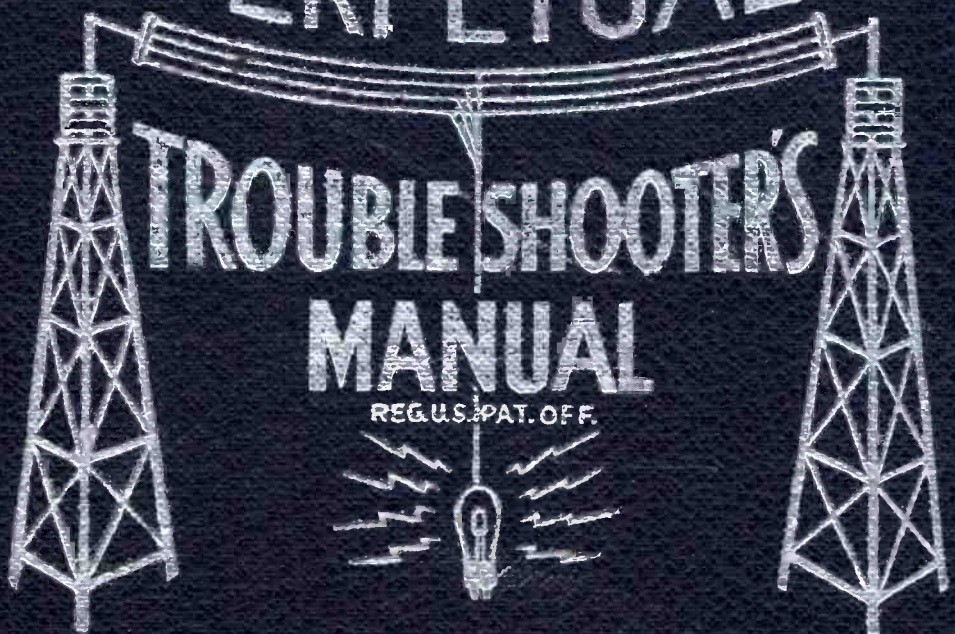
VOLUME XVII

PERPETUAL TROUBLE SHOOTER'S MANUAL



REG. U.S. PAT. OFF.

JOHN F. RIDER

SEARS. ROEBUCK AND CO.

MODEL 6686
Chassis
139.151

"A" SUPPLY

The "A" supply is obtained from a center tap full wave selenium rectifier filtered by a condenser input filter consisting of two condensers and a low resistance choke. Taps on the power transformer provide a voltage change to the rectifier giving two "A" load voltages. Terminal voltages for various loads are indicated on the wiring diagram.

"B" SUPPLY

The "B" supply is also obtained from a selenium rectifier operated in half wave into a condenser input filter of one choke followed by another condenser.

The "A" and "B" circuits are not common to each other. The minus of the "A" circuit is grounded to the chassis.

POWER DRAIN

The power drain is 5 watts when the "A" and "B" circuits are loaded with loads indicated on the wiring diagram. The input watts under no-load should not be more than 2.5 watts and the primary current without load not more than 150 MA at 118 volts, 60 cycles.

"A" SUPPLY FAILS

When the "A" voltage is excessively low the rectifier, condensers or transformer may be defective. To check the transformer remove the Tap-Changer-Plug and test the transformer voltage from F to F and S to S for voltages shown on the schematic. A voltmeter measurement from center tap to either side should be exactly half of these voltages. A high resistance meter must be used for correct readings. If half the rectifier has shorted the D.C. output voltage will drop to approximately 1/2 volt. Another check for the rectifier is to remove the "A" minus lead soldered to the rectifier bracket and measure the D.C. voltage from the bracket to the center tap of the transformer. This should be 2.5 volts with the Tap-Changer-Plug in the 6-tube position. Low capacity or high leakage of the input capacitor will cause a drop in "A" voltage. Replacement of the input capacitor is then necessary and for long life the sealed aluminum tube capacitor shown in the parts list as C_3 should be used for replacement.

"B" SUPPLY FAILS

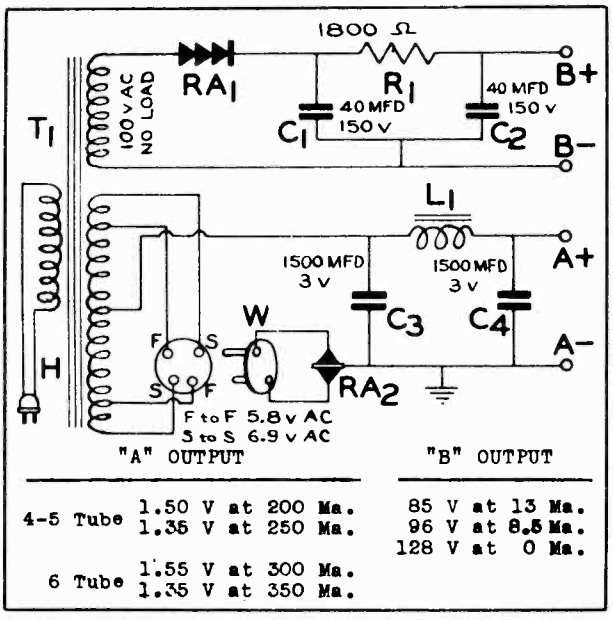
Test the A.C. voltage of the transformer plate winding as shown on the circuit with the rectifier connection removed. When installing a new rectifier note that the transformer lead is connected to the minus side of the "B" rectifier.

EXCESSIVE HUM

When excessive hum is noticed in the radio it may be due to the "A" supply or the "B" supply. The hum will be very loud when the input condenser C_3 opens in service. This open condenser will cause the output voltage to drop to 1 volt D.C. with a 6-tube load with Tap-Changer-Plug on 6-tube position. The hum will be somewhat less in volume if the second section or output condenser has opened and this will not change the output voltage.

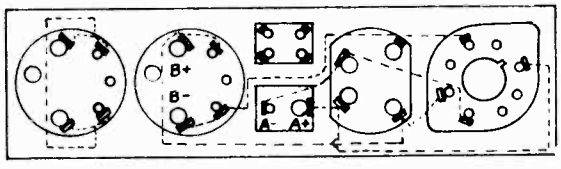
When the hum is caused by the "B" supply, the condensers of the filter circuit have probably opened.

To determine whether the hum is introduced by the "A" supply or the "B" supply, batteries may be substituted for each separate supply while one circuit is tested.



	"A" OUTPUT	"B" OUTPUT
4-5 Tube	1.50 V at 200 Ma. 1.35 V at 250 Ma.	85 V at 13 Ma. 96 V at 8.5 Ma. 128 V at 0 Ma.
6 Tube	1.55 V at 300 Ma. 1.35 V at 350 Ma.	

CIRCUIT DIAGRAM

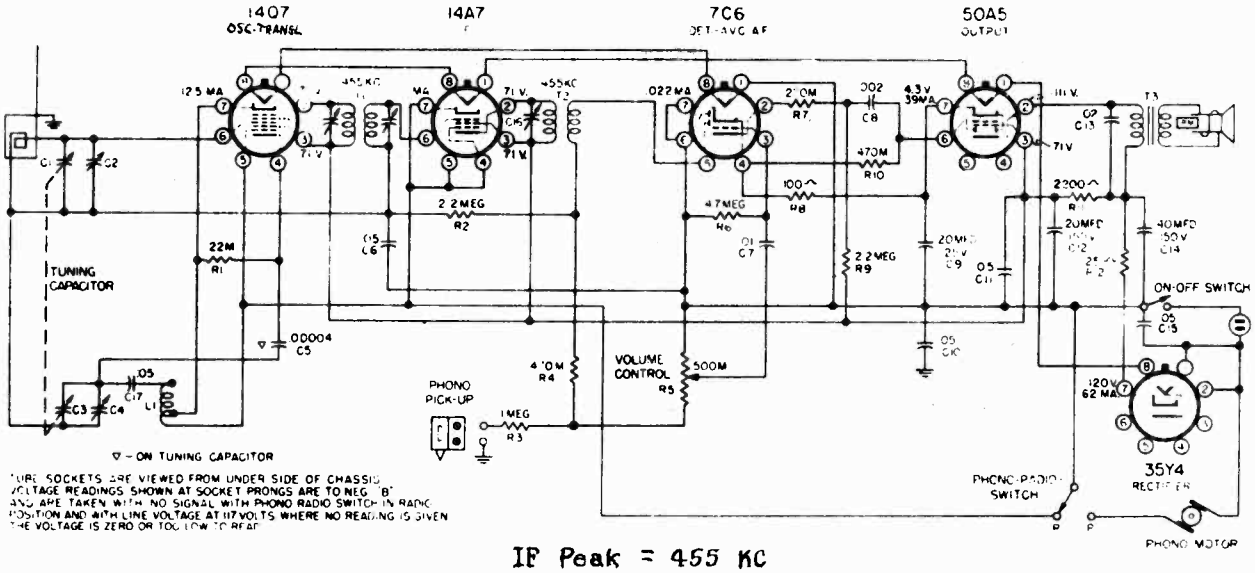


WIRING DIAGRAM OF SOCKET ASSEMBLY (Back)

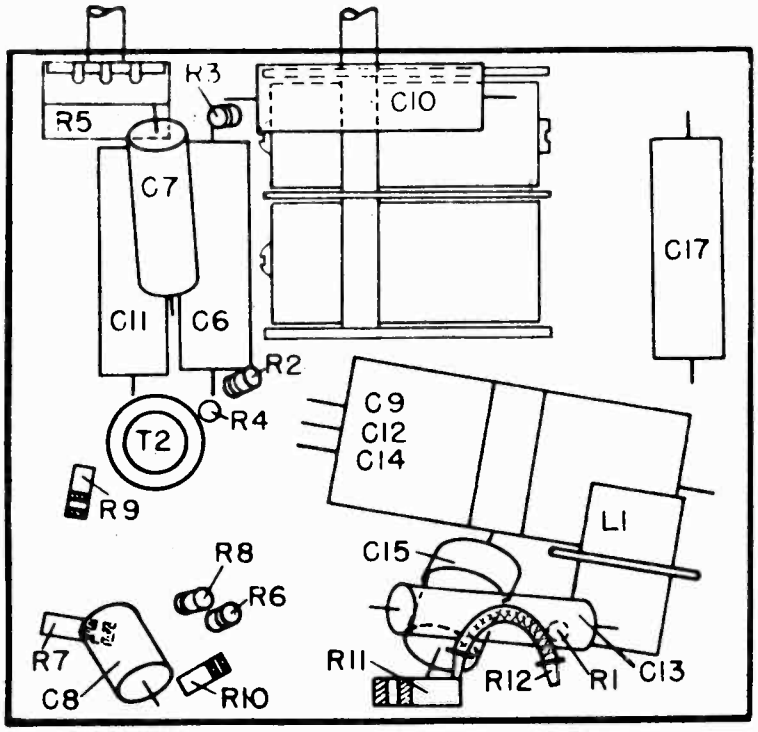
Schematic Location	Part No.	Description
C_1,C_2	J 20690	Capacitor 40x40 MFD. 150 V
C_3	J 20687	"A" Input Capacitor 1500 MFD. 3 Volt Aluminum Tube
C_4	J 20622	"A" Filter Capacitor 1500 MFD. 3 Volt Paper Tube
I_1	J 1065	"A" Filter Choke
R_1	J 1066	Resistor 1800 ohm 1 watt Carbon. insulated
RA_1	J 20691	"B" Rectifier, Selenium
RA_2	J 20693	"A" Rectifier Assembly, Selenium
T_1	J 1067	Power Transformer
H	J 20686	Line Cord with Plug
W	J 2727	Tap Change Plug
-	J 8129	Combination Panel (Socket Assem.)

MODEL 7070
Chassis 101.817

SEARS, ROEBUCK AND CO.



IF Peak = 455 KC



LOCATION OF PARTS UNDER CHASSIS

ALIGNMENT PROCEDURE

PRELIMINARY:

Output Meter Connection.....Across loud speaker voice coil
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

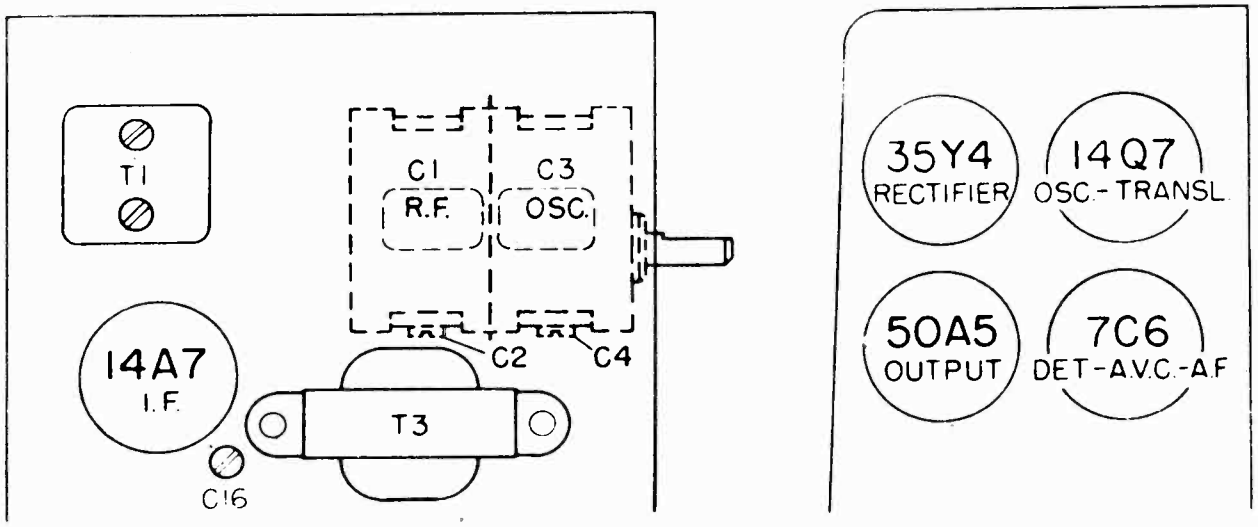
POSITION OF TUNER	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMER ADJUSTMENTS (IN ORDER) SHOWN	TRIMMER FUNCTION
Closed	455 KC	.1 mfd.	14Q7 Transl. grid	C16, T1	IF
1410 KC	1410 KC	.0002 mfd.	Loop	C4	Oscillator
1410 KC	1410 KC	.0002 mfd.	Loop	C2	Transl.

IMPORTANT ALIGNMENT NOTES

The Alignment must be done in the order given.

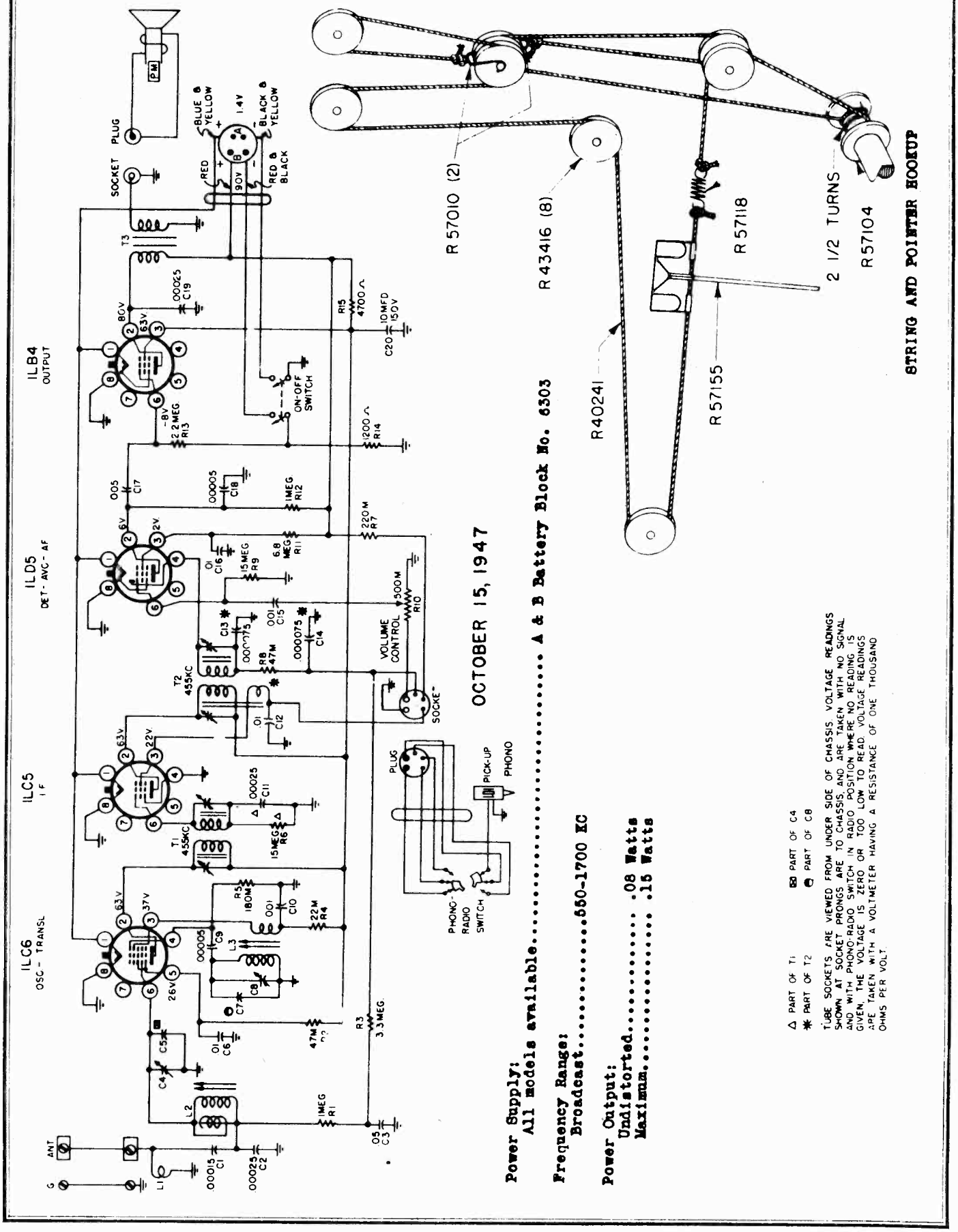
The entire Alignment Procedure should be repeated step by step in the original order for greatest accuracy.

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



MODEL 7210
Chassis 101.820

SEARS, ROEBUCK AND CO.



OCTOBER 15, 1947

Power Supply:
All models available..... A & B Battery Block No. 6303

Frequency Range:
Broadcast.....550-1700 KC

Power Output:
Undistorted..... .08 Watts
Maximum..... .15 Watts

Δ PART OF T1 ■ PART OF C4
✱ PART OF T2 ● PART OF C8

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS AND ARE TAKEN WITH NO SIGNAL AND WITH PHONO-RADIO SWITCH IN RADIO POSITION WHERE NO READING IS GIVEN. THE VOLTAGE IS ZERO OR TOO LOW TO READ. VOLTAGE READINGS ARE TAKEN WITH A VOLTMETER HAVING A RESISTANCE OF ONE THOUSAND OHMS PER VOLT.

SEARS, ROEBUCK AND CO. MODEL 7210

ALIGNMENT PROCEDURE

PRELIMINARY:

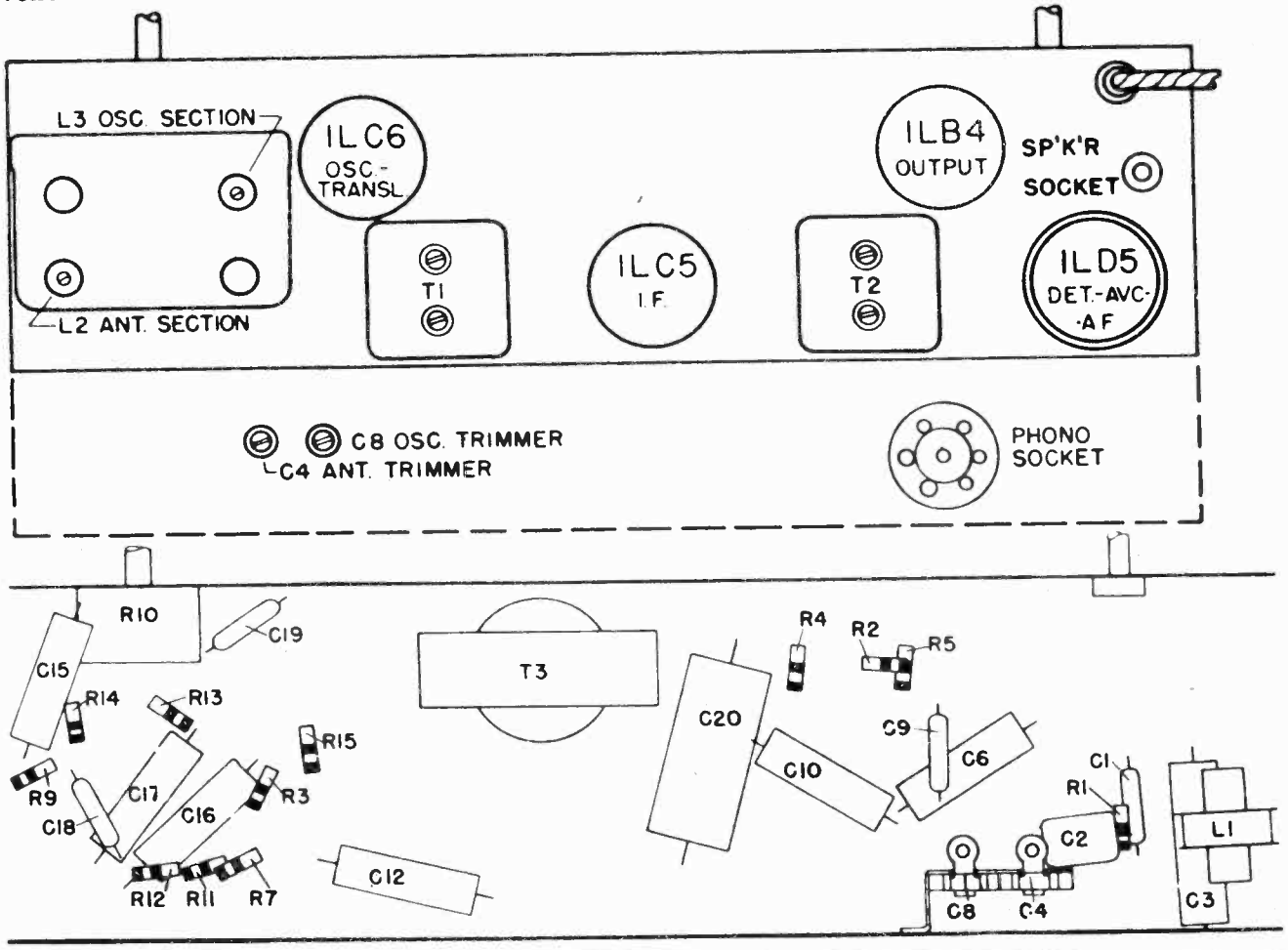
Output Meter Connection.....Across loud-speaker voice coil
Output Meter Reading to Indicate 50 Milliwatts (Standard Output)..... 0.4 volt
Generator Ground Lead Connection.....Receiver chassis
Dummy Antenna Value to be in Series with Generator Output.....See chart below
Connection of Generator Output Lead.....See chart below
Generator Modulation.....30%, 400 cycles
Position of Volume Control..... Fully on
Position of Pointer with Tuner Fully Closed....Line to the left of 540 Kc calibration mark

POSITION OF TUNER	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	ADJUSTMENTS (IN ORDER SHOWN)	FUNCTION
Closed	455 Kc.	.1 mfd.	1LC6 Transl. Grid	T2,T1	I.F.
1725	1725 Kc.	.000075 mfd.	Ant. Terminal	C8	Oscillator
1725	1725 Kc.	.000075 mfd.	Ant. Terminal	C4	Antenna
1500	1500 Kc.	.000075 mfd.	Ant. Terminal	L3	Oscillator
1500	1500 Kc.	.000075 mfd.	Ant. Terminal	L2	Antenna
1725	1725 Kc.	.000075 mfd.	Ant. Terminal	C8,C4	Osc. & Ant. Recheck

IMPORTANT ALIGNMENT NOTES

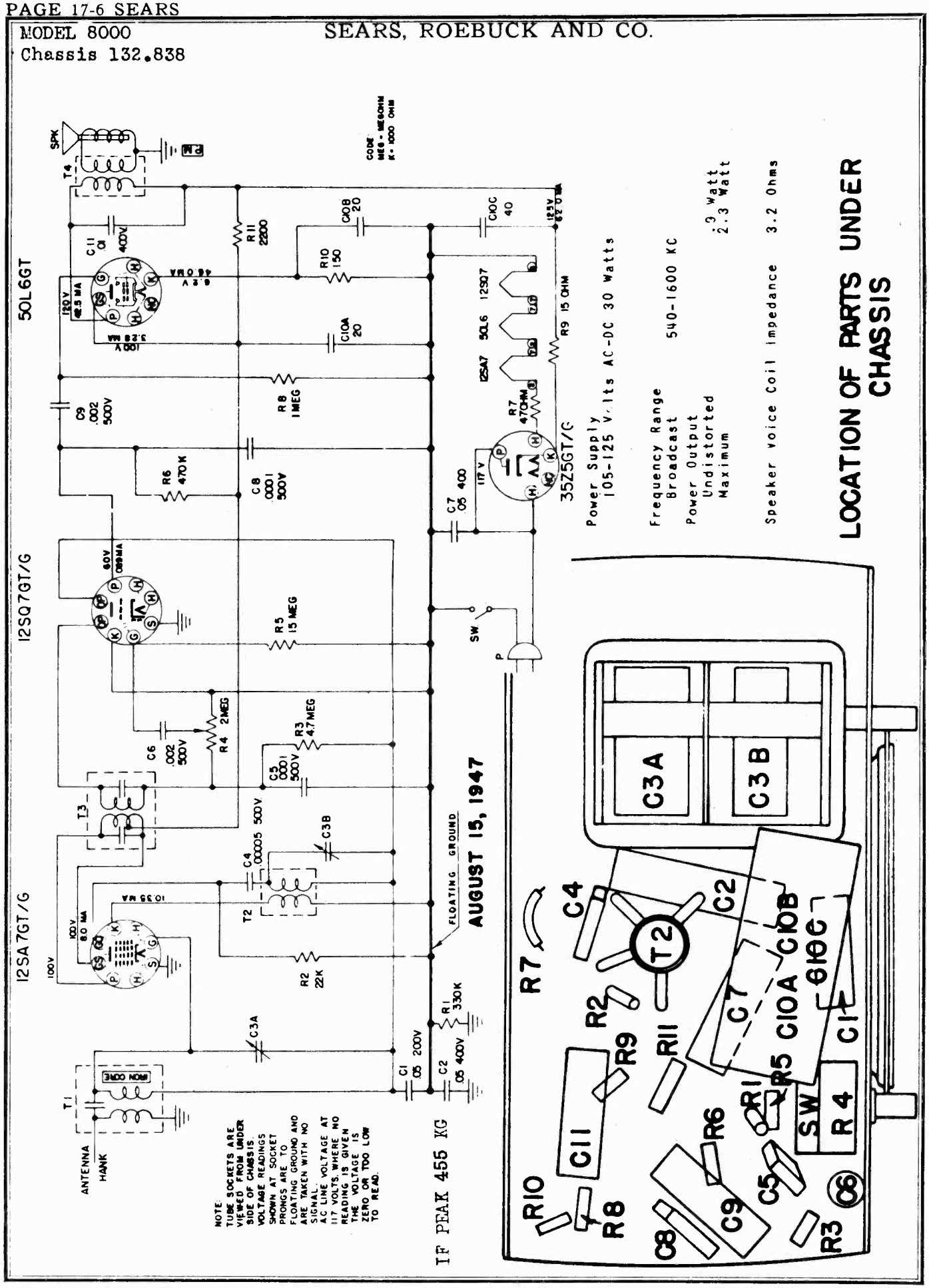
The alignment must be done in the order given.

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



MODEL 8000
Chassis 132.838

SEARS, ROEBUCK AND CO.



ALIGNMENT PROCEDURE

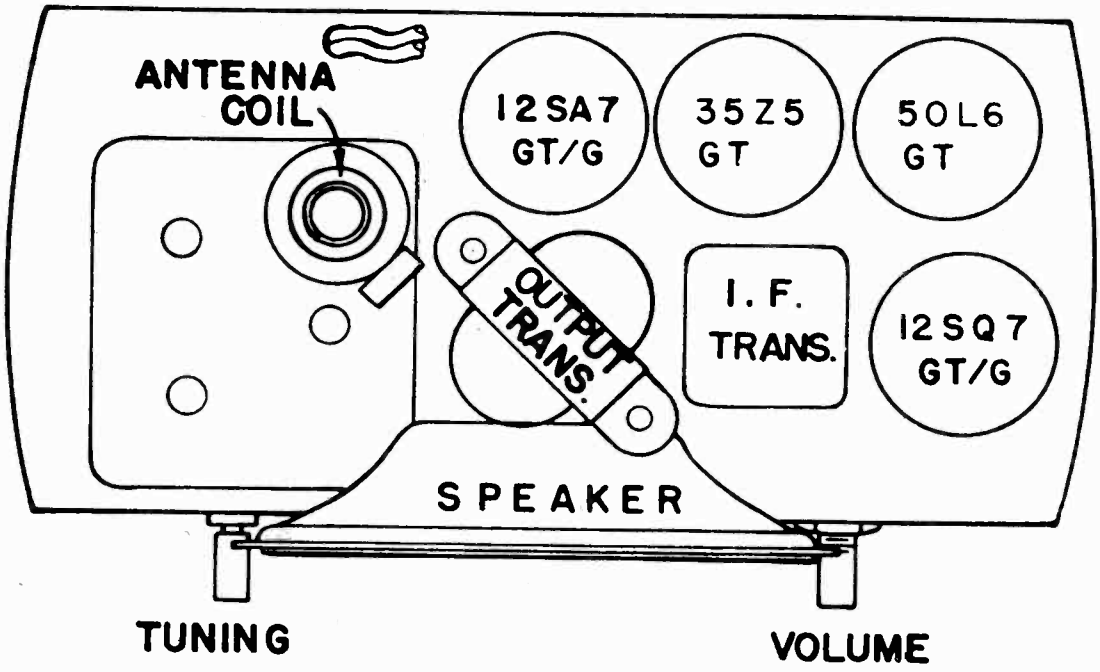
PRELIMINARY:

Output meter connection ..... Across Speaker Voice Coil
Output meter reading to indicate 200 MW (Standard Output) ..... .8 Volt
Generator modulation ..... 30% 400 Cycles
Position of volume control ..... Fully Clockwise
Position of dial pointer with variable condenser fully closed ..... Down

POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION HIGH SIDE	GENERATOR CONNECTION GRD. LEAD	ADJUST TRIMMERS IN ORDER SHOWN	TRIMMER FUNCTION
Open	455 KC	.05 Mfd.	Mixer Grid	Floating Gnd	T3	IF
Open	1620 KC	50 Mmf.	*Ant. Lug	Float. Gnd.	C3B	Oscillator
1400 KC	1400 KC	50 Mmf.	*Ant. Lug	Float. Gnd.	C3A	Antenna
600 KC	600 KC	50 Mmf.	*Ant. Lug	Float. Gnd.	**Check Point	Antenna

IMPORTANT ALIGNMENT NOTES

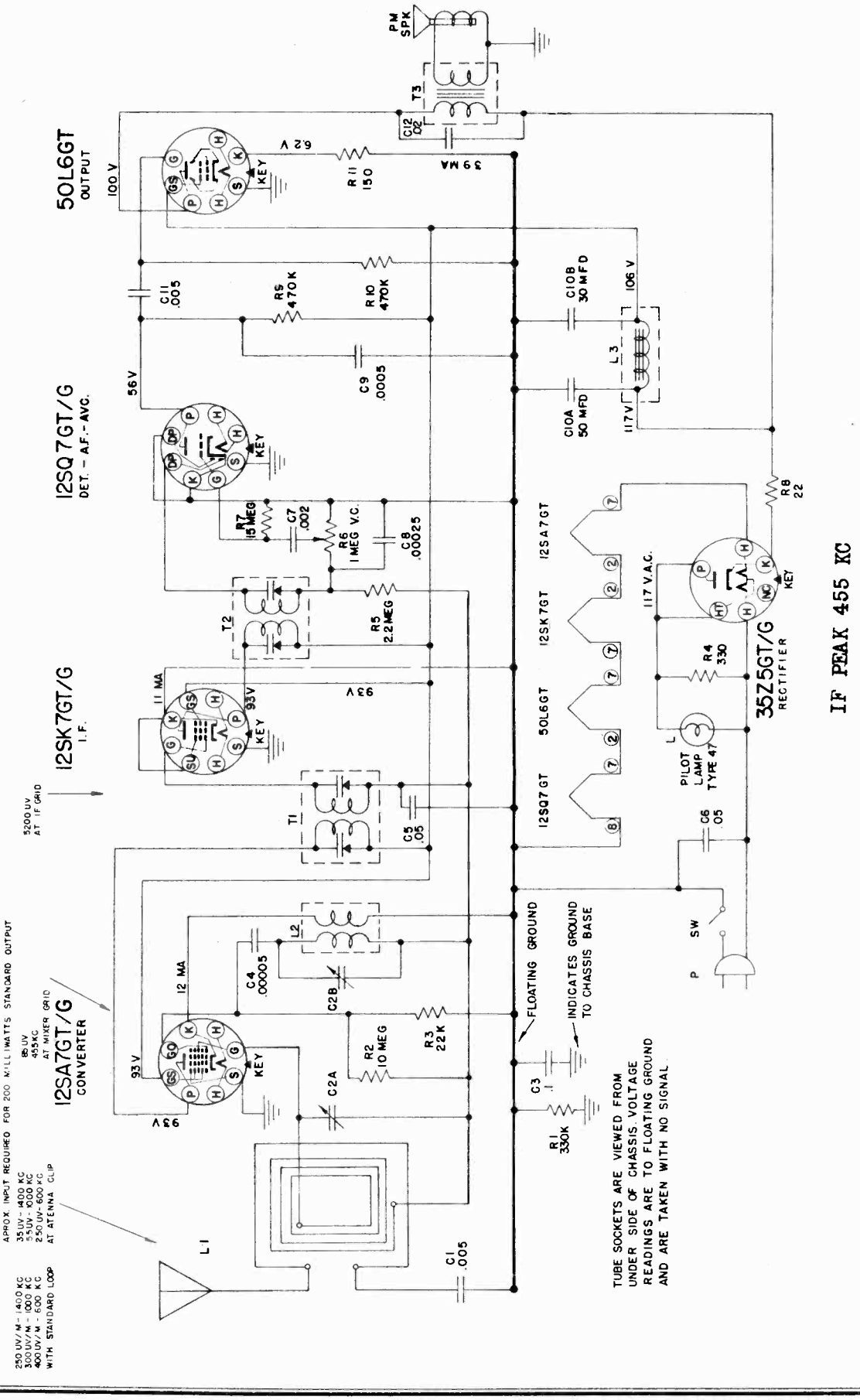
* Antenna hank lug on antenna coil with hank removed.
** Check sensitivity at 600 KC. If low, adjust antenna section plates of variable for maximum output at 600 KC.
The alignment procedure should be repeated in the original order for greatest accuracy. Always keep the output from the signal generator at its lowest possible value to make the A. V. C. action of the receiver ineffective.



TUBE LAYOUT

MODEL 8005
Chassis 132.839

SEARS, ROEBUCK AND CO.



SEARS, ROEBUCK AND CO. MODEL 8005

ALIGNMENT PROCEDURE

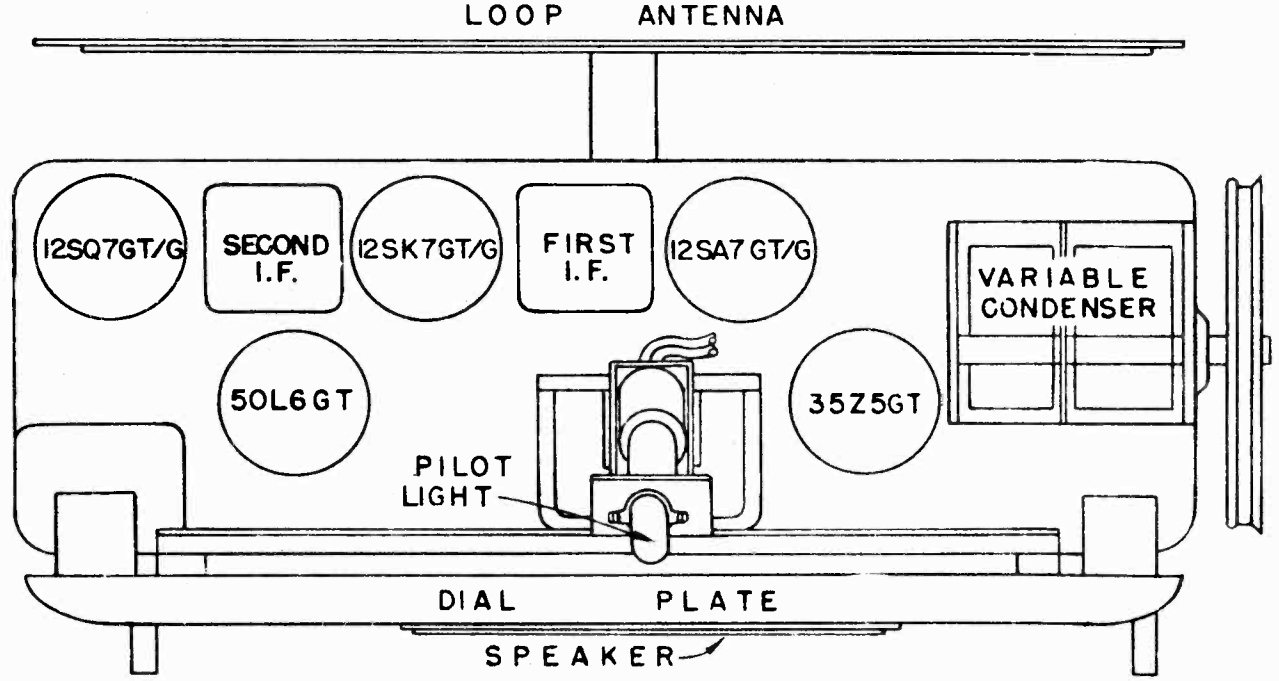
PRELIMINARY:

Output meter connection ..... Across Speaker Voice Coil
Output meter reading to indicate 200 MW (Standard output) ..... .8 Volt
Generator modulation ..... 30% 400 Cycles
Position of volume control ..... Fully clockwise
Dial pointer position with variable condenser closed..... Last mark on dial

POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION HIGH SIDE	GENERATOR CONNECTION GND. LEAD	ADJUST TRIMMERS ORDER SHOWN	TRIMMER FUNCTION
Open	455 KC	.05 Mfd.	Mixer Grid	Fltg. Gnd.	T2-T1	IF
1400 KC	1400 KC	50 Mmf.	*Ant. Lead	Fltg. Gnd.	C2B	Oscillator
1400 KC	1400 KC	50 Mmf.	*Ant. Lead	Fltg. Gnd.	C2A	Antenna
600 KC	600 KC	50 Mmf.	*Ant. Lead	Fltg. Gnd.	**Check Point	Antenna

IMPORTANT ALIGNMENT NOTES

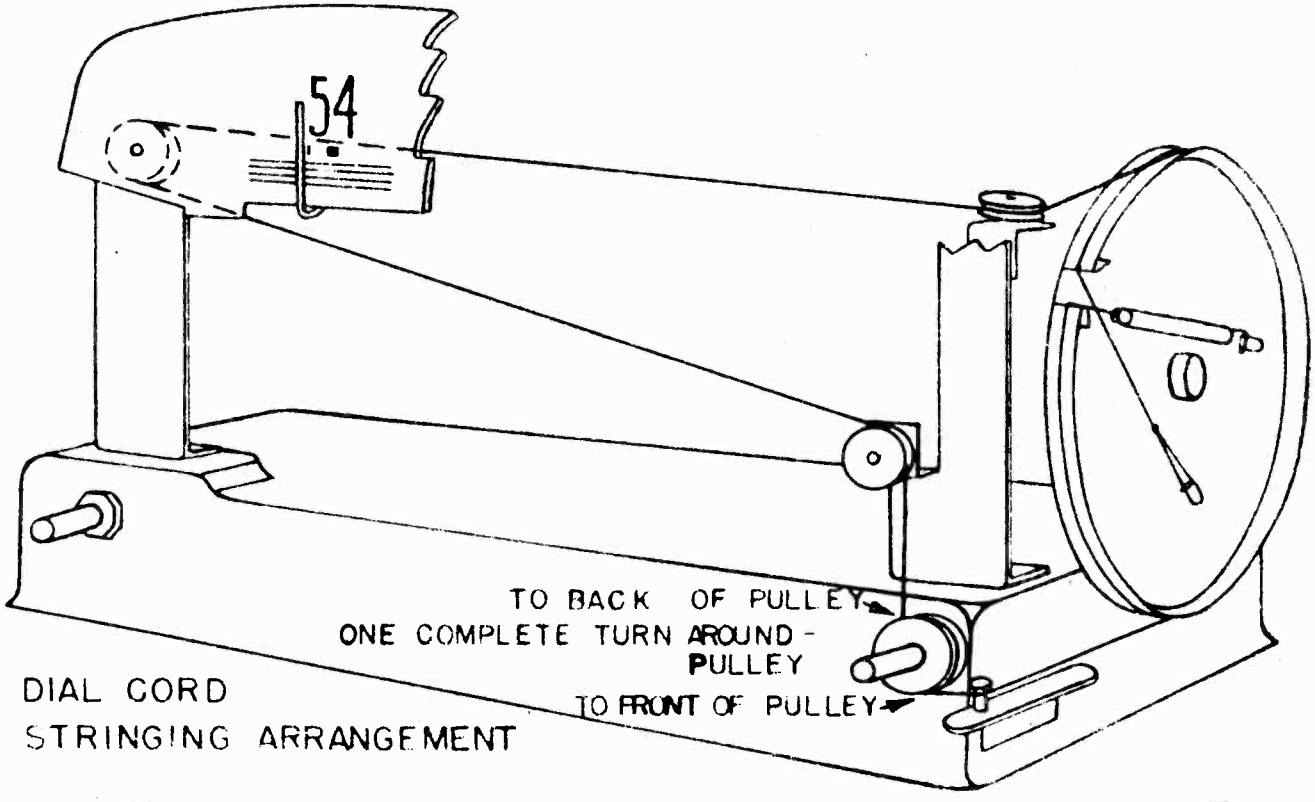
* Connect generator lead to green wire on loop antenna or a test loop may be used on the generator placed a short distance from the set loop.
**Check sensitivity at 600 KC. If low, adjust antenna section plates of variable for maximum output at 600 KC.
The alignment procedure should be repeated in the original order for greatest accuracy Always keep the output from the signal generator at its lowest possible value to make the A. V. C. action of the receiver ineffective.



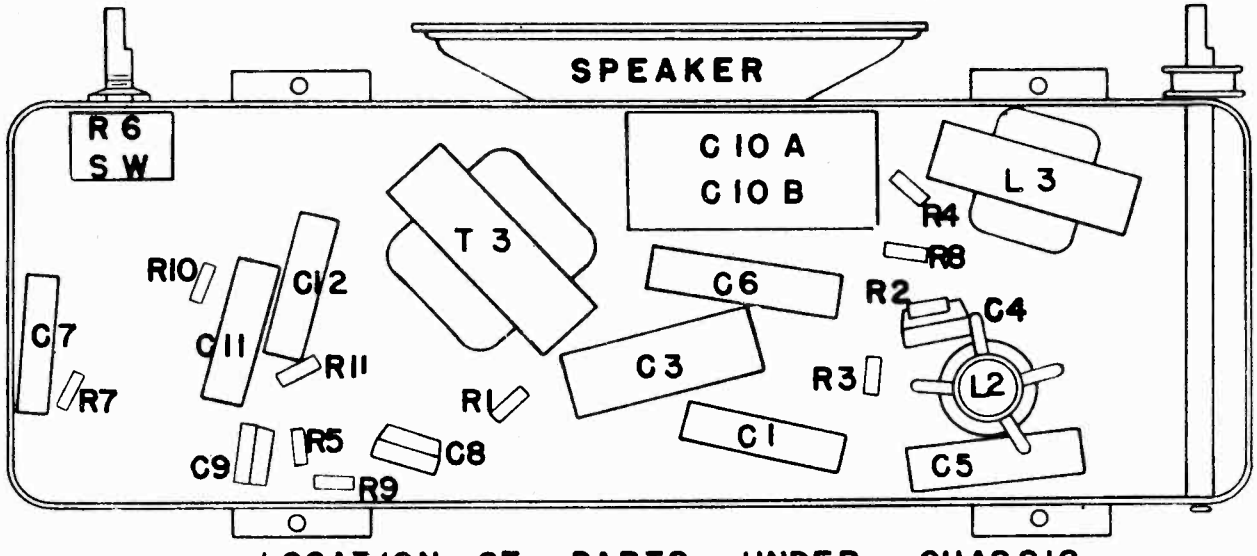
TUBE LAYOUT OUTLINE

MODEL 8005

SEARS, ROEBUCK AND CO.



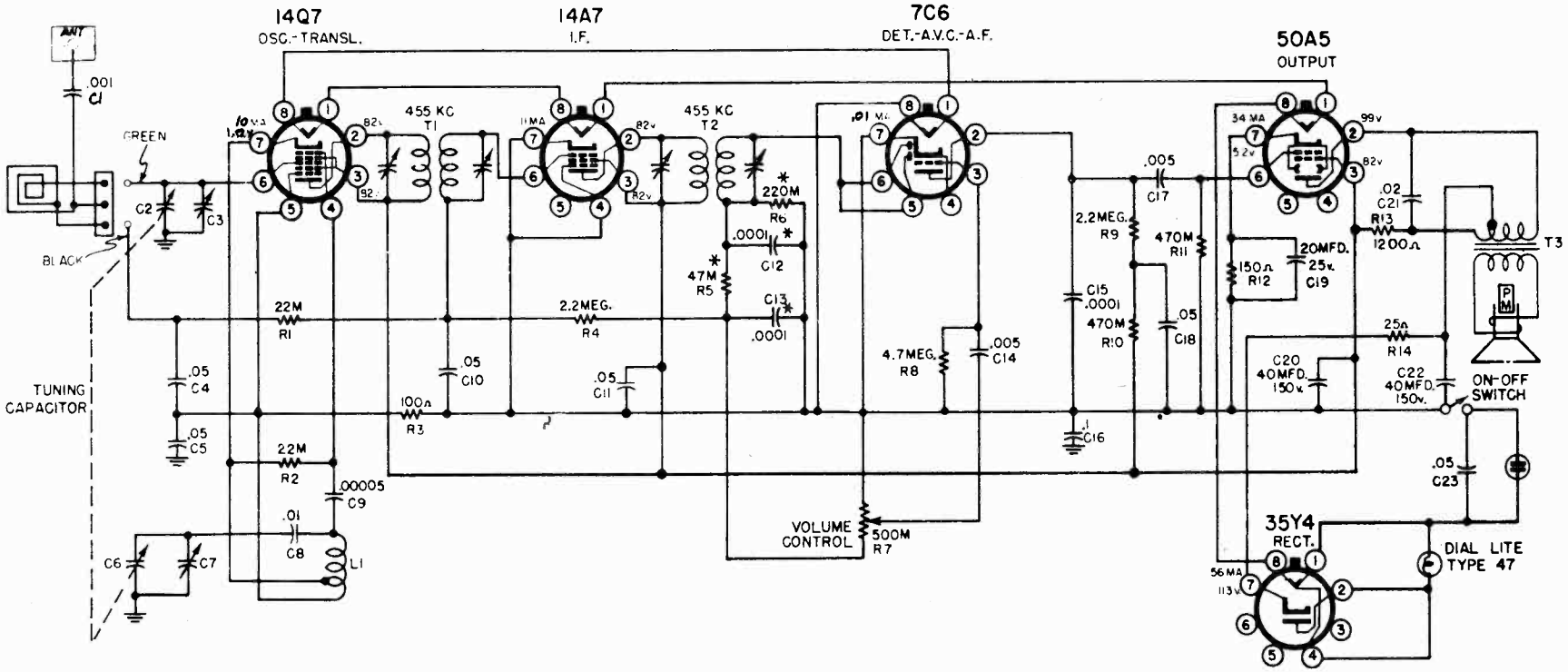
DIAL CORD STRINGING ARRANGEMENT



LOCATION OF PARTS UNDER CHASSIS

SCHEMATIC LOCATION	PART NUMBER	DESCRIPTION	MU CODE
R1		Resistor, 330,000 Ohms, 1/4 W	
R2		Resistor, 10 Meg., 1/4 W	
R3		Resistor, 22,000 Ohm, 1/4 W	
R4		Resistor, 330 Ohm, 1/4 W	
R5		Resistor, 2.2 Megohm, 1/4 W	
R6	N21251	Control, On-Off Sw & Volume, 1 Megohm	
R7		Resistor, 15 Megohm, 1/4 W	
R8		Resistor, 22 Ohm, 1/4 W	
R9, R10		Resistor, 470,000 Ohm, 1/4 W	
R11		Resistor, 150 Ohm, 1/4 W	
C1, C11		Condenser, .005 Mfd., 400 V	
C2A, C2B		Condenser, Variable	AA0
C3		Condenser, .1 Mfd., 400 V	
C4		Condenser, .00005 Mfd., 500V Mica	
C5		Condenser, .05 Mfd., 400 V	
C6		Condenser, .05 Mfd., 200 V	
C7		Condenser, .002 Mfd., 400 V	
C8		Condenser, .00025 Mfd., 500 V Mica	
C9		Condenser, .0005 Mfd., 500 V Mica	
C10A,10B		Electrolytic, 50-30 Mfd., 150 V	

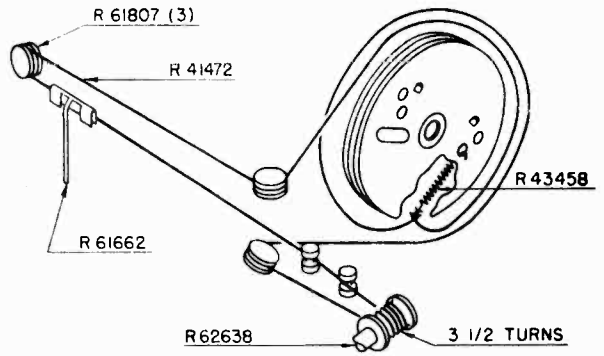
SCHEMATIC LOCATION	PART NUMBER	DESCRIPTION	MU CODE
C12		Condenser, .02 Mfd., 400V	
L1	N21245	Antenna Loop Assembly	
L2	N19354	Coil, Oscillator	
L3	N21246	Choke, Filter	
Spk	N21248	Speaker, 4" P. M.	A5
T1	N21424	Transformer, 1st I. F.	
T2	N21425	Transformer, 2nd I. F.	
T3	N21247	Transformer, Output	
	N21227	Cabinet, Less Metal Grille & Dial Cover	A5
	N19794	Cover, Dial, Clear Plastic	
	N19793	Grille, Metal Cabinet Front	
	N19132	Cord, Dial Drive	
	N21204	Knob, On-Off, Volume or Tuning	
	N21231	Leaflet, Instruction	
	420138	Line Cord with Plug	
	N21145	Dial Pointer	
	N21200	Scale, Dial with Pointer Rail	
	N21243	Shaft, Tuning	
	N21228	Socket, Dial Light with Leads	
		Lamp, Dial, Mazda No. 47	



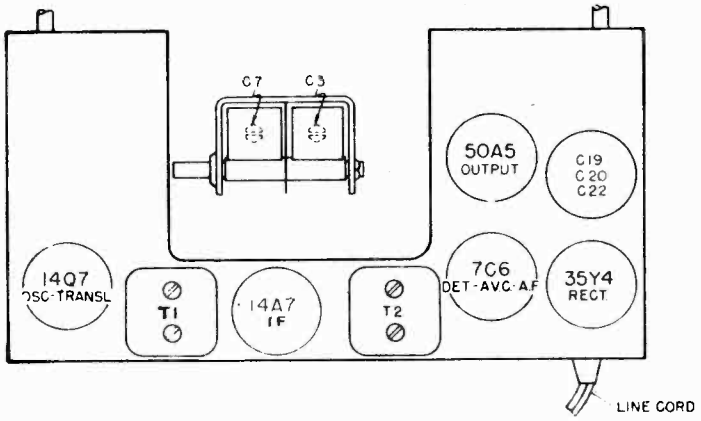
*-PART OF T2

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO NEG. "B", AND ARE TAKEN WITH NO SIGNAL, AND WITH LINE VOLTAGE AT 117 VOLTS. VOLTAGE READINGS ARE TAKEN WITH A VOLTMETER HAVING A RESISTANCE OF ONE THOUSAND OHMS PER VOLT. WHERE NO READING IS GIVEN THE VOLTAGE IS ZERO OR TOO LOW TO READ.

IF Peak = 455 KC

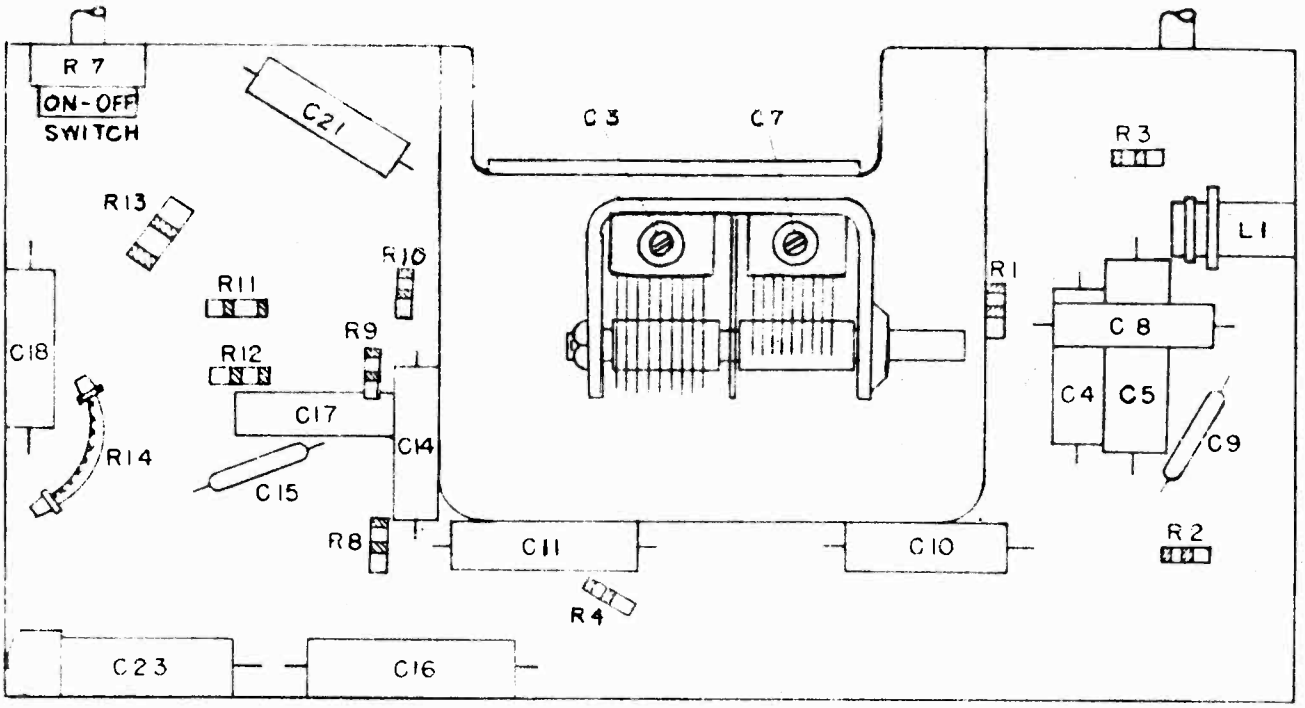


STRING AND POINTER HOOKUP



MODEL 8050

SEARS, ROEBUCK AND CO.



LOCATION OF PARTS UNDER CHASSIS

ALIGNMENT PROCEDURE

PRELIMINARY:

Output Meter reading to indicate 0.05 watt across voice coil.....0.4 Volt
Generator ground lead connection.....I.F. alignment-negative "B" lead
.....R.F. alignment-Receiver chassis
Generator Modulation.....30%,400 cycles
Position of Volume Control.....Fully on
Position of pointer with tuner fully closed.....Last line to left of 540 calibration mark on escutcheon or light brown mark about 1 inch from the left-hand end on the upper edge of the dial background.

POSITION OF TUNER	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMER (ADJ. IN ORDER SHOWN)	TRIMMER FUNCTION
Closed	455 Kc.	0.1 mfd.	Transl. Grid	T2,T1	I.F.
Fully Open	1650 Kc.	.0002 mfd.	Antenna	C7	Osc.
See Note Below	1410 Kc.	.0002 mfd.	Antenna	C3	Ant.

IMPORTANT ALIGNMENT NOTES

NOTE: The 1410 Kc. calibration point is a light brown mark about 2 inches from the right hand end on the upper edge of the dial background.

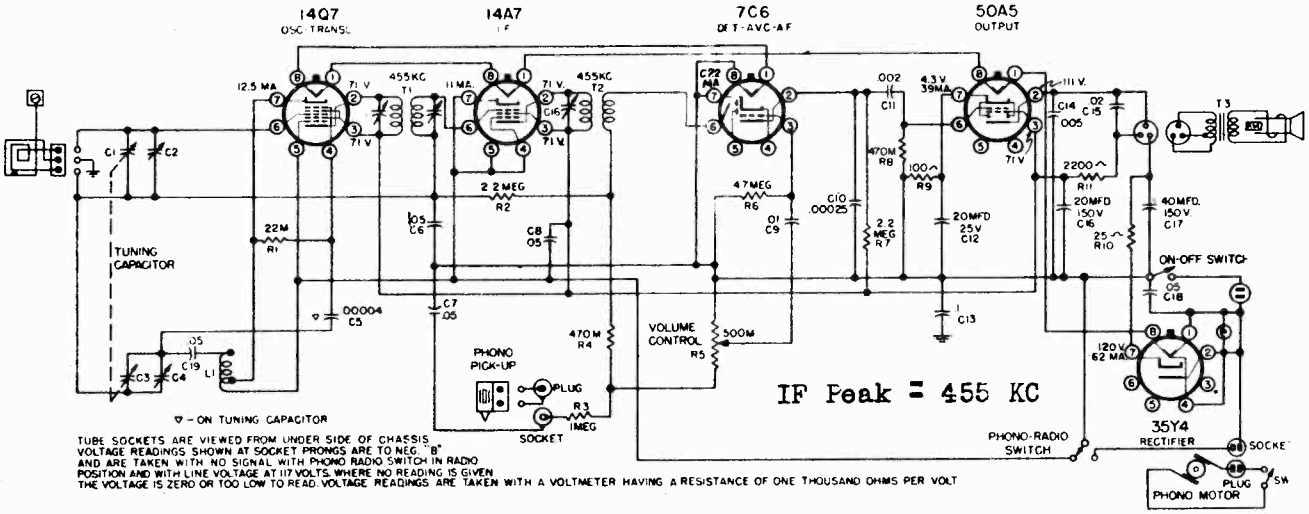
The Alignment must be done in the order given.

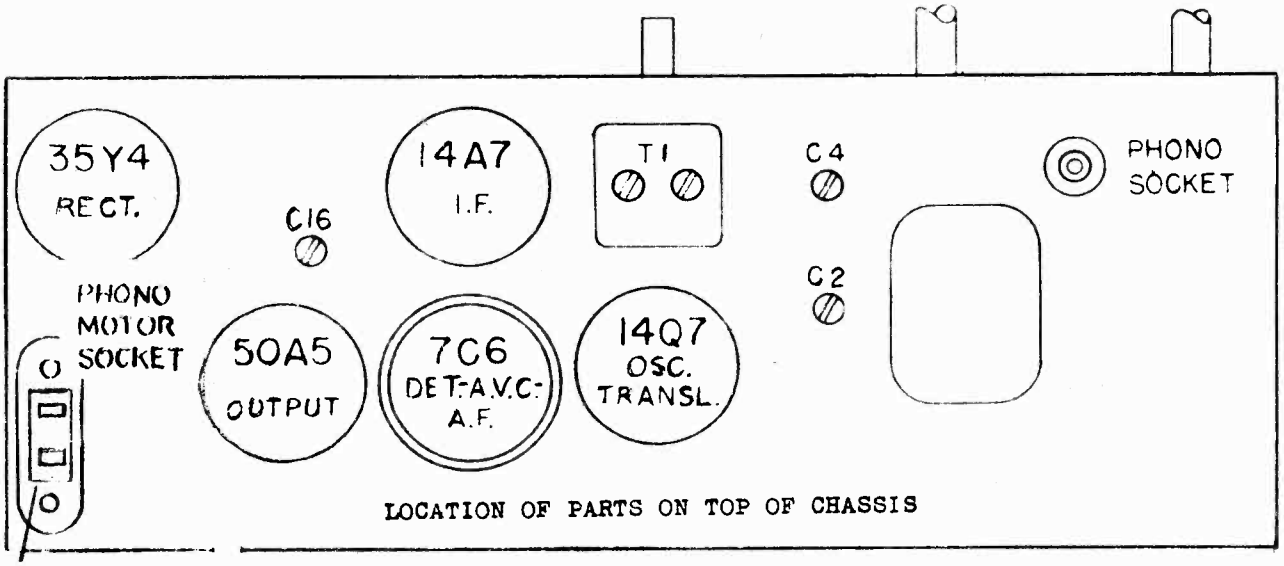
The entire Alignment Procedure should be repeated step by step in the original order for greatest accuracy.

Always keep the output from the generator at its lowest possibly value to prevent the AVC of the receiver from interfering with accurate alignment.

SEARS, ROEBUCK AND CO.

MODEL 8072
Chassis 101.834



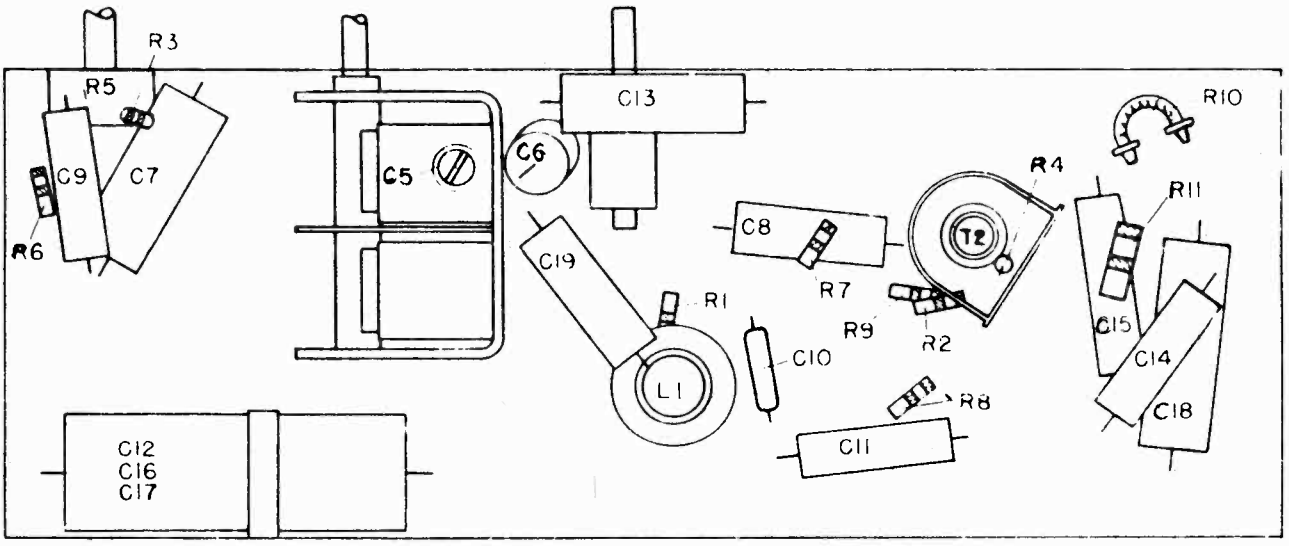


LOCATION OF PARTS ON TOP OF CHASSIS

SCHEMATIC LOCATION	PART NUMBER	DESCRIPTION
	R57433	Arm - Pickup
	R52826	Cartridge - Crystal - Astatic (L-70)
	R57444	Pin - Pickup Arm Hinge
	R62905	Post - Pickup Arm
	R62863	Shaft & Arm Assembly - Pickup Arm
	R57457	Spring - Pickup Arm
	R62864	Bracket & Hub Assembly - Pickup Arm
	R62901	Button - Push (Phono - Radio)
C9		Capacitor - .01 Mfd. 600 Volt
C15		Capacitor - .02 Mfd. 600 Volt
C6,C7,C8, C18,C19		Capacitor - .05 Mfd. 600 Volt
C11		Capacitor - .002 Mfd. 600 Volt
C14		Capacitor - .005 Mfd. 600 Volt
C10		Capacitor - Mica - 250 Mmfd.
C12,C16,C17	R61683	Capacitor - Electrolytic - 40 Mfd. 150 Volt, 20 Mfd. 150 Volt, 20 Mfd. 25 Volt
C1,C3	R61681	Capacitor - Variable - 2 Gang
C16	R62282	Capacitor - Trimmer - Single
L1	R61697	Coil - Oscillator
	R60639	Connector - Loop Terminal
R5	R61684	Control - On-Off & Volume
	R63138	Cord - Line
	R63109	Cord - Pickup Arm
	R62900	Dial - Station
	R49662	Idler Wheel - Phono Motor
	R62524	Knob - Tuning
	R62525	Knob - On-Off - Volume
		Lamp - Mazda Type #47
	R64025	Leaflet - Instruction
	R62904	Loop & Back Cover Assembly

SCHEMATIC LOCATION	PART NUMBER	DESCRIPTION
	R49547	Motor - Phono - 60 Cycle (Less Turntable)
	R57272	Plug - Phono Connector
	R49743	Plug - Speaker
R9		Resistor - 100 Ohm - 1/3 Watt
R1		Resistor - 22,000 Ohm - 1/3 Watt
R4,R8		Resistor - 470,000 Ohm - 1/3 Watt
R3		Resistor - 1 Megohm - 1/3 Watt
R2		Resistor - 2.2 Megohm - 1/3 Watt
R6		Resistor - 4.7 Megohm - 1/3 Watt
R11		Resistor - 2200 Ohm - 1 Watt
R10	R40232	Resistor - Glasohm - 25 Ohm - 1 Watt
	R62906	Rest - Pickup Arm
	R61914	Shield - Switch
	R57193	Shield - Tube
	R44145	Socket - 2 Prong - A. C.
	R57049	Socket - Tube - 8 Prong Lock-In
	R44897	Socket - 1 Prong - Phono Connector
	R60639	Socket - Speaker Cable
	R62173	Socket - Pilot Lamp
		WHEN ORDERING SPEAKER PARTS ALWAYS GIVE THE PART NUMBER ON THE SPEAKER
	R62907	Speaker - 5½" P. M.
	R62910	Cone & Voice Coil
T3	R62911	Output Transformer
	R62854	Spring - Switch Mounting Plate Assembly
	R61687	Switch - Phono - Radio
	R61915	Switch - Phono Motor - Automatic
T1	R61688	Transformer - I. F. #1
T2	R61689	Transformer - I. F. #2
	R49663	Turntable - 9" (only)
	R62206	Washer - Mica - Variable Capacitor

MODEL 8072 SEARS, ROEBUCK AND CO.



LOCATION OF PARTS UNDER CHASSIS

ALIGNMENT PROCEDURE

PRELIMINARY:

Output Meter reading to indicate 0.05 watt across voice coil.....0.4 Volt
Generator ground lead connection.....Receiver chassis
Generator Modulation.....30%,400 cycles
Position of Volume Control.....Fully on
Position of pointer with tuner fully closed.....Between the numerals 5 and 4 at the 540 Kc. calibration mark.

