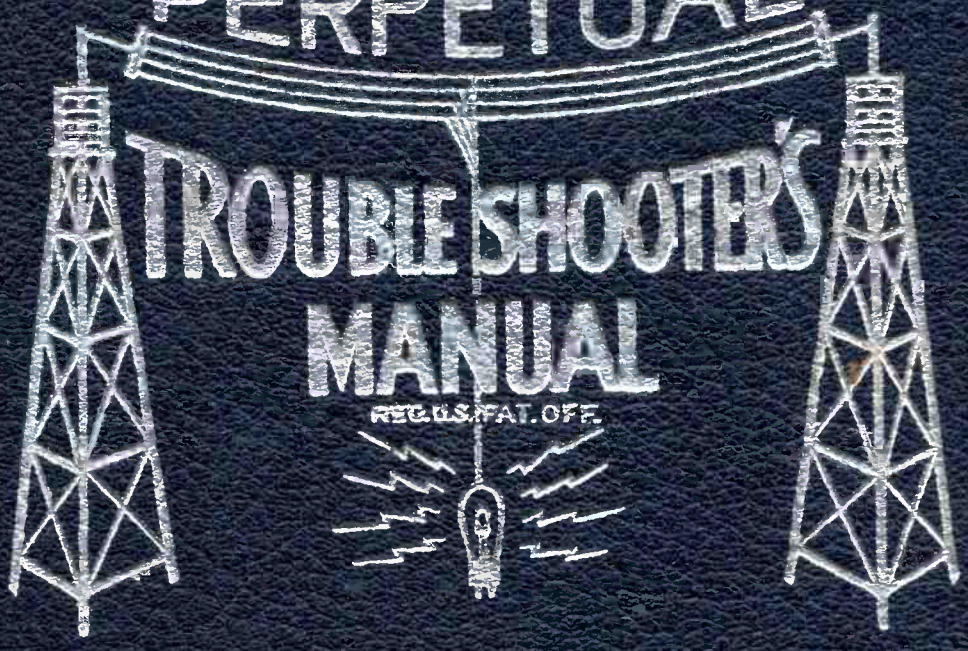
VOLUME XI

PERPETUAL TROUBLESHOOTER'S MANUAL

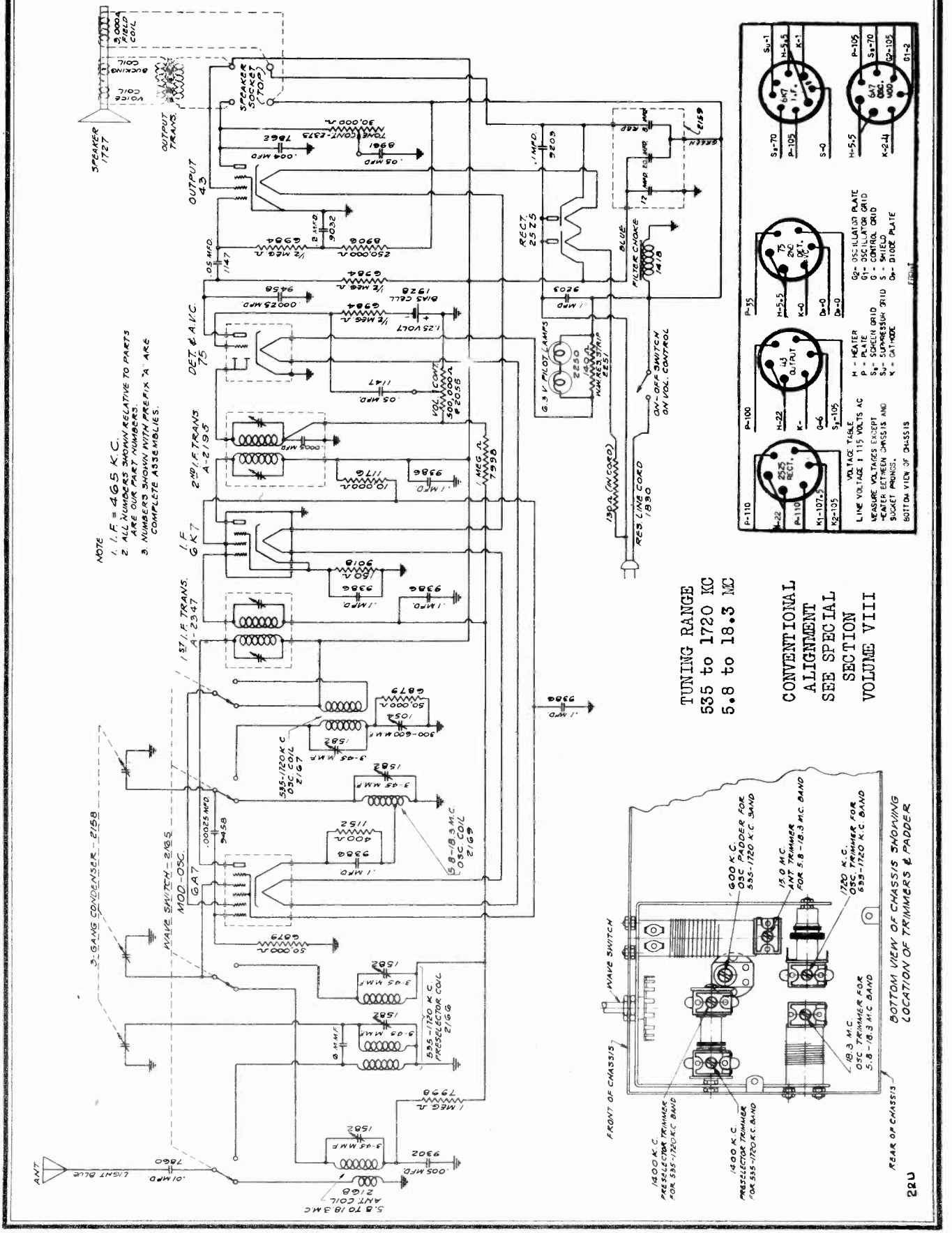
REG. U.S. PAT. OFF.



JOHN F. RIDER

WALGREEN CO.

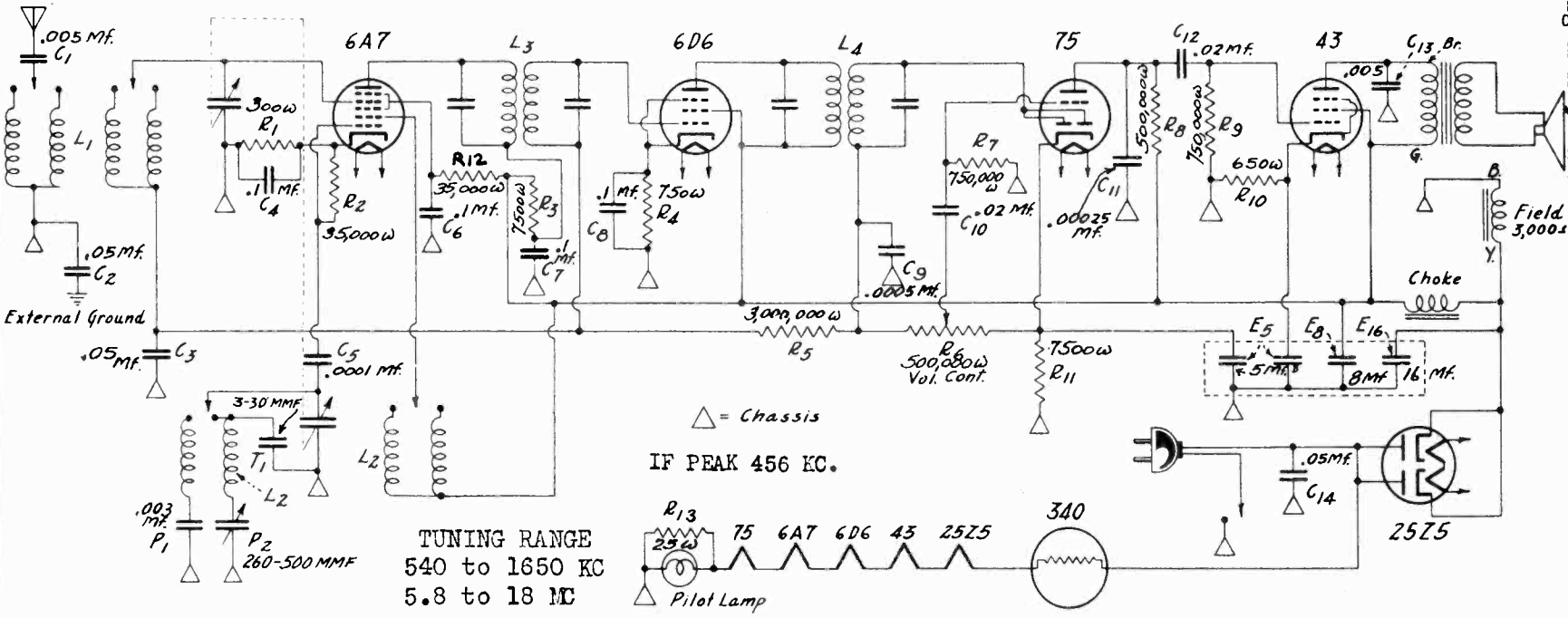
MODEL 22U-73
Schematic, Voltage, Socket
Alignment, Trimmers



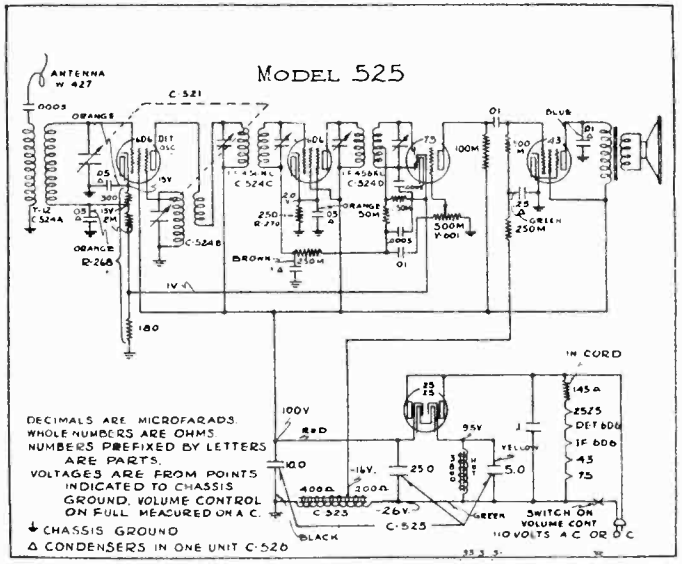
MODEL 66
Schematic
Schematic, Voltage, Socket
MODEL 525
Schematic, Voltage, Socket
Alignment, Trimmers

WALGREEN CO.

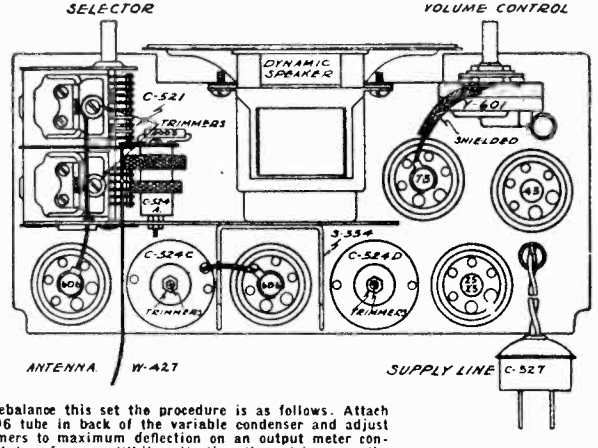
MODEL-66-A.C. D.C.



MODEL 525



Part No.	Description
C 145	.1—300 Volt Condenser
C 155	.0005 Mica Condenser
C 521	Two Gang Condenser
C 522	.01—400 Volt Condenser
C 523	600 Ohm Choke Coil
C 524A	Antenna Coil
C 524B	Oscillator Coil
C 524C	I. F. Transformer
C 524D	I. F. Transformer
C 525	5-25-10 Electrolytic Condenser
C 525B	5-25-10 Electrolytic Condenser
C 526	By-Pass Condenser Block
C 527	Special Cord and Plug
C 531	Dual .05 Condenser
C 534	Dual .1-.025 Condenser
K 214	Knobs
R 268	2480 Ohm Resistor
R 270	250 Ohm—Wire Wound Resistor
V 601	Volume Control
W427	Antenna Wire



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.

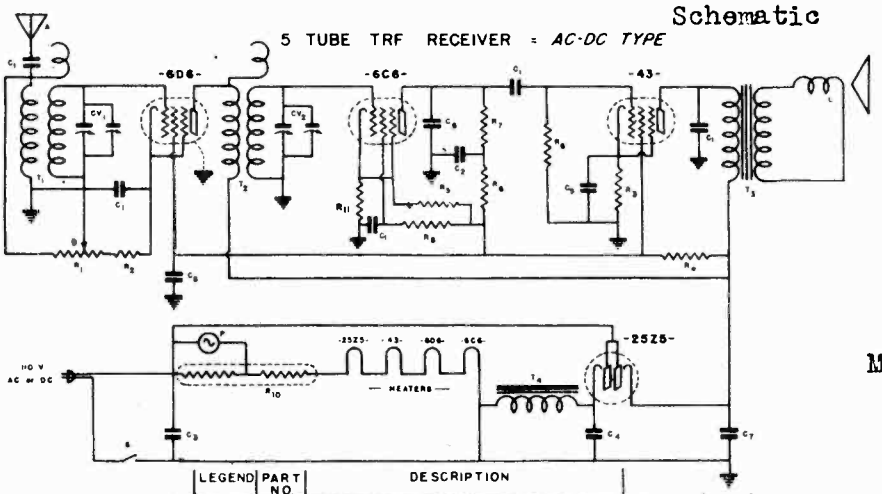
Next disconnect the antenna wire and connect an oscillator in series with a 75 mmf. condenser to the antenna coil. Rotate the condenser plates to the minimum capacity position—extreme left turn, and adjust the trimmer condenser of the rear section of the variable condenser to resonance with an oscillator 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.

IF PEAK 456 KC

WALGREEN CO.

MODEL B-66-RIS
Schematic, Voltage, Socket
Alignment, Trimmers
MODEL 200
Schematic

5 TUBE TRF RECEIVER = *AC-DC TYPE*



ALIGN AT
1500 KC

MODEL 200

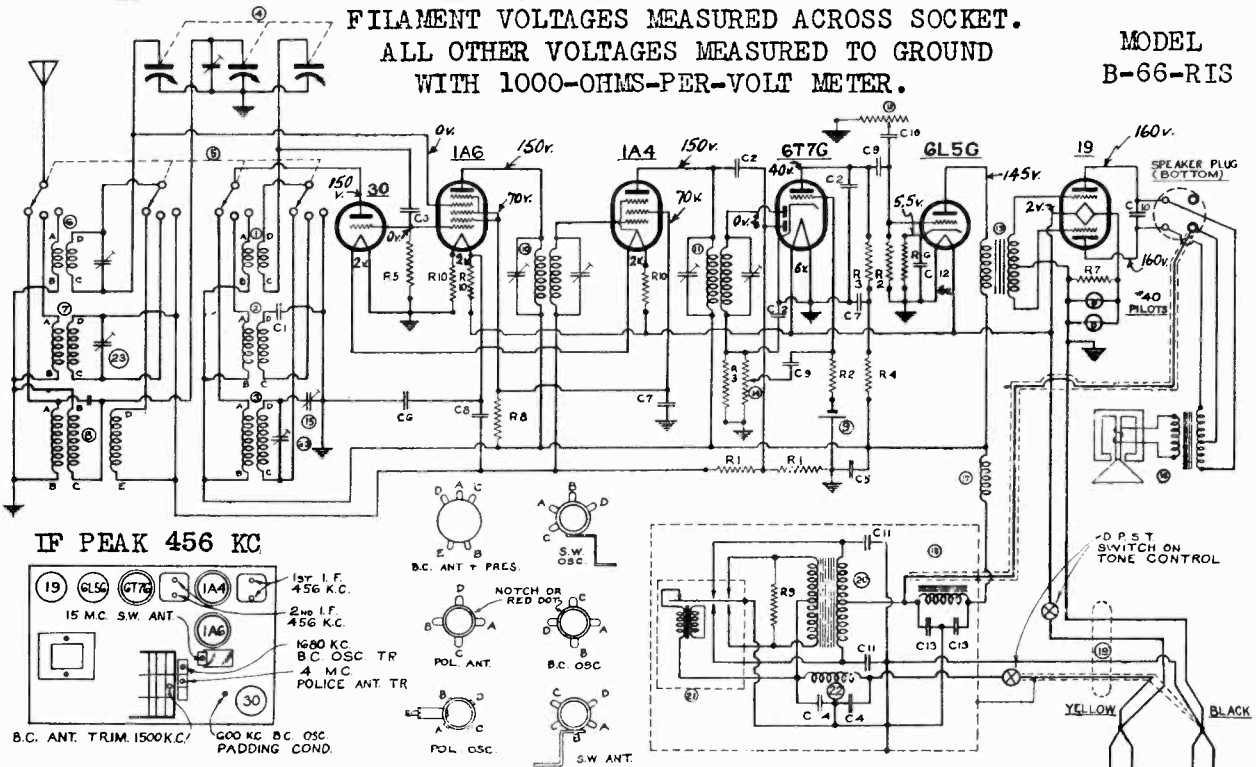
LEGEND	PART NO.	DESCRIPTION
C_1	211	.01 MFD 400 V. TUBULAR CONDENSER
C_2	216	.018 MFD 400 V. TUBULAR CONDENSER
C_3	210	.1 MFD 400 V. TUBULAR CONDENSER
C_4	1N 316	4 MFD 175 W.V. ELECTROLYTIC COND.
C_5	1N 316	5 MFD 25 W.V. ELECTROLYTIC COND.
C_6	1N 316	8 MFD 150 W.V. ELECTROLYTIC COND.
C_7	1N 316	14 MFD 175 W.V. ELECTROLYTIC COND.
C_8	401	.00025 MICA CONDENSER
CV_{1-2}	621	2 GANG VARIABLE CONDENSER

LEGEND	PART NO.	DESCRIPTION
R_1	2006	10,000 OHM VOLUME CONTROL
R_2	—	275 OHM (Minimum on Volume Control)
R_3	104	600 OHM 1/4 WATT CARBON RESISTOR
R_4	108	5,000 OHM 1/4 WATT CARBON RESISTOR
R_5	111	25,000 OHM 1/4 WATT CARBON RESISTOR
R_6	142	51,000 OHM 1/4 WATT CARBON RESISTOR
R_7	116	250,000 OHM 1/4 WATT CARBON RESISTOR
R_8	117	500,000 OHM 1/4 WATT CARBON RESISTOR
R_9	120	3 MEGOHM 1/2 WATT CARBON RESISTOR
R_{11}	105	1000 OHM 1/4 WATT CARBON RESISTOR

LEGEND	PART NO.	DESCRIPTION
R_{10}	2903	L-55-B BALLAST TUBE
T_1	1213	ANTENNA COIL
T_2	1312	R F COIL
T_3	IN 809	SPEAKER OUTPUT TRANSFORMER
T_4	IN 809	SPEAKER FIELD (2500 ohms)
S	—	LINE SWITCH ON VOLUME CONTROL
P	2902	MAZDA #46 PILOT LIGHT
A	2400	INDOOR ANTENNA HANK
L	809	5" DYNAMIC SPEAKER

FILAMENT VOLTAGES MEASURED ACROSS SOCKET.
ALL OTHER VOLTAGES MEASURED TO GROUND
WITH 1000-OHMS-PER-VOLT METER.

MODEL
B-66-RIS



IF PEAK 456 KC

CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII

PART NO.	DESCRIPTION
C1	1500C .001 MFD MICA 5%
C2	1504 .00025 " "
C3	1510 .000025 " "
C4	1625 .5 " " 150v
C5	1616 .25 " " 400v
C6	1614 .25 " " 200v
C7	1601 .1 " " 400v
C8	1600 .1 " " 200V
C9	1603 .01 " " 400V
C10	1611 .006 " " 600 V
C11	1604 .01 " " 600 V
C12	16-100 10 M.F.D. 25V ELECTROLYTIC
C13	1645 8 " 150V "

PART NO.	DESCRIPTION
R1	6017 1 MEG OHM 1/3 W.
R2	6018 .5 " " "
R3	6024 .25 " " "
R4	6026 100,000 " "
R5	6025 50,000 " "
R6	6006 1500 " "
R7	6007 200 " "
R8	6117 25,000 " 1/2 W.
R9	6101 100 " "
R10	60-102 33 1/3 " WIRE WOUND

PART NO.	DESCRIPTION
1	10-135 S.W. OSC. COIL
2	10-138 POLICE OSC. COIL
3	10-134 B.C. OSC. COIL
4	19-106 3 GANG CONDENSER
5	69-103 WAVE SWITCH
6	10-132 S.W. ANT. COIL
7	10-135 POLICE ANT. COIL
8	10-137 B.C. ANT. & PRESEL. C'L
9	4600 BIAS CELL
10	1133 1 ST I.F. TRANSFORMER
11	1134 2 ND. I.F. TRANSFORMER
12	26-102 TONE CONTROL
13	8010 PUSH-PULL AUDIO TRANS.

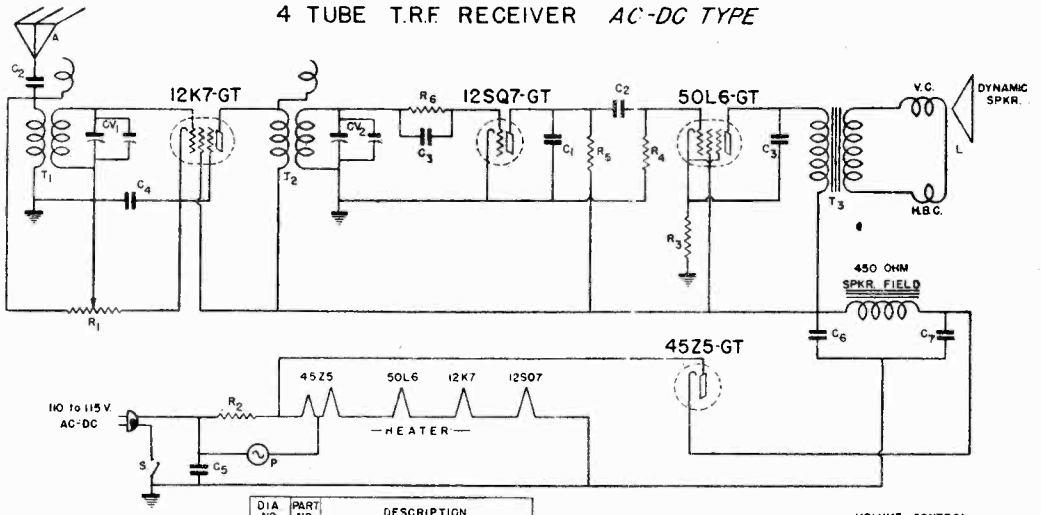
PART NO.	DESCRIPTION
14	24-101 VOLUME CONTROL
15	20-100 M.C. OSC. PADDER
16	SPEAKER
17	3303 R.F. "B" CHOKE
18	3307 FILTER
19	23-103 BATTERY CABLE
20	6041 POWER TRANFORMER
21	3407 VIBRATOR
22	3313 R.F. "A" CHOKE
23	26-102 TRIMMER STRIP

TUNING RANGE
535 to 1680 KC
1.7 to 5.6 MC
5.4 to 20 MC

MODEL 209
MODEL 410
Schematics, Socket

WALGREEN CO.

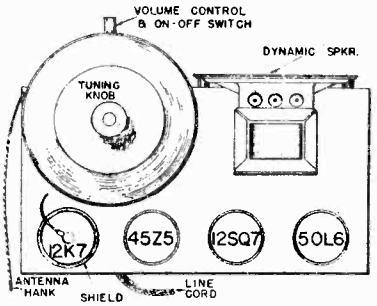
4 TUBE T.R.F. RECEIVER *AC-DC TYPE*



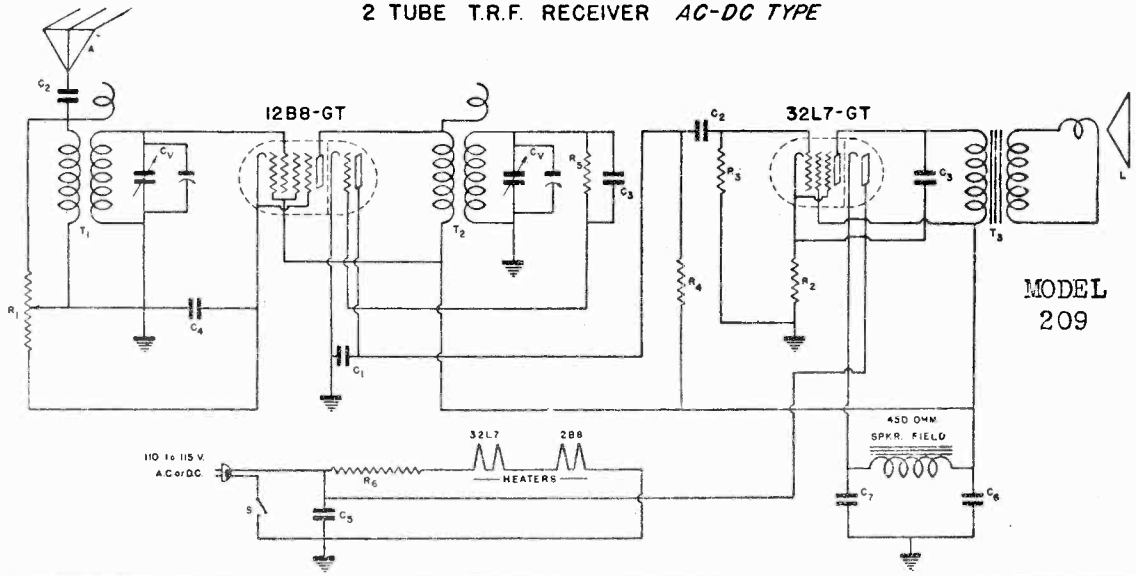
DIA NO.	PART NO.	DESCRIPTION
R_1	2032	25,000 OHM VOLUME CONTROL
R_2	—	10 OHM $\frac{1}{4}$ WATT CARBON RESIST.
R_3	—	150 OHM $\frac{1}{4}$ WATT CARBON RESIST.
R_4	—	$\frac{1}{2}$ MEGOHM $\frac{1}{4}$ WATT CAR. RESIST.
R_5	—	1 MEGOHM $\frac{1}{4}$ WATT CARBON RESIST.
R_6	—	3 MEGOHM $\frac{1}{4}$ WATT CAR. RESIST.
P	—	MAZDA #47 PILOT LIGHT
S	—	LINE SWITCH ON VOLUME CONT.
A	—	ANTENNA WIRE
L	8336	DYNAMIC SPEAKER

DIA NO.	PART NO.	DESCRIPTION
C_1	—	.00025 MFD. 600 V. TUB. COND.
C_2	—	.01 MFD. 400 V. TUBULAR COND.
C_3	—	.02 MFD. 400 V. TUBULAR COND.
C_4	—	.05 MFD. 200 V. TUBULAR COND.
C_5	—	.05 MFD. 400 V. TUBULAR COND.
C_6	IN 343	10 MFD. 150 V. TUBULAR COND.
C_7	IN 343	30 MFD. 150 V. TUBULAR COND.
CV_{1-2}	628C	2 GANG VARIABLE COND.
T_1	A-10	ANTENNA COIL
T_2	R-10	R.F. COIL
T_3	IN 833B	SPEAKER TRANSFORMER

MODEL 410



2 TUBE T.R.F. RECEIVER *AC-DC TYPE*

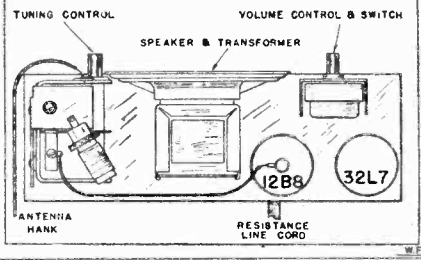


MODEL 209

LEGEND	OUR PART NO.	DESCRIPTION
C_1	—	.00025 MFD. 800V. TUBULAR CONDENSER
C_2	—	.01 MFD. 400 V. TUBULAR CONDENSER
C_3	—	.02 MFD. 400 V. TUBULAR CONDENSER
C_4	—	.05 MFD. 200 V. TUBULAR CONDENSER
C_5	—	.05 MFD. 400 V. TUBULAR CONDENSER
C_6	IN 344	10 MFD. 150 V. ELECTROLYTIC CONDENSER
C_7	IN 344	30 MFD. 150 V. ELECTROLYTIC CONDENSER
C_V	628-D	2 GANG VARIABLE CONDENSER
A	—	AERIAL WIRE
L	833	DYNAMIC SPEAKER

LEGEND	OUR PART NO.	DESCRIPTION
R_1	2031	10,000 OHM VOLUME CONTROL
R_2	—	150 OHM $\frac{1}{4}$ WATT CARBON RESISTOR
R_3	—	500,000 OHM $\frac{1}{4}$ WATT CARBON RESISTOR
R_4	—	1 MEGOHM $\frac{1}{4}$ WATT CARBON RESISTOR
R_5	—	3 MEGOHM $\frac{1}{4}$ WATT CARBON RESISTOR
R_6	1816	240 OHM RESISTANCE LINE CORD
T_1	A-10	ANTENNA COIL
T_2	R-10	R.F. COIL
T_3	ON 833	SPEAKER TRANSFORMER
S	—	LINE SWITCH ON VOLUME CONTROL

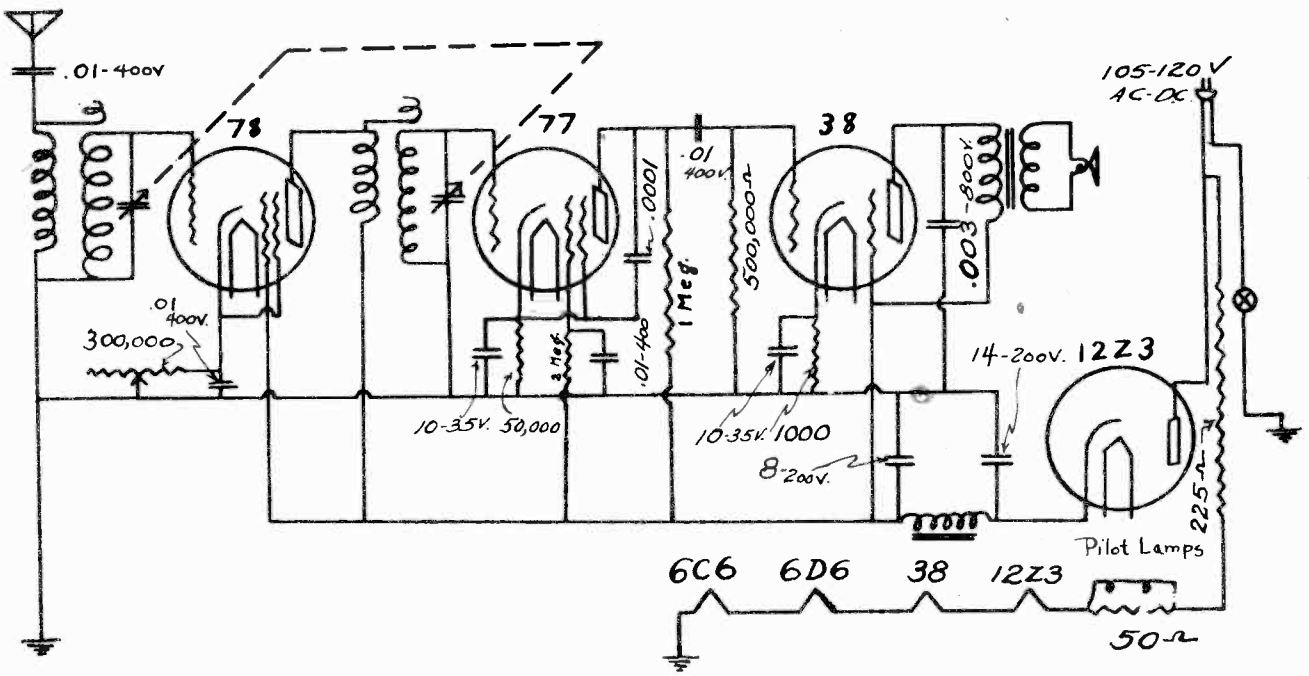
CHASSIS LAYOUT & TUBE LOCATION



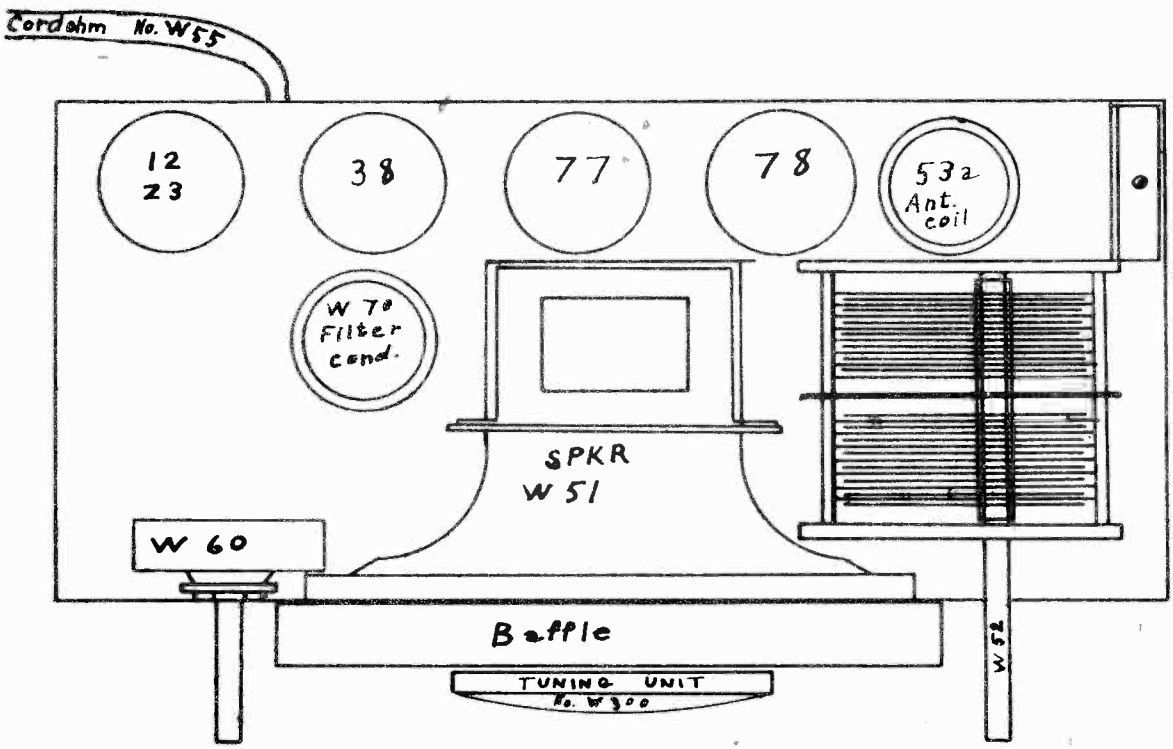
W.F.S.

WALGREEN CO.

MODEL 250
Schematic
Socket

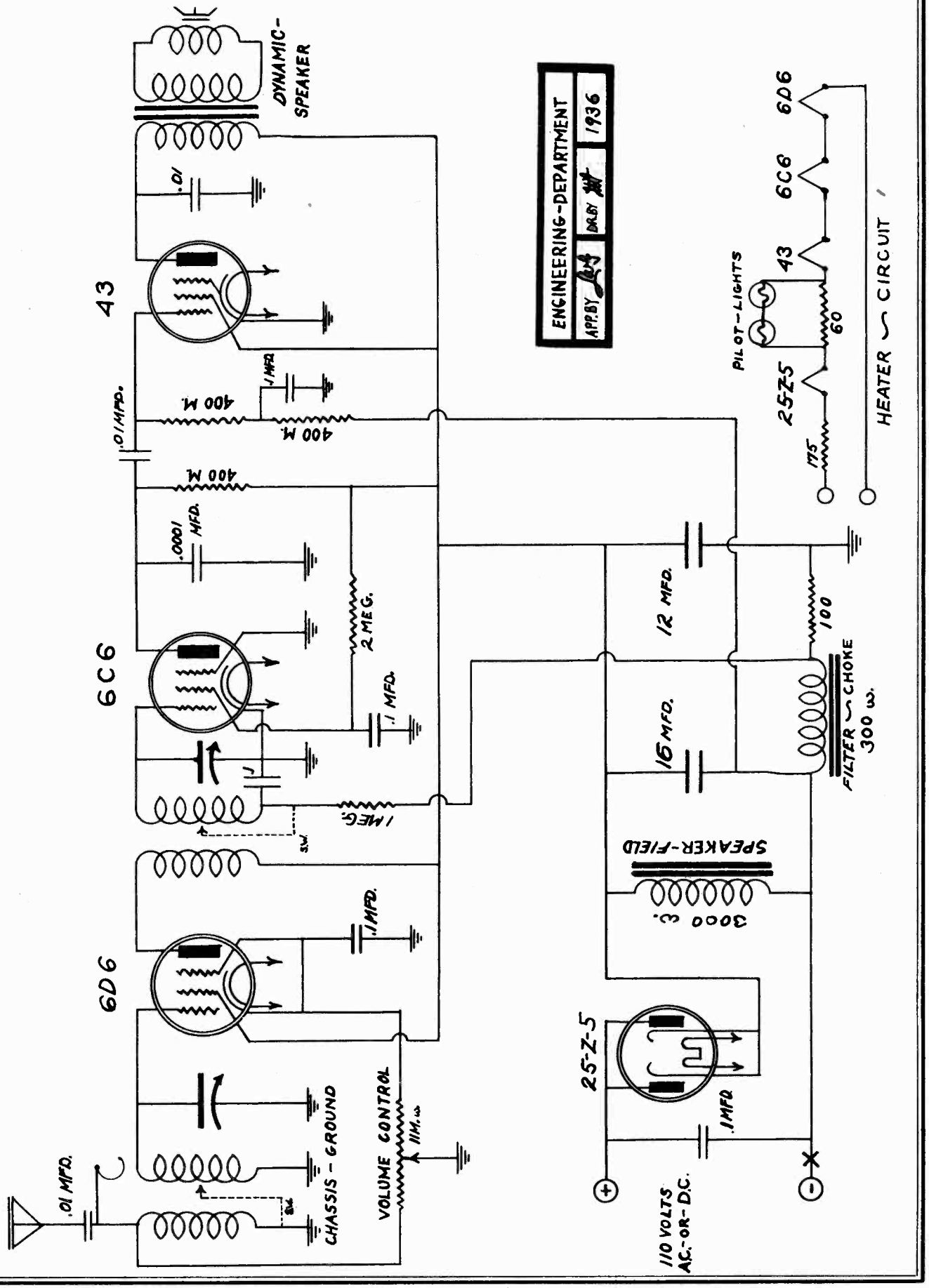


To balance set, remove chassis from cabinet then turn the condenser all the way up and adjust detector stage trimmer condenser to about 1720 kc and align RF stage for maximum gain.



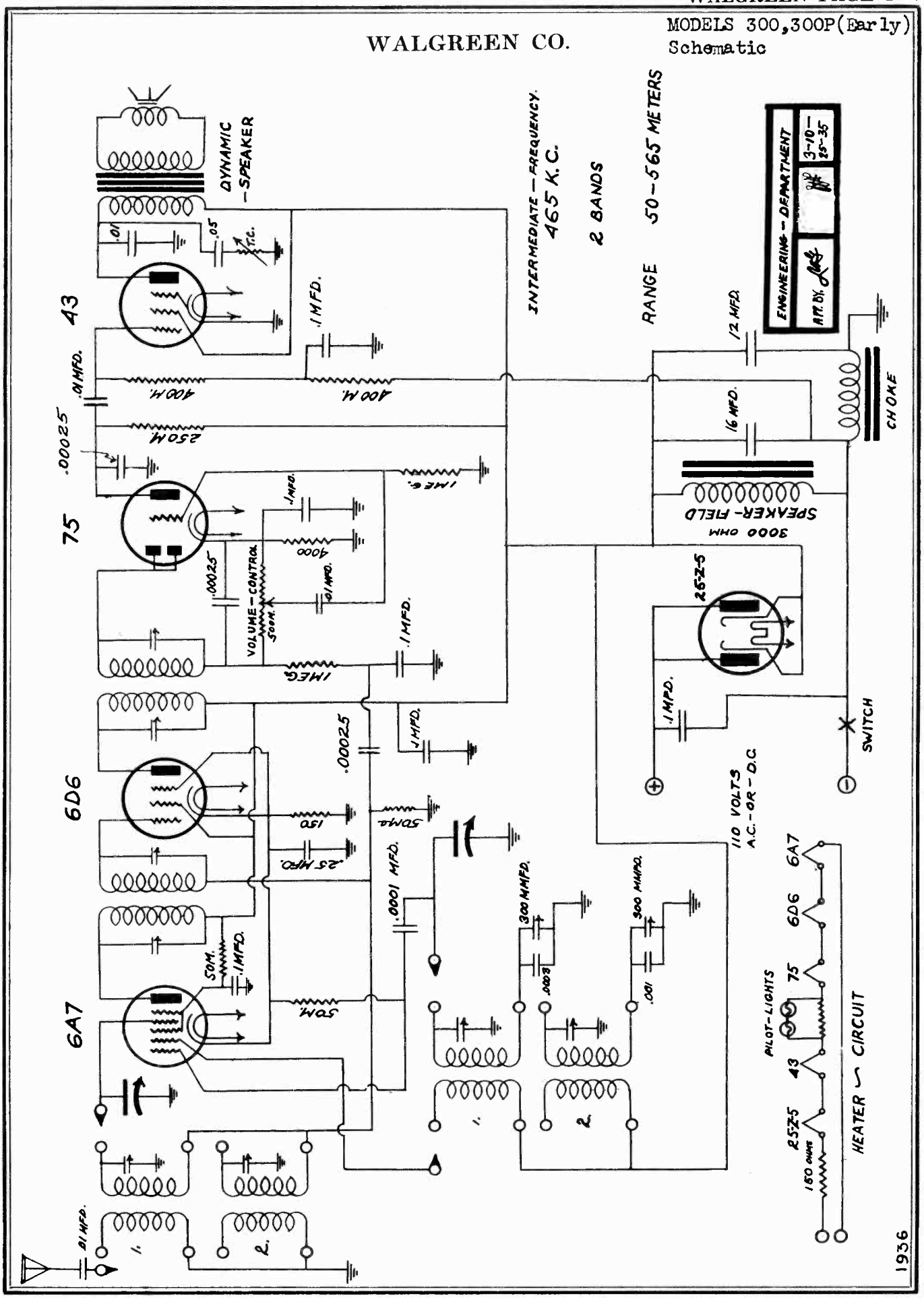
MODEL 252P
Schematic

WALGREEN CO.



WALGREEN CO.

MODELS 300,300P(Early)
Schematic

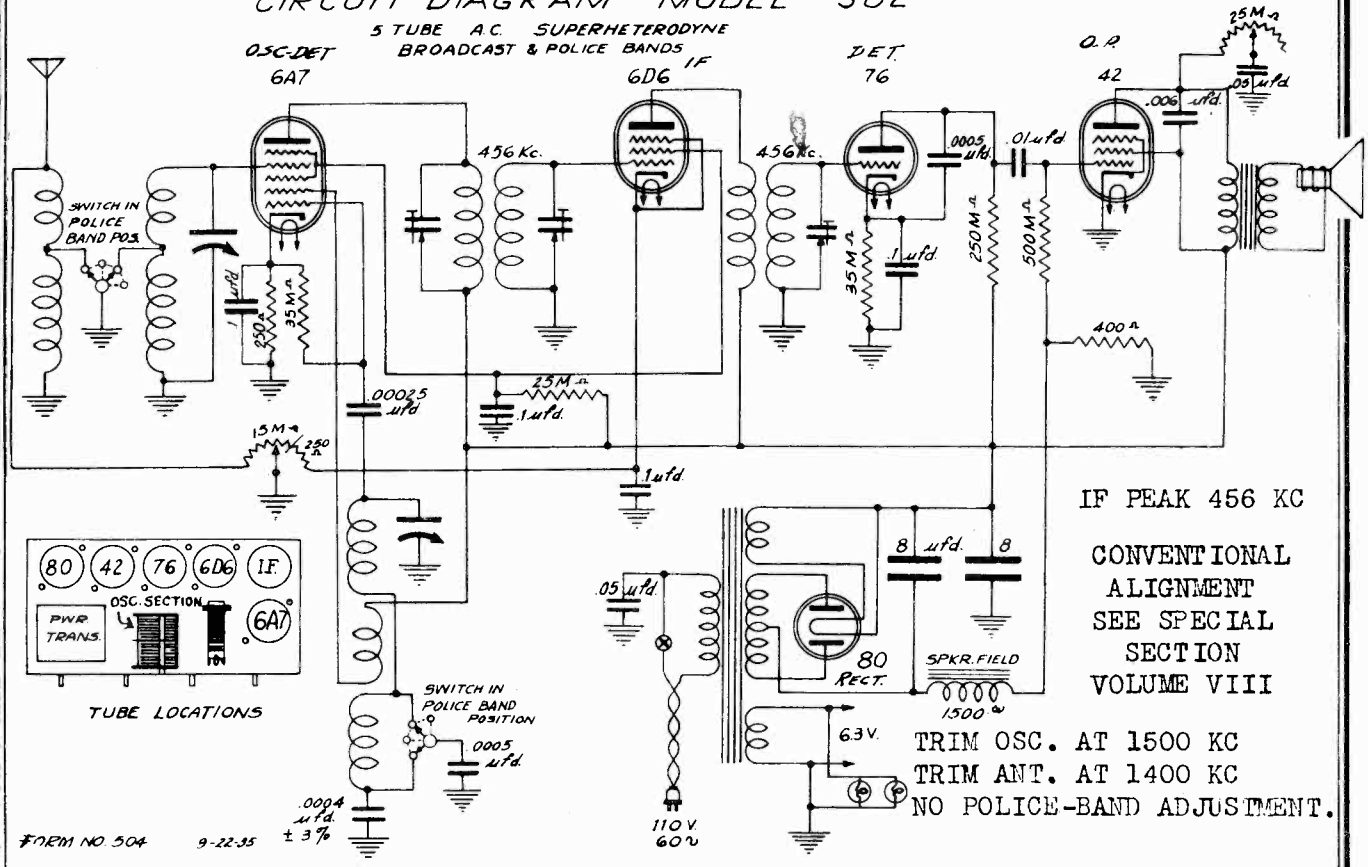


MODEL 400(Late)
Schematic, Voltage
Socket, Trimmers
MODEL 502
Schematic, Socket
Alignment, Trimmers

WALGREEN CO.

CIRCUIT DIAGRAM MODEL 502

5 TUBE A.C. SUPERHETERODYNE
BROADCAST & POLICE BANDS



TUBE LOCATIONS

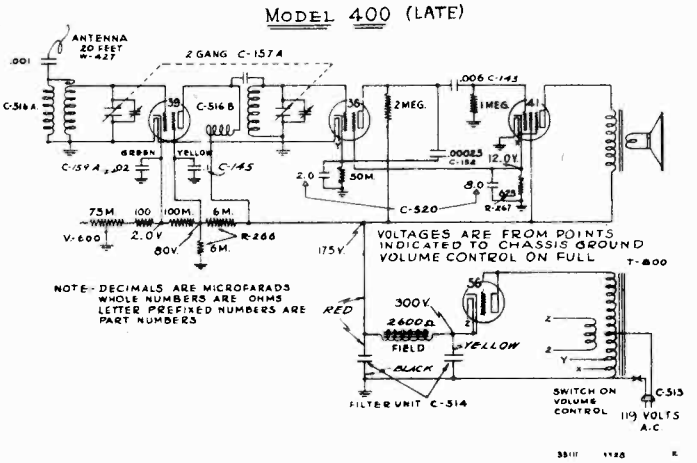
IF PEAK 456 KC

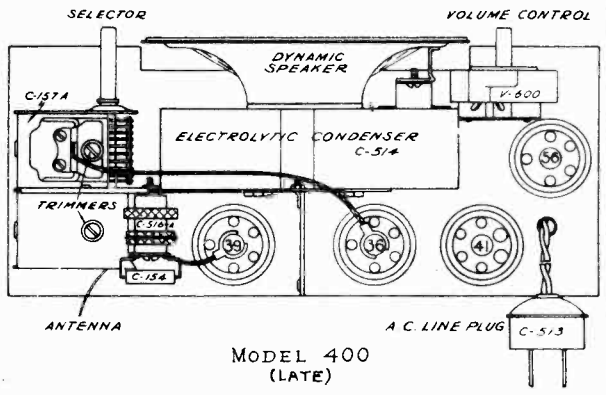
CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII

TRIM OSC. AT 1500 KC
TRIM ANT. AT 1400 KC
NO POLICE-BAND ADJUSTMENT.

FORM NO. 504 9-22-35

MODEL 400 (LATE)





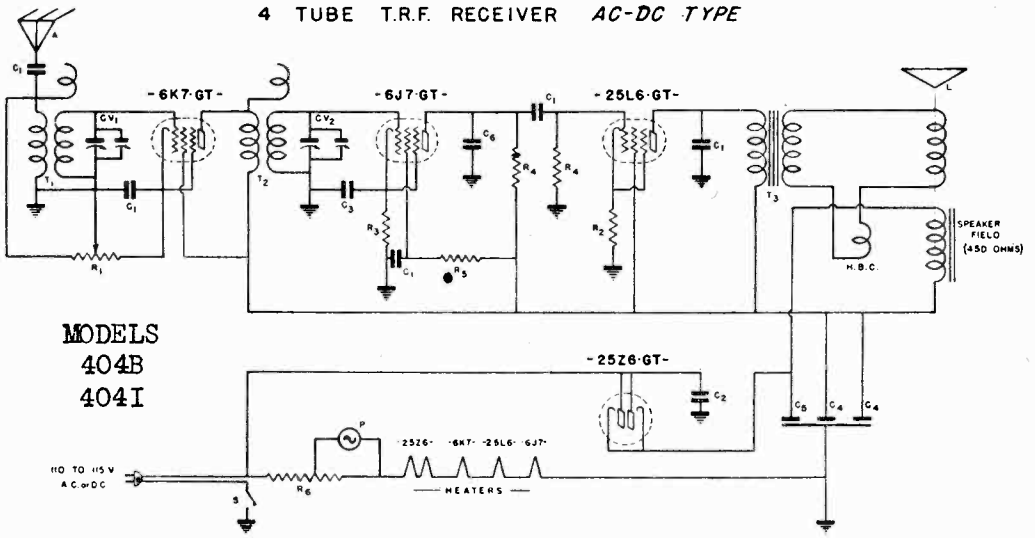
MODEL 400 (LATE)

Model 400 Radio Receiver.
USE ONLY ON 105-115 VOLTS
ALTERNATING CURRENT—45 WATTS

WALGREEN CO.

MODELS 404B, 404I
MODELS 409, 419
Schematics, Socket Trimmers

4 TUBE T.R.F. RECEIVER *AC-DC TYPE*

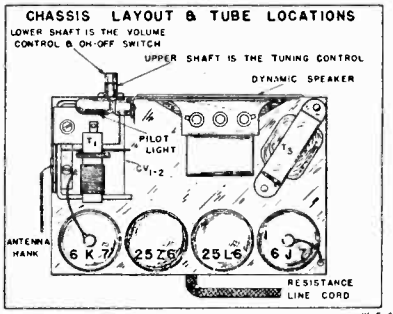


MODELS
404B
404I

LEGEND	OUR PART NO.	DESCRIPTION
C_1	—	.01 MFD. 400 V. TUBULAR CONDENSER
C_2	—	.02 MFD. 400 V. TUBULAR CONDENSER
C_3	—	.25 MFD. 25 V. TUBULAR CONDENSER
C_4	IN 336	10 MFD. 150 W.V. ELECTROLYTIC COND.
C_5	IN 336	20 MFD. 150 W.V. ELECTROLYTIC COND.
C_6	—	.00025 MICA CONDENSER
CV_{1-2}	628-A	2 GANG VARIABLE CONDENSER
T_1	A-10	ANTENNA COIL
T_2	R-10	R.F. COIL
T_3	IN 823	SPEAKER TRANSFORMER

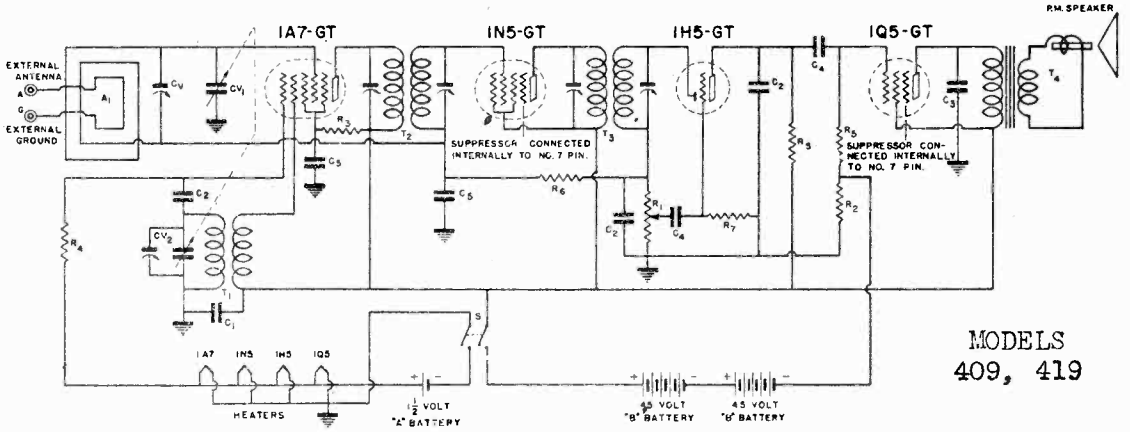
LEGEND	OUR PART NO.	DESCRIPTION
R_1	2028	10,000 OHM VOLUME CONTROL
R_2	—	150 OHM $\frac{1}{4}$ WATT CARBON RESISTOR
R_3	—	25,000 OHM $\frac{1}{4}$ WATT CARBON RESISTOR
R_4	—	500,000 OHM $\frac{1}{4}$ WATT CARBON RESISTOR
R_5	—	2 MEGOHM $\frac{1}{4}$ WATT CARBON RESISTOR
R_6	181-A	210 OHM RESISTANCE LINE CORD
S	—	LINE SWITCH ON VOLUME CONTROL
P	—	MAZDA #44 PILOT LIGHT
A	—	ANTENNA HANK
L	823	DYNAMIC SPEAKER

CHASSIS LAYOUT & TUBE LOCATIONS



W.F.6

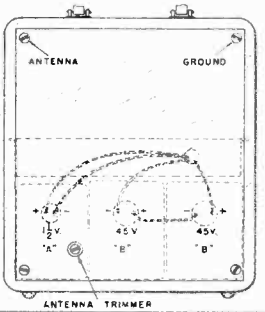
4 TUBE SUPERHETERODYNE RECEIVER - *BATTERY OPERATED*



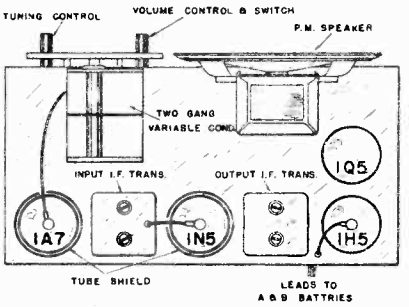
MODELS
409, 419

DIAG. NO.	PART NO.	DESCRIPTION
C_V	518	2 TO 40 MMFD. TRIMMING CONDENSER
CV_{1-2}	648	2 GANG VARIABLE CONDENSER
C_1	—	10 MFD. 200 V. ELECTROLYTIC CONDENSER
C_2	—	.00025 MFD. 800 V. TUBULAR CONDENSER
C_3	—	.002 MFD. 800 V. TUBULAR CONDENSER
C_4	—	.01 MFD. 400 V. TUBULAR CONDENSER
C_5	—	.05 MFD. 200 V. TUBULAR CONDENSER
A_1	3515-A	ANTENNA LOOP
T_1	O-5	OSCILLATOR COIL
T_2	I-3	INPUT I.F. TRANSFORMER
T_3	O-3	OUTPUT I.F. TRANSFORMER
T_4	835-A	PERMANENT MAGNET SPEAKER
S	—	SWITCH ON VOLUME CONTROL
R_1	20090	500,000 OHM VOLUME CONTROL
R_2	—	550 OHM $\frac{1}{4}$ WATT CARBON RESISTOR 10%
R_3	—	30,000 OHM $\frac{1}{4}$ WATT CARBON RESISTOR
R_4	—	250,000 OHM $\frac{1}{4}$ WATT CARBON RESISTOR
R_5	—	500,000 OHM $\frac{1}{4}$ WATT CARBON RESISTOR
R_6	—	2 MEGOHM $\frac{1}{4}$ WATT CARBON RESISTOR
R_7	—	3 MEGOHM $\frac{1}{4}$ WATT CARBON RESISTOR

BACK VIEW OF CABINET



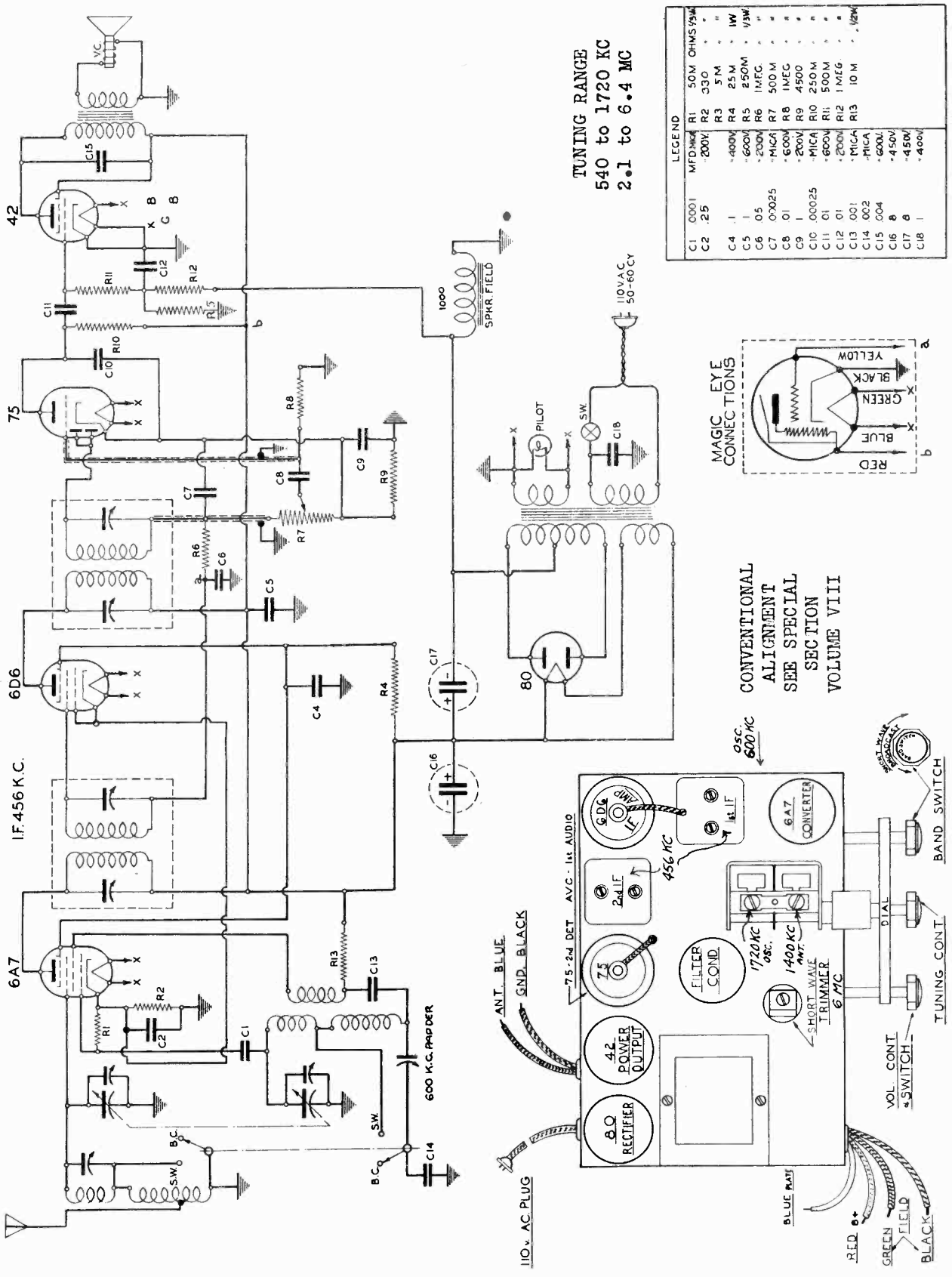
CHASSIS LAYOUT & TUBE LOCATION



W.F.5

MODEL 510 AC(Early)
Schematic,Socket
Alignment,Trimmers

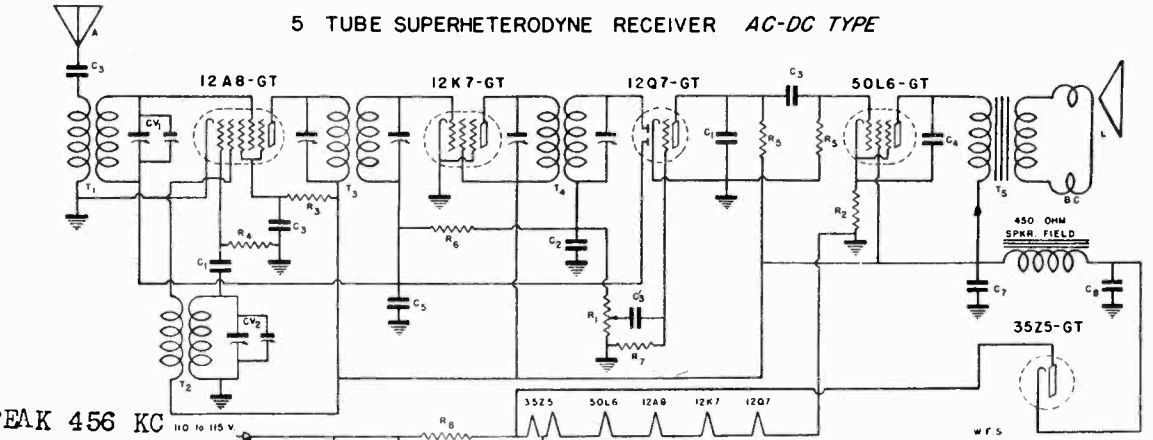
WALGREEN CO.

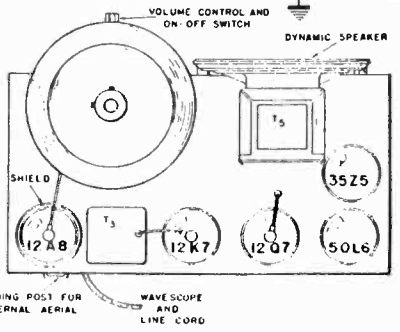


WALGREEN CO.

MODEL 510 AC-DC (Late)
MODEL 529
Schematics, Socket
Trimmers, Alignment

5 TUBE SUPERHETERODYNE RECEIVER *AC-DC TYPE*



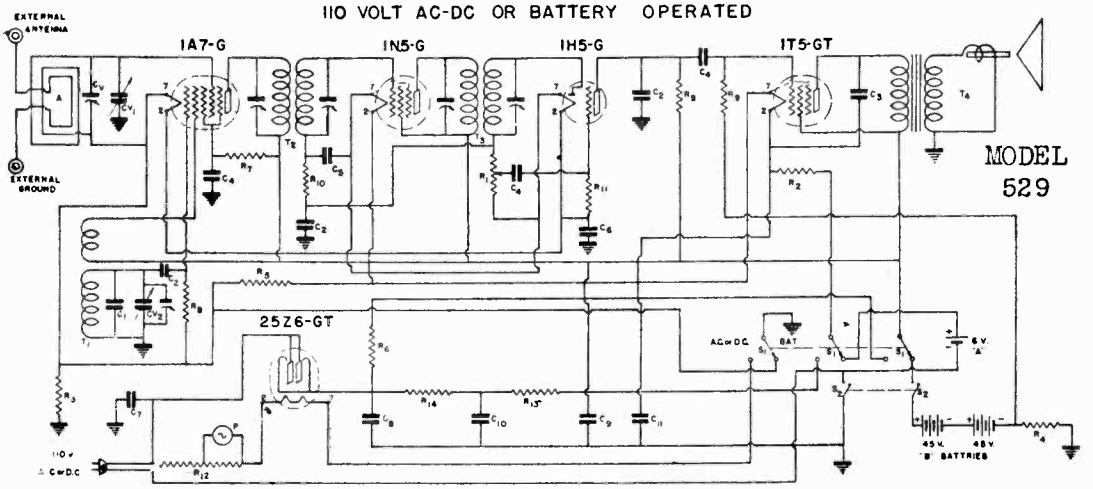


MODEL 510

DIA NO.	PART NO.	DESCRIPTION
C_1	—	.00025 MFD. 600 V. TUBULAR CONDENSER
C_2	—	.0005 MFD. 200 V. TUBULAR CONDENSER
C_3	—	.01 MFD. 400 V. TUBULAR CONDENSER
C_4	—	.02 MFD. 400 V. TUBULAR CONDENSER
C_5	—	.05 MFD. 200 V. TUBULAR CONDENSER
C_6	—	.1 MFD. 400 V. TUBULAR CONDENSER
C_7	IN 344	10 MFD. 150 WV ELECTROLYTIC COND
C_8	IN 344	30 MFD 150 WV ELECTROLYTIC COND
CV_{1-2}	648	2 GANG VARIABLE CONDENSER
P	—	MAZDA NO 47 PILOT LIGHT
A	—	WAVESCOPE AERIAL
L	833-B	DYNAMIC SPEAKER
S	—	LINE SWITCH ON VOLUME CONTROL

DIA NO.	PART NO.	DESCRIPTION
R_1	2009F	500,000 OHM VOLUME CONTROL
R_2	—	150 OHM 1/4 WATT CARBON RESISTOR ±10%
R_3	—	50,000 OHM 1/4 WATT CARBON RESISTOR
R_4	—	25,000 OHM 1/4 WATT CARBON RESISTOR
R_5	—	500,000 OHM 1/4 WATT CARBON RESISTOR
R_6	—	2 MEGOHM 1/4 WATT CARBON RESISTOR
R_7	—	6 MEGOHM 1/4 WATT CARBON RESISTOR
R_8	—	10 OHM 1/4 WATT CARBON RESISTOR
T_1	A-5-A	ANTENNA COIL
T_2	O-5	OSCILLATOR COIL
T_3	I-3	INPUT I.F. TRANSFORMER
T_4	O-3	OUTPUT I.F. TRANSFORMER
T_5	IN 833-B	SPEAKER TRANSFORMER

110 VOLT AC-DC OR BATTERY OPERATED



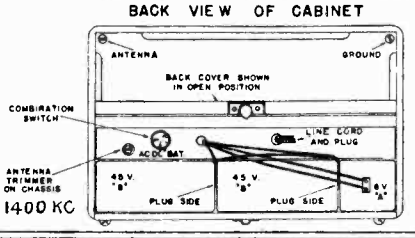
MODEL 529

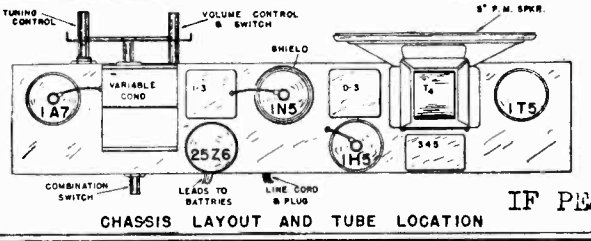
DIAG NO	PART NO	DESCRIPTION
C_1	—	.00002 MICA CONDENSER ±10%
C_2	—	.00025 MFD 600 V. TUBULAR CONDENSER
C_3	—	.002 MFD 600 V. TUBULAR CONDENSER
C_4	—	.01 MFD 400 V. TUBULAR CONDENSER
C_5	—	.03 MFD. 200 V. TUBULAR CONDENSER
C_6	—	.1 MFD 200 V. TUBULAR CONDENSER
C_7	—	.1 MFD 400 V. TUBULAR CONDENSER
C_8	345	40 MFD 200 V. ELECTROLYTIC CONDENSER
C_9	345	20 MFD 200 V. ELECTROLYTIC CONDENSER
C_{10}	345	10 MFD 35 V. ELECTROLYTIC CONDENSER
C_{11}	345	70 MFD 8 V. ELECTROLYTIC CONDENSER
C_V	518	2 TO 40 MMFD TRIMMER CONDENSER

DIAG NO	PART NO	DESCRIPTION
CV_{1-2}	648	2 GANG VARIABLE CONDENSER
A	3518	ANTENNA LOOP
T_1	O-5	OSCILLATOR COIL
T_2	I-3	INPUT I.F. TRANSFORMER
T_3	O-3	OUTPUT I.F. TRANSFORMER
T_4	837	PERMANENT MAGNET SPEAKER
S_1	1940	3 POLE TWO POSITION BAND SWITCH
S_2	—	SWITCH ON VOLUME CONTROL
R_1	2009-E	500,000 OHM VOLUME CONTROL
R_2	—	10 OHM 1/4 WATT CARBON RESISTOR ±10%
R_3	—	30 OHM 1/2 WATT CARBON RESISTOR ±10%
R_4	—	100 OHM 1/4 WATT CARBON RESISTOR

DIAG NO	PART NO	DESCRIPTION
R_5	—	700 OHM 1/4 WATT CARBON RESISTOR
R_6	—	3000 OHM 1/4 WATT CARBON RESISTOR
R_7	—	50000 OHM 1/4 WATT CARBON RESISTOR
R_8	—	150 000 OHM 1/4 WATT CARBON RESISTOR
R_9	—	500 000 OHM 1/4 WATT CARBON RESISTOR
R_{10}	—	2 MEGOHM 1/4 WATT CARBON RESISTOR
R_{11}	—	3 MEGOHM 1/4 WATT CARBON RESISTOR
R_{12}	1818	305 OHM TAPPED RESISTANCE LINE CORD
R_{13}	IN-155	400 OHM 1 WATT WIRE WOUND RESISTANCE
R_{14}	IN-155	2200 OHM 5 WATT WIRE WOUND RESISTANCE
P	—	MAZDA NO 47 PILOT LIGHT

BACK VIEW OF CABINET





CHASSIS LAYOUT AND TUBE LOCATION

IF PEAK 456 KC

INSTRUCTIONS FOR SETTING UP PUSH BUTTONS

After receiver is installed and antenna and ground properly connected, plug line cord into a convenient outlet. Then turn the volume control to about the center of rotation. This will turn the receiver on and put it in an operating condition. Time must be allowed for the tubes to heat up before stations can be tuned in. This time is approximately one-half minute.

The automatic tuning feature of your radio makes it possible to set up 6 favorite American broadcast stations and tune them in quickly with the automatic tuner. Choose stations for push-button operation heard with good volume at all times.

Cut the call letters of your 6 selected stations from the list supplied with your receiver and slip them into the Tab Holder from the top, with the clear celluloid in front of the call letters to protect them. Arrange the call letters in the Tab Holder from right to left. Have the call letters of the lowest frequency station at the extreme right and work progressively to the left so that the highest frequency call letters will be at the extreme left.

Follow the procedure outlined below, in order to adjust the push-buttons properly.

1. By means of the Station Selector Knob tune in WITH THE RIGHT HAND AS ACCURATELY AS POSSIBLE the station having the lowest frequency—that is, your selected station which is tuned in nearest the right-hand side of the dial.

2. After the station has been tuned in accurately with the right hand, continue to hold it in its exact position firmly, and with the left hand loosen the Push-Button to be set up for that station by unscrewing the Push-Button about one turn to the left (counter-clockwise).

3. Continuing to hold the Station Selector Knob in its exact position, PUSH THE PUSH-BUTTON IN ALL THE WAY with the left hand.

4. After the Push-Button has been depressed all the way, tighten it gently toward the right (clockwise). Release Push-Button slowly and when in normal position grip button and tighten firmly.

The Push-Button tuning system is now correctly set up for your first selected station of lowest frequency and the Call Letter Tab for this station should be at the extreme right of the Call Letter Holders.

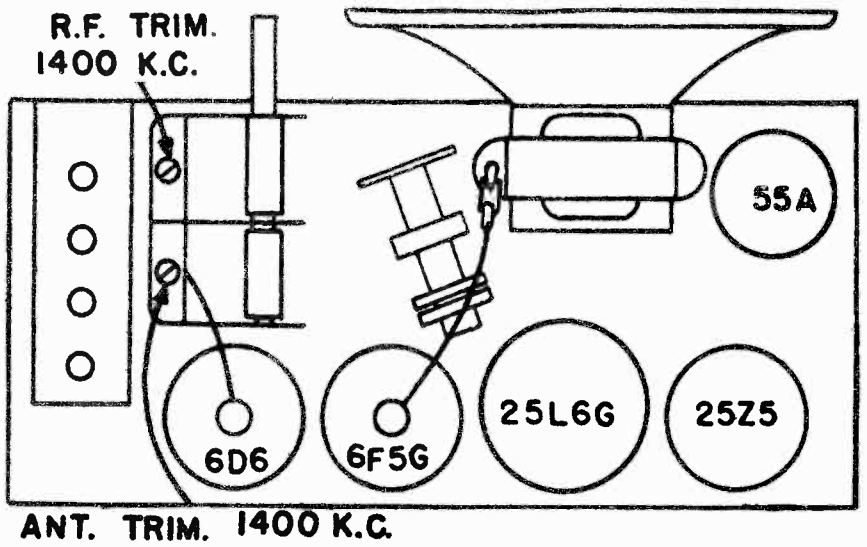
Follow through with this same procedure, setting up the other 5 stations in the order of their frequency—that is, the second station set up will be second lowest in frequency and the third station set up will be third lowest in frequency.

Carefully check each Push-Button for the accuracy of the setting. If, when tuning in any station with its Automatic Push-Button it does not have equal volume or clarity to that obtained with manual tuning, this may indicate the automatic adjustment for that station was not made accurately. Should there be any inaccuracy in any one of the Push-Button adjustments, correction can be made by repeating the above procedure for that button only. Do not reset those Push-Buttons that are accurately adjusted.

No further adjustments are necessary to operate your radio automatically or manually. To receive any one of your four selected stations for automatic operation, merely push in ALL THE WAY the Button set up for that station.

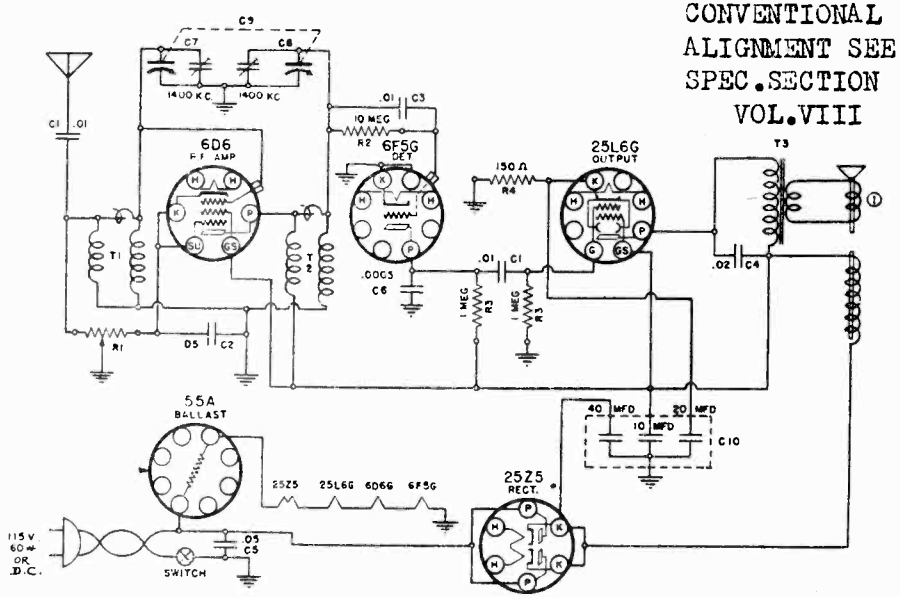
This receiver is made to cover from 1750K.C. to 535K.C.

CODE	PART NO.	DESCRIPTION	CODE	PART NO.	DESCRIPTION 542
C1	1604	.01 MFD. 600V TUBULAR CONDENSER	R1	24-127	VOLUME CONTROL & SWITCH
C2	1622	.05 MFD. 200 V " "	R2	60-193	10 MEGOHM 1/3 W. RESISTOR
C3	16-119	.01 MFD. 400 V. " "	R3	60-195	1 " " "
C4	16-103	.02 MFD. 600 V. " "	R4	60-184	150 OHMS " "
C5	1607	.05 MFD. 400V " "			
C6	15-112	.00C5 MFD. MICA CONDENSER	T1	10-249	ANTENNA COIL
C7, C8, C9	19-135	ANTENNA VARIABLE COND	T2	10-250	R.F. COIL
		OSCILLATOR VARIABLE COND	T3		OUTPUT TRANSFORMER
C10	18-234	FILTER CONDENSER: 40 X 10 MF-400WV 20 MF - 25 WV	1	79-251	SPEAKER



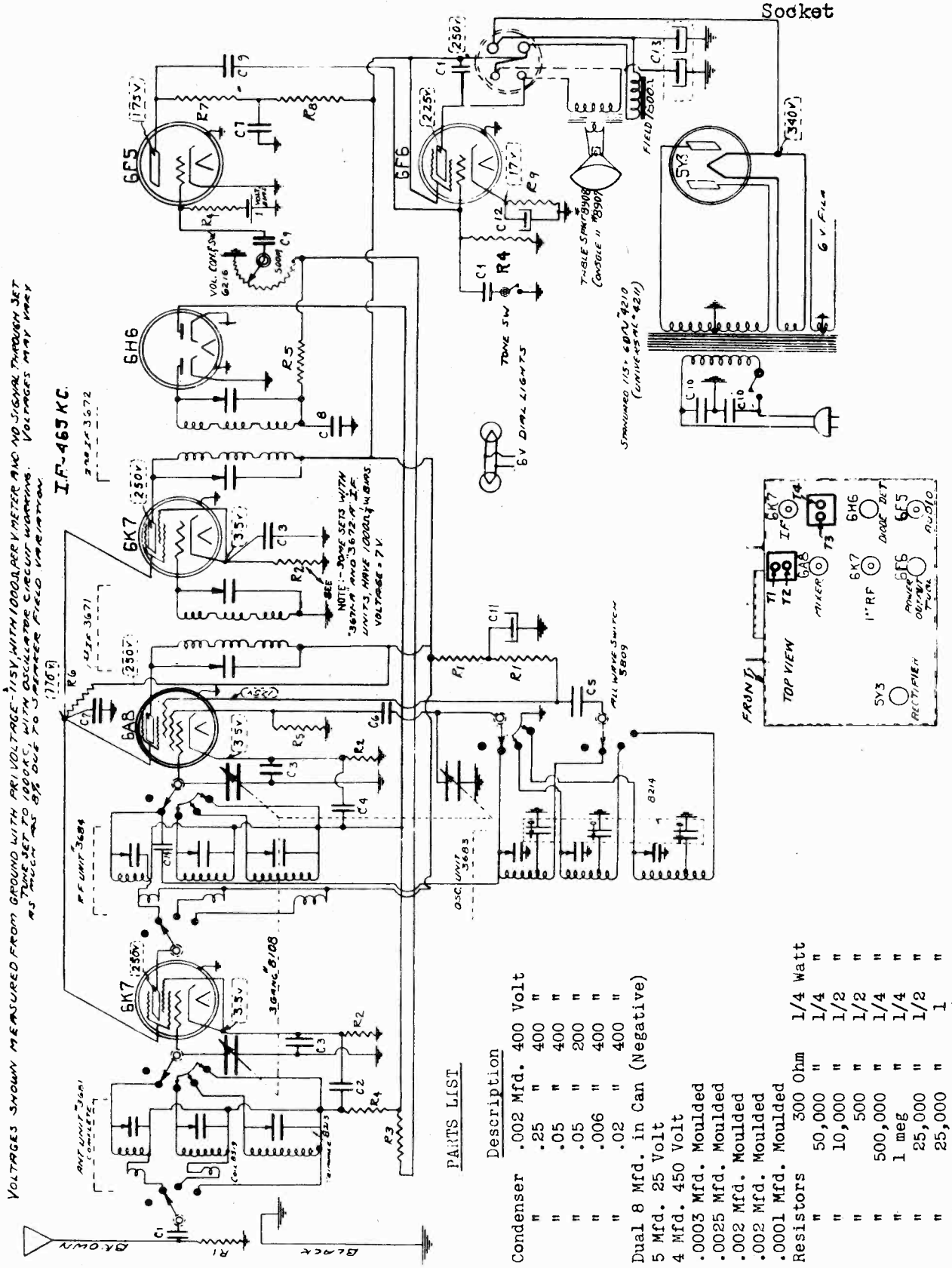
This receiver is a 5 tube AC/DC current operated T.R.F.

CONVENTIONAL ALIGNMENT SEE SPEC. SECTION VOL. VIII



WALGREEN CO.

MODEL 750
Schematic, Voltage
Socket



PARTS LIST

Part No.	Description			
3516 (C2)	Condenser	.002 Mfd.	400 Volt	
2758 (C7)	"	.25 "	400 "	
2757 (C10)	"	.05 "	400 "	
2183 (C3)	"	.05 "	200 "	
3515 (C1)	"	.006 "	400 "	
3517 (C9)	"	.02 "	400 "	
3004 (C13)	Dual 8 Mfd. in Can (Negative)			
3003 (C12)	5 Mfd. 25 Volt			
8814 (C11)	4 Mfd. 450 Volt			
8304 (C8)	.0003 Mfd. Moulded			
8305X (C4)	.0025 Mfd. Moulded			
2287X (C5)	.002 Mfd. Moulded			
287 (C14)	.002 Mfd. Moulded			
2366 (C6)	.0001 Mfd. Moulded			
1836 (R2)	Resistors	300 Ohm	1/4 Watt	
1843 (R5)	"	50,000 "	1/4 "	
3349 (R1)	"	10,000 "	1/2 "	
1890 (R9)	"	500 "	1/2 "	
3328 (R4)	"	500,000 "	1/4 "	
3335 (R3)	"	1 meg "	1/4 "	
3344 (R8)	"	25,000 "	1/2 "	
2650 (R6)	"	25,000 "	1 "	
1824 (R7)	"	250,000 "	1/2 "	

THE I.F. STAGES

The I.F.'s are aligned by the usual system of feeding the intermediate frequency of 465KC into the grid of the 6A7 tube.

The two trimmers in each of the I.F. cans should be very carefully peaked to resonance as they are very critical and will greatly affect the performance of the set. These are trimmers number T1, T2, T3, T4. (See pictorial diagram).

The sensitivity of the I.F. stages will be 30 microvolts or better.

Always use as low an output as possible from the test oscillator in making the various adjustments.

II ALIGNMENT OF SHORTWAVE BAND 5.5 TO 18 M.C.

First check the position of the dial hand by rotating the condenser shaft to the left to full capacity. At this point the dial hand should be straight across in line with the lines dividing the scale in half. If the hand is off position it can be lined up by removing dial glass and setting hand with screw in center of dial.

1. Set the test oscillator to 17 megacycles.

2. Turn wave band switch all the way to right for highest S.W. band, and set dial hand to 17 M.C.

3. Peak trimmer condenser T5 of the oscillator coil (See pictorial) to resonance with 17 M.C. fed into antenna.

4. Adjust antenna and RF coil trimmers T6 and T7 to same frequency after the above mentioned oscillator trimmer has been set.

5. Turn dial hand to 6 M.C. on the same band and peak padding condenser P-1 to 6 M.C.

III SHORTWAVE BAND 1.7 TO 5.5 M.C.

1. Set band switch to this band and dial hand to 5 M.C.
2. Peak trimmer T8 to 5 M.C.
3. Peak antenna and RF trimmer to T9 and T10 to 5 M.C.
4. Rotate dial to 1.7 M.C. and adjust padding condenser P-2 1.7 M.C.

NOTE: After adjusting the two high bands at 17 megacycles and 5 megacycles the test oscillator input to antenna should be increased and receiver dial advanced to .9 megacycle lower and note if test oscillator signal is heard.

In case there is no response the oscillator trimmers have been pulled down too tightly. The trimmers should be released until this condition exists then go back to original point of alignment - reduce antenna input voltage and correct the trimmer adjustment.

EXAMPLE: The receiver has been adjusted to 17 megacycles. Tune receiver to approximately 16.9 M.C.

Increase oscillator signal by "opening up" the attenuator. Move the dial back and forth at 16.9 M.C.

If no signal is heard, let oscillator trimmer off until it is heard at 16.9 M.C.

Reduce signal voltage from generator, go back to 17 M.C. and slightly correct this last trimmer adjustment.

The same applies to the 5 M.C. adjustment.

IV THE BROADCAST BAND

1. Turn wave band switch all the way to left and dial hand set to 1400 KC (the top scale).

2. Peak oscillator trimmer T11 to 1400 KC and RF circuit trimmers T12 and T13 to same frequency.

3. Set dial hand to 550 KC and adjust oscillator padding condenser P-3 to 550 KC.

4. Recheck dial at 1400 KC as in number (1) and (2).

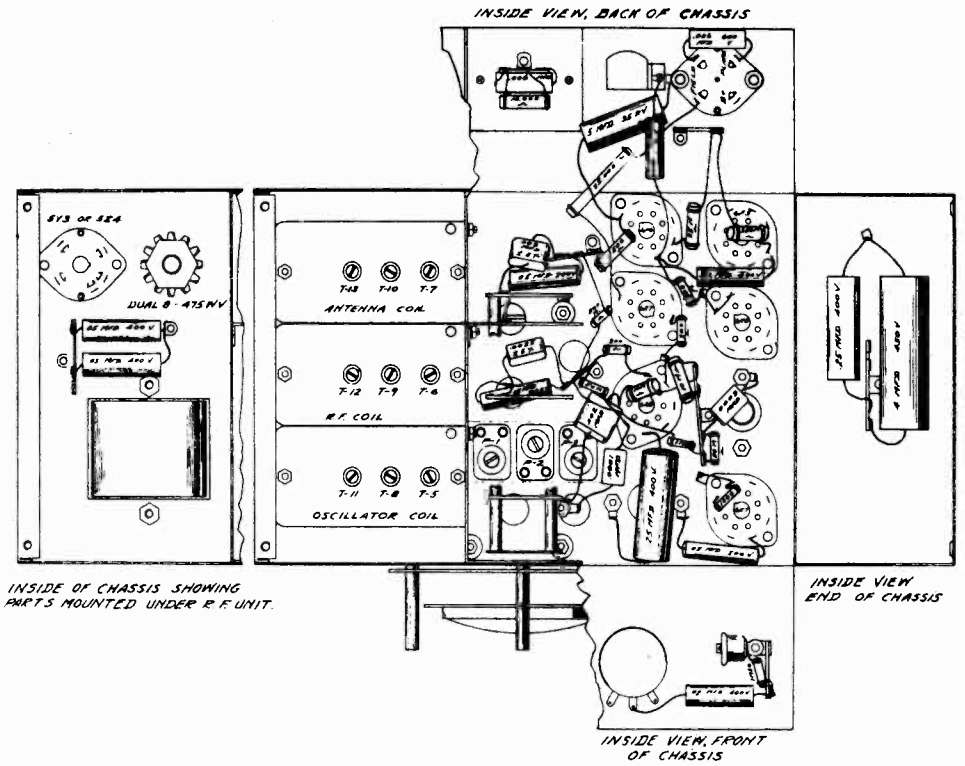
5. Points in the middle of the dial may be checked and if necessary the plates of the front section of variable condenser may be bent for alignment.

V NOTES.

1. Seal all trimmers after their final adjustment.

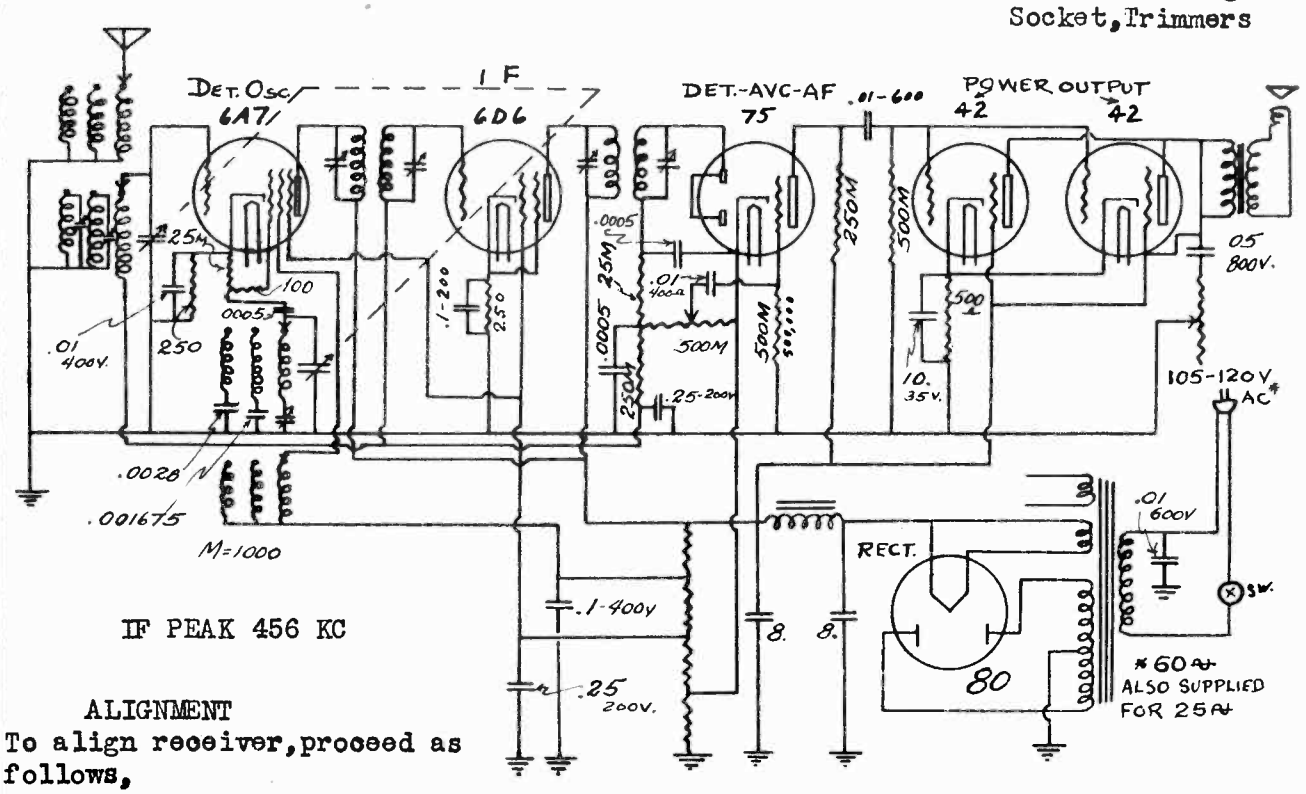
2. Be sure that the settings are being made to the true fundamental signal from the oscillator and not on a harmonic or image frequency.

3. Refer to the schematic for the voltages at the tube sockets.



WALGREEN CO.

MODELS 600,650
Schematic,Alignment
Socket,Trimmers

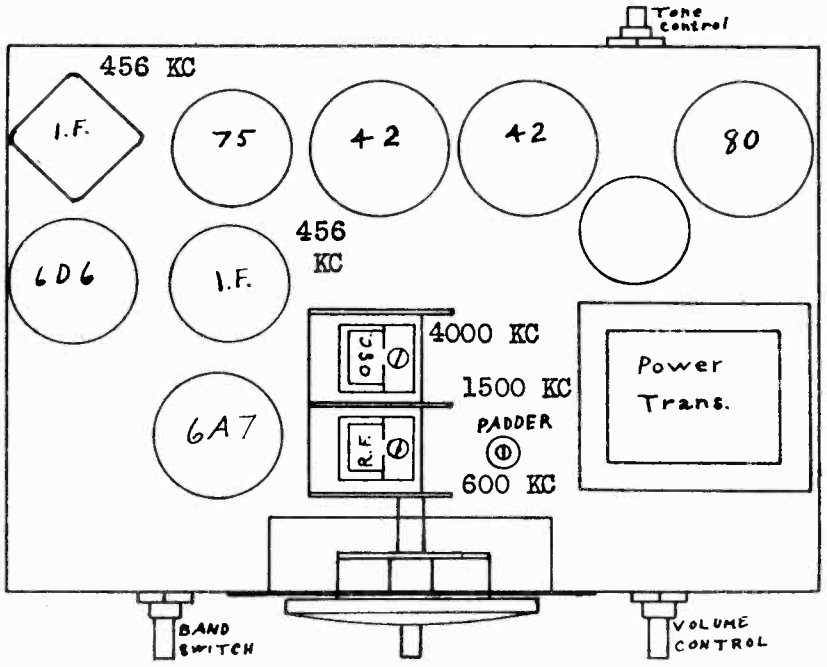


IF PEAK 456 KC

ALIGNMENT

To align receiver,proceed as follows,

1. Apply 456 KC note to control grid of 6A7 and peak IF transformers for maximum gain.
2. Apply 4000 KC note to antenna wire; set band switch to second band and align trimmer on oscillator section of variable condenser to track with 4000 KC on dial
3. Turn band switch to broadcast band; apply 1500 KC note to antenna wire, adjust trimmer of RF section of variable condenser for maximum gain.
4. Apply 600 KC note to antenna, adjust padder condenser for maximum gain, swinging condenser back and forth across 600 KC signal.
5. Check 1400 KC signal for alignment.
6. Turn band switch to second band; check 4000 KC signal for alignment and adjust trimmer on antenna coil for greatest gain at 4000 KC.
7. Turn band switch to last band and adjust trimmer on antenna coil for greatest noise on 12 megacycles.

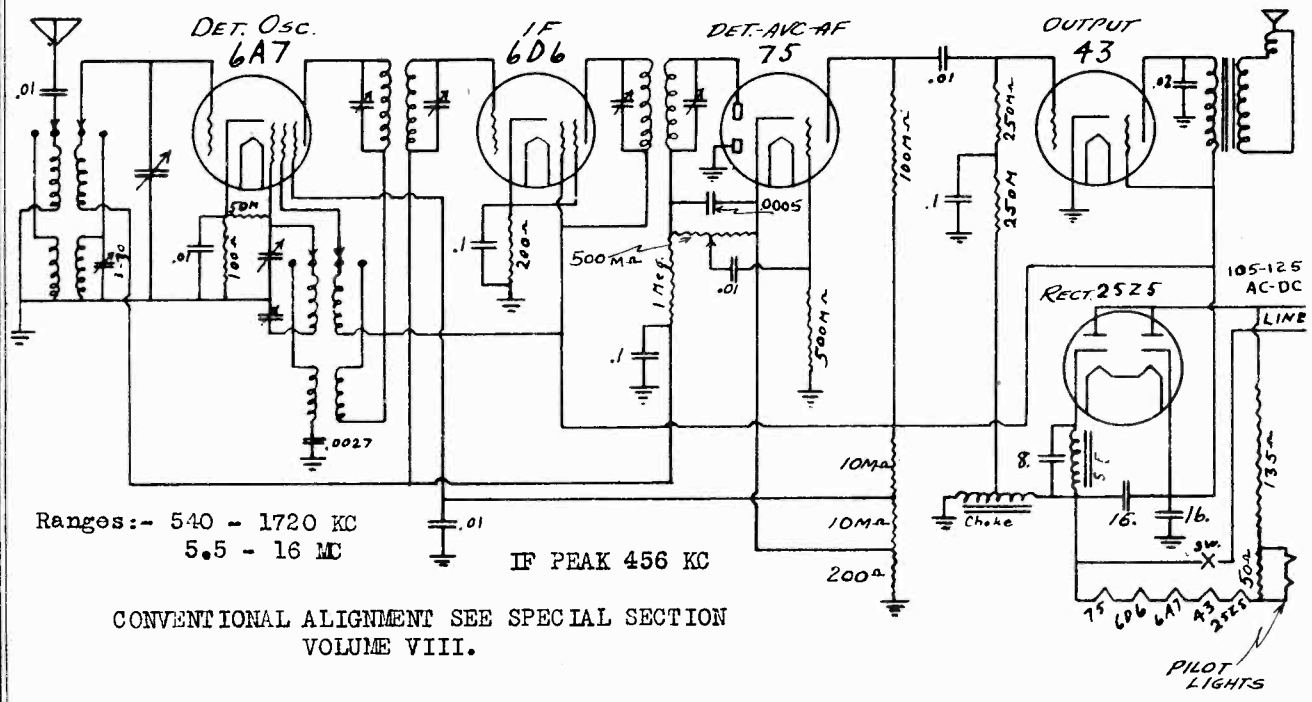


RANGES:-

This receiver covers
540 - 1720 kilocycles
1720- 5000 kilocycles
5.5- 16 megacycles

MODEL 901
Schematic, Alignment
Socket, Trimmers

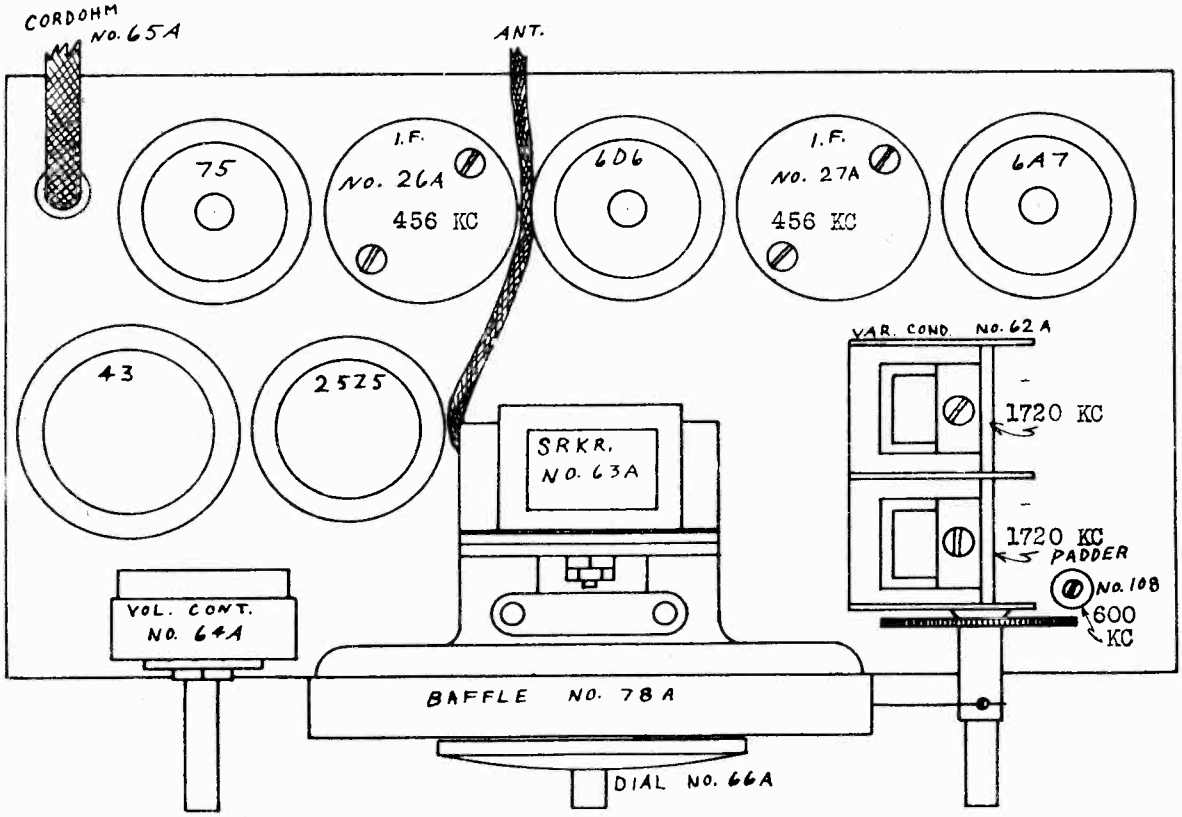
WALGREEN CO.



Ranges:- 540 - 1720 KC
5.5 - 16 MC

IF PEAK 456 KC

CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII.



Check alignment at 1400 KC. To align short wave band, adjust trimmer underneath chassis for greatest noise level around the 25 meter band.

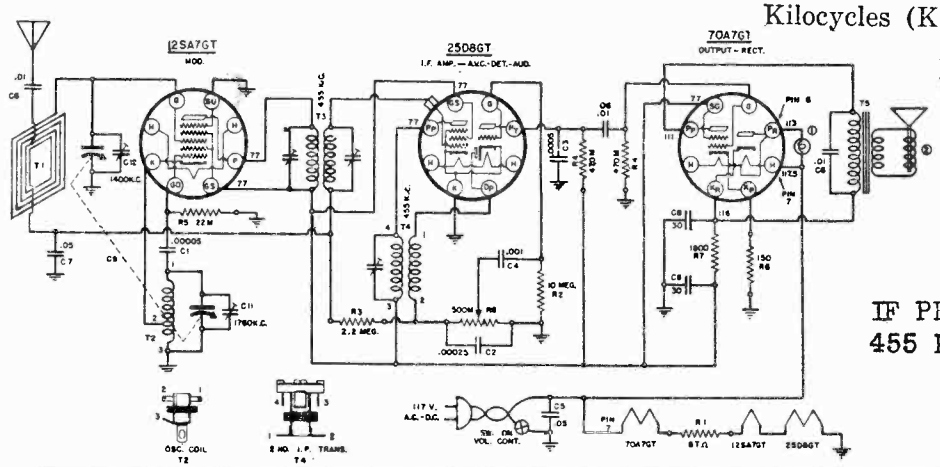
6-14-35- F.W.

This receiver covers a frequency range from 540 Kilocycles to 1760 Kilocycles (K.C.).

Model No. 0-30

Model No. 0-300 to 0-309, Inclusive

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOLUME VIII

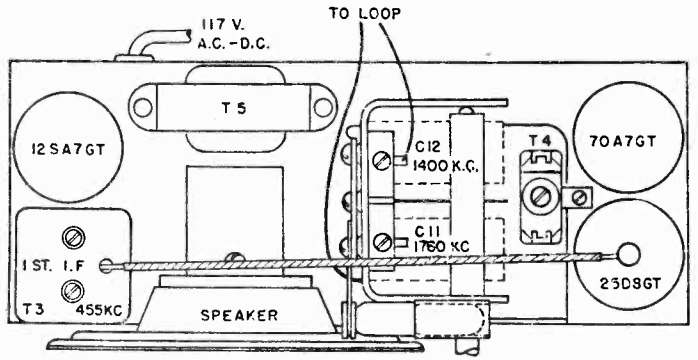


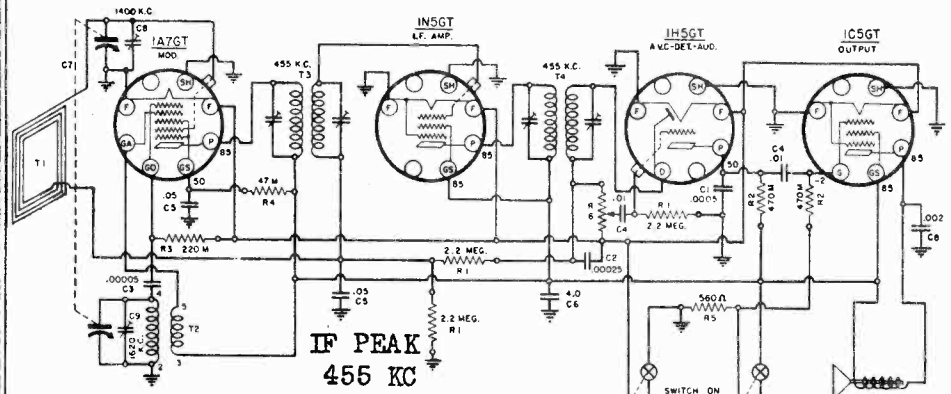
CODE	PART NO	DESCRIPTION
C1	1503	.00005 MFD. MICA CONDENSER
C2	1504	.00025 " " "
C3	15-113	.0005 " " "
C4	15-111	.001 " " "
C5	1607	.05 " - 400 V. TUBULAR CONDENSER
C6	16-121	.01 " - 200 V. " "
C7	1622	.05 " " " "
C8	18-751	30 X 30 " - 150 W.V. ELECTROLYTIC COND.
C9	19-150	2 GANG VARIABLE COND. ALSO C12 & C11

CODE	PART NO.	DESCRIPTION
R1	60-238	87 OHMS 2 W. WIRE WOUND RESISTOR
R2	60-225	10 MEGOHM 1/2 W. CARBON RESISTOR
R3	60-208	2.2 " " " "
R4	60-206	470 M OHM " " "
R5	60-223	22 M " " "
R6	60-240	150 " " "
R7	60-241	1800 " 1 W. " "
R8	24-139	500 M " VOLUME CONTROL

CODE	PART NO.	DESCRIPTION 0-30
T1	82-4	ANTENNA LOOP
T2	10-295	OSCILLATOR COIL
T3	10-296	1 ST. I.F. TRANSFORMER
T4	10-297	2 ND. " "
T5	80-178	OUTPUT "
L	85-4	PILOT LIGHT #47
S	79-270	SPEAKER

IF PEAK
455 KC



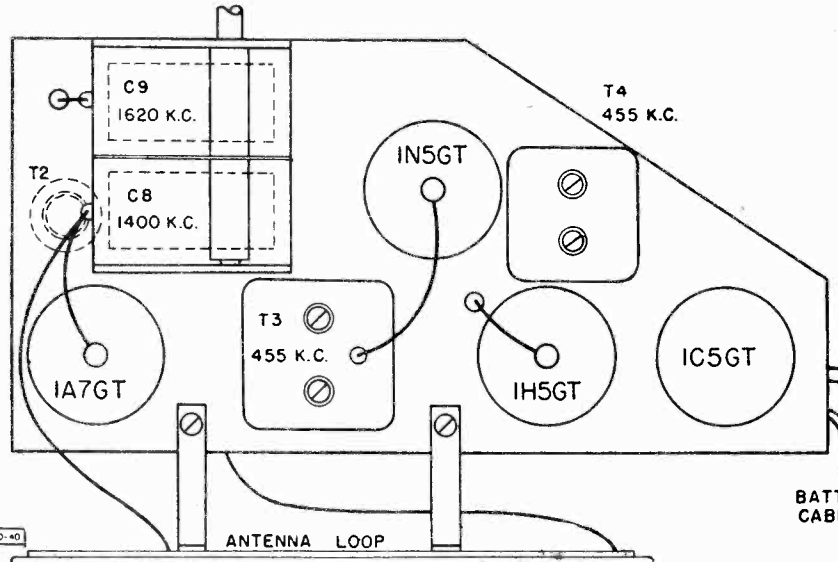


TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER COND.
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONGS, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
CAPACITY READINGS ARE IN MICROFARADS.

CODE	PART NO.	DESCRIPTION
R1	60-179	2.2 MEGOHM 1/3 WATT RESISTOR
R2	60-178	470 M OHM " " "
R3	60-180	220 M " " "
R4	60-177	47 M " " "
R5	60-201	560 Ω " " "
R6	24-138	1 MEGOHM VOLUME CONTROL

CODE	PART NO.	DESCRIPTION
C1	15-112	.0005 MFD. MICA CONDENSER
C2	1504	.00025 " " "
C3	1503	.00005 " " "
C4	16-121	.01 MFD. 200 V. TUBULAR CONDENSER
C5	1622	.05 " 200 V. " "
C6	18-250	4.0 " 150 W.V. " "
C7	19-149	2 GANG VARIABLE COND. ALSO C8 & C9
C8	1609	.002 MFD. 400 V. TUBULAR CONDENSER

CODE	PART NO.	DESCRIPTION 0-40
T1	82-2	ANTENNA LOOP
T2	10-294	OSCILLATOR COIL
T3	10-293	1 ST. I.F. TRANSFORMER
T4	10-281	2 ND. " "
L	79-272	5" SPEAKER



MODEL 0-40, 0-407.

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII

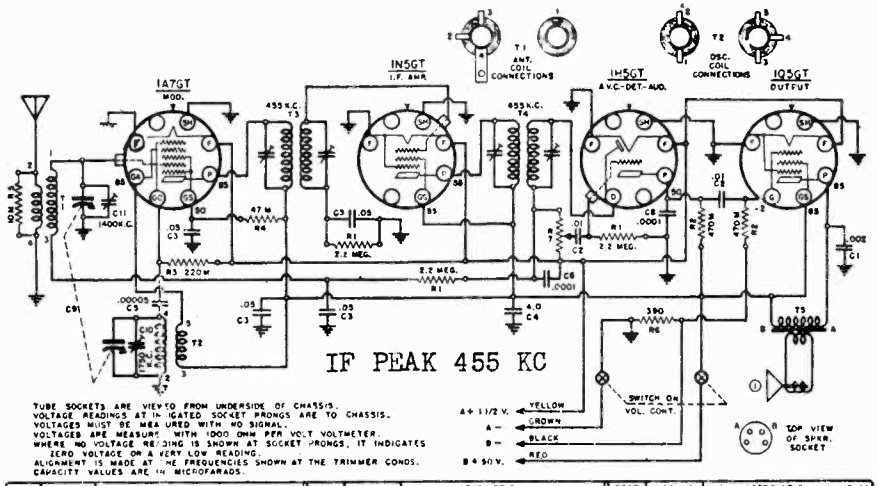
This receiver is made to cover the standard broadcast band from 1620 K.C. to 535 K.C.

MODELS 0-43, 0-430 to 0-439
MODELS 0-44, 0-440 to 0-449 WARWICK MFG. CORP.
MODELS 0-62, 0-620 to 0-629
Schematics, Socket, Trimmers
Alignment, Voltage

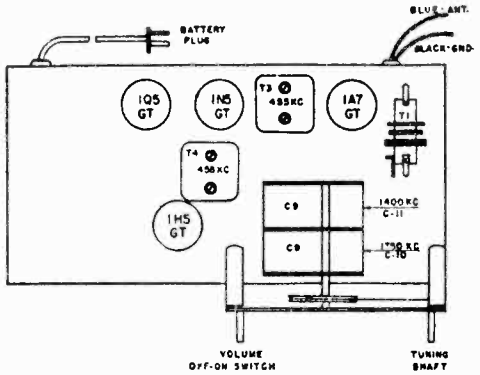
Model No. 0-44

Model No. 0-440 to 0-449, Inclusive

Model No. 0-43 **0-430 to 0-439, Incl.**



CODE	PART NO.	DESCRIPTION	CODE	PART NO.	DESCRIPTION	CODE	PART NO.	DESCRIPTION 0-44
R1	60-179	2.2 MEGOHM 1/4 W. RESISTOR	C1	16-133	.002 MFD. 400V. TUBULAR COND.	T1	10-346	ANTENNA TRANSFORMER
R2	60-178	470M OHM " " "	C2	16-121	.01 " 200V. " "	T2	10-341	OSCILLATOR "
R3	60-180	220M " " "	C3	1622	.05 " " " "	T3	10-342	1ST. I.F. "
R4	60-177	47M " " "	C4	18-250	4.0 " 150W.V. ELECTROLYTIC	T4	10-343	2 ND. I.F. "
R5	60-215	10M " " "	C5	15-120	.00005 MFD. MICA CONDENSER	T5	.....	OUTPUT TRANS. (ON SPKR.)
R6	60-221	390 " " "	C6	1501	.0001 " " " "			
R7	24-149	1 MEGOHM VOLUME CONTROL	C9	19-165	2 GANG VAR. COND. ALSO C10 & C11	1	79-297	5" P.M. SPEAKER



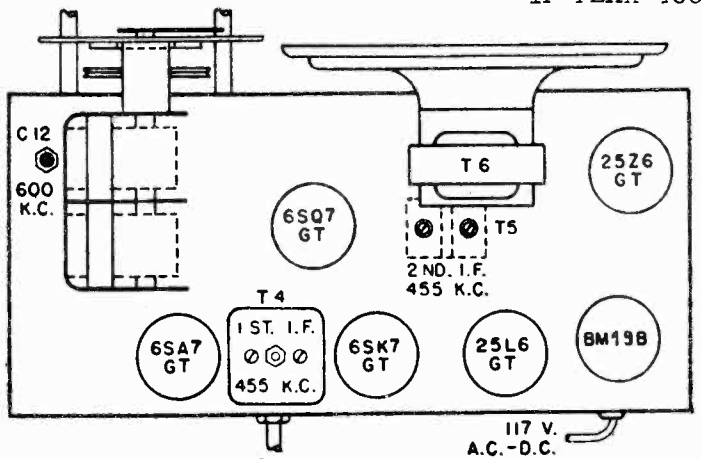
CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII

LOCATION OF PARTS ON TOP OF CHASSIS BASE

MODEL NO. 0-620 TO 0-629, INCLUSIVE

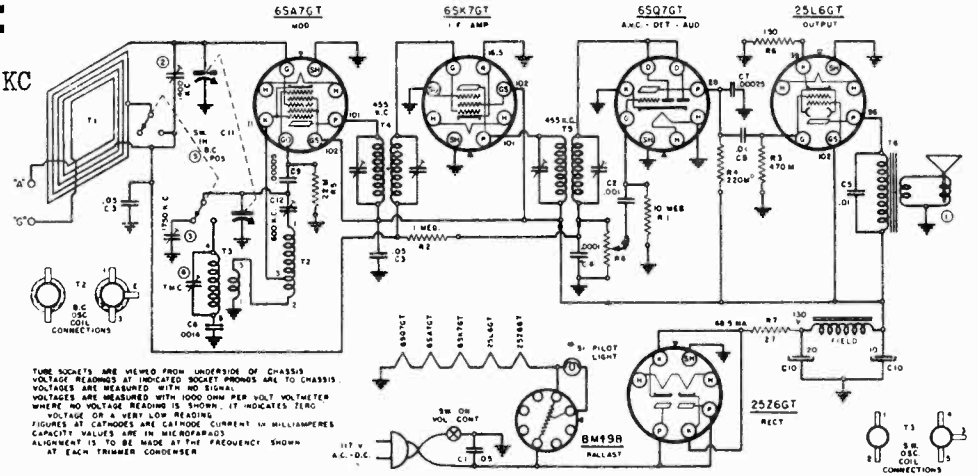
Model No. 0-62

IF PEAK 455 KC



CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII

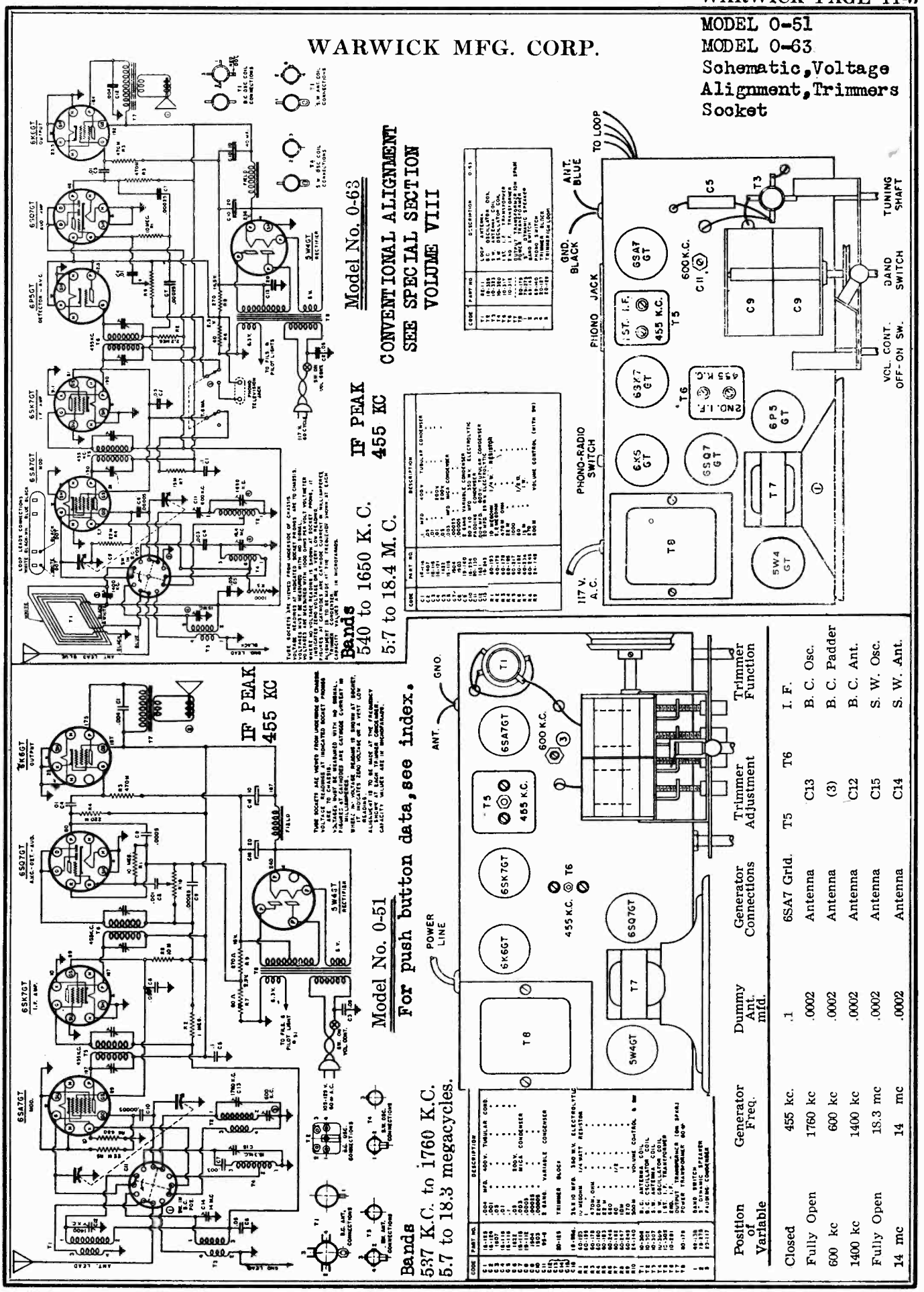
Bands
540 K.C. to 1750 K.C.
2.2 to 7 megacycles.



CODE	PART NO	DESCRIPTION	CODE	PART NO	DESCRIPTION	CODE	PART NO	DESCRIPTION 0-62
R1	60-193	10 MEGOHM 1/4 W RESISTOR	C1	1601	.05 MFD. 400 V. TUBULAR COND.	T1	07-9	LOOP ANTENNA
R2	60-195	" " "	C2	16-126	.001 " " " "	T2	10-330	B.C. OSCILLATOR COIL
R3	60-178	470M OHM " "	C3	1622	.05 " 200 V. " "	T3	10-331	B.C. " "
R4	60-180	220M " "				T4	10-333	1 ST. I.F. TRANSFORMER
R5	60-189	27 M " "	C3	16-121	.01 " " " "	T5	10-281	2 ND. " "
R6	60-184	150 " "	C6	15-118	.0016 MFD. MICA CONDENSER	T6		OUTPUT TRANSFORMER (ON SPKR.)
R7	60-220	27 " "	C7	1504	.00025 " " "	1	79-283	5" DYNAMIC SPEAKER
R8	24-142	500M " VOLUME CONTROL (WITH SW.)	C8	1501	.0001 " " "	2	20-129	TRIMMER (ON LOOP)
			C9	1503	.00005 " " "	3	2050	2 PLATE TRIMMER
			C10	18-241	30 V.-30 " 150 WV. ELECTROLYTIC	4	20-108	1-1/2 PLATE TRIMMER
			C11	19-155	2 GANG VARIABLE CONDENSER	5	89-159	BAND SWITCH
			C12	20-126	PADDING CONDENSER			

WARWICK MFG. CORP.

MODEL O-51
MODEL O-63
Schematic, Voltage
Alignment, Trimmers
Socket

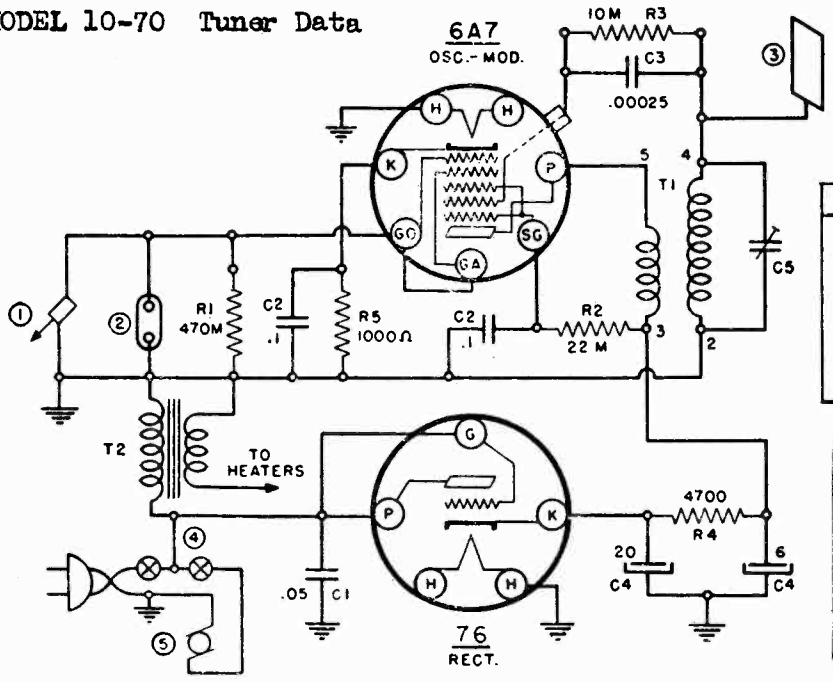


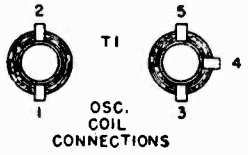
Position of Variable	Generator Freq.	Dummy Ant. mfd.	6SA7 Grid.	T5	T6	
Closed	455 kc.	.1				I. F.
Fully Open	1760 kc	.0002	Antenna	C13		B. C. Osc.
600 kc	600 kc	.0002	Antenna	(3)		B. C. Padder
1400 kc	1400 kc	.0002	Antenna	C12		B. C. Ant.
Fully Open	18.3 mc	.0002	Antenna	C15		S. W. Osc.
14 mc	14 mc	.0002	Antenna	C14		S. W. Ant.

Generator Connections — Trimmer Adjustment — Trimmer Function

MODEL 9-21 Phono.Osc.
Schematic,Notes
MODEL 0-51 MODEL 0-70
MODEL 0-75 MODEL 0-80
MODEL 10-70 Tuner Data

WARWICK MFG. CORP.





CODE	PART NO.	DESCRIPTION 9-21
C1	1607	.05 MFD. 400V. TUB. COND.
C2	16-115	.1 " 200V. " "
C3	1504	.00025 MFD. MICA "
C4	18-241	20 X 6 MFD. 150V. ELECT.
C5	20-119	3 PLATE TRIMMER
T1	10-240	OSCILLATOR TRANS
T2	80-170	FILAMENT TRANS.
5	59-1	PHONOGRAPH MOTOR

CODE	PART NO.	DESCRIPTION
R1	60-178	470M. OHM 1/3 W. RES.
R2	60-185	22 M. " " "
R3	60-215	10 M. " " "
R4	60-189	4700 " " "
R5	60-217	1000 " " "
1	83-130	PICKUP
2	12-1	MICROPHONE TERMINAL
3	82-1	ANTENNA PLATE
4	69-129	SWITCH (DUAL)

PHONO-OSCILLATOR

DESCRIPTION

This unit is a Two Tube Phono-Oscillator. The tubes used are a 6A7 as an oscillator and a 76 as a power rectifier.

This unit should be operated between 1500 K.C. and 1700 K.C. and is so designed that the playing of a record on the unit makes it possible that you receive this same recording from any radio set within a nearby vicinity.

ADJUSTING PUSH BUTTONS FOR MODELS 0-51, 0-70, 0-75, 0-80, and 10-70.

Cut the call letters of your four selected stations from the list supplied with your receiver and slip them into the top of the Push-Buttons, with the clear celluloid on top of the call letters to protect them. Arrange the call letters in the buttons from left to right, having the lowest frequency station (that is, the station closest to 600 K.C. at the left and work progressively towards the right, so that the highest frequency station is toward the right.

Follow the procedure outline below, in order to adjust the push-buttons properly:

1. By means of the tuning knob, tune in with the right hand as accurately as possible the desired station having the lowest frequency.

2. Continuing to hold the tuning control knob in its exact position with the right hand, loosen with the left hand the push-button to be set up for that station, (the one farthest toward the left) by unscrewing the push-button about one turn to the left (counter-clockwise).

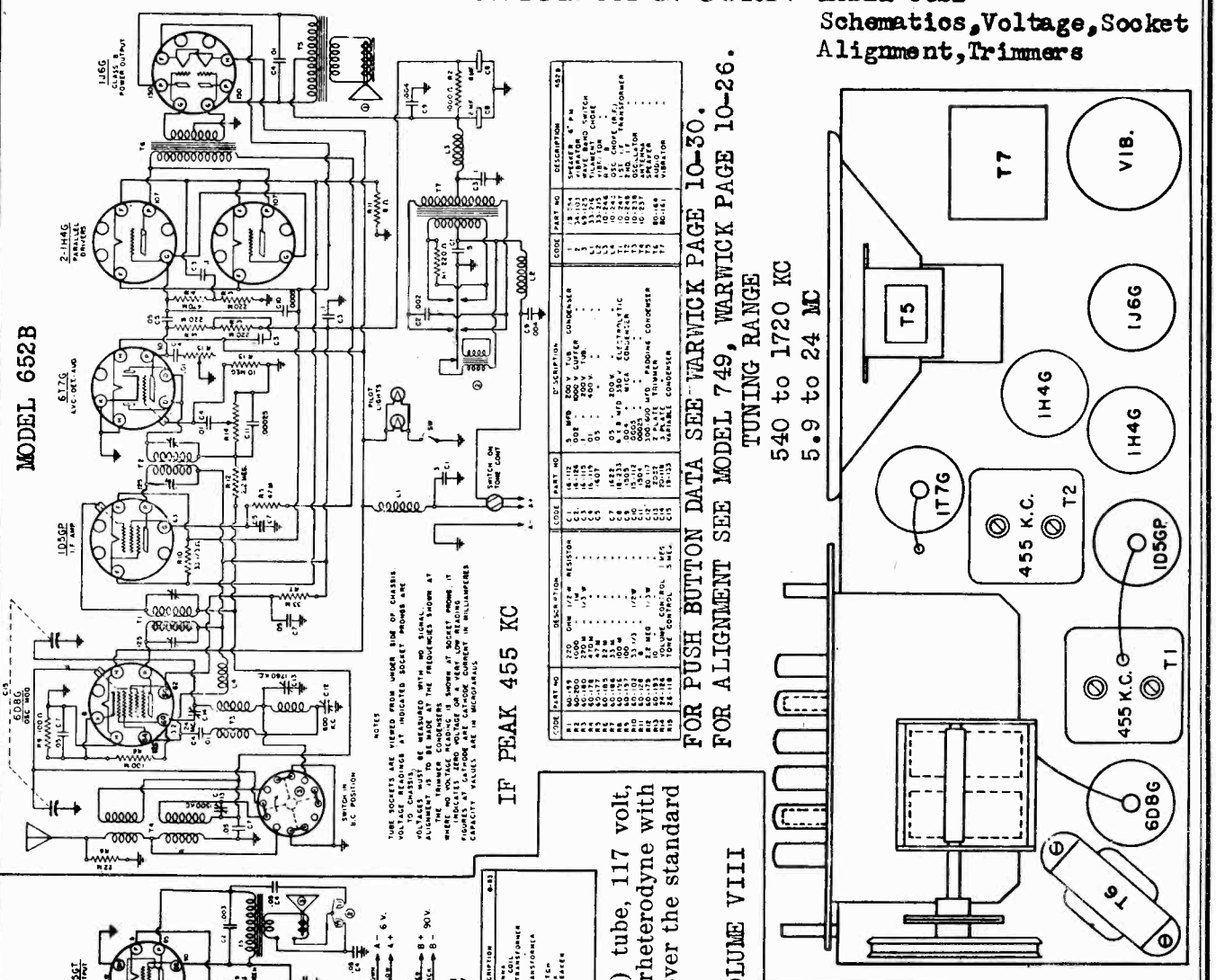
3. Push the push-button in all the way, and then tighten it gently toward the right (clockwise). Release push-button slowly and when in normal position grip button and tighten firmly.

The push-button tuning system is now correctly set up for your first selected station of lowest frequency.

Follow through with this same procedure, setting up the other three stations in the order of their frequency, that is, the second station set up will be second lowest in frequency, etc.

WARWICK MFG. CORP.

MODEL 0-53
MODEL 652B
Schematics, Voltage, Socket Alignment, Trimmers

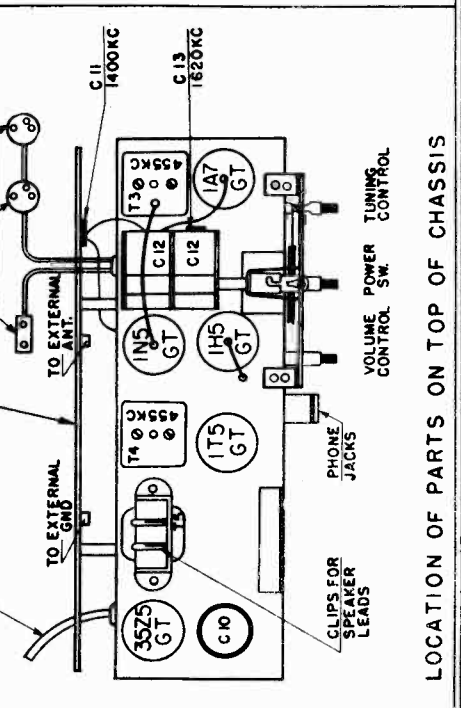


FOR PUSH BUTTON DATA SEE WARWICK PAGE 10-30.
FOR ALIGNMENT SEE MODEL 749, WARWICK PAGE 10-26.

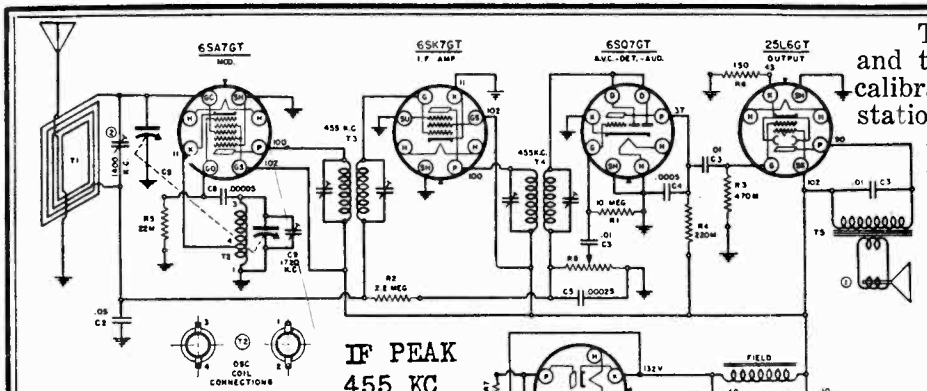
TUNING RANGE
540 to 1720 KC
5.9 to 24 MC

Model No. 0-53 radio receiver is a portable five (5) tube, 117 volt, 50-60 cycle A.C. or 117 volt D.C. or battery operated superheterodyne with self-contained loop antenna and batteries, designed to cover the standard broadcast band from 1620 to 535 K.C.

CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII



LOCATION OF PARTS ON TOP OF CHASSIS



Model No. 0-60

TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES
WHERE NO VOLTAGE READING IS SHOWN AT PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING
ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDENSERS.
CAPACITY VALUES ARE IN MICROFARADS
VOLTAGE READINGS ARE TAKEN WITH A 1000 OHM PER VOLT VOLTMETER

CODE	PART NO	DESCRIPTION
C1	1607	.05 MFD 400 V TUBULAR COND
C2	1622	.05 " 200 V. " "
C3	16-121	.01 " " " "
C4	15-112	.0005 " MFD. MICA CONDENSER
C5	1504	.00025 " " "
C6	1503	.00005 " " "
C7	18-253	40 X 10 " 150 W.V. ELECTROLYTIC
C8	19-153	2 GANG VARIABLE COND. ALSO C9

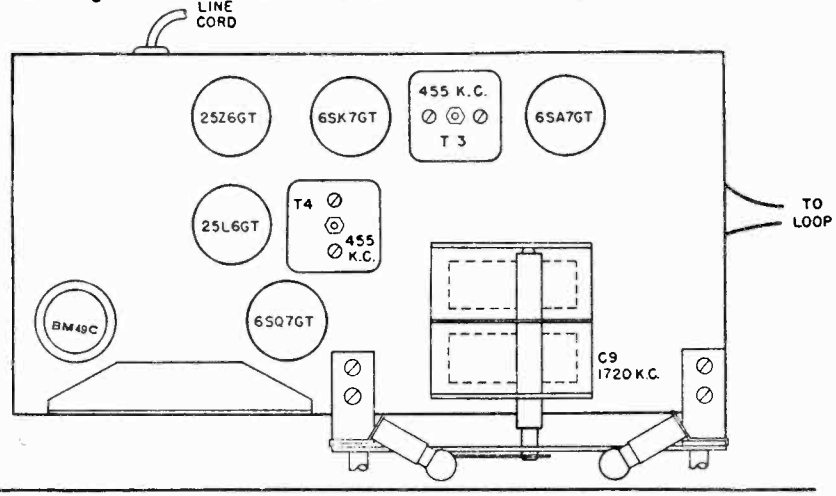
CODE	PART NO	DESCRIPTION
R1	60-183	10 MEGOHM 1/4 W RESISTOR
R2	60-179	2.2 " " "
R3	60-178	470M OHM " "
R4	60-180	220M " " "
R5	60-185	22M " " "
R6	60-184	150 " " "
R7	60-220	27 " " "
R8	24-140	500M " VOLUME CONTROL & SW.

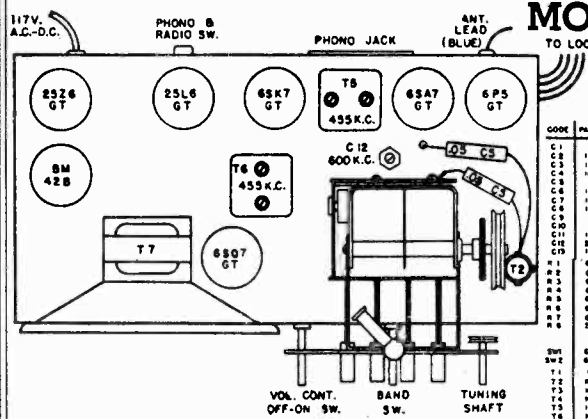
CODE	PART NO	DESCRIPTION 0-60
T1	67-6	ANTENNA LOOP
T2	10-311	OSCILLATOR COIL
T3	10-305	I ST. I.F. TRANSFORMER
T4	10-312	2 ND. " "
T5	------	OUTPUT TRANS. (ON SPKR.)
1	79-277	6 1/2" DYNAMIC SPEAKER
2	20-124	TRIMMER

This model has been designed to cover the standard broadcast band and the first police band from 538 K.C. to 1720 K.C. The dial scale is calibrated directly in kilocycles (less the final 0). Standard broadcast stations are listed in kilocycles in most station lists.

CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII.

Note: Adjust antenna trimmer to 1400KC, see schematic.





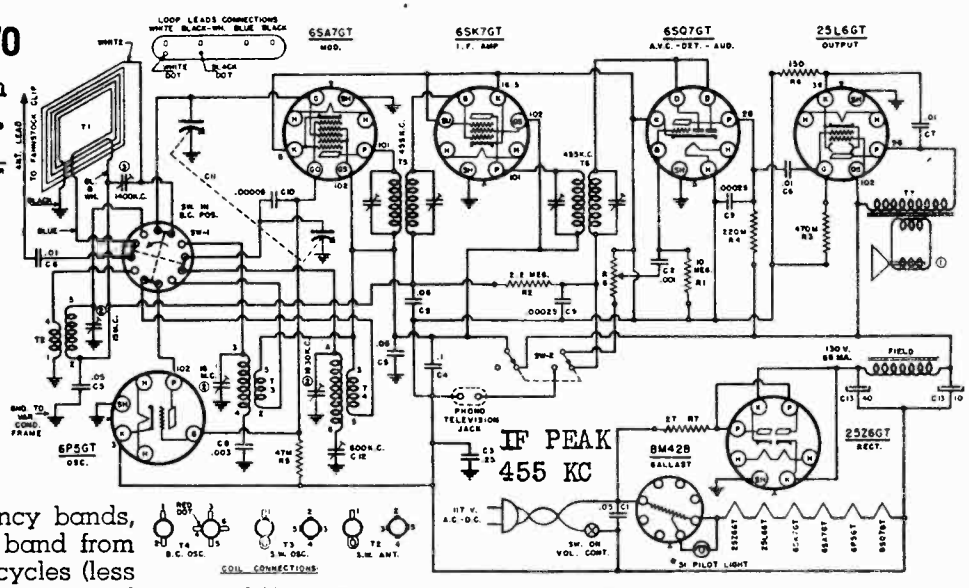
MODEL NO. 10-70

For push button data, see index.

CODE	PART NO	DESCRIPTION
C1	1607	.05 MFD. 400 V. TUBULAR CONDENSER
C2	16-154	.001 " " " "
C3	16-122	.25 " 200 V. "
C4	16-115	.1 " " "
C5	1622	.05 " " "
C6	16-121	.01 " " "
C7	16-118	.01 " 400 V "
C8	15-112	.0003 " MFD. MICA CONDENSER
C9	1504	.00025 " " "
C10	1503	.00005 " " "
C11	19-162	2 GANG VARIABLE CONDENSER
C12	20-130	PADDING CONDENSER
C13	18-256	40 X 10 MFD. 150 W.V. ELECTROLYTIC
R1	60-183	10 MEGOHM 1/4 W. RESISTOR
R2	60-179	2.2 " " "
R3	60-178	470M OHM " "
R4	60-180	220M " " "
R5	60-177	47M " " "
R6	60-184	150 " " "
R7	60-220	27 " " "
R8	24-146	500M " VOLUME CONTROL
SW1	69-148	BAND SWITCH
SW2	69-140	PHONO "
T1	67-11	LOOP ANTENNA (B.C.)
T2	10-337	S.W. ANTENNA COIL
T3	10-338	S.W. OSCILLATOR COIL
T4	10-318	B.C. " "
T5	10-317	I ST. I.F. TRANSFORMER
T6	10-312	2 ND. " "
T7	------	OUTPUT TRANS. (ON SPKR.)
1	79-283	8" DYNAMIC SPEAKER
2	20-127	TRIMMER BLOCK
3	20-129	TRIMMER (ON LOOP)

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOLUME VIII

This model has been designed to cover two seperate frequency bands, a broadcast band from 540 K.C. to 1630 K.C. and a short wave band from 5.7 to 18 M.C. The dial scale has been calibrated directly in kilocycles (less the final 0) on the broadcast band, while the short wave band is calibrated directly in megacycles.



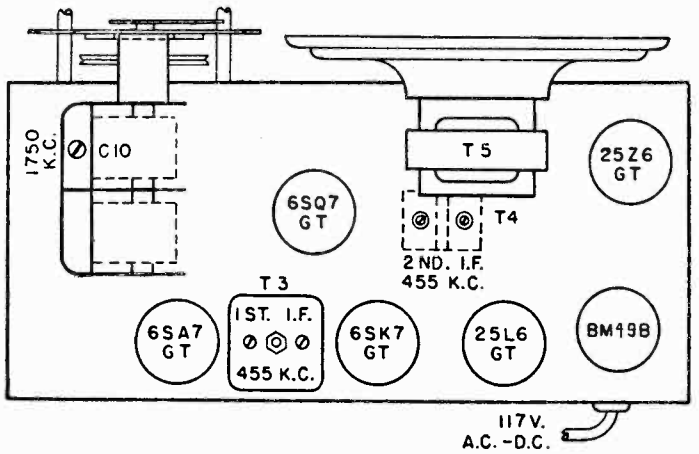
TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO COMMON GND.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
VOLTAGES ARE MEASURED WITH 1000 OHM PER VOLT VOLTMETER.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.

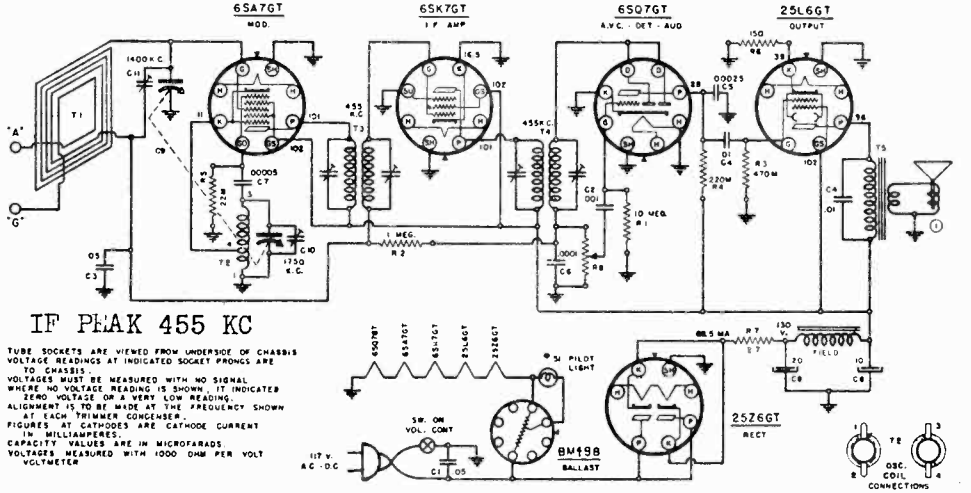
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
ALIGNMENT IS MADE AT THE FREQUENCY SHOWN AT EACH TRIMMER CONDENSER.
CAPACITY VALUES ARE IN MICROFARADS.

MODEL NO. 0-610 TO 0-619, INCLUSIVE

Model No. O-61

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII





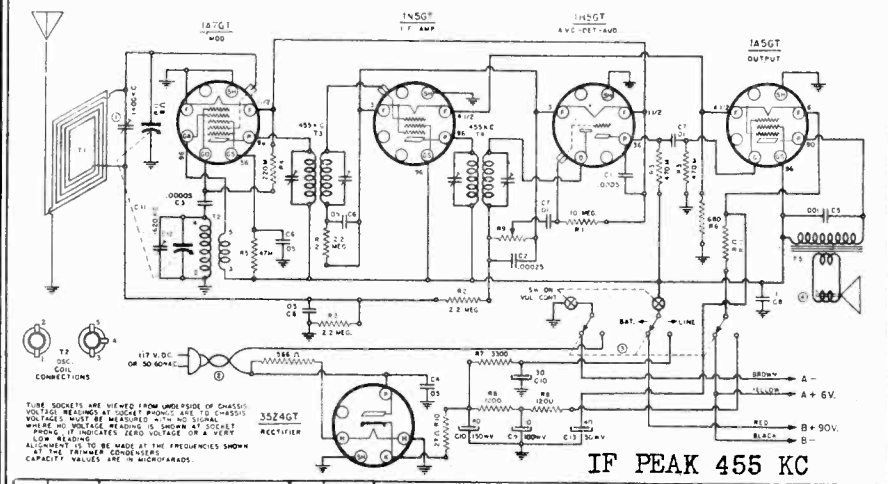
IF PEAK 455 KC

TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
WHERE NO VOLTAGE READING IS SHOWN, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
ALIGNMENT IS TO BE MADE AT THE FREQUENCY SHOWN AT EACH TRIMMER CONDENSER.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.
CAPACITY VALUES ARE IN MICROFARADS.
VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER

CODE	PART NO.	DESCRIPTION
R1	60-193	10 MEGOHM 1/4 W. RESISTOR
R2	60-195	1 " " "
R3	60-178	470M OHM " "
R4	60-180	220M " "
R5	60-177	47M " "
R6	60-195	22M " "
R7	60-184	150 " "
R8	60-220	27 " "
R9	24-102	500M " VOLUME CONTROL (WITH SW.)

CODE	PART NO.	DESCRIPTION
C1	1607	.05 MFD 400V TUBULAR COND
C2	16-124	.001 " " " "
C3	1622	.05 " 200V " "
C4	16-121	.01 " " " "
C5	1504	.00025 MFD MICA CONDENSER
C6	1504	.0001 " " "
C7	1503	.00005 " " "
C8	18-261	20 X 10 " 150 W.V. ELECTROLYTIC
C9	19-154	2 GANG VARIABLE COND. ALSO C10
C11	20-159	TRIMMER (ON LOOP)

CODE	PART NO.	DESCRIPTION O-61
T1	82-6	LOOP ANTENNA
T2	10-332	OSCILLATOR COIL
T3	10-333	1ST. I.F. TRANSFORMER
T4	10-261	2 ND. " "
T5	------	OUTPUT TRANSFORMER (ON SPKR.)
1	79-283	5" DYNAMIC SPEAKER



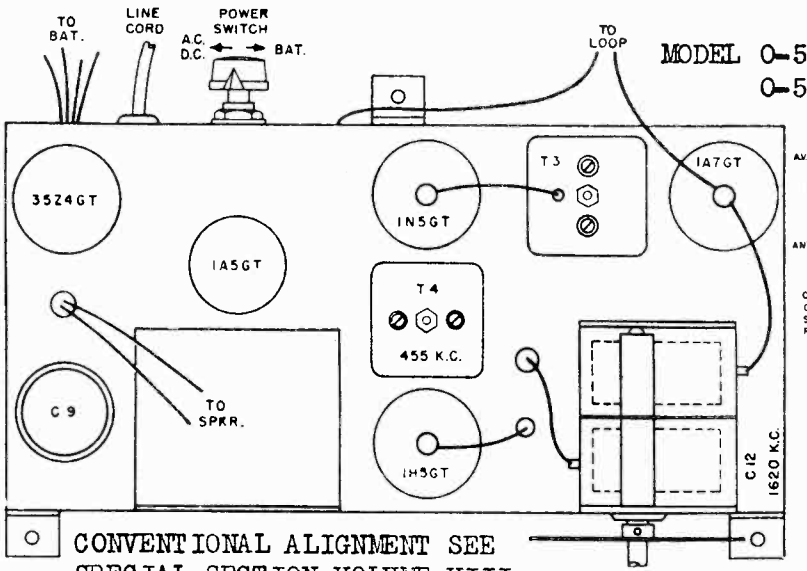
TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS
VOLTAGE READINGS AT SOCKET PRONGS ARE TO CHASSIS
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDENSERS.
CAPACITY VALUES ARE IN MICROFARADS.

IF PEAK 455 KC

CODE	PART NO.	DESCRIPTION
R1	60-193	10 MEGOHM 1/4 W. RESISTOR
R2	60-179	2.2 " " "
R3	60-178	470 M OHM " "
R4	60-180	220 M " "
R5	60-177	47 M " "
R6	60-206	680 " " "
R7	60-266	3300 " 1/2 W "
R8	60-242	1200 " 1 "
R9	24-138	1 MEGOHM VOLUME CONTROL
R10	60-226	27 OHM 1/4 W RESISTOR
R11	60-128	6 " 1/2 "

CODE	PART NO.	DESCRIPTION
C1	15-112	.0005 MFD. MICA CONDENSER
C2	1504	.00025 " " "
C3	1503	.00005 " " "
C4	1607	.05 MFD. 400 V. TUBULAR CONDENSER
C5	16-124	.001 " " " "
C6	1622	.05 " 200 V. " "
C7	16-121	.01 " " " "
C8	16-115	1 " " " "
C9	18-238	10 " 100 W.V. ELECTROLYTIC
C10	18-257	30 X 40 MFD 150 W.V. ELECTROLYTIC
C11	19-152	2 GANG VARIABLE CONDENSER ALSO C12

CODE	PART NO.	DESCRIPTION O-50
T1	82-6	ANTENNA LOOP
T2	10-310	OSCILLATOR TRANSFORMER
T3	10-303	1ST. I.F. "
T4	10-304	2 ND. " "
C13	18-258	40 MFD 50 W.V. ELECTROLYTIC
1	20-109	TRIMMER
2	73-138	LINE CORD (WITH RESISTOR)
3	69-135	SWITCH
4	78-274	5" P.M. SPEAKER } OR 79-276 SPEAKER
T5	80-174	OUTPUT TRANS. }



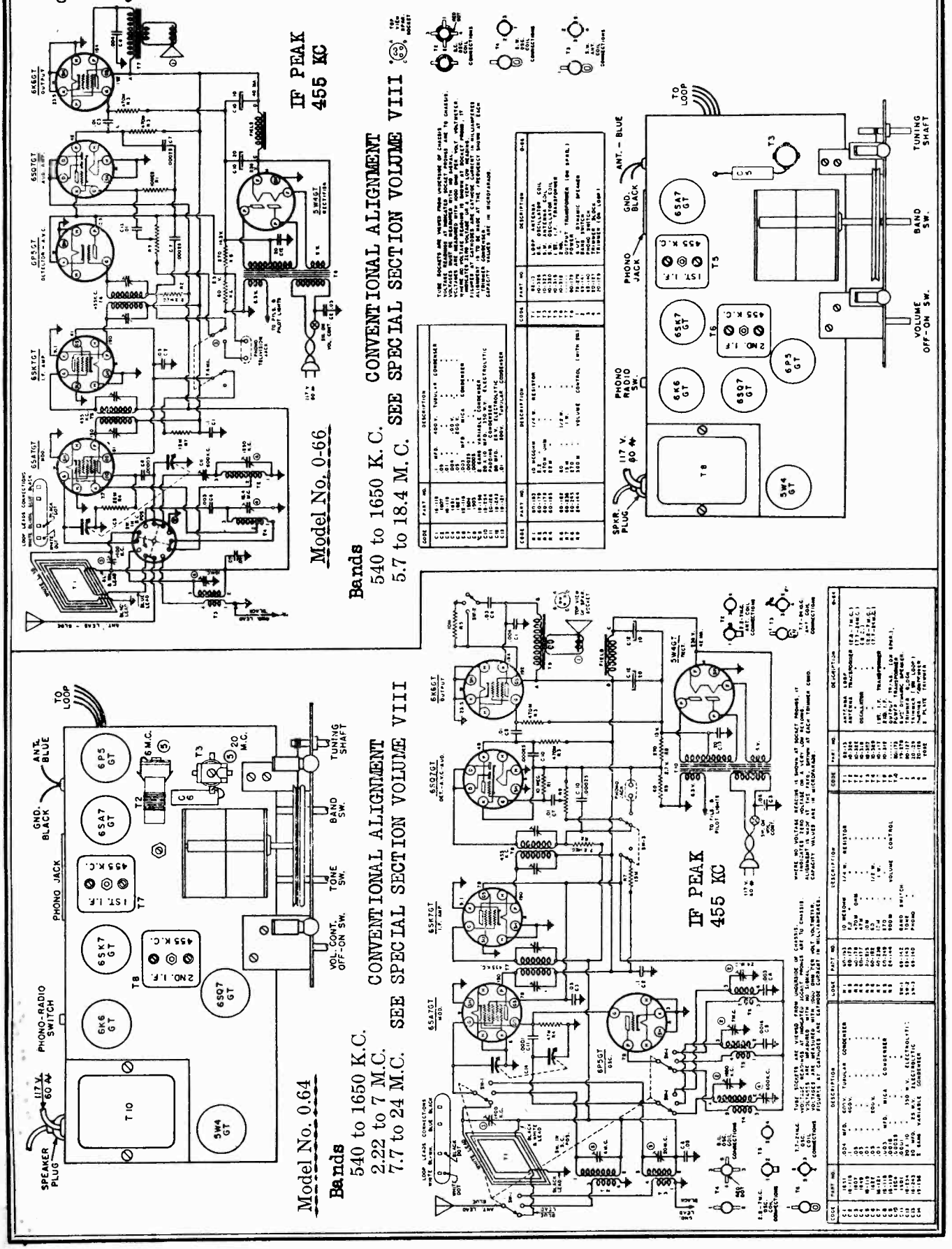
CONVENTIONAL ALIGNMENT SEE
SPECIAL SECTION VOLUME VIII

WARWICK MFG. CORP.

MODELS 0-50, 0-501
MODELS 0-61, 0-610 to 0-619
Schematics, Voltage, Socket
Alignment, Trimmers

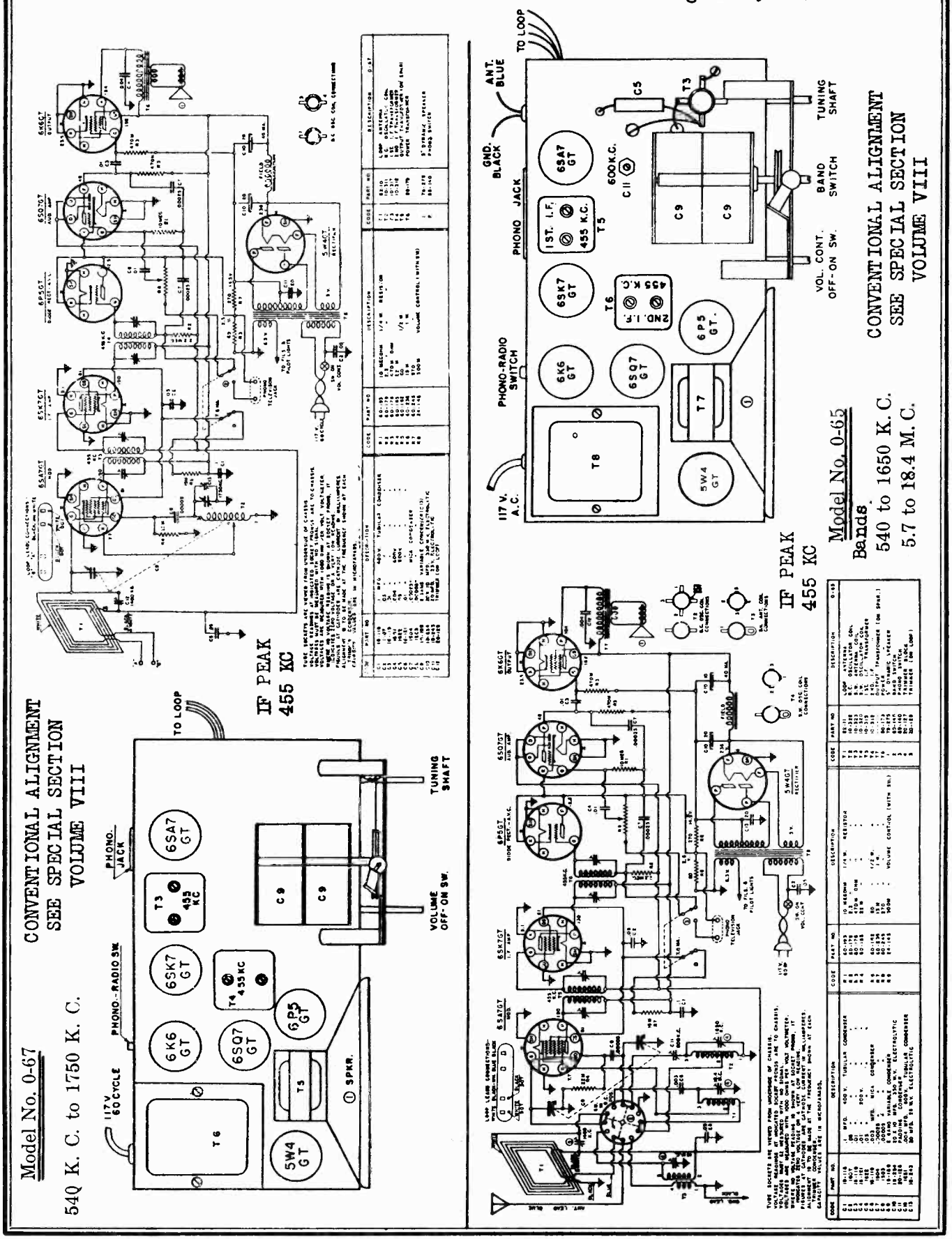
MODEL 0-64
MODEL 0-66
Schematics, Voltage, Socket Alignment, Trimmers

WARWICK MFG. CORP.



WARWICK MFG. CORP.

MODEL 0-65
MODEL 0-67
Schematics, Voltage, Socket
Alignment, Trimmers

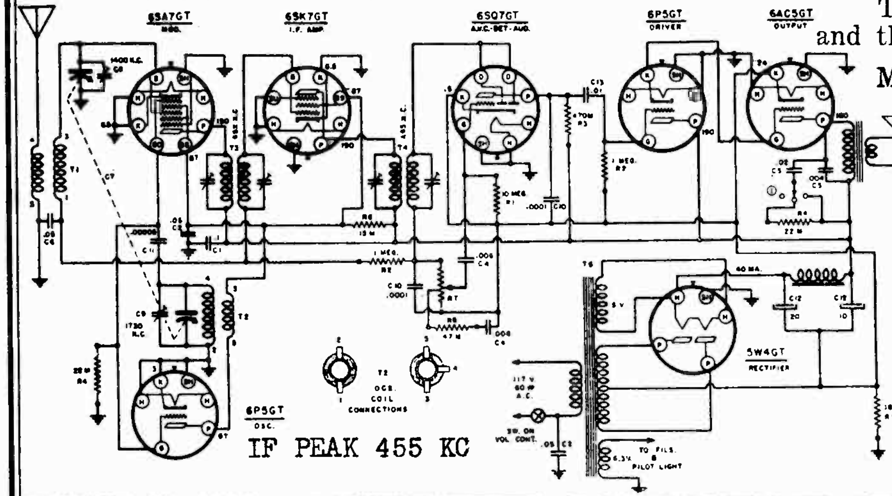


MODEL 0-70
MODEL 0-71
Schematics, Voltage, Socket
Alignment, Trimmers

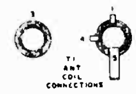
WARWICK MFG. CORP.

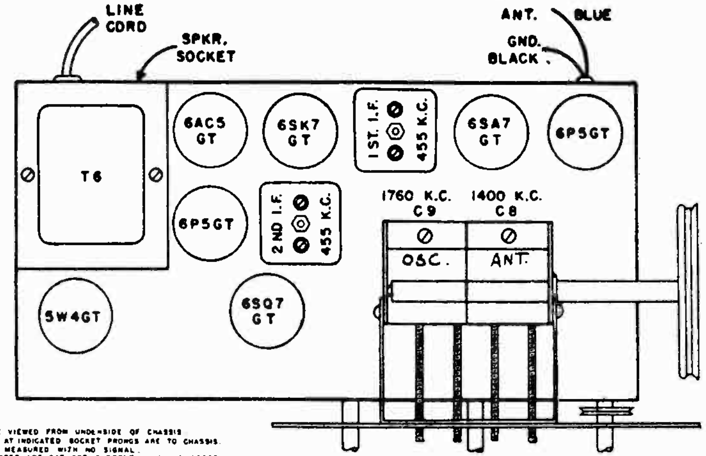
This model has been designed to cover the standard broadcast band and the first police band from 537 K.C. to 1730 K.C.

Model 0-70



IF PEAK 455 KC





TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.
WHERE NO VOLTAGE READING IS SHOWN, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING
ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDENSERS.
CAPACITY VALUES ARE IN MICROFARADS

CODE	PART NO.	DESCRIPTION
C1	16-116	.1 MFD. 400 V. TUBULAR CONDENSER
C2	1607	.05 " " " "
C3	1605	.02 " " " "
C4	16-114	.006 " " " "
C5	15-121	.004 " " " "
C6	1622	.05 " 200 V. " "
C7	95-9	2 GANG VARIABLE CONDENSER ALSO C8 & C9
C10	1501	.0001 MFD. MICA CONDENSER
C11	1503	.00005 " " "
C12	18-254	20 X 10 " 350 WV. ELECTROLTIC COND.
C13	16-119	.01 MFD 400 V. TUBULAR CONDENSER

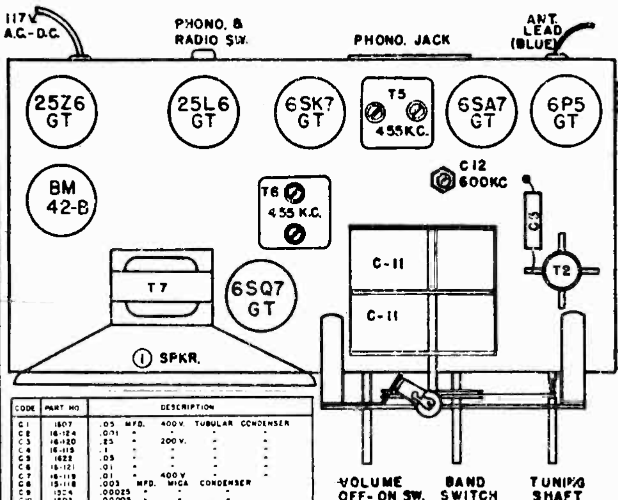
CODE	PART NO.	DESCRIPTION
R1	60-193	10 MEGOHM 1/4 W. RESISTOR
R2	60-192	7 " " "
R3	60-176	470 M OHM " "
R4	60-185	22 M " " "
R5	60-230	180 " " "
R6	60-236	15 M " 1 W "
R7	24-147	500 M " VOLUME CONTROL
R8	60-177	47 M " 1/4 W. RESISTOR

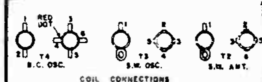
CODE	PART NO	DESCRIPTION 0-70
T1	10-235	ANTENNA COIL
T2	10-318	OSCILLATOR COIL
T3	10-315	1ST I.F. TRANSFORMER
T4	10-312	2ND " "
T5	------	OUTPUT TRANS. (ON SPKR)
T6	80-179	POWER TRANSFORMER
1	69-137	TONE CONTROL SWITCH
2	79-279	6 1/2 DYNAMIC SPEAKER

CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII

For Push Button Data, see Index

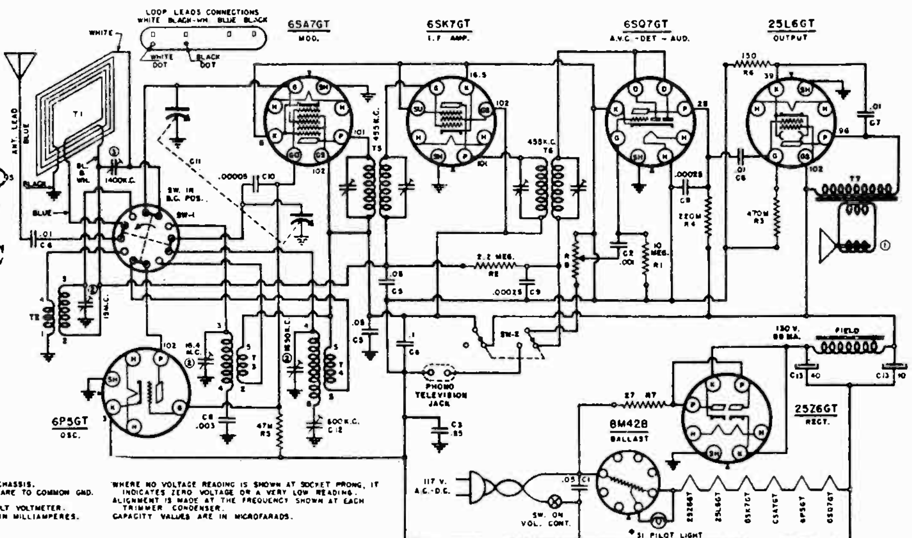
Model No. 0-71





IF PEAK 455 KC

CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII



TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO COMMON GND.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
VOLTAGES ARE MEASURED WITH 1000 OHM PER VOLT VOLTMETER.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.

WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
ALIGNMENT IS MADE AT THE FREQUENCY SHOWN AT EACH TRIMMER CONDENSER.
CAPACITY VALUES ARE IN MICROFARADS.

CODE	PART NO	DESCRIPTION
C1	1607	.05 MFD. 400 V. TUBULAR CONDENSER
C2	16-124	.001 " " " "
C3	16-120	.25 " 200 V. " "
C4	16-115	.1 " " " "
C5	1622	.05 " " " "
C6	16-121	.01 " " " "
C7	16-119	.01 " 400 V " "
C8	15-118	.003 MFD. MICA CONDENSER
C9	1504	.00025 " " "
C10	1503	.00005 " " "
C11	19-160	2 GANG VARIABLE CONDENSER
C12	20-130	PADDING CONDENSER
C13	18-255	40 & 10 MFD 150 W.V. ELECTROLYTIC

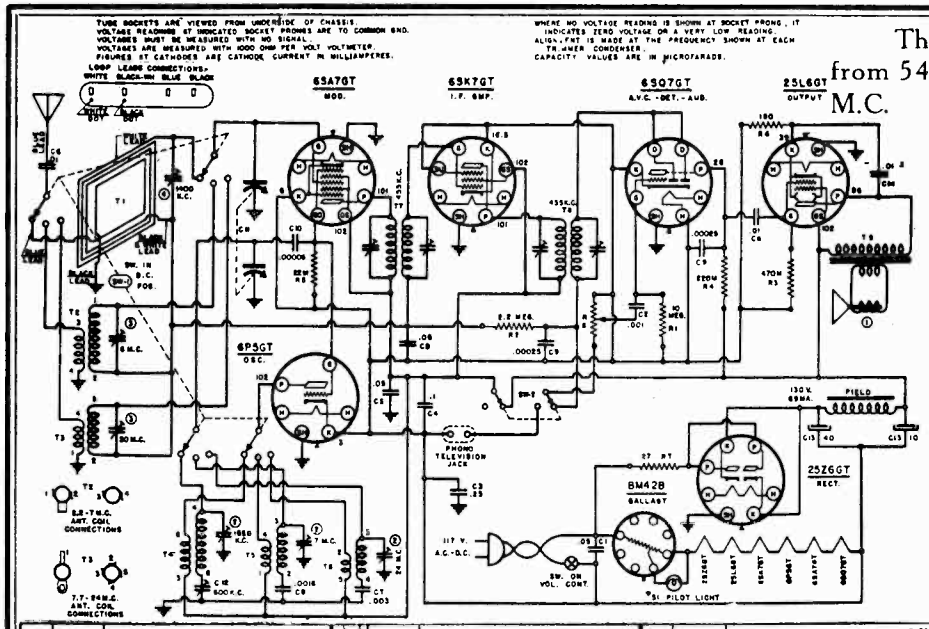
CODE	PART NO.	DESCRIPTION
R1	60-193	10 MEGOHM 1/4 W. RESISTOR
R2	60-179	2.2 " " "
R3	60-178	470M OHM " "
R4	60-180	220M " " "
R5	60-177	47M " " "
R6	60-184	150 " " "
R7	60-220	27 " " "
R8	24-146	500M " VOLUME CONTROL
SW1	69-145	BAND SWITCH
SW2	69-140	PHONO "

CODE	PART NO.	DESCRIPTION 0-71
T1	82-11	LOOP ANTENNA (B.C.)
T2	10-323	S.W. ANTENNA COIL
T3	10-320	S.W. OSCILLATOR COIL
T4	10-318	B.C. " "
T5	10-317	1ST. I.F. TRANSFORMER
T6	10-312	2ND. " "
T7	------	OUTPUT TRANS. (ON SPKR)
1	79-283	5" DYNAMIC SPEAKER
2	20-127	TRIMMER BLOCK
3	20-129	TRIMMER (ON LOOP)

This model has been designed to cover two separate frequency bands, a broadcast band from 540 K. C. to 1650 K. C. and a short wave band from 5.7 to 18.4 M.C.