POSITION OF TUNER	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMER (ADJ. IN ORDER SHOWN)	TRIMMER FUNCTION
Closed	455 Kc.	0.1 mfd.	Transl. Grid	C16,T1	I.F.
Open	1650 Kc.	.0002 mfd.	Loop	C4	Oscillator
1410 Kc.	1410 Kc.	.0002 mfd.	Loop	C2	Transl.

IMPORTANT ALIGNMENT NOTES

The Alignment must be done in the order given.

The entire Alignment Procedure should be repeated step by step in the original order for greatest accuracy.

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

SEARS, ROEBUCK AND CO.

MODEL 7070 MODEL 8000
MODEL 7210 MODEL 8050

MODEL 7070

SCHEMATIC LOCATION	PART NUMBER	DESCRIPTION
	R62212	Arm - Pickup (Less Crystal)
	R52836	Cartridge - Crystal - Astatic L70
	R61642	Button - Phono - Radio Switch
	R61639	Cabinet - Radio - Molded
C6,C10,C11, C17		Capacitor - .05 Mfd. 200 V.
C15		Capacitor - .05 Mfd. 600 V.
C7		Capacitor - .01 Mfd. 400 V.
C13		Capacitor - .02 Mfd. 200 V.
C6		Capacitor - .002 Mfd. 600 V.
C1,C3,C5	R61682	Capacitor - Variable Assembly
C9,C12,C14	R61683	Capacitor - Elect. 20 Mfd. 150 V., 40 Mfd. 150 V., 20 Mfd. 25 V.
C16	R62282	Capacitor - Trimmer - Single
	R61647	Clip - Spring - Speaker Retaining
L1	R61697	Coil - Oscillator
R5	R61684	Control - On-Off & Volume
	R63143	Cord - Line
	R62228	Cover - Bottom
	R61690	Knob - On-Off & Volume
	R61621	Knob - Station Selector
	R61178	Leaflet - Instruction
	R61415	Loop - Antenna
	R49547	Motor - Phono - 60 Cycle (Less Turntable)
	R49749	Idler Wheel
	R49548	Turntable - 8"
	R61645	Plate - Chassis Bottom
	R61694	Plate - Chassis Hold Down
R8		Resistor - 100 Ohm - 1/3 Watt
R1		Resistor - 22,000 Ohm - 1/3 Watt
R7		Resistor - 220,000 Ohm - 1/3 Watt
R4,R10		Resistor - 470,000 Ohm - 1/3 Watt
R3		Resistor - 1 Megohm - 1/3 Watt
R2,R9		Resistor - 2.2 Megohm - 1/3 Watt
R6		Resistor - 4.7 Megohm - 1/3 Watt
R11		Resistor - 2200 Ohm - 1 Watt
R12	R40232	Resistor - Glasohm - 25 Ohm - 1 Watt
	R57193	Shield - Tube
	R62230	Shield - I.F. Transformer
	R57049	Socket - Tube - 8 Prong Lock-in
		WHEN ORDERING SPEAKER PARTS ALWAYS GIVE THE PART NUMBER ON THE SPEAKER
	R61693	Speaker - 4" P.M.
	R61687	Switch - Phono - Radio - S.P.D.T.
T1	R61688	Transformer - I.F. #1
T2	R61689	Transformer - I.F. #2
T3	R61699	Transformer - Output

MODEL 8000

SCHEMATIC LOCATION	PART NO.	DESCRIPTION
R1		Resistor, 330,000 Ohms, 1/4 Watt
R2		Resistor, 82,000 Ohms, 1/4 Watt
R3		Resistor, 4.7 Megohm, 1/4 Watt
R4	#21335	Control - Vol and switch, 2 meg.
R5		Resistor, 15 Megohm, 1/4 Watt
R6		Resistor, 470,000 Ohms, 1/4 Watt
R7	#18177	Resistor, 47 Ohms, 1 Watt
R8		Resistor, 1 Megohm, 1/4 Watt
R9		Resistor, 15 Ohms, 1/4 Watt
R10		Resistor, 150 Ohms, 1/4 Watt
R11		Resistor, 2200 Ohms, 1 Watt
C1		Condenser, .05 Mfd., 200 V
C2, C7		Condenser, .05 Mfd., 400 V
C3A, C3B	#21336	Condenser, Variable, 2 Gang
C4		Condenser, .00005 Mfd., 500 V, Mica
C5, C8		Condenser, .0001 Mfd., 500 V., Mica
C6, C9		Condenser, .002 Mfd., 400 V
C10A, C10B, & C10C	#21455	Condenser, Electrolytic, 40-20 Mfd., 150 Volt, 20 Mfd., 25 Volt
C11		Condenser, .01 Mfd., 400 V
T1	#21420	Coil, Antenna
T2	#21328	Coil, Oscillator
T3	#21329	Transformer, I. F.
Spk	#21470	Speaker, 4" P.M. with Output Transformer
	#21334	Speaker, 4" P.M.
	#21333	Transformer, Output
	#20138	Line Cord with Plug
	#21128	Cabinet, Ivory
	#19828	Grille, Metal Cabinet Front
	#21175	Sticker, Dial Scale
	#21306	Grille Cloth, Rear Cabinet
	#21314	Felt Feet
	#21101	Knob, Tuning, Ivory
	#21176	Pointer, Dial
	#21177	Knob, Volume, Ivory
	#18136	Wire, Antenna Mank

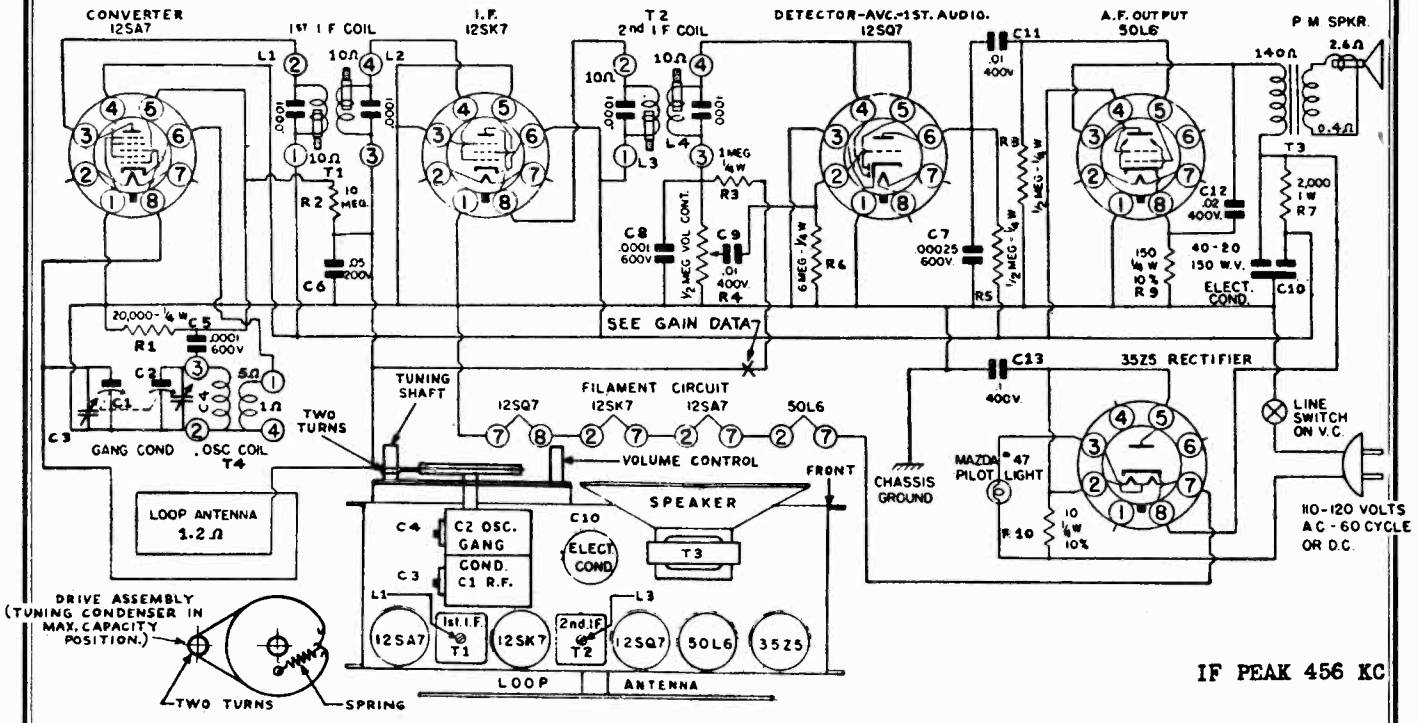
MODEL 8050

SCHEMATIC LOCATION	PART NUMBER	DESCRIPTION
		Lamp - Mazda Type #47
	R54677	Leaflet - Instruction
	R61662	Pointer - Dial
R3		Resistor - 100 Ohm - 1/3 Watt
R12		Resistor - 150 Ohm - 1/3 Watt
R1,R2		Resistor - 22,000 Ohm - 1/3 Watt
R10,R11		Resistor - 470,000 Ohm - 1/3 Watt
R4,R9		Resistor - 2.2 Megohm - 1/3 Watt
R8		Resistor - 4.7 Megohm - 1/3 Watt
R13		Resistor - 1200 Ohm - 1 Watt
R14	R40232	Resistor - Glasohm - 25 Ohm - 1 Watt
	R62638	Shaft - Tuning Assembly
	R57049	Socket - Tube - 8 Prong Lock-In
	R62326	Socket - Pilot Lamp
		WHEN ORDERING SPEAKER PARTS ALWAYS GIVE THE PART NUMBER ON THE SPEAKER
	R62544	Speaker - 5½" P. M.
	R62669	Cone & Voice Coil
T3	R62670	Output Transformer
	R43458	Spring - Dial Drive
T1	R62513	Transformer - I. F. #1
T2	R61142	Transformer - I. F. #2
	R60450	Wafer - Electrolytic Capacitor Mounting
	R62328	Background - Dial
	R57037	Board - Antenna
	R60425	Bracket - Variable Capacitor Mtg. - (Rear)
	R13961	Button - Snap
C16		Capacitor - .1 Mfd. 400 Volt
C8		Capacitor - .01 Mfd. 600 Volt
C2		Capacitor - .02 Mfd. 400 Volt
C4,C5,C10, C11,C18,C23		Capacitor - .05 Mfd. 600 Volt
C1		Capacitor - .001 Mfd. 600 Volt
C14,C17		Capacitor - .005 Mfd. 600 Volt
C9		Capacitor - 50 Mmfd. - Mica
C15		Capacitor - 100 Mmfd. - Mica
C19,C20,C22	R60416	Capacitor - Electrolytic - 40 Mfd. 150 Volt, 20 Mfd. 25 Volt, 40 Mfd. 150 Volt
C2,C6	R61100	Capacitor - Variable - 2 Gang
L1	R61107	Coil - Oscillator
	R60639	Connector - Loop Terminal
R7	R61655	Control - On-Off & Volume
	R16706	Cord - Line
	R41472	Cord - Dial Drive
	R62327	Dial - Station
	R62712	Knob - Tuning
	R62713	Knob - On-Off & Volume

MODEL 7210

SCHEMATIC LOCATION	PART NUMBER	DESCRIPTION
C3		Capacitor - .05 Mfd. 200 Volt
C6,C12,C16		Capacitor - .01 Mfd. 400 Volt
C9,C18		Capacitor - Mica - 50 Mmfd.
C1		Capacitor - Mica - 150 Mmfd.
C19		Capacitor - Mica - 250 Mmfd.
C10,C15		Capacitor - .001 Mfd. 600 Volt
C17		Capacitor - .005 Mfd. 400 Volt
C2		Capacitor - Silver Mica - 250 Mmfd. 500 Volt
C20	R57054	Capacitor - Dry Electrolytic - 10 Mfd. 150 Volt
C4,C8	R57096	Capacitor - Trimmer - 2 Gang
L1	R45255	Coil - Choke - Antenna
R10	R57072	Control - On-Off and Volume
R14		Resistor - 1200 Ohm - 1/3 Watt
R15		Resistor - 4700 Ohm - 1/3 Watt
R4		Resistor - 22,000 Ohm - 1/3 Watt
R2		Resistor - 47,000 Ohm - 1/3 Watt
R5		Resistor - 180,000 Ohm - 1/3 Watt
R7		Resistor - 220,000 Ohm - 1/3 Watt
R1,R12		Resistor - 1 Megohm - 1/3 Watt
R13		Resistor - 2.2 Megohm - 1/3 Watt
R3		Resistor - 3.3 Megohm - 1/3 Watt
R11		Resistor - 6.8 Megohm - 1/3 Watt
R9		Resistor - 15 Megohm - 1/3 Watt
		WHEN ORDERING SPEAKER PARTS ALWAYS GIVE THE PART NUMBER ON THE SPEAKER
	R61642	Speaker - 4" x 6" P.M.
	R62265	Cone and Voice Coil
T3	R57076	Transformer - Output
T1	R57094	Transformer - I. F. 1
T2	R57603	Transformer - I. F. 2
	R57087	Tuner - Perm. Unit
L2	R61675	Coil - Antenna
L3	R61676	Coil - Oscillator

THE SEIBERLING RUBBER CO.



IF PEAK 456 KC

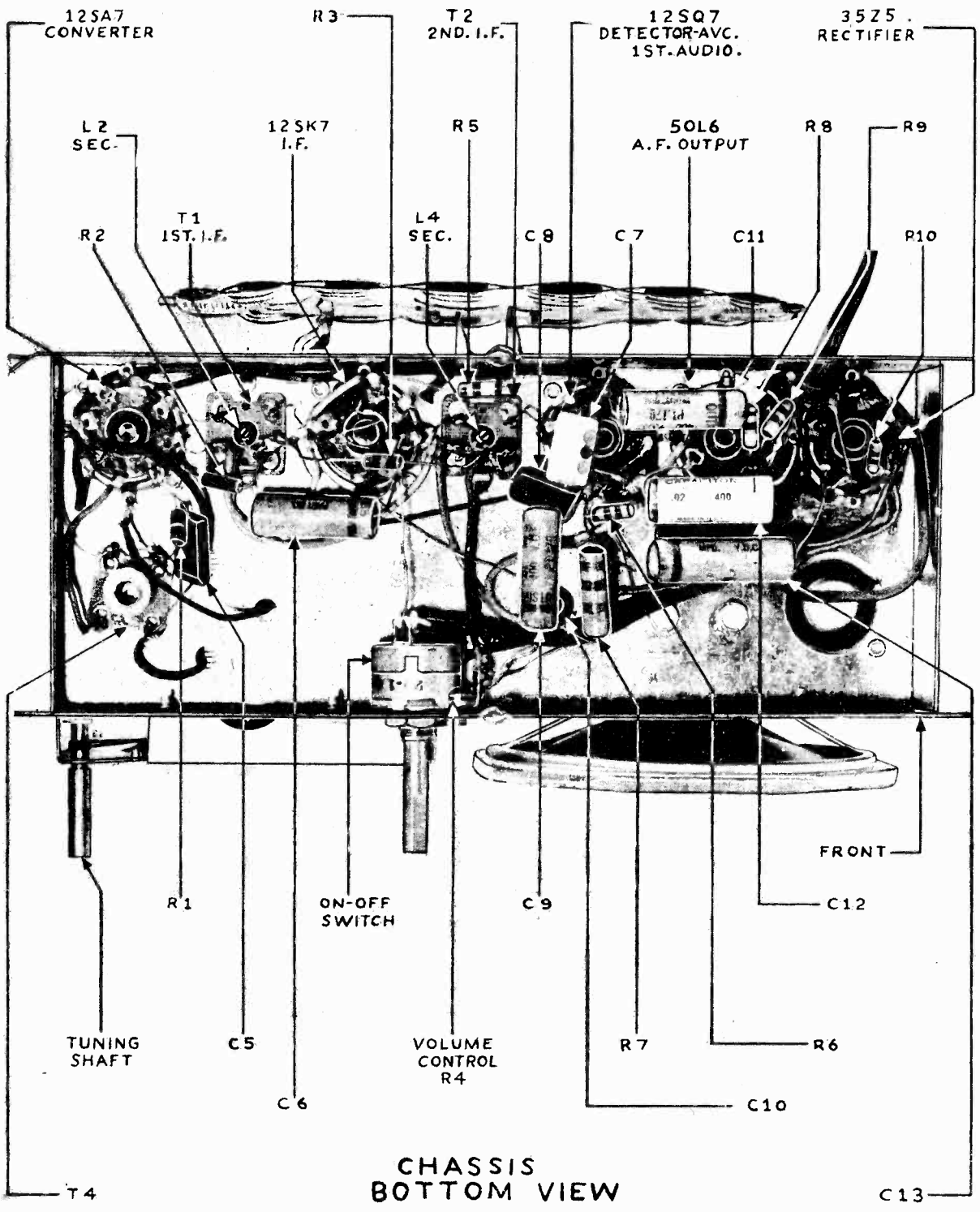
ALIGNMENT

The chassis must be removed from the cabinet in order to align this receiver. Connect the output meter across the voice coil. Connect the signal generator to the standard Hazeltine Loop Model 1150, and couple loosely to the receiver loop. Set the receiver volume control at maximum. The tuning condenser plates should be fully meshed when the dial pointer is at the index mark at the low frequency end of the dial. The signal generator output should at all times be just sufficient to obtain a minimum deflection on the output meter. Set the signal generator to 456 Kc and adjust the i-f trimmers for maximum meter deflection in the following sequence: L4, L3, L2, L1. Set the generator and receiver to 1600 Kc and adjust the oscillator trimmer C4 for maximum output. Set the generator and receiver to 1400 Kc and adjust the loop trimmer C3 for maximum output.

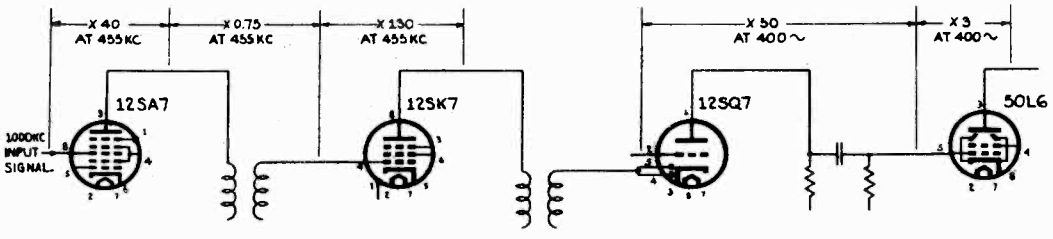
			D-C VOLTAGE		RESISTANCE
TUBE	PIN	VTVM	20,000 OHMS PER VOLT	1000 OHMS PER VOLT	
12SA7	1	0	0	0	0
	2	0	0	0	24
	3	+80	+80	+78	INFINITE
	4	+80	+80	+78	INFINITE
	5	-9.5	-9.5	-4.8	20,000
	6	0	0	0	1
	7	0	0	0	40
	8	-1.5	-0.8	-0.2	1,200,000
12SK7	1	0	0	0	0
	2	0	0	0	12
	3	0	0	0	0
	4	-1.5	-0.8	-0.2	1,200,000
	5	0	0	0	0
	6	+80	+80	+78	INFINITE
	7	0	0	0	26
	8	+80	+80	+78	INFINITE
12SQ7	1	0	0	0	0
	2	-0.5	-0.4	-0.2	6,000,000
	3	0	0	0	0
	4	-0.5	-0.4	-0.2	400,000
	5	-0.5	-0.4	-0.2	400,000
	6	+46	+42	+40	INFINITE
	7	0	0	0	14
	8	0	0	0	0
50L6	1	0	0	0	0
	2	0	0	0	40
	3	+120	+120	+120	INFINITE
	4	+80	+80	+78	INFINITE
	5	0	0	0	460,000
	6	0	0	0	INFINITE
	7	0	0	0	90
	8	+4.5	+4.5	+4.5	150
35Z5	1	0	0	0	INFINITE
	2	0	0	0	120
	3	0	0	0	120
	4	0	0	0	INFINITE
	5	0	0	0	120
	6	0	0	0	120
	7	0	0	0	90
	8	+120	+120	+120	INFINITE

MODEL 1A5

THE SEIBERLING RUBBER CO.

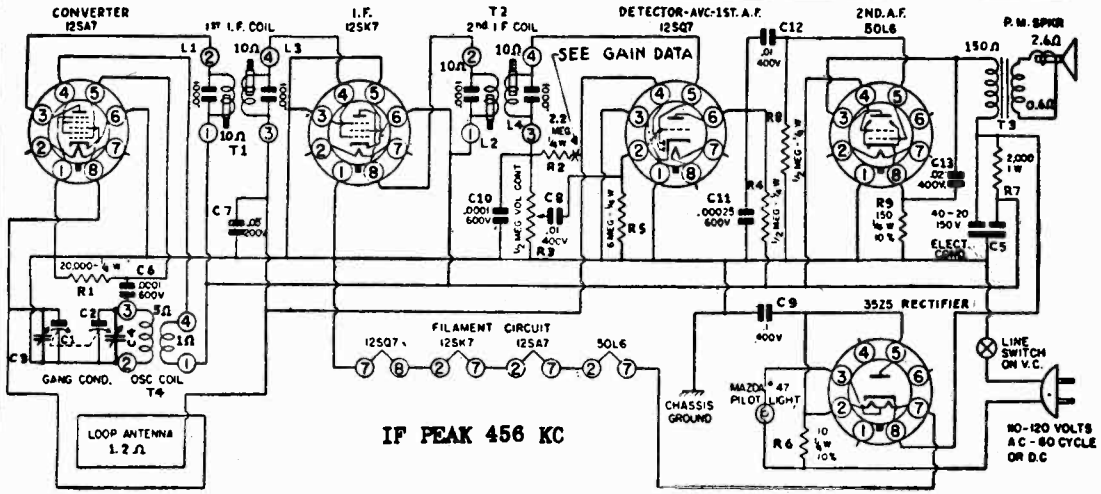


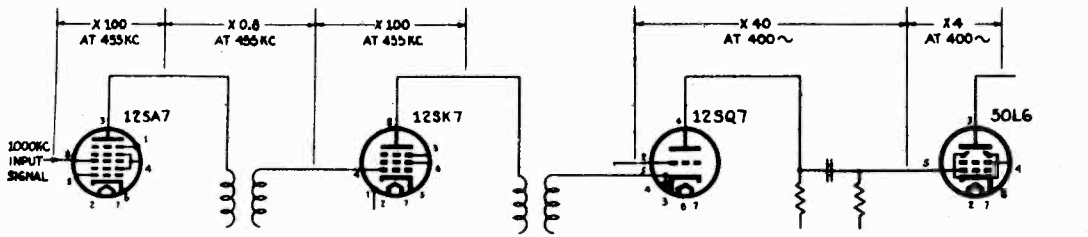
CHASSIS
BOTTOM VIEW



APPROXIMATE GAIN PER STAGE DATA

IN MAKING GAIN PER STAGE MEASUREMENTS, CIRCUIT WAS OPENED AT POINT X TO STOP AVC ACTION, AND A 3-VOLT BATTERY CONNECTED BETWEEN THIS POINT AND GROUND





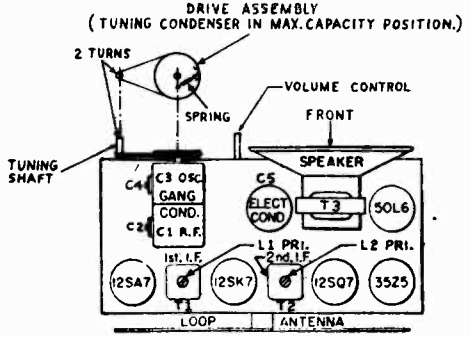
APPROXIMATE GAIN PER STAGE DATA

IN MAKING GAIN PER STAGE MEASUREMENTS, CIRCUIT WAS OPENED AT POINT X TO STOP AVC ACTION, AND A 3-VOLT BATTERY CONNECTED BETWEEN THIS POINT AND GROUND.

TUBE	PIN	VTVM	D-C VOLTAGE 20,000 OHMS PER VOLT	D-C VOLTAGE 1000 OHMS PER VOLT	RESISTANCE
12SA7	1	0	0	0	0
	2	0	0	0	26
	3	+80	+80	+80	5,000,000
	4	+80	+80	+80	5,000,000
	5	-6	-5.6	-2.6	19,000
	6	0	0	0	0
	7	0	0	0	40
	8	-1	-0.4	-0.4	5,000,000
12SK7	1	0	0	0	0
	2	0	0	0	16
	3	0	0	0	0
	4	-1	-0.4	-0.4	5,000,000
	5	0	0	0	0
	6	+80	+80	+78	5,000,000
	7	0	0	0	26
	8	+80	+80	+78	5,000,000
12SQ7	1	0	0	0	0
	2	-1.2	-0.8	-0.6	10,000,000
	3	0	0	0	0
	4	-1	-0.45	-0.4	5,000,000
	5	-0.7	-0.5	-0.2	500,000
	6	+54	+48	+42	5,000,000
	7	0	0	0	15
	8	0	0	0	0
50L6	1	0	0	0	0
	2	0	0	0	40
	3	+125	+120	+120	5,000,000
	4	+80	+80	+80	5,000,000
	5	0	0	0	450,000
	6	0	0	0	INFINITE
	7	0	0	0	90
	8	+5.2	+5	+5	140
3525	1	0	0	0	INFINITE
	2	0	0	0	120
	3	0	0	0	120
	4	0	0	0	INFINITE
	5	0	0	0	120
	6	0	0	0	120
	7	0	0	0	90
	8	130	125	125	5,000,000

ALIGNMENT

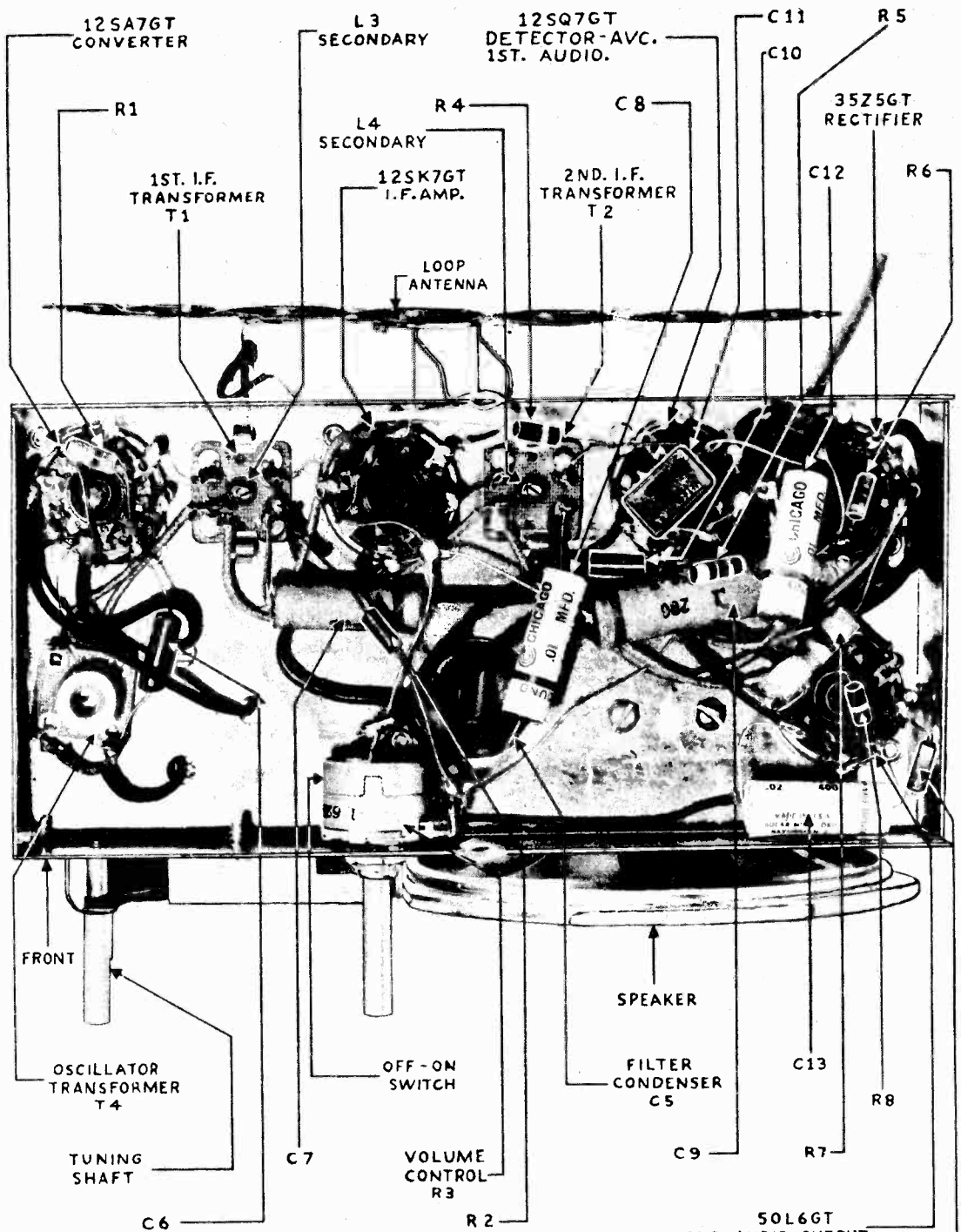
The chassis must be removed from the cabinet in order to align this receiver. Connect the output meter across the voice coil. Connect the signal generator to the Standard Hazeltine Model 1150 loop, and couple loosely to the receiver loop. Set the receiver volume control at maximum. The tuning condenser plates should be fully meshed when the dial pointer is at the index mark at the low frequency end of the dial. The signal generator output should at all times be just sufficient to obtain a minimum deflection on the output meter. Set the signal generator to 456 Kc. Adjust the i-f trimmers for maximum meter deflection in the following sequence: L4, L2, L3, L1. Set the generator and receiver to 1600 Kc and adjust oscillator trimmer C4 for maximum output. Set the generator and receiver to 1400 Kc and adjust loop trimmer C3 for maximum output.



TUBE LAYOUT

MODEL 9A5

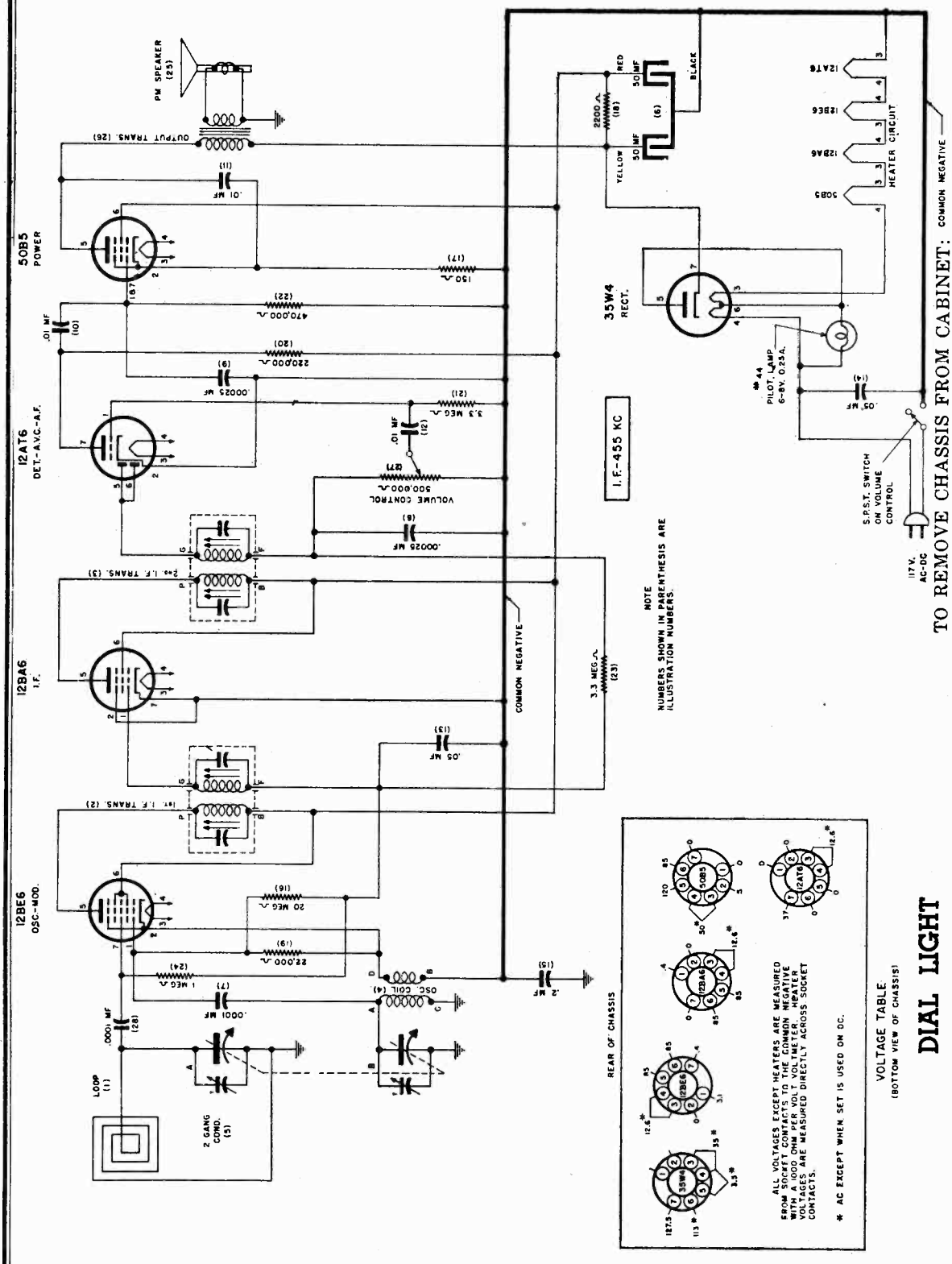
THE SEIBERLING RUBBER CO.



CHASSIS
BOTTOM VIEW

SENTINEL RADIO CORP.

MODELS 1U-309-W, 1U-309-I, 1U-309-R



TO REMOVE CHASSIS FROM CABINET: COMMON NEGATIVE

(A) Remove cabinet back.
(B) Pull knobs off of control shafts.
(C) Unscrew and remove nut and fibre washer on volume control shaft—accessible when knob is removed.
(D) Slide chassis out of cabinet.

TO REINSTALL, reverse the above procedure. Be sure to place fibre washer on volume control shaft before attaching nut. DO NOT tighten nut too much—otherwise, cabinet may crack.

DIAL LIGHT

It is normal for the dial light to be dim for approximately 60 seconds after set is turned "on" and then attain normal brilliance—also, on very loud signals the light may fluctuate.

Always use a 6.3 volt .250 ampere dial light, No. 44 Mazda.

ALIGNMENT PROCEDURE

For alignment procedure read tabulations from left to right, and make the adjustment marked (1) first, (2) next, (3) third.

Before starting alignment:

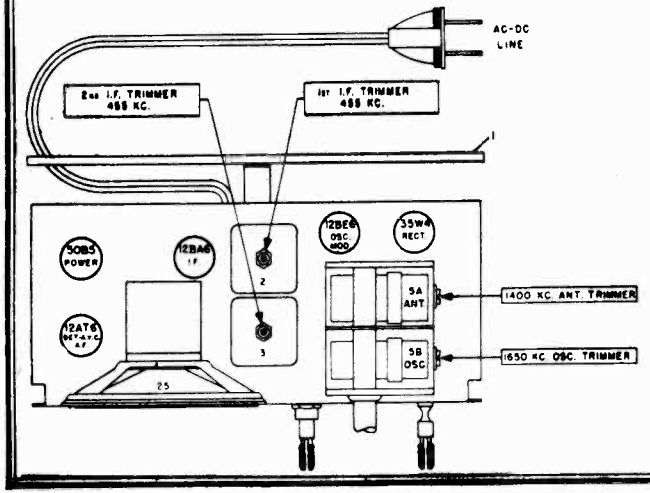
(a) Check tuning dial adjustment by tuning gang condenser until plates touch maximum capacity stop (completely in mesh) at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If dial needle does not point exactly to last line move to correct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

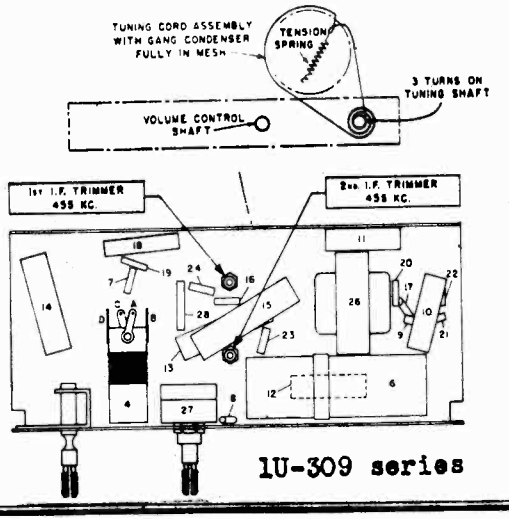
(b) Use an accurately calibrated test oscillator with some type of output measuring device.

(c) PLACE LOOP ANTENNA IN THE SAME POSITION IT WILL BE IN WHEN THE SET IS IN THE CABINET — APPROXIMATELY 5/8" SPACE BETWEEN LOOP AND CHASSIS.

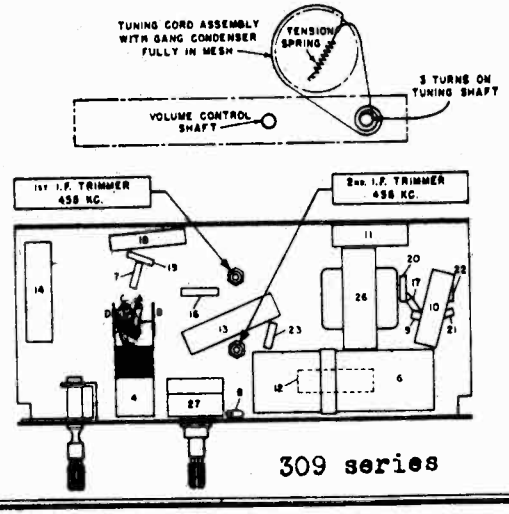
Steps	Set receiver dial to:	TEST OSCILLATOR			Refer to parts layout diagram for location of trimmers mentioned below:
		Adjust test oscillator frequency to:	Use dummy antenna in series with output of test oscillator consisting of:	Attach output of test oscillator to:	
1	Any point where no interfering signal is received.	455 K. C.	.02 MFD. condenser	High side to rear stator plates of tuning condenser. Low side to frame of condenser through a .02 Mfd. blocking condenser.	Adjust each of the second I.F. transformer trimmers for maximum output—then adjust each of the first I.F. trimmers for maximum output.
2	Exactly 1650 K. C.	Exactly 1650 K. C.	.00025 MFD. condenser	High side to green & white antenna lead. Low side to chassis through .02 Mfd. blocking condenser.	Adjust 1650 K. C. oscillator trimmer for maximum output.
3	Approx. 1400 K. C.	Approx. 1400 K. C.	.00025 MFD. condenser	High side to green & white antenna lead. Low side to chassis through .02 Mfd. blocking condenser.	Adjust 1400 K. C. antenna trimmer for maximum output.

1U-309 series, 309 series





1U-309 series



309 series

SENTINEL RADIO CORP.

MODELS 1U-309 series
MODELS 309 series

MODELS 1U-309 series

PARTS LIST

Ill. No.	Part No.	Part Name	Description
1	64E12	Antenna	Loop & Back
2	20E271	Coil	1st I.F. Transformer
	or		
2	20E301	Coil	1st I.F. Transformer
3	20E271	Coil	2nd I.F. Transformer
	or		
3	20E301	Coil	2nd I.F. Transformer
4	20E306	Coil	Oscillator
5	20E273	Condenser	Tuning, 2 Gang
6	25E24	Condenser	Tubular, Dry Elec. 50-50 Mfd. 150 V
7	23E11	Condenser	Fixed Ceramic, .0001 Mfd.
8	23E42	Condenser	Fixed Ceramic, .00025 Mfd.
9	23E42	Condenser	Fixed Ceramic, .00025 Mfd.
10	23E411	Condenser	Fixed Paper, .01 Mfd. 400 Volts
11	23E411	Condenser	Fixed Paper, .01 Mfd. 400 Volts
12	23E411	Condenser	Fixed Paper, .01 Mfd. 400 Volts
13	23E416	Condenser	Fixed Paper, .05 Mfd. 400 Volts
14	23E416	Condenser	Fixed Paper, .05 Mfd. 400 Volts
16	27E206	Resistor	Carbon, Insulated, 20 Megohm 1/3 W.
17	27E151	Resistor	Carbon, Insulated, 150 Ohm 1/3 W.
18	27E222-3	Resistor	Carbon, Insulated, 2,200 Ohm 1 W.
19	27E223	Resistor	Carbon, Insulated, 22,000 Ohm 1/3 W.
20	27E224	Resistor	Carbon, Insulated, 220,000 Ohm 1/3 W.
21	27E335	Resistor	Carbon, Insulated, 3.3 Megohm 1/3 W.
22	27E474	Resistor	Carbon, Insulated, 470,000 Ohm 1/3 W.
23	27E335	Resistor	Carbon, Insulated, 3.3 Megohm 1/3 W.
25	1E27	Speaker	P.M. 3"
26	22E23	Transformer	Output
27	28E27	Vol. Control	500,000 Ohm

MISCELLANEOUS PARTS

Part No.	Part Name	Description
7E129-2	Cabinet	Walnut Plastic
7E129-3	Cabinet	Ivory Plastic
7E129-4	Cabinet	Red Plastic
41E1	Cord	6 ft. Rubber Line Cord
20E274	Dial Cord	Dial Drive Cord
9E9	Dial Crystal	Acetate Dial Crystal
36E32	Dial Scale	Calibrated Scale
20E270	Dial Shaft Assembly	Dial Drive Shaft with bracket.
35E21	Dial Pointer	Dial Indicator
65E2	Dial Spring	Tension Spring for Dial Cord
37E47	Knob	For Walnut Cabinet
37E47-2	Knob	For Ivory and Red Cabinet
17E22	Pilot Lamp Socket	Pilot Lamp Socket with leads
40E2	Pilot Lamp	6.8 Volt .250 Amp. Type #44 Lamp.
10E42	Stud	Trimount Stud for Loop & Back
13E105	Nut	Used to hold chassis in Cabinet
12E123	Washer	Fibre Cushion, Used with 13E105 Nut

MODELS 309 series

PARTS LIST

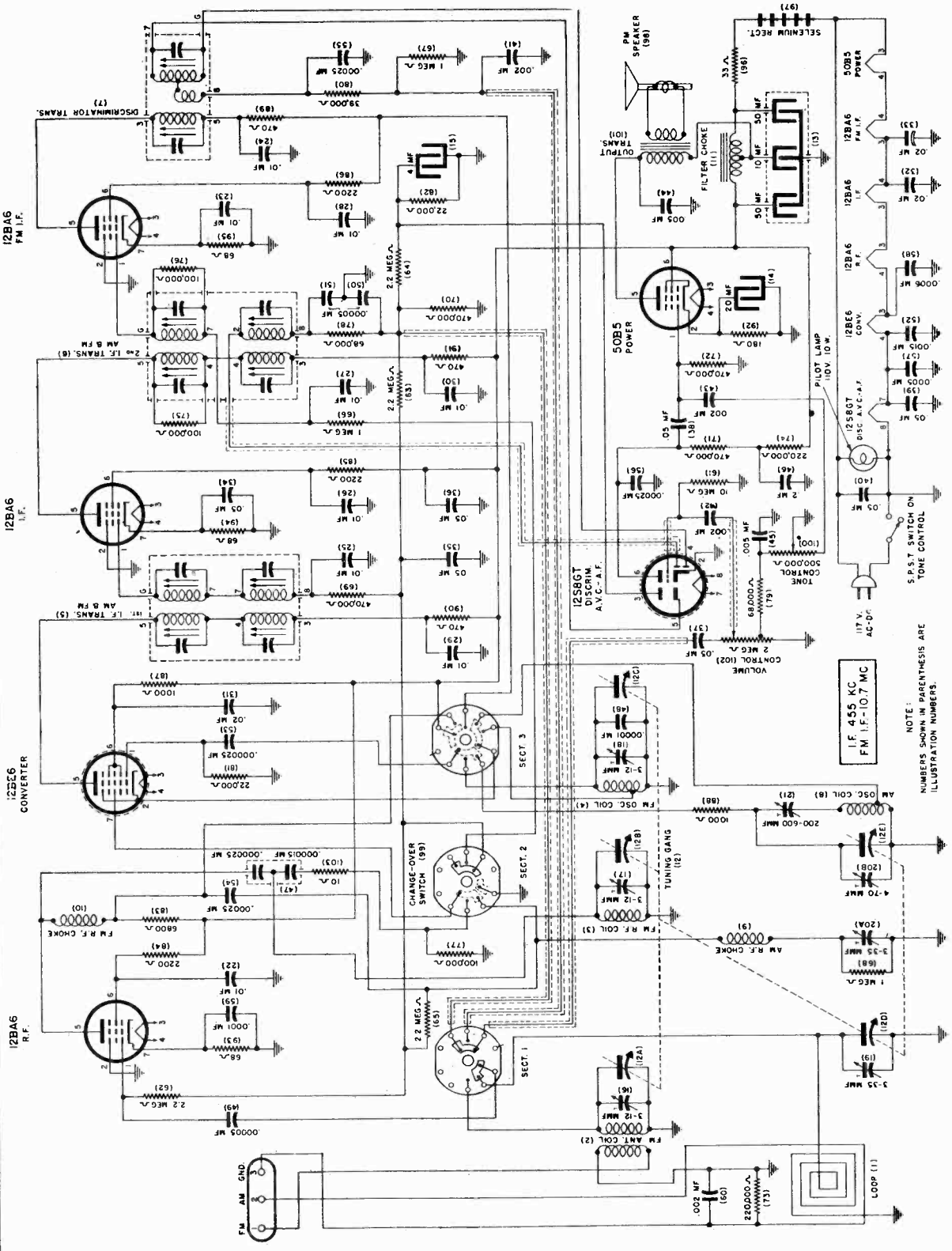
Ill. No.	Part No.	Part Name	Description
1	64E12	Antenna	Loop & Back
2	20E271	Coil	1st I.F. Transformer
	OR		
2	20E301	Coil	1st I.F. Transformer
3	20E271	Coil	2nd I.F. Transformer
	OR		
3	20E301	Coil	2nd I.F. Transformer
4	20E272	Coil	Oscillator
5	20E273	Condenser	Tuning, 2 Gang
6	25E24	Condenser	Dry Electrolytic, 50-50 Mfd. 150 V.
7	23E11	Condenser	Fixed Ceramic, .0001 Mfd.
8	23E42	Condenser	Fixed Mica, .00025 Mfd.
9	23E42	Condenser	Fixed Mica, .00025 Mfd.
10	23E411	Condenser	Fixed Paper, .01 Mfd. 400 V.
11	23E411	Condenser	Fixed Paper, .01 Mfd. 400 V.
12	23E411	Condenser	Fixed Paper, .01 Mfd. 400 V.
13	23E416	Condenser	Fixed Paper, .05 Mfd. 400 V.
14	23E416	Condenser	Fixed Paper, .05 Mfd. 400 V.
15	23E2021	Condenser	Fixed Paper, .2 Mfd. 400 V.
16	27E206	Resistor	Carbon, 20 Megohm, 1/3 W.
17	27E151	Resistor	Carbon, 150 Ohm, 1/3 W.
18	27E222-3	Resistor	Carbon, 2,200 Ohm, 1 W.
19	27E223	Resistor	Carbon, 22,000 Ohm, 1/3 W.
20	27E224	Resistor	Carbon, 220,000 Ohm, 1/3 W.
21	27E335	Resistor	Carbon, 3.3 Megohm, 1/3 W.
22	27E474	Resistor	Carbon, 470,000 Ohm, 1/3 W.
23	27E335	Resistor	Carbon, 3.3 Megohm, 1/3 W.
24	27E105	Resistor	Carbon, 1 Megohm, 1/3 W.
25	1E27	Speaker	3" P.M.
26	22E23	Transformer	Output for speaker
27	28E27	Volume Control	500,000 Ohm, with switch
28	23E11	Condenser	Fixed Ceramic, .0001 Mfd.

MISCELLANEOUS PARTS

Part No.	Part Name	Description
7E129-2	Cabinet	Walnut Plastic
7E129-3	Cabinet	Ivory Plastic
7E129-4	Cabinet	Red Plastic
41E8	Cord	6 ft. Rubber Line Cord
20E274	Dial Cord	Dial Drive Cord
9E9	Dial Crystal	Acetate Dial Crystal
36E32	Dial Scale	Calibrated Scale
20E270	Dial Shaft Assembly	Dial Drive Shaft with bracket
35E21	Dial Pointer	Dial Indicator
65E2	Dial Spring	Tension Spring for Dial Cord
37E47	Knob	For Walnut Cabinet
37E47-2	Knob	For Ivory and Red Cabinet
17E29	Pilot Lamp Socket	Pilot Lamp Socket with leads
40E2	Pilot Lamp	6.8 Volt .250 Amp. Type #44 Lamp
10E42	Stud	Trimount Stud for Loop & Back
13E105	Nut	Used to hold chassis in Cabinet
12E123	Washer	Fibre Cushion, Used with 13E105 Nut

MODELS 302-I, 302-T, 302-W

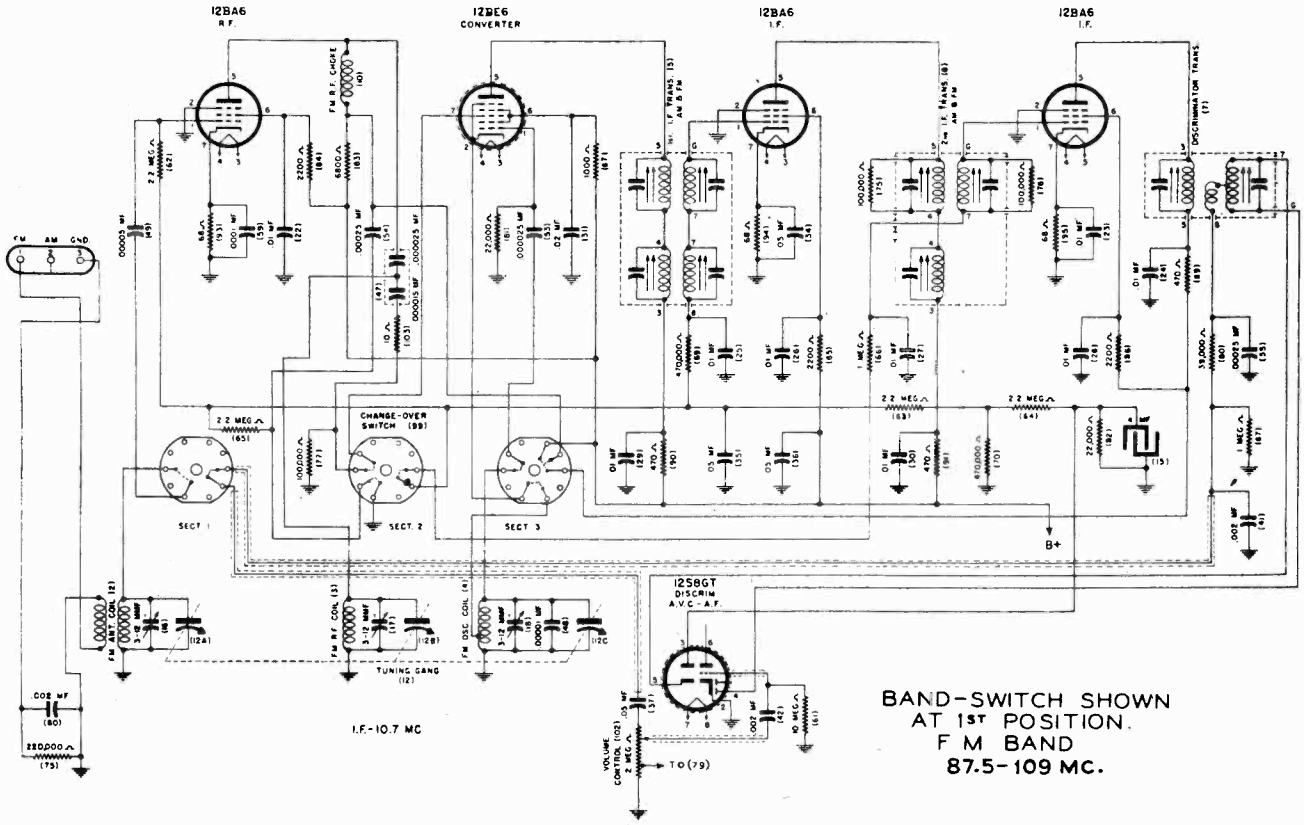
SENTINEL RADIO CORP.



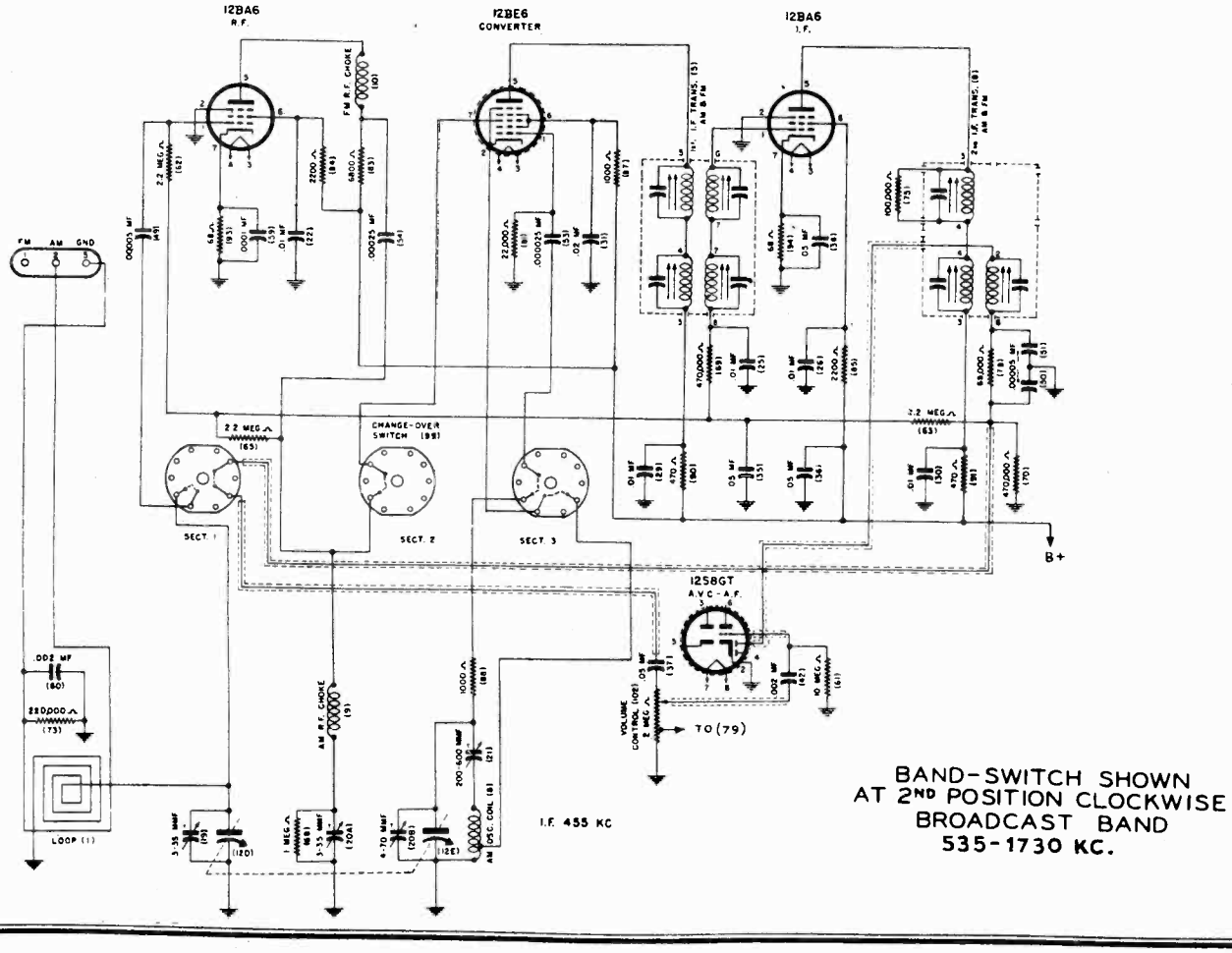
WARNING — DO NOT CONNECT A GROUND TO ANY METAL PART OF THE CHASSIS BECAUSE THIS WILL CAUSE A SHORT AND POSSIBLE DAMAGE.

SENTINEL RADIO CORP.

MODELS 302-I, 302-T, 302-W



BAND-SWITCH SHOWN AT 1ST POSITION. F M BAND 87.5-109 MC.



BAND-SWITCH SHOWN AT 2ND POSITION CLOCKWISE BROADCAST BAND 535-1730 KC.

AM ALIGNMENT PROCEDURE

Be sure to follow procedure carefully and in the order given—otherwise the receiver will be insensitive and the dial calibration incorrect. For alignment procedure read tabulations from left to right. Make the adjustment marked (1) first, (2) next.

Before starting alignment:

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

(b) Use an accurately calibrated test oscillator with some type of output measuring device.

(c) Place loop antenna in the same position it will be in when set is in the cabinet.

Steps	Place band switch for operation on:	Set receiver dial to:	TEST OSCILLATOR: Adjust test oscillator frequency to:	TEST OSCILLATOR: Use dummy antenna in series with output of test oscillator consisting of:	TEST OSCILLATOR: Attach output of test oscillator to:	Refer to parts layout diagram for location of trimmers mentioned below:
1	AM Band position	Any point where no interfering signal is received	Exactly 455 K. C.	0.2 Mfd. Condenser	High side to AM-Osc. stator plates of tuning condenser (12E). Low side to frame of condenser through .01 Mfd. condenser.	Adjust each of the 2nd 455 K. C. AM I. F. transformer trimmers for maximum output, then adjust each of the 1st 455 K. C. I. F. transformer trimmers for maximum output.
2	AM Band position	Rotate gang condenser to maximum capacity	Exactly 455 K. C.	.00025 Condenser	High side to AM "ANT" terminal on loop back. Low side to "GND" terminal on loop back through a .01 Mfd. condenser.	Adjust 455 K. C. trimmer for MINIMUM 455 K. C. Signal.
		Exactly 1730 K. C.	Exactly 1730 K. C.			Adjust 1730 K. C. oscillator trimmer for maximum output.
		Approx. 1400 K. C.	Approx. 1400 K. C.			Adjust 1400 K. C. AM Ant. trimmer for maximum output.
		Approx. 600 K. C.	Approx. 600 K. C.			While rocking gang condenser, adjust 600 K. C. oscillator padder for maximum output.

FM ALIGNMENT

Instructions for Alignment of the Frequency Modulation I. F. Transformers, Discriminator, Oscillator, R. F. and Antenna Circuits, with equipment generally available to the service man.

The equipment necessary for this procedure consists of the following:

A sensitive DC Voltmeter having 20,000 Ohms (or better) per volt, or a Vacuum Tube Voltmeter.

An AM Signal Generator that will supply:

(A) A 10.7 M. C. Signal for I. F. alignment.

(B) A 104 M. C. and 108 M. C. Signal—a Signal Generator that only goes up to 30 M. C. but which has sufficient fourth harmonic present in the carrier could be used for this purpose.

THE GENERATOR USED NEED NOT BE FREQUENCY MODULATED.

IT IS ALWAYS DESIRABLE TO ALIGN THE AM I. F. TRANSFORMERS BEFORE MAKING ANY OF THE FM I. F. ADJUSTMENTS, and to RECHECK AM I. F. TRIMMERS AFTER COMPLETING FM I. F. ADJUSTMENTS.

BE SURE TO MAKE THE FM ADJUSTMENTS IN THE ORDER GIVEN BELOW.

(1) PROCEDURE FOR ALIGNMENT OF FM DISCRIMINATOR TRANSFORMER.

(A) Connect the Voltmeter across the 4 Mfd. condenser (Illus. No. 15 in Parts Drawing).

(B) With a .002 Mfd. Isolation Condenser in series with each Signal Generator lead, connect generator from the grid (Pin #1) of the 12BA6 FM-I. F. Amplifier Tube to chassis.

(C) Set Signal Generator to EXACTLY 10.7 M. C.

(D) Adjust 10.7 M. C. Discriminator Primary Trimmer, mounted on underside of chassis, for MAXIMUM reading on Voltmeter.

(E) Leave Signal Generator set at 10.7 M. C. and modulate with a 400 cycle note.

(F) Adjust 10.7 M. C. Secondary Discriminator Trimmer, located on top of Discriminator Shield Can, for MINIMUM 400 CYCLE RESPONSE IN THE SPEAKER. IMPORTANT—the reading on the Voltmeter will change only slightly with this adjustment. MINIMUM AUDIO RESPONSE WILL BE RATHER CRITICAL IN ADJUSTMENT and will be correct only if a high audio response is found when tuning on each side of minimum setting.

(2) PROCEDURE FOR ALIGNMENT OF FM I. F. TRANSFORMERS.

(A) Leave the Voltmeter connected across the 4 Mfd. Condenser (Illus. No. 15).

(B) Connect Signal Generator to Input Grid (Pin #7) of 12BE6 Converter tube.

(C) Set Signal Generator to EXACTLY 10.7 M. C.—if possible, mark the position where this occurs right on the Generator's calibrated dial because this becomes a reference point in checking for proper FM I. F. alignment.

(D) Adjust each of the 1st and 2nd FM I. F. Transformers' 10.7 M. C. trimmers for MAXIMUM reading on Voltmeter. KEEP OUTPUT OF SIGNAL GENERATOR SO THAT A READING OF APPROXIMATELY 2 TO 4 VOLTS IS OBTAINED ON THE VOLTMETER.

(E) After all the above FM I. F. Transformer Trimmer adjustments have been correctly completed, MAKE A NOTE OF THE READING ON THE VOLTMETER.

(F) Next, detune the signal generator to a slightly HIGHER frequency (higher than the 10.7 reference frequency), until the Voltmeter reads ONE-HALF of the figure noted in (E) above, and MAKE A NOTE OF THE GENERATOR FREQUENCY AT WHICH THIS OCCURS.

(G) Now, detune the signal generator to a LOWER frequency (lower than the 10.7 reference frequency), until the Voltmeter again reads ONE-HALF the original figure noted in (E), and AGAIN NOTE THE GENERATOR FREQUENCY AT WHICH THIS OCCURS.

The difference between the two above frequencies obtained in (F) and (G), the one lower than 10.7 M. C. reference point and the one higher, is the "Half-amplitude" Band width of the FM-I. F. system. These two frequencies (F) and (G), should be somewhat uniformly spaced on either side of the 10.7 M. C. (C) reference frequency. A SLIGHT DIFFERENCE IS NOT SERIOUS. Only when one is more than twice as far as the other from the 10.7 M. C. reference frequency, or when there is a double peak, is the discrepancy serious. Assuming the FM I. F. Transformers have been properly adjusted, a double peak, or extremely one-sided "half-amplitude" band width, is usually caused by regeneration or a defective FM I. F. Transformer.

(3) PROCEDURE FOR THE ALIGNMENT OF THE FM ANTENNA, R. F. AND OSCILLATOR CIRCUITS.

(A) Leave Voltmeter connected across the 4 Mfd. condenser (Illus. No. 15).

(B) Connect the Signal Generator to the "FM" and "GROUND" posts that are attached to the receiver loop back, through a 5 foot or more length of 300 Ohm transmission line.

(C) Set Signal Generator so that it will deliver an unmodulated 108 M. C. signal. If the generator available is not designed to deliver a 108 M. C. signal, use a generator covering at least to 30 M. C. and set this generator frequency to 27 M. C.—the fourth harmonic of which will be 108 M. C.

(D) Set Receiver Dial Pointer to EXACTLY 108 M. C.

(E) Adjust 108 M. C. Oscillator Trimmer for MAXIMUM reading on Voltmeter.

(F) Next, tune the receiver to 104 M. C.

(G) Set Signal Generator to deliver a 104 M. C. unmodulated signal.

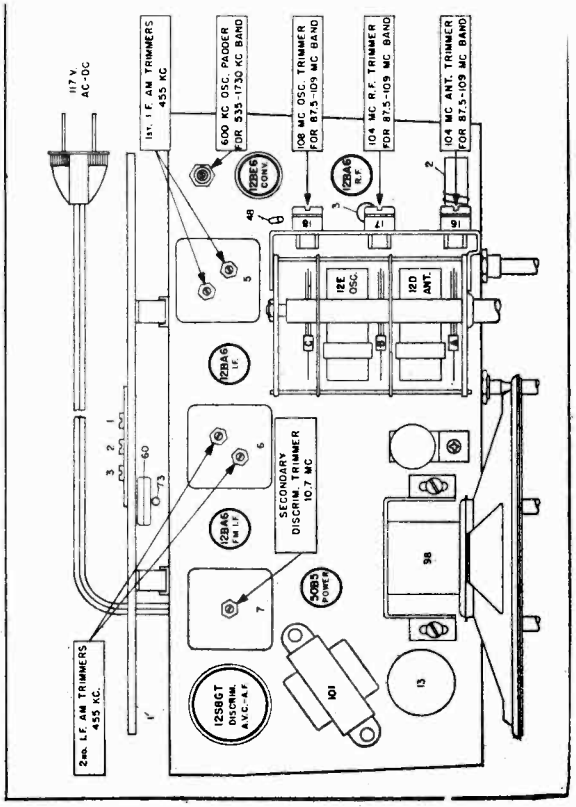
(H) Adjust 104 M. C. Antenna and R. F. Trimmers for MAXIMUM reading on Voltmeter.

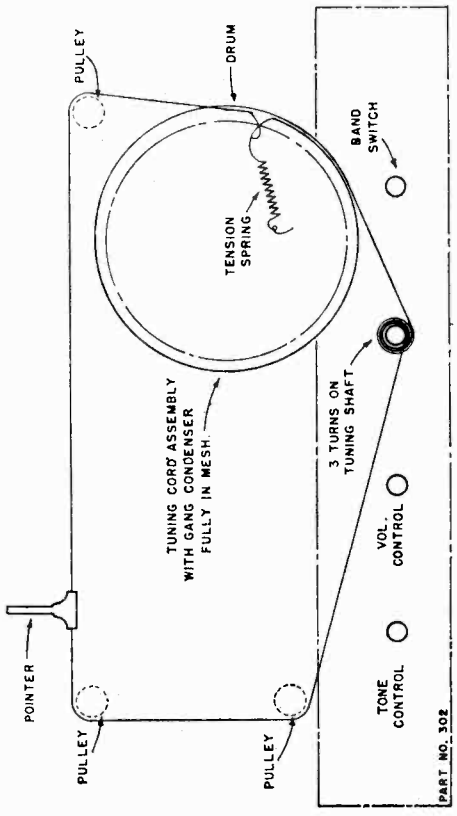
It is somewhat helpful to hear the signal, so, if preferred, an AM modulation on the 108 M. C. and 104 M. C. signal frequencies may be used for alignment of the FM Oscillator, R. F. and Antenna circuits. With modulated or unmodulated signal, ALWAYS ADJUST FOR MAXIMUM READING ON VOLTMETER.

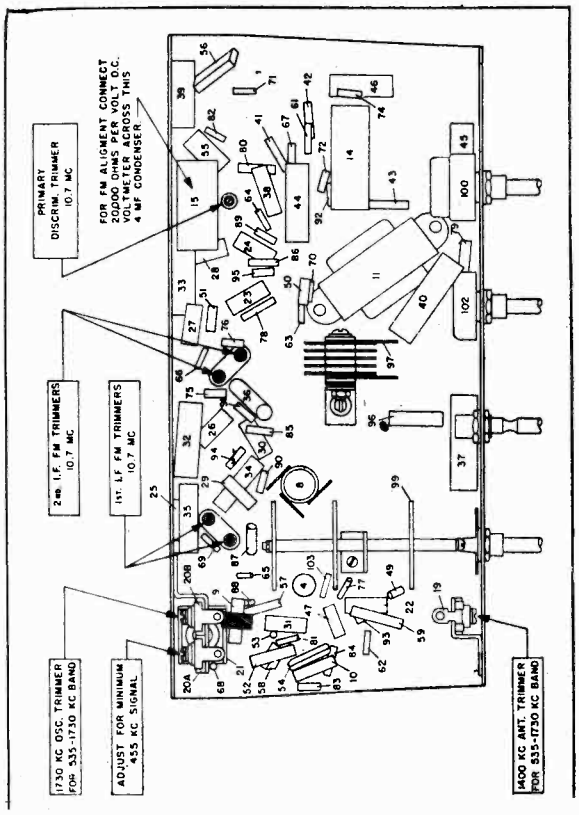
A FREQUENCY MODULATED SIGNAL GENERATOR may be used instead of an AM signal generator. When a Frequency Modulated Signal Generator is used, it is recommended that an unmodulated carrier be used for all of the above adjustments EXCEPT alignment of the Discriminator Secondary Trimmer. Use a frequency modulated signal (22.5 K. C. deviation) and align Discriminator Secondary for MAXIMUM AUDIO RESPONSE heard in speaker.

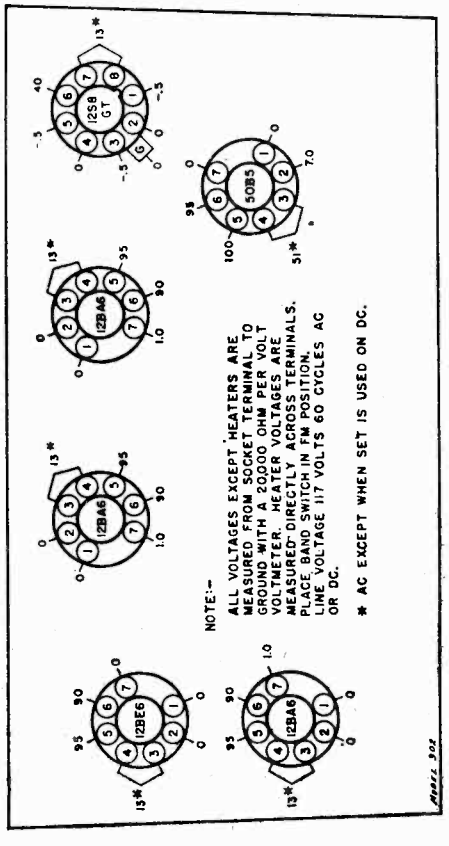
MODELS 302-I,
302-T, 302-W

SENTINEL RADIO CORP.









VOLTAGE TABLE
(BOTTOM VIEW OF CHASSIS)

PARTS LIST

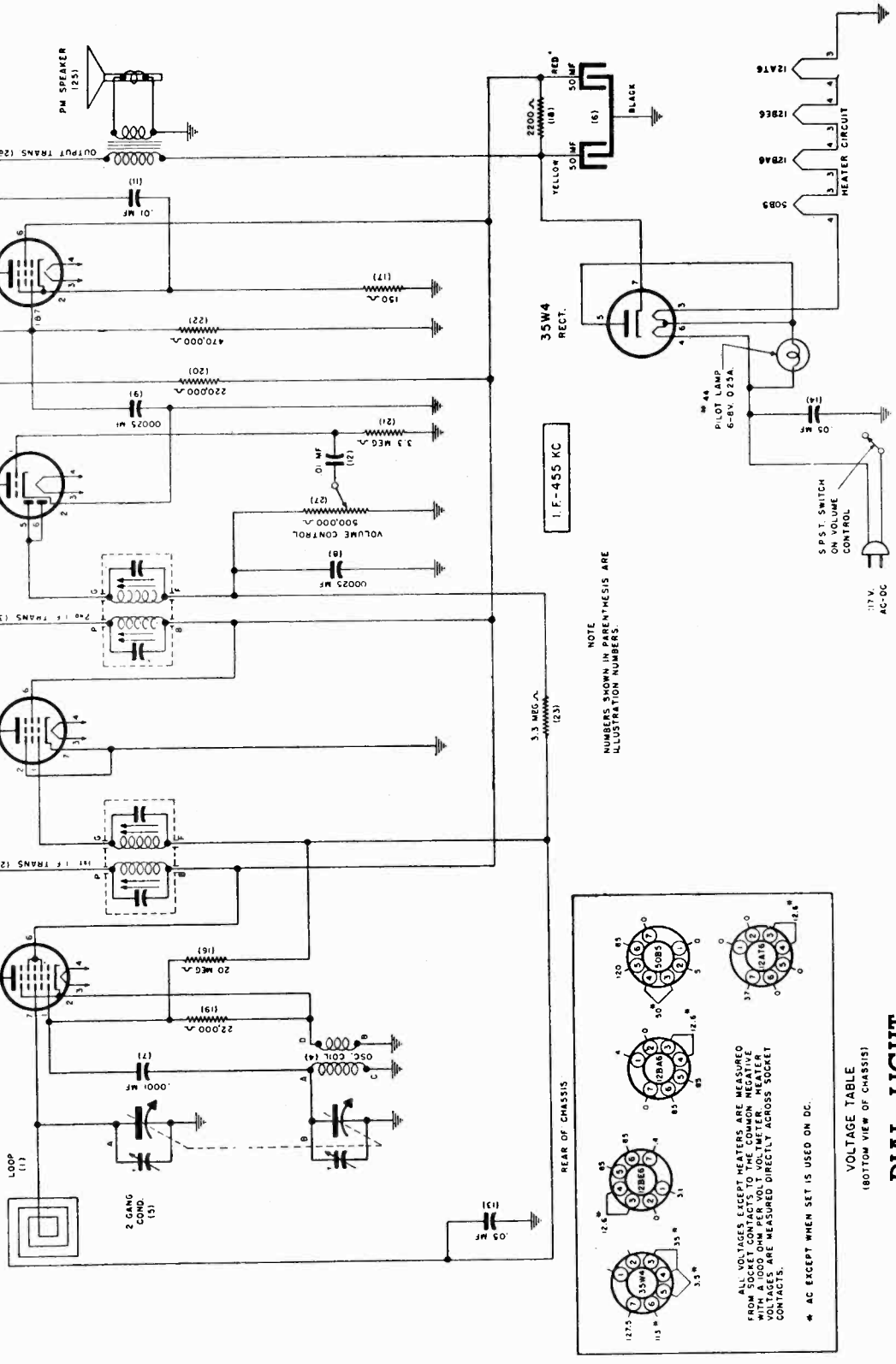
Illus. No.	Part No.	Part Name	Description
1	20E242	Antenna	AM Loop with terminal strip
2	2E53	Coil	FM Antenna
3	2E54	Coil	FM R. F.
4	2E51	Coil	FM Oscillator
5	20E214	Coil	1st AM & FM I. F. Transformer
6	20E215	Coil	2nd AM & FM I. F. Transformer
7	20E213	Coil	Discriminator Transformer
8	20E238	Coil	AM Oscillator
9	2E19	Coil	AM R. F. Choke
10	2E47	Coil	FM R. F. Choke
11	22E21	Condenser	Filter Choke
12	24E30	Condenser	Tuning, 2 Gang
13	25E22	Condenser	Dry Elect. 50-10-50 Mfd. 150 V.
14	25E3	Condenser	Dry Elect. 20 Mfd. 25 V.
15	25E23	Condenser	Dry Elect. 4 Mfd. 50 V.
16	24E28	Condenser	Trimmer, 3-12 MMF
17	24E28	Condenser	Trimmer, 3-12 MMF
18	24E28	Condenser	Trimmer, 3-12 MMF
19	24E3	Condenser	Trimmer, 3-35 MMF
20	24E29	Condenser	Trimmer, 3-35 MMF (A Section), 4-70 MMF (B Section)
21	24E16	Condenser	Padder, 200-600 MMF
22	23E2014-6	Condenser	Tubular, .01 Mfd. 200 V.
23	23E2014-6	Condenser	Tubular, .01 Mfd. 200 V.
24	23E2014-6	Condenser	Tubular, .01 Mfd. 200 V.
25	23E2014-6	Condenser	Tubular, .01 Mfd. 200 V.
26	23E2014-6	Condenser	Tubular, .01 Mfd. 200 V.
27	23E2014-6	Condenser	Tubular, .01 Mfd. 200 V.
28	23E2014-6	Condenser	Tubular, .01 Mfd. 200 V.
29	23E2014-6	Condenser	Tubular, .01 Mfd. 200 V.
30	23E2014-6	Condenser	Tubular, .01 Mfd. 200 V.
31	23E2014-7	Condenser	Tubular, .02 Mfd. 200 V.
32	23E213	Condenser	Tubular, .02 Mfd. 200 V.
33	23E213	Condenser	Tubular, .02 Mfd. 200 V.
34	23E2014-8	Condenser	Tubular, .05 Mfd. 200 V.
35	23E2014-8	Condenser	Tubular, .05 Mfd. 200 V.
36	23E2014-8	Condenser	Tubular, .05 Mfd. 200 V.
37	23E2014-8	Condenser	Tubular, .05 Mfd. 200 V.
38	23E2014-8	Condenser	Tubular, .05 Mfd. 200 V.
39	23E2014-8	Condenser	Tubular, .05 Mfd. 200 V.
40	23E416	Condenser	Tubular, .05 Mfd. 400 V.
41	23E2014-12	Condenser	Tubular, .002 Mfd. 400 V.
42	23E2014-12	Condenser	Tubular, .002 Mfd. 400 V.
43	23E2014-12	Condenser	Tubular, .002 Mfd. 400 V.
44	23E408	Condenser	Tubular, .005 Mfd. 400 V.
45	23E2014-3	Condenser	Tubular, .005 Mfd. 200 V.
46	23E2014-10	Condenser	Tubular, .2 Mfd. 200 V.
47	23E2019	Condenser	Dual Ceramic, .000025 (A), .000015 (B) Mfd. 500 V.
48	23E15	Condenser	Ceramic, .00001 Mfd. 500 V.
49	23E2009-5	Condenser	Ceramic, .00005 Mfd. 500 V.
50	23E2009-5	Condenser	Ceramic, .00005 Mfd. 500 V.
51	23E2009-5	Condenser	Ceramic, .00005 Mfd. 500 V.
52	23E2012-2	Condenser	Ceramic, .0015 Mfd. 500 V.
53	23E16	Condenser	Ceramic, .000025 Mfd. 500 V.
54	23E42	Condenser	Mica, .00025 Mfd. 500 V.
55	23E42	Condenser	Mica, .00025 Mfd. 500 V.
56	23E42	Condenser	Mica, .00025 Mfd. 500 V.
57	23E45	Condenser	Mica, .0005 Mfd. 500 V.
58	23E45	Condenser	Mica, .0005 Mfd. 500 V.
59	23E11	Condenser	Mica, .0001 Mfd. 500 V.
60	23E52	Condenser	Mica, .002 Mfd. 500 V.
61	27E106	Resistor	Carbon, 10 Megohm, 1/3 W.
62	27E225	Resistor	Carbon, 2.2 Megohm, 1/3 W.
63	27E225	Resistor	Carbon, 2.2 Megohm, 1/3 W.
64	27E225	Resistor	Carbon, 2.2 Megohm, 1/3 W.
65	27E225	Resistor	Carbon, 2.2 Megohm, 1/3 W.
66	27E105	Resistor	Carbon, 1 Megohm, 1/3 W.
67	27E105	Resistor	Carbon, 1 Megohm, 1/3 W.
68	27E105	Resistor	Carbon, 1 Megohm, 1/3 W.
69	27E474	Resistor	Carbon, 470,000 Ohm, 1/3 W.
70	27E474	Resistor	Carbon, 470,000 Ohm, 1/3 W.
71	27E474	Resistor	Carbon, 470,000 Ohm, 1/3 W.
72	27E474	Resistor	Carbon, 470,000 Ohm, 1/3 W.
73	27E224	Resistor	Carbon, 220,000 Ohm, 1/3 W.
74	27E224	Resistor	Carbon, 220,000 Ohm, 1/3 W.
75	27E104	Resistor	Carbon, 100,000 Ohm, 1/3 W.
76	27E104	Resistor	Carbon, 100,000 Ohm, 1/3 W.
77	27E104	Resistor	Carbon, 100,000 Ohm, 1/3 W.
78	27E683	Resistor	Carbon, 68,000 Ohm, 1/3 W.
79	27E683	Resistor	Carbon, 68,000 Ohm, 1/3 W.
80	27E393	Resistor	Carbon, 39,000 Ohm, 1/3 W.
81	27E223	Resistor	Carbon, 22,000 Ohm, 1/3 W.
82	27E223	Resistor	Carbon, 22,000 Ohm, 1/3 W.
83	27E682	Resistor	Carbon, 6,800 Ohm, 1/3 W.
84	27E222	Resistor	Carbon, 2,200 Ohm, 1/3 W.
85	27E222	Resistor	Carbon, 2,200 Ohm, 1/3 W.
86	27E222	Resistor	Carbon, 2,200 Ohm, 1/3 W.
87	27E102	Resistor	Carbon, 1,000 Ohm, 1/3 W.
88	27E102	Resistor	Carbon, 1,000 Ohm, 1/3 W.
89	27E471	Resistor	Carbon, 470 Ohm, 1/3 W.
90	27E471	Resistor	Carbon, 470 Ohm, 1/3 W.
91	27E471	Resistor	Carbon, 470 Ohm, 1/3 W.
92	27E181-2	Resistor	Carbon 180 Ohm, 1/2 W.
93	27E680	Resistor	Carbon, 68 Ohm, 1/3 W.
94	27E680	Resistor	Carbon, 68 Ohm, 1/3 W.
95	27E680	Resistor	Carbon, 68 Ohm, 1/3 W.
96	27E330-3	Resistor	Carbon, 33 Ohm, 1 W.
97	57E1	Rectifier	Selenium
98	1E25	Speaker	P. M. Elliptical
99	29E15	Switch	"AM-FM" Changeover
100	28E22	Tone Control	500,000 Ohm
101	22E20	Transformer	Output
102	28E23	Volume Control	2 Megohm
103	27E100	Resistor	Carbon, 10 Ohm, 1/3 W.

MISCELLANEOUS PARTS

Part No.	Part Name	Description
7E52-1	Cabinet	Walnut Plastic
7E52-2	Cabinet	Ivory Plastic
7E141	Cabinet	Wood, Table Model
7E119	Cabinet Back	Back only, for plastic cabinets
7E143	Cabinet Back	Back only, for wood cabinets
65E2	Dial Cord Spring	Tension Spring for Drive Cord
20E308	Dial Cord	18 lb. Dial Drive Cord
35E8-2	Dial Pointer	Dial Indicator
20E270-2	Dial Shaft	Dial Drive Shaft Assembly with Bracket Bearing
36E30	Dial Scale	Calibrated Scale
15E74	Dial Scale Frame	Metal for holding Dial Scale
20E240	Dial Scale Frame Bracket	Right Hand—for Mounting Dial Frame to Chassis, with Idler Pulley
20E240-2	Dial Scale Frame Bracket	Left Hand—for Mounting Dial Frame to Chassis with Idler Pulley
9E11	Dial Crystal	Crystal for Wood Cabinets
20E243	Dial Crystal	Crystal for Plastic Cabinets
40E5	Dial Light	110 Volt, 10 Watt
17E28	Dial Light Socket	Dial Light Socket Assembly
37E27-4	Knob	Marked "Tuning" for Walnut Plastic Cabinets
37E27-27	Knob	Marked "Volume" for Walnut Plastic Cabinets
37E27-26	Knob	Marked "OFF-ON-TONE" for Walnut Plastic Cabinets
37E27-28	Knob	Marked "FM-AM" for Walnut Plastic Cabinets
37E27-9	Knob	Marked "Tuning" for Ivory Plastic Cabinets
37E27-30	Knob	Marked "Volume" for Ivory Plastic Cabinets
37E27-29	Knob	Marked "OFF-ON-TONE" for Ivory Plastic Cabinets
37E27-31	Knob	Marked "FM-AM" for Ivory Plastic Cabinets
37E52-2	Knob	Marked "OFF-ON-TONE" for Wood Cabinets
37E52-3	Knob	Marked "Volume" for Wood Cabinets
37E52-4	Knob	Marked "Tuning" for Wood Cabinets
37E52-5	Knob	Marked "FM-AM" for Wood Cabinets
10E42	Stud	Trimount Stud for Mounting Plastic Cabinet Back
18E4-4	Terminal Strip	Marked "AM-FM-GROUND"
50E55	Tube Shield	For 12S8GT Tube
50E52	Tube Shield	For 12BE6 Tube
50E50	Tube Shield Base	For 50E52 Tube Shield

MODELS 309-I, 309-N, 309-R, 309-W

SENTINEL RADIO CORP.



TO REMOVE CHASSIS FROM CABINET:

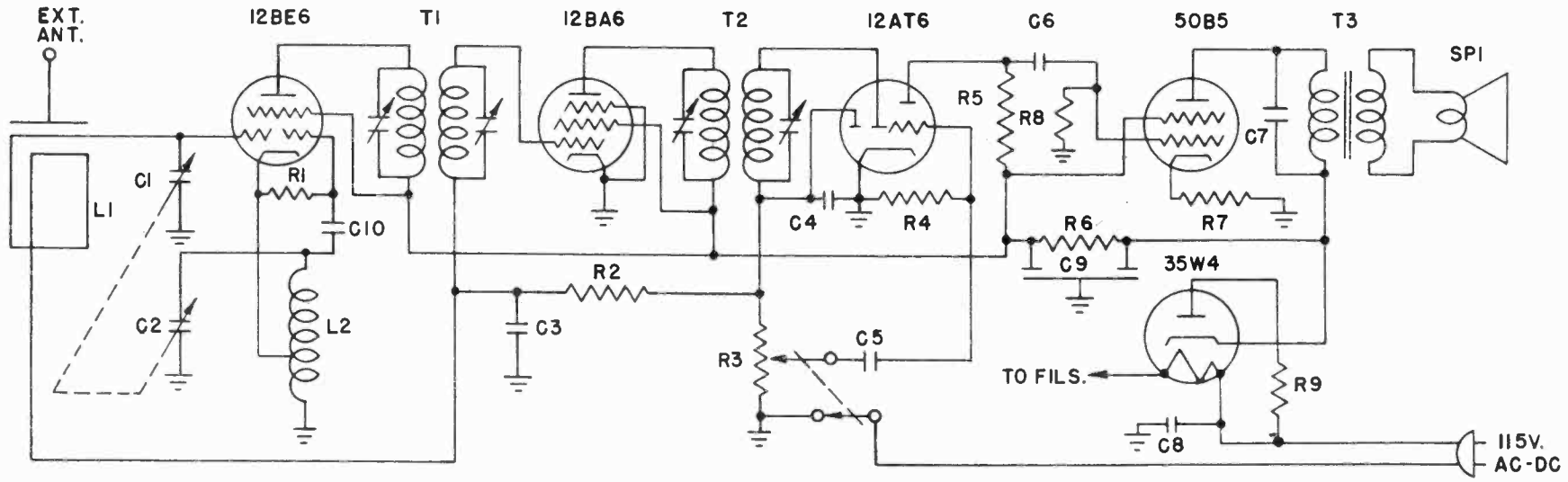
(A) Remove cabinet back.
(B) Pull knobs off of control shafts.
(C) Unscrew and remove nut and fibre washer on volume control shaft—accessible when knob is removed.
(D) Slide chassis out of cabinet.

TO REINSTALL, reverse the above procedure. Be sure to place fibre washer on volume control shaft before attaching nut. DO NOT tighten nut too much—otherwise, cabinet may crack.

DIAL LIGHT

It is normal for the dial light to be dim for approximately 60 seconds after set is turned "on" and then attain normal brilliance—also, on very loud signals the light may fluctuate.

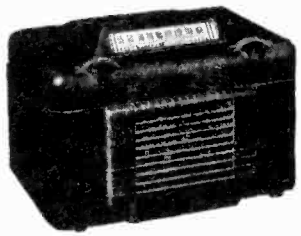
Always use a 6.3 volt .250 ampere dial light, No. 44 Mazda.

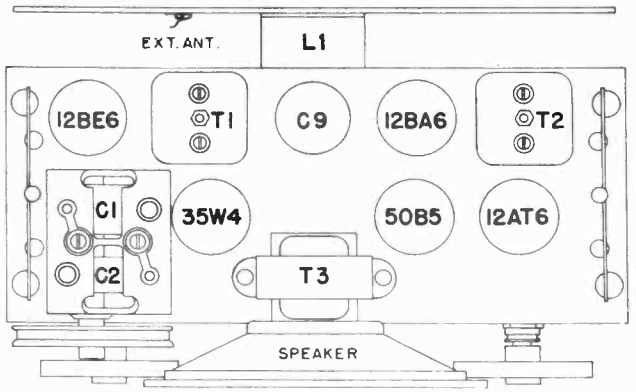


R 1 - 25M OHM 1/3 WATT RESISTOR
R 2 - 5MEG " " " "
R 3 - 500M " POT. WITH SWITCH
R 4 - 5MEG " 1/3 WATT RESISTOR
R 5 - 200M " " " "
R 6 - 1200 " 1/2 " "
R 7 - 150 " " " "
R 8 - 500M " 1/3 " "
R 9 - 22 " 1/2 " "

C 1 - ANT. SECTION GANG CONDENSER
C 2 - OSC. " " "
C 3 - .05 MFD. 200 V. CONDENSER
C 4 - .00025 MFD. 500V. "
C 5 - .006 " " "
C 6 - .01 " 400 V. "
C 7 - .02 " " "
C 8 - .05 " " "
C 9 - 50-50 " 150 V. "
C10 - .0001 " 400V. "

L 1 - LOOP ANTENNA
L 2 - OSC. COIL
T 1 - 465KC. I.F. TRANSFORMER
T 2 - " " " "
T 3 - OUTPUT TRANSFORMER
SP1 - 5" P.M. SPEAKER

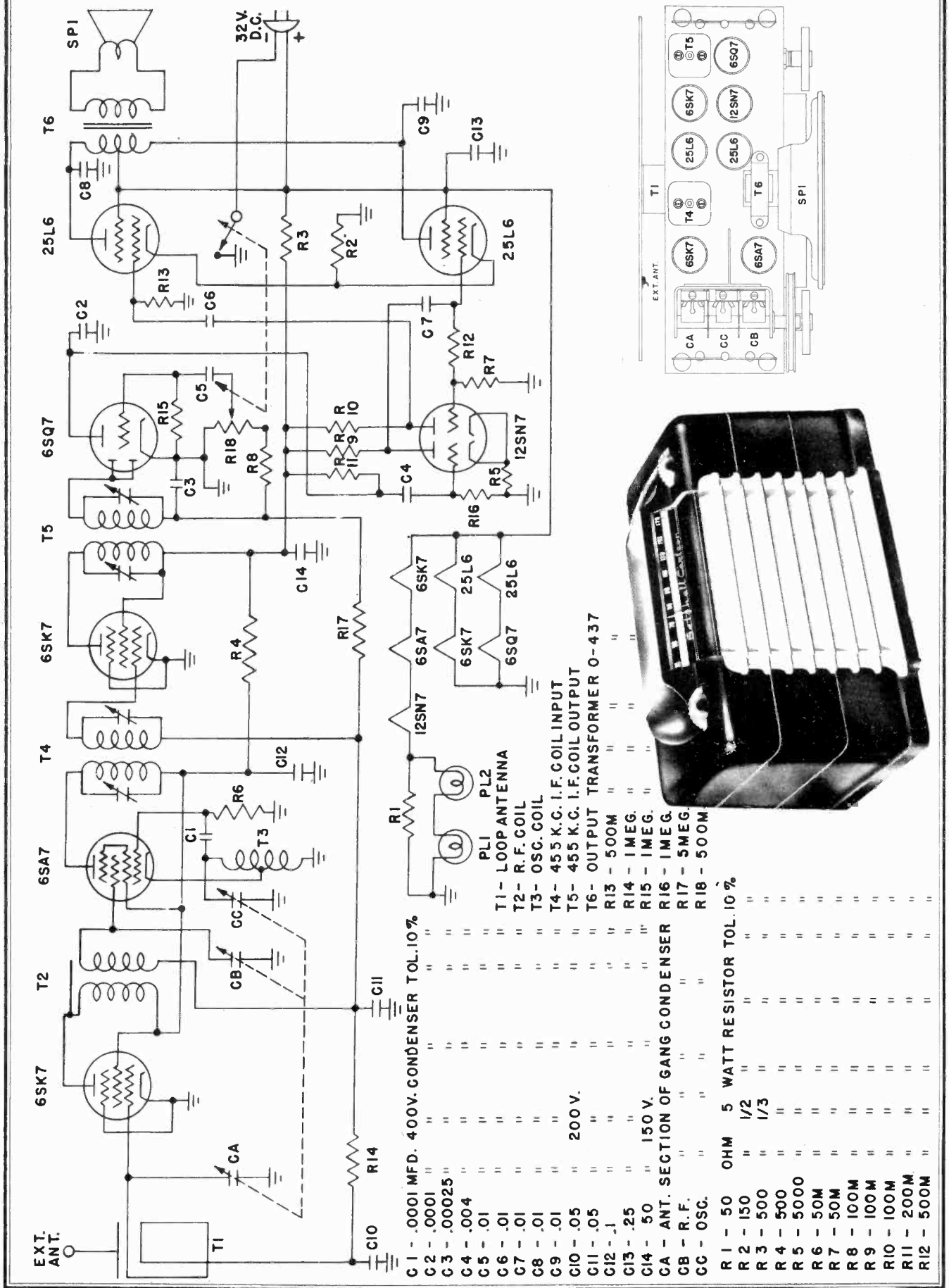




For alignment see procedure A, How It Works

MODEL 437

SETCHELL CARLSON, INC.



C 1 - .0001 MFD. 400V. CONDENSER TOL. 10%
C 2 - .0001 " " " " "
C 3 - .00025 " " " " "
C 4 - .004 " " " " "
C 5 - .01 " " " " "
C 6 - .01 " " " " "
C 7 - .01 " " " " "
C 8 - .01 " " " " "
C 9 - .01 " " " " "
C10 - .05 " 200 V. " " "
C11 - .05 " " " " "
C12 - .1 " " " " "
C13 - .25 " " " " "
C14 - 50 " 150 V. " " "
CA - ANT. SECTION OF GANG CONDENSER
CB - R.F. " " " " "
CC - OSC. " " " " "

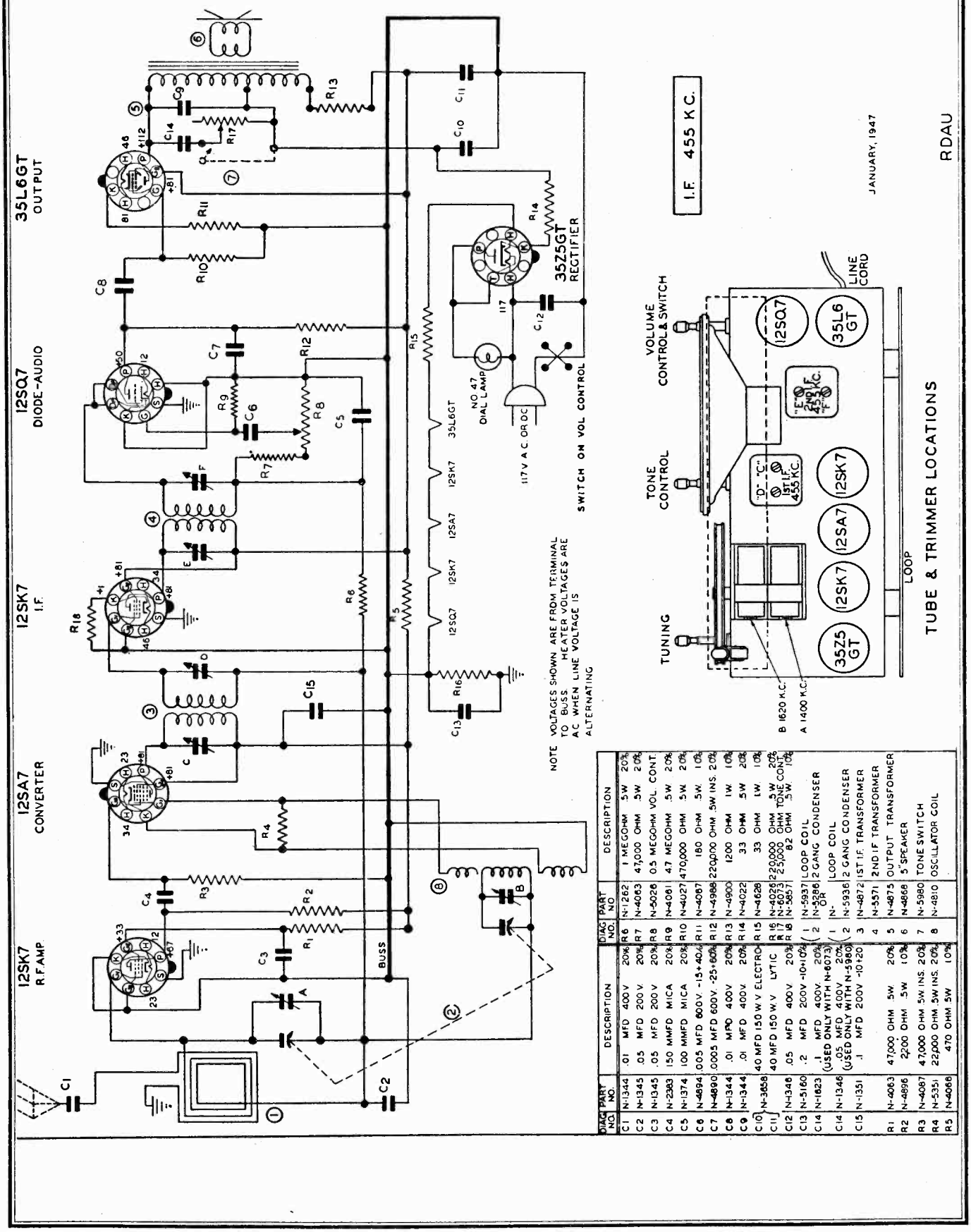
R 1 - 50 OHM 5 WATT RESISTOR TOL. 10 %
R 2 - 150 " 1/2 " " "
R 3 - 500 " 1/3 " " "
R 4 - 500 " " " " "
R 5 - 5000 " " " " "
R 6 - 50M " " " " "
R 7 - 50M " " " " "
R 8 - 100M " " " " "
R 9 - 100M " " " " "
R10 - 100M " " " " "
R11 - 200M " " " " "
R12 - 500M " " " " "
R16 - 1MEG. " " " " "
R17 - 5MEG. " " " " "
R18 - 500M " " " " "

PL1 PL2 - LOOP ANTENNA
T1 - LOOP ANTENNA
T2 - R.F. COIL
T3 - OSC. COIL
T4 - 455 K.C. I.F. COIL INPUT
T5 - 455 K.C. I.F. COIL OUTPUT
T6 - OUTPUT TRANSFORMER O-437

For alignment see procedure A, How It Works

SONORA RADIO & TELEV. CORP.

MODELS RDA, RDAU



DIAG NO.	PART NO.	DESCRIPTION
C1	N-1344	.01 MFD 400V 20%
C2	N-1345	.05 MFD 200 V 20%
C3	N-1345	.05 MFD 200 V 20%
C4	N-2383	150 MMFD MICA 20%
C5	N-1374	100 MMFD MICA 20%
C6	N-4894	.005 MFD 600V. -15+40%
C7	N-4890	.0005 MFD 600V. -25+60%
C8	N-1344	.01 MFD 400V 20%
C9	N-1344	.01 MFD 400V 20%
C10	N-3858	40 MFD 150 W.V ELECTRO
C11		40 MFD 150 W.V LYTIC
C12	N-1346	.05 MFD 400V 20%
C13	N-5160	.2 MFD 200V -10+10%
C14	N-1823	.1 MFD 400V 20% (USED ONLY WITH N-6073)
C14	N-1346	.05 MFD 400V 20% (USED ONLY WITH N-5980)
C15	N-1351	.1 MFD 200V -10+20
R1	N-4063	47,000 OHM 5W 20%
R2	N-4896	2200 OHM .5W 10%
R3	N-4087	47,000 OHM 5W INS. 20%
R4	N-5351	22,000 OHM 5W INS. 20%
R5	N-4068	470 OHM 5W 10%
R6	N-1262	1 MEGOHM .5W 20%
R7	N-4063	47,000 OHM .5W 20%
R8	N-5026	0.5 MEGOHM VOL. CONT
R9	N-4081	.47 MEGOHM .5W 20%
R10	N-4027	470,000 OHM .5W 20%
R11	N-4087	180 OHM .5W 10%
R12	N-4988	220,000 OHM .5W INS. 20%
R13	N-4900	1200 OHM 1W 10%
R14	N-4022	33 OHM .5W 20%
R15	N-4628	33 OHM 1W 10%
R16	N-4026	220,000 OHM .5W 20%
R17	N-6073	25,000 OHM TONE CONT.
R18	N-3857	82 OHM .5W 10%
1	N-5937	LOOP COIL
2	N-5286 OR	2 GANG CONDENSER
1	N-	LOOP COIL
2	N-5936	2 GANG CONDENSER
3	N-4872	1ST I.F. TRANSFORMER
4	N-5571	2ND I.F. TRANSFORMER
5	N-4875	OUTPUT TRANSFORMER
6	N-4868	5" SPEAKER
7	N-5980	TONE SWITCH
8	N-4810	OSCILLATOR COIL

Lack of sensitivity and poor tone quality may be due to any one or a combination of causes such as weak or defective tubes or speaker, open or grounded bias resistor, bypass condenser, etc. Never attempt to realign set until all other possible sources of trouble have been first thoroughly investigated and definitely proved not to be the cause.

NOTE: IT IS ABSOLUTELY NECESSARY THAT AN ACCURATELY CALIBRATED TEST OSCILLATOR WITH SOME TYPE OF OUTPUT MEASURING DEVICE BE USED WHEN ALIGNING THE RECEIVER AND THAT THE PROCEDURE BE CAREFULLY FOLLOWED. OTHERWISE THE RECEIVER WILL BE INSENSITIVE AND THE DIAL CALIBRATION WILL BE INCORRECT. THE TRIMMERS WILL BE REFERRED TO BY THEIR FUNCTION AS INDICATED ON THE PARTS DIAGRAM.

ALIGNMENT PROCEDURE

GENERAL DATA. The alignment of this receiver requires the use of a test oscillator that will cover the frequencies of 455, 600, 1400 and 1620 KC and an output meter to be connected across the primary or secondary of the output transformer. If possible, all alignments should be made with the volume control on maximum and the test oscillator output as low as possible to prevent the AVC from operating and giving false readings.

CORRECT ALIGNMENT PROCEDURE. The intermediate frequency (I.F.) stages should be aligned properly as the first step. After the I.F. transformers have been properly adjusted and peaked, the broadcast band should be adjusted.

I.F. ALIGNMENT. Remove the chassis and loop antenna from the cabinet and set them up on the bench so that they occupy exactly the same respective positions on the bench as they did in the cabinet. Care should be taken to have no iron or other metal near the loop. Do not make this set-up on a metal bench. With the gang condenser set at minimum, adjust the test oscillator to 455 KC and connect the output to the grid of the first detector tube (12SA7) through a .05 or .1 mfd. condenser. The ground on the test oscillator should be connected to the ground buss, indicated on the circuit diagram. Align all four I.F. trimmers to peak or maximum reading on the output meter.

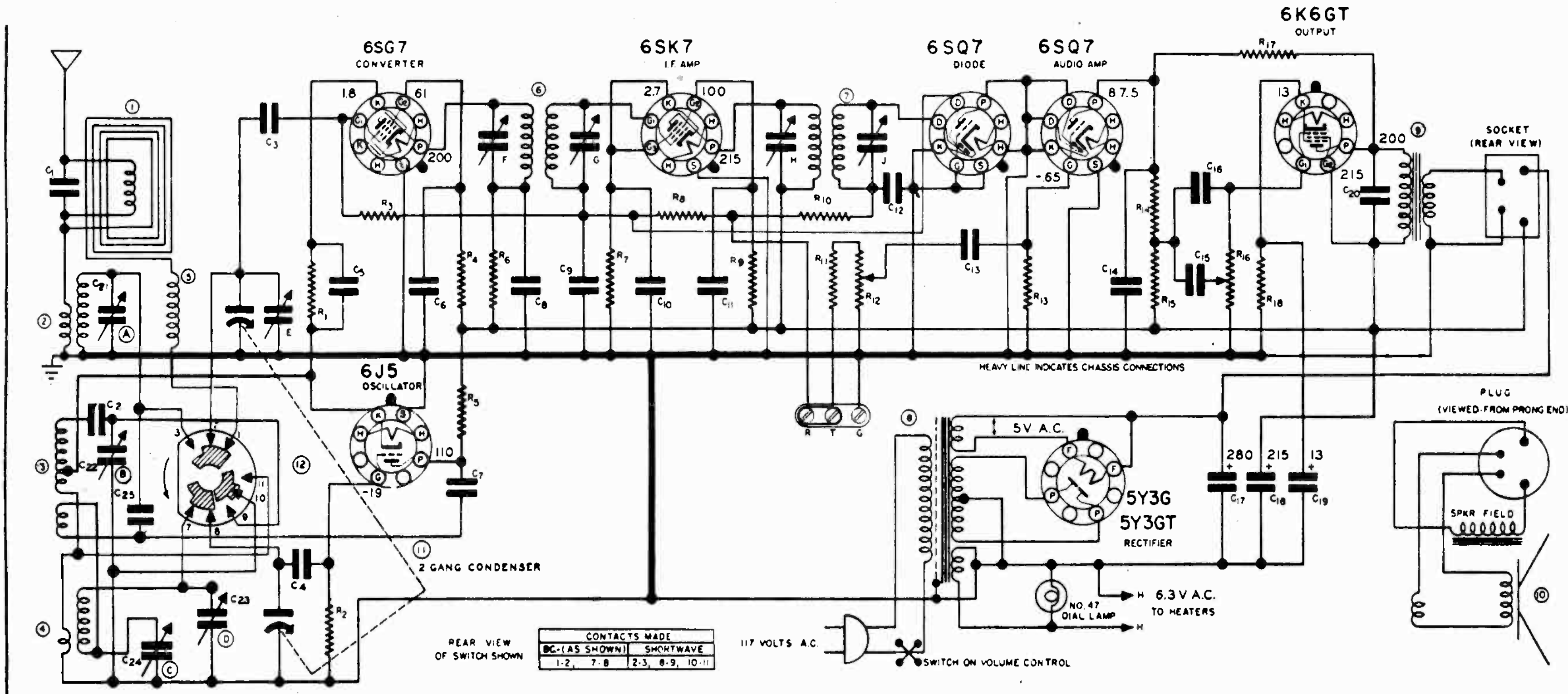
BROADCAST BAND ALIGNMENT. Connect the test oscillator to the antenna of the set through a 100 mmfd. (.0001) condenser. With the gang condenser set at minimum capacity, set the test oscillator at 1620 KC, and adjust the oscillator (or 1620 KC trimmer) on gang condenser. Next—set the test oscillator at 1400 KC, and tune in the signal on the gang condenser. Adjust the antenna trimmer (or 1400 KC trimmer) for maximum signal. Next set the test oscillator at 600 KC, and tune in signal on condenser to check alignment of coils.

TUNING RANGE

This receiver is designed to operate over the standard broadcast band which extends from 535 to 1620 Kilocycles (KC) (185 to 560 Meters).

DIAL CALIBRATION. The scale is calibrated from 55 to 160 (Standard Broadcast). This band covers all Standard Broadcasts frequencies of the United States, Canada, Mexico, Cuba and many Central and South American Countries. Add a zero to figures on the scale to obtain kilocycles.

SONORA RADIO & TELEV. CORP.

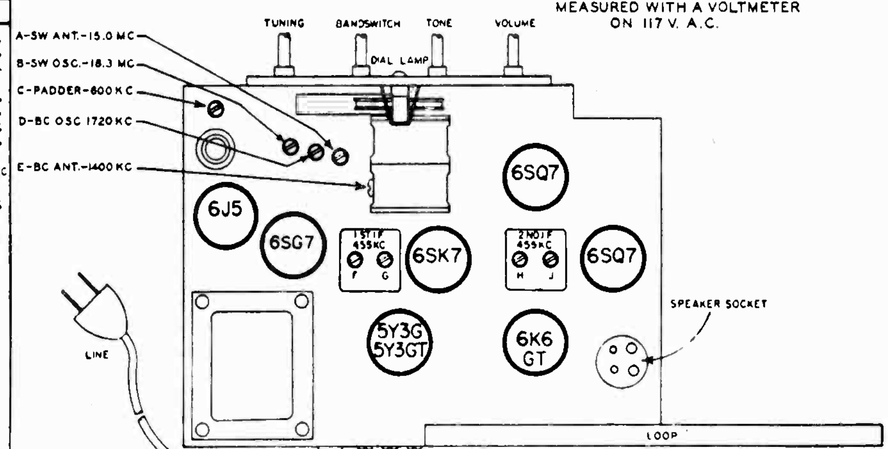


ALL VOLTAGES SHOWN ARE MEASURED WITH A VOLTMETER ON 117 V. A.C.

I.F. - 455 KC.

DIAG NO	PART NO	
R1	N-3341	1,000 OHM .5W. 10 %
R2	N-4063	47,000 OHM .5W. 20 %
R3	N-4062	3.3 MEGOHM .5W 20 %
R4	N-4423	330,000 OHM .5W. 20 %
R5	N-4451	27,000 OHM .5W 10 %
R6	N-1258	10,000 OHM .5W. 20%
R7	N-4121	270 OHM .5W. 10 %
R8	N-1262	1 MEGOHM .5W. 20%
R9	N-4063	47,000 OHM .5W. 20%
R10		47,000 OHM .5W. 20% IN 2ND I.F. COIL
R11	N-4063	47,000 OHM .5W 20%
R12	N-4843	0.5 MEGOHM VOLUME CONTROL
R13	N-1263	10 MEGOHM .5W. 20 %
R14	N-4064	33,000 OHM .5W. 20 %
R15	N-4423	330,000 OHM .5W. 20 %
R16	N-4398	0.5 MEGOHM TONE CONTROL
R17	N-4424	2.2 MEGOHM .5W. 10 %
R18	N-4421	470 OHM 1. W 10 %
C1	N-1343	.00025 MFD. MICA 20%
C2	N-1690	.004 MFD MICA 5 %
C3	N-1343	.00025 MFD MICA 20%
C4	N-1342	.00005 MFD. MICA 20%
C5	N-1345	.05 MFD 200 V. 20%
C6	N-1376	.02 MFD 400 V. 20%
C7	N-1344	.01 MFD 400 V 20%
C8	N-1623	.1 MFD. 400 V 20 %
C9	N-1345	.05 MFD. 200 V. 20 %

DIAG NO	PART NO	DESCRIPTION
C10	N-1351	.1 MFD. 200V 20%
C11	N-1623	.1 MFD 400V. 20%
C12		.0001 MFD MICA 20% IN 2ND I.F. COIL
C13	N-1344	.01 MFD. 400V 20%
C14	N-1374	.0001 MFD. MICA 20%
C15	N-4894	.005 MFD 600V 20%
C16	N-1344	.01 MFD 400V. 20%
C17, C18, C19	N-441K	12 MFD 400 WV, 10 MFD 400 WV, 20 MFD 25 WV ELECTROLYTIC
C20	N-4894	.005 MFD 600V 20%
C21, C22, C23	N-2158	3 SECTION TRIMMER
C24	N-1254	PADDER
C25	N-5920	4.0 MMFD COPOLENE
1	N-4401	LOOP ANTENNA
2	N-5921	SW ANTENNA COIL
3	N-4404	SW OSCILLATOR COIL
4	N-4403	BC OSCILLATOR COIL
5	N-4407	LOOP SERIES COIL
6	N-4405	1ST I.F. TRANSFORMER
7	N-4406	2ND I.F. TRANSFORMER
8	N-4396	POWER TRANSFORMER
9	N-4395	OUTPUT TRANSFORMER
10	N-4394	6½" DYNAMIC SPEAKER
11	N-4397	2 GANG CONDENSER
12	N-4400	BANDSWITCH

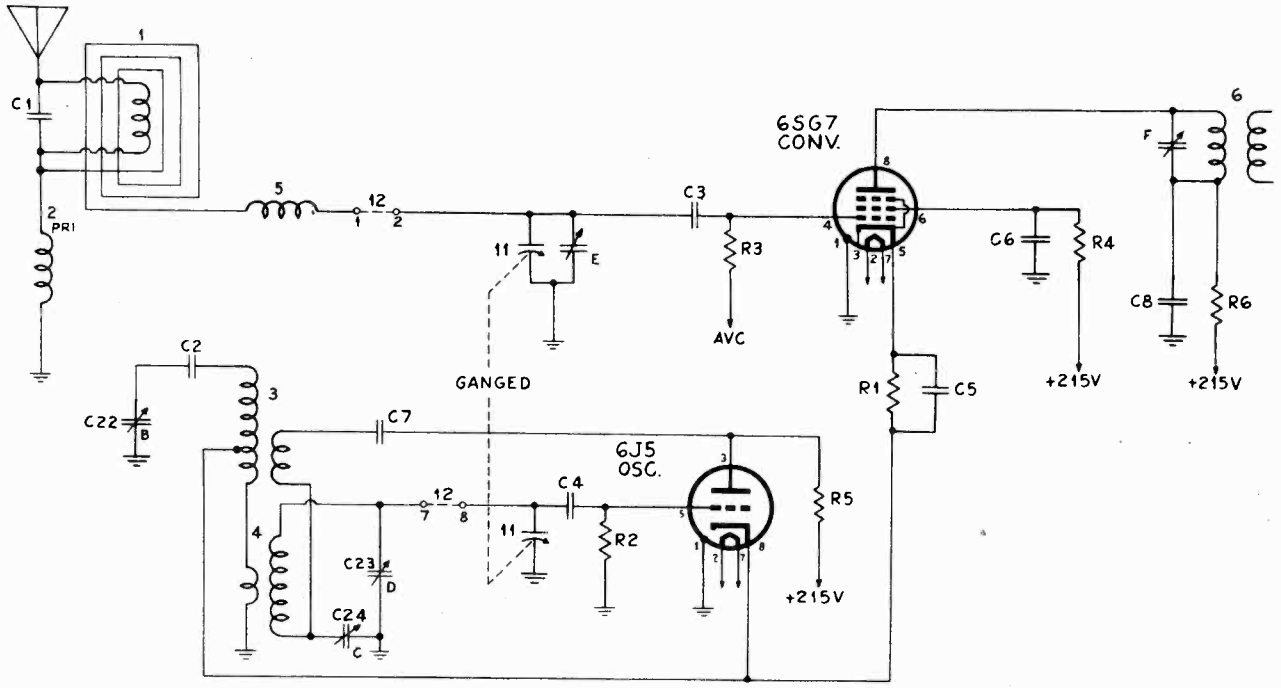


TUBE AND TRIMMER LOCATIONS

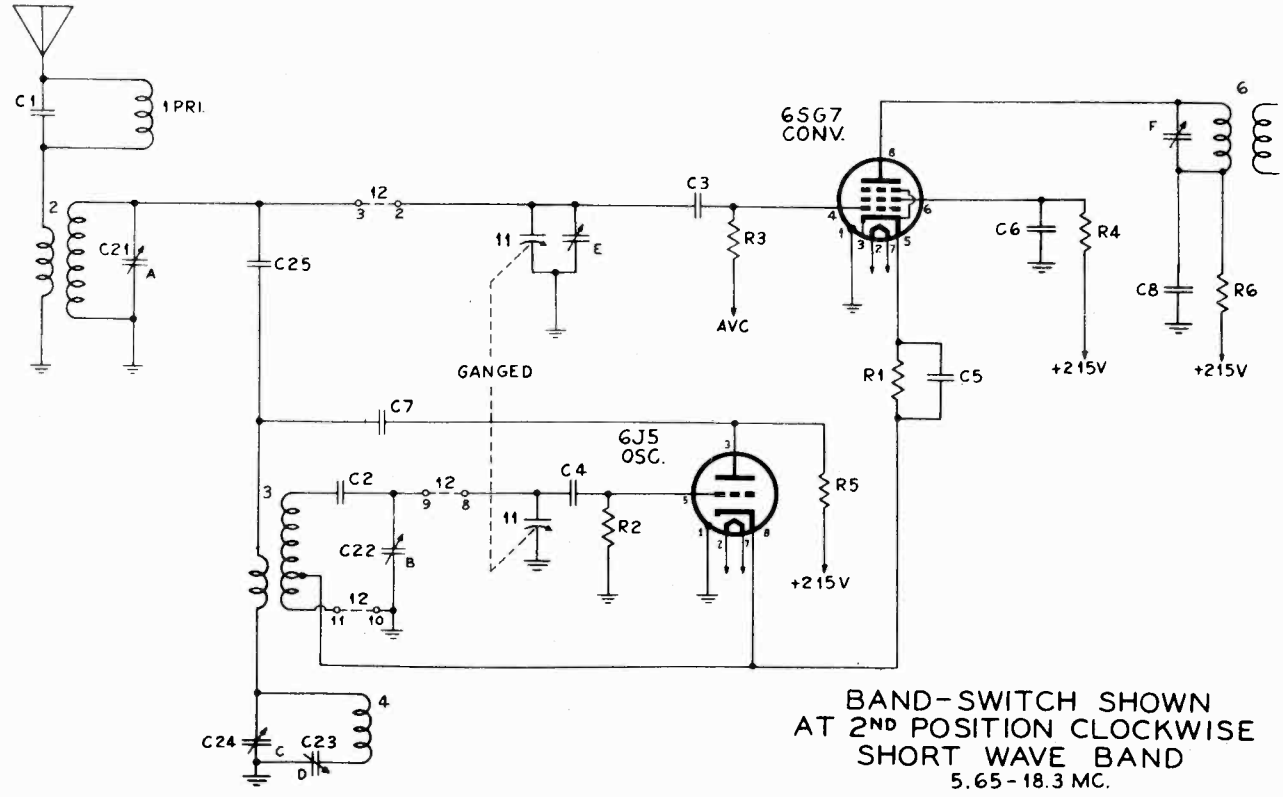
"clarified schematics"

MODEL RET

SONORA RADIO & TELEV. CORP.



BAND-SWITCH SHOWN
AT 1ST POSITION
BROADCAST BAND
535-1720 KC.



BAND-SWITCH SHOWN
AT 2ND POSITION CLOCKWISE
SHORT WAVE BAND
5.65-18.3 MC.

Lack of sensitivity and poor tone quality may be due to any one or a combination of causes such as weak or defective tubes or speaker, open or grounded bias resistor, bypass condenser, etc. Never attempt to realign set until all other possible sources of trouble have been first thoroughly investigated and definitely proved not to be the cause.

NOTE: IT IS ABSOLUTELY NECESSARY THAT AN ACCURATELY CALIBRATED TEST OSCILLATOR WITH SOME TYPE OF OUTPUT MEASURING DEVICE BE USED WHEN ALIGNING THE RECEIVER AND THAT THE PROCEDURE BE CAREFULLY FOLLOWED. OTHERWISE THE RECEIVER WILL BE INSENSITIVE AND THE DIAL CALIBRATION WILL BE INCORRECT. THE TRIMMERS WILL BE REFERRED TO BY THEIR FUNCTION AS INDICATED ON THE PARTS DIAGRAM.

ALIGNMENT PROCEDURE

GENERAL DATA. The alignment of this receiver requires the use of a test oscillator that will cover the frequencies of 455, 600, 1400, 1720, 6000, 15000, and 18300 KC, and an output meter to be connected across the primary or secondary of the output transformer. If possible, all alignments should be made with the volume control on maximum and the test oscillator output as low as possible to prevent the AVC from operating and giving false readings.

CORRECT ALIGNMENT PROCEDURE. The intermediate frequency (I.F.) stages should be aligned properly as the first step. After the I.F. transformers have been properly adjusted and peaked, the Broadcast and Short Wave bands should be adjusted.

I.F. ALIGNMENT. Remove the chassis and loop antenna from the cabinet and set them up on the bench so that they occupy exactly the same respective positions on the bench as they did in the cabinet. Care should be taken to have no iron or other metal near the loop. Do not make this set-up on a metal bench. With the Band Switch set to the Broadcast Band and with the gang condenser set at minimum, adjust the test oscillator to 455 KC and connect the output to the grid of the first detector tube 6SG7 through a .05 or .1 mfd. condenser. The ground on the test oscillator should be connected to the receiver ground. Align all four I.F. trimmers to peak or maximum reading on the output meter.

BROADCAST BAND ALIGNMENT. With the Band Switch turned to the Broadcast Position, connect the test oscillator to the antenna of the set through a 100 mmfd. (.0001) condenser, and the ground on the test oscillator to the receiver ground. With the gang condenser set at minimum capacity, set the test oscillator at 1720 KC, and adjust the oscillator (or 1720 KC trimmer). For the antenna adjustment set the test oscillator at 1400 KC, and tune in the signal on the gang condenser. Adjust the antenna trimmer (or 1400 KC trimmer) for maximum signal. Next set the test oscillator at 600 KC, and tune in the signal on the condenser. Adjust the 600 KC Pad while rocking the gang to obtain maximum output.

SHORT WAVE BAND ALIGNMENT. With the band switch turned to the S.W. position, connect the test oscillator to the antenna with a 400 ohm dummy and the ground on the test oscillator to the ground connection on the receiver. Adjust the S.W. oscillator to give a maximum output with the dial at 18300 KC (extreme end). Set the test oscillator at 15000 KC and tune in the signal with the dial. Adjust the antenna trimmer for maximum output. With a strong signal input turn the dial to approximately 1 M.C. lower in frequency and pick up the image frequency. If the image is not received, it will be necessary to return the dial to 18300 KC to reduce the capacity in the oscillator trimmer until a second signal is received. Proceed as before with the alignment of the antenna and recheck for image frequency. Check the sensitivity at 6000 KC to determine if the coils and mica pad are not defective.

TUNING RANGE

This receiver is designed to operate over two tuning ranges; the broadcast band which extends from 535 to 1720 Kilocycles (KC) (174 to 560 Meters), and the International Short Wave Band which extends from 5.65 to 18.3 Megacycles (MC) (16.4 to 53 Meters).

DIAL CALIBRATION. (STANDARD BROADCAST BAND). The outside scale is calibrated from 55 to 170 (Standard Broadcast). This band covers all Standard Broadcast frequencies of the United States, Canada, Mexico, Cuba, and many Central and South American Countries. Add a zero to figures on the scale to obtain kilocycles.

DIAL CALIBRATION. (SHORT WAVE BAND). The entire inside scale is devoted to short wave American and foreign broadcasts. This scale is calibrated from 6 to 18 megacycles (MC). Consult the Sonora Short-Wave Station list for the proper frequency and time for best short wave reception.

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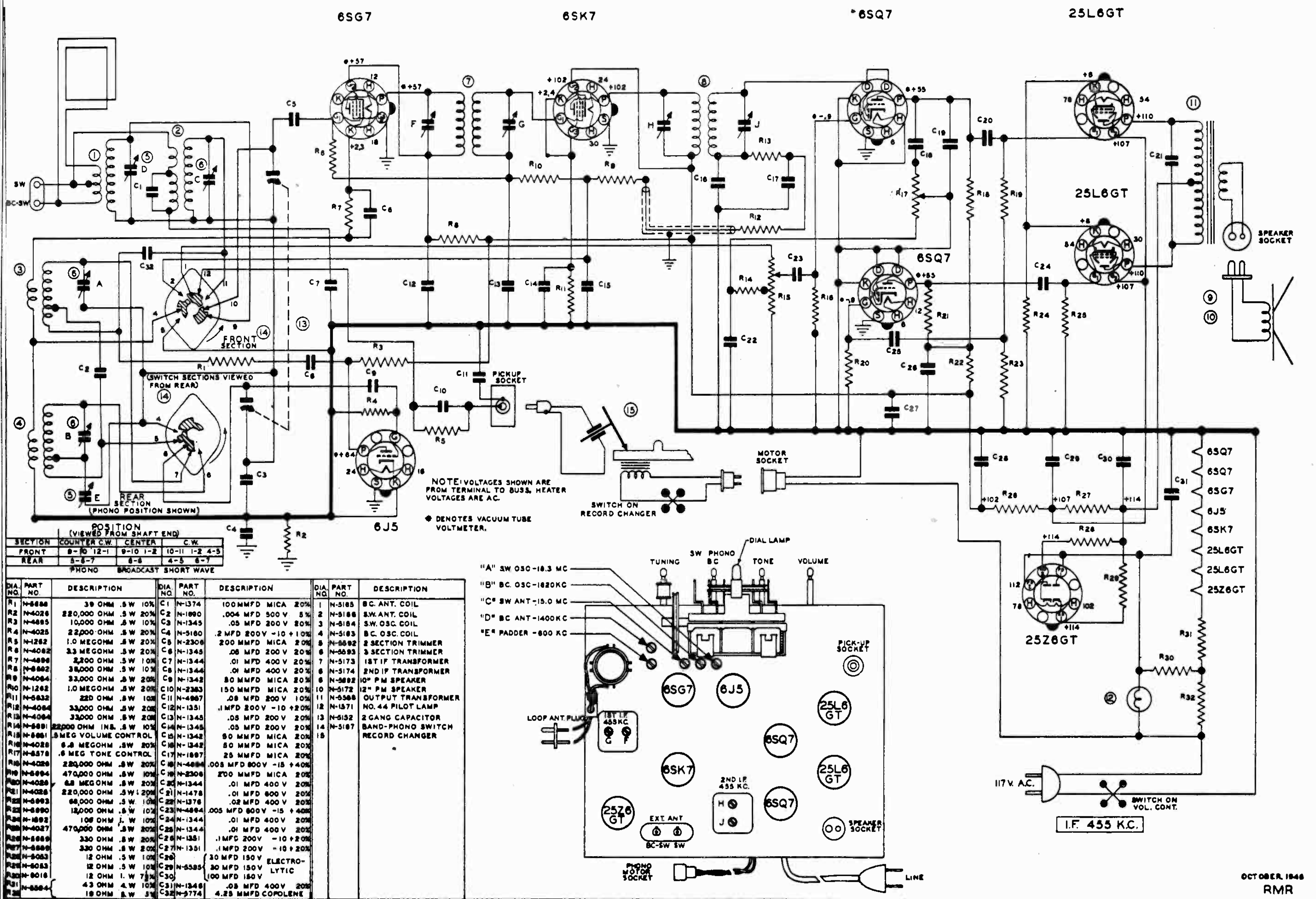


NOTE: VOLTAGES SHOWN ARE FROM TERMINAL TO BUSS. HEATER VOLTAGES ARE A.C.

● DENOTES VACUUM TUBE VOLTMETER.

POSITION (VIEWED FROM SHAFT END)

SECTION	COUNTER C.W.	CENTER	C.W.
FRONT	9-10 12-1	9-10 1-2	10-11 1-2 4-5
REAR	5-6-7	6-8	4-5 6-7
	PHONO	BROADCAST	SHORT WAVE

DIA. NO.	PART NO.	DESCRIPTION
R1	N-6686	39 OHM .5 W 10%
R2	N-4026	220,000 OHM .5 W 20%
R3	N-4885	10,000 OHM .5 W 10%
R4	N-4025	22,000 OHM .5 W 20%
R5	N-1262	1.0 MEGOHM .5 W 20%
R6	N-4062	3.3 MEGOHM .5 W 20%
R7	N-4896	2,200 OHM .5 W 10%
R8	N-6892	36,000 OHM .5 W 10%
R9	N-4064	33,000 OHM .5 W 20%
R10	N-1262	1.0 MEGOHM .5 W 20%
R11	N-6832	220 OHM .5 W 10%
R12	N-4064	33,000 OHM .5 W 20%
R13	N-4064	33,000 OHM .5 W 20%
R14	N-6881	22000 OHM INS. .5 W 10%
R15	N-6881	.5 MEG VOLUME CONTROL
R16	N-4028	6.8 MEGOHM .5W 20%
R17	N-6578	.6 MEG TONE CONTROL
R18	N-4026	220,000 OHM .5W 20%
R19	N-6894	470,000 OHM .5W 10%
R20	N-4028	6.8 MEGOHM .5W 20%
R21	N-4026	220,000 OHM .5W 20%
R22	N-6893	68,000 OHM .5 W 10%
R23	N-6890	12,000 OHM .5 W 10%
R24	N-1892	100 OHM 1. W 10%
R25	N-4027	470,000 OHM .5W 20%
R26	N-6869	330 OHM .5 W 20%
R27	N-6869	330 OHM .5 W 20%
R28	N-6053	12 OHM .5 W 10%
R29	N-6053	12 OHM .5 W 10%
R30	N-6016	12 OHM 1. W 7½%
R31	N-6564	43 OHM 4. W 10%
R32	N-6564	18 OHM 8. W 5%

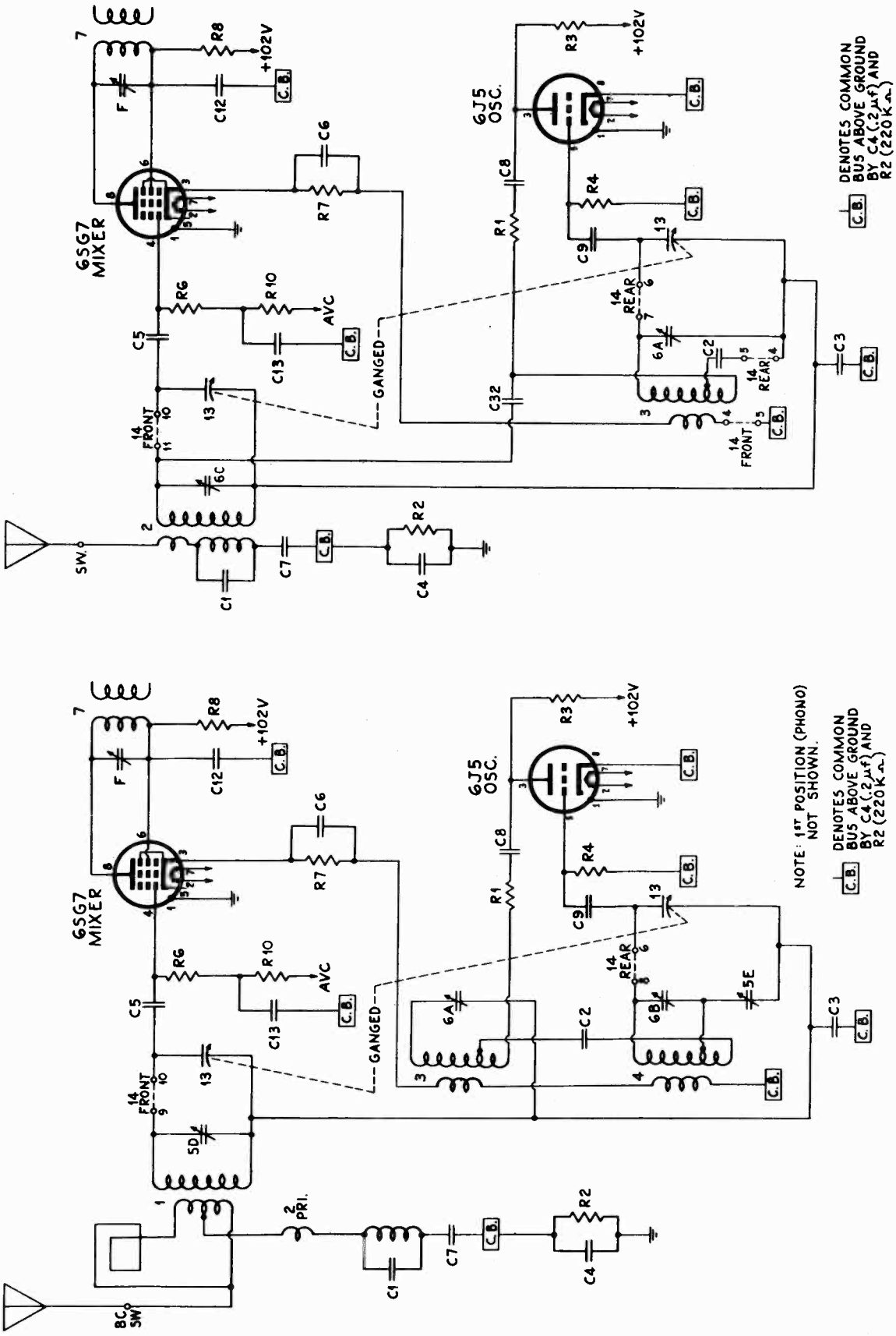
DIA. NO.	PART NO.	DESCRIPTION
C1	N-1374	100 MMFD MICA 20%
C2	N-1690	.004 MFD 500 V 5%
C3	N-1345	.05 MFD 200 V 20%
C4	N-5160	.2 MFD 200V -10 +10%
C5	N-2306	200 MMFD MICA 20%
C6	N-1345	.05 MFD 200 V 20%
C7	N-1344	.01 MFD 400 V 20%
C8	N-1344	.01 MFD 400 V 20%
C9	N-1342	50 MMFD MICA 20%
C10	N-2383	150 MMFD MICA 20%
C11	N-4867	.05 MFD 200 V 10%
C12	N-1351	.1 MFD 200V -10 +20%
C13	N-1345	.05 MFD 200 V 20%
C14	N-1345	.05 MFD 200 V 20%
C15	N-1342	50 MMFD MICA 20%
C16	N-1342	50 MMFD MICA 20%
C17	N-1667	25 MMFD MICA 20%
C18	N-4694	.005 MFD 600V -15 +40%
C19	N-2306	200 MMFD MICA 20%
C20	N-1344	.01 MFD 400 V 20%
C21	N-1478	.01 MFD 600 V 20%
C22	N-1376	.02 MFD 400 V 20%
C23	N-4694	.005 MFD 600V -15 +40%
C24	N-1344	.01 MFD 400 V 20%
C25	N-1344	.01 MFD 400 V 20%
C26	N-1351	.1 MFD 200V -10 +20%
C27	N-1351	.1 MFD 200V -10 +20%
C28	N-5585	30 MFD 150 V ELECTROLYTIC
C29	N-5585	30 MFD 150 V ELECTROLYTIC
C30	N-5585	100 MFD 150 V ELECTROLYTIC
C31	N-1346	.05 MFD 400V 20%
C32	N-5774	4.25 MMFD COPOLENE

DIA. NO.	PART NO.	DESCRIPTION
1	N-5165	BC. ANT. COIL
2	N-5166	S.W. ANT. COIL
3	N-5164	S.W. OSC. COIL
4	N-5163	BC. OSC. COIL
5	N-5692	2 SECTION TRIMMER
6	N-5693	3 SECTION TRIMMER
7	N-5173	1ST IF TRANSFORMER
8	N-5174	2ND IF TRANSFORMER
9	N-5692	10" PM SPEAKER
10	N-5172	12" PM SPEAKER
11	N-5586	OUTPUT TRANSFORMER
12	N-1571	NO. 44 PILOT LAMP
13	N-5132	2 GANG CAPACITOR
14	N-5167	BAND-PHONO SWITCH
15		RECORD CHANGER

RECORD CHANGER: Oak Model 6666, RCD. CH. 15-1

SONORA RADIO & TELEV. CORP.

MODEL RMR



AUTOMATIC TUNING

ADJUSTMENT. All adjustments are simply made from the top of the cabinet using an ordinary screw driver.
To make adjustments remove all six buttons, which pull off readily. The center buttons should be removed first, since by depressing the adjacent buttons with thumb and finger a firm grip may be secured on either center button. The side buttons can then be easily removed.
Loosen the screw of the desired button and with the manual tuning knob tune to any desired station. Hold the manual tuning knob in position and depress the button shaft as far as possible. With the button fully depressed, tighten the screw firmly.
Be sure the push button knob is held down in position while being tightened.
After the stations are adjusted, it is advisable to check each button to assure sufficient tightening.
To assure accurate adjustment, the volume control should be set at a moderate level and the station tuned in slowly to a point of maximum volume and clarity.
It is not necessary to follow any particular sequence of stations since each button is adjustable to any station.
With each button definitely set and securely tightened to the selected station, the tuner is ready for operation.