WARWICK MFG. CORP.

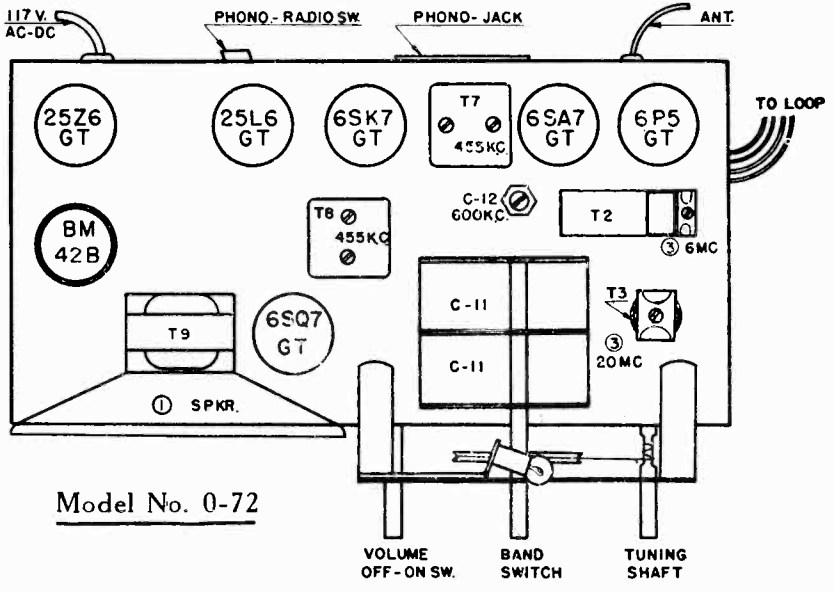
MODEL 0-72
MODEL 0-73
Schematics, Voltage, Socket Alignment, Trimmers



CODE	PART NO.	DESCRIPTION	CODE	PART NO.	DESCRIPTION	CODE	PART NO.	DESCRIPTION 0-72
C1	1807	.05 MFD. 400V. TUBULAR CONDENSER	R1	60-193	10 MEGOHM 1/4 RESISTOR	T1	82-11	LOOP ANTENNA
C2	16-184	.001 " " " "	R2	60-178	2.2 " " "	T2	10-324	ANTENNA COIL (2.2-7 M.C.)
C3	16-120	.25 " 200 V. " "	R3	60-176	470M OHM " "	T3	10-388	ANTENNA COIL (7.7-24 M.C.)
C4	16-115	.1 " " " "	R4	60-180	220M " "	T4	10-318	OSCILLATOR COIL (.9-2.2 M.C.)
C5	1808	.05 " " " "	R5	60-185	82M " "	T5	10-387	OSCILLATOR COIL (2.2-7 M.C.)
C6	16-181	.01 " " " "	R6	60-184	150 " "	T6	10-389	OSCILLATOR COIL (7.7-24 M.C.)
C7	16-116	.003 MFD. MICA CONDENSER	R7	60-220	27 " "	T7	10-317	1ST I.F. TRANSFORMER
C8	16-119	.0016 " " "	R8	56-145	500M " VOLUME CONTROL	T8	10-318	2ND " "
C9	1804	.00025 " " "				T9	------	OUTPUT TRANSFORMER (ON SPKR.)
C10	1803	.00005 " " "						
C11	19-188	2 GANG VARIABLE CONDENSER	SW1	69-144	BAND SWITCH	1	79-283	5" DYNAMIC SPEAKER
C12	80-186	PADDING CONDENSER	SW2	69-140	PHONO "	2	20-167	TRIMMER BLOCH
C13	19-186	40 & 10 MFD. 150 W.V. ELECTROLYTIC				3	2082	2 PLATE TRIMMER
C14	16-118	.01 MFD. 400 V. TUBULAR CONDENSER				4	20-129	TRIMMER (ON LOOP)

This model has been designed to cover three seperate frequency bands from 540 K.C. to 1650 K.C., 2.22 M.C. to 7 M.C. and from 7.77 M.C. to 24 M.C.

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOLUME VIII

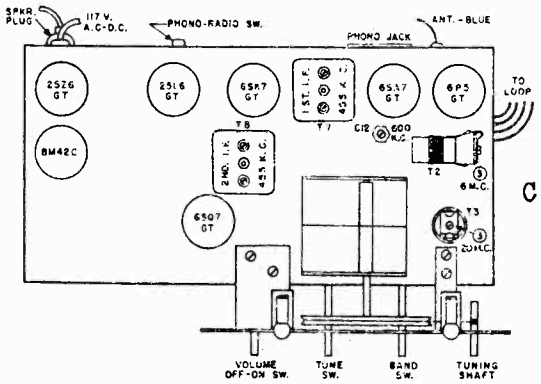


Model No. 0-72

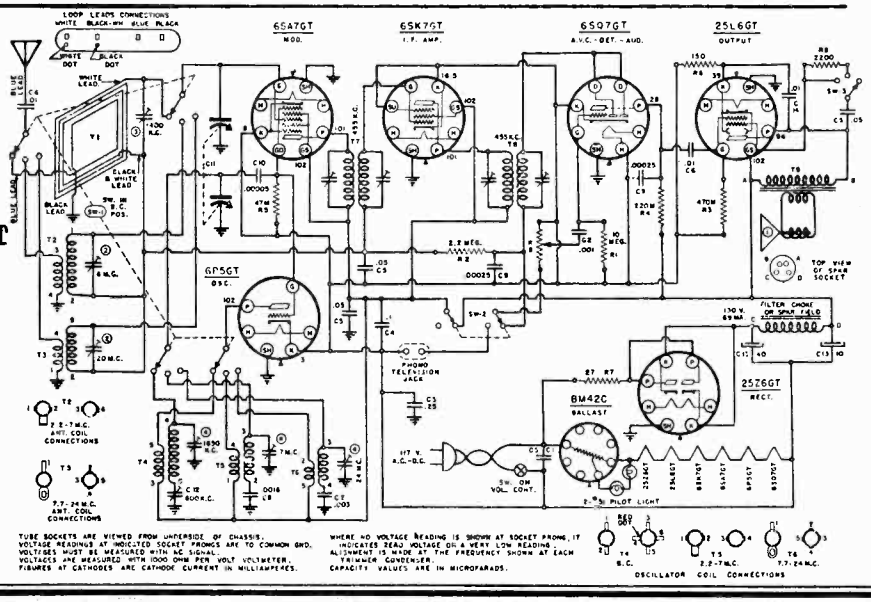
Model No. 0-73

Bands
540 K.C. to 1650 K.C.
2.22 M.C. to 7 M.C.
7.77 M.C. to 24 M.C.

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOLUME VIII



OSCILLATOR COIL CONNECTIONS



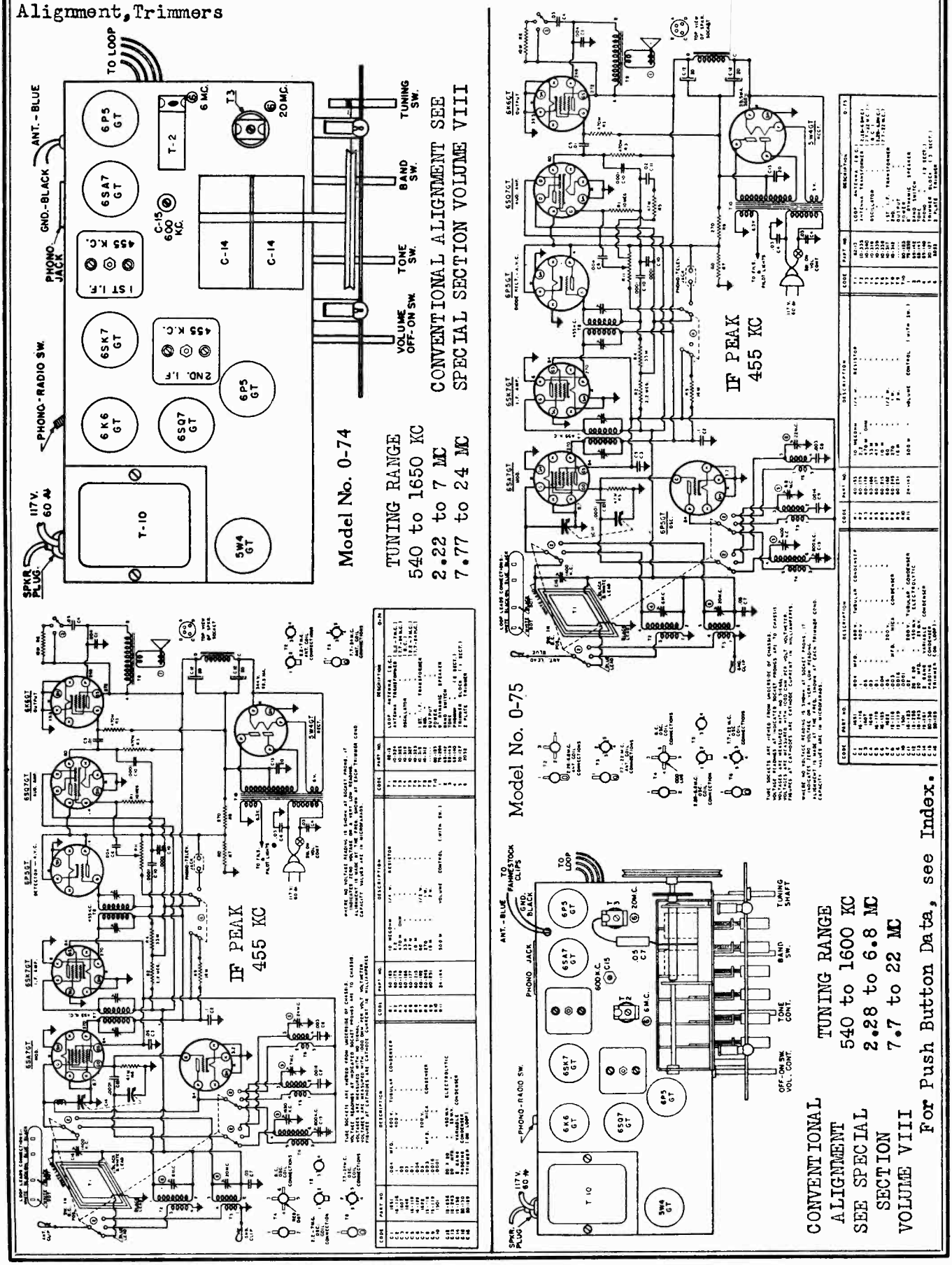
CODE	PART NO.	DESCRIPTION	CODE	PART NO.	DESCRIPTION	CODE	PART NO.	DESCRIPTION 0-73
C1	1807	.05 MFD. 400V. TUBULAR CONDENSER	R1	60-193	10 MEGOHM 1/4 W. RESISTOR	T1	82-11	LOOP ANTENNA
C2	16-184	.001 " " " "	R2	60-178	2.2 " "	T2	10-324	ANTENNA COIL (2.2-7 M.C.)
C3	16-120	.25 " 200 V. " "	R3	60-176	470M OHM " "	T3	10-388	ANTENNA COIL (7.7-24 M.C.)
C4	16-115	.1 " " " "	R4	60-180	220M " "	T4	10-318	OSCILLATOR COIL (.9-2.2 M.C.)
C5	1808	.05 " " " "	R5	60-177	47M " "	T5	10-387	OSCILLATOR COIL (2.2-7 M.C.)
C6	16-181	.01 " " " "	R6	60-184	150 " "	T6	10-389	OSCILLATOR COIL (7.7-24 M.C.)
C7	16-116	.003 MFD. MICA CONDENSER	R7	60-220	27 " "	T7	10-317	1ST I.F. TRANSFORMER
C8	16-119	.0016 " " "	R8	60-233	2200 " "	T8	10-318	2ND " "
C9	1804	.00025 " " "	R9	56-144	500M " VOLUME CONTROL	T9	------	OUTPUT TRANSFORMER (ON SPKR.)
C10	1803	.00005 " " "				1	79-277	8 1/2" DYNAMIC SPEAKER
C11	19-188	2 GANG VARIABLE CONDENSER	SW1	69-142	BAND SWITCH	1	79-281	10" " "
C12	80-186	PADDING CONDENSER	SW2	69-140	PHONO "	2	79-291	8" P.M. SPEAKER
C13	19-435	40 & 10 MFD. 150 W.V. ELECTROLYTIC	SW3	69-143	TONE "	3	2082	2 PLATE TRIMMER
C14	16-118	.01 MFD. 400V. TUBULAR CONDENSER				3	20-129	TRIMMER (ON LOOP)
						4	20-127	TRIMMER BLOCH

TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO COMMON GND.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
VOLTAGES ARE MEASURED WITH 1000 OHM PER VOLT VOLTMETER.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
ALIGNMENT IS MADE AT THE FREQUENCY SHOWN AT EACH TRIMMER CONDENSER.
CAPACITY VALUES ARE IN MICROFARADS.

OSCILLATOR COIL CONNECTIONS

MODEL 0-74
MODEL 0-75
Schematics, Voltage, Socket
Alignment, Trimmers

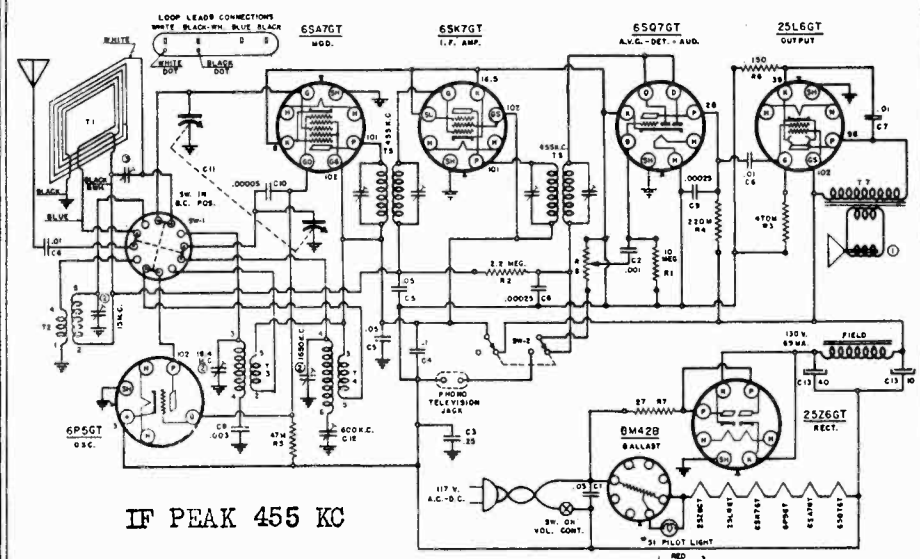
WARWICK MFG. CORP.



Model No. 0-76

This model has been designed to cover two separate frequency bands, a broadcast band from 540 K. C. to 1650 K. C. and a short wave band from 5.7 to 18.4 M.C.

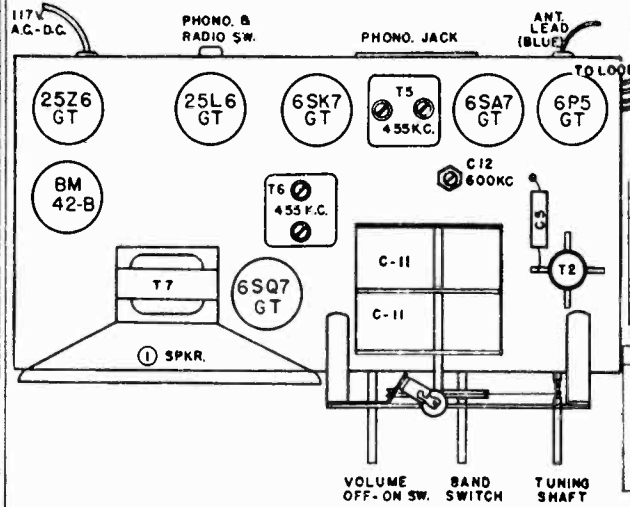
CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII



IF PEAK 455 KC

TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS. VOLTAGE READINGS AT INDICATED SOCKET PHONOS ARE TO COMMON GND VOLTAGES MUST BE MEASURED WITH NO SIGNAL. VOLTAGES ARE MEASURED WITH 1000 OHM PER VOLT VOLTMETER. FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.

WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING. ALIGNMENT IS MADE AT THE FREQUENCY SHOWN AT EACH TRIMMER CONDENSER. CAPACITY VALUES ARE IN MICROFARADS.



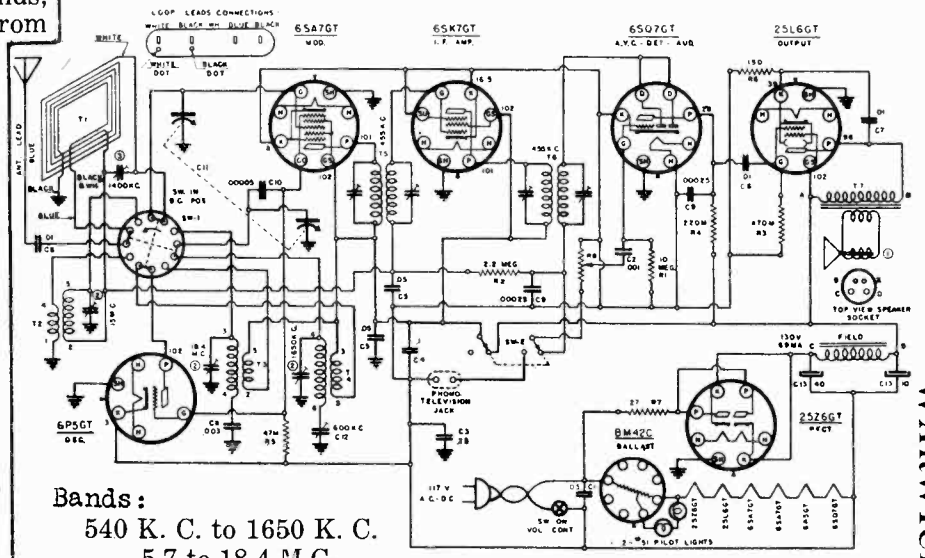
CODE	PART NO.	DESCRIPTION	0-76
T1	82-11	LOOP ANTENNA (B.C.)	
T2	10-323	S.W. ANTENNA COIL	
T3	10-322	S.W. OSCILLATOR COIL	
T4	10-318	B.C. " "	
T5	10-317	1ST. I.F. TRANSFORMER	
T6	10-312	2ND. " "	
T7	------	OUTPUT TRANS. (ON SPKR.)	
1	79-283	5" DYNAMIC SPEAKER	
2	20-127	TRIMMER BLOCK	
3	20-129	TRIMMER (ON LOOP)	

CODE	PART NO.	DESCRIPTION
C1	180T	.05 MFD. 400 V. TUBULAR CONDENSER
C2	16-124	.001 " " " "
C3	16-120	.25 " " " "
C4	16-115	.1 " " " "
C5	1632	.05 " " " "
C6	16-121	.01 " " " "
C7	16-119	.05 " 400 V. " "
C8	15-118	.003 MFD. MICA CONDENSER
C9	150M	.00025 " " "
C10	150S	.00005 " " "
C11	19-156	II GANG VARIABLE CONDENSER
C12	20-128	PADDING CONDENSER
C13	18-295	40 X 10 MFD. 150 W.V. ELECTROLYTIC

CODE	PART NO.	DESCRIPTION
R1	60-193	10 MEGOHM 1/4 W. RESISTOR
R2	60-179	2.2 " " " "
R3	60-178	470M OHM " "
R4	60-180	220M " "
R5	60-177	47M " "
R6	60-184	150 " "
R7	80-220	27 " "
R8	84-144	500M " VOLUME CONTROL
SW1	69-141	BAND SWITCH
SW2	69-140	PHONO. "

CODE	PART NO.	DESCRIPTION
N1	60-193	10 MEGOHM 1/4 W. RESISTOR
R2	60-179	2.2 " " " "
R3	60-178	470M OHM " "
R4	60-180	220M " "
R5	60-177	47M " "
R6	60-184	150 " "
R7	80-220	27 " "
R8	84-144	500M " VOLUME CONTROL
SW1	69-141	BAND SWITCH
SW2	69-140	PHONO. "

Model No. 0-78



Bands:
540 K. C. to 1650 K. C.
5.7 to 18.4 M.C.

IF PEAK 455 KC

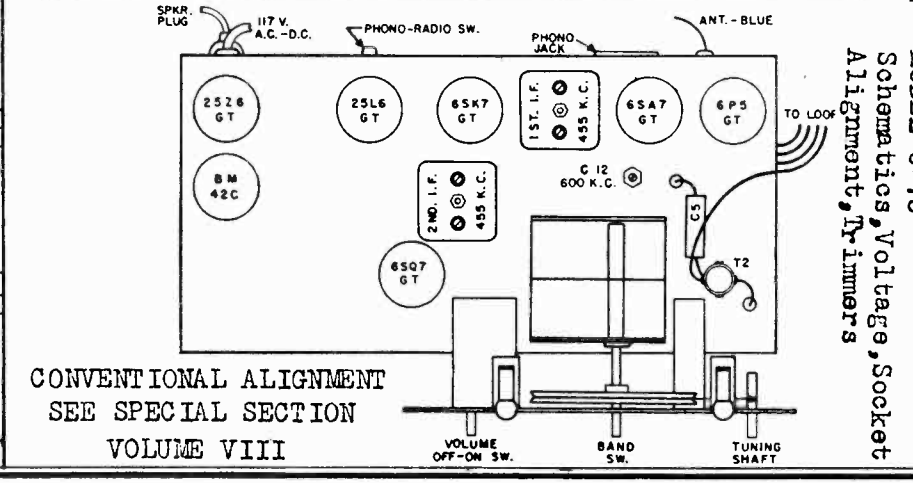
TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS. VOLTAGE READINGS AT INDICATED SOCKET PHONOS ARE TO COMMON GROUND VOLTAGES MUST BE MEASURED WITH NO SIGNAL. VOLTAGES ARE MEASURED WITH 1000 OHM PER VOLT VOLTMETER. FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.

WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING. ALIGNMENT IS MADE AT THE FREQUENCY SHOWN AT EACH TRIMMER CONDENSER. CAPACITY VALUES ARE IN MICROFARADS.

CODE	PART NO.	DESCRIPTION
C1	180T	.05 MFD. 400 V. TUBULAR CONDENSER
C2	16-124	.001 " " " "
C3	16-120	.25 " " " "
C4	16-115	.1 " " " "
C5	1632	.05 " " " "
C6	16-121	.01 " " " "
C7	16-119	.05 " 400 V. " "
C8	15-118	.003 MFD. MICA CONDENSER
C9	150M	.00025 " " "
C10	150S	.00005 " " "
C11	19-156	II GANG VARIABLE CONDENSER
C12	20-128	PADDING CONDENSER
C13	18-295	40 X 10 MFD. 150 W.V. ELECTROLYTIC

CODE	PART NO.	DESCRIPTION
R1	60-193	10 MEGOHM 1/4 W. RESISTOR
R2	60-179	2.2 " " " "
R3	60-178	470M OHM " "
R4	60-180	220M " "
R5	60-177	47M " "
R6	60-184	150 " "
R7	80-220	27 " "
R8	84-144	500M " VOLUME CONTROL
SW1	69-141	BAND SWITCH
SW2	69-140	PHONO. "

CODE	PART NO.	DESCRIPTION 0-78
T1	82-13	LOOP ANTENNA (B.C.)
T2	10-323	S.W. ANTENNA COIL
T3	10-322	S.W. OSCILLATOR COIL
T4	10-318	B.C. " "
T5	10-315	1ST. I.F. TRANSFORMER
T6	10-312	2ND. " "
T7	------	OUTPUT TRANSF. (ON SPKR.)
1	79-277	8-1/2" DYNAMIC SPEAKER
2	20-121	TRIMMER BLOCK
3	20-119	TRIMMER (ON LOOP)



CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII

WARWICK MFG. CORP.

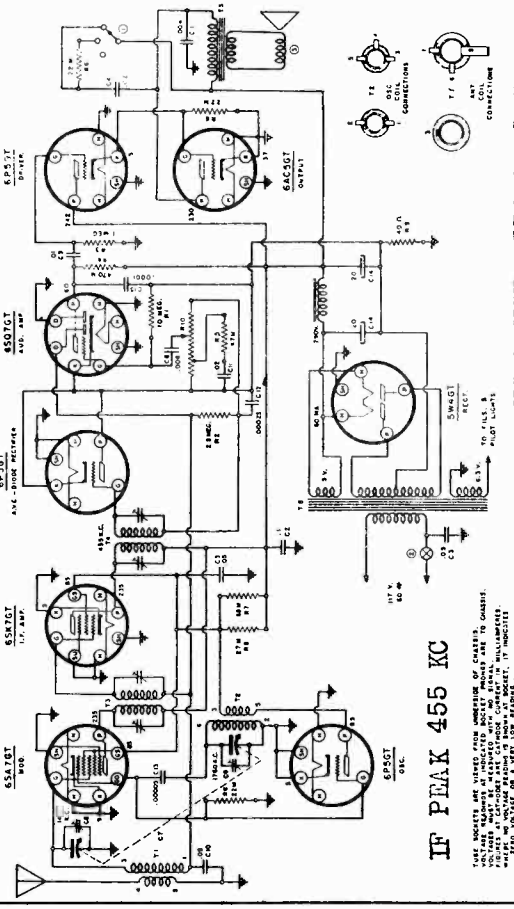
MODEL 0-76
MODEL 0-78
Schematics, Voltage, Socket Alignment, Trimmers

MODEL 0-77
MODEL 0-80

WARWICK MFG. CORP.

Schematics, Voltage, Socket Alignment, Trimmers

Model No. 0-80



IF PEAK 455 KC

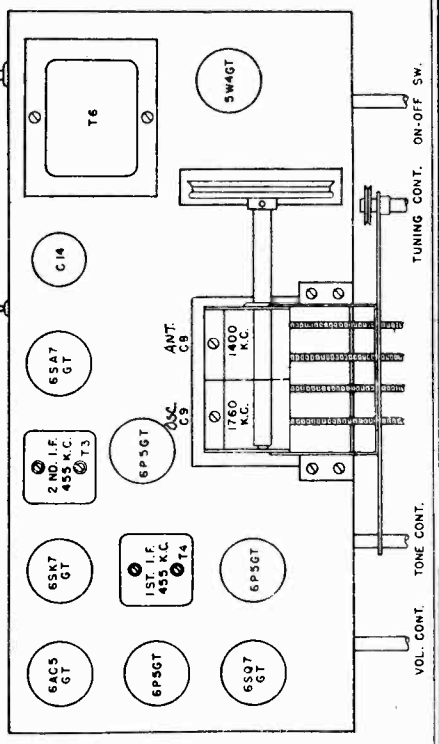
TUNING RANGE: 537 to 1730 KC

CODE	PART NO.	DESCRIPTION	CODE	PART NO.	DESCRIPTION	CODE	PART NO.	DESCRIPTION
C1	18-155	.005 MFD. 600 V. TUBULAR CONDENSER	R1	80-193	10 MEGOHM 1/4 W. CARBON RESISTOR	T1	40-238	ANTENNA COIL
C2	18-118	.05 " " 400 V. " "	R2	80-195	2.2 " " " "	T2	40-239	OSCILLATOR COIL
C3	18-119	.1 " " 400 V. " "	R3	80-196	470 M Ohm " " "	T3	40-312	2 MC. I.F. TRANSFORMER
C4	1401	.02 " " " " "	R4	80-197	470 " " " "	T4	40-311	2 MC. I.F. TRANSFORMER
C5	18-118	.05 " " " " "	R5	80-198	220 " " " "	T5	40-310	POWER TRANSFORMER
C6	18-118	.05 " " " " "	R6	80-199	220 " " " "	T6	40-240	
C7	1401	.02 " " " " "	R7	80-200	470 " " " "			
C8	18-118	.05 " " " " "	R8	80-201	1 M " " " "	T1	52-131	LOOP CONTROL
C9	1402	.005 " VARIABLE CONDENSER (SEE C8 & C9)	R9	80-202	1 M " " " "	T2	52-132	6" DYNAMIC SPEAKER
C10	18-119	.1 MFD. 400 V. TUBULAR CONDENSER	R10	80-203	1/4 W. WIRE WOUND RESISTOR			
C11	18-118	.05 MFD. 400 V. " "	R11	80-132	500 M VOLUME CONTROL			
C12	18-155	.005 MFD. 600 V. " "						
C13	18-118	.05 " " 400 V. " "						
C14	18-118	.05 " " " " "						
C15	1501	30-30-20 MFD. 450 V. ELECTROLYTIC CONDENSER						

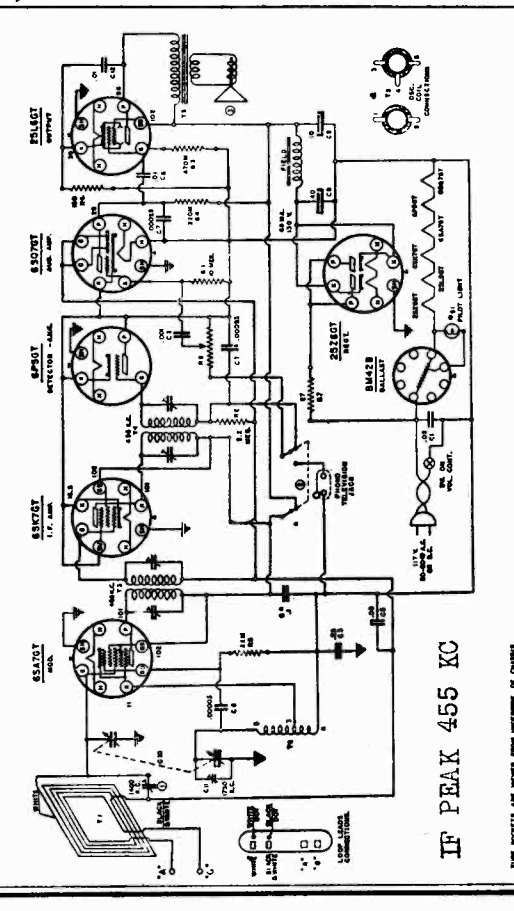
TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS.
VOLTAGES ARE MEASURED WITH 1000 OHMS PER VOLT METER, FROM SOCKET TERMINALS TO CHASSIS.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
VOLTAGES MAY BE MEASURED WITH A VACUUM TUBE VOLTMETER, BUT READINGS WILL BE LOWER.
ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE CHASSIS.
CAPACITY VALUES ARE MICROFARADS.

CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII

For Push Button Data see Index.



Model No. 0-77



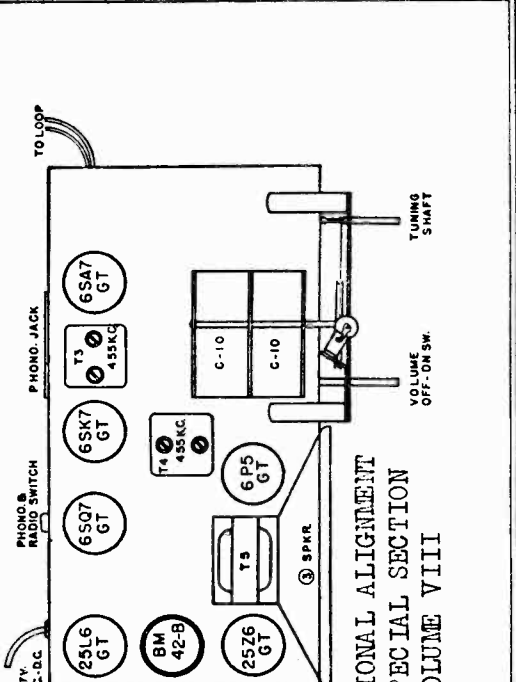
IF PEAK 455 KC

TUNING RANGE: 540 to 1750 KC

CODE	PART NO.	DESCRIPTION	CODE	PART NO.	DESCRIPTION
C1	18-155	.005 MFD. 600 V. TUBULAR CONDENSER	R1	80-193	10 MEGOHM 1/4 W. CARBON RESISTOR
C2	18-118	.05 " " 400 V. " "	R2	80-195	2.2 " " " "
C3	18-119	.1 " " 400 V. " "	R3	80-196	470 M Ohm " " "
C4	1401	.02 " " " " "	R4	80-197	470 " " " "
C5	18-118	.05 " " " " "	R5	80-198	220 " " " "
C6	18-118	.05 " " " " "	R6	80-199	220 " " " "
C7	1402	.005 " VARIABLE CONDENSER (SEE C8 & C9)	R7	80-200	470 " " " "
C8	18-119	.1 MFD. 400 V. TUBULAR CONDENSER	R8	80-201	1 M " " " "
C9	18-118	.05 " " " " "	R9	80-202	1 M " " " "
C10	18-155	.005 MFD. 600 V. " "	R10	80-203	1/4 W. WIRE WOUND RESISTOR
C11	18-118	.05 " " 400 V. " "	R11	80-132	500 M VOLUME CONTROL
C12	18-155	.005 MFD. 600 V. " "			
C13	18-118	.05 " " 400 V. " "			
C14	18-118	.05 " " " " "			
C15	1501	30-30-20 MFD. 450 V. ELECTROLYTIC CONDENSER			

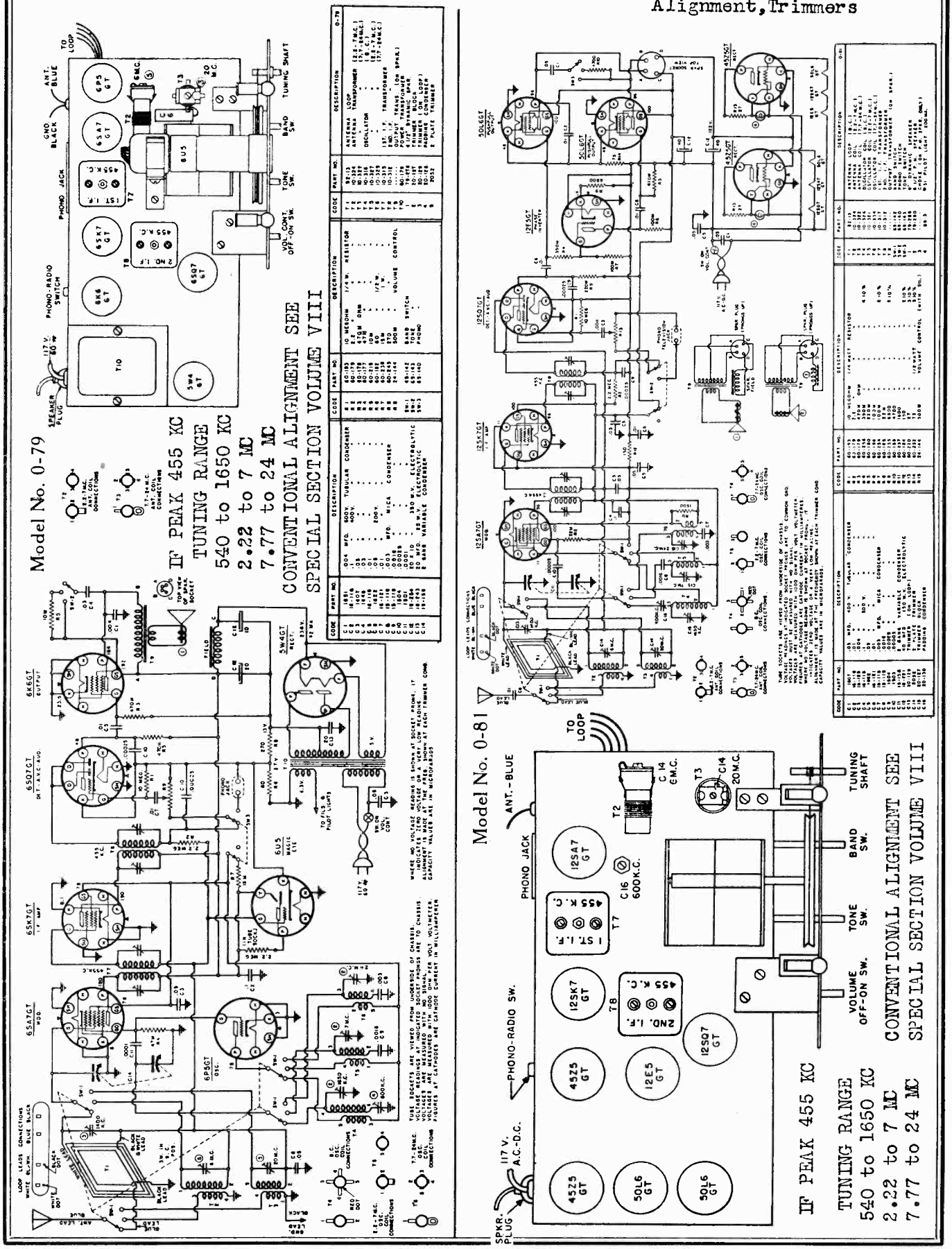
TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS.
VOLTAGES ARE MEASURED AT INDICATED SOCKET PINS AND TO CHASSIS.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
VOLTAGES MAY BE MEASURED WITH A VACUUM TUBE VOLTMETER, BUT READINGS WILL BE LOWER.
ALIGNMENT IS TO BE MADE AT THE FREQUENCY SHOWN AT THE CHASSIS.
CAPACITY VALUES ARE MICROFARADS.

CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII



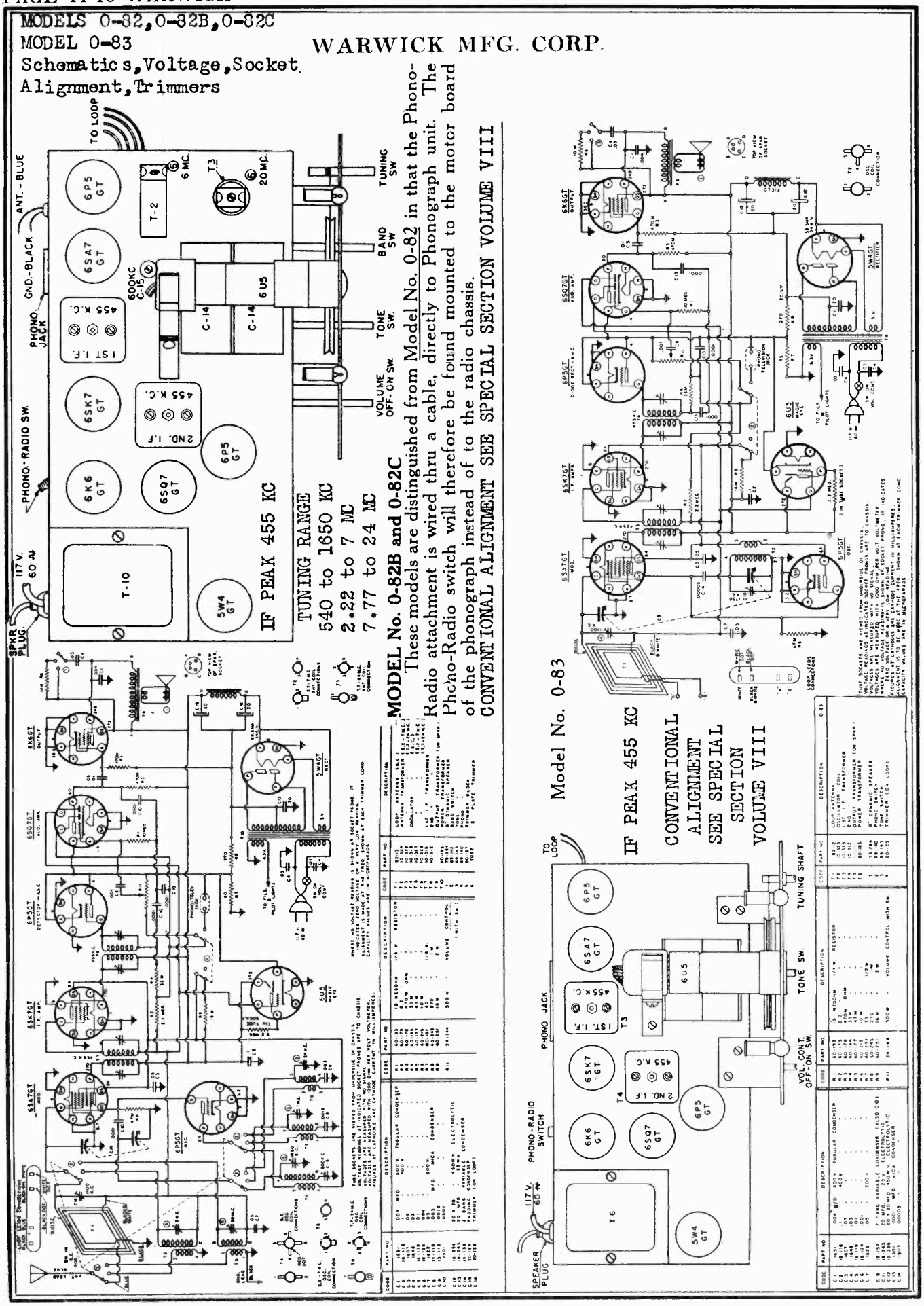
WARWICK MFG. CORP.

MODEL 0-79
MODEL 0-81
Schematics, Voltage, Socket
Alignment, Trimmers



MODELS 0-82, 0-82B, 0-82C
MODEL 0-83
Schematics, Voltage, Socket
Alignment, Trimmers

WARWICK MFG. CORP.



WARWICK MFG. CORP.

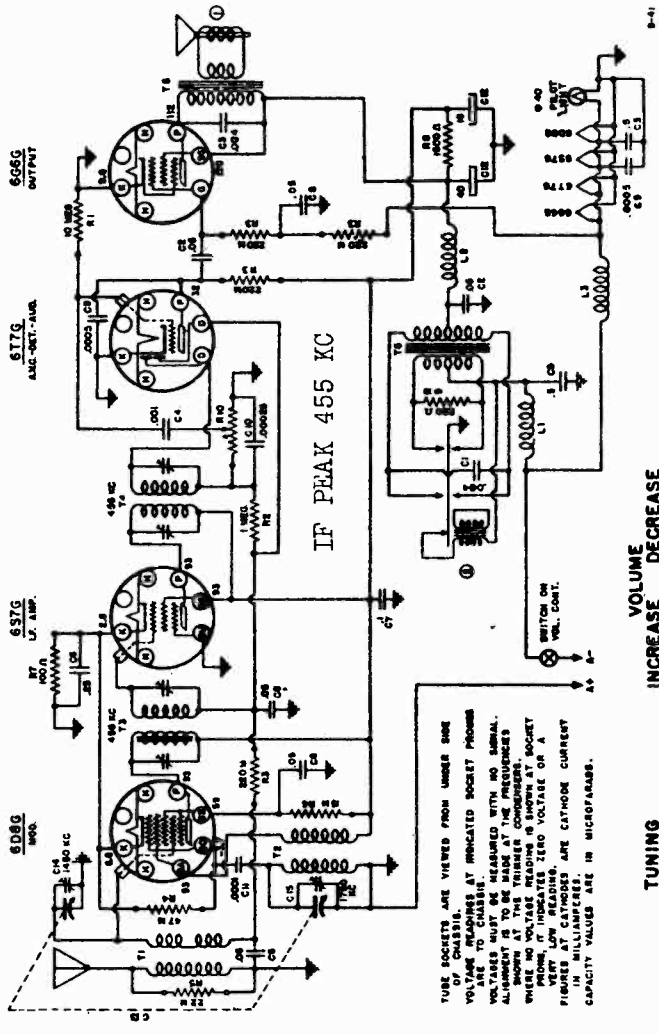
MODELS 9-41,9-44,406
Schematic,Voltage,Socket
Alignment,Trimmers

Schematic Location	Part No.	Description	Selling Price Each
	1011323128	Cable—Battery	.45
	101373509	Caps—Grid Small ..... Doz.	.10
	1012739257	Drum & Lever Assem.	.40
	10140522?7	Knob—Tuning, Ivory or Cream & Tan	.15
	10140522132	Knob—Volume, Ivory or Cream & Tan	.15
	101318901	Lamp—Pilot No. 40	.15
	1012739248	Lever—Driver	.05
	1012739247	Link—Connecting	.05
L3	1011633218	Choke—Filament	.20
L2	1011610246	Choke—R.F. (B)	.20
L1	1011633217	Choke—Vibrator	.20
	101373516	Clamps—Battery	.20
C1	1012216127	Condenser—Buffer .004 mfd. 1000V.	.25
C2		Condenser—.05 mfd. 400V Tub.	.25
C3		Condenser—.004 mfd. 400V Tub.	.25
C4		Condenser—.001 mfd. 400V Tub.	.25
C5		Condenser—.5 mfd. 200V Tub.	.25
C6		Condenser—.25 mfd. 200V Tub.	.25
C7		Condenser—.1 mfd. 200V Tub.	.25
C8		Condenser—.05 mfd. 200V Tub.	.25
C9		Condenser—.0005 mfd. Mica	.25
C10		Condenser—.00025 mfd. Mica	.25
C11		Condenser—.0001 mfd. Mica	.25
C12	1012118236	Condenser—Electrolytic 40x16 mfd. 200V	1.00
C13	1012019132	Condenser—Variable C14 & C15	2.05
	1012524124	Control—Volume 500M ohm	.75
1		1015179256 Speaker—5" P.M. with	5.00
T5	•	Output Transformer	
	1012770110	Spring—Drive	.05
	1012670111	Spring—Ribbon	.05
	1012770105	Spring—String	.05
T1	1011810239	Transformer—Antenna	.45
T2	1011810240	Transformer—Oscillator	.30
T3	1015510253	Transformer—1st I.F.	1.25
T4	1015710252	Transformer—2nd I.F.	.80
T6	1016580160	Transformer—Power, Virb.	1.75
	1013722112	Tripoints—Back Panel ..... Doz.	.15
	1013722103	Tripoints—Ribbon ..... Doz.	.15
	10127957	Tuner—4 Button	1.20
2	1016234103	Vibrator	4.00
	10128866	Washers—"C" ..... Doz.	.10

*When ordering Speaker output transformer refer to number stamped on speaker frame.

	1012752131	Push Button & Stems, Cream & Tan or Ivory	.15
R1		Resistors—10 meg ohm 1/3W	.20
R2		Resistors—1 meg ohm 1/3W	.20
R3		Resistors—220M ohm 1/3W	.20
R4		Resistors—47M ohm 1/3W	.20
R5		Resistors—22M ohm 1/3W	.20
R6		Resistors—15M ohm 1/3W	.20
R7		Resistors—100 ohm 1/3W	.20
R8		Resistors—1500 ohm 1/2W	.20
R9		Resistors—220 ohm 1/2W	.20

PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE



CONVENTIONAL ALIGNMENT, SEE SPECIAL SECTION, VOLUME VIII

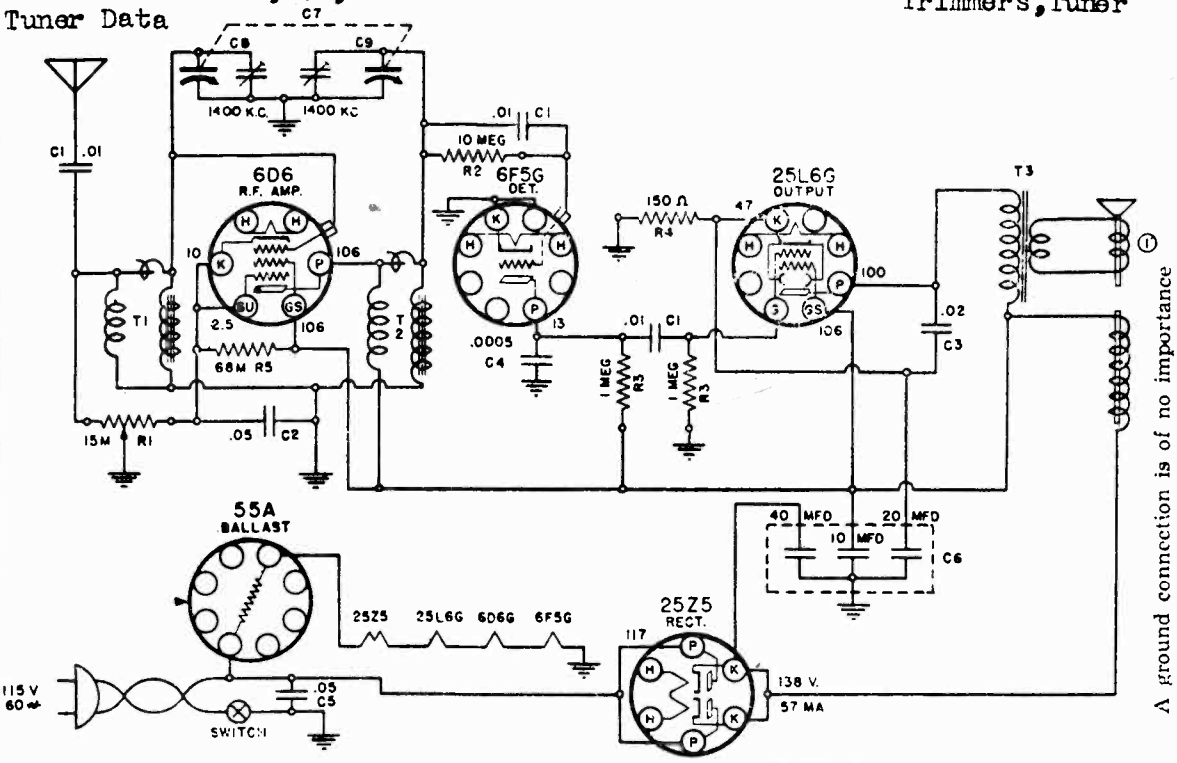
FOR SETTING UP PUSH BUTTONS - SEE INDEX

MODELS 9-41, 9-44, 406
MODEL 9-42 MODELS 9-61, 9-63, 630, 631

WARWICK MFG. CORP.

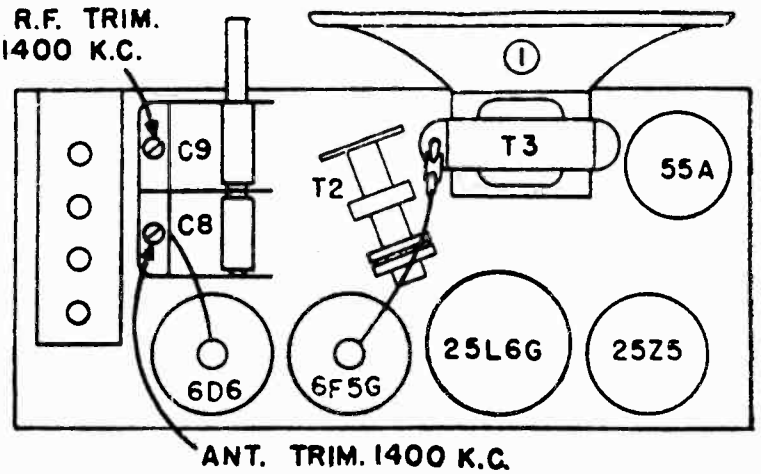
MODELS 9-51, 9-52, 9-54, 542
Schematic, Voltage, Socket Trimmers, Tuner

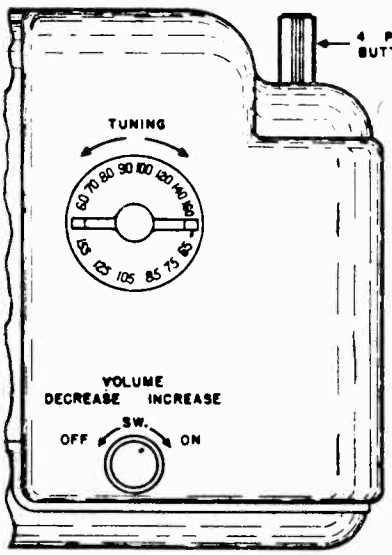
Tuner Data



A ground connection is of no importance and therefore has been eliminated

WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDENSERS.
CAPACITY VALUES ARE IN MICROFARADS.





TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS WITH A 1000 OHM PER VOLT VOLTMETER.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.

PUSH BUTTON DATA for MODELS 9-41, 9-44, 406; 9-42; 9-61, 9-63, 9-64, 630, 631; 9-51, 9-52, 9-54, 542(1938):

SETTING PUSH-BUTTONS

1. By means of the Station Selector Knob, tune in WITH THE RIGHT HAND AS ACCURATELY AS POSSIBLE the station having the highest frequency—that is, your selected station which is tuned in nearest number 160 on the Station Selector Knob.

2. After the station has been tuned in accurately with the right hand, continue to hold it in its exact position firmly, and with the left hand loosen the Push-Button to be set up for that station by unscrewing the Push-Button about one turn to the left (counter-clockwise).

3. Continuing to hold the Station Selector Knob in its exact position, PUSH THE PUSH-BUTTON IN ALL THE WAY with the left hand.

4. After the Push-Button has been depressed all the way, tighten it gently toward the right (clockwise). Release Push-Button slowly and when in normal position grip button and tighten firmly.

The Push-Button tuning system is now correctly set up for your first selected station of highest frequency and the Call Letter Tab for this station should be in the Push-button nearest the rear of the receiver.

Follow through with this same procedure, setting up the other 3 stations in the order of their frequency—that is, the second station set up will be second highest in frequency and the third station set up will be third highest in frequency.

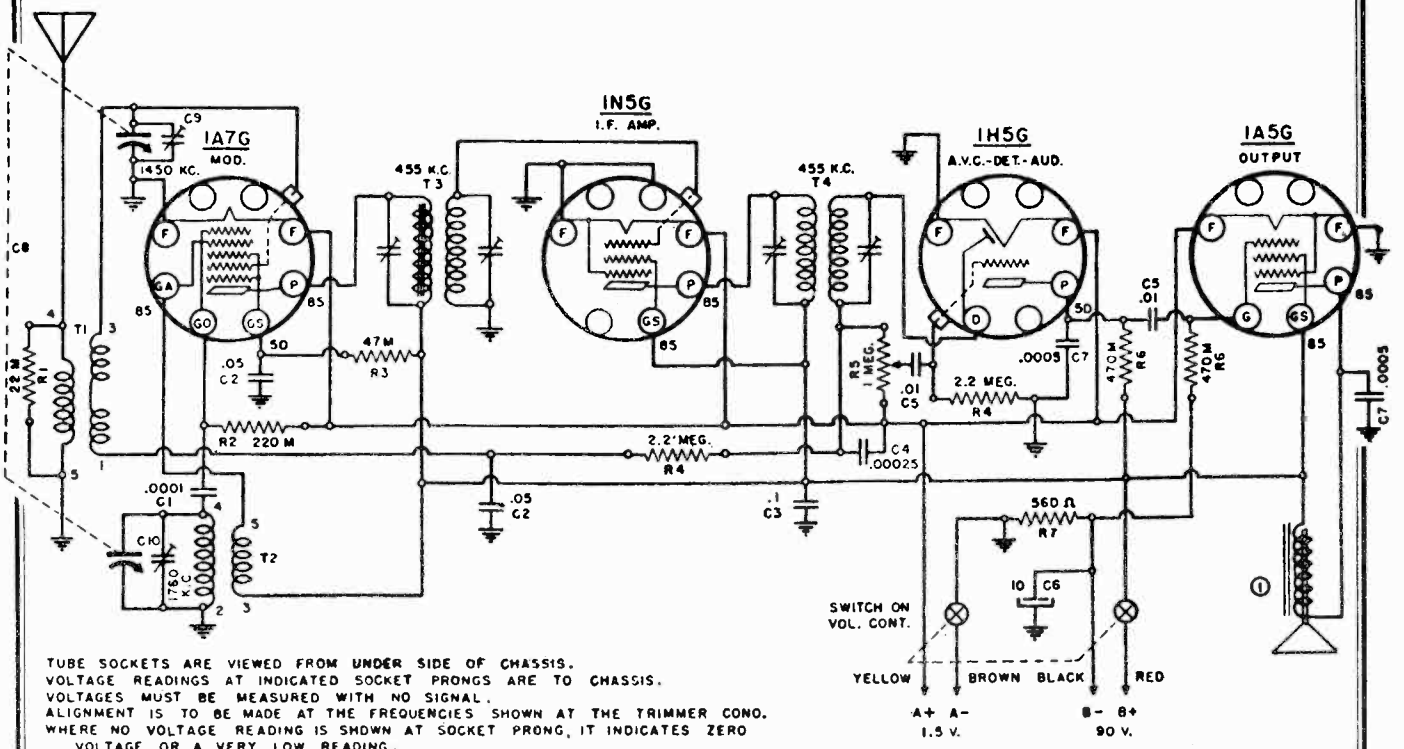
Carefully check each Push-Button for the accuracy of its setting. If, when tuning in any station with its Automatic Push-Button it does not have equal volume or clarity to that obtained with manual tuning, this may indicate the automatic adjustment for that station was not made accurately. Should there be any inaccuracy in any one of the Push-Button adjustments, correction can be made by repeating the above procedure for that button only. Do not reset those Push-Buttons that are accurately adjusted.

No further adjustments are necessary to operate your radio automatically or manually. To receive any one of your selected stations for automatic operation, merely push in ALL THE WAY the Button set up for that station.

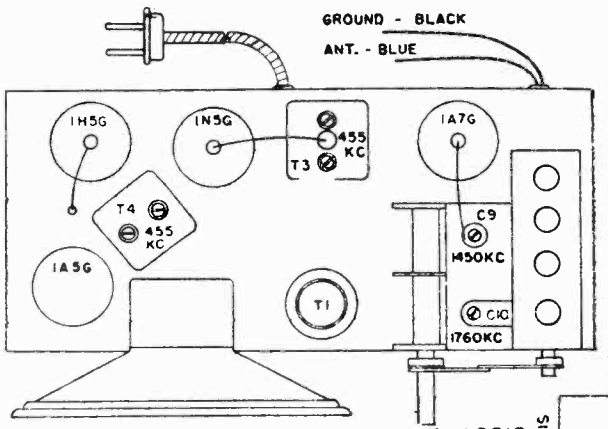
To receive all other stations in the regular manner turn the tuning knob to the frequency of the station desired.

WARWICK MFG. CORP.

MODEL 9-42
Schematic, Voltage, Socket Alignment, Trimmers



TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER COND.
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
CAPACITY VALUES ARE IN MICROFARADS.

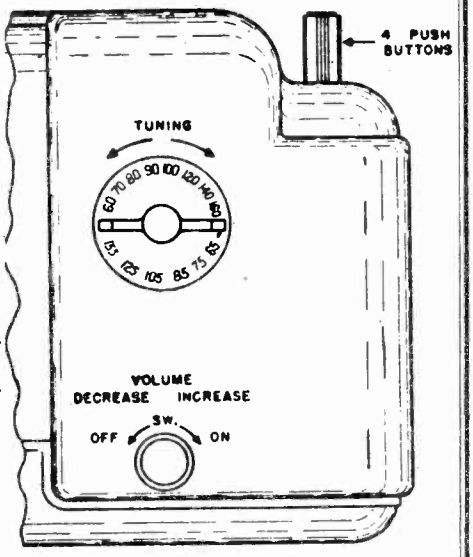


LOCATION OF PARTS ON TOP OF CHASSIS

IF PEAK 455 KC

CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII

FOR PUSH BUTTON DATA - SEE INDEX



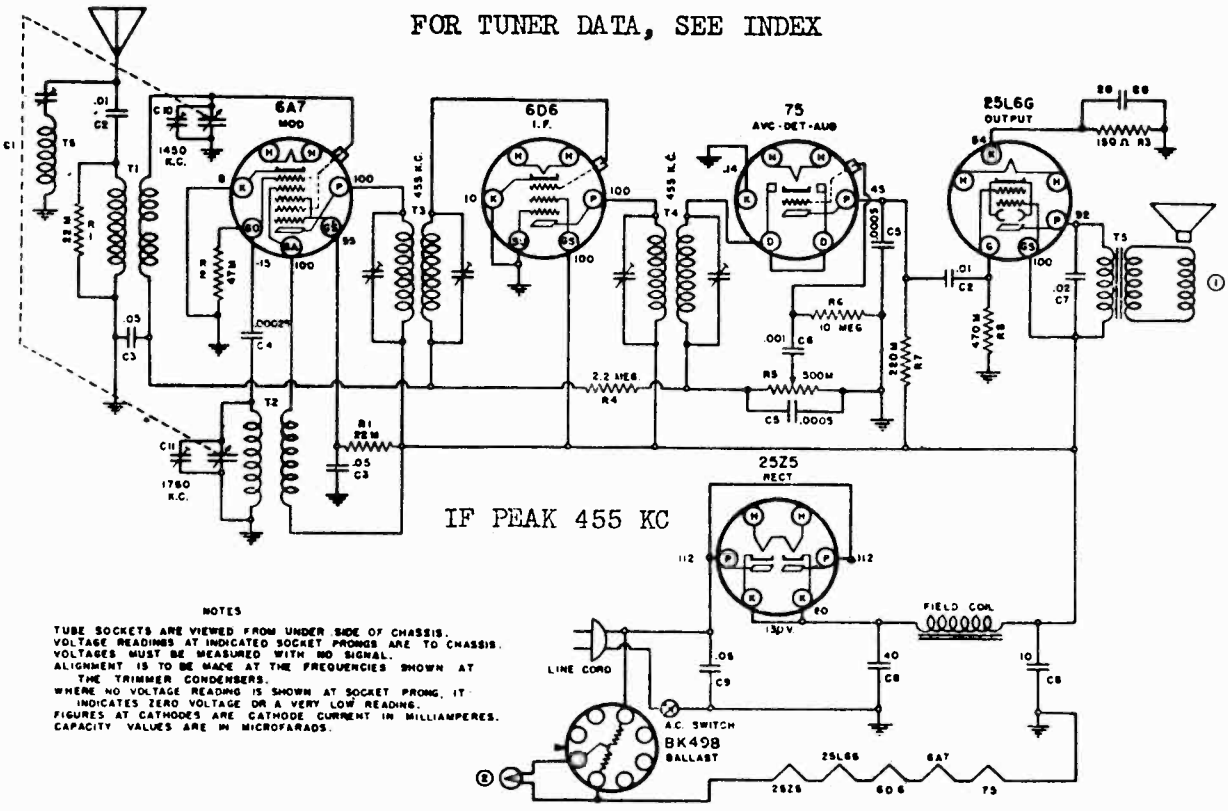
	Part No.	Description	Price Each
	1011242184	Cabinet—Molded, Walnut	2.65
	1011323130	Cable—Battery	.62
	101373509	Clips—Grid ..... Doz.	.15
C1		Condenser—.0001 mfd. Mica	.25
C2		Condenser—.05 mfd. 200 V. Tub.	.25
C3		Condenser—.1 mfd. 200 V. Tub.	.25
C4		Condenser—.00025 mfd. Mica	.25
C5		Condenser—.01 mfd. 400 V. Tub.	.25
C6	1012118235	Condenser—Elec. 10 mfd. 35 Volts	.50
C7		Condenser—.0005 mfd. Mica	.25
C8	1012019134	Condenser—Variable C9 and C10	.80
R5	1012524126	Control—Volume 1 meg ohm	.90
	101374710	Grommet—Rubber 3/8" ..... Doz.	.20
	101374700	Grommet—Rubber 1/4" ..... Doz.	.20
	1014067367	Knob—Tuning, Ivory or Cream & Tan	.38
	1014052116	Knob—Volume, Ivory or Cream & Tan	.15
	1012752129	Knob—(Push Button) & Stem, Ivory or Cream and Tan	.15
R1		Resistor—22 M ohm 1/3 W	.20
R2		Resistor—220 M ohm 1/3 W	.20
R3		Resistor—47 M ohm 1/3 W	.20
R4		Resistor—2.2 meg ohm 1/3 W	.20
R6		Resistor—470 M ohm 1/3 W	.20
R7		Resistor—560 ohm 1/3 W	.20
1	10151179260	Speaker—5" Permanic	2.40
	1012770109	Spring	.05
T1	1011810258	Transformer—Antenna	.75
T2	1011810257	Transformer—Oscillator	.75
T3	1015510251	Transformer—1st I.F.	1.50
T4	1015710259	Transformer—2nd I.F.	1.25
	1013722112	Tri-points—Back panel ..... Doz.	.15
	101289956	Tuner	1.30

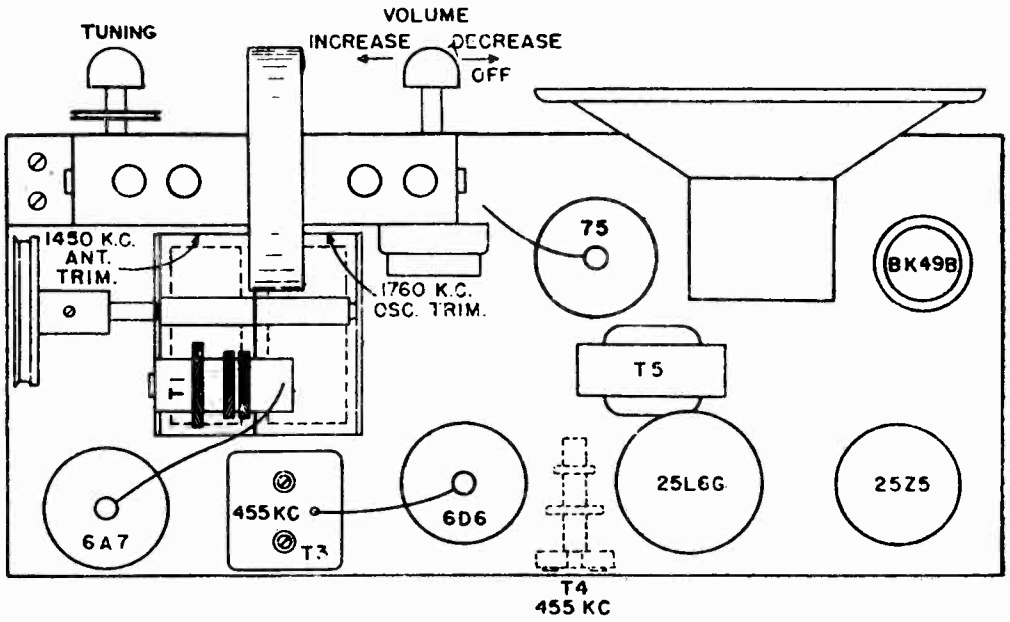
ALL PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE

MODELS 9-61,9-63,9-64
630,631
Schematic,Voltage,Socket
Alignment,Trimmers

WARWICK MFG. CORP.

FOR TUNER DATA, SEE INDEX





FOR CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII

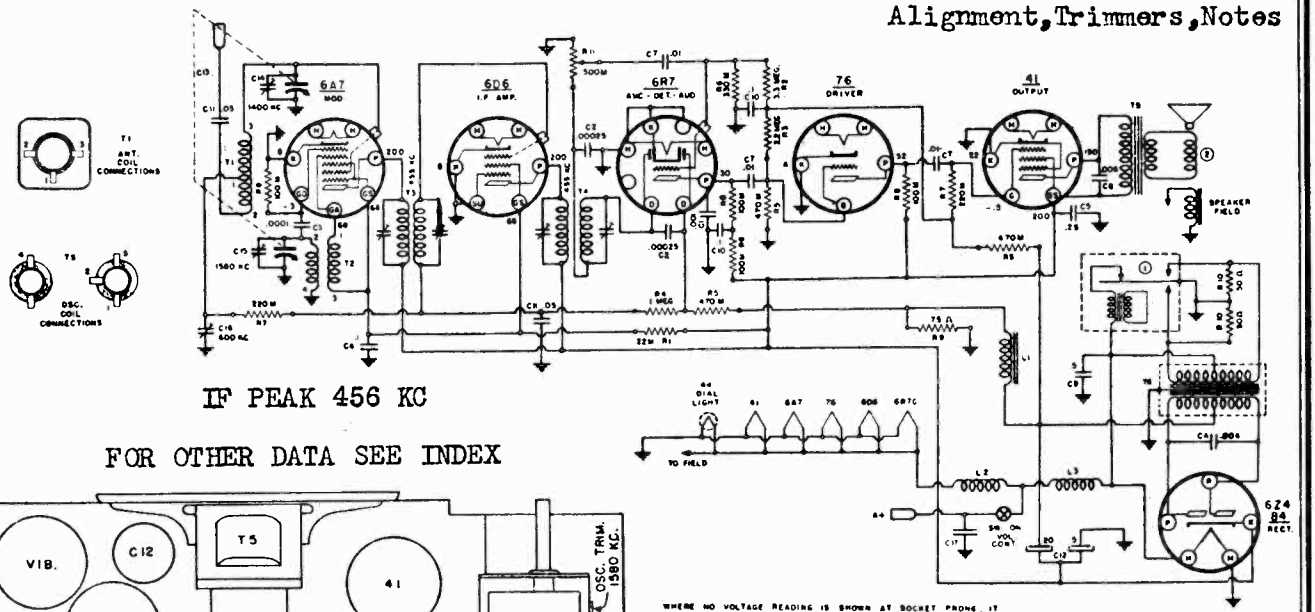
POWER SUPPLY

The receiver is designed for operation from 105-130 volt Alternating Current (A.C.) supply or a 105-130 volt Direct Current (D.C.) supply. Never connect the receiver to any supply having a higher voltage than that specified on the sticker. If you are not sure of the power supply voltage at your home, your Power Company will furnish the information.

When using a D.C. supply allow sufficient time for tubes to warm up (approximately 1½ minutes), and if at that time the receiver does not operate, remove the line cord plug from the socket and reverse. Replace plug in the reverse position and allow tubes to warm up, at which time the receiver will operate.

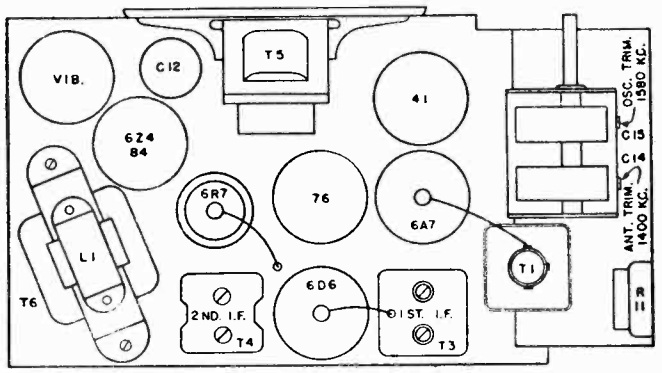
WARWICK MFG. CORP.

MODEL 9-627
Schematic, Voltage, Socket
Alignment, Trimmers, Notes



IF PEAK 456 KC

FOR OTHER DATA SEE INDEX



LOCATION OF PARTS ON TOP OF CHASSIS

WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.
CAPACITY VALUES ARE IN MICROFARADS
VOLTAGES TAKEN WITH A 6V. INPUT.

TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS
VOLTAGES MUST BE MEASURED WITH NO SIGNAL
ALIGNMENT IS TO MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDENSERS.

CODE	PART NO.	DESCRIPTION	S-62
T1	10-253	ANTENNA TRANSFORMER	
T2	10-224	OSCILLATOR	"
T3	10-221	1 ST. I.F.	"
T4	10-222	2 ND. I.F.	"
T5		OUTPUT TRANS. (ON SPKR.)	
T6	80-168	POWER TRANSFORMER	84-T
L1	33-215	FILTER CHOKE	
L2	33-210	FILAMENT CHOKE	
L3	33-211	VIBRATOR CHOKE	
-	34-102	VIBRATOR	
S	78-240	S" SPEAKER	

CODE	PART NO.	DESCRIPTION
R1	60-216	22 M OHM 1 W. CARBON RES.
R2	60-209	3.3 MEGOHM 1/2 W. " " "
R3	60-208	2.2 " " " " "
R4	60-187	1 " " " " "
R5	60-206	470 M OHM " " "
R6	60-210	330 M " " " "
R7	60-207	220 M " " " "
R8	60-173	100 M " " " "
R9	60-211	75 " " " "
R10	60-212	50 " " " "
R11	24-119	VOLUME CONTROL 500M OHMS

CODE	PART NO.	DESCRIPTION
C1	15-111	.001 MFD. MICA CONDENSER
C2	1504	.00025 " " "
C3	1501	.0001 " " "
C4	16-119	.05A MFD 1500 V BUFFER COND.
C5	16-117	.25 " 600 V. TUB. CONDENSER
C6	16-116	.1 " " " "
C7	16-119	.01 " " " "
C8	16-120	.005 " " " "
C9	16-118	.5 " 500 V. OVAL "
C10	16-119	.1 " " TUB. "
C11	1502	.05 " " " "
C12	18-240	20 + 5 MFD. ELECTROLYTIC 300 V.
C13	19-127	2 GANG VARIABLE COND. ALSO C14 & C15
C16	20-117	300-600 MFD. PADDING CONDENSER
C17	59-1	SPARK PLATE

ALIGNMENT PROCEDURE

PRELIMINARY

Output Meter Connections	Across Loud Speaker Voice Coil
Output Meter Reading to Indicate 1 Watt	1.85 Volts
Generator Ground Lead Connection	Receiver Chassis
Dummy Antenna Value to Be in Series with Generator Output	See Chart Below
Connection of Generator Output Lead	See Chart Below
Generator Modulation	30%, 400 Cycles
Position of Volume Control	Fully On

Position of Variable	Generator Frequency	Dummy Antenna	Generator Connections	Trimmer Adjustment (In Order Shown)	Trimmer Function
Closed	455 Kc.	.1 mfd.	6A7 Grid	T3 T4	I. F.
Fully Open	1580 K. C.	.0002 mfd.	Antenna Conn.	C15	Osc. Trimmer
1400 K.C.	1400 K.C.	.0002 mfd.	Antenna Conn.	C14	Ant. Trimmer
600 K. C.	600 K. C.	.0002 mfd.	Antenna Conn.	C16	Antenna Padder

The variable condenser should be at 600 k.c. for antenna adjustment.

The alignment procedure should be repeated in the original order, step by step, to insure greater accuracy. A final adjustment of antenna padder condenser C16 is always made after the receiver is installed in the car, in order to match the car antenna.

Always keep the output power from the generator at its lowest possible value to prevent the A.V.C. of the receiver from interfering with accurate alignment.

THE AMMETER LEAD

The ammeter cable (See "H" in Fig. 1) has a spring clip at one end and a fuse receptacle at the other. Compress the spring clip and slide it over the ammeter stud on the back of the car's ammeter. When the clip is released it will spring out and grip the stud securely. (See fig 1.) (The cable clip may be connected to either stud of the ammeter. If connected to one stud, the current taken by the radio will register on the ammeter. If connected to the other stud, it will not register.) In a few cars such as the first models of the Ford V-8 the ammeter does not have terminals. In such cases the spring clip should be fastened to any available terminal behind the dash which is connected to the ungrounded side of the battery at all times. Some terminals will be so connected only when the ignition or light switches are turned "On." Insert the fibre sleeve and fuse (See "J" and "K" in Fig. 1) in the other end of the ammeter cable. The black wire coming from the radio receiver has a plug at its end which should be inserted into the fuse receptacle after the fuse sleeve and fuse have been inserted.

THE GENERATOR CONDENSER

The Generator Condenser should be mounted to the generator frame by means of any one of the generator assembly bolts. Scrape all dirt and paint away so that a clean metal to metal contact is made. The flexible lead from the Generator Condenser should be connected to the output terminal of the generator.

MODEL 9-627
Assembly, Notes
Tuner Data

WARWICK MFG. CORP.

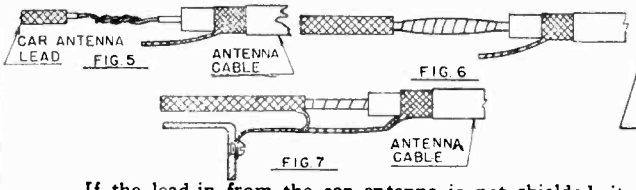
ANTENNA

Insert the single prong of the antenna cable (See "G" in Fig. 1) into its receptacle located on the bottom of the receiver case and near the front left hand corner. Note that the other end of this cable has a white covered wire protruding from its end and a bright metal pigtail. The white covered inner-wire and the bright metal pigtail are to be connected to the car's antenna in the following manner:

If an antenna was located coming from the corner post of the car, it will probably have an inner wire covered with the metal braid. (If it has a plug at its end, cut off the plug). Scrape clean and solder the white wire of the receiver's antenna lead to the inner wire of the car antenna lead. Be certain these inner wires do not at any time touch the outer shield. (See Fig. 5.)

After the connection is cleaned and connected, cover the joint carefully with tape. (See Fig. 6.)

Connect the pigtail of the receiver's antenna wire to the pigtail braid of the car's antenna lead-in. Wrap pigtails and solder together using rosin core solder. IMPORTANT—Make certain when bolting soldered pigtail ends to car that the section is scraped clean and a good chassis ground. (See Fig. 7.)



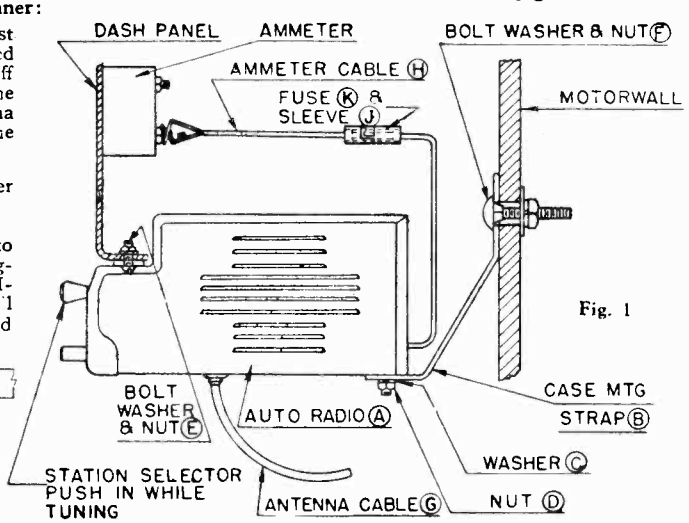


Fig. 1

If the lead-in from the car antenna is not shielded, it is advisable to do so to overcome motor noise. Slip a shielded loom over the entire length of the car antenna lead-in. In some cases where a roof antenna is used, the lead-in is brought down through a corner post of the car frame at the end of the windshield (See Figure 2). If the radio antenna cable is long enough to be inserted several inches into the corner post, connect antenna lead-in and the radio antenna cable as shown in Figures 5, 6 and 7, and after taping, insert the splice and all the unshielded portion of the lead-in up into the corner post. If this cannot be done, this type of lead-in should be covered with a shielded loom several inches into the corner post. Connect the lead-in and shielding as illustrated in Figures 5, 6 and 7. The other end of the shielding at the car antenna should be grounded. To eliminate crackling and noisy reception due to antenna lead-in pick-up, the shielded antenna lead-in should be either insulated from chassis (or car body) or grounded at interval points, leading from the radio antenna cable to the car antenna. Be sure to use car chassis or grounded section of body only for grounding.

THE DISTRIBUTOR SUPPRESSOR

To install the distributor suppressor, cut the CENTER lead from the distributor cap in two, as close as possible to the distributor cap. Screw the Distributor Suppressor to one end of the cut cable and then to the other end leading to the distributor cap.

SETTING PUSH-BUTTONS

1. By means of the Station Selector Knob, tune in WITH THE RIGHT HAND AS ACCURATELY AS POSSIBLE the station having the lowest frequency—that is, your selected station which is tuned in nearest the right-hand side of the dial.

2. After the station has been tuned in accurately with the right hand, continue to hold it in its exact position firmly, and with the left hand loosen the Push-Button to be set up for that station by unscrewing the Push-Button about one turn to the left (counter-clockwise).

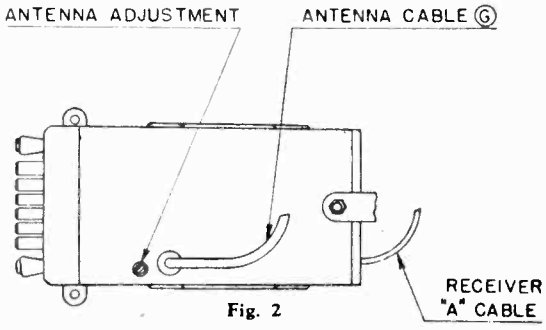


Fig. 2

3. Continuing to hold the Station Selector Knob in its exact position, PUSH THE PUSH-BUTTON IN ALL THE WAY with the left hand.

4. After the Push-Button has been depressed all the way, tighten it gently toward the right (clockwise). Release Push-Button slowly and when in normal position grip button and tighten firmly.

The Push-Button tuning system is now correctly set up for your first selected station of lowest frequency and the Call Letter Tab for this station should be at the extreme right of the Call Letter Holder.

Follow through with this same procedure, setting up the other 5 stations in the order of their frequency—that is, the second station set up will be second lowest in frequency and the third station set up will be third lowest in frequency.

Carefully check each Push-Button for the accuracy of its setting. If, when tuning in any station with its Automatic Push-Button it does not have equal volume or clarity to that obtained with manual tuning, this may indicate the automatic adjustment for that station was not made accurately. Should there be any inaccuracy in any one of the Push-Button adjustments, correction can be made by repeating the above procedure for that button only. Do not reset those Push-Buttons that are accurately adjusted.

No further adjustments are necessary to operate your auto radio automatically or manually. To receive any one of your six selected stations for automatic operation, merely push in ALL THE WAY the Button set up for that station.

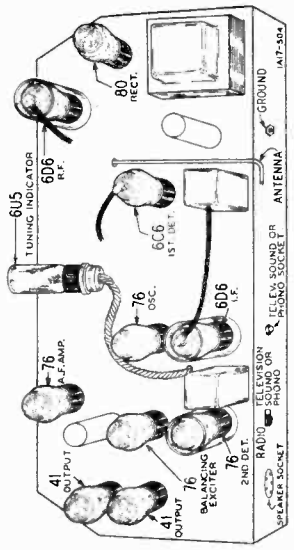
To receive all other stations in the regular manner, push in the Station Selector Knob and turn it to the frequency of the station desired.

IMPORTANT: ANTENNA ADJUSTMENT

The antenna adjustment control is located close to the antenna cable receptacle as shown in Figure 2. To make the adjustment first, remove plug button from bottom of case by inserting a screwdriver between case and plug button, then tune in a weak station with full volume at or very close to 600 kilocycles (60) on the dial. Second, insert a small screwdriver into the antenna adjustment screw shown in Figure 2 and turn the screwdriver either to the left or right until the volume of the station is at its maximum point. While adjusting the antenna adjustment screw it is advisable to vary the station selector knob a degree or two to obtain the best adjustment. Now insert plug button into case. The receiver is now balanced and no further radio electrical adjustments are necessary.

WELLS-GARDNER & CO.

MODEL 1A17
Schematic, Voltage, Socket Sensitivity, Coils



Sensitivity (For 0.5 Watt Output)

B Range ..... 2.0 Microvolts Average
C Range ..... 3.0 Microvolts Average
D Range ..... 8.0 Microvolts Average

Power Consumption - 80 Watts (At 117 volts 60 cycles)

Power Output - - - - - - - 5.0 Watts Undistorted
5.5 Watts Maximum

Selectivity - - 32 KC Broad at 1000 times Signal

Intermediate Frequency - - - - - - - 456 KC.

Speaker - - - - - - - - 10" Electro-Dynamic

Dial Lamps

The dial lamps used are of the bayonet pin type (bulb No. 51). To replace any lamp, first turn the radio off. Then pull the clip off and replace the lamp.

Voltages at Sockets

The voltages at sockets are shown on the schematic circuit diagram. Unless otherwise specified, the voltage indicated is between the socket terminal and ground.

These voltages are read under the following conditions:

Line Voltage—117.

Volume Control—Maximum.

Antenna Shorted to Ground.

Readings taken with 1000 ohm-per-volt meter. Plate and screen voltages are read on 500 volt scale.

ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.

Connect Radio Chassis to Ground Post of Signal Generator with a Short Heavy Lead.

Allow Chassis and Signal Generator to "Heat Up" for several minutes.

IMPORTANT—Follow procedure in the order shown.

The following equipment is required for aligning:

An All Wave Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.

Output Indicating Meter—Non-Metallic Screwdriver.

Dummy Antennas—.1 mf., 200 mmf., and 400 ohms.

SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
I. F.					
456 KC	Grid of 1st Det.	.1 mf.	B Range	Turn Rotor to Full Open	2nd I.F. (C23) & (C24) 1st I.F. (C20) & (C21)
RANGE D					
18,300 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C10)
15,000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Max. Output	Ant. Range D (C2) Int. Range D (C6) Rock Rotor—See Note A
RANGE C					
5400 KC	Antenna Lead	400 Ohm	C Range	Turn Rotor to Full Open	Oscillator Range C (C11)
5000 KC	Antenna Lead	400 Ohm	C Range	Turn Rotor to Max. Output	Antenna Range C (C3) Int. Range C (C7)
RANGE B					
1600 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C12)
1400 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Max. Output Set indicator to 1400 KC— See Note B	Ant. Range B (C4) Int. Range B (C8)
600 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Max. Output	600 KC (C13) Rock Rotor—See Note A

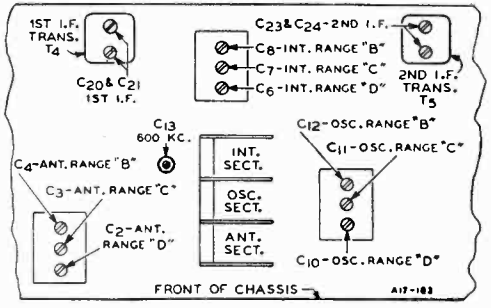
Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

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

NOTE A—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

NOTE B—If the pointer is not at 1400 KC on the dial, loosen the 2 clamps which hold the pointer assembly on the cord, move the pointer, to the 1400 KC mark, and tighten the clamps.

CAUTION—When aligning the short wave bands, be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 5000 KC. The signal will then be heard at 5000 KC on the dial of the radio. The image signal, which is much weaker, will be heard at 5000 less 912 KC, or 4088 KC on the dial. It may be necessary to increase the input signal to hear the image.



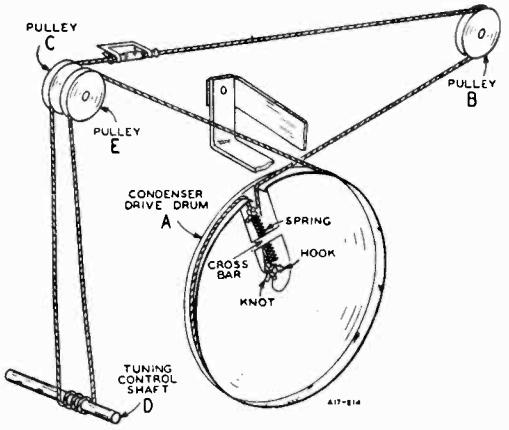
Drive Cord Replacement

Tie a knot with a small loop at one end of the new drive cord. Slide a 1¾ inch length of fabric tubing on the cord. The free end of the drive cord should be tied to the tension spring in such a manner that there is a distance of 56⅜ inches between the knots.

Turn the gang condenser to full open position.

Place the looped end of the drive cord over the hook on condenser drive drum A—See illustration. Bring the cord up through the slot in the drum rim and pass to the right (from back of chassis) and around pulley B. Then bring the cord to the left and over pulley C. See that the fabric tubing is now between pulleys B and C. Continue cord down to control shaft D and wind 3½ turns counter-clockwise (from back of chassis) on shaft D. Bring cord up to and over pulley E. Bring cord down to top of drive drum A and wind one turn clockwise around the drum rim.

Pass the remaining drive cord and tension spring through the slot in the drum. Place free end of



spring over the hook on the condenser drive drum.

ATTACHING DIAL POINTER—Tune in a 1500 KC signal. Move the pointer to the 1500 KC mark on the dial and clamp it tightly over the fabric tubing on the cord.

WELLS-GARDNER & CO.

MODEL 1A29 (Early)
Schematic, Voltage, Socket, Sensitivity

Power Consumption - 100 Watts (At 117 volts 60 cycles)

Power Output - - - - - - - 9 Watts Undistorted
10 Watts Maximum

Selectivity (Sharp) - 26 KC Broad at 1000 times Signal

Intermediate Frequency - - - - - - - 456 KC

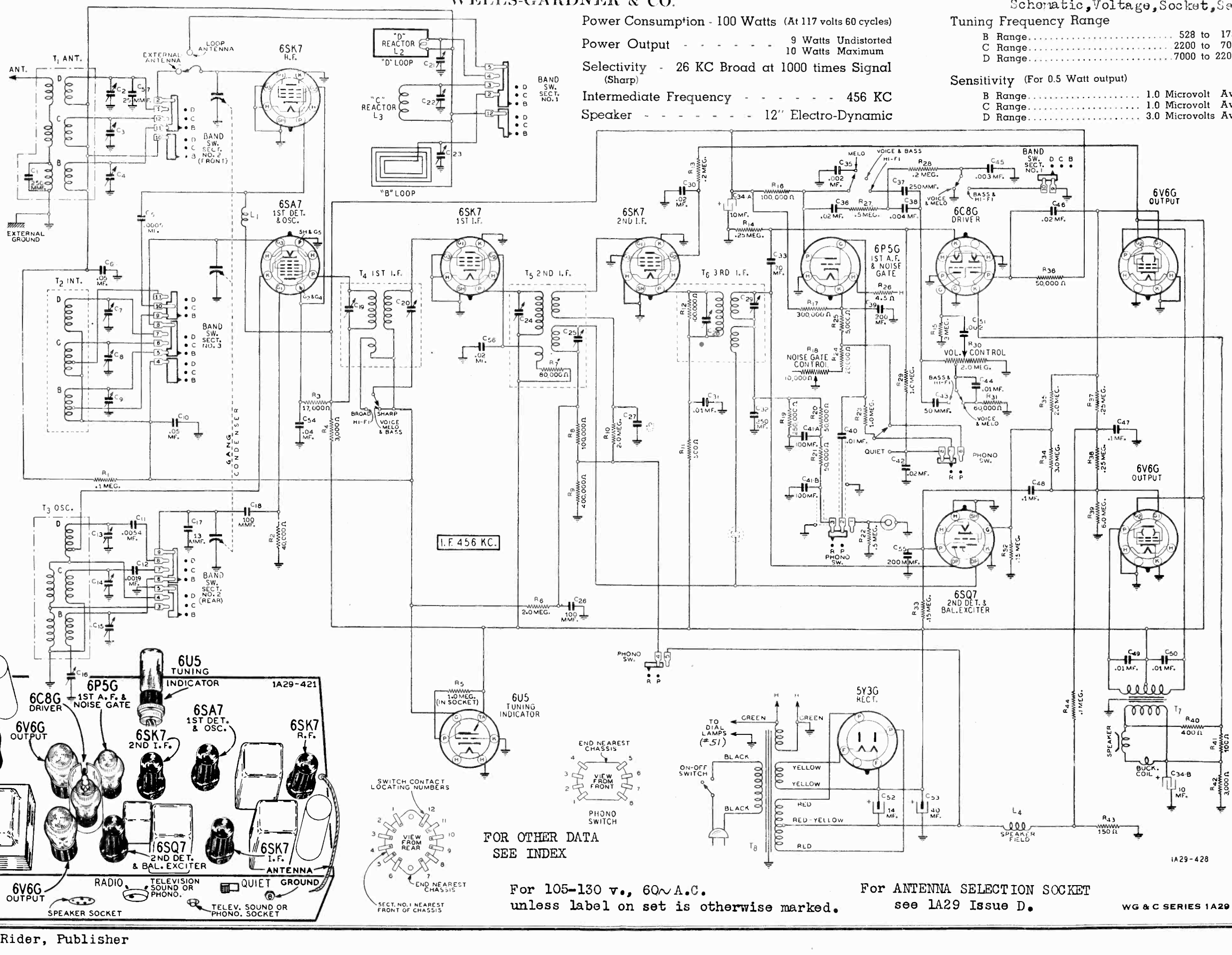
Speaker - - - - - - - - 12" Electro-Dynamic

Tuning Frequency Range

B Range	528 to 1730 KC
C Range	2200 to 7000 KC
D Range	7000 to 22000 KC

Sensitivity (For 0.5 Watt output)

B Range	1.0 Microvolt Average
C Range	1.0 Microvolt Average
D Range	3.0 Microvolts Average



FOR OTHER DATA SEE INDEX

For 105-130 v., 60~ A.C. unless label on set is otherwise marked.

For ANTENNA SELECTION SOCKET see 1A29 Issue D.

WG & C SERIES 1A29

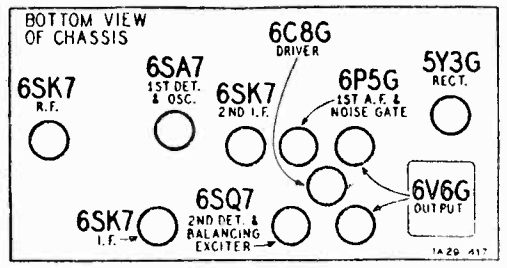
MODEL 1A29, Issue D
Schematic, Voltage, Socket, Sensitivity
Antenna, Coil Data

WELLS-GARDNER & CO.

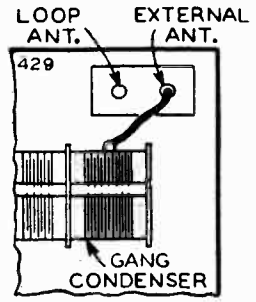
Power Output - - - - - - - 9 Watts Undistorted
10 Watts Maximum

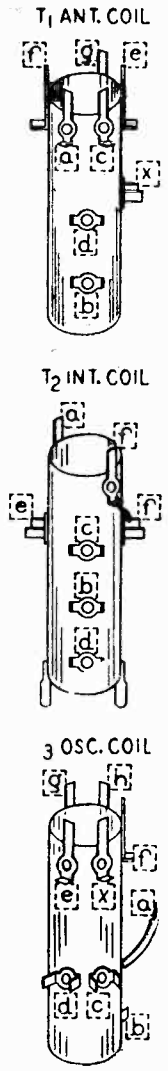
Selectivity - 26 KC Broad at 1000 times Signal
(Sharp)

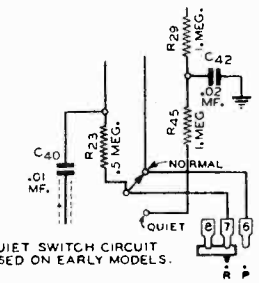
Power Consumption - 100 Watts (At 117 volts 60 cycles)



ANTENNA SELECTION SOCKET—At the right front corner of the chassis base (from back of cabinet) is a 2 hole pin tip socket—See illustration. If it is desired to operate the radio using the loop antennas, the pin tip should be inserted in the hole farthest from the side of the chassis. If it is desired to operate the radio using an external antenna, insert the pin tip in the hole nearest the side of the chassis.







See also schematic of early 1A29.

Tuning Frequency Range

B Range	528	to	1730 KC
C Range	2200	to	7000 KC
D Range	7000	to	22000 KC

Sensitivity (For 0.5 Watt output)

B Range	1.0 Microvolt	Average
C Range	1.0 Microvolt	Average
D Range	3.0 Microvolts	Average

For 105-130 v., 60~ A.C., unless label on set is otherwise marked.

FOR OTHER DATA SEE INDEX

Speaker - 12" Electro-Dynamic

WG & C SERIES 1A29—ISSUE D

ISSUE-D
1A29-510

Series 1A29 CHANGES MADE FOR "B" ISSUE SETS TO REDUCE HUM MODULATION. Sept. 8, 1939

In order to reduce hum modulation, the following circuit changes have been made. These changes are shown schematically on the back of this sheet. Models on which these changes have already been made can be identified by the Chassis Number 1A29-2B or 1A29-3B.

Resistor R1, 400,000 Ohms, in series with the AVC connection to the antenna coil, has been removed from the circuit.

The AVC line is no longer connected to the antenna coil at terminal "D." Instead, this terminal is connected to ground. The bypass condenser C6, .05 mf., formerly connected between the same terminal and ground, has been removed from the circuit.

The AVC line which formerly connected to the "D" terminal of the antenna coil and C6, is now connected through a 3 megohm resistor R46 to G1 of the 6SK7 R.F. tube.

G1 of the 6SK7 R.F. tube, which was formerly connected directly to the stator of the gang condenser, is now connected to this point through a .0005 mf. condenser C59.

Series 1A29 CHANGES MADE FOR ISSUE "C" Sept. 26, 1939

In order to obtain Underwriters' approval, the issue letter will be advanced to "C" when the following changes are made:

A cardboard shield is used with the electrolytic condenser which is insulated from the chassis.

The tube socket clip tension is reduced.

A wiring change was made to remove high voltage from pin No. 1 on the 6V6G tube socket. A terminal strip has been added to eliminate the use of the pin connection for this purpose.

Series 1A29 CHANGES FOR "D" ISSUE October 27, 1939

The following changes are made in the "D" issue of this model:

Condenser C37 is changed from 250 mmf. to 500 mmf. to add high frequencies in the high fidelity position.

The noise gate switch has been eliminated so that the noise gate circuit functions all of the time.

The Quiet switch, however, is still continued at the same position on the back panel of the chassis. When this switch is in the quiet position, two circuits are affected in the following manner:

The 6SK7 1st I.F. tube is biased with a 1500 ohm resistor connected between cathode and ground to reduce sensitivity.

A positive voltage secured from the B+ line through a 15 Megohm resistor is applied to the AVC diode circuit. Under no signal conditions, this loads the AVC diode circuit, effectively short circuiting both the signal and AVC secondaries of the 2nd I.F. transformer (T5 in schematic).

When a signal of predetermined intensity is received, the voltage developed in the AVC circuit offsets this positive voltage. The signal is amplified through the transformer and normal reception is obtained.

The effect of the circuits mentioned above, with the switch in the quiet position, is to reduce sensitivity and to "squelch" all signals, both noise and station, until a signal of a certain intensity or greater is received.

Series 1A29 DISTORTION February 21, 1940

Reference is made to a distortion in this model which manifests itself as a rasping sound and is heard on a signal of moderate volume. This may be an overload condition caused by a signal of high modulation.

It can be corrected by changing the signal diode load resistor, R19, from 250,000 ohms to 125,000 ohms.

Series 8A30 SERVICING AUTOMATIC RECORD CHANGER November 20, 1939

IF LANDING POSITION OF NEEDLE IS NOT CONSTANT
OR PICKUP ARM CANNOT BE ADJUSTED TO SET
NEEDLE DOWN IN STARTING GROOVE OF RECORD

In the first production of the automatic record changer, the pickup arm may display the following symptoms:

1. After the pickup arm has been set for the correct landing position, the needle does not lower consistently to the starting groove of a record during the playing of any one size of records.

2. The needle lowers so far away from the starting groove of the record that turning the needle landing adjusting screw does not bring the needle to the starting groove.

In early production, the pickup lead was permitted to hang down directly below the foot of the pickup. In such instances, the lead may become entangled with the rotating mechanism for the pickup arm. This will produce either one of the above actions.

To remedy the condition, clamp the pickup lead to the bracket - See Fig. 1, leaving enough slack in the lead to permit free action of the pickup arm. That portion of the lead under the clamp should be covered with tape.

The clamping arrangement consists of a small clamp, a No.6 shakeproof lockwasher, and a 6-32 shakeproof self-tapping machine screw. On request, these items will be supplied free of charge by the factory.

IF PICKUP ARM DOES NOT SET NEEDLE DOWN IN
STARTING GROOVE OF BOTH 10" AND 12" RECORDS

It may be found that any one setting of the needle landing adjusting screw will not cause the phono pickup arm to set the needle down in the starting groove for both 10" and 12" records.

This condition may be remedied as follows: Set the automatic record changer for 10" record operation. Turn the needle landing adjusting screw so that the pickup arm sets the needle down in the starting groove of a 10" record.

Replace the 10" record with a 12" record and set the automatic record changer for 12" record operation. Start the mechanism. Note the landing position of the needle.

MODEL 1A29
MODEL 8A30
MODEL 8A31
Alignment, Trimmers

WELLS-GARDNER & CO.

ALIGNMENT PROCEDURE

SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
I. F.					1A29 ONLY: 1st I.F. (C19) & (C20); 2nd I.F. (C24) & (C25); 3rd I.F. (C28) & (C29)
456 KC	Grid of 1st Det.	.1 mf.	B Range See Note A	Turn Rotor to Full Open	1st I.F. (C17) & (C18); 2nd I.F. (C24) & (C25)
RANGE B					
1730 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C15)
1500 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Max. Output Set Indicator to 1500 KC—See Note B	Ant. Range B (C4) Int. Range B (C9)
600 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Max. Output	600 KC (C43) (C16 on 1A29) Rock Rotor—See Note C
RANGE C					
7000 KC	Antenna Lead	400 Ohm	C Range	Turn Rotor to Full Open	Oscillator Range C (C14)
6000 KC	Antenna Lead	400 Ohm	C Range	Turn Rotor to Max. Output	Antenna Range C (C3) Int. Range C (C8)
RANGE D					
22,000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C13)
21,000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Max. Output	Ant. Range D (C2) Int. Range D (C7) Rock Rotor—See Note C
LOOP RANGE B					
1500 KC See Note D	None—See Note D		B Range	Turn Rotor to Max. Output	Loop Trimmer (C23) See Note E
LOOP RANGE C					
6000 KC See Note D	None—See Note D		C Range	Turn Rotor to Max. Output	Loop Trimmer (C22) See Note E
LOOP RANGE D					
21,000 KC See Note D	None—See Note D		D Range	Turn Rotor to Max. Output	Loop Trimmer (C21) Rock Rotor—See Note C

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

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

NOTE A—For all adjustments, with the exception of the 3 loop range adjustments, the pin tip should be in the external antenna hole of the Antenna Selection Socket—See illustration on page one.

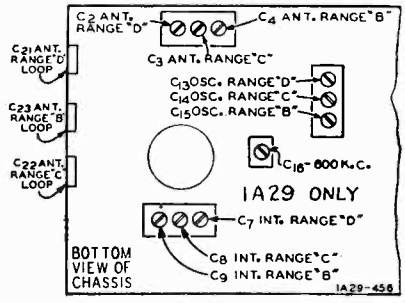
NOTE B—If the pointer is not at 1500 KC on the dial remove pointer from drive cord. Tune in a 1500 KC signal. Set pointer at the 1500 KC mark on the dial scale. Attach pointer to drive cord.

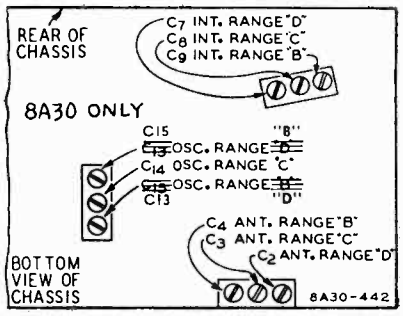
NOTE C—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

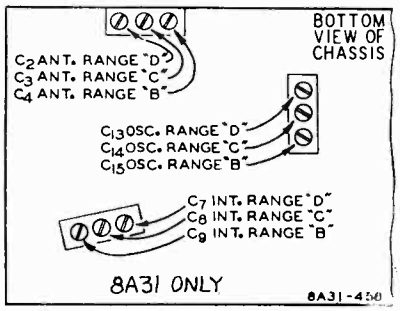
NOTE D—Re-install set in cabinet. Connect a loop approximately one foot in diameter across the antenna and ground posts of the signal generator. Place signal generator so that this loop is between 3 and 10 feet from loop in cabinet. Insert pin tip in loop antenna hole of Antenna Selection Socket—See illustration on schematic page.

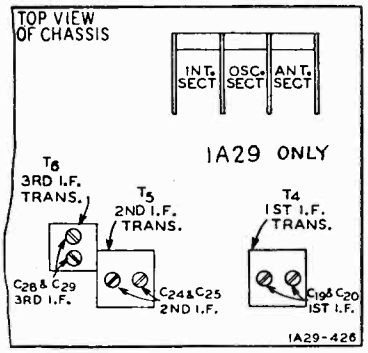
Note E (CONSOLE MODELS)—Turn knob of loop until output is maximum.

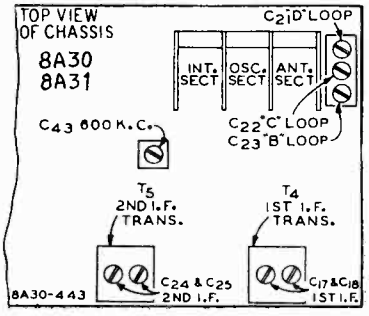
CAUTION—When aligning the short wave bands, be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 5000 KC. The signal will then be heard at 5000 KC on the dial of the radio. The image signal, which is much weaker, will be heard at 5000 less 912 KC, or 4088 KC on the dial. It may be necessary to increase the input signal to hear the image.

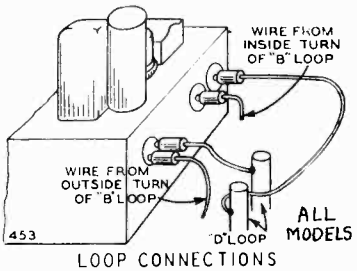












WELLS-GARDNER & CO.

MODEL 1A29 MODEL 6A27
MODELS 6A26, 6A26S
MODEL 6D1 MODEL 8A30
MODEL 8A31 Tuner Data

Procedure for Setting the Station Buttons

ALL MODELS

There are 6 buttons on the automatic tuning dial by means of which 6 stations may be set for quick tuning.

It is better to list the station with the lowest kilocycle number first, the station with the next higher kilocycle number next, and so on.

Any button may be used for any station you can receive, although it will be more convenient to set the stations so that the kilocycle numbers decrease from left to right.

Setting a Station Button

6A26, 6A26S, 6A27, 6D1

At the right side of the cabinet (from the front) will be seen a cap which covers a hole in the cabinet—See illustration. Pry off this cap being careful not to scratch the cabinet. Removal of the cap will expose a large locking screw. Using a screwdriver, loosen the mechanism by turning this screw in a counter-clockwise direction. The screw will turn easily until the dial pointer stops moving. Then exert a slight amount of additional pressure and continue to turn the screw about one and one-half complete turns.

1A29 ONLY

Turn the tone and selectivity control to any of the sharp positions.

1A29, 8A30, 8A31

Turn the manual tuning knob so that the pointer moves toward 1700 KC until the stop is reached.

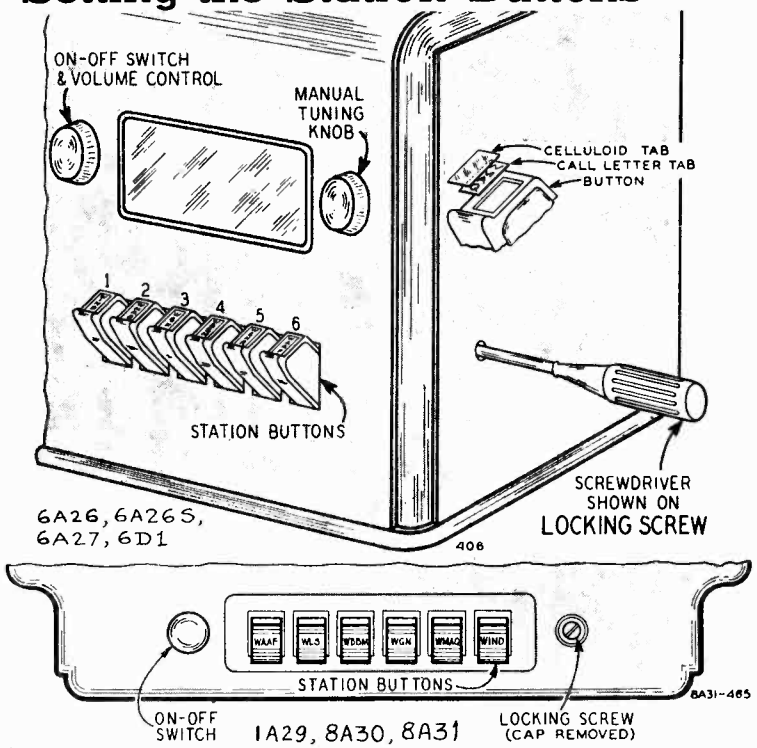
At the right side of the escutcheon (from the front) will be seen a cap which covers a hole in the escutcheon —See illustration. Pull off this cap.

At the end of the tube in back of the hole in the escutcheon is the locking screw. Using a small handle screwdriver, unlock the mechanism by turning this screw several turns in a counter-clockwise direction.

ALL MODELS

Select the first station from the list you have prepared, and carefully tune in this station by means of the manual tuning knob using the tuning eye as a guide.

With one hand, hold the manual tuning knob to prevent it from turning and with the other hand, push one of the station buttons shown in the illustration *all the way down*. It will go down easily at first and then a firm gentle pressure must be applied to push it down the rest of the way. It is better to start with the left hand button.



Hold *this* button all the way down. With the other hand, see whether or not this station is still accurately tuned in by moving the tuning knob a slight amount back and forth while observing the tuning eye. *Be sure to hold the button all the way down.*

Release the button after the station is tuned in.

Carefully tune in the second station on your list. Then hold the tuning knob and push the second button slowly and firmly all the way down. Check for accurate tuning.

Proceed in the same manner to set any additional stations on your list on the remaining station buttons.

6A26, 6A26S, 6A27, 6D1

After all the stations are set, it will be necessary to lock the mechanism so that the settings will not change. Do this by turning the locking screw in a clockwise direction until it is tight. It will turn easily until the dial pointer stops moving. Then additional pressure must be exerted. Tighten firmly but not excessively. Replace the cap over the hole.

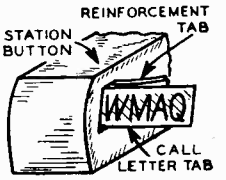
Remove the correct station call letter tab from the sheets supplied by bending the sheet back and forth at the score mark until the tab can be broken off. Press this tab all the way to the bottom of the space provided in the button. Cover the call letter tab with a celluloid tab, pressing this in until it snaps into place.

1A29, 8A30, 8A31

After all the stations are set, it will be necessary to lock the mechanism so that the settings will not change. Turn the manual tuning knob so that the pointer moves toward 1700 KC until the stop is reached. Then, with the SMALL HANDLE screwdriver, turn the locking screw in a clockwise direction until it is tight. Tighten the locking screw firmly but not excessively to avoid stripping the threads. Replace the cap over the hole.

Insert a celluloid reinforcement tab half way in the slot at the front of the first station button.

Remove the correct station call letter tab for this button from the sheet supplied by bending the sheet back and forth at the score marks. Place the call letter tab in front of the celluloid reinforcement tab and insert it in slot. Push both tabs all the way in the button slot. Follow the same procedure for inserting the station call letter tabs in any other buttons.



ALL MODELS

If at any time you wish to change the setting of a button from one station to another, repeat the above procedure. Changing the setting of one button will not affect the setting of any of the other buttons.

MODEL 1A29 Issue D

Drive Cord Replacement

Turn gang condenser to completely closed position. Remove 5Y3G tube from socket. Remove guide arm from front of chassis—See illustration.

Use a drive cord approximately 70 inches in length. Tie a large knot with a small loop at one end of the new drive cord. Thread other end of cord up through hole in rim of condenser drive pulley. Pull cord through hole until large knot is flush against pulley rim.

Wind ¾ turn in a clockwise direction (from right side of chassis) around condenser drive pulley. Wind cord over pulleys A, B, and C as shown. Wind 3½ turns in a clockwise direction (from front of chassis) around tuning control shaft. Turns should progress toward the chassis.

Wind 1¼ turns in a clockwise direction (from right side of chassis) around condenser drive pulley. This turn should be at left side (from front of chassis) of pulley groove. Pass cord through hole in pulley rim. Secure tension spring to cord loop. Knot other end of cord to spring. Stretch spring and secure free end to hook on drive pulley.

Replace 5Y3G tube. Replace guide arm.

Dial Pointer Attachment—Tune in a signal of known frequency. Set the pointer at this frequency on the dial scale. Secure pointer to cord—See illustration.

MODELS 8A30, 8A31.

Drive Cord Replacement

Use a drive cord approximately 70 inches in length. Tie a large knot with a small loop at one end of the new drive cord. Thread other end of cord up through hole in rim of condenser drive pulley. Pull cord through hole until large knot is flush against pulley rim.

Turn gang condenser to completely closed position. Remove guide arm from front of chassis—See illustration.

Wind ¼ turn in a clockwise direction (from right side of chassis) around condenser drive pulley. Wind cord over pulleys A, B, and C as shown. Wind 4½ turns in a clockwise direction (from front of chassis), around tuning control shaft. Turns should progress toward the chassis.

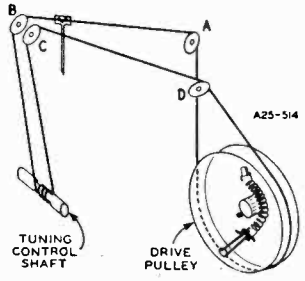
Wind 1¾ turns in a clockwise direction (from right side of chassis) around condenser drive pulley. This turn should be at left side (from front of chassis) of pulley groove. Pass cord through hole in pulley rim. Secure tension spring to cord loop. Knot other end of cord to spring. Stretch spring and secure free end to hook on drive pulley. Replace guide arm.

Dial Pointer Attachment—Tune in a signal of known frequency. Set the pointer at this frequency on the dial scale. Secure pointer to cord—See illustration.

MODEL 5A25S

Drive Cord Replacement

Remove dial lamp socket and bracket from dial mounting plate.



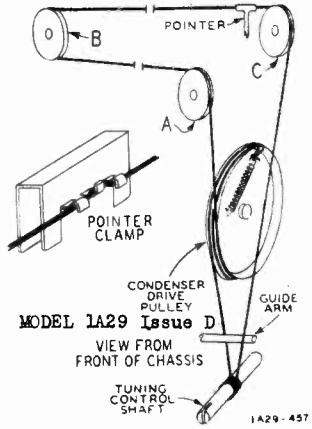
Remove tension spring from pulley. Double new drive cord and knot both ends to same loop on tension spring. There should be a distance of 13 inches between knot and looped end of cord.

Secure other end of spring to hook on pulley. Thread looped end of cord, starting from inside of drive pulley, through hole in rim of drive pulley.

Turn gang condenser to completely closed position. Remove any twists in doubled cord. Pass one portion of cord over pulleys A and B as shown in illustration. Then wind 3½ turns counter-clockwise (from rear of chassis) around tuning control shaft—See illustration

Loop ½ turn around bottom half of drive pulley. Continue cord over pulley D. Pull remaining portion of cord and place over pulley C.

Dial Pointer Attachment—Tune in a station of known frequency. Set the pointer at this frequency on the dial scale and secure pointer to cord—See illustration.



Adjusting Audio Noise Gate Control

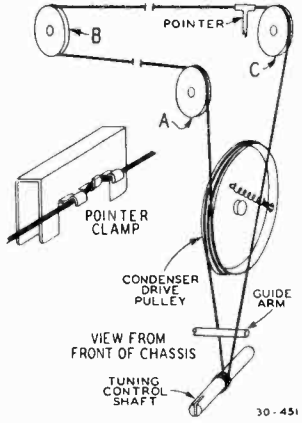
MODEL 1A29 Issue D.

CAUTION—Ordinarily the setting of the noise gate control should not be changed unless the 6P5G tube is replaced.

To adjust this control, use external antenna connection and short circuit the antenna lead. The noise switch on back panel of the chassis should be in the normal position. Turn the gang condenser to the completely closed position. Open the plate circuit of the 6P5G noise gate tube and insert a microammeter in series. On the back panel of the chassis near the noise gate switch will be seen an adjusting screw. This is the adjustment for variable resistance R18. Rotate this screw until the plate current is between 5 and 10 microamperes.

ALTERNATE METHOD—Turn band switch to B range. Use external antenna connection and short circuit antenna lead. Noise switch should be in the normal position. Turn the gang condenser to the completely closed position. Turn the noise gate control screw (R18) in a clockwise direction as far as it will go. All of the resistance will be in the circuit. Then turn the screw until tube noise starts to come through.

Disconnect antenna lead from ground and connect it to an external antenna. Tune in a weak station. If signal appears to be distorted, decrease the resistance by turning the adjusting screw in a counter-clockwise direction until the distortion is eliminated.



FOR MODELS 8A-30, 8A31.

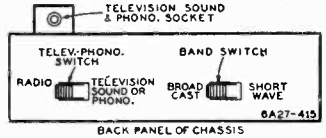
Television Sound or Phonograph Connections

FOR MODELS 1A29(Early), 1A29 Issue D, 6A26, 6A26S, 6A27, 6D1, 8A30, 8A31.

If Television programs ever become available in your community, the audio amplifier and speaker of this radio may be used to reproduce

For Models 6A26, 6A26S

For Models 6A27, 6D1.



Television sound in conjunction with any "Television Picture Receiver and Sound Converter." Phonograph records may also be played through the radio.

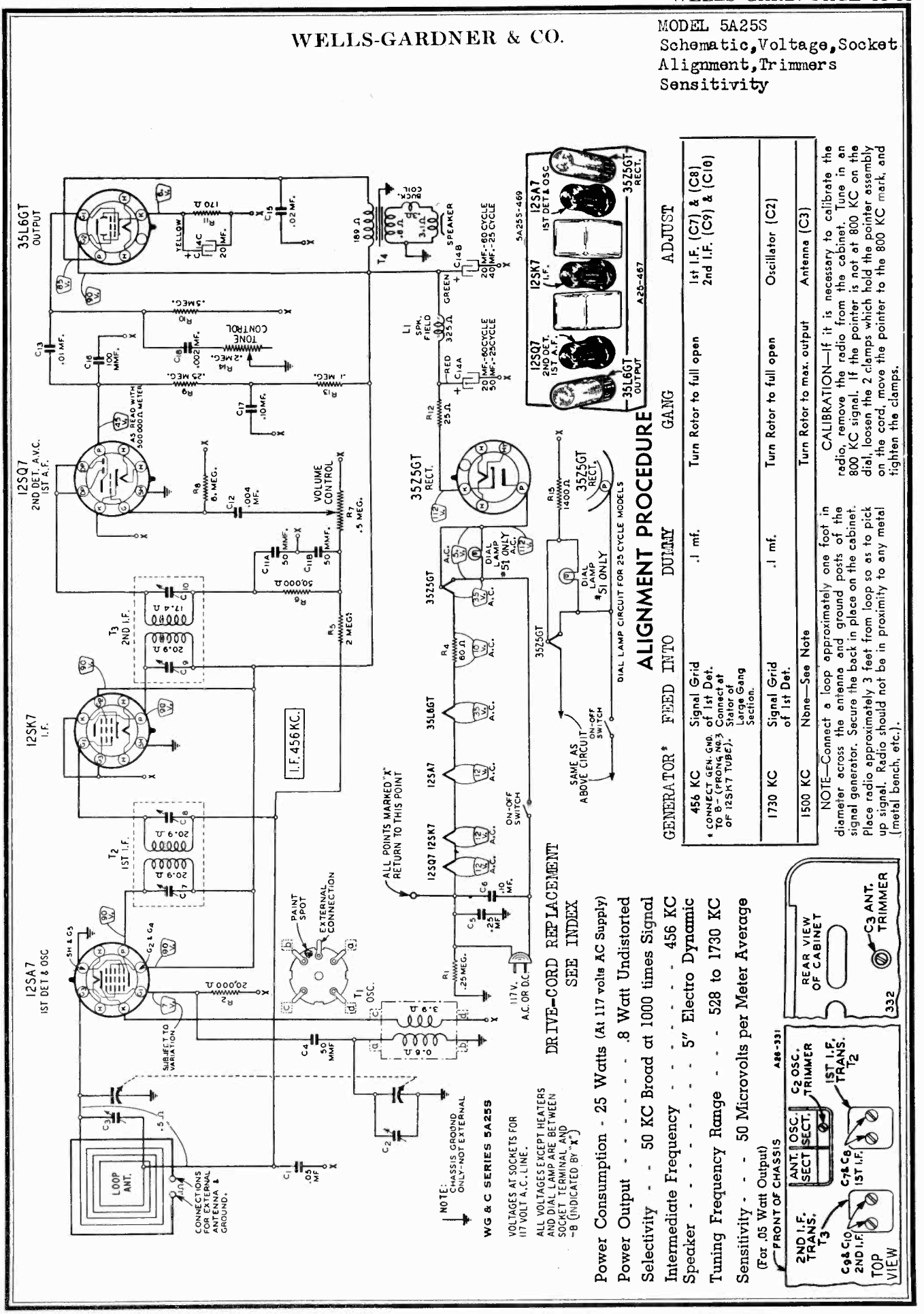
On the back panel of the chassis base is a switch and a socket for a single shielded pin tip at which connections are made. The connector on the cable from a television receiver or from a phono pickup can be inserted in the socket. (The cable connector must be a single shielded pin tip type, Part No. M93.)

When phonograph or television sound reproduction is desired, the switch should be moved to the "Phono-Television Sound" position. For radio reception, the switch should be in the "Radio" position.

*For Model 1A29 Issue D use Part No. 6A224.

WELLS-GARDNER & CO.

MODEL 5A25S
Schematic, Voltage, Socket
Alignment, Trimmers
Sensitivity



DRIVE-CORD REPLACEMENT
SEE INDEX

Power Consumption - 25 Watts (At 117 volts AC Supply)
Power Output - - - - - - - .8 Watt Undistorted
Selectivity - - 50 KC Broad at 1000 times Signal
Intermediate Frequency - - - - - - - - 456 KC
Speaker - - - - - - - - 5" Electro Dynamic
Tuning Frequency Range - - - 528 to 1730 KC
Sensitivity - - - 50 Microvolts per Meter Average
(For .05 Watt Output)

ALIGNMENT PROCEDURE

GENERATOR*	FEED INTO	DUMMY	GANG	ADJUST
456 KC	Signal Grid of 1st Det.	.1 mf.	Turn Rotor to full open	1st I.F. (C7) & (C8) 2nd I.F. (C9) & (C10)
1730 KC	Signal Grid of 1st Det.	.1 mf.	Turn Rotor to full open	Oscillator (C2)
1500 KC	None—See Note		Turn Rotor to max. output	Antenna (C3)

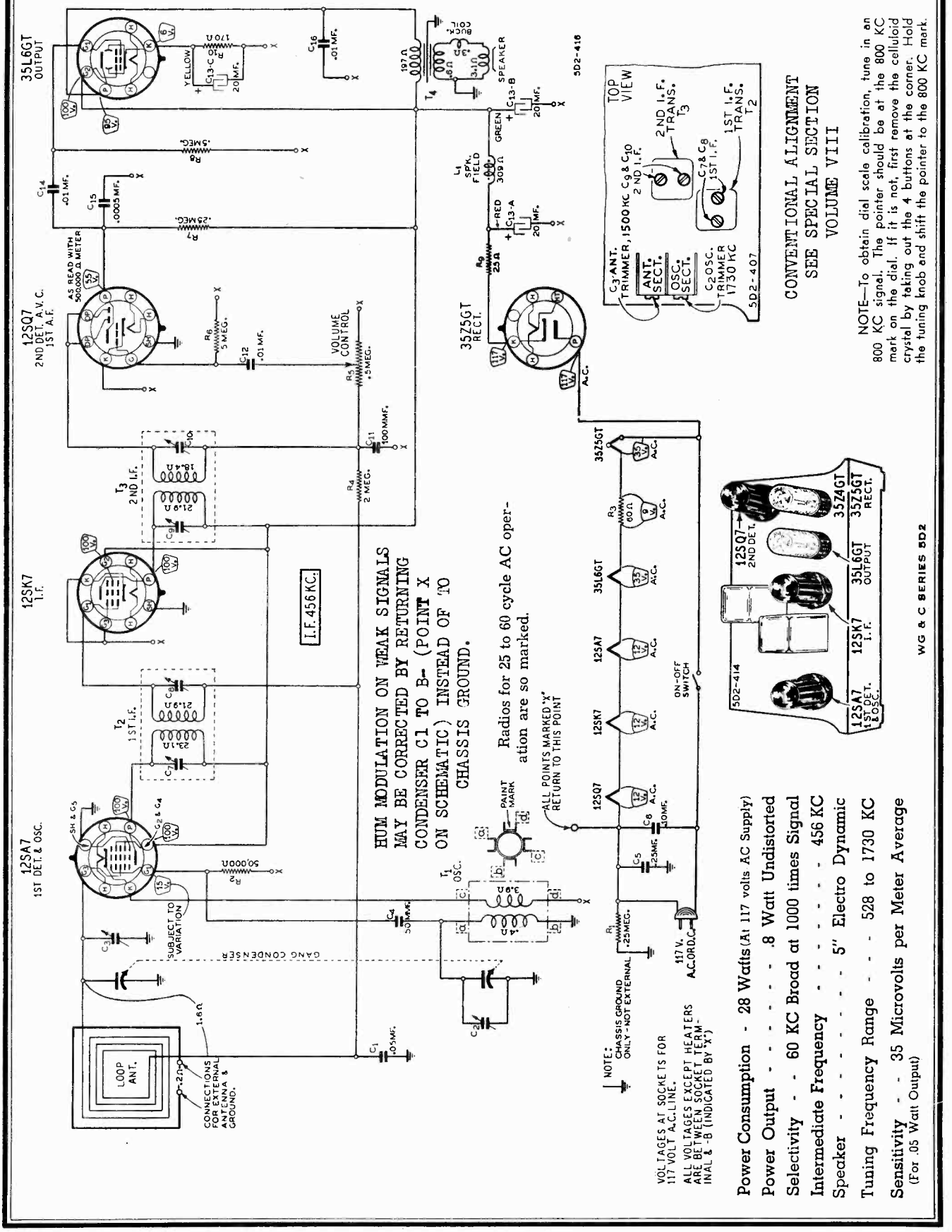
* CONNECT GEN. GND. TO B- (PRONG No.3 OF 12SK7 TUBE). Connect at Stator of Large Gang Section.

NOTE—Connect a loop approximately one foot in diameter across the antenna and ground posts of the signal generator. Secure the back in place on the cabinet. Place radio approximately 3 feet from loop so as to pick up signal. Radio should not be in proximity to any metal (metal bench, etc.).

CALIBRATION—If it is necessary to calibrate the radio, remove the radio from the cabinet. Tune in an 800 KC signal. If the pointer is not at 800 KC on the dial, loosen the 2 clamps which hold the pointer assembly on the cord, move the pointer to the 800 KC mark, and tighten the clamps.

MODEL 5D2
Schematic, Voltage, Socket
Alignment, Trimmers
Sensitivity

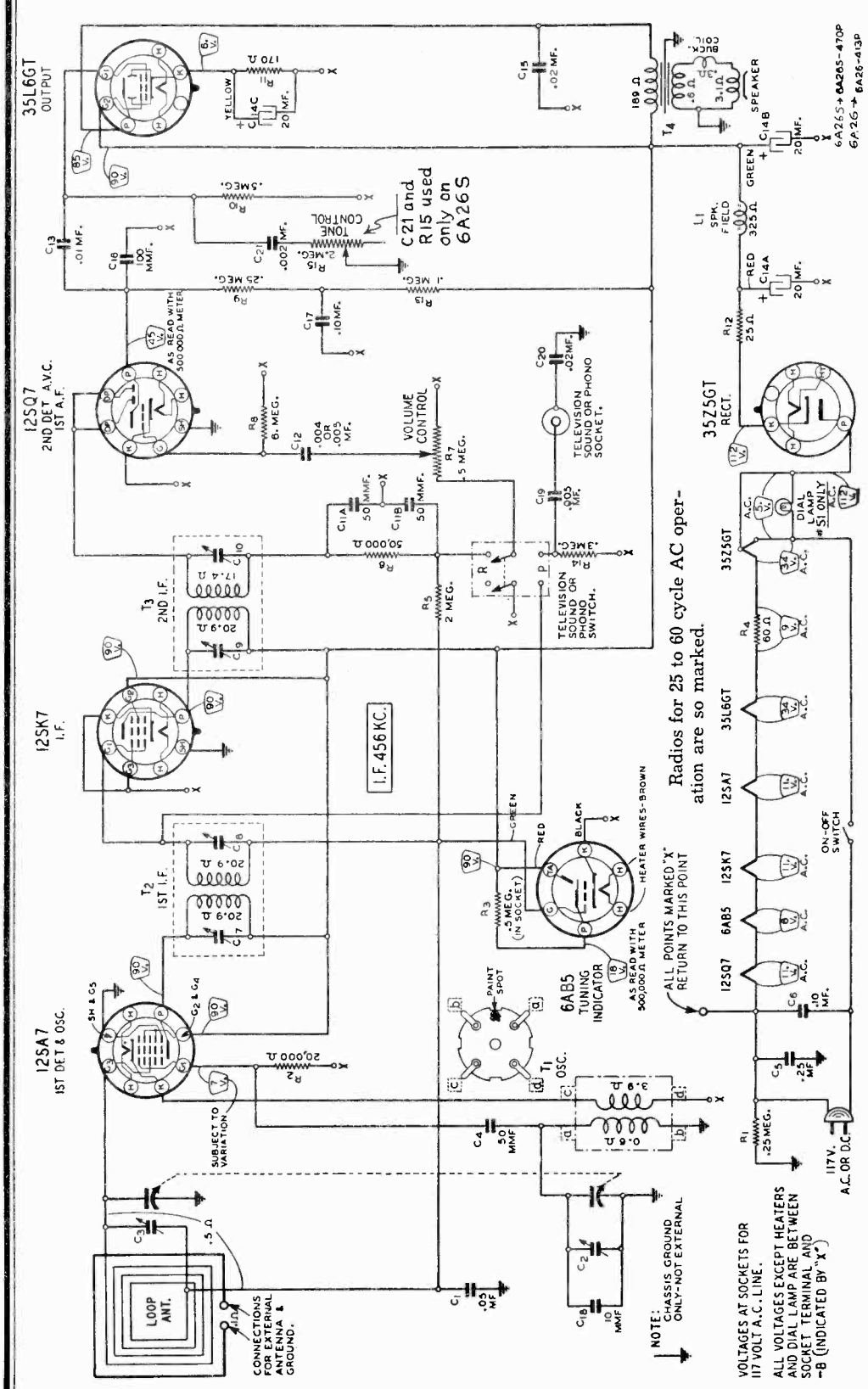
WELLS-GARDNER & CO.



Power Consumption - 28 Watts (At 117 volts AC Supply)
Power Output - - - - - - - .8 Watt Undistorted
Selectivity - - 60 KC Broad at 1000 times Signal
Intermediate Frequency - - - - - - - - 456 KC
Speaker - - - - - - - - 5" Electro Dynamic
Tuning Frequency Range - - - 528 to 1730 KC
Sensitivity - - 35 Microvolts per Meter Average
(For .05 Watt Output)

WELLS-GARDNER & CO., INC.

MODELS 6A26, 6A26S
Schematic, Voltage, Socket
Sensitivity, Notes



VOLTAGES AT SOCKETS FOR 117 VOLT A.C. LINE.

ALL VOLTAGES EXCEPT HEATERS AND DIAL LAMP ARE BETWEEN SOCKET TERMINAL AND -B ((INDICATED BY "X")

WG & C SERIES 6A26	WG & C SERIES 6A26S
Power Consumption - 28 Watts (At 117 volts AC Supply)	
Power Output - - - - - - - .8 Watt Undistorted	
Selectivity - - 50 KC Broad at 1000 times Signal	
Intermediate Frequency - - - - - - - 456 KC	
Speaker - - - - - - - - 5" Electro Dynamic	
Tuning Frequency Range - - - 528 to 1730 KC	
Sensitivity - - - 40 Microvolts per Meter Average (For .05 Watt Output)	

TO REDUCE MODULATION HUM:
Insulate dial-lamp clip from mounting bracket.
Return condenser C1 to B- (point X on schematic) instead of to chassis ground.
Dress lead from condenser C12 to volume control as far as possible from heater leads.
Use ground connection with external antenna.
DISTORTION and BLOCKING:
Check whether resistor R10 has open circuited due to loose pigtail connection to resistor proper.

MODELS 6A26,6A26S
MODEL 6A27
MODEL 6D1
Alignment,Trimmers

WELLS-GARDNER & CO.

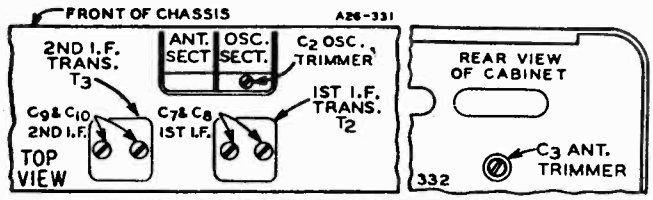
ALIGNMENT PROCEDURE: 6A26, 6A26S

Connect Ground Post of Signal Generator to B—(12SK7—Prong No. 3) in Chassis.

SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM (See Trimmer Illustration)
456 KC	Signal Grid of 1st Det. Connect at Stator of Large Gang Section.	.1 mf.	Turn Rotor to full open	1st I.F. (C7) & (C8) 2nd I.F. (C9) & (C10)
1730 KC	Signal Grid of 1st Det.	.1 mf.	Turn Rotor to full open	Oscillator (C2)
1500 KC	None—See Note		Turn Rotor to max. output	Antenna (C3)

NOTE—Connect a loop approximately one foot in diameter across the antenna and ground posts of the signal generator. Secure the back in place on the cabinet. Place radio approximately 3 feet from loop so as to pick up signal. Radio should not be in proximity to any metal (metal bench, etc.).

CALIBRATION—If it is necessary to calibrate the radio, remove the radio from the cabinet. Tune in an 800 KC signal. If the pointer is not at 800 KC on the dial, loosen the 2 clamps which hold the pointer assembly on the cord, move the pointer to the 800 KC mark, and tighten the clamps.



ALIGNMENT PROCEDURE: 6A27, 6D1

Remove Jumper on Loop Antenna for All Adjustments. Connect Ground Post of Signal Generator to B—(12SK7—Prong No. 3) in Chassis.

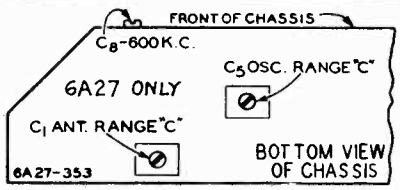
SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM (See Trimmer Illustrations)
I. F.					
456 KC	Signal Grid of 1st Det. Connect at Stator of Large Gang Section.	.1 mf.	B Range	Turn Rotor to full open	1st I.F. (C11) & (C12) 2nd I.F. (C13) & (C14)
RANGE B					
1730 KC	Signal Grid of 1st Det.	.1 mf.	B Range	Turn Rotor to full open	Oscillator Range B (C4)
1500 KC	Red Antenna Screw at Back of Loop	.1 mf.	B Range	Turn Rotor to max. output	Antenna Range B (C6)—See Illustration below.
600 KC	Same as Above	.1 mf.	B Range	Turn Rotor to max. output	600 KC (C8) Rock Rotor—See Note A
RANGE C (6A27 ONLY)					
6500 KC	Same as Above	.1 mf.	C Range	Turn Rotor to full open	Oscillator Range C (C5)
6000 KC	Same as Above	.1 mf.	C Range	Turn Rotor to max. output	Ant. Range C (C1) Rock Rotor—See Note A
RANGE D (6D1 ONLY)					
12,200 KC	Same as Above	.1 mf.	D Range	Turn Rotor to full open	Oscillator Range D (C3)
11,000 KC	Same as Above	.1 mf.	D Range	Turn Rotor to max. output	Ant. Range D (C2) Rock Rotor—See Note A

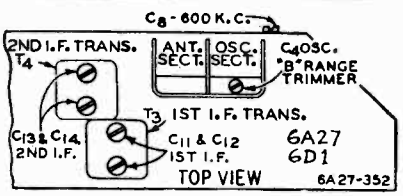
Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

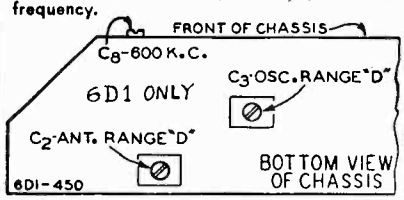
After each range is completed, repeat the procedure as a final check.

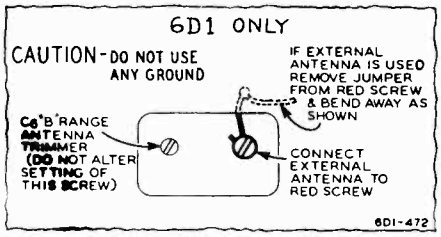
NOTE A—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

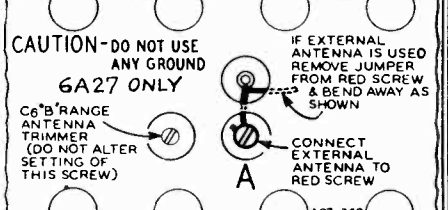
CAUTION—When aligning the short wave bands be sure NOT to adjust at the image frequency.





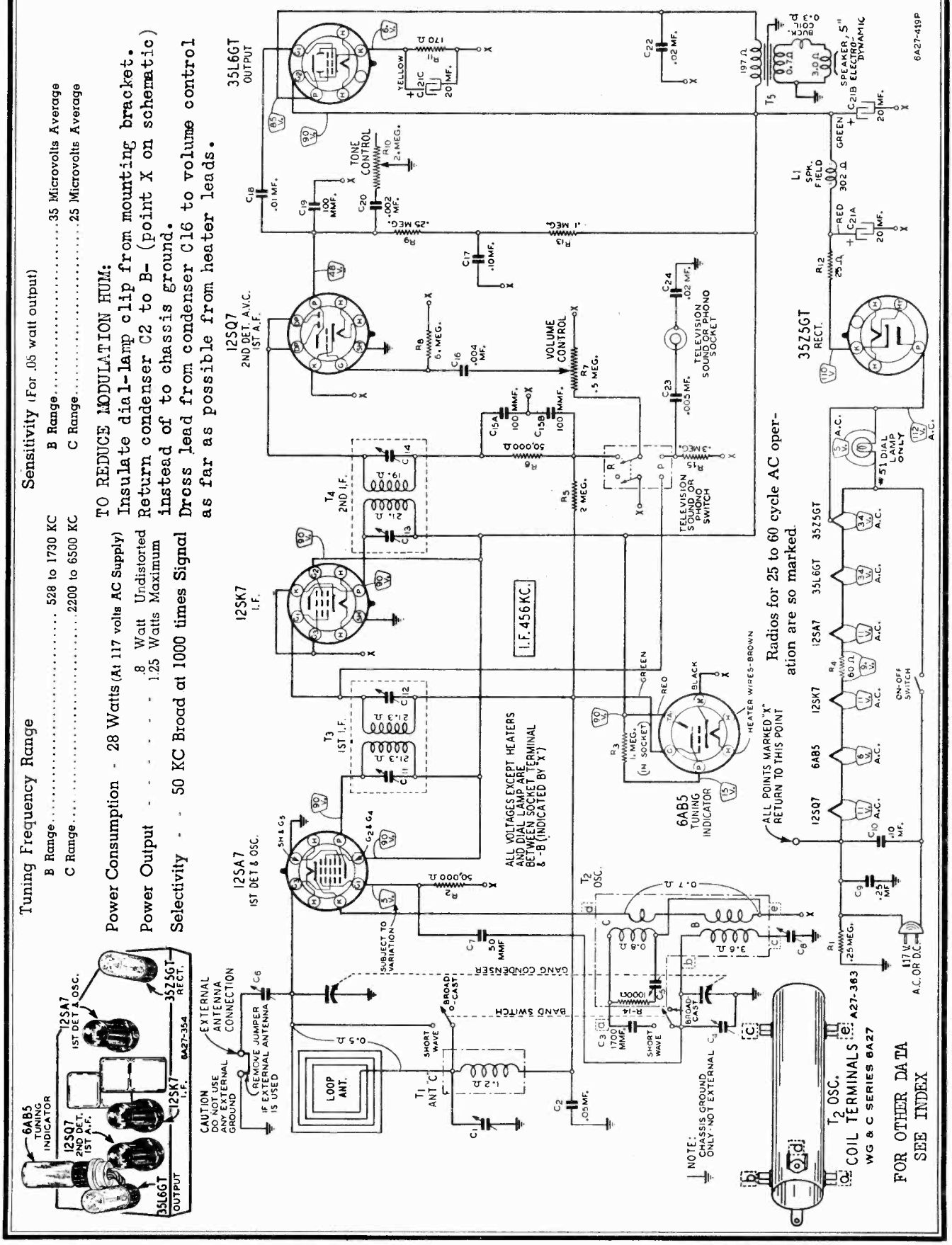






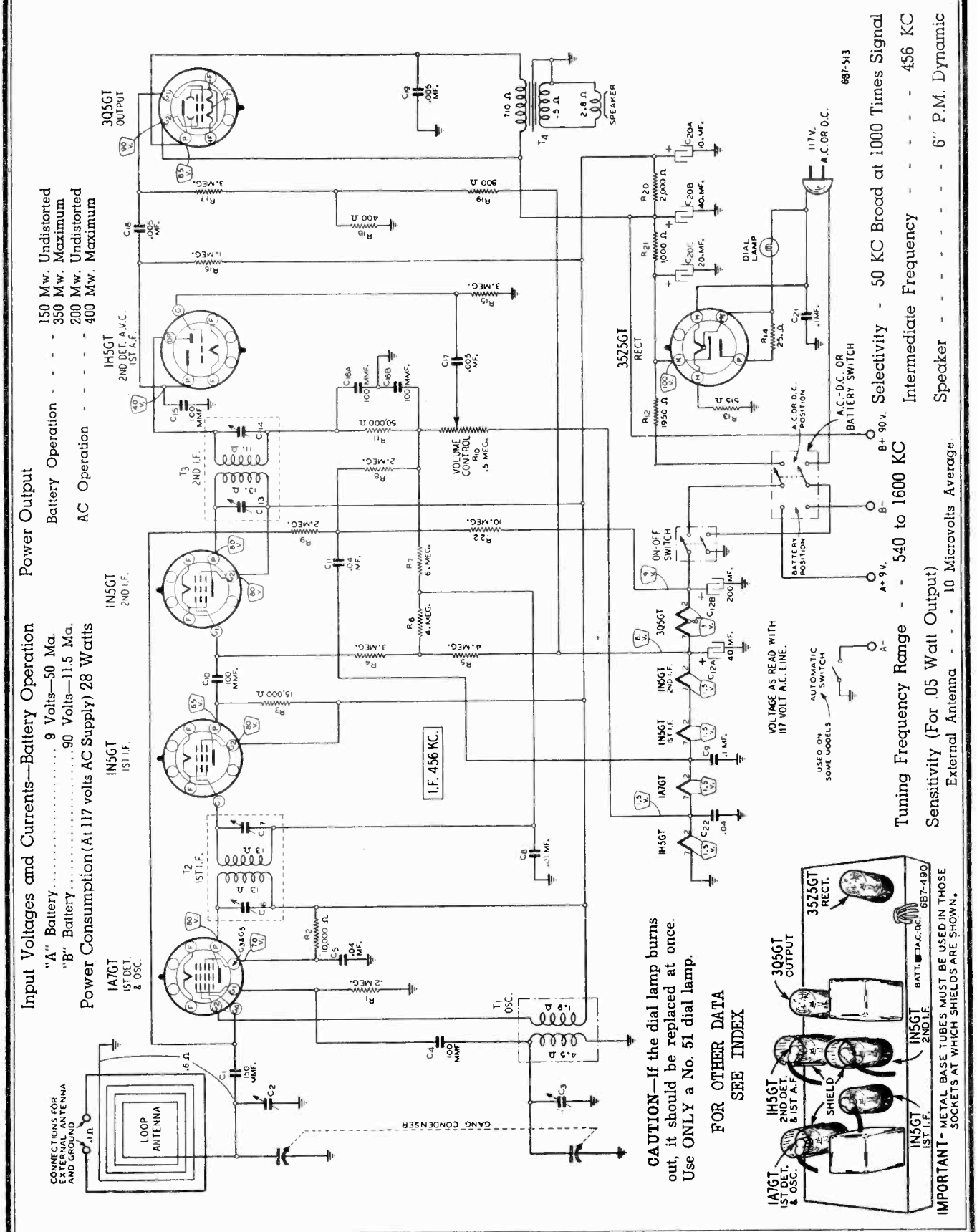
WELLS-GARDNER & CO., INC.

MODEL 6A27
Schematic, Voltage, Socket
Sensitivity



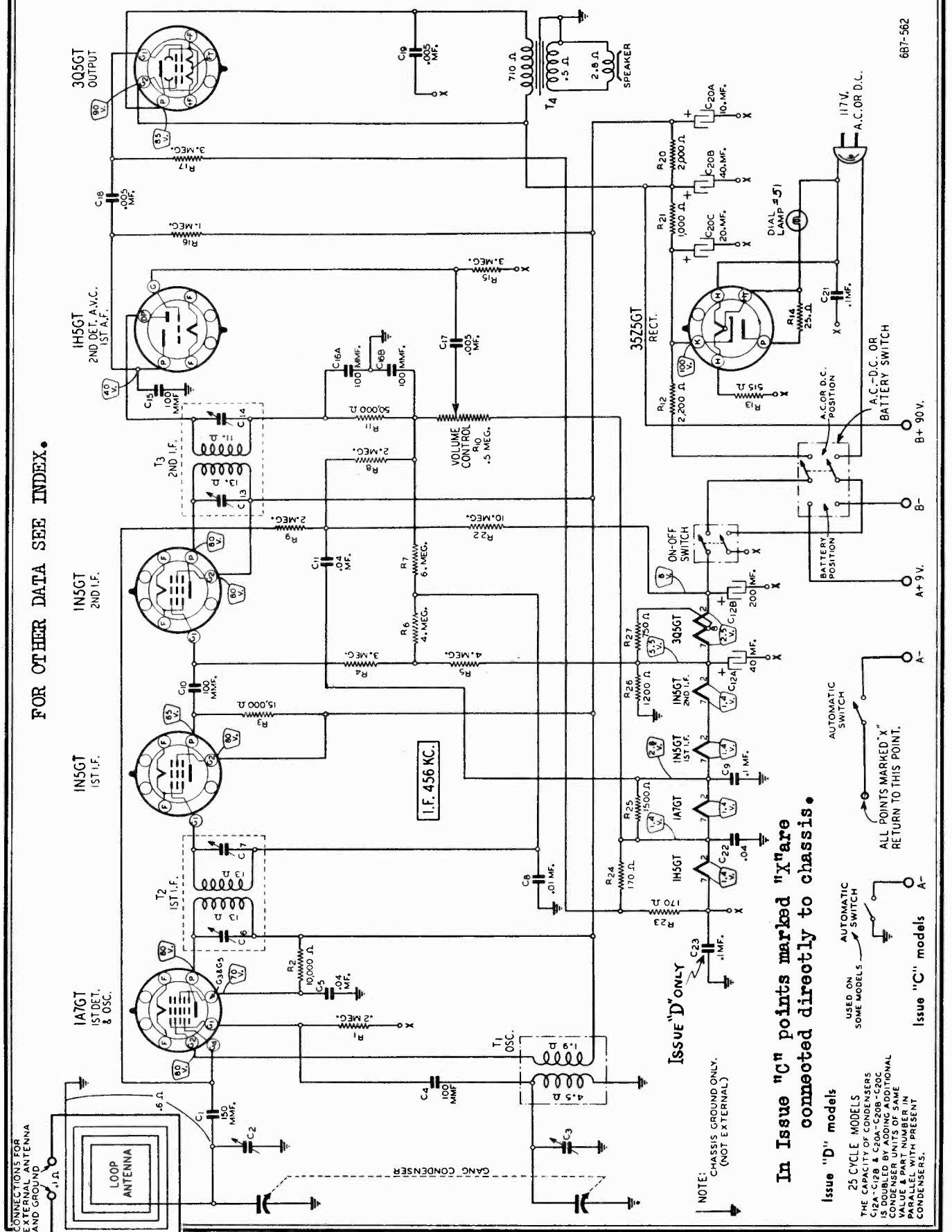
MODEL 6B7(Early)
Schematic,Voltage,Socket
Sensitivity
MODEL 6B7,Issues B,C,D
Socket Layout

WELLS-GARDNER & CO.



WELLS-GARDNER & CO.

MODEL 6B7, Issues C, D
6B7-3, 6B7-4
Schematic, Voltage



FOR OTHER DATA SEE INDEX.

Removing Chassis from Cabinet

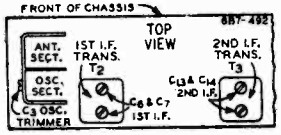
Take out the 2 screws, one at each side on the outside of the cabinet. Grasp the chassis shelf at each rear corner and edge it away from the cabinet front until the chassis shelf and chassis slide easily out of the cabinet.

To remove the shelf from the chassis, take out the bolt and the 2 screws at the bottom of the shelf.

Using Radio Without Batteries—The radio may be used without batteries when it is operated on AC-DC. If this is done, tape the prongs of the battery plugs to prevent them from accidentally touching each other, and place the plugs and cables in the battery compartment.

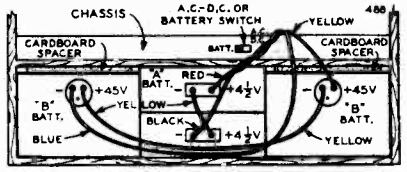
NOTE A—Chassis must be in cabinet. Connect a loop approximately one foot in diameter across the antenna and ground posts of the signal generator. The back of the cabinet must be in place. Place radio approximately 3 feet from loop so as to pick up signal. Radio should not be in proximity to any metal (metal bench, etc.).

CALIBRATION (For models with pointer in front of dial scale)—To obtain dial scale calibration, tune in an 800 KC signal. The pointer should be at the 800 KC mark on the dial. If it is not, hold the pulley at the back of the dial and loosen the pointer screw. Set the pointer at the 800 KC mark. Hold the pointer and retighten the pointer screw.



Two 4½ Volt "A" batteries—Portable Size 4" x 1⅞" x 4⅝" High

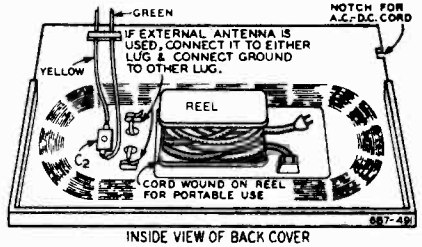
Two 45 Volt "B" batteries—Portable Size 4⅛" x 2½" x 5⅜" High



Caution

The metal chassis is connected to one side of the line through a .10 mfd. condenser. Both AC and DC power lines are generally grounded on one side. If the side of the line not connected to the metal chassis through this condenser is grounded and the metal chassis comes in contact with an external ground, this condenser will be connected across the line and there will be an increase in hum.

Therefore, in any service work on the chassis, keep it on a wood or other insulated surface to avoid contacts with ground. The person working on the set should avoid getting in contact with any ground.



INSIDE VIEW OF BACK COVER

ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.

Connect Radio Chassis to Ground Post of Signal Generator with a Short Heavy Lead.

Allow Chassis and Signal Generator to "Heat Up" for several minutes.

The following equipment is required for aligning:

A Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.

Output Indicating Meter—Non-Metallic Screwdriver.

Dummy Antenna—.1 mf.

SIGNAL GENERATOR		DUMMY ANTENNA	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM (See Trimmer Illustration below and Illustration of Back—Page 1)
FREQUENCY SETTING	CONNECTION AT RADIO			
456 KC	Signal Grid of 1st Det. (Top Cap)	.1 mf.	Turn Rotor to full open	1st I.F. (C6) & (C7) 2nd I.F. (C13) & (C14)
1600 KC	Signal Grid of 1st Det.	.1 mf.	Turn Rotor to full open	Oscillator (C3)
1500 KC	None—See Note A		Turn Rotor to max. output	Antenna (C2)

Series 6B7 CHANGES MADE FOR ISSUE "B" November 28, 1939

To satisfy Underwriter's requirements, the chassis issue will become "B" when several changes in the routing of wires and the arrangement of parts in the chassis have been made.

Chassis with these changes have had the 6 lug terminal strip 4A98 removed.

PROLONGING TUBE LIFE
CHANGES FOR ISSUE "C" Jan. 9, 1940

To compensate for variations in tube characteristics as well as high line voltages, the following changes have been made in the filament series circuit to reduce the voltages across the tube filaments and to prolong tube life.

Resistor R12, which is in series with the filament series, has been changed from 1950 ohms to 2200 ohms.

There was unequal emission from the 2 sections of the filament of the 3Q5GT output tube. This caused unequal voltages across the 2 sections of the filament and shortened the tube life. There is now a 750 ohm resistor (R27) across one section which equalizes the currents through both portions.

The four 1⅛ volt tube filaments were shunted with 1200 ohms - Resistors R19 - 800 ohms and R18 400 ohms (See old schematic). The connecting point between these 2 resistors established the grid (bias) voltage for the output tube. These 4 tubes are now shunted by one 1200 ohm Resistor R26.

The 1A7GT 1st Detector Filament is now shunted with a 1500 ohm resistor - R25.

The 1H5GT 2nd Detector Filament is now shunted with 340 ohms - Resistors R24 and R23 in series. The connecting point between these 2 resistors establishes the grid (bias) voltage for the output tube.

Series 6B7-3, 6B7-4 CHANGES MADE FOR ISSUE "D" March 11, 1940

To satisfy additional Underwriters requirements, the chassis has been isolated from the AC-DC line except for a connection through a .1 mf. condenser - See schematic On these models the battery wires are held by a clamp located under the chassis shelf. On previous issues this clamp was above the shelf. The battery compartment cardboard fillers have been made smaller to clear the above mentioned clamp.

On chassis with the above changes incorporated, the issue letter becomes "D."

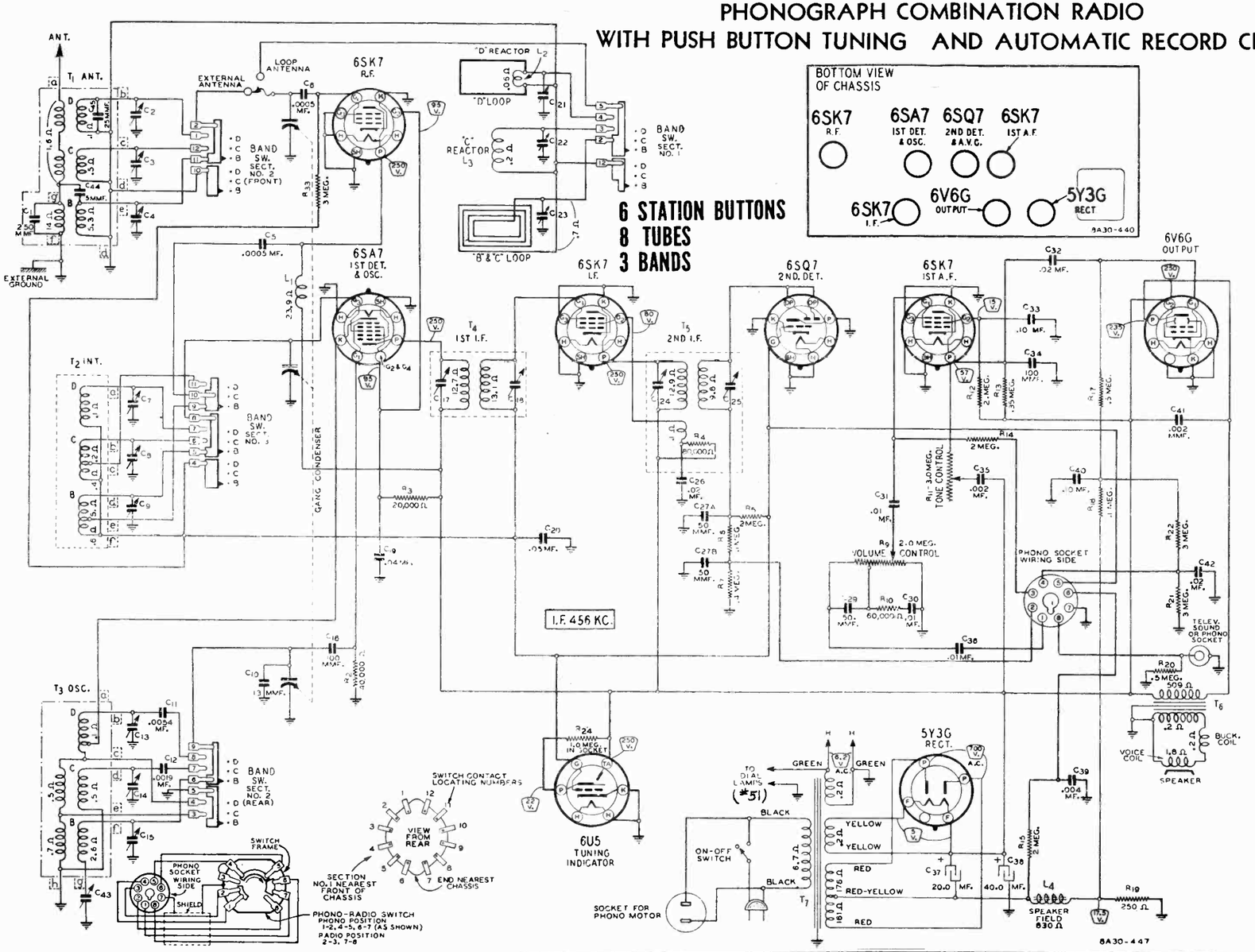
All voltages on this issue chassis except the heaters and dial lamp are measured between socket terminal and B- (indicated by "X") - See schematic

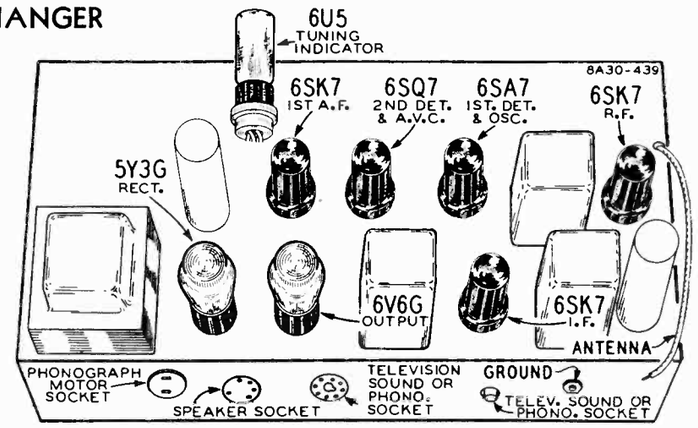
MODEL 8A30
Schematic, Voltage, Socket, Sensitivity
Antenna Data, Coils

WELLS-GARDNER & CO.

PHONOGRAPH COMBINATION RADIO
WITH PUSH BUTTON TUNING AND AUTOMATIC RECORD CHANGER

6 STATION BUTTONS
8 TUBES
3 BANDS





Antenna and Ground

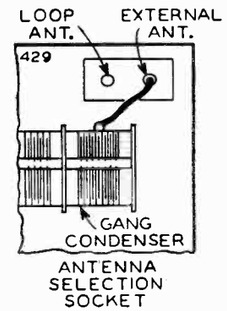
Two loop antennas are incorporated in the speaker chamber and may be used for broadcast band and short wave reception. For the reception of local or nearby stations, an outside antenna is usually not required. The use of the loop antenna may, in some locations, provide best broadcast band operation.

In general, however, more stations will be heard and noise will sometimes be reduced by using an outside antenna.

For best reception of short wave stations, an outside antenna is recommended.

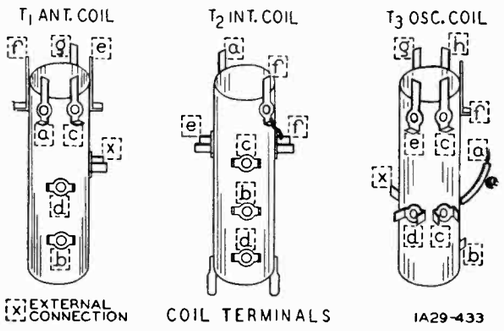
A white wire will be found coming out of the chassis. Connect this wire to the outside antenna lead.

On the back panel of the chassis base is a screw (marked GND) under which the ground wire should be fastened.



ANTENNA SELECTION SOCKET—At the right front corner of the chassis base (from back of cabinet) is a 2 hole pin tip socket—See illustration. If it is desired to operate the radio using the loop antennas, the pin tip should be inserted in the hole farthest from the side of the chassis. If it is desired to operate the radio using an external antenna, insert the pin tip in the hole nearest the side of the chassis. The socket may be reached after removing the four wing nuts holding the cover over the opening in the cabinet back.

Important—A good antenna and ground are essential for best operation of this radio. Connections should be clean and tight. Do not use an old outside antenna as in most cases it will be unsatisfactory.



SPECIFICATIONS

Power Consumption — 71 Watts (At 117 volts 60 cycles) 88 Watts (Phonograph Operating)

Power Output — 4.0 Watts Undistorted 5.0 Watts Maximum

Selectivity — 30 KC Broad at 1000 times Signal

Intermediate Frequency — 456 KC

Speaker — 10" Electro-Dynamic

Receivers of this model which are to be used on 25 cycle, 230 volt, or other service are so marked on label.

Tuning Frequency Range

B Range	528 to 1730 KC
C Range	2200 to 7000 KC
D Range	7000 to 22000 KC

Sensitivity (For 0.5 Watt output)

B Range	1.0 Microvolt Average
C Range	1.0 Microvolt Average
D Range	3.0 Microvolts Average

FOR OTHER DATA SEE INDEX

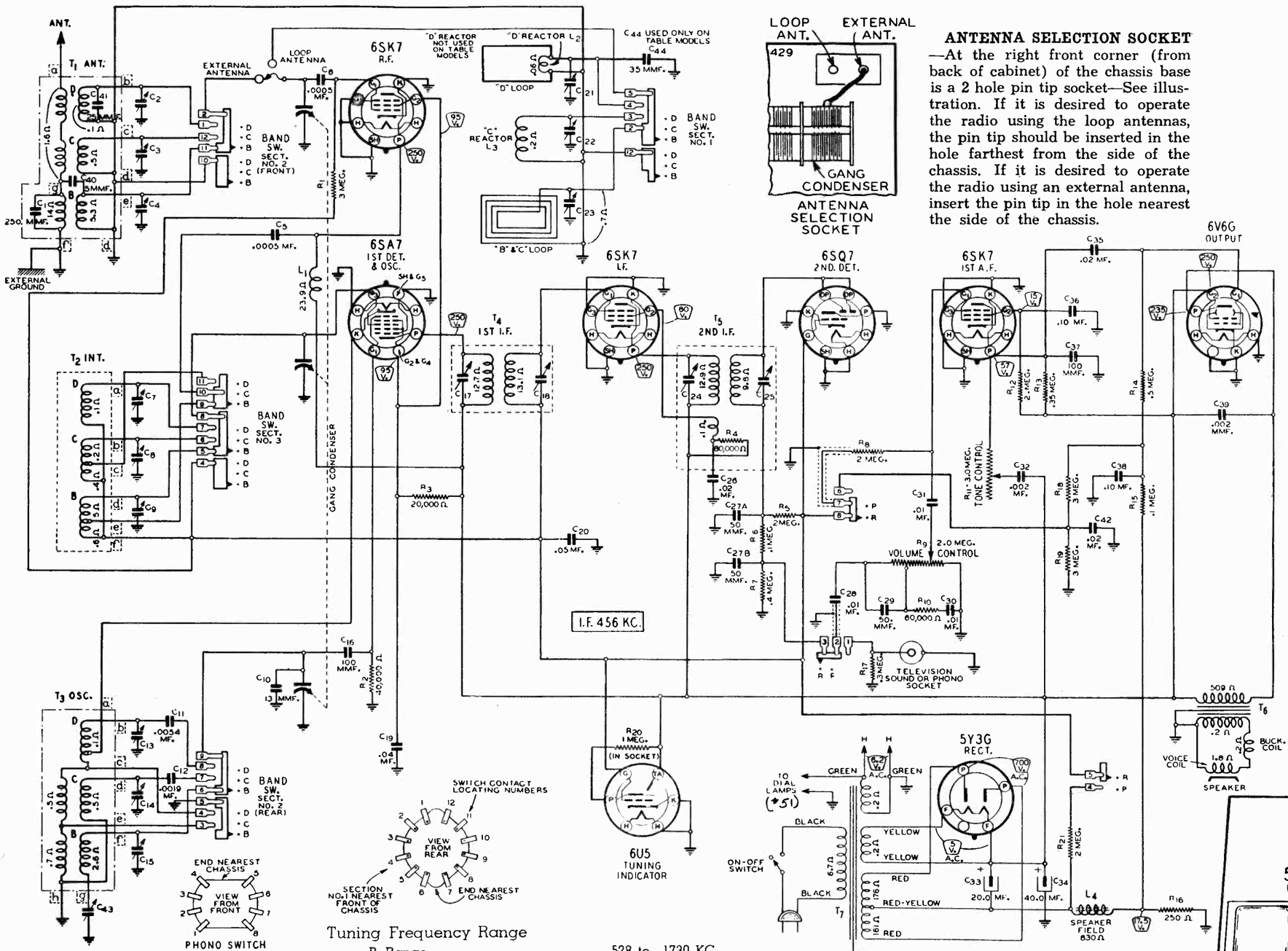
Voltages at Sockets

Line Voltage—117.
Volume Control—Maximum.
Antenna Shorted to Ground.

Readings taken with 1000 ohm-per-volt meter. Plate and screen voltages are read on 500 volt scale.

MODEL 8A31
Schematic, Voltage, Socket, Coils
Sensitivity, Notes

WELLS-GARDNER & CO.



ANTENNA SELECTION SOCKET—At the right front corner (from back of cabinet) of the chassis base is a 2 hole pin tip socket—See illustration. If it is desired to operate the radio using the loop antennas, the pin tip should be inserted in the hole farthest from the side of the chassis. If it is desired to operate the radio using an external antenna, insert the pin tip in the hole nearest the side of the chassis.

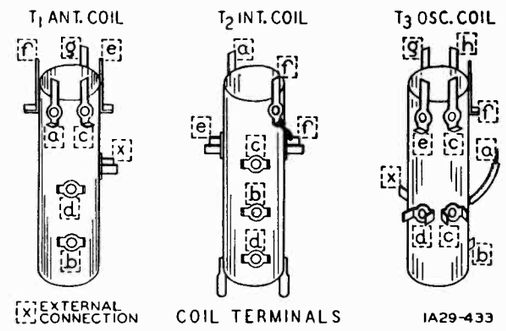
Power Consumption 70 Watts (At 117 volts 60 cycles)

Power Output - - - - - - - 4.0 Watts Undistorted
5.0 Watts Maximum

Selectivity - - 30 KC Broad at 1000 times Signal

Intermediate Frequency - - - - - - - 456 KC

Speaker - - - - 8" or 10" Electro-Dynamic



TO REDUCE MODULATION-HUM:
Interchange 1st A-F tube with R-F and I-F tubes; select tube position which reduces hum. If appreciable hum remains, try several new 6SK7 1st A-F tubes and use the one which reduces hum to a minimum.