OPERATION. With the set turned on to a moderate level of volume, the automatic tuner is operated by merely pressing a button set to the desired station.
Station selection may be made automatically or manually at will, since the manual tuning control functions integrally with the automatic unit.
The station call letter tabs enclosed in the Operating Instruction Sheet envelope should be inserted into the slot of the push-buttons, using designations corresponding to the station selected for each button. After inserting call letter tabs, the buttons may be replaced.

Lack of sensitivity and poor tone quality may be due to any one or a combination of causes such as weak or defective tubes or speaker, open or grounded bias resistor, bypass condenser, etc. Never attempt to realign set until all other possible sources of trouble have been first thoroughly investigated and definitely proved not to be the cause.

NOTE: IT IS ABSOLUTELY NECESSARY THAT AN ACCURATELY CALIBRATED TEST OSCILLATOR WITH SOME TYPE OF OUTPUT MEASURING DEVICE BE USED WHEN ALIGNING THE RECEIVER AND THAT THE PROCEDURE BE CAREFULLY FOLLOWED. OTHERWISE THE RECEIVER WILL BE INSENSITIVE AND THE DIAL CALIBRATION WILL BE INCORRECT. THE TRIMMERS WILL BE REFERRED TO BY THEIR FUNCTION AS INDICATED ON THE PARTS DIAGRAM.

ALIGNMENT PROCEDURE

GENERAL DATA. The alignment of this receiver requires the use of a test oscillator that will cover the frequencies of 455, 600, 1400, 1620, 6000, 15000, and 18300 KC, and an output meter to be connected across the primary or secondary of the output transformer. If possible, all alignments should be made with the volume control on maximum and the test oscillator output as low as possible to prevent the AVC from operating and giving false readings.

CORRECT ALIGNMENT PROCEDURE. The intermediate frequency (I.F.) stages should be aligned properly as the first step. After the I.F. transformers have been properly adjusted and peaked, the Broadcast and Short Wave bands should be adjusted.

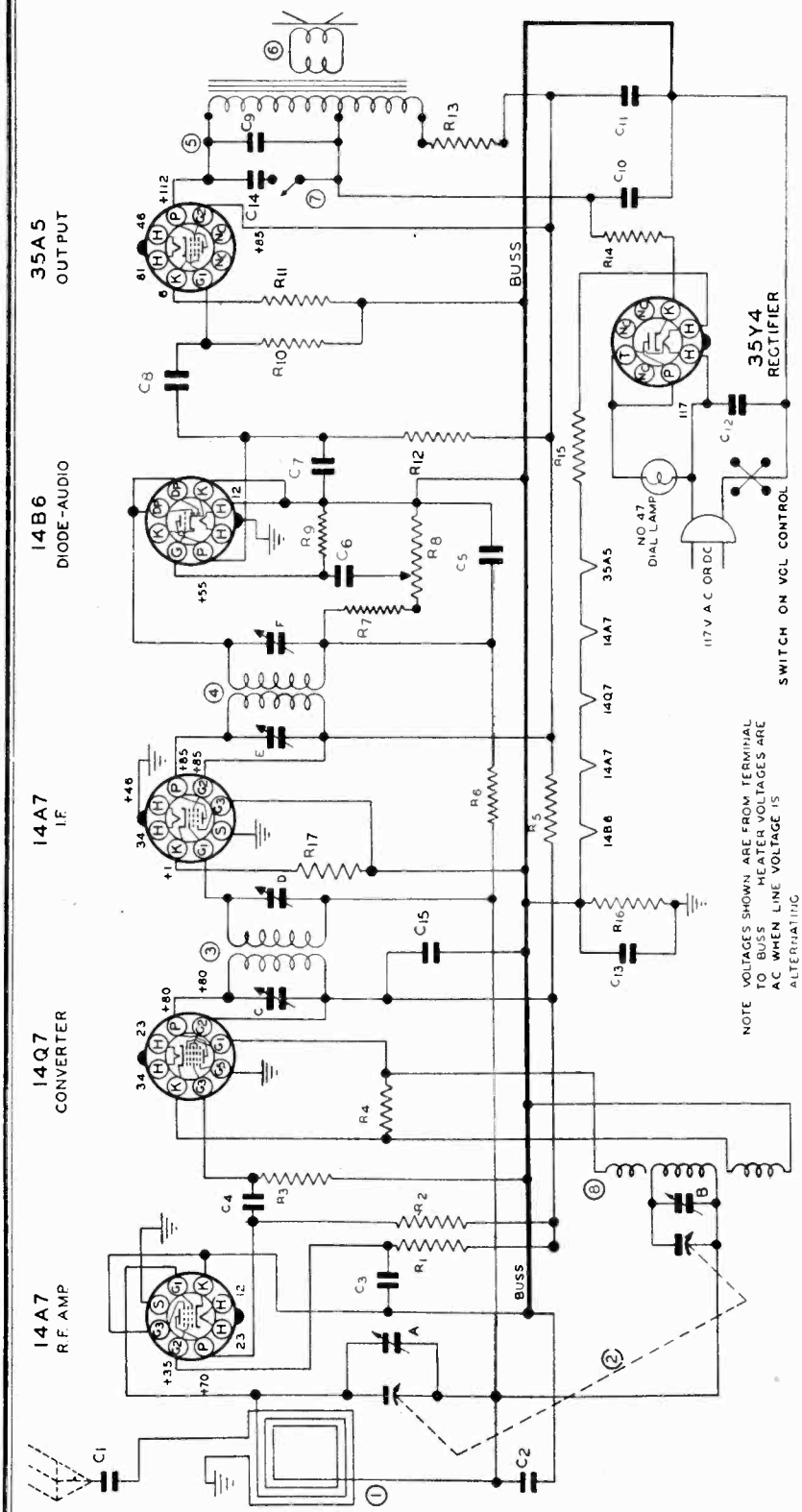
I. F. ALIGNMENT. Remove the chassis from the cabinet. With the Band Switch set to the Broadcast Band and with the gang condenser set at minimum, adjust the test oscillator to 455 KC and connect the output to the grid of the first detector tube 6SG7 through a .05 or .1 mfd. condenser. The ground on the test oscillator should be connected to the ground buss, indicated on the circuit diagram. Align all four I.F. trimmers to peak or maximum reading on the output meter.

BROADCAST BAND ALIGNMENT. With the Band Switch turned to the Broadcast Position, connect the test oscillator to the antenna of the set through a 100 mmfd. (.0001) condenser, and the ground on the test oscillator should be connected to the buss, indicated on the circuit diagram. With the gang condenser set at minimum capacity, set the test oscillator at 1620 KC, and adjust the oscillator (or 1620 KC trimmer). For the antenna adjustment, it is necessary to connect the loop on the cabinet to the chassis or use an equivalent dummy. An equivalent dummy can be constructed by winding two turns of hookup wire on a piece of carton material to form a loop 22x35 inches. Set the test oscillator at 1400 KC, and tune in the signal on the gang condenser. Adjust the antenna trimmer (or 1400 KC trimmer) for maximum signal. Next set the test oscillator at 600 KC, and tune in signal on the condenser. Adjust 600 KC pad while rocking the gang to obtain maximum output.

SHORT WAVE BAND ALIGNMENT. With the band switch turned to the S.W. position, connect the test oscillator to the antenna with a 400 ohm dummy and the ground on the test oscillator to the buss, indicated on the circuit diagram. Adjust the S.W. oscillator to give a maximum output with the dial at 18300 KC (extreme end). Set the test oscillator at 15000 KC and tune in the signal with the dial. Adjust the antenna trimmer for maximum output. With a strong signal input turn the dial to approximately 1 M.C. lower in frequency and pick up the image frequency. If the image is not received, it will be necessary to return the dial to 183000 KC to reduce the capacity in the oscillator trimmer until a second signal is received. Proceed as before with the alignment of the antenna and recheck for image frequency. Check the sensitivity at 6000 KC to determine if the coils and mica pad are not defective.

SONORA RADIO & TELEV. CORP.

MODEL RZLU



DIAG NO.	PART NO.	DESCRIPTION	DIAG NO.	PART NO.	DESCRIPTION
C1	N-1344	.01 MFD 400V	R6	N-1262	1 MEGOHM 5W 20%
C2	N-1345	.05 MFD 200V	R7	N-4063	47,000 OHM 5W 20%
C3	N-1345	.05 MFD 200V	R8	N-5026	.05 MEGOHM VOL CONT
C4	N-2383	150 MMFD MICA	R9	N-4061	.47 MEGOHM 5W 20%
C5	N-1374	100 MMFD MICA	R10	N-4027	470,000 OHM 5W 20%
C6	N-4894	.005 MFD 600V -15+40%	R11	N-4067	180 OHM 5W 10%
C7	N-4890	.0005 MFD 600V -25+60%	R12	N-4988	220,000 OHM 5W INS 20%
C8	N-1344	.01 MFD 400V	R13	N-4900	1200 OHM 1W 10%
C9	N-1344	.01 MFD 400V	R14	N-4022	33 OHM 5W 20%
C10	N-3658	40 MFD 150 W V ELECTRO	R15	N-4628	33 OHM 1W 10%
C11		40 MFD 150 W V LYTIC	R16	N-4026	220,000 OHM 5W 20%
C12	N-1346	.05 MFD 400V 20%	R17	N-5657	82 OHM 5W 10%
C13	N-5160	.2 MFD 200V -10+10%	1	N-5937	LOOP COIL
C14	N-1346	.05 MFD 400V 20%	2	N-5286 OR	2 GANG CONDENSER
C15	N-1351	.1 MFD 200V -10+20%	1	N-5765	LOOP COIL
			2	N-5938	2 GANG CONDENSER
			3	N-4872	1ST I.F. TRANSFORMER
			4	N-5571	2ND I.F. TRANSFORMER
R1	N-4063	47,000 OHM 5W 20%	5	N-4875	OUTPUT TRANSFORMER
R2	N-4896	2200 OHM 5W 10%	6	N-4868	5" SPEAKER
R3	N-4067	47,000 OHM 5W INS 20%	7	N-4942	TONE SWITCH
R4	N-5351	22,000 OHM 5W INS 20%	8	N-4810	OSCILLATOR COIL
R5	N-4066	470 OHM 5W 10%			

Lack of sensitivity and poor tone quality may be due to any one or a combination of causes such as weak or defective tubes or speaker, open or grounded bias resistor, bypass condenser, etc. Never attempt to realign set until all other possible sources of trouble have been first thoroughly investigated and definitely proved not to be the cause.

NOTE: IT IS ABSOLUTELY NECESSARY THAT AN ACCURATELY CALIBRATED TEST OSCILLATOR WITH SOME TYPE OF OUTPUT MEASURING DEVICE BE USED WHEN ALIGNING THE RECEIVER AND THAT THE PROCEDURE BE CAREFULLY FOLLOWED. OTHERWISE THE RECEIVER WILL BE INSENSITIVE AND THE DIAL CALIBRATION WILL BE INCORRECT. THE TRIMMERS WILL BE REFERRED TO BY THEIR FUNCTION AS INDICATED ON THE PARTS DIAGRAM.

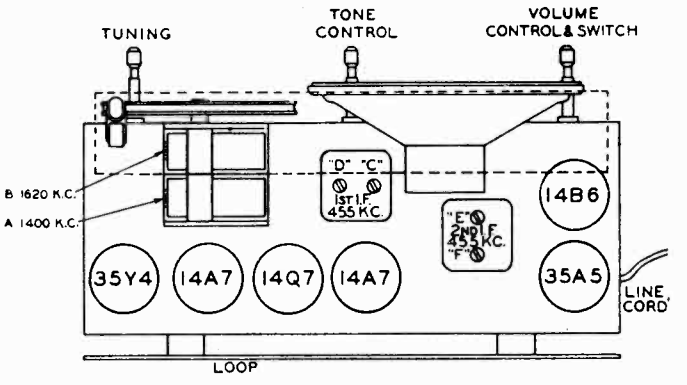
ALIGNMENT PROCEDURE

GENERAL DATA. The alignment of this receiver requires the use of a test oscillator that will cover the frequencies of 455, 600, 1400 and 1620 KC and an output meter to be connected across the primary or secondary of the output transformer. If possible, all alignments should be made with the volume control on maximum and the test oscillator output as low as possible to prevent the AVC from operating and giving false readings.

CORRECT ALIGNMENT PROCEDURE. The intermediate frequency (I.F.) stages should be aligned properly as the first step. After the I.F. transformers have been properly adjusted and peaked, the broadcast band should be adjusted.

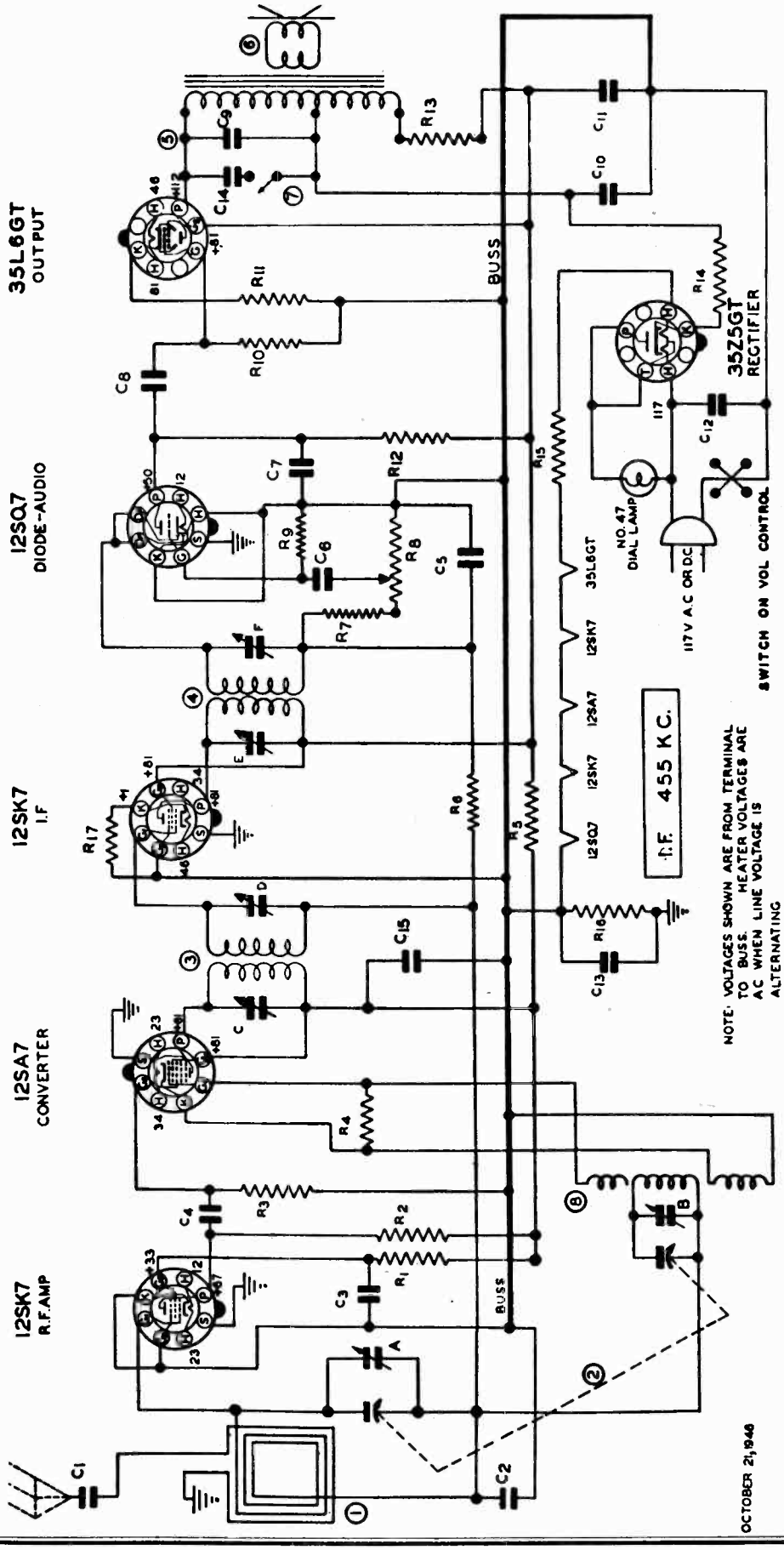
I.F. ALIGNMENT. Remove the chassis and loop antenna from the cabinet and set them up on the bench so that they occupy exactly the same respective positions on the bench as they did in the cabinet. Care should be taken to have no iron or other metal near the loop. Do not make this set-up on a metal bench. With the gang condenser set at minimum, adjust the test oscillator to 455 KC and connect the output to the grid of the first detector tube (14Q7) through a .05 or .1 mfd. condenser. The ground on the test oscillator should be connected to the ground buss, indicated on the circuit diagram. Align all four I.F. trimmers to peak or maximum reading on the output meter.

BROADCAST BAND ALIGNMENT. Connect the test oscillator to the antenna of the set through a 100 mmfd. (.0001) condenser. With the gang condenser set at minimum capacity, set the test oscillator at 1620 KC, and adjust the oscillator (or 1620 KC trimmer) on gang condenser. Next—set the test oscillator at 1400 KC, and tune in the signal on the gang condenser. Adjust the antenna trimmer (or 1400 KC trimmer) for maximum signal. Next set the test oscillator at 600 KC, and tune in signal on condenser to check alignment of coils.



TUBE & TRIMMER LOCATIONS

SONORA RADIO & TELEV. CORP. MODEL RZU-222



SONORA RADIO & TELEV. CORP.

SERVICE DATA

Lack of sensitivity and poor tone quality may be due to any one or a combination of causes such as weak or defective tubes or speaker, open or grounded bias resistor, bypass condenser, etc. Never attempt to realign set until all other possible sources of trouble have been first thoroughly investigated and definitely proved not to be the cause.

NOTE: IT IS ABSOLUTELY NECESSARY THAT AN ACCURATELY CALIBRATED TEST OSCILLATOR WITH SOME TYPE OF OUTPUT MEASURING DEVICE BE USED WHEN ALIGNING THE RECEIVER AND THAT THE PROCEDURE BE CAREFULLY FOLLOWED. OTHERWISE THE RECEIVER WILL BE INSENSITIVE AND THE DIAL CALIBRATION WILL BE INCORRECT. THE TRIMMERS WILL BE REFERRED TO BY THEIR FUNCTION AS INDICATED ON THE PARTS DIAGRAM.

ALIGNMENT PROCEDURE

GENERAL DATA. The alignment of this receiver requires the use of a test oscillator that will cover the frequencies of 455, 600, 1400 and 1620 KC and an output meter to be connected across the primary or secondary of the output transformer. If possible, all alignments should be made with the volume control on maximum and the test oscillator output as low as possible to prevent the AVC from operating and giving false readings.

CORRECT ALIGNMENT PROCEDURE. The intermediate frequency (I.F.) stages should be aligned properly as the first step. After the I.F. transformers have been properly adjusted and peaked, the broadcast band should be adjusted.

I.F. ALIGNMENT. Remove the chassis and loop antenna from the cabinet and set them up on the bench so that they occupy exactly the same respective positions on the bench as they did in the cabinet. Care should be taken to have no iron or other metal near the loop. Do not make this set-up on a metal bench. With the gang condenser set at minimum, adjust the test oscillator to 455 KC and connect the output to the grid of the first detector tube (12SA7) through a .05 or .1 mfd. condenser. The ground on the test oscillator should be connected to the ground buss, indicated on the circuit diagram. Align all four I.F. trimmers to peak or maximum reading on the output meter.

BROADCAST BAND ALIGNMENT. Connect the test oscillator to the antenna of the set through a 100 mmfd. (.0001) condenser. With the gang condsenser set at minimum capacity, set the test oscillator at 1620 KC, and adjust the oscillator (or 1620 KC trimmer) on gang condenser. Next—set the test oscillator at 1400 KC, and tune in the signal on the gang condenser. Adjust the antenna trimmer (or 1400 KC trimmer) for maximum signal. Next set the test oscillator at 600 KC, and tune in signal on condenser to check alignment of coils.

GROUND. No ground connection should be used when operaitng this receiver. The receiver gets its ground connection through the power line and any external connection to the chassis may cause a short circuit and consequent damage.

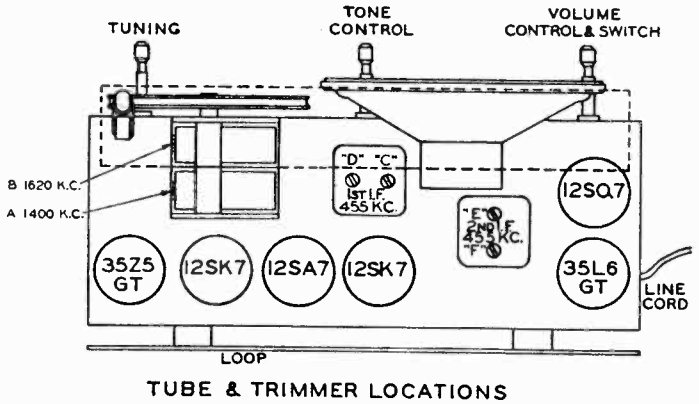
TUNING RANGE

This receiver is designed to operate over the standard broadcast band which extends from 535 to 1620 Kilocycles (KC) (185 to 560 Meters).

DIAL CALIBRATION. The scale is calibrated from 55 to 160 (Standard Broadcast). This band covers all Standard Broadcast frequencies of the United States, Canada, Mexico, Cuba and many Central and South American Countries. Add a zero to figures on the scale to obtain kilocycles.

POWER SUPPLY. This receiver is designed to operate on any alternating current supply (AC) ranging from 110 to 120 volts, 50 to 60 cycles; or on any direct current supply (DC) ranging from 110 to 120 volts.

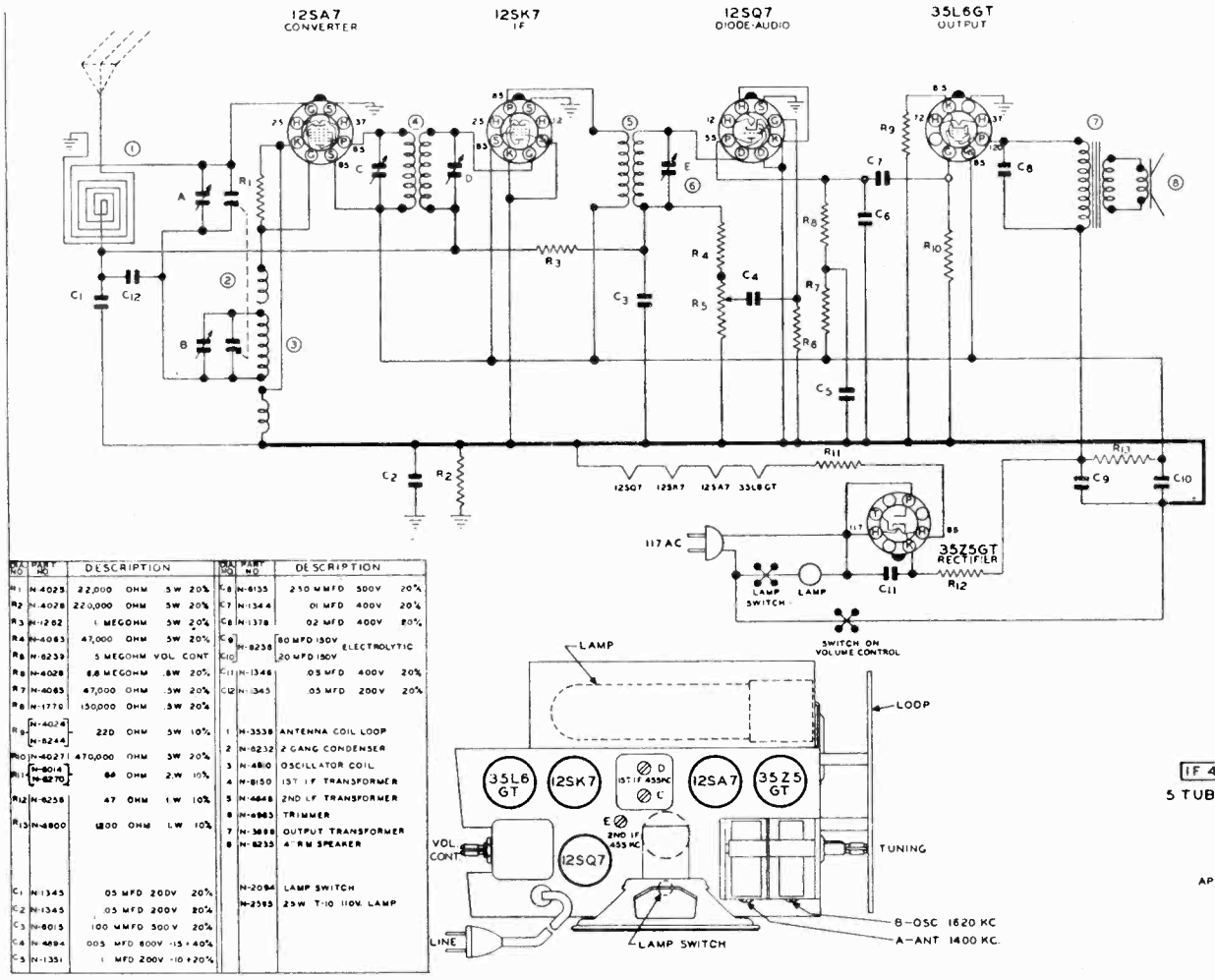
DIAG NO.	PART NO.	DESCRIPTION	DIAG NO.	PART NO.	DESCRIPTION
C1	N-1344	.01 MFD 400 V. 20%	R6	N-1262	1 MEGOHM .5W 20%
C2	N-1345	.05 MFD 200 V. 20%	R7	N-4063	47,000 OHM .5W 20%
C3	N-1345	.05 MFD 200 V. 20%	R8	N-5026	0.5 MEGOHM VOL. CONT.
C4	N-2383	150 MMFD MICA 20%	R9	N-4061	4.7 MEGOHM .5W 20%
C5	N-1374	100 MMFD MICA 20%	R10	N-4027	470,000 OHM .5W 20%
C6	N-4894	.005 MFD 600V -15+40%	R11	N-4067	180 OHM .5W. 10%
C7	N-4890	.0005 MFD 600V -25+60%	R12	N-4988	220,000 OHM .5W. INS. 20%
C8	N-1344	.01 MFD 400V. 20%	R13	N-4900	1200 OHM 1W 10%
C9	N-1344	.01 MFD 400V. 20%	R14	N-4022	33 OHM .5W 20%
C10	N-3658	40 MFD 150 W.V. ELECTRO	R15	N-4628	33 OHM 1W 10%
C11		40 MFD 150 W.V. LYTIC	R16	N-4026	220,000 OHM .5W 20%
C12	N-1346	.05 MFD 400V. 20%	R17	N-5857	82 OHM .5W. 10%
C13	N-5160	.2 MFD 200V. -10+10%	1	N-5937	LOOP COIL
C14	N-1346	.05 MFD 400V. 20%	2	N-5286 OR	2 GANG CONDENSER
C15	N-1351	.1 MFD 200V. -10+20%	1	N-5765	LOOP COIL
			2	N-5936	2 GANG CONDENSER
			3	N-4872	1ST I.F. TRANSFORMER
			4	N-5571	2ND I.F. TRANSFORMER
R1	N-4063	47,000 OHM .5W. 20%	5	N-4875	OUTPUT TRANSFORMER
R2	N-4896	2,200 OHM .5W 10%	6	N-4868	5" SPEAKER
R3	N-4087	47,000 OHM 5W. INS. 20%	7	N-4942	TONE SWITCH
R4	N-5351	22,000 OHM .5W INS. 20%	8	N-4810	OSCILLATOR COIL
R5	N-4066	470 OHM .5W 10%			



TUBE & TRIMMER LOCATIONS

SONORA RADIO & TELEV. CORP.

MODELS WCU-246, WCU-247



DIAG NO	PART NO	DESCRIPTION
R1	N-4025	22,000 OHM 5W 20%
R2	N-4028	220,000 OHM 5W 20%
R3	N-1262	1 MEGOHM 5W 20%
R4	N-4063	47,000 OHM 5W 20%
R5	N-6239	5 MEGOHM VOL CONT
R6	N-4028	68 MEGOHM 5W 20%
R7	N-4063	47,000 OHM 5W 20%
R8	N-1770	150,000 OHM .5W 20%
R9	N-4024 / N-8244	220 OHM 5W 10%
R10	N-4027	470,000 OHM 5W 20%
R11	N-8014 / N-8270	68 OHM 2W 10%
R12	N-8258	47 OHM 1W 10%
R13	N-4800	1200 OHM 1W 10%
C1	N-1345	.05 MFD 200V 20%
C2	N-1345	.05 MFD 200V 20%
C3	N-8015	100 MMFD 500V 20%
C4	N-4884	.005 MFD 600V -15+40%
C5	N-1351	1 MFD 200V -10+20%

DIAG NO	PART NO	DESCRIPTION
C6	N-8135	250 MMFD 500V 20%
C7	N-1344	.01 MFD 400V 20%
C8	N-1378	.02 MFD 400V 20%
C9	N-8238	80 MFD 150V ELECTROLYTIC
C10		20 MFD 150V
C11	N-1346	.05 MFD 400V 20%
C12	N-1345	.05 MFD 200V 20%
1	N-3538	ANTENNA COIL LOOP
2	N-6232	2 GANG CONDENSER
3	N-4880	OSCILLATOR COIL
4	N-8150	1ST I.F. TRANSFORMER
5	N-4848	2ND I.F. TRANSFORMER
6	N-4983	TRIMMER
7	N-3888	OUTPUT TRANSFORMER
8	N-8235	4" P.M. SPEAKER
	N-2094	LAMP SWITCH
	N-2595	25W T-10 110V. LAMP

SERVICE DATA

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NOTE: IT IS ABSOLUTELY NECESSARY THAT AN ACCURATELY CALIBRATED TEST OSCILLATOR WITH SOME TYPE OF OUTPUT MEASURING DEVICE BE USED WHEN ALIGNING THE RECEIVER AND THAT THE PROCEDURE BE CAREFULLY FOLLOWED. OTHERWISE THE RECEIVER WILL BE INSENSITIVE AND THE DIAL CALIBRATION WILL BE INCORRECT. THE TRIMMERS WILL BE REFERRED TO BY THEIR FUNCTION AS INDICATED ON THE PARTS DIAGRAM.

ALIGNMENT PROCEDURE

GENERAL DATA. The alignment of this receiver requires the use of a test oscillator that will cover the frequencies of 455, 600, 1400 and 1620 KC and an output meter to be connected across the primary or secondary of the output transformer. If possible, all alignments should be made with the volume control on maximum and the test oscillator output as low as possible to prevent the AVC from operating and giving false readings.

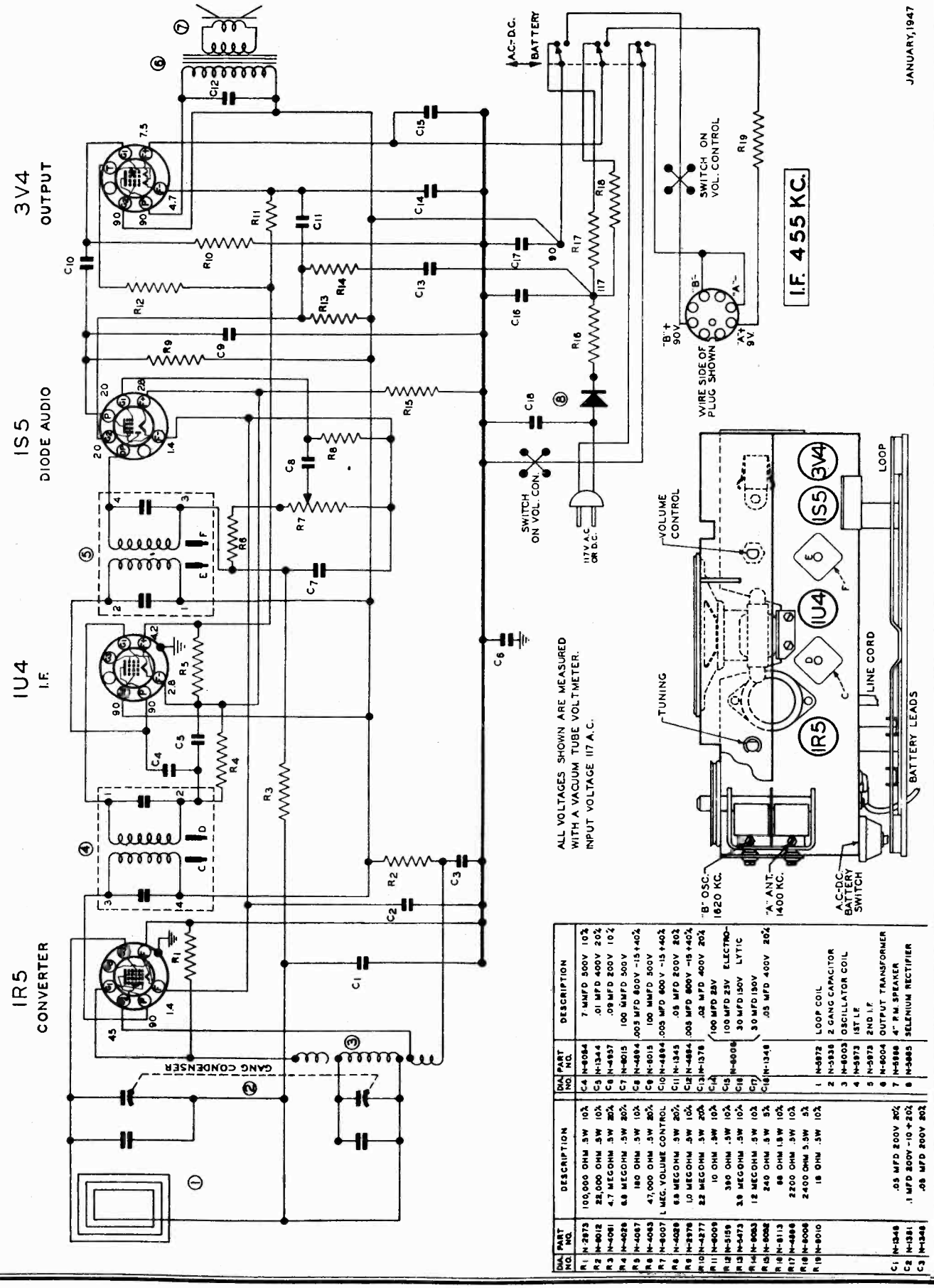
CORRECT ALIGNMENT PROCEDURE. The intermediate frequency (I.F.) stages should be aligned properly as the first step. After the I.F. transformers have been properly adjusted and peaked, the broadcast band should be adjusted.

I.F. ALIGNMENT. Remove the chassis and loop antenna from the cabinet and set them up on the bench so that they occupy exactly the same respective positions on the bench as they did in the cobinet. Care should be taken to have no iron or other metal near the loop. Do not make this set-up on a metal bench. With the gang condenser set at minimum, adjust the test oscillator to 455 KC and connect the output to the grid of the converter tube (12SA7) through a .05 or .1 mfd. condenser. The ground on the test oscillator should be connected to the ground buss, indicated on the circuit diagram. Align all three I.F. trimmers to peak or maximum reading on the output meter.

BROADCAST BAND ALIGNMENT. Connect the test oscillator to the antenna of the set through a 100 mmfd. (.0001) condenser. With the gang condenser set at minimum capacity, set the test oscillator at 1620 KC, and adjust the oscillator (or 1620 KC trimmer) on gang condenser. Next — set the test oscillator at 1400 KC, and tune in the signal on the gang condenser. Adjust the antenna trimmer (or 1400 KC trimmer) for maximum signal. Next set the oscillator at 600 KC, and tune in signal on condenser to check alignment of coils.

MODEL WDU

SONORA RADIO & TELEV. CORP.



DIA. NO.	PART NO.	DESCRIPTION	DIA. NO.	PART NO.	DESCRIPTION
R1	N-2873	100,000 OHM .5W 10%	C4	N-6084	7 MMFD 500V 10%
R2	N-8012	22,000 OHM .5W 10%	C5	N-1344	.01 MFD 400V 20%
R3	N-4081	4.7 MEGOHM .5W 20%	C6	N-4937	.09 MFD 200V 10%
R4	N-4028	6.8 MEGOHM .5W 20%	C7	N-8015	100 MMFD 500V
R5	N-4087	180 OHM .5W 10%	C8	N-4894	.005 MFD 600V -15+40%
R6	N-4083	47,000 OHM .5W 20%	C9	N-8015	100 MMFD 500V
R7	N-8007	1 MEG. VOLUME CONTROL	C10	N-4894	.005 MFD 600 V -15+40%
R8	N-4028	6.8 MEGOHM .5W 20%	C11	N-1345	.05 MFD 200V 20%
R9	N-3978	10 MEGOHM .5W 10%	C12	N-4894	.005 MFD 600V -15+40%
R10	N-4277	22 MEGOHM .5W 20%	C13	N-1378	.02 MFD 400V 20%
R11	N-8009	10 OHM .5W 10%	C14		100 MFD 25V
R12	N-3159	390 OHM .5W 10%	C15	N-8008	100 MFD 25V ELECTRO-
R13	N-3473	3.9 MEGOHM .5W 10%	C16		30 MFD 150V LYTIC
R14	N-8063	12 MEGOHM .5W 10%	C17		30 MFD 150V
R15	N-8082	240 OHM .5W 5%	C18	N-1348	.03 MFD 400V 20%
R16	N-8113	68 OHM 1.8W 10%	1	N-8872	LOOP COIL
R17	N-4088	2200 OHM .5W 10%	2	N-3935	2 GANG CAPACITOR
R18	N-8008	2400 OHM 3.5W 5%	3	N-8003	OSCILLATOR COIL
R19	N-8010	18 OHM .5W 10%	4	N-8873	1ST I.F.
			5	N-8873	2ND I.F.
			6	N-8004	OUTPUT TRANSFORMER
C1	N-1348	.03 MFD 200V 20%	7	N-8888	4" P.M. SPEAKER
C2	N-1381	.1 MFD 200V -10+20%	8	N-8885	SELENIUM RECTIFIER
C3	N-1348	.03 MFD 200V 20%			

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NOTE: IT IS ABSOLUTELY NECESSARY THAT AN ACCURATELY CALIBRATED TEST OSCILLATOR WITH SOME TYPE OF OUTPUT MEASURING DEVICE BE USED WHEN ALIGNING THE RECEIVER AND THAT THE PROCEDURE BE CAREFULLY FOLLOWED. OTHERWISE THE RECEIVER WILL BE INSENSITIVE AND THE DIAL CALIBRATION WILL BE INCORRECT: THE TRIMMERS WILL BE REFERRED TO BY THEIR FUNCTION AS INDICATED ON THE PARTS DIAGRAM.

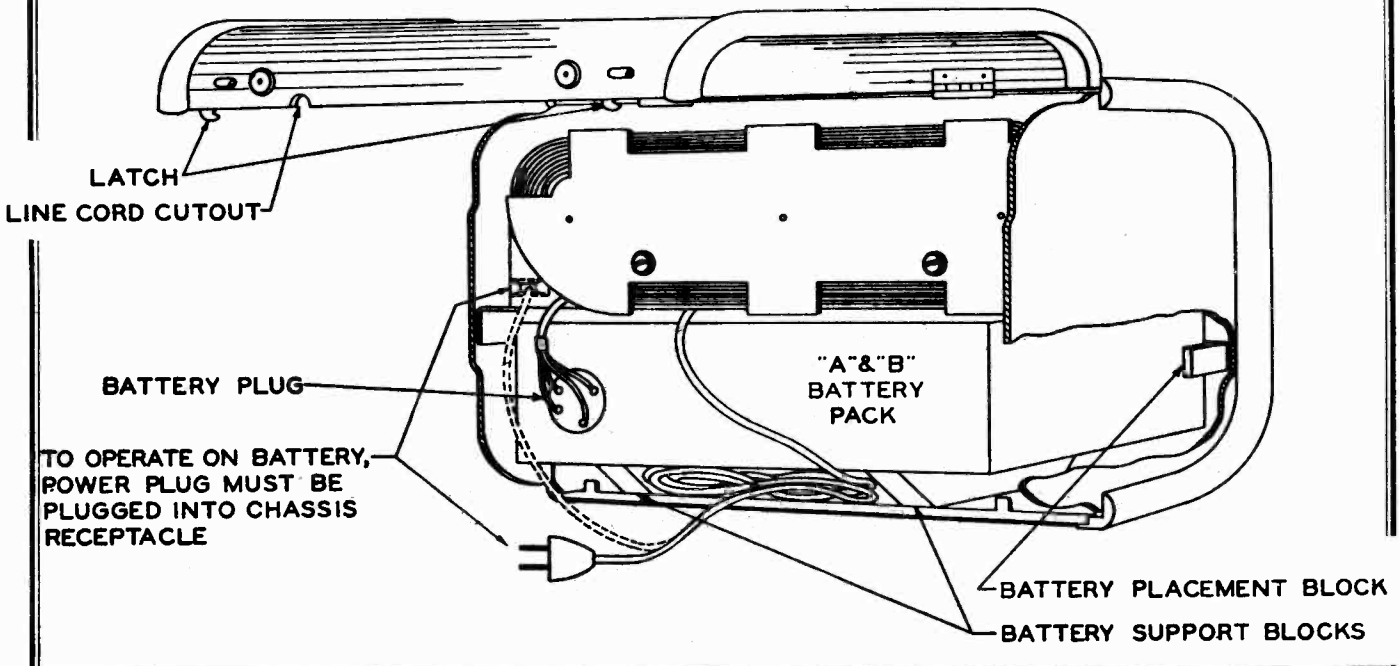
ALIGNMENT PROCEDURE

GENERAL DATA. The alignment of this receiver requires the use of a test oscillator that will cover the frequencies of 455, 600, 1400 and 1620 KC and an output meter to be connected across the primary or secondary of the output transformer. If possible, all alignments should be made with the volume control on maximum and the test oscillator output as low as possible to prevent the AVC from operating and giving false readings.

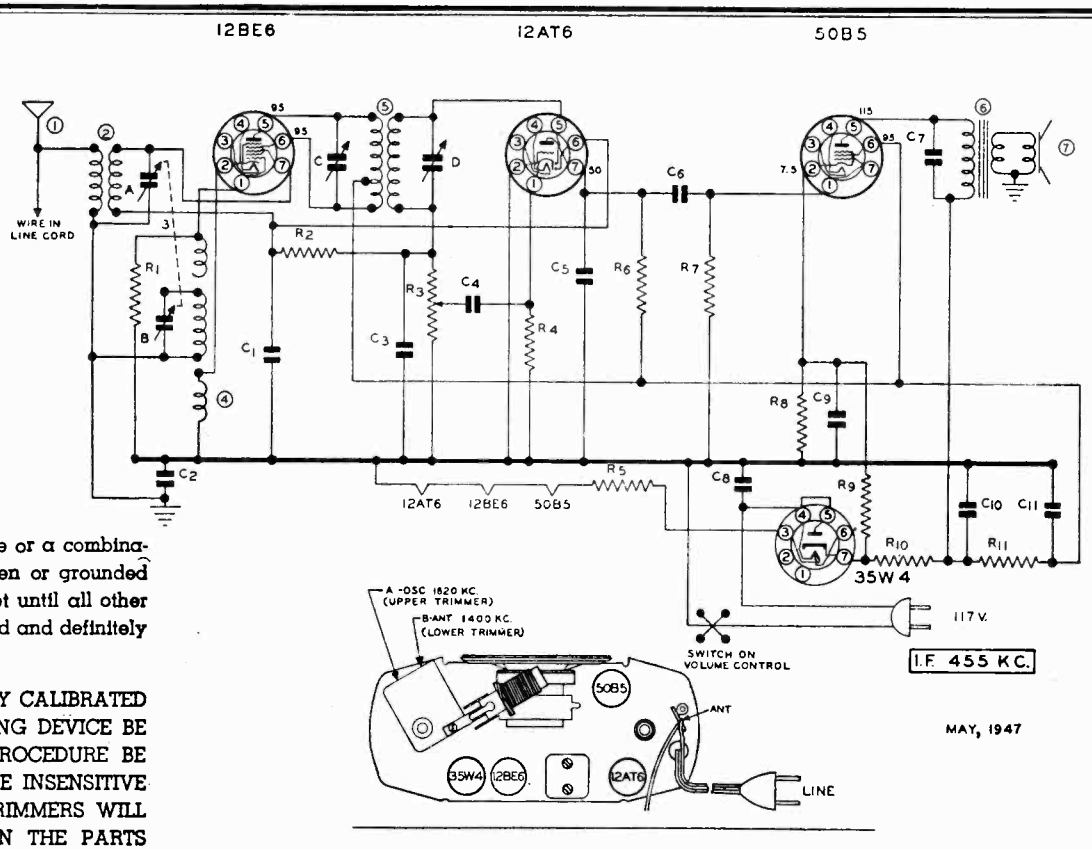
CORRECT ALIGNMENT PROCEDURE. The intermediate frequency (I.F.) stages should be aligned properly as the first step. After the I.F., transformers have been properly adjusted and peaked, the oscillator and loop should be adjusted.

I.F. ALIGNMENT. Remove the chassis and loop antenna from the cabinet and set them up on the bench so that they occupy exactly the same respective positions on the bench as they did in the cabinet. Care should be taken to have no iron or other metal near the loop. Do not make this set-up on a metal bench. With the gang condenser set at minimum, adjust the test oscillator to 455 KC and connect the output to the grid of the first detector tube (1R5) through a .05 to .1 mfd condenser. The ground on the test oscillator should be connected to the ground buss, indicated on the circuit diagram. Align all four I.F. trimmers to peak or maximum reading on the output meter. Each I.F. has an adjustment at the top and bottom of the can.

LOOP ALIGNMENT. Connect the test oscillator to a dummy loop which can be made by coiling 2 turns of hookup wire about 6" in diameter. Place this dummy loop about a foot from the loop on the receiver and in the same plane as the receiver loop. With the gang condenser set at minimum capacity, set the test oscillator at 1620 KC, and adjust the oscillator (or 1620 KC trimmer) on gang condenser. Next — set the test oscillator at 1400 KC, and tune in the signal on the gang condenser. Adjust the antenna trimmer (or 1400 KC trimmer) for maximum signal. Next set the test oscillator at 600 KC, and tune in signal on condenser to check alignment of coils.



DIA NO	PART NO	DESCRIPTION
R1	N-8012	22,000 OHM .5W 10%
R2	N-4061	4.7 MEGOHM .5W 20%
R3	N-8275	2.0 MEGOHM VOL. CONT.
R4	N-4028	68 MEGOHM .5W 20%
R5	N-8258	47 OHM 1W 10% INSUL.
	N-8259	47 OHM 1W 10% WIREW'D
R6	N-4423	330,000 OHM .5W 20%
R7	N-4027	470,000 OHM .5W 20%
R8	N-4087	180 OHM .5W 10%
	N-8297	180 OHM .5W 10% WIREW'D
R9	N-4084	33,000 OHM .5W 20%
R10	N-4022	33 OHM .5W 20%
R11	N-3052	2200 OHM .5W 20%
C1	N-1345	.05 MFD 200V 20%
C2	N-1345	.05 MFD 200V 20%
C3	N-8015	100 MMFD 500V
C4	N-2063	.003 MFD 600V -15+40%
C5	N-8015	100 MMFD 500V
C6	N-1344	.01 MFD 400V 20%
C7	N-1344	.01 MFD 400V 20%
C8	N-1346	.05 MFD 400V 20%
C9	N-8281	20 MFD 25V ELECTRO-LYTIC
C10		40 MFD 150V
C11		20 MFD 150V
1	N-3744	ANTENNA HANK
2	N-8292	ANTENNA COIL
3	N-8278	2 GANG CAPACITOR
4	N-8412	OSCILLATOR COIL
5	N-8295	I.F. TRANSFORMER
6	N-3899	OUTPUT TRANSFORMER
8	N-8414	OUTPUT TRANSFORMER
7	N-8279	3½ P.M. SPEAKER



MAY, 1947

Lack of sensitivity and poor tone quality may be due to any one or a combination of causes such as weak or defective tubes or speaker, open or grounded bias resistor, bypass condenser, etc. Never attempt to realign set until all other possible sources of trouble have been first thoroughly investigated and definitely proved not to be the cause.

NOTE: IT IS ABSOLUTELY NECESSARY THAT AN ACCURATELY CALIBRATED TEST OSCILLATOR WITH SOME TYPE OF OUTPUT MEASURING DEVICE BE USED WHEN ALIGNING THE RECEIVER AND THAT THE PROCEDURE BE CAREFULLY FOLLOWED, OTHERWISE THE RECEIVER WILL BE INSENSITIVE AND THE DIAL CALIBRATION WILL BE INCORRECT. THE TRIMMERS WILL BE REFERRED TO BY THEIR FUNCTION AS INDICATED ON THE PARTS DIAGRAM.

ALIGNMENT PROCEDURE

GENERAL DATA. The alignment of this receiver requires the use of a test oscillator that will cover the frequencies of 455, 600, 1400 and 1620 KC and an output meter to be connected across the primary or secondary of the output transformer. If possible, all alignments should be made with the volume control on maximum and the test oscillator output as low as possible to prevent the AVC from operating and giving false readings.

CORRECT ALIGNMENT PROCEDURE. The intermediate frequency (I.F.) stage should be aligned properly as the first step. After the I.F. transformer has been properly adjusted and peaked, the broadcast band should be adjusted.

I.F. ALIGNMENT. Remove the Chassis from the cabinet. With the Knob Indicator set at 1620 KC, adjust the test oscillator to 455 KC and connect the output to the grid of the first detector tube (12BE6) through an .05 or .1 MFD condenser. The ground on the test oscillator should be connected to the ground buss indicated on the circuit diagram. Adjust both I.F. trimmers to peak or maximum reading on the output meter.

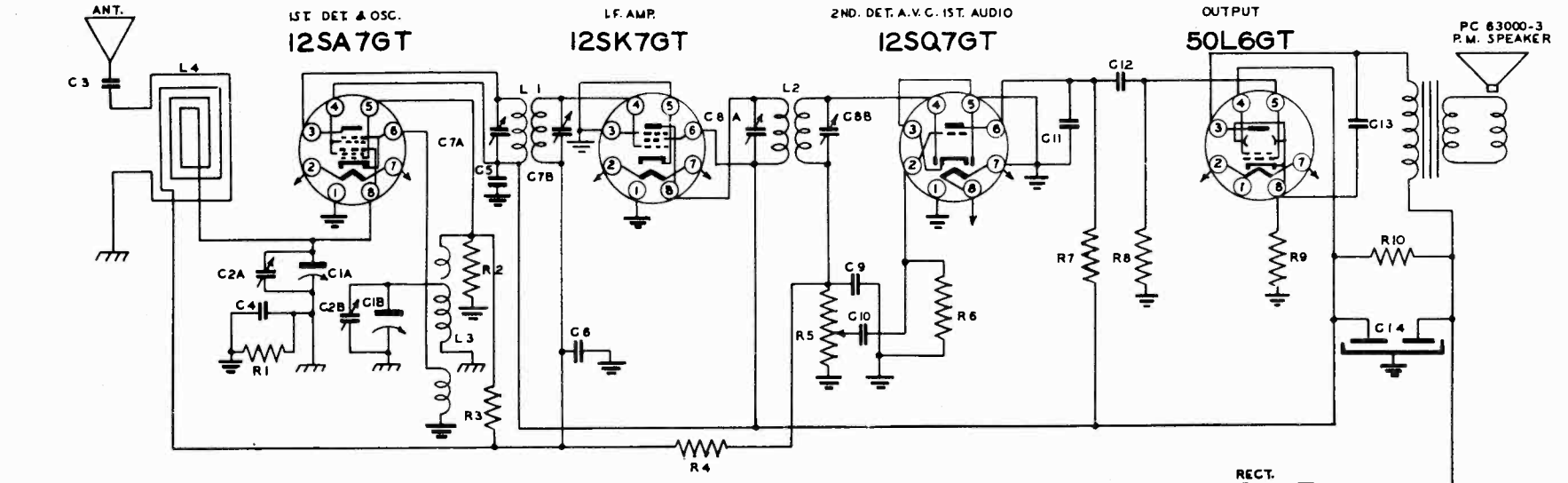
TUNING RANGE

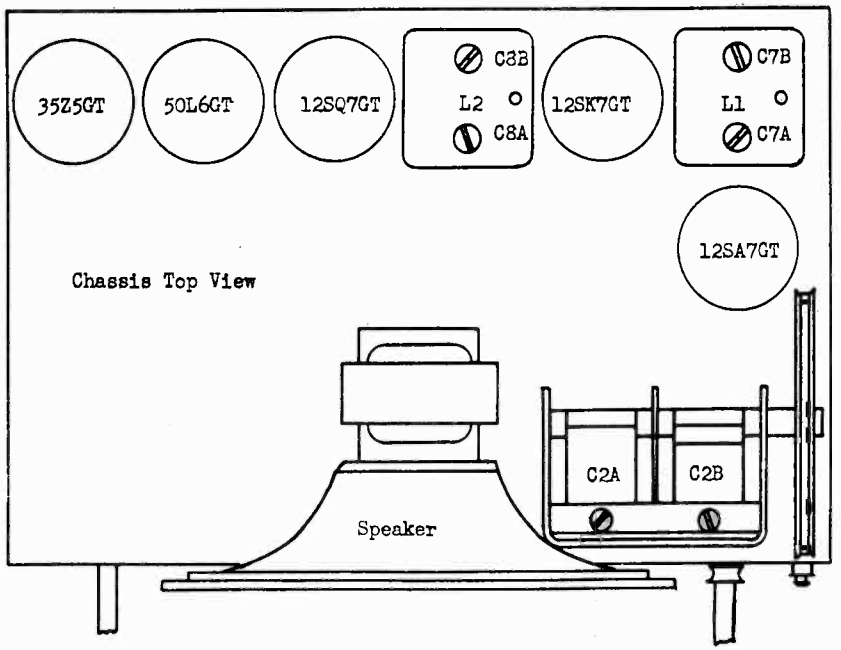
This receiver is designed to operate over the standard broadcast band which extends from 535 to 1620 Kilocycles (KC) (185 to 560 Meters).

BROADCAST BAND ALIGNMENT. Connect the test oscillator to the antenna lead through a 50 mmfd. (.00005) condenser. With the gang condenser set at minimum capacity, set the test oscillator at 1620 KC, and adjust the oscillator (or 1620 KC trimmer) on gang condenser. Next set the test oscillator at 1400 KC, and tune in the signal on the gang condenser. Adjust the antenna trimmer (or 1400 KC trimmer) for maximum signal. Next set the test oscillator at 600 KC, and tune in signal on condenser to check alignment of coils.

INTERMEDIATE FREQUENCY 456 K.C.

BOTTOM VIEWS OF ALL SOCKET CONNECTIONS





C1A & B	VARIABLE CONDENSER		PB 40406
C2A & B	TRIMMERS ON VARIABLE		
C3	.001 MFD.	400 V.	PC 40GL-102
C4	.15 MFD.	400 V.	PC 40GL-154
C5	.05 MFD.	200 V.	PC 40GK-503
C6	.05 MFD.	200 V.	PC 40GK-503
C7A & B	NO. 1 I.F. TRIMMERS		AB 43500-44
C8A & B	NO. 2 I.F. TRIMMERS		AB 43500-55
C9	270 MMF.	MICA	MC 60G-271
C10	.01 MFD.	400 V.	P.C 40GL-103
C11	510 MMF.	MICA	MC 60G-511
C12	.002 MFD.	400 V.	PC 40GL-202
C13	.01 MFD.	400 V.	PC 40GL-103
C14	ELECT. CONDENSER		PA 4301-1
	RED 30 MFD.	YELLOW 40 MFD.	
C15	.05 MFD.	400 V.	PC 40GL-503

R1	150,000 Ω	.5W	BR12N-154
R2	22,000 Ω	.5W	BR12S-223
R3	15 MEGOHM	.5W	BR12S-156
R4	2.2 "	.5W.	BR12N-225
R5	.5 MEG. VOL. CONT. & SW.		PA 4400-3
R6	5.6 MEGOHM	.5W	BR12S-565
R7	220,000 Ω	.5W	BR12N-224
R8	470,000 Ω	.5W	BR12N-474
R9	150 Ω	.5W	BR12S-151
R10	1200 Ω	1W.	CR12S-122
R11	82 Ω	.5W	BR12S-820

L1	NO. 1 I.F. COIL ASSEMBLY	AA 6800-12
L2	NO. 2 I.F. COIL "	AA 6800-2
L3	B.C. OSCILLATOR COIL ASSEMBLY	AA 6797-1
L4	LOOP ASSEMBLY	AB 43025-1

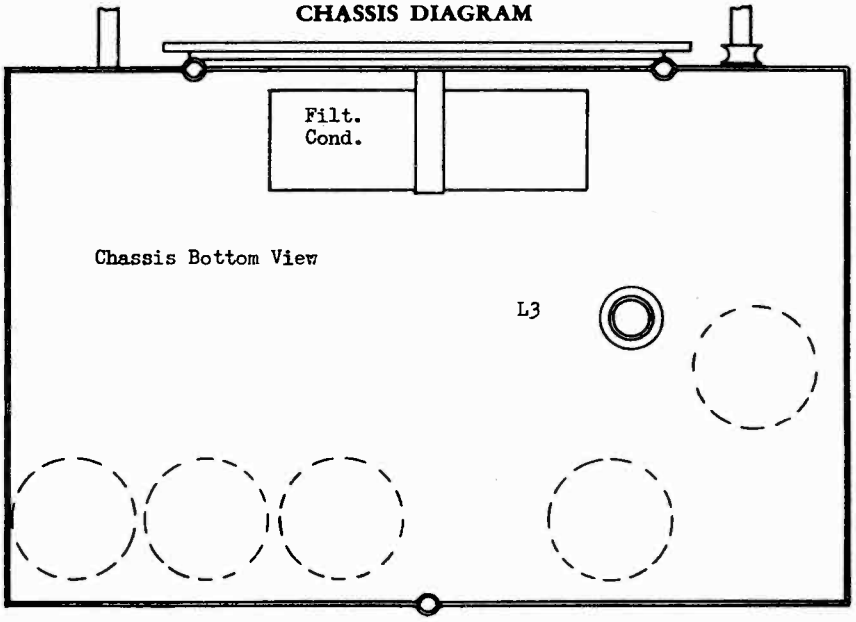
CHASSIS GROUND

COMMON GROUND

MODELS 5-16, 5-AW16

THE SPARKS-WITHINGTON CO.

CHASSIS DIAGRAM



ALIGNMENT DATA

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	TUNING COND. SETTING	TRIMMER	REMARKS
1	Set dial pointer with left-hand stop line and with condenser closed.						
2	I.F.	*	* *	456 KC	Open	C8A & B	Peak accurately
						C7A & B	Peak accurately
3	R.C.	* * *	Dummy Loop	1500 KC	1500 KC	C2B Osc.Trim.	Peak accurately
						C2A R.F.Trim.	Peak accurately
4	(Repeat operation 2 and 3).						
5	(Check calibration at 600 KC, 1000 KC, and 1500 KC).						
6	(Check operations 1 to 5 inclusive).						

* Pin No. 6 on 12SA7GT
** Standard Dummy

VOLTAGE CHART

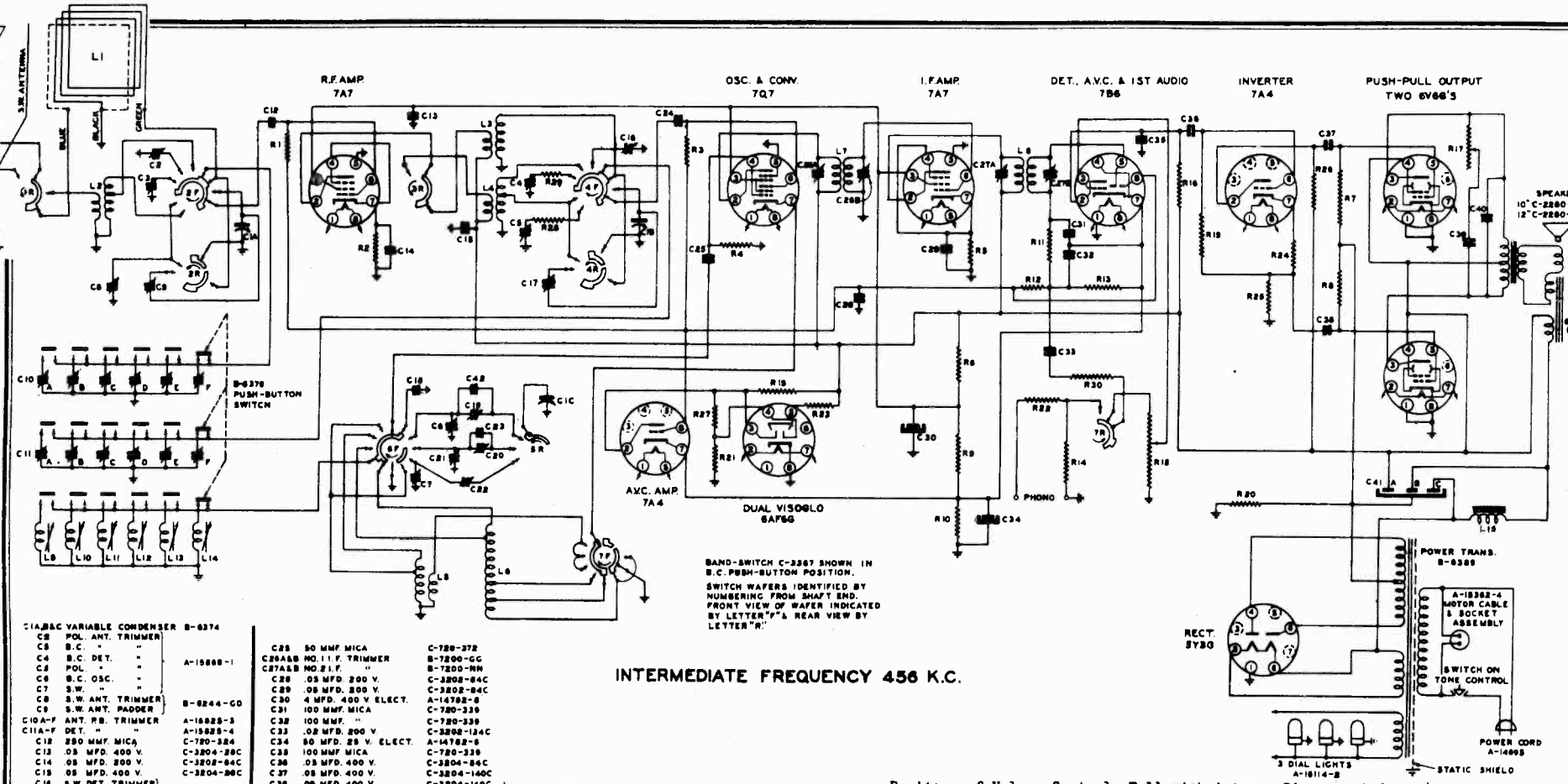
Line Voltage: 117 Volts A.C. Position of Volume Control: Full with set tunned to quiet channel.

TUBE	FUNCTION	Voltage of Socket Prong to Gnd.(See Prong Nos. on Schematic							
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8
12SA7GT	1st Det. & Osc.	12*	80	80	* *	0	* *	* *	0
12SK7GT	I.F. Amp.	24*	80	80	0	0	* *	0	36*
12SQ7GT	2nd. Det. A.V.C. & 1st Audio	24*	55	-.35	0	0	-.55	0	12*
50L6GT	Power Output	85*	110	85	0	0	* *	5.4	36*
35Z5GT	Rectifier	117*	110*	0	110*	0	0	115	85*

NOTES: Voltage readings are for schematic diagram on back of sheet. Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 20,000 ohms per volt voltmeter. All AC voltages made with rectifier type voltmeter. Unless designated otherwise, voltages in table are + DC voltages.

* AC volts.
** Cannot be measured with 20,000 ohms per volt voltmeter.

THE SPARKS-WITHINGTON CO. MODEL 10 series, 10-21



C1A,B&C VARIABLE CONDENSER B-6374
C2 POL. ANT. TRIMMER
C3 B.C. " "
C4 B.C. DET. " } A-15868-1
C5 POL. " "
C6 B.C. OSC. " "
C7 S.W. " "
C8 S.W. ANT. TRIMMER } B-6244-GD
C9 S.W. ANT. PADDER
C10A-F ANT. R.B. TRIMMER A-16825-3
C11A-F DET. " " A-15825-4
C12 250 MMF. MICA C-720-324
C13 .05 MFD. 400 V. C-3204-28C
C14 .05 MFD. 200 V. C-3202-84C
C15 .05 MFD. 400 V. C-3204-28C
C16 S.W. DET. TRIMMER } B-7200-EG
C17 S.W. DET. PADDER
C18 380 MMF. MICA B-8258-4
C19 B.C. OSC. PADDER } B-7200-YY
C20 PO OSC. PADDER
C21 " " TRIMMER } B-7200-DG
C22 S.W. OSC. PADDER
C23 2200 MMF. MICA C-720-338
C24 250 MMF. MICA C-720-324

C25 50 MMF. MICA C-720-372
C26A&B NO. 1 I.F. TRIMMER B-7200-GG
C27A&B NO. 2 I.F. " B-7200-HH
C28 .05 MFD. 200 V. C-3202-84C
C29 .05 MFD. 200 V. C-3202-84C
C30 4 MFD. 400 V. ELECT. A-14782-8
C31 100 MMF. MICA C-720-336
C32 100 MMF. " C-720-336
C33 .02 MFD. 200 V. C-3202-124C
C34 50 MFD. 25 V. ELECT. A-14782-6
C35 100 MMF. MICA C-720-336
C36 .05 MFD. 400 V. C-3204-84C
C37 .05 MFD. 400 V. C-3204-140C
C38 .05 MFD. 400 V. C-3204-140C
C39 .02 MFD. 600 V. C-3206-134C
C40 .002 MFD. 600 V. C-3206-116C
C41A 15 MFD. 450 V. } ELECT. A-14884-7
C41B 10 MFD. 450 V. } ELECT. A-14884-7
C41C 15 MFD. 450 V. } ELECT. A-14884-7
C42 250 MMF. MICA C-720-324

R1 1 MEGOHM .25 W. C-2795-96B
R2 1000 Ω. .25 W. C-2795-62B
R3 1 MEGOHM .25 W. C-2795-96B
R4 20,000 Ω. .25 W. C-2795-190B
R5 620 Ω. .25 W. C-2795-184B
R6 18,000 Ω. 3 W. C-2795-77A
R7 47,000 Ω. .25 W. C-2795-82B
R8 47,000 Ω. .25 W. C-2795-82B
R9 22,000 Ω. 1 W. C-2797-101B
R10 220 Ω. .25 W. C-2795-142B
R11 18,000 Ω. .25 W. C-2795-77B
R12 3.3 MEGOHMS .25 W. C-2795-104B
R13 100,000 Ω. .25 W. C-2795-90B
R14 270,000 Ω. .25 W. C-2795-91B
R15 2 MEG. VOL. CONT. A-15140-2

R16 270,000 Ω. .25 W. C-2795-91B
R17 .25 MEG. TONE CONT. & SW. A-15129-12
R18 100,000 Ω. .25 W. C-2795-90B
R19 470,000 Ω. .25 W. C-2795-94B
R20 150 Ω. 3 W. C-2795-141A
R21 1 MEGOHM .25 W. C-2795-96B
R22 270,000 Ω. .25 W. C-2795-91B
R23 56,000 Ω. .25 W. C-2795-82B
R24 2700 Ω. .25 W. C-2795-169B
R25 22,000 Ω. .25 W. C-2795-191B
R26 22,000 Ω. .25 W. C-2795-191B
R27 1. MEGOHM .25 W. C-2795-96B
R28 51 Ω. .25 W. C-2795-128B
R29 150 Ω. .25 W. C-2795-139B
R30 330,000 Ω. .25 W. C-2795-92B

L1 LOOP ANTENNA B-1586-8
L2 POL. & S.W. ANT. COIL A-20201
L3 B.C. DET. COIL A-20353
L4 POL. & S.W. DET. COIL A-20302
L5 POL. & S.W. OSC. COIL A-20300
L6 B.C. OSC. COIL A-20382
L7 NO. 1 I.F. COIL A-12064-45
L8 NO. 2 I.F. COIL A-12064-46
L9-L14 P.B.B.C. OSC. COIL B-8387
L15 FILTER CHOKE A-15386

INTERMEDIATE FREQUENCY 456 K.C.