Tuning Frequency Range

B Range	528 to 1730 KC
C Range	2200 to 7000 KC
D Range	7000 to 22000 KC

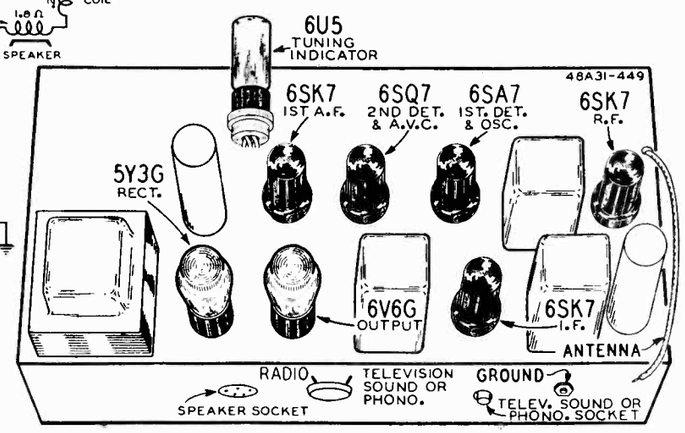
Sensitivity —External Antenna—(For 0.5 Watt output)

B Range	1.0 Microvolt Average
C Range	1.0 Microvolt Average
D Range	3.0 Microvolts Average

FOR OTHER DATA SEE INDEX

Dial Lamps

The dial lamps used are of the bayonet pin type (bulb No. 51). To replace any lamp, first turn the radio off. Then pull the clip off and replace the lamp.



WG & C SERIES 8A31

Automatic Record Changer

(Patents Pending)

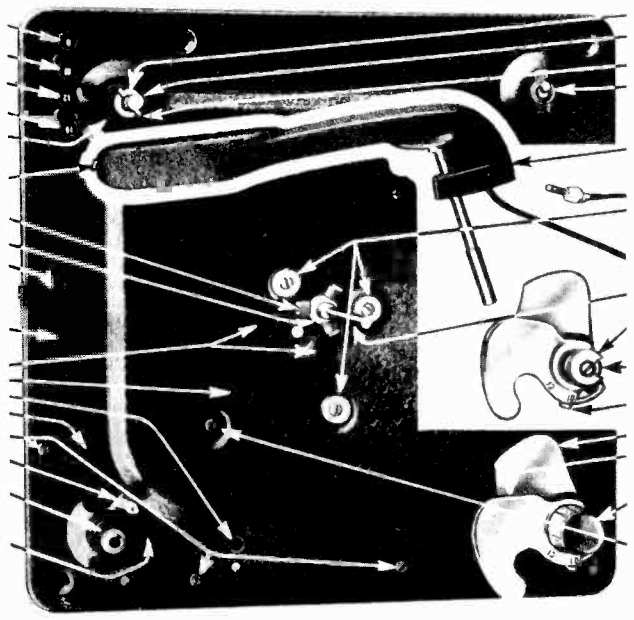


PHOTO A-B. Top View.

For the Service Man

This Manual 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 assuring its continued satisfactory operation, or to remedy some difficulty which has appeared. For his convenience, the "Operating Instructions," supplied to 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 any time while needle is upon a record. . . . To play manually, turn plates out of the way as for reloading, and press "M" button.

(What are here called the "plates" of the Changer are frequently known among mechanics as "blades"--a name best avoided when talking with users because it may convey to some an exaggerated impression of danger in the movement of these parts).

Illustrations

The three photos illustrate all vital parts of the Changer. Letters are used alphabetically, to refer to points on the photos; thus, Motor Oiling Holes "AK" are found by simply glancing down Column A (left side of Photo A-B) to letters AK. Reference letters must NOT be used for ordering parts: order only by the factory numbers. Where no number is given, part cannot be separately supplied; order the Assembly containing it.

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) No. 2) No. 3) Three oil holes on motor gear housing. Reach all three through two holes AK.

No. 4 Through hole marked AL, drop the oil upon flat surface of cam. It will distribute itself to proper points.

No. 5 Through hole marked AM, see felt wick, and drop the oil directly upon it.

No. 6 Through hole marked AN, see felt wick, and drop the oil directly upon it.

To Check Oiling

If squeaks are heard compare the squeak with and without a load of records; any stack of wax records in motion is likely to squeak a little against a pin through their center. See that all five wicks are in position, including three 1/4" round wicks in frame of Motor, one washer-shaped wick ("No. 5") on Lift CV, and one ("No. 6") on Cam Lever CS. 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 or low-viscosity 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. The gearbox of the Motor is packed with a semi-fluid grease at the factory, and it should never be necessary to take it apart for lubrication purposes.

General Description of the Change Cycle

An automatic record player for records of two sizes has three principal duties to perform. These duties are here performed by three mechanisms, interconnected and built together but largely separate in their operation.

(1) The record-changing mechanism--brought into operation originally by the contact of Lifter Cam DG with Pawl DH--is the simplest of the three. It is driven by the cam groove (not visible) on under side (in Photo C-D) of Cam Gear DF. As Cam Lever CS is forced, by the Pawl, out underneath Lift CV (which is shown revolved to the right for visibility) the Lift rises and forces roller DJ into the under groove in Cam Gear. The motion is transferred to Rear Changer Shaft (at ED) through Cam Connecting Rod DE (EC), thence through Changer Connecting Rod FD to Front Changer Shaft BB.

(2) The pickup-operating mechanism--likewise brought into operation originally by the cam-and-pawl action upon Cam Lever CS--is driven in part by the groove in upper (visible) side of Cam Gear DF. As Cam Lever is forced out, at the beginning of the change cycle, against Link CG, it causes the Link to push upward upon Pickup Plunger DA, thus lifting needle from record. The same pressure upon Link CG works, through Guide Arm CD, to force Stud DD down into the groove on the Cam Gear. This rotates the pickup arm, while Pickup Plunger DA holds it up off of record. It is rotated first out beyond the turntable until Selector Plates BL have dropped the next record, then rotated back to proper position to start playing.

(3) The mechanism for bringing needle into correct starting position must operate accurately for both 10" and 12" records. Partly due to this requirement, the starting position is not determined by the cam action. The upper groove on Cam Gear is designed so that it, acting alone, would carry the needle farther back toward record pin than would ever be desirable as a starting adjustment. Travel of pickup arm toward Record Pin is then stopped, at proper point for lowering onto the record, by action of Lever Hub CL. The stopping takes place as lug EW (upon the Lever Hub) strikes the shoulder on Rod EX. This enables the entire mechanism rotated by cam action on Guide Arm CD to travel on past the proper point of rotation for record-starting, while the pickup arm itself, which is held rigid to Lever Hub CL, is accurately stopped at proper record-starting point.

Correct adjustment for starting position of needle requires therefore only correct adjustment of Rods EX and FK; the radial difference of 1 inch between correct starting position for 10" and 12" records is taken care of by exact dimensioning, at the factory, of surfaces at right end of Rod FK which stop against the "10" and "12" key stems. Due to this, when Adjusting Cam at FP is turned (as directed below under Adjustment A) the starting position of needle is simultaneously altered for both 10" and 12" records.

Adjustments

There are three adjustments that can be made. Except on certain early Changers (See B, below), ALL THREE CAN BE MADE FROM ABOVE: CHANGER NEED NOT BE REMOVED FROM CABINET. All adjustments are correctly made at the factory, and ordinarily need never be altered. Should it become necessary to readjust, due to accident or tampering, proceed as follows:

A. ADJUSTING LANDING POSITION OF NEEDLE ON THE RECORD. If needle comes down on the sound track, playing of records will not start at their beginning. Insert screwdriver through hole AJ. Turn screw head on Needle Landing Adjusting Cam FP very slightly counter-clockwise. If needle comes down too close to outer edge of record, or out beyond edge of record, turn Adjusting Cam clockwise.

The factory adjustment of needle landing is 1/8" in from outer edge of record.

Compare also Paragraph 12 below.

B. ADJUSTING DISTANCE FROM RECORD PIN AT WHICH TRIGGER WILL TRIP AND CHANGE CYCLE WILL BEGIN. Insert screwdriver through hole AR. Turn screw head on Trip Adjusting Cam CJ clockwise for earlier tripping, or counter-clockwise for later tripping. (Effect is to alter position of the Cam which strikes Trigger CP. It may be found that Cam has been revolved through a half-turn; in this case, above directions would apply only after Cam has been returned to correct position by revolving screw head one-half turn).

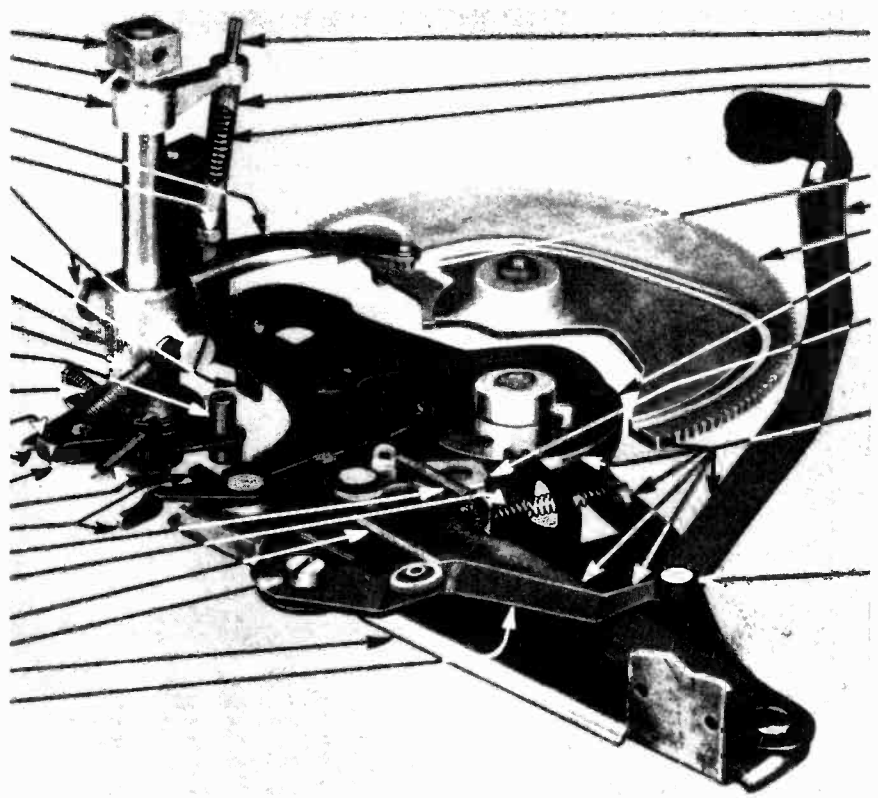
On some models of this Changer no hole will be found in Main Plate at AR. To make the adjustment on these Changers, access must be had to the under-side of the mechanism. Instead of Cam CJ, there will be found a Trip Adjustment Screw, so placed that its end strikes the trigger directly. For earlier tripping, turn this Screw clockwise; for later tripping turn it counter-clockwise.

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 1⅜" to 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

MODEL 8A30, Automatic Record Changer
Assembly Views, Adjustments

WELLS-GARDNER & CO.

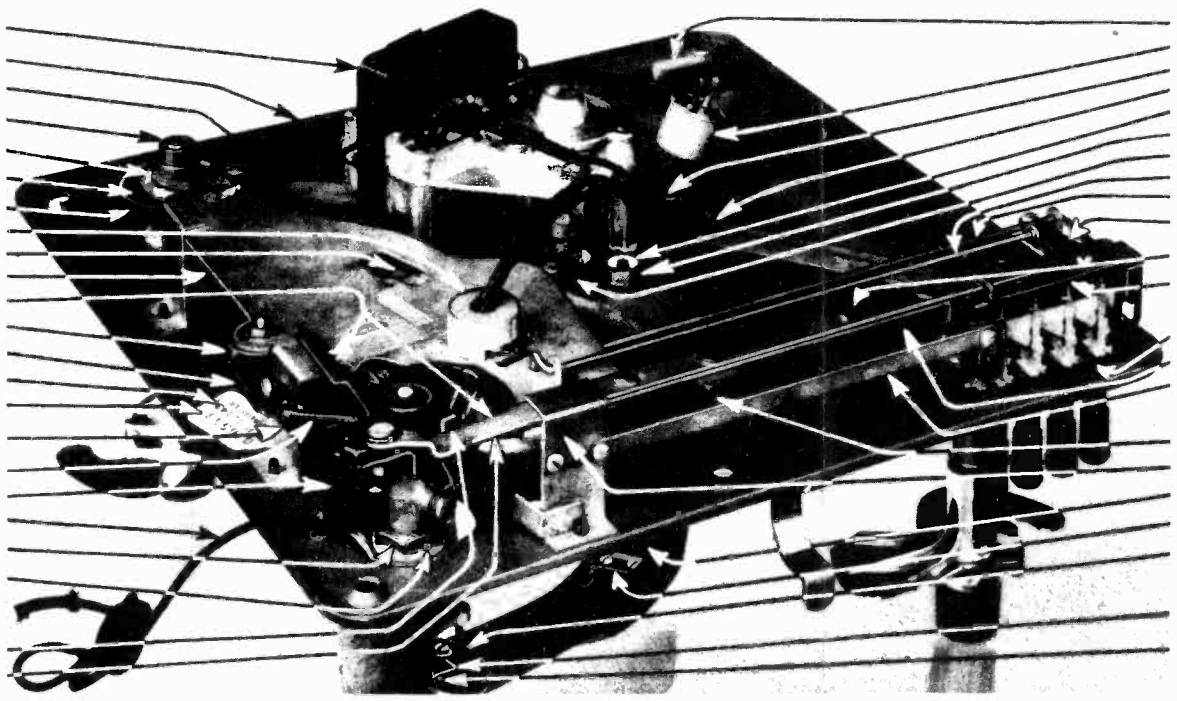
P-12123	Swivel Shaft and Head Assem. . .	CA
P-2522	Fibre Washer (2 required) . . .	CB
P-12048	Lifter Guide	CC
P-12111	Swivel Guide Arm Assembly . . .	CD
P-12003	Lifter Rod Nut (AP)	CE
P-12072	Trunnion Shoulder Screw (2 reqd)	CF
	Link	CG
P-12701	Swivel Tube and Trunnion Assem.	CH
P-12087	Swivel Guide Arm Spring	CI
	Trip Adjusting Cam	CJ
P-12089	Swivel Spreader Spring	CK
P-12703	Stop Lever and Trigger Adj. Assem.	CL
P-12026	Upper Swivel Spreader	CM
P-12027	Lower Swivel Spreader	CN
P-12099	Pickup Leader Spring (ER) . . .	CO
	Trigger.	CP
P-12084	Pawl Spring	CQ
P-12085	Cam Lever Spring	CR
	Cam Lever	CS
P-12007	Shoulder Screw	CT
	Sub-Plate	CU
	Cam Connecting Rod Lift	CV



DA	Pickup Plunger	P-12095
DB	Pickup Plunger Sleeve	P-12096
DC	Pickup Plunger Spring	P-12097
DD	Stud	
DE	Cam Connecting Rod	
DF	Cam Gear	
DG	Lifter Cam	
DH	Pawl	
DI	Sub-Plate and Gear Assembly . .	P-12709
DJ	Roller	

Photo C-D. View of Sub-Plate Assembly, Together with Certain Other Assemblies

	(Give Model No. as at EN). Changer Motor	EA
	(Give Model No.) . Main Mounting Plate Assm.	EB
	Cam Connecting Rod . . .	EC
P-12400	Changer Shaft Collar	ED
	Spreader Hub Assembly	EE
P-12045	Spring Roller	EF
P-12088	Changer Spreader Spring	EG
	Cycling Switch	EH
P-12085	Cam Lever Spring	EI
P-12709	Sub-Plate and Gear Assem. (DI) . .	EJ
P-12116	Adjusting Rod Assembly	EK
	Cam Connecting Rod Lift (CV). . .	EL
P-12083	Cam Connecting Rod Lift Spring .	EM
	Changer Model Number	EN
	Changer Serial Number	EO
P-12505	Rejection Rod Support	EP
P-12084	Adjusting Rod Lever Spring . . .	EQ
P-12099	Pickup Leader Spring (CO)	ER
(Give Model No. as at EN)	Pickup Cord . . .	ES
P-12053	Post Nut	ET
#1228	Shakeproof Washer	EU
M-93	Male Plug (on end of cord) . . .	EV
	Lug on Lever-Hub Assem.	EW
	Adjusting Rod	EX



FA	On-Off Switch (Give Model No. see at EN)	
FB	Male Plug with #7002 Shell . .	M-21
FC	Cord Clamp	292-8
FD	Changer Connecting Rod Assem..	P-12122
FE	Shim . . . . . (Assortment)	P-1397
FF	Grommet Sleeve (3 reqd.) . . .	P-12059
FG	Idler Gear	
FH	Manual Key Rod	P-12077
FI	Rejection Rod	P-12510
FJ	Manual and Rejection Rod Spring	P-12090
FK	Extension Rod	
FL	Key Control Bracket	P-12038
FM	Key Control Unit	P-12079
FN	Adjusting Rod Spring	P-12087
FO	Control Unit Truss Bar	P-12094
FP	Needle Landing Adjusting Cam	
FQ	Adjusting Rod Bracket	P-12036
FR	Pickup Cartridge (Give Model No. as at EN)	
FS	Cartridge Clamp	P-2218
FT	Tone Arm Lift Plate	P-2223
FU	Hinge Pin Spring	P-2235
FV	Tone Arm Hinge Pin	P-2234

Photo E-F. Bottom View

early manufacture, it may be impossible to find an adjustment that will always trip and never cut off, but these may always be played manually.

C. ADJUSTING HEIGHT TO WHICH PICKUP ARM RISES. The arm should rise, during the change cycle, high enough so that it clears by only 1/4" the record above it, next to be played. (Be careful, before deciding that readjustment is necessary, to see that the record at bottom of stack is not a warped one.) To make this adjustment, loosen Lock-Nut AP (CE) and turn Pickup Sleeve DB to lengthen or shorten Pickup Plunger DA. However, if Pickup is made to rise too close to bottom record, Stud DD may never clear the groove in Cam Gear. In making this adjustment, therefore, care must be taken to see that Pickup arm does not keep moving back and forth continuously (due to Stud DD remaining in engagement with groove). When correct adjustment is found, tighten Lock Nut securely.

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 serious fault within Motor, remove entire Motor EA (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 give Model Number at EN; also 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 EB, and that it has not become bent. When the new Motor has been attached, with three screws through Grommet Sleeves FF 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 BK, 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 BF nearest the Shelf Plate to which record appeared closest. This should improve evenness of operation. However, unless the unevenness was 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 FE, 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 cardboard--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.

Before tightening screws, drop Drive Pinion Assembly AH into mesh with Idler Gear (but not down far enough to seat upon drive pin). Then make sure that when the three screws are tightened, Drive Pinion and Idler still work freely together and do not bind. If necessary, loosen screws again, and shift them until proper tooth clearance is obtained. Then tighten screws, and test, as above directed, the centering of Record Pin between Changer Posts.

In wiring up, consult wiring diagram for particular installation. Use only Underwriters' approved wire. See that Motor Frame is well grounded by wire soldered to lugs, as shown on Bottom View photo.

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. For tightening setscrews, a No. 8 size Allen (hexagon) wrench is required: be sure that setscrews are properly seated on the holes or flats provided. 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 CV 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:

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.

5. CHANGER IS NOISY WHEN IN CYCLE. Check oiling.

6. MOTION OF PICKUP TOWARD RECORD PIN WILL NOT TRIP CHANGER MECHANISM.

a. (Only on models not having Trip Adjustment Hole AR) It may be found that, instead of trigger being actuated, there is stretching of Swivel Spring CK, allowing the spreaders to open. Increase tension of the Spring, 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 (looking from needle end) so that it stands vertical, or even leans a little in outward direction.

b. If trigger is being properly actuated, probably Cam Lever CS is binding against Sub-Plate CU. Look for dirt or obstructions; see that Pawl DH and Trigger CP are working freely on their rivets. If the Lever engages the Pawl so that Lift CV forces roller DJ up into the under groove on Cam Gear, 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 FM: 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 FI. 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 CP 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. First see that button goes clear down; then follow its action through Manual Rod FH.

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 ON-OFF SWITCH FAILS TO STOP CHANGER AT ALL. Either of these two conditions would indicate failure of Cycling Switch FH. Cycling Switch operates normally to short-circuit the manual On-Off Switch (which may be located in position shown at FA or elsewhere) during change cycle only. Such damage to Cycling Switch (not likely to occur) would necessitate returning either the Sub-Plate Assembly or 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 FR. 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 (some unevenness may even be advantageous) this is due to Record Pin not being correctly centered between Changer Posts. If necessary, it can be corrected as described above; see "Replacing Motor."

14. LAST RECORD DROPS ON ONE SIDE ONLY. This suggests a Changer Post bent out of perpendicular to Main Plate. Test as directed above under "Replacing Motor." If Post must be straightened, be careful not to bend other parts.

15. CHANGER CONTINUES CYCLING. Probably due to failure of Lift CV to be drawn 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

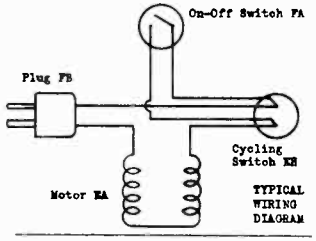
First detach the entire changer mechanism (except Changer Connecting Rod Assembly FD and Cam Connecting Rod Assembly DE, also seen at EC) from Main Plate EB. To do this, first take out Shoulder Screw CT, to free the rest of the mechanism from Assembly DE. Then remove the three screws AO, which hold Sub-plate Assembly DI to Main Plate EB. Also remove Screw BN, which holds Cam Gear DF. Pull off the four Key Control Buttons. Remove, then, the two screws that hold Key Control Unit FM to Main Plate. Now remove Control Unit Truss Bar FO, Rejection Rod Support EP, and Extension Rod Bracket FQ--this means taking out five screws. Remove Flat Spring FJ, by taking out one screw. Rods FB and FI can then, with due care, be extracted without bending. Free the Cam Connecting Rod Assembly DE, by loosening setscrew holding Spreader Hub EE to Rear Changer Shaft. In reassembling, reverse the procedure, taking care to get all springs properly connected as shown in the photos, without stretching any of them.

Replacement Parts

When spare parts or sub-assemblies are required, order them direct from the factory, by factory number and name as given on photos --not by reference letters. Where no number is given, order by full and exact description. Always specify Serial Number as seen at EO, and Model Number as seen at FN. Parts shown in above photographs, but not given factory numbers, are furnished only in assemblies as shown with factory numbers.

Handy Reference

Shops having frequent occasion to service this Changer can obtain on request a second copy of this Manual, for posting, both sides visible, above bench.



MODEL 6D1
Schematic, Voltage, Socket
Sensitivity

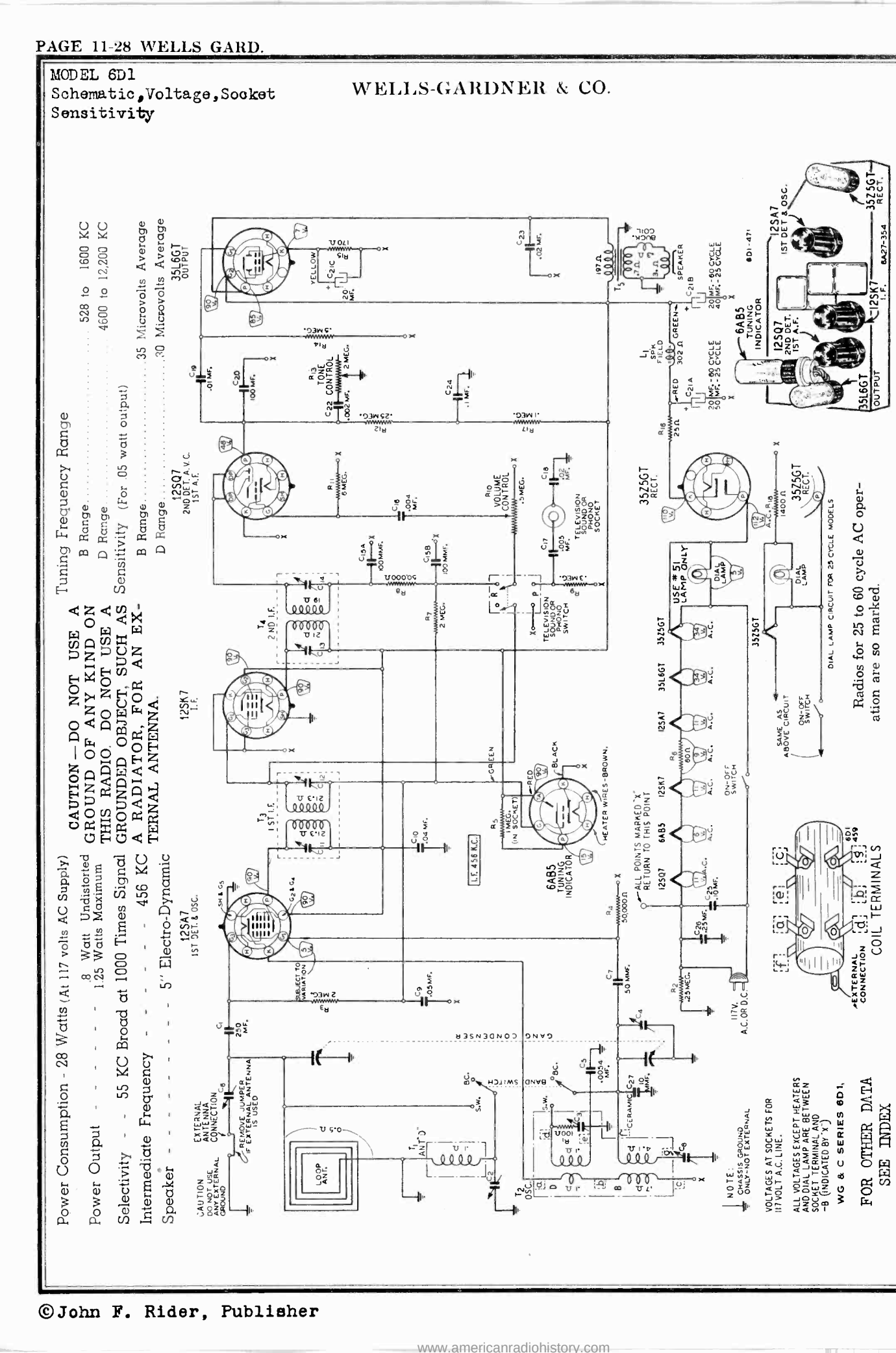
WELLS-GARDNER & CO.

Power Consumption - 28 Watts (At 117 volts AC Supply)
Power Output - - - - - - - - .8 Watt Undistorted
1.25 Watts Maximum
Selectivity - - 55 KC Broad at 1000 Times Signal
Intermediate Frequency - - - - - - - 456 KC
Speaker - - - - - - - - - - 5" Electro-Dynamic

CAUTION—DO NOT USE A GROUND OF ANY KIND ON THIS RADIO. DO NOT USE A GROUNDED OBJECT, SUCH AS A RADIATOR, FOR AN EXTERNAL ANTENNA.

Tuning Frequency Range
B Range ..... 528 to 1600 KC
D Range ..... 4600 to 12,200 KC

Sensitivity (For 05 watt output)
B Range ..... 35 Microvolts Average
D Range ..... 30 Microvolts Average

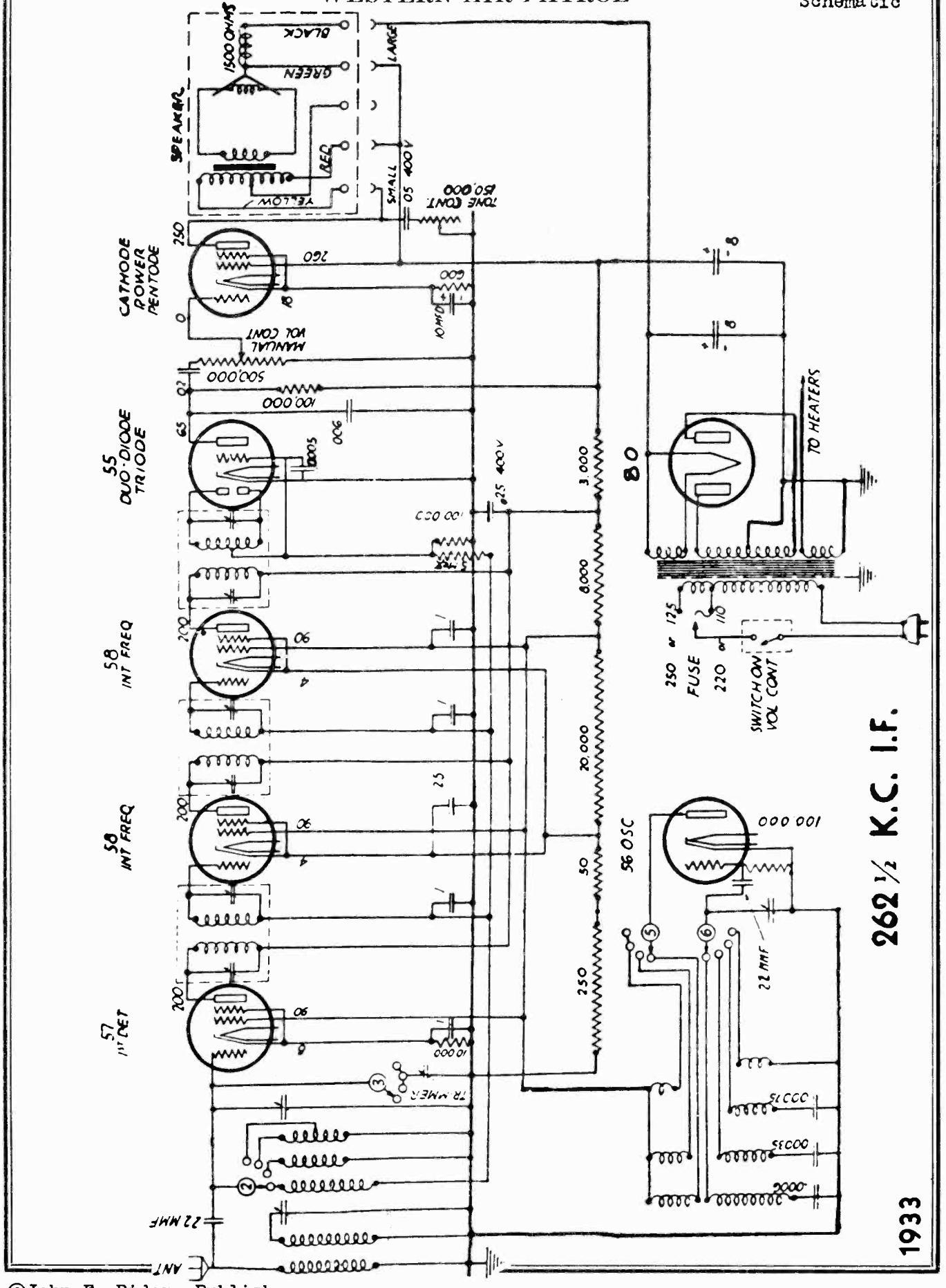


Radios for 25 to 60 cycle AC operation are so marked.

FOR OTHER DATA SEE INDEX

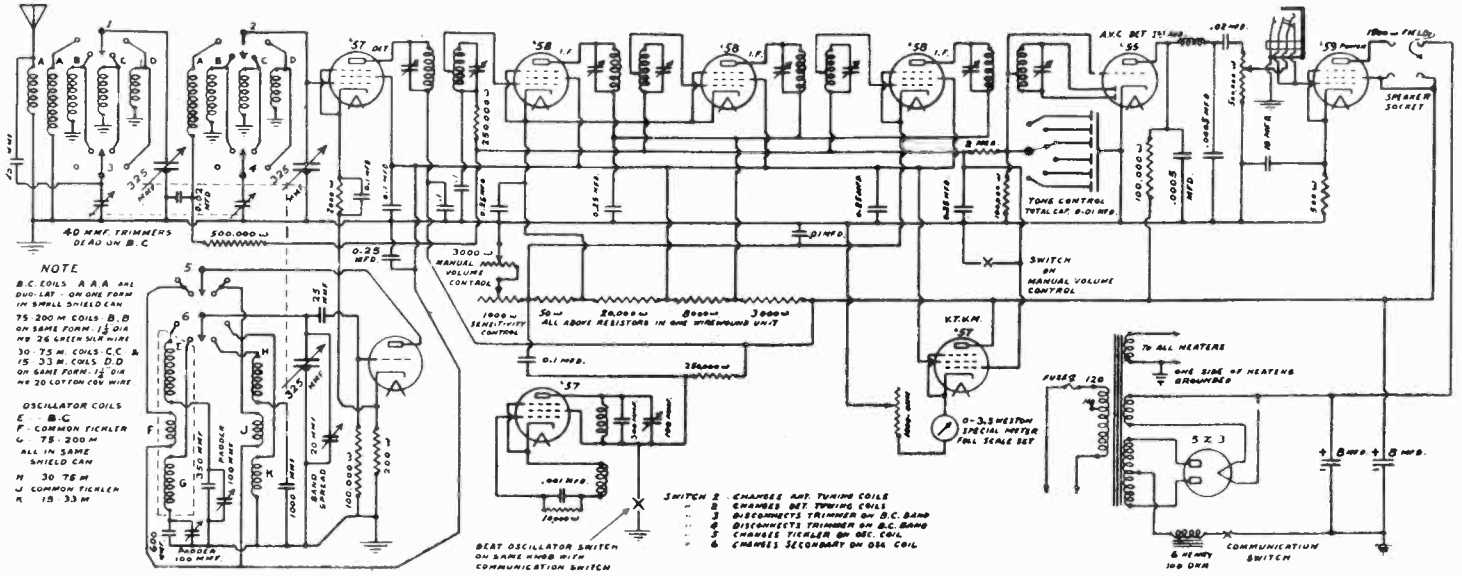
MODEL W221
Schematic

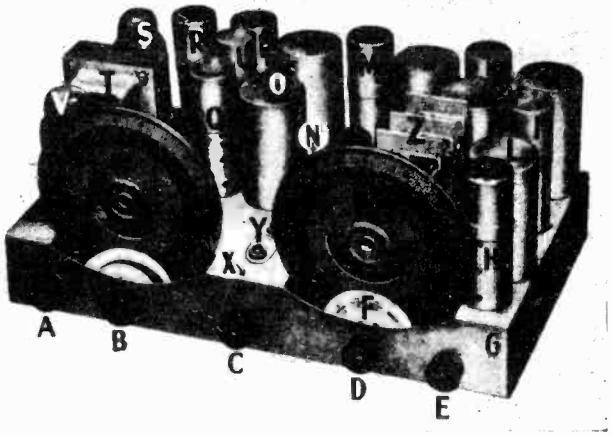
WESTERN AIR PATROL



MODEL W403
Schematic, Alignment
Socket, Trimmers

WESTERN AIR PATROL





PR-10 Chassis

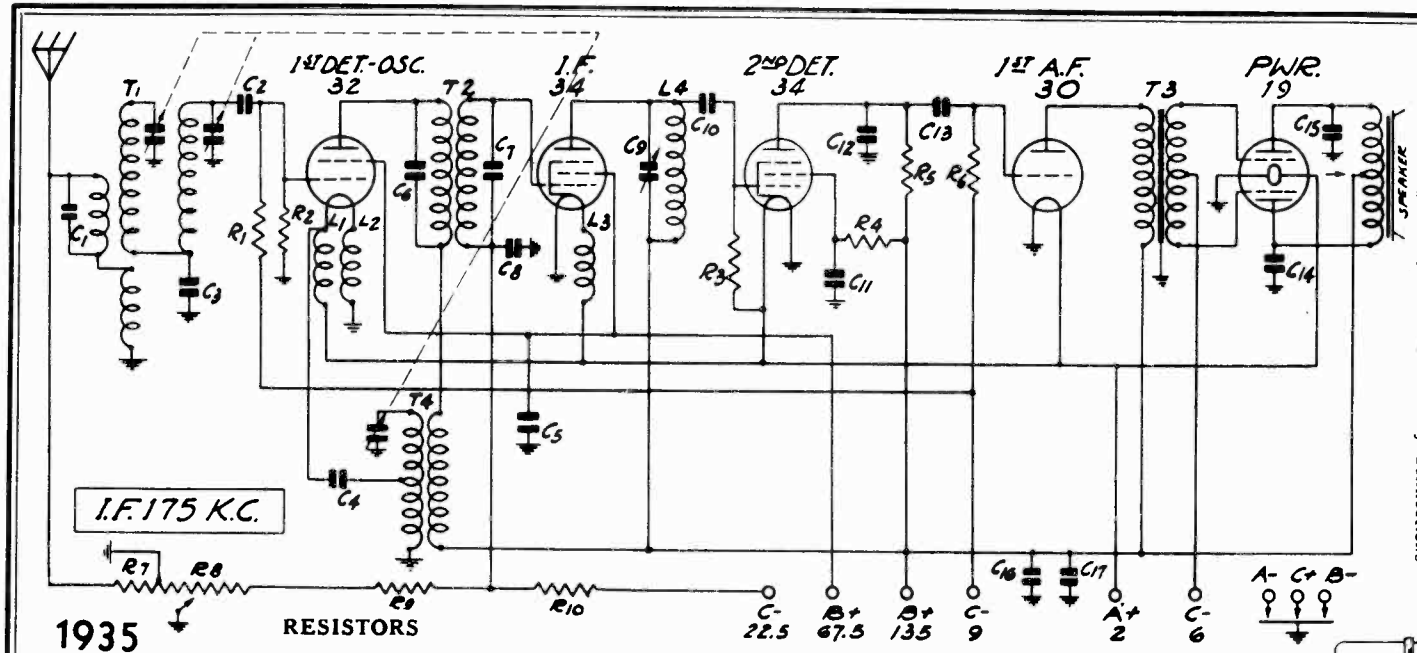
A—"B" on and off, Beat Oscillator switch.
B—Push, Tone Control. Normal, Band Spread.
C—Volume Control, Power Switch.
D—Push, Band Change. Normal, Main Tuning.
E—Short-Wave Trimmer, two gang.
F—Band Indicator.
G—Heavy 18-gauge Chromium Plated Chassis.
H—First Detector—#57.
I—First I. F. Tube—#58.
J—B. C. and 75 Meter Oscillator.
K—Second I. F. Tube—#58.
L—Three Stages I. F.
M—Third I. F. Tube—#58.
N—High Frequency Oscillator Tube—#56.
O—Beat Oscillator Control.
P—Second Detector and AVC Tube—#55.
Q—Beat Oscillator Tube—#57.
R—Vacuum Tube Volt Meter—#57.
S—Output Tube—#59.
T—Heavy Duty Power Supply.
U—Moisture-proof Filter.
V—Rectifier Tube—5Z3.
W—Patterson Velvet Tuning Dials.
X—Manual Control Mounts Here.
Y—Sensitivity, "R" Meter Adjustments.
Z—Three-gang Condenser, Rubber Mounted.

To rebalance the receiver does not require any equipment. The meter will indicate the exact resonance point of the I.F. trimmers and also the condenser gang. Proceed as follows: Set band spread dial at "O," then tune in a station on the high frequency end of the Broadcast band (any station around 1400 K.C. is okay). Next, adjust the trimmer on the condenser section nearest the dial until the station reads exactly on its known K.C. Now, tune in a station in around 600 K.C. and be careful to be on the exact center of the carrier. All of the above operations must be made with the manual control in off position. Next, turn the sensitivity control toward minimum so that the meter reads about R-9. Now, adjust each of the eight I.F. trimmers very carefully until the meter swings the farthest to the right. You probably will not be able to increase the gain more than 1.5-R. It should not be necessary to turn any trimmer more than 1/8 of a turn.

1934

WESTERN AIR PATROL

MODEL W409
Schematic
Socket



1935 RESISTORS

Part No.	Code	Resistance	Wattage	Type
P-A94505	R1	5 Megohm	0.2	Carbon
P-A94105	R2	1 Megohm	0.2	Carbon
P A94205	R3	2 Megohm	0.2	Carbon
P-B94104	R4	100,000 Ohm	0.5	Carbon
P-B94403	R5	40,000 Ohm	0.5	Carbon
P-A95105	R6	1 Megohm	0.2	Carbon
P-96001	R7	3,000 Ohm		Volume Control
	R8	60,000 Ohm		
P-A94901ww	R9	900 Ohm	0.2	Wire Wound
P-A94652	R10	6,500 Ohm	0.2	Carbon
*P-A94106	R1	10 Megohm	0.2	Carbon
*P-A94205	R2	2 Megohm	0.2	Carbon

*These resistors were used on first models.

CONDENSERS

Part No.	Code	Capacity	Voltage	Type
P-81812	C1	200 mmf		Wire—Part of Ant. Assem
P-81801	C2	35 mmf		Wire—Part of Ant. Assem.
P-80862	C3	0.05 mf	200V	Tubular
P-80862	C4	0.05 mf	200V	Tubular
P-80862	C5	0.05 mf	200V	Tubular
P-81806	C6	70 mmf		Wire
P-81804	C7	45 mmf		Wire
P-80862	C8	0.05 mf	200V	Tubular
P-1685	C9	70+ 30 mmf		I. F. Trimmer
P-81800	C10	50 mmf		Wire
P-81045	C11	0.25 mf	200V	Tubular
P-80863	C12	0.004 mf	600V	Tubular
P-80898	C13	0.006 mf	600V	Tubular
P-80969	C14	0.01 mf	400V	Dual Tubular
	C15	0.01 mf	400V	
P-80864	C16	0.1 mf	200V	Tubular
P-80968	C17	4.0 mf	150V	Electrolytic
P-81036	3 Gang Condenser			

Fig. 1—Schematic Circuit Diagram.

MISCELLANEOUS

Part No.	ITEM
P-2131	No. 32 Socket
P-1645	No. 34 Socket
P-1644	No. 30 Socket
P-1833	No. 19 Socket
P-1640	Speaker Socket
P-20406-A	Tube Shield for 34 and 32 Tubes
P-20786	Tube Shield Base
P-50586-D	Audio Input Transformer T3
P-5168	Double Tuned Ant. Trans. Assem. Comp. with resistors and condensers T1 less can
P-40432	Can for above Assem.
P-5199	1st I.F. Coil and Can Assem. T2
P-5187	Oscillator Coil and Can Assem. T4
P-5188	2nd I.F. Coil and Can Assem. L4
P-5172	Double Filament Reactor L1, L2
P-5189	Single Filament Reactor L3
P-30342-A	Grid Cap Only
P-2060	Knob, plain
P-2122	Knob, Arrow Indicator
P-1441-A	Double Insulated Terminal Strip
P-1786	Five Lug Terminal Strip
P-1831	On-Off Switch
P-20711	Gang Condenser Shield
P-10272	Rubber Chassis Cushions
P-70703	Antenna and Ground Wire
P-70749	"B" Battery Wire Assem.
P-70771	"A" Battery Wire Assem.
P-70772	"C" Battery Wire Assem.
P-2124	Speaker 6"
P-2125	Speaker 8"

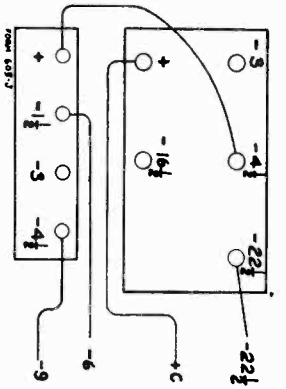


Fig. 3—Optional "C" Battery Connections

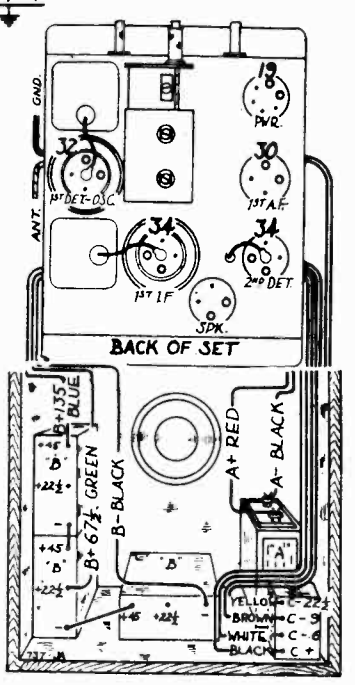


Fig. 2—Tube Arrangement and Battery Connections.

MODEL W409
Circuit Data, Voltage
Alignment, Resistance

WESTERN AIR PATROL

Circuit

This receiver is designed to operate from a battery power supply the values of which are shown in Fig. 1. All of the tubes used are of the 2 volt type. The receiver is designed to operate at a very low current drain from the batteries and still have a very satisfactory quality of output.

The circuit has a preselector stage incorporating 2 tuned circuits for image rejection. This couples into the type 32 first detector-oscillator tube through a combination of inductive coupling in T1 and capacitive coupling through C3. In Fig. 1 the two coils to the right of the 32 1st detector tube are the primary and secondary of the 1st I. F. transformer while below this tube are the oscillator coils. The oscillating circuit is tuned by the oscillator section of the gang condenser and is always resonant at a frequency of 175 K. C. above the frequency to which the R. F. circuit is tuned.

One stage of I. F. amplification is employed using a 34 tube. Fixed condensers tune the primary and secondary of the first I. F. transformer. A second I. F. unit of the impedance coupled type is provided in which the inductance L4 is tuned by a trimmer condenser C9. The volume control is of the variable antenna input and I. F. bias type. Referring to Fig 1 it will be noted that one end of the volume control strip is connected to the antenna and the other end is connected to resistor R9. Also note that the volume control strip is tapped. Bias voltage for the 34 I. F. tube is obtained from a potentiometer consisting of resistors R9, R10 and the 60,000 ohm section of the volume control R8 which resistors are connected across the 22½ volt "C" battery.

As the slider of the volume control is moved away from the antenna end, the signal input to the antenna stage is increased. The bias voltage of the I. F. tube is not affected until the tap is reached. As the slider moves from this point to the end of the strip the I. F. bias is decreased, thus increasing the sensitivity. When this happens the plate current goes up and more battery current is used.

A 34 tube is used as the 2nd detector or demodulator. Demodulation takes place in the grid circuit of this tube.

Resistance coupling is used between the 2nd detector and the 1st audio stage which uses a 30 tube. The 1st audio stage is transformer coupled to the output stage. Class "B" amplification is employed in the output stage which uses a type 19 tube. This consists of two output tubes in one envelope. A magnetic reproducer is used.

A 3 pole switch controls all three sources of battery supply.

Condenser Alignment

Misalignment or mistracking of condensers generally manifests itself as broad tuning and lack of volume at portions or all of the broadcast band. The receivers are all properly aligned at the factory with precision instruments and realignment should not be attempted unless all other possible causes of the faulty operation have first been investigated and unless the service technician has the proper equipment. A signal generator that will provide accurately calibrated signals over the broadcast band and at the intermediate frequency, and an output meter are required for indicating the effect of adjustments.

First set the signal generator to a frequency of 175 K. C. Connect the antenna lead of the signal generator to the grid of the 1st detector thru a .05 mfd. condenser. The ground lead from the signal generator goes to the ground lead of the receiver. Adjust trimmer condenser C9 on the back panel of the chassis until maximum output is obtained. **A non-metallic screw driver should be used in making this adjustment as the I. F. trimmer is at B+ potential.**

Next set the signal generator for 1730 K. C. Turn the rotor to the full open position. The antenna lead from the signal generator is in this instance connected to the antenna lead of the receiver. Adjust the trimmer of the oscillator section of the 3 gang condenser until maximum output is obtained. The oscillator section is the one with the cut plate rotor.

Then set the signal generator for 1400 K. C. and turn the rotor until maximum output is obtained. Adjust the other two trimmers on the gang condenser for maximum output.

To obtain dial scale calibration tune in an 800 K. C. signal and set the dial pointer at that mark on the dial scale. When calibrated in this manner, the setting will be approximately correct at both ends of the scale.

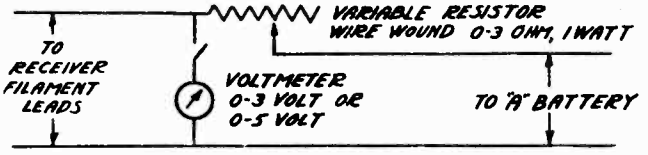


Fig. 4—Using Voltage Regulator with 3 Volt "A" Battery

The use of the cut plate type of condenser eliminates the necessity of a 600 K. C. padder and no adjustment at this frequency, therefore, is required.

D. C. Resistance of Windings

Following are the D.C. resistances of the various windings in the chassis.

Part No.	Item	Code	D. C. Resistance in Ohms
P-5168	Double Tuned Ant. Coil Pri.	T1	19.2
	Double Tuned Ant. Coil Sec. (Preselector)	T1	3.2
	Double Tuned Ant. Coil Sec. (1st Det.)	T1	3.2
P-5199	1st I.F. Coil Pri.	T2	90.0
	1st I.F. Coil Sec.	T2	116.0
P-50586-D	Audio Input Trans. Pri.	T3	1010.
	Audio Input Trans. Sec. Cent. Tap to outside end	T3	648.
	Audio Input Trans. Sec. Cent. Tap to inside end	T3	588.
P-5187	Oscillator Coil, Grid Winding	T4	4.1
	Oscillator Coil, Plate Winding	T4	10.4
P-5172	Double Filament Reactor Assem.	L1	.61
	Double Filament Reactor Assem.	L2	.61
P-5189	Single Filament Reactor Assem.	L3	.61
P-5188	2nd I.F. Reactor Coil	L4	52.1
P-2124	6" Magnetic Speaker, Center Tap to outside end		272.
	6" Magnetic Speaker, Center Tap to inside end		225.
P-2125	8" Magnetic Speaker (same as P-2124)		

VOLTAGES AT SOCKETS
Volume Control at Maximum—Antenna Shorted to Ground
B+135 Volts
Voltages to Chassis

Type of Tube	Function	Across Filament	Plate to Cath.	Screen to Cath.	Grid to Cath.	Normal Plate M. A.
32	1st Det. & Osc.	2.0	135	67.5	7.5(1)(2)	2.5
34	I. F	2.0	135	67.5	2.5(3)	2.8
34	2nd Det.	2.0	50	40(1)	0	1.8
30	1st Audio	2.0	135		9(4)	3.0
19	Output	2.0	135		6	1.8 Total

(1) With 250,000 ohm meter.
(2) Subject to variation due to oscillatory current.
(3) With 25,000 ohm meter.
(4) As read at "C" battery.

Voltages

Check the voltages at the sockets to see if correct values are being delivered to the tubes. The antenna and ground should be disconnected and the antenna and ground leads from the set connected together. The volume control should be turned to the right or maximum position.

The voltage chart gives the voltages with all tubes in, the speaker connected and the set in operating condition. These voltages are typical of the sets but will vary slightly with variations in individual receivers, tubes, test equipment used and battery voltages.

WESTERN AIR PATROL

MODEL W416
Schematic

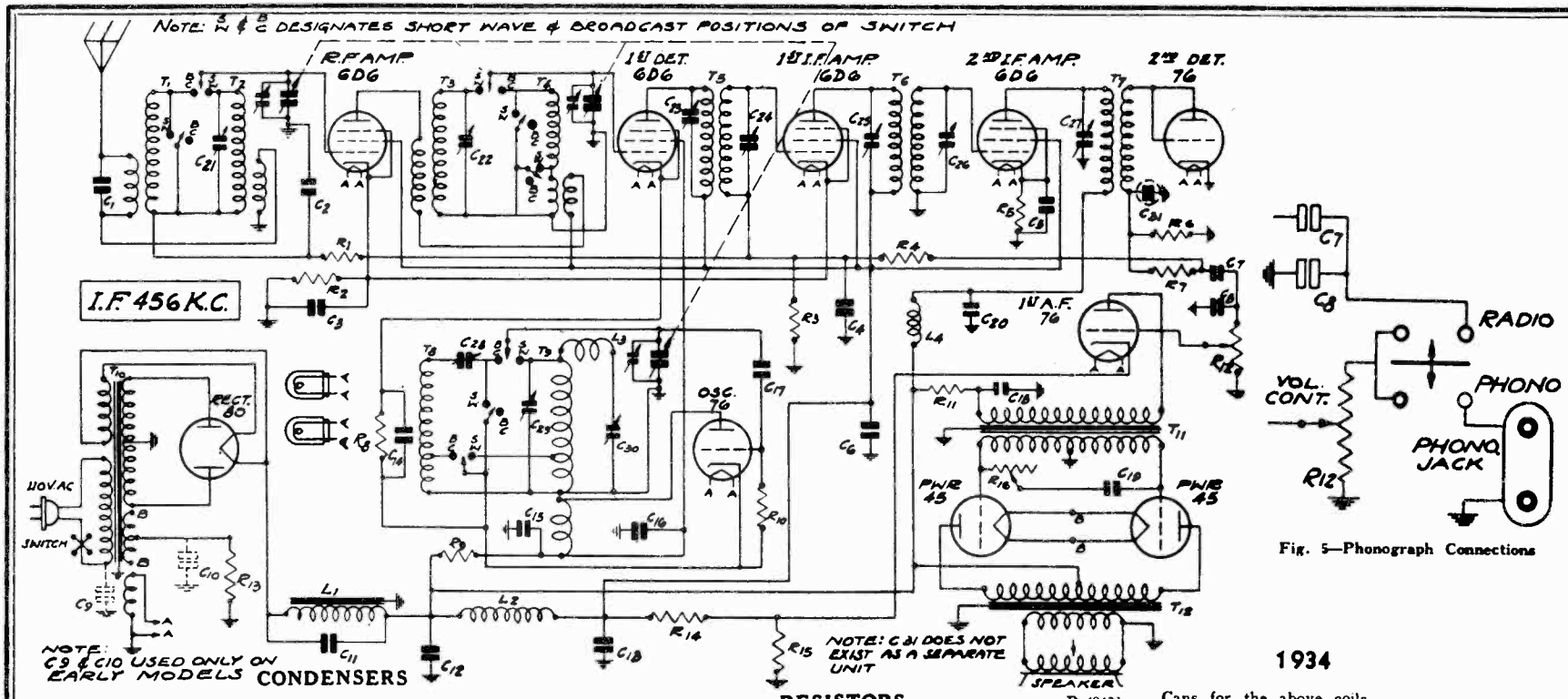


Fig. 1—Schematic Circuit Diagram

Fig. 5—Phonograph Connections

CONDENSERS

Part No.	Code	Capacity	Volts	Type
P-80919	C1	250 mmfd.		Moulded
P-80862	C2	.05 mfd.	200V.	Tubular
P-80888	C3	.25 mfd.	200V.	Tubular
P-80862	C4	.05 mfd.	200V.	Tubular
P-80862	C5	.05 mfd.	200V.	Tubular
P-80888	C6	.25 mfd.	200V.	Tubular
P-80862	C7	.05 mfd.	200V.	Tubular
P-81005	C8	35 mmfd.	600V.	Moulded
*P-80997	C9	.01 mfd.	600V.	Condenser in metal can
*P-80888	C10	.25 mfd.	200V.	Tubular
P-80985	C11	.15 mfd.	200V.	Tubular
P-81039	C12	16.0 mfd.	400V.	Wet Electrolytic
P-81018	C13	6.0 mfd.	150V.	Dry Electrolytic
	C16	2.0 mfd.	300V.	
	C18	2.0 mfd.	300V.	
P-80862	C14	.05 mfd.	200V.	Tubular
P-80864	C15	.10 mfd.	200V.	Tubular
P-81005	C17	35 mmfd.	600V.	Moulded
P-80863	C19	.004 mfd.	600V.	Tubular
P-81041	C20	.10 mfd.	400V.	Tubular
P-2102	C21	3-40 mmfd.		Ant. S.W. Trimmer
P-2102	C22	3-40 mmfd.		1st Det. S.W. Trimmer
P-2103	C23	200+ 50 mmfd.		Dual Trimmer
	C24	200+ 50 mmfd.		Part of I.F. Assem.
P-2103	C25	200+ 50 mmfd.		Dual Trimmer
	C26	200+ 50 mmfd.		Part of I.F. Assem.
P-1685	C27	70+ 30 mmfd.		3rd I.F. Coil Trimmer
P-2112	C28	300-500 mmfd.		600 K.C. Trimmer
P-2102	C29	3-40 mmfd.		Osc. S.W. Trimmer
P-1685	C30	70+ 30 mmfd.		6000 K.C. Trimmer
P-81027		Three Gang Condenser		

RESISTORS

Part No.	Code	Resistance	Watts	Type
P-A95204	R1	200,000 ohm	.2	Carbon
P-98023	R2	150 ohm	.5	Flex. Wire Wound
P-A95105	R3	1 megohm	.2	Carbon
P-A95205	R4	2 megohm	.2	Carbon
P-98024	R5	400 ohm	.5	Flex. Wire Wound
P-A94304	R6	300,000 ohm	.2	Carbon
P-A95104	R7	100,000 ohm	.2	Carbon
P-A94252	R8	2,500 ohm	.2	Carbon
P-98022	R9	30,000 ohm	2.0	Carbon
P-A95104	R10	100,000 ohm	.2	Carbon
P-C94303	R11	30,000 ohm	1.0	Carbon
P-96005	R12	2 megohm		Volume Control and Switch
P-98006	R13	780 ohm	3.0	Armored Wire Wound
	R14	6000 ohm	1.4	
	R15	460 ohm	.2	
P-97003	R16	3 megohm		Tone Control

*Used in Early Models only.

Part No.	Item
P-50638	Power Transformer 115V. 60 cycles T 10
P-50639	Power Transformer 115V. 25 cycles T 10
P-50640	Power Transformer 115-230V. 40-60 cycles T 10
P-50641	Power Choke L 1
P-50642	Audio Output Transformer T 12
P-50643	Audio Input Transformer T 11
P-5176	Antenna R.F. Trans. T 1 and T 2 less can
P-5177	Interstage R.F. Trans. T3 and T4 less can
P-5178	Oscillator Coil Assembly T8 and T9 less can
P-5186	3rd I. F. Coil T7 less can

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P-40433	Cans for the above coils
P-5184	1st I.F. Coil & Can Assembly T5
P-5185	2nd I.F. Coil & Can Assembly T6
P-5190	H. F. Oscillator Tracking Coil L3
P-5151	I.F. Plate Isolating Reactor L4
P-70702	A.C. Cord & Plug
P-1421	Single Insulated Terminal Strip
P-1441	Double Insulated Terminal Strip
P-2060	Small Knob
P-2062	Large Knob
P-30342A	Grid Cap only
P-30456	Small Pointer
P-20912	Large Double End Pointer
P-2012	Pilot Light Bulb
P-10272	Rubber Mounting Feet
P-10320	Glass Crystal
P-20875	Crystal Retaining Ring
P-2152	8" Dynamic Speaker Mantel L2
P-1968	10" Dynamic Speaker Console L2
P-2101	Three Position Band Change Switch
P-20905	Condenser Shield
	8" Black Drive Cord (V.C. or T.C. Ind.)
	29" Black Drive Cord (Cond. Drive)
P-2126	Pilot Lamp Socket & Clip Assembly
P-20911	Bottom Shield
P-1011A	Phono-Radio Switch
P-1193	Phono Jack
P-2025	No. 80 Socket
P-1643	No. 45 Socket
P-2022	No. 76 Socket
P-1885	No. 6D6 Socket
P-1637	Speaker Socket
P-40434	Tube Shield—Aluminum (for earlier models)
P-40424	Tube Shield Base—Aluminum (for earlier models)

MODEL W416 WESTERN AIR PATROL

Voltage, Socket, Changes
Alignment, Trimmers
Drive Cord Data

Replacing Drive Cord

Remove chassis from cabinet.

Take off the pilot light assembly by lifting off the two sockets and spring clips.

Detach the large pointer by removing the screw at the center of the dial.

Loosen the dial assembly by taking out the two screws which secure the bottom of this assembly to the chassis.

Then lay the complete dial assembly face downward in front of the chassis. It is not necessary to remove the volume control and tone control collars which hold the indicator cords of these two controls in position.

Turn the drive drum until the opening in this drum is approximately vertical and with the hole at the top as shown in Fig. 4.

Remove the tension spring and the old drive cord.

See that the eyelet is in the hole in the drive drum as shown in Fig. 4. Insert one end of the drive cord from the outside through the hole in the eyelet in the drive drum.

Tie the end of the cord which has been inserted in the hole to one end of the tension spring.

Wrap the cord in a clockwise direction (facing front of chassis) around the drive drum approximately one-half turn.

Then tilt the chassis up on its back panel and bring the cord mentioned in the previous paragraph down to the drive shaft. Wrap it two and one-half times around the drive shaft as shown in Fig. 4.

Then bring this cord up from the drive shaft and wrap it around the drive drum approximately one and one fifth turns in a clockwise direction until it is up to the hole in this drum as illustrated.

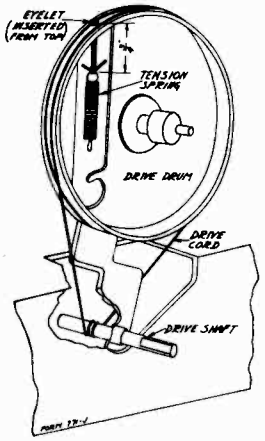


Fig. 4—Drive Cord Replacement

Insert the free end of the cord through the hole in the eyelet and tie it to the end of the tension spring. The end of the spring, when hanging free, should be approximately ¼" from the flange of the drum as shown in Fig. 4. Cut off the surplus length of cord after it is knotted.

Then secure the other end of the tension spring over the spur on the drive drum.

Replace the dial assembly and pointer.

Replace the pilot light assembly after which the chassis may be reinstalled in the cabinet.

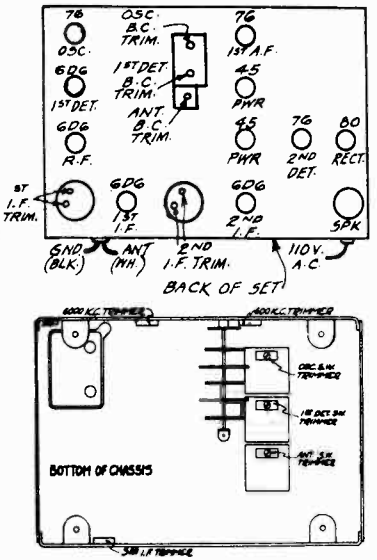


Fig. 2—Tube Arrangement & Location of Trimmers

Voltages at Sockets

LINE VOLTAGE — 115

ANTENNA SHORTED TO GROUND

Type of Tube	Function	Across Fila. or Heater	Plate to Cath.	Screen to Cath.	Cath. to Ground	Normal Plate M. A.
6D6	R. F.	6.3	95	95	2.8	7.0
6D6	1st Det.	6.3	88	95	9.2	2.9
76	Osc.	6.3	110	—	—	5.0
6D6	1st I. F.	6.3	95	95	2.8	7.0
6D6	2nd I. F.	6.3	300	95	3.3	6.0
76	2nd Det.	6.3	—	—	—	—
76	1st Audio	6.3	160	—	9.0	4.0
45	Output	2.5	245	—	48.0	30.0
80	Rectifier	5.0	890 V. A. C. pl. to pl.			58.0 per plate

Phono Connections

Phonograph connections can be made as shown in Fig. 5. A single pole double throw switch and double pin jack are required. These should be mounted on the back panel of the chassis close to the 2nd detector. The connections are made by opening the diode circuit at the point shown in the illustration and completing the connections to the switch and pin jacks as indicated. A high impedance pick-up should be used. If a low impedance pick-up is used a step-up transformer will be required for sufficient volume. The volume control of the set will regulate the phono volume.

Change in Early Models

In the early models of this receiver the side of the trimmer condenser C27 which is shown in Fig. 1 as connected to ground was connected to the B+ side of the 3rd I. F. coil primary.

Condenser Alignment

Correct alignment is extremely important in connection with all wave receivers. The receivers are all properly aligned at the factory with precision instruments and realignment should not be attempted unless all other possible causes of the faulty operation have first been investigated and unless the service technician has the proper equipment. A signal generator that will provide an accurately calibrated signal of 456 K. C. and accurately calibrated signals over the broadcast and short wave bands, 530-1740 K. C. and 5.8-18.3 M. C., is required. An output indicating meter is also necessary. It will be practically impossible to align the receiver if unsatisfactory apparatus is used.

Use a non-metallic screw driver for the adjustments. The complete procedure is as follows:

Intermediate Frequency Adjustment

Set the signal generator for 456 K. C. Connect the antenna lead of the signal generator to the grid of the 1st detector through a .05 mfd. condenser. Turn the tuning condenser rotor until the plates are completely out. The ground lead from the signal generator goes to the ground lead of the receiver. The volume control should be at the maximum position. Reduce the signal so that A. V. C. action is not obtained.

Then adjust the five I. F. trimmer condensers until maximum output is obtained. The adjusting screws for the 1st and 2nd trimmer condensers are reached from the top of the chassis and are in the round I. F. cans - See Fig. 2. The openings to these trimmer condensers are covered over by small cover plates which are held in position by screws. Loosen these screws until the cover plates can be swung around. **CAUTION - Use an insulated screwdriver for adjusting trimmers to prevent short circuiting to ground.** In the 3rd I. F. coil, only the primary has a variable trimmer condenser. This condenser is mounted on the back panel of the chassis as shown in Fig. 2 and the adjustment screw is reached through a hole in the back panel.

Broadcast Band Adjustment

The broadcast short wave switch should be in the broadcast position. Set the signal generator for 1740 K. C. Turn the rotor to the full open position. The antenna lead from the signal generator is in this instance connected to the antenna lead of the receiver. Reduce the signal so that A. V. C. action is not obtained. Adjust the oscillator broadcast trimmer until maximum output is obtained. This trimmer is on the tuning condenser and its location is shown in Fig. 2.

Then set the signal generator for 1500 K. C. Turn the rotor until maximum output is obtained. Loosen the set screw in the pointer hub and set the pointer at the 1500 K. C. mark on the broadcast band scale. Retighten the hub set screw. Then adjust the antenna and 1st detector broadcast trimmers until maximum output is obtained.

Next set the signal generator for 600 K. C. and adjust the 600 K. C. trimmer. The adjusting screw is reached through a hole in the front panel of the chassis as shown in Fig. 2. Turn the tuning condenser rotor until maximum output is obtained. Then turn the rotor slowly back and forth over this setting at the same time adjusting the 600 K. C. trimmer screw until the highest output is obtained.

Short Wave Band Adjustment

CAUTION—After the broadcast band alignment as described above has been made, do not change the adjustment of any of the broadcast band trimmers.

In aligning the short wave band of the receiver, it will be noted that the signal will be heard with the signal generator set at two points 912 K. C. apart. That is, if the receiver is tuned to 15,000 K. C. a signal will be heard when the signal generator is set at 15,000 K. C. and again at approximately 15,912 K. C. This is due to image reception or the fact that a 456 K. C. beat is obtained when the signal is 456 K. C. lower than the receiver oscillator and also when the signal is 456 K. C. higher than the receiver oscillator. Care should be taken to see that the receiver is tracked with the signal generator adjusted to the lower of the two frequencies at which a signal is heard, in order that the oscillator in the receiver will be 456 K.C. higher in frequency than the signal.

Turn the broadcast short wave switch to the short wave position. Turn the rotor to the full open position. As explained above, the volume control should be at the maximum position and the signal should be reduced to prevent A. V. C. action. Set the signal generator for 18,300 K. C. Then adjust the oscillator short wave trimmer for maximum output. This trimmer is reached from under the chassis and its position is shown in Fig. 2. If a maximum output peak cannot be reached, it may be due to the fact that the antenna and 1st detector short wave trimmers are screwed down too far. Back off these two trimmer screws two or three turns and then adjust the oscillator short wave trimmer for maximum output.

Next set the signal generator for 15,000 K. C. Turn the rotor until maximum output is obtained. Then adjust the antenna and 1st detector short wave trimmers for maximum output.

Next set the signal generator for 6000 K. C. and adjust the 6000 K. C. trimmer. This condenser is mounted on the front panel of the chassis as shown in Fig. 2 and is reached through a hole in the front panel. Turn the tuning condenser rotor until maximum output is obtained. Then turn the rotor slowly back and forth over this setting, at the same time adjusting the 6000 K. C. trimmer screw until the highest output is obtained.

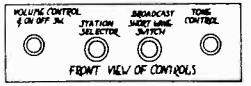


Fig. 3—Arrangement of Controls

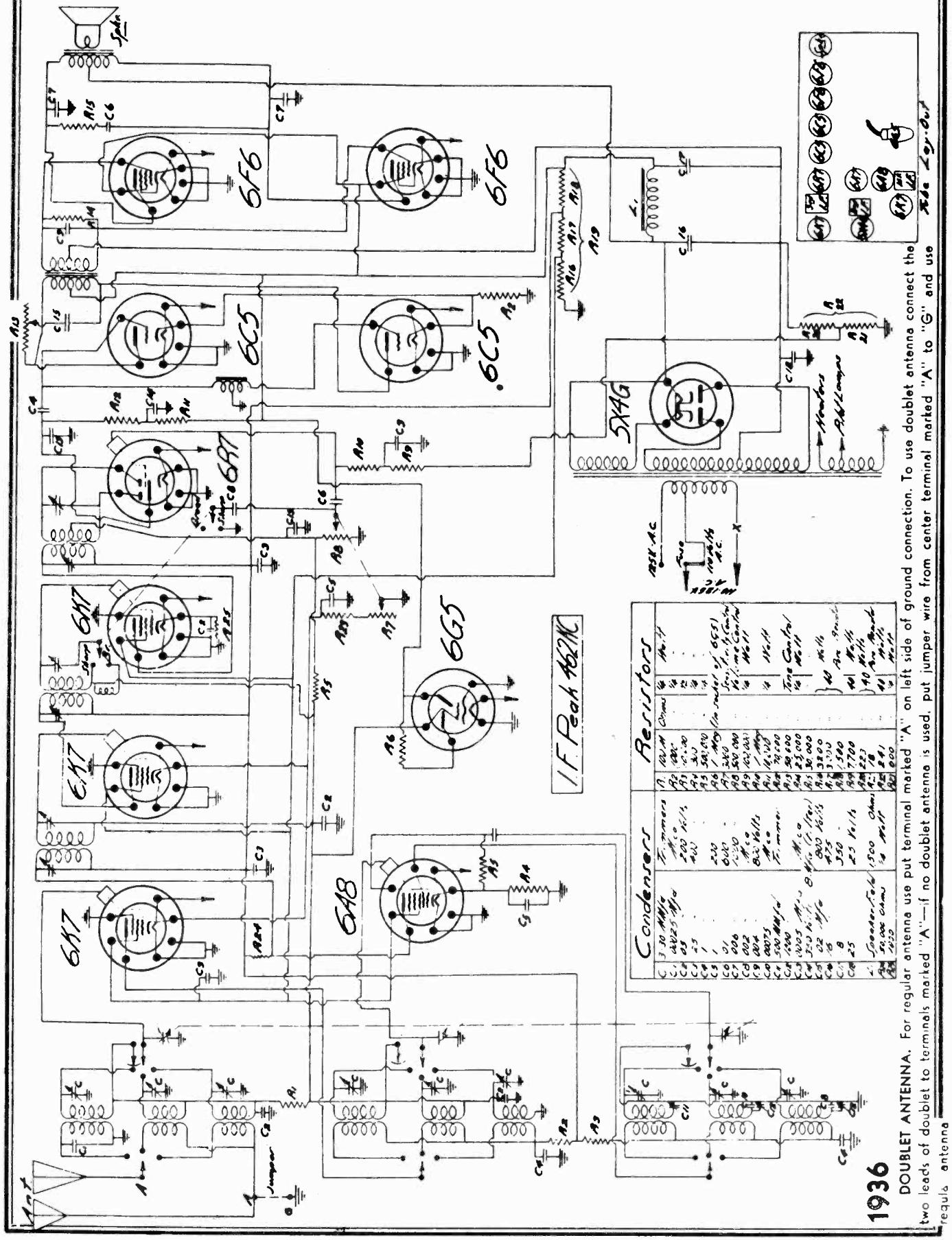
D. C. Resistance of Windings

Following are the D.C. resistances of the various windings in the chassis.

Part No.	Item	Code		D.C. Resistance in Ohms
P-5176	S.W. and B.C. Antenna R.F. Transformer Primaries (in series)	T1	T2	27.9
	B.C. Antenna R.F. Transformer Secondary	T1		5.0
	S.W. Antenna R.F. Transformer Secondary	T2		Small
P-5177	S.W. and B.C. Interstage R.F. Transformer Primaries (in series)	T3	T4	2.7
	B.C. Interstage R.F. Transformer Secondary	T4		4.4
	S.W. Interstage R.F. Transformer Secondary	T3		Small
P-5178	S.W. Oscillator Grid Coil	T9		Small
	S.W. Oscillator Plate Coil	T9		.25
	B.C. Oscillator Grid Coil	T8		3.5
P-5190	S.W. Oscillator Tracking Coil	L3		1.27
P-5184	1st I.F. Coil Primary	T5		5.0
	1st I.F. Coil Secondary	T5		5.0
P-5185	2nd I.F. Coil Primary	T6		5.0
	2nd I.F. Coil Secondary	T6		5.0
P-5186	3rd I.F. Coil Primary	T7		9.3
	3rd I.F. Coil Secondary	T7		26.3
P-50643	Audio Input Transformer Primary	T11		3800.
	Audio Input Transformer Secondary Center Tap to Outside	T11		2600.
	Audio Input Transformer Secondary Center Tap to Inside	T11		2008.
P-50642	Audio Output Trasformer Primary Center Tap to Outside	T12		360.
	Audio Output Transformer Primary Center Tap to Inside	T12		320.
	Audio Output Transformer Secondary	T12		.44
P-1968	Speaker Voice Coil			3.0
	Speaker Field Coil	L2		5000.
P-50641	Filter Choke	L1		150.
P-50638	Power Transformer 115V. 60 Cycles Pri.	T10		5.3
	Power Transformer 115V. 60 Cycles H.T. Sec. Center Tap to Outside	T10		120.
	Power Transformer 115V. 60 Cycles H.T. Sec. Center Tap to Inside	T10		110.
	Power Transformer 115V. 60 Cycles Sec. (80 Fil.)	T10		Small
	Power Transformer 115V. 60 Cycles Sec. (AA Fil.)	T10		Small
	Power Transformer 115V. 60 Cycles Sec. (BB Fil.)	T10		Small

WESTERN AIR PATROL

MODEL W491
Schematic, Socket



DOUBLET ANTENNA. For regular antenna use put terminal marked "A" on left side of ground connection. To use doublet antenna connect the two leads of doublet to terminals marked "A"—if no doublet antenna is used, put jumper wire from center terminal marked "A" to "G" and use regula antenna

MODEL W831
Schematic, Voltage, Socket
Alignment, Trimmers

WESTERN AIR PATROL

Input Voltages and Currents
"A" Battery ..... 2 Volts—3 Amperes
"B" Battery ..... 90 Volts—11.5 to 15 Ma.
Power Output - - - - 135 Milliwatts Undistorted
Selectivity - - - - 40 KC Broad at 1000 Times Signal

Intermediate Frequency - - - - - - - 456 KC.
Speaker - - - - - - - - - - 6" Dynamic
Tuning Frequency Range - - - 528 to 1730 KC.
Sensitivity - - - - - - - - 40 Microvolts

VOLTAGES AT SOCKETS
Volume Control: Maximum — Antenna Shorted to Ground
"A" Battery — 2 Volts

Tube	Function	Across Filament	Plate to Ground	Screen to Ground	Control Grid
1D7G	1st Det.-Osc.	2.0	87 87(1)	64	3.5(2)
1D5G	I.F.	2.0	87	64	3.5(2)
1H6G	2nd Det.-1st Audio	2.0	32(3)		1.25(4)
1F5G	Power	2.0	82	87	3.5(2)

(1) Anode Grid (G2) to ground
(2) As read across R6 and R7
(3) As read on 100 volt scale (1000 ohm per volt meter). Subject to variation.
(4) As read across R7

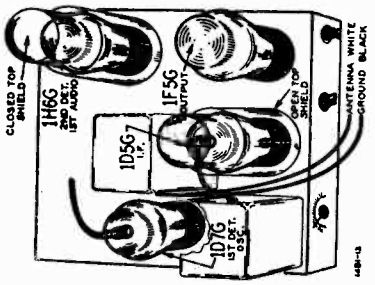


Fig. 2—Tube Arrangement

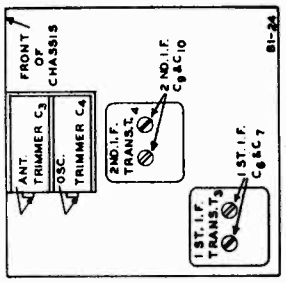


Fig. 3—Trimmer Location

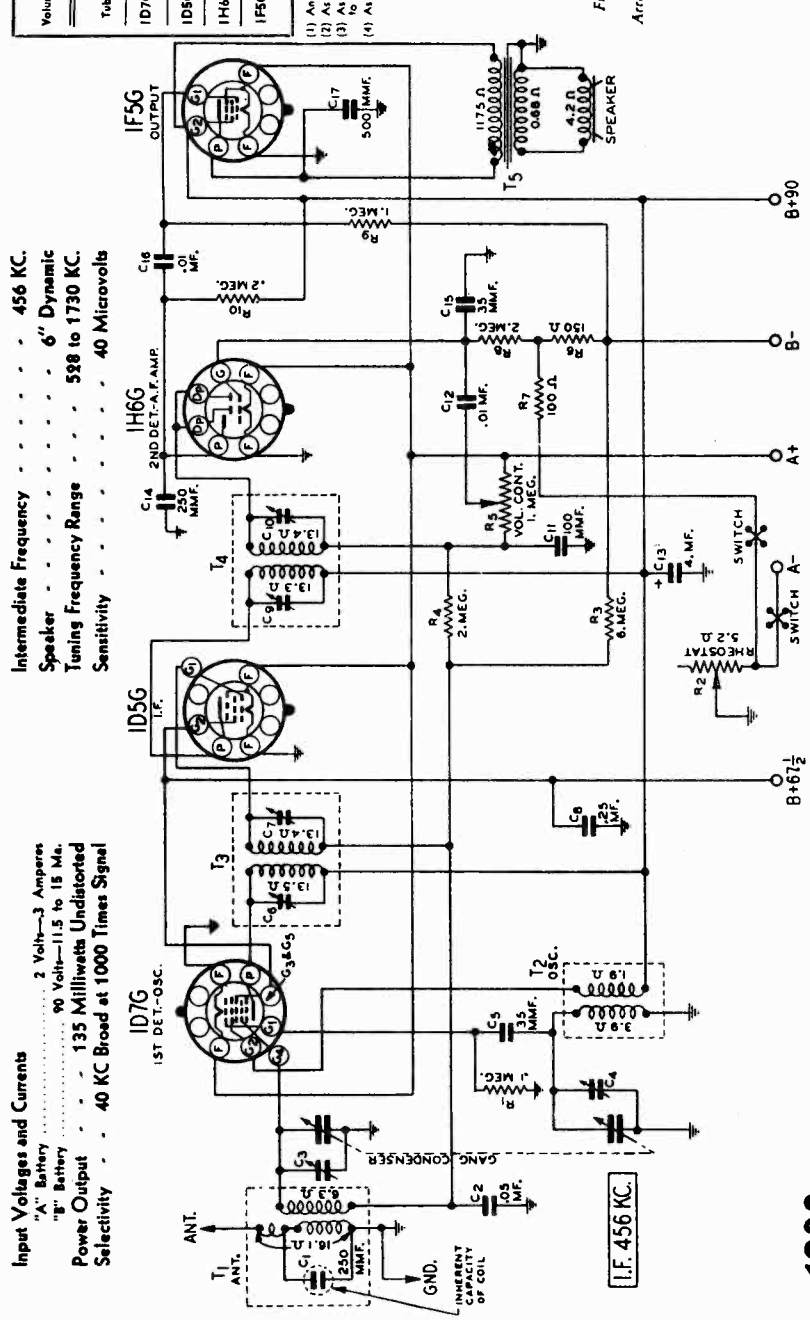


Fig. 1—Schematic Circuit Diagram

ALIGNMENT PROCEDURE

STEP (Follow Order as Given)	DUMMY ANTENNA	SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	TRIMMERS ADJUSTED See Illustration	PROCEDURE INITIAL STEPS	PROCEDURE ADJUSTMENT
I. F.	.1 mf.	456 KC	Grid of 1st Det.	2nd I. F. (C9) & (C10) 1st I. F. (C6) & (C 7)	Turn rotor to full open	Adjust to Maximum Output
1730 KC Adj.	200 mmf.	1730 KC	Antenna Lead	Osc. (C4)	Turn rotor to full open	Adjust to Maximum Output
1500 KC Adj.	200 mmf.	1500 KC	Antenna Lead	Ant. (C3)	Turn Rotor to Max. Output	Adjust to Maximum Output

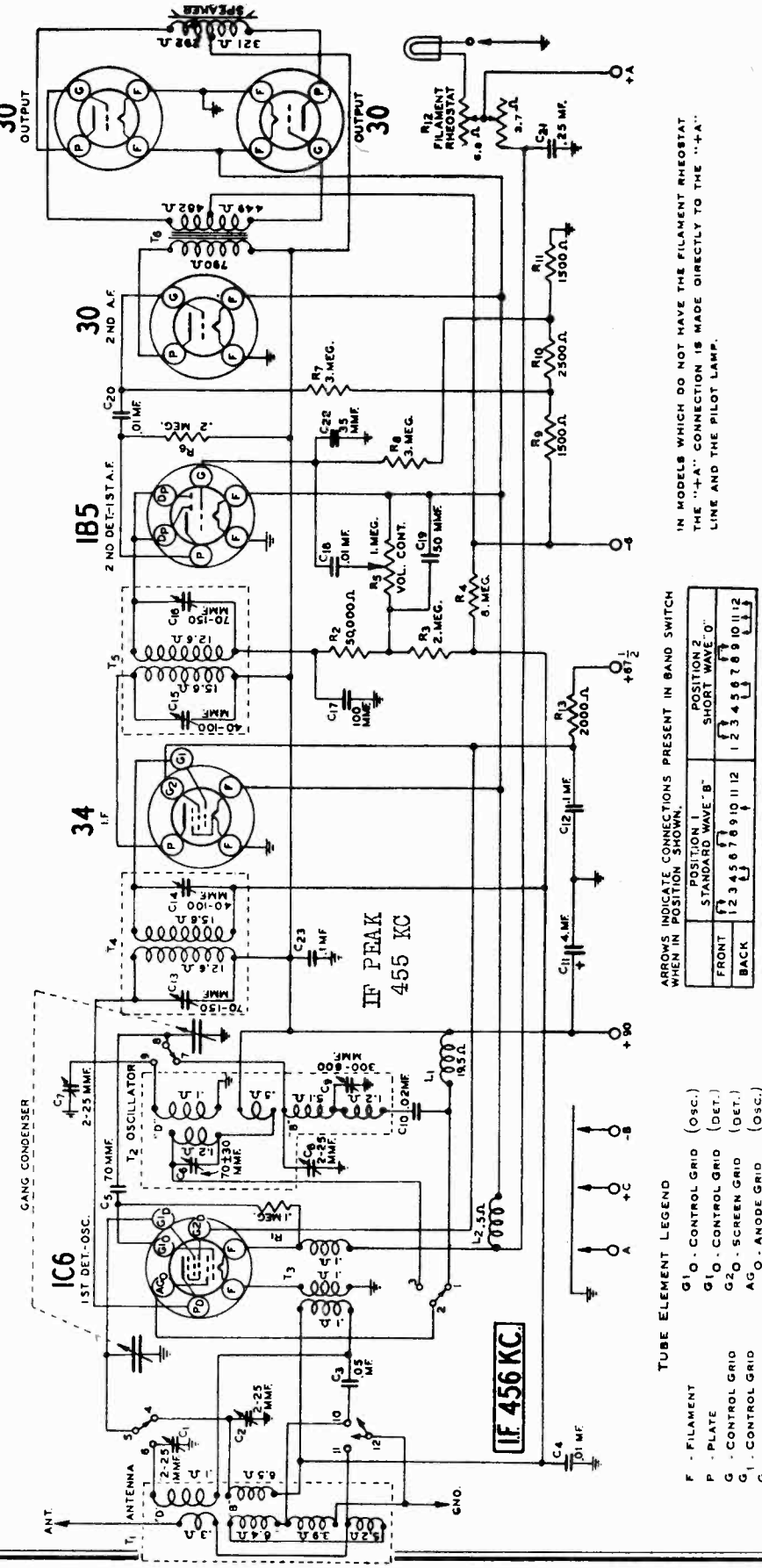
Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

NOTE—To obtain dial scale calibration, tune in an 800 KC signal. The pointer should be at the 800 KC mark on the dial. If it is not, note the position of the pointer and remove the chassis from the cabinet. Loosen the pointer screw and set the pointer so that it will be at the 800 KC mark. Tighten the pointer screw and replace the chassis in the cabinet. If the pointer is not at the 800 KC mark another adjustment will be necessary.

1938

WESTERN AIR PATROL

MODEL W493
Schematic



IN MODELS WHICH DO NOT HAVE THE FILAMENT RHEOSTAT THE "+A" CONNECTION IS MADE DIRECTLY TO THE "+A" LINE AND THE PILOT LAMP.

ARROWS INDICATE CONNECTIONS PRESENT IN BAND SWITCH WHEN IN POSITION SHOWN.

	POSITION 1 STANDARD WAVE "B"	POSITION 2 SHORT WAVE "D"
FRONT	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12
BACK		

TUBE ELEMENT LEGEND

F - FILAMENT	G_1 - CONTROL GRID	(OSC.)
P - PLATE	G_1 - CONTROL GRID	(DET.)
G - CONTROL GRID	G_2 - SCREEN GRID	(DET.)
G_1 - CONTROL GRID	AG - ANODE GRID	(OSC.)
G_2 - SCREEN GRID	P_D - PLATE	(DET.)
D_P - DIODE PLATE		

SPECIFICATIONS

Speaker - - - 6 inch Magnetic—Mantel Models
8 inch Magnetic—Console Models

Input Voltages and Currents
"A" Battery - - - - - - - - 2 Volts—.42 Amperes
"B" Batteries - 90 & 67½ Volts—11.5 to 25.5 Ma.
"C" Battery - - - - - - - - - - - - 6 Volts

Tuning Frequency Range
B Range - - - - - - - - - - 528 to 1730 KC
D Range - - - - - - - - - - 5650 to 16,000 KC

Power Output - - - 400 Milliwatts Undistorted

Sensitivity
B Range Average - 25 to 35 Microvolts Absolute
D Range Average - 25 to 60 Microvolts Absolute

Selectivity - - 30 KC Broad at 1000 Times Signal

Intermediate Frequency - - - - - - 456 KC

1937

SWITCH CONTACT LOCATION NUMBERING

MODEL W493
Voltage, Socket, Trimmers Alignment

WESTERN AIR PATROL

Standard and Short Wave Battery Radio

6 Tube - 2 Band

Tubes

The tubes used in this receiver are of the 2 volt series. All of them are of the filament or directly heated types. All of them have a 2 volt filament and should not be connected to a power supply not intended for this type of tube. **Maximum filament voltage range is 1.8 to 2.0 volts. Operation of the tubes at under or over this value will be injurious to the tubes and may affect operation of the receiver.**

VOLTAGES AT SOCKETS
Volume Control at Maximum — Antenna Shorted to Ground
Band Switch in Standard Wave Position

Type of Tube	Function	Across Filament	Plate to Ground	Screen to Ground	Grid to Ground
1C6	1st Det.-Osc.	2.0	90 90(1)	60	6(2)
34	I.F.	2.0	90	60	6(2)
1B5	2nd Det.-1st A.F.	2.0	30(3)		1.5(4)
30	2nd A.F.	2.0	90		4.0(5)
30	Power	2.0	90		6

(1) Anode Grid to ground.
(2) As read at "C" Battery.
(3) As read with 500,000 ohm meter.
(4) As read from negative end of R11 to ground.
(5) As read from negative end of R10 to ground.

Alignment Procedure

Correct alignment is extremely important in connection with all wave receivers. The receivers are all properly aligned at the factory with precision instruments and re-alignment should not be attempted unless all other possible causes of the faulty operation have first been investigated and unless the service technician has the proper equipment.

A signal generator that will provide an accurately calibrated signal at 456, 1730, 1500, 600, 16,000, 15,000 and 6000 KC and an output indicating meter are required. It will be practically impossible to align the receiver if unsatisfactory apparatus is used.

Use a non-metallic screwdriver for the adjustments. The complete procedure is as follows:

I. F. Adjustment

Set the signal generator for a signal of 456 KC.

Connect the output of the signal generator through a .1 mf. condenser to the grid of the 1st detector.

Connect the ground lead of the radio to the ground post of the signal generator.

Turn the band switch to the Range B position (standard wave band).

Turn the volume control to the maximum position.

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

Then adjust the four I.F. trimmers until maximum output is obtained. The adjusting screws for these condensers are reached from the top of the chassis, and the location is shown in Fig. 7.

Range B Alignment

After the procedure for the alignment of each range, as explained below, is completed, it is advisable to repeat the procedure as a final check.

1730 KC Adjustment

Set the signal generator for 1730 KC.

Turn the rotor of the tuning condenser to the full open position.

Keep the band switch in the standard wave position.

Connect the antenna lead of the radio through a 200 mmf. condenser to the output of the signal generator.

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

Adjust the oscillator Range B trimmer (C8) until maximum output is obtained. The location of this trimmer is shown in Fig. 7.

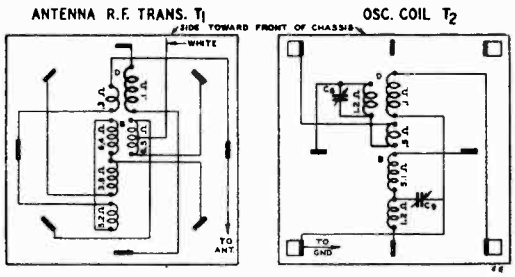


Fig. 8—R.F. and Oscillator Coil Base Terminal Arrangement and D.C. Resistance of Windings

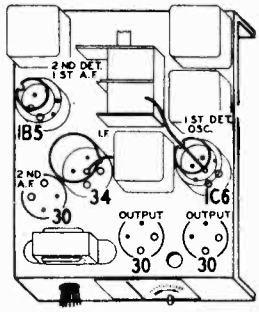


Fig. 9—Tube Arrangement

1500 KC Adjustment

Set the signal generator for 1500 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Loosen the pointer screw and set the pointer at the 1500 KC mark on the standard wave band scale. Retighten the screw.

Adjust the antenna Range B trimmer (C2) to maximum.

Do not change the setting of the oscillator Range B trimmer.

600 KC Adjustment

Set the signal generator for 600 KC.

Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth at the same time adjusting the 600 KC trimmer (C9) until the peak of greatest intensity is obtained. See Fig. 7 for location of this trimmer.

Range D Alignment

CAUTION—When aligning the short wave band be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 15,000 KC. The signal will then be heard at 15,000 on the dial of the radio. The image signal, which is much weaker, will be heard at 15,000 less 912 KC, or 14,088 KC. It may be necessary to increase the input signal to hear the image.

16,000 KC Adjustment

Set the signal generator for 16,000 KC.

Connect the antenna lead of the radio through a 400 ohm resistor to the output of the signal generator.

Turn the rotor of the tuning condenser to the full open position.

Turn the band switch to the Range D position (short wave band).

Adjust the oscillator Range D trimmer (C7) until maximum output is obtained. See Fig. 7 for location of this trimmer.

15,000 KC Adjustment

Set the signal generator for 15,000 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the antenna Range D trimmer (C1) to maximum. When adjusting this trimmer, it will be necessary at the same time to turn the tuning condenser rotor slowly back and forth until the peak of greatest intensity is obtained.

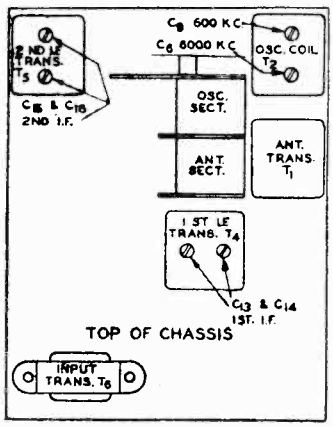
Do not change the setting of the oscillator Range D trimmer.

6000 KC Adjustment

Set the signal generator for 6000 KC.

Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth at the same time adjusting the 6000 KC (C6) trimmer until the peak of greatest intensity is obtained. See Fig. 7 for location of this trimmer.



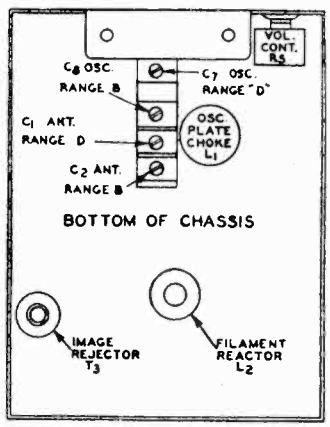
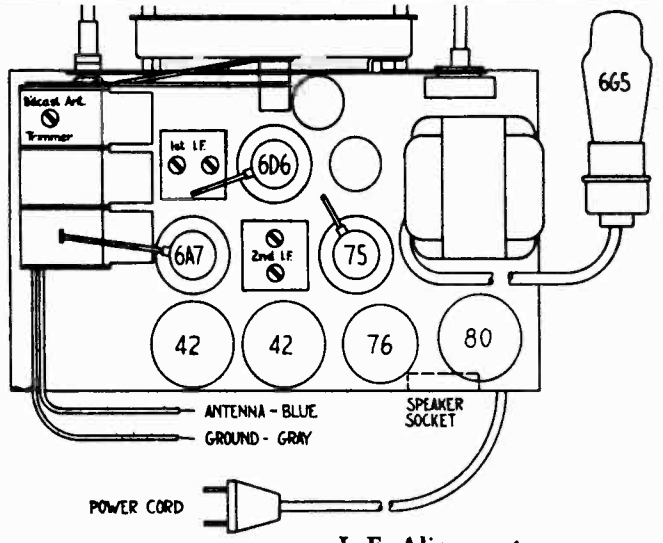
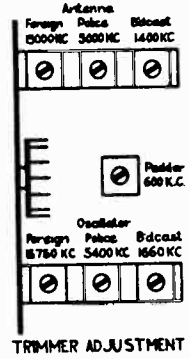


Fig. 7—Location of Trimmers





I. F. Alignment

The I.F. frequency of this receiver is 456 K.C. For realignment, use the following procedure.

It is necessary to use an accurately calibrated signal generator. Couple the signal generator to the grid of the 6A7 tube with a tenth microfarad condenser in series with the "high" lead of the signal generator. Connect the ground side of the signal generator to the chassis. Set the signal generator to 456 K.C. Be sure the wave switch of the set is in the broadcast position and the volume control set at maximum. Attenuate the signal generator so that the signal is just audible in the speaker. If an ouput meter is used, it should be connected across the voice coil terminals of the speaker. Use ½ volt as standard output.

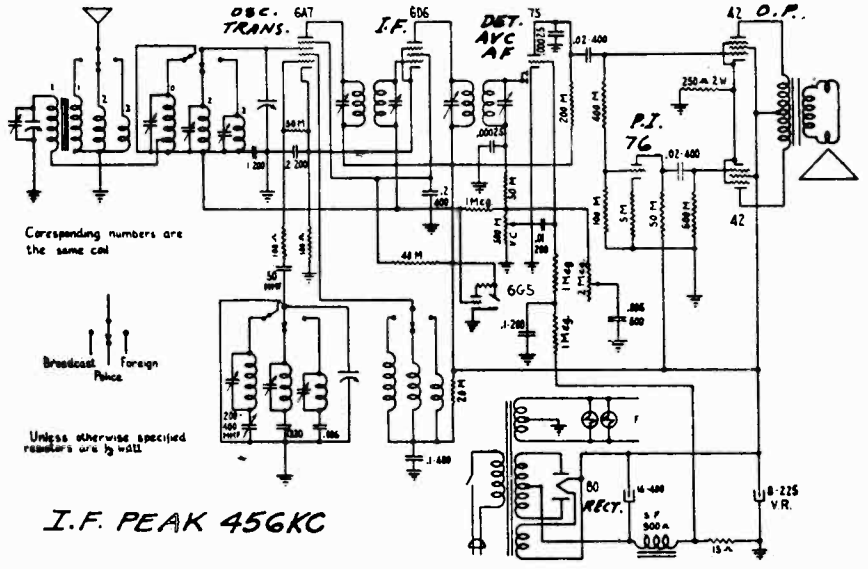
Adjust the 2nd I.F. transformer first. Each screw should be adjusted for maximum output. After number two I.F. has been adjusted, number one I.F. should be adjusted for maximum output. After both transformers have been adjusted, it is necessary to recheck No. 2 transformer and then recheck No. 1.

See TUBE LAYOUT for location of I.F. and R.F. trimmers and padder.

RF. (See above diagram for location of trimmers.) Using 200 mmf condenser in series with the generator, feed 1660 kc to antenna lead and adjust broadcast oscillator trimmer for top frequency. Set generator to 1400 kc, tune receiver and adjust the *two* antenna trimmers. Set generator to 600 kc, tune receiver to signal and adjust padder. The tuning condenser should be rocked back and forth through the signal while the padder is being set in order to secure perfect alinement.

Using 400 ohm resistor in series with generator, set band selector in center position, set generator to 5400 kc and adjust oscillator trimmer for top frequency. Set generator to 5000 kc, tune receiver to signal and adjust antenna trimmer.

Turn band selector to extreme clockwise position. Using 400 ohm resistor in series with generator, set oscillator top frequency for 15,750 kc—screw trimmer down tight, then unscrew to *second* peak. Set generator to 15,000 kc, tune receiver to signal and adjust antenna trimmer—Screw trimmer down tight, then unscrew to *first* peak, rocking the tuning condenser back and forth through the signal while the adjustment is being made. **Above procedure for alinement at 15,000 kc must be followed exactly to insure proper tracking. A dead spot at about 12,000 kc will result if antenna and oscillator circuits are not set in proper relation to each other.**



I.F. PEAK 456KC

Part No.	Req.	Description
2163		Cable, Drive, Approx. 20"
3351	1	Cond. 8 MF. 225 V. Reg. Wet El.
3774		Schematic Diagram
3775		Tube Sticker
2560	1	Condenser, Padder
2597	4	Condenser, Trimmer, 1-10
1611	1	Condenser, Trimmer, 5-35
3157	1	Condenser, Trimmer
1286	1	Condenser, Mica, .00025
2780	1	Condenser, Mica, .00005
2741	1	1 Condenser, Mica, 1330
2872	1	Variable Condenser
576	2	Condenser, .02, 400 V., Paper
572	2	Condenser, .1, 200 V., Paper
565	1	Condenser, .01, 200 V., Paper
581	1	Cond., .005, 600 V., Paper
2792	1	Condenser, .2, 200 V., Paper
2793	1	1 Cond., .006, 600 V., Paper
3352	1	Condenser, .2, 400 V., Paper
575	1	Condenser, .1, 400 V., Paper
624	2	Resistor, 1/3 W., 1 Meg.
2731	1	Resistor, 1/3 W., 500 M.
2730	1	Resistor, 1/3 W., 200 M.
631	2	Resistor, 1/3 W., 50 M.
617	1	Resistor, 1/3 W., 20 M.

Part No.	Req.	Description
3353	1	Resistor, 2 W., 250 Ohm
2689	2	Resistor, 1/3 W., 100 Ohm
2883	1	Resistor, 1/3 W., 5 M.
2882	1	Resistor, 1/3 W., 15 Ohm
2881	1	Resistor, 1/3 W., 400 M.
2880	1	Resistor, 1/3 W., 100 M.
636	1	Resistor, 1/3 W., 40 M.
2724	1	Switch, Band
2837	1	Coil, Antenna
2772	1	Coil, Oscillator
2845	1	Coil, B. C. Antenna
3343	1	Transformer, Power
3344	1	Transformer, 1st I. F.
3345	1	Transformer, 2nd I. F.
3375	1	Cond. Elec. 16 MF., 400 V
2908	1	Spring, Drive Cable
3374	1	Indicator
2378	1	Pointer
2726	1	Control, Vol. & Switch
2737	1	Control, Tone
1732	1	A. C. Cord
3778	1	Book, Instruction
2897	1	Escutcheon Tuning Tube
2981	1	Tuning Tube Cable
3710	1	Speaker, 8"
3377	1	Escutcheon

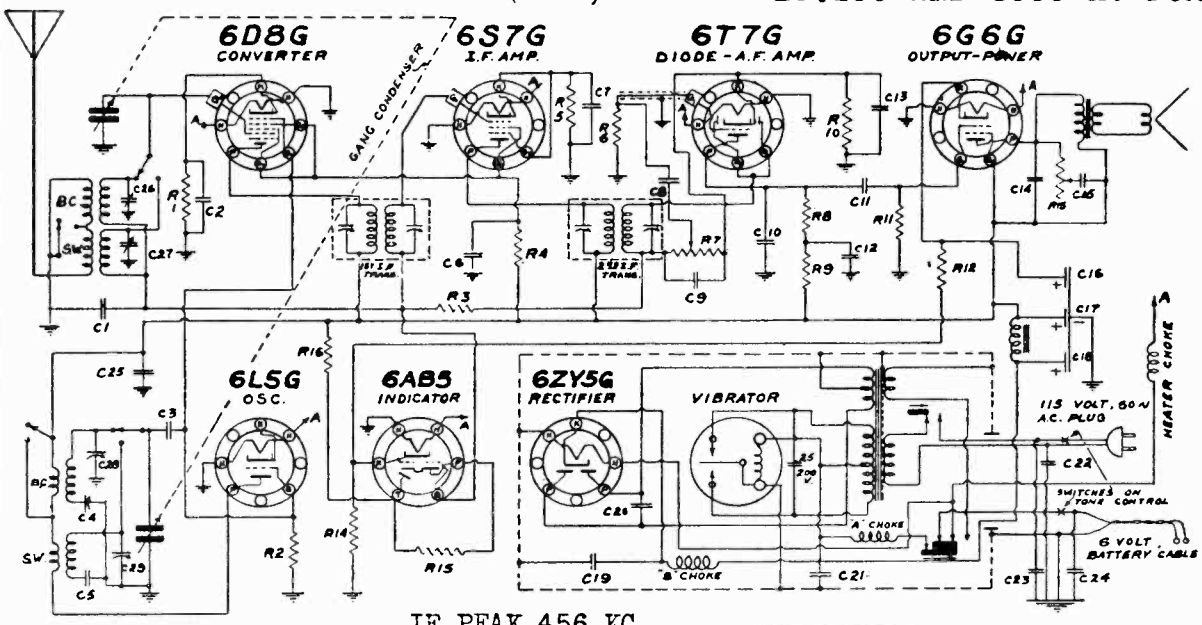
MODEL D715(1938-9)
Schematic, Socket Trimmers, Alignment

WESTERN AUTO SUPPLY CO.

Seven Tube Combination 6 Volt Battery and 110-120 Volt AC 60 Cycle Dual Wave Superheterodyne

ALIGNMENT:

FOLLOW PROCEDURE OF D709 (1938) BUT USE 18.100 AND 6000 KC FOR S.W.



This receiver requires a good ground.

IF PEAK 456 KC

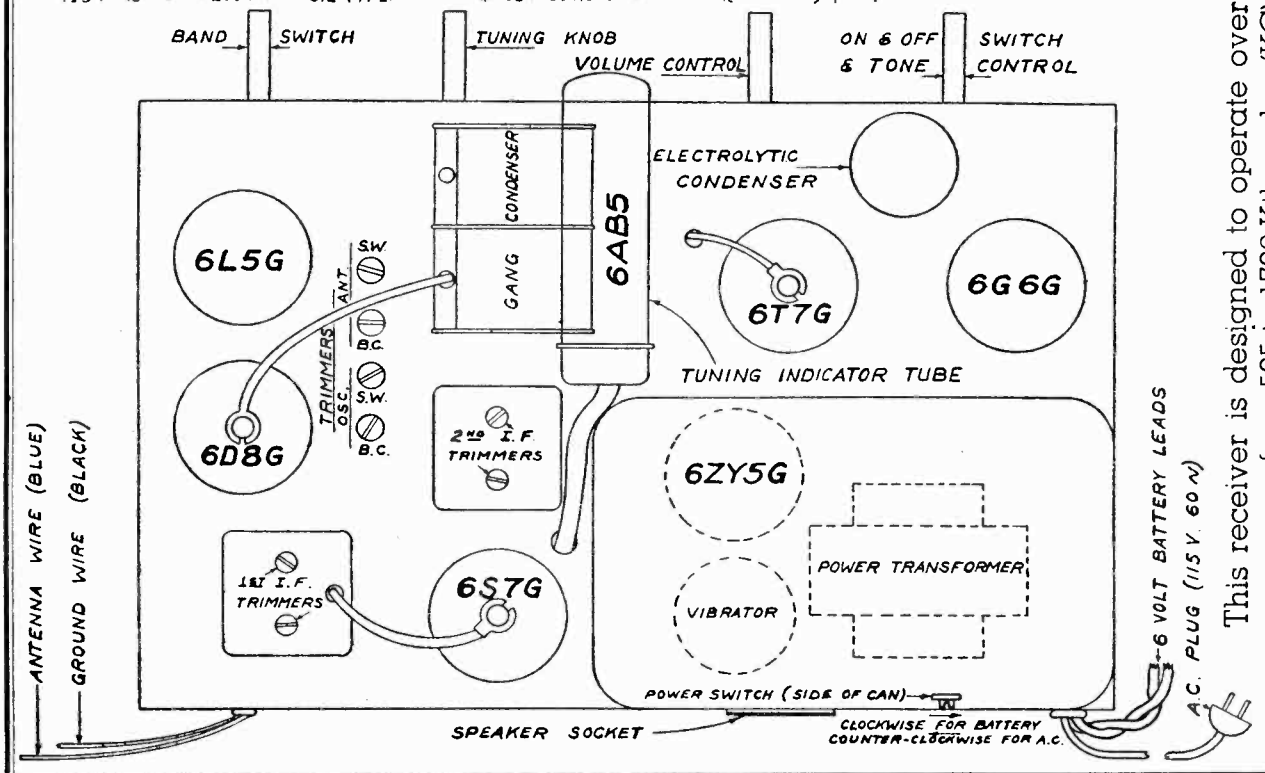
CONDENSERS

No.	CAPACITY	TYPE	No.	CAPACITY	TYPE
1	.05 Mfd.	200 V.	14	.005 Mfd.	600 V.
2	.05 Mfd.	200 V.	15	.05 "	400 V.
3	50 mmf.	MICA	16	.5 "	25 V.
4	300-600 mmf	MICA	17	8 "	200 V.
5	4000 mmf	M. ±5%	18	8. "	200 V.
6	.1 Mfd.	200 V.	19	.01 "	600 V.
7	.05 "	200 V.	20	.015 "	1000 V.
8	.01 "	400 V.	21	.5 "	10 V.
9	250 mmf	MICA	22	.05 "	400 V.
10	250 "	"	23	.01 "	600 V.
11	.01 Mfd.	400 V.	24	.5 "	10 V.
12	.1 "	200 V.	A5	.1 "	200 V.
13	.5 "	200 V.	* OIL TYPE		

RESISTORS

No.	OHMS	WATTS	SPL. TOL.
1	1500	½	± 10%
2	40,000	½	± 10%
3	1,000,000	½	
4	30,000	½	
5	1,500	½	± 10%
6	1,000,000	½	
7	500,000	½	(VOL CONT.)
8	500,000	½	
9	200,000	½	
10	10,000	½	± 10%
11	500,000	½	
12	325	½	± 10%
13	100,000	½	(TONE CONT.)
14	110	½	± 10%
15	250,000	½	
16	15,000	½	

BAND SWITCH IN BROADCAST POSITION
POWER SWITCH IN BATTERY POSITION.
I.F. - 456 K.C.
C26 TO C29, 2-20 mmf TRIMMERS.



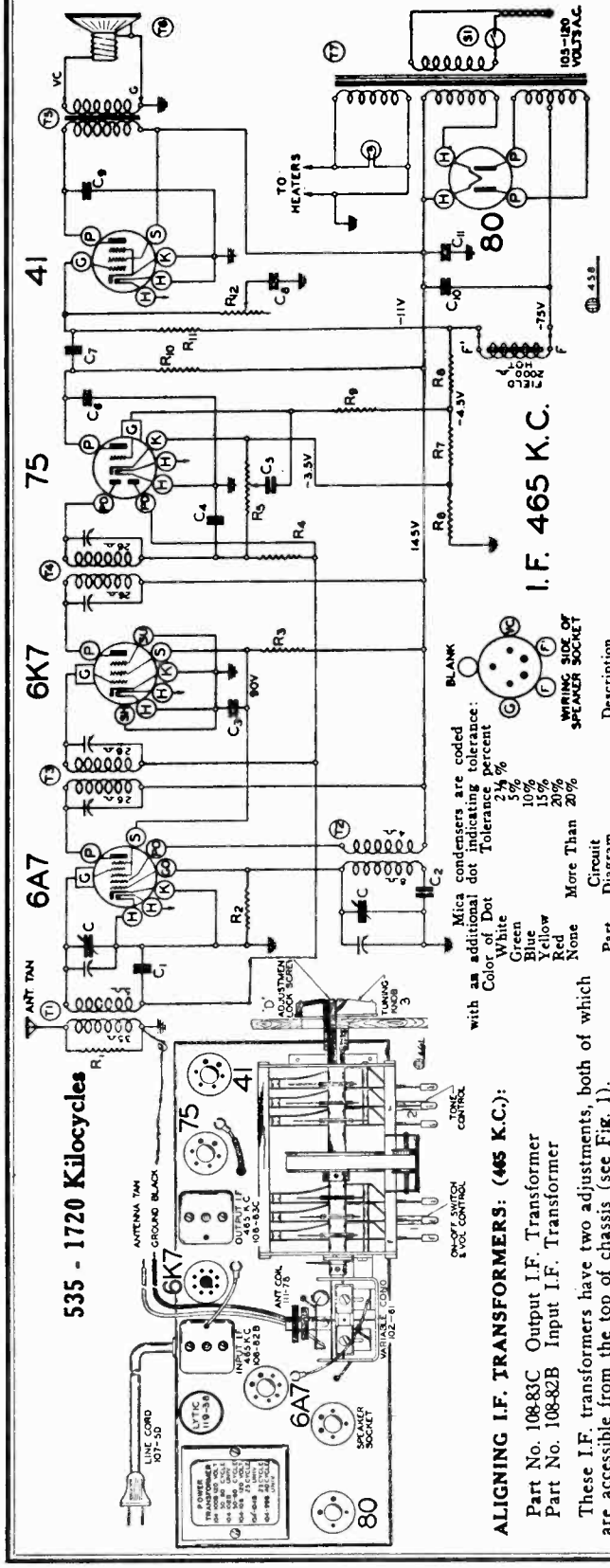
This receiver is designed to operate over two tuning ranges; from 535 to 1730 Kilocycles (KC) (173.4 to 561 meters), and from 5650 to 18,100 Kilocycles (KC) (16.5 to 53 Meters).

WESTERN AUTO SUPPLY CO.

MODEL D717(1937)
Schematic, Voltage Alignment, Trimmers Socket, Tuner

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

All voltages as indicated on diagram are measured with 115 volts on the primary of the power transformer.



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

Part No. 108-83C Output I.F. Transformer
Part No. 108-82B Input I.F. Transformer

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

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

(a) Connect external oscillator set at 465 kilocycles, in series with 1 mfd. condenser, to the control grid cap of the type 6K7 tube, and adjust the output I.F. transformer (No. 108-83C) to resonance.

(b) Move oscillator output clip from grid of 6K7 to grid of 6A7 and adjust input I.F. transformer (No. 108-82B) to resonance.

(c) With oscillator still connected to 6A7, readjust output I.F. transformer (108-83C) if necessary.

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

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

(a) With external oscillator set at 1720 kilocycles, adjust oscillator trimmer to resonance. This adjustment is on the top of rear section of variable gang condenser. (See Fig. 1).

(b) Re-set external oscillator to 1400 kilocycles, rotate condenser, pick up oscillator signal and adjust antenna trimmer to resonance. (Top of front section of gang condenser).

(c) Check sensitivity at 600 and 1000 kilocycles.

PROCEDURE FOR SETTING THE "PRESTO-MATIC" LEVERS:

There are six levers on the dial by means of which six stations may be selected,

Press down any one of the six "Presto-matic" levers. Holding it down, tune in by means of knob No. 3 any one of your favorite stations. Turn the tuning knob very slowly back and forth until the signal is clearest. The station will then be accurately tuned in.

Release the lever and press down any other "Presto-matic" lever and again hold it down, tune in by means of knob No. 3 another favorite station.

When you have selected all your favorite stations, hold tuning knob No. 3 securely and with a coin or a screw driver, tighten the special locking screw ("D") in the center of the tuning knob, (See Fig. 1).

This screw will lock in place all the stations you have selected on the "Presto-matic" levers. (Note: Locking Screw "D" is loose when radio is shipped from factory).

If you should desire to change any station you selected to another, hold tuning knob No. 3 securely, loosen locking screw ("D") and select the new station as explained.

Mica condensers are coded with an additional dot indicating tolerance:

Color of Dot	Tolerance, percent
White	2½%
Green	5%
Blue	10%
Yellow	15%
Red	20%
None	More Than 20%

(No. 7K 800000 and up)

Part No.	Circuit Diagram Reference	Description
		CONDENSERS
100-9	C1	.05 x 200 Volt Tubular
100-11	C5	.01 x 400 Volt Tubular
100-19	C7	.006 x 600 Volt Tubular
100-26	C9	.02 x 400 Volt Tubular
100-71	C3	.004 x 600 Volt Tubular (with Bracket)
100-74	C10, C11	.1 x 400 Volt Tubular (with Bracket)
119-38		5MFD x 200 w.v.; 5MFD x 250 w.v. Electrolytic Filter
129-2	C6	.0005 Mica - Type MT - 20%
129-5	C4	.0001 Mica - Type MT - 20%
129-75	C2	.0003386 Mica Compression Type Padder
		RESISTORS
106-29	R6, R7, R8	100 Ohm; 33 Ohm; 200 Ohm Metal Clad Resistor
130-4	R4, R9	3 Meg Ohm - 1/3 Watt - 20%
130-9	R10	200M Ohm - 1/3 Watt - 20%
130-12	R2	50M Ohm - 1/3 Watt - 20%
130-17	R1	10M Ohm - 1/3 Watt - 20%
130-118	R11	600M Ohm - 1/3 Watt - 20%
130-149	R3	15M Ohm - 1/3 Watt - 20%
		COILS
108-82B	T3	Input I.F. Coil Assembly Complete With Can
108-83C	T4	Output I.F. Coil Assembly Complete With Can
110-62	T2	Oscillator Coil Assembly Complete
111-78	T1	Antenna Coil Assembly Complete
		SOCKETS
121-6		Six Prong Socket - Marked "41"
121-6		Six Prong Socket - Marked "75"
121-7		Seven Prong Socket - Marked "6A7"
121-8		Five Prong Socket - Marked "SPKR"
121-9		Four Prong Socket - Marked "80"
121-27		Eight Prong Octal Socket - Marked "6K7"
		TRANSFORMERS
104-100B	T7	Power Transformer 50/60 Cycle 105-115 Volt
104-102B		Universal 50/60 Cycle Transformer
104-108		Power Transformer 25/60 Cycle - 105-115 Volts
104-104B		Universal 25/60 Cycle Transformer
104-99B		Universal 40/60 Cycle Transformer

SPEAKER

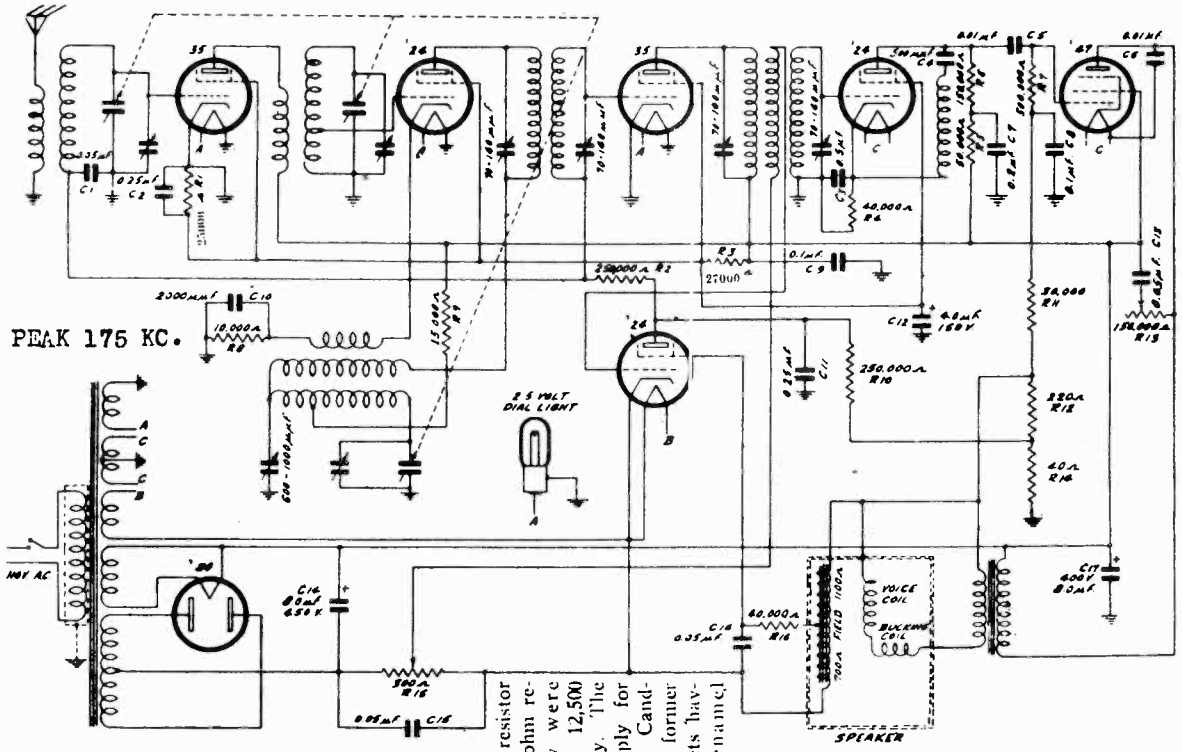
114-97	T6	Five Inch Dynamic Speaker (Field 2000 Ohm)

MISCELLANEOUS

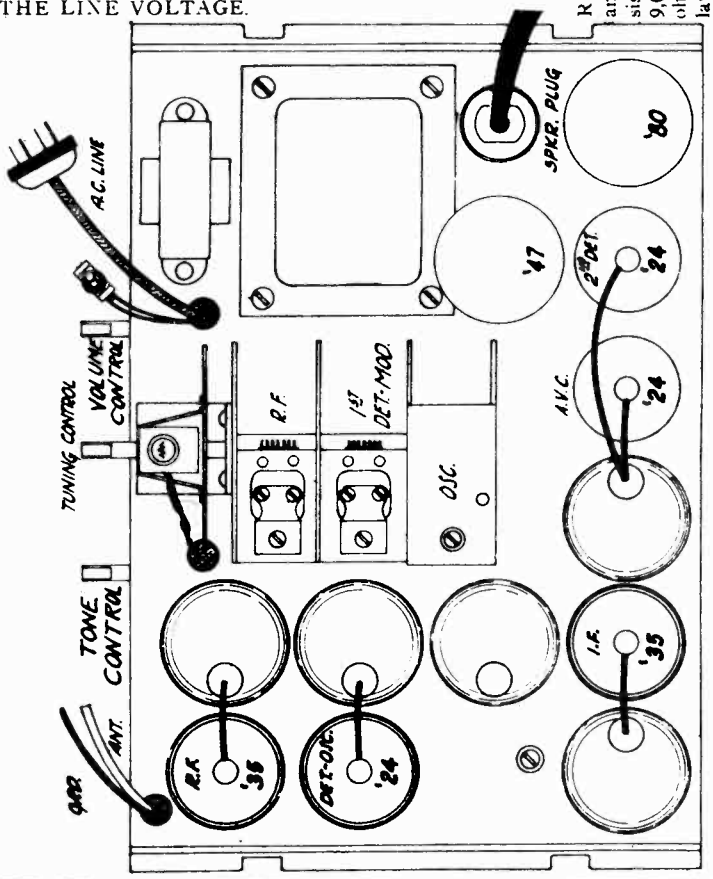
101-59	R12	Tone Control (1 Meg Ohm)
101-94	R5, S1	Volume Control and Switch (1 Meg Ohm)
102-61	C	Two Gang Variable Condenser
105-53	T5	Output Transformer (For Speaker)
107-5D		Line Cord and Plug
128-109		Wood Knob (Spring Type)
128-126		Special Tuning Knob

MODEL S720
Schematic, Voltage
Socket, Trimmers

WESTERN AUTO SUPPLY CO.



TURN THE VOLUME CONTROL ALL THE WAY ON, CONNECT THE ANTENNA AND GROUND LEADS TOGETHER AND TURN THE GANG CONDENSER PLATES ALL THE WAY OUT. CHECK THE LINE VOLTAGE.



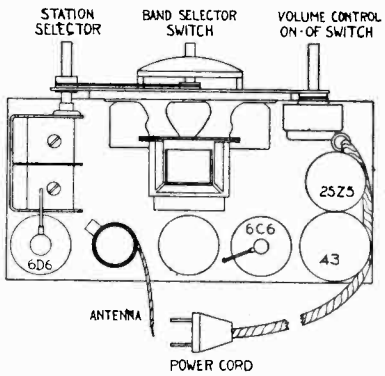
R1—25,000 ohm resistor and R3—27,000 ohm resistor formerly were 9,000 ohms and 12,500 ohms respectively. The latter values apply for all sets having Candohm units; the former values for all sets having vitreous enamel units.

The voltages shown are measured to the cathode of the heater type tubes and to filament of the '47 Pentode.

TUBE	CIRCUIT.	LINE VOLTAGE 90 V.	100 V.	110 V.	120 V.	130 V.
R.F. '35	Screen-Grid	70	78	85	92	100
	Plate	192	213	234	256	277
Det.-Modulator '24	Screen-Grid	70	78	85	92	100
	Plate	192	213	234	256	277
I.F '35	Screen-Grid	70	78	85	92	100
	Plate	192	213	234	256	277
2nd Detector '24	Screen-Grid	70	78	85	92	100
	Plate	154	171	187	204	221
Audio '47	Accelerating Grid	199	221	244	267	289
	Plate	181	200	220	240	260
A. V. C. '24	Grid	12.3	13.7	15.1	16.5	17.8
	Screen-Grid	34.5	38.5	42	46	50
Rectifier '80	Plate to Plate	308	342	376	410	445
	Current (both plates)	52.3 MA	58.1 MA	64 MA	69.7 MA	75.5 MA

WESTERN AUTO SUPPLY CO.

MODEL D729(1937)
MODEL D730(1938-9)
Schematics, Socket
Trimmers, Alignment



MODEL D729 (1937)

Ranges

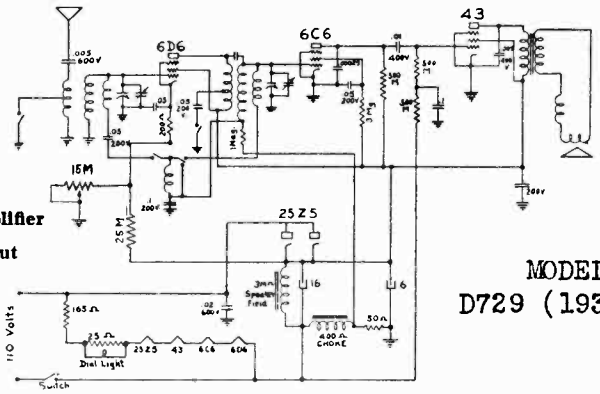
540 and 1600 K.C.

75 to 200 meters

Tubes

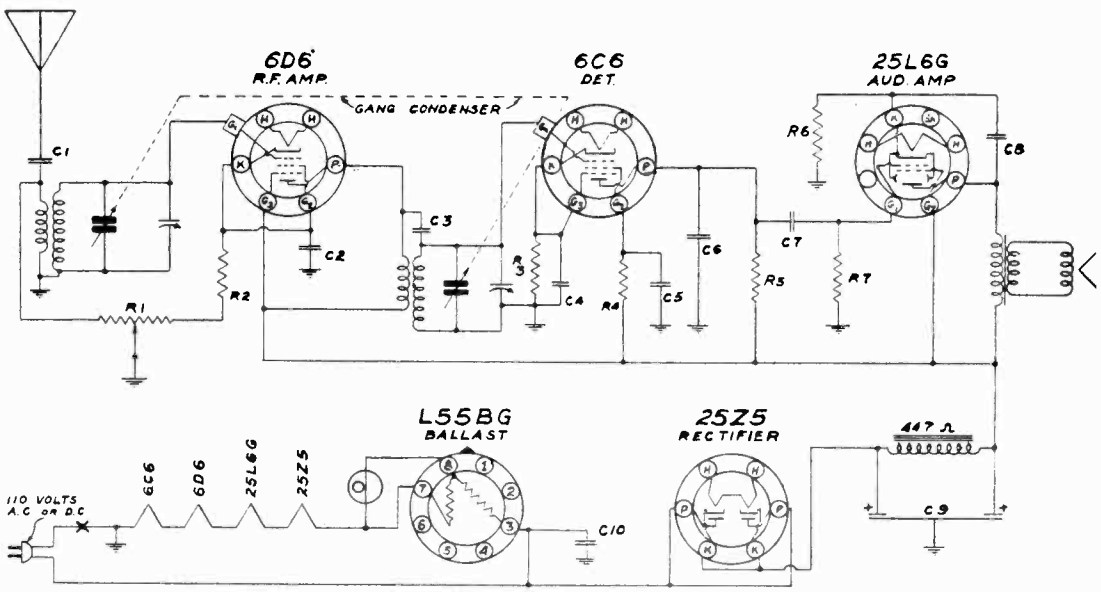
1—No. 6D6 R. F. Amplifier
1—No. 6C6 Detector
1—No. 43 Power Output
1—No. 25Z5 Rectifier

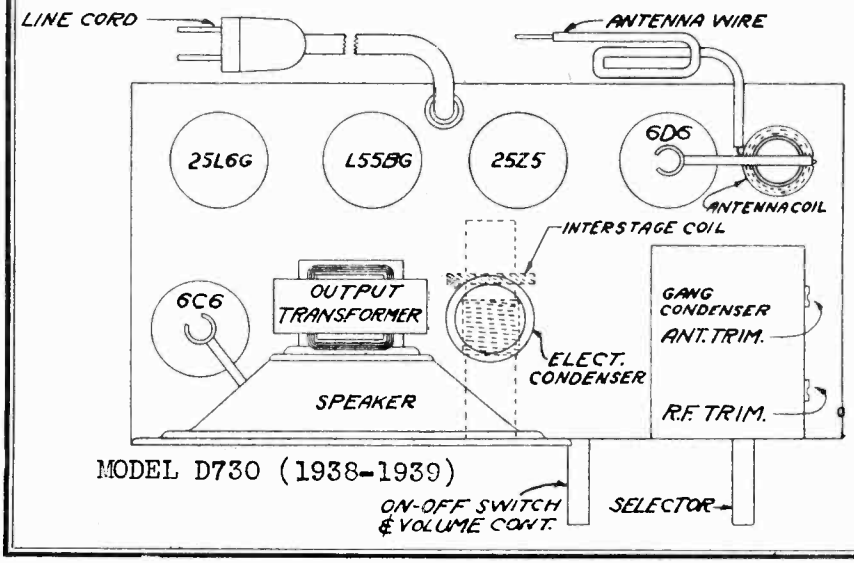
If this receiver should fail to operate when connected to direct current, reverse the attachment plug in the light socket.



MODEL D729 (1937)

This receiver is designed to operate on 105 to 125 volts, direct or alternating current.





MODEL D730 (1938-1939)

MODEL D730 (1938-1939)

CONDENSERS

No	CAPACITY	TYPE
C1	.002 MFD.	400 V
C2	.1 "	200 V
C3	1.5 mult.	GIMMIK
C4	.25 MM	200 V.
C5	.1 "	200 V.
C6	.0002 "	600 V.
C7	.01 "	400 V.
C8	.02 "	400 V
C9	16.0-12.0-	150 V. ELECT

RESISTORS

No	OHMS R.	WATTS	
R1	75,000		VOL. CONT
R2	250	1/4	
R3	25,000	1/4	
R4	2,000,000	1/2	
R5	500,000	1/4	
R6	110	1/2	WIRE WOUND
R7	500,000	1/4	

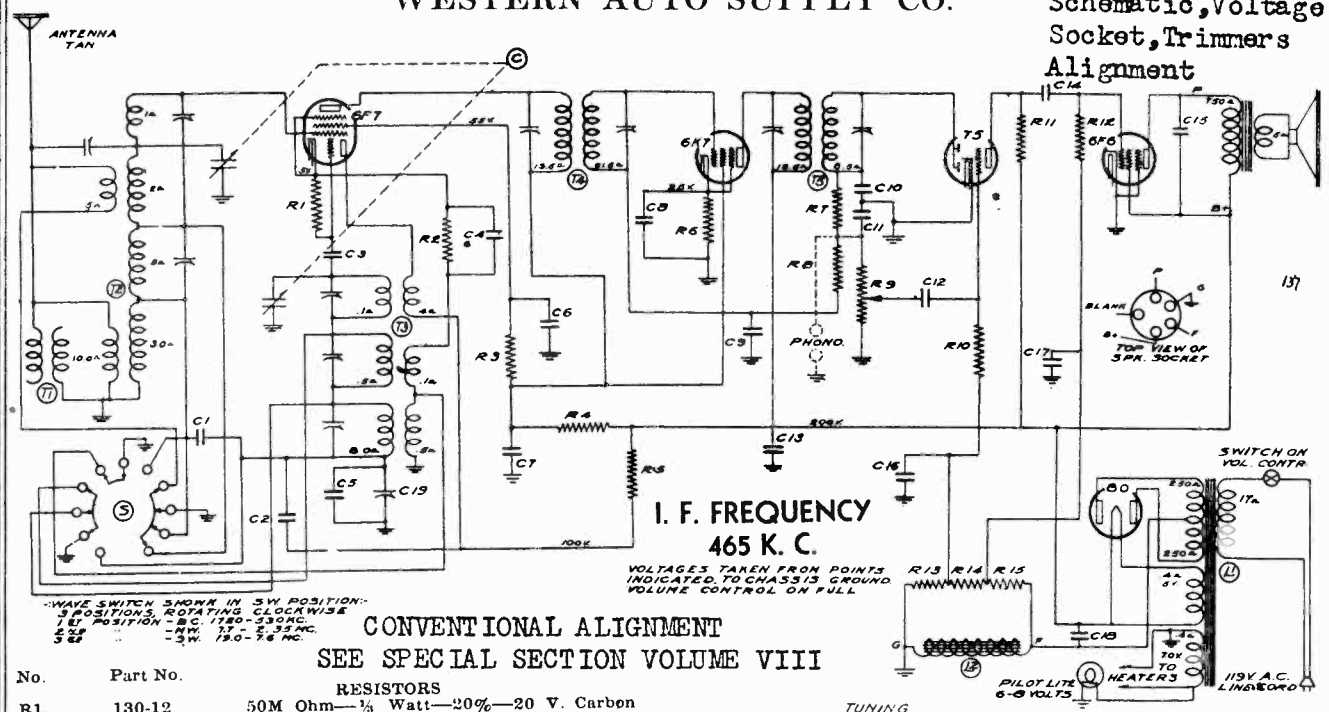
C10 .1 Mfd. 400 V

ALIGNMENT DATA AND SERVICING

Connect a signal generator to the antenna lead of the receiver through a 100 Mmf. condenser. Set the dial pointer at 1400 KC. Set the generator at 1400 KC. Now adjust the antenna and RF trimmers of the gang condenser to maximum output.

WESTERN AUTO SUPPLY CO.

MODEL D731(1935)
Schematic, Voltage
Socket, Trimmers
Alignment



CONVENTIONAL ALIGNMENT

SEE SPECIAL SECTION VOLUME VIII

No.	Part No.	
		RESISTORS
R1.	130-12	50M Ohm—⅛ Watt—20%—20 V. Carbon
R2.	130-39	700 Ohm—⅛ Watt—20%—20 V. Carbon
R3.	130-20	100M Ohm—⅛ Watt—20%—50 V. Carbon
R4.	130-44	25M Ohm—½ Watt—20%—150 V. Carbon
R5.	130-42	20M Ohm—½ Watt—20%—100 V. Carbon
R6.	130-32	250 Ohm—½ Watt—20%—10 V. Wire Wound
R7.	130-12	50M Ohm—⅛ Watt—20%—20 V. Carbon
R8.	130-3	500M Ohm—⅛ Watt—20%—100 V. Carbon
R9.	101-18	500M Ohm Volume Control
R10.	130-10	1 meg Ohm—⅛ Watt—20%—100 V. Carbon
R11.	130-11	250M Ohm—⅛ Watt—10%—100 V. Carbon
R12.	130-11	250M Ohm—⅛ Watt—10%—100 V. Carbon
R13.	130-48	15M Ohm—⅛ Watt—10%—20 V. Carbon
R14.	130-47	180M Ohm—⅛ Watt—10%—100 V. Carbon
R15.	130-46	800M Ohm—⅛ Watt—10%—100 V. Carbon
		CONDENSERS
C1.	129-23	.002 Mica—MW—5%
C2.	100-20	.1 x 120 V.—25%
C3.	129-5	.0001 Mica—MT—20%
C4.	100-20	.1 x 200 V.—25%
C5.	129-24	.00038—MT—5%
C6.	118-1	.1x 200 V.—Dual Plus 50%; Minus 10%
C7.	118-1	.1 x 200 V.—Dual Plus 50%; Minus 10%
C8.	118-1	.1 x 200 V.—Dual Plus 50%; Minus 10%
C9	118-1	.1 x 200 V.—Dual Plus 50%; Minus 10%
C10.	129-51	.000125—Mica MT—20%
C11.	129-51	.000125—Mica MT—20%
C12.	100-22	.05 x 200 V.—25%
C13.	103-7	.8 mfd. x 300 V. Electrolytic
C14.	100-11	.01 x 400 V.—25%
C15.	100-19	.006 x 600 V.—25%
C16.	118-1	.1 x 200 V.—Dual Plus 50%; Minus 10%
C17.	118-1	.1 x 200 V.—Dual Plus 50%; Minus 10%
C18.	103-6	.8 mfd. x 350 V. Electrolytic
C19.	124-5	B. C. Series Pad J-3-S.
		MISCELLANEOUS
T1.	105-10	Antenna Choke Coil
T2.	111-27	Antenna Coil
T3.	110-22	Oscillator Coil
T4.	108-38A	Input I.F. Transformer
T5.	108-40	Output I.F. Transformer
C	102-12	Two Gang Variable Cond.
S	125-6	Wave Change Switch
L1.	104-14A	Power Transformer 50/60 Cycle
L1.	104-18	Power Transformer 25 Cycle
L2.	114-11	Speaker—Field Resistance 1550 Ohms
L1.	104-17	Power Trans. Universal 50/60 Cycle
L1.	104-41	Power Trans. Universal 25 Cycle.

Transformers are available and chassis are sometimes equipped with universal transformers for operation on 40 and 60 cycles and with primary taps for 108, 125, 150, 220 and 250 volts (see instructions) and also sometimes equipped with 25 cycle transformers with 105-115 volt or 220 volt primaries, not universals.

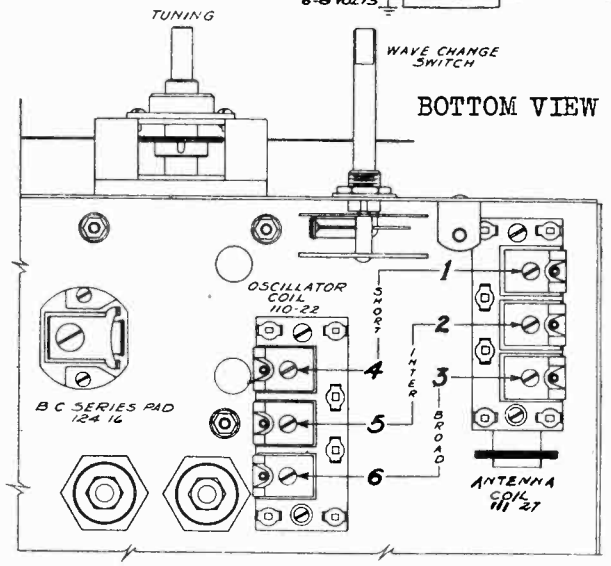
Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt. These voltages are clearly indicated on the circuit diagrams.

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

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

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

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



ALIGNMENT FREQUENCIES

Intermediate Frequency 465 KC
Adjust output then input transformers

Broadcast Band
Adjust trimmer number 6 at 1720 KC
Adjust trimmer number 3 at 1400 KC.
Adjust series pad at 600 KC
Tracking and sensitivity check- 1000 KC

Short wave Band
Adjust trimmer number 4 at 18 MC
Adjust trimmer number 1 at 18 MC
Tracking and sensitivity check- 9 MC

Intermediate Band
Adjust trimmer number 5 at 7 MC
Adjust trimmer number 2 at 7 MC
Tracking and sensitivity check-2.5 MC

Schematic, Voltage
Socket, Trimmers

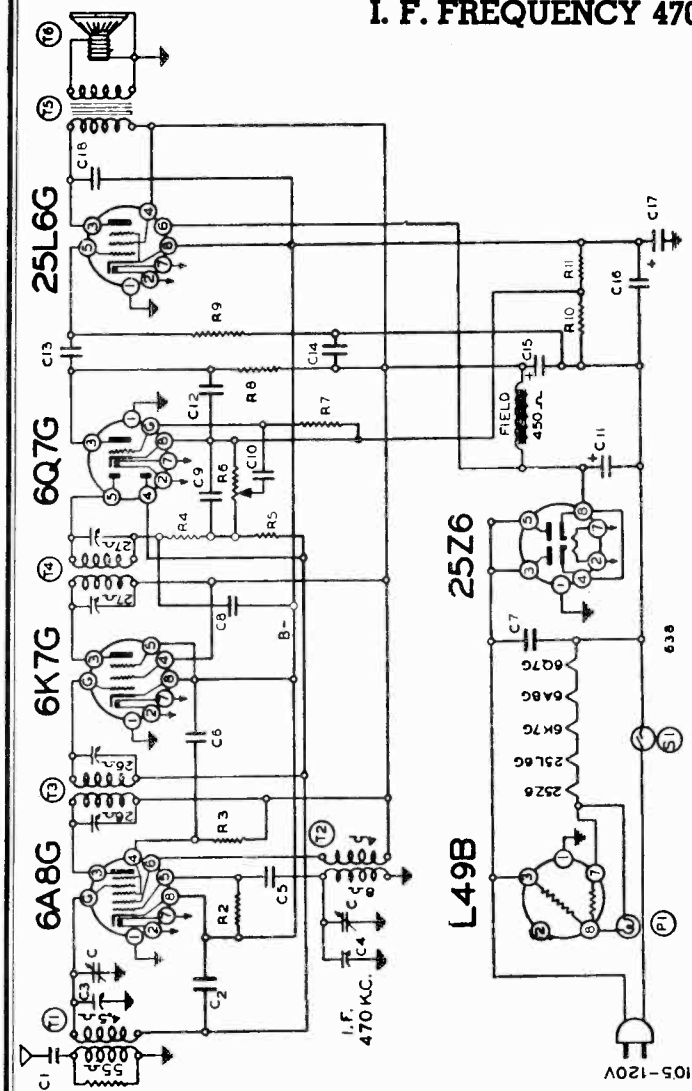
MODEL D731 (1938-9)
5-Lever Model

WESTERN AUTO SUPPLY CO.

FOR TUNER DATA
SEE INDEX

Frequency Range — 535 - 1720 Kilocycles

I. F. FREQUENCY 470 KILOCYCLES



1—Type 6K7G Remote Cut-Off Pentode, I. F. Amplifier (470 K.C.).
1—Type 6Q7G Duplex-Diode Triode Second Detector, A.V.C. and First Audio.
1—Type 25L6G Beam Output Amplifier.
1—Type 25Z6G High Vacuum Rectifier.
1—Type L49B Ballast Tube.

Code No.	Part No.	Description
		RESISTORS
R1	13017	10M ohm—½ w.
R2	13012	50M ohm—½ w.
R3	130149	15M ohm—½ w.
R4	13012	50M ohm—½ w.
R5	130170	3 megohm—½ w.
R6	101127	Volume control (1 megohm)
R7	130225	15 megohm—½ w.
R8	130100	150M ohm—½ w.
R9	13011	250M ohm—½ w.
R10	130231	75 ohm—½ w.
R11	130174	50 ohm—½ w.
		CONDENSERS
C	10284	2 gang variable condenser
C1	1292	.0005 mica
C2	10026	.02 x 400 v.
C3		Antenna Trimmer—on gang
C4		Oscillator Trimmer—on gang
C5	12912	.00025 mica
C6	1009	.05 x 200 v.
C7	1001	.1 x 400 v.
C8	1295	.0001 mica
C9	1295	.0001 mica

Code No.	Part No.	Description
C10	10011	.01 x 400 v.
C11	11953C	30 mid. lytic
C12	12912	.00025 mica
C13	10011	.01 x 400 v.
C14	1009	.05 x 200 v.
C15	11953C	30 mid. lytic
C16	11953C	40 mid. lytic
C17	10091	.15 x 400 v.
C18	10067	.025 x 400 v.
		NOTE:—C11, 15 and 16—One unit for 60 cycle
		Use 11953C (30 mid. 30 mid. 40 mid.)
		C11, 15 and 16—One unit for 25 cycle
		Use 11962C (60 mid. 60 mid. 40 mid.)
		PARTS
T1	111108	Antenna Coil complete
T2	11073	Oscillator Coil complete
T3	10882F	Input I.F.—470 kc. complete
T4	10883F	Output I.F.—470 kc. complete
T5	10560	Output Transformer
T6	114116E	5 inch Dynamic Speaker (450 ohm field)
S1		Off-on switch on volume control
P1	10794	T-44 Pilot Light

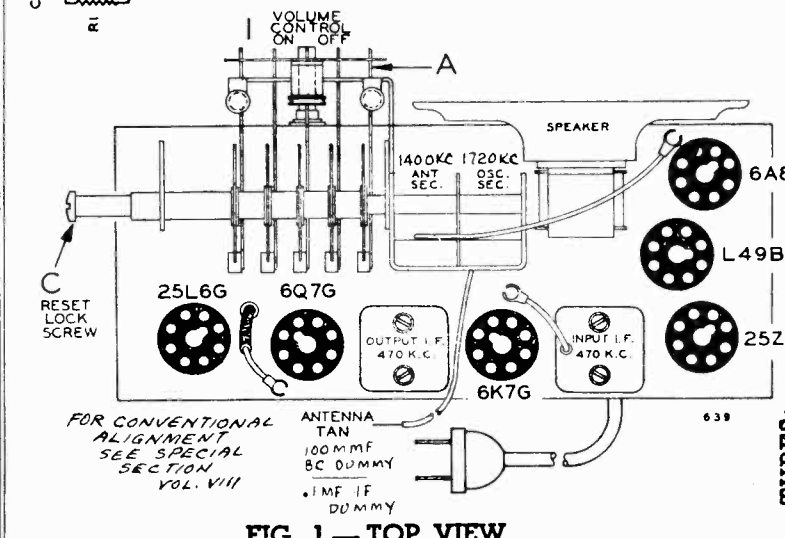


FIG. 1 — TOP VIEW

TUBES:

DESCRIPTION:

The tube complement of this chassis consists of the following octal base glass tubes.

The type and function of each tube is as follows:

1—Type 6A8G Pentagrid Mixer, First Detector-oscillator.

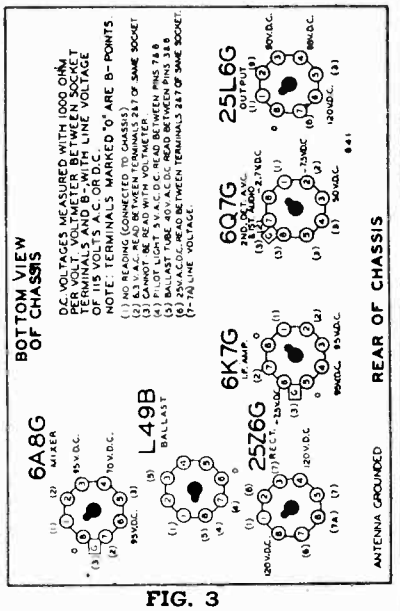
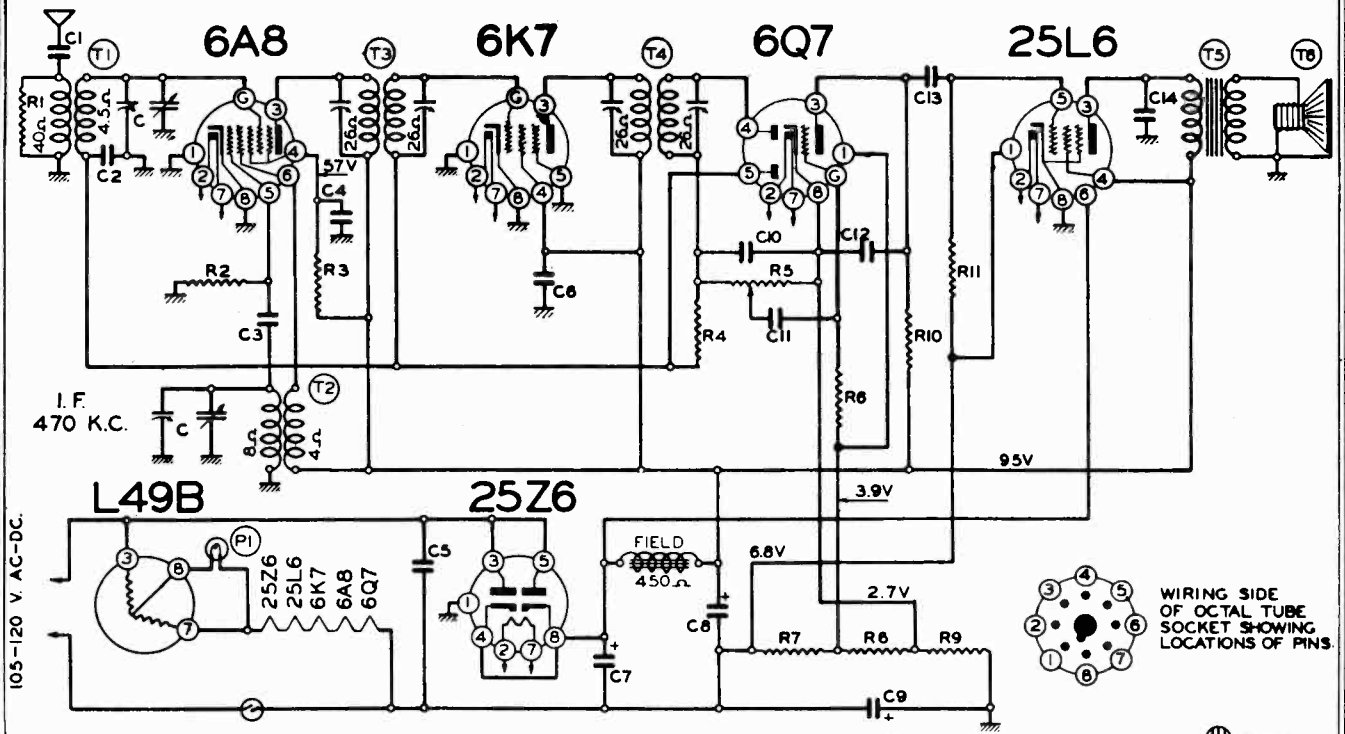


FIG. 3

MODEL D731(1938-9)
4-Lever Model
Schematic, Voltage
Socket, Trimmers

WESTERN AUTO SUPPLY CO.



Frequency Range —
530 - 1720 Kilocycles

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII

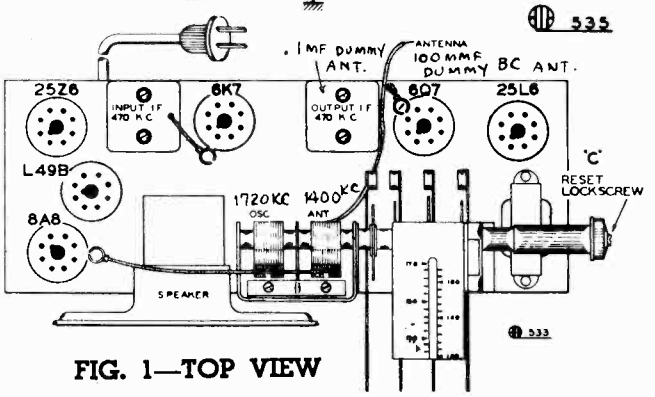


FIG. 1—TOP VIEW

LIST OF REPAIR PARTS (No. 175500 and up)

Part No.	Circuit Diagram Reference	Description	List Price Each
		CONDENSERS	
1001	C5	.1 x 400 Volt Tubular Condenser	$ .25
1009	C2, C4	.05 x 200 Volt Tubular Condenser	.25
10011	C11, C13	.01 x 400 Volt Tubular Condenser	.25
10020	C6	.1 x 200 Volt Tubular Condenser	.25
10067	C14	.025 x 400 Volt Tubular Condenser	.25
11953	C7 C8, C9	30MFD—30MFD—40MFD Lytic Filter Condenser	1.50
1292	C1	.0005 Mica Type Condenser—20%	.25
1295	C10	.0001 Mica Type Condenser—20%	.25
12912	C3, C12	.00025 Mica Type Condenser—20%	.25
		RESISTORS	
13011	R11	250M Ohm—⅓ Watt Resistor—20%	.20
13012	R2	50M Ohm—⅓ Watt Resistor—20%	.20
13019	R6	1 Meg. Ohm—⅓ Watt Resistor—20%	.20
13021	R1	20M Ohm—⅓ Watt Resistor—20%	.20
130100	R10	150M Ohm—⅓ Watt Resistor—20%	.20
130149	R3	15M Ohm—⅓ Watt Resistor—20%	.20
130170	R4	3 Meg. Ohm—¼ Watt Resistor—25%	.20
130174	R7, R9	50 Ohm—⅓ Watt Resistor—10%	.20
130215	R8	25 Ohm—⅓ Watt Resistor—10%	.20
		COILS	
10882F	T4	Input I. F. Coil Assembly Complete with Can	1.25
10883F	T3	Output I. F. Coil Assembly Complete with Can	1.25
11073	T2	Oscillator Coil Assembly Complete	.50
11192B	T1	Antenna Coil Assembly Complete	.60

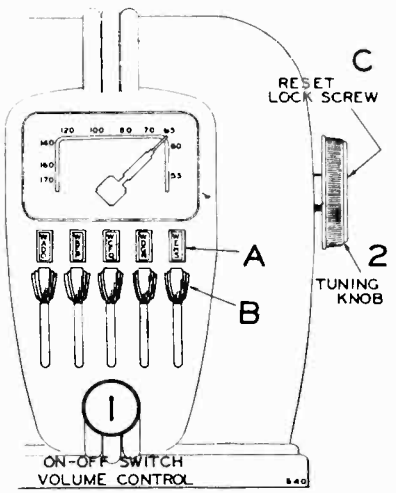


FIG. 2.—FRONT VIEW

FOR SETTING PUSH BUTTONS
SEE INDEX

WESTERN AUTO SUPPLY CO.

MODELS D731(1938-9)
4 and 5-Lever Models
Alignment, Tuner Data

PROCEDURE FOR SETTING THE AUTOMATIC LEVERS:

There are four levers on the dial by means of which stations my be selected, (See "B" Fig. 2) see note

Make a list of local stations you tune in regularly; any number up to and including four.

Punch out from the set of station call letter tabs supplied, the call letters of the stations you have selected.

Above each automatic tuner lever an opening in the cabinet is provided for inserting the call letter tabs, (See "A" Fig. 2).

Insert the call letter tabs in the rectangular openings in the cabinet above each of the automatic tuner levers. One of the small celluloid tabs supplied should be snapped into place over each of the station call letter tabs.

Press DOWN ALL THE WAY any one of the automatic tuner levers. Holding it down FIRMLY, tune in by means of the tuning knob (No. 2) the station indicated on the station call letter tab above this lever. Turn the tuning knob very slowly back and forth (while still holding lever in downward position) until the signal is clearest. The station will then be accurately tuned in. Release the lever.

Press down another automatic tuner lever. Holding it down FIRMLY, carefully tune in the station indicated on the call letter tab above this lever. Release this lever.

Follow this procedure until you have selected all of your favorite stations.

Now rotate the tuning knob (No. 2) to the right (clockwise) as far as it will turn, and with a coin (half dollar), tighten the special locking screw ("C") in the center of the tuning knob, (See Fig. 1).

It is VERY IMPORTANT that this locking screw is turned until it is ABSOLUTELY TIGHT.

This screw will lock in place all the stations you have selected on the automatic tuner levers. (Note: Locking screw "C" is loose when radio is shipped from factory).

If you should desire to change any station you selected to another, hold the tuning knob No. 2 securely and with a coin loosen the locking screw "C" one or two turns; select the new station as explained. Be sure to retighten the locking screw, otherwise the stations you have selected will not stay adjusted to the levers.

The automatic dial is now set up for quick tuning.

NOTE:
For arrangement of levers for 5 lever model see Fig. 2 on schematic page for 5 lever model.

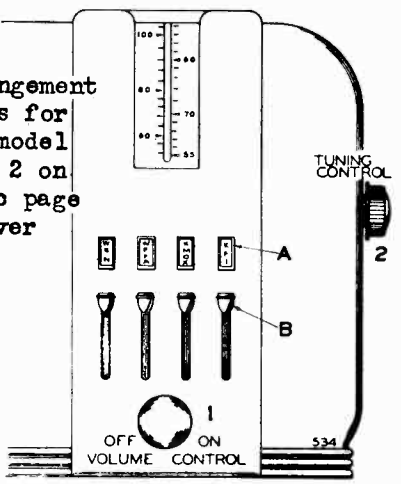


FIG. 2—FRONT VIEW

DESCRIPTION:

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

The type and function of each tube is as follows:

1—Type 6A8G Pentagrid Mixer, First Detector-oscillator.
1—Type 6K7G Remote Cut-Off Pentode, I.F. Amplifier(470 K.C.)
1—Type 6Q7G Duplex-Diode Triode Second Detector, A.V.C. and First Audio.
1—Type 25L6G Beam Output Amplifier.
1—Type 25Z6G High Vacuum Rectifier.
1—Type L49B Ballast Tube.

SERVICE NOTES:

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

All voltages as indicated on diagram are measured with 117 volt A.C. or D.C. line.

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

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

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

ALIGNING INSTRUCTIONS:

CAUTION:—No aligning adjustments should be attempted without first thoroughly checking over all other possible causes of trouble, such as poor installations, open or grounded antenna systems, low line voltages, defective tubes, condensers and resistors. In order to properly align this chassis, an oscillator (generator) is absolutely necessary. No aligning adjustments should be attempted with the chassis in the cabinet.

All adjustments should be made with a non-metallic screw driver.

RESONANCE INDICATOR:

Use as a resonance indicator an output meter connected across the primary of the speaker input transformer or by means of an adapter between the plate and screen terminals of the type 25L6G output tube. Maximum deflection of the meter indicates resonance. Use only enough signal to get a readily readable output. A low range output meter or the low scale of a multi-range meter should be used.

ALIGNING I.F. TRANSFORMERS: (470 K.C.):

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

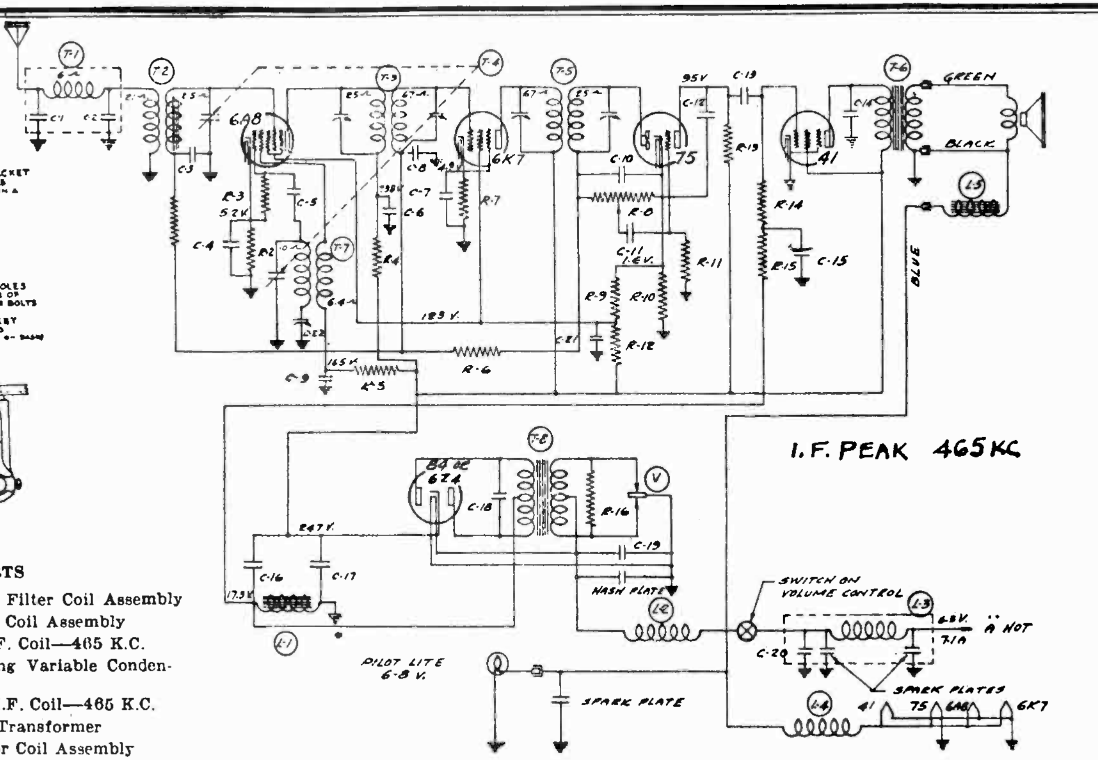
1. With volume control full on (the extreme right of its rotation), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:
   (a) Connect external oscillator set at 470 kilocycles, in series with .1 mfd. condenser, to the control grid cap of the type 6K7G tube, and adjust the output I.F. transformer (No. 108-83F) to resonance.
   (b) Move oscillator output clip from grid of 6K7G to grid of 6A8G and adjust input I.F. transformer (No. 108-82F) to resonance.
   (c) With oscillator still connected to 6A8G, readjust output I.F. transformer (108-83F) if necessary.

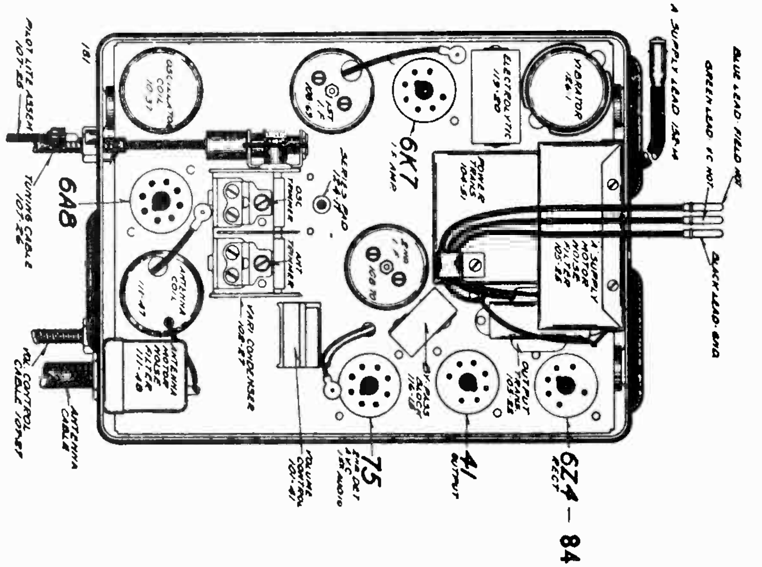
R.F. ALIGNMENT: (530-1720 K.C.)

1. With gang condenser in its minimum capacity position, plates entirely out of mesh, connect an external oscillator in series with a 100 mmf. condenser to the antenna lead and chassis ground and make the following adjustments:
   (a) With external oscillator set at 1720 kilocycles, adjust oscillator trimmer to resonance. This adjustment is on the top of rear section of variable gang condenser. (See Fig. 1).
   (b) Re-set external oscillator to 1400 kilocycles, rotate condenser, pick up oscillator signal and adjust antenna trimmer to resonance. (Top of front section of gang condenser).
   (c) Check sensitivity at 600 and 1000 kilocycles.

MODEL D734(1935)
Schematic,Voltage
Socket,Trimmers

WESTERN AUTO SUPPLY CO.





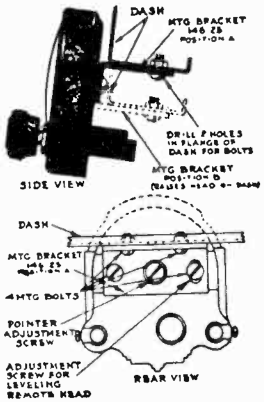
CONDENSERS

C1	129-3	.00002 Mica—"0"—20%
C2	129-49	.00009 Mica—"0"—5%
C3	100-9	.05x200 Volt
C4	100-6	.25x200 Volt
C5	129-21	.0002 Mica—"MT"—"0"—20%
C6	100-1	.1 x400 Volt 50%—10%
C7	100-33	.1 x200 Volt 50%—10%
C8	100-9	.05x200 Volt 25%—25%
C9	100-1-B	.1 x400 Volt 50%—10%
C10	129-12	.00025 Mica—"MT"—"0"—20%
C11	100-9	.05 x200 Volt 25%—25%
C12	129-5	.0001 Mica—"MT"—"0"—20%
C13	116-15	.05 x400 Volt
C14	116-15	.007x800 Volt
C15	100-33	.1x200 Volt 50%—10%
C16	119-20	8.0 Mfd. Electrolytic Condenser—350 Working Volts
C17	119-20	4.0 Mfd. Electrolytic Condenser—350 Working Volts
C18	100-36	.01x1400 Volt—10%
C19	100-35	.5 x 200 Volt 50%—10%
C20	100-35	.5 x 200 Volt 50%—10%
C21	100-33	.1 x 200 Volt 50%—10%
C22	124-17	Single Padder J-4-S

NOTE: C-13 and C-14 in one unit—part number 116-15.

RESISTORS

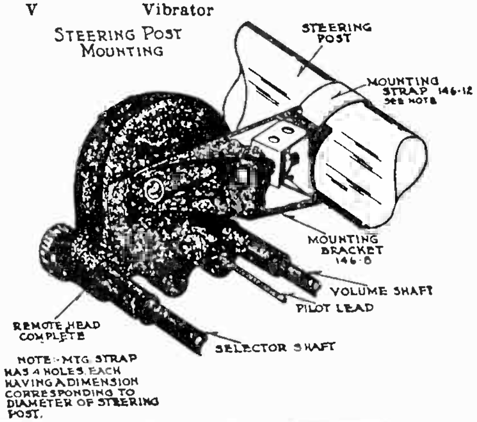
R1	130-20	100M Ohm—¼ Watt—20% 50 Volt—Carbon
R2	130-79	400 Ohm—⅓ Watt—10% 10 Volt—Carbon
R3	130-94	50M Ohm—⅓ Watt—10% 10 Volt—Carbon—Ins.
R4	130-23	2M Ohm—⅓ Watt—20% 10 Volt—Carbon
R5	130-42	20M Ohm—⅓ Watt—20% 100 Volt—Carbon—Ins.
R6	130-68	1 Meg Ohm—⅓ Watt—10% 20 Volt—Carbon
R7	130-79	400 Ohm—⅓ Watt—10% 10 Volt—Carbon
R8	101-41	500M Ohm—Volume Control and Switch
R9	130-106	50M Ohm—½ Watt—10% 100 Volt—Carbon—Ins.
R10	130-101	600 Ohm—⅓ Watt—10% 10 Volt—Carbon—Ins.
R11	130-68	1 Meg Ohm—⅓ Watt—10% 20 Volt—Carbon
R12	130-95	12M Ohm—⅓ Watt—10% 100 Volt—Carbon
R13	130-3	500M Ohm—⅓ Watt—20% 100 Volt—Carbon
R14	130-5	300M Ohm—⅓ Watt—20% 10 Volt—Carbon
R15	130-45	250M Ohm—⅓ Watt—20% 20 Volt—Carbon—Ins.
R16	130-84	200 Ohm—⅓ Watt—20% 10 Volt—Carbon—Ins.



PARTS

T1	111-48	Antenna Filter Coil Assembly
T2	111-47	Antenna Coil Assembly
T3	108-69	Input I.F. Coil—465 K.C.
T4	102-27	Two Gang Variable Condenser
T5	108-70	Output I.F. Coil—465 K.C.
T6	105-22	Output Transformer
T7	110-37	Oscillator Coil Assembly
T8	104-51	Power Transformer
L1	105-23	Filter Choke
L2	105-19	"A" Choke
L3	105-25	"A" Filter Assembly
L4	105-24	"A" Choke
L5	114-34	5¼" Speaker (Field resistance 4 ohms)
V		Vibrator

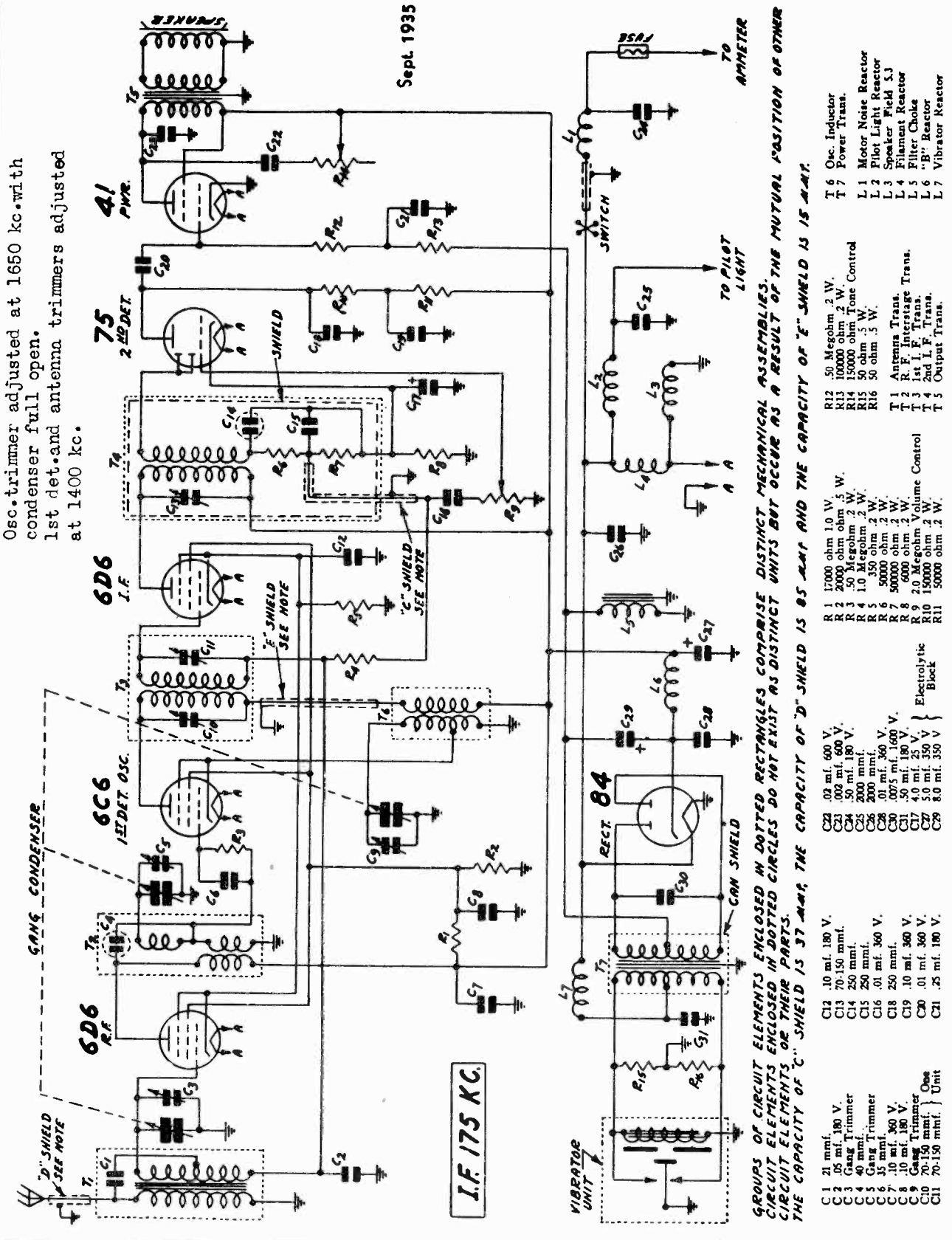
STEERING POST MOUNTING



MODEL D737(1935)
Schematic

WESTERN AUTO SUPPLY CO.

Power Consumption - - 6.5 Amperes at 6.3 Volts **Tuning Frequency Range - - - - 530-1650 KC**
Power Output - - - - 3 Watts Undistorted



GROUPS OF CIRCUIT ELEMENTS ENCLOSED IN DOTTED RECTANGLES COMPRISE DISTINCT MECHANICAL ASSEMBLIES.
CIRCUIT ELEMENTS ENCLOSED IN DOTTED CIRCLES DO NOT EXIST AS DISTINCT UNITS BUT OCCUR AS A RESULT OF THE MUTUAL POSITION OF OTHER CIRCUIT ELEMENTS OR THEIR PARTS.
THE CAPACITY OF "C" SHIELD IS 37 MMF, THE CAPACITY OF "D" SHIELD IS 85 MMF AND THE CAPACITY OF "E" SHIELD IS 15 MMF.

C 1 21 mmf.
C 2 .05 mf. 180 V.
C 3 Gang Trimmer
C 4 40 mmf.
C 5 Gang Trimmer
C 6 35 mmf.
C 7 .10 mf. 360 V.
C 8 .10 mf. 180 V.
C 9 Gang Trimmer
C10 70-150 mmf. } One
C11 70-150 mmf. } Unit
C12 .10 mf. 180 V.
C13 70-150 mmf.
C14 250 mmf.
C15 250 mmf.
C16 .01 mf. 360 V.
C18 250 mmf.
C19 .10 mf. 360 V.
C20 .01 mf. 360 V.
C21 .25 mf. 180 V.
C22 .02 mf. 600 V.
C23 .002 mf. 600 V.
C24 .50 mf. 180 V.
C25 2000 mmf.
C26 2000 mmf.
C28 .01 mf. 360 V.
C30 .005 mf. 1600 V.
C31 .50 mf. 180 V.
C17 4.0 mf. 25 V. } Electrolytic Block
C27 5.0 mf. 350 V } Electrolytic Block
C29 8.0 mf. 350 V } Electrolytic Block
R 1 17000 ohm 1.0 W.
R 2 20000 ohm ohm .5 W.
R 3 .50 Megohm .2 W.
R 4 1.0 Megohm .2 W.
R 5 350 ohm .2 W.
R 6 50000 ohm .2 W.
R 7 500000 ohm .2 W.
R 8 6000 ohm .2 W.
R 9 2.0 Megohm Volume Control
R10 150000 ohm .2 W.
R11 50000 ohm .2 W.
R12 .50 Megohm .2 W.
R13 100000 ohm .2 W.
R14 150000 ohm Tone Control
R15 50 ohm .5 W.
R16 50 ohm .5 W.
T 1 Antenna Trans.
T 2 R. F. Interstage Trans.
T 3 1st I. F. Trans.
T 4 2nd I. F. Trans.
T 5 Output Trans.
T 6 Osc. Inductor
T 7 Power Trans.
L 1 Motor Noise Reactor
L 2 Pilot Light Reactor
L 3 Speaker Field S.J.
L 4 Filament Reactor
L 5 Filter Choke
L 6 "B" Reactor
L 7 Vibrator Reactor

MODEL D737(1935)
Voltage, Socket
Trimmers, Coils
Changes

WESTERN AUTO SUPPLY CO.

Receivers of this series having this change incorporated can be identified by a green paint mark on the battery lead. There will also be a letter "C" stamped on the chassis.

It will be necessary in many Ford V8 installations to take the steps described above. If motor noise persists after the regular procedure has been followed, make this change in the "A" line circuit in Ford V8s or any other cars.

If motor noise still persists, it may be radiated through the openings in the chassis case on the tuning condenser side. Remove the chassis from the case and solder a piece of tin plate on the inside of the case over the openings on the tuning condenser side to completely cover these openings.

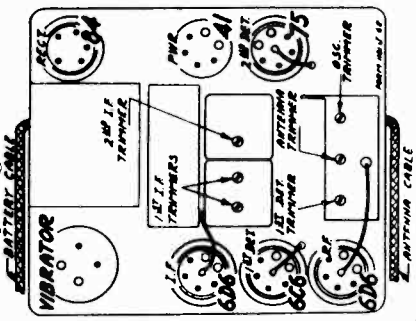


Fig. 2—Location of Tubes and Trimmers

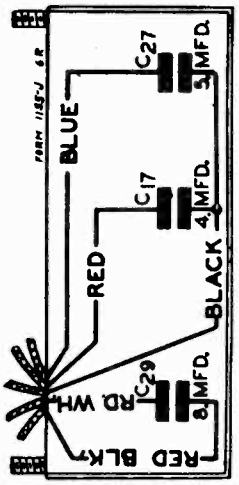
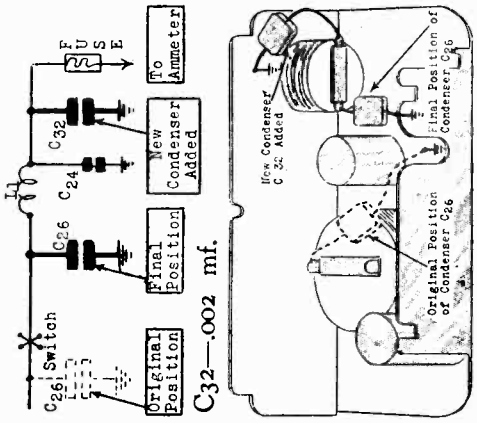


Fig. 4—Condenser Block—Internal Wiring



Schematic, Fig. 1, shows changes to eliminate motor noise. Fig. 2, below, shows new parts positions

VOLTAGES AT SOCKETS

Antenna Disconnected **Battery 6 Volts Under Load**

Type of Tube	Function	Across Heater	Plate to Ground	Screen to Ground	Cathode to Ground	Cathode Current M. A.
6D6	R. F. Amp.	5.8	220	90	4.5	6.3
6C6	1st Det. Osc.	5.8	220	90	0	2.4
6D6	I. F. Amp.	5.8	220	90	4.5	6.3
75	2nd Det.	5.8	130(1)		1.2	0.3
41	Power	5.8	210	220	16(2)	25.5
84	Rectifier	5.8				50.0

(1) With 250,000 Ohm Meter
(2) As read across filter choke.

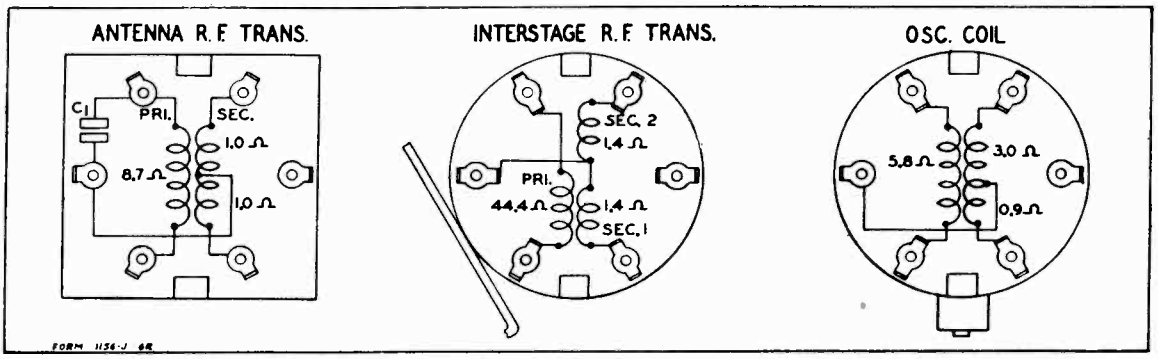


Fig. 3—R. F. and Oscillator Coil Base Terminal Arrangement and D. C. Resistance of Windings

D. C. Resistance of Windings

Following are the D. C. resistances of the various windings in the chassis. The values given below will vary slightly in different sets.

Part No.	Winding	Code	D. C. Resistance in Ohms
P-9A443	Antenna Transformer	T1	
	Primary Winding		8.7
	Secondary Winding—Either Portion		1.0
P-9A439	Interstage Transformer	T2	
	Primary Winding		44.4
	Secondary Winding—Either Portion		1.4
P-9A441	1st I. F. Transformer	T3	
	Primary Winding		93.5
	Secondary Winding		97.6
P-9A442	2nd I. F. Transformer	T4	
	Primary Winding		44.1
	Secondary Winding		49.6
P-12A227	Dynamic Speaker		
	Output Transformer Primary	T5	416.6
	Output Transformer Secondary	T5	Small
	Speaker Field	L3	5.3
	Speaker Voice Coil		Small
P-9A440	Oscillator Coils	T6	
	Grid Coil		
	Long Portion		3.0
	Short Portion		0.9
	Plate Coil		5.8
P-53X108	Power Transformer	T7	
	Primary Winding		
	Center Tap to Inside		Small
	Center Tap to Outside		Small
	Secondary Winding		
	Center Tap to Inside		200.
	Center Tap to Outside		200.
P-9A444	Motor Noise Reactor	L1	Small
P-9A448	Pilot Light Line Reactor	L2	Small
P-9A446	Filament Reactor	L4	Small
P-52X42	Filter Choke	L5	312.5
P-9A447	R. F. "B" Plate Reactor	L6	4.1
P-9A445	Vibrator Filter Reactor	L7	Small

WESTERN AUTO SUPPLY CO.

MODEL D737-C (1936)
Schematic, Socket Trimmers

Power Consumption - -	7.0 Amperes at 6.0 Volts
Power Output - - - - -	3 Watts Undistorted
Sensitivity - - - - -	1.0 Microvolt Absolute
Selectivity - -	45 KC Broad at 1000 Times Signal
Tuning Frequency Range - - -	530 to 1650 KC
Intermediate Frequency - - - - - -	175 KC
Speaker - - - - - - - - - -	6 inch Dynamic

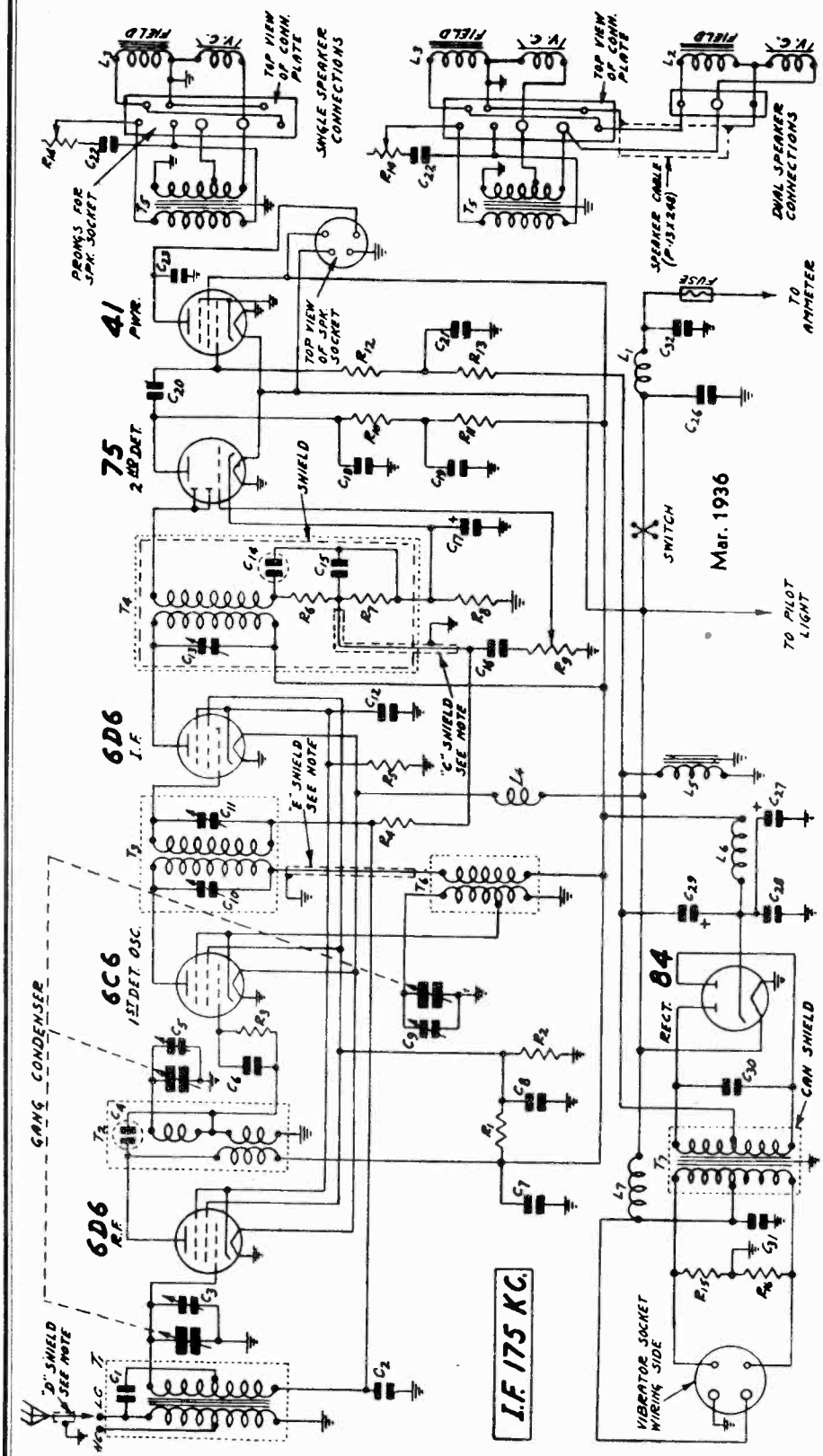


Fig. 2—Location of Tubes and Trimmers

Fig. 4—Condenser Block—Internal Wiring

GROUPS OF CIRCUIT ELEMENTS ENCLOSED IN DOTTED RECTANGLES COMPRISE DISTINCT MECHANICAL ASSEMBLIES. CIRCUIT ELEMENTS ENCLOSED IN DOTTED CIRCLES DO NOT EXIST AS DISTINCT UNITS BUT OCCUR AS A RESULT OF THE MUTUAL POSITION OF OTHER CIRCUIT ELEMENTS OR THEIR PARTS. THE CAPACITY OF "C" SHIELD IS .37 MAH; THE CAPACITY OF "D" SHIELD IS .05 MAH AND THE CAPACITY OF "E" SHIELD IS .15 MAH.

C1	10 mmf.	C22	.02 mf. 600 V.	R12	.50 Megohm .2 W.	L 1	Motor Noise Reactor
C2	.05 mf. 180 V.	C23	.002 mf. 600 V.	R13	100000 ohm .2 W.	L 2	Speaker Field 4.9 ohm
C3	Gang Trimmer	C26	2000 mmf.	R14	150000 ohm Tone Control	L 3	Speaker Field 5.3 ohm
C4	40 mmf.	C28	2000 mmf.	R15	50 ohm .5 W.	L 4	Filament Reactor
C5	Gang Trimmer	C30	.0075 mf. 1600 V.	R16	50 ohm .5 W.	L 5	Filter Reactor
C6	35 mmf.	C31	.50 mf. 180 V.	T 1	Antenna Trans.	L 6	"B" Reactor
C7	.10 mf. 360 V.	C32	2000 mmf.	T 2	R.F. Inter. Trans.	L. 7	Vibrator Reactor
C8	.10 mf. 180 V.	C17	4.0 mf. 25 V. } Electrolytic	T 3	1st I.F. Trans.		
C9	Gang Trimmer	C27	5.0 mf. 350 V. } Block	T 4	2nd I.F. Trans.		
C10	70-150 mmf. } Dual	C29	8.0 mf. 350 V. }	T 5	Output Trans.		
C11	70-150 mmf. }	R 1	17000 ohm 1.0 W.	T 6	Osc. Inductor		
C12	.10 mf. 180 V.	R 2	20000 ohm .5 W.	T 7	Power Trans.		
C13	70-150 mmf.	R 3	.50 Megohm .2 W.				
C14	250 mmf.	R 4	1.0 Megohm .2 W.				
C15	250 mmf.	R 5	350 ohm .2 W.				
C16	.01 mf. 360 V.	R 6	50000 ohm .2 W.				
C18	250 mmf.	R 7	500000 ohm .2 W.				
C19	.10 mf. 360 V.	R 8	6000 ohm .2 W.				
C20	.01 mf. 360 V.	R 9	2.0 Megohm Vol. Control				
C21	.25 mf. 180 V.	R10	150000 ohm .2 W.				
		R11	50000 ohm .2 W.				

MODEL D737-C(1936)
Voltage,Resistance
Coils,Antenna Data

WESTERN AUTO SUPPLY CO.

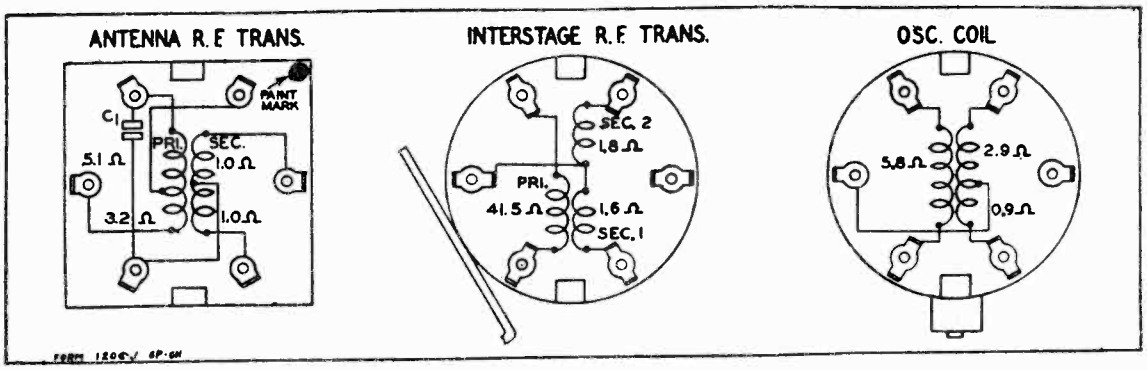


Fig. 3—R. F. and Oscillator Coil Base Terminal Arrangement and D. C. Resistance of Windings

D. C. Resistance of Windings

Following are the D. C. resistances of the various windings in the chassis. The values given below will vary slightly in different sets.

Code	Winding	D. C. Resistance in Ohms
T1	Antenna Transformer	
	Primary Winding	
	Long Portion	5.1
	Short Portion	3.2
	Secondary Winding—Either Portion	1.0
T2	Interstage Transformer	
	Primary Winding	41.5
	Secondary Winding	
	No. 1	1.6
	No. 2	1.8
T3	1st I. F. Transformer	
	Primary Winding	88.0
	Secondary Winding	87.0
T4	2nd I. F. Transformer	
	Primary Winding	43.0
	Secondary Winding	48.2
	Dynamic Speaker	
T5	Output Transformer	
	Primary	416.6
	Secondary	Small
L3	Speaker Field	5.3
	Speaker Voice Coil	Small
T6	Oscillator Coils	
	Grid Coil	
	Long Portion	2.9
	Short Portion	0.9
	Plate Coil	5.8
T7	Power Transformer	
	Primary Winding	
	Center Tap to Inside	Small
	Center Tap to Outside	Small
	Secondary Winding	
	Center Tap to Inside	200.0
	Center Tap to Outside	200.0
L1	Motor Noise Reactor	Small
L4	Filament Reactor	.22
L5	Filter Choke	300.0
L6	R. F. "B" Plate Reactor	4.0
L7	Vibrator Filter Reactor	Small

VOLTAGES AT SOCKETS

Antenna Disconnected Battery 6 Volts Under Load

Type of Tube	Function	Across Heater	Plate to Ground	Screen to Ground	Cathode to Ground	Cathode Current M. A.
6D6	R. F. Amp.	5.6	245	105	5.2	7.5
6C6	1st Det. Osc.	5.6	245	105	0	2.9
6D6	I. F. Amp.	5.6	245	105	5.2	7.5
75	2nd Det.	5.8	120(1)		1.4	0.14
41	Power	5.8	235	245	15.0(2)	30.0
84	Rectifier	5.8				52.0

(1) With 250,000 Ohm Meter
(2) Read Across Filter Choke

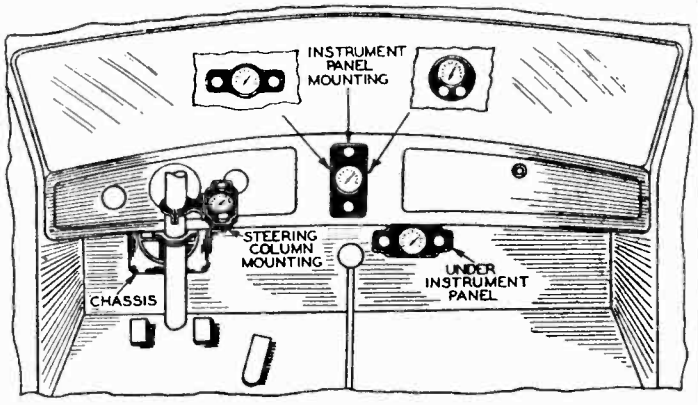


Fig. 1—Various Control Head Mountings

Antenna

IMPORTANT—If the car antenna is of high capacity (600 mmf. or higher) insert the antenna plug with the mark on the HC side—See Fig. 10. If it is a low capacity antenna, insert the plug with the mark on the LC side.

The General Motors cars have steel roofs, and a running board or other under car antenna must be used. These are low capacity antennas. The Chrysler motor cars (except Plymouth) have a steel roof separated from the body proper, which is used as an antenna. These are high capacity antennas. Other cars without steel roofs such as Ford and Plymouth have a built-in roof antenna which is of low capacity.

If a running board or under-car antenna is used, it must be one which is covered with a suitable insulation, to prevent short circuiting in wet weather.

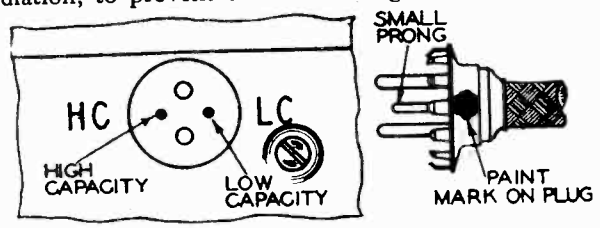


Fig. 10—Antenna Plug Insertion

Alignment and Calibration

Misalignment or mistracking of condensers generally manifests itself as broad tuning and lack of volume at portions or all of the standard wave band. The receivers are all properly aligned at the factory with precision instruments and realignment should not be attempted unless all other possible causes of the faulty operation have first been investigated and unless the service technician has the proper equipment.

A signal generator that will provide accurately calibrated signals over the standard wave band and at the intermediate frequency, and an output meter are required for indicating the effect of adjustments.

Use a non-metallic screwdriver for the adjustments. The complete procedure is as follows:

I. F. Adjustment

Set the signal generator for a signal of 175 KC.

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

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

Short out the oscillator section of the tuning condenser.

Set the volume control at the maximum position.

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

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

1650 KC Adjustment

Set the signal generator for 1650 KC.

Turn the rotor of the tuning condenser to the full open position.

If a low capacity antenna is used connect the shielded antenna lead from the chassis through a 150 mmf. condenser to the antenna post of the signal generator. (If high capacity, use 1500 mmf.)

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

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

1400 KC Adjustment

Set the signal generator for 1400 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the 1st detector and antenna trimmers for maximum output

Do not change the setting of the oscillator trimmer.

Adjusting Antenna Trimmer

After the receiver is installed and the car antenna is connected it will be necessary to adjust the antenna trimmer. Tune in a weak signal between 1200 and 1400 KC with the volume control about three-fourths on. Remove the cover of the chassis case. **The antenna trimmer is on the center tuning condenser section—see Fig. 2.** Turn the adjusting screw of this condenser up or down until maximum output is obtained. CAUTION—Do not turn any of the other trimmer adjusting screws for this adjustment.

Calibrating the Receiver

To calibrate the receiver, tune in a station of known frequency. At the back of the control head is the calibration screw. Remove the pilot lamp assembly. Insert a fine blade screwdriver and turn this screw until the pointer on the dial scale is at the frequency of the station being received. The knob must be held during this adjustment.

If the control head is inaccessible it may be calibrated by setting the pointer from the front. Remove the crystal by inserting a knife blade under the lower edge. Loosen the pointer screw, set the pointer and retighten.

Suppression of Ignition and Generator Noise

The two units mentioned below must be used in every case:

Distributor Suppressor—Remove the high tension lead to the distributor. Insert a distributor suppressor and connect the wire to the other end of the suppressor (see Fig. 13). If this is not practical, cut the high tension lead *close to the distributor* and use a wood screw end type distributor suppressor in this line.

Generator Condenser—The generator condenser is installed at the cut-out as shown in Fig. 13. The lead from the condenser goes to the terminal on the cut-out.

In some of the new cars the cut-out relay is on the front of the dash or in some other location. It will be most convenient to mount this generator condenser at the relay.

Withdraw Antenna Cable Plug

Turn on the receiver and start the engine.

If motor noise is heard, proceed as follows:

Shielding High Tension Lead—In some cars when the coil is mounted on the dash, the high tension lead from the coil to within about four inches of the distributor must be covered with braided shielding and the shield grounded to the motor block or frame.

Bypass Condenser—Try a .25 or .5 mfd. condenser from the ammeter to ground. Try a condenser from the car fuse to ground, switch to ground, windshield wiper connections and various other 6 volt connections to ground noting what effect these condensers have on the noise pick-up.

Try a .25 or .5 mfd. condenser from the "Hot" side of the coil primary to ground. In some cases this condenser may not help. It can be tried out, however, experimentally.

Spark Plug Suppressors—If motor noise persists, spark plug suppressors must be installed. One suppressor is put on each plug as shown in Fig. 13. These are not regularly supplied with the receiver and must be purchased extra. Seventy percent of all cars will not require spark plug suppressors.

Care should be taken that a good mechanical and electrical connection is made between the spark plugs, suppressors and plug wires.

Then Reinsert Antenna Cable Plug

If motor noise is heard when the antenna cable is reconnected, proceed as follows until the noise is satisfactorily reduced:

Dome Light Lead—To determine the amount of noise due to the dome light lead, disconnect this lead at the ammeter, block, or where it is connected, coil it up, and tuck it as far as possible up in the column at which it comes down. Then, with the engine running, ground the end of this wire. If this is found to reduce the noise noticeably, interference is being radiated by the dome light lead. Reconnect the dome light lead and try a .25 or .5 mfd. condenser from the connecting point of the lead to ground. If this does not cure the noise, disconnect the lead and encase it in braided copper shield from the point where it leaves the column post to the point of connection. Keep the lead as far away as possible from car ignition wires and ground the shield.

If the noise due to the dome light lead still persists, disconnect this lead and remove it from the front corner post, at which point it is generally run down. Run the lead down one of the side posts in back of the door and direct to the storage battery. If done in this manner this lead should be fused.

Bonding Cables—Try grounding to the dash all cables and tubing which pass through it, such as oil lines, gas lines, etc. By means of a file, contact can be established between any of the lines and the dash, in order to determine whether such a ground will reduce the noise. To bond the cables to the dash, clean the point of contact, wrap a length of braided shielding around the cable and solder the connection. Then solder the end of the shielding to the dash or ground it under a screw head if one is convenient.

Sufficient play should be left in the bonding shielding so that movement of the cables or tubing will not loosen this shielding from the dash.

High and Low Tension Leads—In some cases, the high and low tension leads between the coil and distributor are run close together. In some cars they are in the same conduit. If this is the case, remove the low tension lead from this conduit. In any event, keep the high and low tension leads as far apart from each other as possible. Shield and ground the shield of the low tension lead, if separating the two leads is not sufficient.

Steering Column, Etc.—It is possible for the steering column, foot pedals and brake lever to carry interference to the back of the dash at which point it may affect the radio receiver. See if each of these items are well grounded to the frame of the car. By means of a file or a braided shielding jumper, contact can be established between any of these items and the frame in order to determine whether such a ground will reduce the noise. A piece of one inch braided shielding should be used if such a ground is necessary and this shielding may be grounded under a screw head, nut or may be soldered in position.

Grounding Engine and Other Parts—The engine must, in every case, be well grounded to the frame of the car. If it is not, use a very heavy braided lead for this purpose, similar to a storage battery ground lead. In like manner it may be necessary to check the grounding of the metal dash, instrument panel, radiator and hood to the frame of the automobile.

Weak Pick-up—Noise, on occasion, may be due to weak pick-up caused by the automobile being in a shielded location or by a faulty antenna system. The action of the automatic volume control, due to the low pick-up, causes the set to operate at its maximum sensitivity, thereby increasing noisy reception, due both to external pick-up and internal conditions.

Loose Parts in Car—Noisy operation is also caused in some instances by loose parts in the car body or frame. These loose parts rubbing together affect the grounding and cause noises, due to the rubbing or wiping action. Tightening up the frame and body at all points and in some cases, the use of a copper jumper will eliminate noise of this nature.

Making Final Adjustments and Bolting Chassis in Place

Battery Cable

The battery connection is made at the ammeter. The end of the battery cable with the connecting lug is secured to one of the posts at the back of the ammeter in the instrument panel.

The other end of the battery cable has a fuse receptacle with bayonet fitting. **Insert the fuse shield** and fuse into the receptacle and connect it to the bayonet pin connector in the end of the battery lead coming from the chassis case as shown in Fig. 11.

Fuse

A 20 ampere automobile fuse is used in the battery cable. This fuse is placed in an insulating shield and is in the receptacle provided for it at the chassis end of the battery cable. **CAUTION—Be sure the fuse shield is on the fuse before the latter is inserted in the receptacle.** *If a fuse blows, do not replace it without first investigating the cause.*

Bolting Chassis in Place

Place the nuts and flat washers on the mounting bolts and put the chassis in place on the dash, extending the mounting bolts through the drilled holes in the dash.

On one of the mounting bolts assemble the extra shakeproof lockwasher as shown in Fig. 9. Then complete the assembly to the dash as illustrated.

After the chassis is in place, secure the flexible shafts and electrical cables into position at the nearest convenient point.

Advancing Generator Charging Rate

The installation of the automobile radio imposes an additional drain on the car storage battery. This can be compensated for by advancing the charging rate of the car generator. Check the state of charge of the storage battery about a week after the installation of the automobile radio is made and have the charging rate adjusted accordingly.

Readjusting Flexible Shafts

When the receiver is in position on the dash, loosen the flexible shaft casing set screws on the chassis. Allow the casing to position itself so that it does not bind. Then retighten the set screws.

MODELS D-740,S740(1934)
(Mallory Vibrator 296)

WESTERN AUTO SUPPLY CO.

Schematic,Voltage,Socket
Alignment,Trimmers

ALIGNMENT

1. Connect output meter across voice coil of speaker.
2. Set volume control on full.
3. Set tone control to bass position.
4. Connect dial light.

(A) I. F. Adjustment

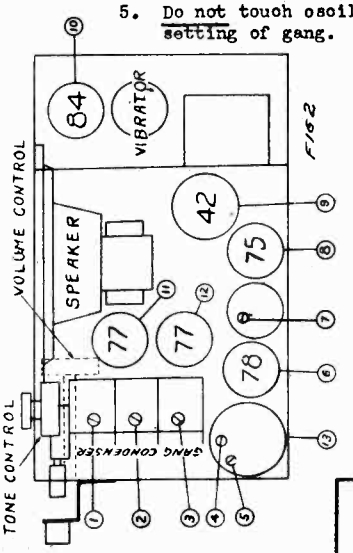
1. Connect a .1 mfd. condenser in series with antenna lead of test osoillator.
2. Set test oscillator to 175 K. C.
3. Connect test oscillator to grid of 1st I. F. tube #6 (see Fig. #2) and adjust #7 to maximum output.
4. Connect test oscillator to grid of 1st Det. #12 and adjust condensers #4 and 5 to maximum output.
5. Repeat the above adjustments for accuracy.

(B) Oscillator Adjustment

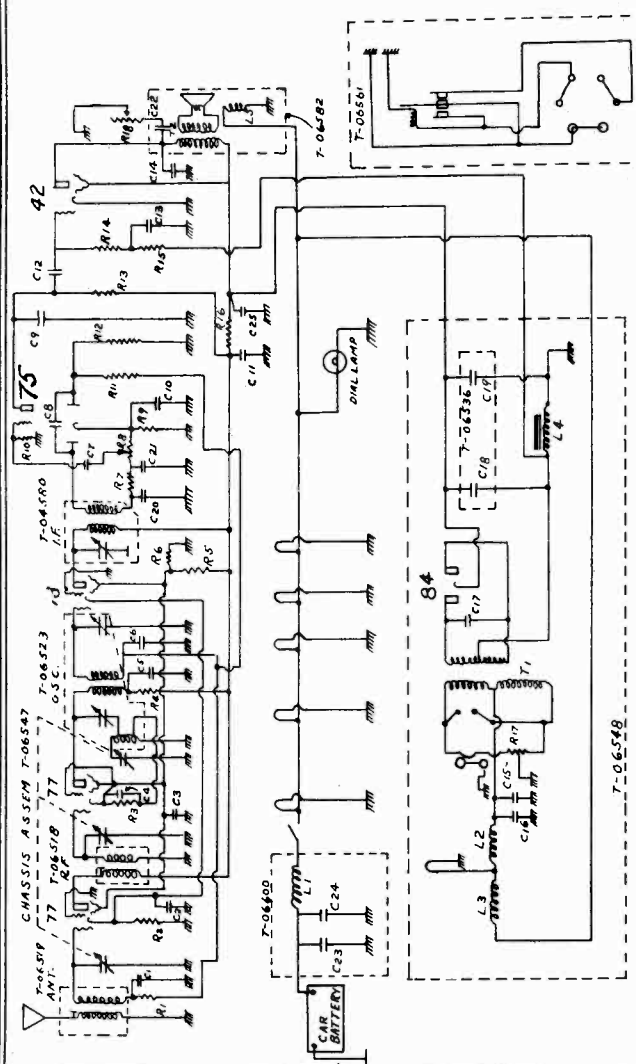
1. Set test oscillator to 1500 K. C.
2. Connect test oscillator leads to grid of 1st Det. #12.
3. Set gang condenser to 1500 K. C. as follows:
   (a) Open gang to fullest extent.
   (b) Close slowly to the thickness of a thin cardboard strip or approximately .015 thousands of an inch.
4. Peak oscillator condenser #3 on end of gang.

(C) R. F. Adjustment

1. Set test oscillator to 1400 K. C.
2. Change antenna condenser in oscillator lead from .1 mfd. to .0002 mfd., and connect test oscillator to antenna lead of set.
3. Set condenser gang at 1400 K. C.
4. Peak condensers #1 and 2 on gang.
5. Do not touch oscillator trimmer #3 at 1400 K.C. setting of gang.



#1 RF Trimmer Condenser
#2 1st Det. Trimmer Cond.
#3 Osc. Trimmer Cond.
#4)
#5) 1st IF Trimmer Cond.
#6 IF Amplifier
#7 2nd IF Trimmer Cond.
#8 2nd Det. AVC & AF Amplifier
#9 Power Output
#10 Rectifier
#11 RF Amplifier
#12 Det. and Osc.
#13 1st IF & Osc. Coil



R1	100,000 ohms 1/4 W	R15	250,000 ohms 1/4W	C1	.05 mfd. 2 ply	C14	.005 mfd. 3 ply	
R2	500 " "	R16	4,000 " 1 W	C2	.25 " "	C15	.5 " 2 ply	
R3	7500 " "	R17	200 Center tapped	C3	.25 " "	C16	.5 " 2 ply	
R4	2000 " "	R18	1/2 meg. Tone Control	C4	.002 " 4 ply	C17	.02 " 4 ply	
R5	40,000 " "			C5	.05 " 3 ply	C18	6. mfd.)	
R6	75,000 " "	T1	Power Trans.	C6	.05 " 2 ply	C19	10. ")	
R7	50,000 " "	T2	Output Trans.	C7	.005 " 3 ply	C20	10 mmfd. mica	
R8	1/2 meg. Vol. Control			C8	100 mmfd. mica	C21	100 " "	
R9	5000 ohms 1/4 W	L1	Filter Choke	C9	.002 mfd. 4 ply	C22	.05 mfd. 3 ply	
R10	1 meg. " "	L2	" "	C10	.5 " 2 ply	C23	.001 mica	
R12	1/2 meg. " "	L3	" "	C12	.005 " 3 ply	C24	.5 mfd. 2 ply	
R13	100,000 " "	L4	Power "	C13	.1 " 2 ply	C25	.001 mica	
R14	250,000 " "	L5	Field Coil					

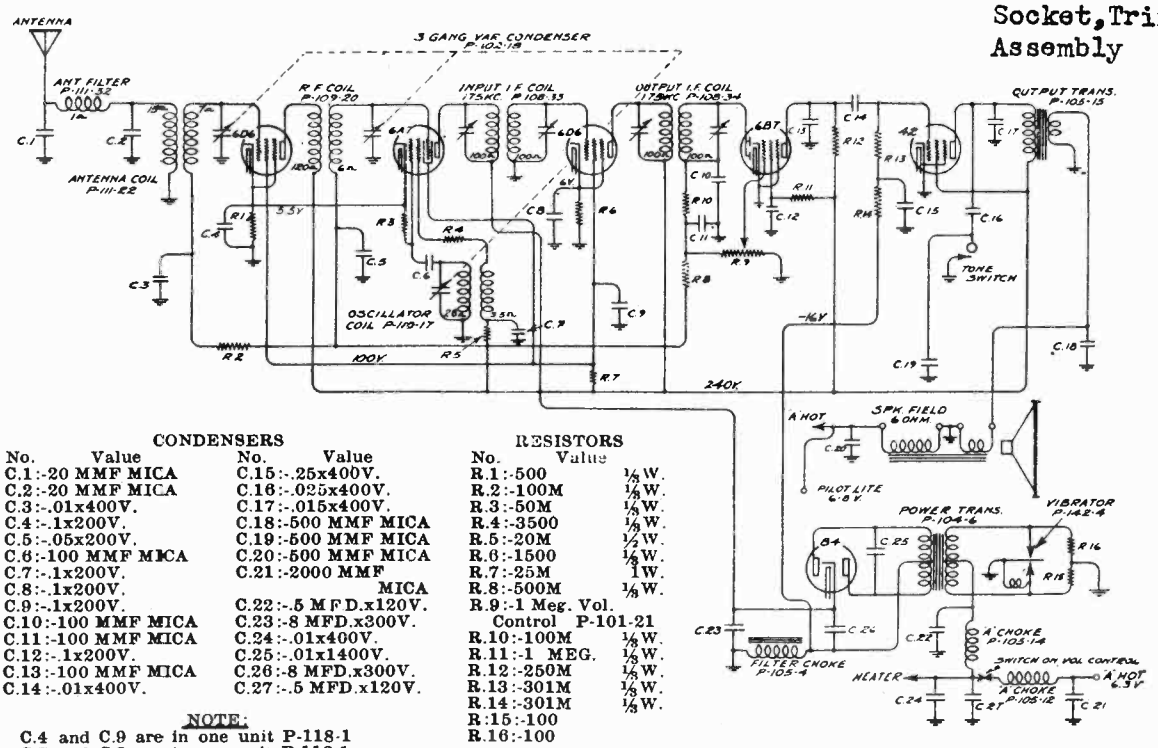
MODEL S740 SOCKET VOLTAGES
(Car Battery 6 Volts Under Load)

Tube	Use	Fil.	Plate	Screen	Cathode	Bias
77	RF	5.3	179	79	2.9	
77	Det. Osc.	5.3	178	79	4.3 to 8.4	
78	IF	5.3	179	79	2.9	
75	2nd Det. AVC	5.3	113			
42	AF	5.3	201	217	1.2	13.0

The above readings were taken from ground or metal of chassis to socket terminals and will vary slightly with different types of voltmeters used.

WESTERN AUTO SUPPLY CO.

MODEL D739
Schematic, Voltage
Socket, Trimmers
Assembly



CONDENSERS

No.	Value	No.	Value
C.1	-20 MMF MICA	C.15	-.25x400V.
C.2	-20 MMF MICA	C.16	-.025x400V.
C.3	-.01x400V.	C.17	-.015x400V.
C.4	-.1x200V.	C.18	-500 MMF MICA
C.5	-.05x200V.	C.19	-500 MMF MICA
C.6	-100 MMF MICA	C.20	-500 MMF MICA
C.7	-.1x200V.	C.21	-2000 MMF MICA
C.8	-.1x200V.	C.22	-.5 MFD.x120V.
C.9	-.1x200V.	C.23	-8 MFD.x300V.
C.10	-100 MMF MICA	C.24	-.01x400V.
C.11	-100 MMF MICA	C.25	-.01x1400V.
C.12	-.1x200V.	C.26	-8 MFD.x300V.
C.13	-100 MMF MICA	C.27	-.5 MFD.x120V.
C.14	-.01x400V.		

RESISTORS

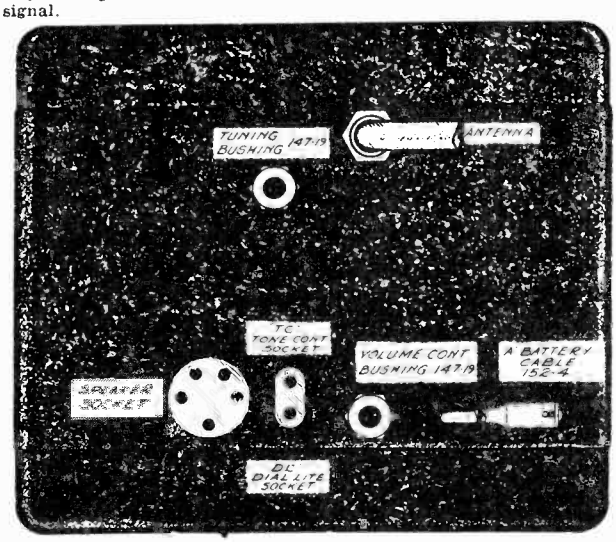
No.	Value
R.1	-500 ⅛ W.
R.2	-100M ⅛ W.
R.3	-50M ⅛ W.
R.4	-3500 ⅛ W.
R.5	-20M ½ W.
R.6	-1500 ⅛ W.
R.7	-25M 1W.
R.8	-500M ⅛ W.
R.9	-1 Meg. Vol. Control P-101-21
R.10	-100M ⅛ W.
R.11	-1 MEG. ⅛ W.
R.12	-250M ⅛ W.
R.13	-301M ⅛ W.
R.14	-301M ⅛ W.
R.15	-100
R.16	-100

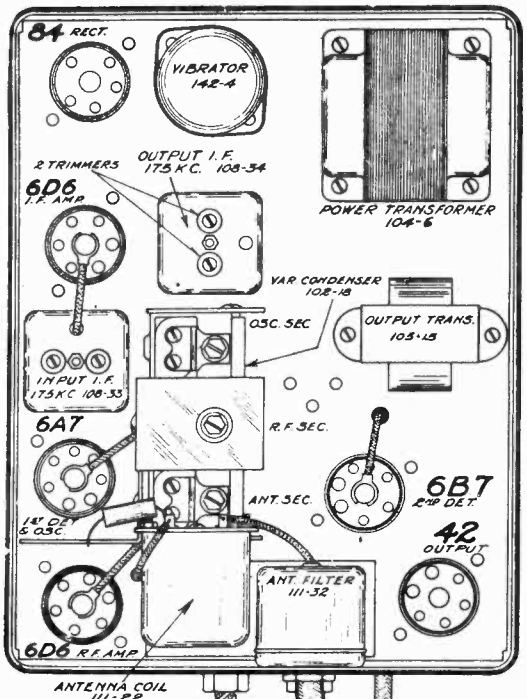
NOTE:

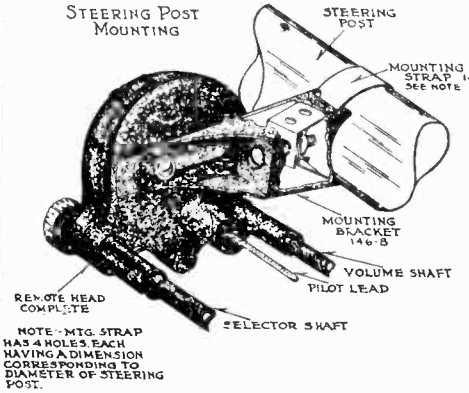
C.4 and C.9 are in one unit P-118-1
C.7 and C.8 are in one unit P-118-1
C.26 and C.23 are in one unit P-119-17
R.16 and R.15 are in one unit P-106-6
Numbers prefixed by letter "P" are part numbers.
Voltages taken from points indicated to chassis ground. Vol. control on full, no signal.

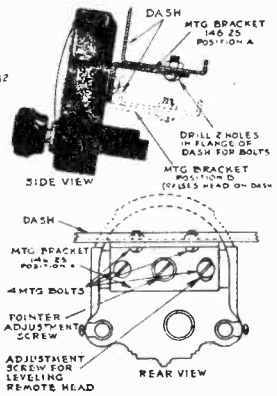
Serial No. 60001 and up.

IF PEAK 175 KC.









MODEL D739
Alignment, Notes
Parts

WESTERN AUTO SUPPLY CO.

DUMMY ANTENNAS:
The dummy antennas referred to in the following instructions are:
"I.F. Dummy" —A .1 mfd. condenser connected in series with the test oscillator output lead.
"Broadcast Dummy"—A 200 mmfd. condenser connected in series with the output lead of the test oscillator.

RESONANCE INDICATOR:
Use as a resonance indicator an output meter connected across the primary of the speaker input transformer, or by means of an adapter between the plate and the screen of the type 42 output tube. Maximum deflection of the meter indicates resonance. Use only enough signal to get a readily readable output. A low range output meter or the low scale of a multi-range meter should be used.

I.F. ALIGNMENT:
1. With variable condenser in its minimum capacity position (plates entirely out of mesh) and with volume control full on, connect test oscillator set at 175 K.C., in series with I.F. dummy antenna, to the grid cap of the type 6A7 tube.
2. Adjust trimmer condensers of both input (108-33) and output (108-34) I.F. transformers to resonance with oscillator. See top view for location of these transformers. There are two adjustments on each and they are accessible from the top of the transformer shield and should be adjusted with an insulated screw driver.

BROADCAST ALIGNMENT:
1. With variable condenser in its minimum capacity position, connect test oscillator set at 1550 K.C. and in series with broadcast dummy, to the antenna lead of receiver.
2. Adjust oscillator trimmer of variable condenser to resonance (this adjustment is on the end section of the three gang condenser—see top view).
3. Shift test oscillator to 1400 K.C. and pick up signal by rotating condenser and adjust R.F. (center) and antenna (front) trimmers to resonance, see top view.
   (a) Check for sensitivity at 1000, 800 and 600 K.C. by setting test oscillator to these frequencies and picking up the signal by rotating variable condenser. Under no circumstances bend plates of oscillator section, bend R.F. and antenna plates only if absolutely necessary.

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

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

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

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

Failure to operate, noisy or weak reception is usually due to defective tubes, the tubes making poor contact with sockets or grid clips making poor contact with the caps of the tubes. Tubes may be checked very easily by replacing with other tubes which are known to be good. If fuse blows out frequently and insulating sleeve has been properly placed over fuse, the trouble is probably in the vibrator, it should be replaced. Do not attempt to make any adjustments on the vibrators.

REPAIR PARTS

Serial No. 60001 and up

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

Part No.	Description	List Price Ea.
	CONDENSERS	
	Unless otherwise listed, all single section tubular paper by-pass condensers	$ .25
	Unless otherwise listed, all dual section tubular paper by-pass condensers	.50
	Unless otherwise listed, all molded mica condensers	.25
119-17	Dual 8 mfd. electrolytic filter condenser	2.25
148-1	.5 Mfd. Generator Condenser	.50
148-3	.5 Mfd. Ammeter Condenser	.40
148-5	.5 Mfd. x 120 Volt Condenser	.50
148-6	Special Ford Ignition Coil Condenser	.60
	COILS	
105-12	"A" Choke - 28 Turns No. 12 Wire	.10
105-14	"A" Choke - 37 Turns No. 12 Wire	.10
108-33	Input I.F. Transformer Complete with Shield	1.50
108-34	Output I.F. Transformer Complete with Resistors and Condensers, Mounted in Shield	2.50
109-20	R.F. Coil Complete - Less Shield	1.00
110-17	Oscillator Coil Complete with Bracket	.75
111-22	Antenna Coil Complete - Less Shield	1.00
111-32	Antenna Filter Assembly Complete with Shield and Antenna Cable	1.50
	RESISTORS	
	Unless otherwise listed, all carbon resistors	.20
100-6	200 Ohm Center Tapped Resistor	.25
168-2	Distributor Suppressor	.40
168-3	Cable Type Suppressor	.40
	TRANSFORMERS	
104-6	Power Transformer	3.00
105-4	380 Ohm Filter Choke	.85
105-15	Output Audio Transformer	1.50
	MISCELLANEOUS	
101-21	Volume Control with Switch	1.35
102-18	Three Gang Variable Condenser	4.00
113-30	Two Lug Terminal Strip	.05
113-37	Terminal Strip	.05
115-34	Antenna and R.F. Coil Shield	.15
114-21	Speaker Chassis Only	5.00
114-22	Ford Header speaker chassis only	5.00
128-4	Complete Speaker Housing for 114-21	2.50
128-5	Ford speaker housing for 114-22	2.50
140-5	Set Case less Covers	1.00
140-6	Covers for Above	1.25
142-4	Plug-in Vibrator	4.50
147-19	Flexible Cable Control Bushing	.10
152-2	Battery Cable & Fuse Assembly	.35
152-3	Fuse Insulating Sleeve	.05
152-4	Chassis Battery Cable Assembly	.30
152-6	Antenna Cable	.50
152-8	Speaker Cable with Plug for 114-21	1.00
152-9	Special Ford Header speaker cable and plug	1.25
153-4	Special Speaker-Tone Control-Dial Light Socket Assembly	.25
160-11	Mounting Studs Complete with Nut & Washer	.05
169-1	15 Amp. Fuse (3AG-15)	.05

Part No.	Description	List Price Ea.
	All Sockets	.10
123-1	Dome Lite Filter	.90
	Plate Antenna	3.50
	REMOTE CONTROL PARTS	
112-39	Selector Control Shaft	.20
112-41	Idler Gear	.15
112-42	Pointer Shaft	.05
112-85	Volume Control Shaft	.10
112-45	Bezel (Crystal Retainer)	.15
112-40	Celluloid Dial Crystal	.15
112-48	Pointer Shaft Gear	.05
112-90	Celluloid dial	.25
116-13	6-8 Volt, T-51 Bulb Bayonet Base	.10
116-14	6-8 volt T-51 frosted glass bayonet lamp	.13
116-9	Pilot Light Assembly	.45
116-11	Tone Control Assembly Unit Complete	.35
131-5	Black Bakelite Remote Control Knobs	.15
146-8	Die Cast Remote Control Mounting Bracket	.30
146-12	Steering Column Strap	.15
146-26	Dash Mounting Bracket	.15
147-3	Selector Control Bushing for 112-39 Shaft	.10
147-4	Volume Control Bushing for 112-43 Shaft	.10
149-26	Flexible Volume Control Cable - 24"	1.50
150-26	Flexible Selector Control Cable - 24"	1.50
151-7	Remote Control Head complete with Steering Column Bracket	5.00
	Dash Mounting Kit (specify make and year of car)	1.25
151-8	Special General Motors Control Head	7.00
	Dash Mounting Kits for 1935 Chevrolet and Pontiac for use with 151-8 head	1.50
	Dash Mounting Kits for 1935 Oldsmobile for use with 151-8 head	1.75

Vibrators can be reconditioned at a cost of $3.00 each, if the old unit is returned.
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.
Mica condensers are coded with an additional dot indicating tolerance:

Tolerance Percent	Color of Dot
2½%	White
5%	Green
10%	Blue
15%	Yellow
20%	Red
More Than 20%	None.

All prices quoted are list and are subject to the usual trade discounts. Shipments are F.O.B. our Factory. When remitting in advance, please include postage.
WE CANNOT SUPPLY SPEAKER PARTS, CONES, TRANSFORMERS OR FIELDS SEPARATELY. WE CAN REPLACE OR REPAIR A DAMAGED SPEAKER FOR $2.00 NET, IF IT IS RETURNED TO OUR FACTORY TRANSPORTATION CHARGES PREPAID.
PRICES SUBJECT TO CHANGE WITHOUT NOTICE.
BRC - CHICAGO

MODELS S743, D743-W (1935)

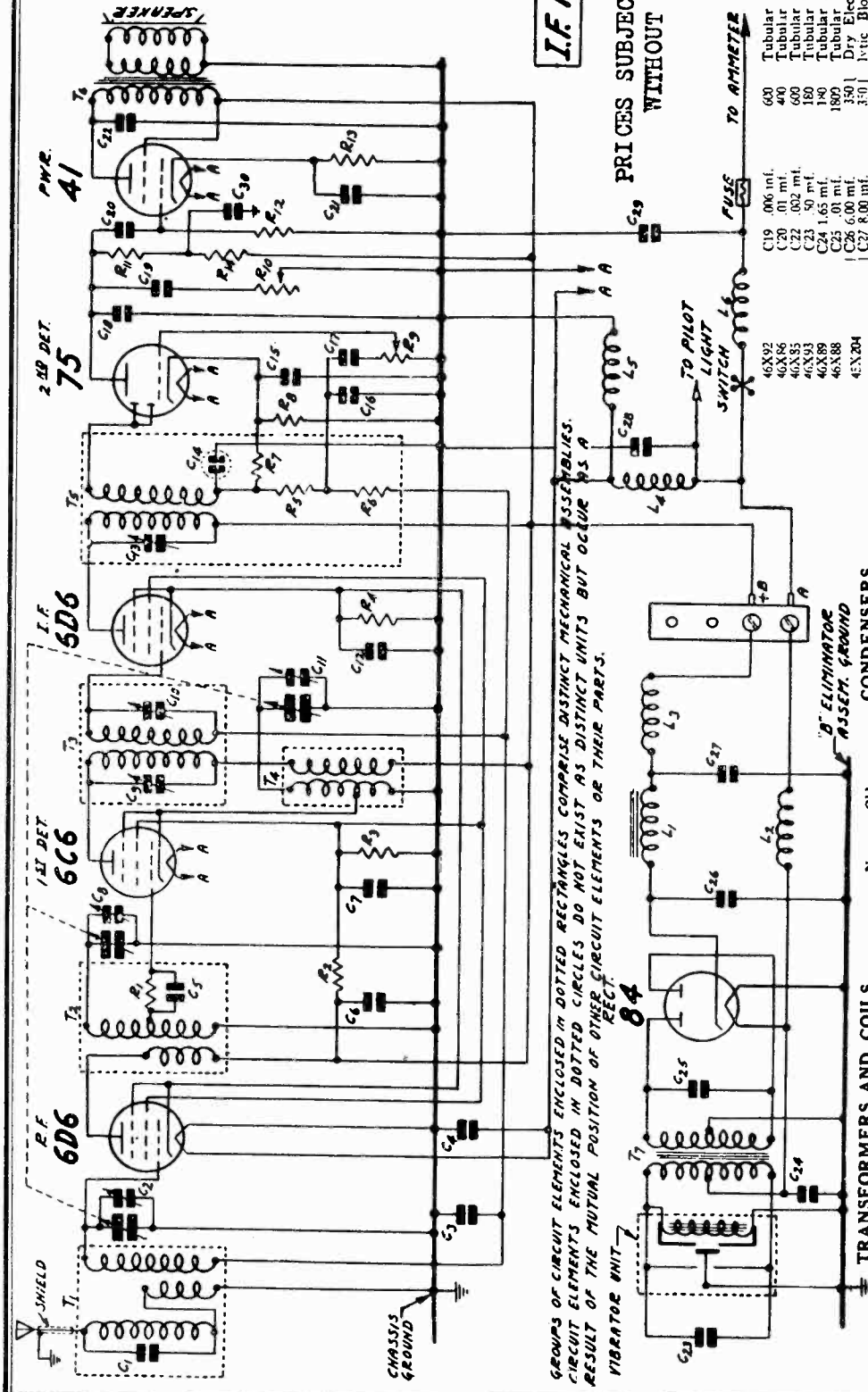
WESTERN AUTO SUPPLY CO Schematic

Power Output - 3 Watts Maximum
Sensitivity - 1.5 Microvolts Absolute
Frequency Range - 530 to 1650 KC
Speaker - 6 Inch Dynamic
Power Consumption - 5.75 Amperes at 6 Volts

I.F. 175 KC.

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

April, 1935



TRANSFORMERS AND COILS

New Part No.	Old Part No.	Description	Code	List Price
51X17-6S	50632	Output Transformer	T6	1.65
9A368-6S		Antenna Coil Assembly (Less Can)	T1	.50
9A369-6S		R.F. Interstage Coil Assembly (Less Can)	T2	1.25
1A23-6S		Dual Coil Can Assembly Only (for above two coils)		.30
9A371-6S		1st I.F. Coil & Can Assembly Complete	T3	1.70
9A370-6S		Oscillator Coil & Can Assembly Complete	T4	.60
9A372-6S		2nd I.F. Coil & Can Assembly Complete	T5	2.05
9A373-6S		Pilot Light Choke Assembly	L4	.15
9A313-6S		Motor Noise Choke Assembly	L6	.25
9A268-6S	5174	R.F. "B" Choke Coil Assembly	L3	.10
9A374-6S		Filament Reactor	L2	.30
53X72-6S	50633	Power Transformer	T7	3.20
52X27-6S	50637	Filter Choke	L1	.90

New Part No.	Old Part No.	Code	Capacity	Voltage	Type	List Price
47X34	1965	C1	.0005 mf.		Moulded	.15
46X20		C2	Antenna Trimmer Part of Gang Condenser			
47X50		C3	.05 mf.	180	Tubular	.15
47X53		C4	.003 mf.		Moulded	.25
46X81		C5	.00035 mf.	400	Moulded	.10
46X83		C6	.10 mf.		Tubular	.25
		C7	.10 mf.	180	Tubular	.25
		C8	1st Detector Trimmer Part of Gang Condenser			
		C9	130-340 mmf.		1st I. F. Trimmer Con-	.50
		C10	130-340 mmf.		densers	
		C9	70-150 mmf.		1st I. F. Trimmer Con-	.50
		C10	70-150 mmf.		densers	
		C11	Oscillator Trimmer Part of Gang Condenser			
46X82		C12	.10 mf.	180	Tubular	.25
17A18		C13	70-140 mmf.		2nd I.F. Trimmer Condenser	.35
		C14	.00025 mf.	Part of 2nd I.F. Coil Assembly		
43X203		C15	12.00 mf.	25	Dry Electro-	.70X201
4 X52		C21	12.00 mf.	25	lytic Block	*A95201
46X84		C16	.0002 mf.		Moulded	1.35
47X52		C17	.01 mf.	180	Tubular	.15
		C18	.00025 mf.		Moulded	.15

New Part No.	Code	Capacity	Voltage	Type	List Price
46X92	C19	.006 mf.	600	Tubular	.20
46X86	C20	.01 mf.	400	Tubular	.20
46X85	C22	.002 mf.	600	Tubular	.20
46X93	C23	.50 mf.	180	Tubular	.15
46X89	C24	1.65 mf.	140	Tubular	.30
46X88	C25	.01 mf.	1800	Tubular	.30
45X204	C26	6.00 mf.	350	Dry Electro	2.10
	C27	8.00 mf.	350	lytic Block	
46X93	C28	.50 mf.	180	Tubular	.25
4 X50	C29	.005 mf.		Moulded	.25
46X94	C30	.25 mf.	300	Tubular	.30
14A39				3 Section Gang Condenser	4.20

New Part No.	Code	Resistance	Wattage	Type	List Price
A95504	R1	300,000 Ohm	0.2	Carbon	.10
B94153	R2	15,000 Ohm	0.5	Carbon	.15
B94203	R3	20,000 Ohm	0.5	Carbon	.15
41X41	R4	450 Ohm	0.2	Armored Wire Wound	.30
	R13	800 Ohm	0.3		
A95503	R5	50,000 Ohm	0.2	Carbon	.10
A95105	R6	1.0 Megohm	0.2	Carbon	.10
A94504	R7	500,000 Ohm	0.2	Carbon	.10
A95752	R8	7,500 Ohm	0.2	Carbon	.10
86X200	R9	2.0 Megohm		Volume Control & Switch	.80
70X201	R10	350 Ohm		Tone Control	1.15
*A95201	R11	200,000 Ohm	0.2	Carbon	.25
†A95154	R11	150,000 Ohm	0.2	Carbon	.10
A95504	R12	500,000 Ohm	0.2	Carbon	.10
†A95503	R14	50,000 Ohm	0.2	Carbon	.10

MODELS S743,D743-W(1935)
Alignment,Voltage,Socket WESTERN AUTO SUPPLY CO.
Trimmers,Resistance

Remove chassis from case.

Establish ground connection between chassis and power supply.

Reconnect A and B wires from power supply to chassis.

Set the signal generator for a signal of 175 KC.

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

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

Short out the oscillator section of the tuning condenser.

Set the volume control at the maximum position.

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

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

1650 KC. Adjustment

Set the signal generator for 1650 KC.

Turn the rotor of the tuning condenser to the full open position.

Connect the shielded antenna lead from the chassis through a 250 mmf. condenser to the antenna post of the signal generator.

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

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

1400 K C. Adjustment

Set the signal generator for 1400 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the 1st detector and antenna trimmers for maximum output.

Do not change the setting of the oscillator trimmer.

Voltages at Sockets
Antenna Disconnected - Voltage at Battery 6.1

Type of Tube	Function	Across Heater	Plate to Ground	Screen to Ground	Cath. to Ground	Normal Plate M.A.
6D6	R. F.	5.8	218	100	5.2	5.8
6C6	1st Det. and Osc.	5.8	218	100		2.0
6D6	I. F.	5.8	218	100	5.2	5.8
75	2nd Det. & 1st A. F.	5.8	160 (1)		1.4	2.8
41	Output	5.8	210	220	16.0	16.0
84	Rectifier	5.8				20.0 per plate

Speaker Field ..1.15 Amperes "B" Unit .....3.00 Amperes
Chassis ..... 1.50 Amperes Pilot Lamp ....0.1 Amperes

(1) Measured on 1000 V. Scale (1000 Ohms per volt)

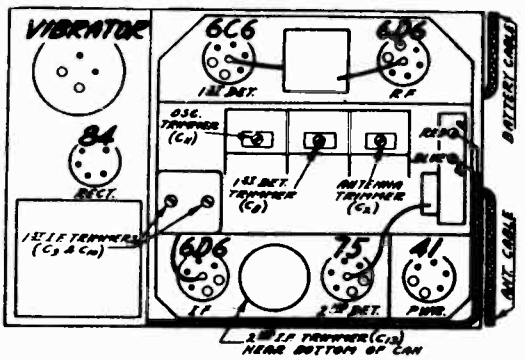


Fig. 2—Tube Arrangement and Trimmers

Adjusting Antenna Trimmer

After the receiver is installed and the car antenna is connected it will be necessary to adjust the antenna trimmer. Tune in a weak signal between 1200 and 1400 KC. with the volume control about three-fourths on. Remove the cover of the chassis case. The antenna trimmer is the trimmer condenser closest to the terminal strip—see Fig. 2. Turn the adjusting screw of this condenser up or down until maximum output is obtained. CAUTION—Do not turn any of the other trimmer adjusting screws for this adjustment.

Calibrating the Receiver

After installing the receiver in the car, it will be necessary to calibrate the control unit. Tune in a station of known frequency at about the center of the dial. At the back of the control unit is a calibration screw—See Fig. 4 in the installation manual enclosed with each receiver. Remove the pilot light assembly.

The calibration screw will be seen at the bottom of the receptacle from which the pilot light assembly is withdrawn. Insert a screwdriver and turn this screw until the pointer on the dial scale is at the frequency of the station being received. The knob must be held during this adjustment.

Voltages At Sockets

On the voltage chart are given the voltages at the sockets with all tubes in and the set in operating condition. The antenna should be disconnected.

The voltages can be read with the chassis in the case, by means of an analyzer plug.

If the chassis unit is taken out of the case all of the socket terminals can easily be reached under the chassis with test prods.

If the chassis is taken out, a jumper wire must be connected from the chassis base to the metal wall of the "B" power unit, in order to complete the ground circuit.

D. C. Resistance of Windings

Following are the D. C. resistances of the various windings in the chassis.

New Part No.	ITEM	Code	D. C. Resistance in Ohms
9A368-6S	Antenna Trans. Primaries in Series	T1	6.3
	Antenna Trans. Secondary	T1	2.5
9A369-6S	R.F. Interstage Trans. Pri.	T2	4.5
	R.F. Interstage Trans. Sec. (Center Tap to inside)	T2	1.8
	(Center Tap to ground)		1.3
9A371-6S	1st I.F. Trans. Primary	T3	58.
	1st I.F. Trans. Secondary	T4	58.
9A370-6S	Oscillator Cathode Coil (Total)	T4	3.
	Oscillator Plate Coil	T4	6.
9A372-6S	2nd I.F. Trans. Primary	T5	46.
	2nd I.F. Trans. Secondary	T5	46.
9X17-6S	Output Trans. Primary	T6	440.
	Output Trans. Sec. and Voice coil in paralle	T6	.4
9X72-6S	Power Trans. Primary	T7	.3
	Power Trans. Secondary	T7	500.
9X27-6S	Filter Choke	L1	300.
9A374-6S	Filament Reactor	L2	Small
9A268-6S	R.F. "B" Choke	L3	3.5
9A375-6S	Pilot Light Choke Assembly	L4	Small
12A62A	Speaker Field	L5	5.
9A376-6S	Motor Noise Choke	L6	Small

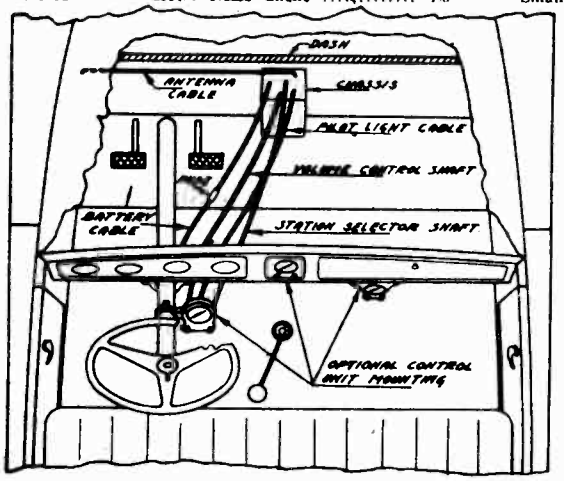
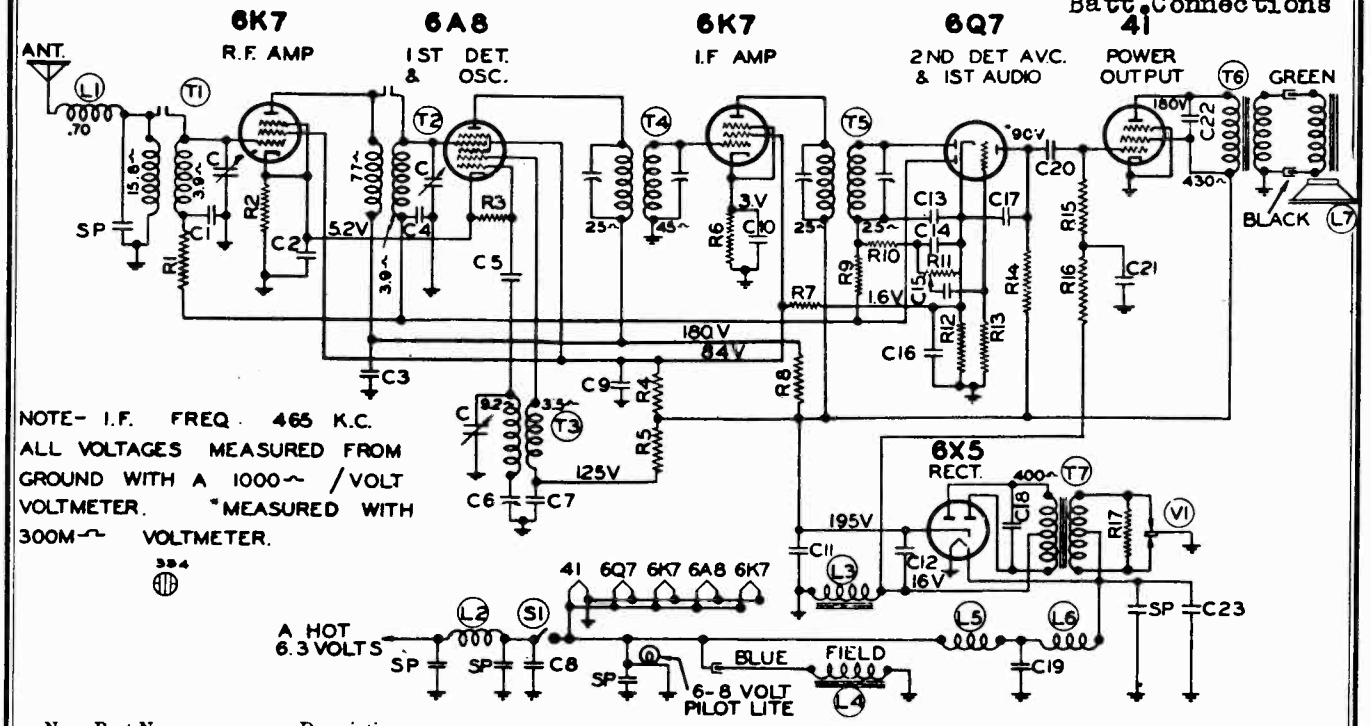


Fig. 1—General Mounting Position

MODEL D743(1936)
Schematic, Voltage
Socket, Trimmers
Batt. Connections

WESTERN AUTO SUPPLY CO.



No.	Part No.	Description

CONDENSERS

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

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

RESISTORS

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

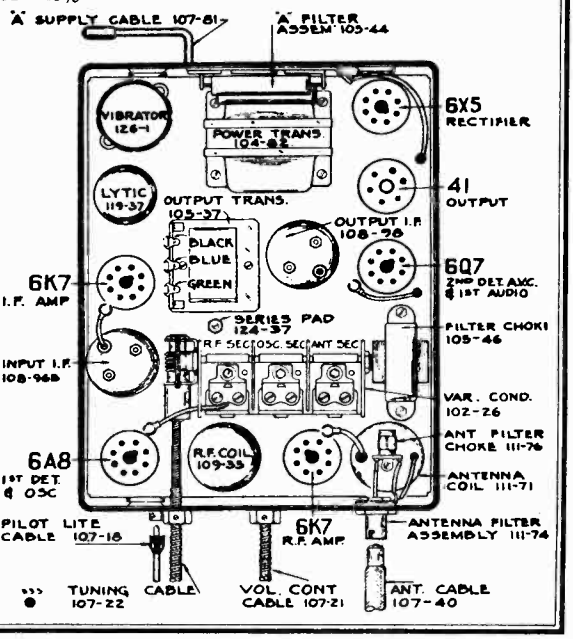
PARTS

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

CONNECTIONS TO BATTERY

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

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



MODEL D743(1936)
Alignment, Notes

WESTERN AUTO SUPPLY CO.

SERVICE NOTES

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

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

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

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

DESCRIPTION

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

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

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

DUMMY ANTENNAS

The dummy antennas referred to in the following instructions are:

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

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

RESONANCE INDICATOR

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

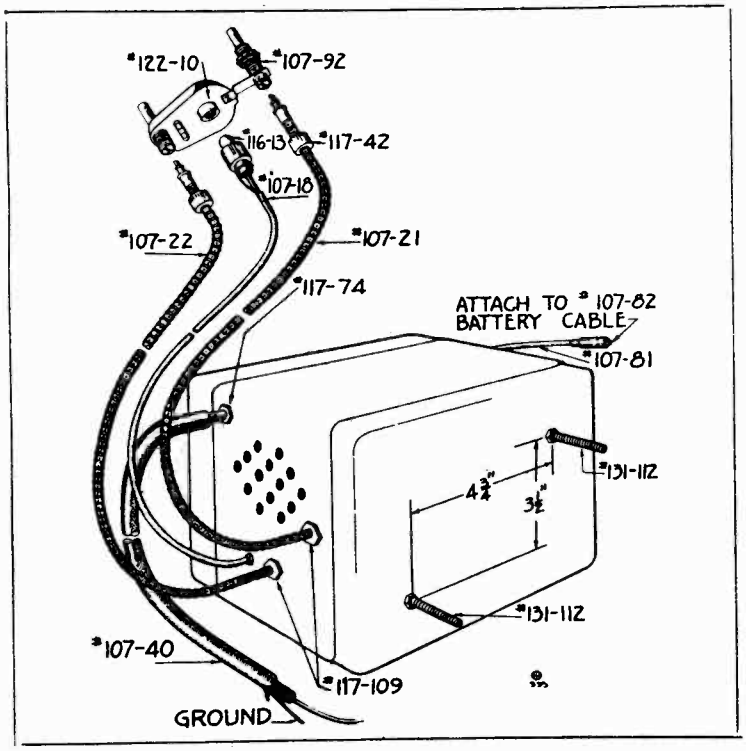
I.F. ALIGNMENT: (465 K.C.)

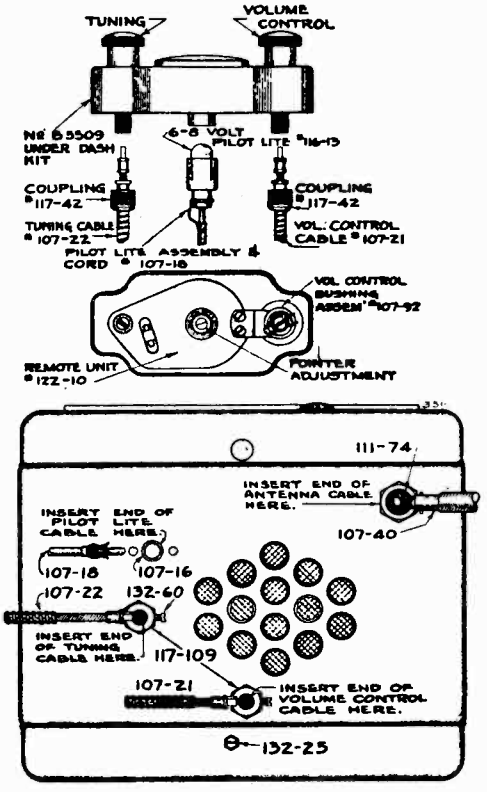
1. With variable condenser in its minimum capacity position (plates entirely out of mesh) and with volume control full on, connect test oscillator set at 465 K.C. in series with I.F. dummy antenna, to grid of 6K7 I.F. tube.
2. Adjust trimmer condensers of output I.F. transformer No. 108-98 to resonance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

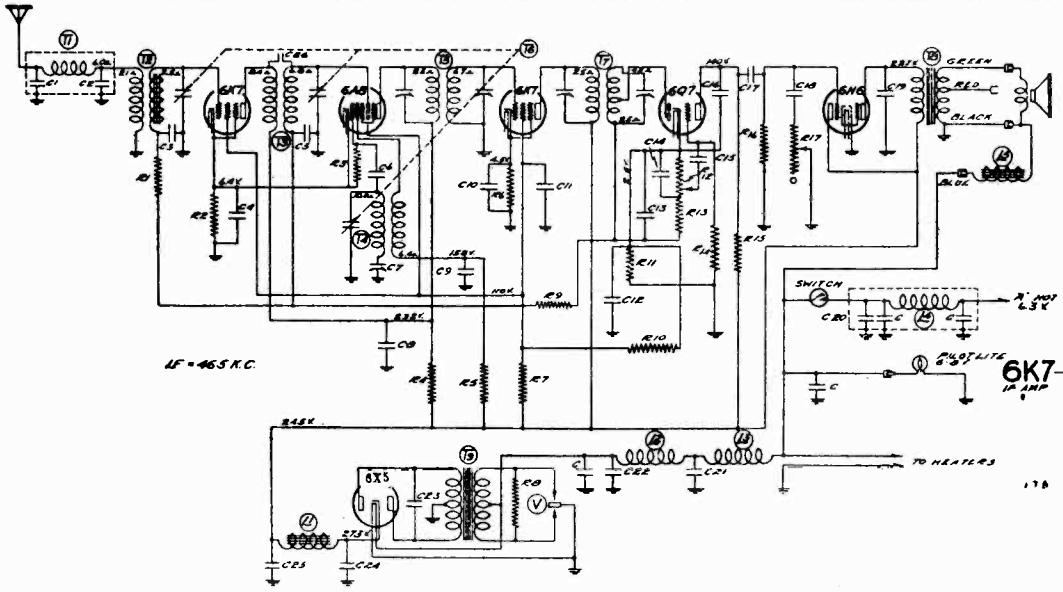
BROADCAST ALIGNMENT

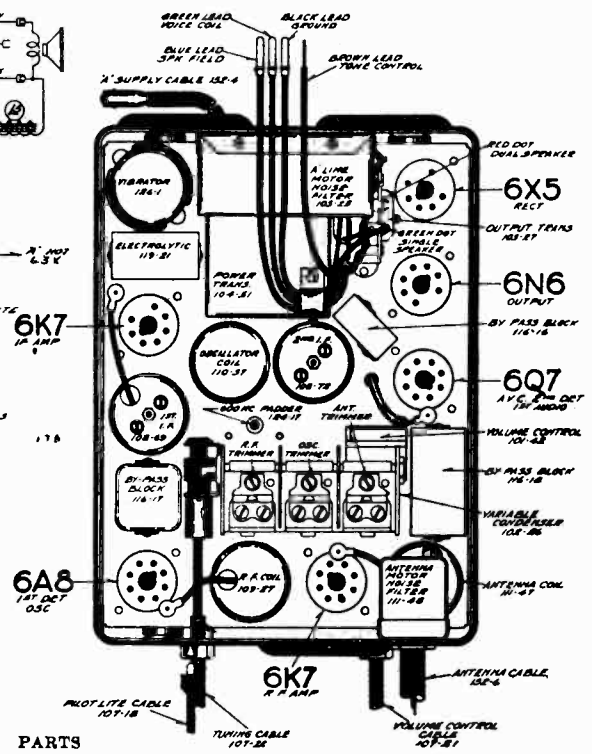
1. With variable condenser in its minimum capacity position, connect test oscillator set at 1550 K.C. in series with broadcast dummy to the antenna lead of receiver.
2. Adjust oscillator trimmer of variable condenser to resonance. (This adjustment is on the middle section of the three-gang condenser—see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

WIRING CONNECTIONS AND ASSEMBLY









No.	Part No.	Description
		RESISTORS
R1	130-20	100M Ohm - ⅛ Watt 20% - 50 Volt - Carbon
R2	130-99	300 Ohm - ⅛ Watt - 20% - 10 Volt - Carbon
R3	130-94	50M Ohm - ⅛ Watt - 10% - 10 Volt - Carbon
R4	130-98	1500 Ohm - ⅛ Watt 20% - 25 Volt - Carbon
R5	130-42	20M Ohm - ⅛ Watt - 20% - 100 Volt - Carbon
R6	130-70	500 Ohm - ⅛ Watt - 10% - 10 Volt - Carbon
R7	130-95	12M Ohm - 1.2 Watt - 10% - 100 Volt - Carbon
R8	130-97	200 Ohm - ⅛ Watt - 10% - 10 Volt - Carbon
R9	130-3	500M Ohm - ⅛ Watt - 20% - 100 Volt - Carbon
R10	130-108	40M Ohm - ⅛ Watt - 10% - 100 Volt - Carbon
R11	130-107	800 Ohm - ⅛ Watt - 10% - 10 Volt - Carbon
R12	101-42	50M Ohm - Volume Control and Switch
R13	130-22	5M Ohm - ⅛ Watt - 20% -10 Volt - Carbon
R14	130-68	1 Meg Ohm - ⅛ Watt - 10% - 20 Volt - Carbon
R15	130-9	200M Ohm - ⅛ Watt - 20% - 20 Volt - Carbon
R16	130-3	500M Ohm - ⅛ Watt - 20% - 100 Volt - Carbon
R17	101-45	1 Meg Ohm - Tone Control

		CONDENSERS
C		Spark Plate
C1	129-3	.00002 Mica - "O" - 20%
C2	129-49	.00009 Mica - "O" - 5%
C3	116-18	.05 x 200 Volt
C4	116-18	.25 x 200 Volt
C5	116-17	.05 x 200 Volt
C6	129-21	.0002 Mica - MT - "O" - 20%
C7	124-17	Single Padder J-4-S
C8	116-17	.1 x 400 Volt
C9	116-18	.1 x 400 Volt
C10	116-17	.1 x 200 Volt
C11	116-17	.1 x 200 Volt
C12	116-16	.05 x 200 Volt
C13	129-5	.0001 Mica - MT - "O" - 20%
C14	129-2	.0005 Mica - MT - "O" - 20%
C15	116-18	.02 x 200 Volt
C16	129-5	.0001 Mica - MT - "O" - 20%
C17	116-16	.05 x 400 Volt
C18	100-37	.003 x 600 Volt - 10%
C19	116-16	.01 x 800 Volt
C20	100-35	.5 x 200 Volt - 50% - 10%
C21	100-35	.5 x 200 Volt - 50% - 10%
C22	100-35	.5 x 200 Volt - 50% - 10%
C23	100-36	.01 x 1400 Volt - 10%
C24	119-21	8.0 mfd. Lytic Cond. 350 Working Volts
C25	119-21	4.0 mfd. Lytic Cond. 350 Working Volts
C26		5.0 mmf. Gimmick

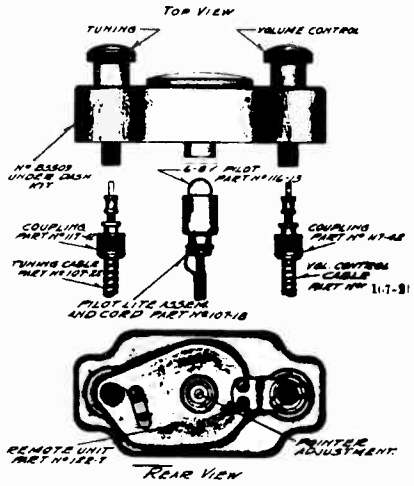
		PARTS
T1	111-48	Antenna Filter Coil Assembly
T2	111-47	Antenna Coil Assembly
T3	109-27	R.F. Coil Assembly
T4	110-37	Oscillator Coil Assembly
T5	108-69	Input I.F. Coil—465 Kc.
T6	102-26	Three Gang Variable Condenser
T7	108-72	Output I.F. Coil—465 Kc.
T8	105-27	Output Transformer
T9	104-51	Power Transformer
L1	105-23	Filter Choke
L2	105-19	"A" Choke
L3	105-24	"A" Choke
L4	105-26	"A" Choke
L5	114-34	5¼" Speaker (Field Resistance—4 Ohms)
V	126-1	Vibrator

C3, C4, C9, C15, in one unit—part No. 116-18.

C5, C8, C10, C11, in one unit—part No. 116-17.

C12, C17, C19, in one unit—part No. 116-16.

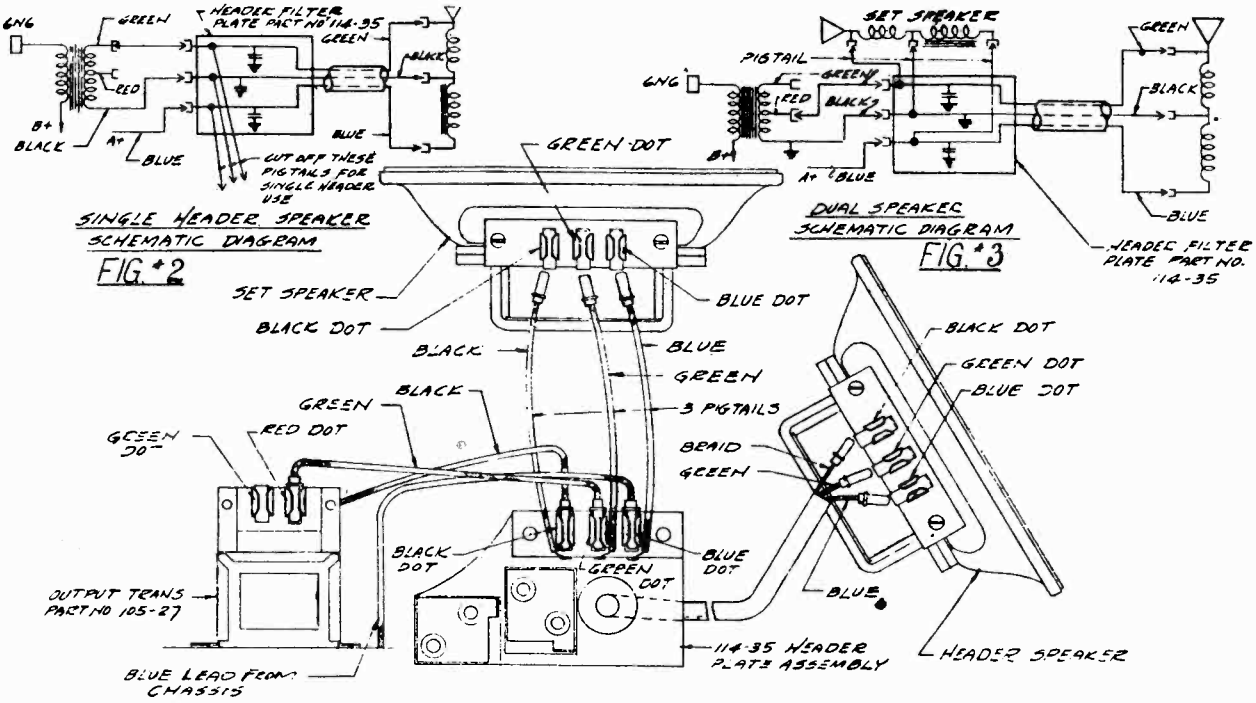
C24, C25, in one unit—part No. 119-21.



MODEL D744(1936)
Alignment, Assembly

WESTERN AUTO SUPPLY CO.

Notes



NO SPARK PLUG SUPPRESSORS ARE REQUIRED

DESCRIPTION:

Model No. 666 is a six-tube superheterodyne receiver having a tuning range of 530 K.C. to 1550 K.C., operates from a 6.0 volt storage battery and uses the automotive type 6.3 volt tubes. The "B" supply is obtained from a vibrator with a tube rectifier.

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

The receiver is so designed that it may be used as either a single or two unit installation. Taps are provided on the output transformer to a pin jack terminal board, a red dot distinguishing dual speaker tap and green dot for single speaker operation.

For complete details see illustration and Header speaker data chart.

Dash kits for the remote control head are available for 1936 cars drilled for dash plates.

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

All adjustments are accessible and any part replaceable without removing the chassis from the case.

TUBE COMPLEMENT

1—Type No. 6K7—Remote Cut-off Pentode as an R.F. Amplifier
1—Type No. 6A8—Pentagrid Converter (composite first detector and oscillator)
1—Type No. 6K7—Remote Cut-off Pentode as an I.F. Amplifier (465 K.C.)
1—Type No. 6Q7—Duplex Diode Triode Second Detector, A.V.C. and First Audio
1—Type No. 6N6—Twin Triode Output Amplifier
1—Type No. 6X5—High Vacuum Rectifier

The tube complement consists of the latest "Metal-Glass" tubes which are interchangeable with metal tubes.

Cars with floating power must have the motor bonded to the bulkhead and again to the frame to provide a direct path for the high frequency interference developed in the ignition system. ⅝" copper braid will be necessary, SMALL DIAMETER WIRE WILL NOT DO. Bond flexible shaft leads, such as free wheeling, choke wires, etc., which pick up motor noise and reradiate it into the car. Free wheeling cables should be grounded at the point at which they go through the fire wall of the car. In extreme cases it has been found necessary to ground the steering column.

I.F. ALIGNMENT

1. With variable condenser in its minimum capacity position (plates entirely out of mesh) and with volume control full on, connect test oscillator set at 465 K.C. in series with I.F. dummy antenna, to grid of 6K7 I.F. tube.
2. Adjust trimmer condensers of output I.F. transformer No. 108-72 to resonance with oscillator.
3. Move test oscillator connection to grid of 6A8 tube and adjust trimmer condensers of input I.F. transformer No. 108-69 to resonance with oscillator. See top view for location of these transformers. There are two adjustments on each and they are accessible from the top of the transformer shield and should be adjusted with an insulated screw driver.

BROADCAST ALIGNMENT

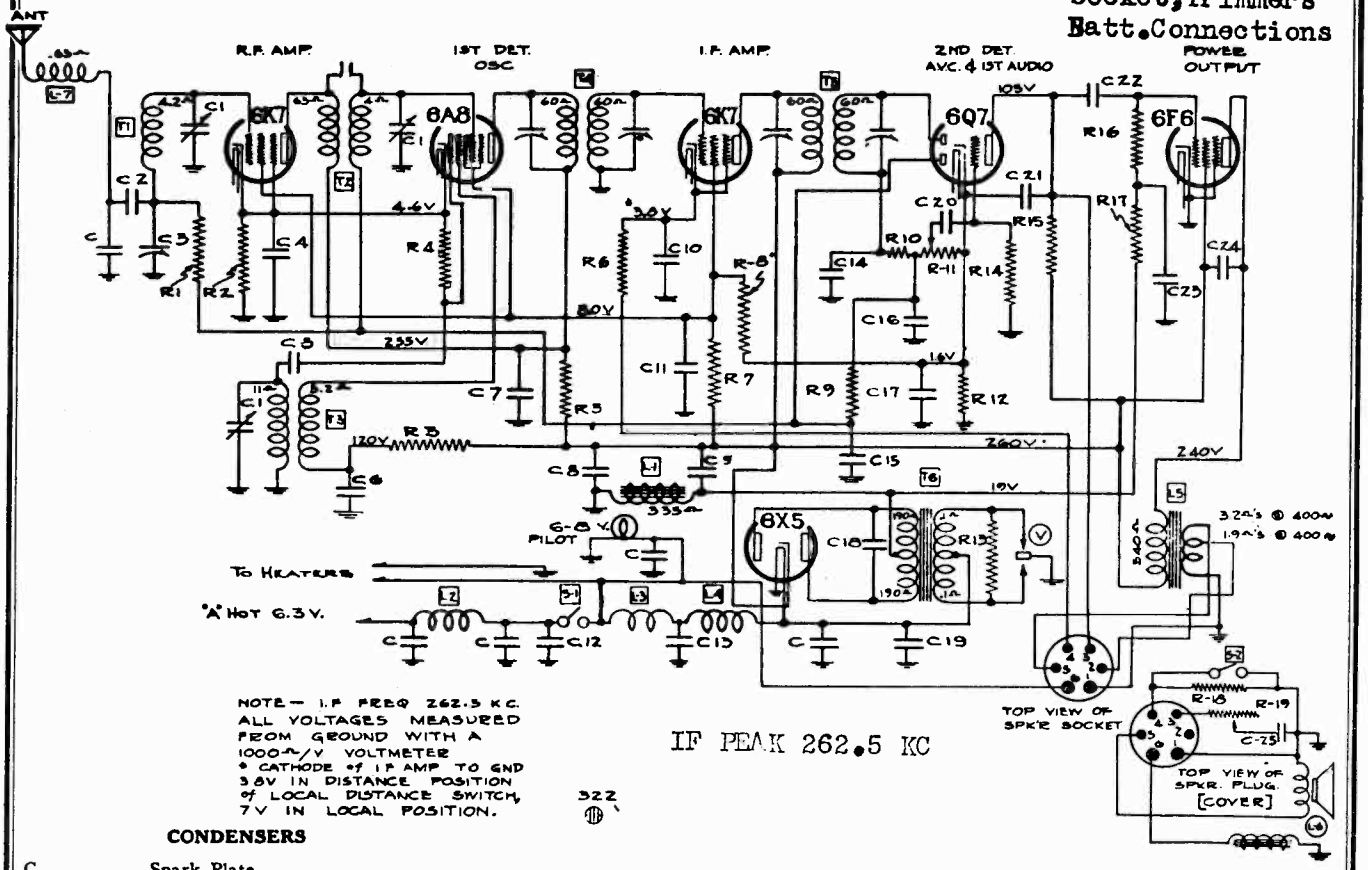
1. With variable condenser in its minimum capacity position, connect test oscillator set at 1550 K.C. in series with broadcast dummy to the antenna lead of receiver.
2. Adjust oscillator trimmer of variable condenser to resonance. (This adjustment is on the middle section of the three-gang condenser—see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

Make certain that the instrument panel has a ground connection to the frame of the car.

NOTE—Where ignition coils are mounted in motor compartments a .5 mfd cond (143-1 or 143-3) connected between primary coil terminal and receiver mounting bolt will often reduce motor noise.

MODEL D744(1937)
Schematic, Voltage
Socket, Trimmers
Batt. Connections

WESTERN AUTO SUPPLY CO.



NOTE— I.F. FREQ 262.5 K.C. ALL VOLTAGES MEASURED FROM GROUND WITH A 1000Ω/V VOLTMETER * CATHODE of I.F. AMP TO GND 5.8V IN DISTANCE POSITION of LOCAL DISTANCE SWITCH, 7V IN LOCAL POSITION.

CONDENSERS

C		Spark Plate
C1	102-45	3 Gang Condenser
C2	129-73	.002 Mica - MW-W - 10%
C3	124-36	Series Pad
C4	116-20	.1 x 200 v. - 20%
C5	129-12	.00025 Mica - MT - 20%
C6	116-19	.1 x 400 - 20%
C7	116-19	.1 x 400 - 20%
C8	119-34	8. mfd. - 350 W v.
C9	119-34	4 mfd. 350 W v.
C10	116-19	.05 x 200 v. - 20%
C11	116-20	.25 x 200 v. - 20%
C12	100-31	.5 x 120 v. - 10-50% - Braid leads
C13	100-31	.5 x 120 v. - 10-50%
C14	129-5	.0001 Ceramicon - 20%
C15	116-19	.05 x 200 v. - 20%
C16	129-5	.0001 Ceramicon - 20%
C17	116-20	.02 x 200 - 20%
C18	100-36	.01 x 1400 v. - 20% - 10% "A"
C19	100-31	.5 x 120 v. - 10% - 50%
C20	116-20	.02 x 200 - 20%
C21	129-5	.0001 Ceramicon - 20%
C22	100-55	.01 x 400 - 25%
C23	100-48	.25 x 200 - 20%
C24	100-54	.006 x 600 - 25%
C25	100-11	.01 x 400 - 25%
C4, C11, C17, C20 All in Block 116-20		
C7, C6, C10, C15 All in Block 116-19		

RESISTORS

R1	130-141	250M ohm - 1/3 w. Insulated
R2	130-54	500 ohm - 1/3 w.
R3	130-138	50M ohm - 1/2 w. Insulated
R4	130-52	50M ohm - 1/3 w.
R5	130-137	1500 ohm - 1/3 w. Insulated
R6	130-154	1000 ohm - 1/3 w. Insulated
R7	130-143	30M ohm - 1.2 w.
R8	130-139	40M ohm - 1/3 w. Insulated
R9	130-19	1 meg - 1/3 w.
R10	130-162	50M ohm - 1/3 w. Insulated
R11	101-73	250M ohm - Volume Control
R12	130-153	700 ohm - 1/3 w.
R13	130-84	200 ohm - 1/3 w.
R14	130-19	1 meg ohm - 1/3 w.
R15	130-11	250M ohm - 1/3 w.
R16	130-5	300M ohm - 1/3 w.
R17	130-11	250M ohm - 1/3 w.
R18	130-161	4000 ohm - 1/3 w. Insulated
R19	101-45	Tone Control 1 Meg ohm.

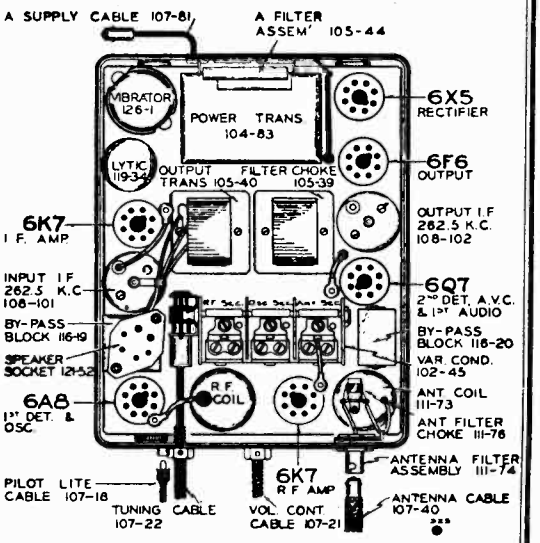
PARTS

L7	111-76	Antenna Filter Choke Assem
T1	111-73	Antenna Coil Complete
T2	109-36	R.F. Coil Complete
T3	110-59	Oscillator Coil Complete
T4	108-101	I.F. Input
T5	108-102	I.F. Output
T6	104-83	Power Transformer
L1	105-39	Filter Choke (335 ohms)
L2	105-26	"A" Choke
L3	105-24	"A" Choke
L4	105-19	"A" Choke
L5	105-40	Output transformer
L6	114-62	Speaker. Dynamic
S1		Switch on Volume Control
S2	125-28	Sensitivity switch.

CONNECTIONS TO BATTERY

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

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



MODEL D744(1937)
Alignment, Notes

WESTERN AUTO SUPPLY CO.

Assembly

SERVICE NOTES

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

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

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

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

DESCRIPTION

Model No. 667 is a six-tube superheterodyne receiver having a tuning range of 530 K.C. to 1550 K.C., operates from a 6.0 volt storage battery and uses the automotive type 6.3 volt tubes. The "B" supply is obtained from a vibrator with a tube rectifier.

The I.F. frequency used is 262.5 K.C., the R.F. end of the receiver consisting of a high gain iron core antenna coil which gives high signal to noise ratio and an R.F. stage especially designed to give high image rejection and high I.F. attenuation. The I.F. transformers are designed to give high gain and selectivity and yet to have a broad nose for ease of tuning and hi-fidelity response. They are of the air core type and wound with solid wire to give *minimum* drift and variation of gain due to climatic changes.

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

DUMMY ANTENNAS

The dummy antennas referred to in the following instructions are:

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

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

CITY-COUNTRY SWITCH

This switch is located on the chassis cover.

City—While driving in the city or close to broadcasting stations, it is best to turn the knob to the "city" position for least noise.

Country—When driving in the country, or when listening to distant stations, best results are obtained with the knob turned to the "country" position. In this position the sensitivity is at a maximum.

RESONANCE INDICATOR

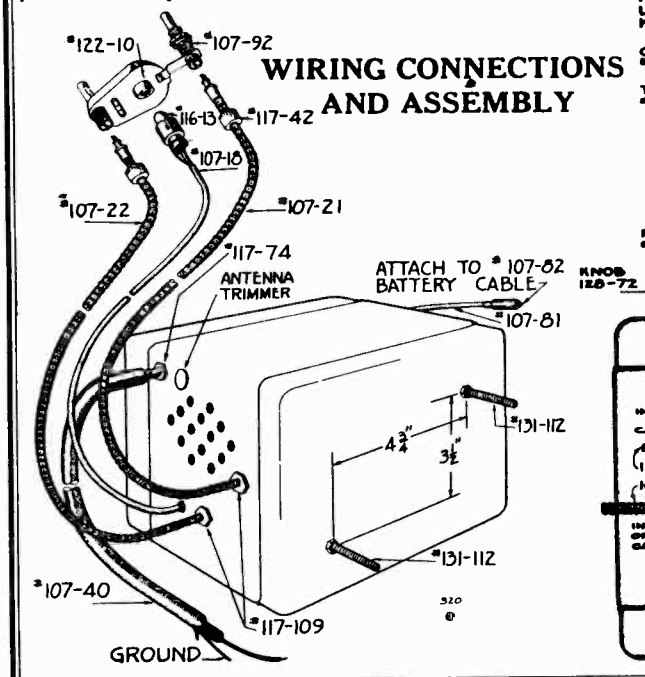
Use as a resonance indicator an output meter connected across the primary of the speaker input transformer, or by means of an adapter between the plate and screen terminals of the type 6F6 output tube. Maximum deflection of the meter indicates resonance. Use only enough signal to get a readily readable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

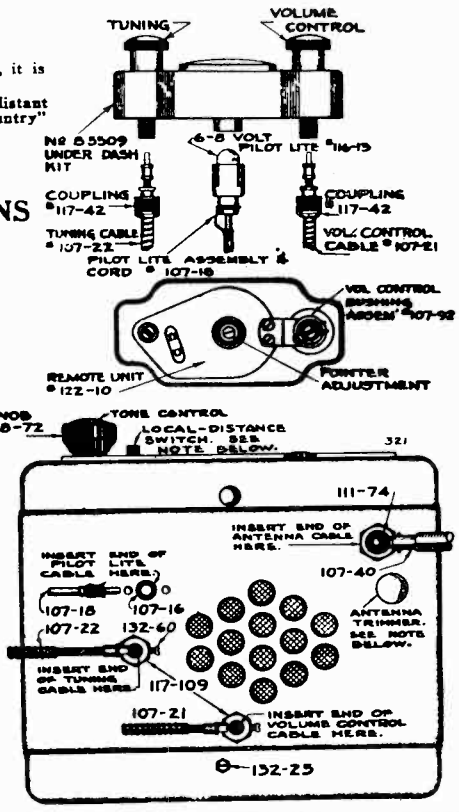
I.F. ALIGNMENT: (262.5 K.C.)

1. With variable condenser in its minimum capacity position (plates entirely out of mesh) and with volume control full on, connect test oscillator set at 262.5 K.C. in series with I.F. dummy antenna, to grid of 6K7 I.F. tube.
2. Adjust trimmer condensers of output I.F. transformer No. 108-102 to resonance with oscillator.
3. Move test oscillator connection to grid of 6A8 tube and adjust trimmer condensers of input I.F. transformer No. 108-101 to resonance with oscillator. See top view for location of these transformers. There are two adjustments on each and they are accessible from the top of the transformer shield and should be adjusted with an insulated screw driver.

BROADCAST ALIGNMENT

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





ADJUSTING ANTENNA TRIMMER

Tune in a weak signal at approximately 600 KC with the volume control about three-fourths on. Turn the adjusting screw of the antenna trimmer up or down until maximum output is obtained. See Fig. 1 for location of this trimmer.

DIAL ADJUSTMENT

Tune set to some station of a known frequency (between 800 and 1200 K.C.), hold selector knob, then remove pilot light assembly from back of remote head and with a screw driver adjust the slotted screw through this opening and in this way adjust the dial pointer to the correct frequency setting.

MODEL D745 (1936)
Schematic, Socket
Trimmers, Coils

WESTERN AUTO SUPPLY CO.

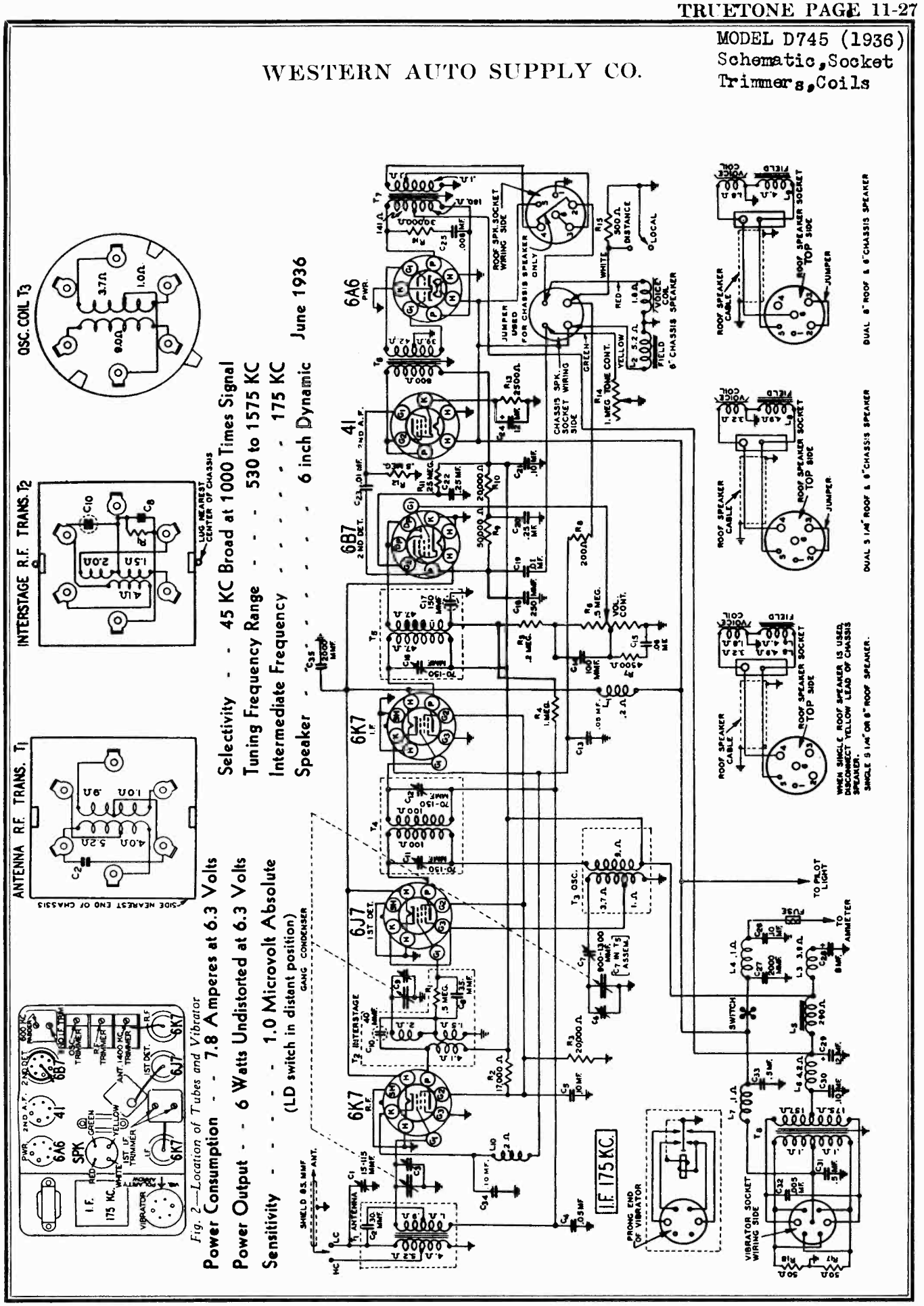


Fig. 2—Location of Tubes and Vibrator

6 Tube Synchronous Vibrator Automobile Radio

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

Type of Tube	Function	Across Heater	Plate to Ground	Screen to Ground	Cathode to Ground
6K7	R.F.	5.6	260	110	3
6J7	1st Det.	5.6	260	110	
6K7	I.F.	5.6	260	110	3
6B7	2nd Det.	5.6	55	50	
41	2nd A.F.	5.7	255	55	30
6A6	Pwr.	5.7	275		

I. F. Adjustment

Set the signal generator for a signal of 175 KC.

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

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

Turn the Local-Distance switch to the Distance position and keep it in this position for all adjustments.

Set the volume control at the maximum position.

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

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

1575 KC Adjustment

Set the signal generator for 1575 KC.

Turn the rotor of the tuning condenser to the full open position.

If a low capacity antenna is used, connect the shielded antenna lead from the chassis through a 150 mmf. condenser to the antenna post of the signal generator. (If high capacity, use 1500 mmf.) The antenna plug must be correctly inserted, dependent on the capacity of the antenna used.

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

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

1400 KC Adjustment

Set the signal generator for 1400 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the R.F. interstage and antenna 1400 KC trimmers for maximum output.

Do not change the setting of the oscillator trimmer.

600 KC Adjustment

Set the signal generator for 600 KC.

Connect the output of the signal generator through a .05 mf. condenser to the control grid of the 6K7 R.F. tube.

Turn the tuning condenser rotor until maximum output is obtained. Then turn the tuning condenser rotor back and forth, at the same time adjusting the 600 KC padder (see Fig. 2) until the peak of greatest intensity is obtained.

Re-connect the output of the signal generator to the shielded antenna lead through a 150 mmf. condenser (1500 mmf. if antenna is high capacity).

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

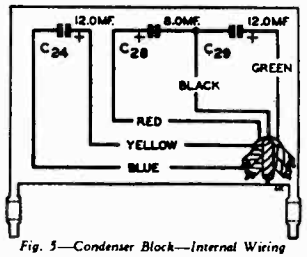


Fig. 5—Condenser Block—Internal Wiring

Adjusting Antenna 600 KC Trimmer

After the receiver is installed and the car antenna is connected, it will be necessary to adjust the antenna trimmer. Tune in a weak signal at approximately 600 KC with the volume control about three-fourths on. Turn the adjusting screw of the antenna 600 KC trimmer up or down until maximum output is obtained. See Fig. 3 for location of this trimmer.

As shown in this illustration, the antenna plug is inserted in one of two ways, depending on whether the car has a high or low capacity antenna. Full instructions are in the installation manual packed with each radio.

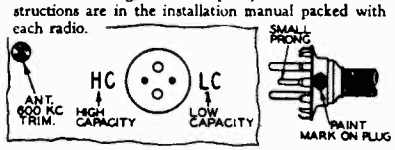


Fig. 3—Antenna Plug Insertion

Calibrating the Radio

To calibrate the radio, tune in a station of known frequency. At the back of the control head is the calibration screw. Remove the pilot lamp assembly. Insert a fine blade screwdriver and turn this screw until the pointer on the dial scale is at the frequency of the station being received. The knob must be held during this adjustment.

If the control head is inaccessible it may be calibrated by setting the pointer from the front. Remove the crystal by inserting a knife blade under the lower edge. Loosen the pointer screw, set the pointer and retighten.

Replacement Parts

There is a large letter on the chassis which identifies the set as to major part changes. When ordering parts please be sure to mention the series number and this large letter.

Part No.		Description	List Price
P-3A223	6J7	Tube Socket	$0.15
P-3A311	6K7	Tube Socket	.15
P-3A285	6A6	Tube Socket	.15
P-3A116	41	Tube Socket	.10
P-3A120	6B7	Tube Socket	.15
P-3A229		6 Prong Socket (External Speaker)	.15
P-3A226		Antenna Socket	.10
P-3A228		Vibrator Socket	.15
P-3A231		4 Prong Socket (Internal Speaker)	.10

SPEAKER

P-12A242		6" Dynamic Speaker	$4.35

Part No.	Code	Description	List Price
P-9A588	L4	"A" Line Reactor	.20
P-52X45	L5	"B" Reactor	.80
P-9A585	L6	"B" Reactor	.30
P-9A587	L7	Vibrator Reactor	.50
P-9A614	L10	Filament Choke	.20

RESISTORS

CARBON

Part No.	Code	Resistance	Wattage	List Price
P-A9684	R1	500,000 Ohms	0.2	$0.15
P-C9417	R2	17,000 Ohms	1.0	.15
P-B9420	R3	20,000 Ohms	0.5	.15
P-A9505	R4	1 Megohm	0.2	.10
P-A9504	R5	200,000 Ohms	0.2	.10
P-A9482	R7	4,500 Ohms	0.2	.15
P-A9481	R8	300 Ohms	0.2	.15
P-B9503	R9	50,000 Ohms	0.5	.10
P-A9502	R10	30,000 Ohms	0.2	.10
P-A9564	R11	250,000 Ohms	0.2	.10
P-A9584	R12	500,000 Ohms	0.2	.10
P-B9482	R13	2,500 Ohms	0.5	.15
P-B9501	R15	800 Ohms	0.5	.15
P-C9503	R16	30,000 Ohms	1.0	.10
P-B9600	R17	50 Ohms	0.5	.15
P-B9600	R18	50 Ohms	0.5	.15

VARIABLE

P-36X217	R6	500,000 Ohms	Volume Control & Switch	1.00
P-40X212	R14	1 Megohm	Tone Control	.70

CONDENSERS

TUBULAR

Part No.	Code	Capacitance	Voltage	List Price
P-46X200	C4	.05 mf.	100	$0.15
P-46X101	C5	.10 mf.	200	.15
P-46X200	C13	.05 mf.	100	.15
P-46X105	C18	.05 mf.	100	.15
P-46X161	C19	.01 mf.	600	.15
P-46X109	C20	.25 mf.	360	.30
P-46X105	C21	.10 mf.	360	.30
P-46X143	C22	.05 mf.	360	.30
P-46X120	C23	.01 mf.	360	.15
P-46X101	C26	.006 mf.	600	.15
P-46X198	C26	.10 mf.	100	.20
P-46X105	C30	.10 mf.	360	.30
P-46X106	C31	.5 mf.	100	.40
P-46X183	C32	.0066 mf.	1,600	.20
P-46X136	C33	.5 mf.	100	.40
P-46X98	C34	.10 mf.	100	.20

ELECTROLYTIC

P-46X211	C24	12 mf.	25	Electrolytic Block 2.70
	C28	8 mf.	450	
	C29	12 mf.	450	

MOLDED

P-47X66	C2	30 mmf.	.15
P-47X53	C8	35 mmf.	.10
P-47X57	C14	100 mmf.	.10
P-47X66	C15	250 mmf.	.15
P-47X41	C27	2,000 mmf.	.30
P-47X41	C35	2,000 mmf.	.30

TRIMMER

P-17A48	C1	25-115 mmf.	Antenna Trimmer	.20
	C3		Antenna Trimmer—Part of Gang Condenser	
	C5		Oscillator Trimmer—Part of Gang Condenser	
P-17A46	C7	900-1,300 mmf.	600 KC Oscillator Padding Cond.	.55
	C16	70-150 mmf.	2nd I. F. Primary Trimmer	
P-17A33	C9		Interstage Trimmer Part of Gang Condenser	.40
	C11	70-150 mmf.		
	C12	70-150 mmf.	1st I. F. Trimmer	

MISCELLANEOUS

	C10	40 mmf.	Integral Part of Interstage Transformer Assembly
	C17	180 mmf.	Integral Part of 2nd I. F. Transformer Assembly
P-14A81		Three Section Gang Condenser Assembly complete with Drive Gears	$4.80

Part No.		Description	List Price
P-19A36		Vibrator Unit	$4.10
Specify Name and Model of Receiver		Chassis Case Only	2.00
		Chassis Case Cover Only	2.00
		Spring Clamp Button	.10
		Tone Control Knob	.10
		Local-Distance Switch Knob	.10
		8-32 x 3/16" Headless Cup Point Set Screw	Doz. .15
P-38X14		Grid Clip only—Glass Tube	.10
P-38X44		Grid Clip only—Metal Tube	.10
P-32X30		Tube Shield Base	.10
P-32X50		Tube Shield	.15
P-2A84		Local-Distance Switch	.40

TRANSFORMERS AND COILS

Part No.	Code	Description	List Price
P-9A580	T1	Antenna Transformer & Can Assembly	$1.60
P-9A581	T2	Interstage Transformer & Can Assembly	1.55
P-9A582	T3	Oscillator Coil & Can Assembly	1.35
P-9A583	T4	1st I. F. Coil & Can Assembly	1.40
P-9A584	T5	2nd I. F. Coil & Can Assembly	1.30
P-50X32	T6	Input Transformer	1.30
P-61X43	T7	Output Transformer	1.40
P-53X134	T8	Power Transformer	3.10
P-9A586	L1	Filament Reactor	.55
	L3	R.F. "B" Reactor } One Assembly	

CABLE AND FLEXIBLE SHAFT ASSEMBLIES

Part No.	Quan. Used	Description	List Price
P-18A40	2	20" Volume Control or Tuning Control Flexible Drive Shaft ea.	$1.10
P-18A42	2	25" Volume Control or Tuning Control Flexible Drive Shaft ea.	1.30
P-18A44	2	36" Volume Control or Tuning Control Flexible Drive Shaft ea.	1.65
P-13X252	1	Pilot Light Cable less Lamp	.45
P-13X253	1	48" Antenna Cable & Plug	.95
P-13X227	1	Battery Cable (long section with fuse receptacle)	.35
P-13X234	1	"A" Cable—Short Section Connected to Chassis (Part of Chassis Assembly)	.35

MOUNTING BOLT ASSEMBLY

P-20X59	3	Double End Hex Bolts for Mounting Chassis to Dash ea.	.10
	3	5/16"—18 Spring Locknut for above Mounting Assembly doz.	.10
P-19X18	6	Flat Washers for above Mounting Assembly doz.	.15
	6	5/16"—18 Hex Nuts for above Mounting Assembly doz.	.15
	1	5/16" Shakeproof Lockwasher to Ground Chassis Case to Metal Dash Surface on Engine Side doz.	.10

MISCELLANEOUS MOUNTING ITEMS

P-7A32	1	Pilot Light Bulb	.20
P-16X14	1	20 Ampere Fuse	.10
P-16X3	1	Fuse Shield	.10
P-21A6	1	Distributor Suppressor	.35
P-48X27	1	Generator Condenser	.45
P-21A5	1	Choke Condenser Unit (Not Shipped with Set)	1.00
P-21A7		Spark Plug Suppressors (Not Shipped with Set) ea.	.35

CONTROL HEAD AND PLATE ASSEMBLY

Part No.	Quan. Used	Description	List Price
*P-28A27	1	No. 6 Control Head only with ¾" Hex Nut	3.00
*P-28A28	1	Volume Control Fitting complete with Retaining Spring, ¾" Hex Nut and Lock Washer	.25
*	1	Dial Scale (Specify Name and Model of Radio)	.10
*P-15X45	1	Pointer	.10
*	1	Pointer Screw 3-48 x 5/16" doz.	.10
†P-17X13	1	Dial Crystal	.25
†		Control Knobs—Specify Car, Year and Model ea.	.25

NOTE: Prices of Instrument Panel Plate Kits are shown in Chart on Page 6.
* Shipped with each Set
†Shipped with Panel Kit

ROOF MOUNTING SPEAKER KITS

1936 BUICK, CHEVROLET, PONTIAC, OLDSMOBILE

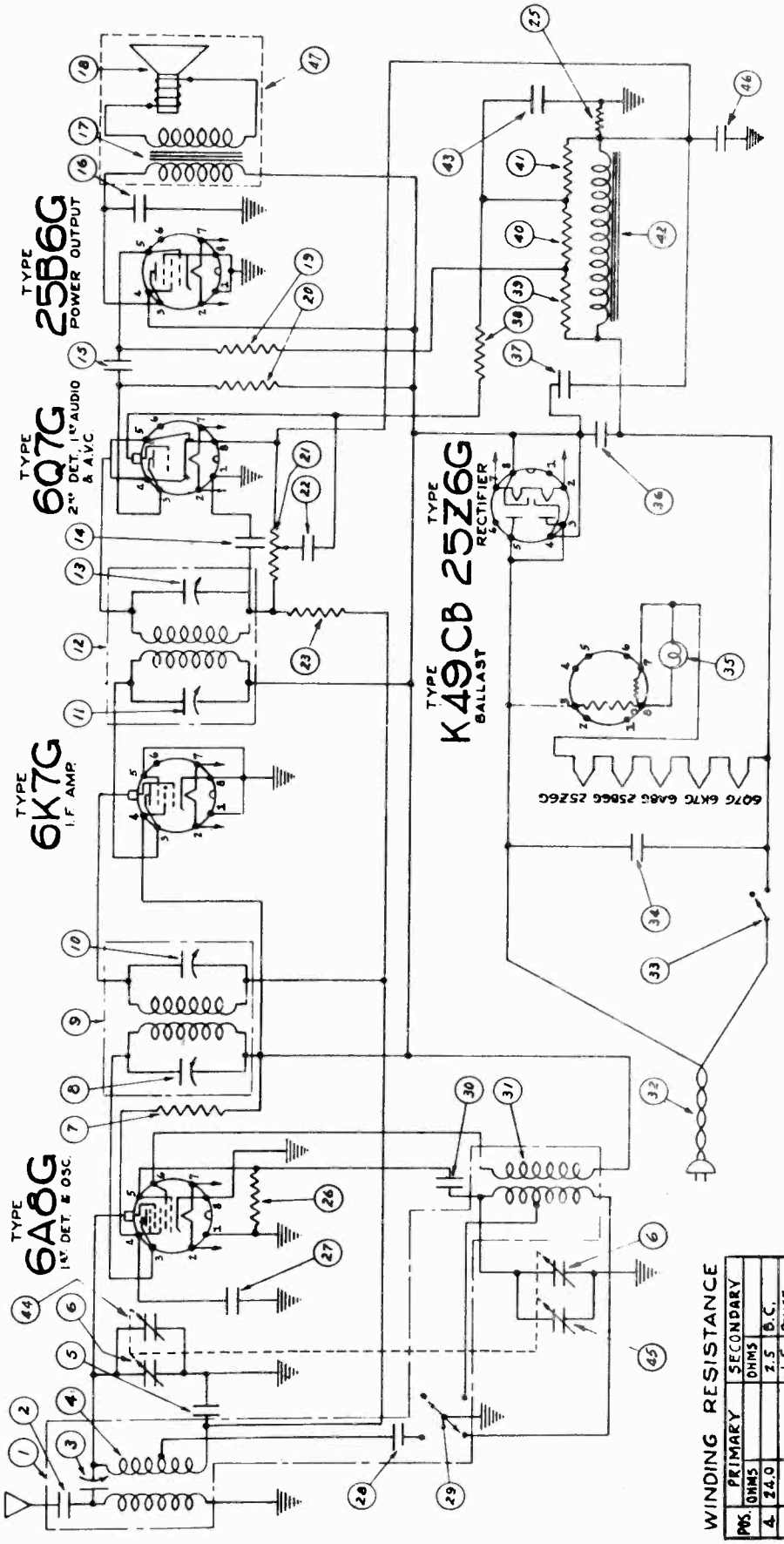
Part No.	Description	List Price
P-21A27	SPEAKER KIT ASSEMBLY COMPLETE Includes	$8.35
P-12A234	6¼" Dynamic Speaker	3.05
P-23A86	Mounting Kit—Includes Trim Ring, Speaker Housing, Self Tapping Screws & Clamp Springs	2.80
P-13X248	Speaker Cable Assembly Complete	1.85
P-21A28	SPEAKER KIT ASSEMBLY COMPLETE Includes	9.65
P-12A233	8" Dynamic Speaker	4.65
P-23A87	Mounting Kit—Includes Trim Ring and Self Tapping Screws	3.80
P-13X248	Speaker Cable Assembly Complete	1.85

1936 FORD—STANDARD AND DELUXE

Part No.	Description	List Price
P-21A29	SPEAKER KIT ASSEMBLY COMPLETE Includes	4.15
P-12A234	6¼" Dynamic Speaker	3.05
P-23A88	Mounting Kit—Includes Hex Nuts, Lockwashers and Bolts	.60
P-13X248	Speaker Cable Assembly Complete	1.85

WESTINGHOUSE ELEC. SUPPLY CO.

MODEL WR120
Schematic, Voltage



INT. FREQ. 455 KC.

ELECTRICAL SPECIFICATIONS

Type and Number of Tubes ..... 1 #6A8G, 1 #6K7G, 1 #6Q7G, 1 #25B6G, 1 #25Z6G, 1 #K49CB (Ballast) - Total 6

Power Supply Characteristics 105-125 volts D.C., or 105-125 volts, 50-60 cycle A.C.

Power Consumption ..... 48 Watts

Total Power Output ..... 2.3 Watts

Undistorted Power Output ..... 1.35 Watts

Tuning Ranges ..... (Broadcast Band 540-1500 KC.
(Short wave Band 1500-3000 KC.

Line-Up Frequencies ..... I.F. 455 KC., 1400 KC.

WINDING RESISTANCE

POS.	PRIMARY OHMS	SECONDARY OHMS	
4	24.0	2.5	B.C.
		1.5	Police
9	9.5	9.5	
12	18.5	18.5	
17	155		
18	4.5		
31	3.0	4.0	B.C.
		2.0	Police
42	375		

SOCKET VOLTAGES

TUBE	STAGE	FIL.	PIN NO	PLATE	PIN NO.	SCREEN	PIN NO.	BIAS
6A8G	1ST. DET. & OSC.	6.3	2 To 7	98	1 To 3	48	1 To 4	
6K7G	I.F. AMPLIFIER	6.3	2 To 7	98	1 To 3	98	1 To 4	-1.2
6Q7G	2ND DET. 1ST AUD. & AVC	6.3	2 To 7	32	1 To 3			
25B6G	POWER OUTPUT	25.5	2 To 7	90	1 To 3	98	1 To 4	
25Z6G	RECTIFIER	25.5	2 To 7					
K49C	BALLAST							

MODEL WR120
Alignment, Parts

WESTINGHOUSE ELEC. SUPPLY CO.

GENERAL DESCRIPTION

This model is a five-tube (plus a ballast tube), two-band superheterodyne receiver, designed to operate over the standard broadcast band, extending from 540 to 1500 KC., and a short-wave band extending from 1500 to 3000 KC.

The receiver uses a type 6A8G tube as a first detector-oscillator, a type 6K7G as an I.F. amplifier, a type 6Q7G as a second detector, A.V.C., and first audio, a type 25B6G as an output, a type 25Z6G as a rectifier and a K49CB as a ballast tube.

LINE-UP CAPACITOR ADJUSTMENTS

To properly align the circuits of this receiver, it is essential to use a high grade modulated test oscillator, the output of which can be continuously varied and reduced sufficiently to prevent overload as the individual circuits of the receiver are brought into alignment. A conventional output meter should be connected across the terminals of the speaker voice coil to indicate when the individual circuits are correctly aligned. The sensitivity of the meter must be sufficient to give satisfactory reading with low input signals.

Before attempting to align the receiver, the service man should familiarize himself with the general layout of the chassis, location of the various tubes and alignment condensers.

ALIGNMENT OF I.F. (455 KC.)

1. Set the volume control to maximum position and wave-change switch to standard broadcast band.

2. Connect the output meter across the voice coil terminals of the speaker.

3. Set the test oscillator to 455 KC., and adjust its output to produce a measureable reading on the output meter when the test signal is applied to the grid of the type 6A8G first detector-oscillator tube through a 0.5 mfd. blocking condenser.

4. Adjust the four trimmer condensers on the top of the two I.F. coils (square housings) to maximum output.

ALIGNMENT OF OSCILLATOR AND R.F.

1. Check the pointer setting to be sure that it is exactly horizontal when the tuning condenser is completely closed.

2. Set the test oscillator and dial indicator to 1400 KC., and adjust the oscillator trimmer condenser (rear section of gang) to maximum output.

3. Apply the test signal to coil end of the antenna cable through a .0001 mfd. blocking condenser and adjust trimmer condenser (front section of gang) to maximum output.

4. Check sensitivity over the band.

5. Turn wave-change switch to the short-wave band and check the sensitivity over scale.

TRAP ALIGNMENT

This receiver is provided with a tuned trap which can be adjusted from the bottom without removing the receiver from the cabinet. This trimmer does not need to be adjusted unless there is code interference, in which case, adjustment is made to eliminate the undesired signal.

SERVICE PARTS LIST

Dia. #	Part #	Description of Parts	List Price
1	RC 95298	Composite coil	$ 2.35
2	CW 6-005	.005 mfd., 600 V. condenser	.15
3		Trimmer condenser - part of RC 95298	
4		Preselector coil - part of RC 95298	
5	SA 105327	.05 mfd., 200 V. dual condenser	.30
6	CG 9562	Variable condenser	3.00
7	RE 3333	33,000 ohm, 1/2 W. resistor	.10
8		Trimmer condenser - 80-200 mmf. - part of IC 95107	
9	IC 95107	1st I.F. coil - 455 KC.	1.50
10		Trimmer condenser - 80-200 mmf. - part of IC 95107	
11		Trimmer condenser - 35-130 mmf. - part of IC 95108	
12	IC 95108	2nd I.F. coil - 455 KC.	1.20
13		Trimmer condenser - 35-130 mmf. - part of IC 95108	
14	CM 956	.00025 mfd. mica condenser	.20
15	CW 6-005	.005 mfd., 600 V. condenser	.15
16	CW 6-005	.005 mfd., 600 V. condenser	.15
17	TR 9588	Output transformer	1.35
18	DM 9512	Diaphragm and coil assembly	1.50
19	RE 4743	470,000 ohm, 1/2 W. resistor	.10
20	RE 2243	220,000 ohm, 1/2 W. resistor	.10
21	VR 9549	Volume control	.80
22	CW 6-005	.005 mfd., 600 V. condenser	.15
23	RE 4743	470,000 ohm, 1/2 W. resistor	.10
25	RE 1003	10 ohm, 1/2 W. resistor	.10
26	RE 4733	47,000 ohm, 1/2 W. resistor	.10
27		.05 mfd., 200 V. dual condenser - part of SA 105327	
28	CW 6-005	.005 mfd., 600 V. condenser	.15
29	SW 9576	Wave-change switch	.35
30	CM 9513	.0001 mfd. mica condenser	.10
31		Oscillator coil assembly - part of RC 95298	
32	CB 9512	Line cable	.50
33		On-off switch - part of VR 9549	
34	CW 4-05	.05 mfd., 400 V. condenser	.15
35	LP 951	Dial lamp - 6-8 V.	.20
36	CE 9559	40 mfd., 150 V. electrolytic condenser	.75
37	CE 9560	30 mfd., 150 V. electrolytic condenser	.75
38	RE 4743	470,000 ohm, 1/2 W. resistor	.10
39	RE 4743	470,000 ohm, 1/2 W. resistor	.10
40	RE 4743	470,000 ohm, 1/2 W. resistor	.10
41	RE 6833	68,000 ohm, 1/2 W. resistor	.10
42		Field coil - part of SK 9567	
43	CW 2-25	.25 mfd., 200 V. condenser	.20
44		Trimmer condenser - part of CG 9562	
45		Trimmer condenser - part of CG 9562	
46	CW 2-10	.1 mfd., 200 V. condenser	.15
47	SK 9567	Speaker	4.00

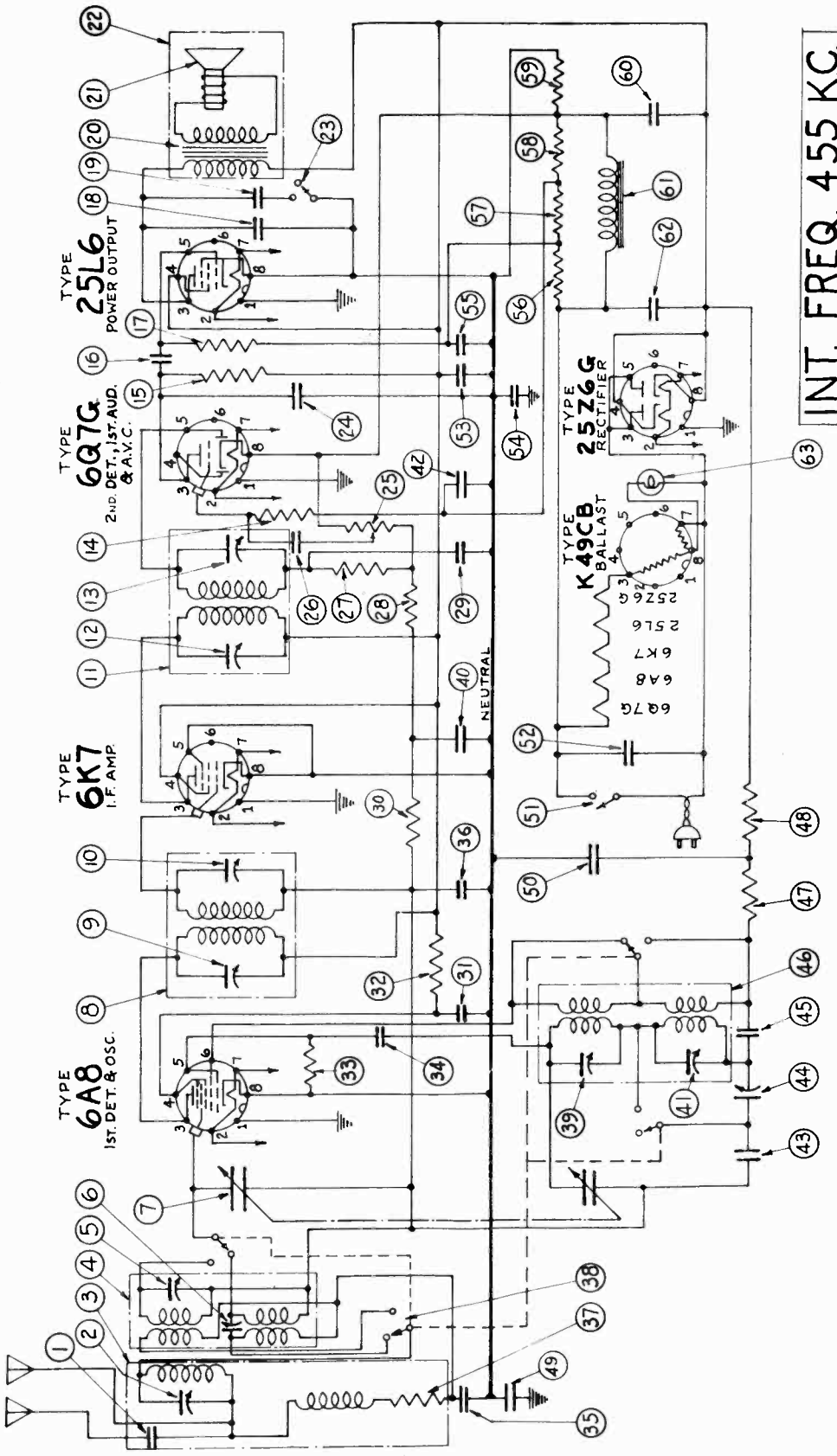
MISCELLANEOUS

Part #	Description of Parts	List Price
CV 95229	Celluloid cover for dial	.35
DS 9589	Celluloid dial scale	.70
FA 9519	Silk grill cloth	.15
FP 101869	Felt foot (4 used)	.05
IS 95216	Rubber pulley on drive shaft	.05
KA 9583	Cabinet	
KL 105344	"Hank" antenna cable	.20
KN 95127	Knob (3 used)	.12
NT 958	3/8" Pal nut for volume and switch	.05
PL 95112	Dial supporting plate	.25
PR 97160	Cord for dial drive — Per Yard	.05
PU 9529	Dial drive pulley assembly	.25
SI 9571	Dial indicator pointer	.20
SP 9551	Spring for dial drive cord	.05
SP 9553	Spring clip for celluloid dial cover	.05
SO 956	Octal base tube socket (6 used)	.20
SO 9529	Dial light socket assembly	.15
TU 95170	Insulation tube for electrolytic condenser	.05

PRICES SUBJECT TO CHANGE
WITHOUT NOTICE

MODEL WR140

WESTINGHOUSE ELEC. SUPPLY CO. Schematic, Voltage



SOCKET VOLTAGES

TUBE	STAGE	FIL.	PIN NO. PLATE	PIN NO. SCREEN	PIN NO. CAT.	CATH
6A8	1st DET. & Osc.	6.3	2 to 7 — 105	3 to 8 — 45	4 to 8 — 97	—
6K7	I.F. AMP.	6.3	2 to 7 — 105	3 to 8 — 105	4 to 8 —	—
6Q7G	2nd DET. 1st AUD. & A.V.C.	6.3	2 to 7 — 45	3 to 8 —	—	0.7
25L6	Power Output	6.3	2 to 7 — 98	3 to 8 — 105	4 to 8 —	—
25Z6G	RECTIFIER	25.3	2 to 7 —	—	—	—
K49CB	BALLAST	—	—	—	—	105

ELECTRICAL SPECIFICATIONS

Type and Number of Tubes . 1 #6A8, 1 #6K7, 1 #6Q7G, 1 #25L6, 1 #25Z6G, 1 #K49CB - Total 6
Power Supply Characteristics ..... 105-125 V., DC. or 105-125 V., 50-60 cycle A.C.
Power Consumption ..... 45 Watts
Total Power Output ..... 2.2 Watts
Undistorted Output ..... 1.2 Watts
Tuning Ranges ..... (Broadcast Band 535- 1,720 KC.
..... (Short-wave Band 5,800-17,500 KC.
Line-Up Frequencies ..... I.F. 455 KC., 1500 KC., 600 KC., 15,000 KC.

WINDING RESISTANCE

Pos.	PRIMARY		SECONDARY	
	OHMS		OHMS	
3	10.0		10.0	
4	34.5	B.C.	4.0	B.C.
5	0.5	S.W.	0.2	S.W.
8	90		90	
11	90		90	
20	155		0.2	
21			4.5	
46	1.0	B.C.	4.0	B.C.
46	1.0	S.W.	0.5	S.W.
61	375			

GENERAL DESCRIPTION

This model is a five-tube (plus ballast tube), A.C.-D.C., two-band superheterodyne receiver designed to operate over the standard broadcast band, extending from 535-1720 KC., and a short-wave band extending from 5800-17,500 KC.

LINE-UP CAPACITOR ADJUSTMENTS

To properly align the circuits of this receiver, it is essential to use a high grade modulated test oscillator, the output of which can be continuously varied and reduced sufficiently to prevent overload as the individual circuits of the receiver are brought into alignment. A conventional output meter should be connected across the terminals of the speaker voice coil to indicate when the individual circuits are correctly aligned. The sensitivity of the meter must be sufficient to give satisfactory readings with low input signals.

Before attempting to align the receiver, the service man should familiarize himself with the general layout of the chassis, location of the various tubes and alignment condensers.

ALIGNMENT OF I.F. (455 KC.)

1. Set the volume control to maximum position, the wave-change switch to standard broadcast band and the dial pointer to approximately 600 KC.

2. Connect the output meter across the voice coil terminals of the speaker.

3. Set the test oscillator to 455 KC., and adjust its output to produce a measurable reading on the output meter when the test signal is applied to the grid of the first detector-oscillator tube through a 0.5 mfd. blocking condenser.

4. Adjust the four I.F. trimmer condensers underneath the chassis (under the square coil housings) to maximum output.

BROADCAST BAND

1. Check the pointer setting to be sure that it is exactly horizontal when the tuning condenser is completely closed.

BA 9525	Speaker baffle	$ .05
CV 954	Tube shield	.10
CV 95232	1st I.F. coil cover	.25
CV 95233	2nd I.F. coil cover	.25
CV 95261	Base plate	1.25
DS 9585	Dial scale	1.60
FP 108003	Felt knob washer	.05
IS 95216	Rubber drive bushing	.05
KA 9593	Cabinet	
KN 95128	Knob - small (push-on type)	.12
KN 95129	Knob - large (push-on type)	.12
KN 95150	Knob - small (set screw type)	.12

2. Set the test oscillator and dial indicator at 1500 KC., and adjust the oscillator trimmer (the rear trimmer on the coil fastened to the back plate of the chassis).

3. Set the test oscillator and dial pointer to 600 KC.

4. Adjust the oscillator lag condenser (on the base near the antenna coil) for maximum output, at the same time rocking the gang condenser.

5. Reset test oscillator and dial pointer to 1500 KC., and recheck operation #2.

6. Connect the test oscillator to the blue antenna lead through a .0002 mfd. condenser and adjust the antenna trimmer (the bottom condenser on the coil on the top of the chassis).

7. Check sensitivity and calibration over the scale.

ALIGNMENT OF THE SHORT-WAVE BAND

1. Turn the wave-change switch to the short-wave position.

2. Set the test oscillator and dial pointer to 15,000 KC., and adjust the short-wave oscillator trimmer (the trimmer on the inside end of the coil on the back plate of the chassis). Two positions may be found. Use the one with the least capacity, that is, with the trimmer screw farthest out.

3. Adjust the short-wave antenna trimmer (the top condenser on the coil on the top of the chassis).

4. Check sensitivity and calibration over the scale.

TRAP ALIGNMENT

This receiver is provided with a tuned trap (the upright coil under the chassis) which is adjusted to eliminate a signal at the I.F. frequency (455 KC.) applied to the antenna. If there is code interference which is known to originate near the 455 KC. channel, this trimmer may be adjusted to minimize the undesired signal.

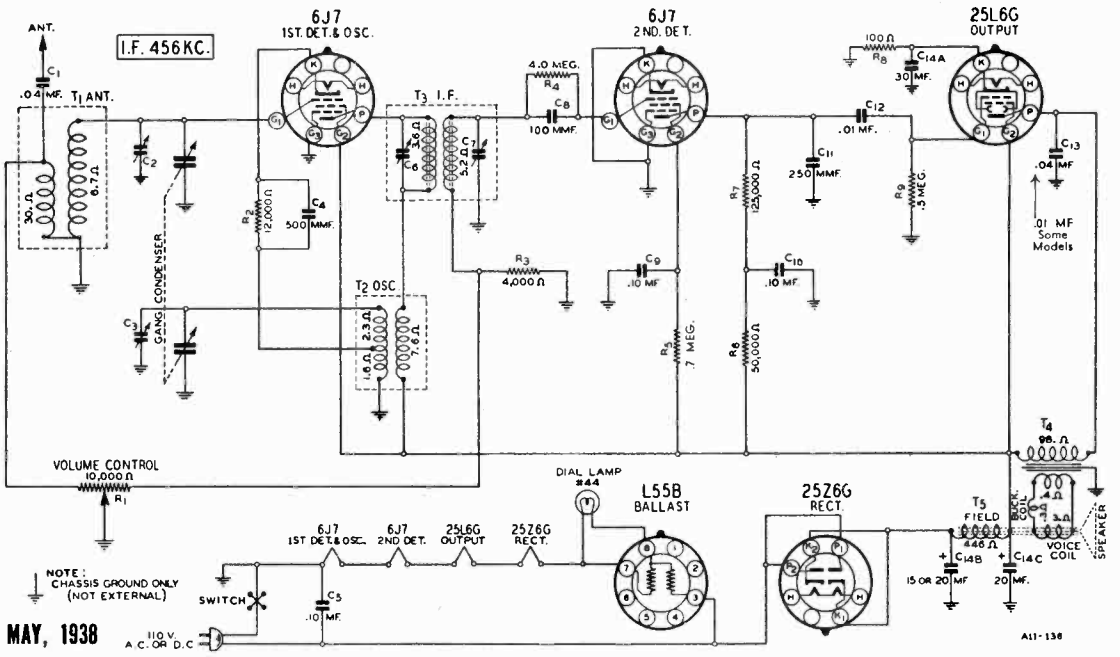
KN 95151	Knob - large (set screw type)	.12
PL 95115	Escutcheon dial plate	1.50
PL 95128	Dial supporting plate	.30
PR 97160	Dial drive cord Per Yard	.05
PU 9544	Dial drive pulley	.40
SC 953	Felt foot and mounting screw	.05
SH 9550	Dial drive shaft	.20
SI 9575	Dial pointer	.20
SO 956	Octal tube socket (5 used)	.20
SO 9539	Dial lamp socket	.35
SP 9551	Dial cord spring	.05

PARTS LIST

Dia. #	Part #	Description of Parts	List Price
1		.00005 mfd. mica condenser - part of RC 95296	$
2		Trimmer condenser 100-200 mmf. - part of RC 95296	
3	RC 95296	Trap coil assembly	1.25
4	RC 95356	Preselector coil assembly	1.60
5		Trimmer condenser 4-25 mmf. - part of RC 95356	
6		Trimmer condenser 4-25 mmf. - part of RC 95356	
7	CG 9565	Gang condenser	3.75
8	IC 95109	1st I.F. coil - 455 KC.	1.20
9		Trimmer condenser - part of IC 95109	
10		Trimmer condenser - part of IC 95109	
11	IC 95110	2nd I.F. coil - 455 KC.	1.20
12		Trimmer condenser - part of IC 95110	
13		Trimmer condenser - part of IC 95110	
14	RE 1053	1 meg., 1/2 W. resistor	.10
15	RE 2243	220,000 ohm, 1/2 W. resistor	.10
16	CW 6-005	.005 mfd., 600 V. condenser	.15
17	RE 4743	470,000 ohm, 1/2 W. resistor	.10
18	CW 4-01	.01 mfd., 400 V. condenser	.15
19	CW 2-10	.1 mfd., 200 V. condenser	.15
20	TR 9588	Output transformer	2.00
21	DM 9537	Speaker diaphragm	1.75
22	SK 9596	Speaker	.55
23	SW 9595	Tone control	.15
24	CW 6-001	.001 mfd., 600 V. condenser	.15
25	VR 9547	Volume control - .5 meg.	.80
26	CW 6-005	.005 mfd., 600 V. condenser	.15
27	RE 4733	47,000 ohm, 1/2 W. resistor	.10
28	RE 1053	1 meg., 1/2 W. resistor	.10
29	CM 9513	100 mmf. mica condenser	.10
30	CW 2-10	.1 mfd., 200 V. condenser	.15
31	CW 2-10	.1 mfd., 200 V. condenser	.15
32	RE 3933	39,000 ohm, 1/2 W. resistor	.10
33	RE 4733	47,000 ohm, 1/2 W. resistor	.10
34	CM 9513	100 mmf. mica condenser	.10
35	CW 4-01	.01 mfd., 400 V. condenser	.15
36	CW 2-05	.05 mfd., 200 V. condenser	.15
37		10,000 ohm, 1/2 W. resistor - part of RC 95296	
38	SW 9574	Wave-change switch	.70
39		Trimmer condenser 4-35 mmf. - part of RC 95301	
40	CW 2-10	.1 mfd., 200 V. condenser	.15
41		Trimmer condenser 4-35 mmf. - part of RC 95301	
42	CW 2-10	.1 mfd., 200 V. condenser	.15
43	CM 959	2000 mmf. mica condenser	.25
44	CS 9585	Oscillator series (lag) condenser - 225-700 mmf.	.35
45	CW 6-005	.005 mfd., 600 V. condenser	.15
46	RC 95301	Oscillator coil assembly	1.50
47	RE 2223	2200 ohm, 1/2 W. resistor	.10
48	RE 2223	2200 ohm, 1/2 W. resistor	.10
49	CW 6-10	.1 mfd., 600 V. condenser	.15
50	CE 9575	8 mfd., 150 V. electrolytic condenser	.70
51		On-off switch - part of VR 9547	
52	CW 6-10	.1 mfd., 600 V. condenser	.15
53	CW 2-10	.1 mfd., 200 V. condenser	.15
54	CW 6-10	.1 mfd., 600 V. condenser	.15
55	CW 2-25	.25 mfd., 200 V. condenser	.20
56	RE 8243	820,000 ohm, 1/2 W. resistor	.10
57	RE 2243	220,000 ohm, 1/2 W. resistor	.10
58	RE 3333	33,000 ohm, 1/2 W. resistor	.10
59	RE 1003	10 ohm, 1/2 W. resistor	.10
60	CE 9574	30 mfd., 150 V. electrolytic condenser	.90
61		Speaker field (not serviced)	
62	CE 9557	40 mfd., 150 V. electrolytic condenser	1.00
63	LP 951	Dial lamp - 6-8 V., .2 Amp.	.20
64	RE 4723	4700 ohm, 1/2 W. resistor	.10
65	RE 1053	1 meg., 1/2 W. resistor	.10

WESTINGHOUSE ELEC. SUPPLY CO.

MODEL WR150
Early, Late
Schematic, Voltage
Alignment, Socket
Trimmers, Notes



MAY, 1938

CIRCUIT

This radio, popularly known as an AC-DC set, is, as the name implies, built to operate from either a 117 volt AC or DC power supply.

An R.F. transformer with tuned secondary feeds into a 6J7 tube which functions as the 1st detector and oscillator. The oscillating circuit is resonant at 456 KC above the frequency to which the R.F. transformer secondary is tuned.

The output of this tube is fed through an iron core I.F. transformer into another 6J7 tube which functions as the 2nd detector.

The volume control is of the variable antenna input and I.F. gain type.

Resistance coupling is used between the 2nd detector and the output stage which uses a 25L6G tube.

A 25Z6G rectifier tube is used. For AC operation, the filter unit consists of the rectifier tube, filter condensers and the speaker field which serves as a choke. For DC operation, the rectifier tube acts as a low resistance series resistor.

The heaters of the 4 tubes and the ballast tube are in series across the line. The dial lamp is in parallel with one section of the ballast tube resistance.

CAUTION—The metal chassis is connected to one side of the line through the switch. Both AC and DC power lines are generally grounded on one side. If the side of the line not connected to the metal chassis is grounded, and the metal chassis comes in contact with an external ground, a line short circuit will result.

In any service work, therefore, on the AC-DC chassis, keep it on a wood or other insulated surface to avoid contacts with ground. The person working on the set should avoid coming in contact with any ground.

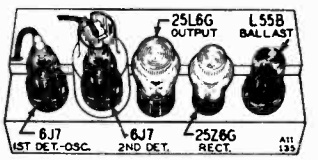
Pilot Lamp—Use ONLY a No. 44 dial lamp. This lamp draws .25 amperes at 6.3 volts.

25 Cycle Models—For 25 cycle operation, the 3 section electrolytic condenser is replaced by one with values as shown:

C14A	30 mf.	25	Dry Electrolytic—60 CYCLE MODELS
C14B	15 or 20 mf.	200	
C14C	20 mf.	120	
C14A	30 mf.	25	Dry Electrolytic—25-40 CYCLE MODELS
C14B	60 mf.	200	
C14C	30 mf.	200	

DISTORTION — Early Models — If distortion is encountered at medium or low volume levels in the early models, change the .5 megohm 2nd detector screen series resistor (R 5) to a .7 megohm resistor.

Speaker	5" Dynamic
Tuning Frequency Range	530 to 1730 KC
Sensitivity	180 Microvolts Average
Power Consumption	48 Watts (At 117 volts AC Supply)
Power Output	.8 Watts Undistorted
Selectivity	30 KC Broad at 100 times Signal
Intermediate Frequency	456 KC



ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments. Allow Chassis and Signal Generator to "Heat Up" for Several Minutes.

SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM (See Illustration)
456 KC	Grid of 1st Det.	.1 mf.	Turn rotor to full open	I.F. (C6) & (C7)
1730 KC	Antenna Lead	200 mmf.	Turn rotor to full open	Oscillator (C3)
1500 KC	Antenna Lead	200 mmf.	Turn rotor to max. output	Antenna (C2)

The following equipment is required for aligning: Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed. Output Indicating Meter; Non-Metallic Screwdriver. Dummy Antennas — .1 mf. and 200 mmf.

NOTE—To obtain dial scale calibration, tune in an 800 KC signal. The pointer should be at the 800 KC mark on the dial. If it is not, loosen the pointer screw, set the pointer at the 800 KC mark and retighten the pointer screw.

VOLTAGES AT SOCKETS FOR 117 VOLT AC LINE

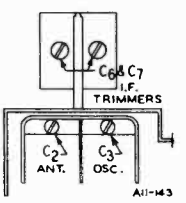
See Note Below Regarding Voltages when Operated on DC

Volume Control Maximum—Antenna Lead Grounded—Readings taken with 1000 Ohm-per-volt Meter.

TUBE	FUNCTION	Voltage Between Socket Prong and Ground (Unless Otherwise Indicated)							
		Prong No. 1	Prong No. 2	Prong No. 3	Prong No. 4	Prong No. 5	Prong No. 6	Prong No. 7	Prong No. 8
6J7	1st Det. & Osc.		6.3(1)	98	98			6.3(1)	6.0
6J7	2nd Det.		6.3(1)	10	13			6.3(1)	
25L6G	Output		24(1)	92	98			24(1)	5
25Z6G	Rectifier		24(1)	117(2)	125	117(2)		24(1)	125
L55B	Ballast			56.6(3)				56.6(3)	4.5(4)

(1) AC voltage across terminals 2 and 7.
(2) AC voltage to ground.
(3) AC voltage across terminals 3 and 7.
(4) AC voltage across terminals 7 and 8.

DC OPERATION—Filament and ballast tube voltages will be the same as AC (for 117 volt line). The plate, screen and bias voltages will be slightly lower than those shown above. When operated on DC, the rectifier tube acts as a low resistance series resistor with a drop of approximately 6 volts between plate and cathode.

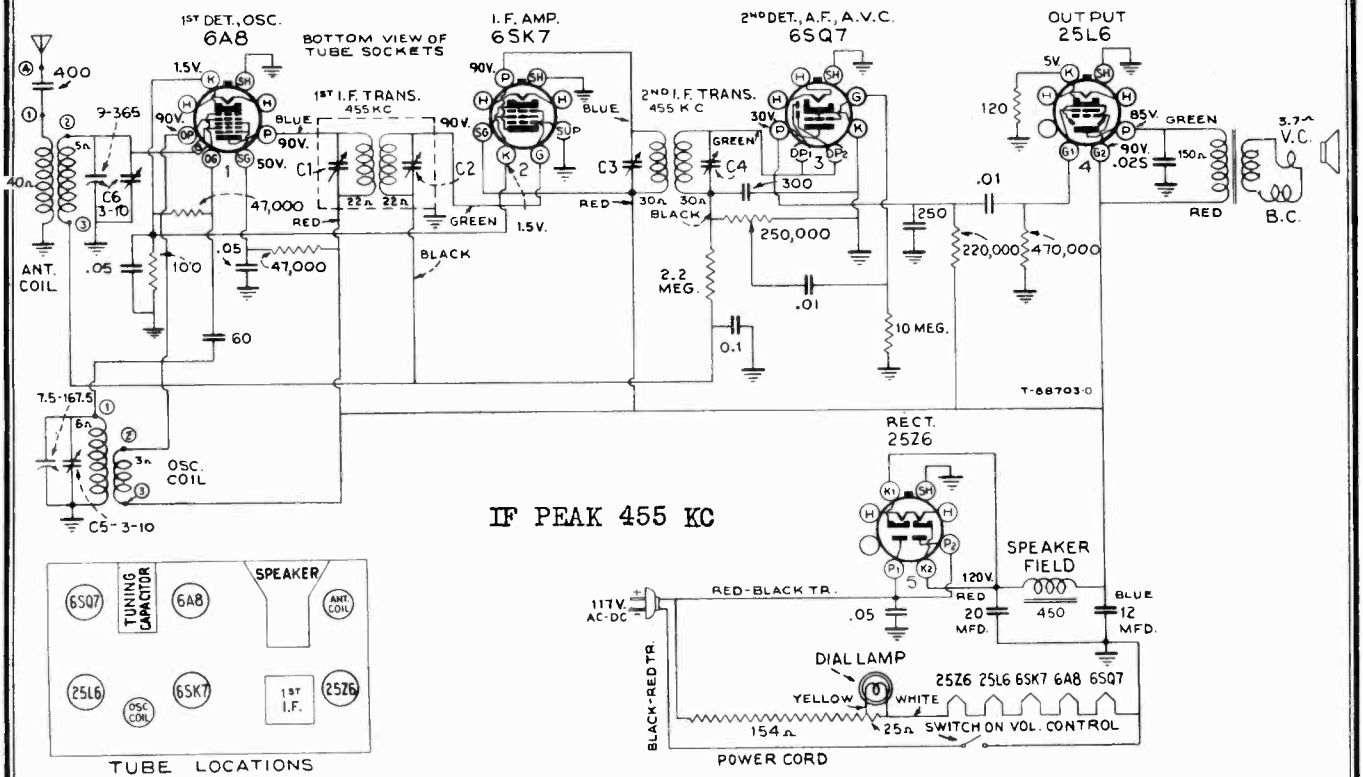


CAUTION—In any service work on the AC-DC chassis, keep it on a wood or other insulated surface to avoid contacts with ground.

MODELS WR165W, WR165I
WR165M

WESTINGHOUSE ELEC. SUPPLY CO.

Schematic, Voltage
Alignment, Socket
Trimmers, Lead Dress



IF PEAK 455 KC

TUBE LOCATIONS

Electrical and Mechanical Specifications

FREQUENCY RANGE ..... 530-1,720 kc

INTERMEDIATE FREQUENCY ..... 455 kc

WR-165-W, Molded plastic cabinet, walnut finish, with ivory dial and walnut knobs.

WR-165-I, Molded ivory plastic cabinet with ivory dial and red knobs.

WR-165-M, Solid mahogany wood cabinet, maple finish, with ivory dial and walnut knobs.

POWER SUPPLY RATINGS

A-C Rating ..... 105-125 volts, 50-60 cycles, 50 watts
D-C Rating ..... 105-125 volts, direct current, 50 watts

POWER OUTPUT (125 volt, 60 cycle supply)

Undistorted ..... 1.5 watts
Maximum ..... 2.0 watts

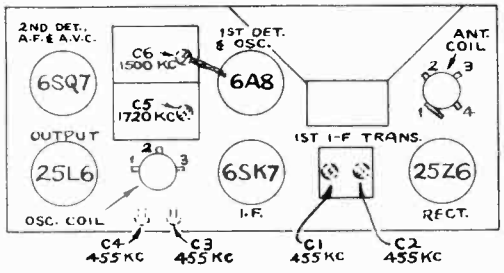
LOUDSPEAKER

Type ..... 4-inch Electrodynamic

Dial Lamp (1) ..... Mazda 47, 6.3 volts, .15 amp.

Alignment Procedure

Output Meter Alignment.—Connect the meter across the voice coil, and turn the receiver volume control to maximum.



Trimmer Locations

Test-Oscillator.—Connect the low side of the test-oscillator to the receiver chassis, through a .01 mfd. capacitor, and keep the output as low as possible. The antenna should be rolled up and kept at least one foot from chassis during alignment.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	6A8 1st-Det. grid cap, in series with .01 mfd.	455 kc	Quiet point at 1,600 kc end of dial	C1, C2, C3, C4 (1st and 2nd I-F transformers)
2	Antenna term. of ant. trans. in series with 100 mmfd.	1,720 kc	Full clockwise (out of mesh)	C5 (oscillator)
3		1,500 kc	Resonance on 1,500 kc signal.	C6 (antenna)

Precautionary Lead Dress

1. Dress 1st I-F plate and grid leads against chassis and away from each other. Dress plate lead from 6SK7 close to chassis.
2. Dress electrolytic capacitor against rear apron.
3. Keep leads away from adjusting screws to allow easy access.
4. Dress output plate lead along front apron and away from 6A8.
5. Dress parts at ends of chassis to clear cabinet bosses.

Power-Supply Polarity.—For operation on d-c, the power plug must be inserted in the outlet for correct polarity. If the set does not function, reverse the plug. On a-c, reversal of the plug may reduce hum.

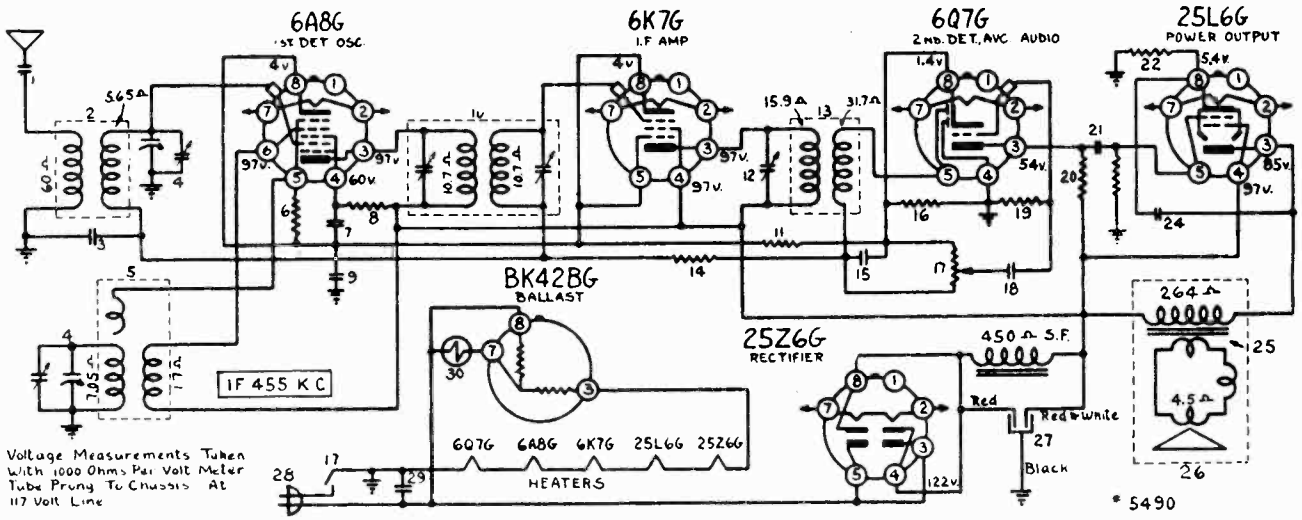
Resistor in Power Cord.—The power cord contains a resistor which becomes warm during operation.

Antenna.—The set is equipped with length of antenna wire. Do not connect the antenna to ground. If an outdoor antenna is used, it should not be longer than 100 feet, including lead-in. If it is longer, connect a 100 to 200 mmf. capacitor in series with the lead-in.

MODEL WR152

WESTINGHOUSE ELEC. SUPPLY CO. MODEL WR166A

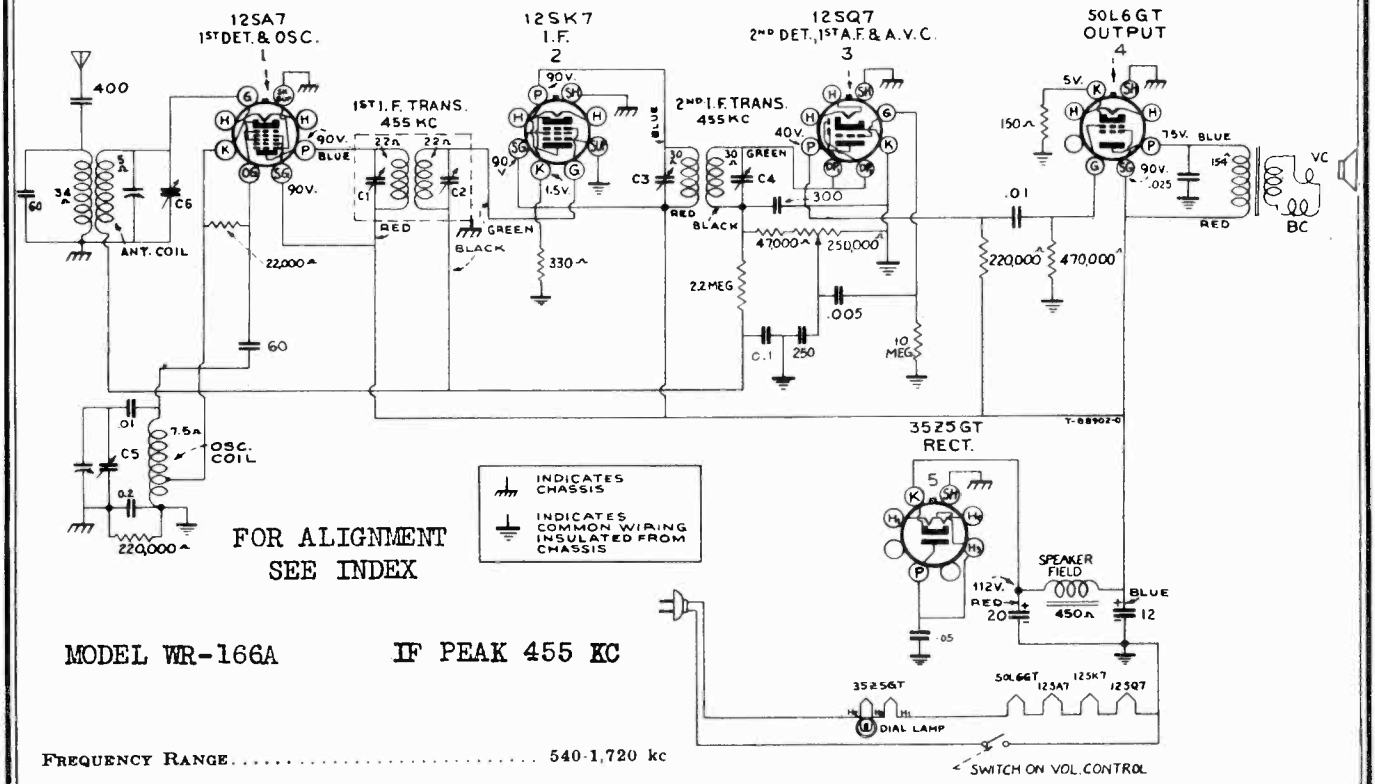
Schematics, Voltage



Readings should hold within ± 20%.