Line Voltage: 117 Volts A.C.

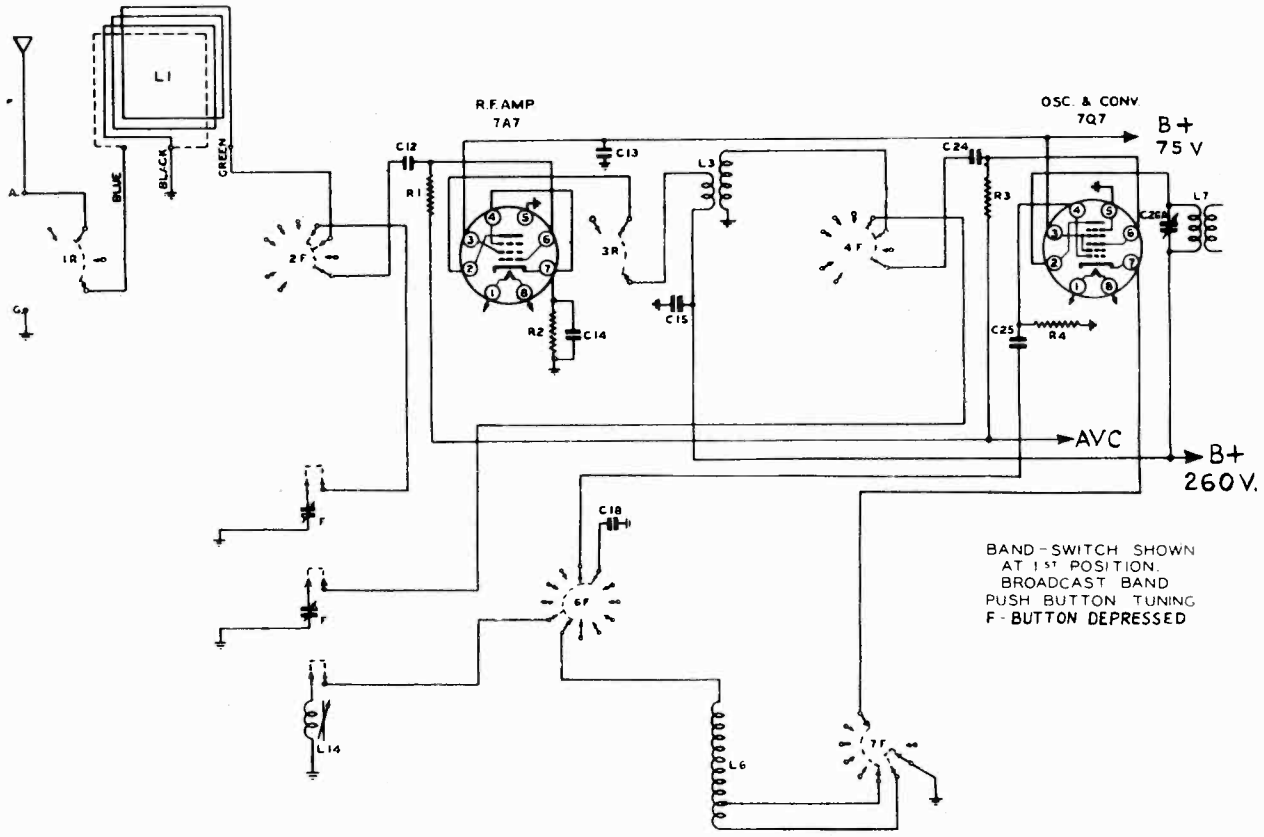
Position of Volume Control: Full with Antenna Disconnected
Position of Band Switch: Broadcast

TUBE	FUNCTION	Voltage of Socket Prongs to Gnd. See Prong Nos. on Schematic Dia.								
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	No. 9
7A7	R-F Amplifier	0	260	75	3.8	0	0	3.8	6.2*	-
7Q7	Osc - Converter	0	260	75	-2.3	0	0	0	6.2*	-
7A7	I.F. Amplifier	0	260	75	3	0	0	3	6.2*	-
7B6	2nd Det - AVC - 1st Audio	0	140	0	1.1	0	.5	.6	6.2*	-
7A4	Inverter	0	223	50	0	0	17	60	6.2*	-
7A4	Viso-Glo Amplifier	0	40	160	0	275	0	1.2	6.2*	-
6V6G	Power Amplifier	0	0	260	265	-17	-17.5	6.3*	0	-
6V6G	Power Amplifier	0	0	260	265	-17	265	6.3*	0	-
5Y3G	Rectifier	0	390	0	355*	0	355*	0	390	-
6AF6G	Viso-Glo	0	0	40	17	260	0	6.2*	0	-

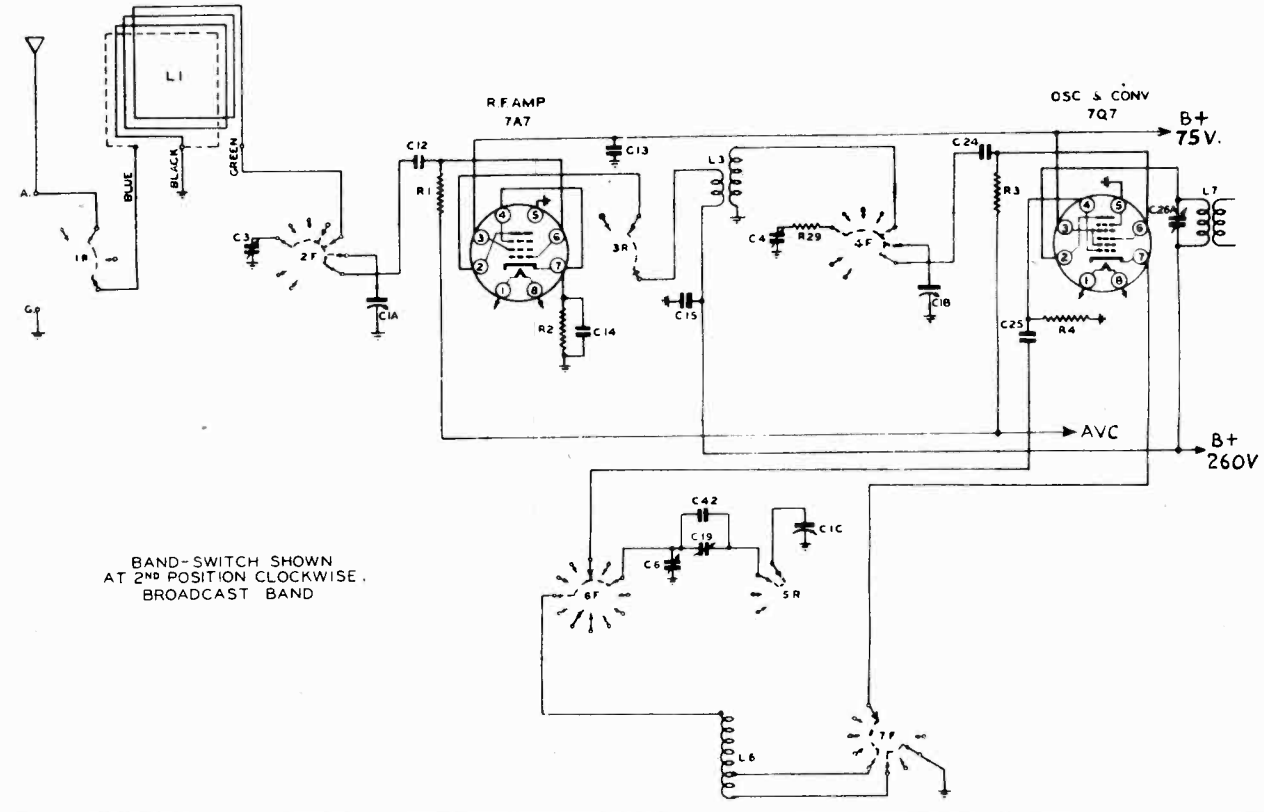
Notes: Voltage readings are for schematic diagram. Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 20,000 ohms per volt voltmeter. All AC voltages made with rectifier type voltmeter. Unless designated otherwise, voltages in table are + DC voltages.
*AC volts.

MODEL 10 series,
10-21

THE SPARKS-WITHINGTON CO.



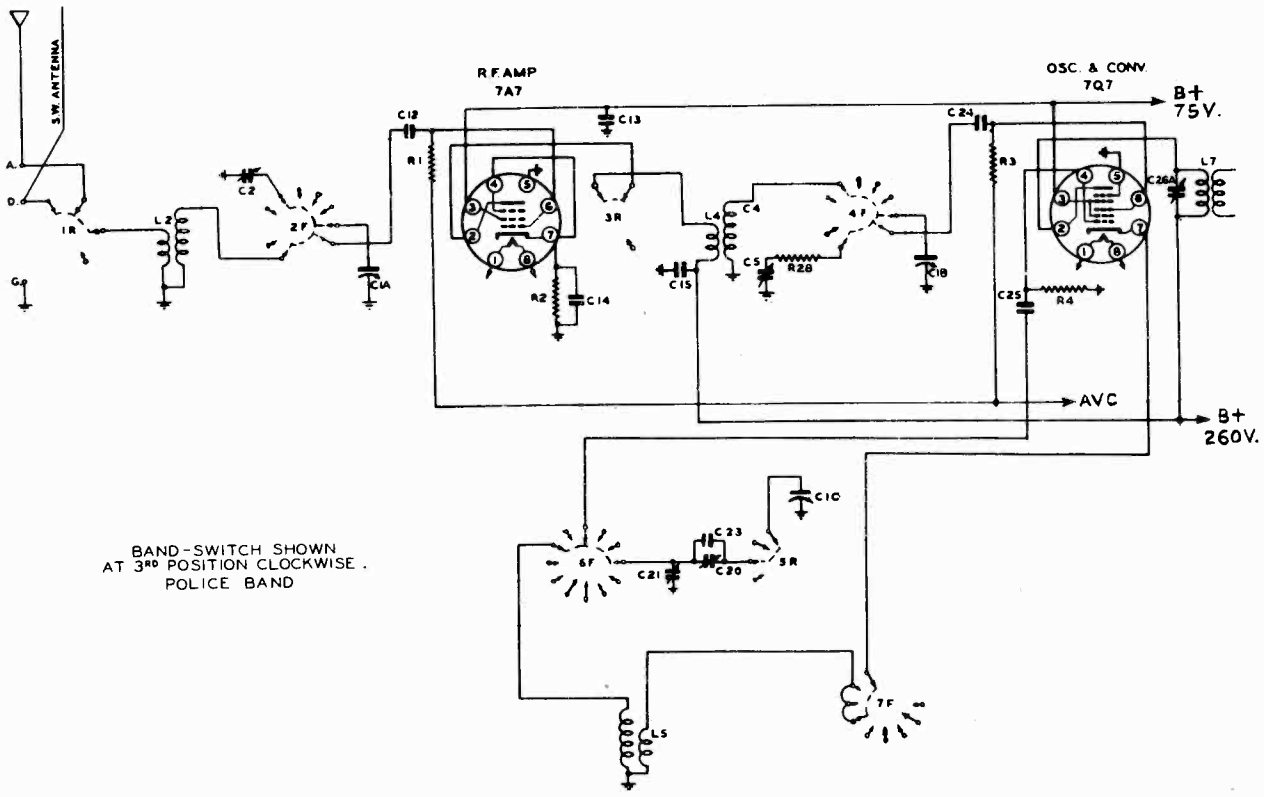
BAND-SWITCH SHOWN
AT 1ST POSITION.
BROADCAST BAND
PUSH BUTTON TUNING
F-BUTTON DEPRESSED



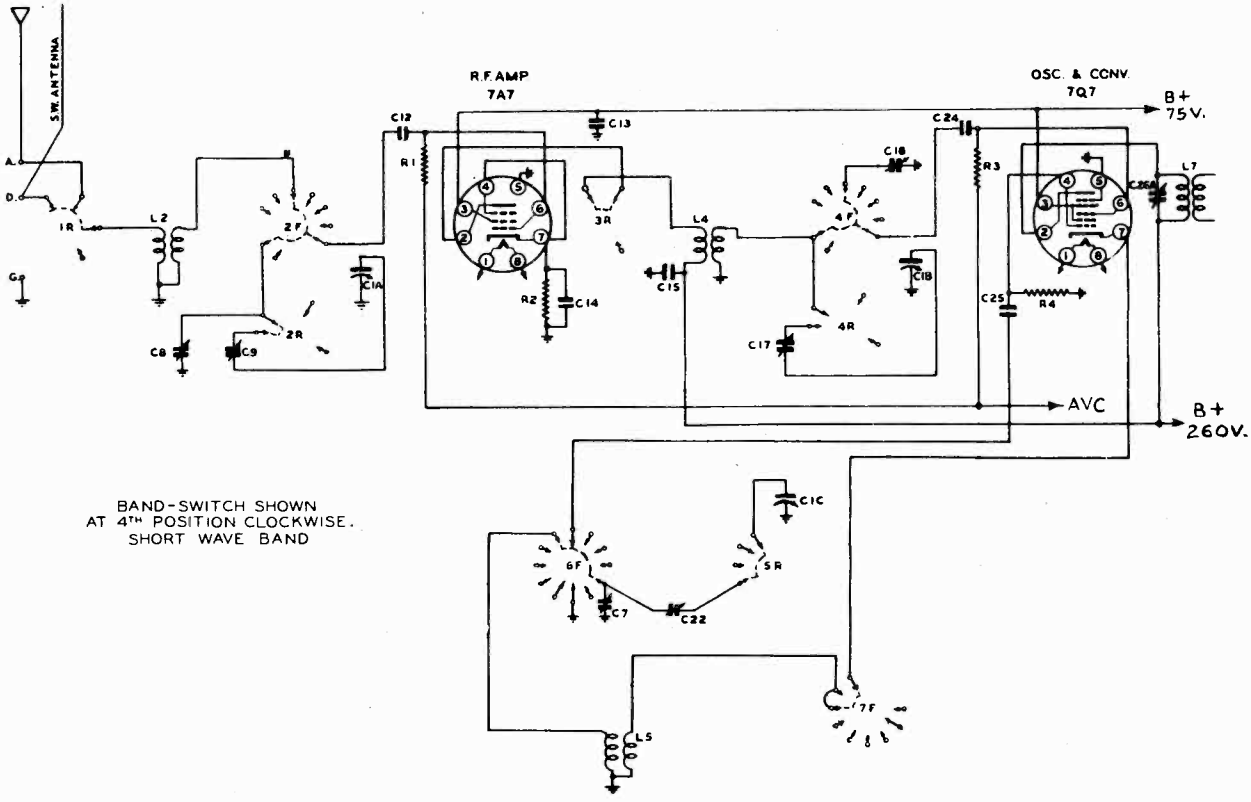
BAND-SWITCH SHOWN
AT 2ND POSITION CLOCKWISE.
BROADCAST BAND

THE SPARKS-WITHINGTON CO.

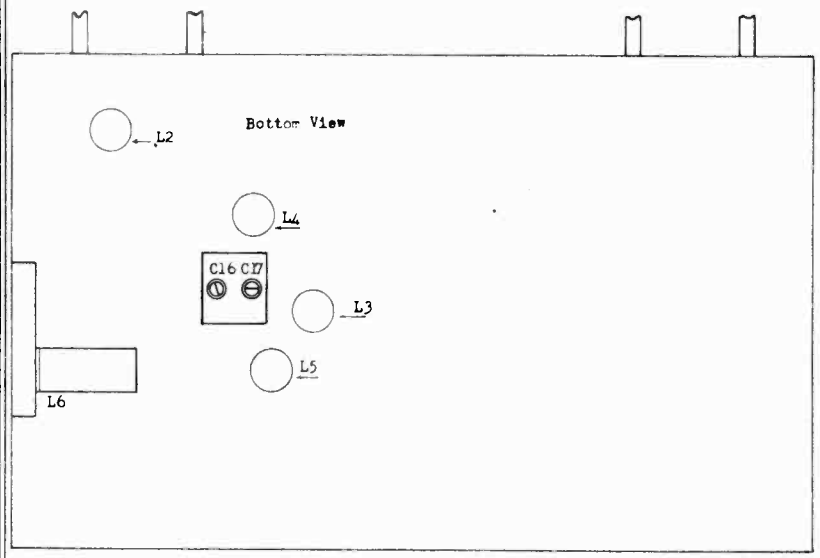
MODEL 10 series, 10-21



BAND-SWITCH SHOWN AT 3RD POSITION CLOCKWISE. POLICE BAND



BAND-SWITCH SHOWN AT 4TH POSITION CLOCKWISE. SHORT WAVE BAND

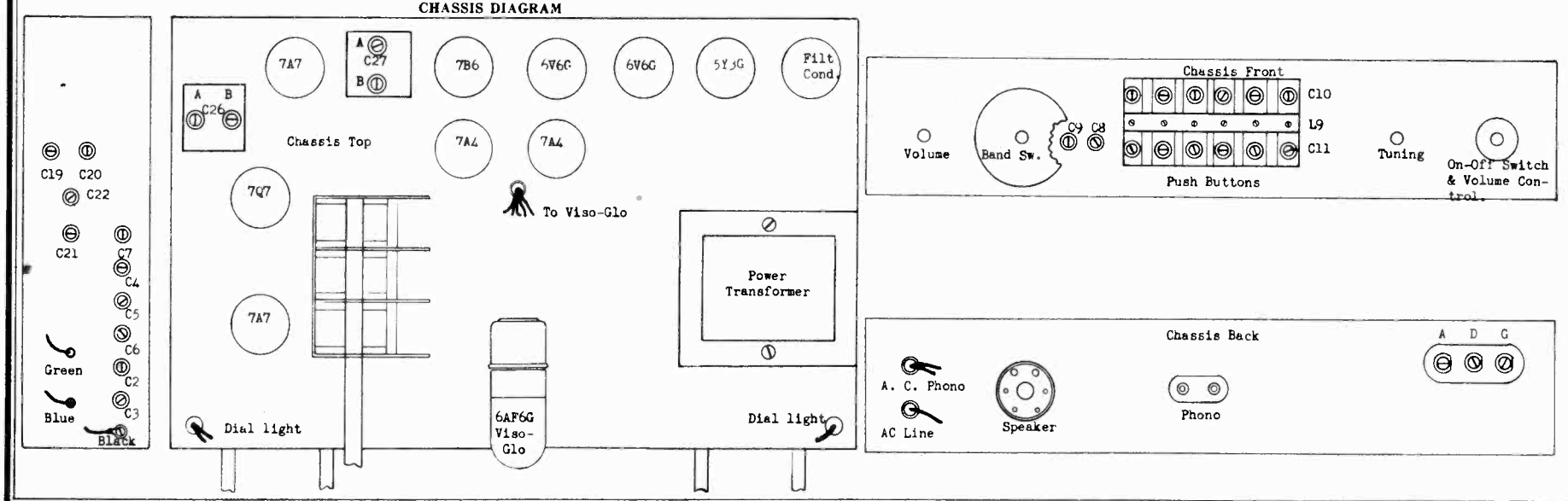


ALIGNMENT CHART

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND SETTING	TRIMMERS	REMARKS
1	Set dial pointer even with left hand stop line with condenser gang fully meshed.							
2	I.F.	*	.1 MFD	456 KC	BC	Open	C27 A&B	Peak accurately
3							C26 A&B	Peak accurately
4	Broadcast Band	ANT	See Note	1500 KC	BC	1500 KC	C6 Osc.	Peak accurately
							C4 R.F.	Peak accurately
							C3 Ant.	Peak accurately
5				600 KC	BC	600 KC	C19 Pad.	Rock **
6	Repeat operation 4.							
7	Check calibration and sensitivity at 600 KC, 1000 KC and 1500 KC.							
8	Police Band	ANT	See Note	7 MC	Police	7 MC	C21 Osc.	Peak accurately
							C5 R.F.	Peak accurately
							C2 Ant.	Peak accurately
9				2.5 MC	Police	2.5 MC	C20 Pad.	Rock **
10	Check calibration and sensitivity at 7 MC, 4 MC and 2.5 MC.							
11	Short Wave Band	ANT	See Note	11.7	SW	11.7	C7 Osc. Tr.	Peak accurately
							C16 RF Tr.	Rock **
							C8 Ant. Tr.	Rock **
12				9.3	SW	9.3	C22 Osc. "	Peak accurately
							C17 RF Pad	Rock **
							C9 Ant. "	Rock **
13	Repeat operation 12 as many times as necessary until additional gain cannot be obtained.							
14	Check calibration and sensitivity at 11.7 and 9.3.							
15	Check operations 1 to 14.							

NOTES: Use dummy antenna as described on page 1.
*Connect generator to pin #6 on 7Q7 Oscillator Converter Tube.
**Rock dial while adjusting for maximum output.

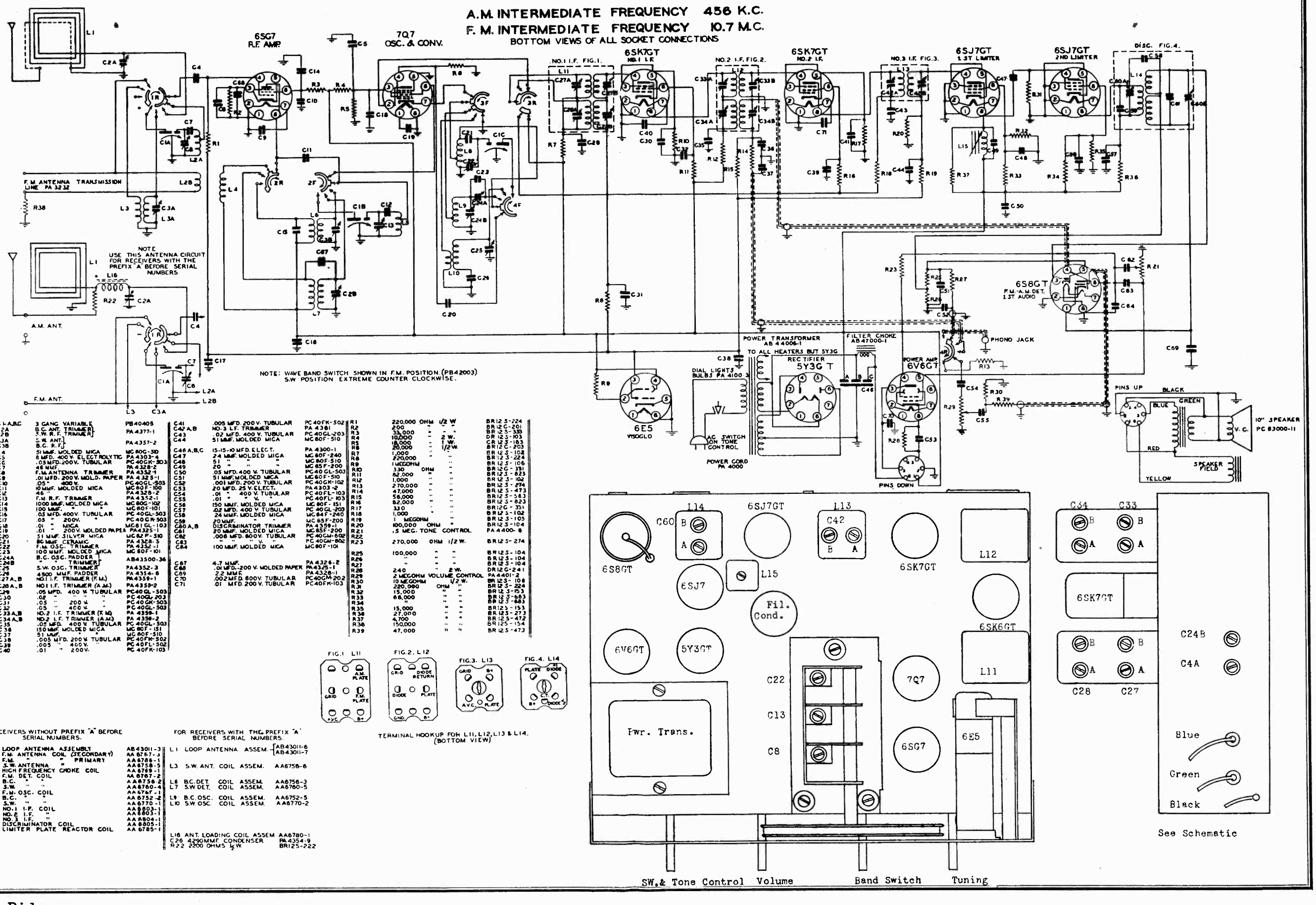
CHASSIS DIAGRAM



THE SPARKS-WITHINGTON CO.

A.M. INTERMEDIATE FREQUENCY 456 K.C.
F. M. INTERMEDIATE FREQUENCY 10.7 M.C.

BOTTOM VIEWS OF ALL SOCKET CONNECTIONS



C1-A,B,C	3 GANG VARIABLE	PB40405
C2A	B.C. ANT. TRIMMER	PA 4377-1
C2B	S.W. R.F. TRIMMER	
C3A	S.W. ANT.	PA 4357-2
C3B	B.C. R.F.	
C4	51 MMF. MOLDED MICA	MC 60G-510
C5	8 MFD. 400 V. ELECTROLYTIC	PA 4303-4
C6	.05 MFD. 200 V. TUBULAR	PC 40GK-503
C7	46 MMF.	PA 4328-2
C8	F.M. ANTENNA TRIMMER	PA 4352-1
C9	.01 MFD. 200 V. MOLD. PAPER	PA 4325-1
C10	.05 " 400 V.	PC 40GL-503
C11	10 MMF. MOLDED MICA	MC 60F-100
C12	46 "	PA 4328-2
C13	F.M. R.F. TRIMMER	PA 4352-1
C14	1000 MMF. MOLDED MICA	MC 60G-102
C15	100 MMF. " "	MC 60F-101
C16	.05 MFD. 400 V. TUBULAR	PC 40GL-503
C17	.03 " 200 V.	PC 40GK-503
C18	.01 " MICA	MC 61GL-103
C19	.01 " 200 V. MOLDED PAPER	PA 4325-1
C20	51 MMF. SILVER MICA	MC 62F-510
C21	80 MMF. CERAMIC	PA 4328-3
C22	F.M. OSC. TRIMMER	PA 4352-1
C23	100 MMF. MOLDED MICA	MC 60F-101
C24A	B.C. OSC. PADDER	AB43500-36
C24B	" " TRIMMER	
C25	S.W. OSC. TRIMMER	PA 4352-3
C26	4500 MMF. PADDER	PA 4354-8
C27 A,B	NO.1 I.F. TRIMMER (F.M.)	PA 4359-1
C28 A,B	NO.1 I.F. TRIMMER (A.M.)	PA 4358-2
C29	.05 MFD. 400 V. TUBULAR	PC 40GL-503
C30	.02 " " "	PC 40GL-203
C31	.05 " 200 V. "	PC 40GK-503
C32	.05 " 400 V. "	PC 40GL-503
C33 A,B	NO.2 I.F. TRIMMER (F.M.)	PA 4359-1
C34 A,B	NO.2 I.F. TRIMMER (A.M.)	PA 4358-2
C35	.05 MFD. 400 V. TUBULAR	PC 40GL-503
C36	150 MMF. MOLDED MICA	MC 60F-151
C37	51 MMF. " "	MC 60F-510
C38	.005 MFD. 200 V. TUBULAR	PC 40FK-502
C39	.005 " 400 V. "	PC 40FL-502
C40	.01 " 200 V.	PC 40FK-103
C41	.005 MFD. 200 V. TUBULAR	PC 40FK-502
C42 A,B	NO.3 I.F. TRIMMER	PA 4361
C43	.02 MFD. 400 V. TUBULAR	PC 40GL-203
C44	51 MMF. MOLDED MICA	MC 60F-510
C46 A,B,C	15-15-10 MFD. ELECT.	PA 4300-1
C47	24 MMF. MOLDED MICA	MC 60F-240
C48	51 " " "	MC 60F-510
C49	20 " " "	MC 65F-200
C50	.05 MFD. 400 V. TUBULAR	PC 40GL-503
C51	51 MMF. MOLDED MICA	MC 60F-510
C52	.001 MFD. 200 V. TUBULAR	PC 40GK-102
C53	20 MFD. 25 V. ELECT.	PA 4303-2
C54	.01 " 400 V. TUBULAR	PC 40FL-103
C55	.01 " " "	PC 40FL-103
C56	150 MMF. MOLDED MICA	MC 60F-151
C57	.02 MFD. 400 V. TUBULAR	PC 40GL-203
C58	24 MMF. MOLDED MICA	MC 64F-240
C59	20 MMF. " "	MC 65F-200
C60 A,B	DISCRIMINATOR TRIMMER	PA 4359-1
C61	20 MMF. MOLDED MICA	MC 65F-200
C62	.008 MFD. 800 V. TUBULAR	PC 40GM-802
C63	" " " "	PC 40GM-802
C64	100 MMF. MOLDED MICA	MC 60F-101
C67	4.7 MMF.	PA 4326-2
C68	.01 MFD. 200 V. MOLDED PAPER	PA 4325-1
C69	2.2 MMF.	PA 4326-1
C70	.002 MFD. 800 V. TUBULAR	PC 40GM-202
C71	.01 MFD. 200 V. TUBULAR	PC 40FK-103

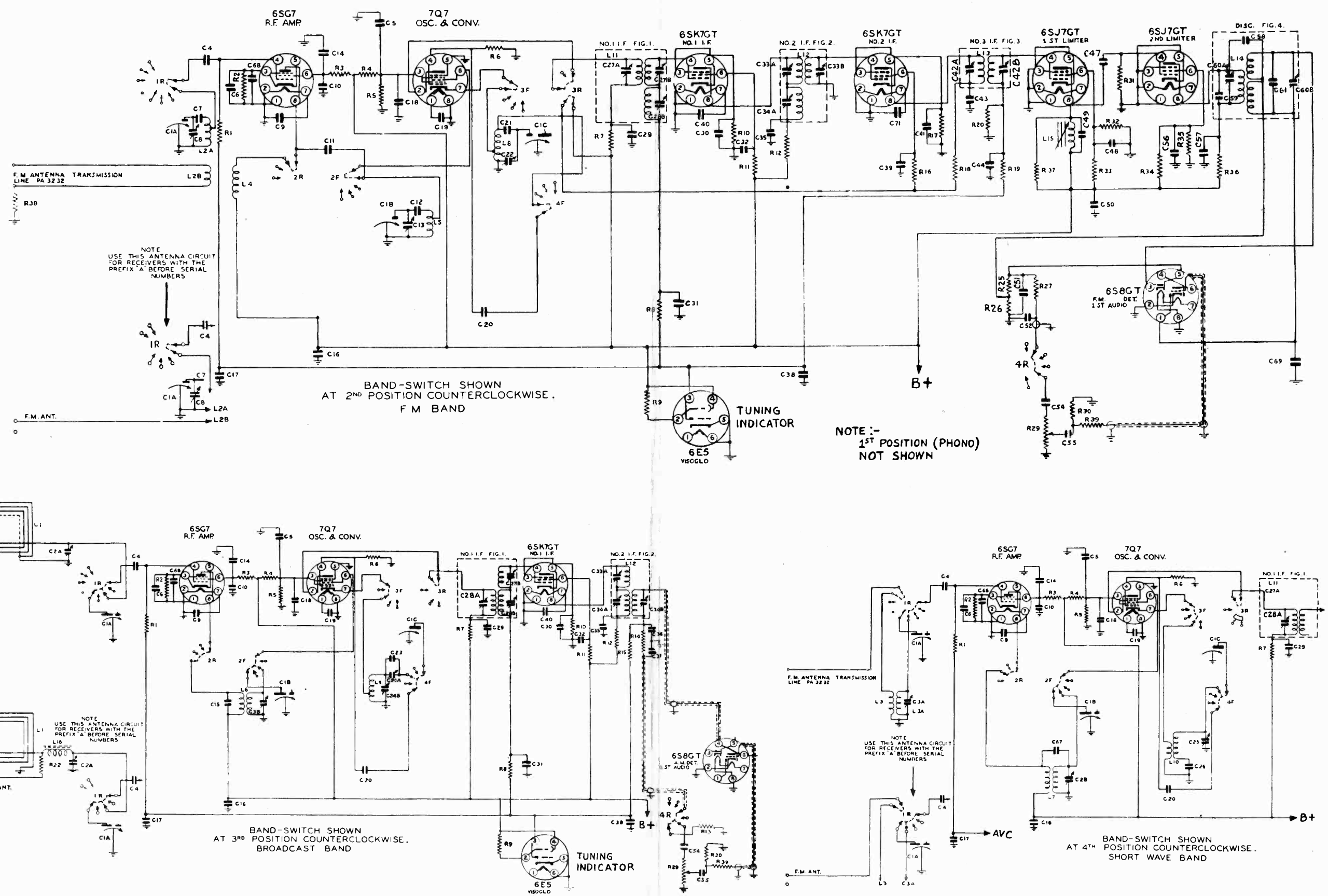
R1	220,000 OHM 1/2 W	BR 12 S-224
R2	200 " " "	BR 12 G-201
R3	33,000 " " "	DR 12 S-333
R4	10,000 " 2 W.	DR 12 S-103
R5	18,000 " 1 W.	GR 12 S-183
R6	20,000 " 1/2 W.	BR 12 C-203
R7	1,000 " "	BR 12 S-102
R8	220,000 " "	BR 12 S-224
R9	1 MEGOHM " "	BR 12 S-105
R10	330 OHM "	BR 12 G-331
R11	82,000 " "	BR 12 S-823
R12	1,000 " "	BR 12 S-102
R13	270,000 " "	BR 12 S-274
R14	47,000 " "	BR 12 S-473
R15	58,000 " "	BR 12 S-583
R16	82,000 " "	BR 12 S-823
R17	330 " "	BR 12 G-331
R18	1,000 " "	BR 12 S-102
R19	1 MEGOHM " "	BR 12 S-105
R20	100,000 OHM "	BR 12 S-104
R21	.5 MEG. TONE CONTROL	PA 4400-8
R22	270,000 OHM 1/2 W.	BR 12 S-274
R23	100,000 " " "	BR 12 S-104
R25	" " " "	BR 12 S-104
R26	" " " "	BR 12 S-104
R27	" " " "	BR 12 S-104
R28	240 " 2 W.	DR 12 G-241
R29	2 MEGOHM VOLUME CONTROL	PA 4401-2
R30	10 MEGOHM 1/2 W.	BR 12 S-106
R31	220,000 OHM "	BR 12 S-224
R32	15,000 " "	BR 12 S-153
R33	68,000 " "	BR 12 S-683
R34	" " "	BR 12 S-683
R35	15,000 " "	BR 12 S-153
R36	27,000 " "	BR 12 S-273
R37	4,700 " "	BR 12 S-472
R38	150,000 " "	BR 12 S-154
R39	47,000 " "	BR 12 S-473

FOR RECEIVERS WITHOUT PREFIX 'A' BEFORE SERIAL NUMBERS.

L1	LOOP ANTENNA ASSEMBLY	AB43011-3
L2A	F.M. ANTENNA COIL (SECONDARY)	AA 6767-3
L2B	F.M. " PRIMARY	AA 6766-1
L3	S.W. ANTENNA "	AA 6758-5
L4	HIGH FREQUENCY CHOKE COIL	AA 6769-1
L5	F.M. DET. COIL	AA 6767-2
L6	B.C. " "	AA 6758-2
L7	S.W. " "	AA 6760-4
L8	F.M. OSC. COIL	AA 6767-1
L9	B.C. " "	AA 6752-2
L10	S.W. " "	AA 6770-1
L11	NO.1 I.F. COIL	AA 6803-1
L12	NO.2 I.F. "	AA 6803-1
L13	NO.3 I.F. "	AA 6804-1
L14	DISCRIMINATOR COIL	AA 6805-1
L15	LIMITER PLATE REACTOR COIL	AA 6785-1

FOR RECEIVERS WITH THE PREFIX 'A' BEFORE SERIAL NUMBERS.

L1	LOOP ANTENNA ASSEM.	AB43011-6 / AB43011-7
L3	S.W. ANT. COIL ASSEM.	AA 6758-6
L5	B.C. DET. COIL ASSEM.	AA 6758-3
L7	S.W. DET. COIL ASSEM.	AA 6760-5
L9	B.C. OSC. COIL ASSEM.	AA 6752-5
L10	S.W. OSC. COIL ASSEM.	AA 6770-2
L16	ANT. LOADING COIL ASSEM	AA 6780-1
C26	4290 MMF. CONDENSER	PA 4354-9
R22	2200 OHMS 1/2 W.	BR 125-222


6SG7
R.F. AMP
7Q7
OSC. & CONV.
6SK7GT
NO.1 I.F.
6SK7GT
NO.2 I.F.
6SJ7GT
1 ST LIMITER
6SJ7GT
2ND LIMITER
DISC. FIG.4.
NO.1 I.F. FIG.1.
NO.2 I.F. FIG.2.
NO.3 I.F. FIG.3
F.M. ANTENNA TRANSMISSION LINE PA 3232
NOTE
USE THIS ANTENNA CIRCUIT FOR RECEIVERS WITH THE PREFIX 'A' BEFORE SERIAL NUMBERS
F.M. ANT.
BAND-SWITCH SHOWN AT 2ND POSITION COUNTERCLOCKWISE.
F M BAND
6E5
VISOGLO
TUNING INDICATOR
B+
6S8GT
F.M. DET. 1ST AUDIO
NOTE :-
1ST POSITION (PHONO)
NOT SHOWN
A.M. ANT.
BAND-SWITCH SHOWN AT 3RD POSITION COUNTERCLOCKWISE.
BROADCAST BAND
TO I-F AMPL CONTINUED SAME AS 3RD POSITION (BC BAND)
AVC
BAND-SWITCH SHOWN AT 4TH POSITION COUNTERCLOCKWISE.
SHORT WAVE BAND

ALIGNMENT CHART

OPER-ATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANT.	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNNING COND. SETTING	TRIMMER	REMARKS
1	Set dial pointer even with left-hand stop line with condenser closed.							
2	A.M.-I.F.	Pin #6 of 7Q7 Convt. Tube	.02 MFD Cond.	456 KC.	BC.	Open	C34A & B C28A & B	Peak Accurately " "
3	BC. R.F.	BC. ANT.	*	1600 KC.	BC.	1600 KC.	C24B Osc.T.	" "
4				1500 KC.		1500 KC.	C3B R.F.TR. C2A Ant.TR.	" " " "
5				600 KC.		600 KC.	C24A Osc. P.	**
6	Repeat operations 3, 4, & 5.							
7	Check calibrations at 600 KC., 1000 KC., and 1500 KC.							
8	S.W. BAND	F.M. ANT. to GND.	*	18 MC.	S.W. BAND	18 MC.	C25 Osc.Tr. C2B R.F.Tr. C3A Ant.Tr. C26 Osc. P.	Peak Accurately ** ** See Oper. #9
9	C26 Osc. Padder is precision set at the factory and should not be moved.							
10	Repeat operation #8.							
11	Check calibration at 6 MC. and 18 MC.							
12	SPECIAL NOTE: For complete F.M.-I.F. visual alignment instructions see pages 17-12, 17-13, and 17-14. An alternate F.M.-I.F. alignment using a V.T.V.M. is shown in operations 13, 14, 15, 16, 17, and 18 below.							
13	LIMITER	Pin No. 4 on 1st Lim. Tube.	.02 MFD. Cond.	10.7 MC. Unmod.	F.M.	Optional	L15 Slug	***
14	Disc. Stage Pri.	Pin #4 on 1st limiter to Gnd.	.02 MFD. Cond.	10.7 MC. Unmod.	F.M.	Optional	C60A Disc. Prim.	***
15	Disc. Stage Sec.	Pin #4 on 1st Limiter to Gnd.					C60B Disc. Sec.	See Note 1.
16	F.M.-I.F.	Note "A"	.02 MFD. Cond.	10.7 MC. Unmod.	F.M.	10.7 MC.	C42A & B No. 3. I.F.	See Note 2.
17		Note "B"					C33A & B No. 2 I.F.	" " "
18		Note "C"					C27A & B No. 1 I.F.	" " "
19	F.M.-R.F.	F.M. Ant.	270 OHMS	108 MC. Unmod.	F.M.	108 MC. 300 Channel	C22 Osc.Tr. C13 R.F.TR. C8 Ant.Tr.	" " " " " " " " "
20	Repeat operation 19.							
21	Check calibration at 200, 250, and 300 channels.							

NOTE: The F.M.-I.F. alignment proceedure shown above is made with a measurements vacuum tube voltmeter.
* Use dummy antenna
** Rock dial while adjusting for maximum output.
*** Connect V.T.V.M. from C.T. of discriminator coil to chassis gnd. using lowest scale on D.C. range. Adjust for maximum reading.

NOTE 1: Connect V.T.V.M. from pin #5 of 6S8GT tube to gnd. adjust for zero reading on V.T.V.M.

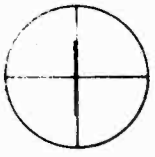
NOTE 2: Connect V.T.V.M. between A.V.C. terminal on #3 I.F. Trans. to gnd. Tune for maximum response on lowest scale D.C. range.
"A" Connect signal generator between pin #4 on No. 2 I.F. tube and gnd.
"B" Connect signal generator between pin #4 on No. 1 I.F. tube and Gnd.
"C" Connect signal generator between pin #6 on 7Q7 converter tube and gnd.

F.M. I.F. ALIGNMENT

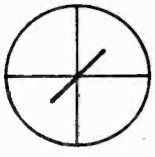
In that the alignment of the I.F. stages of an F.M. receiver is inherently far more critical than is the case in the conventional A.M. receiver the visual method using an oscilloscope and frequency modulated signal generator should be used where such equipment is available. In case this equipment is not available any good signal generator providing a stable signal at 10.7 Mc. may be used providing a vacuum tube voltmeter and zero center voltmeter are used in place of the output meter. Both methods are outlined below.

Visual Alignment of F.M.-I.F. Transformers and Discriminators.

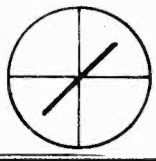
1. Equipment required.
   (a) Cathode ray oscilloscope with both vertical and horizontal amplifiers and preferably with calibrated screen.
   (b) Frequency modulated signal generator providing sweep width up to approximately 400 Kc., preferably variable. The modulation voltage should be available at terminals to syncronize the oscilloscope sweep.
   (c) Insulated alignment tools and shielded leads for the scope and signal generator.
2. Preliminary adjustments.
   (a) Set the signal generator for a center frequency of 10.7 Mc. and allow sufficient warm up time for the generator to stabilize. It is very important that the frequency remain at exactly 10.7 Mc. throughout the entire alignment procedure. A shift in frequency during alignment might result in stagger tuning with consequent impairments of receiver performance.
   (b) Turn the oscilloscope on and after focusing the beam for the smallest spot of desired brilliance, center the spot exactly.
   (c) Connect syncronize or sweep terminals of signal generator to the horizontal input post on the oscilloscope.
3. Alignment of plate reactor and discriminator.
   (a) Connect output from signal generator to pin #4 of 1st limiter tube (6SJ7GT).
   (b) Connect output cable from pin #5 of 6S8GT tube to the vertical input terminals on the scope.
   (c) With the sweep or modulation control off advance the R.F. control on the signal generator to give a trace approximating Fig. 1.



   (d) If the sweep control is now advanced the trace will tilt like Fig. 2.



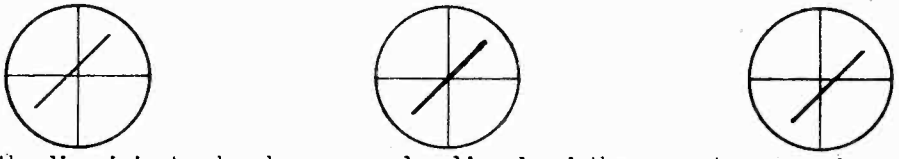
   (e) Adjust core in L15 plate reactor for maximum vertical deflection. Note that the length of trace increases as Fig. 3.



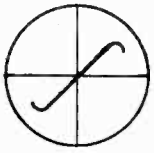
ALIGNMENT DATA

(f) Align discriminator transformer by adjusting primary C60A for maximum vertical deflection, meanwhile keeping the trace in the exact center of the screen by adjusting secondary C60B. See Fig. 4.

Fig. 4



When the discriminator has been properly aligned and the generator sweep increased to about 400 Kc. the conventional shaped discriminator curve will be presented on the screen. See Fig. 5.



This presentation will be helpful for final alignment and balance of the discriminator transformer. Make sure that the straight center position crosses the exact center of the screen and that the distance from the vertical center line to each peak is approximately equal.

4. Alignment of #3 I.F. Transformer

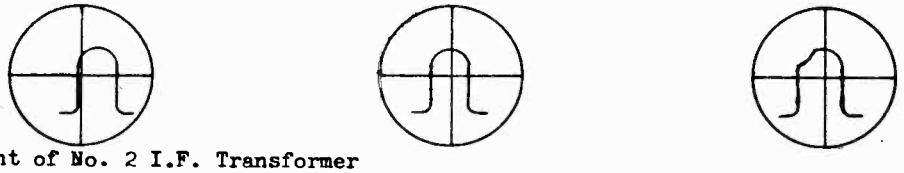
(a) Connect input from signal generator to pin #4 on No. 2 I.F. amplifier tube (6SK7GT).

(b) Connect output cable from AVC terminal on #3 I.F. transformer to the vertical terminals on the scope using a 50 K ohm isolating resistor at the set end of the cable.

(c) With generator sweep width set for approximately 400 Kc. increase R.F. output until a convenient pattern is presented on the screen.

(d) Adjust C42A and C42B for maximum vertical deflection with a symmetrical curve. See Fig. 6.

Fig. 6



5. Alignment of No. 2 I.F. Transformer

(a) Connect input from signal generator to pin #4 of No. 1 I.F. tube (6SK7GT). The output connection remains at the AVC terminal of the 3rd I.F. transformer.

(b) Align C33A and C33B per instructions and diagram in (c) and (d) above.

6. Alignment of No. 1 I.F. Transformer

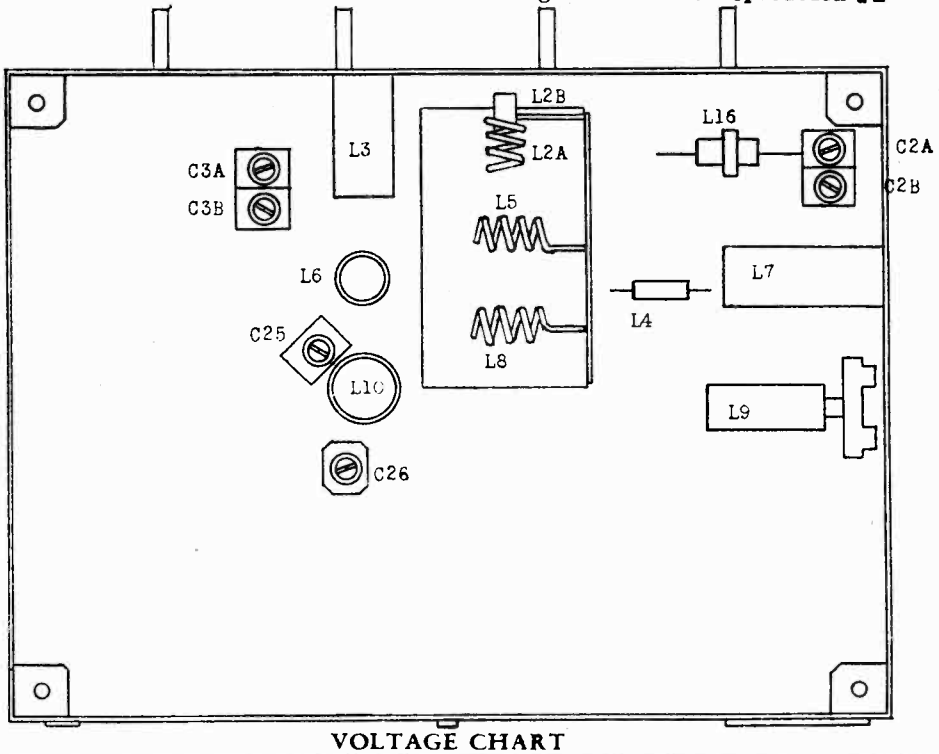
(a) Connect input from signal generator to Pin #6 on the converter tube (7Q7). (Note: There will be an apparent reduction in gain here due to the short circuiting effect of the F.M. detector coil but this may be compensated for by increasing the generator output. If the generator output is still too low the lead from 7Q7 pin #6 to the wave band switch may be unsoldered thus removing the short circuit).

ALIGNMENT DATA

(b) Align C27A and C27B per instructions in (c) and (d) Par. 4. See Fig. 6.

7. Caution: Do not try to "touch up" or worse yet completly align the I.F. channel by applying the signal to the converter grid. To do so will almost certainly result in misalignment of one stage to compensate for the poor alignment of another.

8. For alignment of the A.M.-I.F. transformers see alignment chart. Operation #2



VOLTAGE CHART

Line Voltage: 117 Volts AC

Position of volume control: Full with set tunned to quiet channel.

Position of Band Switch: Broadcast with the exception ***.

TUBE	FUNCTION	Voltage of Socket Prongs to Ground See Prong Nos. on schematic.								
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	Grid Cap
6SG7	R. F. Amplifier	0	0	2.20	.10	2.20	155	6.0*	270	
7Q7	Osc. & Convt.	6.05*	270	110	-9.8	0	**	0	0	
6SK7GT	No. 1 I. F. Amp.	0	0	3.0	**	3.0	95	6.05*	270	
6SK7GT	No. 2 I. F. Amp. ***	0	0	3.0	**	3.0	***	6.05*	270	
6SJ7GT	1st Limiter	0	0	0	-.3	0	46	6.05*	270	
6SJ7GT	2nd Limiter	0	0	0	-.42	0	47	6.05*	207	
6S8GT	F.M.-A.M.Det. 1st Audio	-.20	0	-.20	-.30	**	95	6.05	0	-.27
6V6G	Power Amp.	0	0	260	270	**	****	6.05*	12.5	
5Y3GT	Rectifier	0	375	0	360*	0	360*	360	375	
6E5	Viso-Glo	5.95*	23	-4.4	270					

NOTES: Voltage readings are for schematic diagram Allow 15% ≠ or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 20,000 ohms per volt voltmeter. All AC voltages made with rectifier type voltmeter. Unless designated otherwise, voltages in table are ≠ DC voltages.

* AC volts.

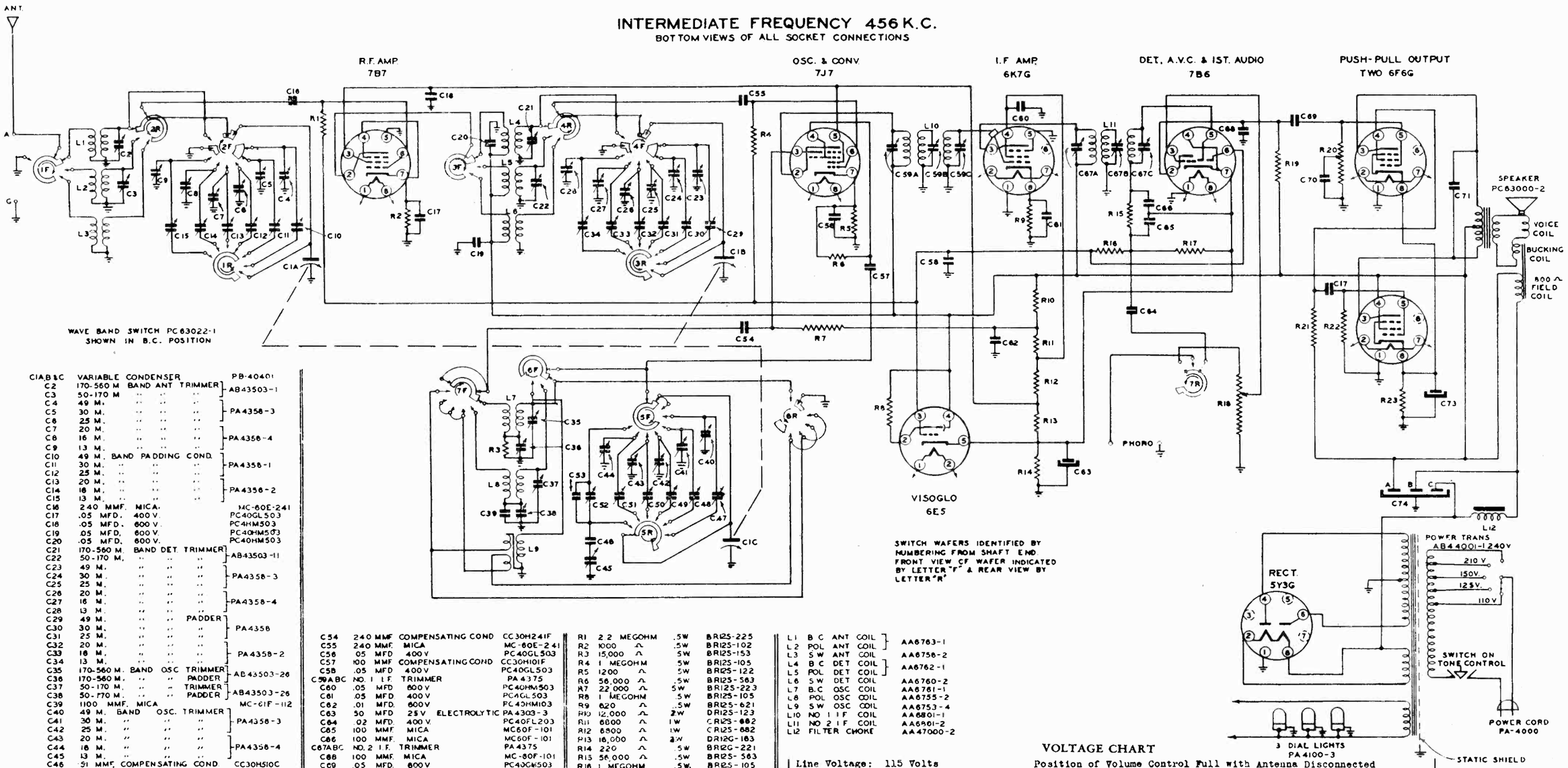
** Cannot be measured with 20,000 ohms per volt voltmeter.

*** Band switch in F.M. position.

**** Zero volts or 237 volts. (Tie point only on some receivers).

INTERMEDIATE FREQUENCY 456 K.C.

BOTTOM VIEWS OF ALL SOCKET CONNECTIONS



C1A,B&C	VARIABLE CONDENSER		PB-40401
C2	170-560 M	BAND ANT TRIMMER	AB43503-1
C3	50-170 M	" " "	
C4	49 M.	" " "	PA4358-3
C5	30 M.	" " "	
C6	25 M.	" " "	
C7	20 M.	" " "	PA4358-4
C8	16 M.	" " "	
C9	13 M.	" " "	
C10	49 M.	BAND PADDING COND.	PA4358-1
C11	30 M.	" " "	
C12	25 M.	" " "	
C13	20 M.	" " "	PA4358-2
C14	16 M.	" " "	
C15	13 M.	" " "	
C16	240 MMF.	MICA	MC-60E-241
C17	.05 MFD.	400 V.	PC40GL503
C18	.05 MFD.	600 V.	PC4HM503
C19	.05 MFD.	600 V.	PC40HM503
C20	.05 MFD.	600 V.	PC40HM503
C21	170-560 M.	BAND DET TRIMMER	AB43503-11
C22	50-170 M.	" " "	
C23	49 M.	" " "	
C24	30 M.	" " "	PA4358-3
C25	25 M.	" " "	
C26	20 M.	" " "	
C27	16 M.	" " "	PA4358-4
C28	13 M.	" " "	
C29	49 M.	" " PADDER	
C30	30 M.	" " "	PA4358
C31	25 M.	" " "	
C32	20 M.	" " "	
C33	16 M.	" " "	PA4358-2
C34	13 M.	" " "	
C35	170-560 M.	BAND OSC TRIMMER	AB43503-26
C36	170-560 M.	" " PADDER	
C37	50-170 M.	" " TRIMMER	AB43503-26
C38	50-170 M.	" " PADDER	
C39	1100 MMF.	MICA	MC-61F-112
C40	49 M.	BAND OSC. TRIMMER	
C41	30 M.	" " "	PA4358-3
C42	25 M.	" " "	
C43	20 M.	" " "	
C44	16 M.	" " "	PA4358-4
C45	13 M.	" " "	
C46	51 MMF.	COMPENSATING COND	CC30H510C
C47	49 M.	BAND OSC PADDER	
C48	30 M.	" " "	PA4358-1
C49	25 M.	" " "	
C50	20 M.	" " "	
C51	16 M.	" " "	PA4358-2
C52	13 M.	" " "	
C53	20 MMF.	COMPENSATING COND.	CC30H200F

C54	240 MMF.	COMPENSATING COND	CC30H241F
C55	240 MMF.	MICA	MC-60E-241
C56	.05 MFD	400 V	PC40GL503
C57	100 MMF.	COMPENSATING COND	CC30H101F
C58	.05 MFD	400 V	PC40GL503
C59A,B,C	NO. 1 I.F.	TRIMMER	PA4375
C60	.05 MFD	600 V	PC40HM503
C61	.05 MFD	400 V	PC4GL503
C62	.01 MFD.	600 V	PC40HM103
C63	50 MFD	25 V ELECTROLYTIC	PA4303-3
C64	.02 MFD	400 V.	PC40FL203
C65	100 MMF.	MICA	MC60F-101
C66	100 MMF.	MICA	MC60F-101
C67A,B,C	NO. 2 I.F.	TRIMMER	PA4375
C68	100 MMF.	MICA	MC-80F-101
C69	.05 MFD.	600 V	PC40GM503
C70	.003 MFD.	600 V.	PC40GM302
C71	.003 MFD	600 V.	PC40GM302
C72	.05 MFD.	600 V.	PC40GM503
C73	20 MFD.	25 V ELECTROLYTIC	PA4303-2
A	15 MFD	450 V.	
C74 B	10 MFD	450 V. ELECTROLYTIC	PA4300-1
C	15 MFD.	450 V.	

R1	2.2	MEGOHM .5W	BR1S-225
R2	1000	Ω .5W	BR1S-102
R3	15,000	Ω .5W	BR1S-153
R4	1	MEGOHM .5W	BR1S-105
R5	1200	Ω .5W	BR1S-122
R6	56,000	Ω .5W	BR1S-563
R7	22,000	Ω .5W	BR1S-223
R8	1	MEGOHM .5W	BR1S-105
R9	620	Ω .5W	BR1S-621
R10	12,000	Ω 2W	DR1S-123
R11	6800	Ω 1W	CR1S-682
R12	6800	Ω 1W	CR1S-682
R13	18,000	Ω 2W	DR1G-183
R14	220	Ω .5W	BR1G-221
R15	56,000	Ω .5W	BR1S-563
R16	1	MEGOHM .5W.	BR1S-105
R17	550,000	Ω .5W	BR1S-564
R18	2	MEGOHM VOL CONT	PA4401-1
R19	270,000	Ω .5W.	BR1S-274
R20	5	MEG. TONE CONT & S.W.	PA4400-1
R21	2000	Ω .5W	BR1G-202
R22	470,000	Ω .5W.	BR1S-474
R23	240	Ω 2W	BR1G-241

L1	B C	ANT COIL	AA6763-1
L2	POL	ANT COIL	
L3	S W	ANT COIL	AA6756-2
L4	B C	DET COIL	AA6762-1
L5	POL	DET COIL	
L6	S W	DET COIL	AA6760-2
L7	B.C	OSC COIL	AA6761-1
L8	POL	OSC COIL	AA6755-2
L9	S W	OSC COIL	AA6753-4
L10	NO 1	I F COIL	AA6801-1
L11	NO 2	I F COIL	AA6901-2
L12	FILTER	CHOKE	AA47000-2

VOLTAGE CHART

Line Voltage: 115 Volts
Position of Band Switch Broadcast

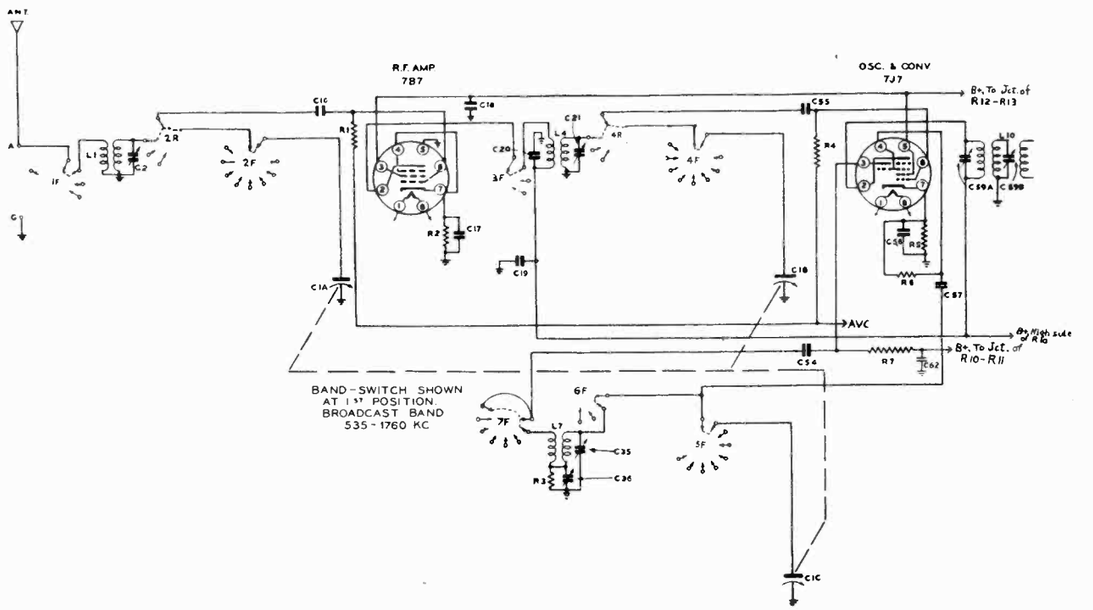
Position of Volume Control Full with Antenna Disconnected
Position of Tap Plug - 110 Volts

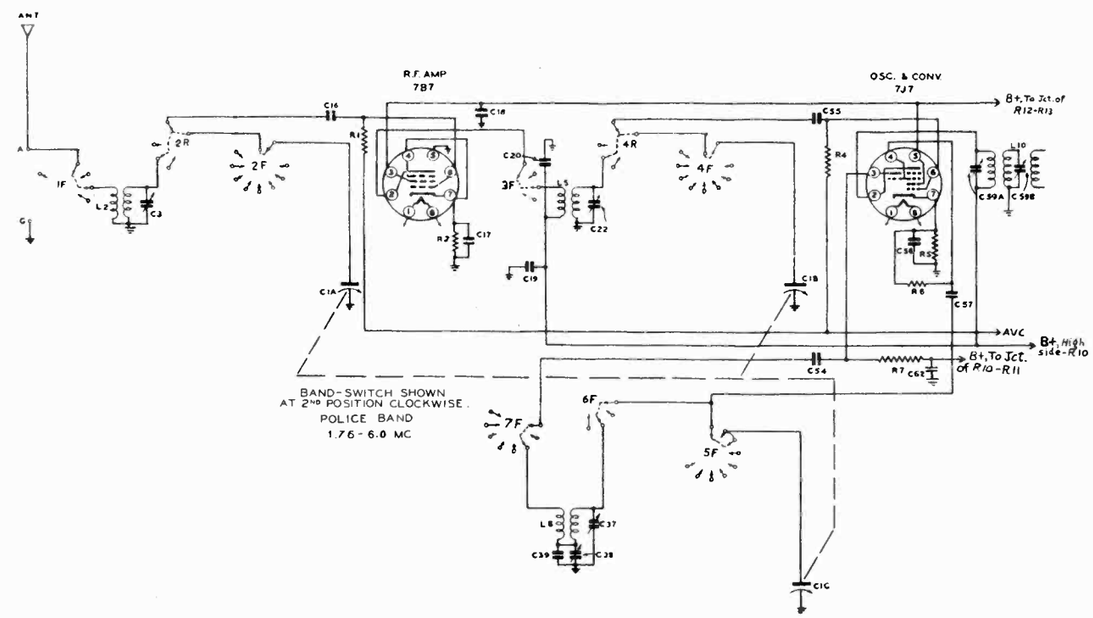
TUBE	FUNCTION	Voltage of Socket Prongs to Gnd. (See Prong Nos. on Schematic Dia.)								
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	Grid Cap.
7B7	R.F. Amplifier	0	290	75	4.2	0	0	4.2	6.1*	-
7J7	Osc - Converter	0	290	100	-1	75	4.1	4.5	6.1*	-
6K7G	I-F Amplifier	0	0	290	120	0	-	6.1*	9	0
7B6	2nd Det - AVC - 1st Audio	0	150	0	1.2	.5	0	1.2	6.1*	-
6F6G	Push-Pull Power Output	0	0	290	285	0	295	6.1*	20	-
6F6G	Push-Pull Power Output	0	0	290	285	0	295	6.1*	20	-
5Y3G	Rectifier	0	375*	0	350*	0	375*	0	350*	-
6E5	Viso-Glo	0	250	0	295	0	6.1*	-	-	-

Notes: Voltage readings are for schematic diagram in this bulletin. Allow 15% ∱ or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 20,000 ohms per volt voltmeter.
*AC volts.

THE SPARKS-WITHINGTON CO.