MODEL — W R 152

Power Supply	**.105—125 volts, DC or 50—60 cycles AC**
Tuning Range	**.540—1720 K.C.**
Line up Frequencies	**.I.F. 455 K.C., 1720 K.C., 1400 K.C.**
Power Output	**.Two watts**



FOR ALIGNMENT SEE INDEX

MODEL WR-166A IF PEAK 455 KC

FREQUENCY RANGE	540-1,720 kc
INTERMEDIATE FREQUENCY	455 kc
POWER OUTPUT (125 volt, 60 cycle supply)	
Undistorted	0.5 watts
Maximum	1.25 watts
LOUDSPEAKER	
Type	4-inch Electrodynamic
Dial Lamp (1)	Mazda 47, 6.3 volts, .15 amp.
POWER SUPPLY RATINGS	
A-C Rating	105-125 volts, 50-60 cycles, 30 watts
D-C Rating	105-125 volts, direct current, 30 watts

FIG. No. 1

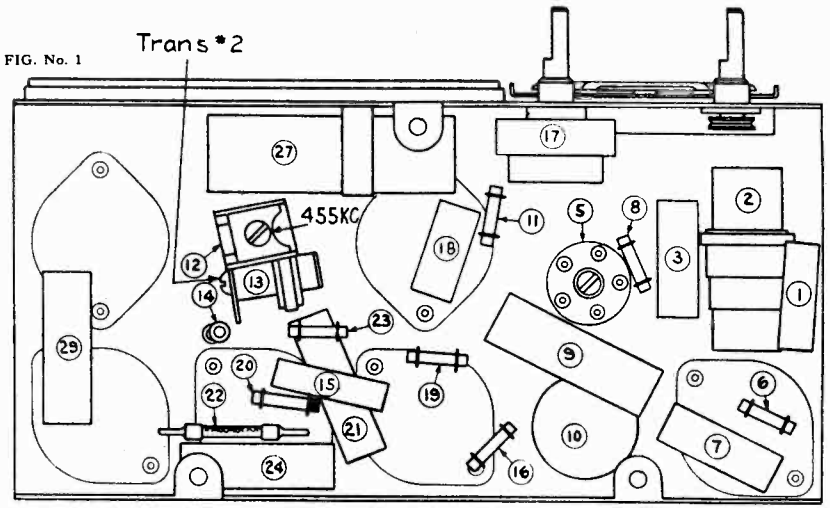


DIAGRAM NO.	PART NO.	DESCRIPTION OF PARTS	LIST PRICE
1	D3137	.001 mf.—400 v. Condenser	.15
2	D5497	Antenna Coil Assembly	1.00
3	D580	.05 mf.—200 v. Condenser	.15
4	D5485	Variable Condenser inc. Trimmers	1.75
5	D4875	Oscillator Coil Assembly	1.00
6	D631	50,000 ⅓ watt Resistor	.15
7	D580	.05 mf.—200 v. Condenser	.15
8	D617	20,000 ⅓ watt Resistor	.15
9	D2792	.2 mf.—200 v. Condenser	.15
10	D2972	1 St. I.F. Transformer Assembly	2.00
11	D2605	200 ohm ⅓ watt Resistor	.15
12	D1611	5—35 mmf. Trimmer Condenser	.15
13	D5004	2 nd. I.F. Transformer Assembly	1.00
14	D624	1 meg.⅓ watt Resistor	.15
15	D4810	.0005 mf.—400 v. Condenser	.15
16	D2689	100 ohm ⅓ watt Resistor	.15
17	D5486	½ meg. Volume Control and ON-OFF Switch	1.25
18	D565	.01 mf.—200 v. Condenser	.15
19	D624	1 meg. ⅓ watt Resistor	.15
20	D598	200,000 ohm ⅓ watt Resistor	.15
21	D2600	.02 mf.—600 v. Condenser	.15
22	D4813	120 ohm ½ watt Flexohm Resistor	.15
23	D615	½ meg. ⅓ watt Resistor	.15
24	D5500	.04 mf.—600 v. Condenser	.15
25	D5484T	Output Transformer	1.00
26	D5484	Speaker, 5 in., complete	3.00
27	D5499	16—20 mf CCCW 150 WV Condenser	1.00
28	D1732	Line Cord and Plug	.25
29	D5500	.04 mf.—600 v. Condenser	.15
30	D530	Dial Lamp, .15 amp., 6.3 volt, Mazda No. 40	.10
	D3268	8 Prong Tube Socket	.10
	D4395	Drive Cable, 9 in.	.10
	D2908	Drive Cable Spring	.10
	D5488	Dial Scale	.30
	D5489	Pointer	.15
	D5493	Knob	.05
	D5503	Dial Escutcheon	.30
	D3333	Escutcheon Screws, set of 4	.05

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

Alinement Procedure

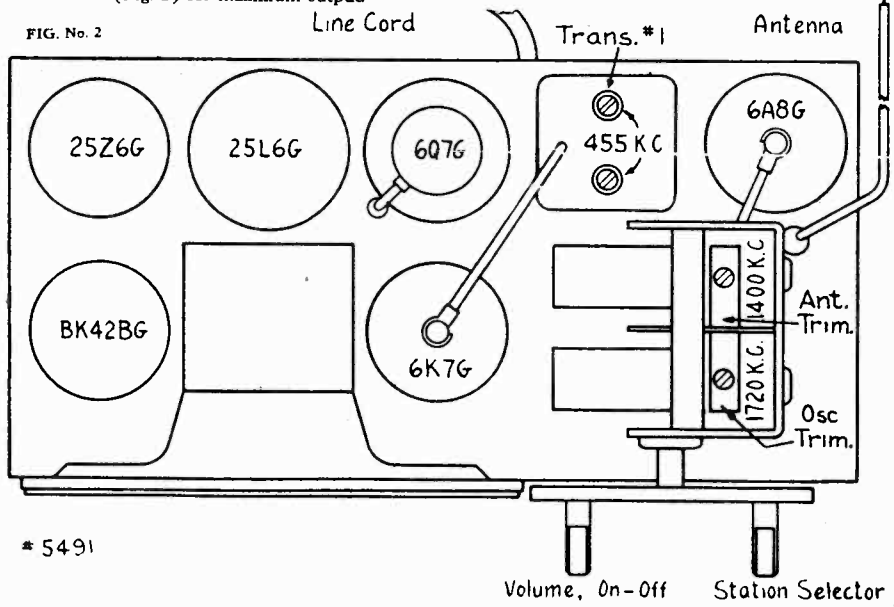
Connect a high impedance AC voltmeter across the voice coil terminals of the loud speaker. The volume control should be set a few degrees back of maximum volume position. Always use a weak signal from the signal generator, strong signals tend to cause improper adjustment.

See Fig. 1 and 2 for location of all trimmers.

I.F.: Connect the generator ground to receiver chassis through a .1 mf condenser. Using a .1 mf condenser in series with the high side of the generator, apply a 455 K.C. signal to the grid of the 6K7G I.F. amplifier tube, and aline transformer Trimmer No. 12 (Fig. 1) to maximum output. Next connect generator to the grid of the 6A8G tube and aline both trimmers of transformer No. 1 (Fig. 2) for maximum output.

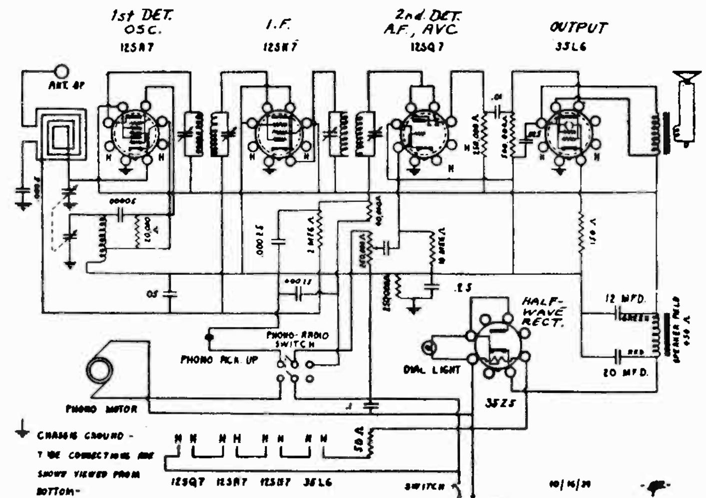
R.F.: Connect the high side of the generator to the antenna through a 100 mmf. condenser. Turn the variable condenser to minimum capacity, feed a 1720 K.C. signal in from the generator and adjust oscillator trimmer (Fig. 2) for top frequency. Next tune the receiver to about 1400 K.C., feed in signal from generator and adjust the antenna trimmer (Fig. 2) for maximum output.

FIG. No. 2



WESTINGHOUSE ELEC. SUPPLY CO.

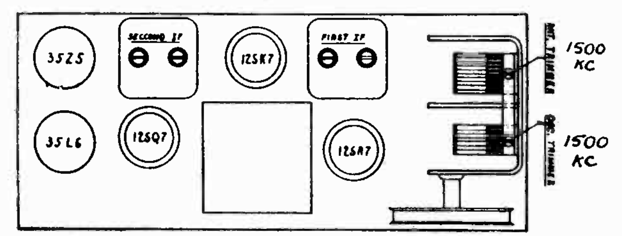
MODEL WR475
Schematic, Socket Trimmers, Alignment



WESTINGHOUSE RADIO
Model WR-475

Frequency Range....................540-1,720 kc

Intermediate Frequency..................455 kc

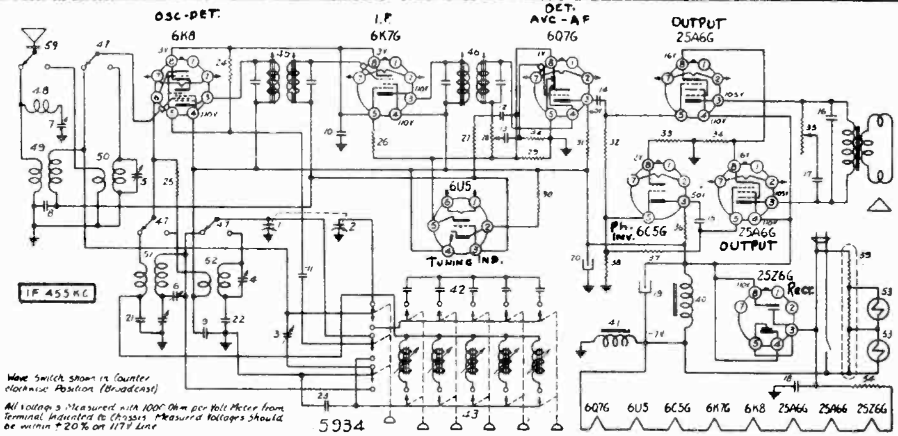


CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII

Dial Lamp (1)......Mazda 47, 6-8 Volt, .15 amp.
Power Supply Ratings
105-125 Volts, 60 cycles, Radio 30 Watts and Phonograph motor 30 watts.

LOUDSPEAKER
Type....................4-inch electro dynamic
Voice-coil impedance.....3.2 ohms at 400 cycles
Power Output (125 volt, 60 cycle supply)
Undistorted..........................0.5 watts
Maximum..............................1.2 watts
PHONOGRAPH.........Synchronous (Self starting)
Records..........10-inch and 12-inch, 78 r.p.m.
Pickup, crystal, 200,000 ohms at 1,000 c.p.s.
Average output of pickup............2½ volts at 1,000 c.p.s.

MODEL WR162
Schematic, Voltage Alignment, Socket Trimmers, Dial Data



WR162

CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII

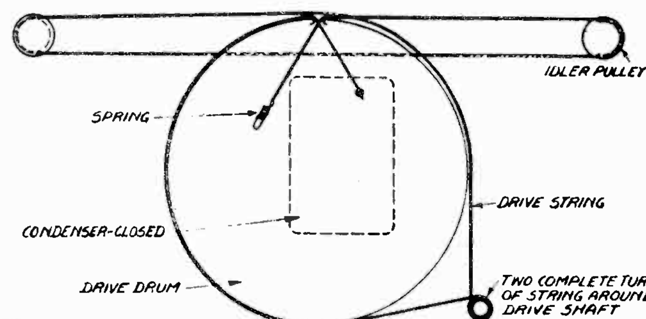


DIAGRAM SHOWING METHOD OF STRINGING DRIVE DRUM

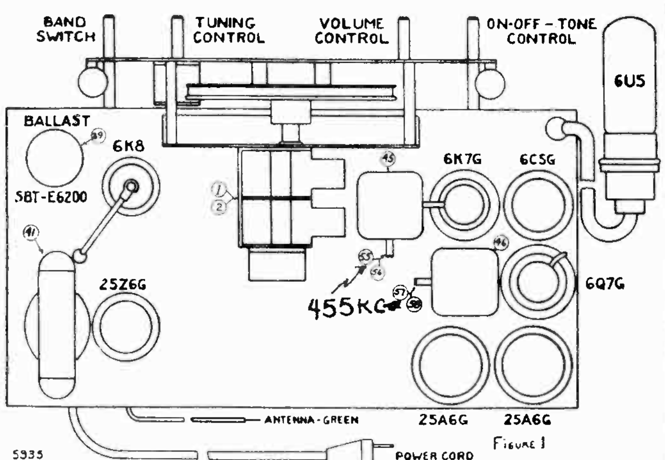


Figure 1

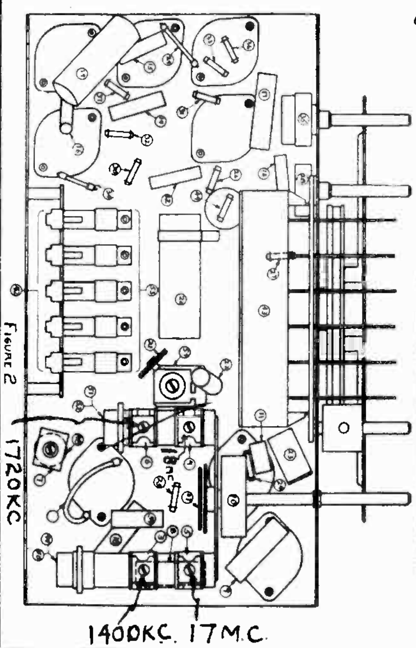


Figure 2

MODELS WR-162 and WR-262

Electrical Specifications

Power Supply	105-125 volts, 60 cycles A.C.—unless otherwise specified.
Tuning Range	540 to 1720, 5800 to 18,000 K.C.
Line up Frequencies	I.F. 455 K.C., 1720 K.C., 1400 K.C., 600 K.C., 18,000 K.C., 17,000 K.C.
Power Output	Three watts

MODEL WR-162

PARTS LIST

DIAGRAM NO.	PART NO.	DESCRIPTION OF PARTS	LIST PRICE
1, 2	D-5531	Variable Condenser	$2.60
3, 4, 5	D-5562	1-10 MMF Trimmer	.20
59	D-824	.002 MF 600V Condenser	.15
6	D-3157	3-35 MMF Trimmer	.20
7	D-3272	30-140 MMF Trimmer	.25
8, 9, 10	D-572	.1 MF 200V Condenser	.15
11	D-2780	50 MMF Mica Condenser	.20
12	D-4810	.0005 MF 400V Condenser	.15
13	D-568	.01 MF 400V Condenser	.15
14, 15	D-576	.02 MF 400V Condenser	.15
16	D-3138	.001 MF 800V Condenser	.15
19	D-5780	20 MF 150V Electrolytic Condenser	1.00
17, 18	D-2600	.02 MF 600V Condenser	.15
19	D-5780	20 MF 150 V Electrolytic Condenser	2.00
20	D-5968	45 MF 150V Electrolytic Condenser	1.25
21	D-5565	500 MMF Special 3% Tolerance	.20
22	D-2793	.006 MF 600V 5% Condenser	.15
23	D-5564	270 MMF Special 2% Tolerance	.25
24	D-631	50,000 ohm 1/3 Watt Resistor	.15
25	D-617	20,000 ohm 1/3 watt Resistor	.15
26	D-3004	150,000 ohm 10% 1/3 watt Resistor	.15
27, 44	D-624	1 Megohm 1/3 watt Resistor	.15
28	D-5576	500,000 ohm Volume Control	1.00
29	D-3808	50 ohm ¾ watt Resistor	.20
31, 32	D-2730	200,000 ohm 1/3 watt Resistor	.15
33	D-2883	5,000 ohm 1/3 watt Resistor	.15
34	D-3937	500 ohm ½ watt Resistor	.20
35	D-5575	100,000 ohm Tone Control and Switch	1.25
36	D-2880	100,000 ohm 1/3 watt 10% Resistor	.15
37	D-602	250,000 ohm 1/3 watt Resistor	.15
38	D-2688	60,000 ohm 1/3 watt Resistor	.15
39	D-5938	Ballast Lamp	1.00
48	D-5556	Wave Trap Coil	.30
49, 50	D-5554	Antenna Coil	1.65
51, 52	D-5555	Oscillator Coil	1.50
45	D-5548	1st IF Transformer	2.20
46	D-5549	2nd IF Transformer	2.20
47	D-5551	Wave Switch	.80
41	D-4295	Filter Choke, 130 Ohm	1.25
42	D-5542	5 Gang Trimmer	1.35
54	D-4301	35 ohm 4 watt Resistor	.30
43	D-5544	Push Button Switch	2.75
53	D-5557A	Push Button Coil Assembly (These coils cannot be furnished separately)	3.00

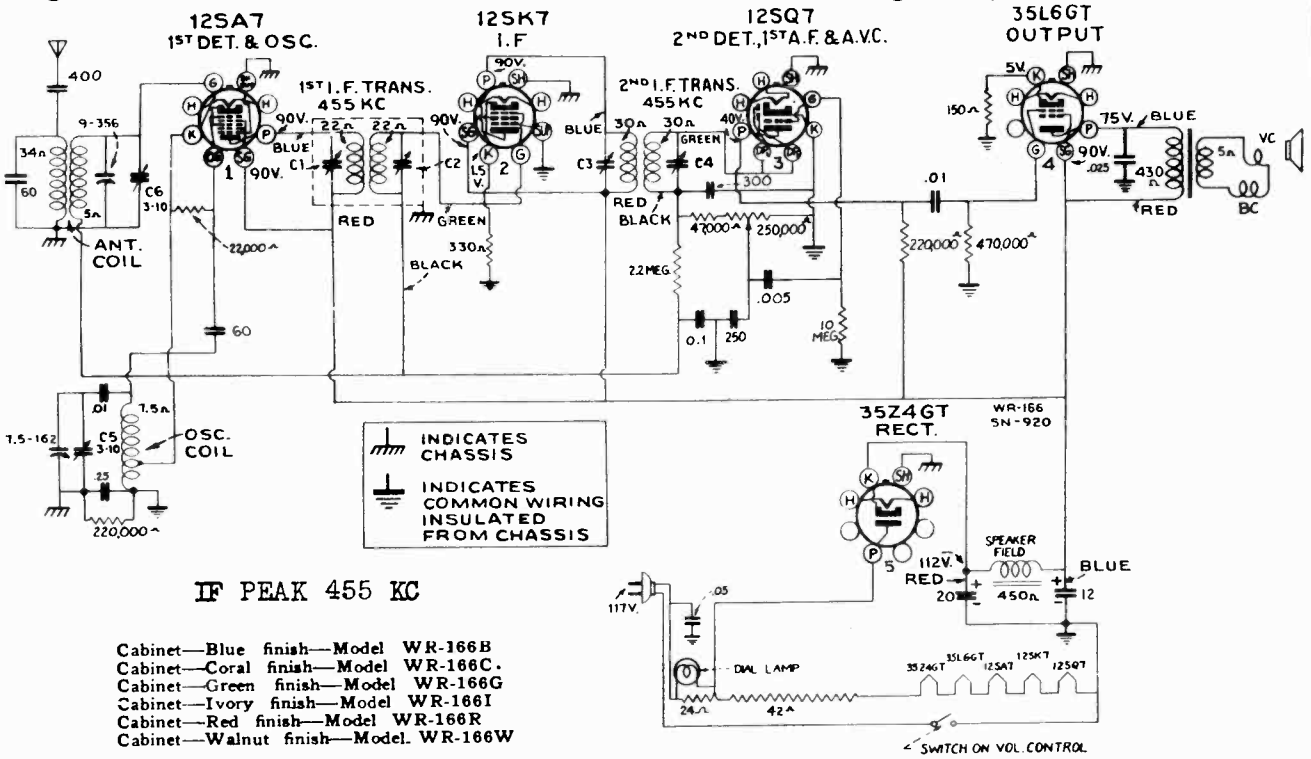
MODEL WR-262

DIAGRAM NO.	PART NO.	DESCRIPTION OF PARTS	LIST PRICE
1, 2	D-5531	410 MMF Variable Condenser	$2.60
3, 4, 5	D-5562	1-10 MMF Trimmer	.20
6	D-3157	3-35 MMF Trimmer	.20
7	D-3272	10-140 MMF Trimmer	.25
8, 9, 68	D-572	.1 MF 200V Condenser	.15
10	D-2792	.2 MF 200V Condenser	.15
11	D-2780	50 MMF Mica Condenser	.20
12, 13	D-4810	.0005 MF 400V Condenser	.15
14, 15	D-576	.02 MF 400V Condenser	.15
16	D-2695	.003 MF 600V Condenser	.15
17	D-5563	.03 MF 600V Condenser	.15
18	D-3135	.003 MF 800V Condenser	.15
19	D-2793	.006 MF 600V Condenser	.15
20	D-5565	.0005 MF Special Condenser	.20
21	D-5564	270 MMF Special Condenser	.25
22	D-5553	8 MF 200 W.V., 20 MF 35 W.V.— Electrolytic Condenser	1.00
23	D-598	20,000 ohm 1/3 W. Resistor	.15
24	D-4530	30,000 ohm 1 W. Resistor	.20
25	D-636	40,000 ohm 1/3 W. Resistor	.15
26, 27	D-2689	100 ohm 1/3 W. Resistor	.15
28, 29, 35	D-624	1 Megahm 1/3 W. Resistor	.15
30	D-598	200,000 ohm 1/3 W. Resistor	.15
31	D-615	500,000 ohm 1/3 W. Resistor	.15
32	D-3353	250 ohm 2 W. Resistor	.20
33	D-5576	500,000 ohm Volume Control	1.00
34	D-5575	100,000 ohm Tone Control and ON-OFF Switch	1.25
36	D-631	50,000 ohm 1/3 W. Resistor	.15
37	D-5101	16 MF 225 W.V. Reg. Electrolytic Condenser	1.00
38	D-3285	16 MF 350 W.V. Electrolytic Condenser	1.00
40	D-2560	400 MMF Padder Condenser	.35
67	D-634	500 ohm 1/3 W. Resistor	.15
65, 66	D-563	.05 MF 400V Condenser	.15
69	D-2688	60,000 ohm 1/3 W. Resistor	.15
70	D-603	100,000 ohm 1/3 W. Resistor	.15
41	D-5548	First I.F. Assembly	2.20
42	D-5549	Second I.F. Assembly	2.20
43	D-5550	Power Transformer	3.60
44	D-5567-T	Output Transformer	1.10
45	D-5567	6-inch Speaker	3.75
46	D-1732	Line Cord and Plug	.25
47		Push Button Oscillator Coils—	
	D-5557	Low Frequency	.60
	D-5558	Medium Frequency	.60
	D-5559	High Frequency	.60
48	D-5542	Trimmer Condenser Assembly For Push Buttons	1.35
49	D-5551	Band Switch	.80
50	D-5544	Push Button Switch	2.75
51	D-530	Dial Lamps, 6.3 V., .15 amp., Mazda No. 40	.10
52, 53	D-5554	Antenna Coil Assembly	1.65
54, 55	D-5555	Oscillator Coil Assembly	1.50
56	D-5556	Wave Trap Coil	.30
	D-2163	Dial Drive Cable, 36"	.10
	D-5560	Dial Pointer	.15
61	D-2981	Tuning Tube Cable and Socket	.60
	D-3268	8-prong Octal Tube Socket	.10
	D-5569	Dial Escutcheon	1.90
	D-5573	Tuning Tube Escutcheon	.60

MODEL WR166A
Socket, Trimmers
Alignment
MODEL 166L
Alignment, Lead Dress

WESTINGHOUSE ELEC. SUPPLY CO

MODELS WR166B, WR166C
WR166G, WR166I, WR166R
WR166W
Schematic, Socket, Voltage
Alignment, Trimmers, Lead Dress



IF PEAK 455 KC

Cabinet—Blue finish—Model WR-166B
Cabinet—Coral finish—Model WR-166C.
Cabinet—Green finish—Model WR-166G
Cabinet—Ivory finish—Model WR-166I
Cabinet—Red finish—Model WR-166R
Cabinet—Walnut finish—Model. WR-166W

Electrical and Mechanical Specifications

FREQUENCY RANGE	530-1,720 kc
Dial Lamp (1)	Mazda 47, 6.3 volts, .15 amp.
POWER SUPPLY RATINGS	
A-C Rating	105-125 volts, 50-60 cycles, 30 watts
D-C Rating	105-125 volts, direct current, 30 watts
INTERMEDIATE FREQUENCY	455 kc
POWER OUTPUT (125 volt, 60 cycle supply)	
Undistorted	0.75 watts
Maximum	1.5 watts
LOUDSPEAKER	
Type	4-inch Electrodynamic

Alignment Procedure

Output Meter Alignment.—Connect the meter across the voice coil, and turn the receiver volume control to maximum.

Precautionary Lead Dress

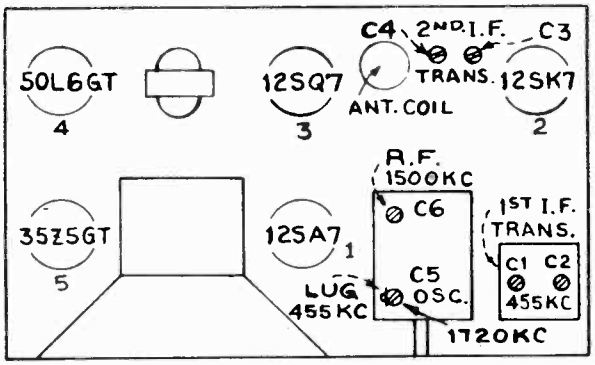
1. Dress 1st I-F plate and grid leads against chassis and away from each other. Dress plate lead from 12SK7 close to chassis.
2. Dress electrolytic capacitor against rear apron.

Test-Oscillator.—Connect the low side of the test-oscillator to the receiver chassis, through a .01 mfd. capacitor, and keep the output as low as possible.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	Tuning condenser stator (osc.) in series with .01 mfd.	455 kc	Quiet point at 1,600 kc end of dial	C1, C2, C3, C4 (1st and 2nd I-F transformers)
2	Antenna term. of ant. trans. in series with 100 mmfd.	1,720 kc	Full clockwise (out of mesh)	C5 (oscillator)
3		1,500 kc	Resonance on 1,500 kc signal	C6 (antenna)

Power-Supply Polarity.—For operation on d-c, the power plug must be inserted in the outlet for correct polarity. If the set does not function, reverse the plug. On a-c, reversal of the plug may reduce hum.

Antenna.—The set is equipped with a length of antenna wire. Do not connect the antenna to ground. If an outdoor antenna is used, it should not be longer than 100 feet, including lead-in. If it is longer, connect a 100 to 200 mmf. capacitor in series with the lead-in.

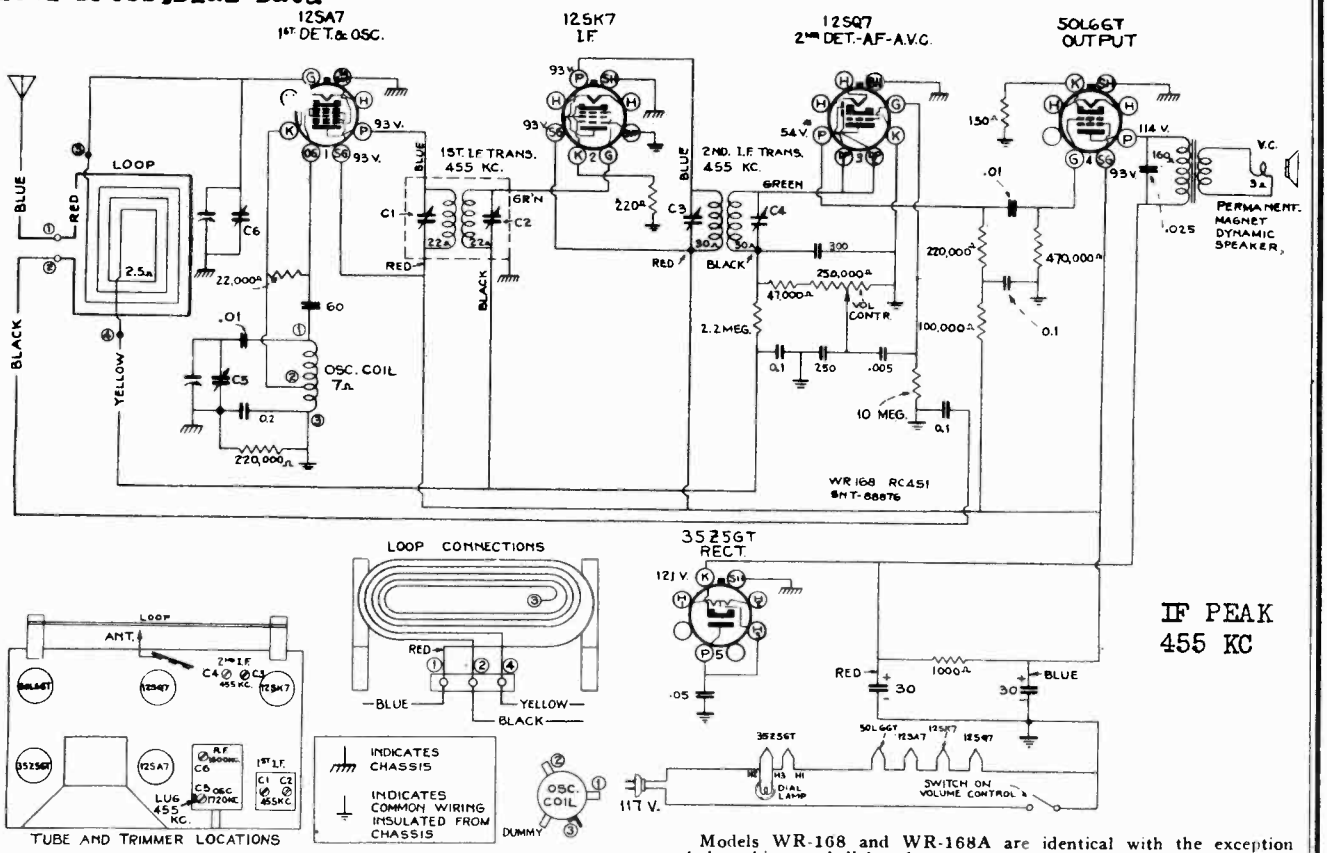


TUBE AND TRIMMER LOCATIONS

NOTE: 35L6GT is used in No.4 socket in Model WR-166.

MODELS WR168, WR168A
Schematic, Voltage, Socket
Alignment, Trimmers
Lead Dress, Dial Data

WESTINGHOUSE ELEC. SUPPLY CO.



Models WR-168 and WR-168A are identical with the exception of the cabinet and dial scale.

FREQUENCY RANGE	530-1,720 kc
INTERMEDIATE FREQUENCY	455 kc
Dial Lamp (1)	Mazda 51, 7.5 volts, 0.2 amp.

POWER SUPPLY RATINGS

A-C Rating	105-125 volts, 50-60 cycles, 30 watts
D-C Rating	105-125 volts, direct current 30 watts

POWER OUTPUT (125 volt, 60 cycle supply)

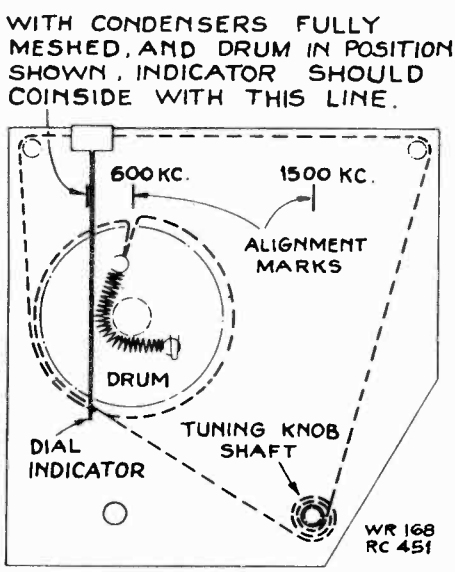
Undistorted	0.75 watts
Maximum	1.5 watts

LOUDSPEAKER

Type	5-inch permanent magnet dynamic

Calibration Marks.—The tuning dial is fastened in the cabinet and can not be used for reference during alignment. Therefore calibration marks corresponding to dial readings of 600 kc, and 1,500 kc have been stamped in the plate on the front of the chassis as shown in the accompanying drawing. These marks are used for reference during alignment.

Dial Indicator Adjustment.—With the gang condenser in full mesh, the indicator should point to the extreme left mark on the dial scale.



Dial Drive Hookup and Alignment Marks

Alignment Procedure

Output Meter Alignment.—Connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—Connect the low side of the test-oscillator to the receiver chassis, through a .01 mfd. capacitor, and keep the output as low as possible.

Antenna.—The set is equipped with a built-in loop antenna. If an outdoor antenna is used, it may be connected to the "ANT" terminal on rear of cabinet. It should not be longer than 100 feet, including lead-in. If it is longer, connect a 100 to 200 mmf. capacitor in series with the lead-in.

Power-Supply Polarity.—For operation on d-c, the power plug must be inserted in the outlet for correct polarity. If the set does not function, reverse the plug. On a-c, reversal of the plug may reduce hum.

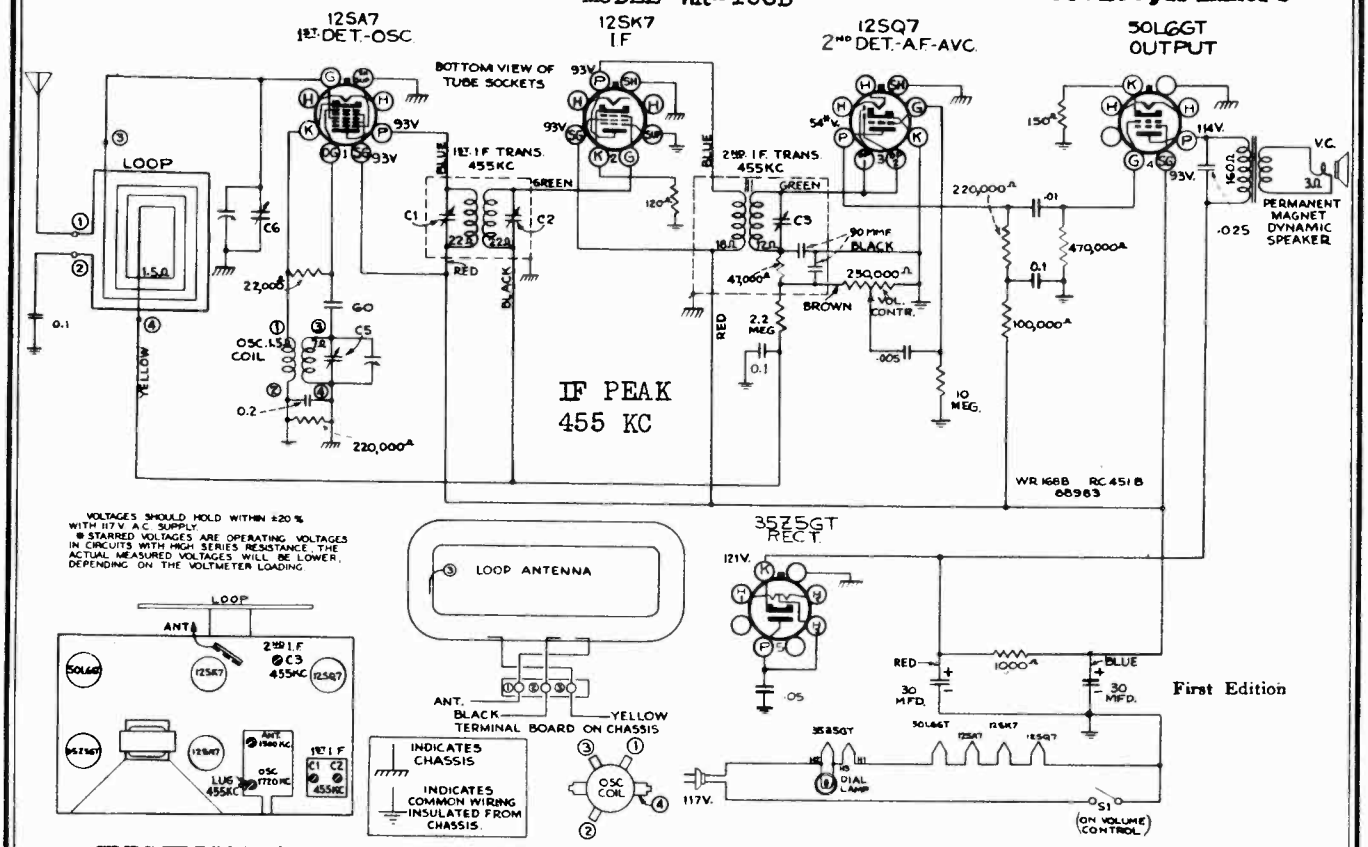
Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	Tuning condenser stator (osc.) in series with .01 mfd.	455 kc	Quiet point at 1,600 kc end of dial	C1, C2, C3, C4 (1st and 2nd I-F transformers)
2	Antenna term. of ant. loop in series with 100 mmfd.	1,720 kc	Full clockwise (out of mesh)	C5 (oscillator)
3		1,500 kc	1,500 kc cal. mark	C6 (antenna)

Precautionary Lead Dress.—1. The oscillator grid lead, R-F grid lead and diode plate lead should be kept separated as far as possible 2. Dress blue 1st I-F lead under volume control close to chassis 3. Dress blue 2nd I-F lead close to chassis and behind 12SK7 socket.

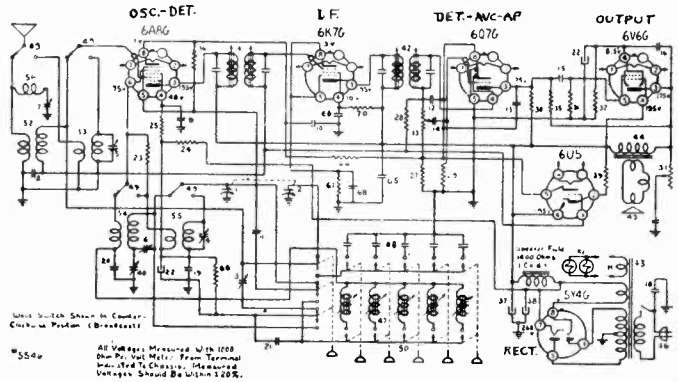
WESTINGHOUSE ELEC. SUPPLY CO.

MODEL WR168B
MODEL WR262
Schematics, Voltage
Socket, Trimmers

MODEL WR-168B



For SPECIFICATIONS, ALIGNMENT, LEAD DRESS and DIAL DRIVE DATA, see MODEL WR-168.



MODEL — WR262

FOR SPECIFICATIONS AND PARTS
SEE INDEX
FOR STRINGING DRIVE DRUM
SEE MODEL WR-162
CONVENTICNAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII
IF PEAK 455 KC

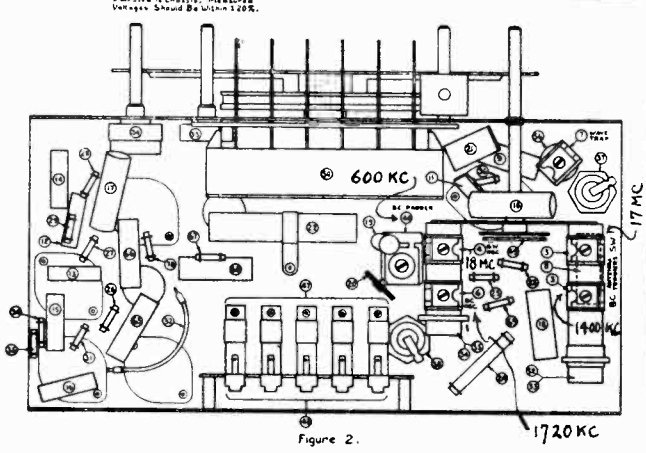


Figure 2.

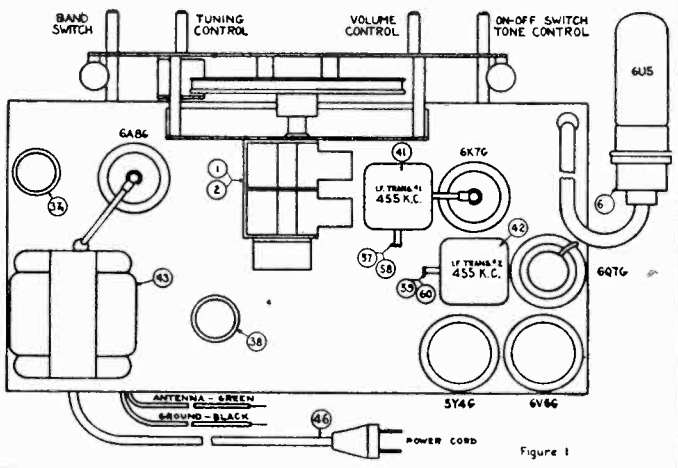
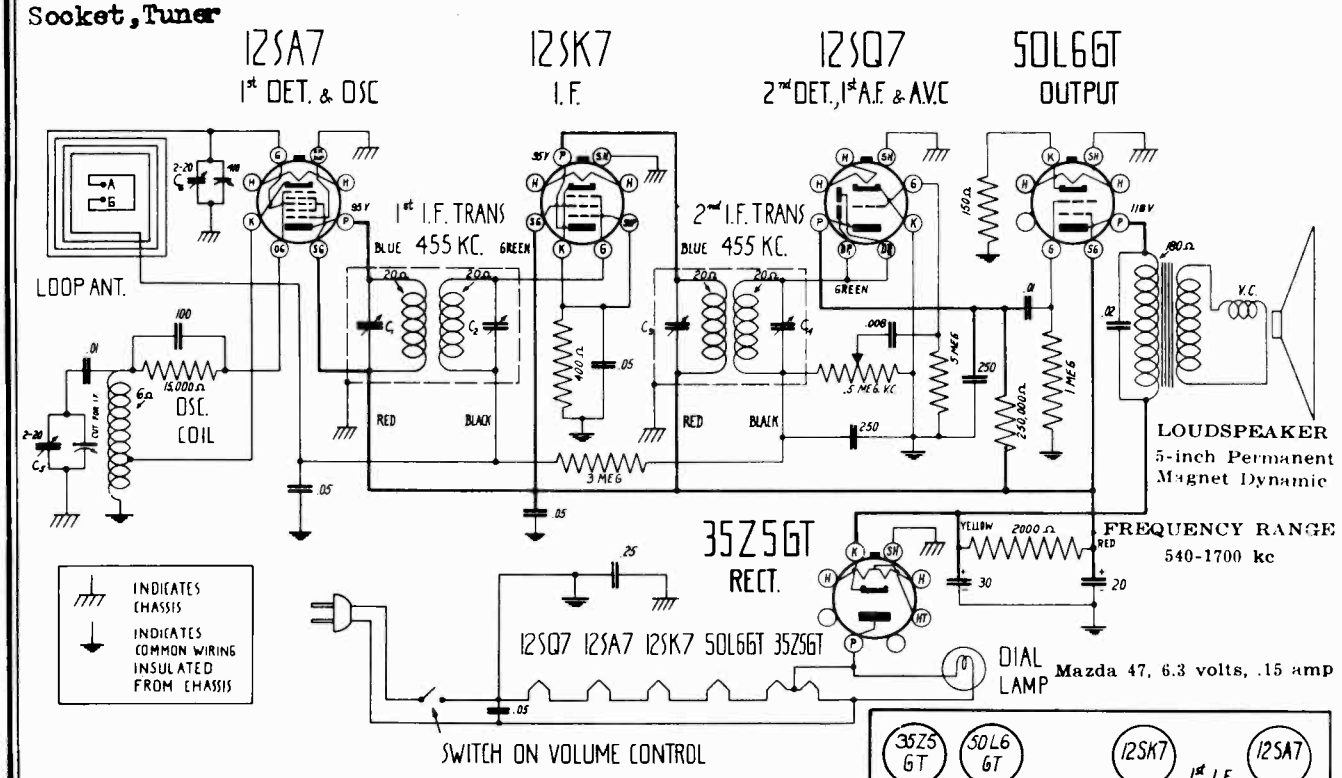


Figure 1

MODEL WR169
Schematic, Voltage
Alignment, Trimmers
Socket, Tuner

WESTINGHOUSE ELEC. SUPPLY CO.



POWER OUTPUT (125 volt, 60 cycle supply)

Undistorted	1.0 watts
Maximum	1.75 watts

POWER SUPPLY RATINGS

A-C Rating	105-125 volts, 40-60 cycles, 30 watts
D-C Rating	105-125 volts, direct current, 30 watts

Tube Changing

The tubes can be changed by removing the back and taking off the wing nuts which hold the loop antenna in place. The loop antenna may then be detached from the back of the chassis.

Alignment Procedure

Output Meter Alignment.—Connect the meter across the voice coil, and turn the receiver volume control to maximum.

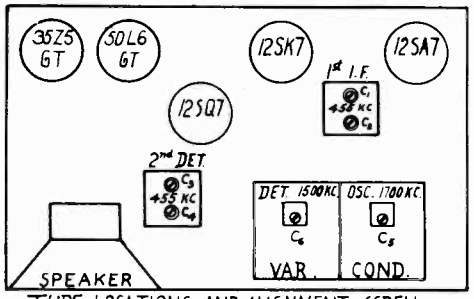
Test Oscillator

Connect the low side of the test oscillator to the binding post on the loop antenna marked "GND."

Steps	Connect high side of test-oscillator to—	Tune test-osc to—	Adjust dial pointer to—	Adjust the following for max. peak output—
1	Binding post marked "ANT."	455 kc	Quiet point at 1,600 kc end of dial	C1, C2, C3, C4 (1st and 2nd I-F transformers)
2		1,700 kc	Right end of scale (out of mesh)	C5 (oscillator)
3		1,500 kc	Resonance on 1,500 kc signal	C6 (antenna)

Important

When aligning the receiver, it is important to keep the loop antenna attached to the receiver by means of the wing nuts. Keep metallic objects away from the loop. Keep the output signal from the test-oscillator as low as possible during alignment of the receiver.



TUBE LOCATIONS AND ALIGNMENT SCREW POSITIONS

Push Button Adjustment

The five buttons above the two control knobs are the push button knobs. To adjust any one of these knobs to the desired station, proceed as follows. Pull out the square knob. Loosen up the adjusting screw by turning it one or two complete turns counterclockwise. The screw should not be loosened more than two turns as it may come out. Tune in the desired station with the tuning control. Replace the screw driver blade in the adjusting screw slot and push the screw in as far as it will go. Hold the screw driver in this position and at the same time readjust the tuning knob to be sure the station is tuned to exact resonance. Tighten the screw while holding the tuning control so that the station setting doesn't shift. Replace the knob with the proper station tab placed in the recess.

Power-Supply Polarity.—For operation on d-c, the power plug must be inserted in the outlet for correct polarity. If the set does not function, reverse the plug. On a-c reversal of the plug may reduce hum.

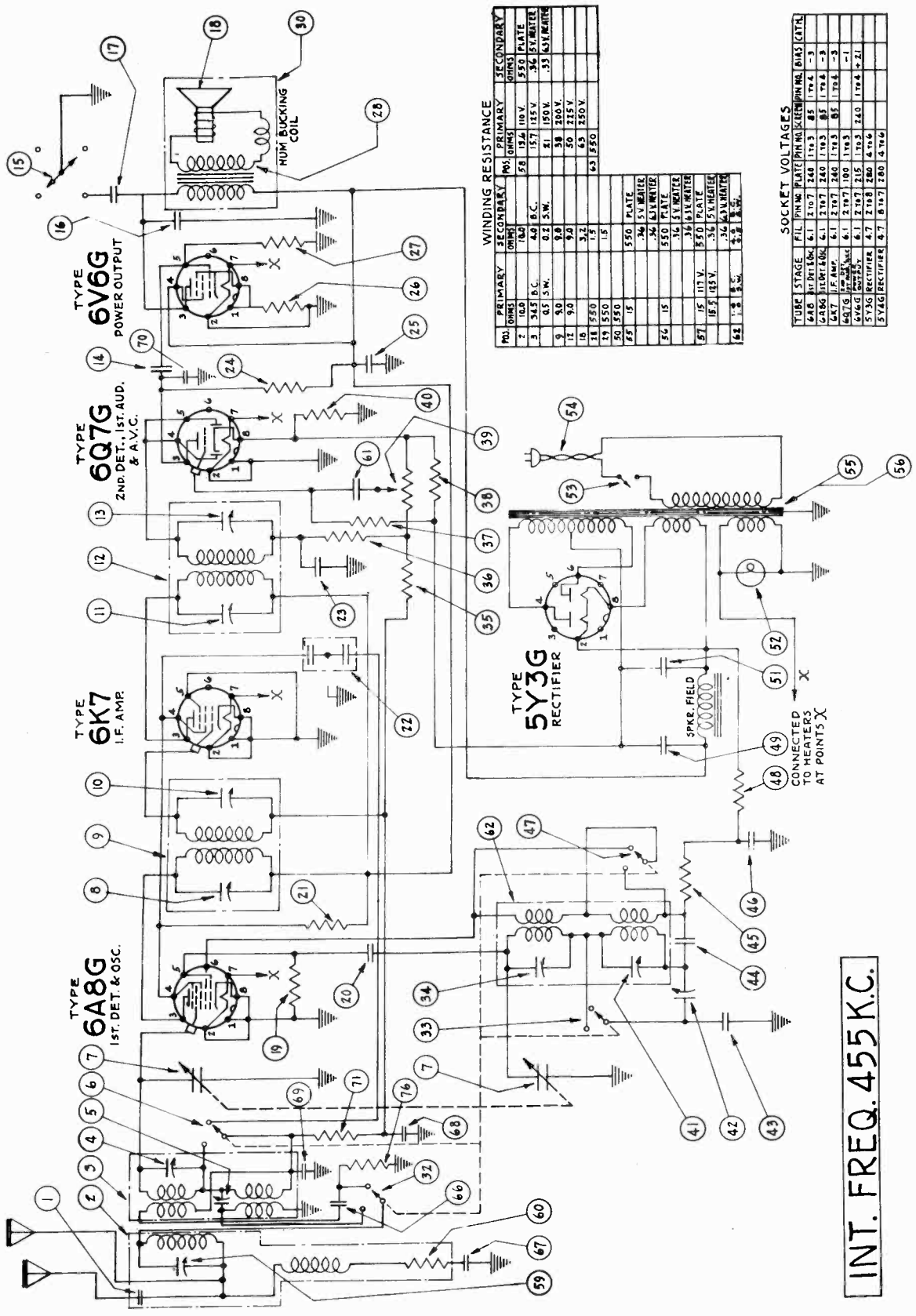
Loop Antenna

This receiver is equipped with a loop antenna which makes the use of an outside aerial unnecessary. In some locations additional radio pick-up may be desired. To accomplish this, an antenna may be attached to the binding post marked "ANT." on the back of the cabinet. A ground wire should be connected to the binding post marked "GND."

Since the loop antenna has a directional effect, it may be found necessary at times to turn the receiver for best reception.

WESTINGHOUSE ELEC. SUPPLY CO.

MODEL WR224
Schematic, Voltage
Resistance



WINDING RESISTANCE

NO.	PRIMARY OHMS	SECONDARY OHMS	NO.	PRIMARY OHMS	SECONDARY OHMS
2	10.0	10.0	58	136	110 V.
3	34.5	4.8 D.C.		15.7	125 V.
	0.5	5 SW.		0.2	5 SW.
9	9.0	9.8		11	150 V.
12	9.0	9.0		38	200 V.
16		3.2		50	225 V.
18	550	1.5	63	550	250 V.
19	550	1.5			
50	550				
65	15	550 PLATE			
		.36 5 V. HEATER			
		.36 6.3 V. HEATER			
54	15	550 PLATE			
		.36 5 V. HEATER			
		.36 6.3 V. HEATER			
57	15	117 V. 550 PLATE			
	16.5	125 V. .36 5 V. HEATER			
		.36 6.3 V. HEATER			
62	1.8	8.2 D.C. 4.2 SW.			

SOCKET VOLTAGES

TUBE	STAGE	FIL.	PIN NO.	PLATE	PIN NO.	SCREEN	PIN NO.	BIAS	CNTRL
6A8	1st Det & Osc.	6.1	2 to 7	240	1 to 3	85	1 to 4	-3	
6A8G	1st Det & Osc.	6.1	2 to 7	240	1 to 3	85	1 to 4	-3	
6K7	I.F. Amp.	6.1	2 to 7	240	1 to 3	85	1 to 4	-3	
6Q7G	1st Det. 2nd Det. & 1st Aud.	6.1	2 to 7	100	1 to 3				-1
6V6G	OUTPUT	6.1	2 to 7	215	1 to 3	240	1 to 4	-21	
5Y3G	RECTIFIER	4.7	2 to 8	280	4 to 6				
5Y4G	RECTIFIER	4.7	8 to 7	280	4 to 6				

SOCKET VOLTAGES

ELECTRICAL SPECIFICATIONS

Type and Number of Tubes	1 #6A8G 1 #6K7, 1 #6Q7G, 1 #6V6G, 1 #5Y3G - Total 5
Power Supply Characteristics	105-125 volts, 50-60 cycle A.C.
Power Consumption	50 Watts
Total Power Output	4 Watts
Undistorted Power Output	2.25 Watts
Tuning Ranges	(Broadcast Band 535 to 1,720 KC. (Short-wave Band 5,800 to 17,000 KC.
Line-Up Frequencies	I.F. 455 KC., 600 KC., 1500 KC., 15,500 KC.

GENERAL DESCRIPTION

This model is a five-tube, alternating current, two-band superheterodyne receiver designed to operate over the standard broadcast band, extending from 535 to 1720 KC., and a short-wave band, extending from 5800 to 17,000 KC.

LINE-UP CAPACITOR ADJUSTMENTS

To properly align the circuits of this receiver, it is essential to use a high grade modulated test oscillator, the output of which can be continuously varied and reduced sufficiently to prevent overload as the individual circuits of the receiver are brought into alignment. A conventional output meter should be connected across the terminals of the speaker voice coil to indicate when the individual circuits are correctly aligned. The sensitivity of the meter must be sufficient to give satisfactory readings with low input signals.

Before attempting to align the receiver, the service man should familiarize himself with the general layout of the chassis, location of the various tubes and alignment condensers.

ALIGNMENT OF I.F. (455 KC.)

1. Set the volume control to maximum position, the wave-change switch to standard broadcast band and the dial pointer to approximately 600 KC.

2. Connect the output meter across the voice coil terminals of the speaker.

3. Set the test oscillator to 455 KC., and adjust its output to produce a measurable reading on the output meter when the test signal is applied to the grid of the first detector-oscillator tube through a 0.5 mfd. blocking condenser.

4. Adjust the four I.F. trimmer condensers underneath the chassis (under the square coil housings) to maximum output.

ALIGNMENT OF OSCILLATOR AND R.F.

1. Check the pointer setting to be sure that it is exactly horizontal when the tuning condenser is completely closed.

2. Set the test oscillator and dial indicator at 1500 KC., and adjust the oscillator trimmer (the rear trimmer on the coil fastened to the back plate of the chassis).

3. Set the test oscillator and dial pointer to 600 KC.

4. Adjust the oscillator lag condenser (on the base near the antenna coil) for maximum output, at the same time rocking the gang condenser.

5. Reset test oscillator and dial pointer to 1500 KC., and recheck operation #2.

6. Connect the test oscillator to the blue antenna lead through a .0002 mfd. condenser and adjust the antenna trimmer (the bottom condenser on the coil on the top of the chassis).

7. Check sensitivity and calibration over the scale.

ALIGNMENT OF THE SHORT-WAVE BAND

1. Turn the wave-change switch to the short-wave position.

2. Set the test oscillator and dial pointer to 15,500 KC., and adjust the short-wave oscillator trimmer (the trimmer on the inside end of the coil on the back plate of the chassis). Two positions may be found. Use the one with the least capacity, that is, with the trimmer screw farthest out.

3. Adjust the short-wave antenna trimmer (the top condenser on the coil on the top of the chassis).

4. Check sensitivity and calibration over the scale.

TRAP ALIGNMENT

This receiver is provided with a tuned trap (the upright coil under the chassis) which is adjusted to eliminate a signal at the I.F. frequency (455 KC.) applied to the antenna. If there is code interference which is known to originate near the 455 KC. channel, this trimmer may be adjusted to minimize the undesired signal.

PARTS LIST

Dia. #	Part #	Description of Parts	List Price
1	CM 9546	.00005 mfd. mica condenser	$ .15
2	RC 95296	Wave trap coil assembly	1.25
3	RC 95300	Antenna coil assembly	1.60
4		Trimmer condenser - part of RC 95300	
5		Trimmer condenser - part of RC 95300	
6,32 33,47	SW 9574	Switch (wave-change)	.70
7	CG 9565	Variable condenser	3.75
8		Trimmer condenser - part of IC 95109	
9	IC 95109	1st I.F. coil assembly (455 KC.)	1.20
10		Trimmer condenser - part of IC 95109	
11		Trimmer condenser - part of IC 95110	
12	IC 95110	2nd I.F. coil assembly (455 KC.)	1.20
13		Trimmer condenser - part of IC 95110	
14	CW 6-005	.005 mfd., 600 V. condenser	.15
15	SW 9572	Switch (tone control)	.40
16	CW 6-01	.01 mfd., 600 V. condenser	.15
17	CW 6-05	.05 mfd., 600 V. condenser	.15
18	DM 9526	Speaker diaphragm assembly	1.50
19	RE 4733	47,000 ohm, 1/2 W. resistor	.10
20	CM 9513	.0001 mfd. mica condenser	.10
21	RE 3333	33,000 ohm, 1/2 W. resistor	.10
22	CW 9535	.1-.1 mfd., 400 V. dual condenser	.30
23	CM 9513	.0001 mfd. mica condenser	.10
24	RE 2243	220,000 ohm, 1/2 W. resistor	.10
25	CW 4-10	.1 mfd., 400 V. condenser	.15
26	RE 271412	.270 ohm, 1 W. resistor	.12
27	RE 4743	470,000 ohm, 1/2 W. resistor	.10
28	TR 95141	Output transformer	1.50
30	SK 9572	Speaker	4.75
34		Trimmer condenser - part of RC 95301	
35	RE 1053	1 meg., 1/2 W. resistor	.10
36	RE 4733	47,000 ohm, 1/2 W. resistor	.10
37	RE 1053	1 meg., 1/2 W. resistor	.10
38	RE 1803	18 ohm, 1/2 W. resistor	.10
39	VR 9553	Volume control, 1/2 meg.	1.00
40	RE 1803	18 ohm, 1/2 W. resistor	.10
41		Trimmer condenser - part of RC 95301	
42	CS 9585	Trimmer condenser (225-700 mmf.)	.35
43	CM 959	.002 mfd. mica condenser	.25
44	CW 6-005	.005 mfd., 600 V. condenser	.15
45	RE 223413	22,000 ohm, 1 W. resistor	.12
46	CE 9568	8 mfd., 450 V. electrolytic condenser	.70
48	RE 1033	10,000 ohm, 1/2 W. resistor	.10
49	CE 9562	18 mfd., 300 V. electrolytic condenser	.80
50		Speaker field coil (not serviced separately)	
51	CE 9554	18 mfd., 450 V. electrolytic condenser	.85
52	LP 9510	Dial lamp - 6.3 V. .25 amp.	.15
53		Switch - part of VR 9553	
54	CB 9512	Line cable assembly	.50
55	TR 95128	Power transformer - 105-125 V., 50-60 cycle	5.00
56	TR 95131	Power transformer - 105-125 V., 25 cycle	6.00
59		Trimmer condenser - part of RC 95296	
60	RE 1033	10,000 ohm, 1/2 W. resistor	.10
61	CW 6-005	.005 mfd., 600 V. condenser	.15
62	RC 95301	Oscillator coil assembly	1.50
66	CW 2-02	.02 mfd., 200 V. condenser	.15
67	CM 9546	.00005 mfd. mica condenser	.15
68	CW 2-05	.05 mfd., 200 V. condenser	.15
69	CM 9525	.0027 mfd. mica condenser	.30
70	CW 6-001	.001 mfd., 600 V. condenser	.15
71	RE 4743	470,000 ohm, 1/2 W. resistor	.10
76	RE 1033	10,000 ohm, 1/2 W. resistor	.10

Runs A,B,C,etc.
Socket,Trimmers
Drive Cord,Notes

WESTINGHOUSE ELEC. SUPPLY CO.

MODEL WR258
MODEL WR260

General Description

Model WR-258 is a five-tube, a-c, superheterodyne receiver employing push-button tuning for five stations in the broadcast band. The tuning range covers standard broadcast and state police calls. Features of this receiver are: Automatic volume control, magnetically tuned i-f transformers, magnetically tuned oscillator coils for each push button, 6-to-1 ratio vernier tuning, illuminated slide-rule dial, and a 5-inch dust-proofed dynamic speaker.

Model WR-260 employs all features of the WR-258 and in addition has a tuning band covering from 1,550 to 3,500 kc for aviation and police reception. It also has a two-point tone control.

Electrical Specifications

FREQUENCY RANGE (Model WR-258)
Broadcast..... 540-1,720 kc

FREQUENCY RANGES (Model WR-260)
Broadcast..... 540-1,550 kc
Police..... 1,550-3,500 kc

Five Electric Tuning Positions..... 550-1,500 kc

(Runs A and B,
1 station between approximately 550-980 kc
2 stations between approximately 650-1,080 kc
2 stations between approximately 850-1,500 kc

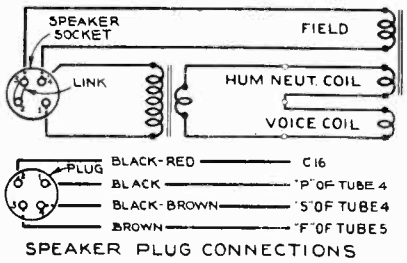
(Runs C and above,
2 stations between approximately 550-980 kc
1 station between approximately 650-1,080 kc
2 stations between approximately 850-1,500 kc

Pilot Lamp (1)..... Mazda No. 44, 6.3 volts, 0.25 ampere

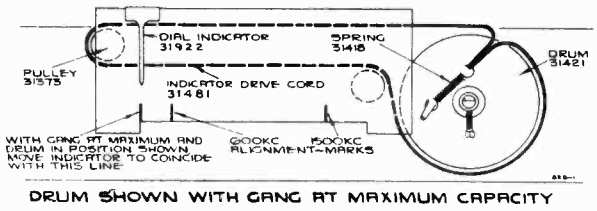
POWER SUPPLY RATINGS
Rating A..... 105-125 volts, 50-60 cycles, 50 watts
Rating B..... 105-125 volts, 25-60 cycles, 50 watts

POWER OUTPUT
Undistorted..... 1.0 watt
Maximum..... 1.5 watts

LOUDSPEAKER
Type..... 5-inch Electrodynamic
Voice Coil Impedance..... 84326-2 4.4 ohms at 400 cycles
84377-1 3.4 ohms at 400 cycles

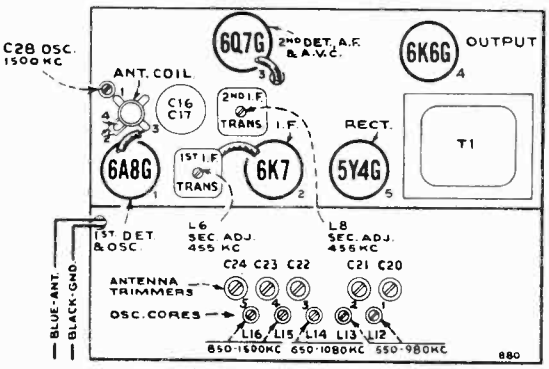


WR-260 Loudspeaker Wiring

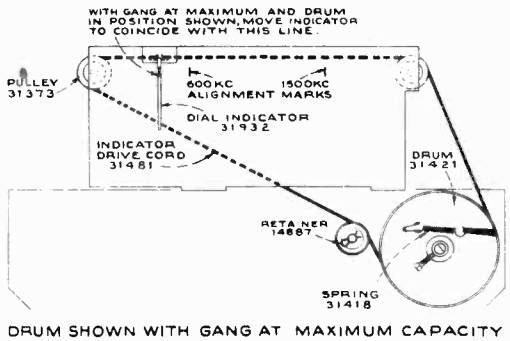


WR-258 Arrangement of Pointer Drive Cord

Loudspeaker.—The loudspeaker voice-coil may be centered in the normal manner by using three narrow feelers to obtain equal spacing of the air-gap. The dust cover must be removed before centering, and may be done by gently cutting it free from the cone, being careful not to cut or damage the cone while doing so.

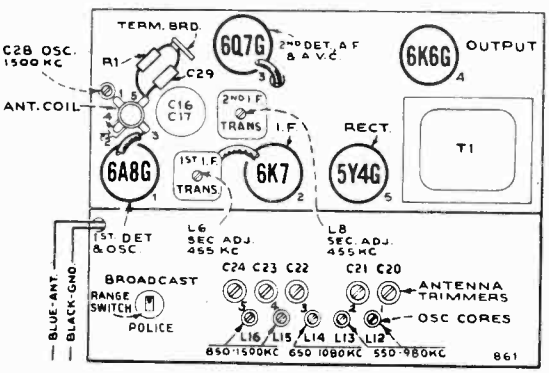


WR-258 Tube and Trimmer Locations



WR-260 Arrangement of Pointer Drive Cord

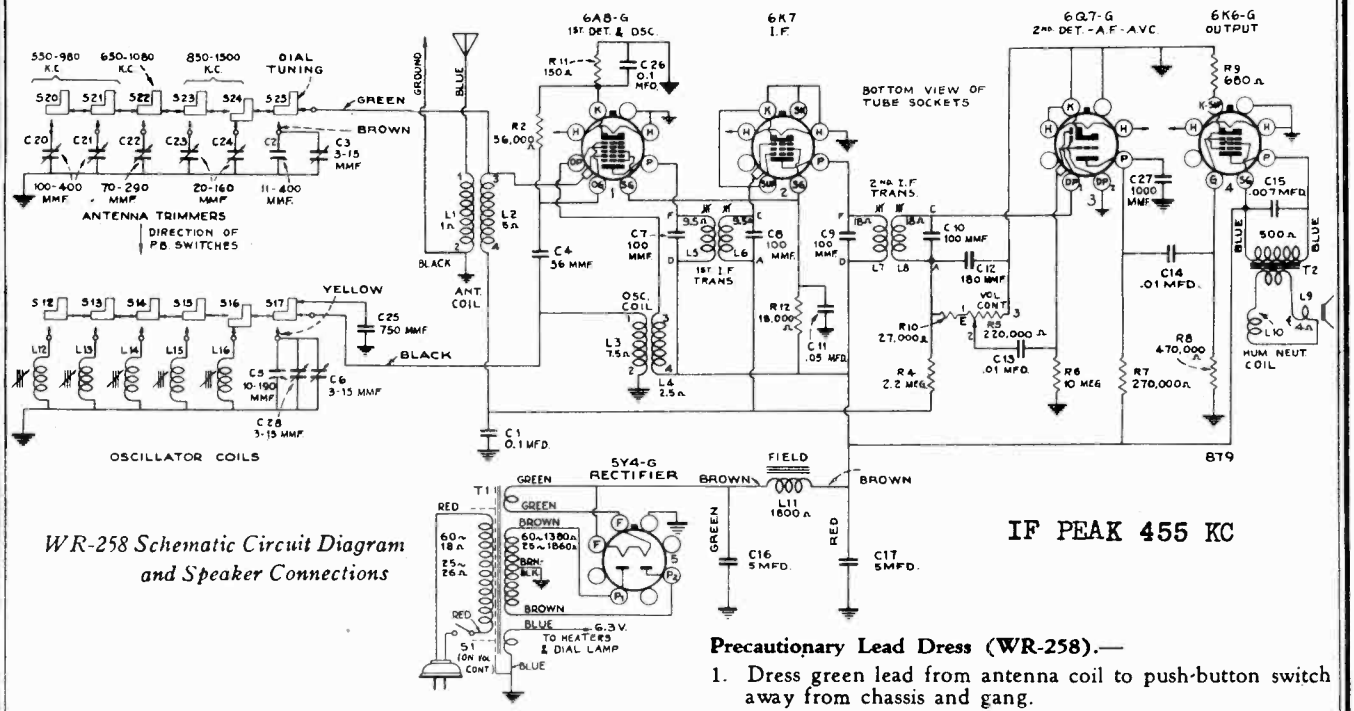
Refer to "Alignment Procedure" for explanation of the "calibration marks" shown in this drawing



WR-260 Tube and Trimmer Locations

MODEL WR258(All Runs)
Schematic, Voltage
Chassis Wiring
Lead Dress

WESTINGHOUSE ELEC. SUPPLY CO.

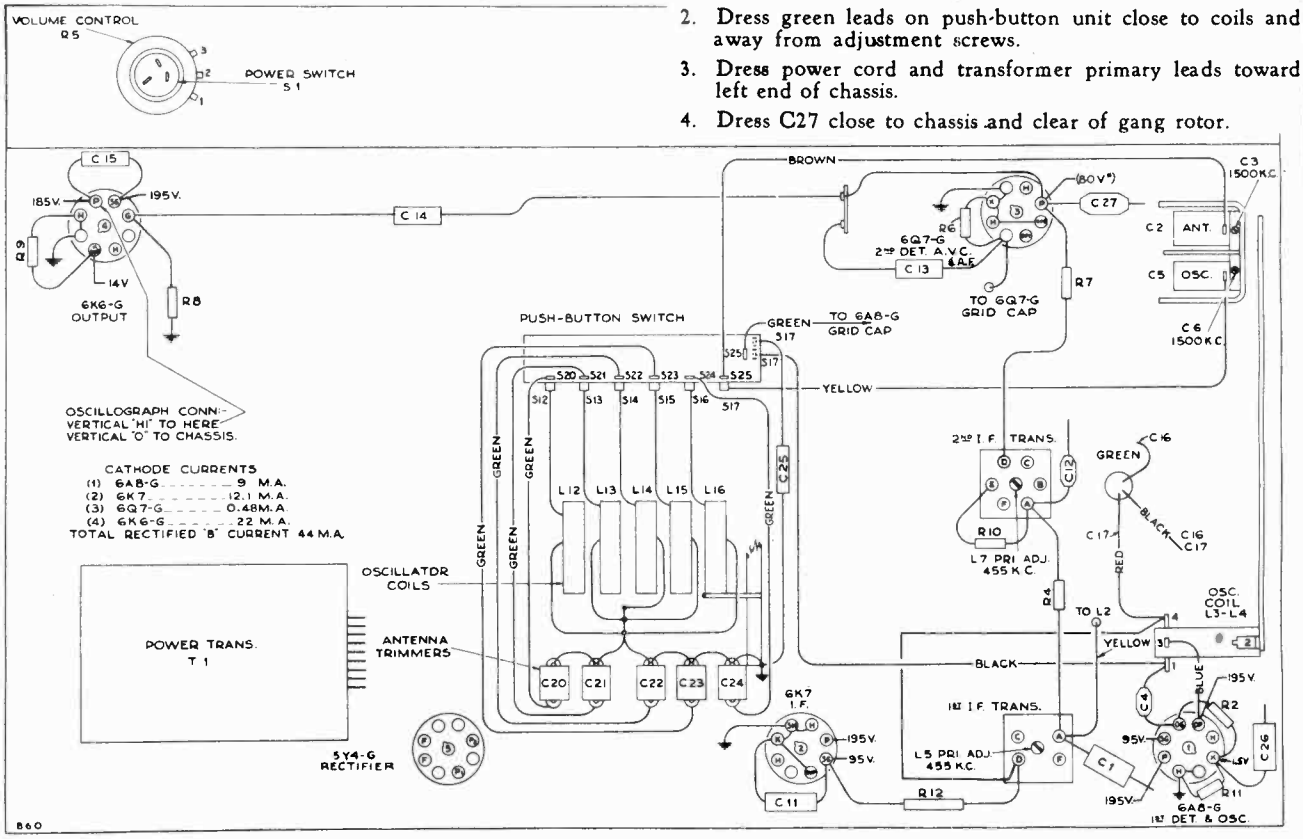


WR-258 Schematic Circuit Diagram and Speaker Connections

IF PEAK 455 KC

Precautionary Lead Dress (WR-258).—

1. Dress green lead from antenna coil to push-button switch away from chassis and gang.
2. Dress green leads on push-button unit close to coils and away from adjustment screws.
3. Dress power cord and transformer primary leads toward left end of chassis.
4. Dress C27 close to chassis and clear of gang rotor.



WR-258 Bottom View of Chassis Showing Socket Voltages, Parts Location, and R-F Wiring

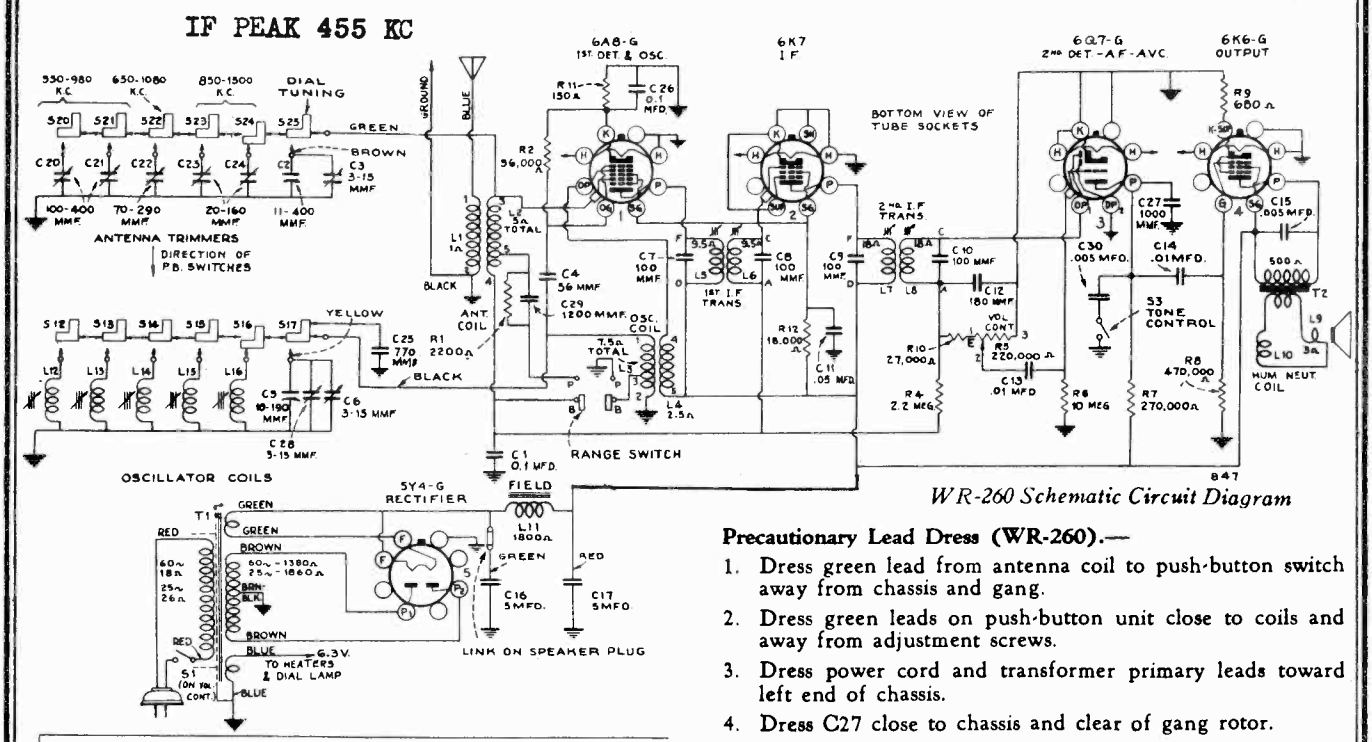
Measurements made to chassis unless otherwise indicated, with set tuned to quiet point and volume control at minimum. Values should hold within approximately ±20% with 117-volt a-c supply.

* **NOTE:** Values with star (*) are operating voltages in circuits with high series-resistance. These voltages will be lower when measured with a voltmeter drawing current through the circuit. Exact voltage may be measured with a vacuum-tube voltmeter if desired. The other values will not be affected by measuring with an ordinary high-resistance voltmeter.

Chassis Wiring
Lead Dress

WESTINGHOUSE ELEC. SUPPLY CO

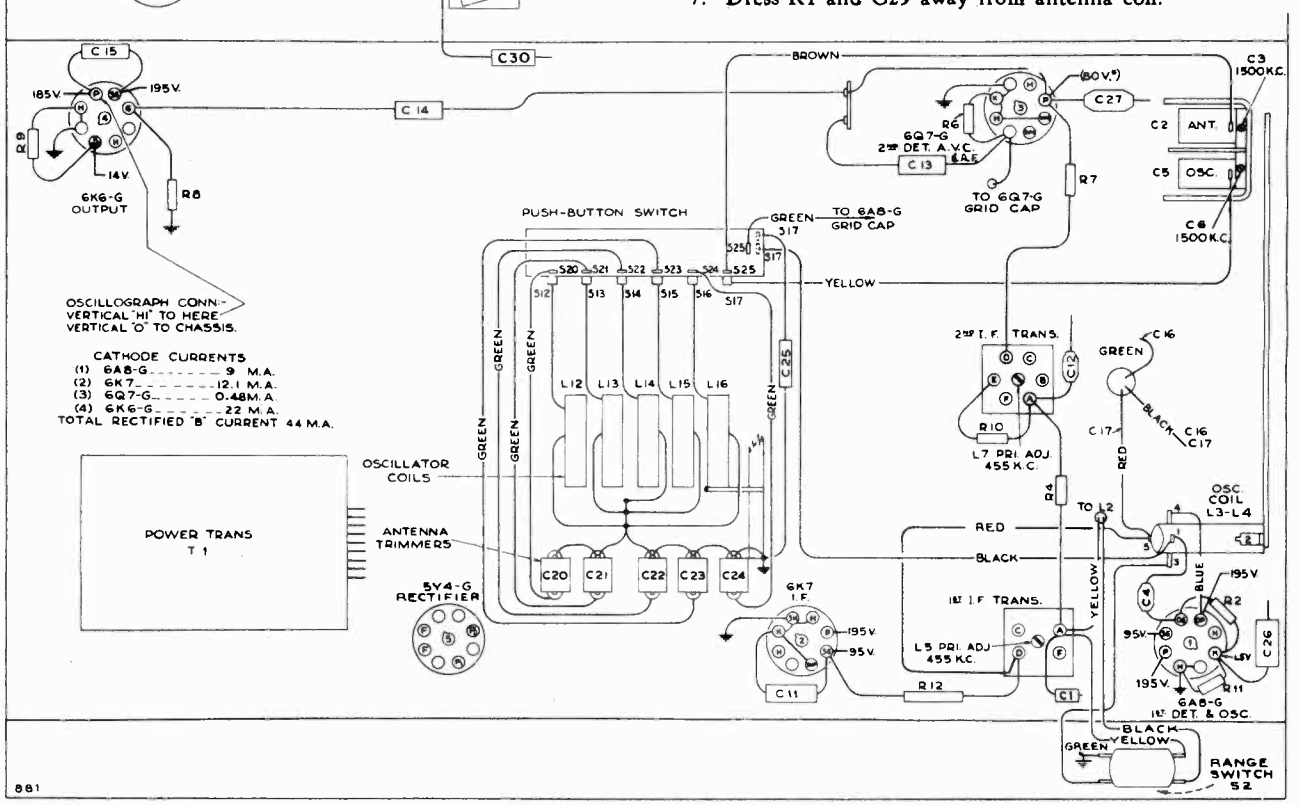
MODEL WR260(All Runs)
Schematic, Voltage



WR-260 Schematic Circuit Diagram

Precautionary Lead Dress (WR-260).—

1. Dress green lead from antenna coil to push-button switch away from chassis and gang.
2. Dress green leads on push-button unit close to coils and away from adjustment screws.
3. Dress power cord and transformer primary leads toward left end of chassis.
4. Dress C27 close to chassis and clear of gang rotor.
5. Keep bus lead from oscillator coil to range switch as short and direct as possible.
6. Dress leads from range switch away from oscillator coil.
7. Dress R1 and C29 away from antenna coil.



WR-260 Bottom View of Chassis Showing Socket Voltages, Parts Location, and R-F Wiring

Measurements made to chassis unless otherwise indicated, with set tuned to quiet point and volume control at minimum. Values should hold within approximately ±20% with 117-volt a-c supply.

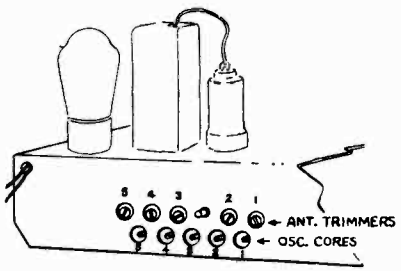
*NOTE: Values with star (*) are operating voltages in circuits with high series-resistance. These voltages will be lower when measured with a voltmeter drawing current through the circuit. Exact voltage may be measured with a vacuum-tube voltmeter if desired. The other values will not be affected by measuring with an ordinary high-resistance voltmeter.

MODEL WR258
MODEL WR260

WESTINGHOUSE ELEC. SUPPLY CO.

Runs A,B,C,etc.
Alignment,Tuner

Adjustments for Electric Tuning



Nos. 1, 2*—Approximately 550-980 kc.
No. 8—Approximately 650-1,080 kc.
Nos. 4, 5—Approximately 850-1,500 kc.

Push Button Adjustments

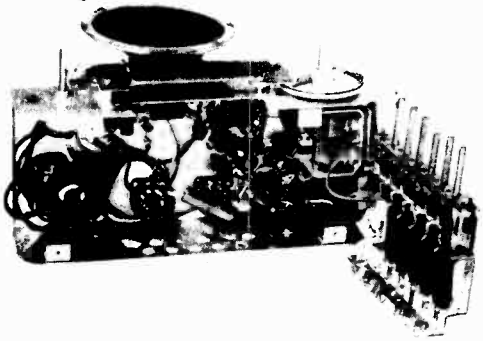
*** NOTE: On runs A and B, the range of No. 2 push button is approx. 650 to 1,080 kc. C21 is 70-290 mmfd. Use Part No. 31416 capacitor bank and Part No. 31384 coil (L13) for replacements. On runs C and above, the range of No. 2 push button is approx. 550 to 980 kc. C21 is 100-400 mmfd. Use Part No. 32066 capacitor bank and Part No. 31415 coil (L13) for replacements. The run letter is stamped on rear apron of chassis after code number — examples: 8T29B, 8023C, etc., also the letters "MOD" are stamped on rear apron of runs C or later.**

These models have six push buttons. The right-hand button connects the gang condenser for dial tuning. The other five buttons are for electric tuning of five different stations in the standard-broadcast range. The station buttons connect to separate magnetically tuned oscillator coils and separate antenna trimmers which must be adjusted for the desired stations. Use an insulated screwdriver or alignment tool. Allow at least five minutes warm-up period before making adjustments. Use a regular antenna for the preliminary adjustments. The procedure is as follows:

1. Make a list of the five desired stations, arranged in order from low to high frequencies.
2. Push in the dial-tuning (right-hand) button, and manually tune in the first station on the list. On Model WR-260, set range switch on rear of set to "Broadcast" position (switch up).
3. Push in station-button No. 1 (left-hand) and adjust No. 1 oscillator core (L12) to receive this station. Screw the core all the way in, to lowest frequency, and then unscrew slowly until the station is received.
4. Adjust No. 1 antenna trimmer (C20) for maximum output on this station.
5. Adjust for each of the remaining four stations in the same manner.

(Clockwise adjustment of oscillator cores and antenna trimmers tunes the circuits to lower frequencies.)

6. Make a final careful adjustment of the oscillator cores and antenna trimmers, using one or two feet of wire as an antenna to ensure sharp peaking.



The Push-Button Assembly is fastened to the chassis by only two screws, and may be quickly and easily swung out for convenient access to the sockets and other parts, as shown in the above illustration.

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing. Turn the receiver volume control to maximum.

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

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

Calibration Marks. — The tuning dial is fastened in the cabinet and cannot be used for reference during alignment. Therefore calibration marks corresponding to dial readings of 600 kc and 1,500 kc have been stamped in the plate on the front of the chassis, as shown in the accompanying drawing. These marks are used for reference during alignment.

Drum and Dial Indicator Adjustment. — As the first step in r-f alignment, check the position of the drum on the front shaft of the gang condenser. With the gang at maximum (full mesh) the drum set-screw should be pointing in the direction shown in the drawing. With the drum in this position, and the gang at maximum, move the dial indicator along the drive cord to coincide with the left-hand line as shown. The indicator is held to the drive cord by means of spring clips.

After completion of alignment, and after the chassis has been fastened in the cabinet, turn the gang to maximum and note whether the dial indicator is at the left-hand end mark on the dial; if it is not, loosen the drum set-screw (which is accessible through a slot in the bottom of the cabinet), turn the drum slightly so that the indicator is at this mark, and then tighten the set-screw.

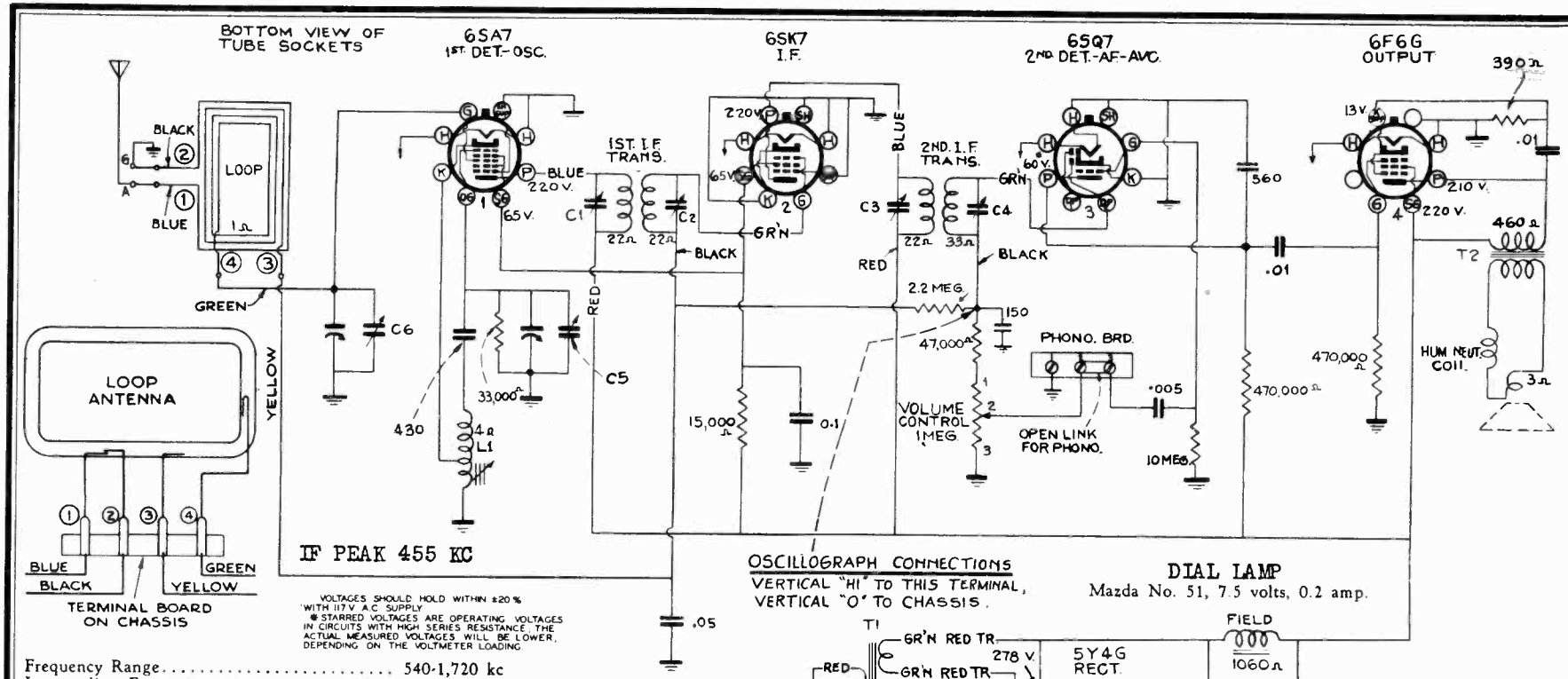
After completion of alignment, seal the i-f core-adjustment screws with household cement.

The dial tuning (right hand) push button must be pushed in for steps 1 to 3, inclusive.

On Model WR-260, set range switch to "Broadcast" position (switch up) and tone control clockwise.

Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
1	6K7 I-F grid cap, in series with .01 mfd.	455 kc	Quiet point between 550-750 kc	L7 and L8 (2nd I-F Trans.)
2	6A8-G grid cap, in series with .01 mfd.	455 kc		L5 and L6 (1st I-F Trans.)
3	Antenna lead (blue) in series with 200 mmf.	1,500 kc	1,500 kc calibration mark	C6 (osc.)† C3 (ant.)
4	Follow "Adjustments for Electric Tuning."			

† The oscillator section of the gang condenser has two trimmers, one on top, accessible through a hole in the chassis, and the other on bottom. It may be necessary to adjust both of these trimmers to secure a peak on 1,500 kc.



Record Player Connections, Using a Double-Pole, Double-Throw Toggle Switch →

Frequency Range	540-1,720 kc
Intermediate Frequency	455 kc

POWER SUPPLY RATINGS

Rating A	105-125 volts, 50-60 cycles, 60 watts
Rating B	105-125 volts, 25-60 cycles, 60 watts

LOUDSPEAKER (RL-79-3)

Type	6-inch Electrodynamic
Voice Coil Impedance	3.4 ohms at 400 cycles

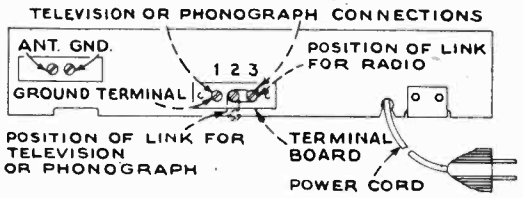
POWER OUTPUT (125-volt supply)

Undistorted	1.4 watts
Maximum	2.3 watts

Loudspeaker.—To center the loudspeaker voice coil, first remove the front dust cover, then loosen the screws holding the spider assembly. Insert three narrow feelers into the air gap, and tighten the spider screws. Remove the feelers and fasten a dust cover in place with loudspeaker cement.

CATHODE CURRENTS

(1)	6SA7	6.6 MA.
(2)	6SK7	10.2 MA.
(3)	6SQ7	35 MA.
(4)	6F66	29.9 MA.
TOTAL "B" CURRENT		46.7 MA.



Back of Chassis

Phonograph Terminal Board.—A 3-terminal board is located on the rear of the chassis for connecting a phonograph pickup, or Record Player, into the audio amplifier of the receiver. The accompanying schematic shows connections for a high-impedance pickup with a switch for changing from radio to records. For low-impedance pickups, a suitable step-up transformer should be used to provide proper impedance matching, and should be connected between the pickup and radio-phono switch.

Antenna.—The set is equipped with a built-in loop antenna. If an outdoor antenna is used, it may be connected to the "A" terminal on the rear of the chassis. The "G" terminal may be connected to a good ground such as a water pipe.

Phonograph or Television Attachment.—A terminal board is provided on the rear of the chassis for connecting a record player or television attachment into the audio-amplifying circuit. The cable from the attachment should be connected to terminals 1 and 3. The shielded or ground lead going to terminal 1. When using the attachment the connection link is disconnected and volume is controlled by the control on the phonograph or television attachment.

First Edition

MODEL WR270
Alignment, Socket
Trimmers, Tuner
Lead Dress

WESTINGHOUSE ELEC. SUPPLY CO.

MODEL WR170
Tuner Data

Alignment Procedure

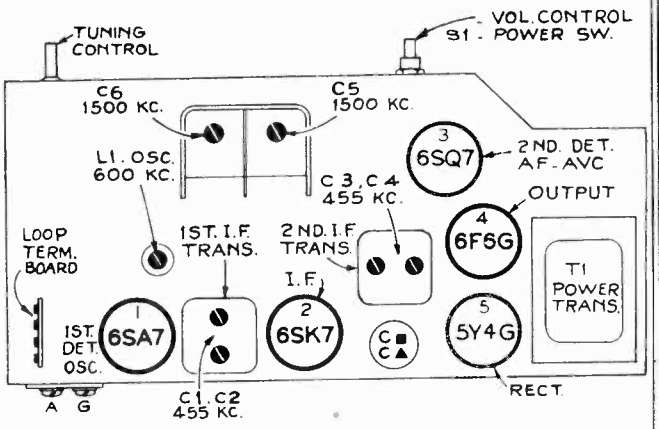
Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown on the schematic drawing.

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

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

Calibration Marks.—The tuning dial is fastened in the cabinet and can not be used for reference during alignment. Therefore calibration marks have been stamped in the plate on the front of the chassis as shown in the accompanying drawing. These marks are used for reference during alignment.

Dial Indicator Adjustment.—With the gang condenser in full mesh, the indicator should point to the extreme left (low frequency) mark on the dial scale.



Tube and Trimmer Locations

Steps	Connect the high side of the test-osc. to—	Tune test osc. to—	Turn radio dial to—	Adjust the following for maximum peak output
1	Antenna Terminal	455 kc	Quiet Point between 1,720-1,500 kc	C3 and C4 (2nd I-F Trans.)
2				C1 and C2 (1st I-F Trans.)
3	Ant. terminal in series with 200 mmfd.	1,500 kc	1,500 kc calibration mark	C5 (osc.) C6 (ant.)
4		600 kc	600 kc calibration mark	L1 (osc.)*
5	Repeat step 3.			

Note.—Oscillator tracks above signal.

* Rock gang condenser slightly while adjusting L1.

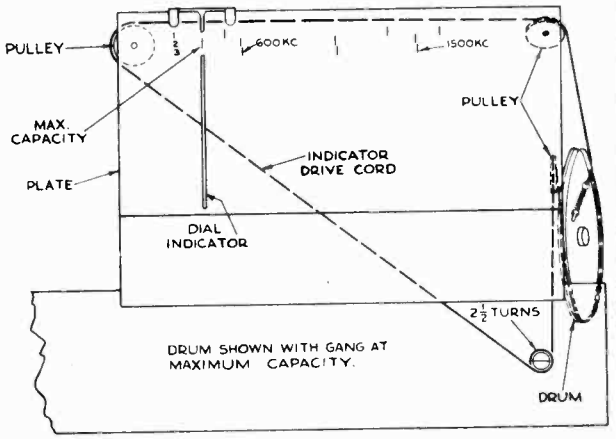
PRECAUTIONARY LEAD DRESS.—

1. Power cord leads must be dressed away from 6SQ7 socket, and toward end of chassis.
2. Green lead 2nd I.F. to 6SQ7 must be dressed against base.
3. Blue lead 2nd I.F. to 6SK7 must be dressed close to base.
4. Green and blue leads from 1st I.F. transformer must be dressed close to base.
5. Green lead from gang to 6SA7 socket must be dressed toward side apron away from other parts.

Adjustments for Push-Button Tuning

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

1. Loosen the push buttons by turning counter-clockwise about one turn from their tight position so they turn freely.
2. Check to be sure the link connection on back of chassis is in "Radio" position (connected between terminals 2 and 3).
3. Press in push-button No. 1 (left) as far as it will go without undue pressure, hold in, retune station with manual control if necessary for best reception, and then carefully tighten up the button. Do not tighten more than ¼ turn after the screw begins to grip or damage to the mechanism may result.
4. Proceed in a similar manner for the remainder of the push-buttons.
5. Insert the station marker tabs in the recesses above the push-buttons.



Dial-Indicator and Drive Mechanism

Refer to "Alignment Procedure" for explanation of the "calibration marks" shown in this drawing.

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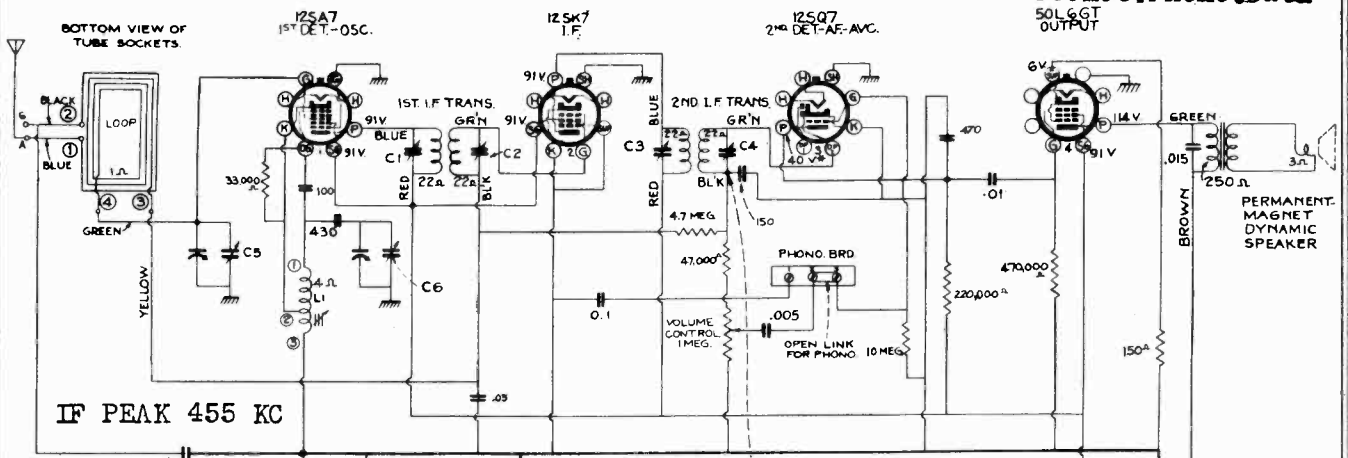
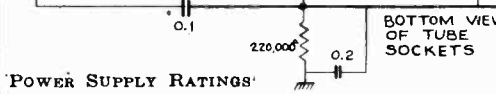
MODEL WR170
Schematic, Voltage
Alignment, Trimmers
Socket. Phono. Data

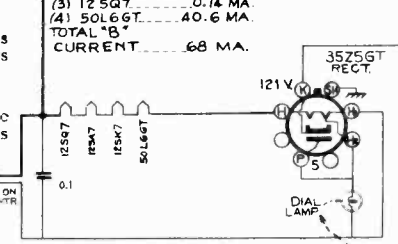


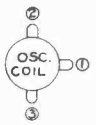


CATHODE CURRENTS

(1) 12SA7	10.2 MA.
(2) 12SK7	16.9 MA.
(3) 12SQ7	0.14 MA.
(4) 50L6GT	40.6 MA.
TOTAL "B" CURRENT	68 MA.

OSCILLOGRAPH CONNECTIONS
VERTICAL "HI" TO THIS TERMINAL
VERTICAL "O" TO GROUND BINDING POST





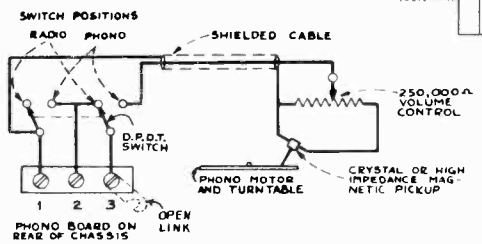
INDICATES CHASSIS

Power Supply Ratings
A-C Rating . 105-125 volts, 50-60 cycles, 35 watts
D-C Rating . . 105-125 volts, direct current, 35 watts

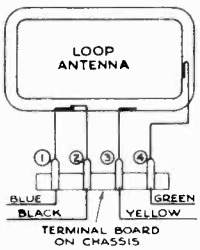
Loudspeaker (84737-2)
Type . . . . . 6-inch permanent magnet dynamic
Voice Coil Impedance . . . . . 4 ohms at 400 cycles

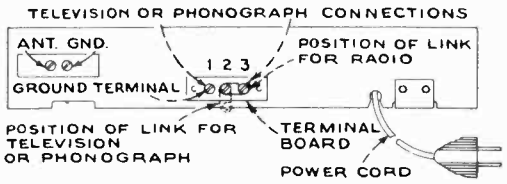
Frequency Range . . . . . 540-1,720 kc
Intermediate Frequency . . . . . 455 kc

Power Output (125 volts, 60 cycle supply)
Undistorted . . . . . 0.8 watts
Maximum . . . . . 1.4 watts

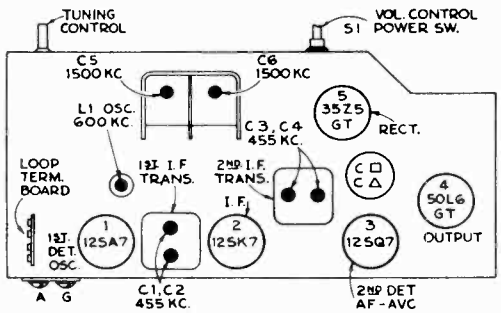


Record Player Connections, Using a Double-Pole, Double-Throw Toggle Switch

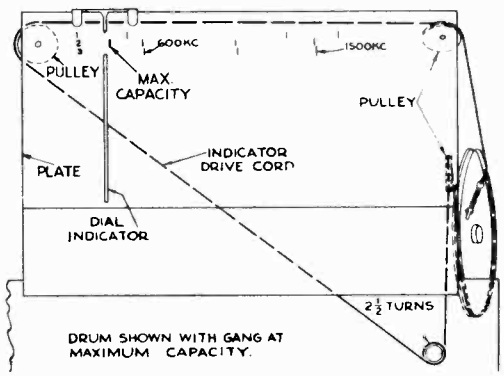




Back of Chassis



Tube and Trimmer Locations



Dial-Indicator and Drive Mechanism

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown on the schematic drawing.

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

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

Calibration Marks.—The tuning dial is fastened in the cabinet and can not be used for reference during alignment. Therefore calibration marks have been stamped in the plate on the front of the chassis as shown in the accompanying drawing. These marks are used for reference during alignment.

Dial Indicator Adjustment.—With the gang condenser in full mesh, the indicator should be set 1/16 inch to the left of the extreme left (low frequency) mark on the dial scale.

Steps	Connect the high side of the test-osc. to—	Tune test osc. to—	Turn radio dial to	Adjust the following for maximum peak output
1	Ant. terminal	455 kc	Quiet Point between 1,720-1,500 kc	C3 and C4 (2nd I-F trans.)
2	Ant. terminal			C1 and C2 (1st I-F trans.)
3	Ant. terminal in series with 200 mmfd.	1,500 kc	1,500 kc calibration mark	C6 (osc.) C5 (ant.)
4		600 kc	600 kc calibration mark	L1 (osc.) (Rock in)
5	Repeat step 3.			

NOTE.—Oscillator tracks above signal.

MODEL WR366

Schematic, Lead Dress

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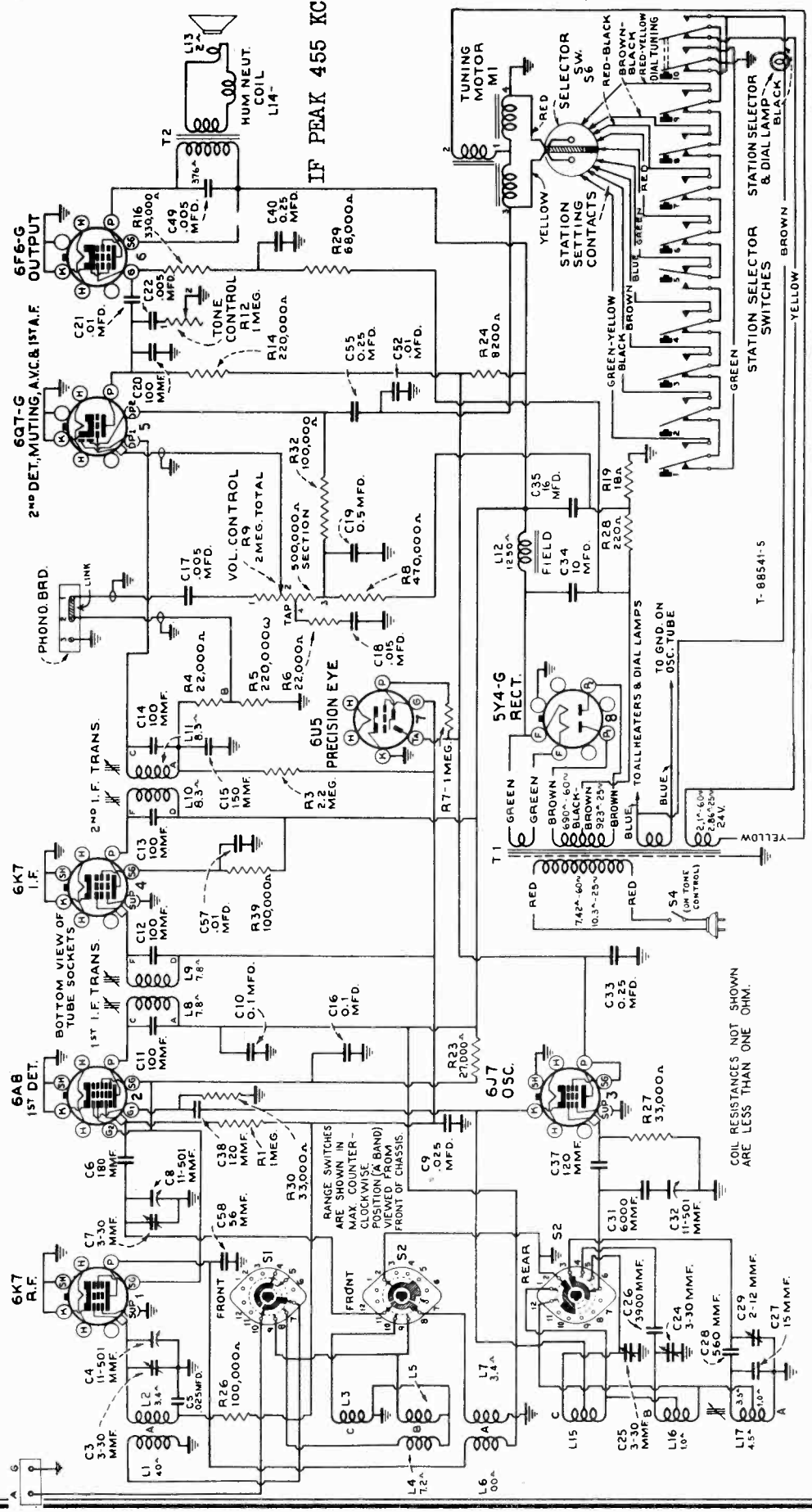

WR-366 Schematic Circuit Diagram

***NOTE:** Values with star (*) are operating voltages in **Precautionary Lead Dress.**—circuits with high series-resistance. These voltages will be lower when measured with a voltmeter drawing current through the circuit. Exact voltage may be measured with a vacuum-tube voltmeter if desired. The other values will not be affected by measuring with an ordinary high-resistance voltmeter.

Measurements made to chassis unless otherwise indicated, with set tuned to quiet point and volume control at minimum. Values should hold within approximately ±20% with 117-volt a-c supply.

1. Leads from the oscillator section of the range switch to the oscillator coils and mica trimmers should be kept as short as possible and dressed away from other parts and wiring.
2. The leads on C31 connecting between the range switch and the oscillator section of the gang should be made as short as possible.
3. The leads from the power transformer and the power cord to the power switch (S4) should be twisted together and dressed away from other wiring.
4. The yellow lead connecting to the transformer motor winding at the rectifier socket should be dressed away from the phono terminals.

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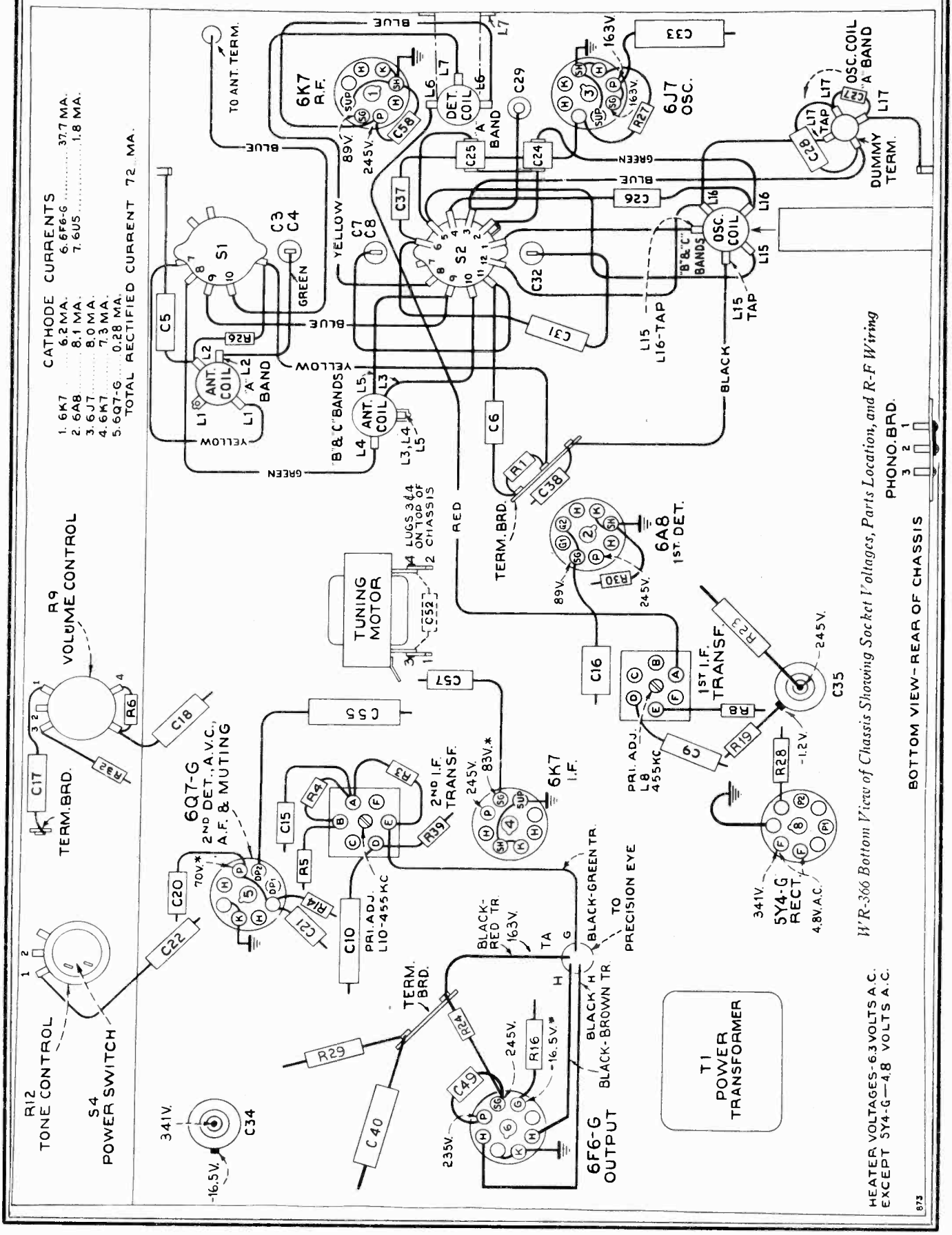
MODEL WR366
Chassis Wiring
Voltage



WR-366 Bottom View of Chassis Showing Socket Voltages, Parts Location, and R-F Wiring

MODEL WR366
MODEL WR368
Socket, Trimmers
Drive Cord Data

WESTINGHOUSE ELEC. SUPPLY CO.

Electrical Specifications

FREQUENCY RANGES

"Standard Broadcast" (A)	540-1,720 kc
"Medium Wave" (B)	2.3-7 mc
"Short Wave" (C)	7-22 mc

R-F ALIGNMENT FREQUENCIES

"Short Wave" (C)	20 mc (osc., ant.)
"Medium Wave" (B)	6.1 mc (osc.)
"Standard Broadcast" (A)	600 kc (osc.), 1,500 kc (osc., ant.)

Intermediate Frequency ..... 455 kc

TUBE COMPLEMENT (WR-366)

(1) RCA-6K7	R-F Amplifier
(2) RCA-6A8	First Detector
(3) RCA-6J7	Heterodyne Oscillator
(4) RCA-6K7	I-F Amplifier
(5) RCA-6Q7-G	2nd Det., 1st A.F., A.V.C.
(6) RCA-6F6-G	Power Output
(7) RCA-6U5	Precision Eye
(8) RCA-5Y4-G	Rectifier

TUBE COMPLEMENT (WR-368)

(1) RCA-6K7	R-F Amplifier
(2) RCA-6A8	First Detector
(3) RCA-6J7	Heterodyne Oscillator
(4) RCA-6K7	I-F Amplifier
(5) RCA-6Q7-G	2nd Det., 1st A.F., A.V.C.
(6) RCA-6F5	Phase Inverter
(7) RCA-6F6-G	Power Output
(8) RCA-6F6-G	Power Output
(9) RCA-6U5	Precision Eye
(10) RCA-5U4-G	Rectifier

Pilot Lamps (3) ..... Center, Mazda No. 47, 6-8 V., 0.15 amp.; Sides, Mazda No. 44, 6.3 V., 0.25 amp.

POWER SUPPLY RATINGS

Rating A ..... 105-125 volts, 50-60 cycles, 80 watts (WR-366), 120 watts (WR-368)
Rating B ..... 105-125 volts, 25-30 cycles, 80 watts (WR-366), 120 watts (WR-368)

POWER OUTPUT	WR-366	WR-368
Undistorted	2.5 watts	10 watts
Maximum	5 watts	12 watts

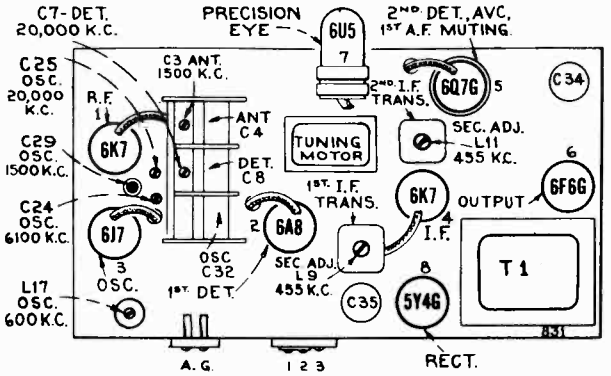
LOUDSPEAKER

Type	12-inch Electrodynamic
Voice Coil Impedance	2.2 ohms at 400 cycles

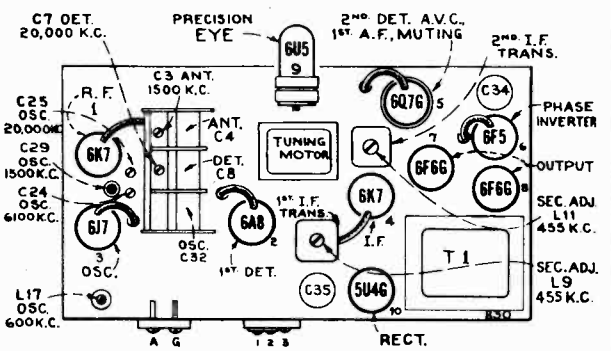
General Description

Model WR-366 is an eight-tube, three-band, superheterodyne receiver employing electric motor tuning for nine broadcast stations and a Precision Eye for precise manual tuning. The tuning ranges cover the standard broadcast band, Municipal and State Police bands, and the American and Foreign short-wave broadcast bands. Among its features are: Continuously variable tone control, illuminated slide-rule dial, automatic volume control, magnetically-tuned i-f transformers, r-f amplifier stage, phonograph terminal board, separate oscillator tube, and bass compensation.

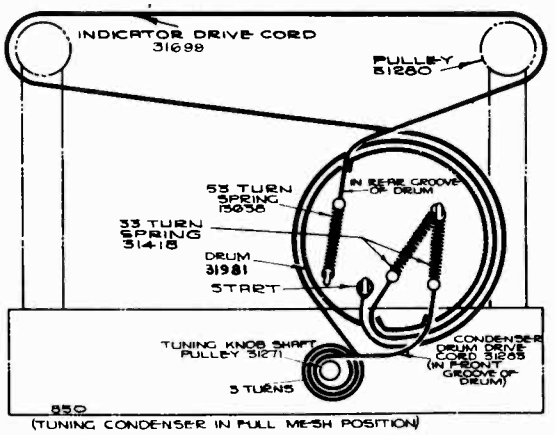
The Model WR-368 is a ten-tube, three-band, superheterodyne receiver with all of the features of the WR-366 and in addition employing push-pull output with a phase inverter and a power output of 12 watts.



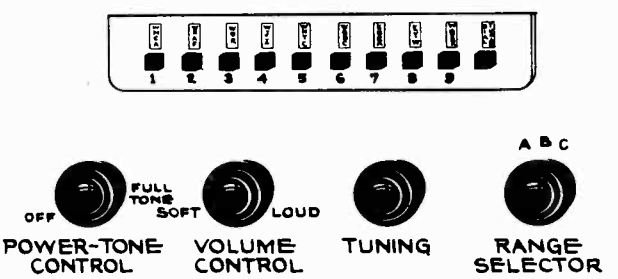
WR-366 Tube and Trimmer Locations



WR-368 Tube and Trimmer Locations



Drive Cord Arrangement for Tuning Condenser and Dial Indicator



Location of Controls

Tuner Assembly Data, Part 1

WESTINGHOUSE ELEC. SUPPLY CO.

MODEL WR366
MODEL WR368
MODEL WR370

Electric Tuning Mechanism

The circuit of the electric tuning mechanism is shown in the schematic diagram, and the mechanical details are illustrated.

The action can be understood by following a cycle of operation:

When a station button is pushed in, it completes the 24-volt circuit through the corresponding station-setting contact and one-half of the brass selector disc, which is connected to one side of the motor field coil. This energizes the motor, and the rotor is pulled forward, engaging with the gear train that drives the tuning condenser and selector disc. The condenser and disc rotate until the insulation line comes under the particular station-setting contact, and the motor circuit is broken. Inertia carries the insulation line past the station-setting contact which then makes contact to the other half of the disc: This completes the circuit to the other side of the motor field coil, causing the motor to reverse. The floating flywheel is still turning in the original direction and therefore slows down the reversal movement of the motor; as a result the selector disc is moved slowly back until the insulation line is under the station-setting contact, when the circuit is broken and the mechanism stops.

Oscillation of Tuning Mechanism

The principal of operation necessitates that the mechanism go through several quick reversals on arriving at the desired station frequency and before reaching a dead stop. Three of four reversals are normal. The number of reversals and consistency of operation depends mainly on the flywheel friction adjustment, however, in some cases the selector disc and station setting contacts are involved. The following suggestions may be helpful where excessive pointer oscillation is experienced.

Oscillation on Certain Buttons Only

(1) Check contact tip of selector assembly for loose fit in body. See that nose of contact is not burned nor distorted out of correct shape. Replace tip if necessary; do not attempt to file the tips.

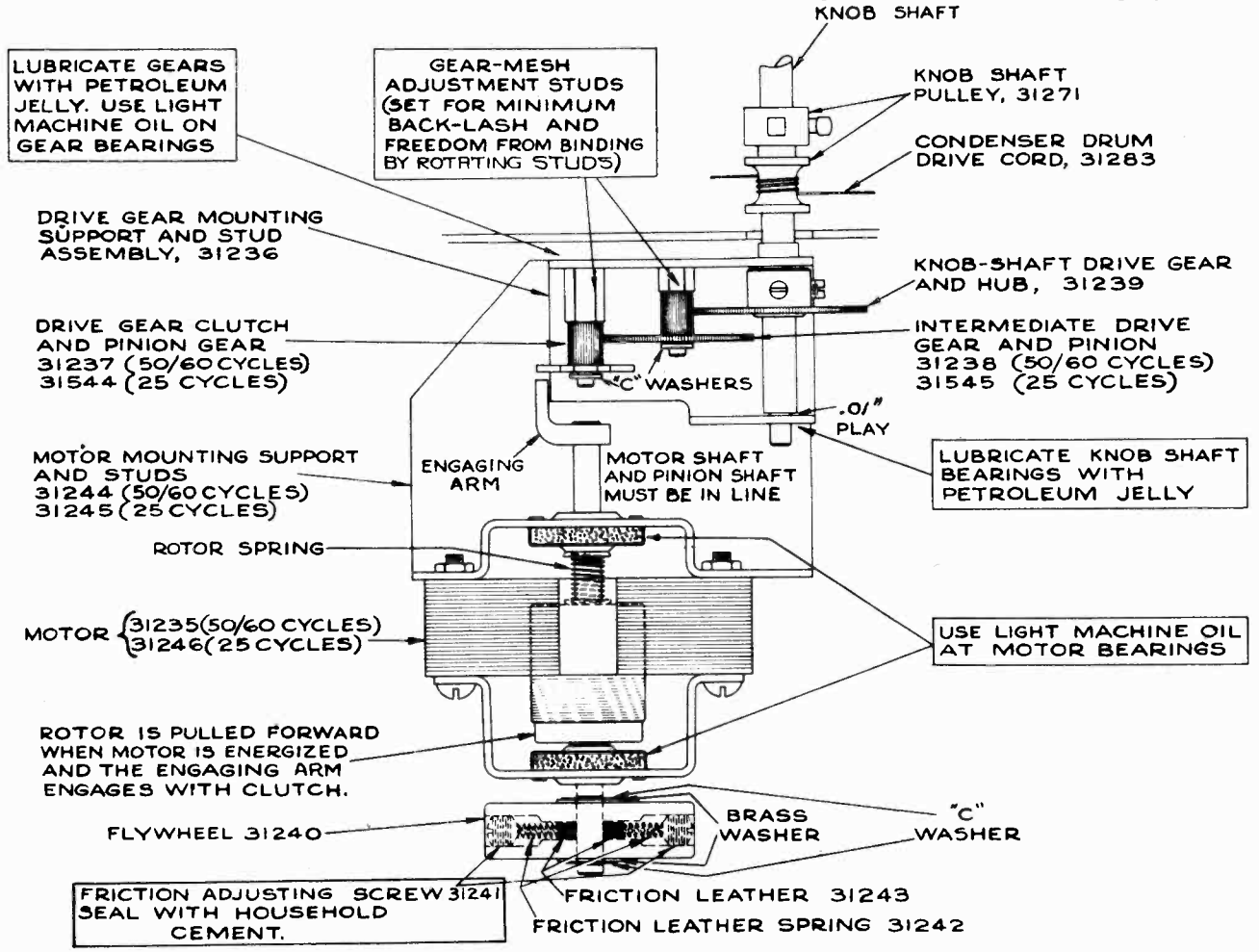
(2) Clean the insulating gap of selector disc, being sure to remove all metal particles and metallic fragments from beveled edges of the brass. Each contact should be checked to assure that clearance exists (approx. .010-in) between it and the disc when stopped in position on the station.

(3) Inspect the insulating gap to see that it has not changed shape due to bending or warping. Replace the disc if cleaning and adjustment fail to give correct operation.

Oscillation On All Buttons

(1) Slow oscillation indicates friction adjustment of flywheel is too tight. Loosen set screw in flywheel slightly.

(2) Rapid oscillation indicates friction adjustment is too loose. Tighten set screw in flywheel slightly.



There must be 1/32-inch clearance between the end of the engaging arm and the face of the intermediate gear when the motor is in its full forward position.

Motor and Gear Mechanism

MODEL WR366
MODEL WR368
MODEL WR370

WESTINGHOUSE ELEC. SUPPLY CO.

Data, Part 2
Tuner, Notes

(3) If definite adjustment cannot be reached, remove spring from behind flywheel set screw and increase its length by stretching; replace and make the necessary adjustments. Install a new spring if necessary.
(4) See that leather friction pad is not binding in its hole, and that it is saturated with lubricant. "Neats-Foot" oil should be used for this purpose.
(5) Incorrect balance of the flywheel sometimes prevents correct adjustment. The standard service replacement flywheel Part No. 31240 may be used to definitely eliminate this cause.
(6) The number of oscillations varies somewhat with line voltage. Avoid making adjustments at very low (105v) or very high (125v) voltages. Adjustments made at 115-118 volts provide good operation of the rated range.
(7) Stability of adjustment is slightly better if made after a brief run-in period.

Adjustment of Selector Disc

The brass selector disc is fastened to the rear shaft of the tuning condenser by means of two set-screws. When the condenser is at maximum (plates fully meshed) the insulation line should be horizontal, with the beveled operating-end at the left (viewed from rear).

The selector disc should be set so that the contact-tip plungers in the station-setting contacts project not more than 1/16-in. from the body of the contacts.

Muting Circuit

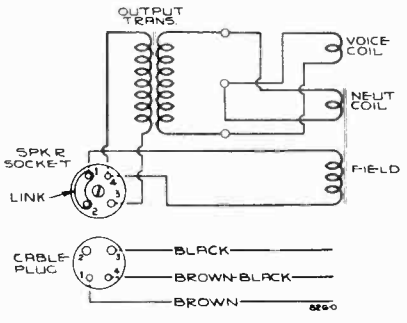
When the electric tuning mechanism is in action, the motor-supply voltage is fed into a diode rectifier circuit which applies a high bias to the first-audio amplifier. This prevents audio amplification and makes the set quiet or "mute" while the mechanism is operating.

Lubrication

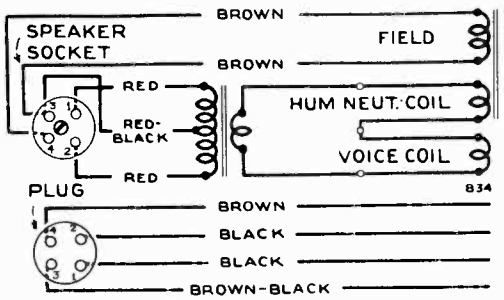
Motor bearings and **gear bearings;** use light machine oil.
Gear faces; use "Pure Oil No. 611" or petroleum jelly.
Dial indicator pulleys and **rails;** use "Castordag" or petroleum jelly.
Selector disc; apply **thin** film of petroleum jelly.
Friction leather on flywheel; apply "neats-foot" oil. When replacing leather, soak it for at least 24 hours in neats-foot oil, and insert in flywheel while dripping.

Push Button Adjustments

Push buttons which stick in the escutcheon may be corrected by centering the rubber retainer-bumper in the rear of the buttons and cementing the rubber in place with plasticon. If the buttons do not lock in place, the chassis may be too far back in the cabinet or the latch bar spring may be out of place.



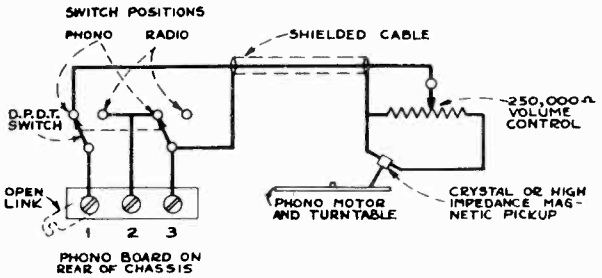
WR-366 Loudspeaker Wiring



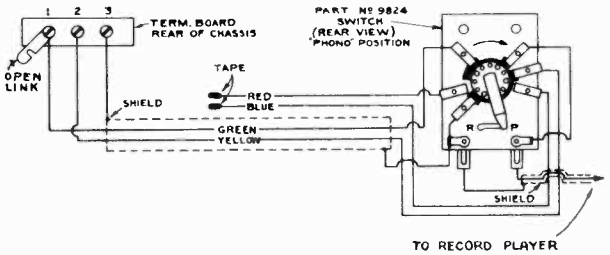
WR-368 Loudspeaker Wiring

Removing Speaker from Cabinet.—Hold the nuts, located between the speaker and baffle, with a pair of long-nose pliers while removing the speaker nuts. Normal shrinkage of the wood baffle may loosen the nuts so that the screws will otherwise turn while removing the speaker.

Centering the Speaker Voice-Coil.—The speaker voice-coil may be centered in the normal manner by using three narrow feelers to obtain equal spacing of the air-gap. The dust cover must be removed before centering. This may be done by gently cutting it free from the cone, being careful not to cut or damage the cone while doing so. After adjustment, a dust cover should be carefully cemented in place to prevent entrance of foreign material.



Phonograph Connections, Using a Double-Pole, Double-Throw Switch



Model WR-366 Model WR-368
Phonograph Connections, Using a Part No. 9824 Switch

Phonograph Terminal Board.—A 3-terminal board is located on the rear of the chassis for connecting a phonograph pickup, or Record Player, into the audio amplifier of the receiver. The upper diagram shows connections for a high-impedance pickup with a switch for changing from radio to records. For low-impedance pickups, a suitable step-up transformer should be used to provide proper impedance matching, and should be connected between the pickup and radio-phono switch. The volume control is optional since the radio volume control may be used to control record volume. The lower diagram shows Part No. 9824 switch and cable, and connections from cable to the phono terminal board. The pickup leads connect to terminals on the switch as shown.

MODEL WR370
Tuner Adjustments

WESTINGHOUSE ELEC. SUPPLY CO.

MODEL WR366
MODEL WR368
Alignment
Tuner Adjustments

ALIGNMENT PROCEDURE

Cathode-Ray Alignment is the preferable method. Connect vertical "Hi" input to terminal No. 2 on phono board and vertical "0" to terminal No. 3.

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

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

Dial-Indicator Adjustment.—Before aligning this receiver it is essential to slide the indicator pointer along the drive cable until it points to the lowest frequency mark on "A" band, (520 kc) with the gang condenser fully meshed.

Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
1	6K7 I-F grid cap, in series with .01 mfd.	455 kc	"A" band, Quiet Point between 550-750 kc	L10, L11 (2nd I-F Transformer)
2	6A8 det. grid cap, in series with .01 mfd.	455 kc		L8, L9 (1st I-F Transformer)
3	Antenna Terminal in series with 300 ohms.	20 mc	20 mc "C" band	C25 (osc.)* C7 (det.)†
4	Antenna Terminal in series with 300 ohms.	6.1 mc	6.1 mc "B" band	C24 (osc.)**
5	Antenna Terminal in series with 200 mmf.	1,500 kc	1,500 kc "A" band	C29 (osc.) C3 (ant.)
6	Antenna Terminal in series with 200 mmf.	600 kc	600 kc "A" band	L17 (osc.)
7	Antenna Terminal in series with 200 mmf.	1,500 kc	1,500 kc "A" band	C29 (osc.)

* Use **minimum** capacity peak if two peaks can be obtained. Check to determine that the correct peak has been used by turning to 19.09 mc, at which point a weaker signal should be received.

** Use **minimum** capacity peak if two peaks can be obtained. Check to determine that the correct peak has been used by turning to 5.19 mc, at which point a weaker signal should be received.

† Rock gang condenser and use maximum capacity peak if two peaks can be obtained with C7.

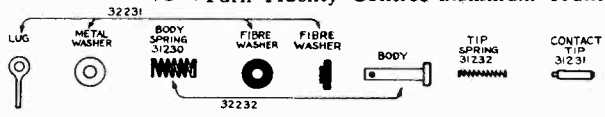
Note that oscillator tracks above (higher frequency) signal on all bands.

ADJUSTMENTS FOR ELECTRIC TUNING

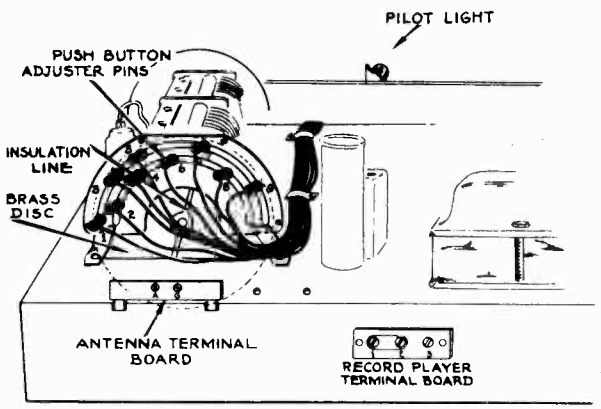
Push buttons No. 1 to 9 are electric tuning station buttons. The right hand push button is for dial tuning.

1. Make a list of the desired nine stations, arranged in order from low to high frequencies.
2. Turn range selector to "A" band, turn power on, and allow a few minutes for warming up.
3. Press down the "dial-tuning" (right-hand) button.*
4. Manually tune in the first station on the list, using the Precision Eye for accurate tuning.
5. Hold down the "dial-tuning" button, and press down station button No. 1 (left). Both buttons will stay down, central dial lamp will light brightly or dully, depending on which side of the disc the contact is located. Move station-setting contact No. 1 to the insulating line on the disc at rear of gang. When the contact is correctly centered on the insulating line, the central dial lamp will go out.
6. Press down any other button in order to release the dial-tuning button and station button No. 1. Then press down station button No. 1 again. The electric tuning mechanism will function to tune in the station, and the central dial lamp will stay on.
7. Repeat this process for the remaining stations.

* WR-370 → Turn Fidelity Control maximum counter-clockwise.



Component Parts of Station-Setting Contact

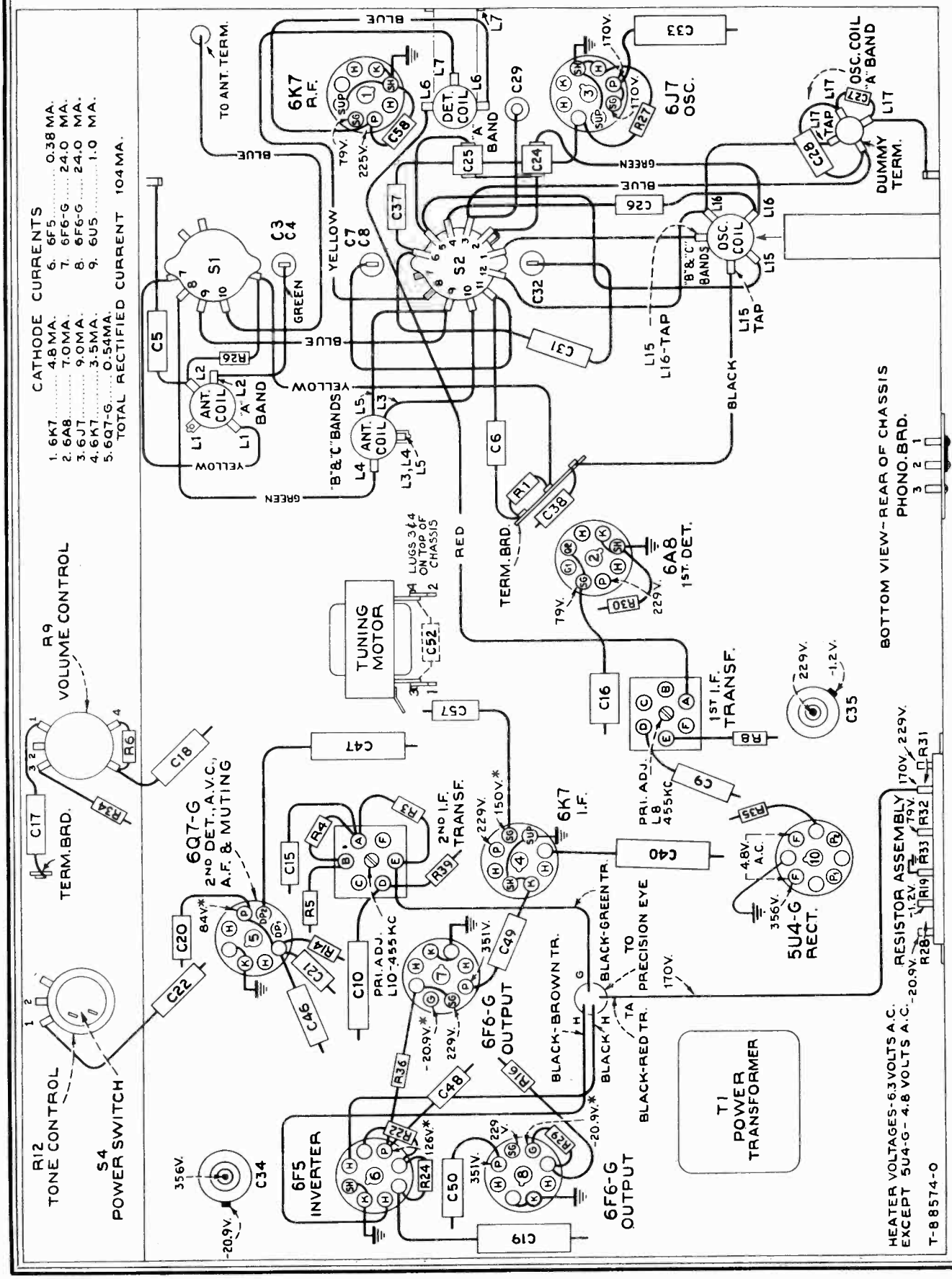


Station Button	Color of Lead To Station-Setting Contact
No. 1	Green-yellow
No. 2	Black
No. 3	Brown
No. 4	Blue
No. 5	Green
No. 6	Red
No. 7	Red-black
No. 8	Brown-black
No. 9	Red-yellow

Station-Setting Contacts and Selector Disc

MODEL WR368
Chassis Wiring
Voltage

WESTINGHOUSE ELEC. SUPPLY CO.



WR-368 Bottom View of Chassis Showing Socket Voltages, Parts Location, and R-F Wiring

Schematic Lead Dress

WESTINGHOUSE ELEC. SUPPLY CO.

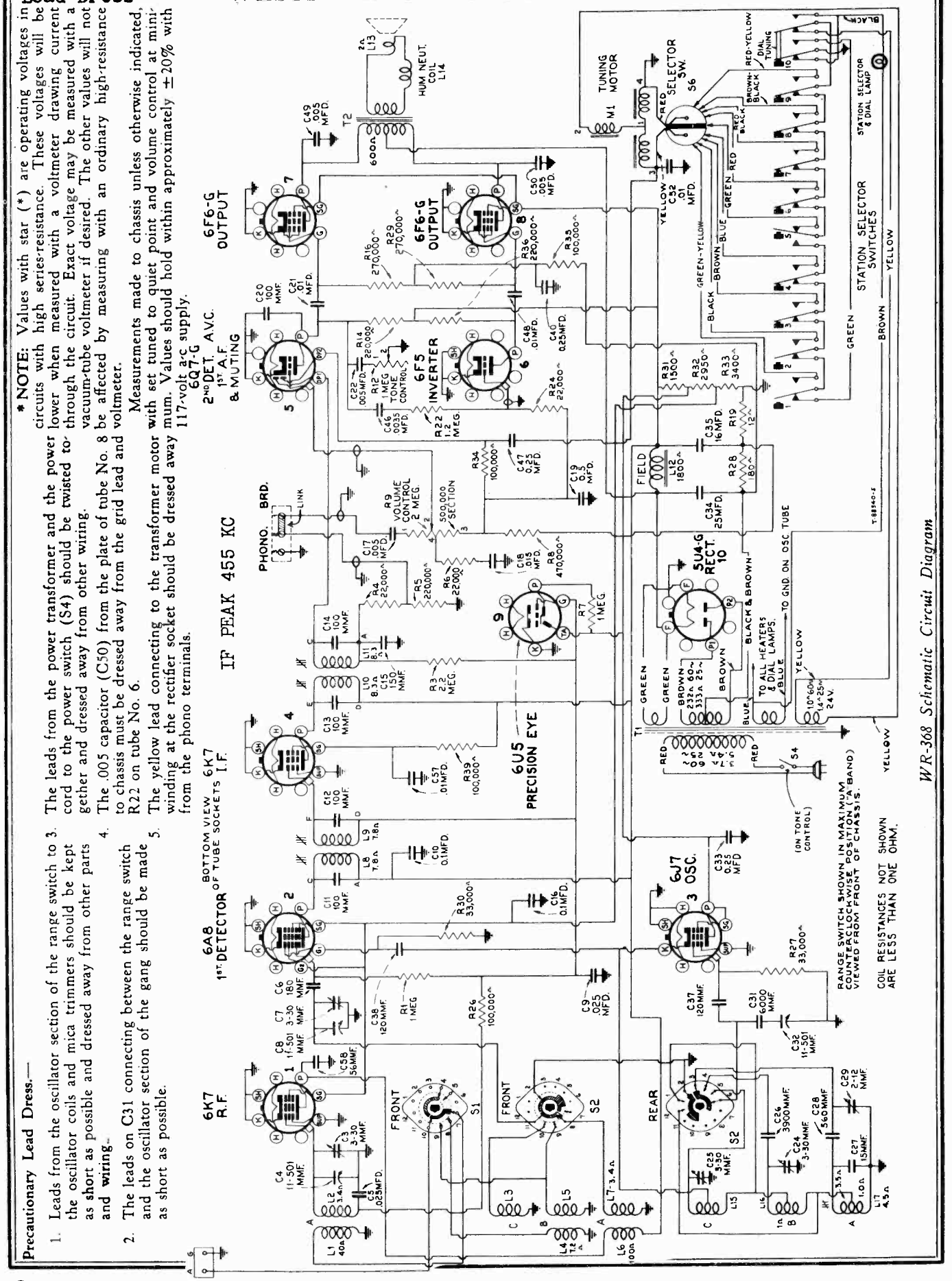
MODEL WR368

Precautionary Lead Dress.—

1. Leads from the oscillator section of the range switch to the oscillator coils and mica trimmers should be kept as short as possible and dressed away from other parts and wiring.
2. The leads on C31 connecting between the range switch and the oscillator section of the gang should be made as short as possible.
3. The leads from the power transformer and the power cord to the power switch (S4) should be twisted together and dressed away from other wiring.
4. The .005 capacitor (C50) from the plate of tube No. 8 to chassis must be dressed away from the grid lead and R22 on tube No. 6.
5. The yellow lead connecting to the transformer motor winding at the rectifier socket should be dressed away from the phono terminals.

***NOTE:** Values with star (*) are operating voltages in circuits with high series-resistance. These voltages will be lower when measured with a voltmeter drawing current through the circuit. Exact voltage may be measured with a vacuum-tube voltmeter if desired. The other values will not be affected by measuring with an ordinary high-resistance voltmeter.

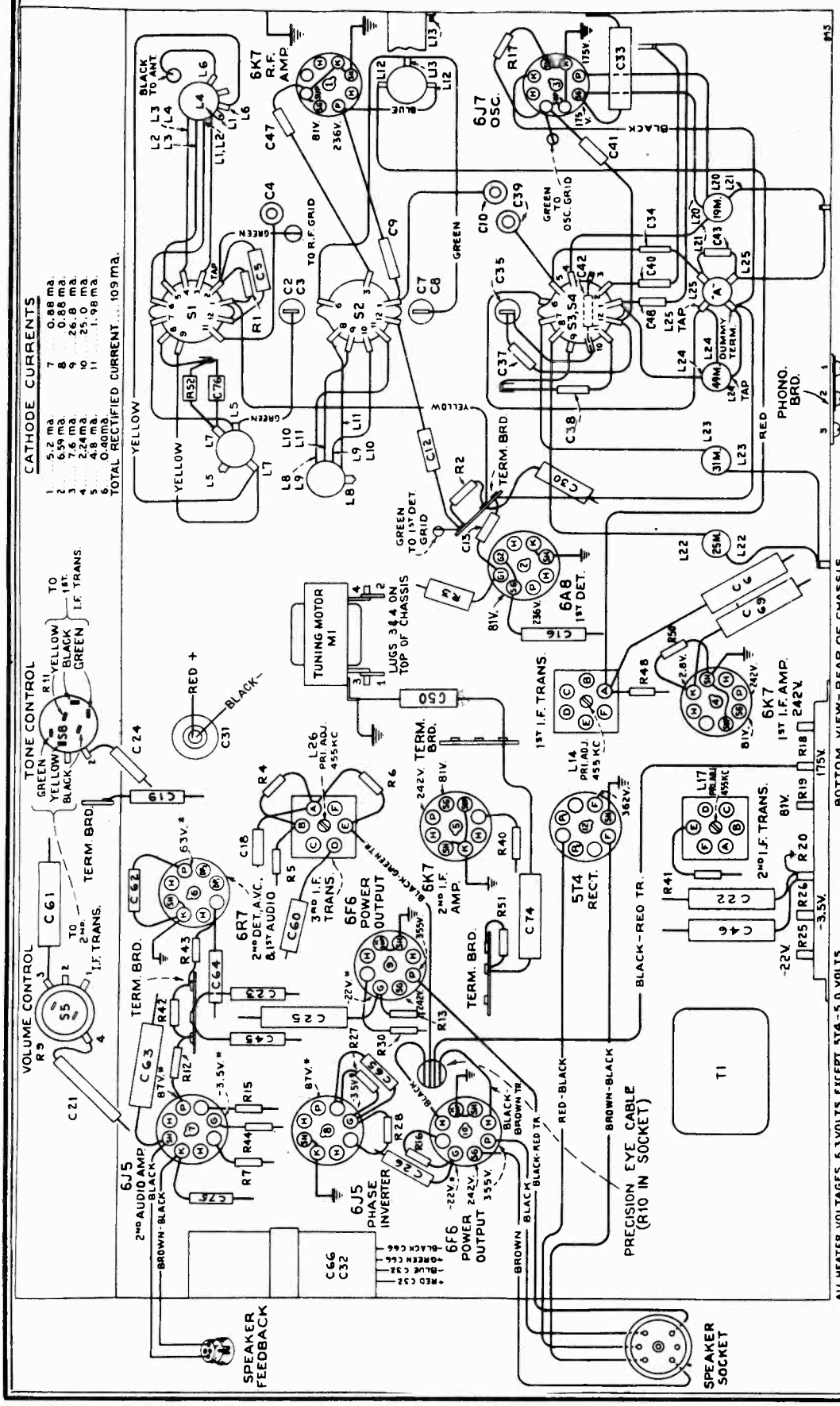
Measurements made to chassis unless otherwise indicated, with set tuned to quiet point and volume control at minimum. Values should hold within approximately ±20% with 117-volt a-c supply.



WR-368 Schematic Circuit Diagram

MODEL WR370
Chassis Wiring
Voltage, Lead Dress

WESTINGHOUSE ELEC. SUPPLY CO.



* **NOTE:** Values with star (*) are operating voltages in circuits with high series-resistance. These voltages will be lower when measured with a voltmeter drawing current through the circuit. Exact voltage may be measured with a vacuum-tube voltmeter if desired. The other values will not be affected by measuring with an ordinary high-resistance voltmeter.

Measurements made to chassis unless otherwise indicated, with set tuned to quiet point and volume control at minimum. Values should hold within approximately ±20% with 117-volt a-c supply.

Precautionary Lead Dress.—

(1) Leads on spread-band antenna and r-f coils and trimming capacitors should be kept short as possible and separated from each other.

(2) Keep black lead from L25 away from C38 and L24.

(3) Keep black lead from L25 to cathode lug on 6J7 away from the chassis and adjacent parts.

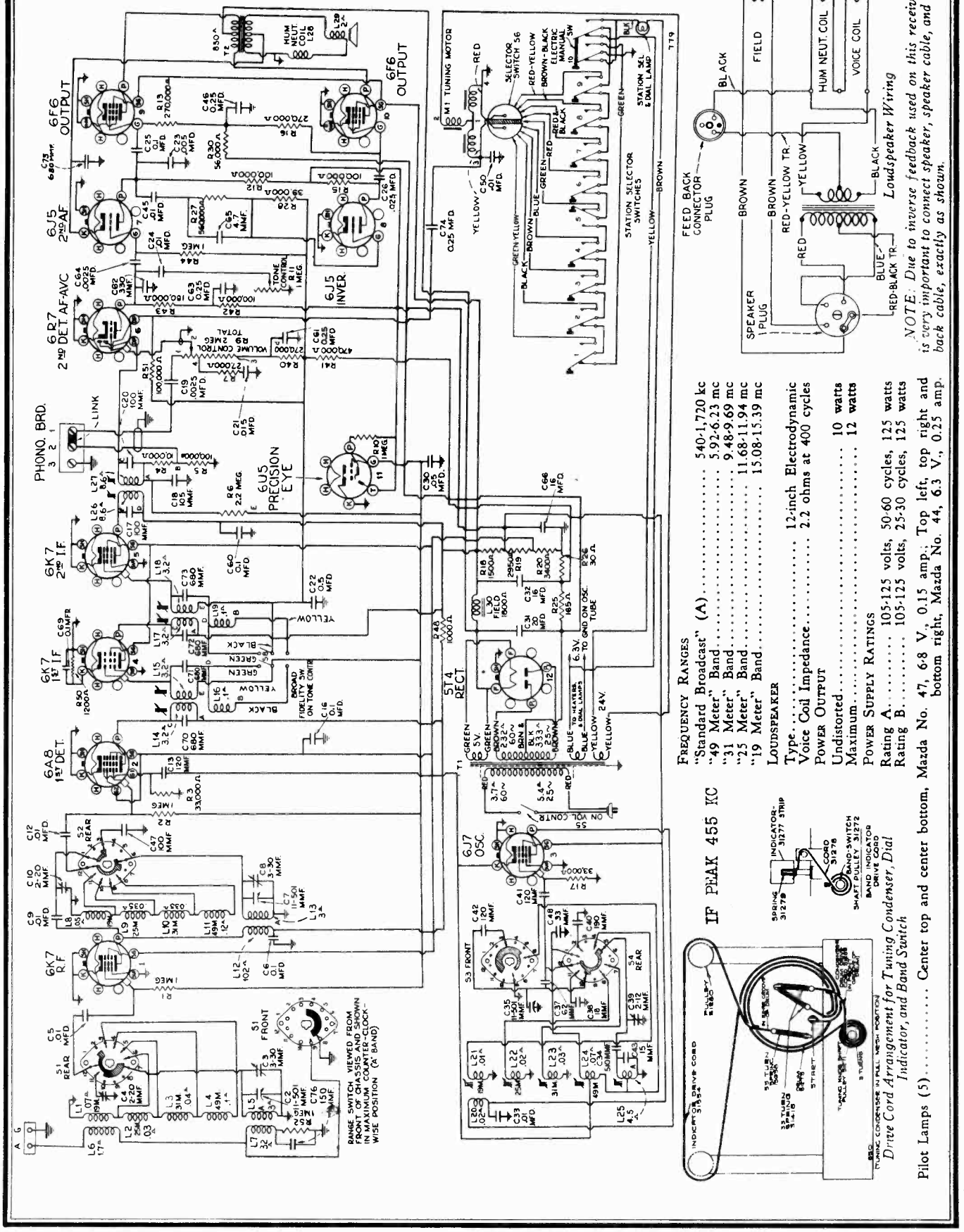
(4) The power cord lead and the primary lead of the power transformer which connect to the power switch should be twisted together, and kept away from Volume Control terminals.

(5) Keep C13 away from the 6A8 control grid lead and from the chassis.

(6) The three leads from the first i-f transformer to fidelity switch should be twisted and kept short but away from adjacent parts. The same applies to the leads from second i-f transformer to fidelity switch.

WESTINGHOUSE ELEC. SUPPLY CO.

MODEL WR370
Schematic, Drive Cord
Speaker Data



Frequency Ranges

"Standard Broadcast" (A)	540-1,720 kc
"49 Meter" Band	5.92-6.23 mc
"31 Meter" Band	9.48-9.69 mc
"25 Meter" Band	11.68-11.94 mc
"19 Meter" Band	15.08-15.39 mc

Loudspeaker

Type	12-inch Electrodynamic
Voice Coil Impedance	2.2 ohms at 400 cycles
Power Output	
Undistorted	10 watts
Maximum	12 watts

Power Supply Ratings

Rating A	105-125 volts, 50-60 cycles, 125 watts
Rating B	105-125 volts, 25-30 cycles, 125 watts

Pilot Lamps (5) ..... Center top and center bottom, Mazda No. 47, 6.8 V., 0.15 amp.; Top left, top right and bottom right, Mazda No. 44, 6.3 V., 0.25 amp.

MODEL WR570 — WESTINGHOUSE ELEC. SUPPLY CO. — **Socket, Notes**

Alignment, Trimmers

Cathode-Ray Alignment is the preferable method. Connect vertical "Hi" input to terminal No. 2 on phono board and vertical "0" to terminal No. 3.

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

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

Calibration Scale on Indicator-Drive-Cord Drum. — The tuning dial is fastened in the cabinet and cannot be used for reference during alignment, therefore a calibration scale is attached to the rear of the indicator-drive-cord drum which is mounted on the front shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

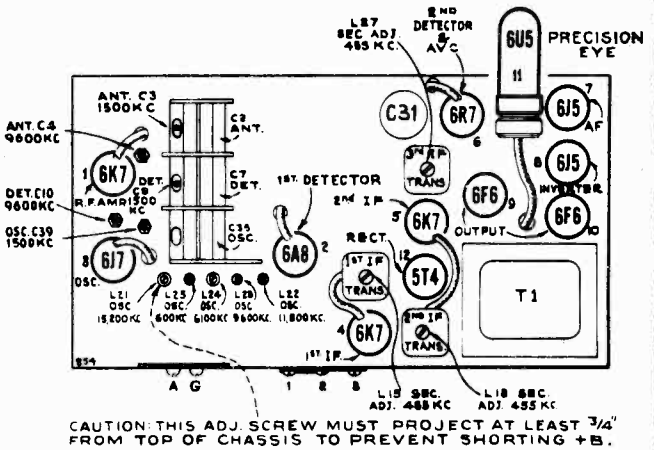
As the first step in r-f alignment, check the position of the drum. The "0" mark on the drum scale must be vertical, and directly over the center of the gang-condenser shaft when the plates are fully meshed. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

To determine the corresponding frequency for any setting of the calibration scales, refer to the accompanying drawing which shows the dial with 0-180° calibration scales drawn at top and bottom.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the "0" mark on the calibration scale when the plates are fully meshed.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the 530 kc mark, and gang condenser fully meshed. The indicator has a spring clip for attachment to the cable.

Spread-Band Alignment.—The most satisfactory method of aligning or checking the spread-band ranges is on actual reception of short-wave stations of known frequency, by adjusting the core of the oscillator coil for each band so that these stations come in at the correct points on the dial.



CAUTION: THIS ADJ. SCREW MUST PROJECT AT LEAST 3/4" FROM TOP OF CHASSIS TO PREVENT SHORTING +B.

Tube and Trimmer Locations

In exceptional cases, when the set is being serviced in a location where the noise level is high enough to prevent reception of short-wave stations, a test-oscillator may be used for alignment, but an extremely high degree of accuracy is required in the frequency settings of the test-oscillator, as a slight error will produce considerable inaccuracy on the spread-band dials. The frequency settings of the test-oscillator may be checked by one or both of the following methods:

1. Determine the exact dial settings of the test-oscillator (for frequencies at or close to the specified alignment frequencies) by zero-beating the test-oscillator against short-wave stations of known frequency.
2. Use harmonics of the standard-broadcast range of a test-oscillator, first checking the frequency settings on this range by means of a crystal calibrator, or by zero-beating against standard broadcast stations.

When a test oscillator is employed for spread-band alignment, a final check should be made on actual reception of short-wave stations of known frequency, and the core of the oscillator coil for each band should be re-adjusted so that the stations come in at the correct points on the dial.

Steps	Connect the high side of test-oscillator to—	Tune Test-Oscillator to—	Range Selector	Set Tuning Gang to—	Adjust the following for max. peak output
1	Turn Fidelity Control to Maximum Counter-clockwise position.				
2	6K7 2nd I-F grid cap in series with .01 mfd.	455 kc	"A"	Quiet Point between 550-750 kc	L26, L27 (3rd I-F transformer)
3	6K7 1st I-F grid cap in series with .01 mfd.	455 kc	"A"	Quiet Point between 550-750 kc	L17, L18 (2nd I-F transformer)
4	6A8 1st-det. grid cap in series with .01 mfd.	455 kc	"A"		L14, L15 (1st I-F transformer)
5	Antenna Terminal in series with 200 mmf.	1,500 kc	"A"	1,500 kc (151.5°)	C39 (osc.) C8 (det.) C3 (ant.)
6	Antenna Terminal in series with 200 mmf.	600 kc	"A"	600 kc (30.0°)	L25 (osc.)
7	Antenna Terminal in series with 200 mmf.	1,500 kc	"A"	1,500 kc (151.5°)	C39 (osc.)
8	Antenna Terminal in series with 300 ohms.	6,100 kc	"49M"	6,100 kc (106°)	L24 (osc.)*
9	Antenna Terminal in series with 300 ohms.	9,600 kc	"31M"	9,600 kc (102°)	L23 (osc.)** C10 (det.) C4 (ant.)
10	Antenna Terminal in series with 300 ohms.	11,800 kc	"25M"	11,800 kc (90.0°)	L22 (osc.)**
11	Antenna Terminal in series with 300 ohms.	15,200 kc	"19M"	15,200 kc (78.0°)	L21 (osc.)**

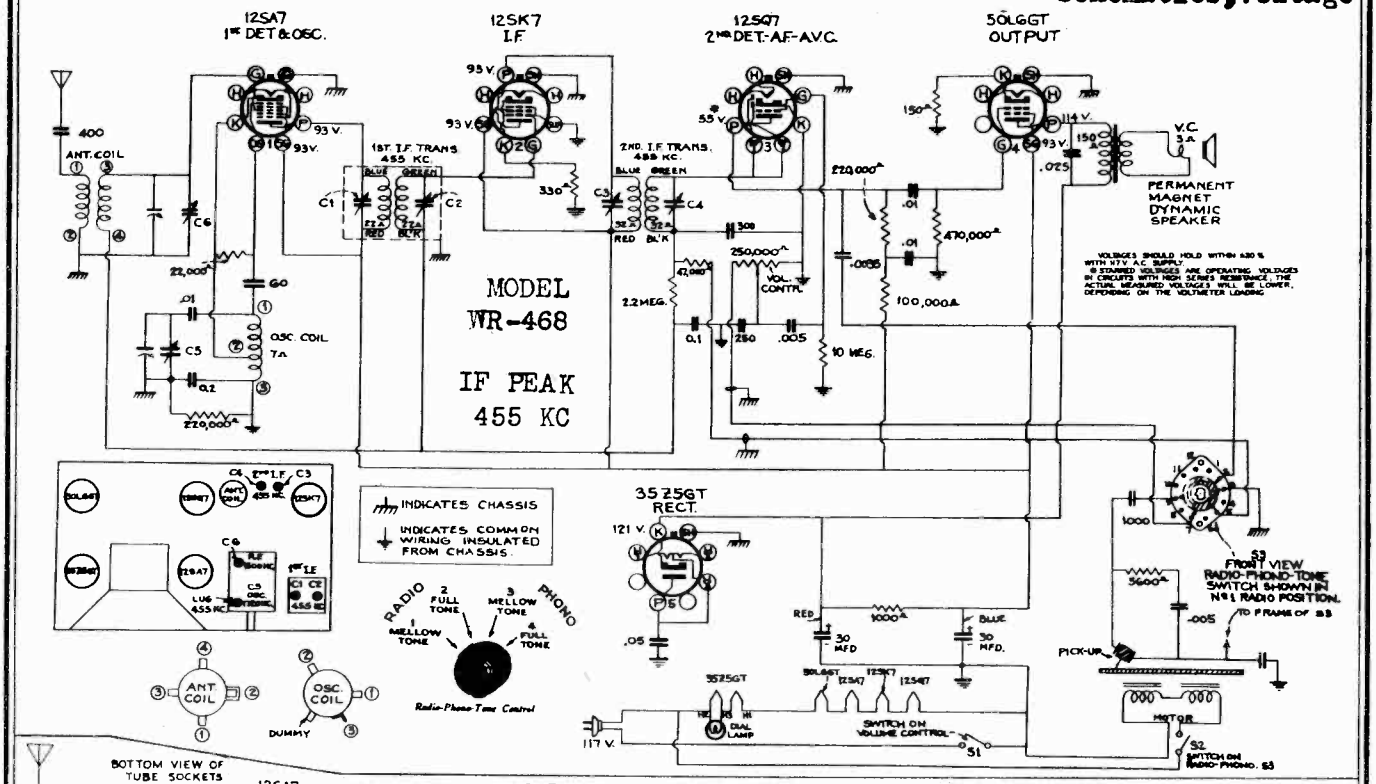
* Use maximum inductance peak (plunger in) if two peaks can be obtained.

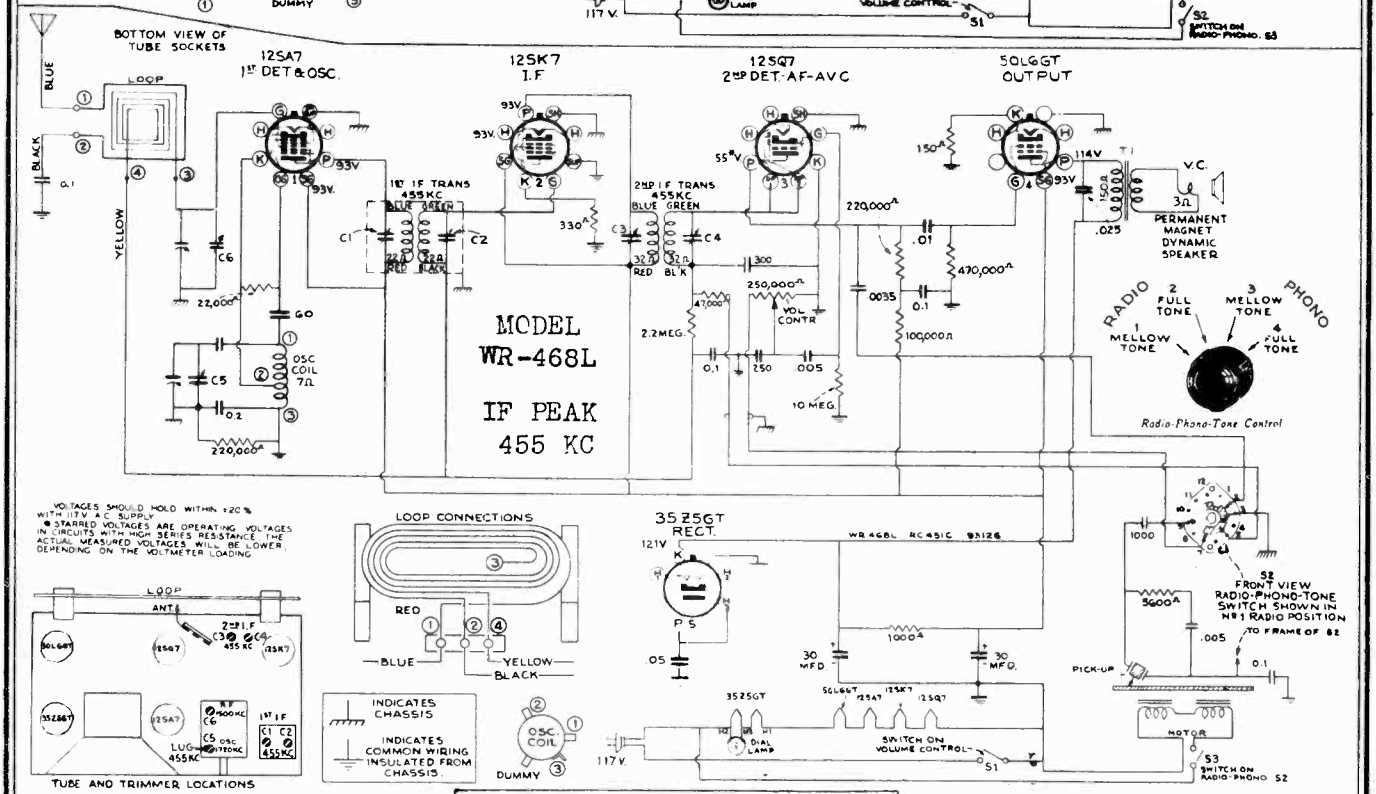
** Use minimum inductance peak (plunger out) if two peaks can be obtained.

Note that oscillator tracks above signal frequency on all bands except "49M," where it tracks below.

WESTINGHOUSE ELEC. SUPPLY CO.

MODEL WR468
MODEL WR468L
Schematics, Voltage





MODELS WR-468 and WR-468L

FREQUENCY RANGE ..... 540-1,720 kc

POWER OUTPUT (125 volt, 60 cycle supply)

Undistorted ..... .75 watts
Maximum ..... 1.3 watts

LOUDSPEAKER

Type ..... 5-inch Permanent Magnet Dynamic
Voice-Coil Impedance ..... 3.4 ohms at 400 cycles

PHONOGRAPH ..... Synchronous (manual starting)

Records ..... 10-inch and 12-inch, 78 r.p.m.
Pickup ..... Crystal, 100,000 ohms at 1,000 c.p.s.
Average Output of Pickup ..... 1½ volts at 1,000 c.p.s. across ½ meg. load
Dial Lamp (1) ..... Mazda 51, 7.5 volts, 0.2 amp.

POWER SUPPLY RATINGS — **First Edition**

A-6 ..... 105-125 volts, 60 cycles, 40 watts

WR-468

Antenna.—The set is equipped with length of antenna wire. Do not connect the antenna to ground. If an outdoor antenna is used, it should not be longer than 100 feet, including lead-in. If it is longer, connect a 100 to 200 mmf. capacitor in series with the lead-in.

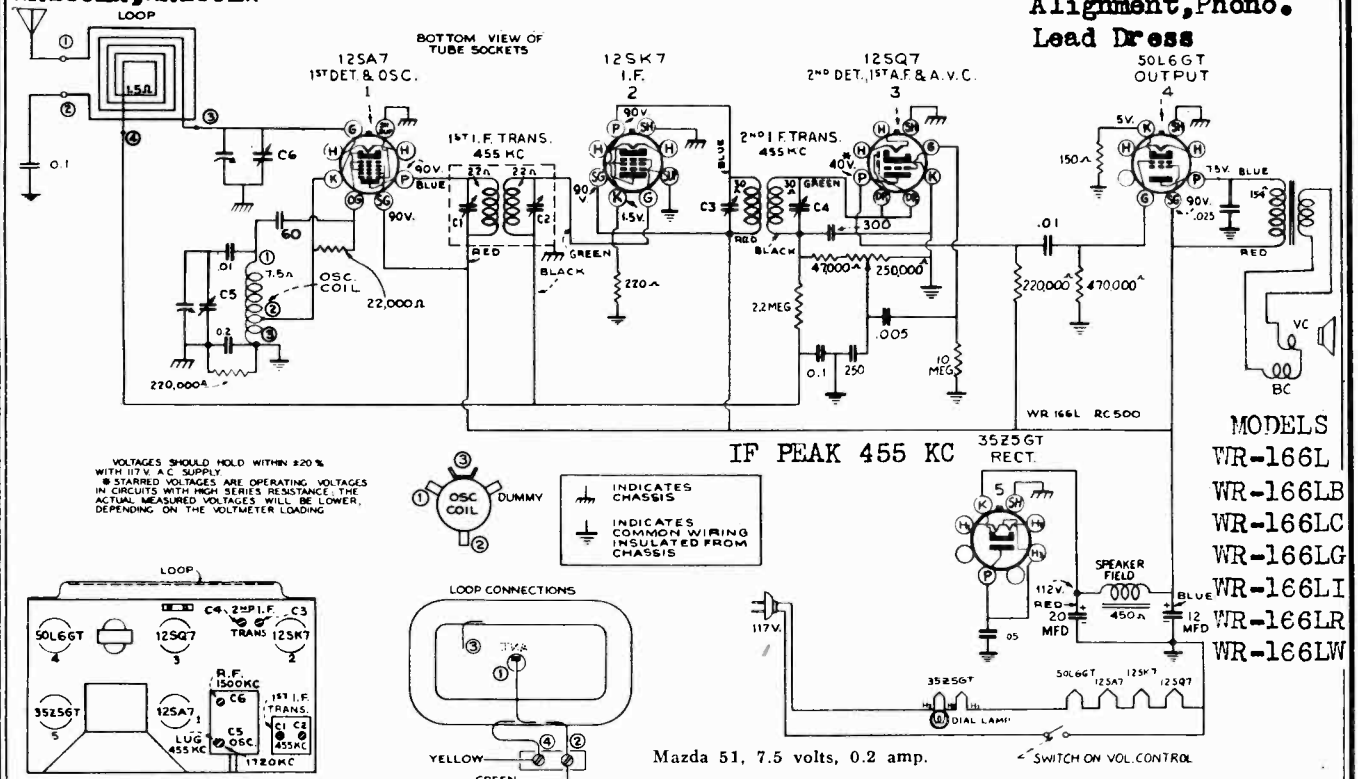
WR-468L

Antenna.—The set is equipped with a built-in loop antenna. If an outdoor antenna is used, it should be connected to the blue antenna lead on the rear of the chassis.

MODELS WR166L
WR166LB, WR166LC
WR166LG, WR166LI
WR166LR, WR166LW

WESTINGHOUSE ELEC. SUPPLY CO.

Schematic, Voltage
Socket, Trimmers
MODELS WR468, WR468L
Alignment, Phono.
Lead Dress



IF PEAK 455 KC

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

TUBE & TRIMMER LOCATIONS

Mazda 51, 7.5 volts, 0.2 amp.

MODELS
WR-166L
WR-166LB
WR-166LC
WR-166LG
WR-166LI
WR-166LR
WR-166LW

Power Supply Ratings

A-C Rating ..... 105-125 volts, 50-60 cycles, 30 watts
D-C Rating ..... 105-125 volts, direct current, 30 watts

Antenna.—The set is equipped with a built-in loop antenna. If an outdoor antenna is used, it may be connected to the "ANT." terminal on rear of cabinet. It should not be longer than 100 feet, including lead-in. If it is longer, connect a 100 to 200 mmf. capacitor in series with the lead-in.