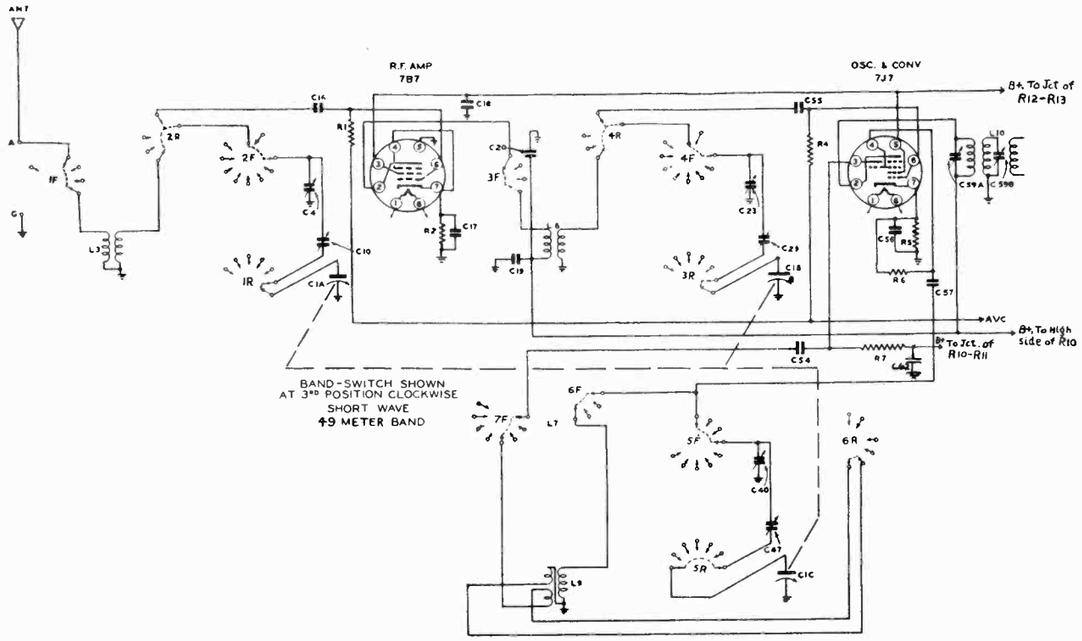
MODEL 843SX

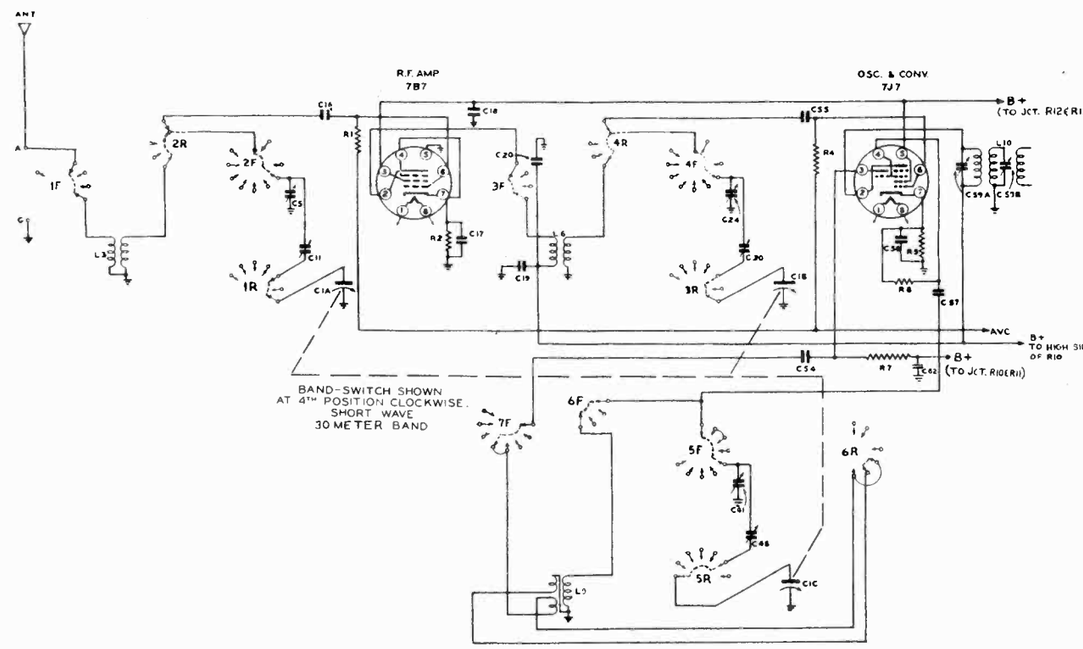




MODEL 843SX

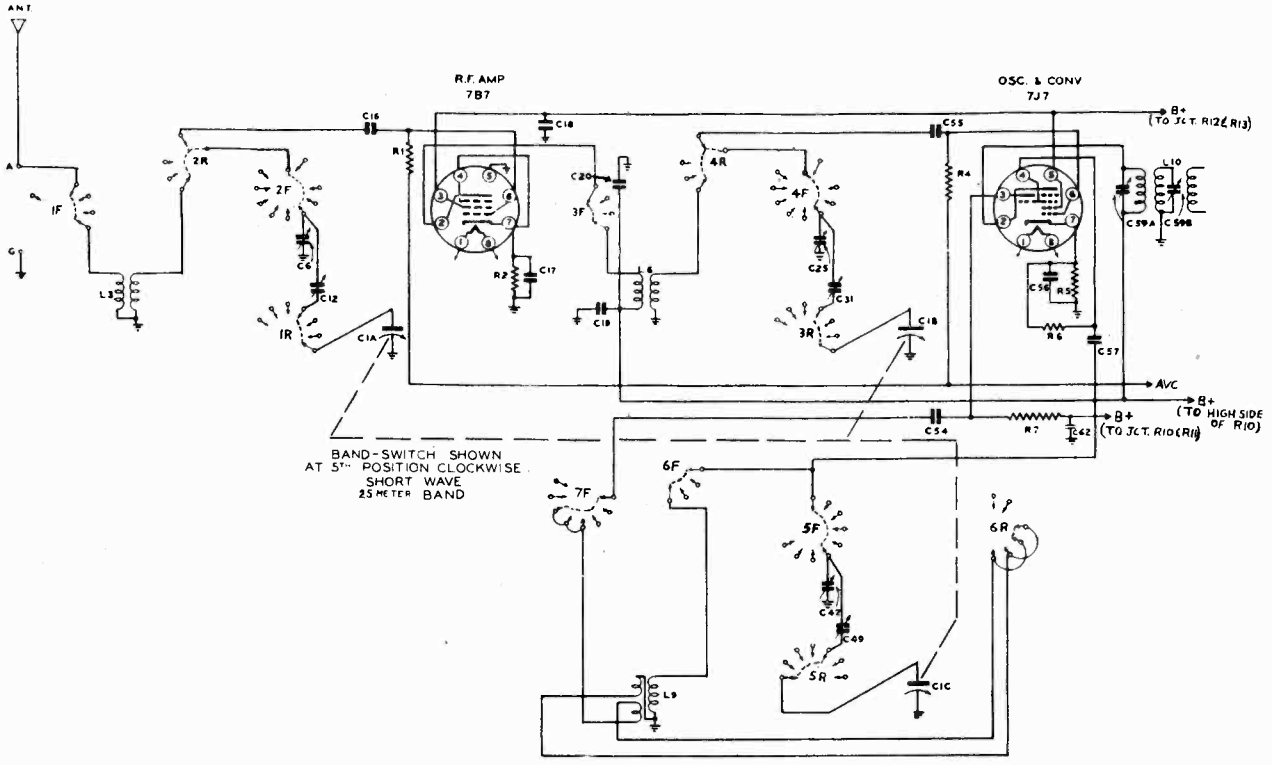
THE SPARKS-WITHINGTON CO.

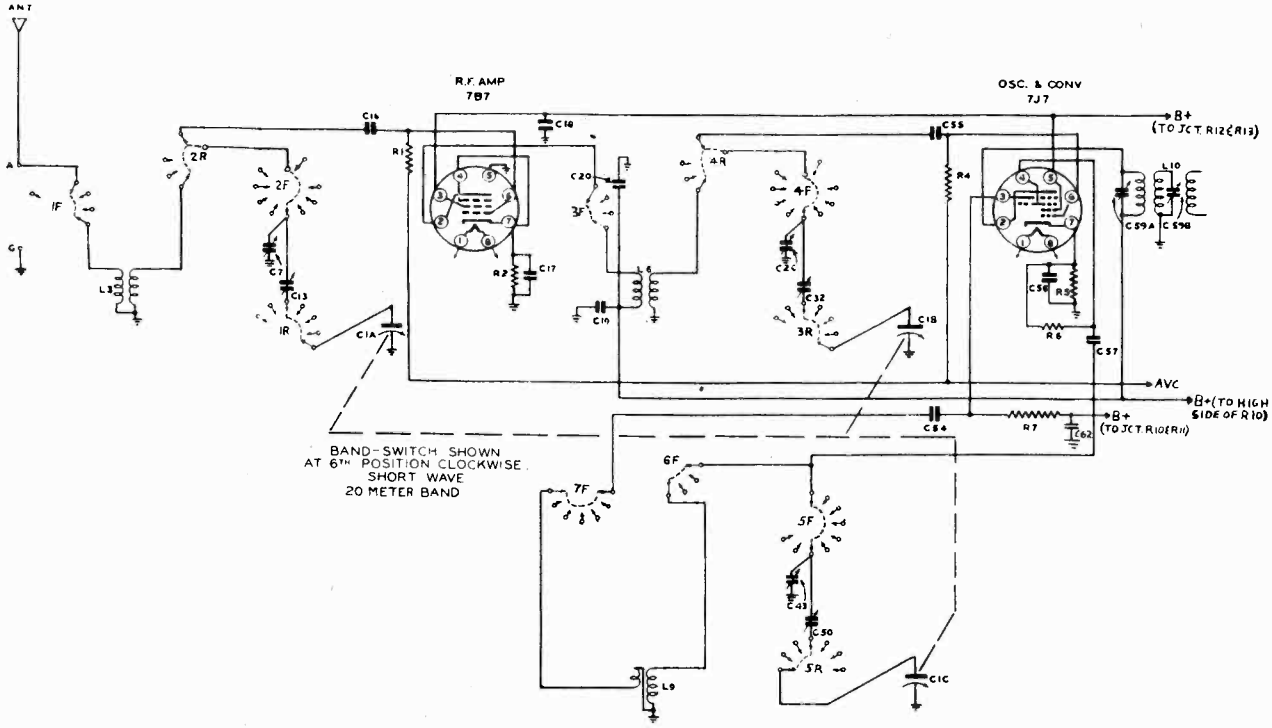




THE SPARKS-WITHINGTON CO.

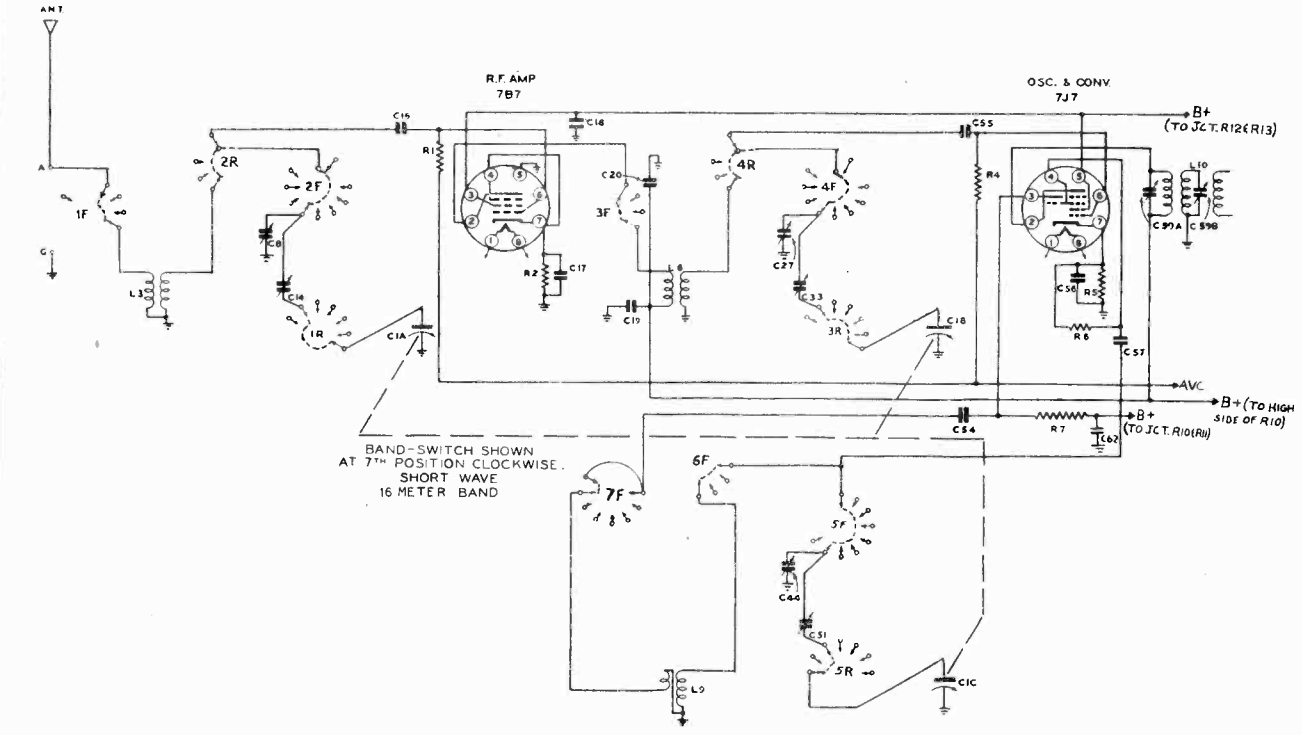
MODEL 843SX

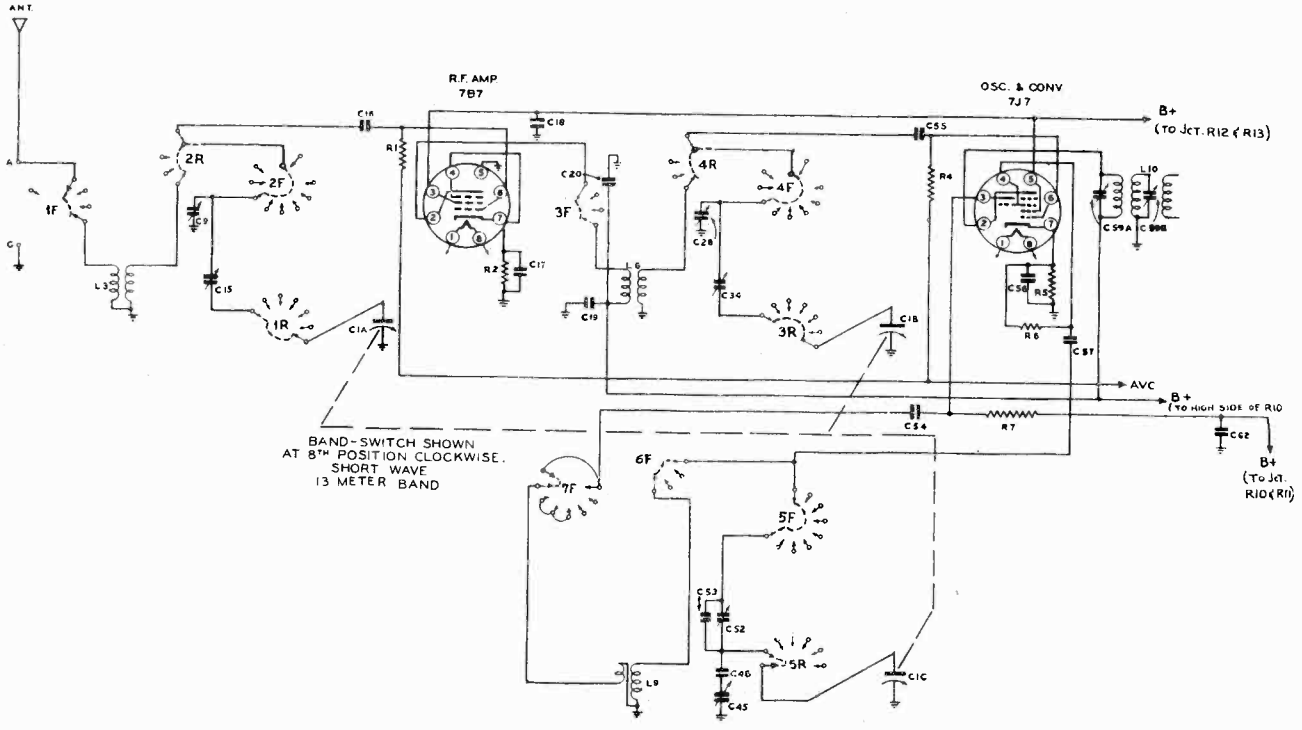




MODEL 843SX

THE SPARKS-WITHINGTON CO.





THE SPARKS-WITHINGTON CO.

ALIGNMENT DATA

OPER-ATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	BAND SWITCH SETTING	GENERATOR FREQUENCY	TUNING COND. SETTING	TRIMMER	REMARKS
1	(Set drive wheel so that pointer is at end of calibration scales with condenser gang fully mesned)							
2	I.F.	Connect to Stator of Detector Section of CI (See Chassis Diagram)	.1 mf.	170-560 Meters	(456 KC)	Open	C67B*	**
3							C67A C67C	Peak accurately
4							C67B*	Peak accurately
5							C59B*	**
6							C59A C59C	Peak accurately
7							C59B*	Peak accurately
8	CAUTION: Do not readjust trimmers C67A & C and C59A & C after red spot trimmers C67B & C59B have been peaked)							
9	170-560 Meter Band	ANT	See Note	170-560 Meters	200 M	200 M	C35 Osc.	Trim.
							C21 Det.	Trim.
							C2 ANT.	Trim.
10					500 M	500 M	C36 Osc.	Pad.
11	(Repeat operation 9)							
12	(Check calibration and sensitivity at 200 M, 300 M and 500 M)							
13	50-170 Meter Band	ANT	See Note	50-170 Meters	55 M	55 M	C37 Osc.	Trim.
							C22 Det.	Trim.
							C3 ANT.	Trim.
14					150 M	150 M	C38 Osc.	Pad.
15	(Repeat operation 13)							
16	(Check calibration and sensitivity at 55M, 95M and 150M)							
17	49 Meter Band	ANT	See Note	49 Meters	35 M	35 M	C40 Osc.	Trim.
18					48 M	48 M	C47 Osc.	Pad.
19					35 M	35 M	C23 Det.	Trim.
							C4 ANT.	Trim.
20					48 M	48 M	C29 Det.	Pad.
							C10 ANT.	Pad.
21	(Check carefully all adjustments for 49 meter band. Be sure band limits are covered)							
22	30 Meter Band	ANT	See Note	30 Meters	27 M	27 M	C41 Osc.	Trim.
23					34.5 M	34.5 M	C48 Osc.	Pad.
24					27 M	27 M	C24 Det.	Trim.
							C5 ANT.	Trim.
25					34.5 M	34.5 M	C30 Det.	Pad.
							C11 ANT.	Pad.
26	(Check carefully all adjustments for 30 meter band. Be sure band limits are covered.							
27	25 Meter Band	ANT	See Note	25 Meters	22 M	22 M	C42 Osc.	Trim.
28					26 M	26 M	C49 Osc.	Pad.
29					22 M	22 M	C25 Det.	Trim.
							C6 ANT.	Trim.
30					26 M	26 M	C31 Det.	Pad.
							C12 ANT.	Pad.
31	(Check carefully all adjustments for 25 meter band. Be sure band limits are covered.)							
32	20 Meter Band	ANT	See Note	20 Meters	18.5 M	18.5 M	C43 Osc.	Trim.
33					21.1 M	21.1 M	C50 Osc.	Pad.
34					18.5 M	18.5 M	C26 Det.	Trim.
							C7 Ant.	Trim.
35					21.1 M	21.1 M	C32 Det.	Pad.
							C13 Ant.	Pad.
36	(Check carefully all adjustments for 20 meter band. Be sure band limits are covered.)							
37	16 Meter Band	ANT	See Note	16 Meters	15.7 M	15.7 M	C44 Osc.	Trim.
38					17.7 M	17.7 M	C51 Osc.	Pad.
39					15.7 M	15.7 M	C27 Det.	Trim.
							C8 Ant.	Trim.
40					17.7 M	17.7 M	C33 Det.	Pad.
							C16 Ant.	Pad.

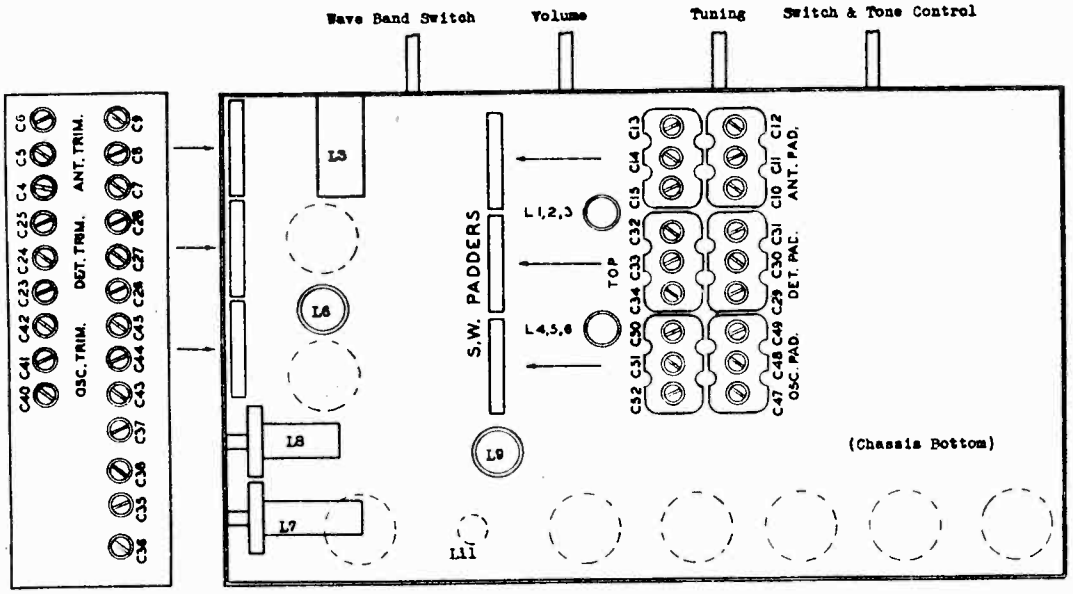
THE SPARKS-WITHINGTON CO.

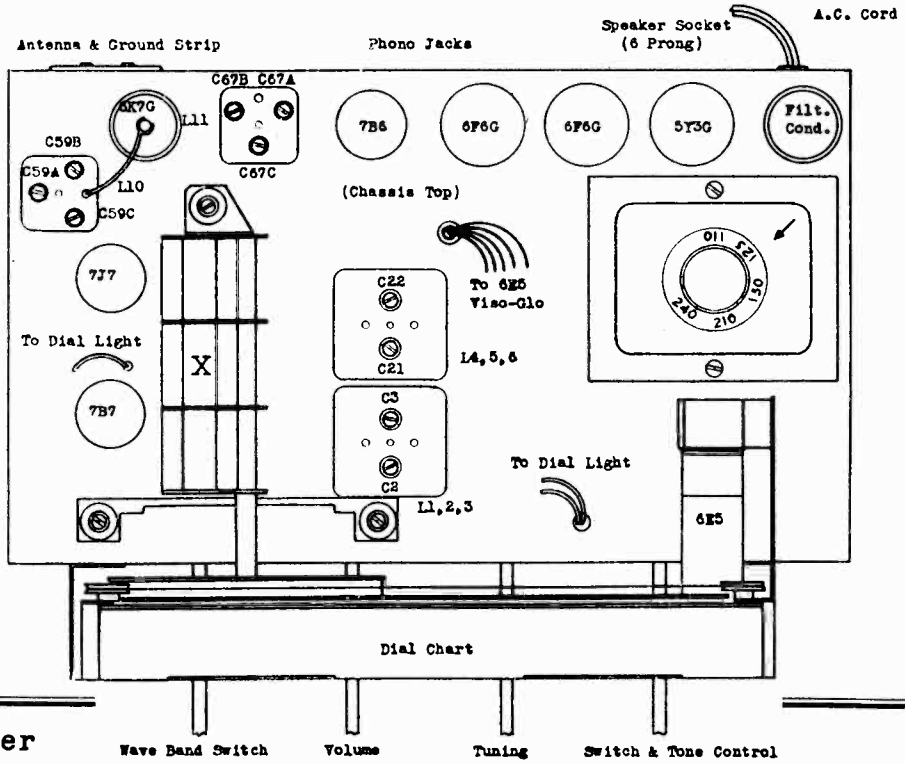
ALIGNMENT DATA

OPER-ATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	BAND SWITCH SETTING	GENERATOR FREQUENCY	TUNING COND. SETTING	TRIMMER	REMARKS
41	(Check carefully all adjustments for 16 meter band. Be sure band limits are covered.)							
42	13 Meter Band	ANT	See Note	13 Meters	13.8 M	13.8 M	C45 Osc.	Trim.
43					15.2 M	15.2 M	C52 Osc.	Pad.
44					13.8 M	13.8 M	C28 Det.	Trim.
							C9 Ant.	Trim.
45					15.2 M	15.2 M	C34 Det.	Pad.
							C15 Ant.	Pad.
46	(Check carefully all adjustments for 13 meter band. Be sure band limits are covered.)							

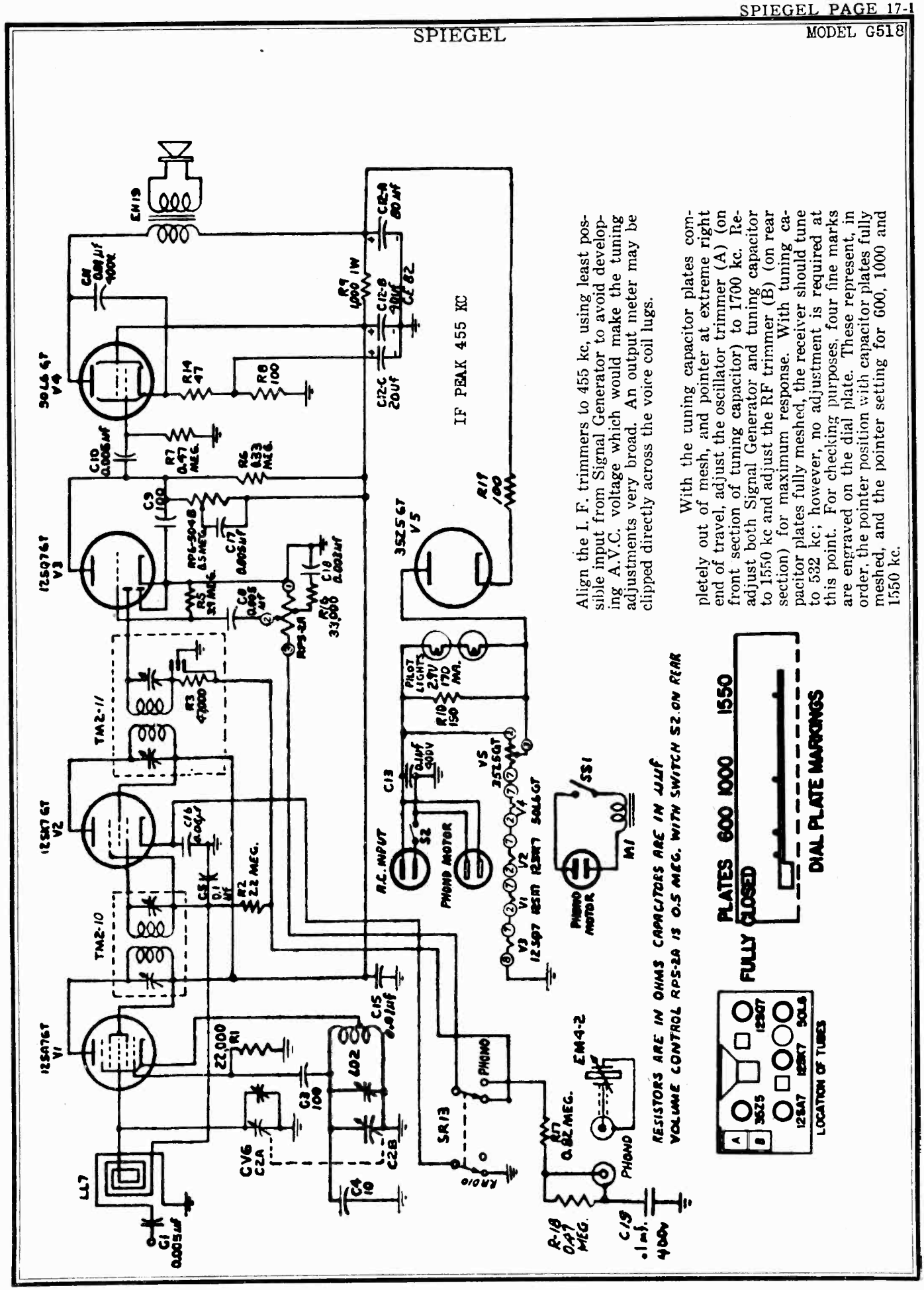
*Bronze color trimmer screw.
**Turn trimmer screw all the way down.
Note - Use dummy antenna described on page (1).

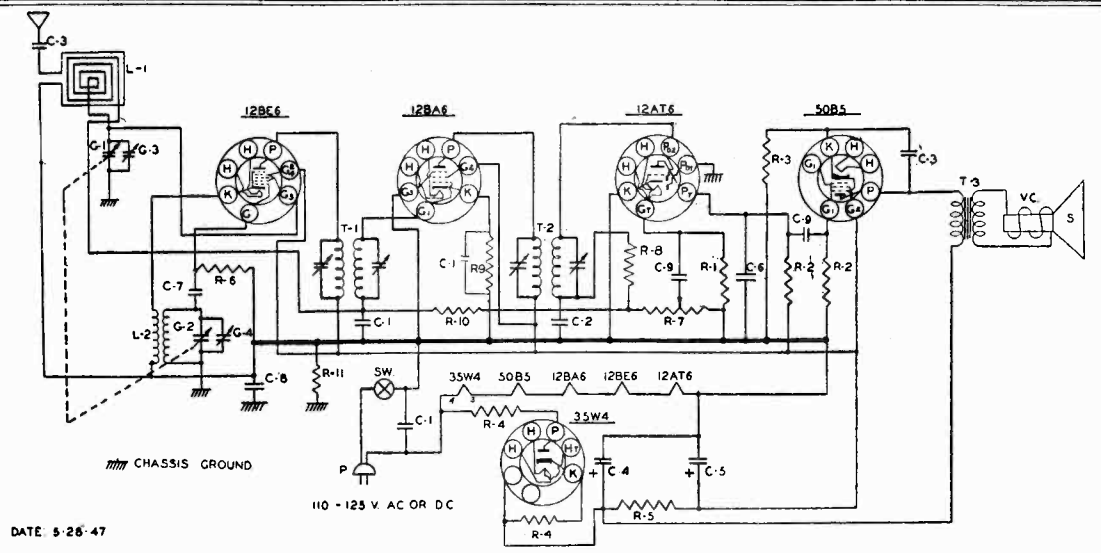
SPECIAL NOTE: All band trimmers should be adjusted to the fundamental of the test signal and not to the image.





SPIEGEL MODEL G518





PART NO.		DESCRIPTION
IR-13	R-1	2.2 MEG. RESISTOR 1/2 W. 20 %
IR-11	R-2	470M RESISTOR 1/2 W. 20 %
IR-14	R-3	150 RESISTOR 1/2 W. 20 %
IR-17	R-4	33 RESISTOR 1/2 W. 20 %
IR-25	R-5	2200 RESISTOR 1 W. 10 %
IR-16	R-6	33 M RESISTOR 1/2 W 20 %
VC-9	R-7	1 MEG. VOLUME CONTROL
GC-7	G-1, G-2	GANG CONDENSER
	G-3	ANT. TRIMMER COND.
IR-19	R-8	100M RESISTOR 1/2 W. 20 %
IR-36	R-9	100 RESISTOR 1/2 W. 20
LO-13	L-2	OSC. COIL
LI-6	T-1	INPUT TRANSFORMER
LI-7	T-2	OUTPUT TRANSFORMER
	T-3	OUTPUT SPK. TRANFORMER
SPK-10	V.C.	VOICE COIL
	S	PM. SPEAKER
IR-20	R-11	220M RESISTOR 1/2 W. 20 %
	SW	AC SW. ON VOLUME CONTROL
CO-1	P	LINE CORD
TU-18		12BE6 - 12BA6 - 12AT6 50B5 - 35W4
PC-5	G-4	OSC. TRIMMER COND
MC-2	C-1	.05 MFD. CONDENSER 400 V
PC-7	C-2	.0001 MFD. MICA CONDENSER 20 %
	C-3	.01 MFD. CONDENSER 400 V
EC-12	C-4	40 MFD. } 150 V. ELECTROLYTIC CONDENSER
	C-5	20 MFD. }
MC-5	C-6	.0005 MFD. CONDENSER 20 %
MC-4	C-7	.000056 MFD. MICA 20 %
PC-8	C-8	.1 MFD. CONDENSER 400 V
LL-12	L-1	LOOP ANTENNA
IR-23	R-10	3.3 MEG. RESISTOR 1/2 W 20 %
PC-6	C-9	.005 MFD. CONDENSER 600 V.

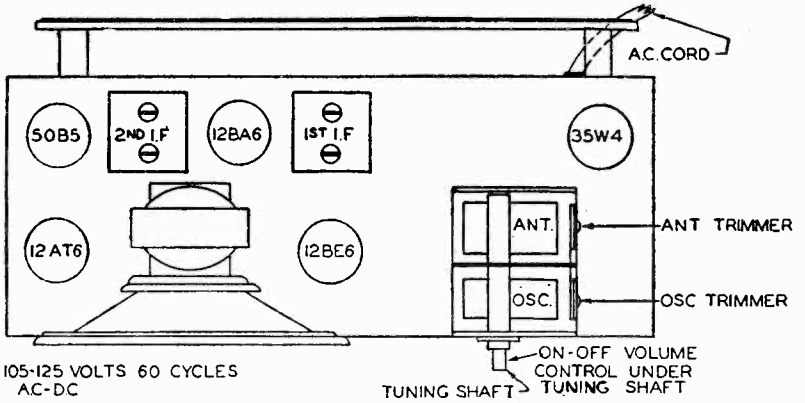
Remove chassis from cabinet for alignment.

A Signal Generator is required having the following frequencies: 455 KC, 1400 KC, 1650 KC. An output meter should be connected across the speaker.

The volume control of the receiver should be turned to maximum during the I. F. and all subsequent alignment and the generator output as low as possible to prevent the A. V. C. from working and giving false readings.

FIRST STEP: Connect the hot lead from the generator to the ANT. section of the gang condenser through the .1 MFD. condenser. The ground lead from the generator must be connected to "B" minus under the chassis. Turn the gang condenser to complete minimum capacity. Set the generator to 455 KC. Adjust the trimmers of the first and second I. F. transformers until a maximum reading is noted on the output meter.

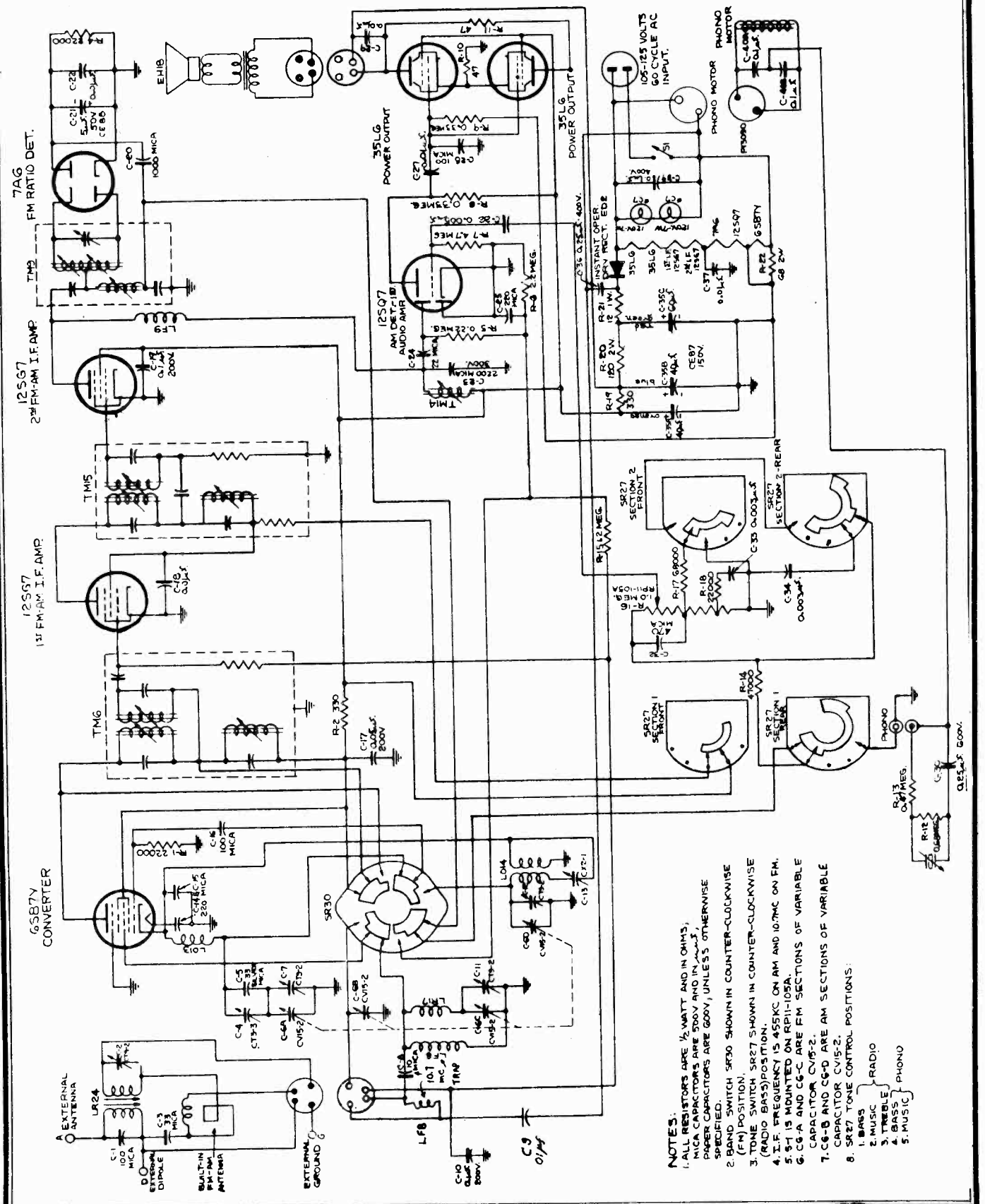
SECOND STEP: With the leads from the generator still connected in the same manner, adjust the Signal Generator to 1650 KC. Adjust the OSC. trimmer until the 1650 KC signal is tuned in. The gang condenser must be at complete minimum capacity for this adjustment.



THIRD STEP: Remove the generator leads from the gang condenser. Loosely couple the generator to the receiver loop by using a complete turn of wire. With the receiver and generator set at 1400 KC, increase the generator output. Adjust the ANT. trimmer until a maximum signal is noted on the output meter. No further adjustment should be made as the coils and gang condenser in this receiver have been specially handled at the factory to insure proper alignment at the lower frequencies.

SPIEGEL

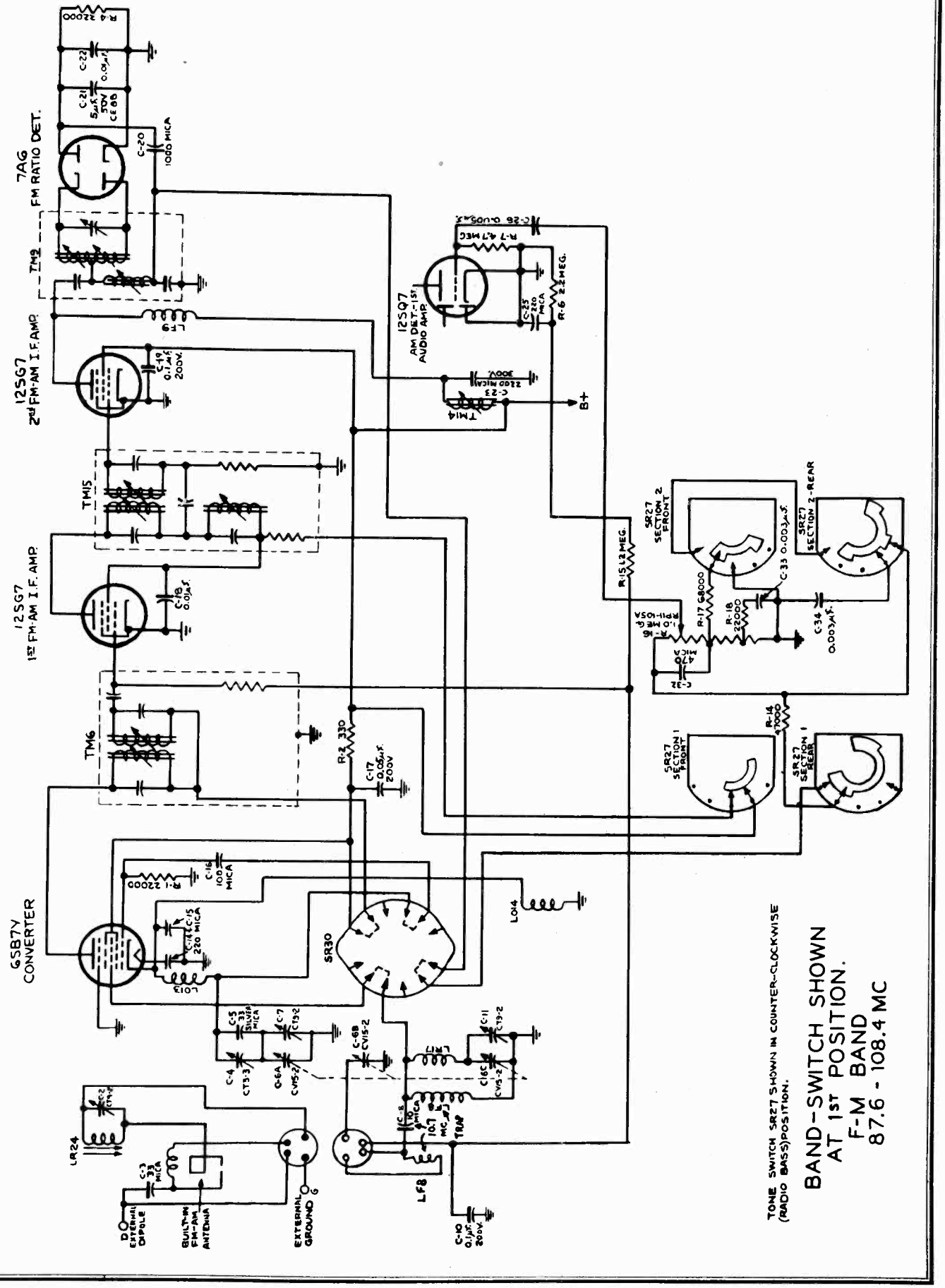
MODEL G725



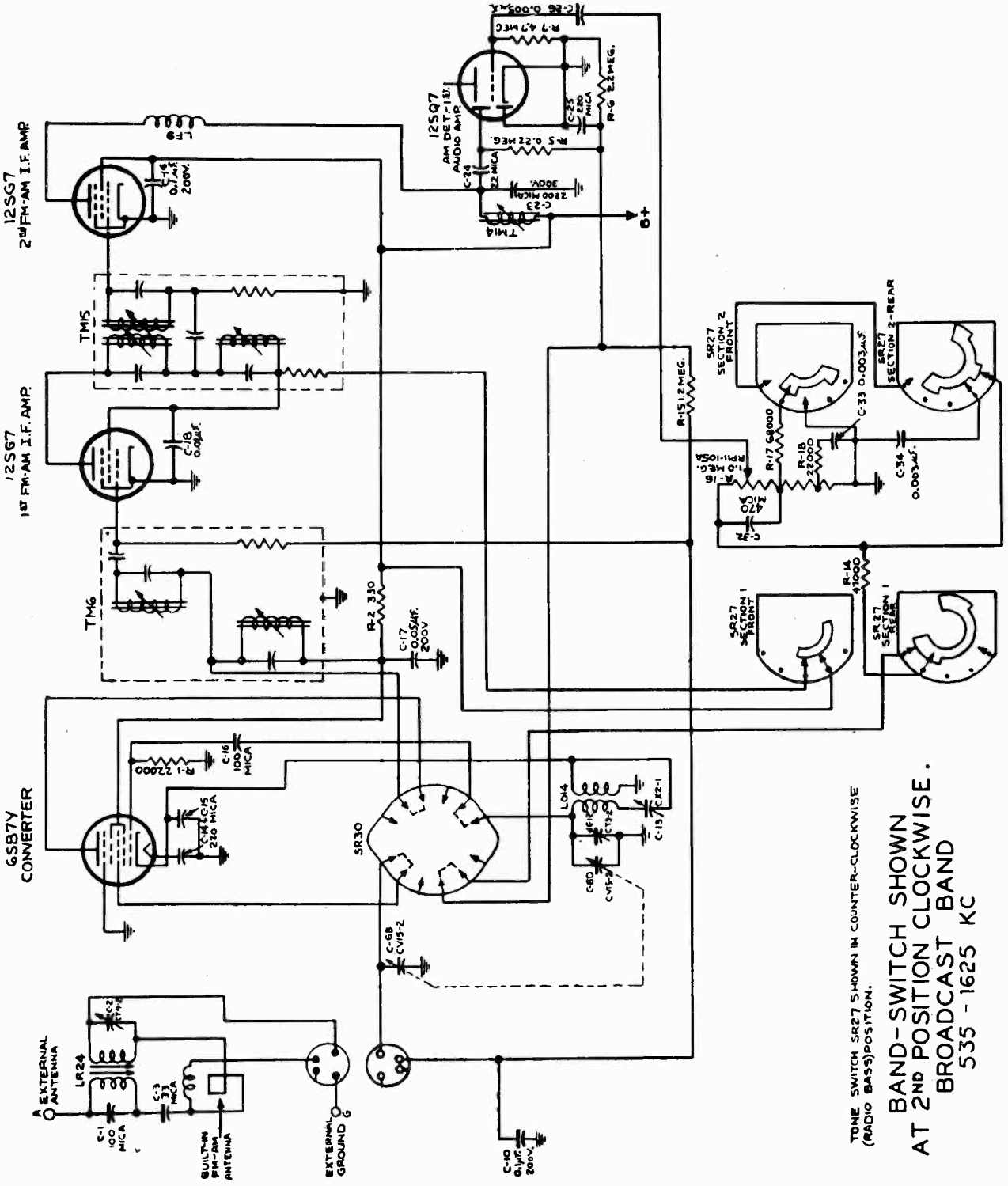
RECORD CHANGER: VM Model 800, RCD. CH. 17-1

MODEL G725

SPIEGEL



SPIEGEL MODEL G725



Alignment: No attempt should be made to realign this receiver until it has been determined that a poor tube or some local condition is not responsible for faulty reception. The following is a list of the minimum equipment necessary to realign this receiver.

1—AM signal generator covering 455 KC, 600 KC, 1550 KC and 10.7 MC

2—FM signal generator covering 10.7 MC, 92 MC and 106 MC

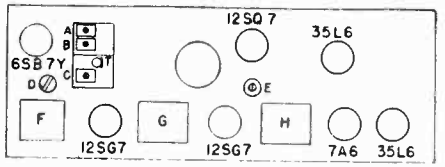
3—Output meter, rectifier type, approximately 0 to 2 volts RMS

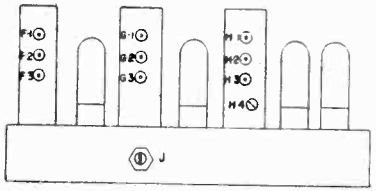
4—Dummy antennas

0.01 MFD Capacitor

300 Ohm Resistor

100MMFD Mica Capacitor

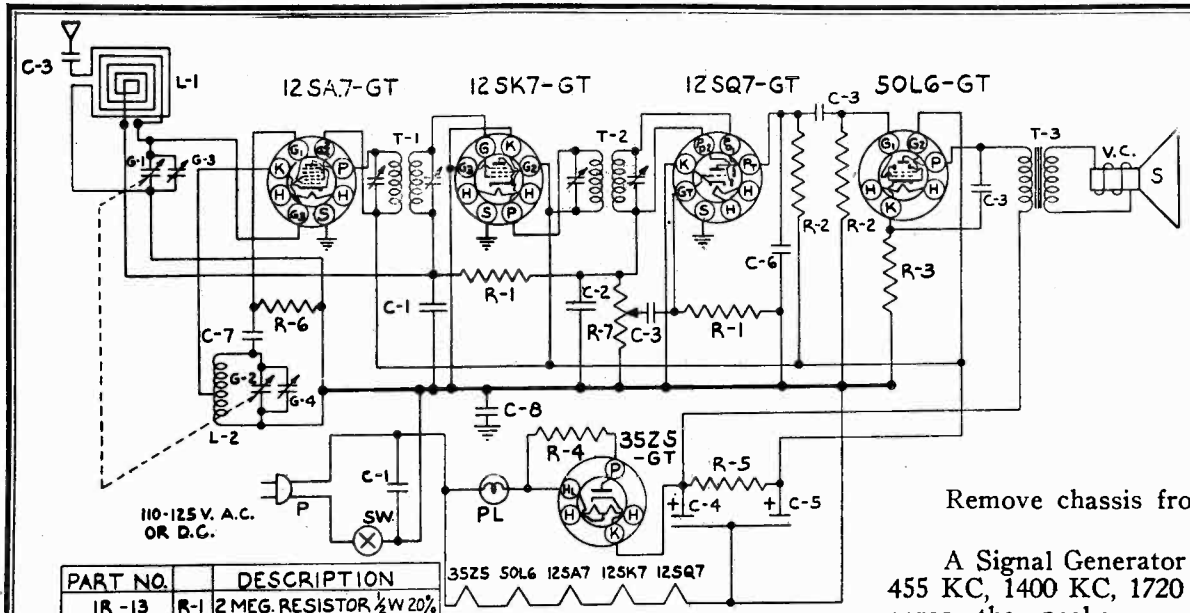




In the following alignment procedure the high side of the signal generator is connected to the terminal indicated in the "Signal Generator Coupling" column below. The ground side of the signal generator is connected directly to the chassis. The output meter should be connected across the voice coil of the speaker for all measurements.

In adjusting the radio frequency trimmers and padders it is advisable to "rock" the variable capacitor gang slightly across the signal being delivered by the signal generator until that particular signal has been accurately peaked.

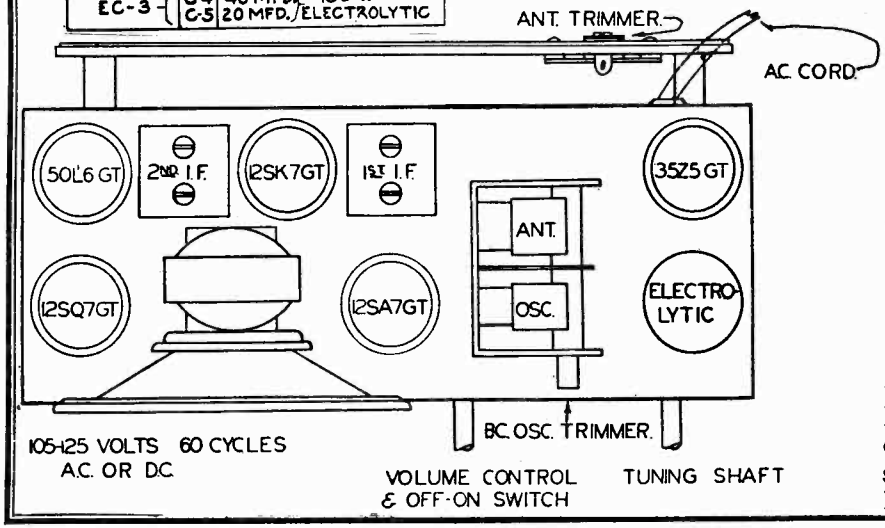
Dummy Antenna	Signal Generator Connection	Signal Generator Frequency	Band Switch Position	Radio Dial Setting	Adjust	Remarks
0.01 MFD	Terminal T	455 KC AM	Broadcast	1625 KC	E G-1 F-1	Adjust for maximum output Repeat for fine adjustment
0.01 MFD	Pin 4 of 12SG7 2nd FM-AM IF with FM Signal Gen.	10.7 MC FM	FM	108 MC	H-2	Adjust for maximum output (Broad adjustment)
0.01 MFD	"	10.7 MC FM	FM	108 MC	H-4	Adjust for maximum output
0.01 MFD	"	10.7 MC AM	FM	108 MC	H-1 or H-3	Adjust whichever is required for minimum output
						Repeat last two steps for fine adjustment until settings for maximum FM output coincide with settings for minimum AM output.
0.01 MFD	Pin 8 of 6SB7Y Converter	10.7 MC FM	FM	108 MC	G-3 — G-2	Adjust for maximum output
0.01 MFD		"	FM	108 MC	F-3 — F-2	Adjust for maximum output
						Repeat last two steps for fine adjustment
			Broadcast	535 KC	Pointer	Adjust pointer to reference mark
100 MMFD	"A" Post on Cabinet	600 KC AM	"	600 KC	J and Core on Ant. Coil in Cab.	Adjust for maximum output
"	"	1550 KC AM	"	1550 KC	B and trimmer on Ant. Coil	Adjust for maximum output
300 OHM Resistor	"	92 MC FM	FM	92 MC	D	Adjust for maximum output
"	"	106 MC FM	FM	106 MC	A and C	Adjust for maximum output



PART NO.		DESCRIPTION
IR-13	R-1	2 MEG. RESISTOR ½W 20%
IR-11	R-2	470M " " "
IR-14	R-3	150 " " "
IR-4	R-4	47 " " "
IR-15	R-5	2200 " " "
IR-16	R-6	33,000 " " "
V.C.-3	R-7	1 MEG. VOLUME CONTROL
GC-2	G-1, G-2	GANG COND.
TC-7	G-3	ANT. TRIMMER COND.
TC-6	G-4	OSC. TRIMMER COND.
PC-5	C-1	.05 MFD. COND. 400 V.
MC-2	C-2	.0001 MFD. MICA 20%
PC-7	C-3	.01 MFD. COND. 400 V.
EC-3	C-4	40 MFD. 150 V.
	C-5	20 MFD. ELECTROLYTIC

DATE 11-30-45

PART NO		DESCRIPTION
MC-5	C-6	.0005 MFD. COND. 20%
MC-4	C-7	.000056 MFD. MICA 20%
PC-9	C-8	.1 MFD COND. 400 V.
LL-1	L-1	LOOP ANTENNA
LO-2	L-2	OSC. COIL
LI-1	T-1	INPUT I.F. TRANSFORMER
LI-2	T-2	OUTPUT I.F. TRANSFORMER
	T-3	OUTPUT SPK. TRANSFORMER
SPK-4	V.C.	VOICE COIL
	S	P.M. SPEAKER
PB-1	PL	#47 PILOT BULB
	SW	A.C. SWITCH ON VOL. CONTROL
CO-1	P	LINE CORD
TU-3		12SA7 GT 12SK7 GT 12SQ7 GT 50L6 GT 35Z5 GT



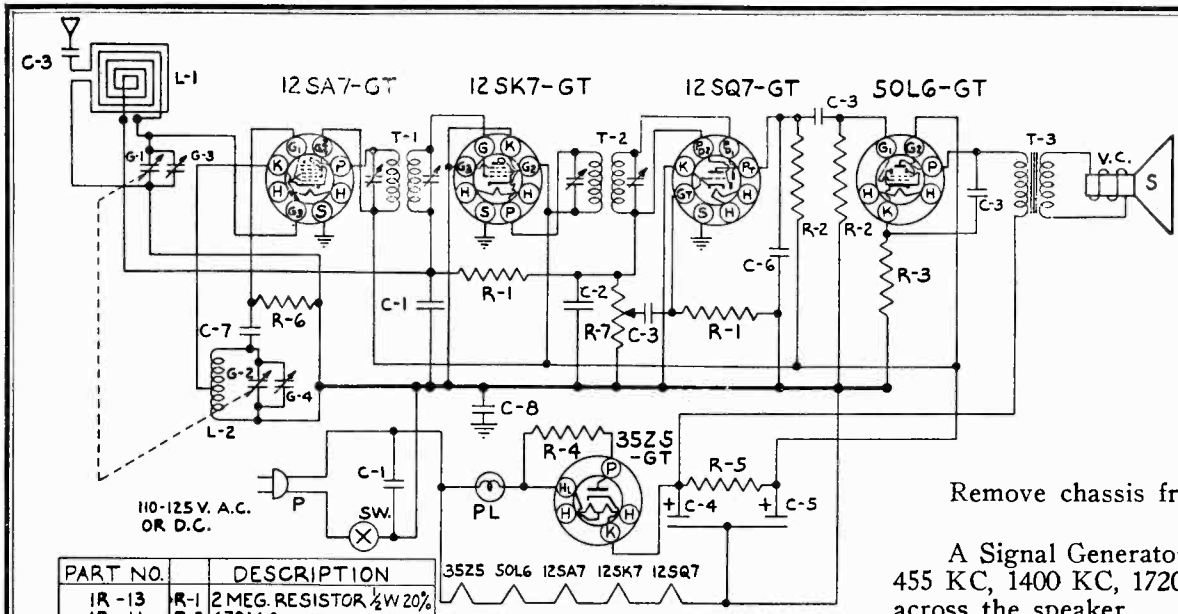
Remove chassis from cabinet for alignment.

A Signal Generator is required having the following frequencies: 455 KC, 1400 KC, 1720 KC. An output meter should be connected across the speaker.

FIRST STEP: Connect the hot lead from the generator to the ANT. section of the gang condenser, through a .1 MFD condenser. The ground lead from the generator must be connected to the metal frame of the gang condenser. Turn the gang condenser to complete minimum capacity. Adjust the generator to 455KC and adjust the trimmers of the 1st and 2nd I.F. transformers until a maximum reading is noted on the output meter.

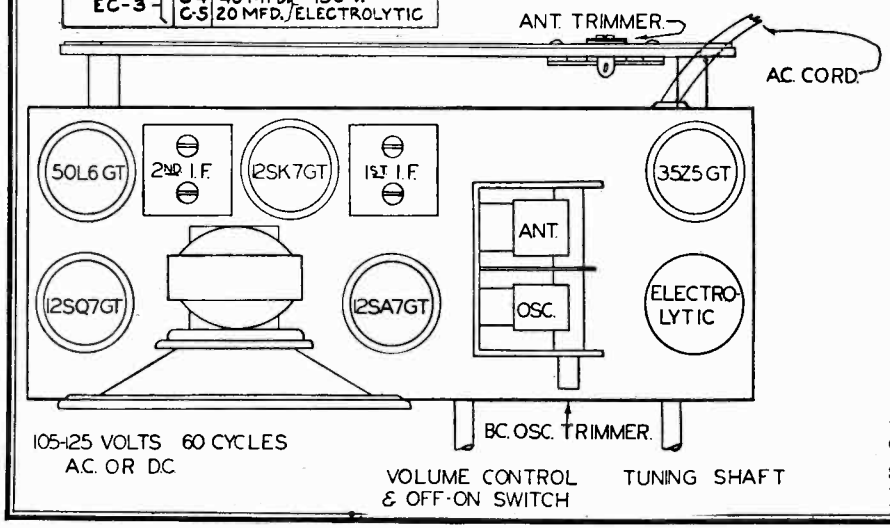
SECOND STEP: With the leads from the generator still connected in the same manner, adjust the Signal Generator to 1720 KC. The OSC. trimmer is located on the front of the chassis between the volume and tuning controls. Adjust this trimmer until the 1720 KC signal is tuned in.

THIRD STEP: Remove the hot lead of the generator from the ANT section of the gang condenser. Connect this lead to the antenna lead wire that projects from the back of the loop antenna through a 200 MMFD condenser. Adjust the Signal Generator to 1400 KC. Rotate the tuning control until this signal is tuned in. The ANT trimmer is located on the back of the loop antenna. Adjust this trimmer until a maximum reading is noted on the output meter. No further adjustment should be necessary, unless the set has been damaged, as the coils and condenser in this receiver have been specially handled at the factory to insure proper alignment at the lower frequencies.



PART NO.		DESCRIPTION
IR-13	R-1	2 MEG. RESISTOR ½W 20%
IR-11	R-2	470M " " "
IR-14	R-3	150 " " "
IR-4	R-4	47 " " "
IR-15	R-5	2200 " " "
IR-16	R-6	33,000 " " "
V.C.-3	R-7	1 MEG. VOLUME CONTROL
GC-2	G-1, G-2	GANG COND.
TC-7	G-3	ANT. TRIMMER COND.
TC-6	G-4	OSC. TRIMMER COND.
PC-5	C-1	.05 MFD. COND. 400 V.
MC-2	C-2	.0001 MFD. MICA 20%
PC-7	C-3	.01 MFD. COND. 400 V.
EC-3	C-4	40 MFD. 150 V.
	C-5	20 MFD. ELECTROLYTIC

DATE 11-30-45



PART NO		DESCRIPTION
MC-5	C-6	.0005 MFD. COND. 20%
MC-4	C-7	.000056 MFD. MICA 20%
PC-9	C-8	.1 MFD COND. 400 V.
LL-1	L-1	LOOP ANTENNA
LO-2	L-2	OSC. COIL
LI-1	T-1	INPUT I.F. TRANSFORMER
LI-2	T-2	OUTPUT I.F. TRANSFORMER
	T-3	OUTPUT SPK. TRANSFORMER
SPK-4	V.C.	VOICE COIL
	S	P.M. SPEAKER
PB-1	PL	#47 PILOT BULB
	SW	A.C. SWITCH ON VOL. CONTROL
CO-1	P	LINE CORD
TU-3		12SA7 GT 12SK7 GT 12SQ7 GT 50L6 GT 35Z5 GT

Remove chassis from cabinet for alignment.

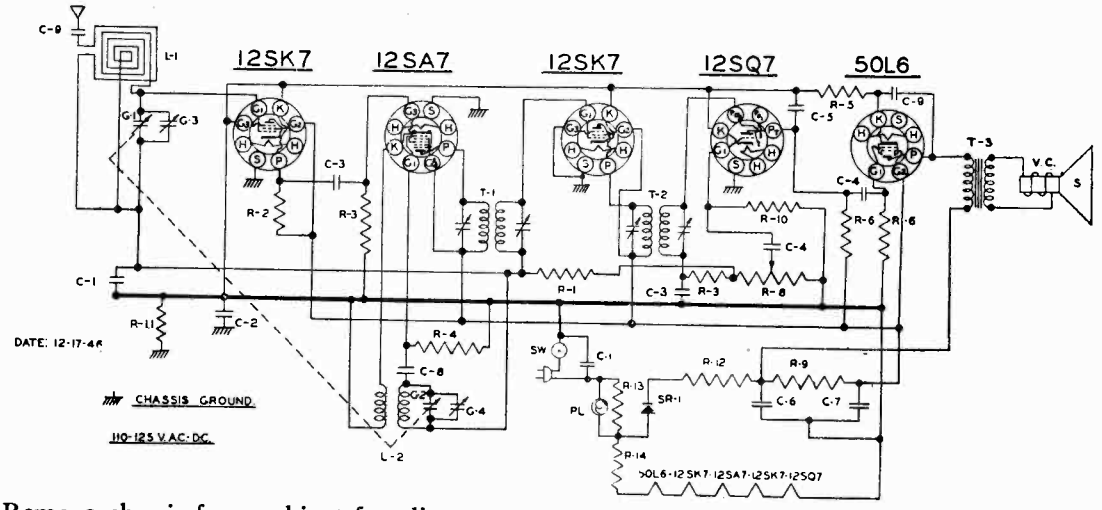
A Signal Generator is required having the following frequencies: 455 KC, 1400 KC, 1720 KC. An output meter should be connected across the speaker.

FIRST STEP: Connect the hot lead from the generator to the ANT. section of the gang condenser, through a .1 MFD condenser. The ground lead from the generator must be connected to the metal frame of the gang condenser. Turn the gang condenser to complete minimum capacity. Adjust the generator to 455KC and adjust the trimmers of the 1st and 2nd I.F. transformers until a maximum reading is noted on the output meter.

SECOND STEP: With the leads from the generator still connected in the same manner, adjust the Signal Generator to 1720 KC. The OSC. trimmer is located on the front of the chassis between the volume and tuning controls. Adjust this trimmer until the 1720 KC signal is tuned in.

THIRD STEP: Remove the hot lead of the generator from the ANT section of the gang condenser. Connect this lead to the antenna lead wire that projects from the back of the loop antenna through a 200 MMFD condenser. Adjust the Signal Generator to 1400 KC. Rotate the tuning control until this signal is tuned in. The ANT trimmer is located on the back of the loop antenna. Adjust this trimmer until a maximum reading is noted on the output meter. No further adjustment should be necessary, unless the set has been damaged, as the coils and condenser in this receiver have been specially handled at the factory to insure proper alignment at the lower frequencies.

SPIEGEL MODEL 5003



Remove chassis from cabinet for alignment.

A Signal Generator is required having the following frequencies: 455 KC, 1400 KC, 1720 KC. An output meter should be connected across the speaker.

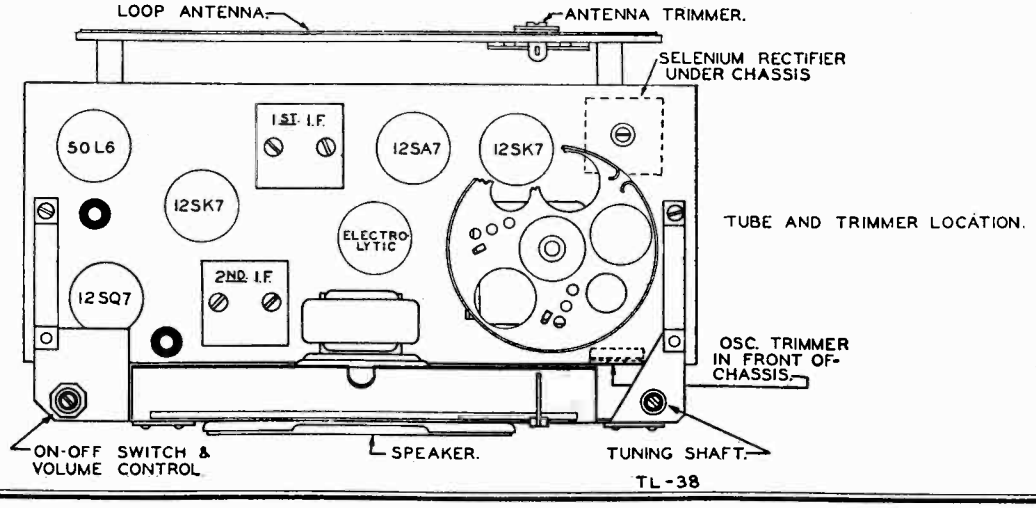
The receiver volume control should be turned to maximum during the I.F. and all subsequent alignments to keep the AVC from working and giving false readings. Keep the generator output as low as possible to prevent overloading.

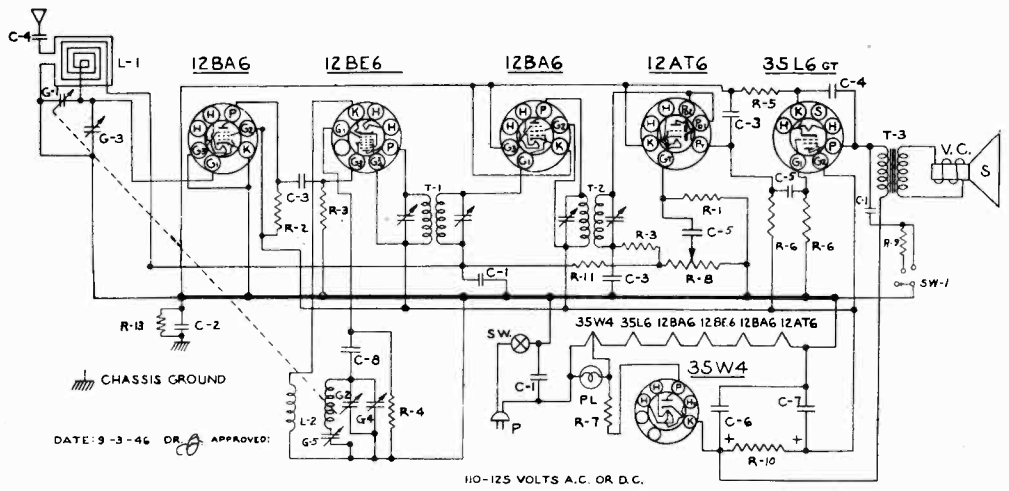
FIRST STEP: Connect the hot lead from the generator to the ANT. section of the gang condenser, through a .1 MFD condenser. The ground lead from the generator must be connected to the floating ground buss under the chassis. Turn the gang condenser to complete minimum capacity. Adjust the generator to 455KC and adjust the trimmers of the 1st and 2nd I.F. transformers until a maximum reading is noted on the output meter.

SECOND STEP: With the leads from the generator still connected in the same manner, adjust the Signal Generator to 1720 KC. The OSC. trimmer is located on the front of the chassis. Adjust this trimmer until the 1720 KC signal is tuned in.

THIRD STEP: Remove the hot lead of the generator from the ANT section of the gang condenser. Connect this lead to the primary of the loop antenna through a 200 MMFD condenser. Adjust the Signal Generator to 1400 KC. Rotate the tuning control until this signal is tuned in. The ANT trimmer is located on the back of the loop antenna. Adjust this trimmer until a maximum reading is noted on the output meter. No further adjustment should be necessary, unless the set has been damaged, as the coils and condenser in this receiver have been specially handled at the factory to insure proper alignment at the lower frequencies.