Frequency Range ..... 540-1,720 kc
Intermediate Frequency ..... 455 kc

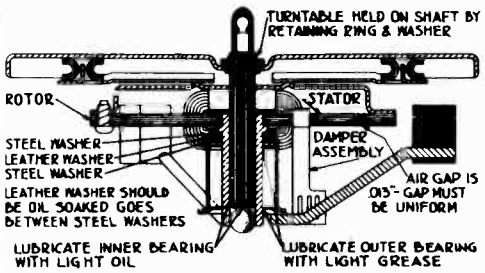
Power Output (125 volt, 60 cycle supply)
Undistorted ..... 0.5 watts
Maximum ..... 1.25 watts

Loudspeaker
Type ..... 4-inch Electrodynamic

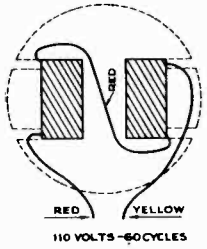
Alignment Procedure WR-468, WR-468L

Output Meter Alignment.—Connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—Connect the low side of the test-oscillator to the receiver chassis, through a .01 mfd. capacitor, and keep the output as low as possible.



Cross Section of Motor Assembly



Motor Coil Assembly and Connections

Phonograph Service Data

The motor is started by turning the radio-phono tone control to either 3rd or 4th position clockwise and giving the turntable a clockwise spin with the hand. Smooth starting and running will be insured by keeping the bearings well cleaned and oiled.

Hum and Vibration.—A small amount of hum when starting, decreasing to a negligible amount when running, is normal. If excessive vibration occurs it may be due to:

1. Insufficient lubrication, or any failure that will cause binding.
2. Leather washer not oiled. (Check to make certain that the leather and steel washers are in the proper position.)
3. Motor not properly supported from motor board.
4. Burrs on poles of rotor or stator. Remove with fine emery cloth.

Precautionary Lead Dress

1. Dress 1st I-F plate and grid leads against chassis and away from each other. Dress plate lead from 12SK7 close to chassis.
2. Dress electrolytic capacitor against chassis apron.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	Tuning condenser stator (osc.) in series with .01 mfd.	455 kc	Quiet point at 1,600 kc end of dial	C1, C2, C3, C4 (1st and 2nd I-F transformers)
2	Antenna term. of ant. trans. in series with 100 mmfd.	1,720 kc	Full clockwise (out of mesh)	C5 (oscillator)
3		1,500 kc	Resonance on 1,500 kc signal	C6 (antenna)

Power Supply.—Although this model employs an ac-dc chassis, it is not suitable for use on dc, as this would damage the motor.

5. **The damper spring must fit without binding or chattering in the slot in the stator. The stator must be free to deflect in either direction between the limits of the damper spring. The damper spring must exert approximately equal force in restoring the stator to its mid-position when the stator is deflected manually in each direction.**

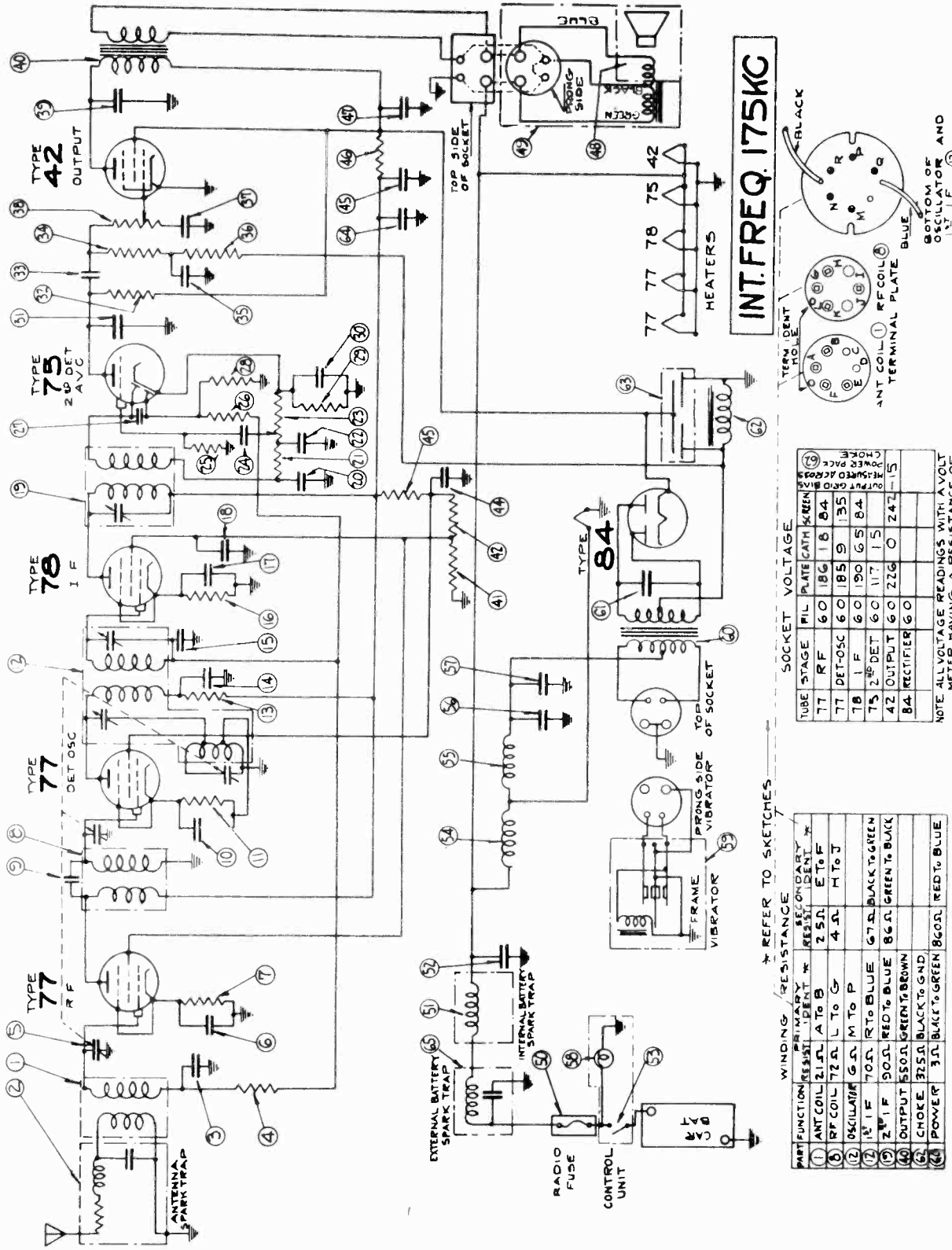
Removing Rotor.—The rotor and turntable assembly simply rests on the ball bearing at bottom of vertical bearing. Remove by lifting up.

Rotor Adjustment.—Loosen the three screws that hold the rotor to the turntable, insert three 13-mil shims at equal distances around the gap between the rotor and stator, and then carefully tighten the three screws.

Lubrication.—Oiling points are indicated in the diagram.

WESTINGHOUSE ELEC. SUPPLY CO.

MODEL WR502
Schematic, Voltage



SOCKET VOLTAGE

TUBE	STAGE	FIL	PLATE	CATH	SCREEN
77	RF	60	186	18	84
77	DET-OSC	60	185	9	135
78	1 F	60	190	65	84
75	2ND DET	60	117	15	
42	OUTPUT	60	226	0	247
84	RECTIFIER	60			

NOTE ALL VOLTAGE READINGS WITH A VOLT METER HAVING A RESISTANCE OF 1000 Ω PER VOLT

* REFER TO SKETCHES

PART	FUNCTION	WINDING RESISTANCE PRIMARY RESIST	IDENT *	SECONDARY RESIST	IDENT *
①	ANT COIL	21 Ω	A TO B	2.5 Ω	E TO F
⑥	RF COIL	72 Ω	L TO G	4 Ω	H TO J
⑫	OSCILLATOR	6 Ω	M TO P		
⑬	1ST I F	70 Ω	R TO BLUE	6.7 Ω	BLACK TO GREEN
⑮	2ND I F	90 Ω	RED TO BLUE	8.6 Ω	GREEN TO BLACK
⑲	OUTPUT	550 Ω	GREEN TO BROWN		
⑳	CHOKE	325 Ω	BLACK TO GND		
㉑	POWER	3 Ω	BLACK TO GREEN	860 Ω	RED TO BLUE

MODEL WR502
Service Data
Vibrator Adjustments

WESTINGHOUSE ELEC. SUPPLY CO.

MODEL WR 503
Service Notes

ELECTRICAL SPECIFICATIONS

Type and Number of Tubes ---------- 2 #77, 1 #78, 1 #75, 1 #42, 1 #84 - Total 6
Battery Current (6.3 Volt Battery) ---------- 6.5 Amperes
Tuning Range ---------- 540 to 1600 K.C.
Maximum Undistorted Output ---------- 3.0 Watts
Maximum Output ---------- 4.0 Watts
Line-Up Frequencies ---------- I.F. 175 K.C., 1400 K.C., 1600 K.C.

GENERAL DESCRIPTION

The Model WR 502 Car-Radio has been designed, manufactured, and tested with special regard for the requirements of automobile radio. The electrical, mechanical and acoustical features of the set have been decided upon after extensive tests in automobiles to determine the proper requirements for greatest satisfaction.

The Model WR 502 receiver is a single-unit compact radio chassis, power pack, and speaker with a separate remote control. The set is contained in a cylindrical housing and is provided with many features which result in improved tone quality, attractive appearance, mechanical stability and desirable service features.

CIRCUIT DESCRIPTION

The circuit is of the superheterodyne type, using a type 77 tube as an R.F. amplifier, a type 77 as a combined first detector-oscillator, a type 78 as an I.F. amplifier, a type 75 used as a combination second detector, A.V.C., and first audio amplifier, a type 42 as an output amplifier, and a type 84 as a rectifier in the power supply.

The Model WR 502 is equipped with three spark traps: an internal, tuned spark trap in the battery circuit to assist in the suppression of ignition interference; an external spark trap, connected in series with the battery cable; and an antenna spark trap, provided in the antenna circuit. These spark traps make the installation of auxiliary suppression equipment unnecessary in most cars.

SERVICE DATA

TROUBLES THAT CAN BE LOCATED AND REMEDIED WITHOUT REMOVING THE RECEIVER FROM THE HOUSING OR CAR

DIAL LIGHT DOES NOT LIGHT

Dial light may be loose in socket, broken or burned out. Socket on end of lead in rear of control head can be pulled straight out.

FUSE BLOWN

Check the fuse in the container on the receiver ammeter feed lead.

SET INOPERATIVE AND TUBES DO NOT LIGHT

Remove the speaker cover and disconnect the speaker plug. Remove the vibrator, all the tubes, and disconnect the dial light cable from the chassis. Check with an ohmmeter from "Hot A" side of battery cable (male bayonet connector inside the fuse-container housing) to ground. Should this show an open circuit when the line switch is closed, obviously a tube or the vibrator is shorted and these parts can be checked separately to determine which is defective. On the other hand, if the ohmmeter shows a closed circuit, the chassis should be removed from the housing and checked.

INSENSITIVE OR WEAK

Check the car antenna for poor connections and grounds. Also check tubes and the receiver alignment.

INTERMITTENT RECEPTION

This is usually caused by a poor connection from the set antenna lead to the car antenna lead-in, and this joint should always be checked when intermittent reception occurs.

MICROPHONIC OR INTERMITTENT

Tap each tube lightly with a small piece of wood or an insulated screw driver handle. The offending tube when tapped will usually howl very loudly if microphonic or will give intermittent results if defective.

LOW POWER OUTPUT

Check tubes and the vibrator. Usually caused by the latter.

RECEPTION CUTS OFF AT CERTAIN SETTINGS OF DIAL-SCALE POINTER

This condition is usually caused by some foreign metallic substance shorting a section of the condenser gang. These particles are often too small to be seen but can be removed by blowing them out with an air pressure hose or an ordinary hand pump. Great care must be taken not to destroy the thin mica insulators assembled under the trimmers on top of the condenser gang.

POOR TONE QUALITY

Foreign material is apt to become lodged between the speaker voice coil and the field core. This hampers the movement of the speaker diaphragm. As the rear of the speaker is open, this space can be blown out clean with an air hose.

BUZZING SOUND IN SPEAKER

This can be remedied in many cases by the method described above. It can also be caused by a loose winding on the voice coil. In such a case the turns of this winding should be carefully pushed together, and a thin coating of collodion or coil cement should be applied to hold the windings in place.

RATTLES

Check receiver for loose cover thumb screws, tube shield, and housing screws. Rattles seemingly in the radio receiver, are often traced to loose parts in the bulkhead or dashboard of the car.

VIBRATOR NOISE

(Be sure that this is checked with the car engine OFF and the antenna disconnected.) Check the spring contact on the receiver housing and cover, and particularly the vibrator top spring. Clean and adjust the vibrator according to the instructions given in another section of these service notes.

SET INOPERATIVE
TUBES LIGHT AND VIBRATOR BUZZES

A. Check the B voltage (approximately 240 volts) from the middle terminal of the electrolytic filter condenser to ground on the chassis. This point is easily reached with the speaker cover removed. If no voltage or low voltage is observed, test the vibrator and 84 rectifier tube. If voltage is still incorrect, the receiver should be removed from the housing.

B. With the speaker plugged in, remove the clip from the grid of the 75 tube and touch the clip to the grid cap of the 75 tube several times in succession. A clicking noise should be heard in the speaker. This is a practical test for the audio amplifier and speaker. If this clicking noise is not heard, the 75 and 42 tubes should be tested and the voltage checked at the plates of these tubes. The speaker should be checked with a volt-ohmmeter by testing across the prongs of the speaker plug for continuity. While making this test, the cable should be moved back and forth to show up any possible intermittent open circuit in the speaker cable. Check the voice coil and field coil for resistance.

If the audio and speaker are still dead, the chassis should be removed from the housing.

If the audio and speaker are working correctly, test the remaining tubes and check the voltage at each socket.

In the event that the chassis has to be removed from the car for repairs, this can easily be done as follows: Disconnect all external cables and the flexible shafts from the receiver. Remove the speaker cover and pull out the speaker plug. Remove the screws around the outside of the housing and pull the chassis straight out, being careful not to damage the antenna cable. The chassis can be removed in many cars in this manner without the necessity of unbolting the chassis housing from the car.

LOCATING TROUBLE IN CHASSIS

To locate a short, open or defective unit which causes low or no "B" voltage, isolate the power pack from the receiver section by disconnecting the two red leads (coming from the receiver section) from each end of the 5000-ohm resistor, #46, in the power pack. Check the voltage from the input side of the resistor to ground, which should be approximately 250 volts. If this voltage is incorrect, the trouble is definitely in the power pack and all component parts should be checked.

Conversely, if the voltage reading proves to be correct, the trouble is in the receiver section and all its parts should be checked.

In locating a short or open in the filament circuit, the power pack can be disconnected from the filament supply of the receiver section by removing the red wire on the top terminal of the "off" and "on" switch connected to the 42 tube. This will connect only the power pack in the filament circuit and if the short or open no longer exists, it will prove that the trouble is in the receiver section.

WEAK OR INSENSITIVE AFTER RE-ALIGNMENT

Check coils and associated circuits in the deficient "stage" of the receiver for proper resistance values.

LOW POWER OUTPUT WITH B VOLTAGE CORRECT

Check the speaker field coil, voice coil and associated audio circuit for resistance continuity and defective condensers.

All riveted component parts can be removed by merely punching out the rivets with a small diameter straight side punch. Replacement parts can be secured with small machine screws and nuts.

In changing the power transformer, it is necessary only to remove the four drive screws, two located directly over the resistor and condenser strip and the other two in back of the condenser gang on the power pack shield. In replacing the power transformer be sure to tighten the screws securely and replace the shield braid bond or vibrator noise will be present.

INSTRUCTIONS FOR ADJUSTING VIBRATOR
MODEL WR-502 ONLY.

After the vibrator has been in use for some time, it may refuse to start operating. This is an indication of worn Tungsten contact points; but, since a reserve of Tungsten has been provided, a simple adjustment can be made to prolong the life of the vibrator.

1. Remove the vibrator unit from its housing by removing the tension spring with a pair of round nosed pliers.

2. Remove the rubber sock, being careful not to bend the wires at the soldered connections.

3. Lay the vibrator on a piece of white paper so that when viewed from above it appears exactly as shown in Fig. 1.

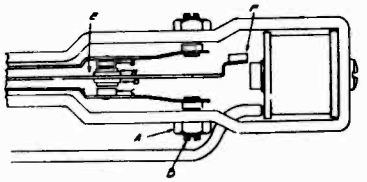


Figure No. 1

WESTINGHOUSE ELEC. SUPPLY CO.

MODEL WR502
Alignment, Socket
Trimmers, Parts

4. Loosen lock nut "A" and turn screw "B" clockwise until .005" of light can be seen between contacts "C" and "D". If the contact points are somewhat roughened, light cannot be seen across their entire diameter, even though they are correctly re-spaced, that is within .005" of touching each other.

5. A simple check on the correctness of the spacing adjustment is obtained by pressing lightly against the center of the read with a small nail in the direction and location shown by arrow "E". When the reed is thus moved so as to close contacts "C" and "D", the weight "F" on the free end of the reed should move 1/64" from its "at rest" position. This check should be made after lock nut "A" has been firmly retightened.

6. Do not readjust the spacing between contacts "G" and "H" unless the Tungsten is nearly all worn away. In this case, re-adjustment may be made the same as for contacts "C" and "D".

7. In re-inserting the vibrator into its rubber sock, be very careful to turn the "flats" of the sock hole so that they are parallel to the flat side of the vibrator frame. This provides ample space in the sock for the free movement of the reed. Make certain that the slot in the prong terminal plate engages the small projection on the inside edge of the housing. Then replace the tension spring. THESE INSTRUCTIONS DO NOT APPLY TO ANY OTHER TYPES OF VIBRATORS.

LINE-UP CAPACITOR ADJUSTMENTS

All the adjustable capacitors, commonly called trimmer condensers, are very accurately adjusted at the factory and will not need any further adjustment unless a coil or I.F. transformer is changed or the adjustments are tampered with in the field. Therefore, DO NOT attempt to change the setting of any of the trimmer condensers unless it is definitely known that adjustment is necessary, and a high grade modulated test oscillator is available. In such a case, proceed as follows, referring to Fig. #2.

1. Set test oscillator to 175 K.C.

2. Set condenser gang to approximately 600 K.C. This will be at a point where the condenser plates are nearly all in mesh.

3. Connect output meter across voice coil of speaker. This may be done by connecting one lead of the output meter to the blue lead of the speaker terminal strip and the other lead to the frame of the chassis. The impedance of the voice coil is 3. ohms.

4. Apply test signal to grid of 78 I.F. tube through a .5 mfd. blocking condenser and adjust trimmer "A" to maximum output reducing output of test oscillator as required.

5. Apply test signal to grid of 77 first detector-oscillator and adjust trimmers "B" and "C" to maximum output.

6. Set test oscillator to 1600 K.C. and rotate condenser gang until the plates are wide open. Place a piece of paper (approximately .015" thick) between the rotor and stator plates at the bottom of the gang and close the rotor down to this spacing. This is the exact setting of the condenser gang for the receiver oscillator at 1600 K.C. and should be carefully set as the resultant alignment of the receiver is directly dependent upon it.

7. Adjust trimmer "D" to maximum output and then remove the paper gauge.

8. Set test oscillator and condenser gang to 1400 K.C.

9. Apply test signal to grid of 77 R.F. tube and adjust trimmer "E" to maximum output.

10. Apply test signal to antenna lead through a .0002 mfd. condenser and adjust trimmer "F" to maximum output.

11. Check sensitivity at several points.

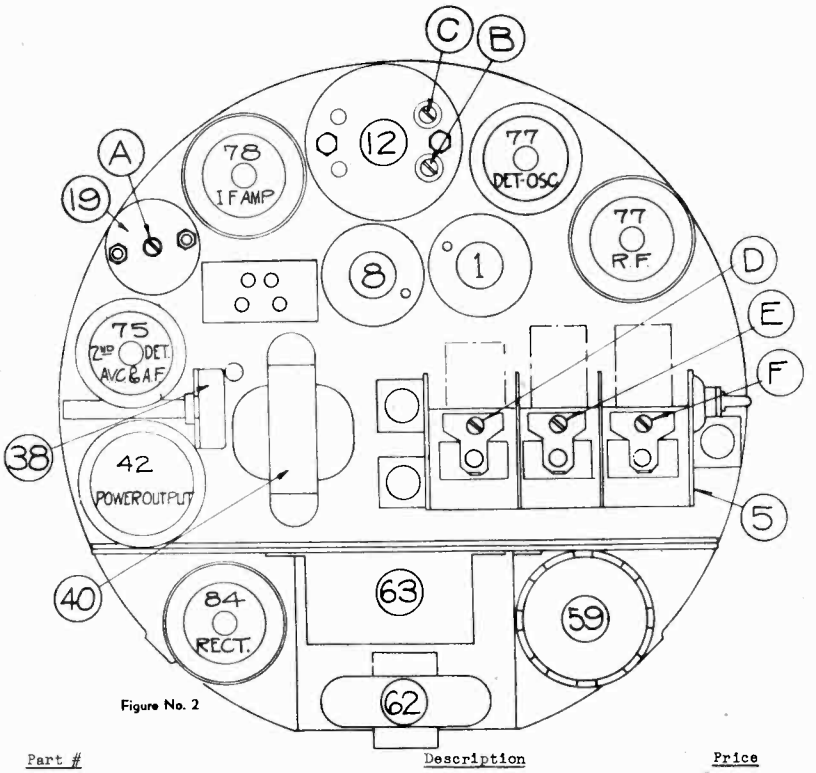


Figure No. 2

Part #	Description	Price
CH 9592	Chassis assembly	$
CU 9517	Tuning unit (less shafts)	2.75
SK 955	Speaker	5.50
	NUTS	
FP 106639	Thumb nut for antenna and battery cable	.10
NT 104935	Nut for mounting studs	.05
	SCREWS & STUDS	
PP 104892	Thumb screws on housing cover	.05
PP 106571	Mounting studs	.05
SC 1026 CA	Self-tapping screw (#6 x 1 inch long)	.05
SC 101700	Self-tapping screw (#7 x 1/4 inch long)	.05
	SOCKETS	
SA 104617	Tube socket - 6 prong	.20
SA 104616	Tube socket - 5 prong	.15
SO 953	Tube socket - 4 prong	.15
BE 956	Base for tube shield	.05
CV 954	Tube shield - long	.10
CV 9516	Tube shield - short	.10
	WASHERS, BUSHINGS & SPACERS	
WA 2-12 CA	Mounting washer	.05
WA 7-10	Mounting lock washer	.05
IS 1002	Rubber bushing for variable condenser	.05
FP 104086	Spacer for speaker plug	.05
SR 953	Spacer for variable condenser rubber bushing	.05
	SPEAKER PARTS (SK 955)	
CL 9513	Speaker field coil	1.10
DM 951	Diaphragm and voice coil assembly	1.25
FA 958	Silk speaker grill cloth	.15
CB 9528	Speaker cable with 4 prong plug	.45
SA 107279	Cover for speaker plug	.10
SA 107278	Speaker plug	.10
	MISCELLANEOUS	
SH 9537	Variable condenser shaft with pinion	.30
KT 956	Spark plug suppressor kit	2.60
DS 956	Dial indicator disc	.35
SW 9541	Switch assembly complete with cables	1.95
SP 958	Spring base for vibrator	.20
FP 105425	Cover for female section of antenna connector	.05
SH 9533	Drive shafts (2 used)	1.50
SA 106754	Coil suppressor	.45
SA 105300	Condenser	.80
FP 105426	Bushing and ferrule for antenna and fuse connectors	.05
FP 105427	Spring in antenna and fuse connector	.05
IS 105428	Insulation washer for fuse and antenna connectors	.05
FP 105429	Fuse container	.05
IS 105430	Insulation tube in fuse container	.05
FP 105431	Male section of antenna connector	.05
FP 79381	Clamp for spark trap and antenna cables	.05
KN 9531	Knob for tone control	.10
GE 9512	Split gear on variable tuning condenser	.50

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

MODEL WR502
Chassis, Parts

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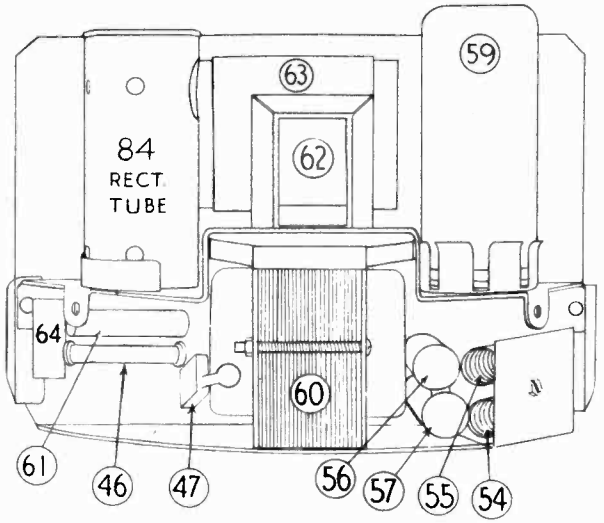


Figure No. 3

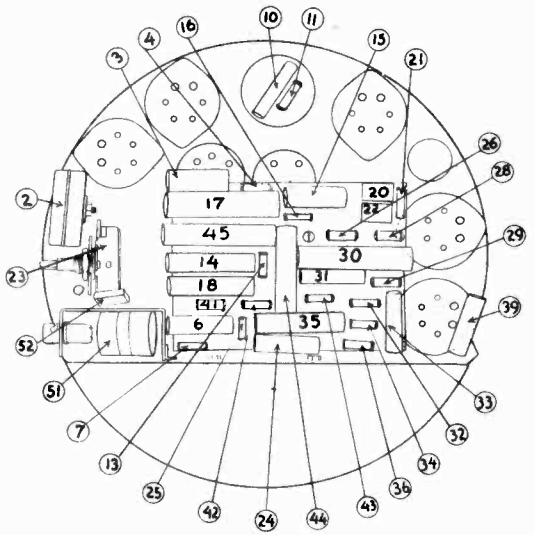


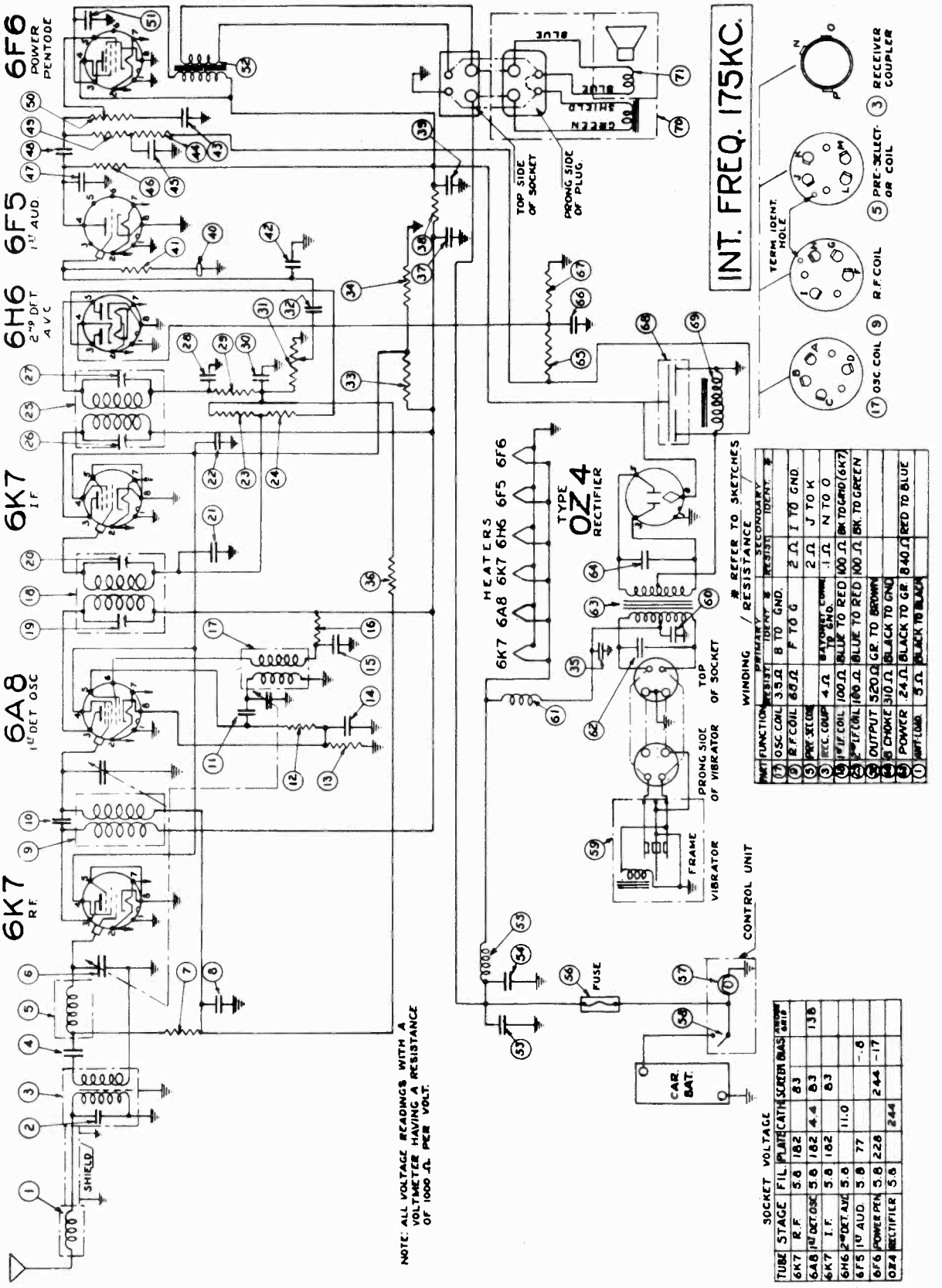
Figure No. 4

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

Dia. #	Part #	Description	Price
1	RC 95128	Antenna coil	$ .75
2	CC 958	Antenna spark trap	1.80
3	SA 106386	.05 mfd., 200 V. condenser	.20
4	SA 105278	100,000 ohm, 1/4 W. resistor	.15
5	CG 9542	3 gang condenser	3.75
6	SA 106386	.05 mfd., 200 V. condenser	.20
7	SA 105264	500 ohm, 1/4 W. resistor	.15
8	RC 95130	R.F. coil	.95
9		Twisted wire	
10	SA 103852	.002 mfd., 600 V. condenser	.20
11	SA 105247	7500 ohm, 1/4 W. resistor	.15
12	RC 95132	Composite coil	2.20
13	SA 105245	2000 ohm, 1/4 W. resistor	.15
14	SA 102492	.05 mfd., 400 V. condenser	.20
15	SA 106386	.05 mfd., 200 V. condenser	.20
16	SA 105270	2500 ohm, 1/4 W. resistor	.15
17	SA 102497	.25 mfd., 200 V. condenser	.20
18	CW 951	.1 mfd., 200 V. condenser	.20
19	IC 951	I.F. coil	1.50
20	CM 9513	.0001 mfd. mica condenser	.10
21	SA 105276	50,000 ohm, 1/4 W. resistor	.15
22	CM 9513	.0001 mfd. mica condenser	.10
23	VR 9524	Volume control	.85
24	SA 103659	.005 mfd., 400 V. condenser	.20
25	SA 105281	1 meg., 1/4 W. resistor	.15
26	SA 105246	1/2 meg., 1/4 W. resistor	.15
27	CM 9513	.0001 mfd. mica condenser	.10
28	SA 105246	1/2 meg., 1/4 W. resistor	.15
29	SA 105249	5000 ohm, 1/4 W. resistor	.15
30	SA 102497	.25 mfd., 200 V. condenser	.20
31	SA 103852	.002 mfd., 600 V. condenser	.20
32	SA 105278	100,000 ohm, 1/4 W. resistor	.15
33	SA 103659	.005 mfd., 400 V. condenser	.20
34	SA 105279	1/4 meg., 1/4 W. resistor	.15
35	CW 951	.1 mfd., 200 V. condenser	.20
36	SA 105279	1/4 meg., 1/4 W. resistor	.15
37	SA 106403	.001 mfd., 600 V. condenser	.20
38	VR 9525	Tone control	.75
39	CW 952	.005 mfd., 600 V. condenser	.20
40	TR 952	Output transformer	1.15
41	SA 105277	75,000 ohm, 1/4 W. resistor	.15
42	SA 105274	20,000 ohm, 1/4 W. resistor	.15
43	SA 105274	20,000 ohm, 1/4 W. resistor	.15
44	SA 102492	.05 mfd., 400 V. condenser	.20
45	SA 102496	.25 mfd., 400 V. condenser	.20
46	SA 107572	5000 ohm, 1 W. resistor	.20
47	CM 951	.001 mfd. mica condenser	.25
48	DM 951	Speaker diaphragm	1.25
49	SK 955	Speaker	5.50
50	FU 951	Fuse (20 amperes)	.05
51	RC 9512	Filter choke	.35
52	CM 953	.00005 mfd. mica condenser	.15
53	SW 9539	Switch assembly complete less cables	1.10
54	SA 105452	Filter choke	.20
55	SA 105452	Filter choke	.20
56	CW 958	.5 mfd., 200 V. condenser	.35
57	CW 958	.5 mfd., 200 V. condenser	.35
58	LP 956	Pilot light - (6 V.-.20 amperes)	.20
59	VI 951	Vibrator	3.75
60	TR 953	Power transformer	3.50
61	SA 106804	.008 mfd., 1600 V. condenser	.20
62	TR 951	"B" choke	.95
63	CE 951	6 and 10 mfd. electrolytic condenser	2.60
64	CM 951	.001 mfd. mica condenser	.25
65	CC 954	Spark trap	1.65

WESTINGHOUSE ELEC. SUPPLY CO.

MODEL WR503
Schematic
Voltage



PART	FUNCTION	PRIMARY RESIST.	PRIMARY IDENT. #	SECONDARY RESIST.	SECONDARY IDENT. #
(17)	OSC. COIL	3.5 Ω	B TO GND.		
(9)	R.F. COIL	6.8 Ω	F TO G	2 Ω	F TO GND.
(5)	PRE-SELECT.			2 Ω	J TO K
(3)	ANT. COUP.	4 Ω	ANTENNA TO GND.	.1 Ω	N TO O
(4)	1ST I.F. COIL	100 Ω	BLUE TO RED	100 Ω	BK TO GRN'D (6K7)
(2)	2ND I.F. COIL	100 Ω	BLUE TO RED	100 Ω	BK. TO GREEN
(1)	OUTPUT	320 Ω	GR. TO BROWN		
(6)	CHOKE	310 Ω	BLACK TO GND.		
(15)	POWER	24 Ω	BLACK TO GR.	840 Ω	RED TO BLUE
(1)	AMP. LOAD	5 Ω	BLACK TO BLACK		

SOCKET VOLTAGE

TUBE	STAGE	FIL.	PLATE	CATH.	SCREEN	BIAS	ANT. coil
6K7	R.F.	5.0	182		83		
6A8	1ST DET. OSC.	5.0	182	4.4	83		135
6K7	I.F.	5.0	182		83		
6H6	2ND DET. AVC.	5.0		11.0			
6F5	1ST AUD.	5.0	77			-.6	
6F6	POWER PEN.	5.0	226		244	-17	
0Z4	RECTIFIER	5.0			244		

ELECTRICAL SPECIFICATIONS

Type and Number of Tubes ..... 1#6A8, 2#6K7, 1#6H6, 1#6F5, 1#6F6, 1#0Z4 - Total 7
Battery Current (6.3 Volt Battery) ..... 6.5 Amperes
Tuning Range ..... 540 to 1600 K.C.
Maximum Undistorted Output ..... 3.0 Watts
Maximum Output ..... 4.0 Watts
Line-Up Frequencies ..... I.F. 175 K.C., 1400 K.C., 1600 K.C.

GENERAL DESCRIPTION

The Model WR-503 Westinghouse All-Metal Tube Car-Radio is a seven tube superheterodyne receiver, which has been designed, manufactured and tested with special consideration for the requirements of automobile radio. The electrical, mechanical and acoustical features of this sat have been developed only after extensive tests in automobiles to determine the proper requirements for greatest satisfaction.

CIRCUIT DESCRIPTION

The circuit is of the superheterodyne type, employing a type 6K7 tube as a R.F. amplifier, a type 6A8 as a combined first detector-oscillator, a type 6K7 as an I.F. amplifier, a type 6H6 used as a combination second detector and A.V.C., a type 6F5 tube as a first audio amplifier, a type 6F6 as an output amplifier, and a type 0Z4 as a rectifier in the power supply.

The Model WR-503 is equipped with two spark traps: an internal, tuned spark trap in the battery circuit to assist in the suppression of ignition interference; and an antenna spark trap provided in the antenna circuit. The use of these spark traps makes the installation of additional suppression equipment unnecessary in most cars.

LINE-UP CAPACITOR ADJUSTMENTS

All the adjustable capacitors, commonly called trimmer condensers, are very accurately adjusted at the factory and will not need any further adjustment unless a coil or I.F. transformer is changed or the adjustments tampered with in the field. Therefore, DO NOT attempt to change the setting of any of the trimmer condensers unless it is definitely known that adjustment is necessary, and a high grade modulated test oscillator and an output meter are available. Then proceed as follows, referring to Figs. 1 and 2. NOTE: Before aligning the gang-condenser trimmers on the bottom of the gang condenser, it will be necessary to remove the three rubber plugs from the bottom of the receiver housing. The setting of the trimmer on the TOP of the gang condenser should NOT BE DISTURBED.

1. Set test oscillator to 175 K.C.

2. Set gang condenser to approximately 600 K.C. This will be at a point where the condenser plates are nearly all in mesh.

3. Connect output meter across voice coil of speaker. This may be done by connecting one lead of the output meter to the blue lead of the speaker terminal strip and the other lead to the frame of the chassis. The impedance of the voice coil is 3.0 ohms.

4. Apply test signal to grid cap of 6K7 I.F. tube through a .5 mfd. blocking condenser and adjust trimmers #26 and #27 to maximum output, reducing output of test oscillator as required.

5. Apply test signal to grid cap of 6A8 first detector-oscillator and adjust trimmers #19 and #20 to maximum output.

6. Set test oscillator to 1600 K.C. and rotate gang condenser until the plates are wide open. Place a piece of paper (approximately .015" thick) between the rotor and stator plates at the top of the gang and close the rotor down to this spacing. This is the exact setting of the gang condenser for the receiver oscillator at 1600 K.C. and should be carefully set as the resultant alignment of the receiver is directly dependant upon it.

7. Adjust trimmer "A" to maximum output and then remove the paper gauge.

8. Set test oscillator and gang condenser to 1400 K.C.

9. Apply test signal to grid cap of 6K7 R.F. tube and adjust trimmer "B" to maximum output.

10. Apply test signal to antenna lead thru a .0002 mfd. condenser and adjust trimmer "C" to maximum output.

11. Check sensitivity at several points.

SERVICE DATA

TROUBLES THAT CAN BE LOCATED AND REMEDIED WITHOUT REMOVING THE RECEIVER FROM THE HOUSING OR CAR. SEE MODEL WR-502.

LOCATING TROUBLE IN CHASSIS

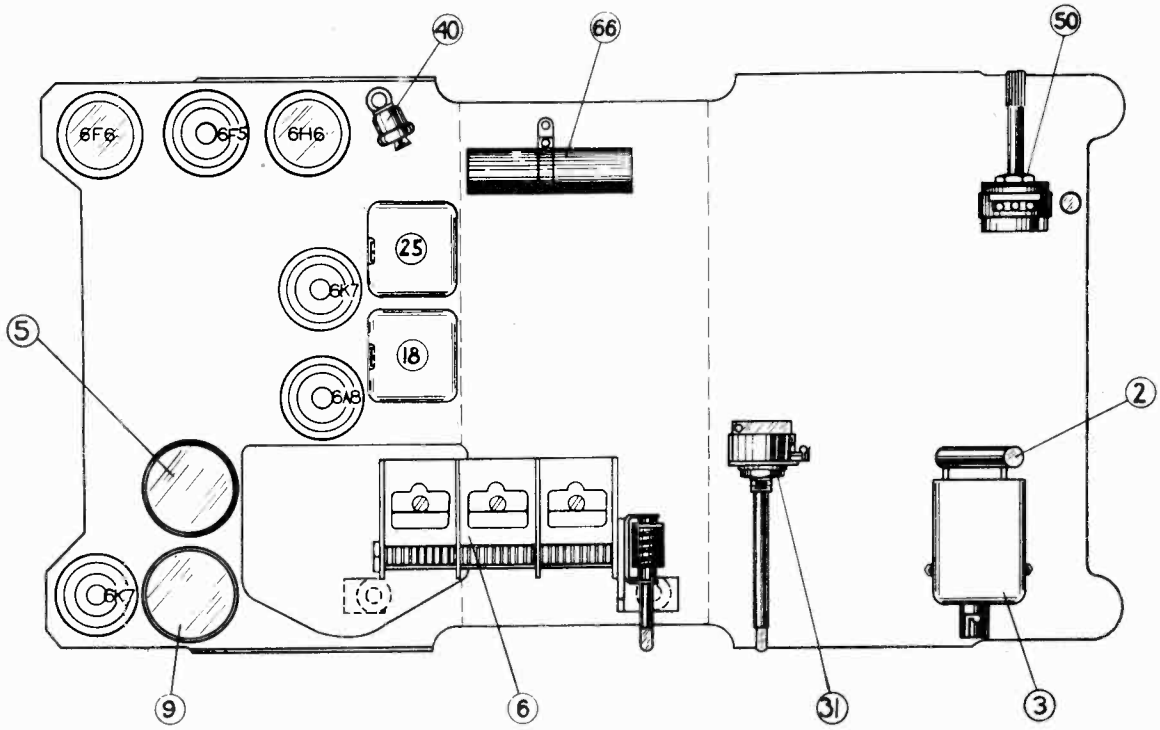
SEE MODEL WR-502.

Dia. #	Part #	Description	List Prices
1		Antenna loading coil - part of RC 95155	$
2		.000075 mfd. condenser - part of RC 95147	
3	RC 95147	Receiver coupler	1.20
4	SA 106277	.01 mfd., 400 V. condenser	.20
5	RC 95149	Preselector coil	.95
6	CG 9537	Variable condenser assembly	3.75
7	RE 9534	100,000 ohm, 1/4 W. resistor	.10
8	SA 106386	.05 mfd., 200 V. condenser	.20
9	RC 95151	R.F. coil	1.25
10	CM 952	.00001 mfd., mica condenser	.20
11	CM 9513	.0001 mfd., mica condenser	.10
12	SA 105276	50,000 ohm, 1/4 W. resistor	.15
13	SA 105264	600 ohm, 1/4 W. resistor	.15
14	SA 106386	.05 mfd., 200 V. condenser	.20
15	SA 106277	.01 mfd., 400 V. condenser	.20
16	SA 105272	10,000 ohm, 1/4 W. resistor	.15
17	RC 95153	Oscillator coil assembly	.70
18	IC 9555	1st I.F. coil	1.75
19		30-100 mmf. condenser - part of IC 9555	
20		30-100 mmf. condenser - part of IC 9555	
21	SA 106386	.05 mfd., 200 V. condenser	.20
22	CW 951	.1 mfd., 200 V. condenser	.20
23	SA 105246	1/2 meg., 1/4 W. resistor	.15
24	SA 105281	1 meg., 1/4 W. resistor	.15
25	IC 9556	2nd I.F. coil	1.75
26		30-100 mmf. condenser - part of IC 9556	
27		30-100 mmf. condenser - part of IC 9556	
28	CM 9513	.0001 mfd. mica condenser	.10
29	SA 105276	50,000 ohm, 1/4 W. resistor	.15
30	CM 9513	.0001 mfd. mica condenser	.10
31	VR 9527	.25 meg. volume control	.75
32	SA 103659	.005 mfd., 400 V. condenser	.20
33	SA 99777	25,000 ohm, 1 W. resistor	.20
34	SA 100512	50,000 ohm, 1/2 W. resistor	.15
35	CW 958	.05 mfd., 200 V. condenser	.35
36	SA 105246	1/2 meg., 1/4 W. resistor	.15
37	SA 102496	.25 mfd., 400 V. condenser	.20
38	SA 106531	4000 ohm, 1 W. resistor	.20
39	CM 951	.001 mfd. mica condenser	.25
40	BY 952	Grid bias cell	.20
41	SA 105281	1 meg., 1/4 W. resistor	.15
42	CM 9519	.0005 mfd.mica condenser	.20
43	SA 106403	.001 mfd., 600 V. condenser	.20
44	SA 105279	250,000 ohm, 1/4 W. resistor	.15
45	SA 102497	.25 mfd., 200 V. condenser	.20
46	SA 105279	250,000 ohm, 1/4 W. resistor	.15
47	SA 106403	.001 mfd., 600 V. condenser	.20
48	CW 9524	.008 mfd., 600 V. condenser	.20
49	SA 105279	250,000 ohm, 1/4 W. resistor	.15
50	VR 9525	250,000 ohm tone control	.75
51	CW 9524	.008 mfd., 600 V. condenser	.20
52	TR 9543	Output transformer	1.15
53	CW 957	.5 mfd., 120 V. condenser	.40
54	CM 953	.00005 mfd. mica condenser	.15
55	RC 95157	Choke coil	.25
56	FU 951	20 ampere fuse	.05
57	LP 951	Pilot light	.20
58	SW 9539	On-off switch assembly	1.10
59	VI 955	Vibrator	3.45
60	CW 958	.5 mfd., 200 V. condenser	.35
61	RC 95156	Choke coil	.25
62	CW 9523	.5 mfd., 120 V. condenser	.40
63	TR 9547	Power transformer	3.50
64	CW 9522	.005 mfd., 1600 V. condenser	$ .20
65	SA 105272	10,000 ohm, 1/4 W. resistor	.15
66	CE 9524	10 mfd. electrolytic condenser	.70
67	SA 105284	30,000 ohm, 1/4 W. resistor	.15
68	CE 951	6 & 10 mfd. electrolytic condenser	2.60
69	TR 961	"B" choke	.95
70	SK 955	Speaker assembly	5.50
71	DM 951	Diaphragm assembly	1.25

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

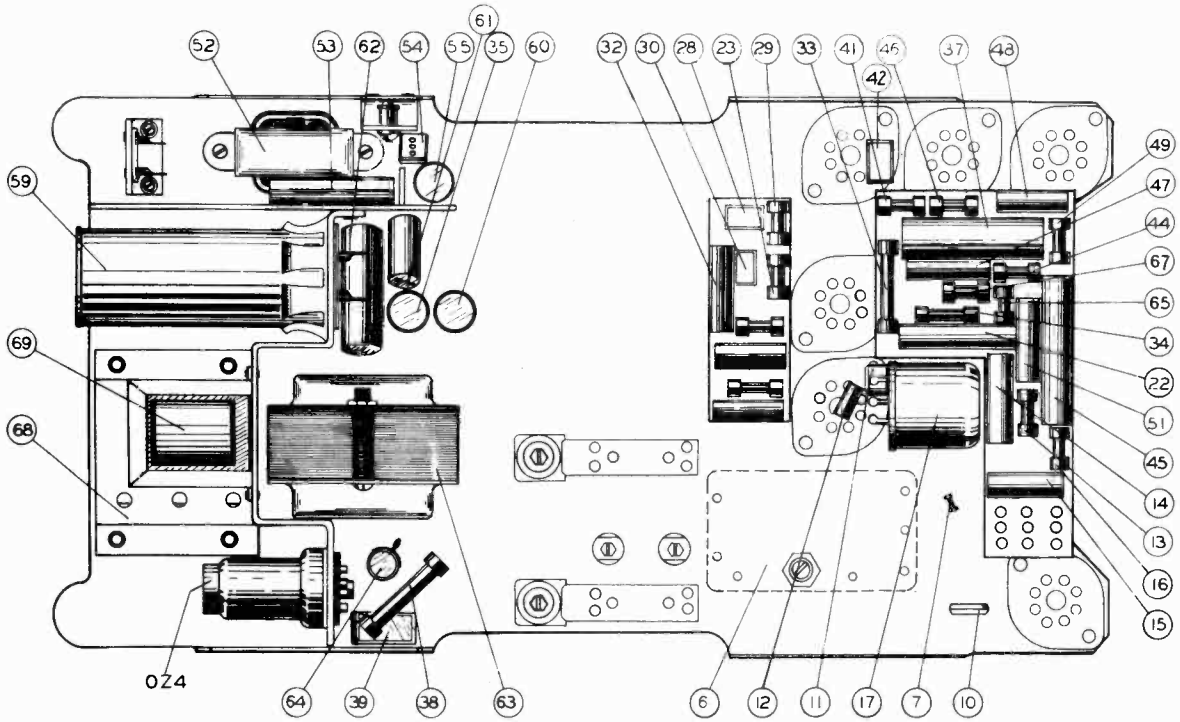
WESTINGHOUSE ELEC. SUPPLY CO.

MODEL WR503
Chassis, Socket
Trimmers



OUTSIDE VIEW OF CHASSIS WITH END BASE PLATES OPENED OUT

Figure No. 1

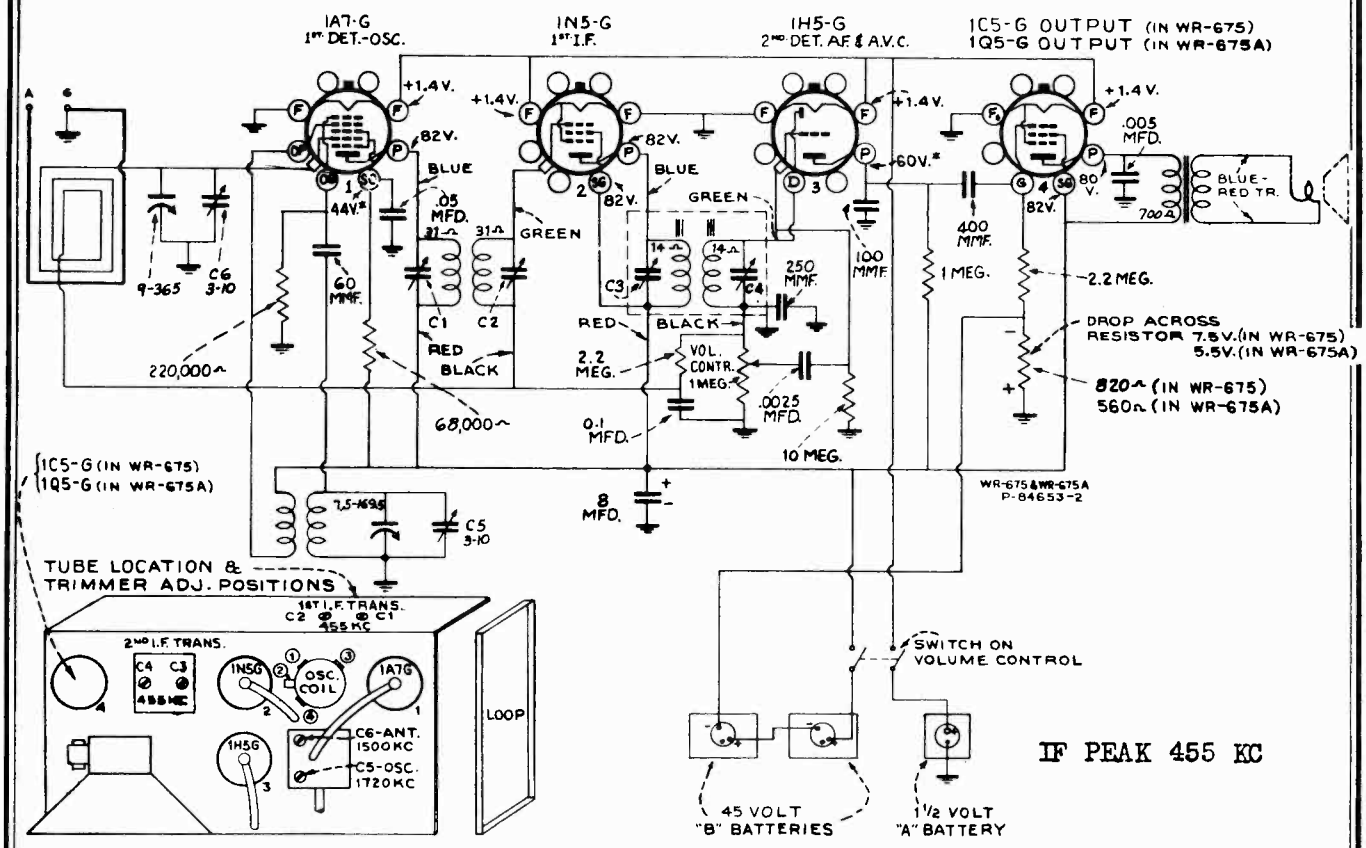


INSIDE VIEW OF CHASSIS WITH END BASE PLATES OPENED OUT

Figure No. 2

MODELS WR675, WR675A
Schematic, Voltage
Socket, Trimmers
Alignment

WESTINGHOUSE ELEC. SUPPLY CO.



Note: Values with star (*) are operating voltages. Values not starred are actual measured voltages.

Measurements are made to chassis unless otherwise indicated, with set tuned to quiet point. Values should hold within approximately ± 20% with rated battery voltage.

Frequency Range ..... 550-1,720 kc
Intermediate Frequency ..... 455 kc

BATTERIES REQUIRED

"A," one 1.5 volt dry plug-type "A," 2⅝-in. x 3¼-in. x 5⅛-in. (Eveready No. 741 or equivalent)
"B," two 45 volt dry plug-type "B," 2½-in. x 4-in. x 5¼-in. (Eveready No. 762 or equivalent)

Alignment Procedure

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

Test-oscillator.—For all alignment operations, keep the output as low as possible to avoid a-v-c action. Connect low side of oscillator to ground terminal on bottom of set.

Pre-setting Dial.—With gang condenser in full mesh, the pointer should be at calibration mark above "55" on dial.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	1A7G 1st-Det. grid cap, in series with .01 mfd.	455 kc	Quiet point at 550 kc end of dial	C1, C2, C3, C4 (1st and 2nd I-F transformers)
2	Antenna terminal thru 220 mmf. capacitor	1,720 kc	Full clockwise (out of mesh)	C5 (oscillator)
3		1,500 kc	Resonance on 1,500 kc signal	C6 (antenna)

CURRENT CONSUMPTION

"A," 0.24 ampere—"B," 9.0 milliamperes

POWER OUTPUT

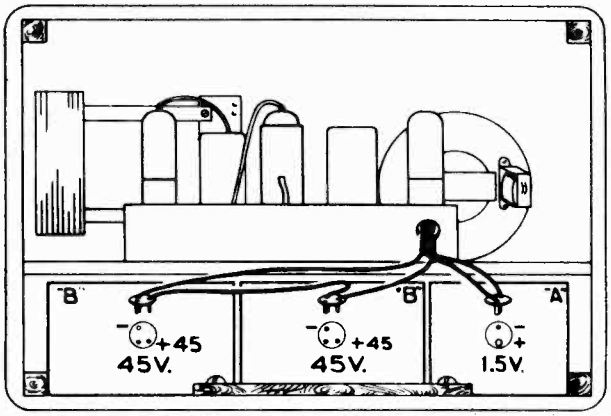
Undistorted ..... 0.10 watt
Maximum ..... 0.21 watt

LOUDSPEAKER

Type ..... 5-inch permanent-magnet dynamic
Voice-coil Impedance ..... 3.2 ohms at 400 cycles

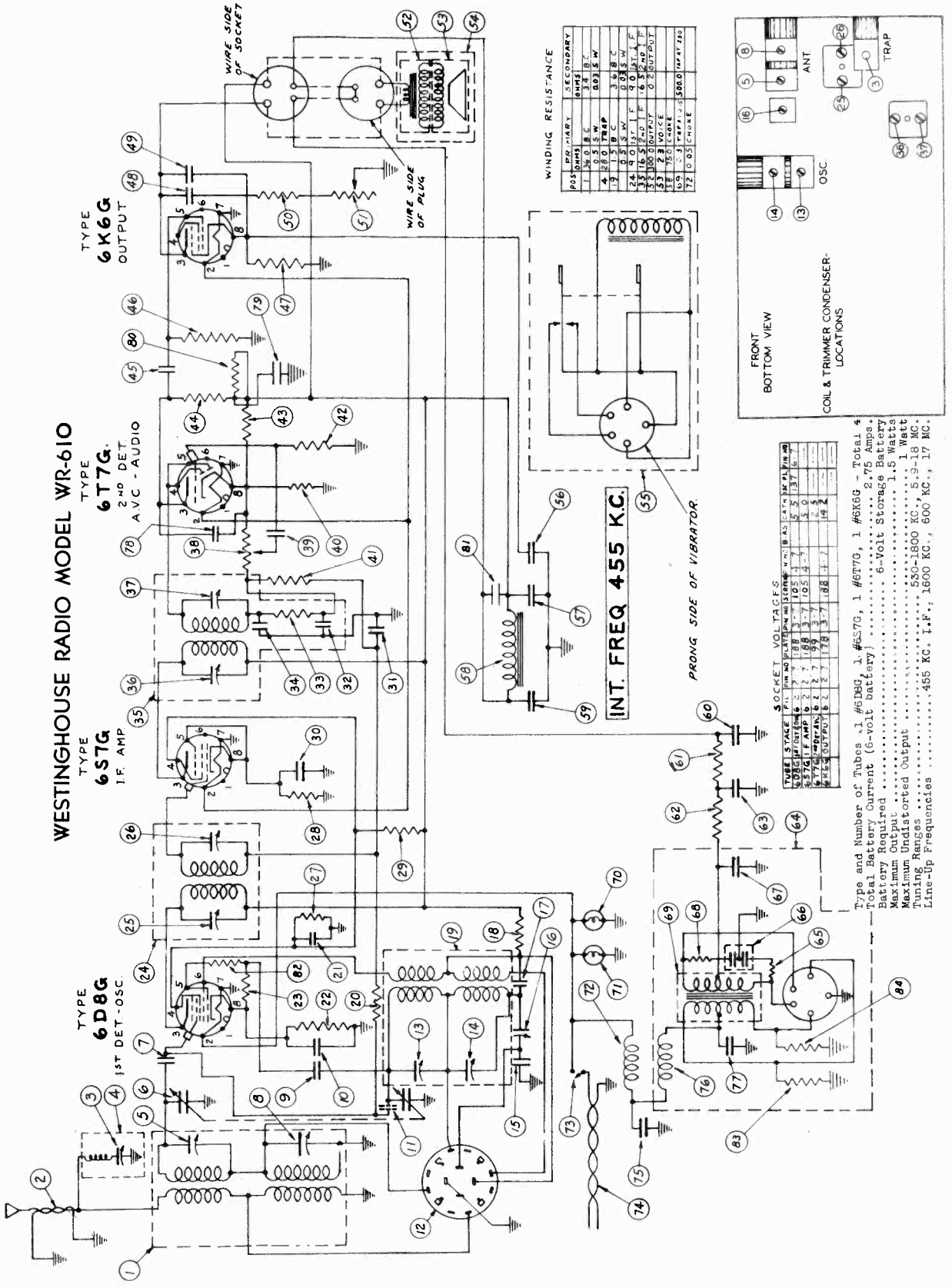
Precautionary Lead Dress.—The spiral shield on the I.F. grid lead should be brought as close as possible to the grid cap.

Antenna.—An antenna and ground may be connected to "A" and "G" at bottom of cabinet. If total length of antenna and lead-in is more than 150 feet, connect a 300 mmf capacitor in series with lead-in.



WESTINGHOUSE ELEC. SUPPLY CO.

MODEL WR610
Schematic, Voltage
Trimmers



GENERAL DESCRIPTION

This model is a four-tube, two-band superheterodyne receiver designed to be operated with only a six-volt storage battery. The receiver employs a type 6D8G tube as a combined first detector-oscillator, a type 6S7G tube as an intermediate frequency amplifier, a type 6T7G tube as a combined second detector, A.V.C. first audio amplifier, and a type 6K6G tube as an audio output amplifier. The power for this model is supplied by a six-volt storage battery. The plate voltage is secured by the use of a combined vibrator and mechanical rectifier built as a part of the chassis.

LINE-UP CAPACITOR ADJUSTMENTS

To properly align this receiver, it is essential to use a high grade modulated test oscillator and a sensitive output meter. The R.F. signal fed into the receiver must be relatively weak or it will cause the A.V.C. to function, making proper alignment difficult. The sensitivity of the output meter must be sufficient to give satisfactory reading with a low input signal. Before attempting to align the chassis, the service man should familiarize himself with the general layout of the chassis, the location of the tubes and the various alignment condensers.

I.F. ADJUSTMENTS (455 KC.)

1. Connect the receiver to the storage battery by connecting the red lead to the positive terminal and the black lead to the negative terminal of the battery.

2. Set the volume control to the maximum position, the tone control to the treble position, the wave-change switch to the broadcast band position and the dial indicator to approximately 600 KC.

3. Set the test oscillator to 455 KC., and apply the test signal to the grid of the type 6D8G detector-oscillator tube through a .5 mfd. condenser.

4. Adjust the four I.F. trimmer condensers #25, #26, #36 and #37 to maximum output.

BROADCAST BAND ADJUSTMENTS

1. With the gang condenser closed, check the dial pointer to make sure that it is exactly horizontal.

2. Set the test oscillator and dial pointer to 1600 KC.

3. With the oscillator still connected to the grid of the detector-oscillator tube, adjust the broadcast oscillator trimmer #14.

4. Connect the test oscillator to the blue antenna lead through a .0002 condenser.

5. Adjust the antenna trimmer #8.

6. Turn the test oscillator and dial pointer to 600 KC.

7. Adjust the oscillator series (lag) condenser #16. This is accomplished by turning the gang condenser back and forth slightly, at the same time adjusting the series (lag) condenser until a maximum is reached.

8. Recheck operation #3 and #5.

9. Check calibration and sensitivity over the scale.

SHORT-WAVE BAND ADJUSTMENTS

1. Turn the wave-change switch to the short-wave position.

2. Set the test oscillator and dial pointer to 17 MC. (17,000 KC.).

3. Adjust the oscillator trimmer #13. Two positions on the trimmer condenser will be found. The one with the least capacity or with the plates farthest out should be used.

4. Adjust the antenna trimmer condenser #5.

WAVE TRAP ADJUSTMENTS

This receiver is provided with a wave trap and the trimmer condenser #3 on this coil should be adjusted to minimize a 455 KC. signal applied to the antenna.

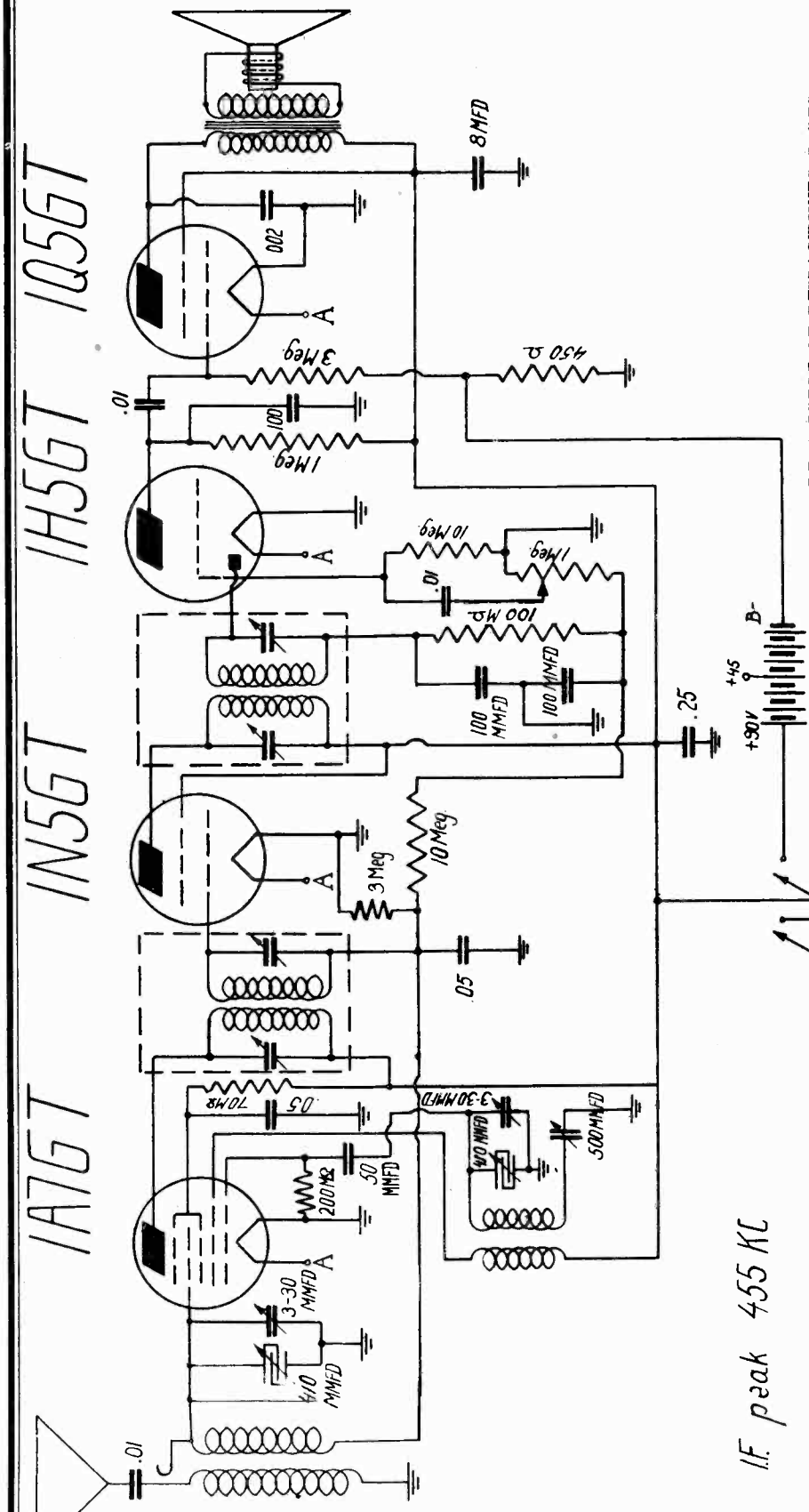
Under actual operating conditions, this trimmer may be adjusted slightly to minimize interfering signals which are known to be on or near the 455 KC. channel.

Dia. #	Part #	Description of Parts	List Price
1	RC 95290	Preselector coil assembly	$ 1.75
2	CB 95159	Cable assembly	.20
3		Trimmer condenser 30-60 mmf. - part of RC 95289	
4	RC 95289	Trap coil assembly	.75
5		Trimmer condenser 4-35 mmf. - part of RC 95290	
6	CG 9567	Variable condenser	3.75
7	CM 9513	100 mmf. mica condenser	.10
8		Trimmer condenser 4-35 mmf. - part of RC 95290	
9	CM 9513	100 mmf. mica condenser	.10
10	CW 4-05	.05 mfd., 400 V. condenser	.15
11		Capacity turn	
12	SW 9591	Wave-change switch	.85
13		Trimmer condenser 2-12 mmf. - part of RC 95291	
14		Trimmer condenser 4-35 mmf. - part of RC 95291	
15	SA 107801	.0025 mfd. mica condenser	.30
16	CS 9585	Oscillator series (lag) condenser 225-700 mmf.	.35
17	CW 4-01	.01 mfd., 400 V. condenser	.15
18	RE 1033	10,000 ohm, 1/4 W. resistor	.10
19	RC 95291	Oscillator coil assembly	1.60
20	RE 1053	1 meg., 1/2 W. resistor	.10
21	CW 4-10	.1 mfd., 400 V. condenser	.15
22	RE 4713	470 ohm, 1/2 W. resistor	.10
23	RE 4733	47,000 ohm, 1/2 W. resistor	.10
24	IC 95122	1st I.F. coil assembly	1.75
25-26		Trimmer condenser 80-200 mmf. - part of IC 95122	
27	RE 4733	47,000 ohm, 1/2 W. resistor	.10
28	RE 4713	470 ohm, 1/2 W. resistor	.10
29	RE 1533	15,000 ohm, 1/2 W. resistor	.10
30	CW 9537	.05 mfd., 400 V. condenser	.30
31		.05 mfd., 400 V. condenser - part of CW 9537	
32		100 mmf. mica condenser - part of IC 95123	
33		47,000 ohm, 1/2 W. resistor - part of IC 95123	
34		100 mmf. mica condenser - part of IC 95123	
35	IC 95123	I.F. coil assembly (diode)	2.25
36-37		Trimmer condenser 30-100 mmf. - part of IC 95123	
38	VR 9560	Volume control - .5 meg.	1.10
39	CW 4-02	.02 mfd., 400 V. condenser	.15
40	RE 4723	4700 ohm, 1/2 W. resistor	.10
41	RE 1053	1 meg., 1/2 W. resistor	.10
42	RE 1053	1 meg., 1/2 W. resistor	.10
43	RE 4743	470,000 ohm, 1/2 W. resistor	.10
44	RE 2243	220,000 ohm, 1/2 W. resistor	.10
45	CW 4-02	.02 mfd., 400 V. condenser	.15
46	RE 4743	470,000 ohm, 1/2 W. resistor	.10
47	RE 6813	680 ohm, 1/2 W. resistor	.10
48	CW 4-02	.02 mfd., 400 V. condenser	.15
49	CW 6-002	.002 mfd., 600 V. condenser	.15
50	RE 1023	1000 ohm, 1/2 W. resistor	.10
51	VR 9559	Tone control - 20,000 ohm	.75
52	TR 95157	Output transformer	2.00
53	DM 9535	Diaphragm assembly	2.75
54	SK 9589	Speaker assembly	6.00
55	VI 9512	Vibrator	4.25
56	CE 9550	40 mfd., 25 V. electrolytic condenser	.75
57	CE 9573	8 mfd., 250 V. electrolytic condenser	.75
58	TR 9526	Choke	1.25
59	CE 9573	8 mfd., 250 V. electrolytic condenser	.75
60	CW 4-10	.1 mfd., 400 V. condenser	.15
61-62	RE 3903	39 ohm, 1/2 W. resistor	.10
63	CW 2-50	.5 mfd., 200 V. condenser	.25
64	PP 952	Power pack assembly (not serviced complete)	
65	RE 6803	68 ohm, 1/2 W. resistor	.10
66	CW 9539	.02-.02 mfd., 1000 V. condenser	.40
67	CW 9513	.05 mfd., 200 V. condenser	.10
68	RE 6803	68 ohm, 1/2 W. resistor	.10
69	TR 95106	Power transformer	4.50
70-71	LP 9516	Dial lamp - 6.3 V., .15 Amp.	.20
72	RC 95288	Choke	.25
73		On-off switch - part of VR 9560	
74	CB 9556	"A" battery cable	.80
75	CW 2-50	.5 mfd., 200 V. condenser	.15
76	RC 95288	Choke	.25
77	CW 9523	.5 mfd., 120 V. condenser	.40
78	CM 9519	500 mmf. mica condenser	.20
79	CW 4-25	.25 mfd., 400 V. condenser	.20
80	RE 2233	220,000 ohm, 1/2 W. resistor	.10
81	CW 4-25	.25 mfd., 400 V. condenser	.20
82-83-84	RE 1013	100 ohm, 1/2 W. resistor	.10

BE 956	Tube shield base			
BK 95182	Electrolytic condenser bracket (large)			
BK 95283	Electrolytic condenser bracket (small)			
CV 954	Tube shield			
CV 95226	I.F. coil cover			
DS 95124	Dial scale			
FP 108003	Felt washer under knob			
IS 1002	Rubber bushing (dial bracket)			
IS 95123	Gang condenser mounting bushing			
IS 95228	Rubber mounting bushing (power pack and chassis)			
IS 95231	Rubber dial drive bushing	SA 104616	Socket (vibrator)	
KA 95115	Cabinet	SA 107257	Socket (speaker)	
KN 95129	Knob (3 used)	SA 107395	Speaker mounting screw	
KN 95151	Knob (wave-change - 1 used)	SH 9557	Drive shaft	
PI 95116	Dial escutcheon plate	SI 9579	Dial pointer	
PL 95130	Dial plate	SO 956	Socket (octal)	
PR 97160	Dial drive cord	SO 9534	Dial lamp socket	
PU 9533	Dial drive pulley	SP 9545	Spring cup (vibrator)	
NT 958	3/8" Pal nut	SP 9551	Dial drive cord spring	

WESTINGHOUSE ELEC. SUPPLY CO.

MODEL WR677
Schematic



LIST PRICE OF REPLACEMENTS PARTS

5139	Battery cable	.75
6113	Dial scale	.85
90049	Dial crystal eso.	1.35
7254	Speaker	5.50
8819	Knob	.10
9944	Drive drum	.15
9945	Drive spring	.08
9943	Pointer	.30
1481	Antenna coil	.50
1515	Oscillator coil	.50
1496A	I.F. Coil	1.25
1497A	Second detector coil	1.25
2422A	Two gang Var. cond.	2.50
2463	8 mfd. elect.	.70
3480	comb. vol. cont.	1.00

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

This is a battery operated superheterodyne receiver with full automatic volume control. It is designed to function with an "A" supply of 1.5 volts and a "B" supply of 90 volts. The broadcast range coverage is **530-1650** kilocycles. The battery recommended is the EVEREADY #748, BURGESS #17GD60, RAY-O-VAC #AB82, or the equivalent. A permenent magnet dynamic speaker is used in this receiver.

TUBES

R C A - 1A7GT (1), R C A - 1N5GT (1), R C A - 1H5GT (1), R C A-1Q5GT (1).
See diagram on label under cabinet for location of tubes.

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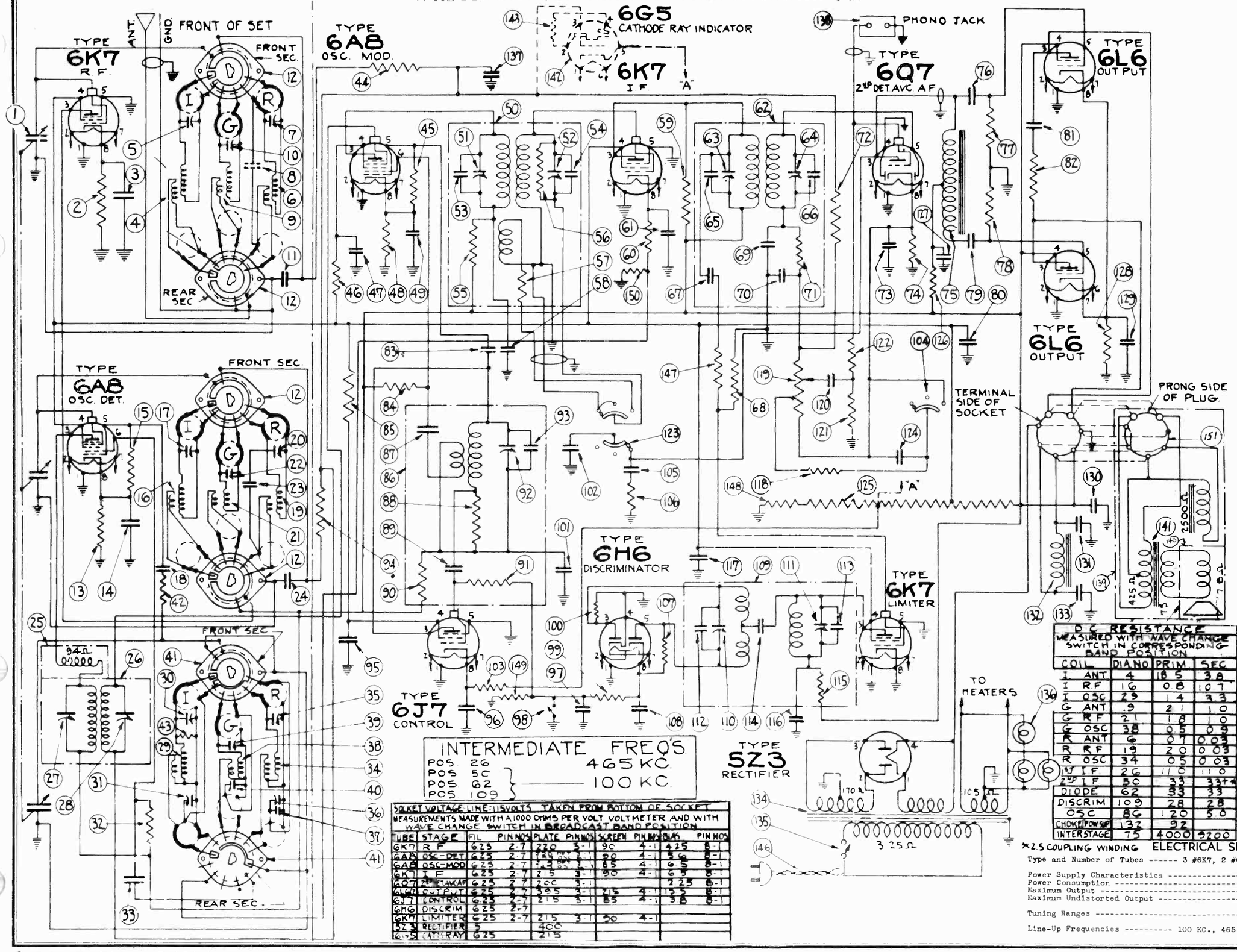


SOCKET VOLTAGE LINE-115 VOLTS TAKEN FROM BOTTOM OF SOCKET
MEASUREMENTS MADE WITH A 1000 OHMS PER VOLT VOLTMETER AND WITH WAVE CHANGE SWITCH IN BROADCAST BAND POSITION

TUBE	STAGE	FIL	PIN NOS	PLATE	PIN NOS	SCREEN	PIN NOS	BIAS	PIN NOS
6K7	R F	6.25	2-7	220	3-1	90	4-1	4.25	B-1
6A8	OSC-DET	6.25	2-7	250 MAX	3-1	90	4-1	3.6	B-1
6A8	OSC-MOD	6.25	2-7	250 MAX	3-1	85	4-1	6.5	B-1
6K7	I F	6.25	2-7	215	3-1	90	4-1	6.5	B-1
6Q7	2ND DET AVC AF	6.25	2-7	200	3-1			2.25	B-1
6L6	OUTPUT	6.25	2-7	395	3-1	215	4-1	13.5	B-1
6J7	CONTROL	6.25	2-7	215	3-1	85	4-1	3.6	B-1
6H6	DISCRIM	6.25	2-7						
6K7	LIMITER	6.25	2-7	215	3-1	90	4-1		
5Z3	RECTIFIER	5		400					
6-5	CATHRAY	6.25		215					

MODEL WR315
Schematic Alignment

ADJUSTMENT OF I.F., CONTROL OSCILLATOR AND DISCRIMINATOR

1. Set the volume control on full and turn the bass control to the bass position (position immediately after set is turned

2. Connect the output meter across the voice coil of the speaker.

3. Set the test oscillator to 100 KC., and adjust the output to give a readable deflection on the output meter when the signal is applied to the grid of the 6K7 I.F. amplifier tube through a 0.5 mfd. blocking condenser.

4. Connect a 10,000 ohm resistor across the primary winding of the third I.F. coil #62. This should be connected to terminals marked "A" and "B" in Figure #2.

5. Adjust trimmer #64 to maximum output, reducing the output of the test oscillator as required.

6. Remove the 10,000 ohm resistor from the primary side of I.F. coil #62 and connect across the secondary winding from terminals marked "C" and "D".

7. Adjust trimmer #63 to maximum output, reducing the output of the test oscillator as required. Remove 10,000 ohm resistor.

8. Turn switch #98 to the left-hand position (viewed from rear of chassis).

9. Set the output of the test oscillator to a high level.

10. Connect a 0 to 5 microammeter across resistor #149 and adjust trimmer condenser #111 to maximum swing of the microammeter, keeping the output of the signal generator set to a point which will give a deflection of approximately 5 microamperes when condenser #111 is tuned to maximum deflection. WHEN THE SIGNAL GENERATOR IS SET TO THIS OUTPUT, DO NOT ALTER THE OUTPUT OF THE SIGNAL GENERATOR UNTIL THE ALIGNMENT OF THE DISCRIMINATOR CIRCUIT IS COMPLETED.

11. Adjust trimmer #110 until the microammeter reading is reduced exactly to zero.

12. Turn switch #98 to the right-hand position and proceed with the alignment of the I.F.

13. Apply the test signal to the grid of the 6A8 oscillator-modulator tube.

14. Connect the 10,000 ohm resistor across the primary of I.F. coil #50 by connecting it to the terminals marked "E" and "F" in Figure #2.

15. Adjust trimmer #52 to maximum output, reducing the output of the test oscillator as required.

16. Remove the 10,000 ohm resistor and connect across the secondary of I.F. transformer #50. Connect to terminals marked "G" and "H".

17. Adjust trimmer #51 to maximum output, reducing the output of the test oscillator as required.

18. Remove the 10,000 ohm resistor.

19. Set the test oscillator to 465 KC., and adjust the control oscillator trimmer #92 to maximum output.

20. Apply the test signal to the grid of the type 6A8 oscillator-detector tube.

21. Connect the 10,000 ohm resistor across the primary of I.F. transformer #26 by connecting it to the points marked "J" and "K" in Figure #2.

22. Adjust trimmer #28 to maximum output, reducing the output of the test oscillator as required.

23. Remove the 10,000 ohm resistor and connect across the secondary of the I.F. transformer #26 by connecting it to the points marked "L" and "M" in Figures #1 and #2.

24. Adjust trimmer #27 to maximum output, reducing the output of the test oscillator as required. Remove the 10,000 ohm resistor.

D C RESISTANCE MEASURED WITH WAVE CHANGE SWITCH IN CORRESPONDING BAND POSITION			
COIL	DIA NO	PRIM.	SEC.
I ANT.	4	18.5	3.8
I RF	16	0.8	10.7
I OSC	29	1.4	3.3
G ANT	.9	2.1	1.0
G RF	2.1	1.8	1.0
G OSC	3.8	0.5	0.5
R ANT	6	0.7	0.03
R RF	19	2.0	0.03
R OSC	34	0.5	0.03
1ST I F	26	11.0	11.0
2ND I F	50	33	33**
DIODE	62	33	33
DISCRIM	109	28	28
OSC	86	1.20	5.0
CHOKE (POWER)	137	92	
INTERSTAGE	75	4000	3200

**2.5 COUPLING WINDING

ELECTRICAL SPECIFICATIONS continued

Type and Number of Tubes ------ 3 #6K7, 2 #6A8, 1 #6Q7, 2 #6L6, 1 #6H6, 1 #6J7, 1 #5Y3, 1 #6G5 - Total 12

Power Supply Characteristics ---------- 105 to 125 volt, 50 to 60 cycle A.C.

Power Consumption ---------- 125 Watts

Maximum Output ---------- 21 Watts

Maximum Undistorted Output ---------- 12.5 Watts

Tuning Ranges ---------- (White Band - 525 to 1,800 KC. (Green Band - 1750 to 6,000 KC. (Red Band - 5800 to 18,500 KC.

Line-Up Frequencies ---------- 100 KC., 465 KC., 1600 KC., 570 KC., 5500 KC., 1900 KC., 17,000 KC., and 6000 KC.

MODEL WR315

WESTINGHOUSE ELEC. INTERNATIONAL CO.

Socket, Trimmers Chassis

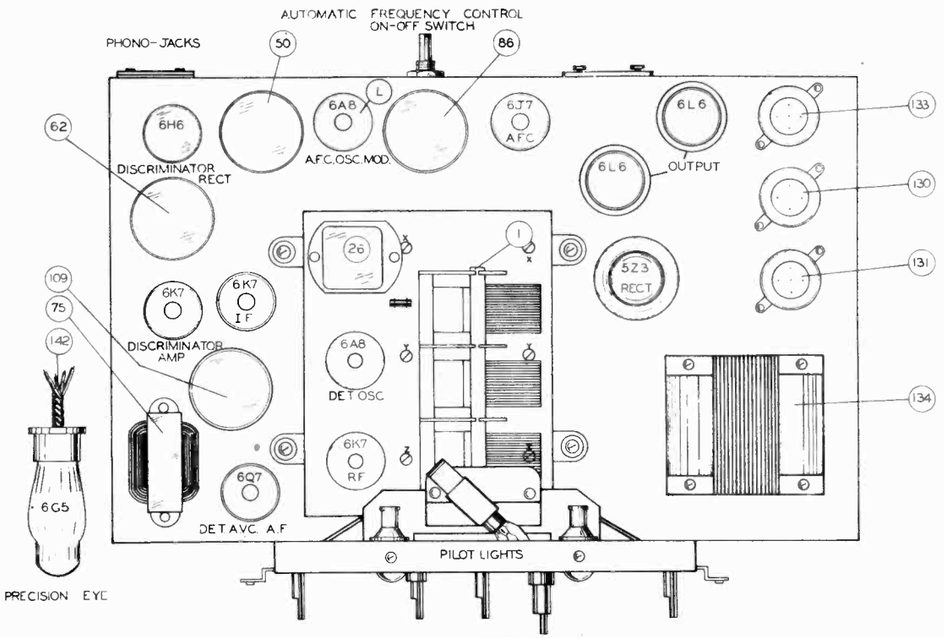


Figure No. 1

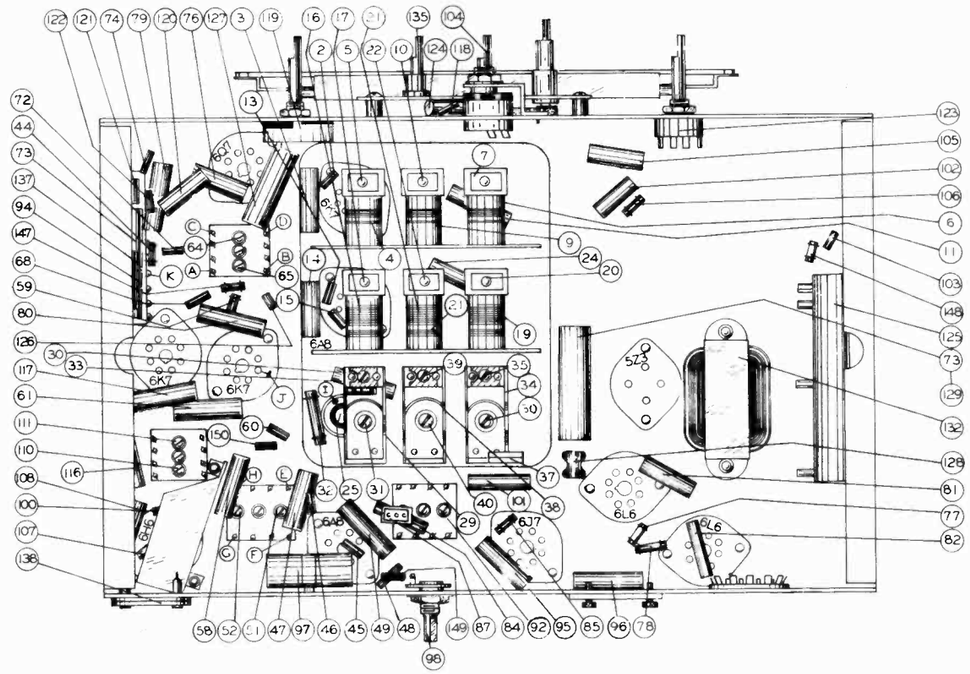


Figure No. 2

ADJUSTMENT OF BROADCAST BAND (CONT.)

1. Set the wave-change switch to the White or Broadcast Band position.

2. Set the test oscillator and dial indicator to 1600 KC.

3. Apply the test signal to the antenna terminal of the chassis through a .0002 mfd. series condenser and adjust the oscillator trimmer condenser #30 until the signal is received at a maximum.

4. Adjust trimmers #17 and #5 to maximum output.

5. Set the test oscillator and dial indicator to 570 KC., and adjust the oscillator series condenser #31 to maximum output. Rock the same time rocking the condenser gang.

6. Return both the test oscillator and dial indicator to 1600 KC., and check the adjustment of trimmers #30, #17 and #5 for accuracy.

ADJUSTMENT OF GREEN BAND

NOTE: In adjusting the two short-wave bands (Green and Red) a .0002 mfd. condenser should be inserted in the antenna lead of the test oscillator leads. This condenser-resistor combination is the approximate equivalent of a short-wave antenna.

1. Set the wave-change switch to the Green Band position.

2. Set the test oscillator and dial indicator to 5500 KC., and adjust the oscillator trimmer condenser #39 until the signal is received at a maximum.

3. Adjust trimmer condensers #22 and #10 for maximum output.

4. Set the test oscillator and dial indicator to 1900 KC., and adjust the oscillator series condenser #40 to maximum output, at the same time rocking the condenser gang.

5. Return both the test oscillator and dial indicator to 5500 KC., and check the adjustment of trimmers #39, #22 and #10 for accuracy.

ADJUSTMENT OF RED BAND

1. Set the wave-change switch to the Red Band position.

2. Set the test oscillator and dial indicator to 17000 KC., and adjust the oscillator trimmer condenser #35 until the signal is received.

NOTE: When adjusting the oscillator trimmer condenser #35 it will be possible to secure two peaks. The peak secured with the trimmer screw turned farthest out should be used. When aligned on the correct peak a strong signal will be heard at 17000 KC., and a weaker signal at approximately 16000 KC. No signal should be heard at 18000 KC.

3. Adjust trimmer condensers #20 and #7 to maximum output.

4. Set the test oscillator and dial indicator to 6000 KC., and adjust the oscillator series condenser #36 to maximum output, at the same time rocking the condenser gang.

5. Return both the test oscillator and dial indicator to 17000 KC., and check adjustment of trimmers #35, #20 and #7 for accuracy.

IMPORTANT: While testing or making repairs on this receiver, the chassis should not be turned upside down or on its side for any long period of time while the set is turned on as the chemicals in the electrolytic filter condensers will come out through the air vents, making the condenser appear to be defective. If left in this position too long the condenser may be injured.

Dia. #	Part #	Description of Parts
1	CG 9551	Variable condenser
2	RE 95102	600 ohm, 1/4 W. resistor
3	CW 2-05	.05 mfd., 200 V. condenser
4	RC 95209	Antenna coil - Broadcast
5	CS 9554	4-30 mmf. trimmer condenser
6	RC 96206	4-30 mmf. trimmer condenser
7	CS 9554	Twisted wire - part of RC 96206
8		
9	RC 96212	Antenna coil - Green Band
10	CS 9554	4-30 mmf. trimmer condenser
11	CW 9513	.05 mfd., 200 V. condenser
12	SW 9555	Switch and bracket assembly - antenna and R.F. sections
13	CE 95102	600 ohm, 1/4 W. resistor
14	CW 9563	.05 mfd., 200 V. condenser
15	RE 9563	50,000 ohm, 1/2 W. insulated resistor
16	RC 95210	R.F. coil - Broadcast
17	CS 9554	4-30 mmf. trimmer condenser
18	CW 9511	.0000065 mfd. mica condenser
19	RC 95207	R.F. coil - Red Band
20	CS 9554	4-30 mmf. trimmer condenser
21	RC 95214	R.F. coil - Green Band
22	CS 9553	1.5-10 mmf. trimmer condenser
23	CW 9512	6 mmf. mica condenser
24	CW 9513	.05 mfd. 200 V. condenser
25	RC 95266	Choke coil assembly
26	IC 9582	1st I.F. coil (465 KC.)
27		35-130 mmf. trimmer condenser - part of IC 9582
28		35-130 mmf. trimmer condenser - part of IC 9582
29	RC 96272	Oscillator coil - Broadcast
30		5-25 mmf. trimmer condenser - part of CS 9540
31		300-600 mmf. trimmer condenser - part of CS 9540
32	RE 9526	5000 ohm, 1 W. resistor
33	CW 9513	.05 mfd., 200 V. condenser
34	RC 95208	Oscillator coil - Red Band
35		3-15 mmf. trimmer condenser - part of CS 9520
36		800-1600 mmf. trimmer condenser - part of CS 9520
37	CW 959	.002 mfd. mica condenser
38	RC 95213	Oscillator coil - Green Band
39		3-15 mmf. trimmer condenser - part of CS 9520
40	SW 9554	800-1600 mmf. trimmer condenser - part of CS 9520
41	RE 9537	Switch and bracket assembly - oscillator section
42	RE 95126	50 ohm, 1/4 W. resistor
43	RE 95103	20,000 ohm, 1/2 W. insulated resistor
44	RE 9563	50,000 ohm, 1/2 W. insulated resistor
45	RE 95106	50,000 ohm, 1/2 W. insulated resistor
46	RE 95106	1000 ohm, 1/2 W. insulated resistor
47	CW 2-05	.05 mfd., 200 V. condenser
48	RE 9567	600 ohm, 1/2 W. insulated resistor
49	CW 2-05	.05 mfd., 200 V. condenser
50	IC 9584	2nd I.F. coil (100 KC.)
51		80-200 mmf. trimmer condenser - part of IC 9584
52		80-200 mmf. trimmer condenser - part of IC 9584
53		
54	CM 9528	350 mmf. mica condenser
55	CM 9528	350 mmf. mica condenser
56	RE 95103	1000 ohm, 1/2 W. insulated resistor
57	RE 95104	75 ohm, 1/2 W. insulated resistor
58	CW 4-05	.05 mfd., 400 V. condenser
59	RE 95103	100,000 ohm, 1/2 W. insulated resistor
60	RE 9567	600 ohm, 1/2 W. insulated resistor
61	CW 2-05	.05 mfd., 200 V. condenser
62	IC 9585	3rd I.F. coil (100 KC.)
63		80-200 mmf. trimmer condenser - part of IC 9585
64		80-200 mmf. trimmer condenser - part of IC 9585
65	CM 9528	350 mmf. mica condenser

MODEL WR315

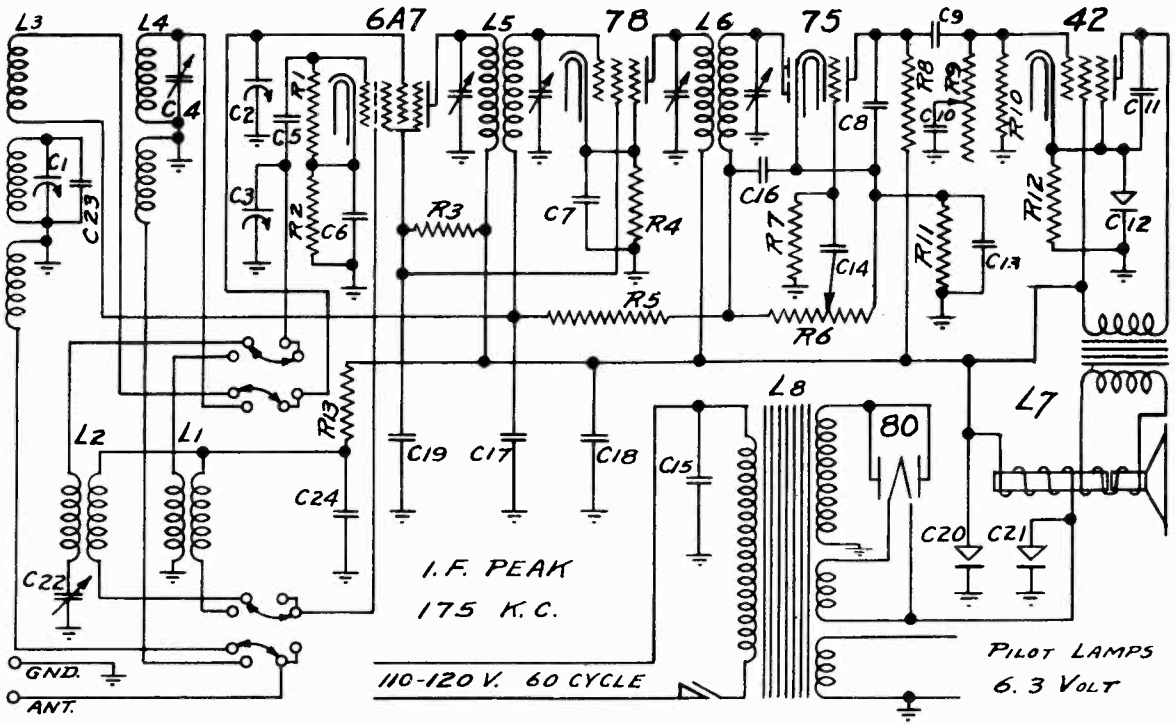
Alignment, Part 2 WESTINGHOUSE ELEC. INTERNATIONAL CO.

Parts List

Dia. #	Part #	Description of Parts
66	CM 9528	350 mmf. mica condenser
67	CM 953	50 mmf. mica condenser
68	RE 95105	100 ohm, 1/2 W. insulated resistor
69		100 mmf. mica condenser - part of IC 9585
70		100 mmf. mica condenser - part of IC 9585
71	RE 9524	50,000 ohm, 1/4 W. resistor
72	RE 95113	1/2 meg., 1/2 W. insulated resistor
73	CE 9515	12 mfd., 25 V. electrolytic condenser
74	RE 95114	2000 ohm, 1/2 W. insulated resistor
75	TR 9579	Interstage transformer
76	CW 4-02	.02 mfd., 400 V. condenser
77	RE 95112	1/4 meg., 1/2 W. insulated resistor
78	RE 95112	1/4 meg., 1/2 W. insulated resistor
79	CW 4-02	.02 mfd., 400 V. condenser
80	CW 2-05	.05 mfd., 200 V. condenser
81	CW 4-005	.005 mfd., 400 V. condenser
82	RE 95111	20,000 ohm, 1 W. insulated resistor
83	CM 953	50 mmf. mica condenser
84	RE 95110	15,000 ohm, 1 W. insulated resistor
85	RE 95106	1000 ohm, 1/2 W. insulated resistor
86	RC 95265	Oscillator coil (365 KC.)
87	RE 95266	500 mmf. mica condenser
88	RE 96107	75 ohm, 1/8 W. resistor
89	CM 953	50 mmf. mica condenser
90	RE 96106	1000 ohm, 1/2 W. insulated resistor
91	RE 95105	1 meg., 1/2 W. insulated resistor
92		45-135 mmf. trimmer condenser - part of RC 95265
93	CM 956	250 mmf. mica condenser
94	RE 95103	100,000 ohm, 1/2 W. insulated resistor
95	CW 2-05	.05 mfd., 200 V. condenser
96	CW 2-05	.05 mfd., 200 V. condenser
97	CW 9525	1 mfd., 100 V. condenser
98	SW 9563	A. F. C. switch
99	RE 95105	1 meg., 1/2 W. insulated resistor
100	RE 95105	1 meg., 1/2 W. insulated resistor
101	CW 4-05	.05 mfd., 400 V. condenser
102	CW 4-02	.02 mfd., 400 V. condenser
103	RE 95126	300 ohm, 1/2 W. insulated resistor
104	VR 9548	Bass control
105	RE 95103	100,000 ohm, 1/2 W. insulated resistor
106	RE 95105	1 meg., 1/2 W. insulated resistor
107	CW 2-05	.05 mfd., 200 V. condenser
108	IC 9583	Discriminator coil
109		80-200 mmf. trimmer condenser - part of IC 9583
110		80-200 mmf. trimmer condenser - part of IC 9583
111		
112	CM 9528	350 mmf. mica condenser
113	CM 9528	350 mmf. mica condenser
114	CM 9519	500 mmf. mica condenser
115	RE 96106	1000 ohm, 1/2 W. insulated resistor
116	CW 4-05	.05 mfd., 400 V. condenser
117	CW 2-05	.05 mfd., 200 V. condenser
118	RE 9524	50,000 ohm, 1/4 W. insulated resistor
119	VR 9548	Volume control, 1/2 meg.
120	CW 4-02	.02 mfd., 400 V. condenser
121	RE 95105	1 meg., 1/2 W. insulated resistor
122	RE 95103	100,000 ohm, 1/2 W. insulated resistor
123	SW 9564	Treble control
124	CW 2-05	.05 mfd., 200 V. condenser
125	RE 9597	140-4500-4500 ohm tapped resister
126	RE 95124	5000 ohm, 1/2 W. insulated resistor
127	CW 4-25	.25 mfd., 400 V. condenser
128	RE 9598	170 ohm, 4 W. resistor
129	CE 9515	12 mfd., 25 V. electrolytic condenser
130	CE 9536	16 mfd., 300 V. electrolytic condenser
131	CE 9628	8 mfd., 450 V. electrolytic condenser
132	CE 9536	12 mfd., 450 V. electrolytic condenser
133	CB 9580	Power transformer ... part of VR 9542
134		Dial lamp (3.2 V., 0.35 amp.)
135	LP 9515	.05 mfd. 200 V. condenser
136	CW 2-05	Phono-jack
137	SA 100050	Choke coil
138	SK 9546	Diaphragm and voice coil
139	DM 9618	Speaker
140	DM 9618	Output transformer
141	TR 9595	Cable to "precision eye"
142	CB 9598	1 meg., 1/4 W. resistor - part of CB 9598
143		
146	CB 9512	Line cable
147	RE 95102	100,000 ohm, 1/2 W. insulated resistor
148	RE 9556	25 ohm, 1/4 W. resistor
149	RE 95113	1/2 meg., 1/2 W. insulated resistor
150	RE 95108	3000 ohm, 1/2 W. insulated resistor
151	PO 9567	Speaker plug

WILCOX-GAY CORP.

MODELS 7G5,7GB5
Schematic,Socket
Trimmers



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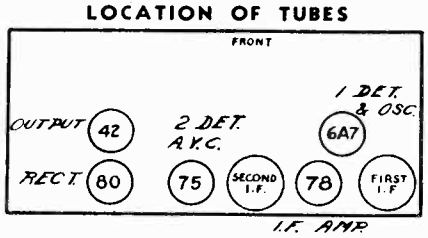
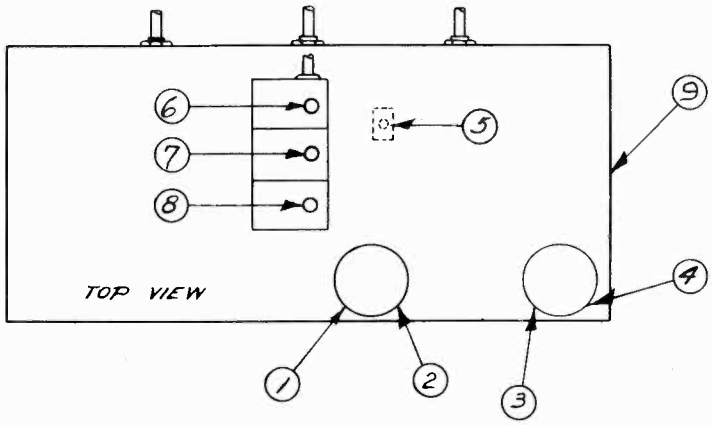




FOR VOLTAGE and ALIGNMENT
SEE INDEX

CODE	PART NO.	RESISTORS
R1	53-941	20,000 Ohm Type M Resistor
R2	53-2014	200 Ohm Type M Resistor
R3	53-1042	25,000 Ohm Type M Resistor
R4	53-1062	250 Ohm Wirewound Resistor
R5	53-926	1 Meg Ohm Type M Resistor
R6	19-2007	500,000 Ohm Volume Control & Switch
R7	53-925	500,000 Ohm Type M Resistor
R8	53-924	250,000 Ohm Type M Resistor
R9	19-2009	250,000 Ohm Tone Control
R10	53-925	500,000 Ohm Type M Resistor
R11	53-919	5,000 Ohm Type M Resistor
R12	53-1063	500 Ohm Wirewound Resistor
R13	53-920	10,000 Ohm Type M Resistor

CODE	PART NO.	CONDENSERS (Cont'd.)
C12	18-928	25 Mfd. 25 V. Dry Elect. Condenser
C13	75-2005	.1 Mfd. 200 V. Paper Condenser
C14	75-2005	.1 Mfd. 200 V. Paper Condenser
C15	75-2003	.01 Mfd. 400 V. Paper Condenser
C16	76-307	.0005 Mfd. Mica Condenser
C17	75-2005	.1 Mfd. 200 V. Paper Condenser
C18	75-2012	.5 Mfd. 400 V. Paper Condenser
C19	75-2005	.1 Mfd. 200 V. Paper Condenser
C20	18-2006	16 Mfd. 250 W. V. Elect. Condenser
C21	18-2005	12 Mfd. 325 W. V. Elect. Condenser
C22	78-2031	600-1350 Mmfd. Trimmer Condenser
C23	76-2003	.00001 Mfd. Mica Condenser
C24	75-2003	.01 Mfd. 400 V. Paper Condenser

CONDENSERS

C1,C2,C3	77-2011	3 Gang Tuning Condenser
C4	78-2010	3-30 Mmfd. Trimmer Condenser
C5	76-2002	.00005 Mfd. Condenser
C6	75-2005	.1 Mfd. 200 V. Paper Condenser
C7	75-2005	.1 Mfd. 200 V. Paper Condenser
C8	76-265	.001 Mfd. Mica Condenser
C9	75-2005	.1 Mfd. 200 V. Paper Condenser
C10	75-2003	.01 Mfd. 400 V. Paper Condenser
C11	75-2001	.002 Mfd. 600 V. Paper Condenser

INDUCTANCES

L1	17-2149	Foreign Band Oscillator Coil Assembly
L2	17-2150	Broadcast Oscillator Coil Assembly
L3	17-2151	Broadcast Preselector Coil Assembly
L4	17-2152	Foreign Band Preselector Coil Assembly
L5	68-2031	First I. F. Transformer Assembly
L6	68-2042	Second I. F. Transformer Coil Assembly
L7	64-2045	5" Speaker, 1500 Ohm Field, 42 Tube Trans.-7G5
L7	64-2046	6½" Speaker, 1500 Ohm Field, 42 Tube Trans.-7GB5
L8	80-2009	Power Transformer for 110-120 V. 60 Cycle

MODELS 7G5,7GB5
MODEL 7J7
MODEL 7K7
Alignment,Voltage

WILCOX-GAY CORP.

MODEL 7J7 - 7K7

TUBE	CIRCUIT	PLATE TO GROUND	SCREEN TO GROUND	CATHODE TO GROUND	2 PLATE TO GROUND	2 GRID TO GROUND
78	R-F Amplifier	290	90	3.8		
6A7	1st Det. & Osc.	290	90	3.6	180	- 18
78	I-F Amplifier	290	90	3.7		
78	I-F Amplifier	260	90	3.4		
75	2nd Det. & AVC	145		15.		
42	Power Output	275	290	20.		
80	Rectifier					

B+ Voltage 290 V. - Speaker Field Drop 85 V.
Meter 1000 ohms per volt - 750 volt Scale

SIGNAL GENERATOR CONNECTION	SIGNAL GENERATOR FREQUENCY	DIAL POSITION	WAVE BAND SWITCH POSITION	TRIMMER NUMBER	OUTPUT SIGNAL
Connect a 100,000 ohm resistor from plate of 2nd I-F tube to gnd. Remove grid clip from 6A7					
Control Grid of 6A7	456 KC	1400 KC	Broadcast (Left)	1	Max.[1]
" " " "	" "	" "	" "	2,3,4,5,6[2]	Max.
Disconn. 100,000 ohm resistor and DO NOT make any other adj. of I-F Amp. Conn. Grid Clip to 6A7.					
*Antenna & Ground Post	1400 KC	1400 KC	Broadcast (Left)	7,8,9	Max.
" " "	600 "	600 "	" "	10[3]	Max.
" " "	5 MC	5 MC	Police (Center)	11,12,13	Max.
" " "	2 "	2 "	" "	14	Max.
" " "	15 "	15 "	Foreign (Right)	15,16,17[4]	Max.

Volume Control in "Full On" position at all times.
(*) Connect a standard dummy antenna between signal generator and receiver.
NOTES - (1) Maintain a midscale reading on output meter across primary of output transformer by adjustment of the signal generator. (2) Repeat above procedure and critically trim each adjustment to absolute resonance to insure perfect alignment. The I.F. sensitivity should be from 15 to 25 microvolts. (3) Investigate ganging of trimmers No. 7, 8, 9 and 10 at 600 KC, 800 KC, 1000 KC, 1200 KC and 1400 KC and any discrepancy of ganging or scale tracking should be corrected by bending slotted side plates of the variable condenser. (4) Investigate ganging of trimmers 15, 16, and 17 at 10 MC and 6 MC to ascertain whether or not the circuits are tracked.

MODEL 7G5 - 7GB5

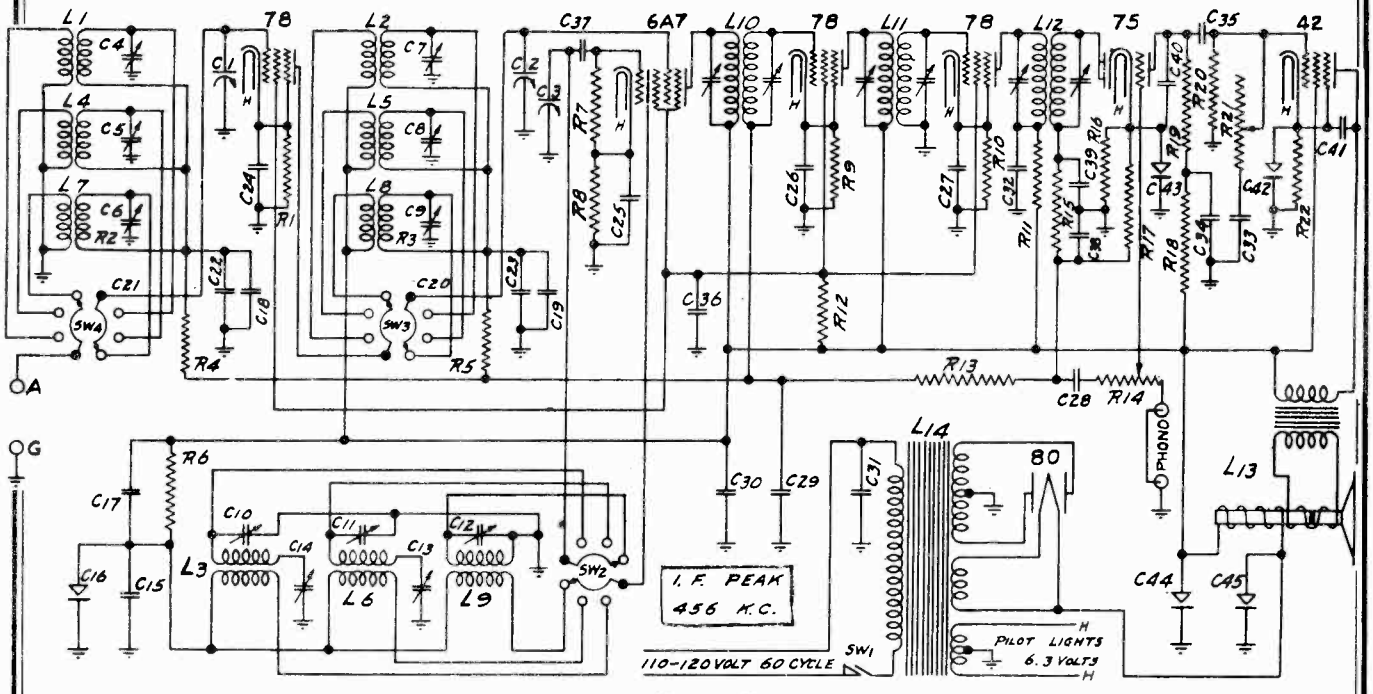
TUBE	CIRCUIT	PLATE TO GROUND	SCREEN TO GROUND	CATHODE TO GROUND	2 PLATE TO GROUND	2 GRID TO GROUND
6A7	1st Det. & Osc.	205	72	2.4	155	- 6.5
78	I-F Amplifier	205	72	2.		
75	2nd Det. & AVC	72		1.3		
42	Power Output	190	207	14		
80	Rectifier					

B+ Voltage 207 - Speaker Field Voltage 70
Line Voltage was 120 - Meter 1000 ohms per volt

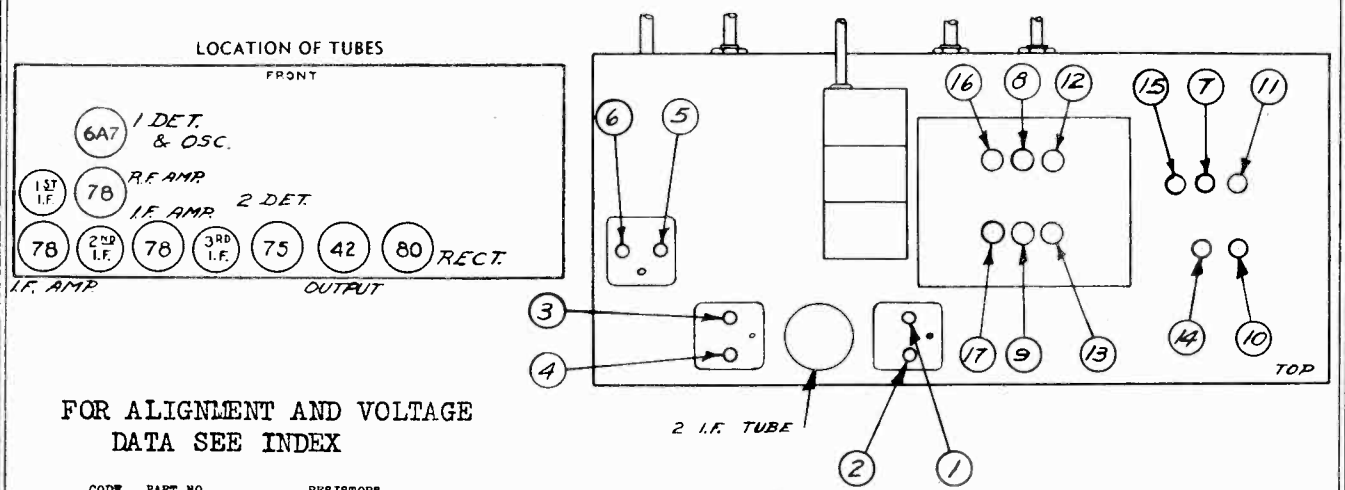
SIGNAL GENERATOR CONNECTION	SIGNAL GENERATOR FREQUENCY	DIAL POSITION	WAVE BAND SWITCH POSITION	TRIMMER NUMBER	OUTPUT SIGNAL
Remove Grid Clip from 6A7.					
Control Grid of 6A7	175 KC	1400 KC	Broadcast (Left)	1,2,3,4[2]	Max.[1]
Connect Grid Clip to 6A7.					
*Antenna & Ground Post	600 "	600 "	" "	5	Max.[1]
" " "	1400 "	1400 "	" "	6,7,8	Max.[1]
" " "	600 "	600 "		5	Max.[1]
" " "	15 MC	15 MC	Foreign (Right)	9	Max.[1]

WILCOX-GAY CORP.

MODEL 7J7
Schematic, Socket Trimmers



LOCATION OF TUBES



FOR ALIGNMENT AND VOLTAGE DATA SEE INDEX

RESISTORS

CODE	PART NO.	
R1	53-1063	500 Ohm Wirewound Resistor
R4	53-923	100,000 Ohm Type M Resistor
R5	53-925	100,000 Ohm Type M Resistor
R6	53-941	20,000 Ohm Type M Resistor
R7	53-941	20,000 Ohm Type M Resistor
R8	53-1062	250 Ohm Wirewound Resistor
R9	53-1063	500 Ohm Wirewound Resistor
R10	53-1063	500 Ohm Wirewound Resistor
R11	53-919	5,000 Ohm Type M Resistor
R12	53-195	25,000 Ohm Type J Resistor
R13	53-926	1 Meg Ohm Type M Resistor
R14	19-2008	500,000 Ohm Volume Control
R15	53-898	50,000 Ohm Type M Resistor
R16	53-925	500,000 Ohm Type M Resistor
R17	53-919	5,000 Ohm Type M Resistor
R18	53-923	100,000 Ohm Type M Resistor
R19	53-924	250,000 Ohm Type M Resistor
R20	53-925	500,000 Ohm Type M Resistor
R21	19-2009	250,000 Ohm Tone Control
R22	53-1063	500 Ohm Wirewound Resistor

CONDENSERS

CODE	PART NO.	
C1, C2, C3	77-2011	3 Gang Tuning Condenser
C4, C5, C6	78-2030	3-50 Mmfd. 3 Gang Trimmer Cond.
C7, C8, C9	78-2030	3-50 Mmfd. 3 Gang Trimmer Cond.
C10, C11, C12	78-2030	3-50 Mmfd. 3 Gang Trimmer Cond.
C13, C14	78-2028	600 and 1600 Mmfd. 2 Gang Trimmer Cond.
C15	75-2003	.01 Mfd. 400 V. Paper Condenser
C16	18-2004	4 Mfd. 450 W. V. Electrolytic Condenser
C17	76-662	.002 Mfd. Mica Condenser
C18	76-662	.002 Mfd. Mica Condenser
C19	76-662	.002 Mfd. Mica Condenser
C22	75-2005	.1 Mfd. 200 V. Paper Condenser
C23	75-2005	.1 Mfd. 200 V. Paper Condenser
C24	75-2005	.1 Mfd. 200 V. Paper Condenser
C25	75-2005	.1 Mfd. 200 V. Paper Condenser
C26	75-2005	.1 Mfd. 200 V. Paper Condenser
C27	75-2005	.1 Mfd. 200 V. Paper Condenser
C28	75-2005	.1 Mfd. 200 V. Paper Condenser
C29	75-2005	.1 Mfd. 200 V. Paper Condenser
C30	75-2012	.5 Mfd. 400 V. Paper Condenser

CONDENSERS (Cont'd.)

CODE	PART NO.	
C31	75-2003	.01 Mfd. 400 V. Paper Condenser
C32	75-2003	.01 Mfd. 400 V. Paper Condenser
C33	75-2003	.01 Mfd. 400 V. Paper Condenser
C34	75-2007	.1 Mfd. 400 V. Paper Condenser
C35	75-2007	.1 Mfd. 400 V. Paper Condenser
C36	75-2007	.1 Mfd. 400 V. Paper Condenser
C37	76-2002	.00005 Mfd. Mica Condenser
C38	76-2001	.0001 Mfd. Mica Condenser
C39	76-2001	.0001 Mfd. Mica Condenser
C40	76-265	.001 Mfd. Mica Condenser
C41	75-2002	.004 Mfd. 600 V. Paper Condenser
C42	18-928	25 Mfd. 25 V. Electrolytic Condenser
C43	18-928	25 Mfd. 25 V. Electrolytic Condenser
C44	18-2005	12 Mfd. 326 W. V. Elect. Condenser
C45	18-721	8 Mfd. 450 W. V. Elect. Condenser

INDUCTANCES

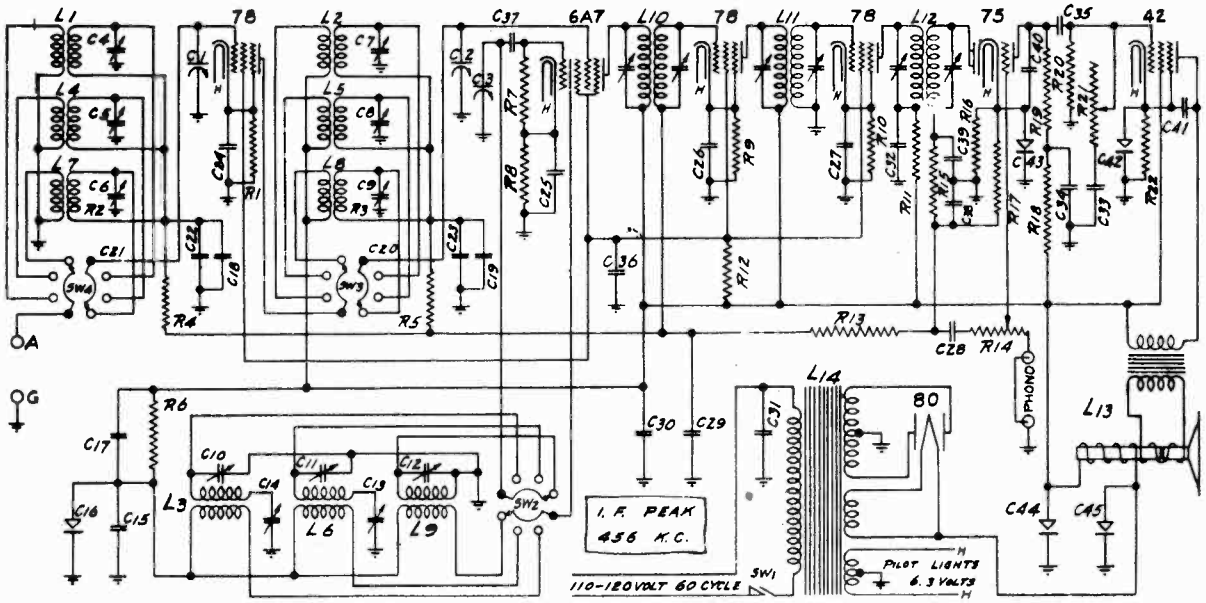
L1	17-2163	Broadcast Antenna Coil Assembly
L2	17-2165	Broadcast R. F. Coil Assembly
L3	17-2176	Broadcast Oscillator Coil Assembly
L4	17-2168	Police Band Antenna Coil Assembly
L5	17-2169	Police Band R. F. Coil Assembly
L6	17-2177	Police Band Oscillator Coil Assembly
L7	17-2171	Foreign Band Antenna Coil Assembly
L8	17-2172	Foreign Band R. F. Coil Assembly
L9	17-2178	Foreign Band Oscillator Coil Assembly
L10	68-2049	First I. F. Transformer Assembly
L11	68-2049	Second I. F. Transformer Assembly
L12	68-2050	Third I. F. Transformer Assembly
L13	64-2050	8" Speaker, 1000 Ohm Field, 42 Tube Trans.
L14	80-2022	110-120 V. 60 Cycle Power Transformer

SWITCHES

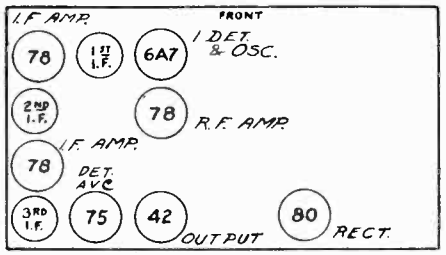
SW1	66-2014	Power Line Off-On Switch
SW2	66-2015	Front Panel of Band Switch
SW3	66-2015	Center Panel of Band Switch
SW4	66-2015	Rear Panel of Band Switch

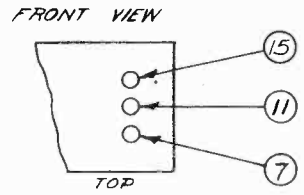
MODEL 7K7
Schematic, Socket
Trimmers

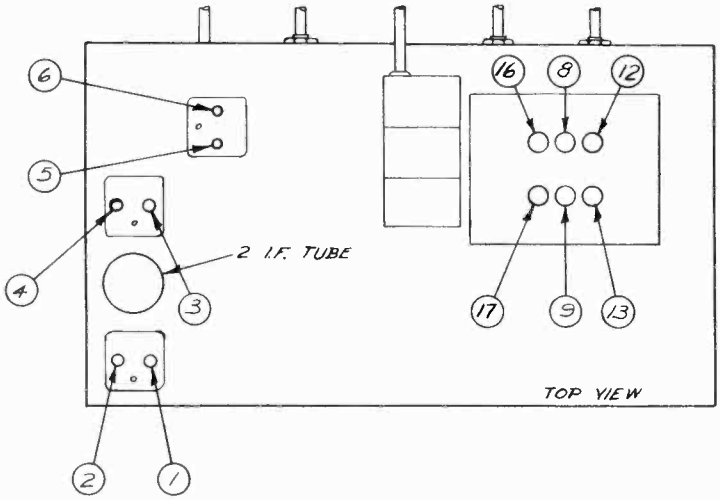
WILCOX-GAY CORP.

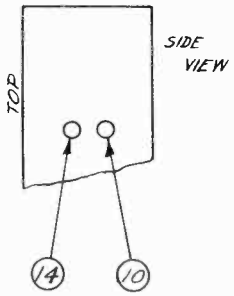


LOCATION OF TUBES









FOR ALIGNMENT AND VOLTAGE DATA SEE INDEX

CODE	PART NO.	RESISTORS
R1	53-1063	500 Ohm Wirewound Resistor
R4	53-923	100,000 Ohm Type M Resistor
R5	53-923	100,000 Ohm Type M Resistor
R6	53-941	90,000 Ohm Type M Resistor
R7	53-941	90,000 Ohm Type M Resistor
R8	53-1062	250 Ohm Wirewound Resistor
R9	53-1063	500 Ohm Wirewound Resistor
R10	53-1063	500 Ohm Wirewound Resistor
R11	53-919	5,000 Ohm Type M Resistor
R12	53-195	25,000 Ohm Type J Resistor
R13	53-926	1 Meg Ohm Type M Resistor
R14	19-9008	500,000 Ohm Volume Control
R15	53-898	50,000 Ohm Type M Resistor
R16	53-925	500,000 Ohm Type M Resistor
R17	53-919	5,000 Ohm Type M Resistor
R18	53-923	100,000 Ohm Type M Resistor
R19	53-924	250,000 Ohm Type M Resistor
R20	53-925	500,000 Ohm Type M Resistor
R21	19-9009	250,000 Ohm Tone Control
R22	53-1063	500 Ohm Wirewound Resistor

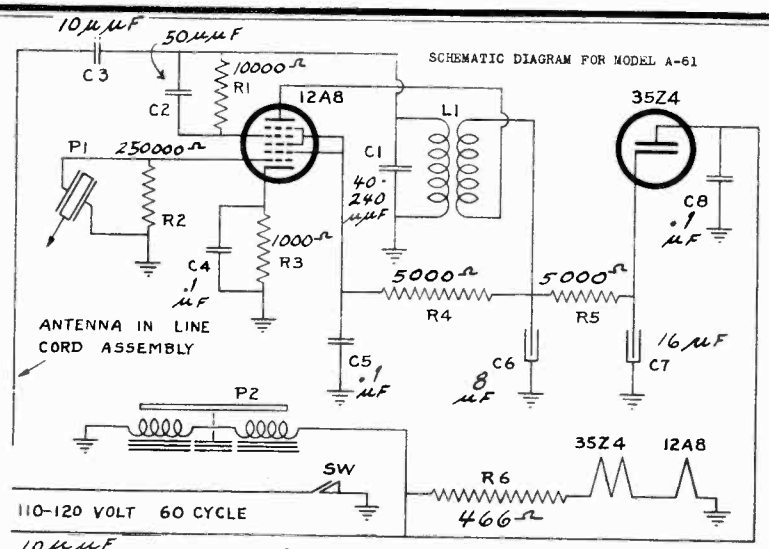
		CONDENSERS
C1, C2, C3	77-9011	3 Gang Tuning Condenser
C4, C5, C6	78-9030	3-50 Mmfd. 3 Gang Trimmer Cond.
C7, C8, C9	78-9030	3-50 Mmfd. 3 Gang Trimmer Cond.
C10, C11, C12	78-9030	3-50 Mmfd. 3 Gang Trimmer Cond.
C13, C14	78-9029	500 and 1500 Mmfd. 2 Gang Trimmer Cond.
C15	75-9003	.01 Mfd. 400 V. Paper Condenser
C16	18-9004	4 Mfd. 450 W. V. Elect. Condenser
C17	76-662	.002 Mfd. Mica Condenser
C18	76-662	.002 Mfd. Mica Condenser
C19	76-662	.002 Mfd. Mica Condenser
C22	75-9005	.1 Mfd. 200 V. Paper Condenser
C23	75-9005	.1 Mfd. 200 V. Paper Condenser
C24	75-9005	.1 Mfd. 200 V. Paper Condenser
C25	75-9005	.1 Mfd. 200 V. Paper Condenser
C26	75-9005	.1 Mfd. 200 V. Paper Condenser
C27	75-9005	.1 Mfd. 200 V. Paper Condenser
C28	75-9005	.1 Mfd. 200 V. Paper Condenser
C29	75-9005	.1 Mfd. 200 V. Paper Condenser
C30	75-9018	.5 Mfd. 400 V. Paper Condenser
C31	75-2003	.01 Mfd. 400 V. Paper Condenser
C32	75-2003	.01 Mfd. 400 V. Paper Condenser
C33	75-2003	.01 Mfd. 400 V. Paper Condenser
C34	75-2007	.1 Mfd. 400 V. Paper Condenser
C35	75-2007	.1 Mfd. 400 V. Paper Condenser
C36	75-2007	.1 Mfd. 400 V. Paper Condenser
C37	76-2002	.00005 Mfd. Mica Condenser
C38	76-2001	.0001 Mfd. Mica Condenser
C39	76-2001	.0001 Mfd. Mica Condenser
C40	76-265	.001 Mfd. Mica Condenser
C41	75-2002	.004 Mfd. 600 V. Paper Condenser
C42	18-998	25 Mfd. 25 V. Elect. Condenser
C43	18-998	25 Mfd. 25 V. Elect. Condenser
C44	18-9005	12 Mfd. 325 W. V. Elect. Condenser
C45	18-721	8 Mfd. 450 W. V. Elect. Condenser

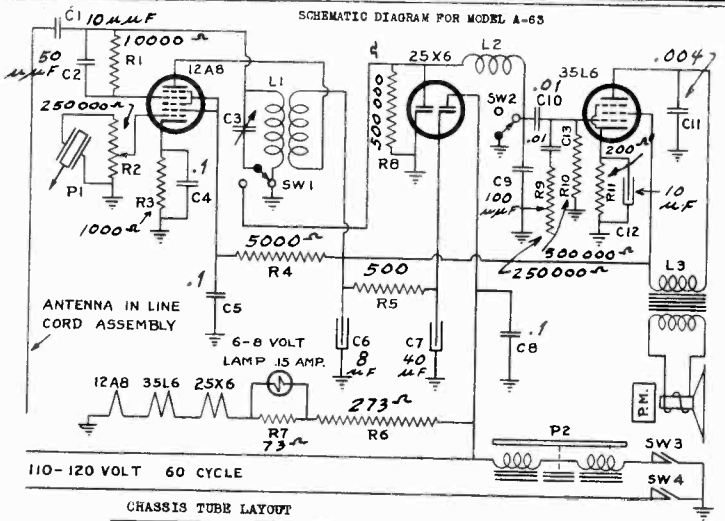
		INDUCTANCES
L1	17-2163	Broadcast Antenna Coil Assembly
L2	17-2166	Broadcast R. F. Coil Assembly
L3	17-2167	Broadcast Oscillator Coil Assembly
L4	17-2168	Police Band Antenna Coil Assembly
L5	17-2169	Police Band R. F. Coil Assembly
L6	17-2170	Police Band Oscillator Coil Assembly
L7	17-2171	Foreign Band Antenna Coil Assembly
L8	17-2172	Foreign Band R. F. Coil Assembly
L9	17-2173	Foreign Band Oscillator Coil Assembly
L10	66-2049	First I. F. Transformer Assembly
L11	66-2049	Second I. F. Transformer Assembly
L12	66-2050	Third I. F. Transformer Assembly
L13	64-2051	12" Speaker, 1000 Ohm Field, 42 Tube Trans.
L14	80-9028	110-120 V. 60 Cycle Power Transformer

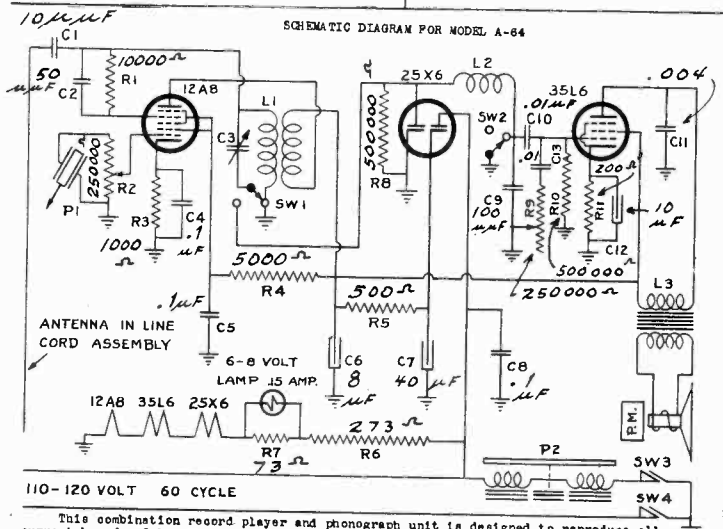
		SWITCHES
SW1	56-2014	Power Line Off-On Switch
SW2	66-2015	Front Panel of Band Switch
SW3	66-2015	Center Panel of Band Switch
SW4	66-2015	Rear Panel of Band Switch

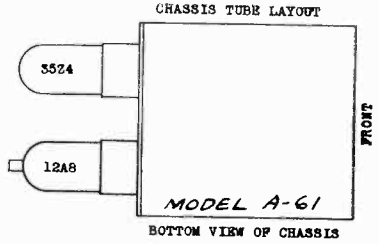
WILCOX-GAY CORP.

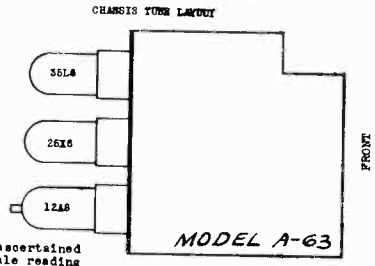
MODEL A61
MODEL A63
MODEL A64











This combination record player and phonograph unit is designed to reproduce all current brands of laterally cut records through any radio receiver, or through the unit itself. (MODEL A-61 IS NOT A COMBINATION UNIT BUT SIMPLY A WIRELESS RECORD PLAYER) *

The unit when used with a radio receiver does not need the connection of any wires, and the clarity and faithfulness of the reproduction will depend on the qualities of the radio receiver. With the use of the "Remote Phono" switch it can also be used as a phonograph, thus enabling one to enjoy this fine unit when radio receiver reproduction is not desired or available.

On the front of the record player toward the right hand side, will be noted three knobs. The knob farthest to the right is the "Master" switch and volume control. Turned to the right a slight click will be heard, and the pilot light will be seen to have become lighted under the tone arm. The remainder of the right hand turn of the control will be for volume control purposes. Rotated to the right, it increases volume; and rotated to the left, the volume is decreased. It should initially be set to the maximum right hand position so that the maximum volume from the record player is obtainable. The control farthest to the left is the "Motor" switch and tone control and operates the table. This knob should be turned to the right when it is desired that the table revolve, and turned to the left when it is desired to stop the table to change records. The center knob is the "Remote-Phono" switch. This switch when turned to "Remote" adjusts the unit for reproduction through a radio receiver, and when turned to "Phono", the adjustment is such that the unit itself will reproduce the record being played.

The radio receiver should now be turned on, and first, it should be ascertained whether or not there is a vacant space at 540 kilocycles, if not, the scale reading of the radio receiver should be varied across the dial from 540 to 750 kilocycles, and a place selected that is free from a radio station. The volume and tone controls should be adjusted as usual.

To place the unit in operation, the master switch and volume control should be turned to its maximum right hand position, a record should then be placed on the table, and the motor switch and tone control turned on so that the table will rotate. The "Remote-Phono" switch should then be turned to "Remote" position.

A new needle should be placed in the pickup arm and the arm set gently on the outside of the record.

To the left of the motor control knobs is a small metal cap. This should be pried up with the screw driver furnished for adjustment, the screw driver inserted into the screw immediately below the hole thus opened. This adjustment should be revolved first in a left hand direction until the record is heard to play from the radio receiver, then it should be varied back and forth across this point until the record player is tuned exactly to the radio receiver. The metal cap can then snapped into the adjustment hole. At any subsequent time the record player may be tuned in at this dial position on the receiver.

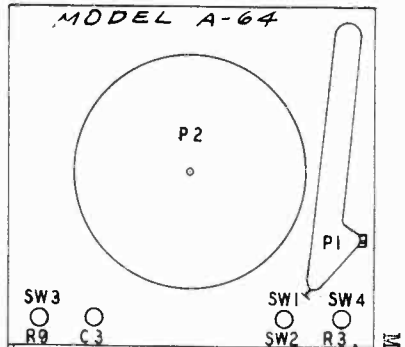
The volume control should be operated mainly on the receiver, however if it is more convenient to bring about this control at the record player, the right hand control may be used, otherwise it should always be left in its maximum position.

When it is desired to operate the record player when radio interference is extremely high, it may be necessary to connect a wire from the wire seen to protrude from the plug of the record player, to the antenna of the radio receiver. Do not make a metallic connection at this point, but simply wrap the wire around the antenna wire to the receiver three or four turns. This will provide sufficient signal intensity to conquer any static condition, and will in no way interfere with the normal operation of the radio receiver.

In case it is difficult to find a cleared channel, or if noise is present, the player may be moved closer to the radio set or its antenna to overcome these conditions.

Change needles regularly for best results.

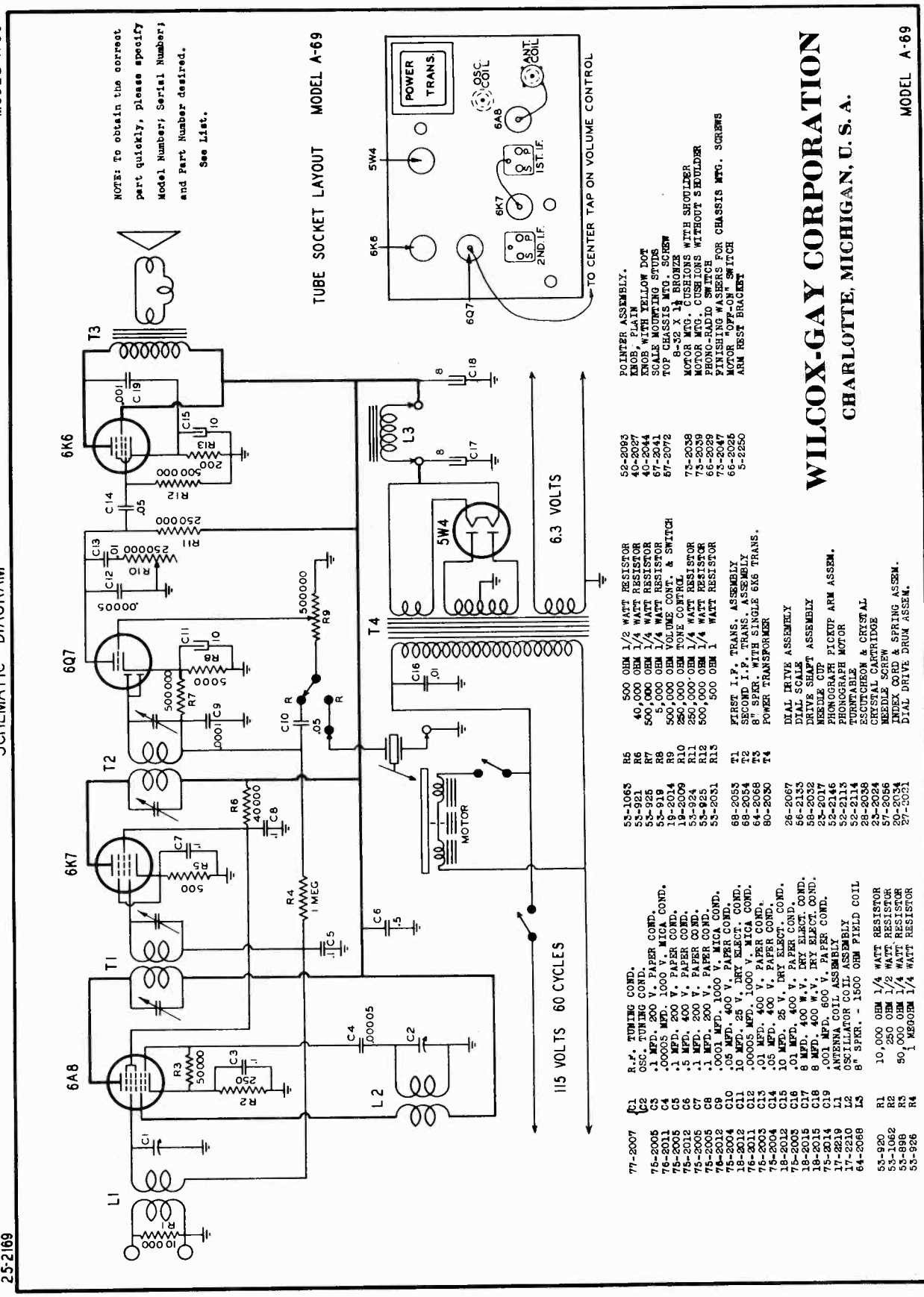
Be sure to tune your set accurately to the record player and don't overlook the necessity of having a cleared channel for operation.



*NOTES SIMILAR FOR MODEL A-61

MODEL A69
Schematic, Socket
Trimmers

WILCOX-GAY CORP.



77-2007	C1	R.F. TUNING COND.	53-1063	R5	500 OHM 1/2 WATT RESISTOR	52-2093
	C2	OSC. TUNING COND.	53-921	R6	40,000 OHM 1/4 WATT RESISTOR	40-2027
75-2005	C3	.1 MFD. 200 V. PAPER COND.	53-925	R7	500,000 OHM 1/4 WATT RESISTOR	40-2044
76-2011	C4	.00005 MFD. 1000 V. MICA COND.	53-919	R8	5,000 OHM 1/4 WATT RESISTOR	67-2041
75-2005	C5	.1 MFD. 200 V. PAPER COND.	19-2014	R9	500,000 OHM VOLUME CONT. & SWITCH	67-2072
75-2012	C6	.5 MFD. 400 V. PAPER COND.	19-2009	R10	250,000 OHM TONE CONTROL	
75-2005	C7	.1 MFD. 200 V. PAPER COND.	53-924	R11	250,000 OHM 1/4 WATT RESISTOR	73-2038
75-2005	C8	.1 MFD. 200 V. PAPER COND.	53-925	R12	500,000 OHM 1/4 WATT RESISTOR	73-2039
76-2012	C9	.0001 MFD. 1000 V. MICA COND.	53-2031	R13	500 OHM 1 WATT RESISTOR	66-2029
75-2004	C10	.05 MFD. 400 V. PAPER COND.				73-2047
18-2012	C11	10 MFD. 25 V. DRY ELECT. COND.	68-2053	T1	FIRST I.F. TRANS. ASSEMBLY	66-2026
76-2011	C12	.00005 MFD. 1000 V. MICA COND.	68-2054	T2	SECOND I.F. TRANS. ASSEMBLY	5-2250
75-2003	C13	.01 MFD. 400 V. PAPER COND.	64-2068	T3	8" SPKR. WITH SINGLE 6K6 TRANS.	
75-2004	C14	.05 MFD. 400 V. PAPER COND.	80-2050	T4	POWER TRANSFORMER	
18-2012	C15	10 MFD. 25 V. DRY ELECT. COND.				
75-2003	C16	.01 MFD. 400 V. PAPER COND.	26-2067		DIAL DRIVE ASSEMBLY	
18-2015	C17	8 MFD. 400 W.V. DRY ELECT. COND.	56-2133		DIAL SCALE	
18-2015	C18	8 MFD. 400 W.V. DRY ELECT. COND.	58-2032		DRIVE SHAFT ASSEMBLY	
75-2014	C19	.001 MFD. 600 V. PAPER COND.	25-2017		NEEDLE CUP	
17-2219	L1	ANTENNA COIL ASSEMBLY	52-2146		PHONOGRAPH PICKUP ARM ASSEM.	
17-2210	L2	OSCILLATOR COIL ASSEMBLY	52-2113		PHONOGRAPH MOTOR	
64-2068	L5	8" SPKR. - 1500 OHM FIELD COIL	52-2114		TURNTABLE	
			28-2038		ESCUTCHEON & CRYSTAL	
53-920	R1	10,000 OHM 1/4 WATT RESISTOR	25-2024		CRYSTAL CARTRIDGE	
53-1062	R2	250 OHM 1/2 WATT RESISTOR	57-2056		NEEDLE SCREW	
53-898	R3	50,000 OHM 1/4 WATT RESISTOR	20-2034		INDEX CORD & SPRING ASSEM.	
53-926	R4	1 MEGOHM 1/4 WATT RESISTOR	27-2021		DIAL DRIVE DRUM ASSEM.	

	POINTER ASSEMBLY.
	KNOB, PLAIN
	KNOB WITH YELLOW DOT
	SCALE MOUNTING STUDS
	TOP CHASSIS MTG. SCREW 8-32 X 1/4 BRONZE
73-2038	MOTOR MTG. CUSHIONS WITH SHOULDER
73-2039	MOTOR MTG. CUSHIONS WITHOUT SHOULDER
66-2029	PHONO-RADIO SWITCH
73-2047	FINISHING WASHERS FOR CHASSIS MTG. SCREWS
66-2026	MOTOR "OFF-ON" SWITCH
5-2250	ARM REST BRACKET

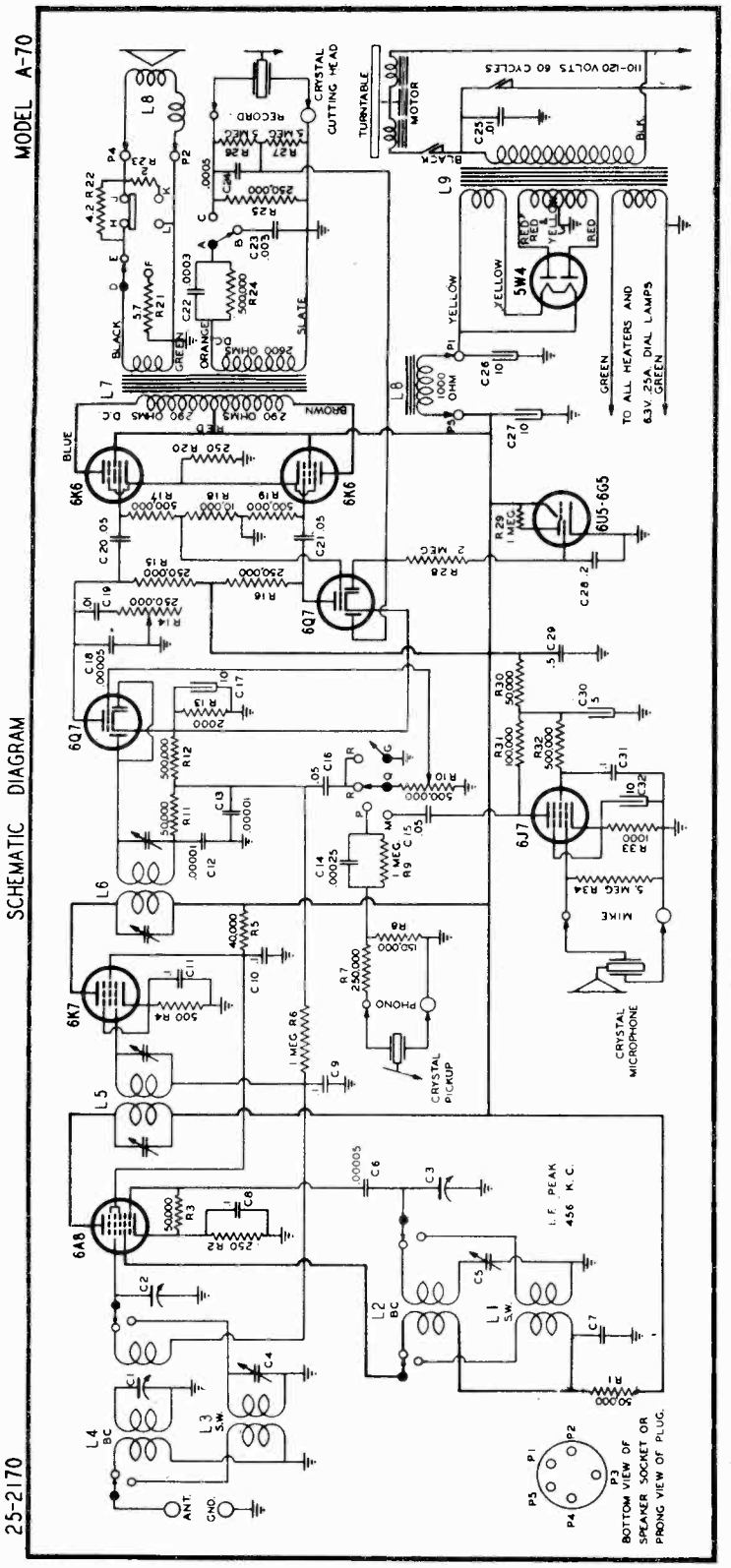
WILCOX-GAY CORPORATION
CHARLOTTE, MICHIGAN, U. S. A.

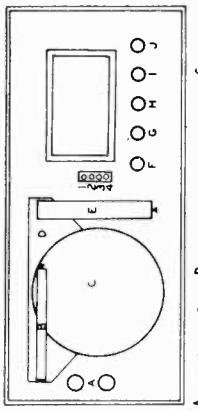
MODEL A-69

WILCOX-GAY CORP.

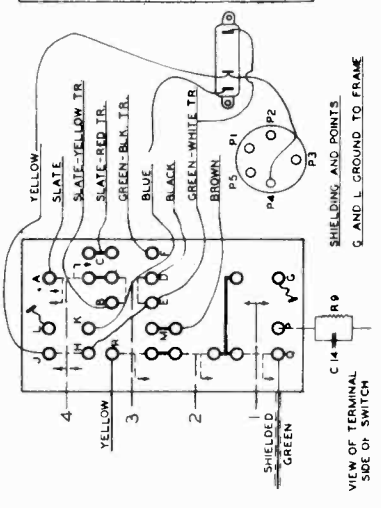
MODELS A70, A81, A82
Chassis 9J9
Schematic, Switch Data

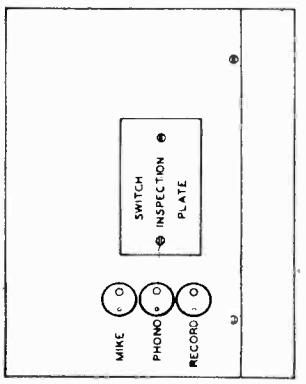
CHASSIS MODEL 9J9





1	OPENS Q-R, CLOSES Q-P, R-G
2	OPENS Q-R, CLOSES Q-M
3	OPENS Q-R, D-E, A-B CLOSES Q-M, D-F, A-C
4 FIRST POS.	OPENS A-B, CLOSES A-C REMAINS CLOSED H-J
4 SECOND POS.	OPENS H-J, CLOSES K-L REMAINS CLOSED A-C
TO USE RADIO ONLY-ALL PLUNGERS UP	
CIRCUITS CLOSED	Q-R, D-E, A-B, H-J
CIRCUITS OPEN	Q-P, D-F, A-C, K-L, Q-M, G-R





DATE DEC. 12, '39

VOLTAGE CHART

MODEL A-70 RECORDIO - Line Voltage 115 V. - P1 to Gnd. 360 V. - P5 to Gnd. 260 V. P1 to P5 (spkr. field) 100 V. - Aerial disconnected. All voltages measured against chassis ground except as noted.

TUBE	POSITION	PLATE	SCREEN	CATHODE
6A8	1st Det.	260	80	2.8
	Osc.	260		
6K7	I.F.	260	80	3.8
6Q7	2nd Det.	100*		1.8

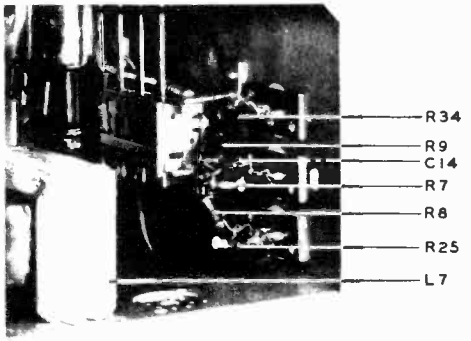
TUBE	POSITION	PLATE	SCREEN	CATHODE
6Q7	Inverter	100*		1.8
6J7	Mike Amp.	35 to 60*	35*	1.3
6K6	Output	250	260	17.5

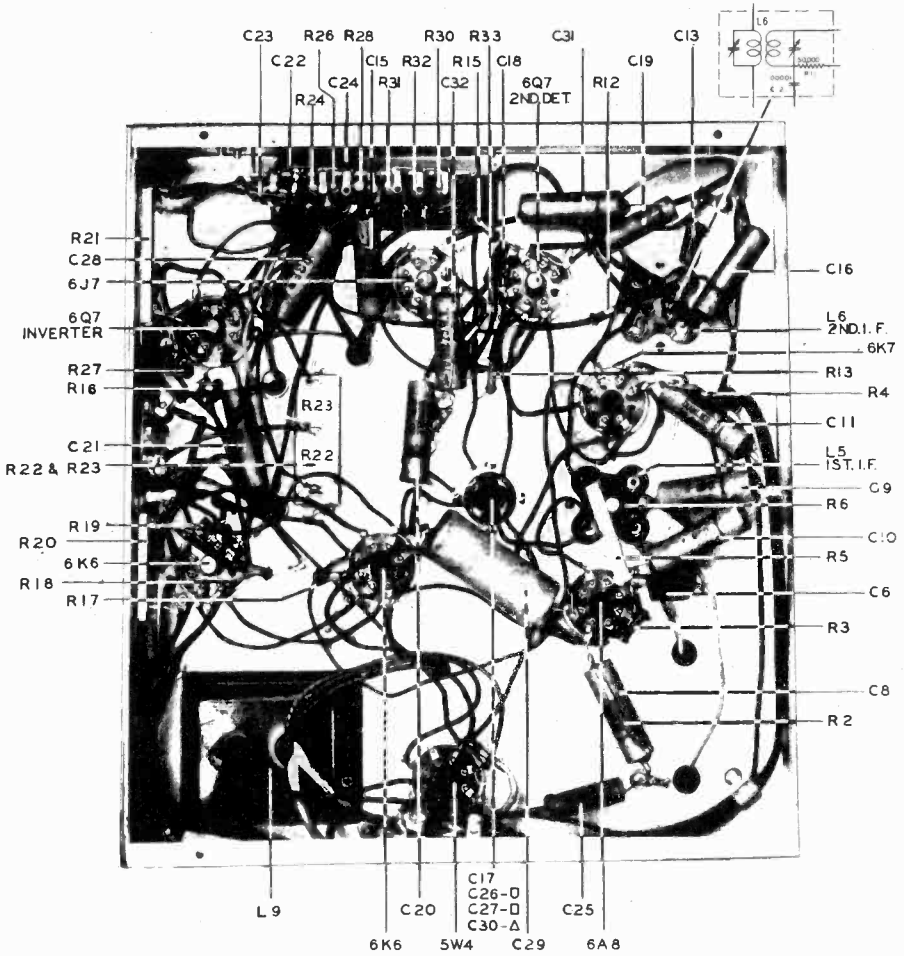
* Not actual voltages due to large values of resistance in circuit between supply voltage and point of measurement. These voltages may vary considerably, depending upon the resistance of voltmeter used.

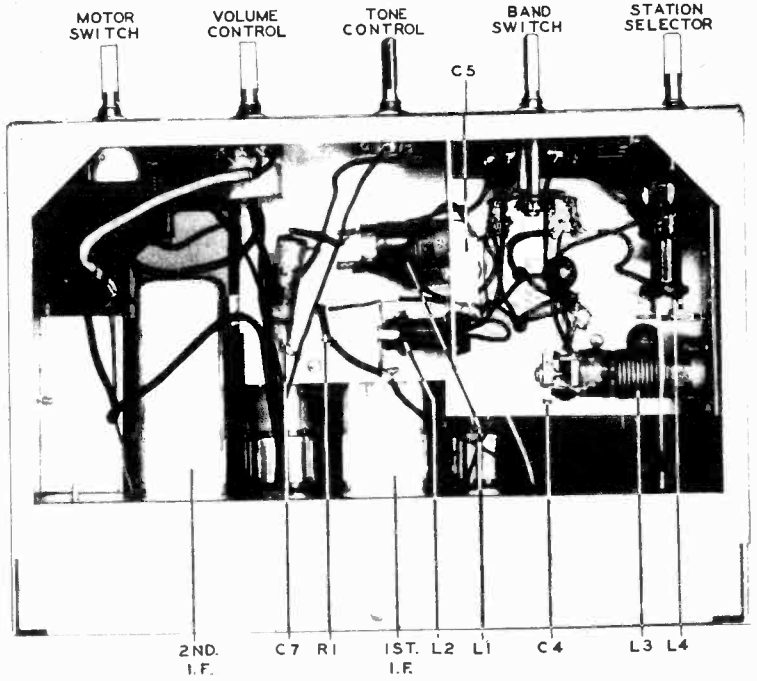
MODEL No.A70-A81-A82
DATE 1-17-40

CHASSIS 9J9

PARTS LAYOUT -







FOLLOWER ARM AND LATERAL FEED SCREW ADJUSTMENT

The follower arm assembly shown in FIGURE 7, consists of a steel channel, at one end of which is attached the pivot post, and at the other end a flat phosphor bronze spring, with a portion of the spring bent at a right angle to form the knife-edge tongue which engages the lateral feed screw.

The worm of the turn-table spindle engages the pinion at the end of the lateral feed screw within the gear housing, and as the feed screw revolves, the knife-edge tongue follows the spiral grooves of the feed screw, causing the follower arm to be moved laterally toward the center of the assembly.

The recording arm assembly is mounted at the upper end of the follower arm pivot post, so that as the follower arm moves in a horizontal plane beneath the recorder assembly mounting plate, the recording arm is caused to move laterally above the mounting plate, in the same direction and at the same rate of travel.

The lateral movement of the recording arm, as related to the rotation of the turn-table is such that 109 grooves per inch are cut into the record surface.

ADJUSTMENT OF PIVOT POST HEIGHT

The recording arm assembly is mounted on the upper end of the pivot post, and held in correct position by means of the two hex-head set screws as illustrated in FIGURE 8.

The end of the pivot post should be flush with the bushing on the top side of the arm platform (FIGURES 4,7, and 8) and when the recording arm is lowered to its horizontal position, a small gap should exist between the pivot post bushings X and Y, FIGURE 4. A few drops of light lubricating oil applied to the pivot post between the bushings will provide smooth movement in the raising and lowering of the recording arm.

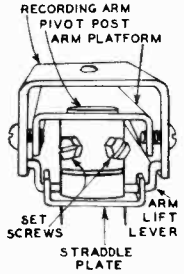


FIG. 8

FOLLOWER ARM HORIZONTAL ADJUSTMENT

Before tightening the hex-head set screws, note that the recording arm is in correct position with respect to the follower arm, so that as the follower arm touches the follower arm stop, the cutting stylus will rest on the outside black line near the center of the record. This will provide a maximum playing time of approximately 2-1/5 minutes for the 6½ inch disc, 3-1/2 minutes for the 8 inch, and 5 minutes for the 10 inch disc.

NOTE: Removal of the straddle plate will allow for greater ease in making the above adjustments.

In the event any adjustment is made which necessitates resetting the hex-head set screws, it is recommended that a check is made as to the height of the recording arm above the record surface and an adjustment of the arm height made if necessary,

FOLLOWER ARM VERTICAL ADJUSTMENT

With the recording arm lowered to a position so that the bottom of the nose of the arm is 2 inches above the turn-table, the tongue of the phosphor bronze spring should just clear the lateral feed screw.

The adjustment for this height may be accomplished by slightly bending up or down, as required, the flat part of the follower arm near the riveted end of the phosphor bronze spring.

PHOSPHOR BRONZE SPRING ADJUSTMENT

As the recording arm is lowered to recording position, it will be noted that the follower arm is also lowered, causing the phosphor bronze spring tongue to become firmly seated in the bottom of the spiral groove of the lateral feed screw.

The pressure of the phosphor bronze spring, bearing against the lateral feed screw should be sufficiently great so that the knife-edge tongue will not have a tendency to climb out of the grooves in the feed screw, which would result in unevenly spaced grooves cut into the record surface. In extreme cases of insufficient spring pressure bearing against the lateral feed screw, the cutting stylus may have a tendency to cut through into the adjacent previously cut groove.

The pressure should not be so great, however (caused by the follower arm being bent downward too far) that the phosphor bronze spring will be lifted away from the end of the adjusting screw, as the arm is lowered.

It can be seen from the preceeding paragraphs covering the follower arm vertical adjustment and the phosphor bronze spring adjustment, that these two adjustments are somewhat interlocking that is - one adjustment slightly affects the other. An adjustment of the phosphor bronze spring screw, so that the phosphor bronze spring assumes the shape and position shown in FIGURE 7, is usually satisfactory, provided the vertical adjustment has been correctly made.

LATERAL FEED SCREW ADJUSTMENT

An adjustment is provided on the worm and gear housing, to take up the end play of the lateral feed screw. To make this adjustment, loosen the large hexagonal lock nut and turn the slotted screw slowly to the right until all end play of the feed screw is eliminated. Then back off the adjustment slightly and tighten the lock nut. A very slight amount of end play in the feed screw should be noticeable after the lock nut has been tightened.

ADJUSTMENT OF CUTTING ARM AND HEAD

When the RECORDIO leaves the factory, all adjustments have been correctly made. To assure this condition, a final check, by observing the over-all performance of the instrument in the making of recordings, is given each RECORDIO before being released for shipment.

It is realized, however, that during shipment, or due to improper handling after installation has been made, adjustments may become altered so that the instrument will not function properly without correction.

These bulletins have been prepared to serve as an aid to the service man in placing the equipment in proper operating condition, when necessary. Also instructive information is included, which may be passed on to other users of RECORDIO, to promote a better understanding of its operation and care.

DEPTH OF CUT

The depth of cut may be observed by holding the record in such a position that a light is reflected from the grooves. If the depth of cut is correct, the grooves will appear to be about as wide as the spaces between them.

The correct depth of cut will produce a thread cut from the record surface that is firm, altho' neither coarse and stiff, nor light and "fluffy".

Provided a new cutting stylus, or one known to be in perfect condition, is being used, the correct depth of cut may be gauged by permitting the cuttings to remain upon the record until completed, then rolling the cuttings in to a hard ball. The size of the ball thus obtained should be approximately, 3/8 inch in diameter, for the 6$\frac{1}{2}$ inch record.

EFFECT OF DULL CUTTING STYLUS

With proper care, the cutting stylus will cut dozens of records satisfactorily, before being dulled so that replacement is necessary.

Many times it may be apparent from casual observation, that because an incorrect cut is being made, an adjustment is in order to bring about correct depth of cut, -whereas the trouble may be due to the cutting stylus having become dulled, either accidentally, or through natural wear.

It is well to FIRST TRY A NEW CUTTING STYLUS before making any adjustments, to preclude the necessity for a complete readjustment. Adjustments made with a dulled cutting stylus being used, will have very little effect upon the depth of cut.

The point and cutting edges of the stylus are razor sharp, and it is obvious that if the cutting stylus should bump or scrape against the turn-table or other metal object, it would be dulled and rendered useless.

During periods of inoperation, the recording arm should always be returned to its normal horizontal position to the right of the turn-table.

THE CUTTING STYLUS SHOULD NEVER BE PERMITTED TO REST ON THE TURN-TABLE Its point is infinitesimally small, and compared to its normal pressure of approximately 1$\frac{3}{4}$ ounces against the record surface (equivalent to several hundred pounds per square inch) it can readily be realized that if this stylus pressure were exerted against a metal surface, its razor sharp point would be crushed or flattened. A magnifying glass is usually required to observe the damaged condition of the stylus point.

A study of FIGURE 1 will serve to stress the importance of careful adjustment of the depth of cut, and the necessity for using a sharp cutting stylus.

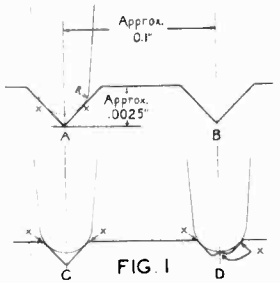


FIG. 1

Line R represents radius of ball-point play-back needle.

A and B - perfectly cut grooves.

C- shallow groove due to improper adjustment

D- shallow imperfect groove due to dulled cutting stylus.

Note width of space between grooves as compared to width of grooves.

Note points of contact X between play back needle point and groove surface.

DEPTH OF CUT ADJUSTMENT

The depth of cut is regulated by an adjustment of the flat head screw on the top of the recording arm, FIGURE 2.

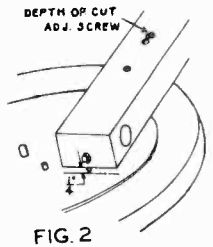


FIG. 2

Turning the screw to the right (clockwise) increases the depth of cut.

Turning the screw to the left (counter-clockwise) decreases the depth of cut.

An examination of the recording arm assembly will show the function of the coil spring attached to the cutting head is to oppose the weight or pressure of the cutting stylus against the record surface, so as to allow cutting a groove of definite depth. For example, it will be seen that turning the screw to the right changes the angle on which the spring acts, so that the groove depth is increased. Turning the screw to the left changes the angle on which the spring acts, so that the groove depth is decreased. It will be seen that the actual spring tension remains very nearly the same and the angle of the axis on which it operates is changed to bring about the possibility of adjusting the depth of cut. (CONTINUED)

In some of the early RECORDIO models the adjusting screw was threaded throughout its full length, altho' only the lower portion of the screw over a span of approximately 3/8 inch contributes to the useful range of adjustment. If the adjusting screw is turned in a clockwise direction so as to raise the spring holding lug to the upper threaded portion of the screw, the adjustment will have passed through a "dead-center" position, which will cause a bobbing up-and-down movement of the cutting head.

If it is found that when using a new cutting stylus, the depth of cut is too shallow, and the adjusting screw has been turned to the full clockwise position in the later models, or to the upper limit of the useful range in the older models, this is an indication that the balance spring is too strong. Its tension may be decreased by spreading the coils of the spring with a pair of diagonal cutting pliers.

CAUTION: Care should be used in removing and replacing the cutting head, when occasion arises, so that the balance spring is not stretched to a length that will prevent its returning to normal length and tension.

When the cutting head is in proper adjustment, and the recording arm is raised to a position approximately 25 to 30 degrees from the vertical plane, the cutting head should float freely in its mounting, with equal up and down movement. The balance spring holding lug should be in a position on the adjusting screw approximately 1/4 inch from the shelf which holds the riveted end of the screw. (FIG.7)

Observe that the leads connecting to the cutting head are shaped to form an "S", FIGURE 3, and that these wires are kept in the clear - not touching the balance spring. Also, the wire leads should not be permitted to droop (arm horizontal) so that they will rub on the turn-table. Also observe that the holding tongues of the finger grips on the nose of the recording arm, are bent back sufficiently so as not to interfere with free movement of the cutting head.

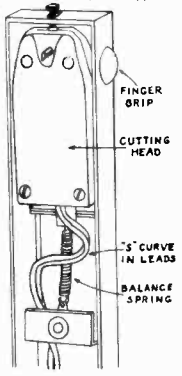


FIG. 3

HEIGHT OF RECORDING ARM ADJUSTMENT

The components of the recording arm assembly are positioned so that the cutting head is parallel, and the stylus is perpendicular to the record surface (FIGURE 7), which condition obtains ONLY with the nose of the recording arm adjusted to the correct height of 1/4 inch above the record surface.

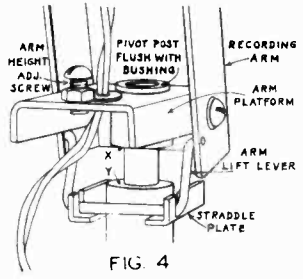


FIG. 4

An adjustable stop (arm height adjusting screw, FIGURES 4 & 7) is mounted on the arm platform to provide a means for adjusting the height of the recording arm. With a blank record on the turn-table and a Wilcox-Gay cutting stylus inserted in the cutting head, the arm height adjustment should be made so that the bottom of the recording arm is 1/4 inch from the record surface as shown in FIGS. 2&7.

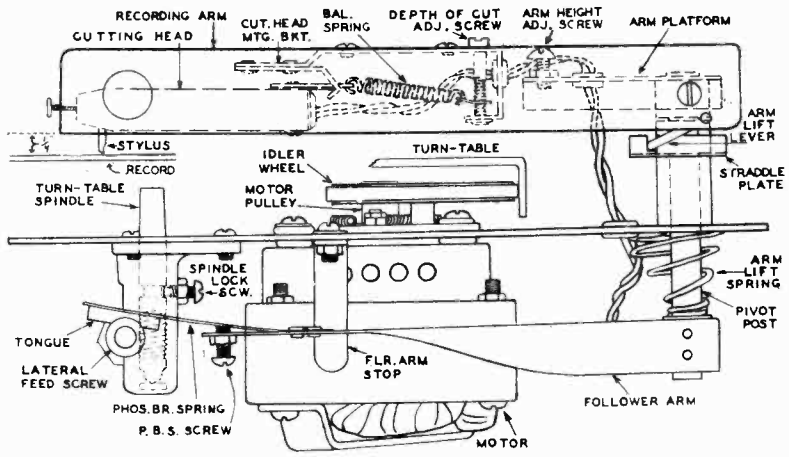


FIG. 7

The connecting wires from the cutting head should not be allowed to double up between the arm and arm platform, but should feed freely through the hole in the platform as the arm is lowered. Otherwise, the wires doubled up may prevent the arm from coming to rest on the head of the height adjusting screw.

There is little likelihood that the arm height adjusting screw will get out of adjustment due to the lock nut becoming loosened. However, there is the possibility that the recording arm may be roughly handled by the operator. If the arm were to be forced backwards after having been raised to its vertical position,- or if, while being lowered to its horizontal position to the right of the turn-table, the arm were dropped or forced downward, the plate on which all of the recording mechanism is mounted, may be bent or sprung slightly. This would destroy the 1/4 inch height adjustment, and readjustment of the arm height adjusting screw would be necessary to bring the nose of the recording arm to exactly 1/4 inch above the record surface.

Also, the straddle plate (FIGURES 4 and 7) may be bent down, which would effect the arm height adjustment. In this event, the straddle plate should be removed and straightened. This is most easily accomplished with the recording arm in the lowered position. Grasp the heel of the arm with the left hand and raise the arm horizontally, at the same time removing the arm lift lever from the slots in the straddle plate. The straddle plate may now be removed by sliding it towards the rear.

The importance of the arm height adjustment may be judged by a study of FIGURE 7. Note that the balance spring serves to hold the knife-edge

(CONTINUED)

MODELS A70, A81 and A82 NOTES CONTINUED

pivot of the cutting head mounting, fully seated in the "V" shape trunnion bearing of the cutting head mounting bracket. Also, that the "pull of the spring is slightly downward, as well as horizontal.

The initial tension and length of the balance spring must be such that when adjusted to the proper tension to produce the correct depth of cut, the spring holding lug will be positioned on the adjusting screw as shown, to create a slight downward "pull" on the cutting head mounting.

As the stylus end of the cutting head is raised and lowered slightly, when cutting records which are not perfectly flat, the cutting stylus varies from its perpendicular plane, and the angle of the cutting edges of the stylus also vary. This tends to produce a varying depth of cut which would place a varying load on the motor, resulting in a variation in the average pitch or tone of the recorded music or speech. This effect is commonly called "wow". However the spring tension, and consequently the stylus pressure, also varies. This variation in stylus pressure opposes the effect of the varying stylus position, resulting in a substantially uniform depth of cut.

It can be seen that if the balance spring were adjusted to a horizontal position with respect to the plane of the cutting head - -

(a) - the downward "pull" of the spring would be lost, resulting in a pronounced variation in the depth of cut when cutting a record having a slightly warped surface.

(b) - the cutting stylus would have a tendency to chatter or dig into the record, due to the "dead-center" position of the spring.

It can also be seen that if the arm were adjusted to an incorrect height above the record surface, the cutting stylus would not be perpendicular, and the tendency towards a greater variation in the depth of cut, which would be more pronounced, would not be fully compensated by the counteracting effect of the varying tension of the balance spring.

MODEL No. A-70
DATE DEC. 12, '39

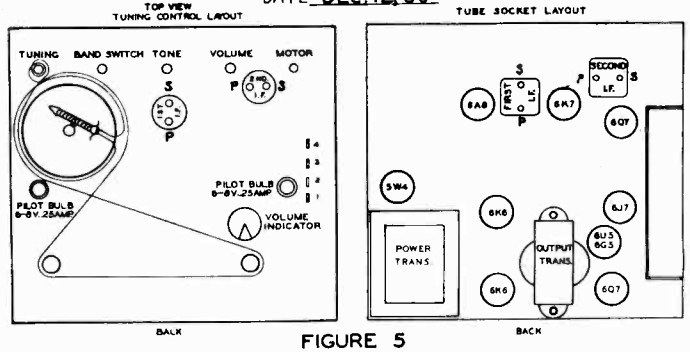


FIGURE 5

MODEL A70

Chassis Model 9J9

An OUTPUT METER or other indicating device should be used for accuracy in making ganging adjustments.

If an output meter is not available, the magic eye (6U5) may be used as an output indicator as follows:

(a) Depress push-button No. 4 "To Record Radio".

(b) Disconnect cutting-head from chassis.

(c) Adjust volume control to near maximum.

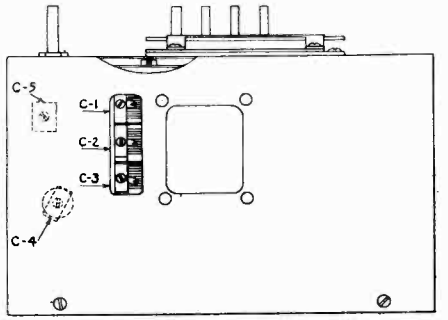


FIG. 6

Connect signal generator to control grid of 6A8 tube. Make connection to side of middle section, (C2) of condenser gang. (FIG. 6)

SIGNAL GENERATOR FREQUENCY	DIAL POSITION	WAVE BAND SWITCH POSITION	TRIMMER NUMBER	FIGURE NUMBER
456 K.C.	1500 K.C.	Broadcast	2nd. I.F.-S*	5
" "	" "	"	" " -P	5
" "	" "	"	1st. I.F.-S	5
" "	" "	"	" " -P	5

Connect signal generator to ANT. and GND. terminals.

Turn condenser gang to full maximum capacity and check position of dial pointer with reference line on the scale, just to the right of 550 K.C. calibration.

600 K.C.	600 K.C.	Broadcast	L.F. Pad. (C-5)	6
1400 K.C.	1400 K.C.	"	Osc. (C-3)	6
1400 K.C.	1400 K.C.	"	Det. (C-2)	6
1400 K.C.	1400 K.C.	"	Pre-Sel. (C-1)	6
Not used. **	15-16 M.C.	Short Wave	Pre-Sel. (C-4)	6

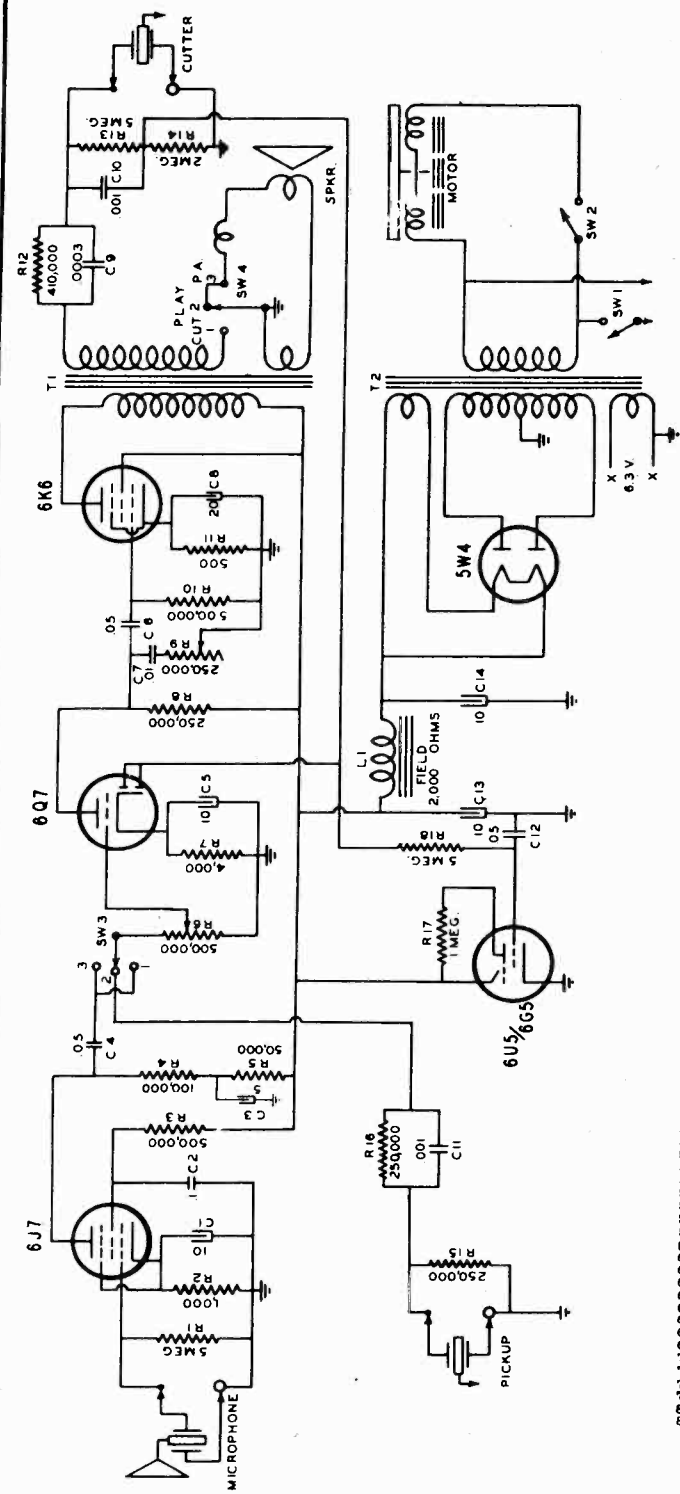
*If the trimming condenser on the secondary of the second I.F. transformer is adjusted throughout its full range, two "peaks" will be observed. The correct peak is the one of lowest capacity in the adjustment of the trimmer. The I.F. trimming condensers when properly adjusted will rest at approximately one and one half turns from the fully closed position.

**Connect antenna to receiver, and adjust dial so that no station is received. Advance volume control until a fair volume of noise is received. Adjust trimmer for greatest noise.

WILCOX-GAY CORP.

MODEL A72 Recordio
Chassis 9Q5
Schematic

CHASSIS 9Q5 — SCHEMATIC DIAGRAM — MODEL A-72

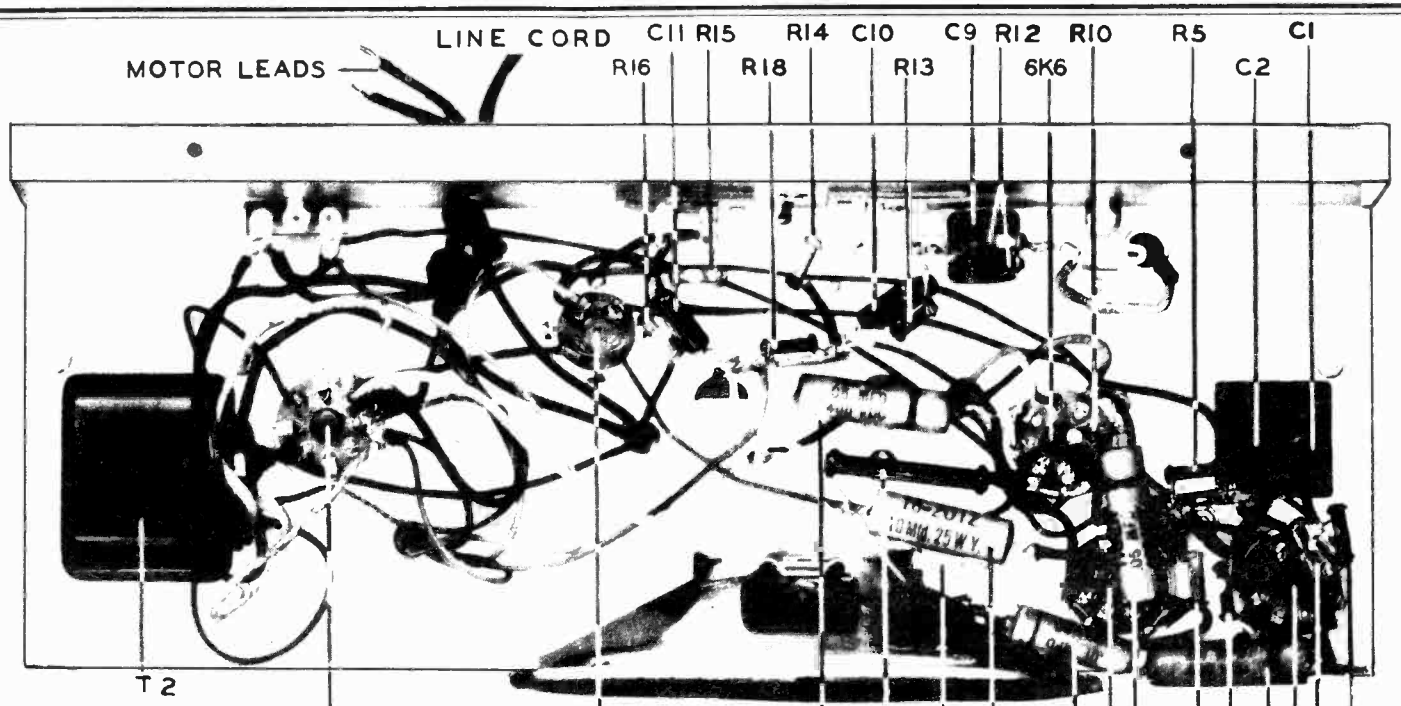


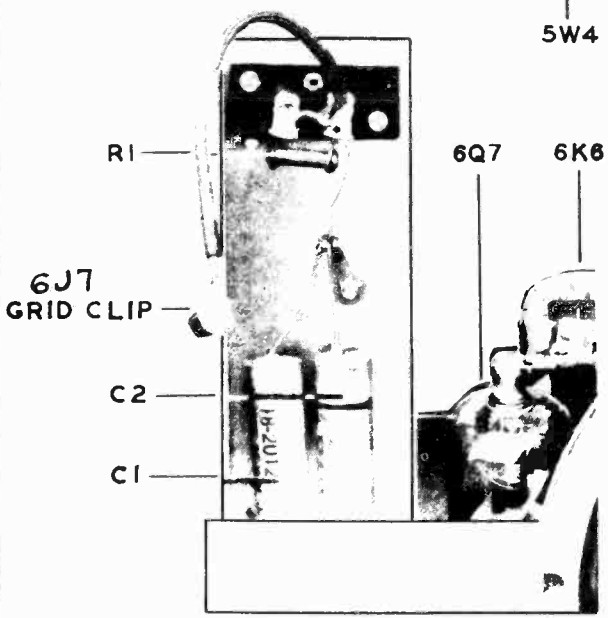
PART NO.	CODE	NAME
18-2012	C1	10 MFD. 25 W.V. ELECT. COND.
75-2005	C2	.1 MFD. 200 VOLT PAPER COND.
18-2017	C3	5 MFD. 350 W.V. ELECT. COND.
75-2004	C4	.05 MFD. 400 W.V. PAPER COND.
18-2012	C5	10 MFD. 25 W.V. ELECT. COND.
75-2004	C6	.05 MFD. 400 W.V. PAPER COND.
75-2003	C7	.01 MFD. 400 W.V. PAPER COND.
18-2017	C8	20 MFD. 25 W.V. ELECT. COND.
76-2017	C9	.0003 MFD. 3000 VOLT MICA COND.
76-2015	C10	.001 MFD. 1000 VOLT MICA COND.
76-2015	C11	.001 MFD. 1000 VOLT MICA COND.
75-2004	C12	.05 MFD. 400 W.V. PAPER COND.
18-2017	C13	10 MFD. 450 W.V. ELECT. COND.
18-2017	C14	10 MFD. 450 W.V. ELECT. COND.
64-2069	L1	6½" SPEAKER WITH 2000 OHM FIELD
53-2020	R1	5 MEGOHM 1/4 WATT RESISTOR
53-2023	R2	1,000 OHM 1/4 WATT RESISTOR
53-985	R3	500,000 OHM 1/4 WATT RESISTOR
53-923	R4	100,000 OHM 1/4 WATT RESISTOR
53-898	R5	50,000 OHM 1/4 WATT RESISTOR
19-2014	R6	500,000 OHM VOL. CONTROL & SWITCH
53-1149	R7	4,000 OHM 1/4 WATT RESISTOR
53-924	R8	250,000 OHM 1/4 WATT RESISTOR
19-2009	R9	250,000 OHM TONE CONTROL
53-925	R10	500,000 OHM 1/4 WATT RESISTOR
53-2031	R11	500 OHM 1 WATT RESISTOR
53-926	R12	410,000 OHM 1 MEGOHM } IN PARALLEL
53-1235		700,000 Ohm }
53-2020	R13	5 MEGOHM 1/4 WATT RESISTOR
53-2024	R14	2 MEGOHM 1/4 WATT RESISTOR
53-924	R15	250,000 OHM 1/4 WATT RESISTOR
53-924	R16	250,000 OHM 1/4 WATT RESISTOR
53-926	R17	1 MEGOHM 1/4 WATT RESISTOR
53-2020	R18	5 MEGOHM 1/4 WATT RESISTOR
19-2014	SW1	MASTER SWITCH ON VOLUME CONTROL
66-2023	SW2	MOTOR OFF-ON SWITCH
66-2028	SW3 } SW4 }	P.A. - CUT - PLAY SWITCH
81-2008	T1	OUTPUT TRANSFORMER
80-2030	T2	POWER TRANSFORMER
2-2007		FOLLOWER ARM ASSEMBLY
2-2008		RECORDER ARM ASSEMBLY
2-2009		PICKUP ARM ASSEMBLY
2-2010		IDLER ARM
5-2321		CUTTING HEAD MTG. BRACKET ASSEM.
7-2037		SNAP BUTTON (NICKLE PLATED)
9-2012		SHIELDED MICROPHONE CABLE ASSEM.
16-2005		IDLER WHEEL STUD CLIP
20-2026		LINE CORD
20-2027		MOTOR CORD
23-2022		NEEDLE CUP & COVER
23-2023		CRYSTAL CUTTING HEAD
23-2024		M52 CRYSTAL CARTRIDGE
23-2029		CUTTING HEAD CUSHIONS
27-2024		2 7/8 DIA. DISC
40-2045		SELECTOR SWITCH KNOB
40-2046		VOLUME CONTROL KNOB
40-2047		MOTOR SWITCH KNOB
40-2049		TONE CONTROL KNOB
46-2002		ARM LIFT LEVER
47-2002		MICROPHONE
47-2003		MICROPHONE STAND
47-2005		MICROPHONE HANDLE
47-2006		RECORDER MOTOR 110 V. 60 CYCLE AC
48-409		8-32 X 5/16 HEX NUTS
48-1393		WING NUT (10/32)
48-2009		PICKUP ARM MTG. NUT
48-2010		MOTOR ASSEMBLY NUTS
51-2059		ROCKER PLATE
51-2063		PIVOT POST STRADDLE PLATE
51-2065		ROCKER CLAMPING PLATE
51-2075		PIVOT SADDLE PLATE & BUSHING ASSEM.
51-2083		ESCUTCHEON PLATE
52-2128		10" TURNTABLE
52-2129		2 PRONG PLUG (MALE)
52-2133		RECORD DRAG PIN
52-2139		MOTOR PULLEY
56-2007		RECORDER ASSEM. UNIT
57-2030		BINDING HEAD SCREW
57-2056		NEEDLE SCREW
57-2069		MACHINE SCREW (8-32 X 5/8)
57-2070		MACHINE SCREW (8-32 X 1/4)
57-2077		FEED SCREW ASSEM.
57-2080		FEED SCREW
58-2036		TURNTABLE SHAFT
66-2023		OFF-ON SWITCH
66-2028		TWO POLE THREE POSITION SWITCH
67-2046		PIVOT POST RETURN SPRING
67-2048		BAFFLE SCREEN
67-2049		CUTTING ARM SPRING
67-2050		DRAG PIN SPRING
67-2053		VENTILATING SCREEN
67-2057		TURNTABLE DRIVE WHEEL TENSION SPRING
73-1336		LOCKWASHERS (9/16 O.D.)
73-2051		THRUST WASHER FOR IDLER WHEEL
73-2052		MOUNTING WASHER FOR IDLER ARM
78-2010		IDLER WHEEL
87-2004		LID SUPPORT
87-2010		FINGER GRIPS (5/8 DIA.)

DATE 1-17-40

MODEL A72 Recordio
Chassis, Voltage
Socket

WILCOX-GAY CORP.





VOLTAGE CHART

Line Voltage 118
C-14 to Gnd. 315
C-13 to Gnd. 235
C-13 to C-14 (spkr. field) 80

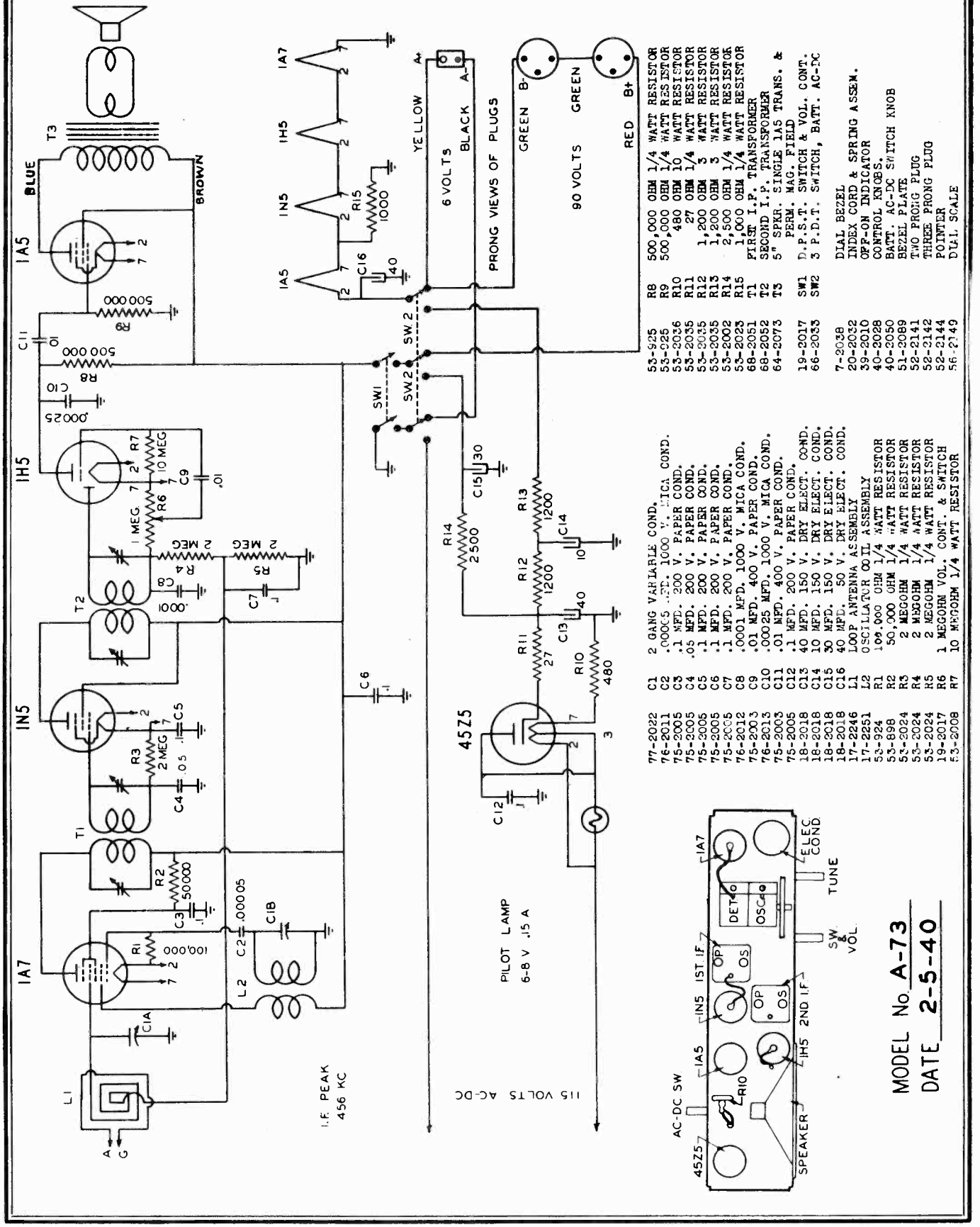
Volume Control at min.
All voltage measurements made against Gnd.(chassis) except as noted.

TUBE	POSITION	PLATE	SCREEN	Cathode
6J7	Mike Amp.	45*	40*	1.2
6Q7	Amp.-Vol. Ind. Rect.	72*		1.4
6K6	Output	222	235	15.0

*Not actual voltages due to large values of resistance in the circuit between supply voltage and point of measurement. These voltage values may vary considerably, depending upon the resistance of voltmeter used.

WILCOX-GAY CORP.

MODEL A73
Chassis 9E5
Schematic, Socket
Trimmers

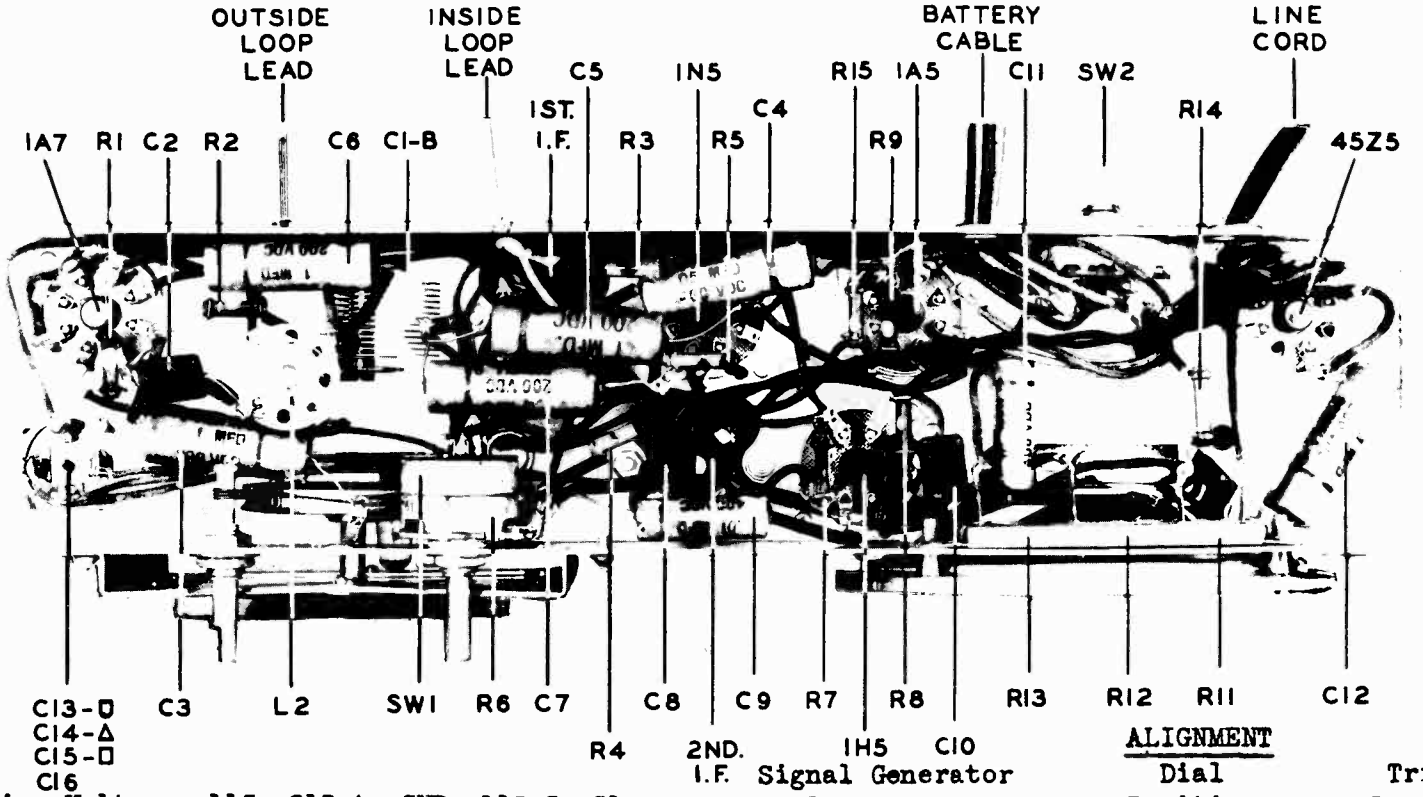


77-2022	C1	2 GANG VARIABLE COND.	53-925	R8	500,000 OHM 1/4 WATT RESISTOR
76-2011	C2	.00005 MFD. 1000 V. MICA COND.	53-925	R9	500,000 OHM 1/4 WATT RESISTOR
75-2005	C3	.1 MFD. 200 V. PAPER COND.	53-2036	R10	480 OHM 10 WATT RESISTOR
75-2005	C4	.05 MFD. 200 V. PAPER COND.	53-2035	R11	27 OHM 1/4 WATT RESISTOR
75-2005	C5	.1 MFD. 200 V. PAPER COND.	53-2035	R12	1,200 OHM 3 WATT RESISTOR
75-2005	C6	.1 MFD. 200 V. PAPER COND.	53-2035	R13	1,200 OHM 3 WATT RESISTOR
75-2005	C7	.1 MFD. 200 V. PAPER COND.	53-2002	R14	2,500 OHM 1/4 WATT RESISTOR
76-2012	C8	.0001 MFD. 1000 V. MICA COND.	53-2023	R15	1,000 OHM 1/4 WATT RESISTOR
75-2003	C9	.01 MFD. 400 V. PAPER COND.	68-2051	T1	FIRST I.F. TRANSFORMER
76-2013	C10	.00025 MFD. 1000 V. MICA COND.	68-2052	T2	SECOND I.F. TRANSFORMER
75-2003	C11	.01 MFD. 400 V. PAPER COND.	64-2073	T3	5" SPKR. SINGLE 1A5 TRANS. & PERM. MAG. FIELD
75-2005	C12	.1 MFD. 200 V. PAPER COND.	19-2017	SW1	D.P.S.T. SWITCH & VOL. CONT.
18-2018	C13	40 MFD. 150 V. DRY ELECT. COND.	66-2033	SW2	3 P.D.T. SWITCH, BATT. AC-DC
18-2018	C14	10 MFD. 150 V. DRY ELECT. COND.			
18-2018	C15	30 MFD. 150 V. DRY ELECT. COND.	7-2038		DIAL BEZEL
18-2018	C16	40 MFD. 50 V. DRY ELECT. COND.	20-2032		INDEX CORD & SPRING ASSEM.
17-2246	L1	LOOP ANTENNA ASSEMBLY	39-2010		OFF-ON INDICATOR
17-2251	L2	OSCILLATOR COIL ASSEMBLY	40-2028		CONTROL KNOBS.
53-924	R1	100,000 OHM 1/4 WATT RESISTOR	40-2050		BATT. AC-DC SWITCH KNOB
53-898	R2	50,000 OHM 1/4 WATT RESISTOR	51-2089		BEZEL PLATE
53-2024	R3	2 MEGOHM 1/4 WATT RESISTOR	52-2141		TWO PRONG PLUG
53-2024	R4	2 MEGOHM 1/4 WATT RESISTOR	52-2142		THREE PRONG PLUG
53-2024	R5	2 MEGOHM 1/4 WATT RESISTOR	52-2144		POINTER
19-2017	R6	1 MEGOHM VOL. CONT. & SWITCH	56-2149		DIAL SCALE
53-2008	R7	10 MEGOHM 1/4 WATT RESISTOR			

MODEL No. A-73
DATE 2-5-40

MODEL A73
Voltage, Alignment
Chassis, Socket

WILCOX-GAY CORP.



VOLTAGE: Line Voltage, 115; C13 to GND, 113.5; C14 to GND, 60; C16 to GND, 5.6; C15 to GND, 90. Aerial disconnected. Vol. cont. at min. All volt. measurements made against ground (chassis).

Tube	Position	Plate	Screen	Cathode*
1A7	1st. Det.	88	45	1.4
	Oscillator	88		
1N5	I.F.	88	90	4.2
1H5	2nd. Det.	32.5**		2.8
1A5	Output	83.5	90	5.6
45Z5	Rectifier			115.0

(*) Cath. volt. of all tubes with exception of 45Z5 is measured from filament prong #2 to ground.
(**) Not actual volt. due to large value of resistance in plate cir. May vary considerably due to resistance of voltmeter used.

ALIGNMENT

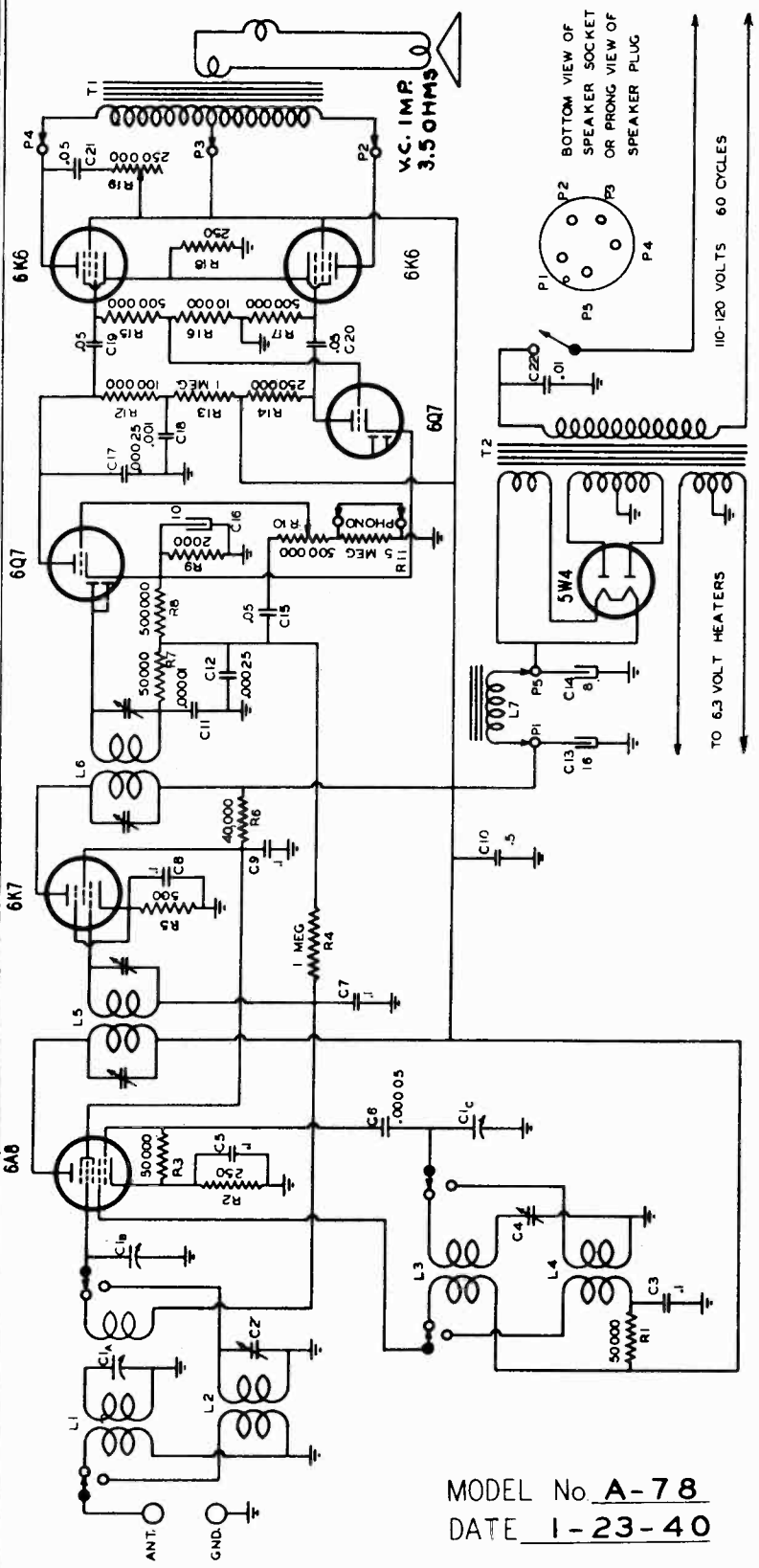
Signal Generator Frequency	Dial Position	Trimmer Location
456 KC	1500 KC	2nd I.F.--S
" "	" "	" " P
" "	" "	1st I.F.--S
" "	" "	" " P
1400 KC	1400 KC	Osc. C1-B
1400 KC	1400 KC	Det. C1-A*

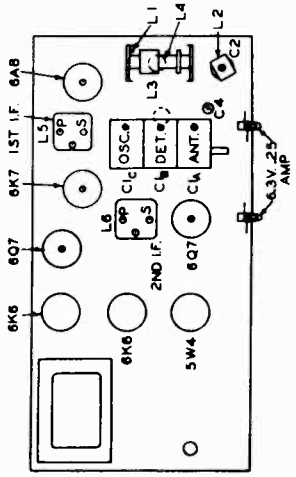
(*) C1-A trimmer is located on rear cover, and is connected across loop antenna. NOTE: An adj. of this trimmer should be made each time the receiver is changed from use with loop antenna to use with outside antenna, and vice versa. As resonance is approached by adj. of trims., sig. gen. attenuator should be adj. for min. sig. that will provide a low reading on the output indicator.

MODEL A79
Alignment, Voltage

WILCOX-GAY CORP.

MODEL A78
Chassis 9P7
Schematic, Socket, Voltage
Trimmers, Alignment





MODEL No. A-78
DATE 1-23-40

VOLTAGE AND ALIGNMENT DATA

DIAL	WAVE BAND SWITCH
1500 KC	Broadcast
600 "	"
1400 "	"

SIGNAL GENERATOR
456 KC
600 "
1400 "

Not Used*

	15-16 MC
	Short Wave

(*) Conn. Ant. to receiver & adj. dial so no station is received. Advance vol. cont. until fair noise vol. is received. Adj. trim. for greatest noise.

TRIMMER (4) I-F	
Padder C-4	
Det. C1-B; Ant. C1-A	
Osc. C1-C	
Ant. C-2	

TUBE	POSITION	PLATE	SCREEN	CATHODE
6A8	1st Det.	225	80	2.8
	Osc.	225		
6K7	I.F.	225	80	3.2

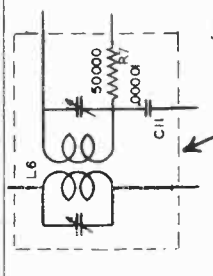
TUBE	POSITION	PLATE	SCREEN	CATHODE
6Q7	2nd Det.	33*		1.2
6Q7	Inverter	65*		1.2
6K6	Output	220	225	15.0

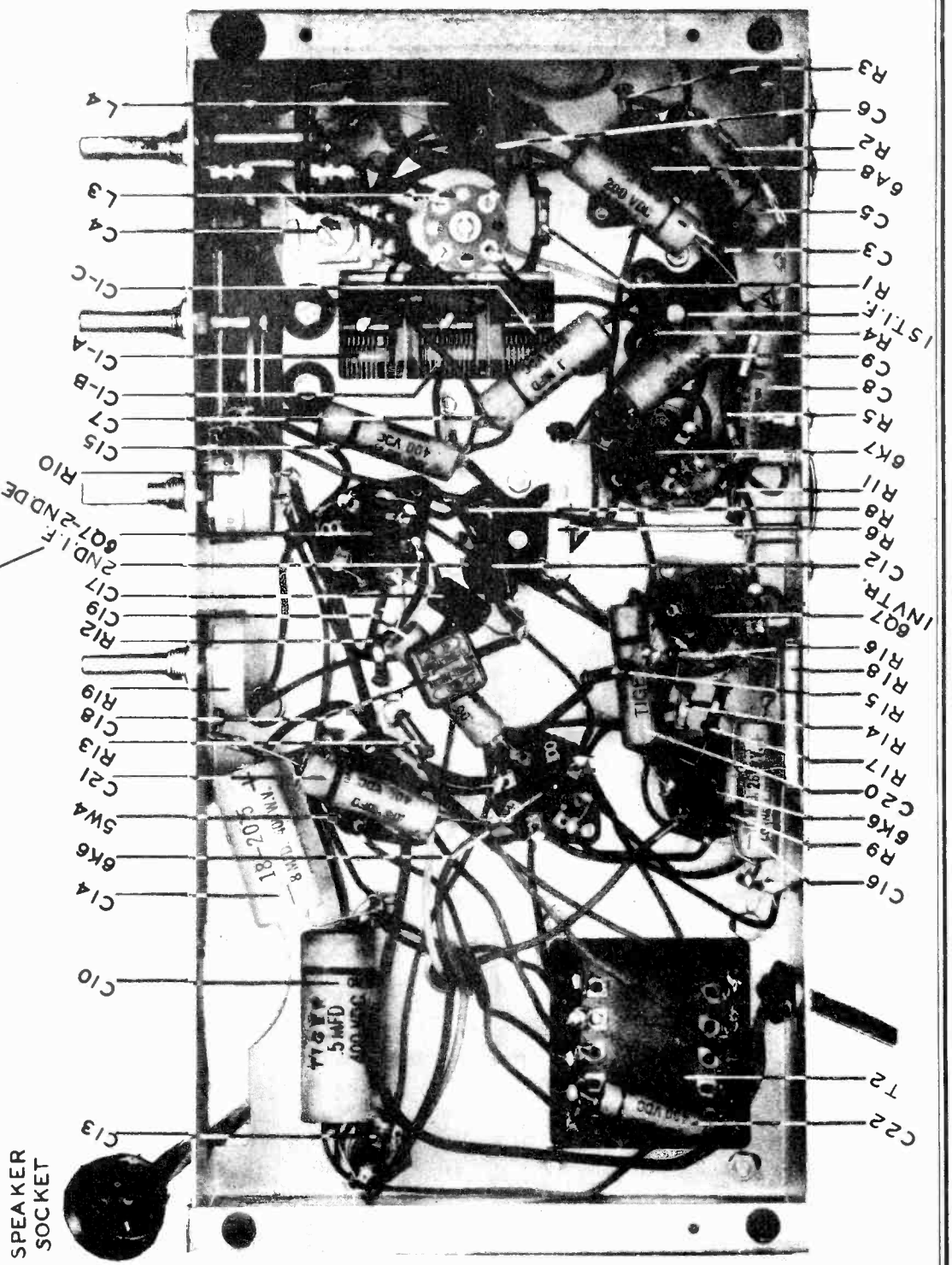
(*) Not actual voltages due to large values of resistance in circuit bet. supply volt. & point of measurement. Values vary considerably depending upon resistance of voltmeter used.

MODEL A78
Chassis

WILCOX-GAY CORP.

MODEL No. A-78
DATE 1-22-40



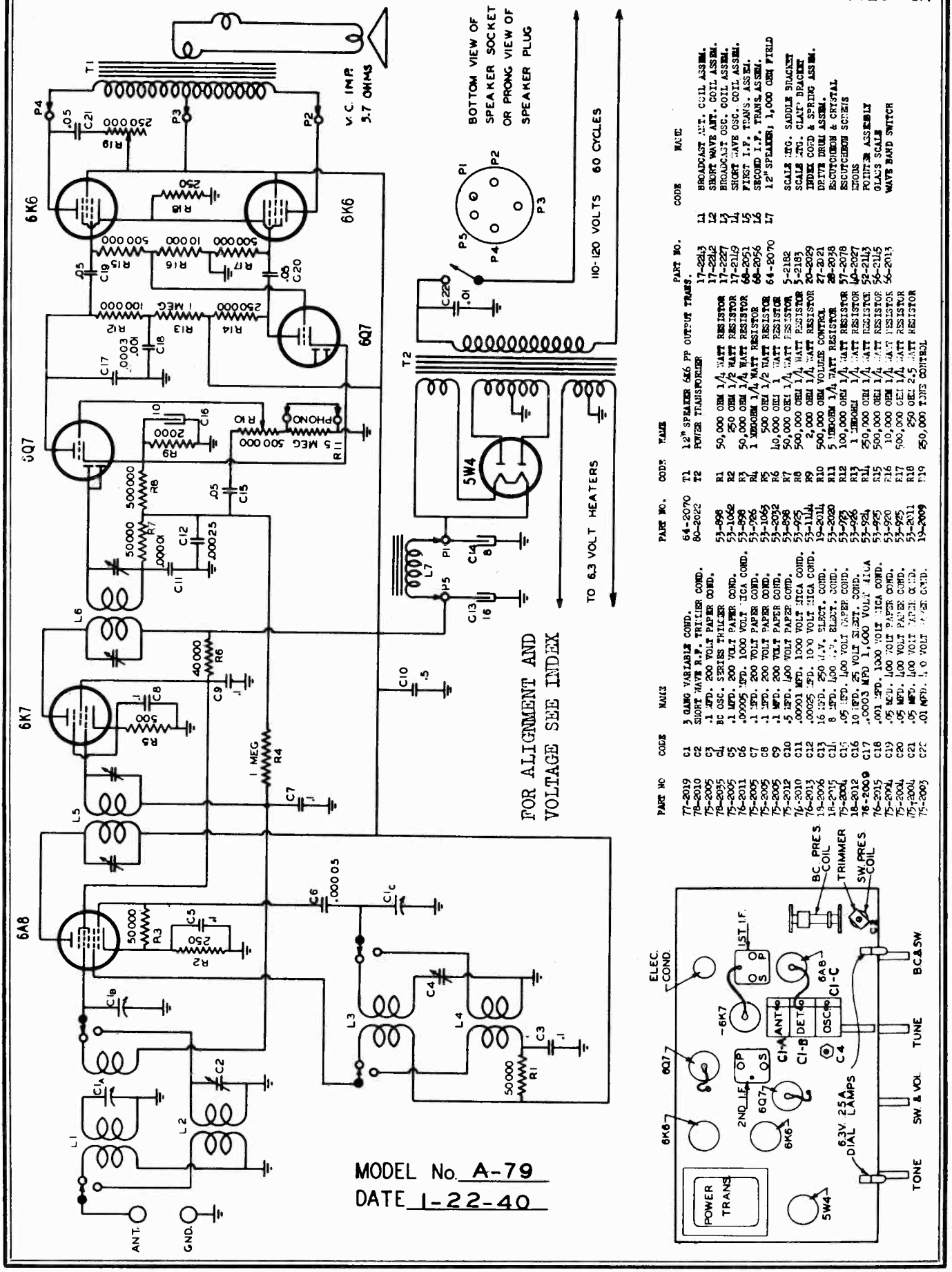


PARTS LAYOUT - CHASSIS 9P7

Schematic, Socket Trimmers

WILCOX-GAY CORP.

MODEL A79
Chassis 9N7



PART NO	CODE	RATE
77-2019	C1	3 GANG VARIABLE COND.
78-2010	C2	SHORT WAVE R.F. TRIMER COND.
75-2005	C3	.1 MFD. 200 VOLT PAPER COND.
78-2035	C4	BC OSC. SERIES TRIMMER
75-2005	C5	.1 MFD. 200 VOLT PAPER COND.
76-2011	C6	.00005 MFD. 1000 VOLT MICA COND.
75-2005	C7	.1 MFD. 200 VOLT PAPER COND.
75-2005	C8	.1 MFD. 200 VOLT PAPER COND.
75-2005	C9	.1 MFD. 200 VOLT PAPER COND.
75-2012	C10	.5 MFD. 400 VOLT PAPER COND.
76-2010	C11	.00001 MFD. 1000 VOLT MICA COND.
76-2013	C12	.00025 MFD. 1000 VOLT MICA COND.
19-2006	C13	16 MFD. 250 V.W. ELECT. COND.
18-2015	C14	8 MFD. 400 V.W. ELECT. COND.
75-2004	C15	.05 MFD. 400 VOLT PAPER COND.
18-2012	C16	10 MFD. 25 VOLT ELECT. COND.
76-2009	C17	.0003 MFD 1,000 VOLT MICA
76-2015	C18	.001 MFD. 1000 VOLT MICA COND.
75-2004	C19	.05 MFD. 400 VOLT PAPER COND.
75-2004	C20	.05 MFD. 400 VOLT PAPER COND.
75-2004	C21	.05 MFD. 400 VOLT PAPER COND.
75-2003	C22	.01 MFD. 400 VOLT PAPER COND.

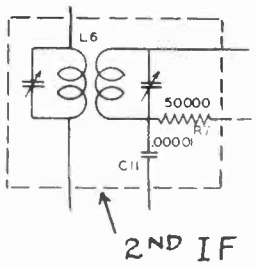
PART NO.	CODE	RATE
64-2070	T1	12" SPEAKER 6A6 PP OUTPUT TRANS.
80-2022	T2	POWER TRANSFORMER
53-898	R1	50,000 OHM 1/4 WATT RESISTOR
53-1062	R2	250 OHM 1/2 WATT RESISTOR
53-898	R3	50,000 OHM 1/4 WATT RESISTOR
53-926	R4	1 MEGOHM 1/4 WATT RESISTOR
53-1065	R5	500 OHM 1/2 WATT RESISTOR
53-2052	R6	40,000 OHM 1 WATT RESISTOR
53-898	R7	50,000 OHM 1/4 WATT RESISTOR
53-925	R8	500,000 OHM 1/4 WATT RESISTOR
53-1104	R9	2,000 OHM 1/4 WATT RESISTOR
19-2014	R10	500,000 OHM VOLUME CONTROL
53-2020	R11	5 MEGOHM 1/4 WATT RESISTOR
53-923	R12	100,000 OHM 1/4 WATT RESISTOR
53-926	R13	1 MEGOHM 1/4 WATT RESISTOR
53-924	R14	250,000 OHM 1/4 WATT RESISTOR
53-925	R15	500,000 OHM 1/4 WATT RESISTOR
53-920	R16	10,000 OHM 1/4 WATT RESISTOR
53-925	R17	500,000 OHM 1/4 WATT RESISTOR
53-2011	R18	250 OHM 2.5 WATT RESISTOR
19-2009	R19	250,000 OHM VOL CONTROL

PART NO.	CODE	RATE
17-2243	L1	BROADCAST ANT. COIL ASSEM.
17-2242	L2	SHORT WAVE ANT. COIL ASSEM.
17-2227	L3	BROADCAST OSC. COIL ASSEM.
17-2149	L4	SHORT WAVE OSC. COIL ASSEM.
68-2051	L5	FIRST I.F. TRANS. ASSEM.
68-2056	L6	SECOND I.F. TRANS. ASSEM.
64-2070	L7	12" SPEAKER; 1,000 OHM FIELD
5-2182		SCALE ENG. SADDLE BRACKET
5-2183		SCALE ENG. CLAMP BRACKET
20-2029		INDEX CORD & SPRING ASSM.
27-2021		DRIVE DRUM ASSEM.
28-2038		ESCUTCHEON & CRYSTAL
57-2078		ESCUTCHEON SCREWS
40-2027		IRONS
52-2143		POINTER ASSEMBLY
56-2115		GLASS SCALE
56-2013		WAVE BAND SWITCH

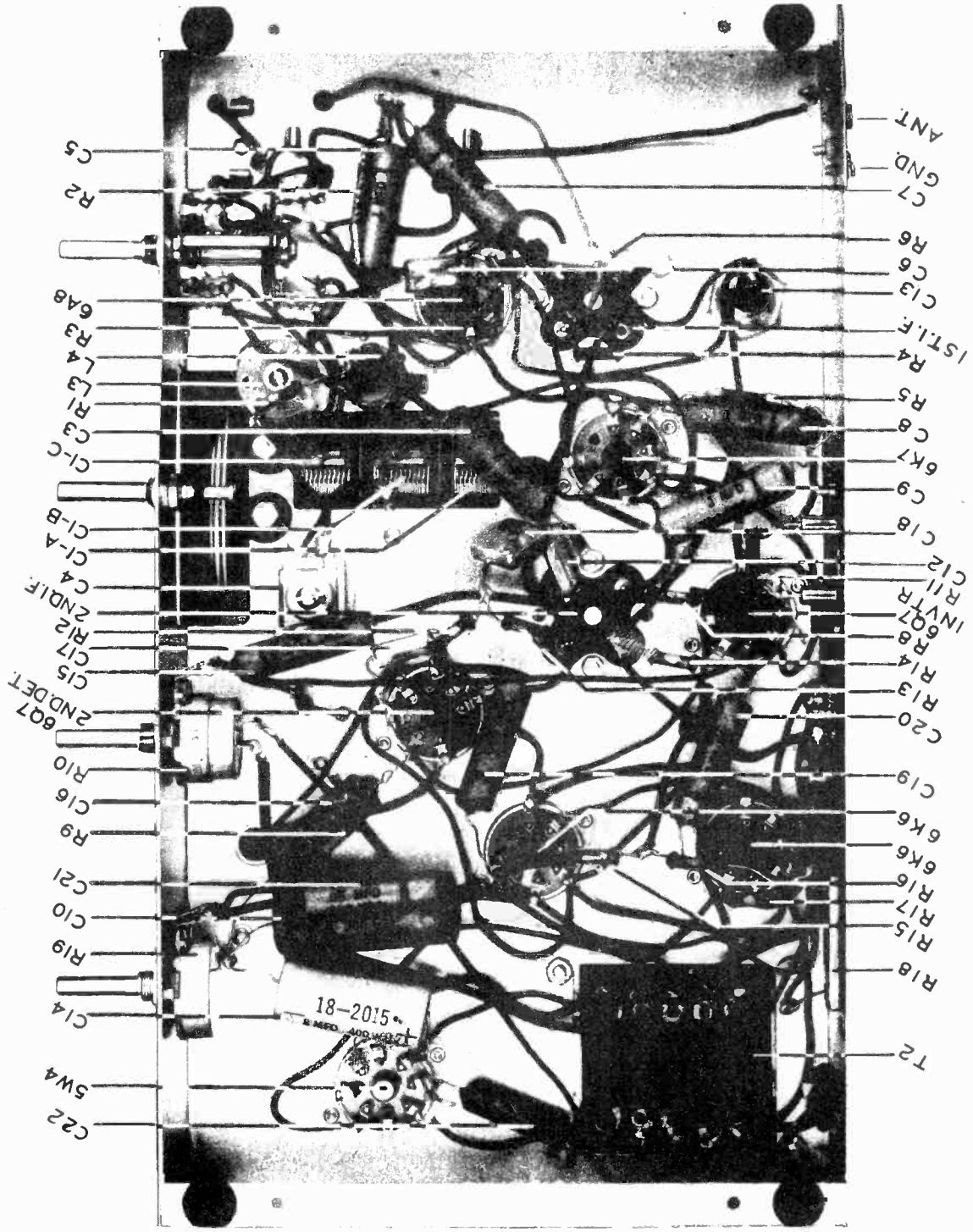
MODEL A79
Chassis

WILCOX-GAY CORP.

CHASSIS 9N7

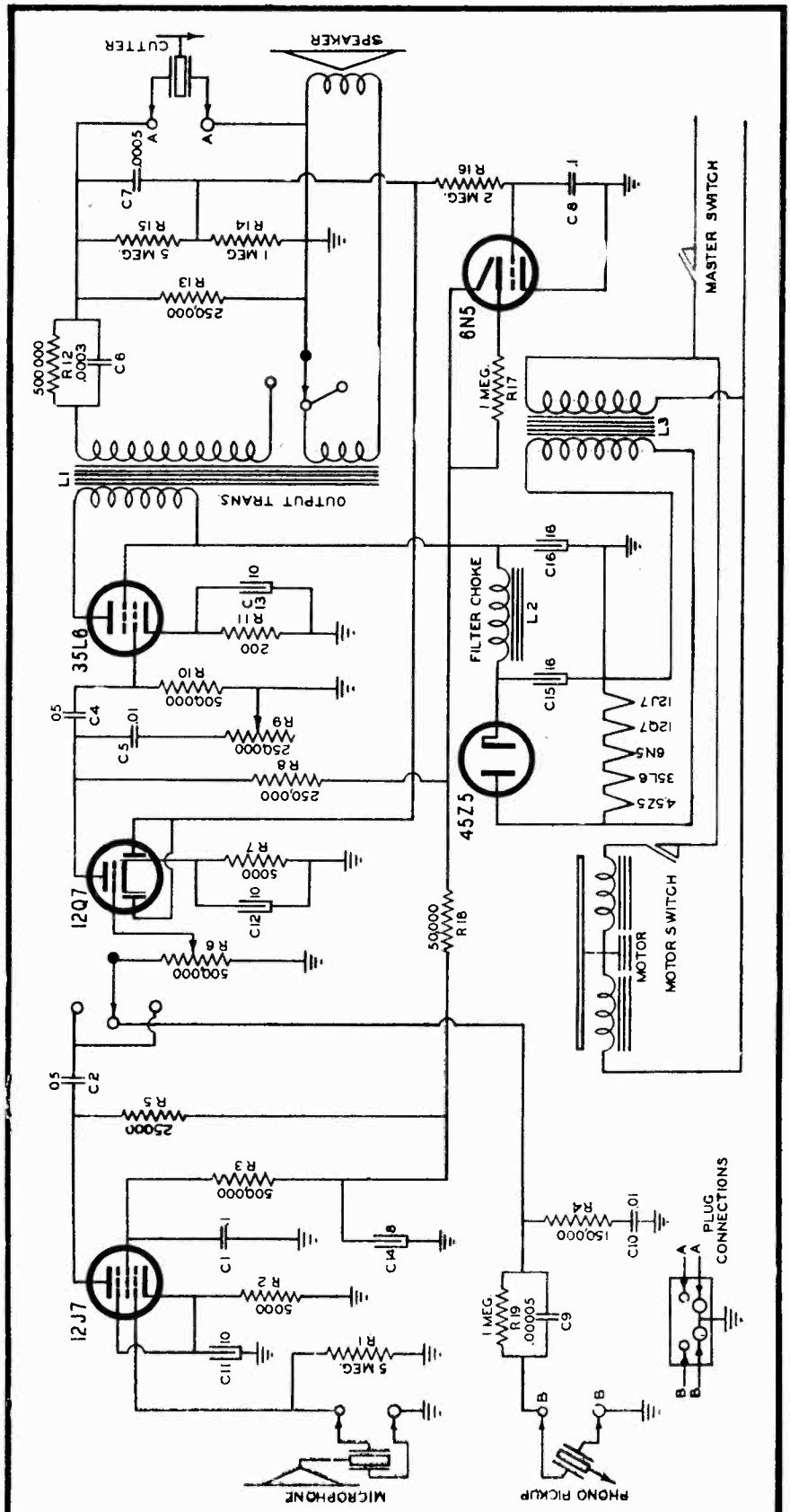


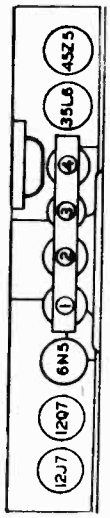
MODEL No. A-79
DATE 1-22-40



WILCOX-GAY CORP.

MODEL A71
Schematic





1—MASTER SWITCH & VOLUME CONTROL
2—MOTOR SWITCH
3—TONE CONTROL
4—PUBLIC ADDRESS—PHONOGRAPH—RECORDING SWITCH

PART NO.	CODE	NAME
53-2020	R1	5 Meg. 1/4 Watt Carbon Resistor
53-919	R2	5,000 Ohm Resistor
53-925	R3	500,000 Ohm Resistor
53-2035	R4	150,000 Ohm Resistor
53-[illegible]	R5	50,000 Ohm Resistor
19-2007	R6	500,000 Ohm Volume Control & Switch
53-919	R7	5,000 Ohm Resistor
53-924	R8	250,000 Ohm Resistor
19-2009	R9	250,000 Ohm Tone Control
53-925	R10	500,000 Ohm Resistor
53-2014	R11	200 Ohm Resistor
53-925	R12	500,000 Ohm Resistor
53-924	R13	250,000 Ohm Resistor
53-926	R14	1 Megohm Resistor
53-2020	R15	5 Meg. 1/4 Watt Carbon Resistor
53-2024	R16	2 Megohm Resistor
53-926	R17	1 Megohm Resistor
53-[illegible]	R18	50,000 Ohm Resistor
53-926	R19	1 Megohm Resistor
		75-2005
		75-2004
		75-2004
		75-2003
		75-2009
		75-2014
		75-2005
		76-2011
		75-2003
		18-2012
		18-2012
		18-2012
		18-2011
		18-2010
		18-2010
		54-2067
		66-2023
		66-2028
		14-2002
		81-2007
		80-2032
	C1	.1 Mfd. 200 Volt Cond.
	C2	.05 Mfd. 400 Volt Cond.
	C4	.05 Mfd. 400 Volt Cond.
	C5	.01 Mfd. 400 Volt Cond.
	C6	.0005 Mfd. Mica 1000 Volt Cond.
	C7	.0005 Mfd. Mica 1000 Volt Cond.
	C8	.1 Mfd. 200 Volt Cond.
	C9	.00005 Mfd. Mica 1000 Volt Elect. Cond.
	C10	.01 Mfd. 400 Volt Cond.
	C11	10 Mfd. 25 Volt Elect. Cond.
	C12	10 Mfd. 25 Volt Elect. Cond.
	C13	10 Mfd. 25 Volt Elect. Cond.
	C14	8 Mfd. 150 Volt Elect. Cond.
	C15	20 Mfd. 150 Volt Elect. Cond.
	C16	20 Mfd. 150 Volt Elect. Cond.
		Speaker
		Switch, 110 Volt
		Switch, 2 Pole, 3 Position
	L2	Filter Choke
	L1	Output Transformer
	L3	Isolation Transformer

ALL RECORD PLAYERS
DATE 4-30-40

LUBRICATION OF ELECTRIC MOTORS IN WILCOX-GAY RECORD PLAYERS AND PHONOGRAPHS

In record player and phonograph models in which the turn-table shaft is driven directly through a reduction worm gearing housed within the motor assembly - -

1 - The motor should be demounted from the motor board.

2 - Remove the three screws surrounding the turn-table shaft.

3 - Remove the shaft and worm gear assembly, and clean the assembly by washing in kerosene or other grease solvent.

4 - Wash out the worm and gear housing of the motor assembly in a similar manner.

5 - Make an application of 600-W motor lubricant to both the worm and gear, and place a small quantity of the same lubricant in the gear housing.

NOTE: An oil hole is provided on some of the motors in these models, so that lubricant may be added, however it is better to follow the above procedure especially in cases where the increased power demand placed upon the motor, because of a "dried out" condition of the lubricant, has become great enough to cause a noticeable reduction in turn-table r.p.m.

Motors used in those models in which the turn-table is rim driven through an idler wheel, may be lubricated as follows:

1 - Remove turn-table.

2 - Apply several drops of electric motor oil to the side of the motor shaft, allowing the oil to run down into the upper bearing.

3 - Oil the idler wheel bearing, using only one or two drops of the oil so that it will not run out onto the rubber rim of the wheel.

4 - Oil the turn-table spindle bearing.

5 - The lower motor bearing may be lubricated by saturating the felt wick which surrounds the lower end of the motor shaft.

NOTE: Electric motor oil may be procured at any automobile service station.

AUDIO OSCILLATION

MODEL No. A-72
DATE 4-24-40

In some of the earlier model A-72 Portable Recordios, an audio oscillation may be noticed to occur with the volume control turned to near maximum position, when the 3-position switch is in the "CUT" position.

This oscillation manifests itself by a flickering of the magic eye (6U5) and will appear in the playback of records which have been cut under this condition, as a "motor-boating" sound of an intensity nearly equal to that of the recorded voice or music.

To correct this audio oscillation, disconnect the 500,000 ohm 6J7 screen grid resistor (R3) from the hum filter composed of C3 and R5, and connect it directly to B+.

Figure 9 shows the original circuit, and Figure 10 represents the circuit after the change has been made. It will be observed that this change has been incorporated in the schematic diagram appearing in Service Bulletin No. 10.

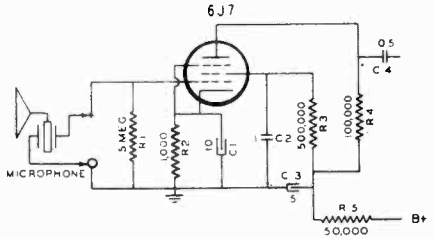


FIG. 9

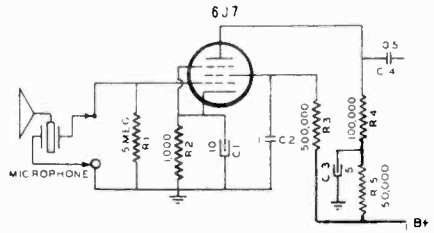
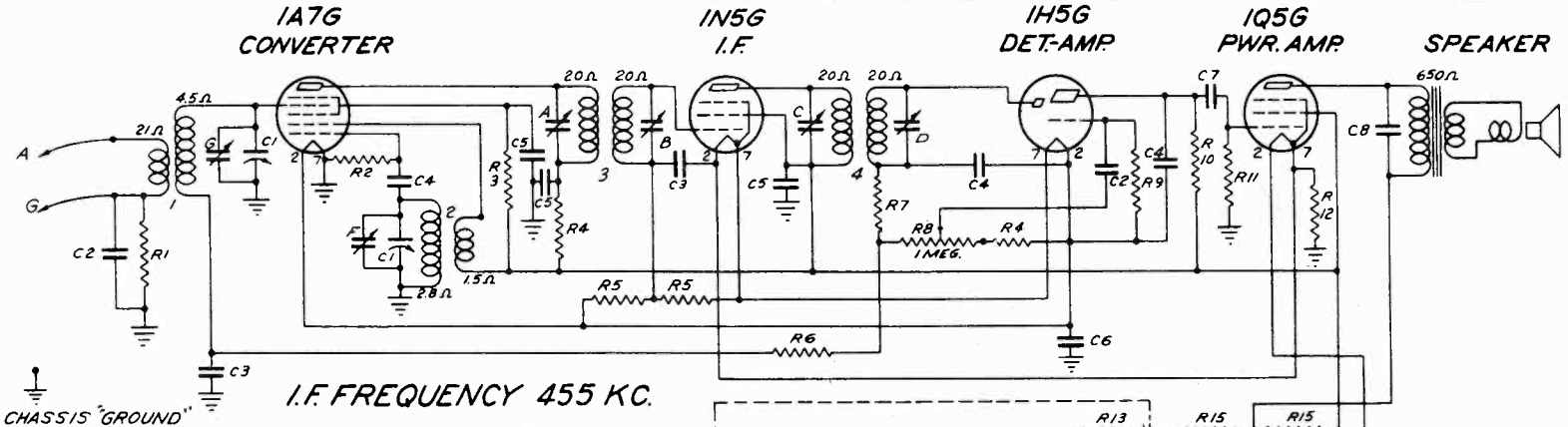
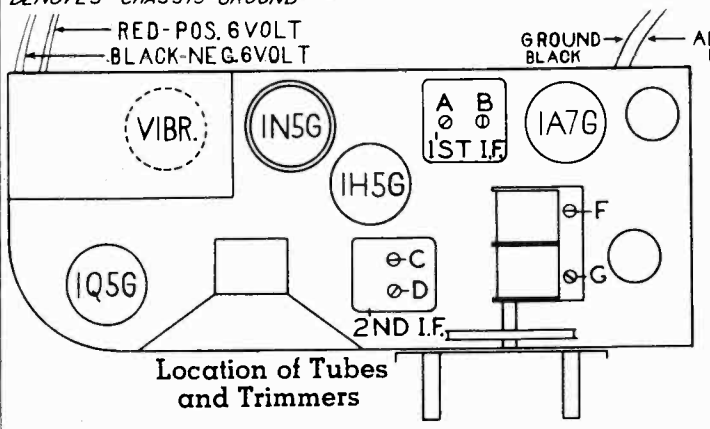


FIG. 10

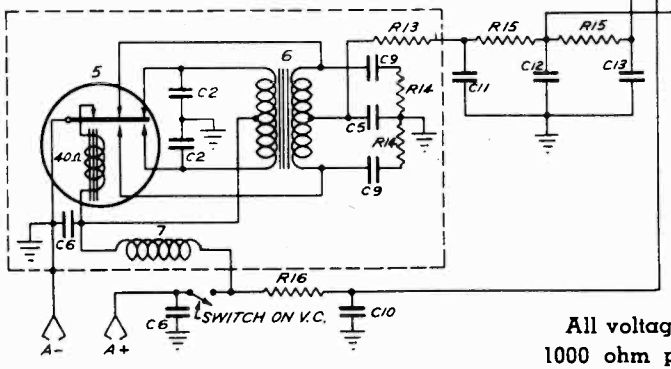
ZENITH RADIO CORP.

MODELS 4B422, 4B466, 4B468
Chassis 5417 4B437
Schematic, Socket, Voltage
Trimmers





Location of Tubes and Trimmers



MODEL	SPEAKER	
4B422	49-345	5"
4B437	49-328	6½"
4B466	49-342	10"
4B468	49-359	8"

FOR ALIGNMENT

SEE INDEX

NOTE

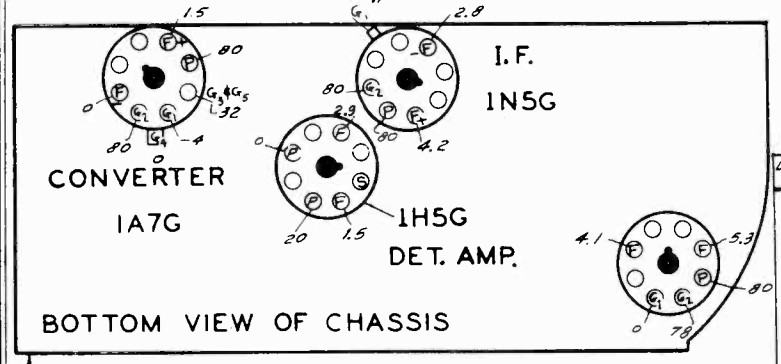
All voltages measured with a 1000 ohm per volt meter from chassis to socket contacts.

Voltage readings are all positive D.C. unless otherwise indicated.

Antenna disconnected volume control full on.

Battery voltage 6 volt.

Battery consumption — .4 ampere.



Socket Voltages

1Q5G PWR AMP.

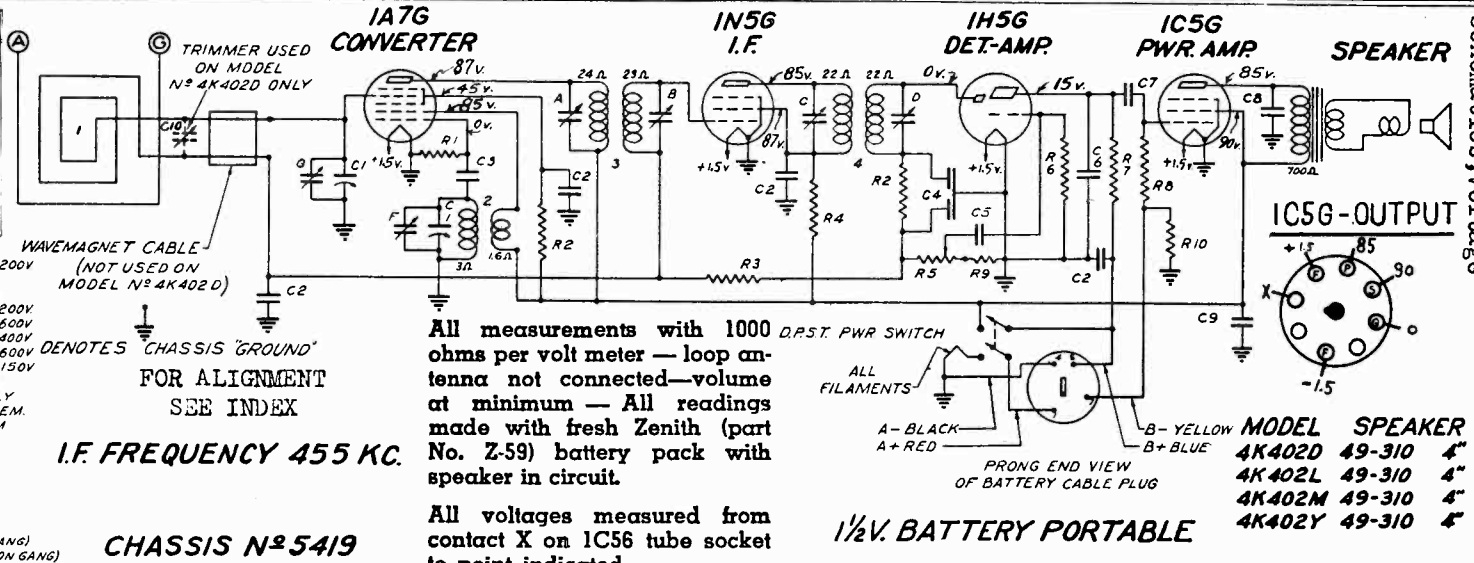
CHASSIS Nº 5417-6V.-SINGLE BAND

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	½ W.		20-208	ANTENNA COIL ASSEMBLY
C2	22-826	.01 MFD.	200V	R3	63-594	68M OHM	½ W.	1	S 6381	OSCILLATOR COIL ASSEM.
C3	22-829	.05 MFD.	200V	R4	63-583	1000 OHM	½ W.	2	95-589	1ST I.F. TRANS.
C4	22-162	.0001 MFD.	600V	R5	63-296	220M OHM	½ W.	3	95-590	2ND I.F. TRANS.
C5	22-828	.05 MFD.	400V	R6	63-669	.39 MEGOHM	½ W.	4	190-17	VIBRATOR
C6	22-199	.5 MFD.	200V	R7	63-593	47M OHM	½ W.	5	95-635	POWER TRANSFORMER
C7	22-243	.01 MFD.	400V	R8	63-1079	VOLUME CONTROL		6	S 5043	CHOKE ASSEMBLY
C8	22-448	.004 MFD.	600V	R9	63-604	10 MEGOHM	½ W.	7		
C9	22-966	.04 MFD.	600V	R10	63-271	1 MEGOHM	½ W.			
C10	22-961	500 MFD. ELECTROLYTIC	15 V.	R11	63-600	2.2 MEGOHM	½ W.			
C11		15 MFD.	250V.	R12	63-1060	90 OHM WIREWOUND	1 W.			
C12	22-742	15 MFD.	250V.	R13	63-577	100 OHM	½ W.	A		1ST I.F. TRANS. PRI.
C13		10 MFD.	250V.	R14	63-697	100 OHM	½ 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		BDCAST OSC. (ON GANG)
R1	63-597	470M OHM	½ W.					G		ANT. BDCAST (ON GANG)

MODELS 4K402D, 4K402L, 4K402M
Chassis 5419 4K402Y
MODELS 5G401D, 5G401L, 5G401M
Chassis 5537 5G401Y
Schematics, Voltage

ZENITH RADIO CORP.

DIAG Nº	PART Nº	DESCRIPTION	
R1	63-652	120 M OHM	½ W
R2	63-593	47 M OHM	¼ W
R3	63-669	3.9 MEGOHM	¼ W
R4	63-583	1000 OHM	¼ W
R5	63-1034	VOLUME CONTROL	
R6	63-604	10 MEGOHM	¼ W
R7	63-271	1 MEGOHM	¼ W
R8	63-600	2.2 MEGOHM	¼ W
R9	63-587	4700 OHM	¼ W
R10	63-238	1000 OHM	¼ W
C1	22-885	TWO-GANG VARIABLE	
C2	22-829	.05 MFD.	200V
C3		100 MMFD.	
C4		DUAL 100 MMFD	
C5	22-826	.01 MFD	200V
C6	22-162	.0001 MFD.	600V
C7	22-243	.01 MFD.	400V
C8	22-448	.004 MFD.	600V
C9	22-684	.8 MFD. ELECTROLYTIC	150V
C10	22-882	TRIMMER COND	
1		WAVEMAGNET ASSEMBLY	
2	57029	OSCILLATOR COIL ASSEM.	
3	57030	1ST I.F. TRANS. ASSEM	
4	95-606	2ND I.F. 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.	
F		BROADCAST OSC (ON GANG)	
G		ANTENNA BROADCAST (ON GANG)	



FOR ALIGNMENT SEE INDEX

I.F. FREQUENCY 455 KC.

CHASSIS Nº 5419

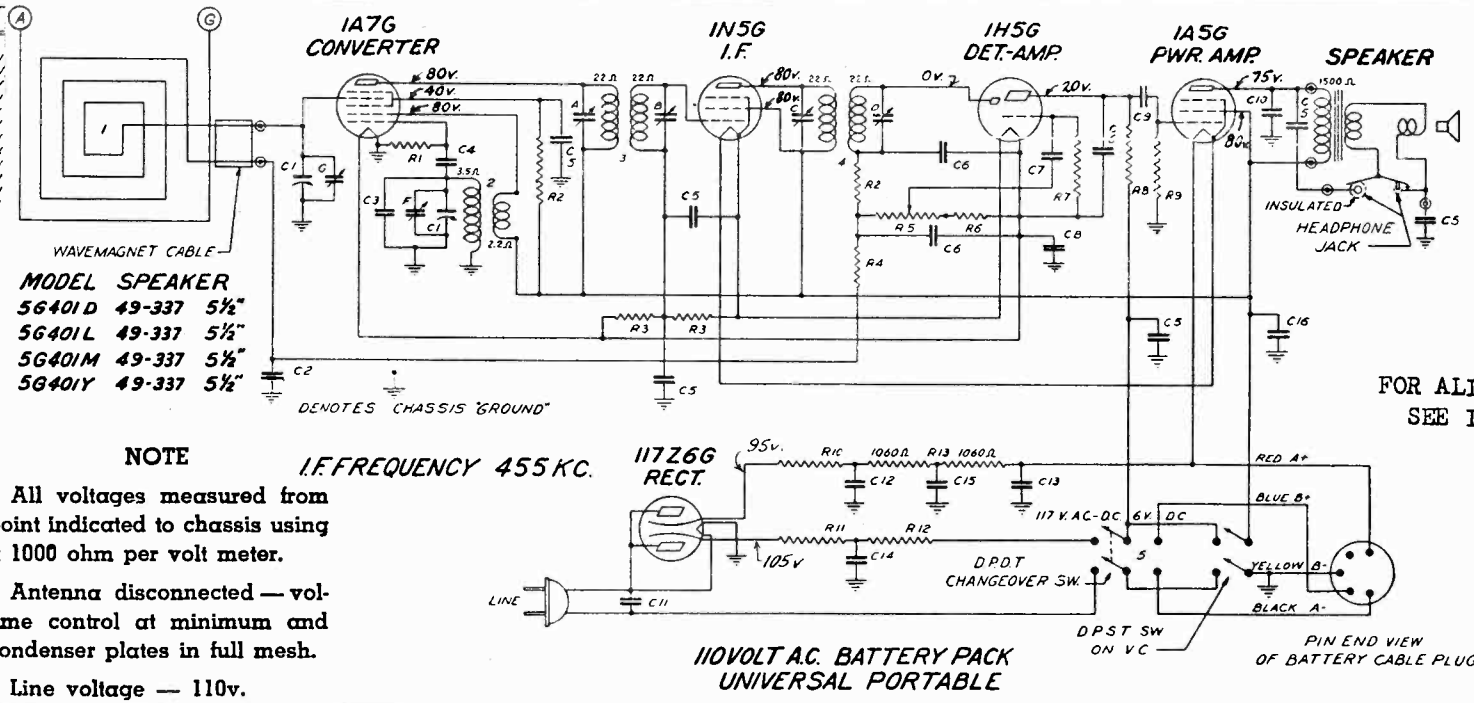
All measurements with 1000 ohms per volt meter — loop antenna not connected—volume at minimum — All readings made with fresh Zenith (part No. Z-59) battery pack with speaker in circuit.

All voltages measured from contact X on 1C56 tube socket to point indicated.

1½V. BATTERY PORTABLE

MODEL	SPEAKER	
4K402D	49-310	4"
4K402L	49-310	4"
4K402M	49-310	4"
4K402Y	49-310	4"

DIAG Nº	PART Nº	DESCRIPTION	
C1	22-800	TWO GANG VARIABLE	
C2	22-138	.2 MFD.	200V
C3	22-802	30 MMFD.	600V
C4	22-182	.00025 MFD.	600V
C5	22-829	.05 MFD.	200V
C6	22-162	.0001 MFD.	600V
C7	22-826	.01 MFD.	200V
C8	22-350	.25 MFD.	200V
C9	22-243	.01 MFD.	400V
C10	22-492	.002 MFD.	600V
C11	22-869	.05 MFD.	400V
C12	22-918	40 MFD ELECTROLYTIC	150V
C13		20 MFD "	25V
C14		120 MFD ELECTROLYTIC	150V
C15	22-871	20 MFD "	150V
C16		20 MFD "	150V
R1	63-652	120 M OHM	½ W
R2	63-593	47 M OHM	¼ W
R3	63-296	220 M OHM	¼ W
R4	63-669	3.9 MEGOHM	¼ W
R5	63-1026	VOLUME CONTROL	
R6	63-597	4700 OHM	¼ W
R7	63-604	10 MEGOHM	¼ W
R8	63-271	1 MEGOHM	¼ W
R9	63-600	2.2 MEGOHM	¼ W
R10	63-1022	150 OHM WIREWOUND	1 W
R11	63-605	1000 OHM	½ W
R12	63-803	2200 OHM	½ W
R13	63-1033	2-SECTION CANDOHM	
1		WAVEMAGNET ASSEMBLY	
2	57027	OSC COIL ASSEMBLY	
3	95-593	1ST I.F. TRANS	
4	95-594	2ND I.F. "	
5	85-190	POWER SWITCH	
A		1ST I.F. TRANS PRI	
B		1ST I.F. " SEC	
C		2ND I.F. " PRI	
D		2ND I.F. " SEC	
F		BROADCAST OSC (ON GANG)	
G		ANTENNA B'DCAST (" ")	



MODEL	SPEAKER	
5G401D	49-337	5½"
5G401L	49-337	5½"
5G401M	49-337	5½"
5G401Y	49-337	5½"

FOR ALIGNMENT SEE INDEX

NOTE

All voltages measured from point indicated to chassis using a 1000 ohm per volt meter.

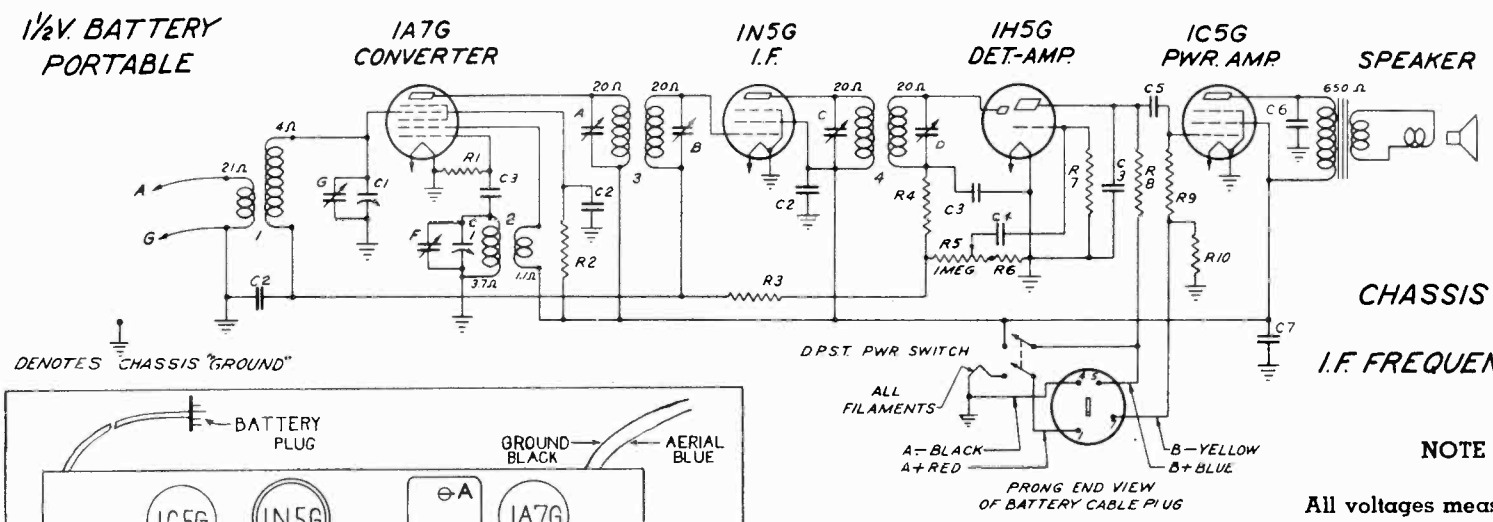
Antenna disconnected — volume control at minimum and condenser plates in full mesh.

Line voltage — 110v.

I.F. FREQUENCY 455 KC.

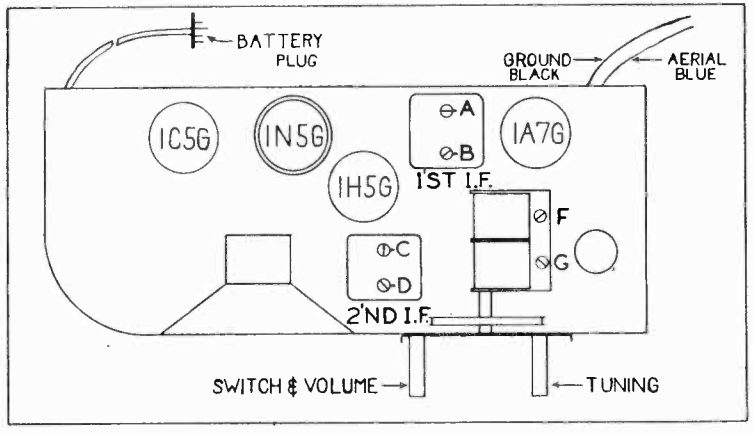
CHASSIS Nº 5537

110 VOLT A.C. BATTERY PACK UNIVERSAL PORTABLE



CHASSIS Nº 5420

I.F. FREQUENCY 455 KC.



MODEL	SPEAKER	
4K422	49-286	5"
4K435	49-328	6½"
4K465	49-359	8"
4K466	49-342	10"

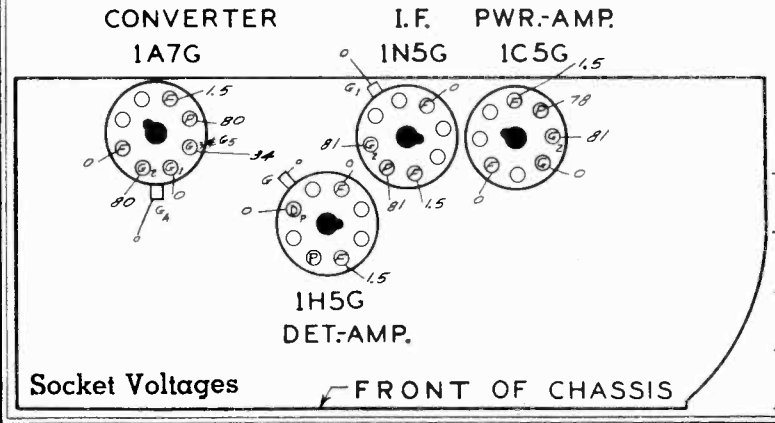
NOTE

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.

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)
R1	63-654	180 OHM	¼ W	1	20-208	ANTENNA COIL		G		ANT. B'DCAST (ON GANG)
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.				

Location of Tubes and Trimmers



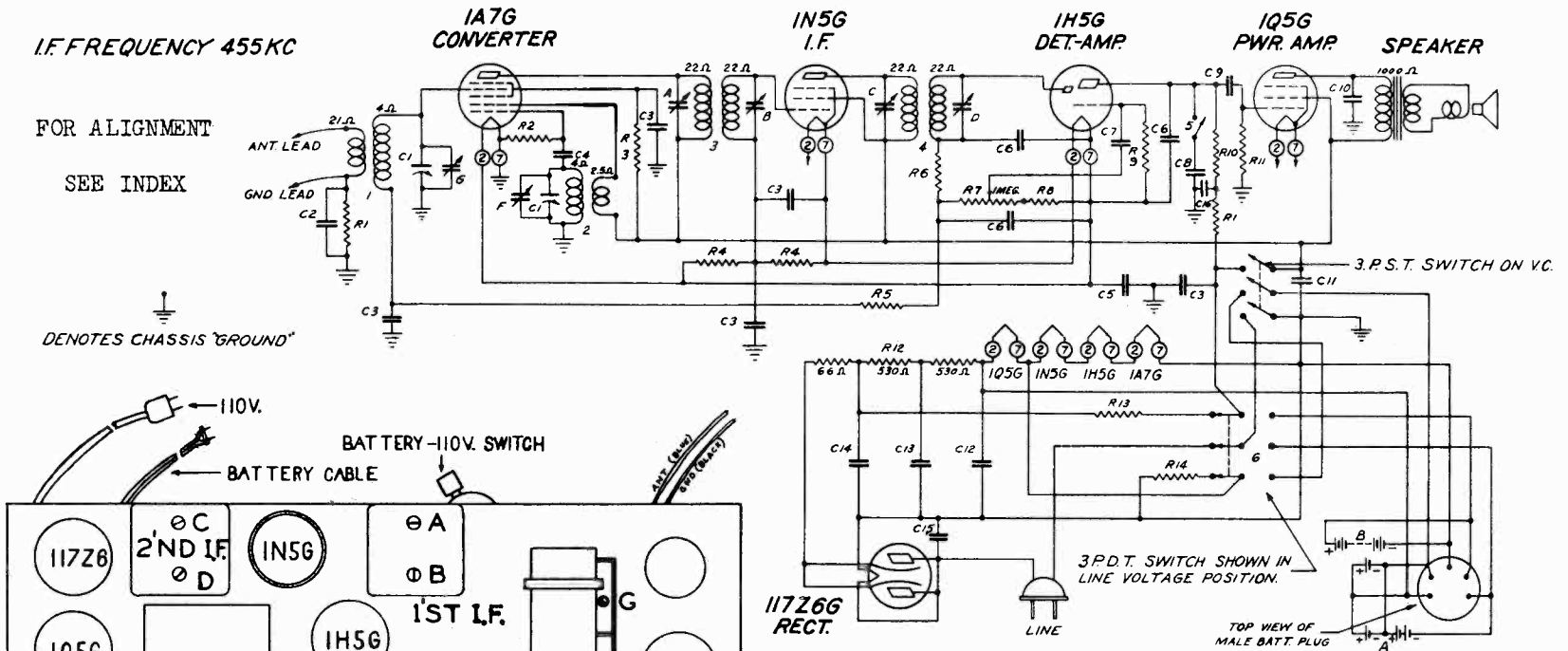
ALIGNMENT PROCEDURE

For Chassis 5417, 5420 and 5536

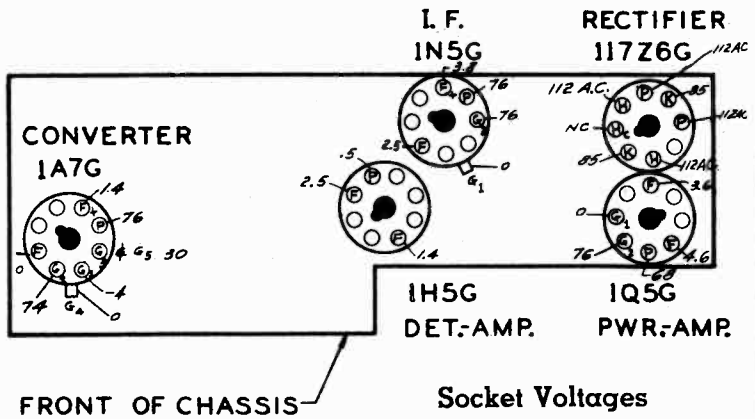
Operation	Connect Test Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial At	Adjust Trimmers	Purpose
1	1A7 Grid	½ Mfd.	455 Kc.	Broadcast	600 Kc.	A, B, C, D	I. F. Alignment
2	Antenna	200 Mmf.	1500 Kc.	Broadcast	1500 Kc.	F	Set Oscillator to Scale
3	Antenna	200 Mmf.	1400 Kc.	Broadcast	1400 Kc.	G	Alignment of Scale

MODELS 5G438, 5G467
Chassis 5536
Schematic, Voltage, Socket
Trimmers

ZENITH RADIO CORP.



Location of Tubes and Trimmers



Socket Voltages

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.

CHASSIS Nº 5536

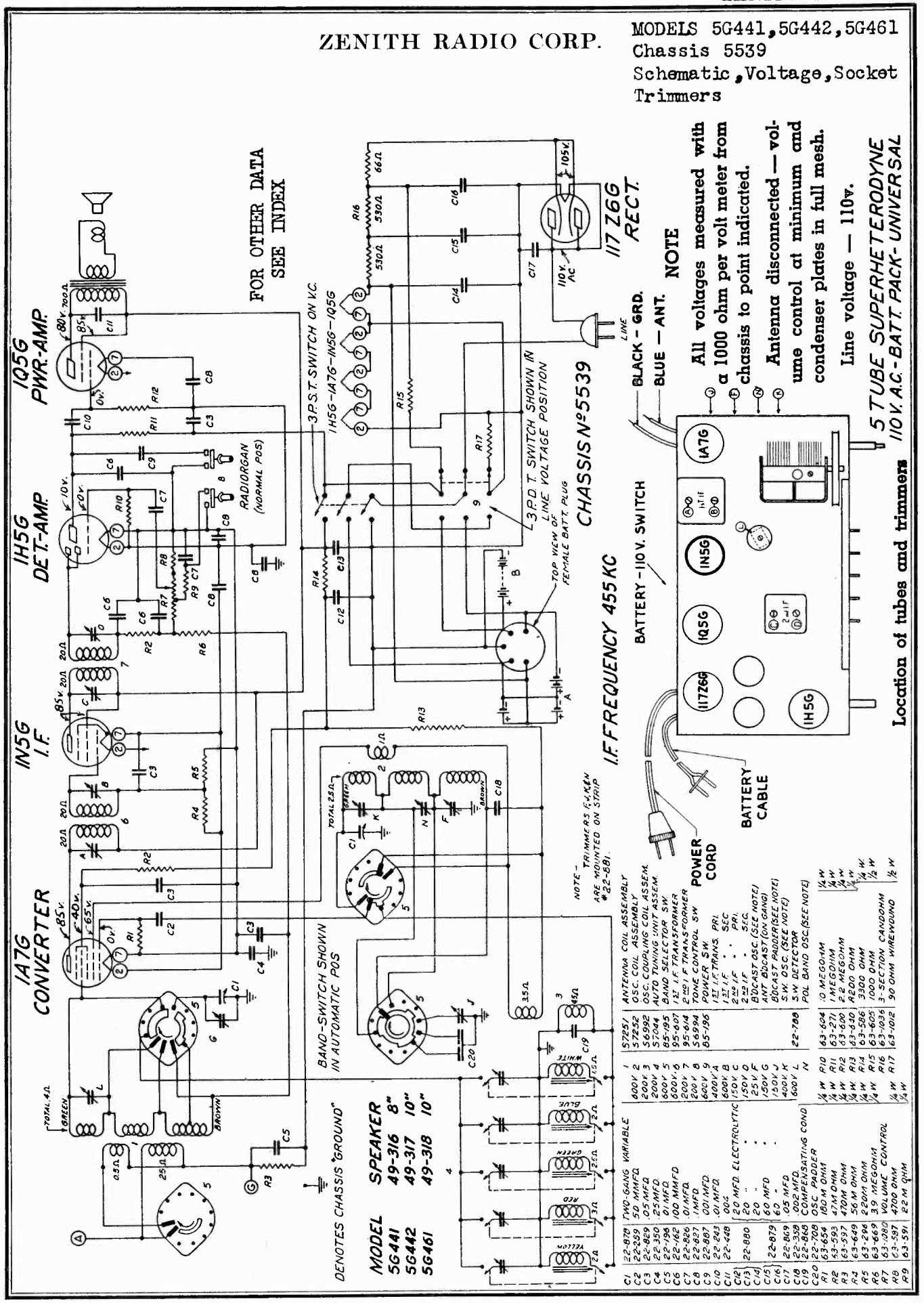
5 TUBE SUPERHETERODYNE
110V. A.C.-BATT. PACK-UNIVERSAL

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	½W	1	20-208	ANTENNA COIL
C2	22-196	.01 MFD.	600V.	R2	63-652	120 M OHM	½W.	2	3-6381	OSC. COIL ASSEMBLY
C3	22-829	.05 MFD.	200V	R3	63-713	47 M OHM	½W.	3	95-593	1ST I.F. TRANS.
C4	22-182	.00025 MFD.	600V	R4	63-296	220 M OHM	½W	4	95-594	2ND I.F. TRANS.
C5	22-350	.25 MFD.	200V	R5	63-669	3.9 MEGOHM	½W	5	85-187	TONE CONTROL SWITCH
C6	22-182	.0001 MFD.	600V	R6	63-593	47 M OHM	½W	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	½W			
C9	22-243	.01 MFD.	400V	R9	63-604	10 MEGOHM	½W	A		1ST I.F. TRANS. PRI.
C10	22-448	.004 MFD.	600V	R10	63-271	1 MEGOHM	½W	B		1ST I.F. - SEC.
C11	22-928	40 MFD. ELECTROLYTIC	150V.	R11	63-600	2.2 MEGOHM	½W	C		2ND I.F. - PRI.
C12		20 MFD. -	25V.	R12	63-1041	3 SECTION CANDOHM		D		2ND I.F. - SEC.
C13	22-879	60 MFD. -	150V	R13	63-605	1000 OHM	½W	F		BROADCAST OSC. (ON GANG)
C14		60 MFD. -	150V	R14	63-1012	90 OHM WIREWOUND	½W	G		ANTENNA BDCAST (ON GANG)
C15	22-869	.05 MFD.	400V							
C16	22-138	.2 MFD.	200V							

ZENITH RADIO CORP.

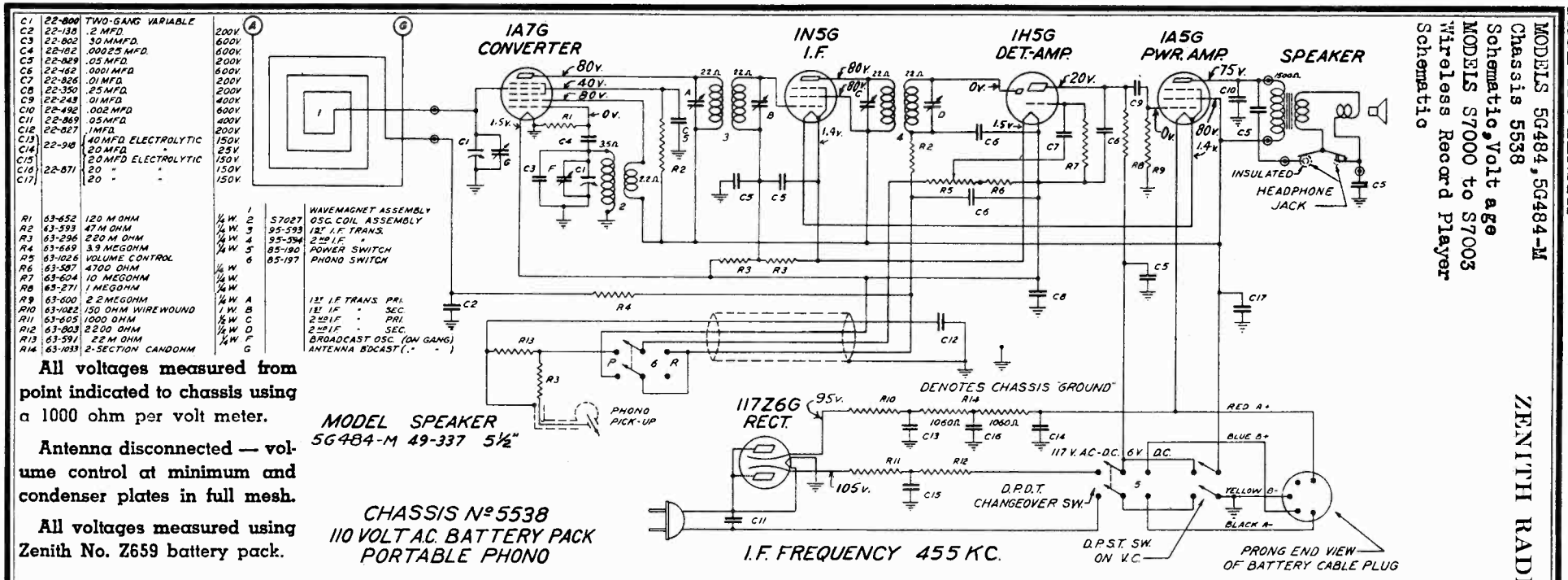
MODELS 5G441, 5G442, 5G461
Chassis 5539
Schematic, Voltage, Socket
Trimmers



C1	22-878	TWO-GANG VARIABLE	400V 2	S7251	ANTENNA COIL ASSEMBLY	
C2	22-359	50 MMFD.	200V 3	S7252	OSC. COIL ASSEMBLY	
C3	22-829	.05 MFD.	200V 4	S6992	OSC. COUPLING COIL ASSEM.	
C4	22-350	.25 MFD.	200V 5	S7044	AUTO TUNING UNIT ASSEM.	
C5	22-196	.01 MFD.	600V 5	85-195	BAND SELECTOR SW.	
C6	22-162	.00 MMFD.	600V 6	95-607	1ST I.F. TRANSFORMER	
C7	22-826	.01 MFD.	200V 7	95-614	2ND I.F. TRANSFORMER	
C8	22-827	.1 MFD.	200V 8	S6994	TONE CONTROL SW.	
C9	23-867	.001 MFD.	60V 9	85-196	POWER SW.	
C10	22-243	.001 MFD.	400V A		1ST I.F. TRANS. PRI.	
C11	22-448	.005	600V B		1ST I.F. " SEC.	
C12		20 MFD ELECTROLYTIC	150V C		2ND I.F. " PRI.	
C13	22-880	20 " "	150V D		2ND I.F. " SEC.	
C14		20 " "	25V E		BDCAST OSC. (SEE NOTE)	
C15	22-879	60 MFD "	150V J		ANT BDCAST (ON GANG)	
C16		60 " "	150V G		BDCAST PADDER (SEE NOTE)	
C17	22-869	.05 MFD.	400V K		S.W. OSC. (SEE NOTE)	
C18	22-359	.002 MFD.	600V L	22-788	S.W. DETECTOR	
C19	22-868	COMPENSATING COND.	N		POL BAND OSC. (SEE NOTE)	
C20	22-708	OSC. PADDER				
R1	63-654	180 M OHM	¼ W	R10	63-604	.10 MEGOHM ¼ W
R2	63-593	47 M OHM	¼ W	R11	63-271	1 MEGOHM ¼ W
R3	63-597	470 M OHM	¼ W	R12	63-600	2.2 MEGOHM ¼ W
R4	63-649	56 M OHM	¼ W	R13	63-630	4200 OHM ¼ W
R5	63-296	2200 OHM	¼ W	R14	63-586	3300 OHM ½ W
R6	63-669	3.9 MEGOHM	¼ W	R15	63-605	1000 OHM
R7	63-080	VOLUME CONTROL	¼ W	R16	63-1035	3-SECTION CANDOHM
R8	63-597	4700 OHM	¼ W	R17	63-1012	90 OHM WIREWOUND ½ W
R9	63-591	22 M OHM	¼ W			

MODELS 5G484, 5G484-M
Chassis 5538
Schematic, Voltage
MODELS S7000 to S7003
Wireless Record Player
Schematic

ZENITH RADIO CORP.



C1	22-800	TWO-GANG VARIABLE		A	
C2	22-138	.2 MFD.	200V.	G	
C3	22-802	.30 MMFD.	600V.		
C4	22-482	.00025 MFD.	600V.		
C5	22-829	.05 MFD.	200V.		
C6	22-462	.0001 MFD.	600V.		
C7	22-826	.01 MFD.	200V.		
C8	22-350	.25 MFD.	200V.		
C9	22-243	.01 MFD.	400V.		
C10	22-492	.002 MFD.	600V.		
C11	22-869	.05 MFD.	400V.		
C12	22-827	.1 MFD.	200V.		
C13	22-916	40 MFD. ELECTROLYTIC	150V.		
C14		20 MFD. "	25V.		
C15		20 MFD. ELECTROLYTIC	150V.		
C16	22-871	20 " "	150V.		
C17		20 " "	150V.		

R1	63-652	120 M OHM	½ W.	1	WAVEMAGNET ASSEMBLY
R2	63-593	47 M OHM	¼ W.	2 S7027	OSC. COIL ASSEMBLY
R3	63-296	220 M OHM	¼ W.	3 95-593	13T I.F. TRANS.
R4	63-669	3.9 MEGOHM	¼ W.	4 95-594	2ND I.F. "
R5	63-1026	VOLUME CONTROL		5 85-190	POWER SWITCH
R6	63-387	4700 OHM	½ W	6 85-197	PHONO SWITCH
R7	63-604	10 MEGOHM	¼ W.		
R8	63-271	1 MEGOHM	¼ W.		
R9	63-600	2.2 MEGOHM	¼ W.	A	13T I.F. TRANS. PRI.
R10	63-1022	150 OHM WIREWOUND	1 W.	B	13T I.F. " SEC.
R11	63-605	1000 OHM	½ W.	C	2ND I.F. " PRI.
R12	63-803	2200 OHM	½ W.	D	2ND I.F. " SEC.
R13	63-591	22 M OHM	¼ W.	F	BROADCAST OSC. (ON GANG)
R14	63-1033	2-SECTION CANDOHM		G	ANTENNA BDCAST (" ")

All voltages measured from point indicated to chassis using a 1000 ohm per volt meter.

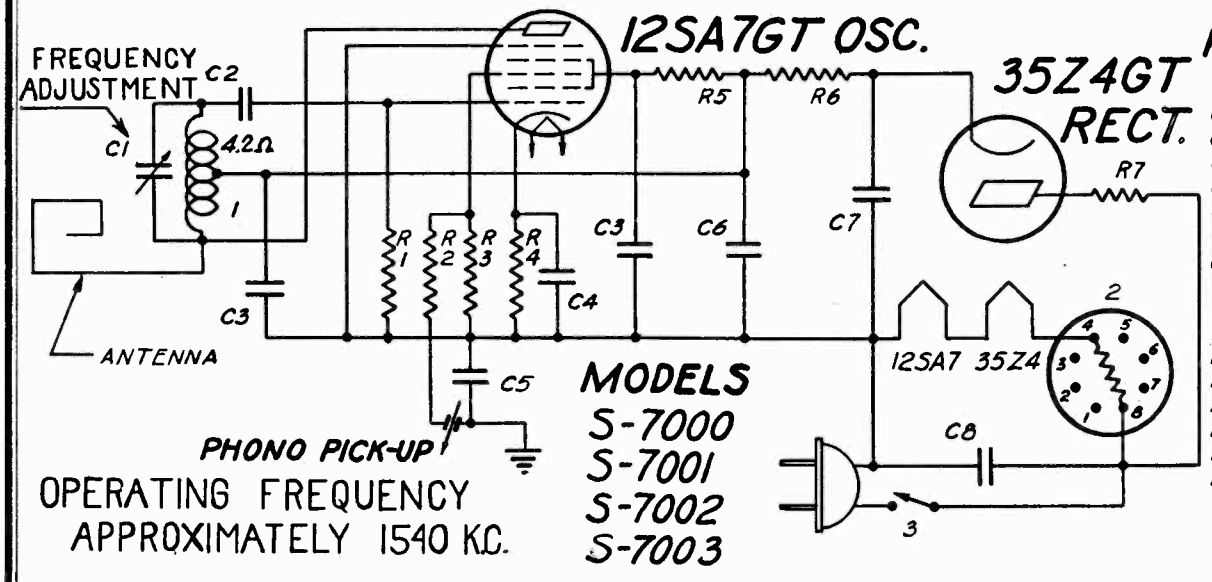
Antenna disconnected — volume control at minimum and condenser plates in full mesh.

All voltages measured using Zenith No. Z659 battery pack.

MODEL SPEAKER
5G484-M 49-337 5½"

CHASSIS Nº 5538
110 VOLT A.C. BATTERY PACK
PORTABLE PHONO

I.F. FREQUENCY 455 KC.



PHONOGRAPH OSCILLATOR

C1	22-690	TUNING CONDENSER	
C2	22-182	.00025 MFD.	600V.
C3	22-243	.01 MFD.	400V.
C4	22-829	.05 MFD.	200V.
C5	22-827	.1 MFD.	200V.
C6	22-876	8 MFD. ELECTROLYTIC	150V.
C7		40 MFD. "	150V.
C8	22-670	.1 MFD.	400V.

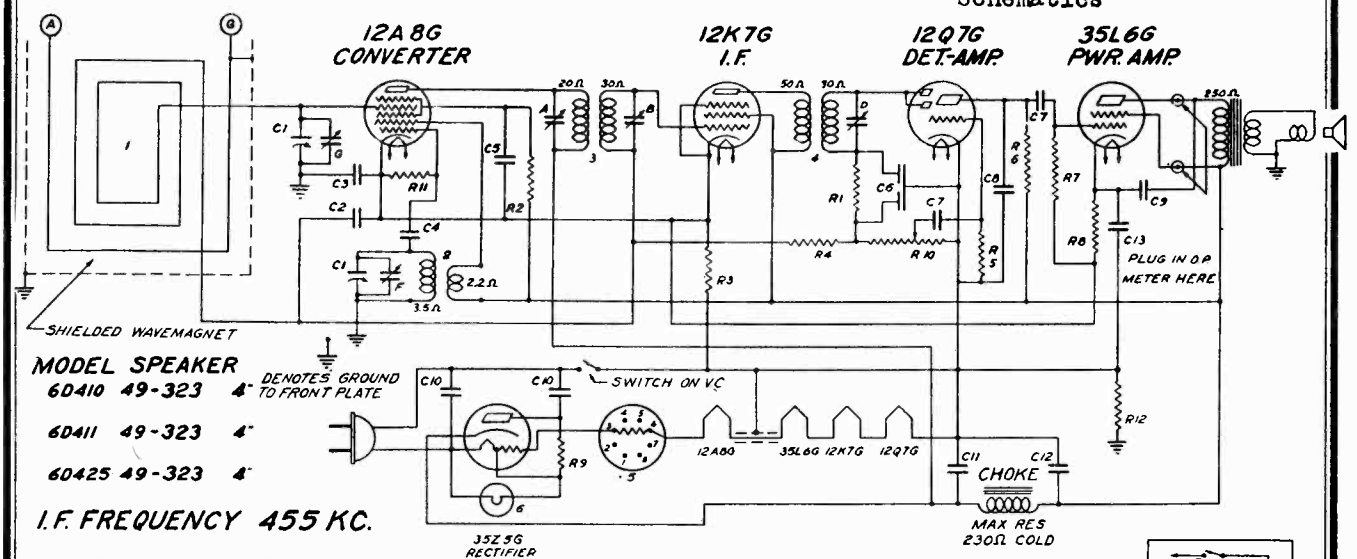
R1	63-591	22 M OHM	¼ W.
R2	63-658	390 M OHM	¼ W.
R3	63-260	100 M OHM	¼ W.
R4	63-583	1000 OHM	¼ W.
R5	63-964	4700 OHM	½ W.
R6	63-803	2200 OHM	½ W.
R7	63-575	47 OHM	¼ W

1	S6854	OSC. COIL ASSEM
2	100-76	BALLAST TUBE
3	85-170	A C SWITCH

FOR ALIGNMENT SEE INDEX

ZENITH RADIO CORP.

MODELS 6D410, 6D411, 6D425
Chassis 5659, 5663
MODELS 6P418, 6P419, 6P428
6P429, 6P430, 6P447, 6P448
6P457
Chassis 5662, 5666
Schematics



MODEL SPEAKER
6D410 49-323 4"
6D411 49-323 4"
6D425 49-323 4"

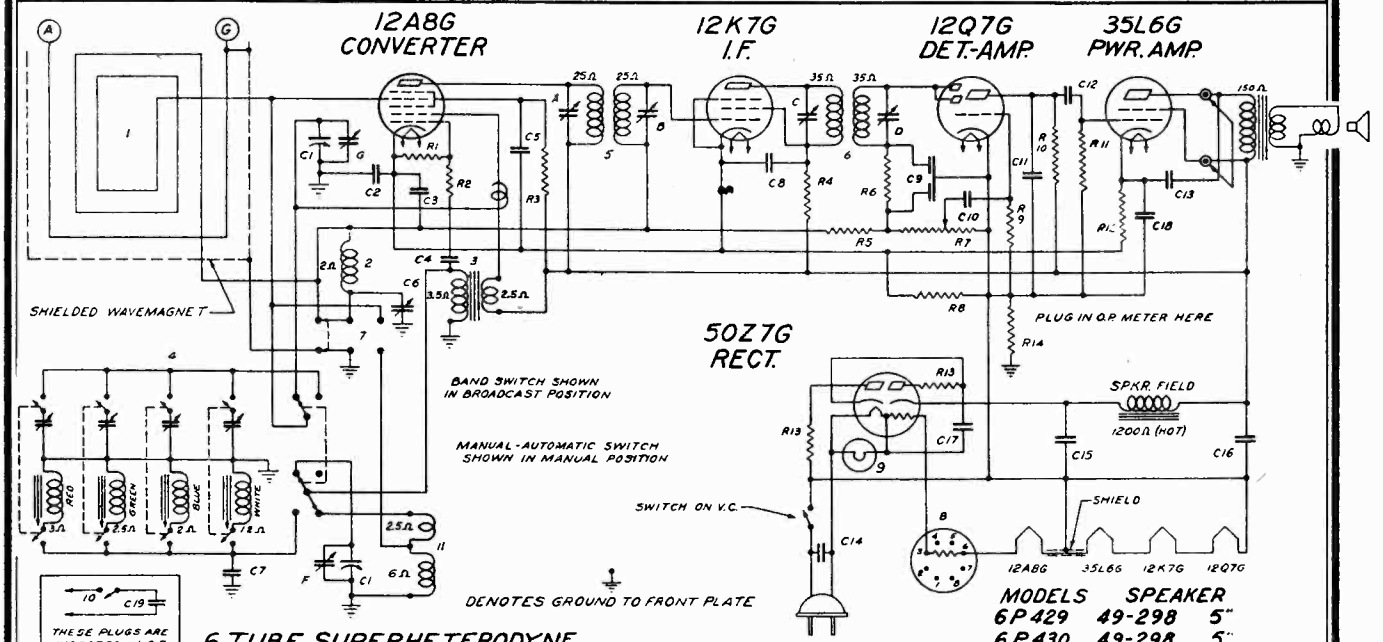
I.F. FREQUENCY 455 KC.

C1	22-885	2-GANG VARIABLE		R1	63-593	47 M OHM	¼ W	4	56903	2ND I.F. TRANS
C2	22-250	.05 MFD	200V	R2	63-591	22 M OHM	¼ W	5	100-77	BALLAST TUBE
C3	22-190	.1 MFD.	200V	R3	63-572	15 OHM	¼ W	6	100-67	PILOT LIGHT 6.3 V. .15 A.
C4		100 MMFD.		R4	63-600	2.2 MEGOHM	½ W	7	MS 517	TONE CONTROL SWITCH
C5	22-841	.02 MFD	200V	R5	63-602	47 MEGOHM	¼ W			
C6		DUAL 100 MMFD.		R6	63-296	220 M OHM	¼ W			
C7	22-837	.01 MFD	400V	R7	63-597	470 M OHM	¼ W			
C8	22-833	.0005 MFD	600V	R8	63-686	150 OHM WIREWOUND	½ W	A		1ST I.F. TRANS PRI.
C9	22-836	.03 MFD	400V	R9	63-1017	27 OHM " "	½ 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		40 MFD	150V	R11	63-713	47 M OHM	¼ W	F		BROADCAST OSC. (ON GANG)
C12	22-835	16 MFD.	150V	R12	63-717	220 M OHM	¼ 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				

FOR OTHER DATA SEE INDEX

C14 — THESE PLUGS ARE INSERTED IN O.P. METER JACKS — USED ON *5663 ONLY

6 TUBE SUPERHETERODYNE
CHASSIS Nº 5659-5663 AC-DC



C19 — THESE PLUGS ARE INSERTED IN O.P. METER JACKS — USED ON Nº 5666 ONLY

6 TUBE SUPERHETERODYNE
VOLTAGE DOUBLER A.C.
CHASSIS Nº 5662 & 5666

FOR OTHER DATA SEE INDEX

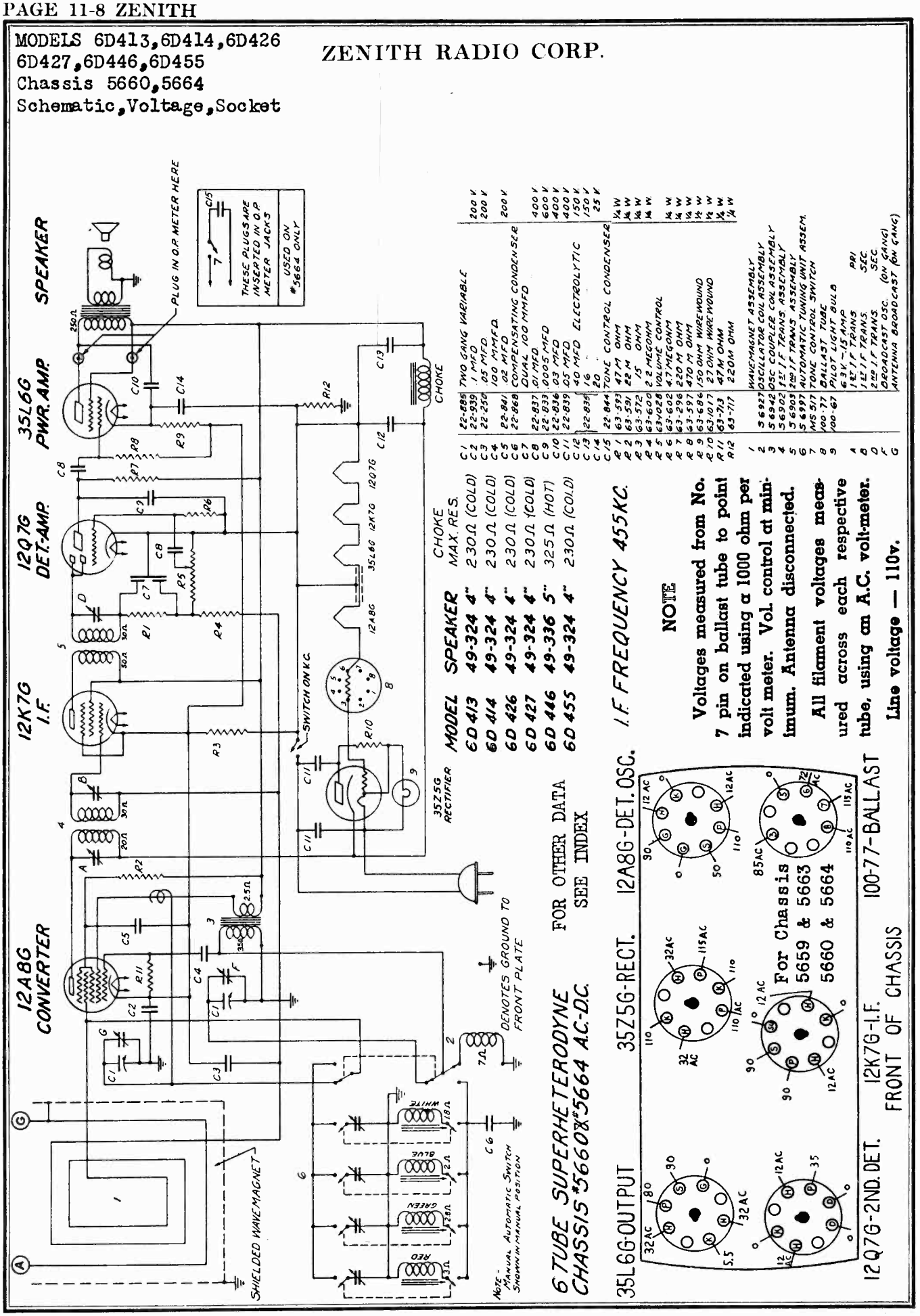
MODELS	SPEAKER	
6P429	49-298	5"
6P430	49-298	5"
6P447	49-298	5"
6P448	49-305	5"
6P457	49-307	10"

C1	22-845	TWO-GANG VARIABLE		C15		20 MFD ELECTROLYTIC	350V	R9	63-978	15 MEGOHM	¼ W	9	100-39 PILOT LIGHT 29 V. .17 A.
C2	22-190	.1 MFD.	200V	C16	22-840	20 " "	250V	R10	63-296	220 M OHM	¼ W	10	MS-517 TONE CONTROL SWITCH
C3	22-250	.05 MFD	200V	C17		20 " "	200V	R11	63-597	470 M OHM	½ W	11	3-7006 OSCILLATOR COIL ASSEMBLY
C4		100 MMFD.		C18		20 " "	25V	R12	63-686	150 OHM WIREWOUND	½ W		
C5	22-842	.02 MFD	400V	C19	22-948	TONE CONTROL COND		R13	63-1023	22 OHM WIREWOUND	½ W		
C6	22-877	TRIMMER CONDENSER						R14	63-717	220 M OHM	¼ 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	¼ W	1		WAVEMAGNET ASSEMBLY		C	2ND I.F. " PRI.
C10	22-838	.005 MFD	600V	R2	63-581	470 OHM	¼ W	2	57004	ANTENNA SHUNT COIL ASSEMBLY		D	2ND I.F. " SEC.
C11	22-833	.0005 MFD	600V	R3	63-591	22 M OHM	¼ W	3	56942	OSC. COUPLER COIL ASSEMBLY		F	BROADCAST OSC. (ON GANG)
C12	22-837	.01 MFD	400V	R4	63-583	1000 OHM	¼ W	4	57024	AUTOMATIC TUNING UNIT ASSEM.		G	ANTENNA BROADCAST (" ")
C13	22-836	.03 MFD	400V	R5	63-722	2.2 MEGOHM	¼ W	5	56915	1ST I.F. TRANS ASSEMBLY			
C14	22-875	.15 MFD	400V	R6	63-593	47 M OHM	¼ W	6	95-598	2ND I.F. TRANSFORMER			
				R7	63-1020	VOLUME CONTROL		7	MS 515	BAND SWITCH			
				R8	63-572	15 OHM	½ W	8	100-79	BALLAST TUBE			

I.F. FREQUENCY 455KC

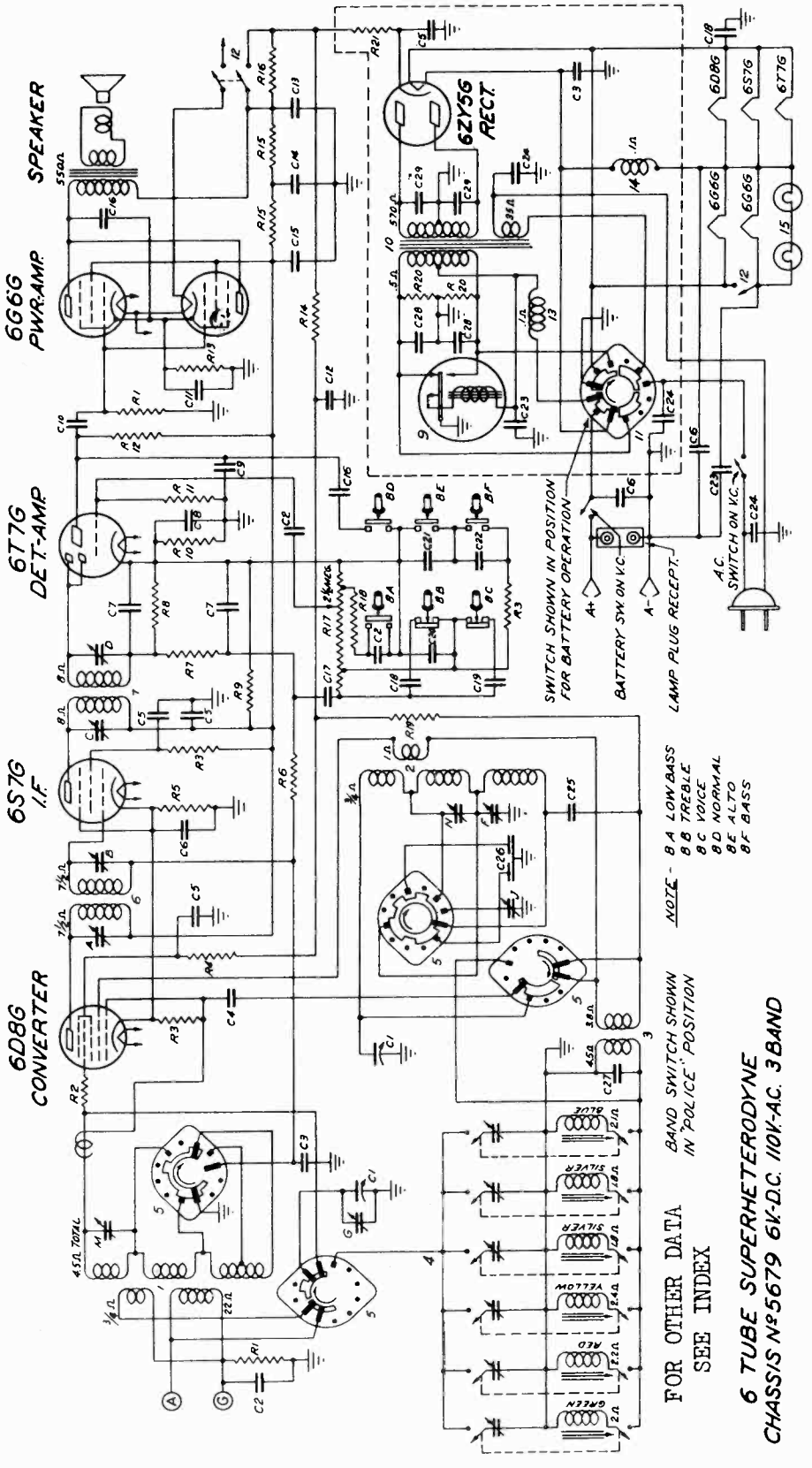
MODELS 6D413,6D414,6D426
6D427,6D446,6D455
Chassis 5660,5664
Schematic,Voltage,Socket

ZENITH RADIO CORP.



ZENITH RADIO CORP.

MODELS 6J436, 6J463
Chassis 5679
Schematic



DENOTES CHASSIS "GROUND"

I.F. FREQUENCY 455 KC.

MODEL	SPEAKER
6J436	49-350 8"
6J463	49-348 10"

DIAG. NO.	PART NO.	DESCRIPTION
C1	22-964	TWO GANG VARIABLE
C2	22-826	.01 MFD.
C3	22-829	.05 MFD.
C4	22-289	50 MMFD.
C5	22-828	.05 MFD.
C6	22-350	.25 MFD.
C7	22-162	.001 MFD.
C8	22-827	.1 MFD.
C9	22-854	.0005 MFD.
C10	22-180	.02 MFD.
C11	22-974	20 MFD. ELECTROLYTIC
C12		20 MFD.
C13		30 MFD. ELECTROLYTIC
C14	22-771	.1 MFD.
C15		.1 MFD.
C16	22-446	.004 MFD.
C17	22-327	.02 MFD.
C18	22-182	.00025 MFD.
C19	22-470	.00015 MFD.
C20	22-716	.005 MFD.
C21	22-458	.006 MFD.
C22	22-326	.003 MFD.
C23	22-199	.5 MFD.
C24	22-830	.02 MFD.
C25	22-358	.002 MFD.
C26	22-973	DUAL OSC. PADDER
C27	22-868	COMPENSATING COND.
C28	22-319	.005 MFD.
C29	22-972	.015 MFD.
R1	63-597	470 M OHM
R2	63-576	68 OHM
R3	63-593	47 M OHM
R4	63-649	56 M OHM
R5	63-628	270 OHM
R6	63-599	1.5 MEGOHM
R7	63-711	22 M OHM
R8	63-659	470 M OHM
R9	63-160	100 M OHM
R10	63-634	820 OHM
R11	63-271	1 MEGOHM
R12	63-296	220 M OHM
R13	63-977	270 OHM WIREWOUND
R14	63-796	10M OHM
R15	63-625	1000 OHM
R16	63-966	4700 OHM
R17	63-990	VOLUME CONTROL
R18	63-591	22 M OHM
R19	63-675	3500 OHM
R20	63-963	120 OHM
R21	63-577	100 OHM
1	S7811	ANTENNA COIL ASSEMBLY
2	S8007	OSCILLATOR COIL ASSEMBLY
3	S7507	OSC. COUPLER COIL ASSEMBLY
4	S7649	AUTOMATIC TUNING UNIT ASSEM.
5	85-210	BAND SELECTOR SWITCH
6	95-649	1ST I.F. TRANSFORMER
7	95-650	2ND I.F. TRANSFORMER
8	S803	TONE CONTROL SWITCH
9	90-11	VIBRATOR
10	95-645	POWER TRANSFORMER
11	85-177	POWER SUPPLY SWITCH
12	85-171	BATT. CONSERVER SWITCH
13	S5043	CHOKE ASSEMBLY
14	S2778	CHOKE ASSEMBLY
15	100-39	PILOT LIGHT 2.9V. .17A
A		1ST I.F. TRANS PRI
B		1ST I.F. - SEC.
C		2ND I.F. - PRI.
D		2ND I.F. - SEC.
E		B'DCAST OSC. (SEE NOTE)
F		ANT B'DCAST (ON GANG)
G		B'DCAST PADDER (SEE NOTE)
J		
M	22-788	SW. ANTENNA
N		POL. BAND OSC. (SEE NOTE)

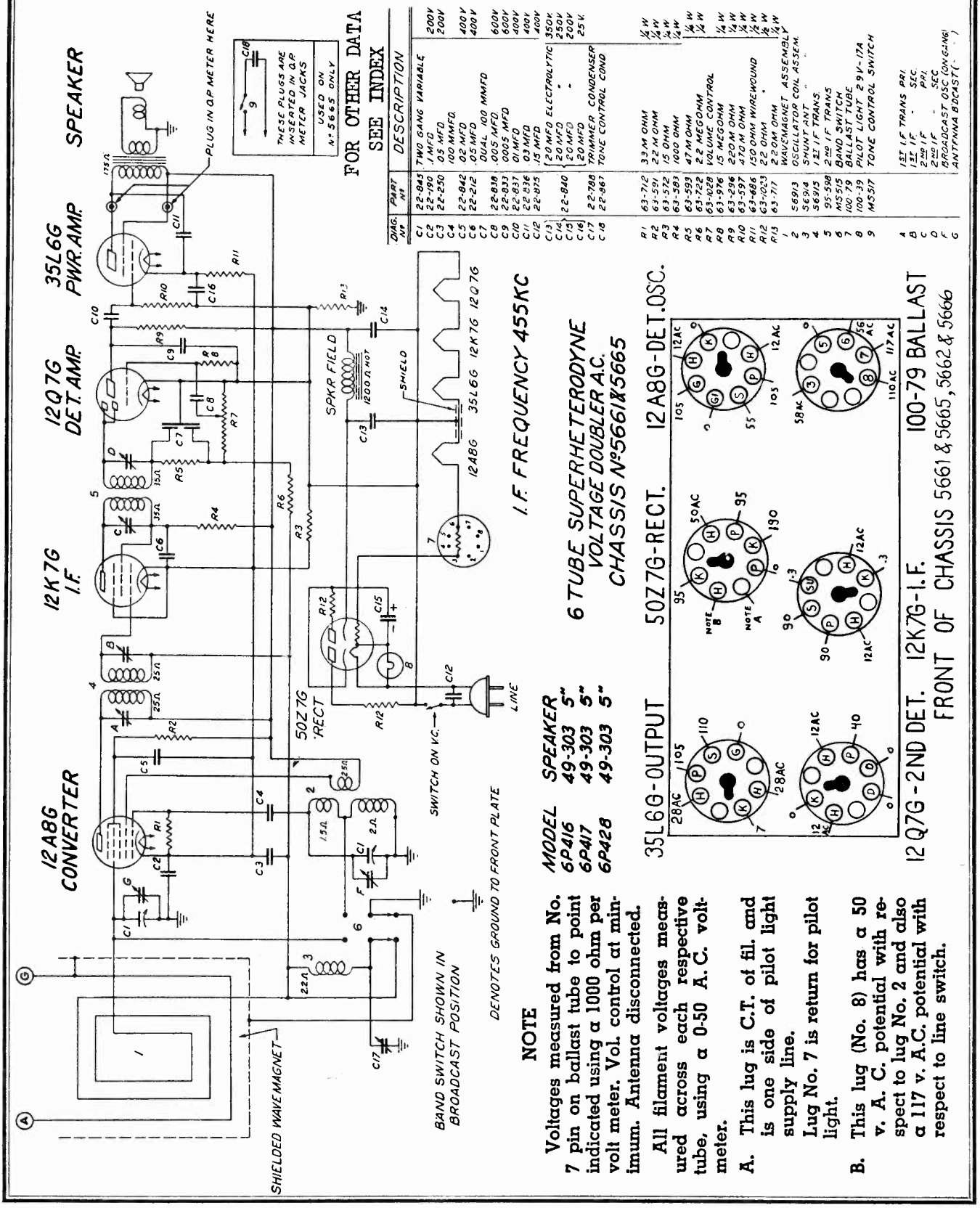
NOTE - TRIMMERS E, J & N ARE MOUNTED ON STRIP #22-1002

6 TUBE SUPERHETERODYNE
CHASSIS Nº5679 6V-D.C. 110V-A.C. 3 BAND

FOR OTHER DATA SEE INDEX

MODELS 6P416 to 6P419, 6P428
Chassis 5661, 5665
Schematic, Voltage, Socket
CHASSIS 5662, 5666
Voltage, Socket

ZENITH RADIO CORP.



MODEL	SPEAKER
6P416	49-303 5"
6P417	49-303 5"
6P428	49-303 5"

DIAG. Nº	PART Nº	DESCRIPTION	
C1	22-845	TWO GANG VARIABLE	200V
C2	22-190	.1 MFD	200V
C3	22-250	.05 MFD	
C4		100 MMFD.	400V
C5	22-842	.02 MFD	400V
C6	22-212	.05 MFD	
C7		DUAL 100 MMFD	
C8	22-838	.005 MFD	600V
C9	22-833	.005 MFD	600V
C10	22-837	.01 MFD	400V
C11	22-836	.03 MFD	400V
C12	22-835	.15 MFD	400V
C13	22-840	20 MFD ELECTROLYTIC	350V
C14		20 MFD "	250V
C15		20 MFD "	200V
C16		20 MFD	25V
C17	22-788	TRIMMER CONDENSER	
C18	22-867	TONE CONTROL COND	
R1	63-712	33 M OHM	½ W
R2	63-591	2.2 M OHM	¼ W
R3	63-532	.5 OHM	¼ W
R4	63-583	1000 OHM	¼ W
R5	63-593	47 M OHM	½ W
R6	63-722	2.2 MEGOHM	½ W
R7	63-028	VOLUME CONTROL	
R8	63-976	.5 MEGOHM	¼ W
R9	63-296	220 M OHM	¼ W
R10	63-597	470 M OHM	¼ W
R11	63-686	150 OHM WIREWOUND	½ W
R12	63-1023	22 OHM "	½ W
R13	63-717	2.2 OM OHM	¼ W
1	5691-3	WAVEMAGNET ASSEMBLY	
2	5691-4	OSCILLATOR COIL ASSEM.	
3	5691-4	SHUNT ANT "	
4	5691-5	1ST I.F. TRANS "	
5	95-598	2ND I.F. TRANS	
6	M5515	BAND SWITCH	
7	100-79	BALLAST TUBE	
8	100-39	PILOT LIGHT 2.9 V-.17A	
9	M5517	TONE CONTROL SWITCH	
A		1ST I.F. TRANS PRI	
B		1ST I.F. " SEC	
C		2ND I.F. " PRI	
D		2ND I.F. " SEC	
E		BROADCAST OSC. COIL (ANTENNA BOOST)	

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.

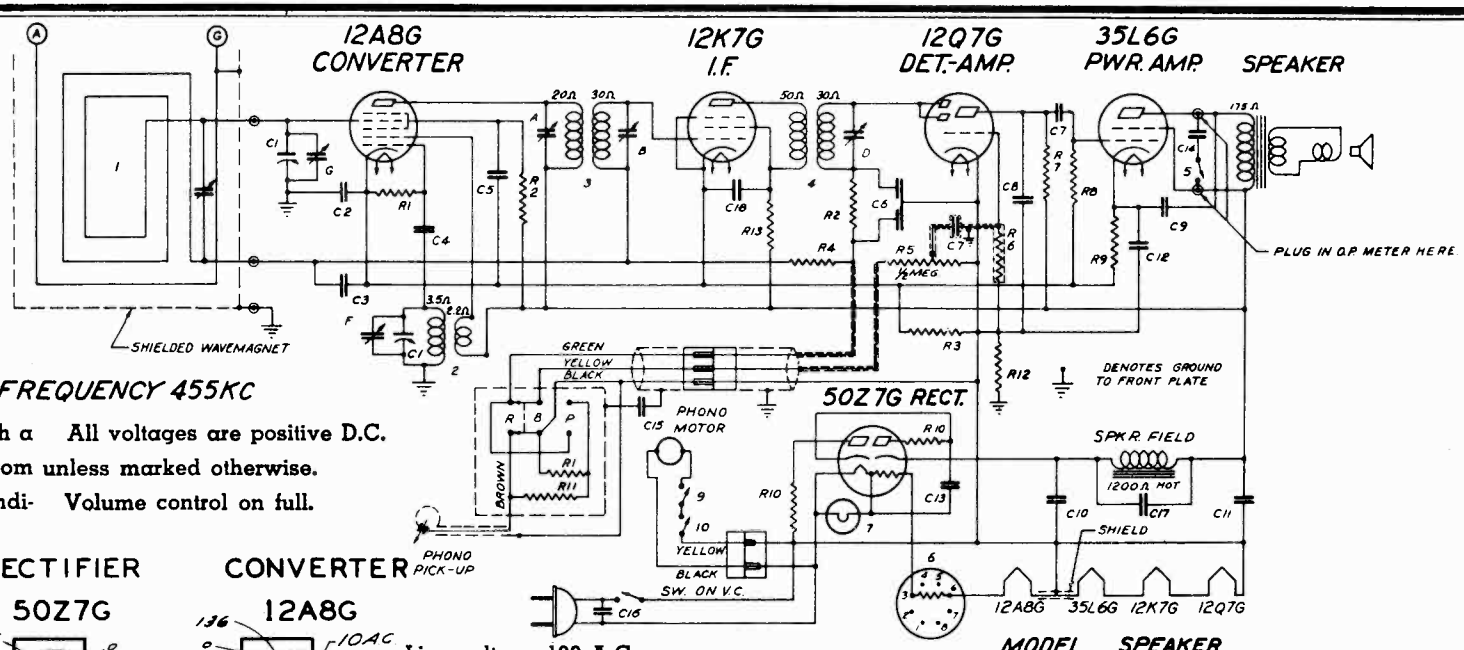
All filament voltages measured across each respective tube, using a 0-50 A.C. voltmeter.

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

F—Filament
H—Heater
D—Diode
G1—Control Grid
G2—Screen Grid
G3—Suppressor Grid
P—Plate
K—Cathode



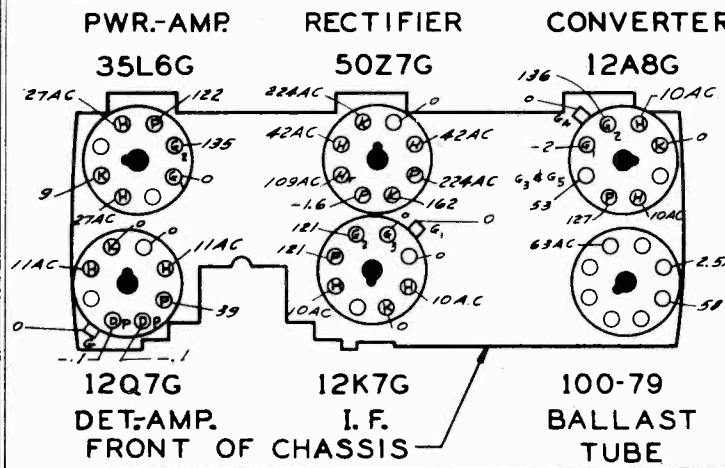
NOTE

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.

I. F. FREQUENCY 455KC

MODEL 6R481 SPEAKER 49-326 5"



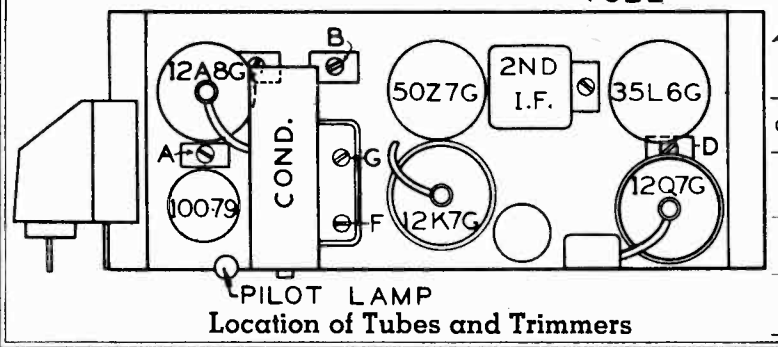
Line voltage 120 A.C.

DIAG. Nº	PART Nº	DESCRIPTION	
C1	22-885	TWO-GANG VARIABLE	
C2	22-938	.2MFD.	200V
C3	22-250	.05 MFD.	200V
C4		100 MMFD.	
C5	22-841	.02 MFD.	200V
C6		DUAL 100 MMFD.	
C7	22-837	.01 MFD.	400V
C8	22-833	.0005 MFD.	400V
C9	22-836	.03 MFD.	400V
C10		20 MFD. ELECTROLYTIC	250V
C11	22-894	20 " "	150V
C12		20 " "	25V
C13	22-893	20 MFD. "	200V
C14	22-844	TONE CONTROL COND.	
C15	22-185	.01 MFD.	200V
C16	22-875	.15 MFD.	400V
C17	22-980	.04 MFD.	400V
C18	22-212	.05 MFD.	400V

R1	63-713	47 M OHM	½ W
R2	63-593	47 M OHM	½ W
R3	63-572	15 OHM	¼ W
R4	63-600	2.2 MEGOHM	¼ W
R5	63-1028	VOLUME CONTROL	
R6	63-724	47 MEGOHM	½ W
R7	63-296	220M OHM	½ W
R8	63-597	470M OHM	½ W
R9	63-686	150 OHM WIREWOUND	½ W
R10	63-1023	22 OHM WIREWOUND	½ W
R11	63-719	470M OHM	¼ W
R12	63-717	220M OHM	¼ W
R13	63-583	1000 OHM	¼ W

1			WAVEMAGNET ASSEMBLY
2	56901		OSC. COIL "
3	56902		1ST I.F. TRANS "
4	56903		2ND I.F. TRANS "
5	MS517		TONE CONTROL SWITCH
6	100-79		BALLAST TUBE
7	100-39		PILOT LIGHT 29V. 0.17A.
8	85-192		PHONO SWITCH
9	85-181		AUTOMATIC STOP SW
10	85-191		A.C SWITCH
A			1ST I.F. TRANS PRI.
B			1ST I.F. " SEC.
D			2ND I.F. " SEC.
F			B'CAST OSC. (ON GANG)
G			ANT. B'CAST (ON GANG)

6 TUBE SUPERHETERODYNE VOLTAGE DOUBLER A.C. CHASSIS Nº5675



Location of Tubes and Trimmers

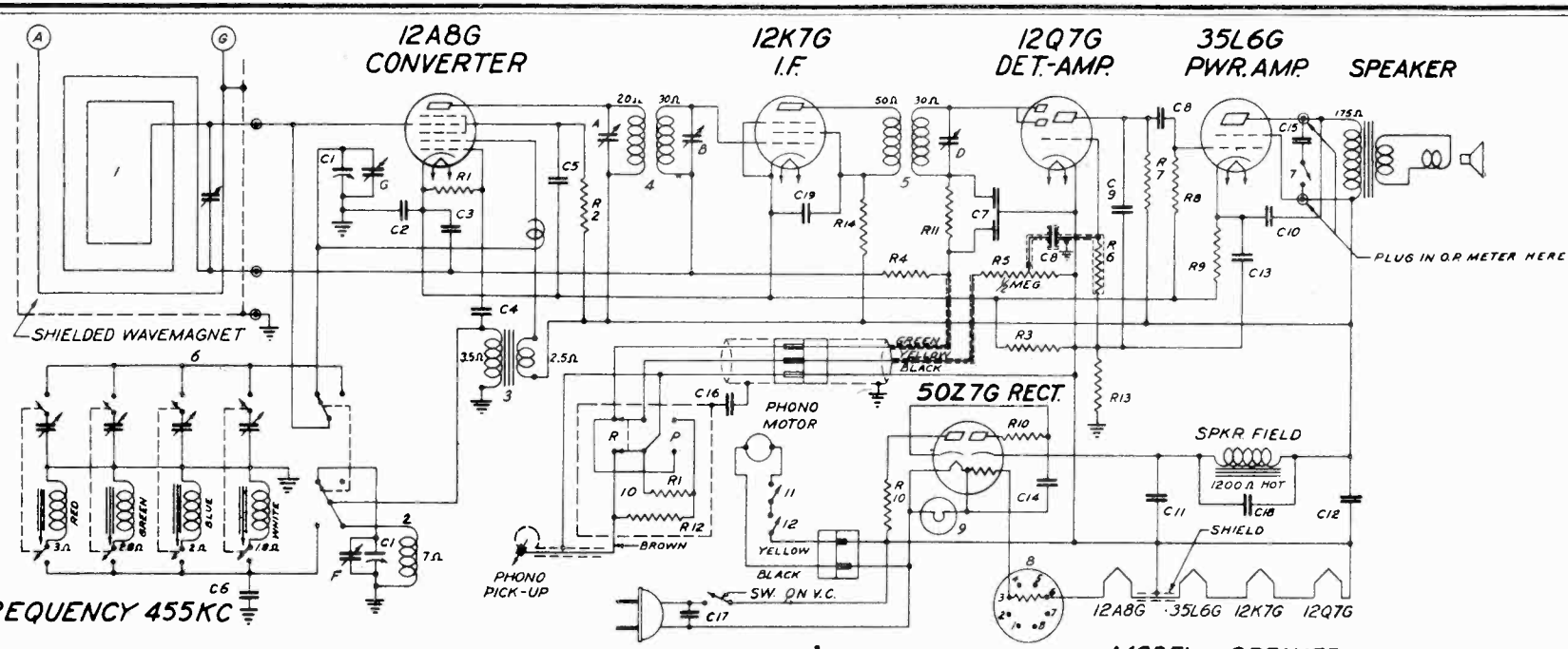
For Chassis 5672-P 5675

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, C	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 6R485
Chassis 5672-P
Schematic, Voltage

ZENITH RADIO CORP.



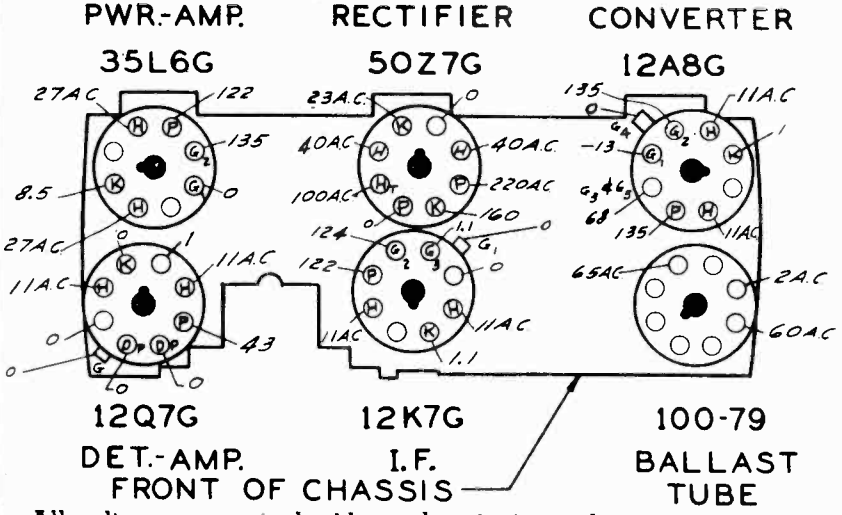
NOTE

All voltages are positive D.C. unless marked otherwise. Volume control on full. Line voltage 112 v. A.C.

MANUAL AUTOMATIC SWITCH SHOWN IN MANUAL POSITION.

DENOTES GROUND TO FRONT PLATE

MODEL 6R485 SPEAKER 49-320 8"



All voltages measured with a 1000 ohm per volt meter from chassis to socket contact indicated.

DIAG. Nº	PART Nº	DESCRIPTION	
C1	22-885	TWO-GANG VARIABLE	
C2	22-938	.2MFD.	200V.
C3	22-250	.05MFD.	200V.
C4		100 MMFD.	
C5	22-841	.02 MFD.	200V.
C6	22-868	COMPENSATING COND.	
C7		DUAL 100 MMFD.	
C8	22-837	.01 MFD.	400V.
C9	22-833	.0005 MFD.	600V.
C10	22-836	.03 MFD.	400V.
C11	22-894	20 MFD. ELECTROLYTIC	250V.
C12		20 " "	150V.
C13		20 " "	25V.
C14	22-893	20 MFD "	200V.
C15	22-844	TONE CONTROL COND.	
C16	22-185	.01 MFD.	200V.
C17	22-875	.15 MFD.	400V.
C18	22-980	.04 MFD.	400V.
C19	22-212	.05 MFD.	400V.

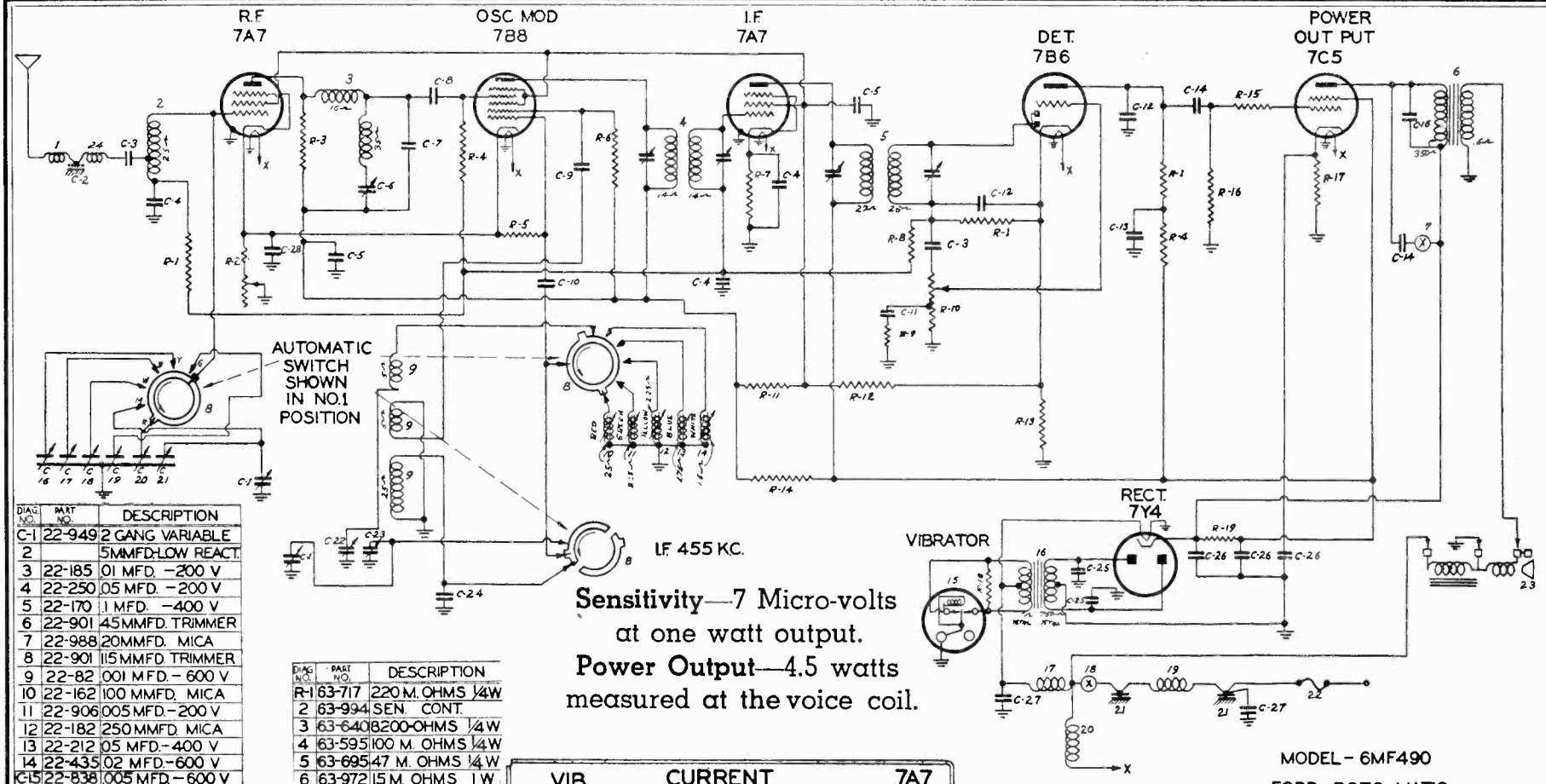
DIAG. Nº	PART Nº	DESCRIPTION	
R1	63-713	47M OHM	½W.
R2	63-591	22M OHM	½W.
R3	63-572	15 OHM	½W.
R4	63-600	2.2 MEGOHM	½W.
R5	63-1028	VOLUME CONTROL	
R6	63-724	4.7 MEGOHM	½W.
R7	63-296	220 M OHM	¼W.
R8	63-597	470 M OHM	¼W.
R9	63-686	150 OHM WIREWOUND	5W.
R10	63-1023	2.2 OHM "	½W.
R11	63-593	47 M OHM	¼W.
R12	63-719	470 M OHM	¼W.
R13	63-717	220 M OHM	¼W.
R14	63-583	1000 OHM	¼W.
1		WAVEMAGNET ASSEMBLY	
2	56927	OSCILLATOR COIL ASSEM.	
3	56942	OSC. COUPLER COIL ASSEM.	
4	56902	1ST I.F. TRANS. ASSEMBLY	
5	56903	2ND I.F. TRANS. "	
6	56997	AUTOMATIC TUNING UNIT ASSEM.	
7	MS517	TONE CONTROL SWITCH	
8	100-79	BALLAST TUBE	
9	100-39	PILOT LIGHT BULB 2.9V. .17A.	
10	85-192	PHONO SWITCH	
11	85-181	AUTOMATIC STOP SWITCH	
12	85-191	A.C. SWITCH	
A		1ST I.F. TRANS PRI.	
B		1ST I.F. " SEC.	
D		2ND I.F. " SEC.	
F		BROADCAST OSC. (ON GANG)	
G		ANTENNA BROADCAST (ON GANG)	

6 TUBE SUPERHETERODYNE
VOLTAGE DOUBLER A.C.
CHASSIS Nº5672-P

FOR OTHER DATA
SEE INDEX

ZENITH RADIO CORP.

MODEL 6MF490
Ford Roto-Matic, 01A18805
Schematic, Voltage



Sensitivity—7 Micro-volts at one watt output.

Power Output—4.5 watts measured at the voice coil.

MODEL - 6MF490

FORD ROTO-MATIC
01A-18805

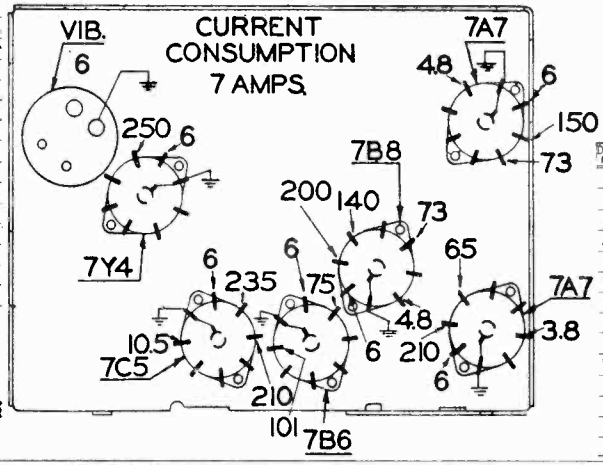
Tuning Range—540-1520 K.C.

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	115 MMFD. 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. - 800 V
26	22-955	10-10-20 MMFD-400-350-25 V
27	22-908	.5 MFD. - 120 V
28	22-190	.1 MFD. - 200 V

DIAG. NO.	PART NO.	DESCRIPTION
R-1	63-717	220 M. OHMS 1/4W
2	63-994	SEN. CONT.
3	63-640	8200-OHMS 1/4W
4	63-595	100 M. OHMS 1/4W
5	63-695	.47 M. OHMS 1/4W
6	63-972	1.5 M. OHMS 1W
7	63-410	1200-OHMS 1/4W
8	63-271	1 MEG OHM 1/4W
9	63-592	33 M. OHMS 1/4W
10	63-1073	VOL. CONT. & SW.
R-11	63-947	27 M. OHMS 2W
12	63-1059	39 M. OHMS 1/2W
13	63-632	560-OHMS 1/4W
14	63-584	1500-OHMS 1/4W
15	63-695	47-OHMS 1/4W
16	63-719	470 M. OHMS 1/4W
17	63-94	330-OHMS 1W
18	63-971	220-OHMS 1/4W
19	63-968	1800-OHMS 2W

ALL MEASUREMENTS WITH 1000 OHM PER VOLT METER FROM CHASSIS GROUND TO POINT INDICATED

ANTENNA DISCONNECTED
VOL. AT MIN.
BATTERY VOLTS-6



DIAG. NO.	PART NO.	DESCRIPTION	DIAG. NO.	PART NO.	DESCRIPTION
1	S-6868	ANT. MOTOR NOISE CHOKE	15	190-15	VIBRATOR
2	S-7588	ANT. COIL ASSEM.	16	95-641	POWER TRANS.
3	S-7572	R.F. COIL ASSEM.	17	20-213	MAIN HASH CHOKE
4	S-7573	1ST I.F. TRANS.	18		SWITCH ON VOL. CONT.
5	S-7574	2ND I.F. TRANS.	19	S-5844	MOTOR NOISE CHOKE
6	95-640	OUTPUT TRANS.	20	20-217	HEATER LINE CHOKE
7	85-208	TONE CONT. SWITCH	21		LOW REACTOR
8	85-207	AUTOMATIC SWITCH	22	136-11	FUSE
9	S-7544	MAN. OSC. COIL ASSEM.	23	49-341	SPEAKER
10	S-7745	AUTO. OSC. COIL ASSEM.	24	S-7760	MOTOR NOISE CHOKE
11	S-7746				
12	S-7747				
13	S-7748				
14	S-7749				

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.

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 with the standard Ford antenna. If the Zenith dummy is not available at your Zenith distributor, you can substitute the values shown.

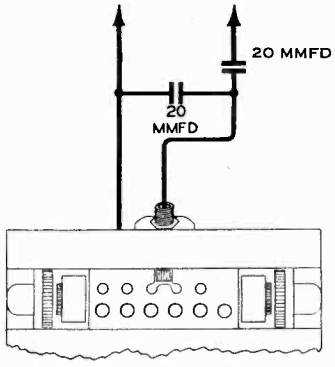


FIG. 2

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 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.

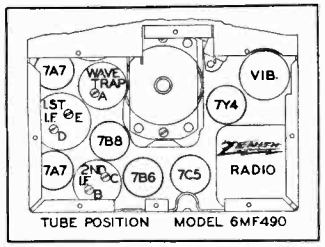


FIG. 3A

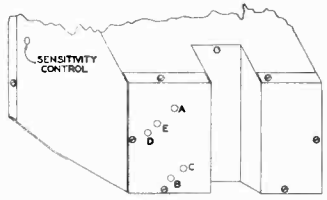


FIG. 3B

R.F.:

The tuning control is rotated until the condenser plates are completely out of mesh (1520 K.C.). Set the signal generator to 1520 K.C. Adjust the 1520 K.C. trimmer shown in Fig. 4 for maximum response.

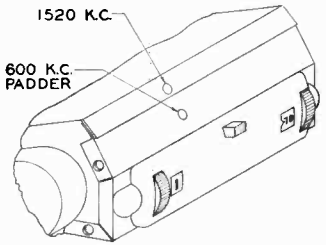


FIG. 4

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).

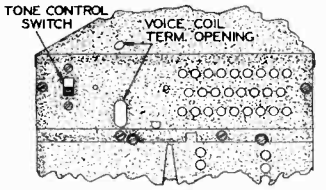


FIG. 6

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.

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

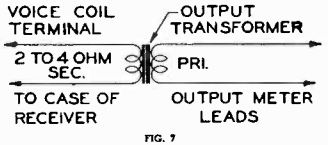


FIG. 7

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.

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.

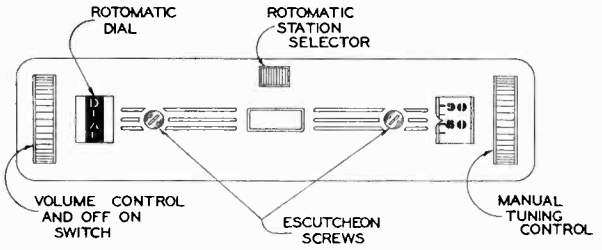


FIG. 8

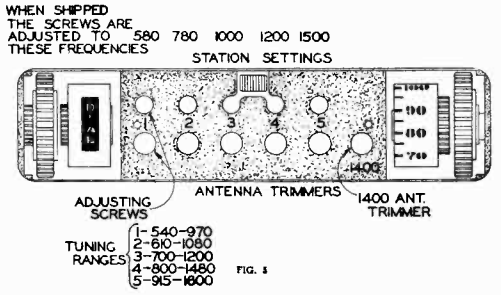


FIG. 5

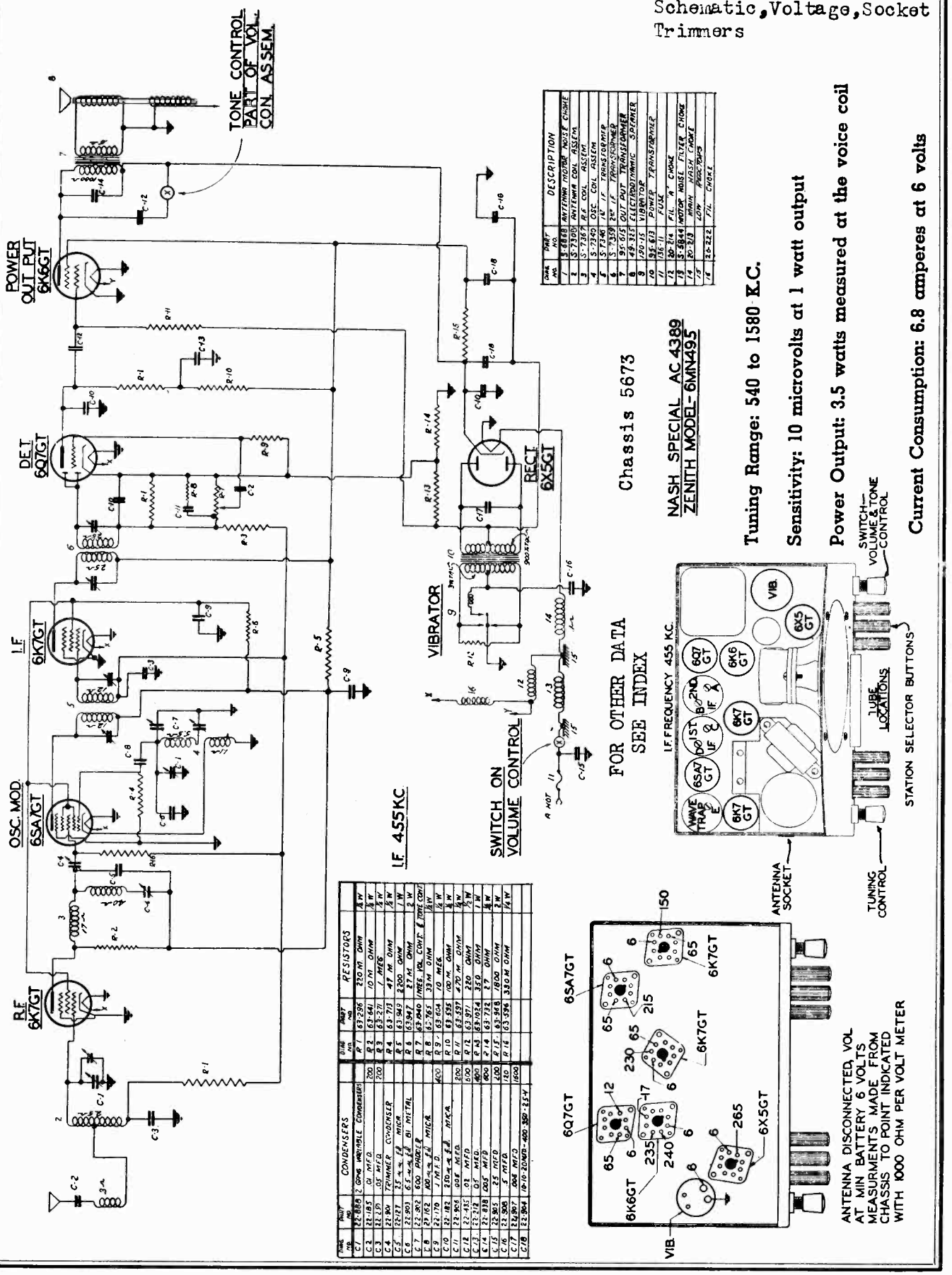
IMPORTANT:

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.

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.

ZENITH RADIO CORP.