PART NO.		DESCRIPTION.
1R-23	R-1	3.9 MEG. RESISTOR 1/2W 20
1R-22	R-2	3900Ω RESISTOR 1/2 W. 10
1R-10	R-3	47M Ω RESISTOR 1/2W 20
1R-9	R-4	22M Ω RESISTOR 1/2 W. 20
1R-14	R-5	150 Ω RESISTOR 1/2 W. 20
1R-11	R-6	470M Ω RESISTOR 1/2 W. 20
VC-4	R-8	1MEG. VOLUME CONTROL
1R-25	R-9	2000 Ω RESISTOR 1 W. 10
1R-13	R-10	2 MEGΩ RESISTOR 1/2 W. 20
1R-20	R-11	220M Ω RESISTOR 1/2 W. 20
1R-35	R-12	75 Ω RESISTOR 2 W. 10
PC-5	C-1	.05 MFD CONDENSER 400 V.
PC-8	C-2	1 MFD CONDENSER 400 V.
MC-2	C-3	.0001MFD. MICA CONDENSER
PC-10	C-4	.005 MFD CONDENSER 400 V.
MC-5	C-5	.0005 MFD MICA CONDENSER.
EC-10	C-6	40MFD } 150 V ELECTROLYTIC
	C-7	40MFD }
MC-4	C-8	.0003 MFD MICA CONDENSER
PC-7	C-9	.01MFD CONDENSER 400V
LO-9	L-2	OSC COIL
CO-1	P	LINE CORD
PB-1	PL	PILOT LITE #47
LI-1	T1	INPUT IF TRANSFORMER
LI-2	T2	OUTPUT IF TRANSFORMER
LL-1	LI	LOOP ANTENNA
SPK-5	T3	SPK. TRANSFORMER
	VC	VOICE COIL
	S	P.M. SPEAKER
GC-2	G-1	GANG CONDENSER
	G-2	
TC-7	G-3	ANT TRIMMER CONDENSER.
TC-6	G-4	OSC. TRIMMER CONDENSER.
	SW.	SWITCH ON VOLUME CONTROL
TU-25		2/12SK7-12SA7-12SQ7 50L6
WR-4	R-13	30Ω } 3W. 5%
	R-14	90Ω }
SR-1	SR-1	SELENIUM RECTIFIER





PART NO.		DESCRIPTION
IR-13	R-1	2.2 MEG. RESISTOR 1-2 W. 20%
IR-22	R-2	3900 Ω RESISTOR 1-2 W. 20%
IR-10	R-3	47000 Ω RESISTOR 1-2 W. 20%
IR-9	R-4	22,000 Ω RESISTOR 1-2 W. 20%
IR-5	R-5	220 Ω RESISTOR 1-2 W. 10%
IR-11	R-6	470 MΩ RESISTOR 1-2 W. 20%
IR-17	R-7	33 Ω RESISTOR 1-2 W. 20%
VC-4	R-8	1 MEG. VOLUME CONTROL
IR-15	R-9	2200 Ω RESISTOR 1-2 W. 20%
IR-25	R-10	22.00 Ω RESISTOR 1 W. 10%
IR-23	R-11	3.3 MEG. RESISTOR 1-2 W. 20%
PC-5	C-1	.05 MFD. COND. 400 V.
PC-8	C-2	.1 MFD. COND. 400 V.
MC-3	C-3	220 MMFD. MICA COND. 20%
PC-7	C-4	.01 MFD. COND. 400 V.
PC-6	C-5	.005 MFD. COND. 600 V.. 20%

Remove the chassis from the cabinet for alignment.

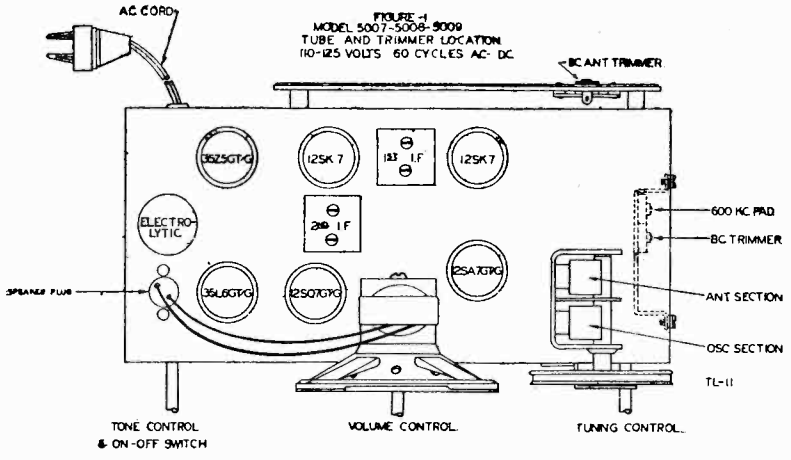
A signal generator is required, having the following frequencies: 455 KC, 1400 KC, 1730 KC. An output meter should be connected across the speaker.

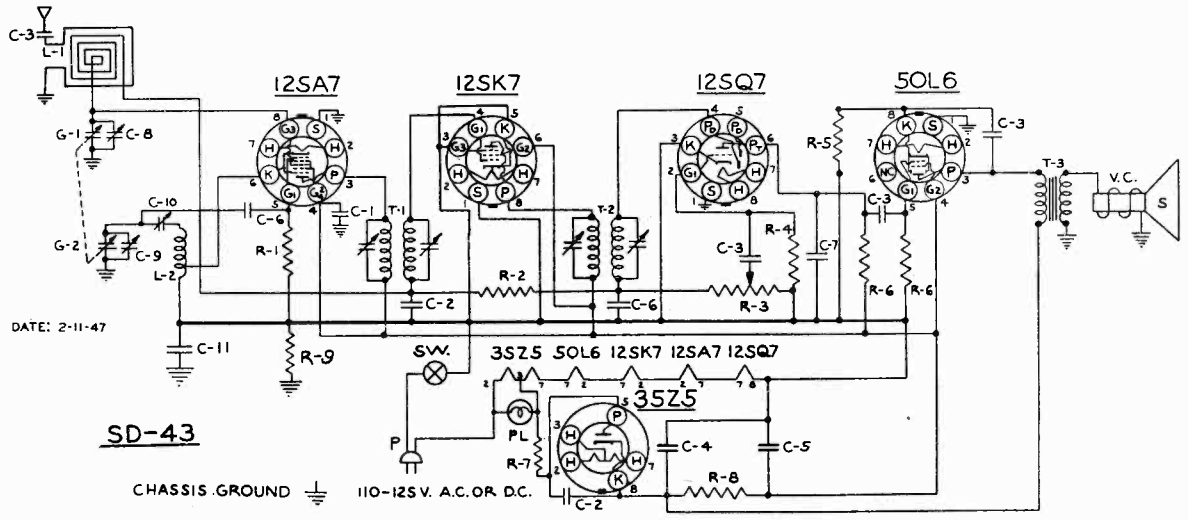
I. F. ALIGNMENT: — Connect the generator lead through a .1 MFD Condenser to the terminal lug on the "Antenna" section of the gang condenser. The ground lead from the generator should be connected to the gang frame. Set the generator at 455 KC. Adjust the trimmer screws in the 1st and 2nd I. F. cans (See Fig. 1) until a maximum reading is noted on the output meter.

The receiver volume control should be turned to maximum during the I. F. and all subsequent alignments, to keep the AVC from working and giving false readings. Keep the generator output as low as possible to prevent overloading.

BC. OR BROADCAST ALIGNMENT: — With the generator leads still connected as in I. F. Alignment, rotate the tuning condenser to complete minimum capacity. Set the generator to 1730 KC. Adjust the BC. oscillator trimmer until the signal is tuned in. Next remove the hot lead of the generator from the "Ant" section of the gang condenser. Connect this lead to the antenna lead wire that projects from the back of the loop antenna through a 200 MMFD condenser. Set the generator to 1400 KC and rotate the tuning condenser until the signal is tuned in. Adjust the BC. antenna trimmer until a maximum reading is noted on the output meter. Set the generator to 600 KC and turn the tuning control until the signal is tuned in. Rock the tuning control back and forth slowly and at the same time adjust the 600 KC pad, slowly to the right or left until a maximum reading is noted on the output meter. It is advisable to return to the 1730 KC adjustment and re-check that setting to make sure it has not changed while padding at 600 KC.

PART NO.		DESCRIPTION	PART NO.		DESCRIPTION
EC-12	C-6	40 MFD.	TC-6	G-4	O.S.C. TRIMMER COND.
	C-7	20 MFD. 150 V. ELECTROLYTIC	CO-1	P	LINE CORD
MC-4	C-8	50 MMFD. MICA COND. 20%	TC-9	G-5	600 KC. PADDING COND.
SW-2	SW-1	TONE SWITCH	TU-	—	12BA6 12BE6 12BA6
LL-2	L-1	LOOP ANTENNA			12AT6 35L6 GT 35W4
LO-3	L-2	OSC. COIL			
L1-6	T-1	INPUT I.F. TRANSFORMER			
L1-7	T-2	OUTPUT I.F. TRANSFORMER			
	T-3	OUTPUT SPK. TRANS.			
SPK-4	V.C.	VOICE COIL			
	S	P.M. SPEAKER			
PB-1	PL	#47 PILOT BULB			
GC-1	G-1	GANG CONDENSER			
	G-2				
TC-7	G-3	ANT. TRIMMER COND.			
IR-20	R-13	220,000 Ω RESISTOR 1-2 W. 20%			





Remove chassis from cabinet for alignment.

A Signal Generator is required having the following frequencies: 455 KC, 1400 KC, 1720 KC. An output meter should be connected across the speaker.

The receiver volume control should be turned to maximum during the I.F. and all subsequent alignments to keep the AVC from working and giving false readings. Keep the generator output as low as possible to prevent overloading.

FIRST STEP: Connect the hot lead from the generator to the ANT. section of the gang condenser, through a .1 MFD condenser. The ground lead from the generator must be connected to the floating ground buss under the chassis. Turn the gang condenser to complete minimum capacity. Adjust the generator to 455KC and adjust the trimmers of the 1st and 2nd I.F. transformers until a maximum reading is noted on the output meter.

SECOND STEP: With the leads from the generator still connected in the same manner, adjust the Signal Generator to 1720 KC. The OSC. trimmer is located on the front of the chassis. Adjust this trimmer until the 1720 KC signal is tuned in.

THIRD STEP: Remove the hot lead of the generator from the ANT section of the gang condenser. Connect this lead to the primary of the loop antenna through a 200 MMFD condenser. Adjust the Signal Generator to 1400 KC. Rotate the tuning control until this signal is tuned in. The ANT trimmer is located on the top of the ANT. section of the gang condenser. Adjust this trimmer until a maximum reading is noted on the output meter. No further adjustment should be necessary, unless the set has been damaged, as the coils and condenser in this receiver have been specially handled at the factory to insure proper alignment at the lower frequencies.

PART NO.		DESCRIPTION
1R-9	R-1	22,000 Ω RESISTOR ½W.20%
1R-23	R-2	3.9 MEG. RESISTOR ½W.20%
VC-4	R-3	1 MEG. VOL. CONTROL & SW.
1R-13	R-4	2 MEG. RESISTOR ½W.20%
1R-14	R-5	150 Ω RESISTOR ½W.20%
1R-11	R-6	470M Ω RESISTOR ½W.20%
1R-17	R-7	39 Ω RESISTOR ½W.20%
1R-25	R-8	2000 Ω RESISTOR 1W.10%
PC-8	C-1	.1MFD.COND.-400V.
PC-5	C-2	.05 MFD. COND.-400V.
PC-7	C-3	.01 MFD. COND.-400V.
EC-8	C-4	40 MFD. 150 V. ELECTROLYTIC
	C-5	20 MFD.
MC-2	C-6	100 MMFD. MICA COND.
MC-5	C-7	500MMFD. MICA COND.
PC-9	C-11	.25 MFD. COND.-400V.
TC-7	C-8	ANTENNA TRIMMER COND
TC-6	C-9	OSC. TRIMMER COND.
TC-9	C-10	OSC. PADDING COND.
1R-20	R-9	220M Ω RESISTOR ½W 20%
GC-1	G-1	GANG CONDENSER
	G-2	
LL-4	L-1	LOOP ANTENNA
LO-7	L-2	OSC. COIL
LI-1	T-1	INPUT I.F. TRANSFORMER
LI-2	T-2	OUTPUT I.F. TRANSFORMER
	T-3	OUTPUT SPKR. TRANSFORMER
SPK-6	V.C.	VOICE COIL
	S	P.M. SPEAKER
PB-1	PL	No. 47 PILOT BULB
	SW.	A.C. SW. ON VOL. CONTROL
CO-1	P	LINE CORD
TU-3	———	12SA7 GT 12SK7 GT 12SQ7 GT 50L6GT 3SZ5GT

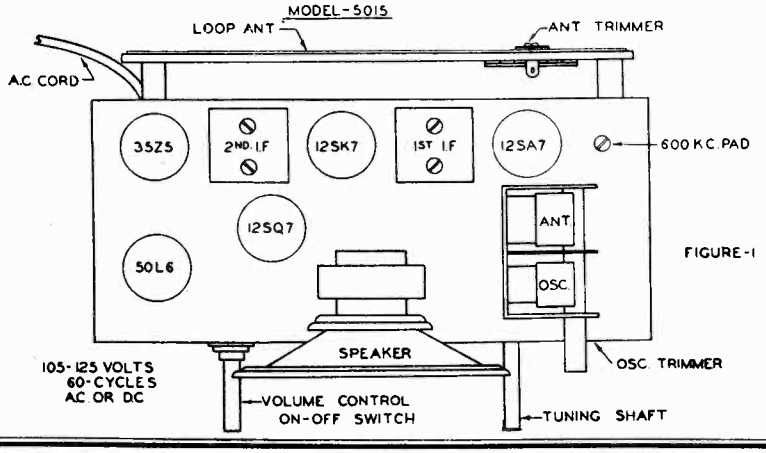
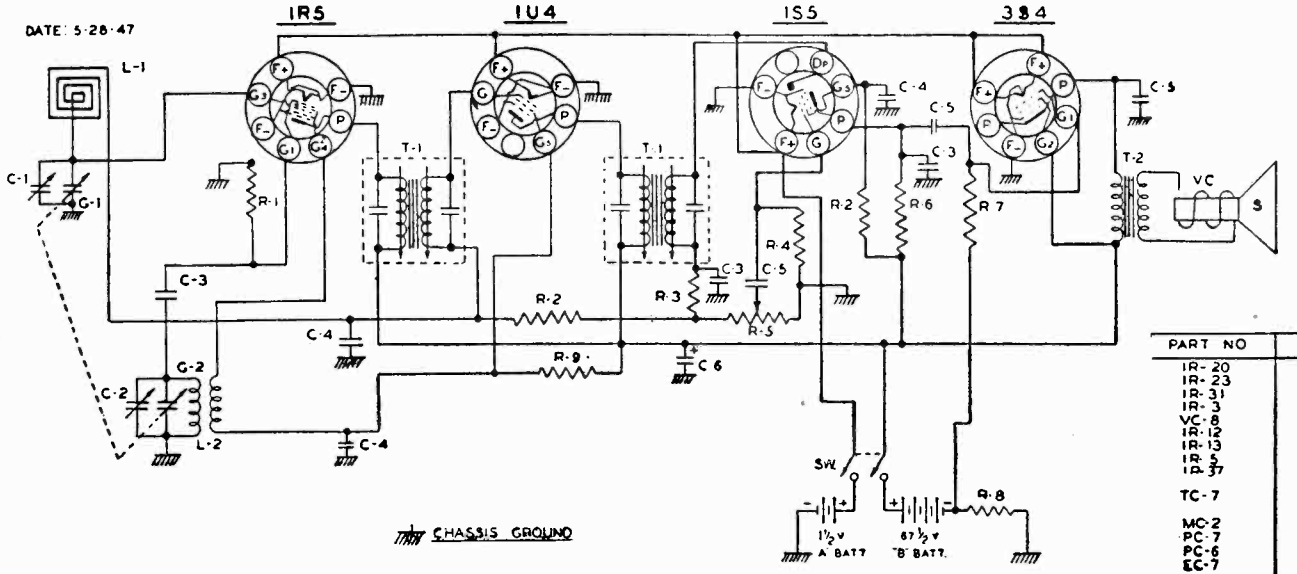


FIGURE-1



PART NO		DESCRIPTION
1R-20	R-1	220MΩ RESISTOR 1/2W 20 %
1R-23	R-2	3.3MEG RESISTOR 1/2W 20 %
1R-31	R-3	82MΩ RESISTOR 1/2W 10 %
1R-3	R-4	10MEG RESISTOR 1/2W 20 %
VC-8	R-5	1MEG VOLUME CONTROL
1R-12	R-6	1MEG RESISTOR 1/2W 20 %
1R-13	R-7	2.2MEG RESISTOR 1/2W 20 %
1R-5	R-8	220Ω RESISTOR 1/2W 10 %
1R-37	R-9	10MΩ RESISTOR 1/2W 20 %
TC-7	C-1	ANT. TRIMMER
	C-2	OSC TRIMMER ON GANG
MC-2	C-3	100MMFD MICA CONDENSER
PC-7	C-4	.01 MFD 400 V.
PC-6	C-5	.005 MFD 600 V.
EC-7	C-6	20MFD 80WV.
GC-4	G-1, G-2	GANG CONDENSER
LL-8	L-1	LOOP ANTENNA
LO-12	L-2	OSC. COIL
LI-5	T-1	I.F. TRANSFORMER
	SW	DPST. SWITCH ON VOLUME CONTROL
SPK-8	T-2	SPEAKER TRANSFORMER
	VC, S	VOICE COIL PM SPEAKER
TU-29		1R5-1U4-1S5-3S4

Remove chassis from cabinet for alignment. A signal generator is required having the following frequencies: 455 KC and 1400 KC. An output meter should be connected across the speaker.

FIRST STEP: Connect the hot lead from the generator to the ANT. section of the gang condenser, through a .1 MFD. condenser. The ground lead from the generator may be connected to any spot on the metal chassis. Turn the gang condenser to complete minimum capacity. Set the generator to 455 KC. Adjust the movable iron cores in the IF cans. These IF adjustments are made in the top and in the bottom of the can under the chassis. Adjust the cores until a maximum reading is noted on the output meter.

The volume control of the receiver should be turned to maximum during the IF and all subsequent alignment and the generator output as low as possible to prevent the AVC from working and giving false readings.

SECOND STEP: With the leads from the generator still connected as in IF alignment, adjust the generator to 1400 KC. Set the dial pointer to 1400 KC on the dial scale. Adjust the oscillator trimmer until the signal is tuned in.

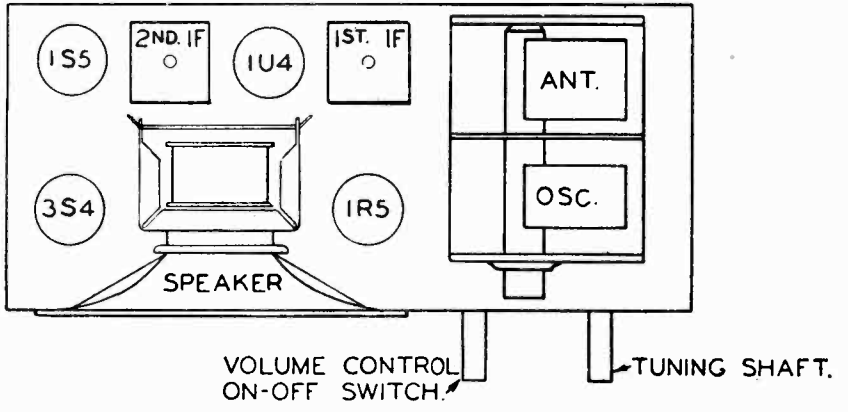
THIRD STEP: Remove the generator leads from the gang condenser.

Replace the chassis in the cabinet. Loosely couple the generator to the receiver loop by making a complete turn over the outside of the cabinet. With the receiver and the generator still set at 1400 KC increase the generator output. Adjust the Antenna trimmer through the back of the chassis until a maximum signal is noted on the output meter.

No further adjustment should be necessary as the coils and gang condenser in this receiver have been specially handled at the factory to insure proper alignment at the lower frequencies.

NOTE: When the antenna trimmer is adjusted at 1400 KC., the chassis as well as the "A" and "B" batteries must be in normal position in the cabinet to reflect the proper loop impedance.

TUBE AND TRIMMER LOCATION.



BATTERY SERVICING

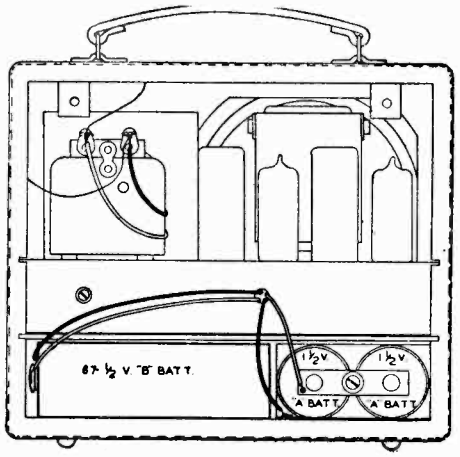
MODEL 5019

Eveready 67½ vlt. #467

Burgess 67½ vlt. #XX45

General 67½ vlt. #W45A

Ray-O-Vac 67½ vlt. #4367



To replace the batteries in this receiver loosen and remove the screw in the back of the cabinet. Remove the back.

To the right looking at the rear of the cabinet is the "A" or flashlight battery assembly. Remove the battery assembly from the cabinet. Loosen the screw in the cross arm assembly until the batteries may be removed. Replace with fresh batteries and retighten the screw making sure that the battery center caps fit into the small recesses in the ends of the cross arm.

To replace the "B" battery, remove it from the cabinet. Disconnect the fasteners from the battery. Replace with a fresh battery and reconnect the fasteners. When replacing the "B" battery in the cabinet, make sure that the terminal end of the battery faces the end of the cabinet.

After the batteries have been installed, replace the back, making sure that the two washers in the bottom of the back fit into the slot near the bottom edge of the cabinet. Replace and tighten the screw.

CAUTION: If the batteries in the receiver wear out from use and the receiver refuses to operate make sure that the volume control is turned all the way to the left in "OFF" position, until the batteries can be replaced. If the switch is left in the "ON" position this will cause the battery cells to burst and they will leak into the receiver which may ruin the component parts.

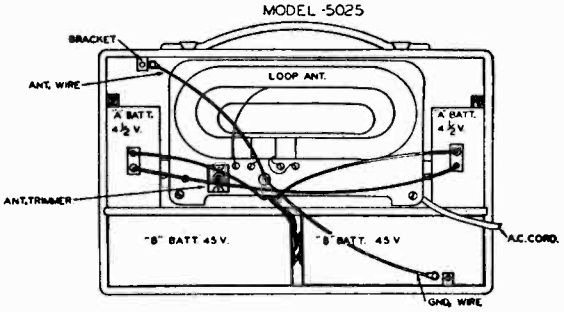
MODEL 5025

"B" BATTERIES
(2 Required)

Mfgr.	Volts	Type No.
Burgess	45 "B"	M30
General	45 "B"	W30B
Bright Star	45 "B"	3033
Usalite	45 "B"	640
Rayovac	45 "B"	P7830
Eveready	45 "B"	482

"A" BATTERIES
(2 Required)

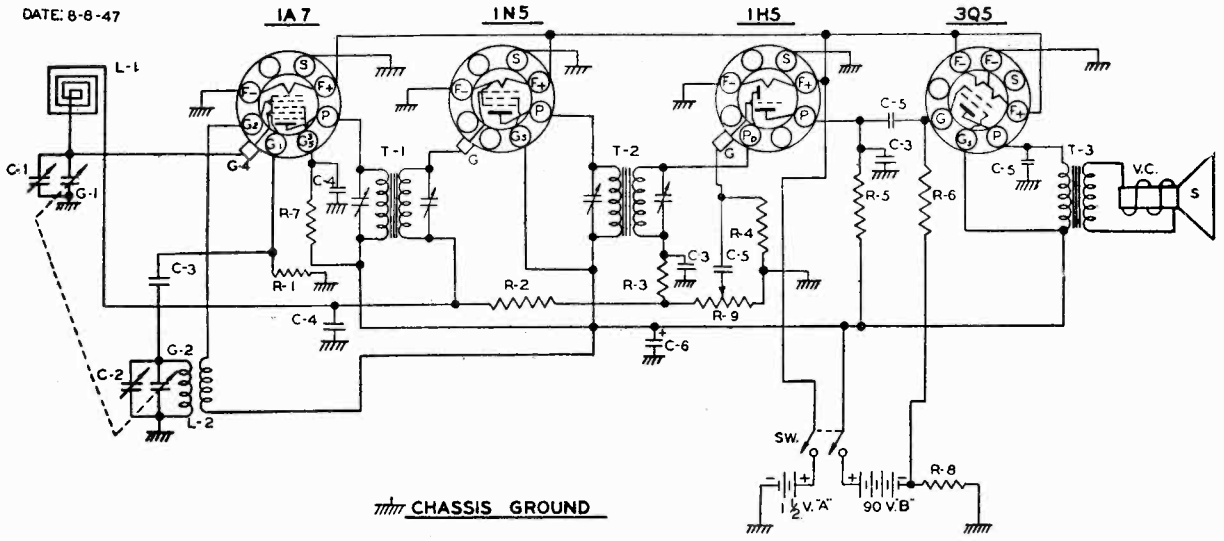
Burgess	4½ "A"	G3
General	4½ "A"	3H3
Bright Star	4½ "A"	361
Usalite	4½ "A"	683
Rayovac	4½ "A"	P83A
Eveready	4½ "A"	746



BATTERY LOCATION.

To replace batteries, loosen and remove the two screws at the left and right hand corners of the cabinet back. Remove the back and pull out the plug from each battery. Never pull on the wires connected to the plugs as they may break. Always grasp the plug form between the fingers, or use a flat blade to pry out the plug. Observe with care the position of the batteries and plugs when replacing. Be sure that batteries and plugs are replaced as shown in the "Battery Location" diagram. (Figure No. 1)

After the batteries have been installed, replace the back. Make sure that the two wires from the loop antenna are held in place between the brackets of the cabinet and the back by the two fastening screws.



Remove chassis from cabinet for alignment. A signal generator is required having the following frequencies: 455 KC and 1400 KC An output meter should be connected across the speaker.

FIRST STEP: Connect the hot lead from the generator to the ANT. section of the gang condenser, through a .1 MFD. condenser. The ground lead from the generator may be connected to any spot on the metal chassis. Turn the gang condenser to complete minimum capacity. Set the generator to 455 KC. Adjust the movable trimmers in the IF cans, until a maximum reading is noted on the output meter.

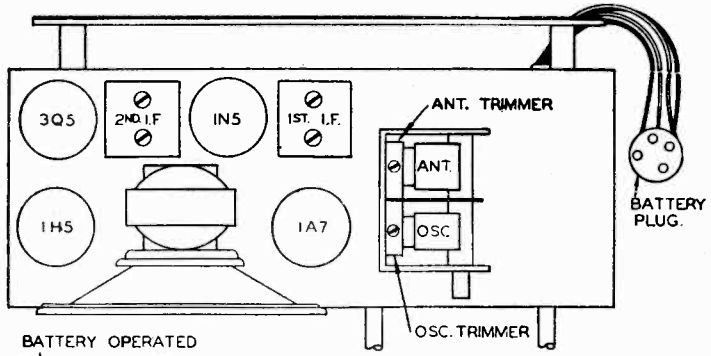
The volume control of the receiver should be turned to maximum during the IF and all subsequent alignment and the generator output as low as possible to prevent the AVC from working and giving false readings.

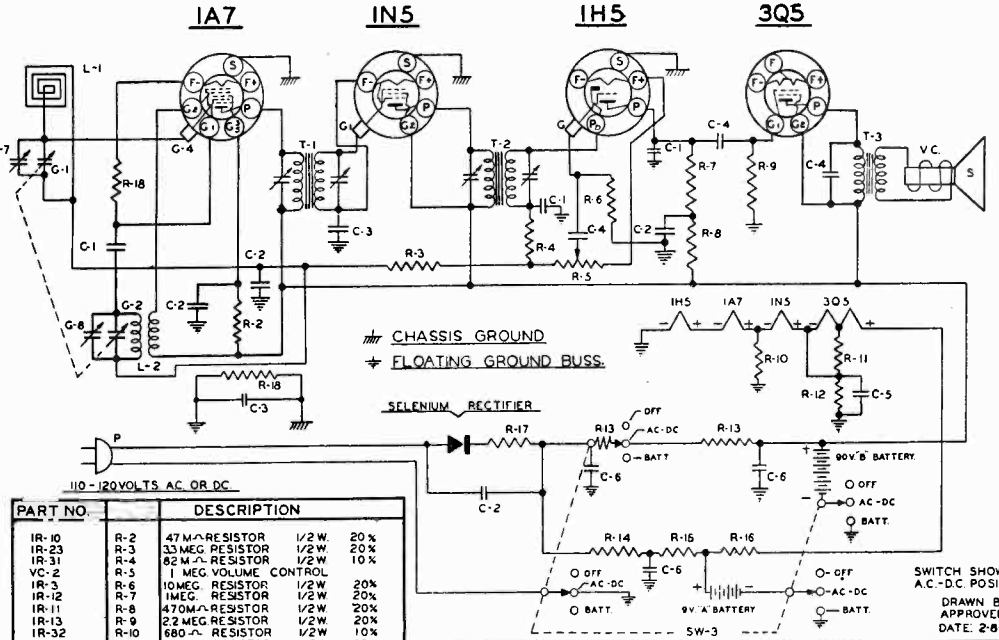
SECOND STEP: With the leads from the generator still connected as in IF alignment, adjust the generator to 400 KC. Set the dial pointer to 1400 KC on the dial scale. Adjust the oscillator trimmer until the signal is tuned in.

THIRD STEP: Remove the generator leads from the condenser. Connect the hot lead from the generator through a 200 MMFD. condenser to one of the leads which project from the back of the loop antenna. Connect the ground lead of the generator to the remaining lead. With the generator and the receiver still tuned to 1400 KC, adjust the antenna trimmer until a maximum reading is noted on the output meter.

PART NO.		DESCRIPTION.	PART NO.		DESCRIPTION.
IR-20	R-1	220M RESISTOR 1/2 W 20	GC-5	G-1	GANG CONDENSER.
IR-23	R-2	.33MEG RESISTOR 1/2 W 20		G-2	
IR-31	R-3	82M RESISTOR 1/2 W 10	LL-5	L-1	LOOP ANTENNA
IR-3	R-4	10MEG RESISTOR 1/2 W 20	LO-12	L-2	OSC. COIL
IR-12	R-5	1MEG RESISTOR 1/2 W 20	LI-3	T-1	INPUT I.F. TRANSFORMER
IR-13	R-6	2.2MEG RESISTOR 1/2 W 20	LI-4	T-2	OUTPUT I.F. TRANSFORMER
IR-16	R-7	33M RESISTOR 1/2 W 20		T-3	SPEAKER TRANSFORMER
IR-5	R-8	220 RESISTOR 1/2 W 10	SPK-	V.C.	VOICE COIL
VC-10	R-9	1MEG. VOLUME CONTROL.		S	PM. SPEAKER
	C-1	ANT. TRIMMER		SW	D.P.S.T. SWITCH ON VOLUME CONTROL
MC-2	C-2	OSC. TRIMMER			
PC-5	C-3	100 MMFD. MICA. CONDENSER.			
PC-6	C-4	.05 CONDENSER 400 V.			
EC-13	C-5	.005 CONDENSER 600 V.			
	C-6	8 MFD-150 V. ELECTROLYTIC CONDENSER			

TUBE AND TRIMMER LOCATION.



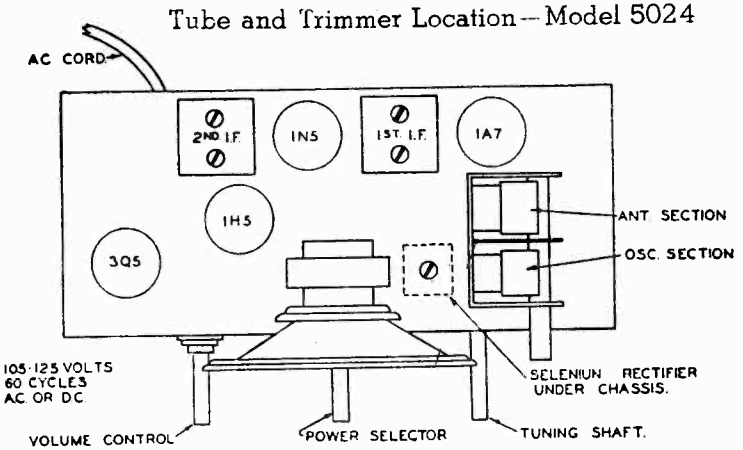


PART NO.		DESCRIPTION	
IR-10	R-2	.47 M Ω RESISTOR	1/2 W. 20%
IR-23	R-3	33 MEG. RESISTOR	1/2 W. 20%
IR-31	R-4	82 M Ω RESISTOR	1/2 W. 10%
VC-2	R-5	1 MEG. VOLUME CONTROL	
IR-3	R-6	10 MEG. RESISTOR	1/2 W. 20%
IR-12	R-7	1 MEG. RESISTOR	1/2 W. 20%
IR-11	R-8	470 M Ω RESISTOR	1/2 W. 20%
IR-13	R-9	2.2 MEG. RESISTOR	1/2 W. 20%
IR-32	R-10	680 Ω RESISTOR	1/2 W. 10%
IR-33	R-11	270 Ω RESISTOR	1/2 W. 10%
IR-21	R-12	330 Ω RESISTOR	1/2 W. 10%
IR-39	R-13	620 Ω RESISTOR	1/2 W. 5%
WR-3A	R-14	1050 Ω	CANDOHM RESISTOR
	R-15	1050 Ω	
	R-16	40 Ω	
IR-35	R-17	82 Ω WIREWOUND RESISTOR	2 W. 10%
IR-20	R-18	220 M Ω RESISTOR	1/2 W. 20%
MC-2	C-1	100 MMFD. CONDENSER. [MICA]	
PC-5	C-2	.05 MFD. CONDENSER	400 V.
PC-8	C-3	.1 MFD. CONDENSER	400 V.
PC-6	C-4	.005 MFD. CONDENSER	600 V.

PART NO.		DESCRIPTION
EC-6	C-5	70 MFD. 10 V. ELECTROLYTIC
EC-4	C-6	40-40-40-150 V. ELECTROLYTIC
TC-7	C-7	ANTENNA TRIMMER
	G-8	OSC. TRIMMER.
GC-4	G-1	GANG CONDENSER
	G-2	
LL-10	L-1	LOOP ANNTENNA
LO-8	L-2	OSC. COIL
LI-3	T-1	INPUT I.F. TRANSFORMER
LI-4	T-2	OUTPUT I.F. TRANSFORMER
CO-1	P	LINE CORD

PART NO.		DESCRIPTION
SPK-5	T-3	OUTPUT SPEAKER TRANSFORMER
	VC	VOICE COIL
	S	P.M. SPEAKER
SW-5	SW-3	4 POLE 3 POSITION
SR-1	—	SELENIUM RECTIFIER
TU-11	—	1A7- 1N5 - 1H5 - 3Q5
"A" BATTERY		9 VOLTS
"B" BATTERY		90 VOLTS

Tube and Trimmer Location—Model 5024



ALIGNMENT AND SERVICE DATA

Remove chassis from cabinet for alignment.

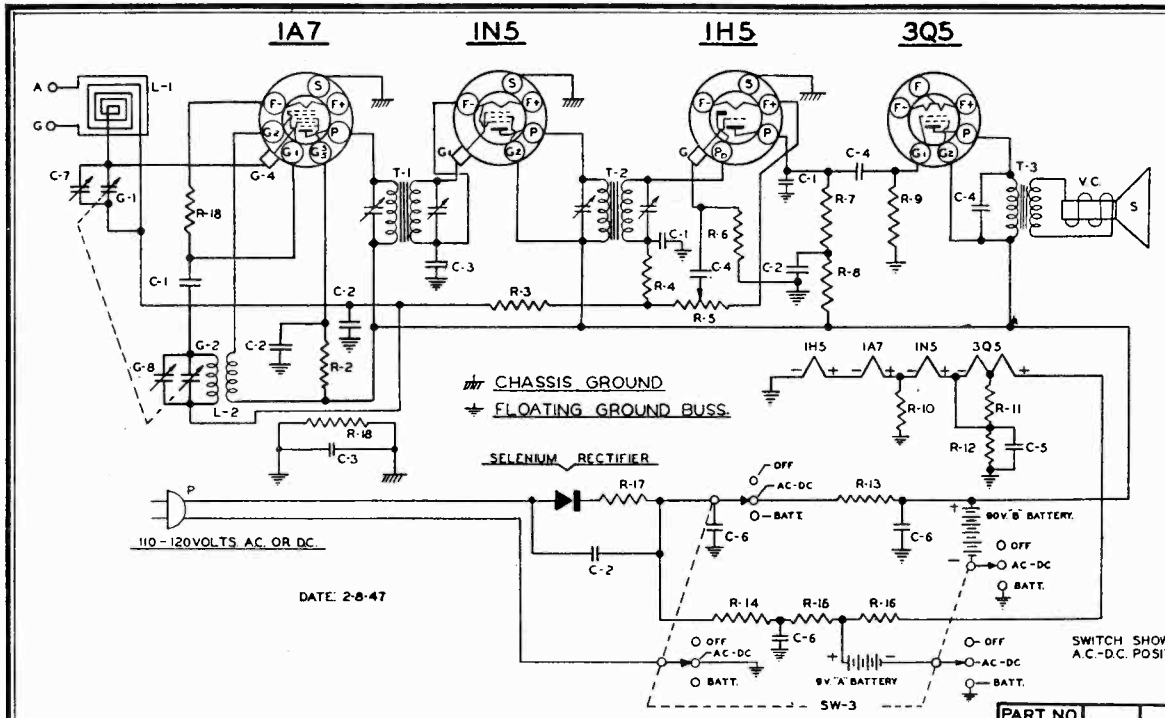
A Signal Generator is required having the following frequencies 455 KC, 1400 KC, 1650 KC. An output meter should be connected across the speaker.

The volume control of the receiver should be turned to maximum during the I. F. and all subsequent alignment and the generator output as low as possible to prevent the A. V. C. from working and giving false readings.

FIRST STEP: Connect the hot lead from the generator to the ANT. section of the gang condenser through the .1 MFD. condenser. The ground lead from the generator must be connected to "B" minus under the chassis. Turn the gang condenser to complete minimum capacity. Set the generator to 455 KC. Adjust the trimmers of the first and second I. F. transformers until a maximum reading is noted on the output meter.

SECOND STEP: With the leads from the generator still connected in the same manner, adjust the Signal Generator to 1650 KC. Adjust the OSC. trimmer until the 1650 KC signal is tuned in. The gang condenser must be at complete minimum capacity for this adjustment.

THIRD STEP: Remove the generator leads from the gang condenser. Loosely couple the generator to the receiver loop by making a complete turn of wire over the outside of the cabinet. With the receiver and generator set at 1400 KC, increase the generator output. Adjust the ANT. trimmer until a maximum signal is noted on the output meter. No further adjustment should be made as the coils and gang condenser in this receiver have been specially handled at the factory to insure proper alignment at the lower frequencies.



PART NO.		DESCRIPTION
IR-10	R-2	.47 MΩ RESISTOR 1/2 W 20%
IR-23	R-3	.33 MEG. RESISTOR 1/2 W 20%
IR-31	R-4	.82 MΩ RESISTOR 1/2 W 10%
VC-2	R-5	1 MEG VOLUME CONTROL
IR-3	R-6	10 MEG. RESISTOR 1/2 W 20%
IR-12	R-7	1 MEG. RESISTOR 1/2 W 20%
IR-11	R-8	470 MΩ RESISTOR 1/2 W 20%
IR-13	R-9	2.2 MEG. RESISTOR 1/2 W. 20%
IR-32	R-10	680 Ω RESISTOR 1/2 W 10%
IR-33	R-11	270 Ω RESISTOR 1/2 W 10%
IR-21	R-12	330 Ω RESISTOR 1/2 W 10%
IR-34	R-13	1200 Ω RESISTOR 1/2 W. 10%
WR-3	R-14	1050 Ω } CANDOHM RESISTOR
	R-15	1050 Ω }
	R-16	40 Ω }
IR-35	R-17	82 Ω WIREWOUND RESISTOR. 2W 10%
IR-20	R-18	220 MΩ RESISTOR 1/2W. 20%
MC-2	C-1	100 MMFD. CONDENSER. [MICA]
PC-5	C-2	.05 MFD. CONDENSER. 400 V.
PC-8	C-3	.1 MFD. CONDENSER 400 V.
PC-6	C-4	.005 MFD. CONDENSER 600 V.

PART NO.		DESCRIPTION	PART NO		DESCRIPTION
EC-6	C-5	70 MFD. 10V. ELECTROLYTIC	SPK-5	T-3	OUTPUT SPEAKER TRANSFORMER
EC-4	C-6	40-40-40-150V ELECTROLYTIC		VC	VOICE COIL
TC-7	C-7	ANTENNA TRIMMER		S	P.M. SPEAKER
TC-6	G-8	OSC. TRIMMER	SW-5	SW-3	4 POLE 3 POSITION
GC-2	G-1	GANG CONDENSER	SR-1	——	SELENIUM RECTIFIER
	G-2		TU-11	——	1A7 - 1N5 - 1H5 - 3Q5
LL-5	L-1	LOOP ANNTENNA	"A" BATTERY		9 VOLTS
LO-8	L-2	OSC. COIL	"B" BATTERY		90 VOLTS.
LF-3	T-1	INPUT I.F. TRANSFORMER			
LI-4	T-2	OUTPUT I.F. TRANSFORMER			
CO-1	P	LINE CORD			

Remove chassis from cabinet for alignment.

A Signal Generator is required having the following frequencies: 455 KC, 1400 KC, 1720 KC. An output meter should be connected across the speaker.

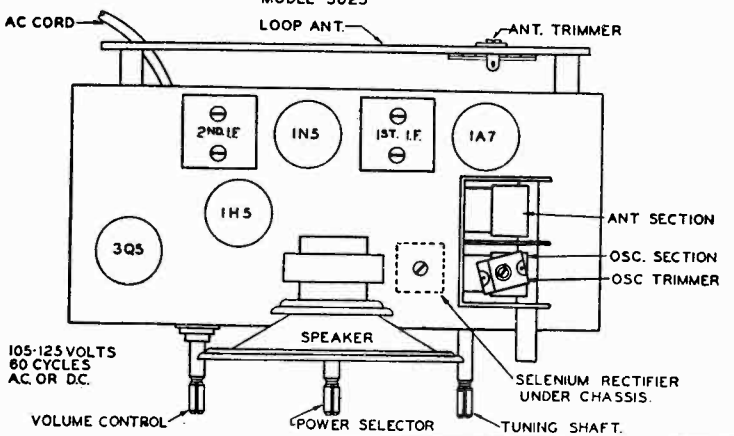
The receiver volume control should be turned to maximum during the I.F. and all subsequent alignments to keep the AVC from working and giving false readings. Keep the generator output as low as possible to prevent overloading.

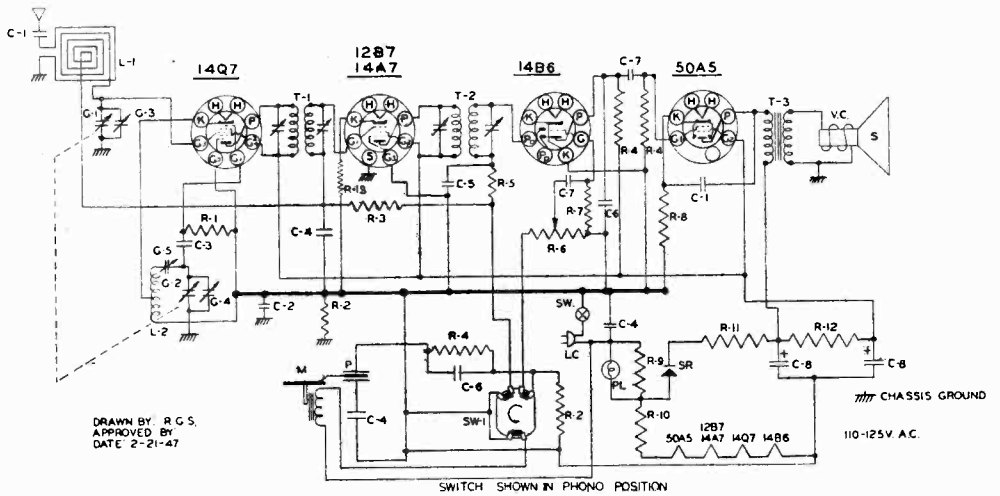
FIRST STEP: Connect the hot lead from the generator to the ANT. section of the gang condenser, through a .1 MFD condenser. The ground lead from the generator must be connected to the floating ground buss under the chassis. Turn the gang condenser to complete minimum capacity. Adjust the generator to 455KC and adjust the trimmers of the 1st and 2nd I.F. transformers until a maximum reading is noted on the output meter.

SECOND STEP: With the leads from the generator still connected in the same manner, adjust the Signal Generator to 1720 KC. The OSC. trimmer is located on the front of the chassis. Adjust this trimmer until the 1720 KC signal is tuned in.

THIRD STEP: Remove the hot lead of the generator from the ANT section of the gang condenser. Connect this lead to the primary of the loop antenna through a 200 MMFD condenser. Adjust the Signal Generator to 1400 KC. Rotate the tuning control until this signal is tuned in. The ANT trimmer is located on the top of the ANT. section of the gang condenser. Adjust this trimmer until a maximum reading is noted on the output meter. No further adjustment should be necessary, unless the set has been damaged, as the coils and condenser in this receiver have been specially handled at the factory to insure proper alignment at the lower frequencies.

TUBE AND TRIMMER LOCATION
MODEL-5025





ALIGNMENT

Remove chassis from cabinet for alignment.

A Signal Generator is required having the following frequencies: 455 KC, 1400 KC, 1720 KC. An output meter should be connected across the speaker.

The receiver volume control should be turned to maximum during the I.F. and all subsequent alignments to keep the AVC from working and giving false readings. Keep the generator output as low as possible to prevent overloading.

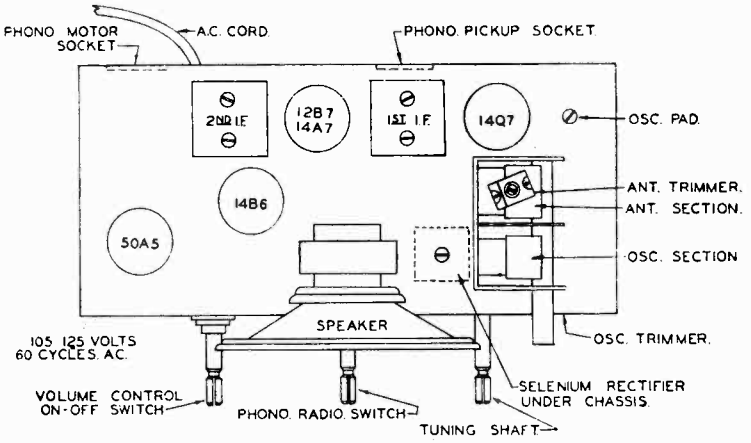
FIRST STEP: Connect the hot lead from the generator to the ANT. section of the gang condenser, through a .1 MFD condenser. The ground lead from the generator must be connected to the floating ground buss under the chassis. Turn the gang condenser to complete minimum capacity. Adjust the generator to 455KC and adjust the trimmers of the 1st and 2nd I.F. transformers until a maximum reading is noted on the output meter.

SECOND STEP: With the leads from the generator still connected in the same manner, adjust the Signal Generator to 1720 KC. The OSC. trimmer is located on the front of the chassis. Adjust this trimmer until the 1720 KC signal is tuned in.

THIRD STEP: Remove the hot lead of the generator from the ANT section of the gang condenser. Connect this lead to the primary of the loop antenna through a 200 MMFD condenser. Adjust the Signal Generator to 1400 KC. Rotate the tuning control until this signal is tuned in. The ANT trimmer is located on the top of the ANT. section of the gang condenser. Adjust this trimmer until a maximum reading is noted on the output meter. No further adjustment should be necessary, unless the set has been damaged, as the coils and condenser in this receiver have been specially handled at the factory to insure proper alignment at the lower frequencies.

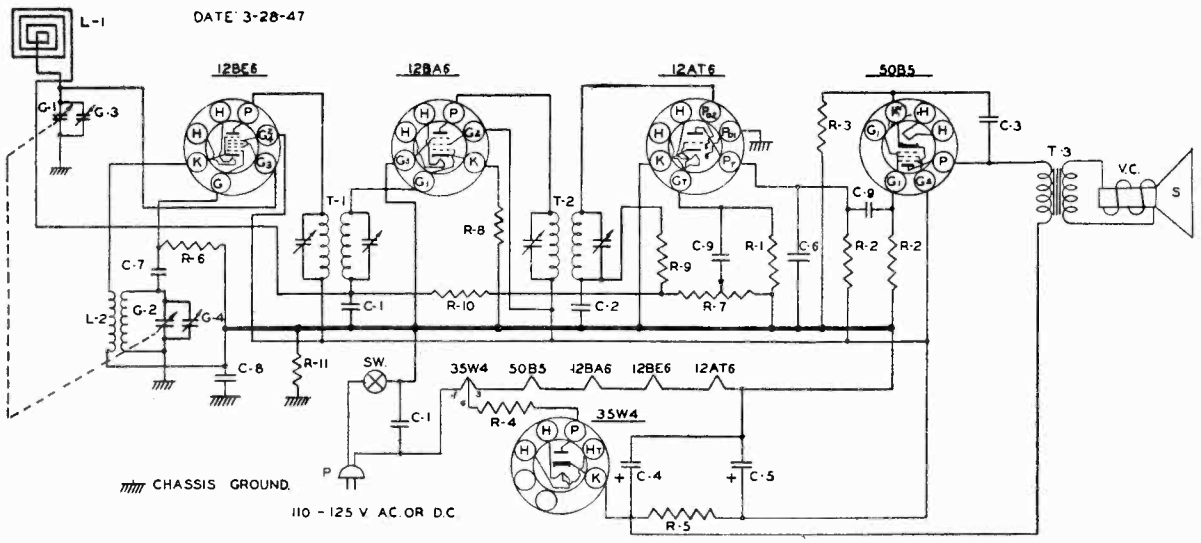
PART NO.		DESCRIPTION.
PC-7	C-1	.01MFD. CONDENSER 400 V.
PC-8	C-2	.1 MFD. CONDENSER 400 V.
MC-4	C-3	50 MMFD. MICA CONDENSER 500 V.
PC-5	C-4	.05 MFD. CONDENSER 400 V.
MC-2	C-5	100 MMFD. MICA CONDENSER 500 V.
MC-5	C-6	500 MMFD MICA CONDENSER 500 V.
PC-10	C-7	.005 MFD. CONDENSER. 400 V.
EC-10	C-8	40 MFD. 40 MFD. 150 V. ELECTROLYTIC
IR-9	R-1	22000 Ω RESISTOR 1/2 W 20 %
IR-20	R-2	220 M Ω RESISTOR 1/2 W 20 %
IR-23	R-3	3.3 MEG. Ω RESISTOR. 1/2 W 20 %
IR-11	R-4	470 M Ω RESISTOR 1/2 W 20 %
IR-10	R-5	47 M Ω RESISTOR 1/2 W 20 %
VC-4	R-6	1 MEG. VOLUME CONTROL
IR-13	R-7	2 MEG. Ω RESISTOR 1/2 W. 20 %
IR-14	R-8	150 Ω RESISTOR 1/2 W. 20 %
WR-5	R-9	30 Ω WIREWOUND RESISTOR 5 W 5 %
	R-10	165 Ω
IR-35	R-11	82 Ω RESISTOR. 2 W. 10 %
IR-25	R-12	2200 Ω RESISTOR. 1 W. 10 %
IR-6	R-13	470 Ω RESISTOR. 1/2 W. 10 %
GC-1	G-1	GANG CONDENSER
	G-2	
TC-7	G-3	ANT. TRIMMER.
TC-6	G-4	OSC. TRIMMER.
TC-9	G-5	600 K.C. TRIMMER.
LL-7	L-1	LOOP
LO-7	L-2	OSC. COIL
LI-1	T-1	INPUT I.F. TRANSFORMER
LI-2	T-2	OUTPUT I.F. TRANSFORMER
	T-3	OUTPUT TRANSFORMER.
SPK-5	VC	VOICE COIL
	S	SPEAKER
SR-1	SR	SELENIUM RECTIFIER.
M-1	M	110 V 60 CYCLES. A.C. MOTOR.
L-75	P	CRYSTAL PICKUP
SW-1	SW-1	RADIO-PHONO. SWITCH.
	SW	A.C. SWITCH ON VOLUME CONTROL
PB-1	PB	#47 PILOT BLUB
CO-1	LC	LINE CORD
TU-28		50A5-14Q7-14A7-14B6-SR-1

TUBE AND TRIMMER LOCATION
MODEL-5030-31



MODEL 5050

SPIEGEL



Remove chassis from cabinet for alignment.

A Signal Generator is required having the following frequencies: 455 KC, 1400 KC, 1650 KC. An output meter should be connected across the speaker.

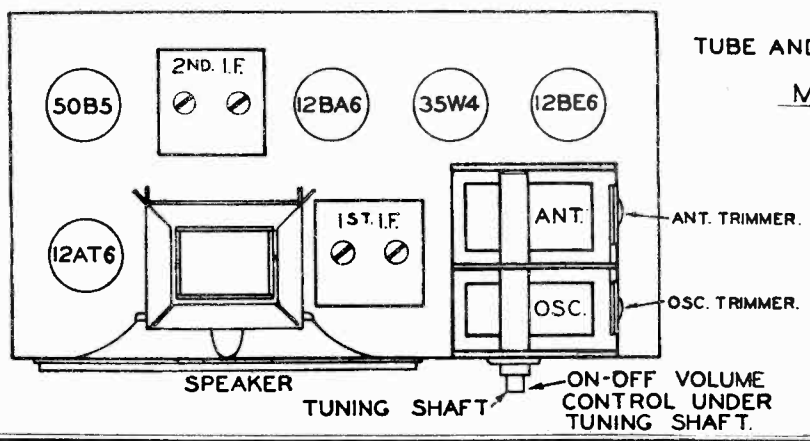
The volume control of the receiver should be turned to maximum during the I. F. and all subsequent alignment and the generator output as low as possible to prevent the A. V. C. from working and giving false readings.

FIRST STEP: Connect the hot lead from the generator to the ANT. section of the gang condenser through a .1 MFD. condenser. The ground lead from the generator must be connected to "B" minus under the chassis. Turn the gang condenser to complete minimum capacity. Set the generator to 455 KC. Adjust the trimmers of the first and second I. F. transformers until a maximum reading is noted on the output meter.

SECOND STEP: With the leads from the generator still connected in the same manner, adjust the Signal Generator to 1650 KC. Adjust the OSC. trimmer until the 1650 KC signal is tuned in. The gang condenser must be at complete minimum capacity for this adjustment.

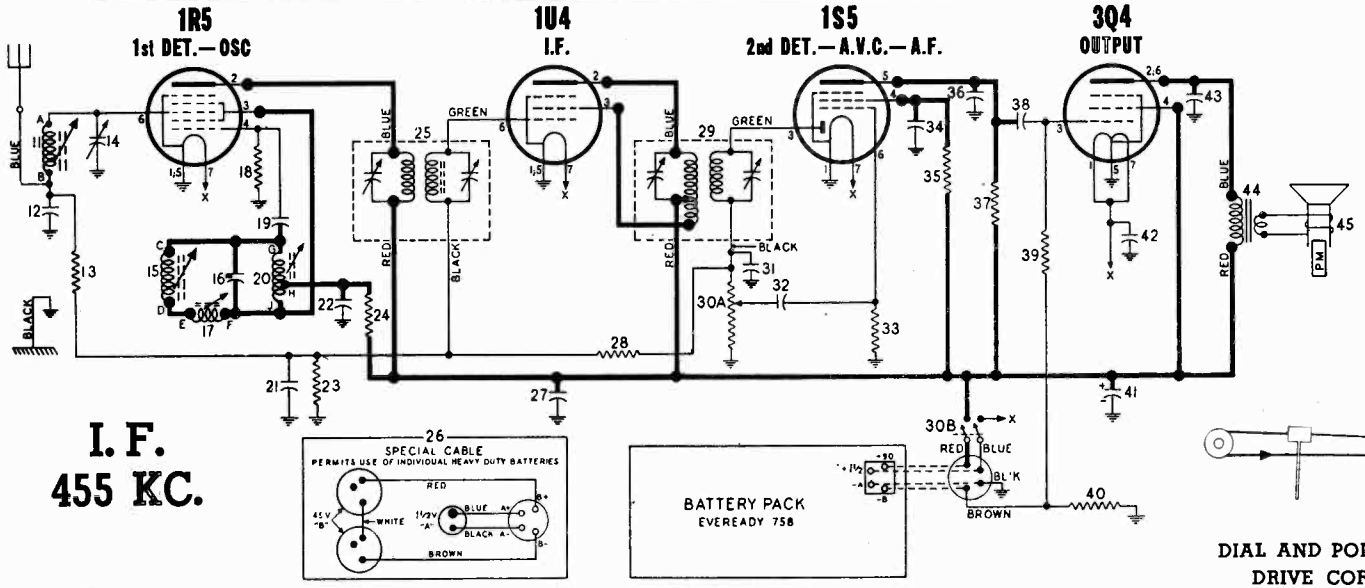
THIRD STEP: Remove the generator leads from the gang condenser and replace the chassis in the cabinet. Loosely couple the generator to the receiver loop by making a complete turn of wire over the outside of the cabinet. With the receiver and generator set at 1400 KC, increase the generator output. Adjust the ANT. trimmer through the hole which is provided in the end of the cabinet until a maximum signal is noted on the output meter. The ANT. trimmer hole in the side of the cabinet is covered by a small plug button. Replace this button after adjustment has been made. No further adjustment should be made as the coils and gang condenser in this receiver have been specially handled at the factory to insure proper alignment at the lower frequencies.

PART NO.		DESCRIPTION
IR-13	R-1	2.2 MEG. RESISTOR 1/2 W. 20%
IR-11	R-2	470 M RESISTOR 1/2 W. 20%
IR-14	R-3	150 RESISTOR 1/2 W. 20%
IR-17	R-4	33 RESISTOR 1/2 W. 20%
IR-25	R-5	2200 RESISTOR 1 W. 10%
IR-16	R-6	33 M RESISTOR 1/2 W. 20%
VC-9	R-7	1 MEG. VOLUME CONTROL
GC-7	G-1, G-2	GANG CONDENSER
	G-3	ANT. TRIMMER COND.
IR-36	R-8	100 RESISTOR 1/2 W. 20%
IR-10	R-9	47 M RESISTOR 1/2 W. 20%
	G-4	OSC. TRIMMER COND.
PC-5	C-1	.05 MFD. CONDENSER 400 V.
MC-2	C-2	.0001 MFD. MICA CONDENSER 20%
PC-7	C-3	.01 MFD. CONDENSER 400 V.
EC-12	C-4, C-5	40 MFD. / 20 MFD. 150 V. ELECTROLYTIC CONDENSER
MC-5	C-6	.0005 MFD. CONDENSER 20%
MC-4	C-7	.000056 MFD. MICA 20%
PC-8	C-8	.1 MFD. CONDENSER 400 V.
LL-9	L-1	LOOP ANTENNA
IR-23	R-10	3.3 MEG. RESISTOR 1/2 W. 20%
PC-6	C-9	.005 MFD. CONDENSER 600 V.
LO-13	L-2	OSC. COIL
LI-6	T-1	INPUT TRANSFORMER
LI-7	T-2	OUTPUT TRANSFORMER
	T-3	OUTPUT SPK. TRANFORMER.
SPK-10	V.C.	VOICE COIL
	S	P.M. SPEAKER
IR-20	R-11	220M RESISTOR 1/2 W. 20%
	SW	AC. SW. ON VOLUME CONTROL
CO-1	P	LINE CORD
TU-18	—	12BE6 - 12BA6 - 12AT6 50B5 - 35W4



TUBE AND TRIMMER LOCATION

MODEL-5050



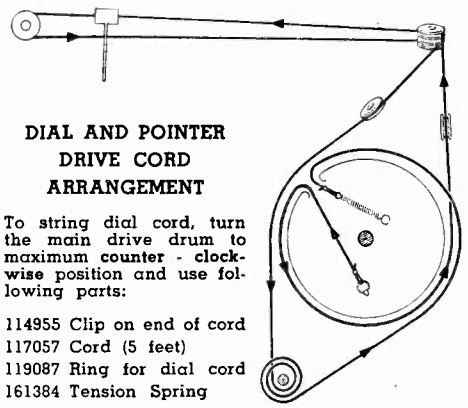
I. F. 455 KC.

POWER LINE OPERATION

The following power pack may be used to operate this set on 110 volt 50-60 cycle A.C. power lines.

Perma-Power Model "A"

This unit is manufactured by the General Transformer Corp., 4321 Knox Ave., Chicago 41, Illinois.



DIAL AND POINTER DRIVE CORD ARRANGEMENT

To string dial cord, turn the main drive drum to maximum counter - clockwise position and use following parts:

114955 Clip on end of cord
117057 Cord (5 feet)
119087 Ring for dial cord
161384 Tension Spring

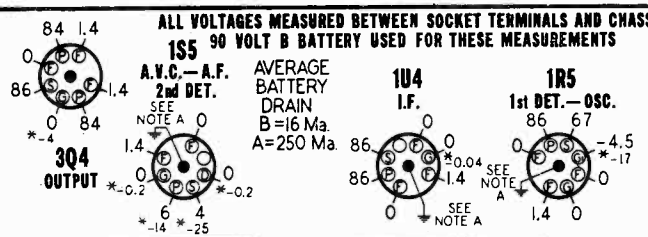
SOCKET VOLTAGES

Measured with voltmeter having sensitivity of 1000 ohms per volt except where indicated by (*). The (*) symbol designates a vacuum tube voltmeter measurement.

VOLUME ON FULL WITH NO SIGNAL — DIAL TUNED TO 540 KC.

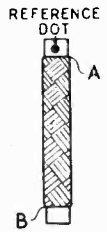
BOTTOM VIEW OF CHASSIS

ALL VOLTAGES MEASURED BETWEEN SOCKET TERMINALS AND CHASSIS
90 VOLT B BATTERY USED FOR THESE MEASUREMENTS

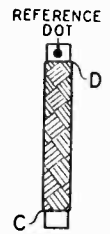


REAR OF CHASSIS

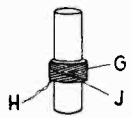
NOTE A: Grounding of center stud on tube socket is necessary to reduce capacity coupling between other pins. Oscillation may result if this ground is omitted.



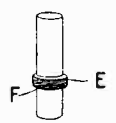
ANTENNA COIL 505192



OSCILLATOR COIL 505192



OSCILLATOR (SHUNT) COIL 505186



OSCILLATOR (SERIES) COIL 505187

Lettered terminals in illustrations correspond to similarly lettered terminals on the circuit diagram.

MODEL A41T1

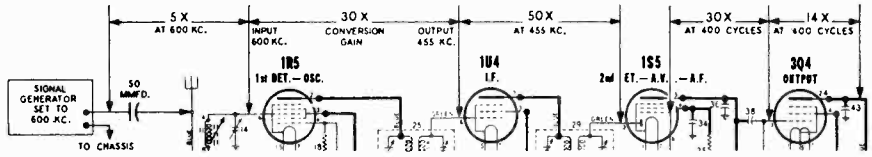
STEWART-WARNER CORP.

STAGE GAIN MEASUREMENT PROCEDURE

REQUIRED INSTRUMENTS: The amount of amplification or "gain" of each of the stages of this receiver may be measured with an A.C. Vacuum Tube Voltmeter or a "channel" type instrument containing a tuned and calibrated amplifier.

PROCEDURE: It is exceedingly important to adhere to the procedure outlined below since the accuracy of these measurements will be affected to a considerable extent by the failure to establish proper operating conditions.

1. Be sure that R.F. and I.F. stages are carefully and accurately aligned by utilizing the alignment procedure given above.
2. Connect Signal Generator as shown below.
3. The values of stage gain which are given here were measured with a fixed bias of 1½ volts on the control grids of all R.F. and I.F. tubes which are connected to the A.V.C. circuit. Therefore, these values are not intended to indicate the full capability of a stage but they will serve as a convenient basis for determining proper operation. In order to duplicate the fixed bias voltage, connect the negative terminal of a 1½ volt battery to A.V.C. at black lead of 1st I.F. and connect the positive battery lead to receiver chassis.
4. Set Signal Generator for operation at 600 Kc with 400 cycle modulation and carefully tune radio receiver to this signal by using an output meter to indicate peak output. If a local station interferes, set generator to a nearby frequency and re-tune the receiver.
5. R.F. and I.F. circuits are slightly de-tuned when contact is made with an instrument probe and this action, which is indicated by a change in the output meter reading, may seriously affect the gain measurement. Therefore, it is important to adjust the associated circuit trimmer for a maximum output meter reading and to set the input signal level to a convenient reference point on the gain measuring instrument while the probe is making contact. After removing the probe it is again necessary to adjust the trimmer so as to obtain the same output meter reading and thereby assure that the signal voltage at the specified point has not changed as a result of circuit de-tuning.
6. When using a "channel" type instrument, carefully tune it for maximum output at desired frequency before making measurements.



DIFFERENCES in tube characteristics, tolerance of parts, adjustment of tuned circuits and variations in line voltage will influence stage gain. These factors should be given due attention in event the gain of a stage varies extensively from the values shown above.

ALIGNMENT PROCEDURE

1. During the alignment of this receiver it will be necessary to set the dial pointer to the following frequencies: 535 Kc. (first mark on dial scale), 1500 Kc. and 1625 Kc. (last mark on dial scale). In order to avoid replacing the chassis in the cabinet each time a dial setting is required, it will be found more convenient to mark the required frequency points on the white dial background plate before starting the alignment.
2. Rotate the tuning control knob counter-clockwise until tuner mechanism is completely closed. Dial pointer should then point to 535 Kc. or the first mark on the dial. If it is set incorrectly, release pointer clip on dial cord and reposition pointer.
3. Connect ground lead of signal generator to receiver chassis.
4. Connect an output meter across speaker voice coil or from plate of 3Q4 tube to chassis through an 0.1 Mfd. condenser.
5. Set volume control at maximum volume position and use a weak signal from the signal generator.

DUMMY ANT. IN SERIES WITH SIGNAL GENERATOR	CONNECT HIGH SIDE OF GENERATOR TO	SIGNAL GENERATOR FREQUENCY	RECEIVER DIAL SETTING	TRIMMER OR SLUG NUMBER	TRIMMER DESCRIPTION	TYPE OF ADJUSTMENT
.1 MFD. Condenser	Terminal "A" On Slug Tuner (see Fig. 1 below)	455 KC	Any point where it does not affect the signal	1-2	2nd I.F.	Adjust for maximum output. Then repeat adjustment.
				3-4	1st I.F.	
Set tuner mechanism to maximum open position by turning the tuning control knob clockwise as far as it will go. Then check whether the positions of the tuning slugs correspond to the positions shown in Fig. 1 below. If settings are incorrect, rotate the individual core and threaded stem until desired position is reached. Note that threaded stem is prevented from moving by a dab of cement at top and that this seal must be removed before stem can be rotated.						
50 MMFD. Mica Condenser	External antenna lead (blue)	535 KC	535 KC (First mark on dial)	5	Broadcast Oscillator (Shunt)	Adjust for maximum output.
50 MMFD. Mica Condenser	External antenna lead (blue)	1625 KC	1625 KC (Last mark on dial)	6	Broadcast Oscillator (Series)	Adjust for maximum output.
50 MMFD. Mica Condenser	External antenna lead (blue)	1500 KC	1500 KC	7	Broadcast Antenna	Adjust for maximum output.
Apply a coating of cement at top of each tuning core stem to prevent movement.						