MODEL 6MN495
Nash Special AC4389
Chassis 5673
Schematic, Voltage, Socket
Trimmers



CHAS. NO.	PART NO.	DESCRIPTION
1	3-6868	ANTENNA MOTOR NOISE CHOKE
2	3-7305	ANTENNA COIL ASSEM.
3	3-7364	R.F. COIL ASSEM.
4	3-7340	OSC. COIL ASSEM.
5	3-7339	2ND I.F. TRANSFORMER
6	3-7315	OUT PUT TRANSFORMER
7	95-615	ELECTRODYNAMIC SPEAKER
8	48-355	VIBRATOR
9	190-13	POWER TRANSFORMER
10	35-613	FUSE
11	136-11	FIL. "R" CHOKE
12	20-764	FIL. "R" CHOKE
13	3-5844	MOTOR NOISE FILTER CHOKE
14	20-763	ANTENNA CHOKE
15	20-762	I.F. CHOKES
16	36-222	FIL. CHOKE

CHAS. NO.	PART NO.	CONDENSERS		CHAS. NO.	PART NO.	RESISTORS	
C1	22-888	2 GANG VARIABLE CONDENSER		R1	63-286	220 M. OHM	½ W
C2	22-185	.01 MFD.	200	R2	63-641	10 M. OHM	½ W
C3	22-190	.05 MFD.	200	R3	63-227	1 MEG	½ W
C4	21-390	TRIMMER CONDENSER		R4	63-713	47 M. OHM	½ W
C5	22-127	25 MMFD. MICA		R5	63-949	2200 OHM	1 W
C6	22-393	65 MMFD. OIL METAL		R6	63-947	47 M. OHM	2 W
C7	22-392	600 PADDER		R7	63-840	I MEG. VOL. CONT. & TONE CONT	
C8	22-162	100 MMFD. MICA		R8	63-765	33 M. OHM	½ W
C9	22-170	.1 MFD.	400	R9	63-654	10 MEG.	½ W
C10	22-182	370 MMFD. MICA		R10	63-595	100 M. OHM	½ W
C11	22-505	.006 MFD.	200	R11	63-597	470 M. OHM	½ W
C12	22-455	.01 MFD.	600	R12	63-397	220 OHM	2 W
C13	22-218	.05 MFD.	400	R13	63-1024	350 OHM	1 W
C14	22-818	.005 MFD.	600	R14	63-732	1.9 OHM	½ W
C15	22-305	.25 MFD.	400	R15	63-968	1800 OHM	2 W
C16	23-306	.5 MFD.	150	R16	63-596	330 M. OHM	½ W
C17	22-907	.004 MFD.	1600				
C18	23-364	16-16-20 MFD-400-350-25 V					

MODEL 6MN496
Nash Deluxe AC4289
Chassis 5676
Schematic, Voltage, Socket
Trimmers

ZENITH RADIO CORP.

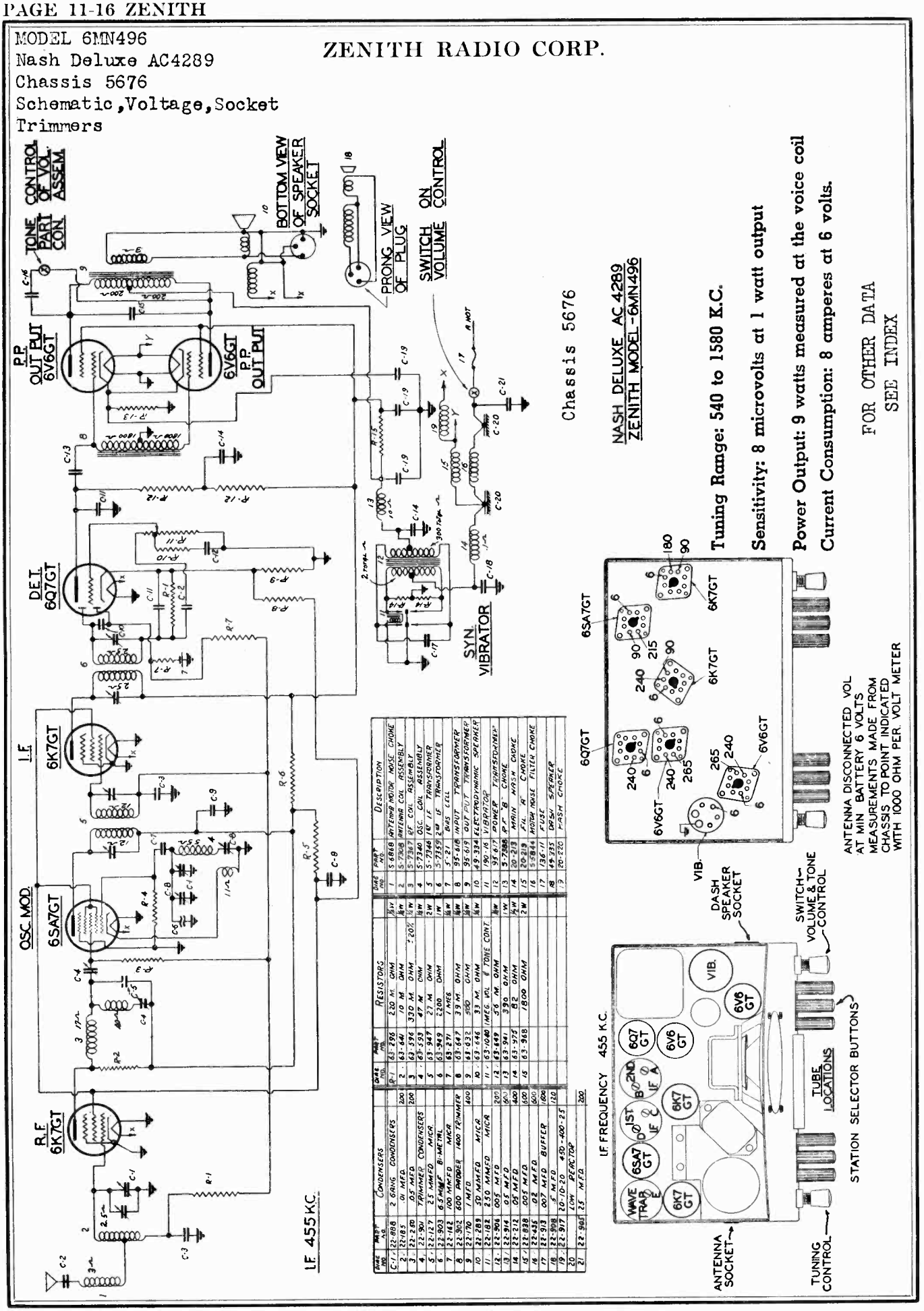
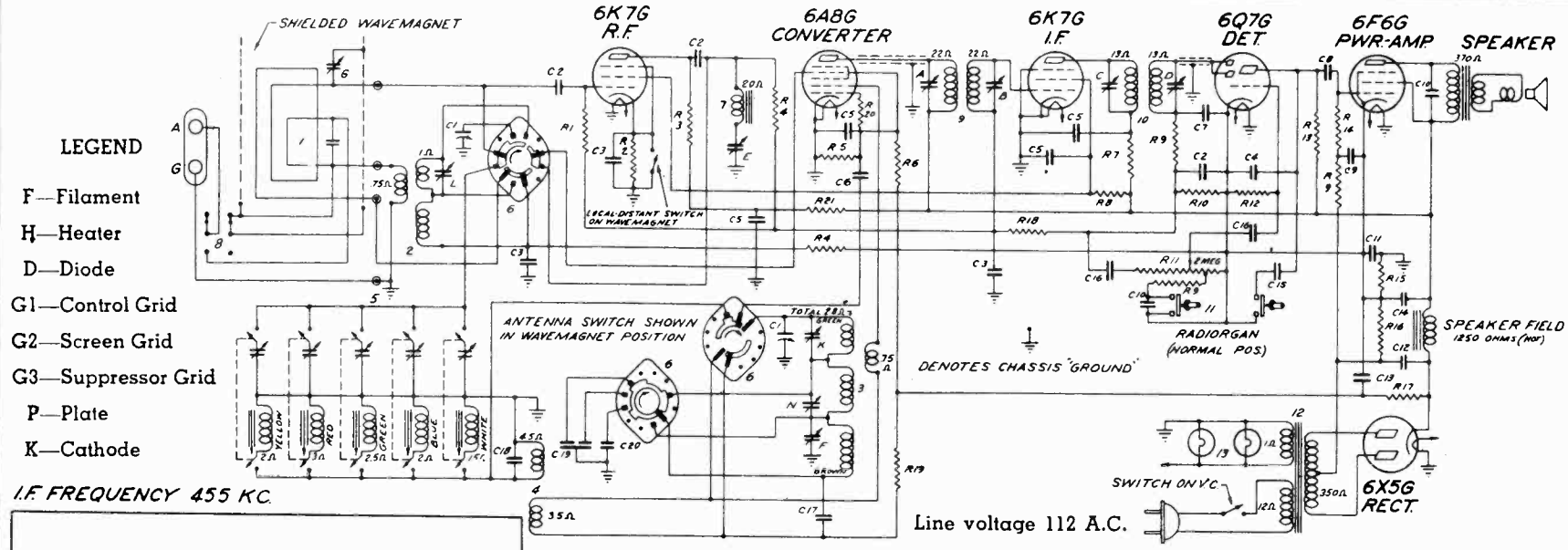


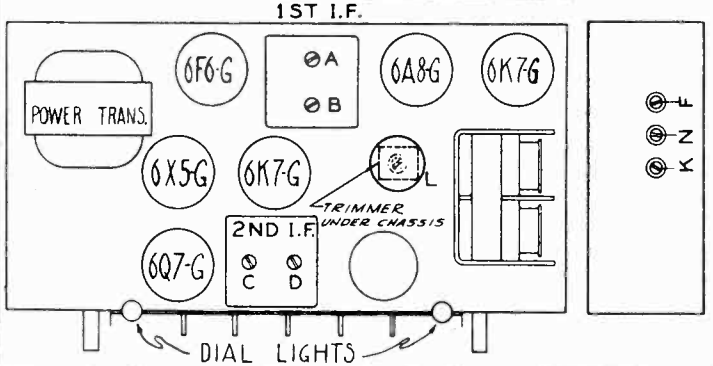
CHART NO.	PART NO.	CONDENSERS	CHART NO.	PART NO.	RESISTORS			CHART NO.	PART NO.	DESCRIPTION
C-1	22-898	2 GANG CONDENSERS	R-1	63-396	220 M. OHM		1/2W	1	5-6868	ANTENNA MOTOR NOISE CHOKE
2	22-185	.01 MFD.	2	63-641	10 M OHM		1/2W	2	5-7308	ANTENNA COIL ASSEMBLY
3	22-240	.05 MFD.	3	63-596	330 M. OHM		1/2W	3	5-7367	R.F. COIL ASSEMBLY
4	22-901	TRIMMER CONDENSERS	4	63-593	47 M OHM		1W	4	5-7340	OSC. COIL ASSEMBLY
5	22-127	2.5 MMFD MICA	5	63-947	27 M OHM		2W	5	5-7348	1ST I.F. TRANSFORMER
6	22-903	6.5 MMF BI-METAL	6	63-949	2200 OHM		1W	6	5-7359	2ND I.F. TRANSFORMER
7	22-142	100 MMFD MICA	7	63-271	1 MEG		1/2W	7	5-721	BIAS CELL
8	22-902	600 PADDER 1400 TRIMMER	8	63-647	39 M OHM		1/2W	8	95-616	INPUT TRANSFORMER
9	22-170	1 MFD 400	9	61-632	560 OHM		1/2W	9	95-619	OUT PUT TRANSFORMER
10	22-289	50 MMFD MICA	10	63-646	33 M. OHM		1/2W	10	49-334	ELECTRODYNAMIC SPEAKER
11	22-182	250 MMFD MICA	11	63-1040	1MEG VOL & TONE CONT.		1/2W	11	190-16	VIBRATOR
12	22-906	.005 MFD 200	12	63-649	56 M. OHM		1W	12	95-617	POWER TRANSFORMER
13	22-914	.05 MFD 600	13	63-941	390 OHM		1W	13	5-7386	R.F. "B" CHOKE
14	22-112	.05 MFD 400	14	63-975	82 OHM		1/2W	14	20-213	MAIN HASH CHOKE
15	22-838	.005 MFD 600	15	63-968	1800 OHM		2W	15	20-219	FIL. "A" CHOKE
16	22-435	.02 MFD BUFFER 600						16	5-7844	MOTOR NOISE FILTER CHOKE
17	22-913	.007 MFD BUFFER 600						17	136-11	FUSE
18	22-908	.1 MFD						18	49-335	DASH SPEAKER
19	22-917	10-10-20 450-400-25 120						19	20-220	HASH CHOKE
20		LOW PEAK TOP								
21	22-904	.25 MFD 200								

ZENITH RADIO CORP.

MODELS 6S439, 6S469
Chassis 5678
Schematic, Voltage, Socket
Trimmers

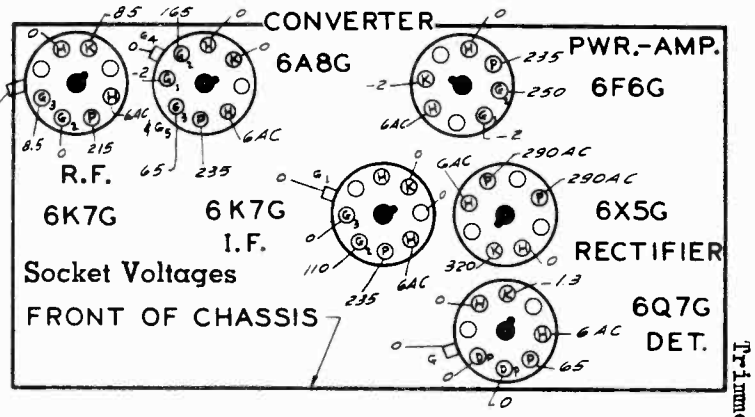


Location of Tubes and Trimmers



MODEL	SPEAKER
6S439	49-364 6"
6S469	49-344 10"

FOR OTHER DATA SEE INDEX



DIAG. NO.	PART NO.	DESCRIPTION		DIAG. NO.	PART NO.	DESCRIPTION		DIAG. NO.	PART NO.	DESCRIPTION		DIAG. NO.	PART NO.	DESCRIPTION
C1	22-849	2 GANG VARIABLE		C20	22-866	OSCILLATOR PADDER		R16	63-1058	280 OHM WIREWOUND	½W	13	100-36	PILOT LIGHT 63V .25A
C2	22-162	.0001 MFD.	600V					R17	63-151	.15 M OHM	1W			
C3	22-829	.05 MFD.	200V					R18	63-599	1.5 MEGOHM	½W			
C4	22-716	.0005 MFD	600V					R19	63-1054	10M OHM	½W	A		1ST I.F. TRANS. PRI.
C5	22-829	.05 MFD.	400V	R1	63-271	1 MEGOHM	½W	R20	63-739	100 OHM	½W	B		1ST I.F. " SEC.
C6	22-289	.50 MMFD.	600V	R2	63-588	6800 OHM	½W	R21	63-585	2200 OHM	½W	C		2ND I.F. " PRI.
C7	22-182	.00025 MFD.	600V	R3	63-607	.15M OHM	½W					D		2ND I.F. " SEC.
C8	22-830	.02 MFD.	600V	R4	63-595	100M OHM	½W	1		WAVEMAGNET ASSEMBLY				
C9	22-819	.03 MFD.	200V	R5	63-592	33M OHM	½W	2	S7546	ANTENNA COIL ASSEMBLY		E		WAVE TRAP
C10	22-229	.005 MFD.	600V	R6	63-381	100M OHM	½W	3	S6937	OSCILLATOR COIL ASSEMBLY		F		BROADCAST OSC. (SEE NOTE)
C11	22-827	.1 MFD.	200V	R7	63-583	1000 OHM	½W	4	S6998	OSC. COUPLER COIL ASSEM.		G		ANTENNA BROADCAST
C12	22-975	20 MFD. ELECTROLYTIC	450V	R8	63-961	47M OHM	1W	5	S7044	AUTOMATIC TUNING ASSEM.		H		SHORT WAVE OSC. (-)
C13	22-976	10 MFD. ELECTROLYTIC	450V	R9	63-593	47M OHM	½W	6	85-205	BAND SELECTOR SWITCH		L	22-788	SHORT WAVE DET.
C14		15 MFD. ELECTROLYTIC	350V	R10	63-659	470M OHM	½W	7	S7300	WAVE TRAP COIL ASSEMBLY		N		POLICE BAND OSC. (-)
C15	22-448	.004 MFD.	600V	R11	63-1038	VOLUME CONTROL	½W	8	85-171	WAVEMAGNET SWITCH				
C16	22-196	.01 MFD.	600V	R12	63-976	15 MEGOHM	½W	9	95-606	1ST I.F. TRANS				NOTE: TRIMMERS F, K, R, N ARE MOUNTED ON STRIP 82-850
C17	22-358	.002 MFD.	600V	R13	63-596	220M OHM	½W	10	95-594	2ND I.F. TRANS.				
C18	22-868	COMPENSATING COND.		R14	63-597	470M OHM	½W	11	S6994	TONE CONTROL SW ASSEM.				
C19	22-853	DUAL OSC. PADDER		R15	63-1057	470 OHM WIREWOUND	½W	12	95-634	POWER TRANS 60~ 115V				

6 TUBE SUPERHETERODYNE
CHASSIS Nº 5678 3BAND

NOTE

All voltages measured with a 1000 ohm per volt meter from chassis to socket contact indicated.

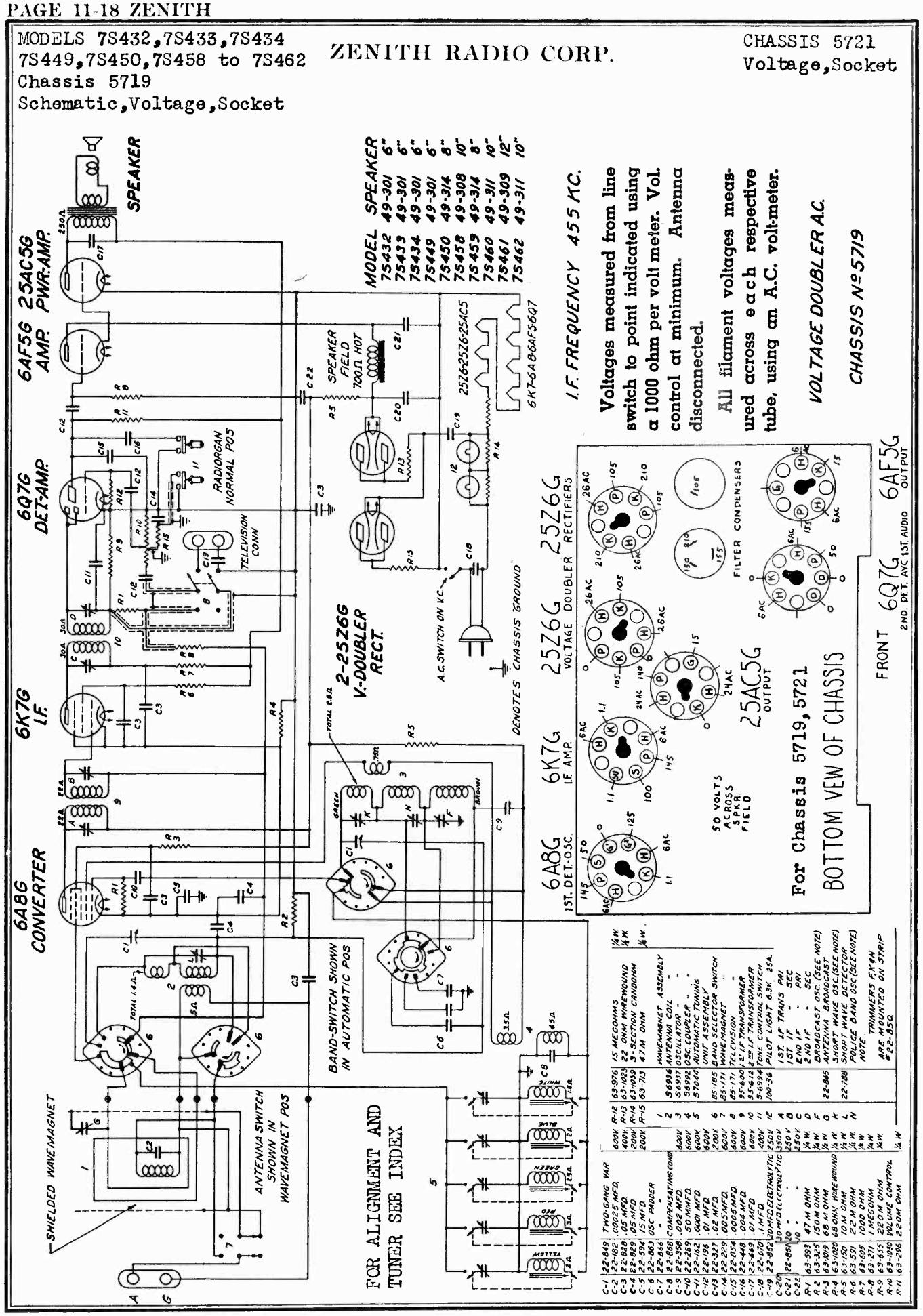
All voltages are positive D.C. unless marked otherwise.

Volume control full on.

MODELS 7S432,7S433,7S434
7S449,7S450,7S458 to 7S462
Chassis 5719
Schematic,Voltage,Socket

ZENITH RADIO CORP.

CHASSIS 5721
Voltage,Socket

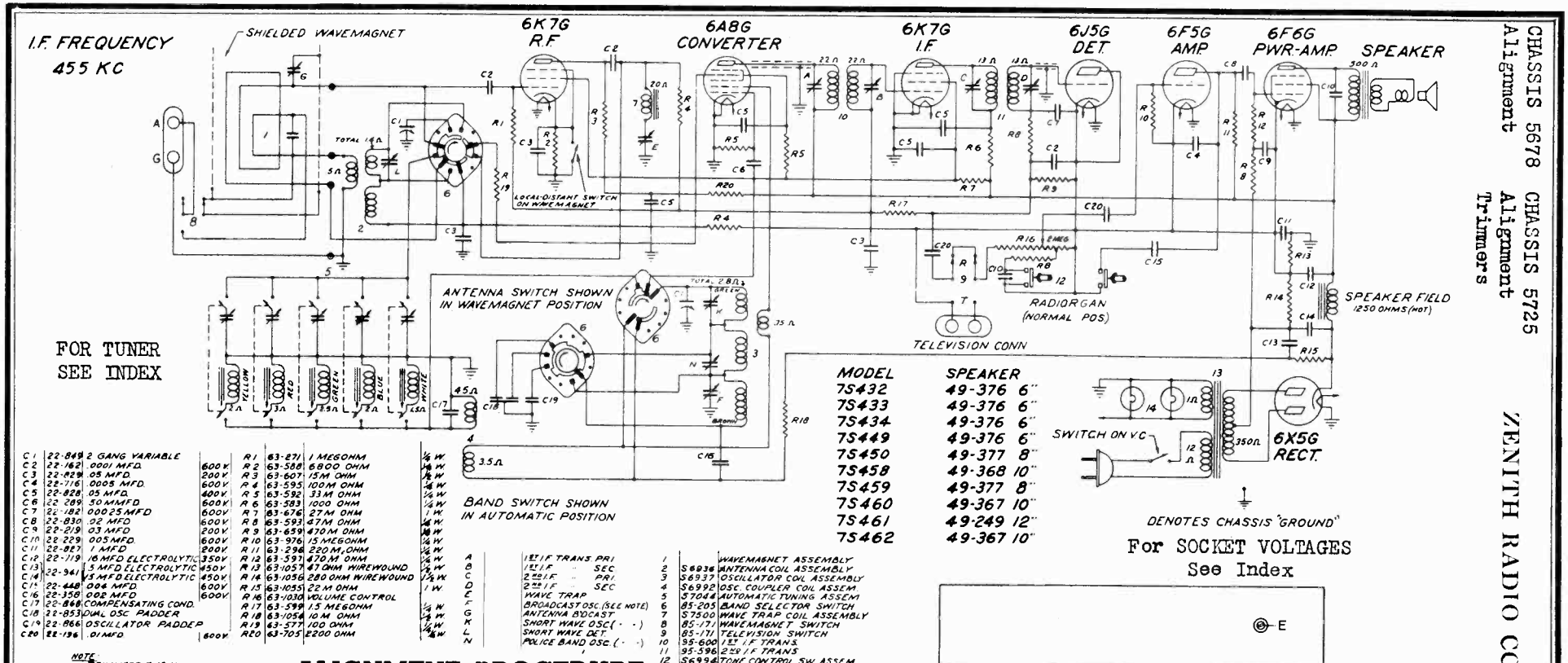


C-1	22-849	TWO-GANG VAR	400V R-12	63-976	15 MEGOHMS ¼W
C-2	22-182	.00025 MFD.	400V R-13	63-1023	22 OHM WIREWOUND ½W
C-3	22-828	.05 MFD.	200V R-14	63-1035	3-SECTION CANDOHM ½W.
C-4	22-829	.05 MFD.	200V R-15	63-713	47M OHM ¼W.
C-5	22-594	.15 MFD.			
C-6	22-863	OSC PADDER	1	56936	WAVEMAGNET ASSEMBLY
C-7	22-866	-	2	56936	ANTENNA COIL - "
C-8	22-868	COMPENSATING COND	3	56937	OSCILLATOR - "
C-9	22-358	.002 MFD.	400V 4	56992	OSC. COUPLER - "
C-10	22-269	.50 MMFD.	600V 5	57048	AUTOMATIC TUNING UNIT ASSEMBLY
C-11	22-162	.0001 MFD.	600V 6	85-185	BAND SELECTOR SWITCH
C-12	22-196	.01 MFD.	200V 7	85-171	WAVEMAGNET "
C-13	22-327	.02 MFD.	600V 8	95-130	TELEVISION "
C-14	22-279	.005 MFD.	600V 9	95-131	1ST I.F. TRANSFORMER
C-15	22-154	.0005 MFD.	600V 10	35648	2ND I.F. "
C-16	22-446	.006 MFD.	600V 11	56994	TONE CONTROL SWITCH
C-17	22-448	.01 MFD.	400V 12	100-36	PILOT LIGHT 6.3V. .25A.
C-18	22-430	.1 MFD.	450V		
C-19	22-852	30 MFD ELECTROLYTIC	350V A		1ST. I.F. TRANS PRI
C-20		30 MFD ELECTROLYTIC	350V B		1ST I.F. " SEC
C-21	22-850	" " "	450V C		2ND I.F. " PRI
R-1	63-593	47 M OHM	¼W. D		2ND I.F. " SEC
R-2	63-325	150 M OHM	¼W. E		BROADCAST OSC (SEE NOTE)
R-3	63-409	68 M OHM	¼W. F	22-865	ANTENNA BROADCAST
R-4	63-1028	68 OHM WIREWOUND	½W. G		SHORT WAVE OSC.(SEE NOTE)
R-5	63-150	10 M OHM	½W. H	22-788	SHORT WAVE DETECTOR
R-6	63-591	2.2 M OHM	¼W. L		POLICE BAND OSC (SEE NOTE)
R-7	63-605	1000 OHM	½W. M		NOTE TRIMMERS F.Y.M.
R-8	63-271	1 MEGOHM	¼W. N		ARE MOUNTED ON STRIP
R-9	63-655	220 M OHM	¼W.		#22-852
R-10	63-1030	VOLUME CONTROL	¼W		
R-11	63-296	220 M OHM	¼W		

CHASSIS 5678 CHASSIS 5725
Alignment Alignment
Trimmers

ZENITH RADIO CORP.

MODELS 7S432, 7S433, 7S434, 7S449
7S450, 7S458 to 7S462
Chassis 5724
Schematic, Alignment, Socket
Trimmers



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"

C1	22-849	2 GANG VARIABLE	
C2	22-162	.0001 MFD.	600 V
C3	22-829	.05 MFD.	200 V
C4	22-716	.0025 MFD.	600 V
C5	22-828	.05 MFD.	400 V
C6	22-289	50 MMFD	600 V
C7	22-182	.00025 MFD	600 V
C8	22-830	.02 MFD	600 V
C9	22-219	.03 MFD.	200 V
C10	22-229	.005 MFD.	600 V
C11	22-827	1 MFD	200 V
C12	22-119	16 MFD ELECTROLYTIC	350 V
C13	22-941	5 MFD ELECTROLYTIC	450 V
C14		5 MFD ELECTROLYTIC	450 V
C15	22-448	.004 MFD.	600 V
C16	22-358	.002 MFD.	600 V
C17	22-868	COMPENSATING COND.	
C18	22-853	DUAL OSC. PADDER	
C19	22-866	OSCILLATOR PADDER	
C20	22-196	.01 MFD.	600 V

R1	63-271	1 MEGOHM	½ W
R2	63-588	6800 OHM	½ W
R3	63-607	.15M OHM	½ W
R4	63-595	100M OHM	½ W
R5	63-592	.33 M OHM	½ W
R6	63-583	1000 OHM	½ W
R7	63-676	27M OHM	1 W
R8	63-593	.47M OHM	½ W
R9	63-659	470 M OHM	½ W
R10	63-976	.15 MEGOHM	½ W
R11	63-298	220 M. OHM	½ W
R12	63-597	470 M OHM	½ W
R13	63-1057	47 OHM WIREWOUND	½ W
R14	63-1056	280 OHM WIREWOUND	1½ W
R15	63-1055	.2 M OHM	1 W
R16	63-1038	VOLUME CONTROL	
R17	63-599	1.5 MEGOHM	½ W
R18	63-1054	10 M OHM	½ W
R19	63-577	100 OHM	½ W
R20	63-705	2200 OHM	½ W

A	1ST I.F. TRANS. PRI.	1	WAVEMAGNET ASSEMBLY
B	1ST I.F. " SEC.	2	S6936 ANTENNA COIL ASSEMBLY
C	2ND I.F. " PRI.	3	S6937 OSCILLATOR COIL ASSEMBLY
D	2ND I.F. " SEC.	4	S6992 OSC. COUPLER COIL ASSEM.
E	WAVE TRAP	5	S7044 AUTOMATIC TUNING ASSEM.
F	BROADCAST OSC. (SEE NOTE)	6	85-205 BAND SELECTOR SWITCH
G	ANTENNA B'CAST	7	S7500 WAVE TRAP COIL ASSEMBLY
H	SHORT WAVE OSC. (· ·)	8	85-171 WAVEMAGNET SWITCH
K	SHORT WAVE DET.	9	85-171 TELEVISION SWITCH
L	POLICE BAND OSC. (· · ·)	10	95-600 1ST I.F. TRANS.
M		11	95-596 2ND I.F. TRANS.
N		12	S6994 TONE CONTROL SW. ASSEM.
		13	95-634 POWER TRANS. 60~ 115 V.
		14	100-36 PILOT LIGHT 6.3 V. .25 A.

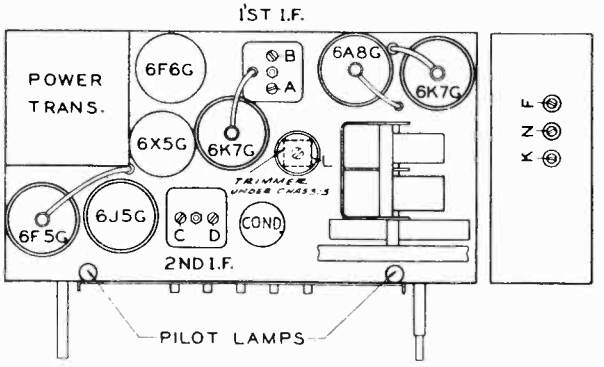
NOTE: TRIMMERS F, K & N ARE MOUNTED ON STRIP #22-950.

ALIGNMENT PROCEDURE

For Chassis 5678, 5724 and 5725

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.	J	Adjust Wavetrap for Minimum
3	Antenna Post (On Loop)	400 Ohms	18000 Kc.	S. W.	18000 Kc.	F	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.	G	Rock Gang and Adjust for Max.
6	Generator Loosely Coupled to Loop		1500 Kc.	Broadcast	1500 Kc.	H	Set Oscillator to Scale
7	Thru One or Two Turns		1400 Kc	Broadcast	1400 Kc.	K	Alignment of Antenna

For SOCKET VOLTAGES See Index

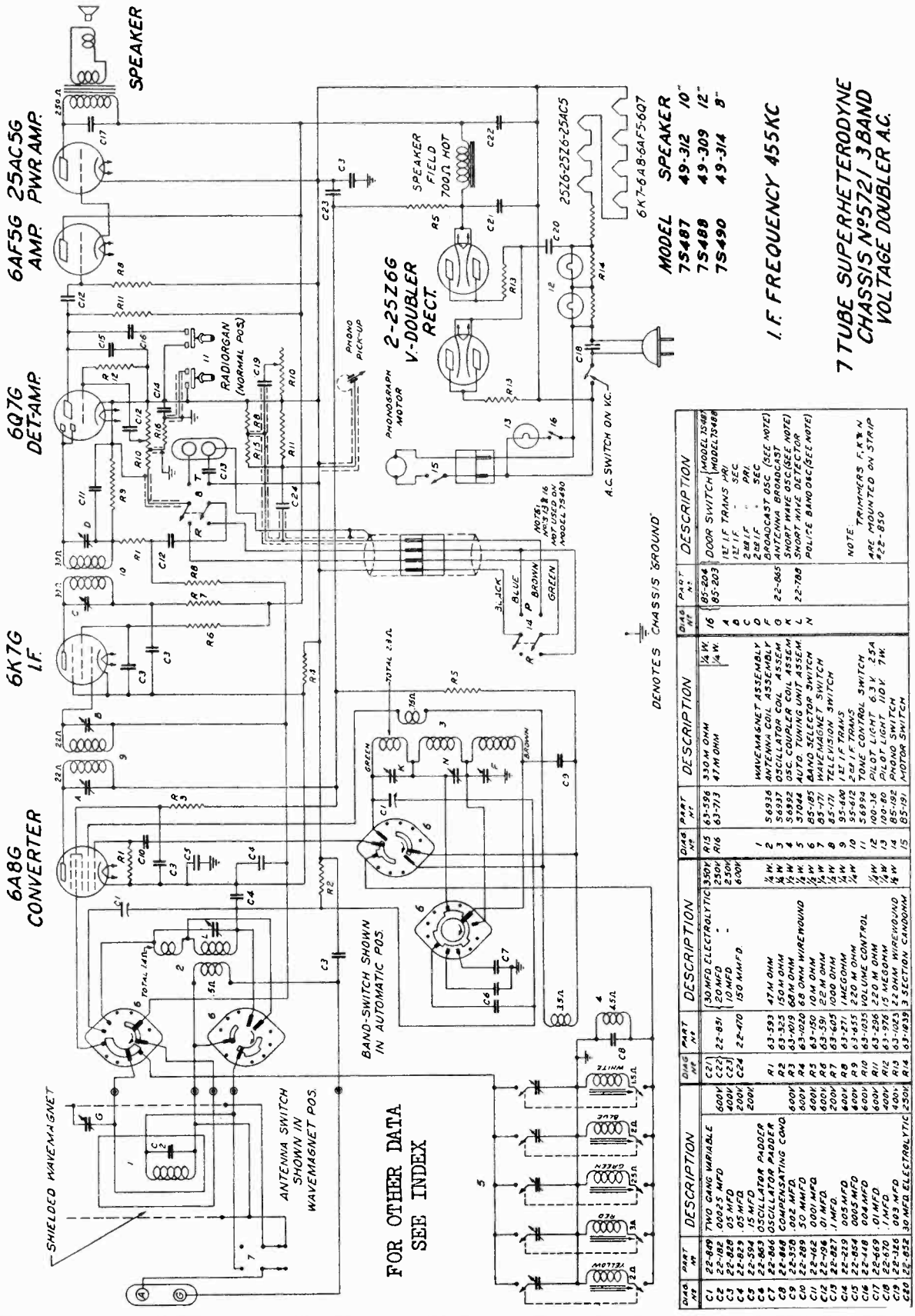


Location of Tubes and Trimmers
For Chassis 5724 and 5725

7 TUBE SUPERHETERODYNE
CHASSIS Nº 5724 3 BAND

MODELS 7S487, 7S488, 7S490
Chassis 5721
Schematic

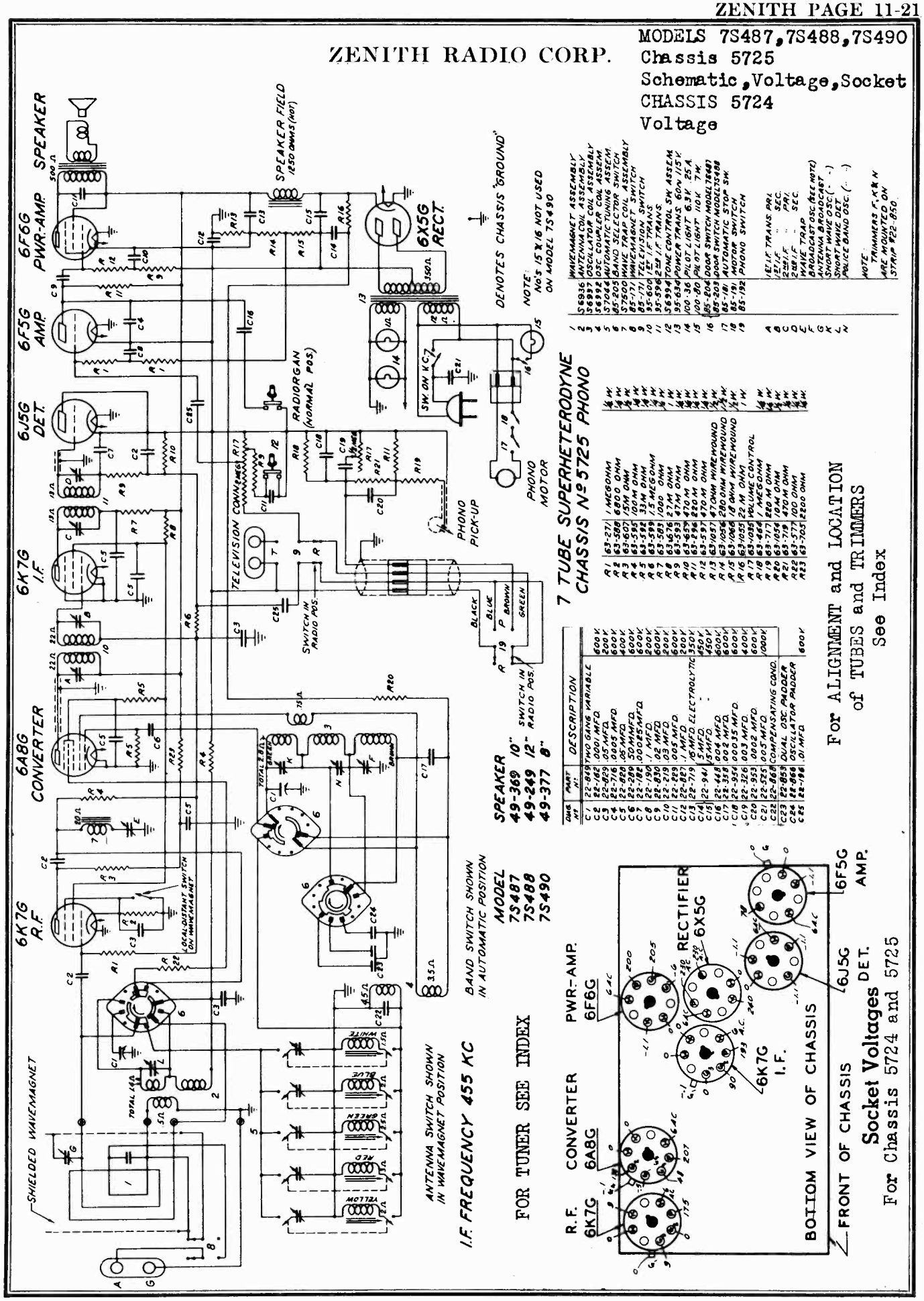
ZENITH RADIO CORP.



DIAG. NO.	PART NO.	DESCRIPTION		DIAG NO.	PART NO.	DESCRIPTION		DIAG NO.	PART NO.	DESCRIPTION
C1	22-849	TWO GANG VARIABLE	600V	C21		(30 MFD ELECTROLYTIC	350V	R15	63-596	330 M OHM	¼ W.	16	85-204	DOOR SWITCH (MODEL 7S487
C2	22-182	.00025 MFD	400V	C22	22-851	20 MFD -	250V	R16	63-713	47 M OHM	¼ W.		85-203	(MODEL 7S488
C3	22-828	.05 MFD	200V	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	22-394	.15 MFD	200V									C		2ND I.F. " PRI.
C6	22-863	OSCILLATOR PADDER		R1	63-593	47 M OHM	¼ W.	2	56936	WAVEMAGNET ASSEMBLY		D		2ND I.F. " SEC.
C7	22-866	OSCILLATOR PADDER		R2	63-325	150 M OHM	½ W.	3	56937	ANTENNA COIL ASSEMBLY		F	22-865	BROADCAST OSC (SEE NOTE)
C8	22-868	COMPENSATING CONO	600V	R3	63-1019	68 M OHM	½ W.	4	56932	OSCILLATOR COIL ASSEM.		G		ANTENNA BROADCAST (SEE NOTE)
C9	22-350	.002 MFD.	600V	R4	63-1020	68 OHM WIREWOUND	½ W.	5	37044	OSC. COUPLER COIL ASSEM.		K		SHORT WAVE OSC (SEE NOTE)
C10	22-289	50 MMFD	600V	R5	63-150	10 M OHM	½ W.	6	85-185	AUTO. TUNING UNIT ASSEM.		L	22-788	SHORT WAVE DETECTOR
C11	22-462	.0001 MFD	600V	R6	63-591	22 M OHM	½ W.	7	85-171	BAND SELECTOR SWITCH		N		POLICE BAND OSC (SEE NOTE)
C12	22-396	.01 MFD.	600V	R7	63-605	1000 OHM	½ W.	8	85-171	WAVEMAGNET SWITCH				
C13	22-827	.1 MFD.	200V	R8	63-271	1 MEGOHM	½ W.	9	85-600	TELEVISION SWITCH				
C14	22-219	.005 MFD	600V	R9	63-655	220 M OHM	½ W.	10	85-612	1ST I.F. TRANS				NOTE: TRIMMERS F, K & N
C15	22-854	.0005 MFD	600V	R10	63-1035	VOLUME CONTROL	1W	11	56934	TONE CONTROL SWITCH				ARE MOUNTED ON STRIP
C16	22-418	.004 MFD	600V	R11	63-256	220 M OHM	½ W.	12	56935	PILOT LIGHT 6.3 V .25A				#22-850
C17	22-869	.01 MFD	600V	R12	63-976	1.5 MEGOHM	½ W.	13	100-16	PILOT LIGHT 110V 7W				
C18	22-870	.1 MFD	400V	R13	63-1023	3.2 M OHM WIREWOUND	4W	14	85-192	PHONO SWITCH				
C19	22-326	.003 MFD	400V	R14	63-1039	3 SECTION CANOHM		15	85-191	MOTOR SWITCH				
C20	22-852	30 MFD ELECTROLYTIC	250V											

ZENITH RADIO CORP.

MODELS 7S487, 7S488, 7S490
Chassis 5725
Schematic, Voltage, Socket
CHASSIS 5724
Voltage



DWG. Nº	PART Nº	DESCRIPTION	
C1	22-849	TWO GANG VARIABLE	600V.
C2	22-182	.0001 MFD.	600V.
C3	22-823	.05 MFD.	200V.
C4	22-776	.0005 MFD.	600V.
C5	22-820	.05 MFD.	400V.
C6	22-209	50 MMFD.	600V.
C7	22-181	.00025 MFD.	600V.
C8	22-830	.02 MFD.	600V.
C9	22-830	.02 MFD.	600V.
C10	22-219	.03 MFD.	200V.
C11	22-229	.005 MFD.	600V.
C12	22-827	.1 MFD.	200V.
C13	22-719	16 MFD. ELECTROLYTIC	350V.
C14	22-941	5 MFD.	450V.
C15		5 MFD.	450V.
C16	22-448	.004 MFD.	600V.
C17	22-338	.002 MFD.	600V.
C18	22-324	.00035 MFD.	600V.
C19	22-326	.003 MFD.	600V.
C20	22-393	.002 MFD.	600V.
C21	22-325	.005 MFD.	1000V.
C22	22-868	COMPENSATING COND.	
C23	22-853	DUAL OSC. PADDER	
C24	22-866	OSCILLATOR PADDER	600V.
C25	22-198	.01 MFD.	600V.

R1	63-271	1 MEGOHM	½ W.
R2	63-580	6800 OHM	½ W.
R3	63-607	15M OHM	½ W.
R4	63-595	100 M OHM	½ W.
R5	63-582	33M OHM	½ W.
R6	63-599	1.5 MEGOHM	½ W.
R7	63-581	1000 OHM	1 W.
R8	63-676	27M OHM	½ W.
R9	63-593	47M OHM	½ W.
R10	63-598	220 M OHM	½ W.
R11	63-597	470 M OHM	½ W.
R12	63-1057	470M WIREWOUND	1 W.
R13	63-1056	280 OHM WIREWOUND	2 W.
R14	63-1066	18 OHM WIREWOUND	2 W.
R15	63-1055	22 M. OHM	1 W.
R16	63-1085	VOLUME CONTROL	
R17	63-464	1 MEGOHM	½ W.
R18	63-717	220 M OHM	½ W.
R19	63-1054	10M OHM	½ W.
R20	63-719	470 M OHM	½ W.
R21	63-577	100 OHM	½ W.
R22	63-705	2200 OHM	½ W.
R23			½ W.

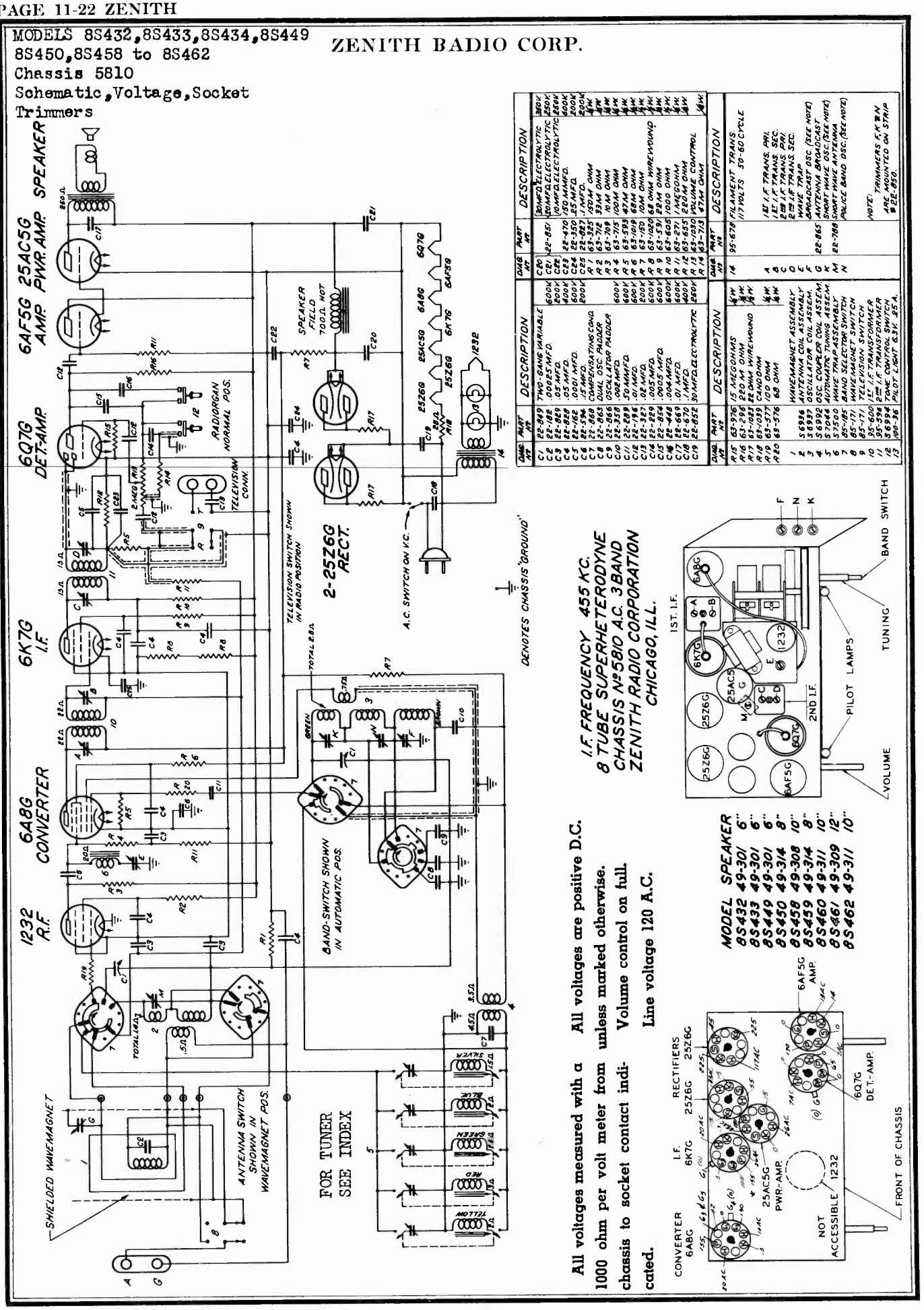
S6936	WAVEMAGNET ASSEMBLY	
S6937	ANTENNA COIL ASSEMBLY	
S6938	OSC. COUPLER COIL ASSEM.	
S7044	AUTOMATIC TUNING ASSEM.	
85-205	BAND SELECTOR SWITCH	
S7500	WAVE TRAP COIL ASSEMBLY	
85-171	WAVEMAGNET SWITCH	
85-171	TELEVISION SWITCH	
85-602	2ND I.F. TRANS.	
85-603	1ST I.F. TRANS.	
S6934	TONE CONTROL SW. ASSEM.	
35-634	POWER TRANS. 60W 115V.	
100-36	PILOT LIGHT 6.3V. .25A.	
100-80	PILOT LIGHT 110V. 7W.	
85-204	DOOR SWITCH MODEL 7S487	
85-203	DOOR SWITCH MODEL 7S488	
85-181	AUTOMATIC STOP SW.	
85-191	MOTOR SWITCH	
85-192	PHONO SWITCH	

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. (")	
L	SHORT WAVE DET. (")	
N	POLICE BAND OSC. (")	

NOTE: TRIMMERS F, K & N ARE MOUNTED ON STRIP Y22-850.

MODELS 8S432,8S433,8S434,8S449
8S450,8S458 to 8S462
Chassis 5810
Schematic,Voltage,Socket
Trimmers

ZENITH RADIO CORP.



DIAG. NO.	PART NO.	DESCRIPTION	
C1	22-849	TWO-GANG VARIABLE	600V
C2	22-828	.0025 MFD.	600V
C3	22-829	.05 MFD.	200V
C4	22-828	.05 MFD.	400V
C5	22-162	.0001 MFD.	600V
C6	22-594	.1 MFD.	200V
C7	22-868	COMPENSATING CONO.	
C8	22-863	DUAL OSC. PADDER	
C9	22-866	OSCILLATOR PADDER	600V
C10	22-858	.002 MFD.	600V
C11	22-869	.50 MMFD.	600V
C12	22-865	.01 MFD.	200V
C13	22-829	.05 MFD.	600V
C14	22-854	.005 MFD.	600V
C15	22-856	.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	22-857	30 MFD. ELECTROLYTIC	350V
C21		10 MFD. ELECTROLYTIC	250V
C22		10 MFD. ELECTROLYTIC	250V
C23	22-870	.150 MMFD.	600V
C24	22-350	.25 MFD.	200V
C25	21-882	.1 MFD.	200V
R1	63-325	.50 M Ω	½W
R2	63-712	.33 M Ω	½W
R3	63-709	.10 M Ω	½W
R4	63-693	.470 M Ω	½W
R5	63-1018	.68 M Ω	½W
R6	63-1020	.68 M Ω	½W
R7	63-1021	.10 M Ω	½W
R8	63-1020	.68 M Ω WIREWOUND	1W
R9	63-539	.22 M Ω	½W
R10	63-605	.1000 Ω	½W
R11	63-271	.1 MEGOHM	½W
R12	63-635	.220 M Ω	1W
R13	63-1030	VOLUME CONTROL	
R14	63-713	.47 M Ω	½W

DIAG. NO.	PART NO.	DESCRIPTION	
R15	63-976	.15 MEGOHMS	½W
R16	63-296	.220 M Ω	½W
R17	63-1023	.2.2 M Ω WIREWOUND	1W
R18	63-1039	.1 M Ω	½W
R19	63-577	.10 Ω	1W
R20	63-576	.60 Ω	1W
1	S 6936	WAVEMAGNET ASSEMBLY	
2	S 6938	ANTENNA COIL ASSEMBLY	
3	S 6937	OSCILLATOR COIL ASSEM.	
4	S 6992	OSC. COUPLER COIL ASSEM.	
5	S 7044	AUTOMATIC TUNING ASSEM.	
6	S 7500	WAVE TRAP ASSEMBLY	
7	25-185	BAND SELECTOR SWITCH	
8	85-171	WAVE MAGNET SWITCH	
9	85-171	TELEVISION SWITCH	
10	25-560	2ND I.F. TRANSFORMER	
11	S 6940	2ND I.F. TRANSFORMER	
12	S 6994	TONE CONTROL SWITCH	
13	100-36	PILOT LIGHT 6.3V. .25 A.	
14	95-676	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	22-865	BROADCAST OSC. (SEE NOTE)	
G		ANTENNA BROADCAST	
K	22-708	SHORT WAVE OSC. (SEE NOTE)	
M		SHORT WAVE ANTENNA	
N		POLICE BAND OSC. (SEE NOTE)	

NOTE: TRIMMERS F, K & N ARE MOUNTED ON STRIP #22-850.

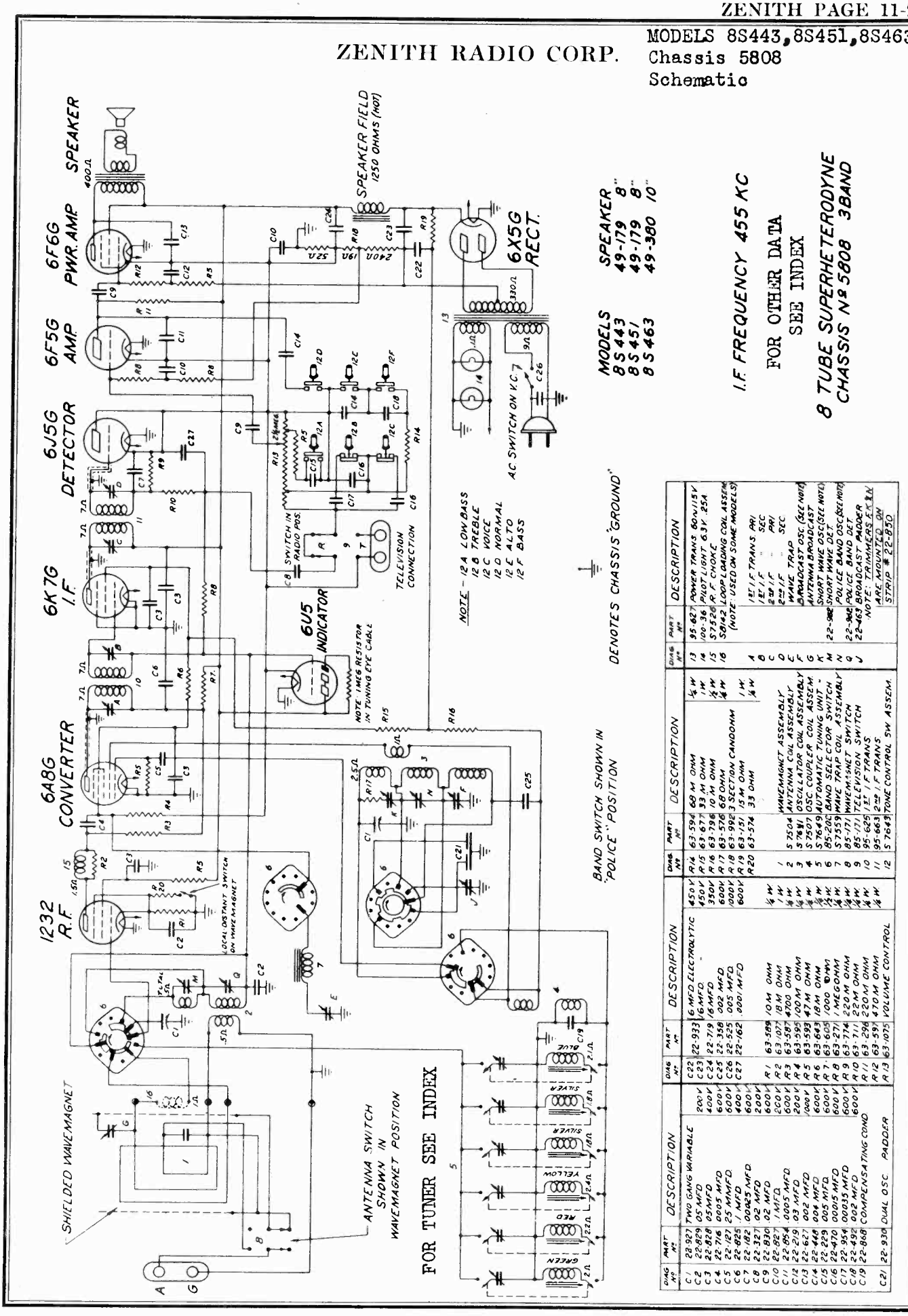
MODEL	SPEAKER	
8S432	49-301	6"
8S433	49-301	6"
8S449	49-301	6"
8S450	49-314	8"
8S458	49-308	10"
8S459	49-314	8"
8S460	49-311	10"
8S461	49-309	12"
8S462	49-311	10"

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.

ZENITH RADIO CORP.

MODELS 8S443, 8S451, 8S463
Chassis 5808
Schematic



DIAG Nº	PART Nº	DESCRIPTION
C1	22-927	TWO GANG VARIABLE
C2	22-829	.05 MFD
C3	22-828	.05 MFD
C4	22-716	.0005 MFD
C5	22-721	25 MMFD
C6	22-825	.1 MFD
C7	22-182	.00025 MFD
C8	22-327	.02 MFD
C9	22-827	.1 MFD
C10	22-954	.0005 MFD
C11	22-219	.03 MFD
C12	22-827	.002 MFD
C13	22-446	.004 MFD
C14	22-229	.005 MFD
C15	22-470	.00035 MFD
C16	22-934	.00035 MFD
C17	22-432	.002 MFD
C18	22-868	COMPENSATING COND
C19		
C20		
C21	22-930	DUAL OSC PADDER
C22	22-933	6 MFD ELECTROLYTIC 450V
C23		16 MFD 450V
C24	22-719	16 MFD 350V
C25	22-358	.002 MFD 600V
C26	22-525	.005 MFD 600V
C27	22-162	.0001 MFD 600V
R1	63-589	10 M OHM ½ W
R2	63-107	1 M OHM 1 W
R3	63-587	4700 OHM ½ W
R4	63-595	100 M OHM ½ W
R5	63-593	47 M OHM ½ W
R6	63-643	1 M OHM ½ W
R7	63-605	1000 OHM ½ W
R8	63-271	1 MEGOHM ½ W
R9	63-714	2.2 M OHM ½ W
R10	63-711	2.2 M OHM ½ W
R11	63-296	220 M OHM ½ W
R12	63-591	470 M OHM ½ W
R13	63-1075	VOLUME CONTROL
R14	63-594	68 M OHM ½ W
R15	63-677	33 M OHM ½ W
R16	63-796	10 M OHM ½ W
R17	63-578	68 OHM ½ W
R18	63-992	3 SECTION CANDOHM 1 W
R19	63-151	15 M OHM ½ W
R20	63-574	33 OHM ½ W
1	S 7504	WAVEMAGNET ASSEMBLY
2	S 7691	ANTENNA COIL ASSEMBLY
3	S 7691	OSCILLATOR COIL ASSEMBLY
4	S 7501	OSC COUPLER COIL ASSEM
5	S 7649	AUTOMATIC TUNING UNIT
6	85-206	BAND SELECTOR SWITCH
7	S 7559	WAVE TRAP COIL ASSEMBLY
8	85-171	WAVEMAGNET SWITCH
9	85-171	TELEVISION SWITCH
10	95-625	1ST I.F. TRANS
11	95-663	2ND I.F. TRANS
12	S 7643	TONE CONTROL SW ASSEM
13	95-627	POWER TRANS 80W 115V
14	100-36	PILOT LIGHT 6.3V .25A
15	S7526	R.F. CHOKE
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 DET.
N		POLICE BAND OSC (SEE NOTE)
Q	22-340	POLICE BAND DET.
J	22-463	BROADCAST PADDER
		NOTE: TRIMMERS EXCEPT ARE MOUNTED ON STRIP # 22-850

MODELS 8S443, 8S451, 8S463

	SPEAKER
8S443	49-179 8"
8S451	49-179 8"
8S463	49-380 10"

I.F. FREQUENCY 455 KC

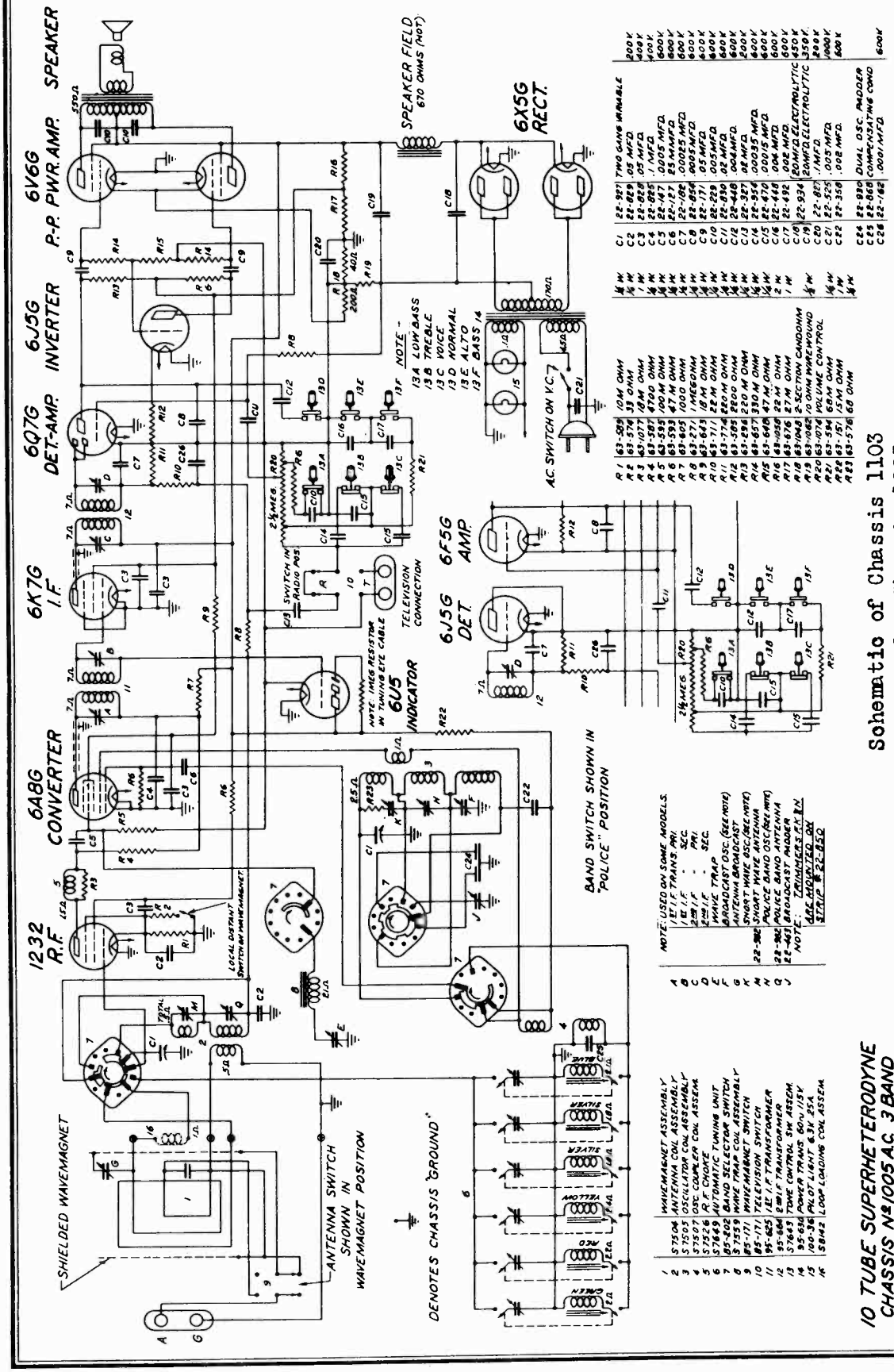
FOR OTHER DATA SEE INDEX

8 TUBE SUPERHETERODYNE
CHASSIS Nº 5808 3 BAND

MODELS 10S443, 10S452, 10S464
10S470, 10S491, 10S492
Chassis 1005

ZENITH RADIO CORP.

MODEL 11S474
Chassis 1103
Schematics



1	S7504	WAVEMAGNET ASSEMBLY
2	S7505	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	S7359	WAVE TRAP COIL ASSEMBLY
9	85-111	WAVEMAGNET SWITCH
10	85-111	TELEVISION SWITCH
11	95-825	1ST I.F. TRANSFORMER
12	95-826	2ND I.F. TRANSFORMER
13	S7641	TONE CONTROL SYSTEM
14	S7642	POWER TRANS. 60~/115V.
15	100-36	PILOT LIGHT 6.3V. .25A.
16	S7643	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
H - SHORT WAVE OSC. (SEE NOTE)
K - SHORT WAVE ANTENNA
M - 22-382 POLICE BAND OSC. (SEE NOTE)
N - POLICE BAND ANTENNA
Q - 22-461 BROADCAST PADDER
J - NOTE: TRIMMERS ARE IN DIE MOUNTED ON STAGE # 22-850

R1	63-309	10M OHM
R2	63-370	33 OHM
R3	63-1077	68M OHM
R4	63-387	4700 OHM
R5	63-595	100M OHM
R6	63-593	47M OHM
R7	63-605	1000 OHM
R8	63-277	1 MEGOHM
R9	63-643	18M OHM
R10	63-711	22M OHM
R11	63-1076	220M OHM
R12	63-598	220M OHM
R13	63-598	330M OHM
R14	63-657	330M OHM
R15	63-646	47M OHM
R16	63-650	22M OHM
R17	63-676	27M OHM
R18	63-1043	2-SECTION CANDOHM
R19	63-1062	70 OHM WIREWOUND
R20	63-1074	VOLUME CONTROL
R21	63-594	68M OHM
R22	63-751	15M OHM
R23	63-576	68 OHM

C1	22-927	TWO GANG VARIABLE	200V
C2	22-829	.05 MFD.	400V
C3	22-828	.05 MFD.	400V
C4	22-825	.1 MFD.	400V
C5	22-147	.0005 MFD.	600V
C6	22-121	25 MMFD.	600V
C7	22-1082	.00025 MFD.	600V
C8	22-854	.0005 MFD.	600V
C9	22-171	.05 MFD.	600V
C10	22-223	.005 MFD.	600V
C11	22-440	.02 MFD.	600V
C12	22-327	.01 MFD.	200V
C13	22-356	.00035 MFD.	600V
C14	22-470	.00015 MFD.	600V
C15	22-448	.004 MFD.	600V
C16	22-492	.002 MFD.	600V
C17	22-934	20MFD. ELECTROLYTIC	450V
C18		20MFD. ELECTROLYTIC	350V
C19	22-827	.1 MFD.	200V
C20	22-525	.005 MFD.	1000V
C21	22-350	.002 MFD.	600V
C22			
C24	22-936	DUAL OSC. PADDER	
C25	22-868	COMPENSATING COND.	600V
C26	22-1082	.0001 MFD.	

10 TUBE SUPERHETERODYNE
CHASSIS Nº1005 A.C. 3 BAND

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"

11 TUBE SUPERHETERODYNE
CHASSIS Nº1103 A.C. 3 BAND

MODEL	SPEAKER
11S474	49-352 12"

Schematic of Chassis 1103 same as for Chassis 1005 except that two tubes are used in place of the 6Q7G.

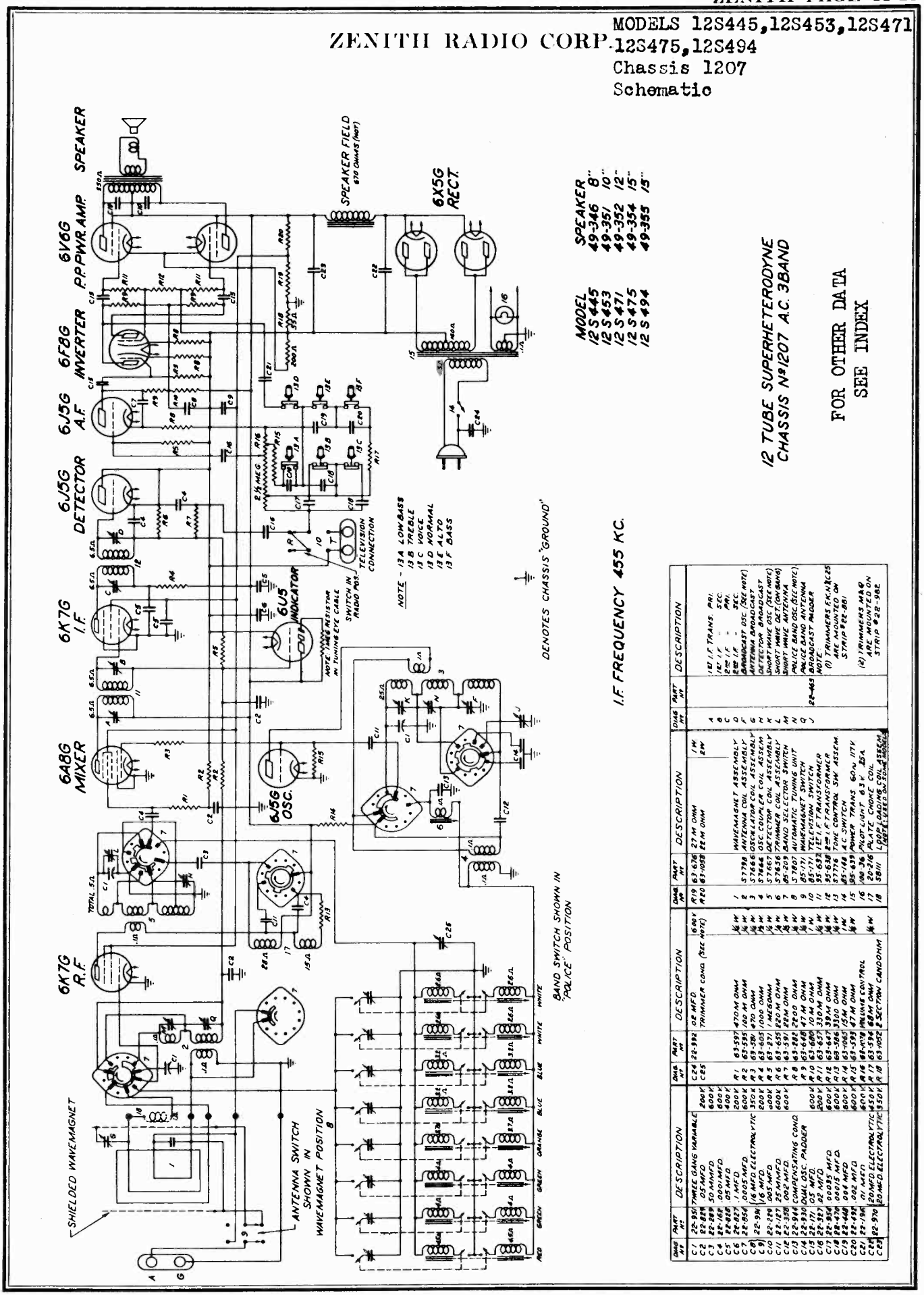
Above partial schematic applies to Chassis 1103 only.

I.F. FREQUENCY 455 KC.

FOR OTHER DATA SEE INDEX

ZENITH RADIO CORP.

MODELS 12S445, 12S453, 12S471
12S475, 12S494
Chassis 1207
Schematic



DIAG Nº	PART Nº	DESCRIPTION
C1	22-932	TWIN GANG VARIABLE
C2	22-884	.05 MFD. 200 V
C3	22-889	.50 MMFD. 600 V
C4	22-168	.0001 MFD. 600 V
C5	22-810	.05 MFD. 400 V
C6	22-827	.1 MFD. 200 V
C7	22-854	.0005 MFD. 600 V
C8	22-936	16 MFD. ELECTROLYTIC 200 V
C9	22-229	.005 MFD. 400 V
C10	22-127	25 MMFD. 600 V
C11	22-358	.002 MFD. 600 V
C12	22-944	COMPENSATING COND.
C13	22-930	DUAL OSC. PADDER
C14	22-171	.05 MFD. 600 V
C15	22-317	.02 MFD. 200 V
C16	22-436	.0025 MFD. 600 V
C17	22-434	.0015 MFD. 600 V
C18	22-440	.044 MFD. 600 V
C19	22-195	.002 MFD. 600 V
C20	22-193	.01 MFD. 600 V
C21	22-196	20 MFD. ELECTROLYTIC 450 V
C22	22-936	20 MFD. ELECTROLYTIC 350 V
C23		
C24	22-932	.02 MFD. TRIMMER COND. (SEE NOTE)
C25		

DIAG Nº	PART Nº	DESCRIPTION	600 V
R1	63-597	470 M OHM	½ W
R2	63-593	100 M OHM	½ W
R3	63-591	22 M OHM	½ W
R4	63-605	1000 OHM	½ W
R5	63-871	1 MEGOHM	½ W
R6	63-655	220 M OHM	½ W
R7	63-591	22 M OHM	½ W
R8	63-882	2200 OHM	½ W
R9	63-648	47 M OHM	½ W
R10	63-680	10 M OHM	1 W
R11	63-671	33 M OHM	½ W
R12	63-601	470 OHM	½ W
R13	63-506	330 OHM	½ W
R14	63-1065	15 M OHM	1 W
R15	63-593	47 M OHM	½ W
R16	63-1078	VOLUME CONTROL	½ W
R17	63-594	68 M OHM	½ W
R18	63-1082	2 SECTION CANDOHM	½ W
R19	63-676	27 M OHM	1 W
R20	63-1058	22 M OHM	2 W

DIAG Nº	PART Nº	DESCRIPTION
1	57758	WAVEMAGNET ASSEMBLY
2	57456	ANTENNA COIL ASSEMBLY
3	57644	OSC. COUPLER COIL ASSEM.
4	57667	DETECTOR COIL ASSEMBLY
5	57636	TRIMMER COIL ASSEMBLY
6	85-259	BAND SELECTOR SWITCH
7	57807	AUTOMATIC TUNING UNIT
8	85-171	WAVEMAGNET SWITCH
9	85-173	TELEVISION SWITCH
10	85-638	I.F. TRANSFORMER
11	85-638	2ND I.F. TRANSFORMER
12	57776	TONE CONTROL SW. ASSEM.
13	85-148	A.C. SWITCH
14	85-639	POWER TRANS. 60 W. 117V
15	100 36	PILOT LIGHT 6.3 V. .15A
16	20-216	PLATE CHOKE COIL
17	58111	LOOP LOADING COIL ASSEM. (SEE NOTE)
18		

DIAG Nº	PART Nº	DESCRIPTION
A		1ST I.F. TRANS. PRI.
B		1ST I.F. " SEC.
C		2ND I.F. " PRI.
D		2ND I.F. " SEC.
E		ANTENNA BROADCAST OSC. (SEE NOTE)
F		ANTENNA BROADCAST DETECTOR BROADCAST
G		SHORT WAVE OSC. (SEE NOTE)
K		SHORT WAVE DET. (ON BAND)
L		SHORT WAVE ANTENNA
M		POLICE BAND OSC. (SEE NOTE)
N		POLICE BAND ANTENNA
Q		BROADCAST ANTENNA
J	22-465	MODEL

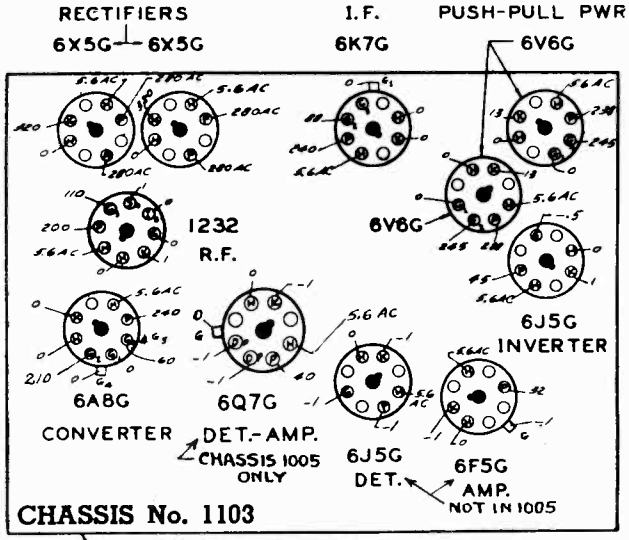
(1) TRIMMERS FOR COILS ARE MOUNTED ON STRIP #22-881

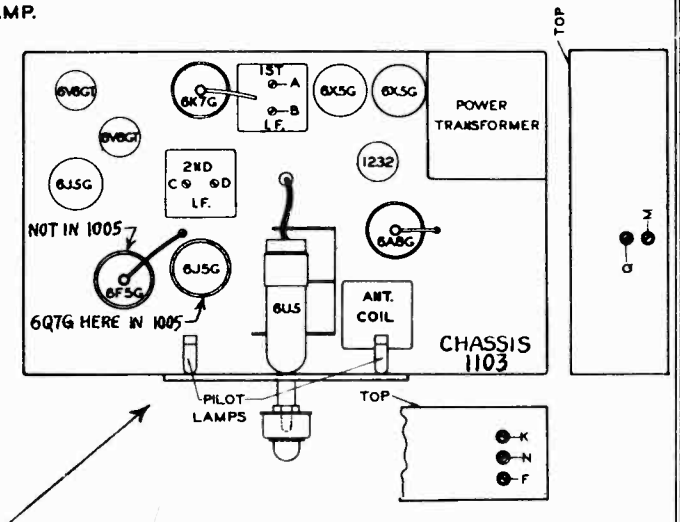
(2) TRIMMERS MAY ARE MOUNTED ON STRIP #22-982

CHASSIS 1005 CHASSIS 1103
CHASSIS 1207 CHASSIS 5808

ZENITH RADIO CORP.

Voltage, Socket, Trimmers





All voltages measured from socket terminal to chassis ground using 1000 ohm per volt meter.

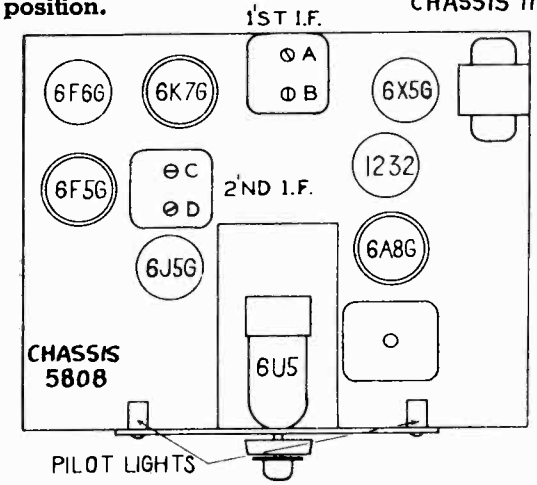
CHASSIS 5808: TRIMMERS Q, M, K, N & F AS IN CHASSIS 1103

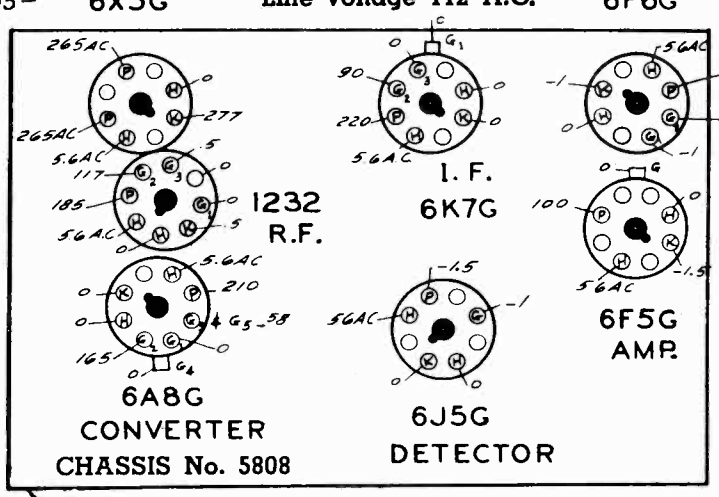
Sensitivity switch in distance position.

RECTIFIER 6X5G

Volume control full on. Line voltage 112 A.C.

PWR.-AMP. 6F6G

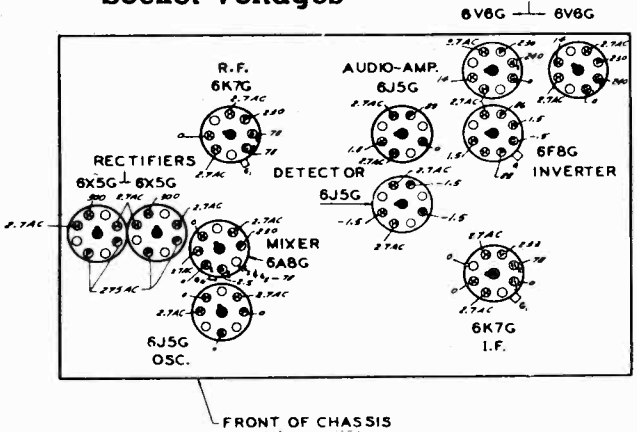


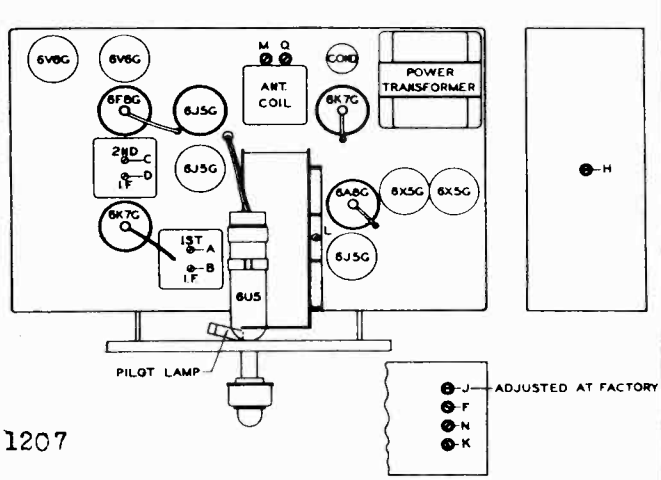


All voltages are positive D.C. unless marked otherwise.

Socket Voltages

Socket Voltages
Location of Tubes and Trimmers





CHASSIS 1207

ZENITH RADIO CORP.

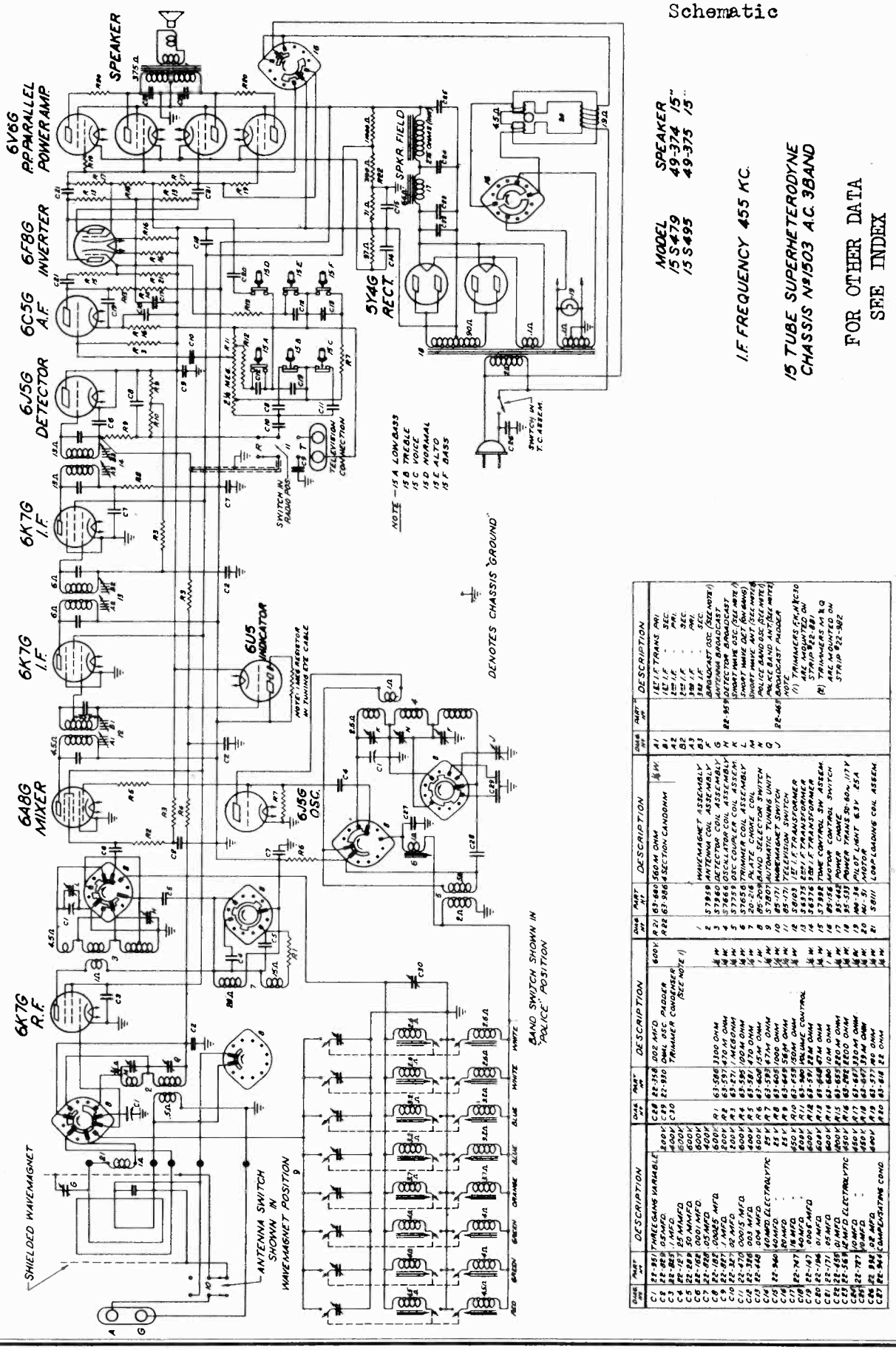
MODELS 15S479, 15S495
Chassis 1503
Schematic

MODEL 15S479 15S495
SPEAKER 49-374 /5"
49-375 /5"

I.F. FREQUENCY 455 KC.

15 TUBE SUPERHETERODYNE
CHASSIS Nº1503 A.C. 3BAND

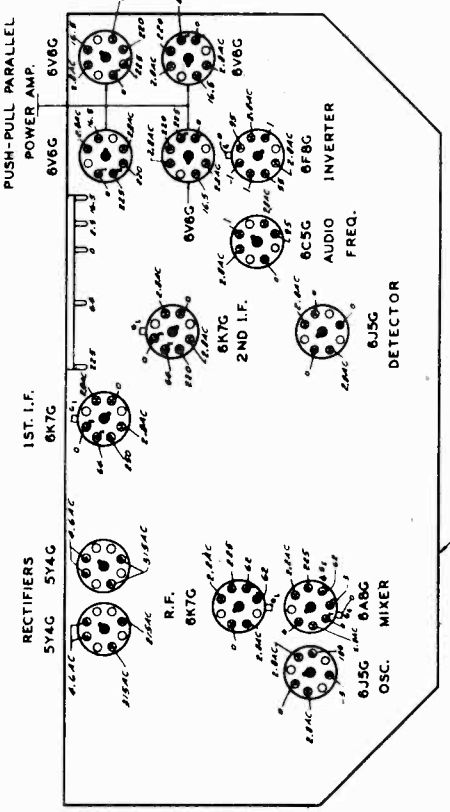
FOR OTHER DATA
SEE INDEX



CHASSIS 1503
CHASSIS 5679
Voltage, Socket
Trimmers

ZENITH RADIO CORP.

CHASSIS No. 1503



Socket Voltages

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.

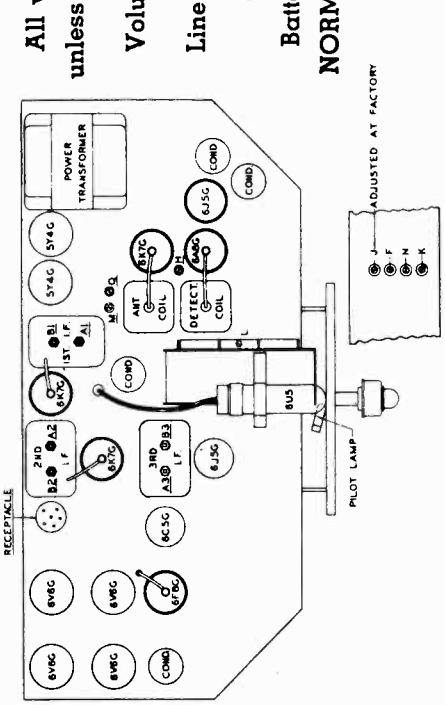
Volume control full on.

Line voltage 112 A.C.

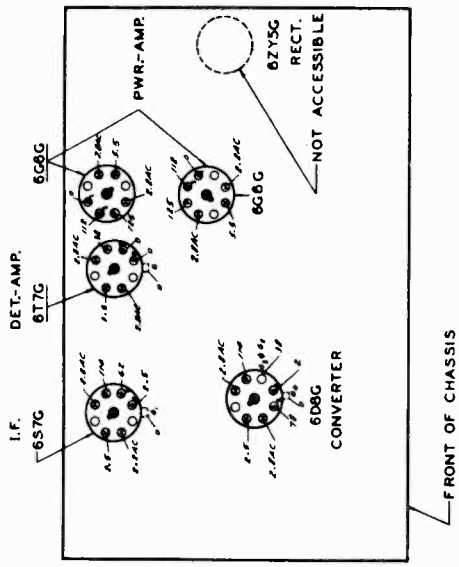
Model 5679 Only

Battery conserver switch in NORMAL position.

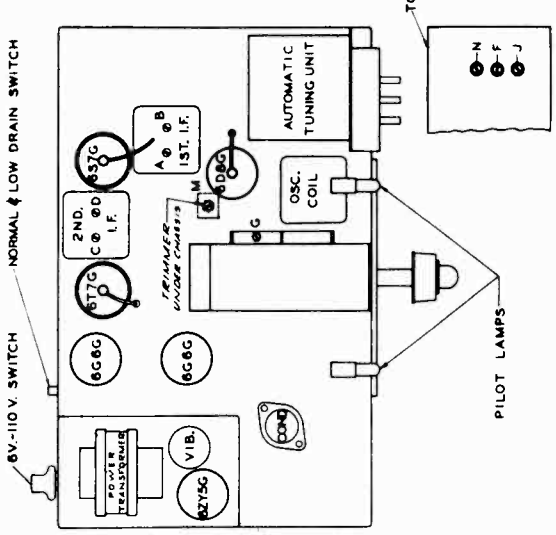
Location of Tubes and Trimmers



CHASSIS No. 5679



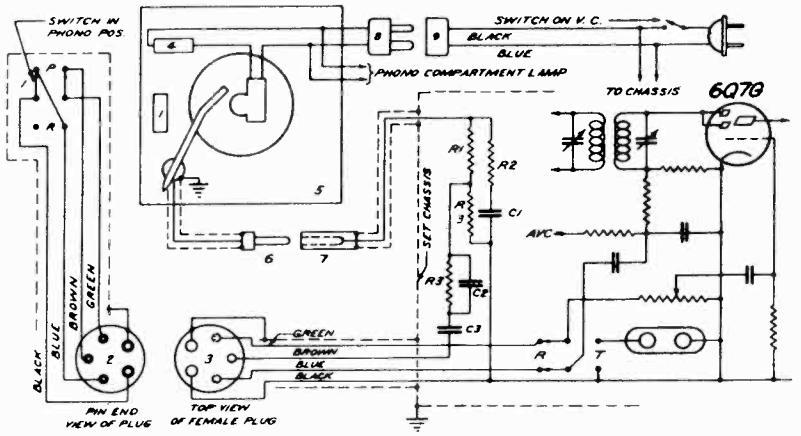
Socket Voltages



Location of Tubes and Trimmers

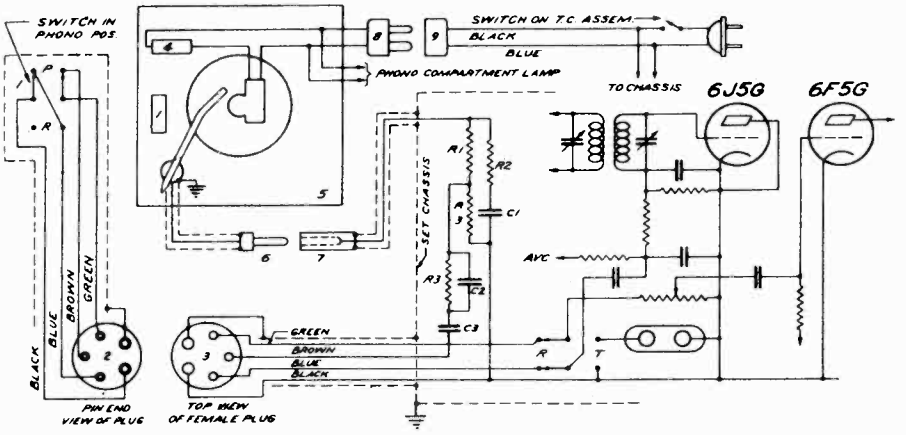
ZENITH RADIO CORP.

MODELS 10S491,10S492
Chassis 1007
MODEL 12S494,Ch.1208
MODEL 15S495,Ch.1504
Phono.Circuit Schematics



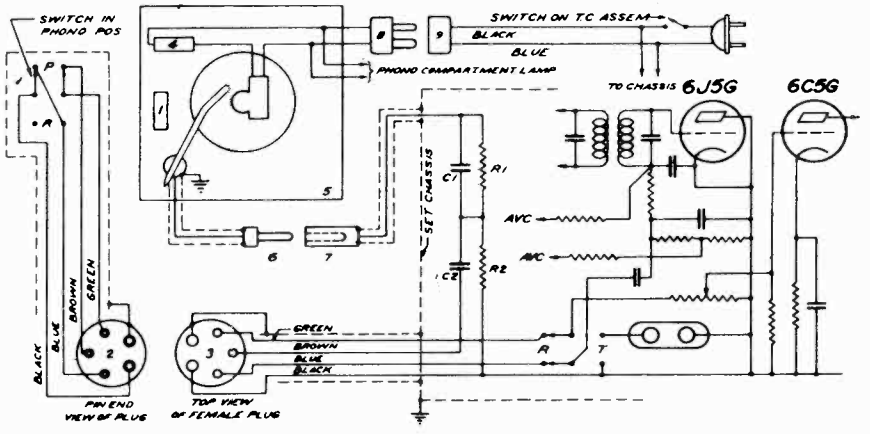
DIAG NO	PART NO	DESCRIPTION	
C1	22-319	.005 MFD.	200V
C2	22-954	.00035 MFD.	600V
C3	22-887	.001 MFD.	600V
R1	63-719	470 M OHM	½W
R2	63-649	56 M OHM	½W
R3	63-271	1 MEGOHM	½W
1	S7224	PHONO SW & WIRE ASSEMBLY	
2			
3	S8070	PLUG & WIRE ASSEMBLY	
4	85-191	A.C. SWITCH	
5	169-36	WEBSTER AUTOMATIC RECORD PLAYER	
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	½W
R2	63-649	56 M OHM	½W
R3	63-271	1 MEGOHM	½W
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	470 M OHM	½W
R2	63-649	56 M OHM	½W
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	

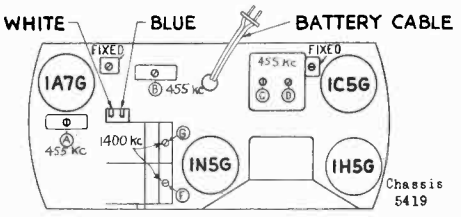
PHONO CIRCUIT DATA
MODEL SPEAKER
15S495 49-375 15"
CHASSIS Nº1504

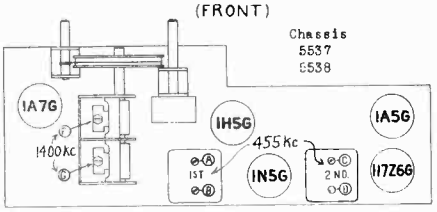
MODELS See Below
Alignment, Trimmers, Socket

ZENITH RADIO CORP.

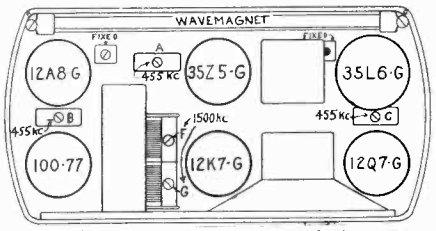
Operation	Connect Test Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	½ Mfd.	455 Kc.	Broadcast	600 Kc.	A, B, C, D	I. F. Alignment
2	Antenna Post (On Loop)	200 Mmf.	18000 Kc.	S. W.	18000 Kc.	K	Set Oscillator to Scale
3	Antenna Post (On Loop)	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

Chassis 1005, 1103, 5808



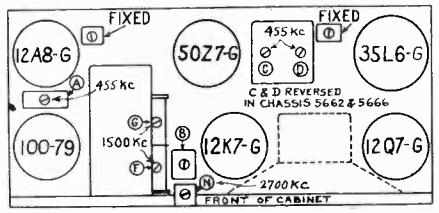


Operation	Connect Test Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Loop Switch	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	½ Mfd.	455 Kc.	Broadcast	.....	600 Kc.	SEE *BELOW A, B, C, D	I.F. Alignment
2	Antenna Post (On Loop)	200 Mmf.	18000 Kc.	S. W.	Ant.	18000 Kc.	K	Set Oscillator 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	Alignment 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			Chassis 1207, 1503				J Adjusted at Factory	*1503 TRIMMERS: A1, B1; A2, B2; A3, B3



Chassis 5659 & 5663, 5660 & 5664

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	B'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	B'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	Chassis 5539



Chassis 5661 & 5665, 5662 & 5666

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.	K	Set Oscillator to Scale
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

Chassis 5679

ALIGNMENT PROCEDURE

Chassis 5419, 5537, 5538
5659 & 5663, 5660 & 5664
5661 & 5665, 5662 & 5666

Set dial at 600 kc; connect 0.5-mf dummy to 1st det. grid and align I.F. at 455 kc.

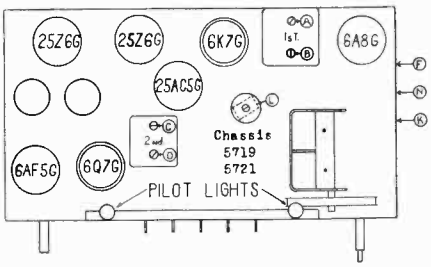
Connect test oscillator to single-turn loop loosely coupled to Wave Magnet.

Set receiver dial to aligning frequency and adjust trimmers to maximum as follows:
(1) Osc. trimmer F
(2) Ant. trimmer G
(3) S-F trimmer N

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

CHASSIS 5719, 5721, 5810.



ZENITH RADIO CORP.

CHASSIS 1005,1103,1207,1503
5539,5660,5664,5662,5666
5672P,5678,5679,5719,5721
5724,5725,5808 Tuner

AUTOMATIC TUNING ADJUSTMENTS

GENERAL:

Each button and its associated tuning adjustment will tune over a portion of the broadcast band, and any station within its tuning range may be selected for automatic tuning on that button.

To adjust the automatic tuning proceed as follows:

PRELIMINARY OPERATIONS:

For Chassis 1005, 1103, 5679, 5808:

Remove the automatic cover plate by pressing the catch pin on the inner side and lifting away from the escutcheon.

Place sensitivity switch in LOCAL position.

Select a station within the range of the No.1 button. See list of frequency ranges at right.

Turn the band switch to Broadcast and then tune in the selected station on the dial - then turn band switch to Automatic position.

TUNING RANGES of BUTTONS:

No. 1 button—upper left .....545 K.C. to 940 K.C.
No. 2 button—upper center ...600 K.C. to 1050 K.C.
No. 3 button—upper right ....660 K.C. to 1150 K.C.
No. 4 button—lower left .....740 K.C. to 1300 K.C.
No. 5 button—lower center ...880 K.C. to 1550 K.C.
No. 6 button—lower right ....880 K.C. to 1550 K.C.

For Chassis 1207, 1503:

Remove the automatic cover plate by pressing on latch pin and lifting away from escutcheon.

Select a station within the range of the No. 1 button. See list of frequency ranges at right.

Turn the band switch to Broadcast and then tune in the selected station on the dial - return band switch to Automatic position.

No. 1 button.....545 K.C. to 850 K.C.
No. 2 " .....620 K.C. to 970 K.C.
No. 3 " .....620 K.C. to 970 K.C.
No. 4 button.....680 K.C. to 1090 K.C.
No. 5 " .....790 K. C. to 1290 K.C.
No. 6 " .....790 K.C. to 1290 K.C.
No. 7 button.....980 K.C. to 1550 K.C.
No. 8 " .....980 K.C. to 1550 K.C.

For Chassis 5539, 5678, 5719, 5721, 5724, 5725:

Remove the automatic cover plate by gently lifting it under one end.

Select a station within the range of the No. 1 button. See list of frequency ranges at right.

Turn the band switch to Broadcast and then tune in the selected station on the dial.

No. 1 or left hand button 545 K.C. to 930 K.C.
No. 2 or second button 600 K.C. to 1050 K.C.
No. 3 or third button 650 K.C. to 1200 K.C.
No. 4 or fourth button 750 K.C. to 1370 K.C.
No. 5 or right hand button 900 K.C. to 1550 K.C.

For Chassis 5660 & 5664, 5662 & 5666, 5672-P:

Remove the automatic cover plate by gently lifting it under one end.

Select a station within the range of the top or No. 1 button. See list of frequency ranges at right.

Press the lowest or "Dial" button, and then tune in the selected station on the dial.

1 or top button — 545 K.C. to 1040 K.C.
2 or second button — 620 K.C. to 1170 K.C.
3 or third button — 720 K.C. to 1370 K.C.
4 or fourth button — 850 K.C. to 1550 K.C.
5 or bottom button—Dial or manual tuning.

ADJUSTMENT PROCEDURE - ALL Chassis:

Press the No. 1 button and tune in the same station on the adjacent automatic adjustments by using the special wrench furnished with the receiver. First, adjust the screw and then the hexagonal nut to the setting which gives the loudest and clearest reception on the desired station (See Fig. 2). Repeat the operation for greatest accuracy.

Select and remove the call letters of the station selected from call letter sheets in this booklet. Moisten the rear surface and place in position on the automatic cover plate opposite the corresponding button.
Follow the above procedure in setting remaining buttons, always selecting a station within the range of the button being set.

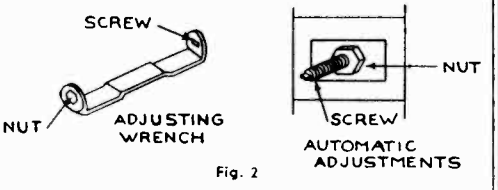


Fig. 2

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.

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.

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.

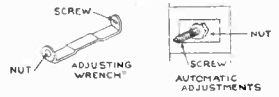
Cutting out in the portable receivers will usually be due to poor connections at the battery pack plug. Slight bending of the prongs will correct this condition.

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.

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.

ZENITH 6MN495
ZENITH 6MN496

ALIGNMENT

NASH SPECIAL AC 4389
NASH DELUXE AC 4289

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.

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.

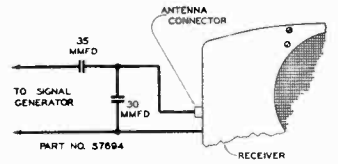


Fig. 3. Dummy Antenna

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.

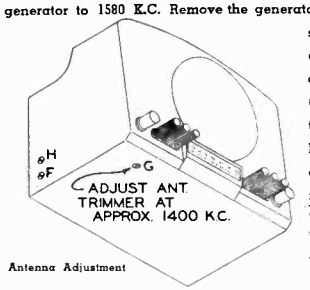


Fig. 4. Antenna Adjustment

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.

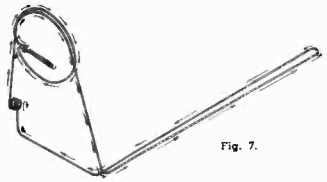


Fig. 7.

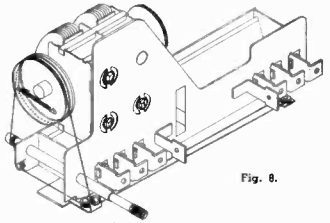


Fig. 8.

Figures 7 and 8 show how the dial cable is strung on both receivers.

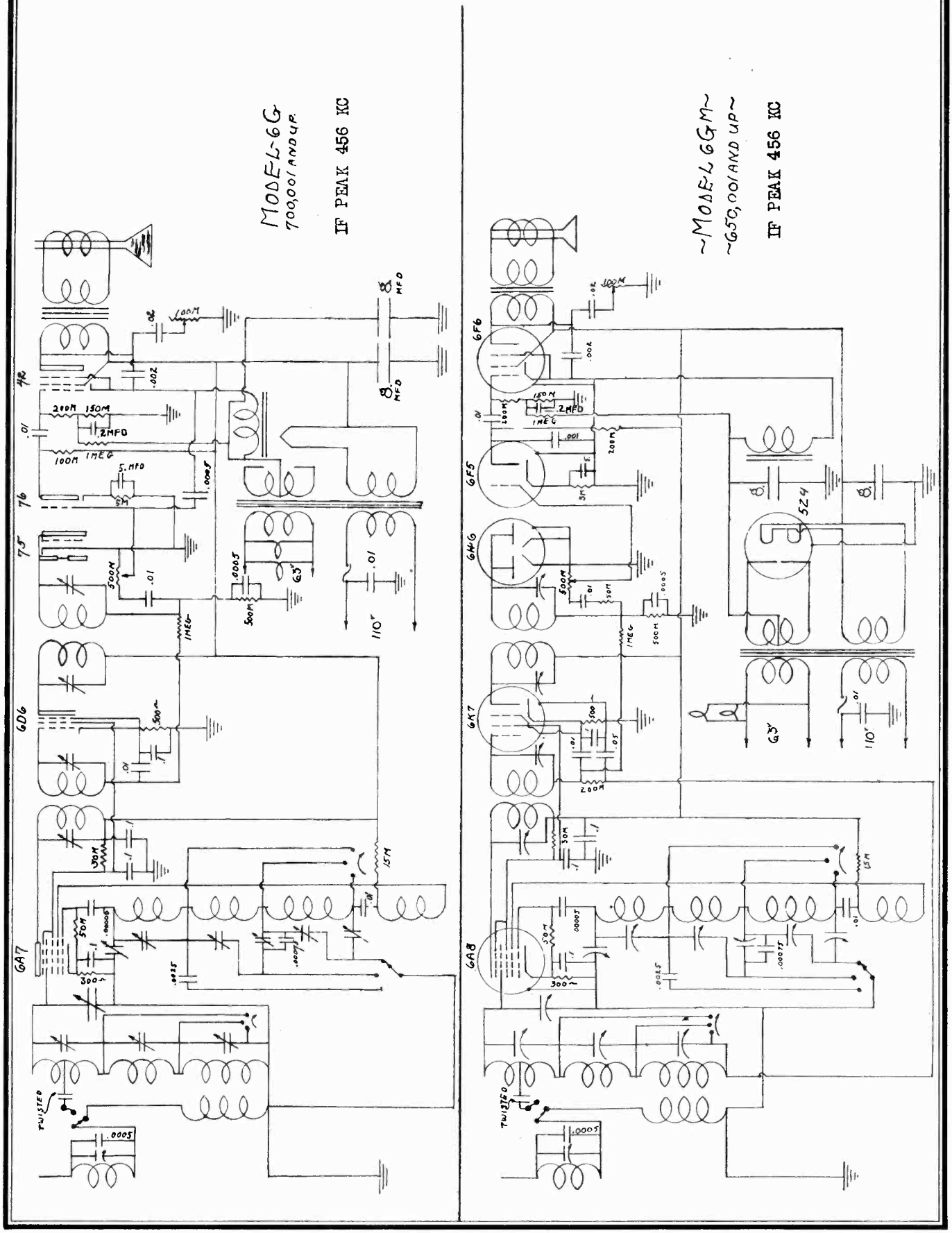
AUTOMATIC TUNING — The automatic tuning mechanism, being entirely mechanical and extremely simple in construction, will require no attention except the original adjustments for the desired stations. It consists of push rods which operate a cam and gear assembly which rotates the tuning condenser to any 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.

ZEPHYR RADIO CO.

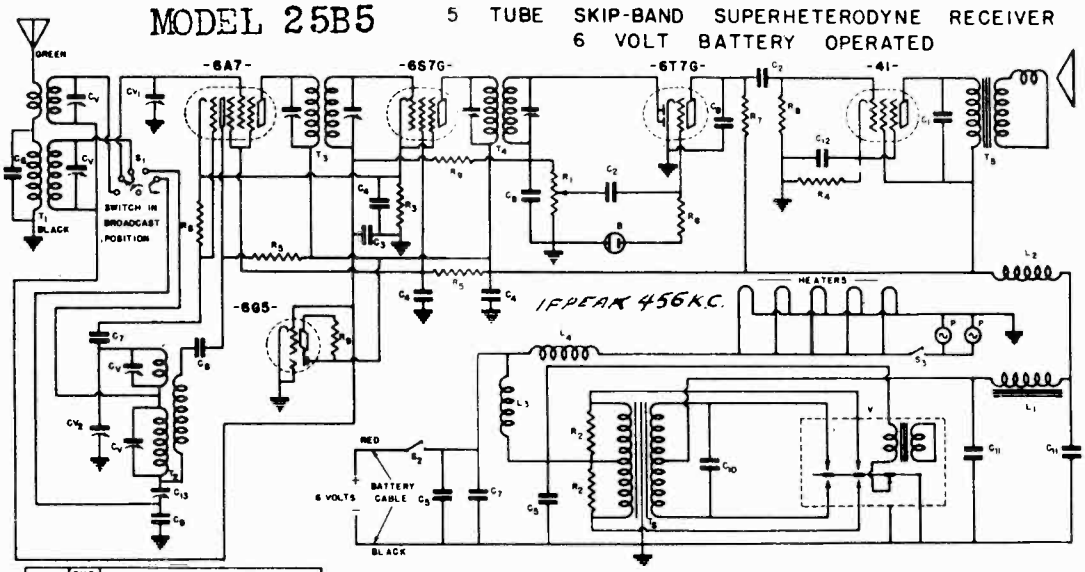
MODEL 6G
MODEL 6GM
Schematics



MODEL 25B5
Schematic
MODEL 43X5
Schematic, Socket

ZEPHYR RADIO CO.

MODEL 25B5 — 5 TUBE SKIP-BAND SUPERHETERODYNE RECEIVER — 6 VOLT BATTERY OPERATED

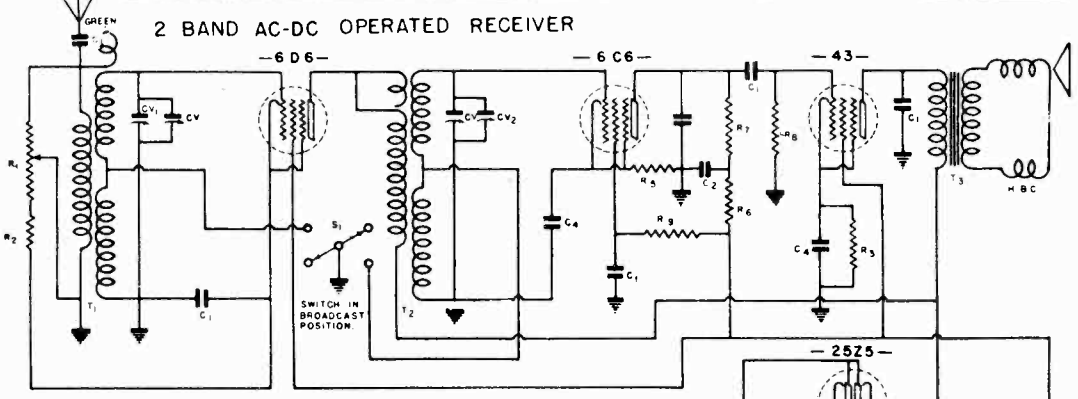


LEGEND	OUR PART NO.	DESCRIPTION
C_1	216	.002 MFD. 600 V. TUBULAR CONDENSER
C_2	211	.01 MFD. 400 V. TUBULAR CONDENSER
C_3	203	.1 MFD. 200 V. TUBULAR CONDENSER
C_4	204	.25 MFD. 200 V. TUBULAR CONDENSER
C_5	217	5 MFD. 100 V. TUBULAR CONDENSER
C_6	412	50 MMFD. MICA CONDENSER
C_7	400	100 MMFD. MICA CONDENSER
C_8	401	250 MMFD. MICA CONDENSER
C_9	411	.0018 MFD. MICA CONDENSER
C_{10}	219	.01 MFD. 1000 W.V. OIL FILLED BUFFER COND.
C_{11}	324	9 MFD. 250 W.V. WET ELECTROLYTIC COND.
C_{12}	304	10 MFD. 35 W.V. WET ELECTROLYTIC COND.
C_{13}	307	3 PLATE PADDING CONDENSER

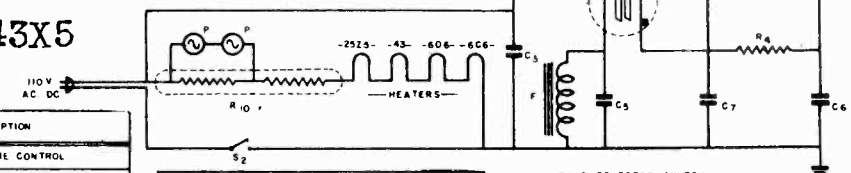
CV_{1-2}	642-A	2 GANG VARIABLE CONDENSER
C_V	500	5-30 MMFD. TRIMMER CONDENSER
T_1	1228	SKIP-BAND ANTENNA COIL
T_2	1412	SKIP-BAND OSCILLATOR COIL
T_3	1503	INPUT I.F. TRANSFORMER
T_4	1507	DIODE I.F. TRANSFORMER
T_5	IN B.I.3	5" P.M. DYNAMIC SPEAKER TRANSFORMER
T_6	1018	VIBRATOR TRANSFORMER
S_1	1920	BAND SELECTOR SWITCH
S_2	—	LINE SWITCH ON VOLUME CONTROL
S_3	—	PILOT LIGHT SPRING SWITCH
P	2901	MAZDA #40 PILOT LIGHTS
V	2501	PLUG IN VIBRATOR
B	3000	6 VOLT CELL

R_1	2005B	500,000 OHM VOLUME CONTROL
R_2	140	100 OHM ½ WATT CARBON RESISTOR
R_3	101	150 OHM ½ WATT CARBON RESISTOR
R_4	104	600 OHM ½ WATT CARBON RESISTOR
R_5	109	10,000 OHM ½ WATT CARBON RESISTOR
R_6	115	50,000 OHM ½ WATT CARBON RESISTOR
R_7	116	250,000 OHM ½ WATT CARBON RESISTOR
R_8	117	500,000 OHM ½ WATT CARBON RESISTOR
R_9	119	1 MEGOHM ½ WATT CARBON RESISTOR
L_1	1100	FILTER CHOKE
L_2	1618	R.F. "B" CHOKE
L_3	1619	R.F. "A" CHOKE
L_4	1620	R.F. "A" CHOKE

2 BAND AC-DC OPERATED RECEIVER

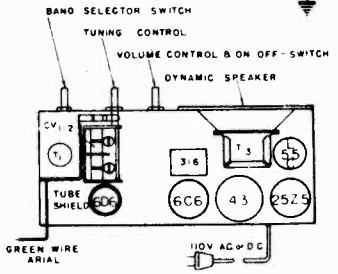


MODEL 43X5



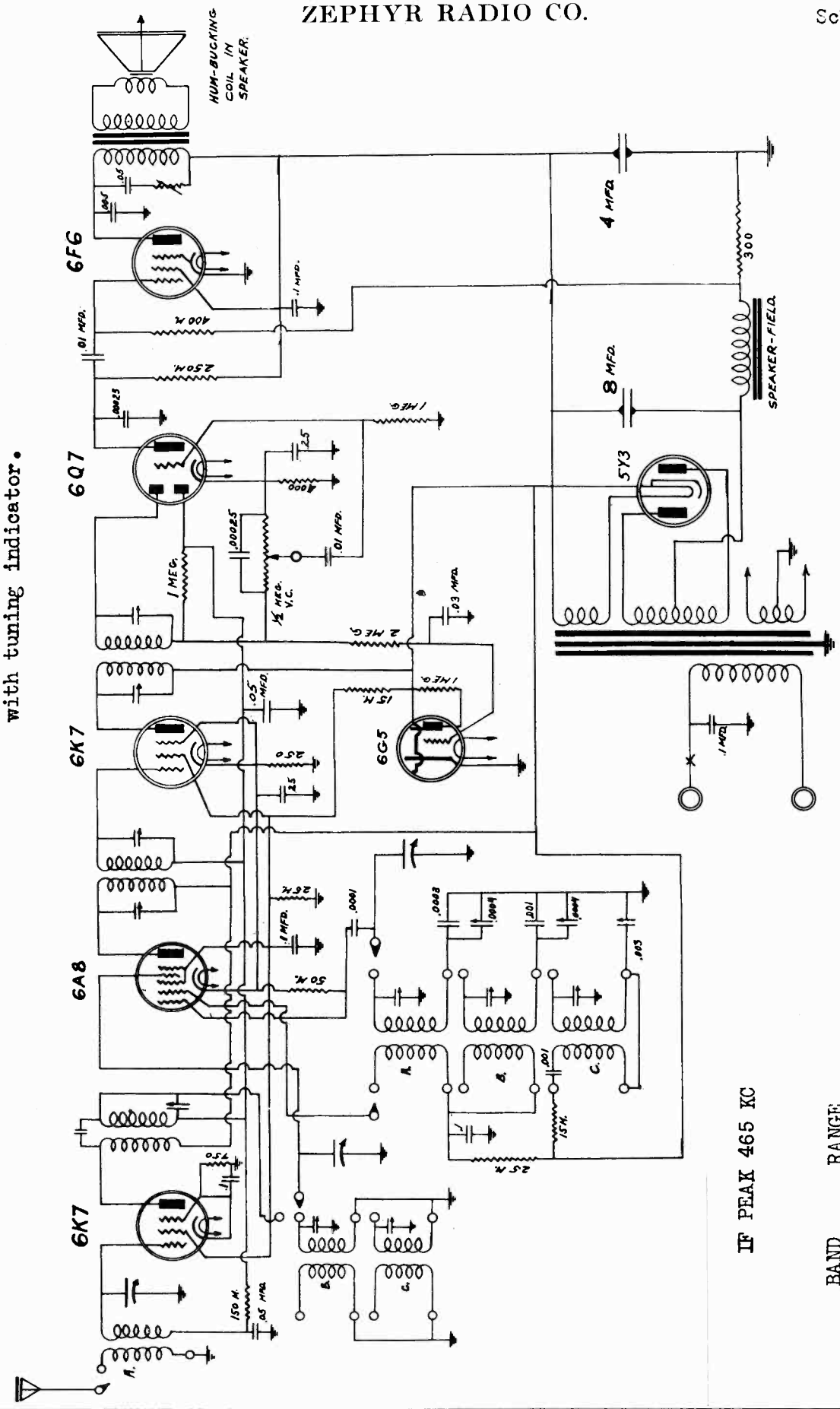
LEGEND	OUR PART NO.	DESCRIPTION
R_1	2005A	10,000 OHM VOLUME CONTROL
R_2	IN 2006A	275 OHM (Minimum on Volume Control)
R_3	104	600 OHM ½ WATT CARBON RESISTOR
R_4	108	5000 OHM ½ WATT CARBON RESISTOR
R_5	111	25,000 OHM ½ WATT CARBON RESISTOR
R_6	142	51,000 OHM ½ WATT CARBON RESISTOR
R_7	116	250,000 OHM ½ WATT CARBON RESISTOR
R_8	117	500,000 OHM ½ WATT CARBON RESISTOR
R_9	120	3 MEGOHM ½ WATT CARBON RESISTOR
R_{10}	2904	L-55-C BALLAST TUBE
T_1	1224	ANTENNA COIL
T_2	1316	INTERSTAGE COIL
T_3	IN 808	OUTPUT TRANSFORMER

F	IN 808	SPEAKER FIELD (2500 OHMS)
C_1	211	.01 MFD 400 V. TUBULAR CONDENSER
C_2	216	.018 MFD 400 V. TUBULAR CONDENSER
C_3	210	.1 MFD 400 V. TUBULAR CONDENSER
C_4	IN 316	3 MFD 35 V ELECTROLYTIC COND.
C_5	IN 316	4 MFD 200 V ELECTROLYTIC COND.
C_6	IN 316	8 MFD 200 V ELECTROLYTIC COND.
C_7	IN 316	14 MFD 200 V ELECTROLYTIC COND.
S_1	1919	BAND SWITCH
CV_{1-2}	615	2 GANG VARIABLE CONDENSER
S_2	IN 2006A	SWITCH ON VOLUME CONTROL
P	2921	MAZDA #44 PILOT LIGHTS



ZEPHYR RADIO CO.

MODEL 32Y6
Schematic



MODEL 32Y6 6 Tube All - Wave with tuning indicator.

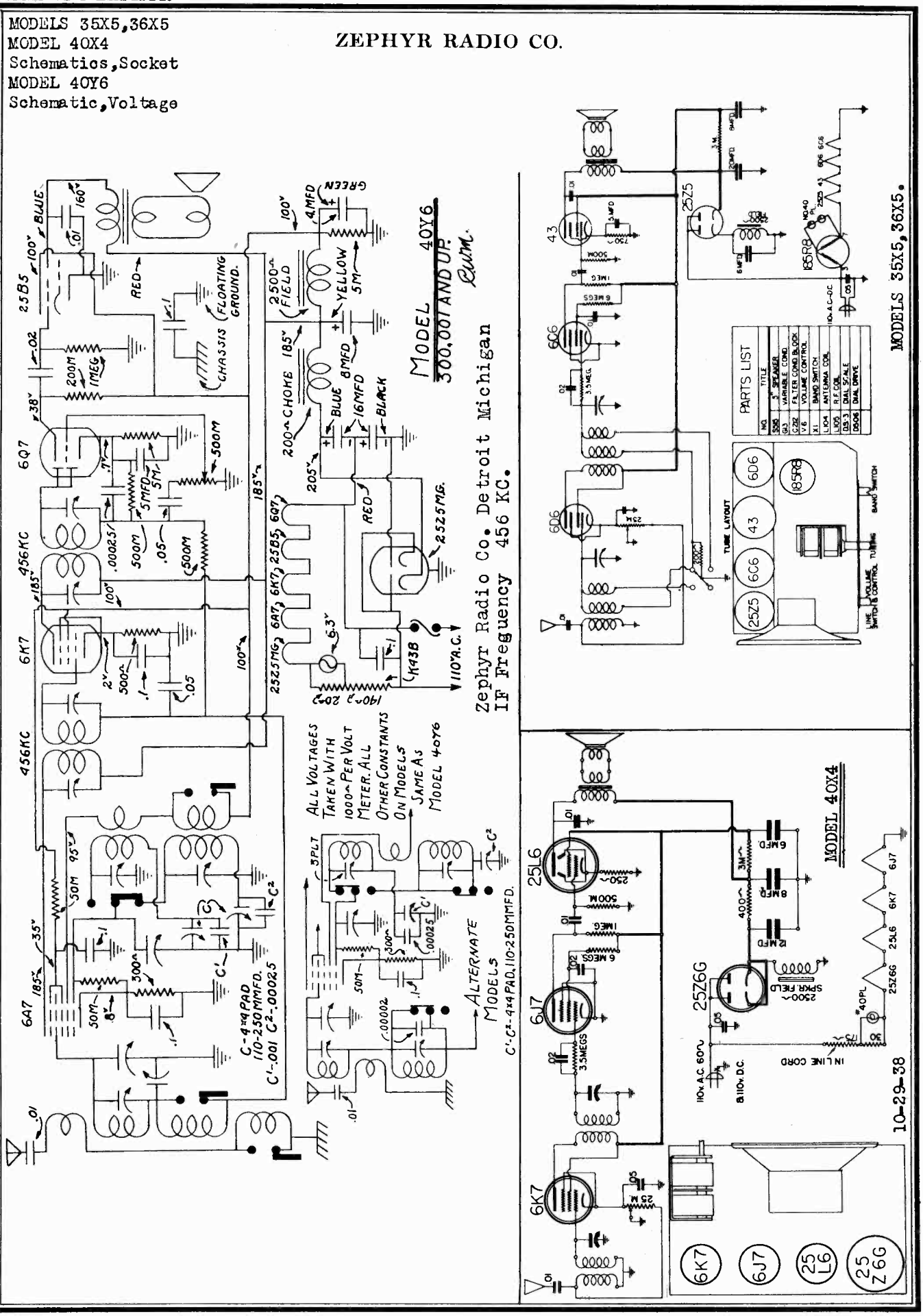
3-BAND-AC — 7-TUBES		
ENGINEERING — DEPARTMENT.		1937 -60-
Dr. by	Appd. LWG	

IF PEAK 465 KC

BAND	RANGE
A	540 - 1740 KC
B	1750 - 5800 KC
C	5.8 - 18.0 MC

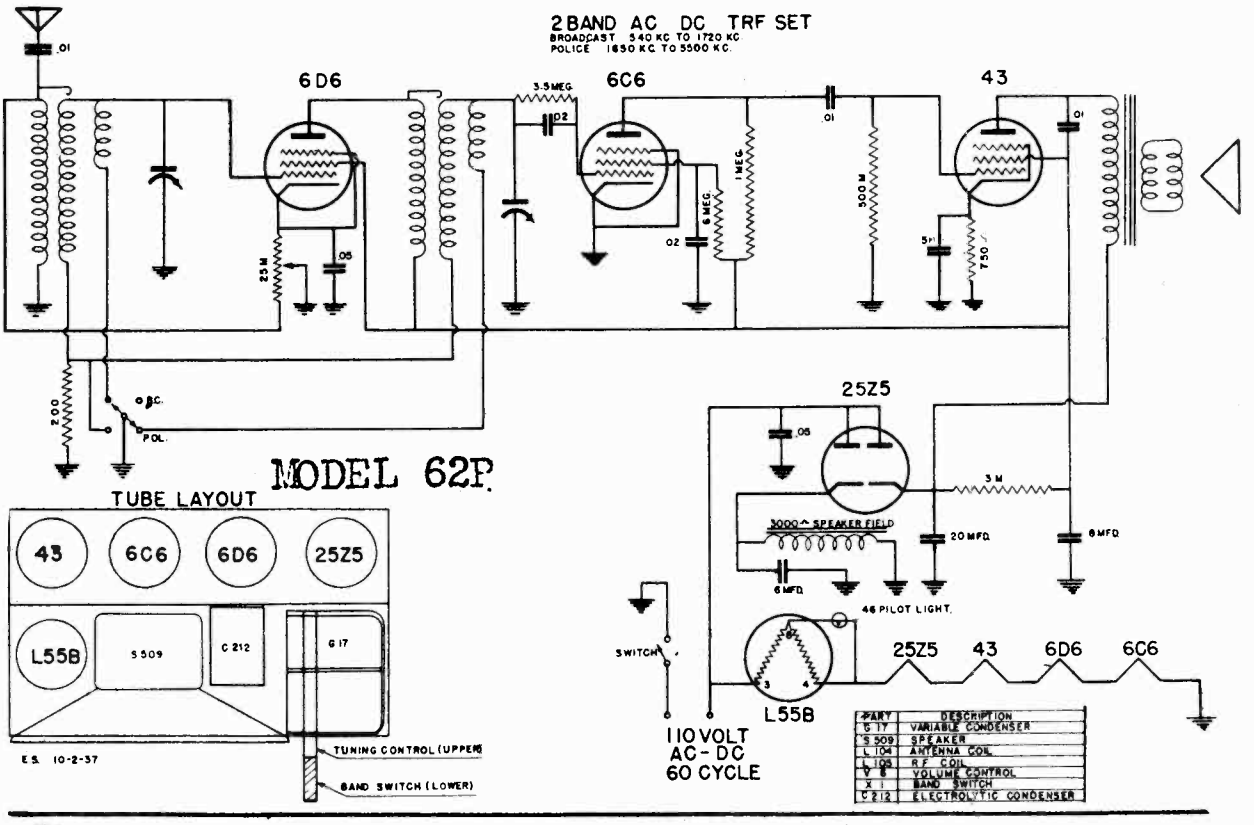
MODELS 35X5,36X5
MODEL 40X4
Schematics,Socket
MODEL 40Y6
Schematic,Voltage

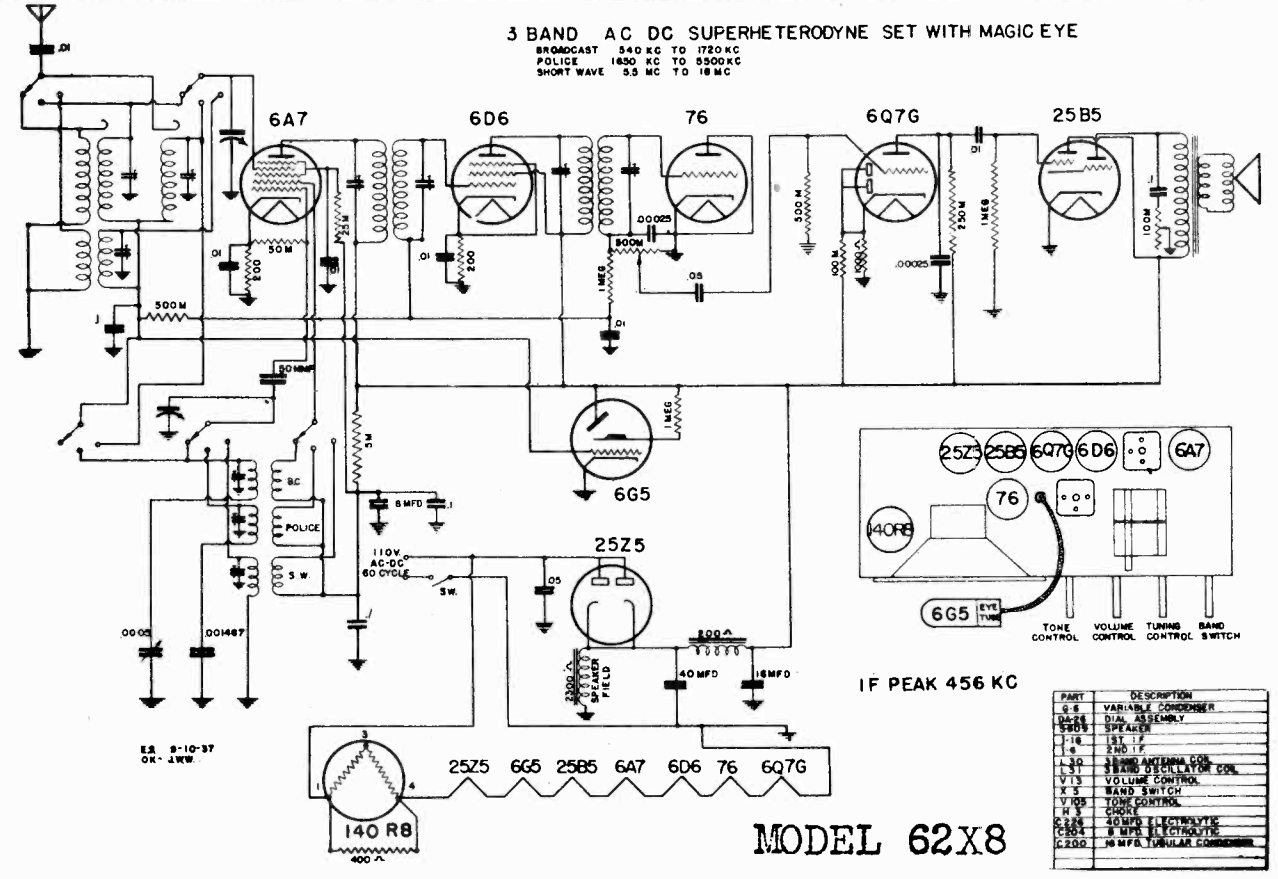
ZEPHYR RADIO CO.



ZEPHYR RADIO CO.

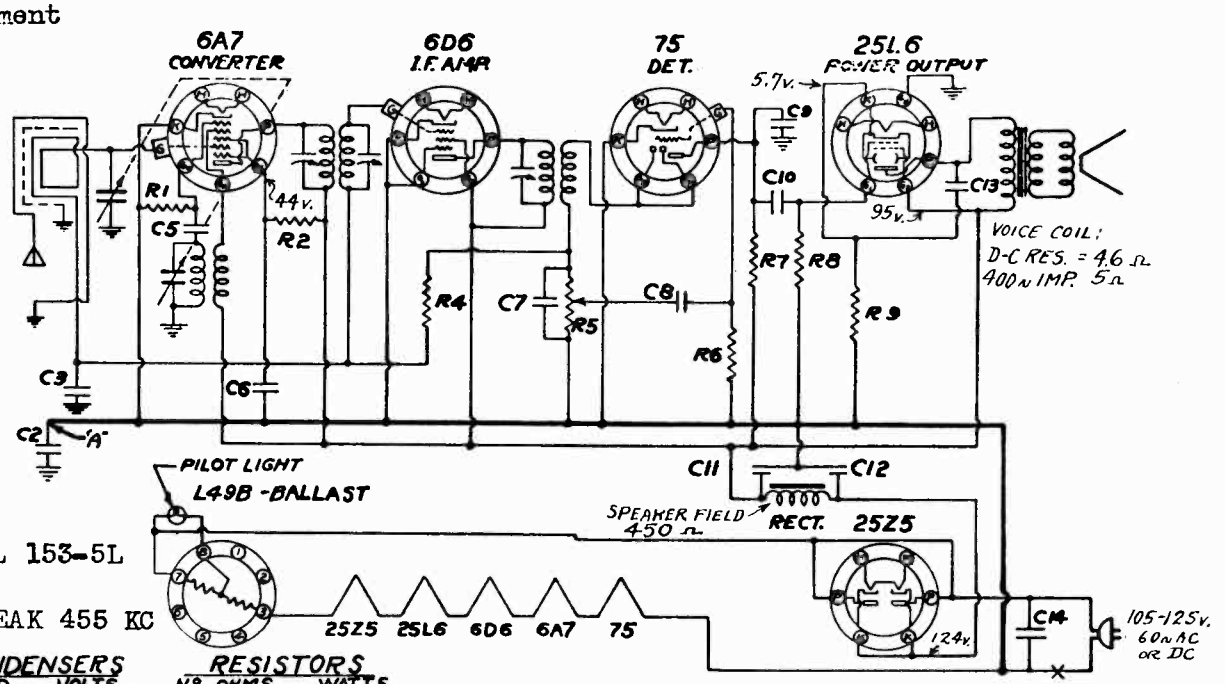
MODEL 62P
MODEL 62X8
Schematics, Socket





MODEL 153-5L
MODEL 352-5R
Schematics, Voltage
Alignment

ZEPHYR RADIO CO.



MODEL 153-5L

IF PEAK 455 KC

CONDENSERS

№	MFD.	VOLTS
C2	.25	200
C3	.02	400
C5	.00005	MICA
C6	.05	400
C7	.00025	MICA
C8	.01	400
C9	.00025	MICA
C10	.01	400
C11	20. }	150
C12	20. }	
C13	.005	600
C14	.05	400

RESISTORS

№	OHMS	WATTS
R1	50,000	½
R2	30,000	1
R4	2,000,000	½
R5	500,000	VOL CONT
R6	5,000,000	½
R7	250,000	½
R8	500,000	½
R9	150	½ ± 10%

⏚ IND. CHASSIS GND.

NOTE: C2 USED ON MODEL 5LL ONLY.
ON MODEL 5L POINT "A" IS CONNECTED TO CHASSIS

VOLTAGES: Line 115 v. AC; meter 1000 ohms per volt.

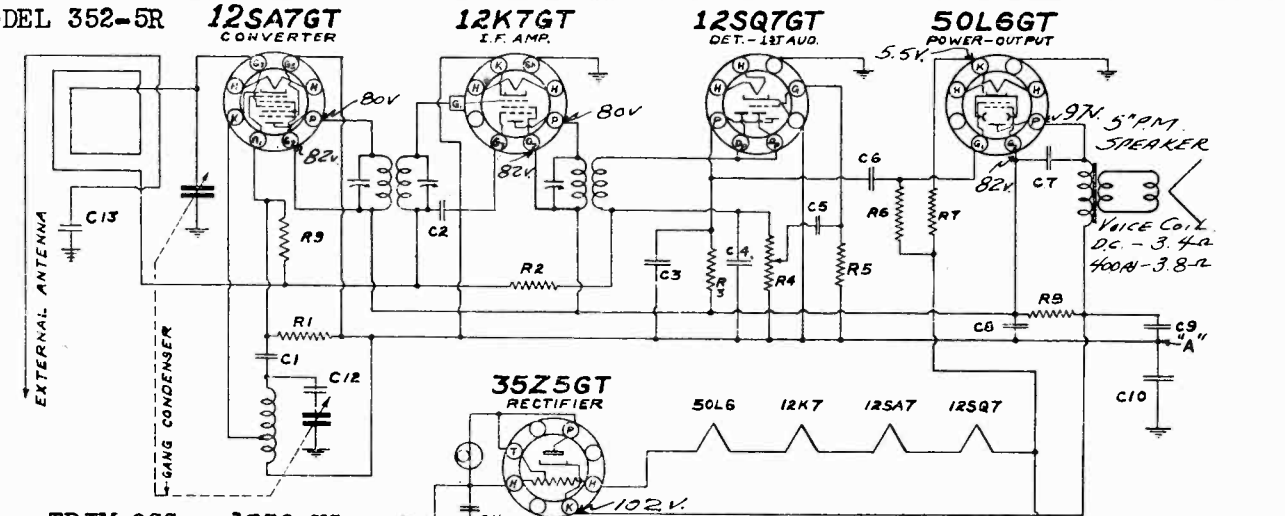
POWER CONSUMPTION: 44 watts.

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII

TRIM OSC. - 1730 KC
TRIM ANT. - 1400 KC

FOR SOCKET LAYOUT
SEE INDEX

MODEL 352-5R



TRIM OSC - 1730 KC
TRIM ANT - 1400 KC

IF PEAK 455 KC

FOR OTHER DATA
SEE INDEX

RESISTORS

№	OHMS	WATTS	№	OHMS	WATTS
R1	20,000	½	R6	500,000	½
R2	2 MEG.	½	R7	150 ± 10%	½
R3	250,000	½	R8	1,000	1
R4	500,000	V.C	R9	15 MEG.	½
R5	5 MEG.	½			

CAPACITORS

№	MFD.	VOLTS	№	MFD.	VOLTS
C1	.0001	MICA	C7	.01	400
C2	.02	400	C8	30.0	150
C3	.0005	MICA	C9	30.0	150
C4	.00025	MICA	C10	.25	200
C5	.01	400	C11	.05	400
C6	.002	600	C12	.02	400
			C13	.001	600

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII

C10 and C14 used in model 5RL only On model 5R point "A" is connected to ground.

Voltages: From point indicated to "A"; line 115 v. AC; meter 1000 ohms per volt - 150-volt scale. Power consumption: 30 watts.

MODELS 666-6J-669-6J inc.
MODELS 696-6M,697-6M
Socket,Trimmers

ZEPHYR RADIO CO.

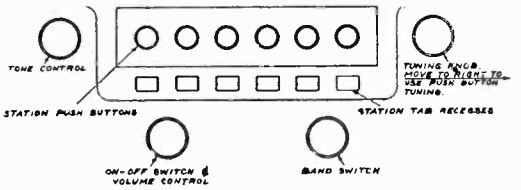
MODEL 381-7H
MODEL 605-7C
Tuner,Socket,Trimmers
MODEL 153-5L

PROCEDURE FOR SETTING UP PUSH BUTTONS

FOR MODELS 381 - 7H and 605 - 7C

There are six push buttons by means of which six stations may be selected (See Fig. 1). Make a list of six stations tuned in regularly. Push the tuning knob to the right until it clicks, this throws it out of engagement with the dial drum, thus when the push buttons are used the tuning knob does not turn. (A slight turn of the knob will automatically throw it back into engagement with the dial drum for manual tuning.)

Fig. 1—Front View



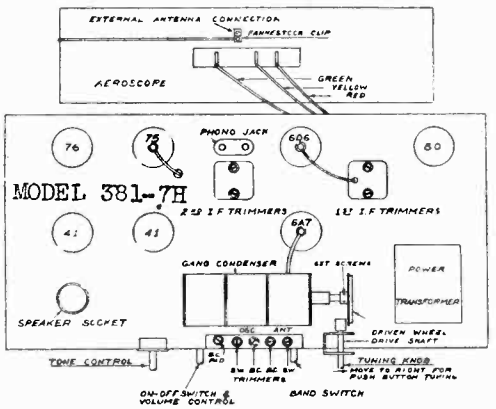
Loosen one of the push buttons by turning the push button knob counter clockwise a turn or less and push it in; while holding the button in, tune in a desired station by means of the station selector wheel. Turn the selector very slowly back and forth until the signal is clearest. Now while holding the push button in, tighten it by turning clockwise. Release the push button and turn the station selector to one end of the dial; push the tuning knob to the right and then check the button by pushing it in and if the station is tuned to the center of the area on the dial covered by the station the adjustment is correct.

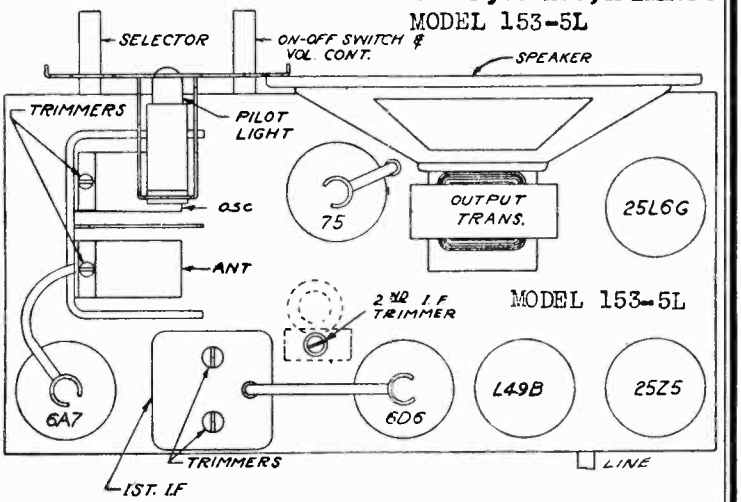
Release the push button and loosen another push button and repeat the above procedure, doing this for the remaining buttons.

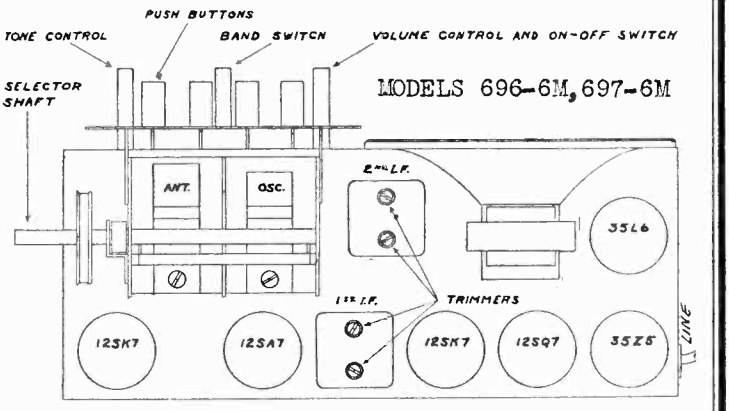
If it is desired to change a button to a different station simply loosen the push button and re-set.

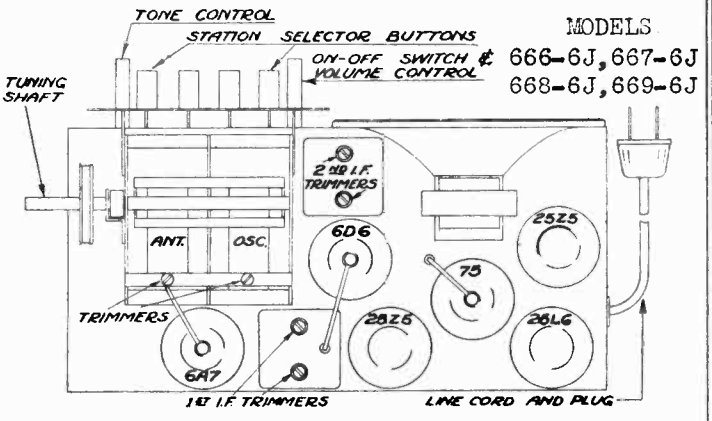
Punch the correct station call letter tabs from the set of sheets supplied and insert them into the recesses under the push buttons.

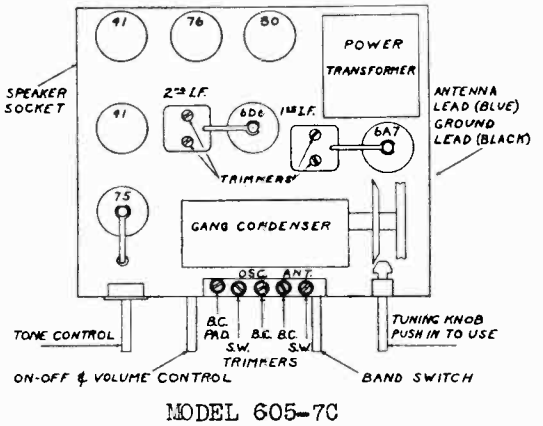
The dial is now set up for quick tuning and all that is necessary is to push the tuning knob to the right until it clicks and then push the button above the desired station all the way in and then release.





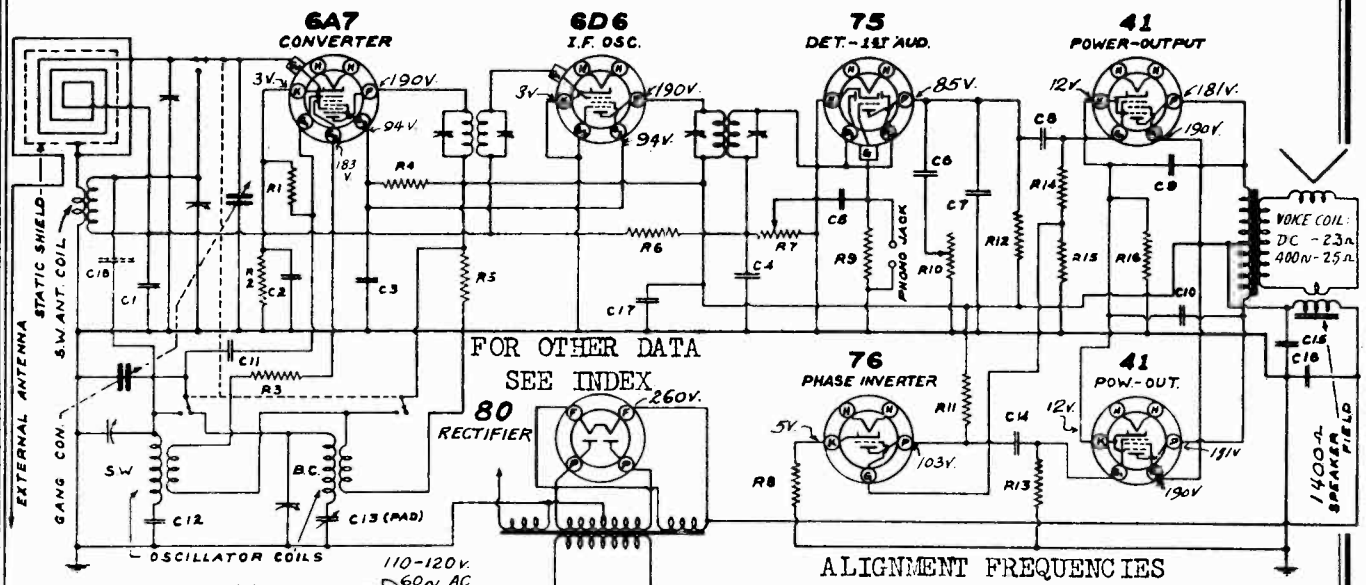






MODEL 381-7H
MODEL 605-7C
Schematics, Voltage
Alignment

ZEPHYR RADIO CO.



IF PEAK 455 KC

SWITCHES SHOWN IN BROADCAST POSITION.
BOTTOM VIEW OF SOCKETS SHOWN.

MODEL 381-7H

ALIGNMENT FREQUENCIES

BC OSC.- 1550 KC SW OSC.- 18.1 MC
BC ANT.- 1400 KC SW OSC.- 16.0 MC
BC PAD - 600 KC

CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII

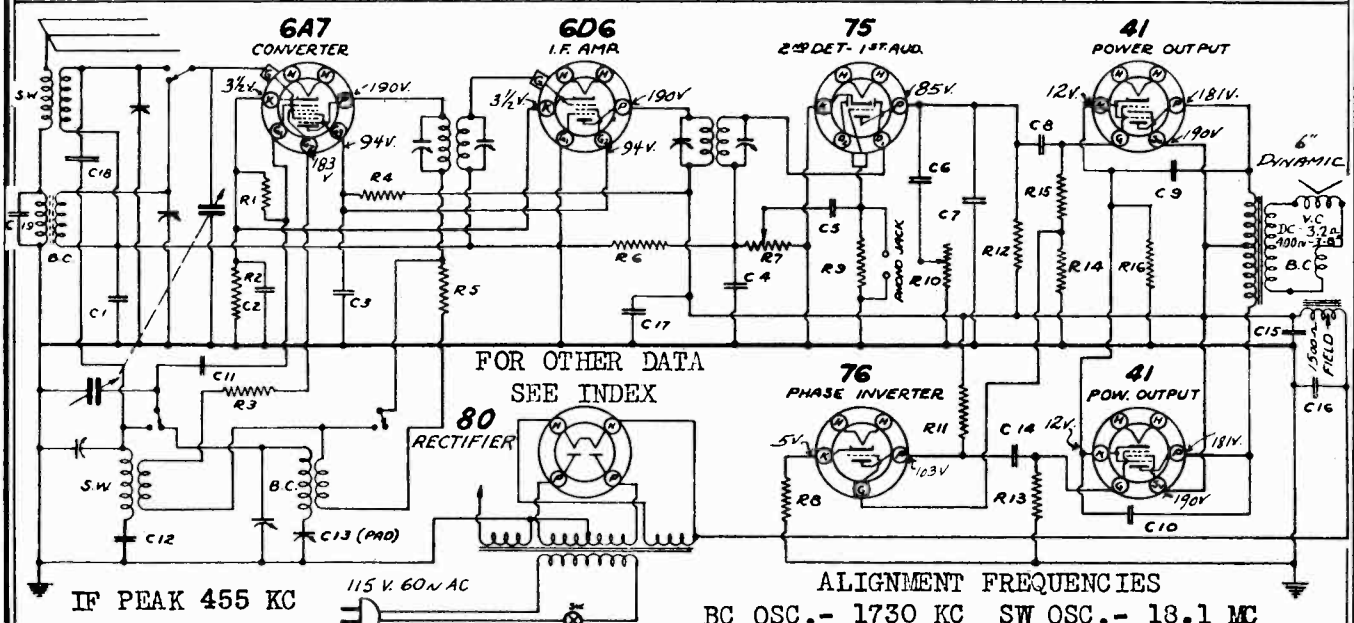
POWER CONSUMPTION: 60 watts.

VOLTAGES: Taken from socket terminals to ground; 20,000 ohms-per-volt meter.

GANG CONDENSER CAPACITY 443 μμfds.

No.	MFDS	VOLTS	No.	MFDS	VOLTS
C1	.05	200	C10	.005	600
C2	.25	200	C11	.0001	MICA
C3	.05	400	C12	.004 ± 5%	MICA
C4	.00025	MICA	C13	300-600 μμfds.	
C5	.01	400	C14	.01	400
C6	.005	600	C15	10.0	350
C7	.00025	MICA	C16	10.0	350
C8	.01	400	C17	.05	400
C9	.005	600	C18	GIMMICK	

No.	OHMS	WATTS
R1	50,000	½
R2	300	½
R3	850	½
R4	20,000	½
R5	1,000	½
R6	2 MEG.	½
R7	500,000	VOL. CON.
R8	3,000	½
R9	5 MEG.	½
R10	500,000	TONE CON.
R11	50,000	½
R12	250,000	½
R13	500,000	½
R14	400,000	½
R15	100,000	½
R16	300	½



IF PEAK 455 KC

BAND SWITCHES SHOWN IN BROADCAST POSITION
BOTTOM VIEW OF TUBE SOCKETS SHOWN

MODEL 605-7C

ALIGNMENT FREQUENCIES

BC OSC.- 1730 KC SW OSC.- 18.1 MC
BC ANT.- 1400 KC SW ANT.- 16.0 MC
BC PAD - 600 KC

CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII

POWER CONSUMPTION: 60 watts.

VOLTAGES: Taken from socket terminals to ground; 20,000 ohms-per-volt meter.

GANG CONDENSER CAPACITY 443 μμfds.

No.	MFDS	VOLTS	No.	MFDS	VOLTS
C1	.05	200	C11	.0001	MICA
C2	.25	200	C12	.004 ± 5%	MICA
C3	.05	400	C13	300-600 μμfd	PADDER
C4	.00025	MICA	C14	.01	400
C5	.01	400	C15	10.0	350
C6	.005	600	C16	10.0	350
C7	.00025	MICA	C17	.05	400
C8	.01	400	C18	GIMMICK	
C9	.005	600	C19	.0001	MICA
C10	.005	600			

No.	OHMS	WATTS
R1	50,000	½
R2	200	½
R3	250	½
R4	20,000	½
R5	1,000	½
R6	2 MEG	½
R7	500,000	VOL. CON.
R8	3,000	½
R9	5 MEG	½
R10	500,000	TONE CON.
R11	50,000	½
R12	250,000	½
R13	500,000	½
R14	100,000	½
R15	400,000	½
R16	300	½

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII

ALIGNMENT FREQUENCIES

BC OSC ------- 1730 KC
BC ANT ------- 1400 KC

RESISTORS

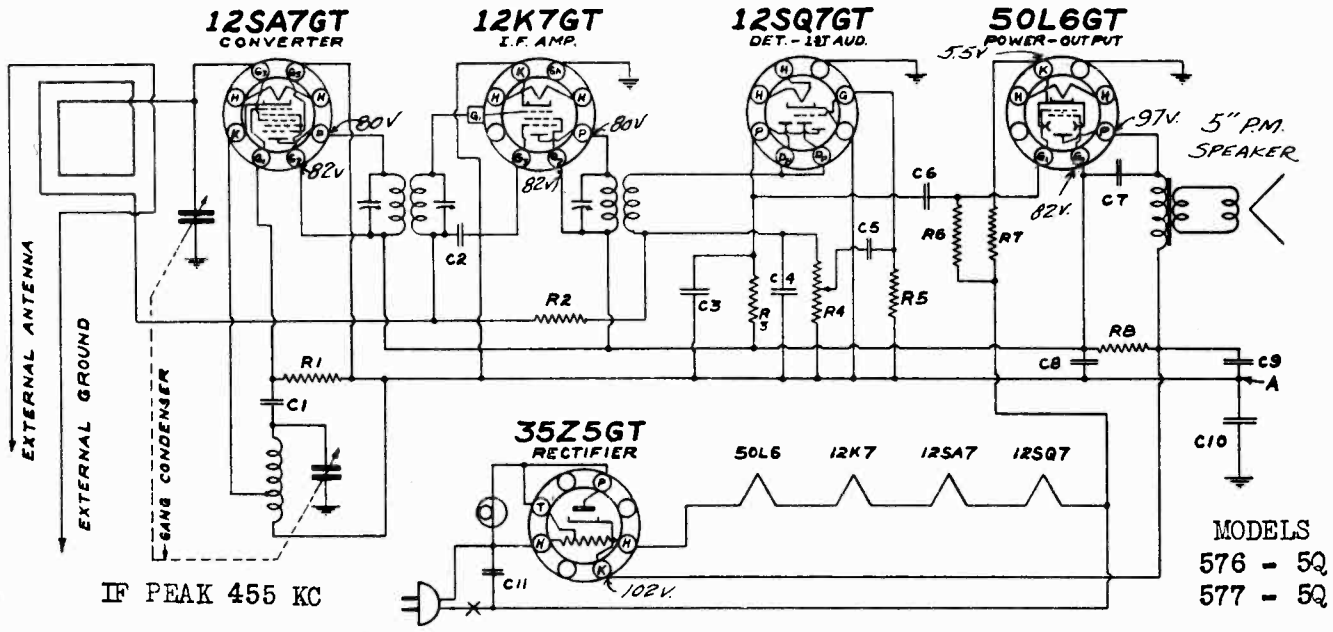
№	OHMS	WATTS	№	OHMS	WATTS
R1	20,000	½	R6	500,000	½
R2	2 MEG.	½	R7	1501 10%	½
R3	250,000	½	R8	1,000	1
R4	500,000	V.C.			
R5	5 MEG.	½			

CAPACITORS

№	MFD	VOLTS	№	MFD	VOLTS
C1	.0001	MICA	C7	.01	400
C2	.02	400	C8	20 0	150
C3	.0005	MICA	C9	30 0	150
C4	.00025	MICA	C10	.25	200
C5	.01	400	C11	05	400
C6	.002	600			

TUBES SHOW BOTTOM VIEW

C10 USED ON MODEL 5QL ONLY. ON MODEL 5Q, POINT "A" IS CONNECTED TO CHASSIS.



VOLTAGES:- Taken from socket terminals to point "A"; 115 V. line; AC power consumption 30 watts; volume control at maximum ; antenna shorted to ground; using a 100 ohm per volt meter.

Voice Coil
DC Resistance - 3.4Ω
At 400 cycles - 3.8Ω

MODELS 352-5R; 576-5Q, 577-5Q.

PROCEDURE FOR SETTING UP PUSH BUTTONS

There are four push buttons located on the top by means of which four stations may be selected (See Fig. 1). Make a list of four stations tuned in regularly. Loosen one of the push buttons by turning the push button knob counter clockwise a turn or less and push it in; while holding the button in, tune in a desired station by means of the station selector. Turn the selector very slowly back and forth until the signal is clearest. Now while holding the push button in, tighten it by turning clockwise. Release the push button and turn the station selector to one end of the dial; then check the button by pushing it in and if the station is tuned to the center of the area on the dial covered by the station the adjustment is correct.

Release the push button and loosen another push button and repeat the above procedure, doing this for the remaining buttons.

If it is desired to change a button to a different station simply loosen the push button and re-set.

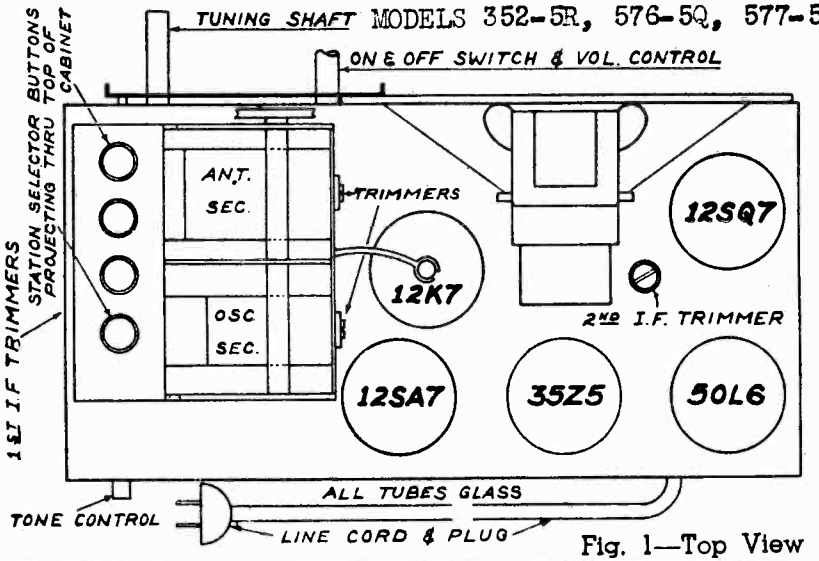
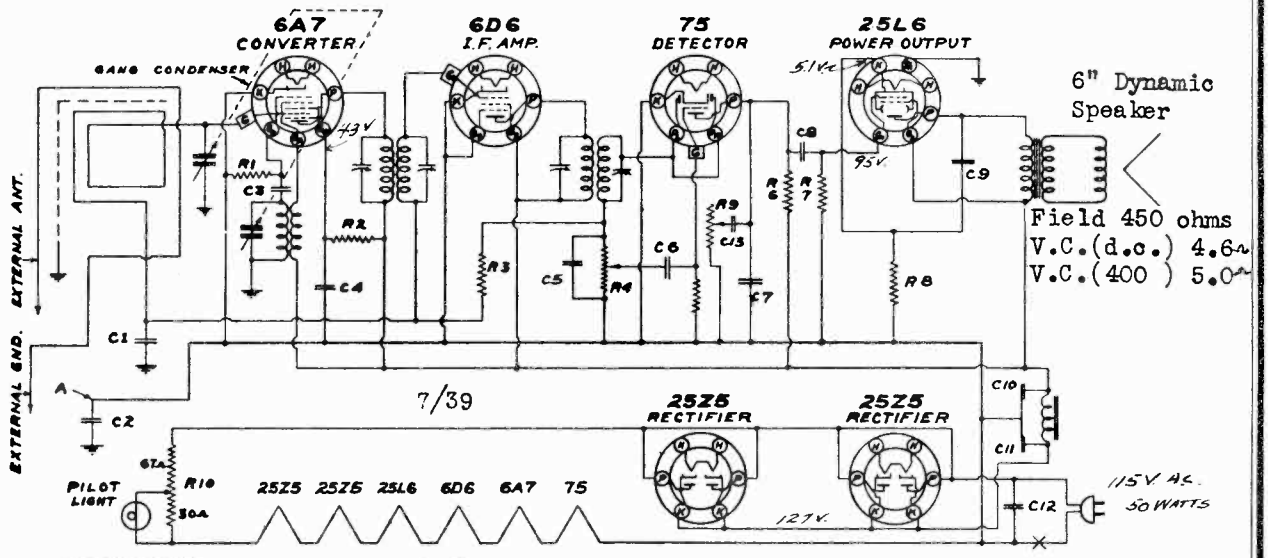


Fig. 1—Top View

MODELS 666-6J to 669-6J
MODELS 696-6M, 697-6M
Schematics, Voltage

ZEPHYR RADIO CO.



RESISTORS

Nº	OHMS	WATTS
R1	50,000	½
R2	30,000	½
R3	1,000,000	½
R4	500,000	VOL. CONT.
R5	5,000,000	½
R6	250,000	½
R7	500,000	½
R8	150 ± 10%	½
R9	250,000	TONE CONT.
R10	67 ± 30	10

CONDENSERS

Nº	MFDS.	VOLTS
C1	.02	200
C2	.25	200
C3	.00005	MICA
C4	.05	200
C5	.00025	MICA
C6	.01	400
C7	.00025	MICA
C8	.01	400
C9	.02	400
C10	20.	150
C11	20.	150
C12	0.05	400
C13	0.005	600

NOTE:- C2 USED ON MODEL 6JL ONLY
ON MODEL 6J POINT "A" IS
CONNECTED TO CHASSIS.

I.F. 455 K.C.
⏚ INDICATES CHASSIS GROUND

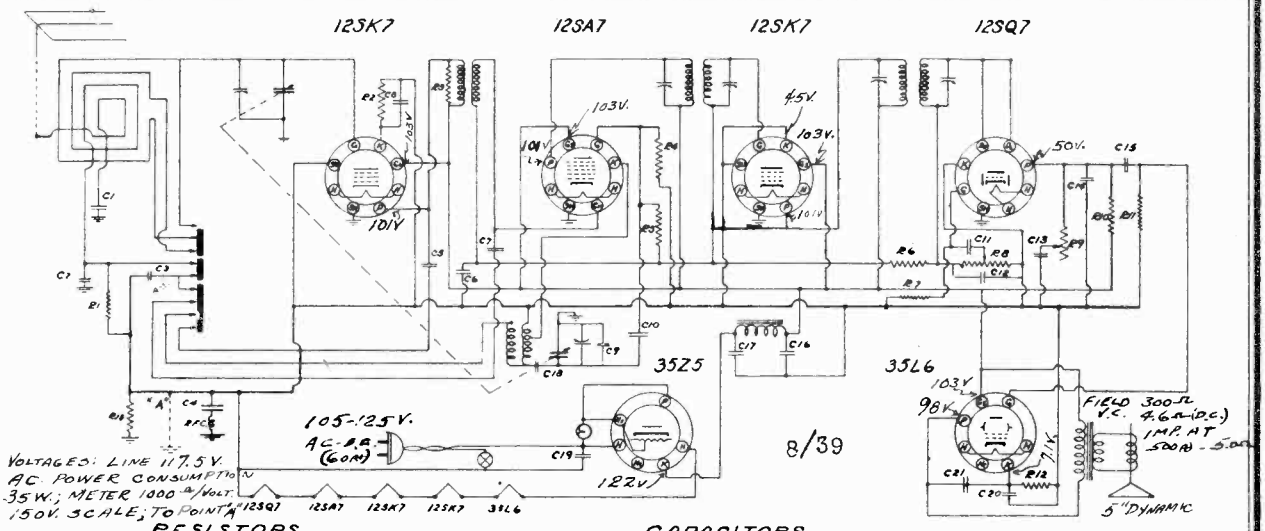
VOLTAGES: Taken with 1000 ohms per volt meter to ground; antenna shorted to ground.

MODELS 666-6J, 667-6J, 668-6J, 669-6J.

I.F. ALIGNMENT CONVENTIONAL
BROADCAST BAND
TRIM OSC 1630 KC
TRIM ANT 1400 KC

SEE SPECIAL SECTION
VOLUME VIII

(See Index for tube layout)



RESISTORS

Nº	OHMS	WATTS	Nº	OHMS	WATTS
R1	150K ±10%	½	R8	500K V.C.	½
R2	600 ±10%	½	R9	500K T.C.	½
R3	5K ±10%	½	R10	150K	½
R4	15 Meg	½	R11	250K	½
R5	25K	½	R12	200 ±10%	½
R6	2 Meg	½	R13	150K	½
R7	5 Meg	½			

CAPACITORS.

Nº	MFD.	VOLTS	Nº	MFD.	VOLTS.	Nº	MFD.	VOLTS
C1	.001	600	C8	.05	200	C15	.01	400
C2	.00127 ±5% Mica		C9	.000010	Mica	C16	20.	150
C3	.05	400	C10	.00005	Mica	C17	20.	150
C4	.25	200	C11	.01	400	C18	.02	400
C5	.00006 ±5% Mica		C12	.00025	Mica	C19	.05	400
C6	.05	200	C13	.005	600	C20	20.	25
C7	.00006 ±5% Mica		C14	.0005	Mica	C21	.02	400

I.F. 455 K.C.

In model 6M only C3, C4, C18, R13 and the R.F. choke (RFC) are not used and points "A" are connected to chassis.

I.F. ALIGNMENT CONVENTIONAL
BROADCAST BAND
TRIM OSC 1630 KC
TRIM ANT 1400 KC

SEE SPECIAL SECTION
VOLUME VIII

MODELS 696-6M, 697-6M
(See Index for tube layout)