NOTE: After set has been reinstalled in the home and antenna and ground have been properly connected, it will be necessary to readjust trimmer #7 (see Fig. 2). Tune set to receive a weak station in the 1400 Kc. to 1600 Kc. section of the dial and carefully set trimmer #7 so as to receive the station with maximum volume.

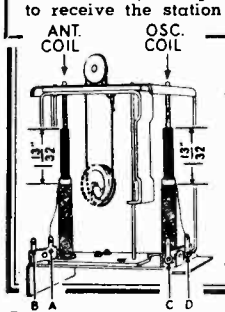


FIG. 1

SLUG TUNER ASSEMBLY
(Drive Parts)
117057 Cord (12")
114955 Clip on cord
504012 Spring

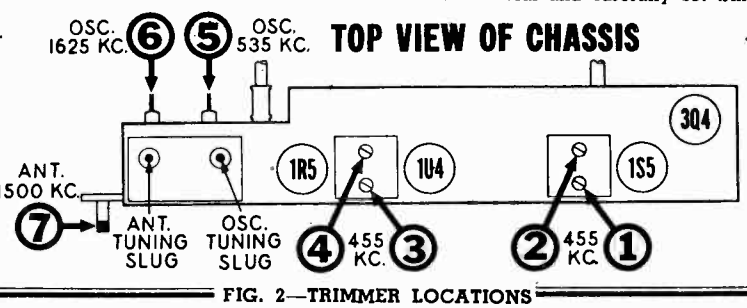


FIG. 2—TRIMMER LOCATIONS

PARTS LIST

ORDER PARTS FROM YOUR
STEWART-WARNER DISTRIBUTOR ONLY

MODEL A41T1

DIA-GRAM NO.	PART NO.	DESCRIPTION
		CONDENSERS
12	502790	Condenser—mica 200 Mmfd. 500 volt
14	505179	Condenser—trimmer 30 to 270 Mmfd.
16	505183	Condenser—ceramic 47 Mmfd. ± 2% 500 volt
19	502929	Condenser—mica 47 Mmfd. 500 volt
21 22	502153	Condenser—.05 Mfd. 200 volt
27	502155	Condenser—.1 Mfd. 200 volt
31	502931	Condenser—mica 100 Mmfd. 500 volt
32	502156	Condenser—.004 Mfd. 400 volt
34	502153	Condenser—.05 Mfd. 200 volt
36	502271	Condenser—mica 260 Mmfd. 500 volt
38	504726	Condenser—.01 Mfd. 200 volt
41	505174	Condenser—electrolytic 10 Mfd. 150 volt
42	502263	Condenser—.5 Mfd. 150 volt
43	502453	Condenser—.002 Mfd. 400 volt
		RESISTORS
13	502268	Resistor—carbon 1 Meg. ¼ watt
18	502132	Resistor—carbon 100,000 Ohms ¼ watt
23	502133	Resistor—carbon 220,000 Ohms ¼ watt
24	502459	Resistor—carbon 6,800 Ohms ¼ watt
28	502268	Resistor—carbon 1 Meg. ¼ watt
30-A, B	505197	Volume control 1 Meg. (with switch)
33	502136	Resistor—carbon 10 Meg. ¼ watt
35	502269	Resistor—carbon 3.3 Meg. ¼ watt
37	502268	Resistor—carbon 1 Meg. ¼ watt
39	502268	Resistor—carbon 1 Meg. ¼ watt
40	505184	Resistor—carbon 270 Ohms ¼ watt
		COILS & TRANSFORMERS
11	505192	Coil—antenna
15	505192	Coil—oscillator
	505191	Tuning slug for ant. or osc. coils 505192
17	505187	Coil—oscillator series (less slug)
	505189	Slug core for oscillator series coil
20	505186	Coil—oscillator shunt (less slug)
	505188	Slug core for oscillator shunt coil
25	505193	Transformer—1st I.F.
29	505194	Transformer—2nd I.F.
44	505182	Transformer—output for W-505168 speaker
		OTHER ELECTRICAL PARTS
26	116566	Battery cable for use with indiv. batt.
45	505168	Speaker—P.M. dynamic (5 inch) includes output transformer
		MISCELLANEOUS PARTS
	505176	Cabinet
	505196	Cable—battery with plug
	502506	Clamp—dial scale mtg.
	505165	"C" washer for tuning shaft
	114955	Clip—retainer on end of dial cord
	504653	Clip—coil mounting
	117057	Cord—dial drive (5 ft. required) per ft.
	505350	Dial scale
	502563	Knob tuning
	505329	Knob—volume and "ON-OFF"
	505170	Permeability tuning mechanism (less coils)
	505328	Pointer
	119087	Ring for dial cord
	17063	Screw—#6 x ¼ holds dial clamp
	18785	Screw—#8 x ⅞" chassis mounting
	504397	Socket—miniature
	161384	Spring—dial cord tension
	504012	Spring for tuning slug drive cord
	505166	Tuning shaft

PARTS LIST

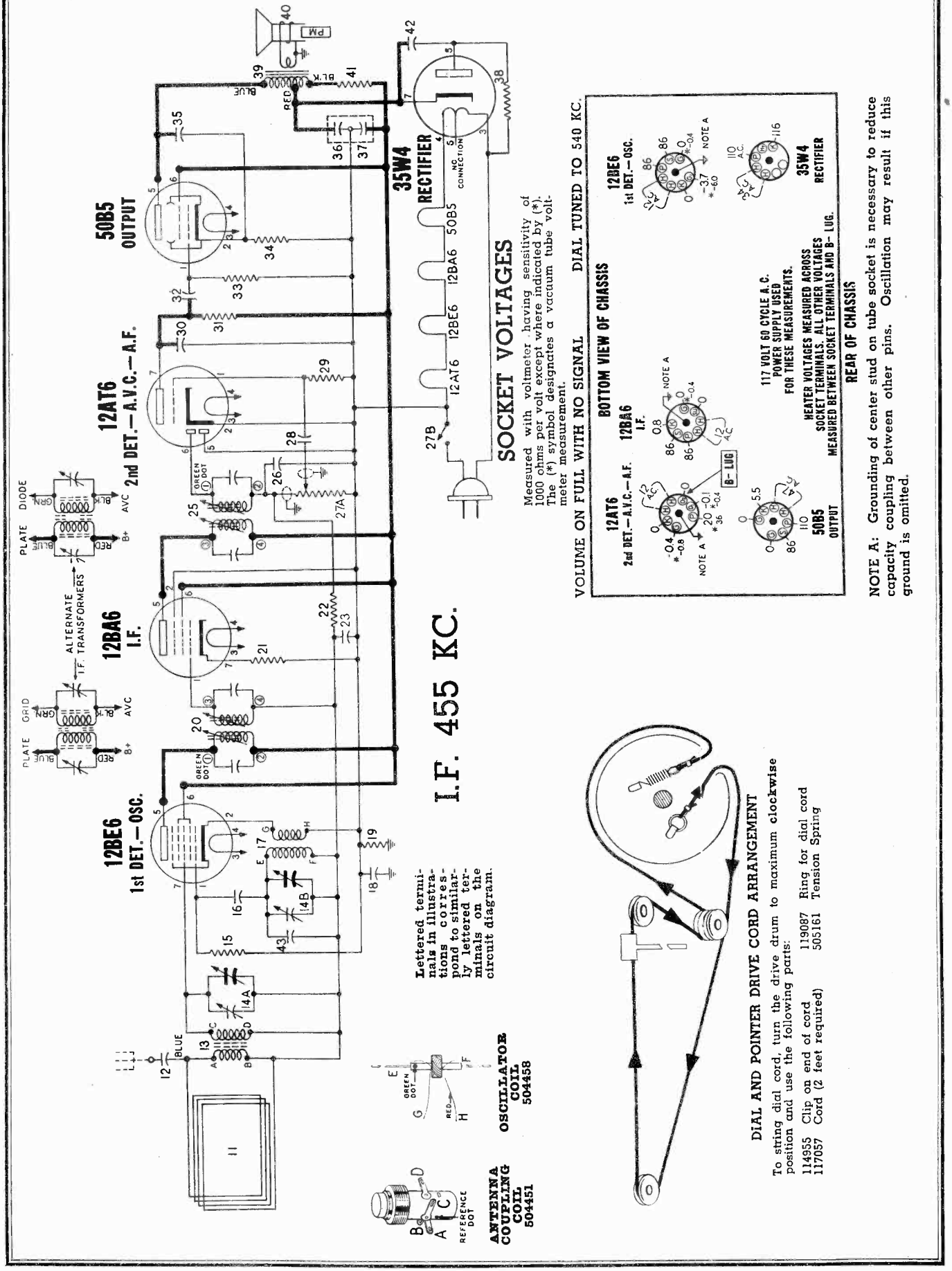
ORDER PARTS FROM YOUR
STEWART-WARNER DISTRIBUTOR ONLY

MODEL A61CR1

DIA-GRAM NO.	PART NO.	DESCRIPTION
		CONDENSERS
13	502151	Condenser—.01 Mfd. 400 volt
14-A, B	505315	Condenser—variable gang (with drum)
16	502931	Condenser—mica 100 Mmfd. 500 volt
19	502153	Condenser—.05 Mfd. 200 volt
20	502157	Condenser—.05 Mfd. 400 volt
22	502152	Condenser—.02 Mfd. 400 volt
25	502153	Condenser—.05 Mfd. 200 volt
33	502931	Condenser—mica 100 Mmfd. 500 volt
36	502156	Condenser—.004 Mfd. 400 volt
39	502152	Condenser—.02 Mfd. 400 volt
41	502157	Condenser—.05 Mfd. 400 volt
45	502405	Condenser—.25 Mfd. 400 volt
48	502150	Condenser—.004 Mfd. 600 volt
49	502271	Condenser—mica 260 Mmfd. 500 volt
51	502410	Condenser—.1 Mfd. 400 volt
53	502152	Condenser—.02 Mfd. 400 volt
55-A, B, C	502207	Condenser—electrolytic A—20 Mfd. 400 volt B—10 Mfd. 400 volt C—20 Mfd. 25 volt
57	502156	Condenser—.004 Mfd. 400 volt
		RESISTORS
12	502466	Resistor—carbon 33,000 Ohms 1 watt
15	502131	Resistor—carbon 47,000 Ohms ¼ watt
18	502128	Resistor—carbon 2,200 Ohms ¼ watt
21	502288	Resistor—carbon 47,000 Ohms 1 watt
23	502459	Resistor—carbon 6,800 Ohms ¼ watt
26	502269	Resistor—carbon 3.3 Meg. ¼ watt
27	502264	Resistor—carbon 47 Ohms ¼ watt
32	502131	Resistor—carbon 47,000 Ohms ¼ watt
35-A, B	505318	Volume Control 1 Meg. (with switch)
37	502132	Resistor—carbon 100,000 Ohms ¼ watt
38	502408	Resistor—carbon 68,000 Ohms ¼ watt
40	502468	Resistor—carbon 4.7 Meg. ¼ watt
42	502406	Resistor—carbon 1,500 Ohms ¼ watt
44	502135	Resistor—carbon 2.2 Meg. ¼ watt
50	502133	Resistor—carbon 220,000 Ohms ¼ watt
52	502133	Resistor—carbon 220,000 Ohms ¼ watt
54	502134	Resistor—carbon 470,000 Ohms ¼ watt
56	504771	Resistor—carbon 3,300 Ohms 2 watt
58	502293	Resistor—wire wound 200 ohms 2 watt
		COILS AND TRANFORMERS
11	505306	Loop antenna
17	505326	Coil-oscillator
24	502657	Transformer—1st I. F.
31	502658	Transformer—2nd I. F.
43	502174	Transformer—power
59	505305	Transformer—output
		OTHER ELECTRICAL PARTS
28	505273	Motor—for type "A" 505650 record changer 115 volt 60 cyc.
	505758	Motor—for type "VM" 505339 record changer 115 volt 60 cyc.
29	505100	Crystal cartridge
30	505269	Switch—"ON-OFF" for type "VM"—505339 record changer
	505759	Switch—"ON-OFF" for type "A"—505650 record changer
34	505317	Switch—radio-phono
46, 47	110629	Lamp—dial (Mazda #44) 6.3V 0.25 Amps.
60	505342	Speaker P. M. dynamic (8 inch)
		MISCELLANEOUS PARTS
	116467	Base for mtg. electrolytic condenser
	505165	"C" washer
	112745	Clip—coil mounting
	114955	Clip—retainer on end of dial cord
	160326	Clip—retains dial scale
	117057	Cord—dial drive (3 ft. required) per ft.
	505324	Dial scale
	505465	Door (less hardware) for Model A61CR1
	505466	Door Pull for Model A61CR1
	505488	Drawer—record changer for Model A61CR3
	505486	Drawer Pull for Model A61CR3
	505666	Emblem, plastic
	505333	Escutcheon—dial
	505457	Hinge (pair) for lid—Model A61CR2
	505464	Hinge (pair) for lid—Models A61CR1 and A61CR4
	505467	Hinge (pair) for door Model A61CR1
	505344	Knob—tuning
	505345	Knob—"VOLUME"
	505346	Knob—"RADIO-PHONO"
	505455	Lid (less hardware) for Model A61CR2
	505462	Lid (less hardware) for Model A61CR1
	505669	Lid (less hardware) for Model A61CR4
	505456	Lid support for Model A61CR2
	505463	Lid support for Models A61CR1 and A61CR4
	505717	Needle—phonograph
	500966	Plug—Phono. pick-up cable
	501031	Plug—Phono. motor cable
	505686	Pointer
	505487	Rail for drawer (supplied in sets)
	119087	Ring for dial cord
	113463	Rubber pad for mtg. chassis
	79905	Screw—No. 8x1½ for loop mounting
	79993	Screw—No. 8x1¼ for mtg. chassis
	505716	Screw—set for phono needle
	503588	Shaft and drum for dial
	505313	Shaft—tuning
	116690	Socket—octal base
	160039	Socket—phono. plug
	160392	Socket—octal (rectifier)
	505307	Socket and phono. motor cable
	505459	Socket—dial lamp
	505161	Spring—tension
	111456	Washer—spring washer for tuning shaft

MODELS A51T1, A51T2, A51T3, A51T4

STEWART-WARNER CORP.



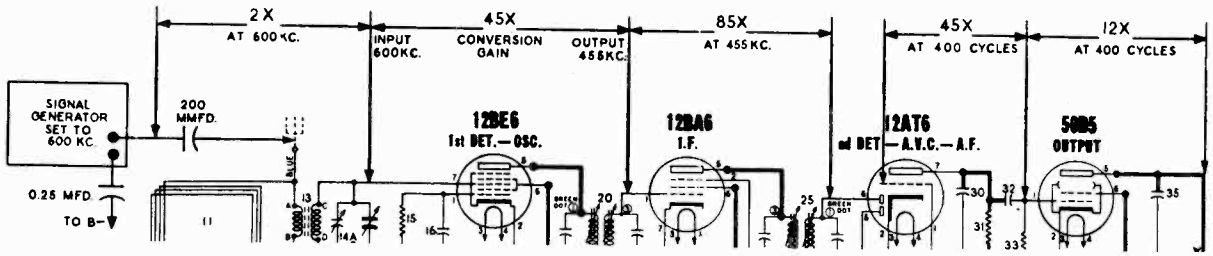
STEWART-WARNER CORP. MODELS A51T1, A51T2, A51T3, A51T4

STAGE GAIN MEASUREMENT PROCEDURE

REQUIRED INSTRUMENTS: The amount of amplification or "gain" of each of the stages of this receiver may be measured with an A.C. Vacuum Tube Voltmeter or a "channel" type instrument containing a tuned and calibrated amplifier.

PROCEDURE: It is exceedingly important to adhere to the procedure outlined below since the accuracy of these measurements will be affected to a considerable extent by the failure to establish proper operating conditions.

1. Be sure that R.F. and I.F. stages are carefully and accurately aligned by utilizing the alignment procedure given above.
2. Connect Signal Generator as shown below.
3. The values of stage gain which are given here were measured with a fixed bias of 3 volts on the control grids of all R.F. and I.F. tubes which are connected to the A.V.C. circuit. Therefore, these values are not intended to indicate the full capability of a stage but they will serve as a convenient basis for determining proper operation. In order to duplicate the fixed bias voltage, connect the negative terminal of a 3 volt battery to A.V.C. at terminal "D" of antenna coupling coil and connect the positive battery lead to B— in receiver chassis.
4. Set Signal Generator for operation at 600 Kc with 400 cycle modulation and carefully tune radio receiver to this signal by using an output meter to indicate peak output. If a local station interferes, set generator to a nearby frequency and re-tune the receiver.
5. R.F. and I.F. circuits are slightly de-tuned when contact is made with an instrument probe and this action, which is indicated by a change in the output meter reading, may seriously affect the gain measurement. Therefore, it is important to adjust the associated circuit trimmer for a maximum output meter reading and to set the input signal level to a convenient reference point on the gain measuring instrument while the probe is making contact. After removing the probe it is again necessary to adjust the trimmer so as to obtain the same output meter reading and thereby assure that the signal voltage at the specified point has not changed as a result of circuit de-tuning.
6. When using a "channel" type instrument, carefully tune it for maximum output at desired frequency before making measurements.

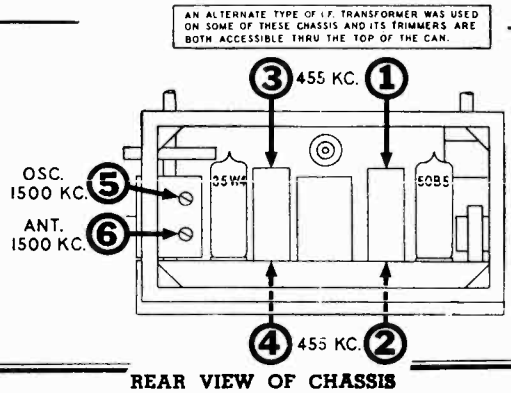


DIFFERENCES in tube characteristics, tolerance of parts, adjustment of tuned circuits and variations in line voltage will influence stage gain. These factors should be given due attention in event the gain of a stage varies extensively from the values shown above.

ALIGNMENT PROCEDURE

1. With the gang condenser fully meshed, the dial pointer should be 1/8" to the left of the 55 mark on the dial. If it is set incorrectly, release the pointer clip on the dial cord and reposition pointer.
2. To remove chassis from cabinet lift edge of insulating sheet at bottom of cabinet and take out mounting screws at each corner. Then remove bottom plate by taking out screws at each end holding it to chassis. Solder approximately 8" of insulated wire to any B— connection (see voltage chart on opposite side for convenient B— location).
3. Connect ground lead of signal generator to B— through a 0.25 Mfd. condenser.
4. Connect output meter across speaker voice coil (terminals at back of speaker) or from plate of 50B5 tube to B— through a 0.1 Mfd condenser.
5. Set volume control at maximum volume position and use a weak signal from the signal generator.

DUMMY ANT. IN SERIES WITH SIGNAL GENERATOR	CONNECT HIGH SIDE OF GENERATOR TO	SIGNAL GENERATOR FREQUENCY	RECEIVER DIAL SETTING	TRIMMER NUMBER	TRIMMER DESCRIPTION	TYPE OF ADJUSTMENT
200 MMFD. Mica Condenser	Lug on trimmer No. 6 on bottom section of gang (see figure below for location of trimmer).	455 KC	Any point where it does not affect the signal.	1-2	2nd I.F.	Adjust for maximum output. Then repeat adjustment.
				3-4	1st I.F.	
200 MMFD. Mica Condenser	External antenna lead	1500 KC	1500 KC	5	Broadcast Oscillator	Adjust for maximum output.
200 MMFD. Mica Condenser	External antenna lead	1500 KC	Tune to 1500 KC generator signal.	6	Broadcast Antenna	Adjust for maximum output.



REAR VIEW OF CHASSIS

PARTS LIST

MODEL A61P1

ORDER PARTS FROM YOUR
STEWART-WARNER DISTRIBUTOR ONLY

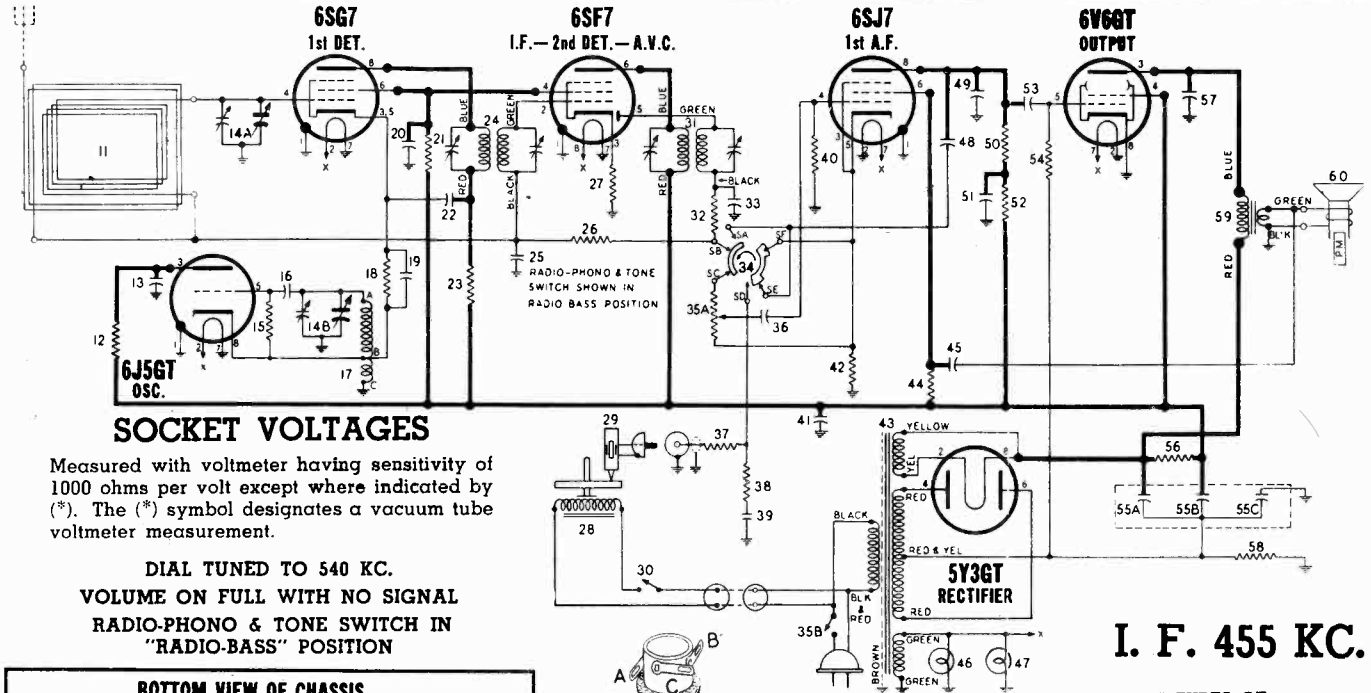
DIAGRAM NO.	PART NO.	DESCRIPTION
		CONDENSERS
1	502160	Condenser—110 Mmfd. 500 volt
4-A, B	502494	Condenser—variable gang (with drum)
5	119132	Condenser—trimmer 2 to 15 Mmfd.
7	502159	Condenser—mica 50 Mmfd. 500 volt
8	502153	Condenser—.05 Mfd. 200 volt
11	502547	Condenser—electrolytic 4 Mfd. 150 volt
15	502153	Condenser—.05 Mfd. 200 volt
16	502155	Condenser— .1 Mfd. 200 volt
17	502153	Condenser—.05 Mfd. 200 volt
25, 26	502159	Condenser—mica 50 Mmfd. 500 volt
28	502155	Condenser— .1 Mfd. 200 volt
31	502156	Condenser—.004 Mfd. 400 volt
35	502160	Condenser—mica 110 Mmfd. 500 volt
37	502155	Condenser— .1 Mfd. 200 volt
40	502151	Condenser—.01 Mfd. 400 volt
42	502527	Condenser—electrolytic 50 Mfd. 25 volt
48	502155	Condenser— .1 Mfd. 200 volt
50	502453	Condenser—.002 Mfd. 400 volt
56-A, B, C	500714	Condenser—electrolytic A—20 Mfd. 150 volt B—20 Mfd. 200 volt C—20 Mfd. 200 volt
58	502153	Condenser—.05 Mfd. 200 volt
59	502411	Condenser—2 Mmfd. 500 volt
		RESISTORS
6	502133	Resistor—carbon 220,000 ohms 1/4 watt
12	504710	Resistor—carbon 33,000 ohms 1/4 watt
14	502136	Resistor—carbon 10 Meg. 1/4 watt
18	502455	Resistor—carbon 27 ohms 1/4 watt
19	502457	Resistor—carbon 330 ohms 1/4 watt
20	502458	Resistor—carbon 430 ohms 1/4 watt
21	502269	Resistor—carbon 3.3 Meg. 1/4 watt
24	502132	Resistor—carbon 100,000 ohms 1/4 watt
29	502269	Resistor—carbon 3.3 Meg. 1/4 watt
30-A,B,C,D	502525	Volume control 1 Meg. (with switch)
32	502269	Resistor—carbon 3.3 Meg. 1/4 watt
33, 34	502456	Resistor—carbon 220 ohms 1/4 watt
36	502268	Resistor—carbon 1 Meg. 1/4 watt
38	502134	Resistor—carbon 470,000 ohms 1/4 watt
39	500712	Resistor—wire wound 1830 ohms 5 watt
41	502135	Resistor—carbon 2.2 Meg. 1/4 watt
44	502266	Resistor—carbon 15,000 ohms 1/4 watt
45	502459	Resistor—carbon 6800 ohms 1/4 watt
46	502457	Resistor—carbon 330 ohms 1/4 watt
47	502455	Resistor—carbon 27 ohms 1/4 watt
49-A, B, C	500715	Resistor—wire wound A—1460 ohms 10 watt B— 155 ohms 1 watt C— 310 ohms 10 watt
54	502454	Resistor—wire wound 47 ohms 1 watt
57	502454	Resistor—wire wound 47 ohms 1 watt
		COILS AND TRANSFORMERS
2	505781	Coil—antenna (series)
3	505440	Loop antenna
9	502498	Coil—oscillator
13	502495	Transformer—1st I.F.
23	500749	Transformer—2nd I.F.
51	502902	Trans.—output for A-502491 speaker
51	502492	Trans.—output for R-502491 speaker
55	502528	Filter choke
		OTHER ELECTRICAL PARTS
22	502536	Cable—battery pack
27	500713	Neon indicator lamp
43-A,B,C,D	502526	Switch—"CHARGE—BATT.—AC-DC"
53	502491	Speaker—P. M. dynamic (5 inch) includes output transformer
		MISCELLANEOUS PARTS
	160026	Base for mtg. electrolytic condenser
	505444	Cabinet—black
	505451	Catch and latch for rear door
	112745	Clip—coil mtg.
	114955	Clip—retainer on end of dial cord
	117057	Cord—dial drive (3 feet required) per ft.
	505400	Door-front for Model A61P1
	505441	Door-rear for Model A61P1
	505712	Door-front for Model A61P2
	505713	Door-rear for Model A61P2
	505720	Door-front for Model A61P3
	505721	Door-rear for Model A61P3
	505687	Escutcheon plate for Model A61P1
	505692	Escutcheon plate for Models A61P2 & A61P3
	505453	Handle & mtg. clips for Model A61P1
	505714	Handle & mtg. clips for Models A61P2 & A61P3
	505452	Hinge (pair) for rear door
	505711	Hinge for front door
	505682	Knob "OFF-VOLUME" (black)
	505683	Knob—"CHARGE—AC-DC" (black)
	505684	Knob—"TUNE" (black)
	505688	Knob—"OFF-VOLUME" (brown)
	505689	Knob—"CHARGE—AC-DC" (brown)
	505690	Knob—"TUNE" (brown)
	500747	Plug for battery cable (fits chassis)
	502537	Plug for battery cable (fits batt. pack)
	131575	Plug button
	505685	Pointer (black)
	505691	Pointer (brown)
	81145	Retaining ring for tuning shaft
	119087	Ring for dial cord
	79894	Screw—No. 8 X 5/8"; for mtg. chassis
	502524	Shaft—tuning control
	117716	Shield—tube
	116690	Socket—octal base
	500681	Socket—battery cable
	161384	Spring—dial cord tension
	111456	Washer—spring washer for tuning shaft

PARTS LIST

MODEL A51T1

DIAGRAM NO.	PART NO.	DESCRIPTION
		CONDENSERS
12	502156	Condenser—.004 Mfd. 400 volt
14	504390	Condenser—variable gang (with drum)
16	504434	Condenser—ceramic 50 Mmfd. 500 volt
18	504446	Condenser—.1 Mfd. 400 volt
23	504444	Condenser—.05 Mfd. 400 volt
26	502271	Condenser—mica 260 Mmfd. 500 volt
28	504445	Condenser—.004 Mfd. 150 volt
30	502271	Condenser—mica 260 Mmfd. 500 volt
32	504450	Condenser—.01 Mfd. 150 volt
35	504449	Condenser—.01 Mfd. 400 volt
36	504431	Condenser—electrolytic 20 Mfd. 150 volt
37	504431	Condenser—electrolytic 20 Mfd. 150 volt
42	504444	Condenser—.05 Mfd. 400 volt
43	502295	Condenser—10 Mmfd. 500 volt
		RESISTORS
15	504440	Resistor—carbon 22,000 ohms 1/3 watt
19	504435	Resistor—carbon 220,000 ohms 1/3 watt
21	504436	Resistor—carbon 82 ohms 1/2 watt
22	504441	Resistor—carbon 2.2 Meg. 1/3 watt
27A, B	504391	Volume control—with switch; 1 Meg.
29	504439	Resistor—carbon 3.3 Meg. 1/3 watt
31	504438	Resistor—carbon 470,000 ohms 1/3 watt
33	504438	Resistor—carbon 470,000 ohms 1/3 watt
34	504437	Resistor—carbon 150 ohms 1/2 watt
38	502574	Resistor—carbon 33 ohms 1/2 watt
41	504442	Resistor—carbon 1500 ohms 1 watt
		OTHER ELECTRICAL PARTS
11	504453	Loop antenna
13	504451	Coil—antenna coupling
17	504458	Coil—oscillator
20	504392	Transformer—1st I.F.
25	504392	Transformer—2nd I.F.
39	504454	Transformer—output
40	504455	Speaker—P.M. dynamic (3-1/2 inch)
		MISCELLANEOUS PARTS
	504389	Bottom plate
	504537	Cabinet—ivory (Model A51T3)
	504538	Cabinet—black (Model A51T4)
	504539	Cabinet—mahogany (Model A51T2)
	112745	Clip—coil mtg.
	114955	Clip—retainer on end of dial cord
	505101	Clip—for mtg. slug tuned I.F. transformers
	117057	Cord—dial drive (2 ft. required) per ft.
	504545	Dial scale (Models A51T2 & A51T3)
	505099	Dial Scale (Model A51T4)
	504452	Insulator for volume control terminals
	505103	Insulating sheet on bottom of cabinet
	504470	Knob—black (Model A51T4)
	504474	Knob—ivory (Model A51T3)
	504541	Knob—mahogany (Model A51T2)
	504544	Pointer
	119087	Ring for dial cord
	116584	Rubber feet
	12531	Screw—No. 8-32 x 3/8; retains bottom plate to cabinet
	17861	Screw—Set, No. 4-40; shaft extension
	83624	Screw—No. 8 x 1/4; retains chassis to bottom plate
	504721	Shaft extension for tuning gang
	504397	Socket—miniature
	505161	Spring—dial cord tension
	504472	Window for dial

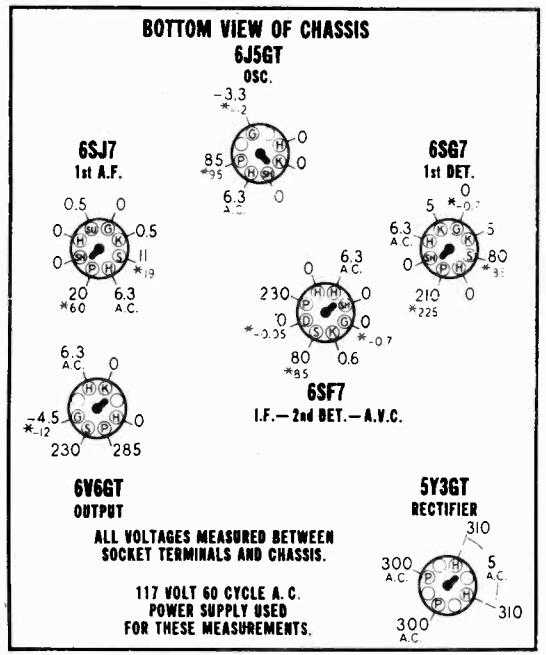
RECORD CHANGER: STEW WAR Model VM505339, RCD. CH. 17-14

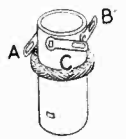


SOCKET VOLTAGES

Measured with voltmeter having sensitivity of 1000 ohms per volt except where indicated by (*). The (*) symbol designates a vacuum tube voltmeter measurement.

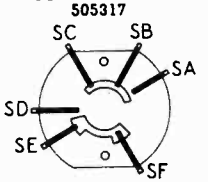
DIAL TUNED TO 540 KC.
VOLUME ON FULL WITH NO SIGNAL
RADIO-PHONO & TONE SWITCH IN "RADIO-BASS" POSITION



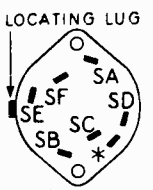


OSCILLATOR COIL 505326

ALTERNATE TYPES OF RADIO-PHONO & TONE SWITCH 505317



REAR VIEW

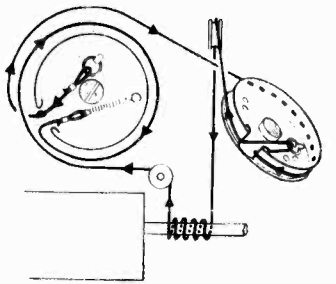


REAR VIEW
*Not used; may serve as wiring junction point.

Lettered terminals in illustrations correspond to similarly lettered terminals on the circuit diagram

DIAL AND POINTER DRIVE CORD ARRANGEMENT

SIDE VIEW
(With dial plate removed)



To string dial cord first slip pointer off its shaft. Then remove dial scale by taking out the six clips around its edges. Dial plate may now be taken off by removing the two screws which are visible and accessible at front of chassis. Now set gang condenser to fully open position and use the following parts:

114955 Clip on end of cord
117057 Cord (3 feet)
119087 Ring for dial cord
505161 Tension spring

To replace and properly position pointer see step 1 in "Alignment Procedure"

AUDIO OSCILLATION

The audio system of this receiver utilizes a two stage type of inverse feed-back arrangement and should it ever be necessary to remove or replace the speaker or output transformer it is important to maintain a definite phase relationship in the feed-back circuit. If the connections to the output transformer are reversed or if the feed-back connection is made to the wrong side of the output transformer secondary, the system will become regenerative instead of degenerative. Under those conditions audio oscillation may result. If that occurs, oscillation may be prevented by reversing the connections to the speaker voice coil.

ALIGNMENT PROCEDURE

1. With the gang condenser fully meshed, the dial pointer should be in a horizontal position at low end of dial, parallel to the bottom edge of dial scale. If it is set incorrectly, merely hold tuning control shaft steady and turn pointer to correct position.
2. Connect an output meter across the speaker voice coil or from the plate of the 6V6GT tube to chassis through a .1 Mfd. condenser.
3. Connect the ground lead of signal generator to the receiver chassis.
4. Set volume control at maximum volume position and use a weak signal from the signal generator.

DUMMY ANT. IN SERIES WITH SIGNAL GENERATOR	CONNECT HIGH SIDE OF SIG. GENERATOR TO	SIGNAL GENERATOR FREQUENCY	RECEIVER DIAL SETTING	TRIMMER NUMBER	TRIMMER DESCRIPTION	TYPE OF ADJUSTMENT
.1 MFD. Condenser	Lug on trimmer No. 6 on antenna section of gang (see figure below for location of trimmer).	455 KC	Any point where it does not affect the signal.	1-2	2nd I.F.	Adjust for maximum output. Then repeat adjustment.
				3-4	1st I.F.	
200 MMFD. Mica Condenser	External Antenna Clip	1400 KC	1400 KC	5	Broadcast Oscillator	Adjust for maximum output.
200 MMFD. Mica Condenser	External Antenna Clip	1400 KC	Tune to 1400 KC generator signal	6	Broadcast Antenna	Adjust for maximum output.

STAGE GAIN MEASUREMENT PROCEDURE

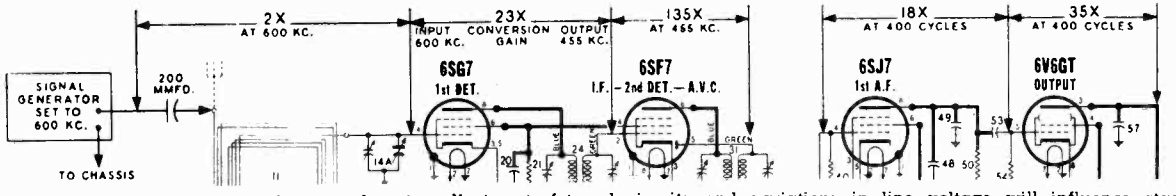
REQUIRED INSTRUMENTS: The amount of amplification or "gain" of each of the stages of this receiver may be measured with an A.C. Vacuum Tube Voltmeter or a "channel" type instrument containing a tuned and calibrated amplifier.

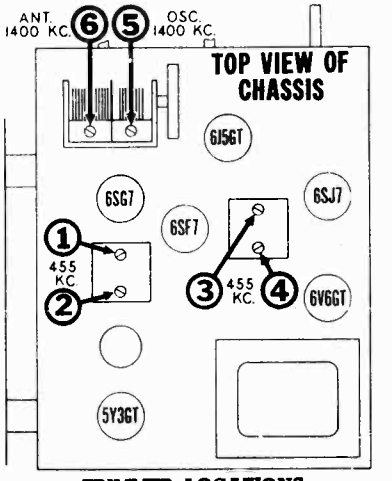
PROCEDURE: It is exceedingly important to adhere to the procedure outlined below since the accuracy of these measurements will be affected to a considerable extent by the failure to establish proper operating conditions.

1. Be sure that R.F. and I.F. stages are carefully and accurately aligned by utilizing the alignment procedure given above.
2. Connect Signal Generator as shown below.
3. The values of stage gain which are given here were measured with a fixed bias of 3 volts on the control grids of all R.F. and I.F. tubes which are connected to the A.V.C. circuit. Therefore, these values are not intended to indicate the full capability of a stage but they will serve as a convenient basis for determining proper operation. In order to duplicate the fixed bias voltage, connect the negative terminal of a 3 volt battery to A.V.C. at black lead of 1st I.F. and connect the positive battery lead to receiver chassis.

IMPORTANT: Disconnect battery when measuring audio stage gain.

4. Set Signal Generator for operation at 600 Kc with 400 cycle modulation and carefully tune radio receiver to this signal by using an output meter to indicate peak output. If a local station interferes, set generator to a nearby frequency and re-tune the receiver.
5. R.F. and I.F. circuits are slightly de-tuned when contact is made with an instrument probe and this action, which is indicated by a change in the output meter reading, may seriously affect the gain measurement. Therefore, it is important to adjust the associated circuit trimmer for a maximum output meter reading and to set the input signal level to a convenient reference point on the gain measuring instrument while the probe is making contact. After removing the probe it is again necessary to adjust the trimmer so as to obtain the same output meter reading and thereby assure that the signal voltage at the specified point has not changed as a result of circuit de-tuning.
6. When using a "channel" type instrument, carefully tune it for maximum output at desired frequency before making measurements.



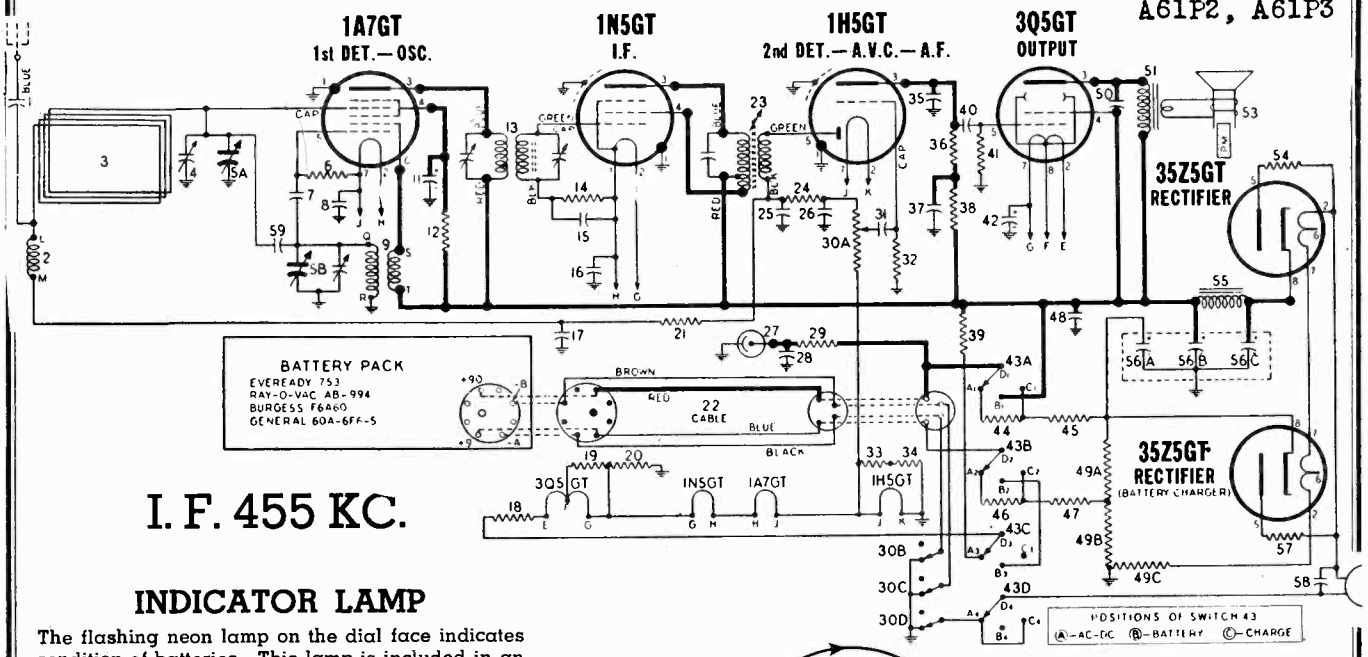


TRIMMER LOCATIONS

DIFFERENCES in tube characteristics, tolerance of parts, adjustment of tuned circuits and variations in line voltage will influence stage gain. These factors should be given due attention in event the gain of a stage varies extensively from the values shown above.

STEWART-WARNER CORP.

MODELS A61P1, A61P2, A61P3



I. F. 455 KC.

INDICATOR LAMP

The flashing neon lamp on the dial face indicates condition of batteries. This lamp is included in an oscillating (R-C) circuit which is designed to oscillate at approximately 3 pulses per second when batteries are in a fully charged condition. As the battery voltage decreases with use, number of pulses per second decreases.

This lamp will only show the true condition of the batteries when the Selector Switch is in the "Battery" position. Lamp flashes more rapidly during charging or "AC-DC" operation.

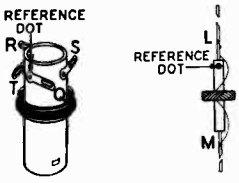
When battery voltage is low (approximately 72 volts) the lamp flashes more slowly (about once per second). The set should not be operated from battery power after this point is reached and batteries should be recharged immediately. Charge for at least twice the time they were used and as soon as possible after they are run down. As batteries age it is necessary to charge for a longer period. For longest battery life, charge immediately after using.

IMPORTANT:

1. Completely dead batteries cannot be recharged.
2. When set is connected to a DC line, check for correct polarity by operating it before attempting to charge the batteries.
3. Batteries will be discharged if "OFF-VOLUME" switch is left **ON** when power cord is not connected to wall outlet.

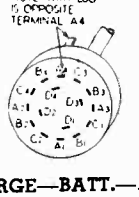
CHARGING CIRCUIT

The battery charging circuit consists of a 35Z5GT rectifier and a suitable resistor voltage dividing network. This circuit provides a very low charging current when the receiver is operated on AC-DC and is just enough to maintain the batteries but will not charge them. A separate charging position is provided for the regular charging operation. A charging rate of approximately ⅓ the discharge rate is used to give best results.



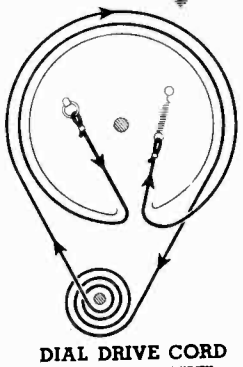
ANTENNA COIL
505781

OSCILLATOR COIL
502498



CHARGE—BATT.—AC-DC SWITCH
502526

Lettered terminals in illustrations correspond to similarly lettered terminals on the circuit diagram.



DIAL DRIVE CORD ARRANGEMENT

To string dial cord, set gang condenser to fully open position and use following parts:

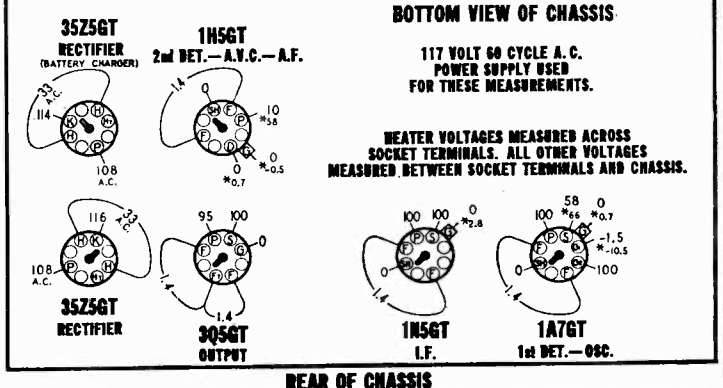
114955	Clip on end of cord
117057	Cord (3 feet)
119087	Ring for dial cord
161384	Tension Spring

SOCKET VOLTAGES

Measured with voltmeter having sensitivity of 1000 ohms per volt except where indicated by (*). The (*) symbol designates a vacuum tube voltmeter measurement.

VOLUME ON FULL WITH NO SIGNAL — **DIAL TUNED TO 540 KC.**

"CHARGE—BATT.—AC-DC" SWITCH IN "AC-DC" POSITION



MODELS A61P1, A61P2, A61P3

STEWART-WARNER CORP.

STAGE GAIN MEASUREMENT PROCEDURE

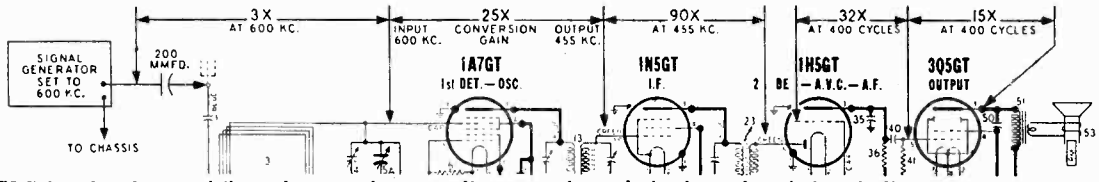
REQUIRED INSTRUMENTS: The amount of amplification or "gain" of each of the stages of this receiver may be measured with an A.C. Vacuum Tube Voltmeter or a "channel" type instrument containing a tuned and calibrated amplifier.

PROCEDURE: It is exceedingly important to adhere to the procedure outlined below since the accuracy of these measurements will be affected to a considerable extent by the failure to establish proper operating conditions.

1. Be sure that R.F. and I.F. stages are carefully and accurately aligned by utilizing the alignment procedure given above.
2. Connect Signal Generator as shown below.
3. The values of stage gain which are given here were measured with a fixed bias of 1½ volts on the control grids of all R.F. and I.F. tubes which are connected to the A.V.C. circuit. Therefore, these values are not intended to indicate the full capability of a stage but they will serve as a convenient basis for determining proper operation. In order to duplicate the fixed bias voltage, connect the negative terminal of a 1½ volt battery to A.V.C. at terminal "M" of Antenna Coil and connect the positive battery lead to receiver chassis.

IMPORTANT: Disconnect battery when measuring audio stage gain.

4. Set Signal Generator for operation at 600 Kc with 400 cycle modulation and carefully tune radio receiver to this signal by using an output meter to indicate peak output. If a local station interferes, set generator to a nearby frequency and re-tune the receiver.
5. R.F. and I.F. circuits are slightly de-tuned when contact is made with an instrument probe and this action, which is indicated by a change in the output meter reading, may seriously affect the gain measurement. Therefore, it is important to adjust the associated circuit trimmer for a maximum output meter reading and to set the input signal level to a convenient reference point on the gain measuring instrument while the probe is making contact. After removing the probe it is again necessary to adjust the trimmer so as to obtain the same output meter reading and thereby assure that the signal voltage at the specified point has not changed as a result of circuit de-tuning.
6. When using a "channel" type instrument, carefully tune it for maximum output at desired frequency before making measurements.



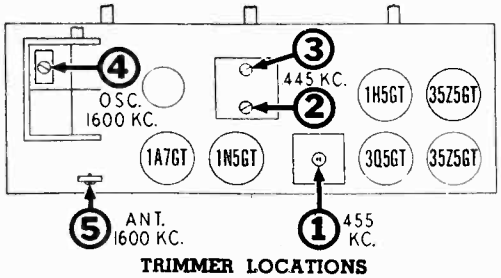
DIFFERENCES in tube characteristics, tolerance of parts, adjustment of tuned circuits and variations in line voltage will influence stage gain. These factors should be given due attention in event the gain of a stage varies extensively from the values shown above.

ALIGNMENT PROCEDURE

1. Disconnect and remove battery from cabinet. Then remove the two plug buttons which are located at bottom of cabinet so that a long blade screwdriver may be inserted to remove chassis holddown screws. After removing these screws be sure to replace and reconnect the battery as battery position affects alignment of loop antenna circuit.
2. **Partially** withdraw the chassis from cabinet so as to obtain access to trimmer adjustments—**do not completely remove the chassis from the cabinet** as position of chassis relative to loop antenna is important.
3. In order to provide a means of coupling the signal generator to the antenna, wind approximately two turns of insulated wire around outside of cabinet so that its position corresponds to that of the built-in loop. Then connect both leads of this coupling to signal generator.
4. Connect an output meter across voice coil of speaker or between plate of 3Q5GT output tube and chassis through a 0.1 mfd. condenser.
5. Set the volume control at maximum volume position and use a weak signal from the signal generator.
6. Set "CHARGE—BATT.—AC-DC" Switch in "AC-DC" position.

DUMMY ANT. IN SERIES WITH SIGNAL GENERATOR	SIGNAL GENERATOR CONNECTION	SIGNAL GENERATOR FREQUENCY	RECEIVER DIAL SETTING	TRIMMER OR SLUG NUMBER	TRIMMER DESCRIPTION	TYPE OF ADJUSTMENT
None	Connect directly to coupling turn around cabinet.	455 KC	Any point where it does not affect the signal.	1	2nd I.F.	Adjust for maximum output. Then repeat adjustment.
				2—3	1st I.F.	
None	Connect directly to coupling turn around cabinet.	1600 KC	1600 KC	4	Broadcast Oscillator	Adjust for maximum output.
None	Connect directly to coupling turn around cabinet.	1600 KC	Tune to 1600 KC generator signal	5	Broadcast Antenna	Adjust for maximum output. Slide chassis all the way into cabinet when making this adjustment.

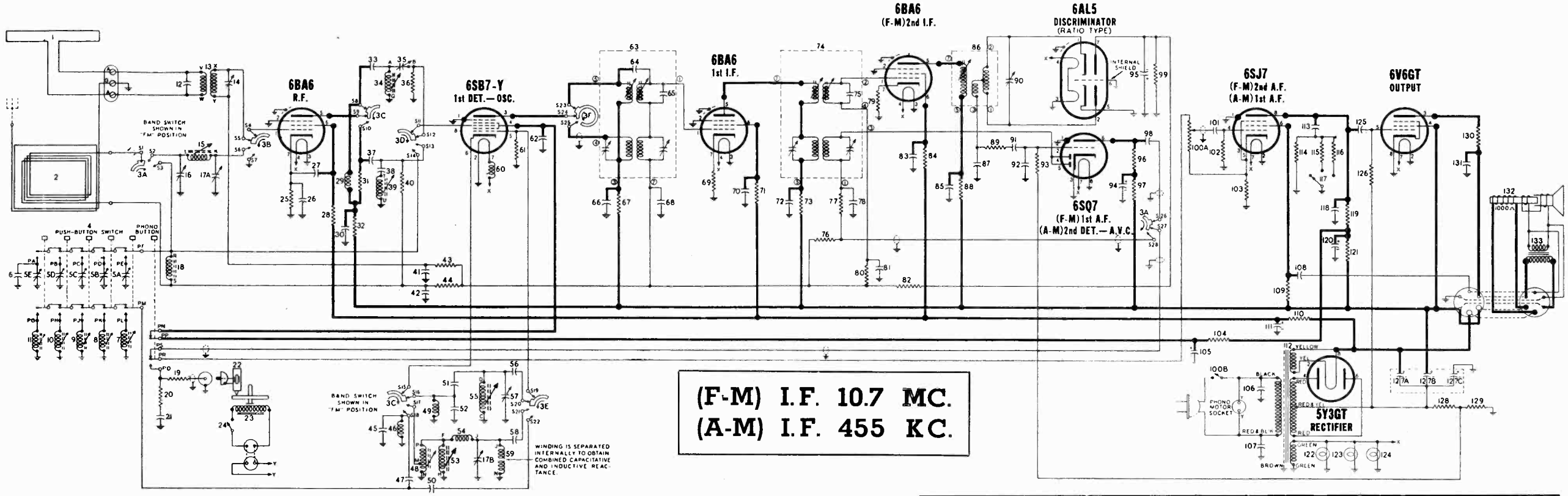
TOP VIEW OF CHASSIS



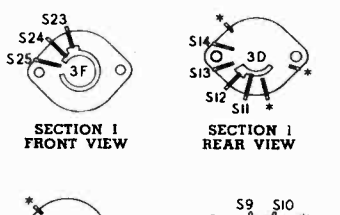
TRIMMER LOCATIONS

STEWART-WARNER CORP.

MODELS A92CR3, A92CR6



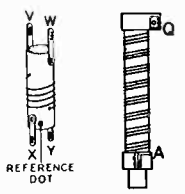
(F-M) I.F. 10.7 MC.
(A-M) I.F. 455 KC.



★Not used; may serve as wiring junction point.

BAND SWITCH 504593

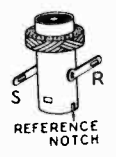
Lettered terminals in illustrations correspond to similarly lettered terminals on the circuit diagram.

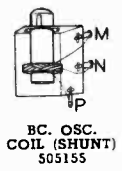


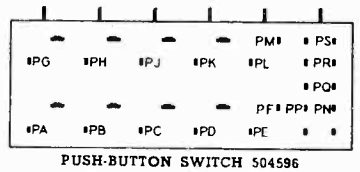
SLUGS FOR MANUAL TUNING COILS

FM R.F. } 505160
FM OSC. }

BC. ANT. } 505152
BC. OSC. }







SOCKET VOLTAGES

Measured with voltmeter having sensitivity of 1000 ohms per volt except where indicated by (*). The (*) symbol designates a vacuum tube voltmeter measurement.

ALL MEASUREMENTS MADE WITH BAND SWITCH IN "FM" POSITION UNLESS OTHERWISE INDICATED
DIAL TUNED TO 108MC. FOR "FM" MEASUREMENTS
DIAL TUNED TO 540KC. FOR "AM" MEASUREMENTS
VOLUME CONTROL SET TO MINIMUM WITH NO SIGNAL
ALL PUSH BUTTONS IN "OUT" POSITION
TONE SWITCH IN SPEECH POSITION

POWER OUTPUT
Undistorted ..... 3.5 watts.
Maximum ..... 6.0 watts.

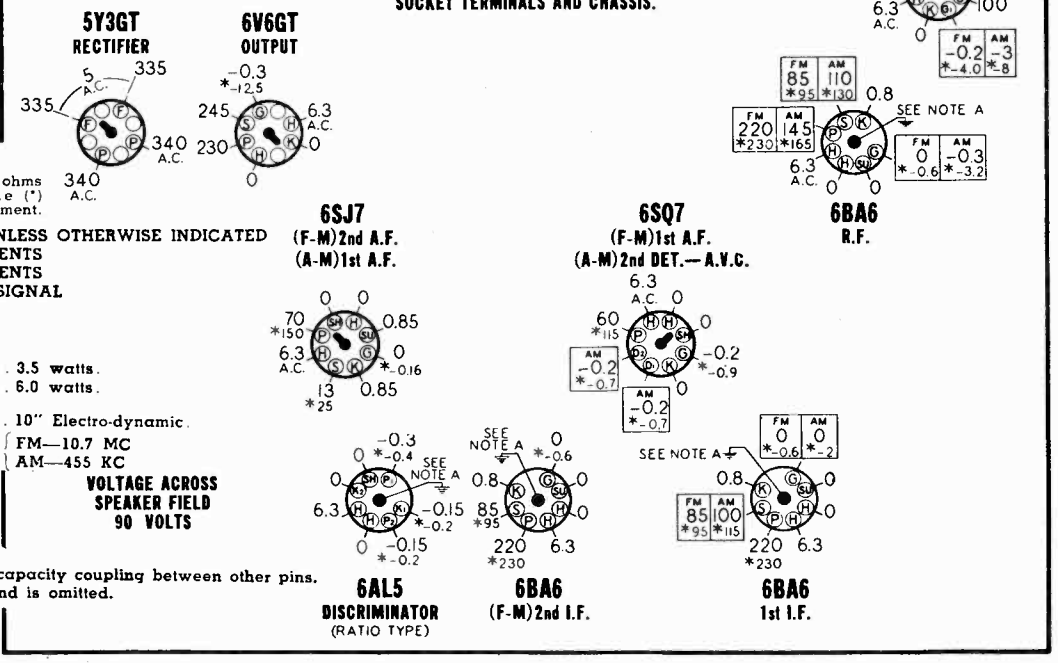
SPEAKER ..... 10" Electro-dynamic.

INTERMEDIATE FREQUENCY ..... FM—10.7 MC
AM—455 KC

VOLTAGE ACROSS SPEAKER FIELD 90 VOLTS

BOTTOM VIEW OF CHASSIS

117 VOLT 60 CYCLE A.C. POWER SUPPLY USED FOR THESE MEASUREMENTS. ALL VOLTAGES MEASURED BETWEEN SOCKET TERMINALS AND CHASSIS.



REAR OF CHASSIS

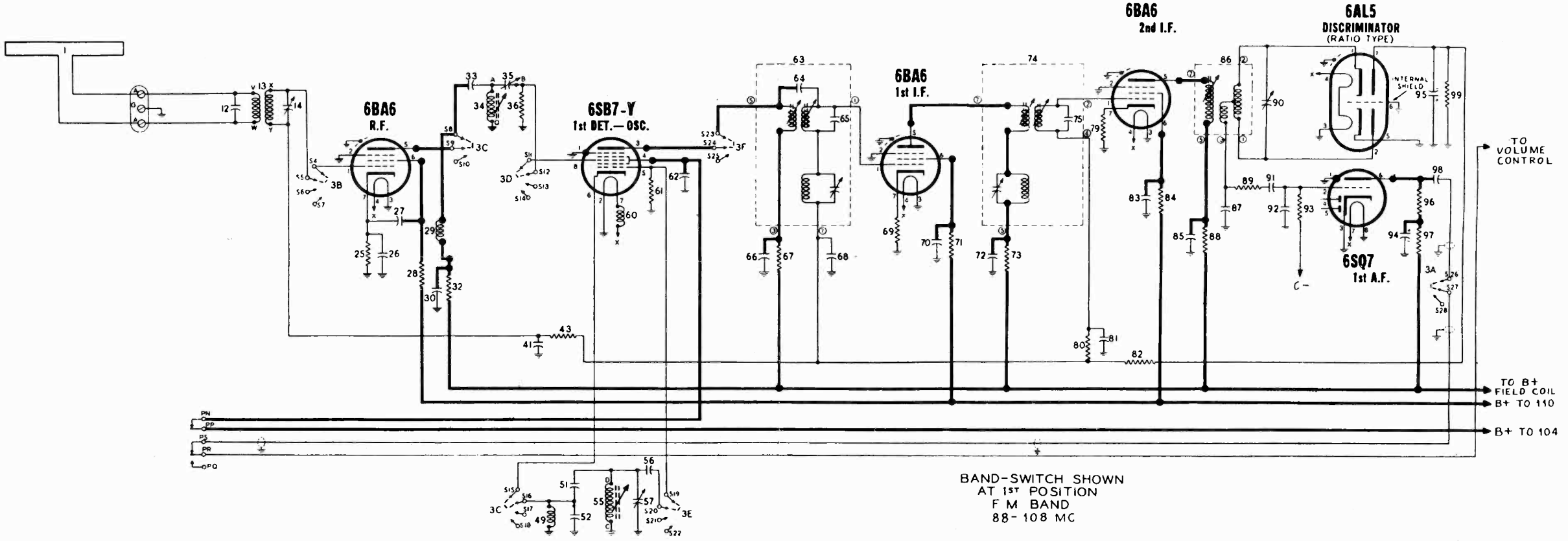
NOTE A: Grounding of center stud on tube socket is necessary to reduce capacity coupling between other pins. Oscillation may result if this ground is omitted.

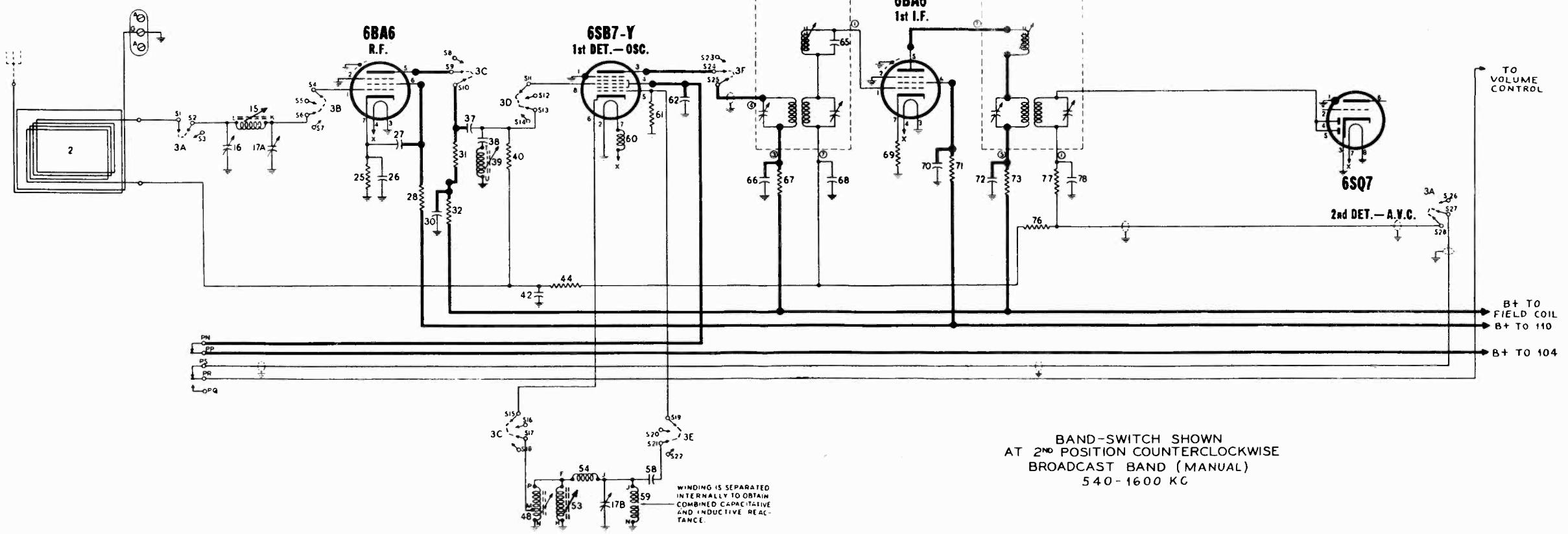
RECORD CHANGERS: STEW WAR Model W504138 for Model A92CR3, RCD. CH. 17-1, Model VM504932 for Model A92CR6, RCD. CH. 17-4

"clarified schematics"

MODELS A92CR3,
A92CR6

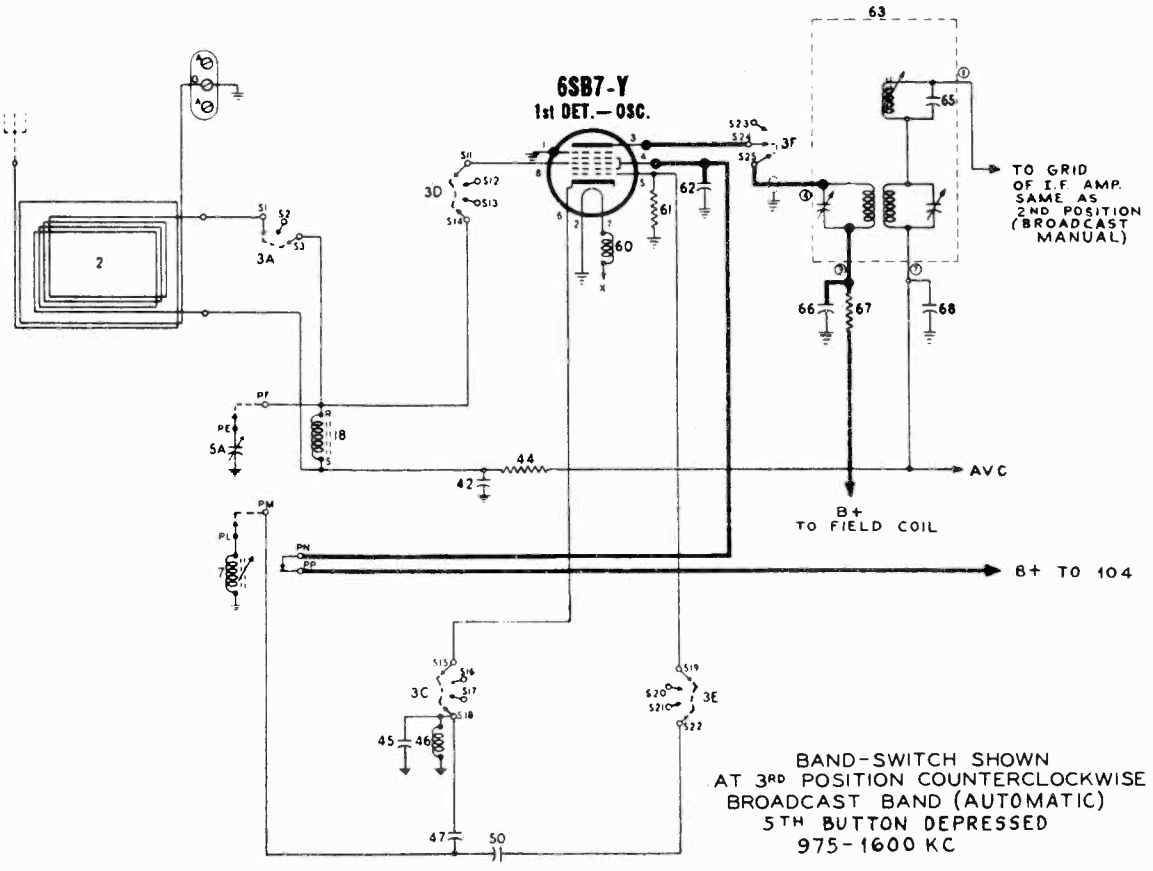
STEWART-WARNER CORP.





STEWART-WARNER CORP.

MODELS A92CR3, A92CR6



STAGE GAIN MEASUREMENT PROCEDURE

REQUIRED INSTRUMENTS: The amount of amplification or "gain" of each of the stages of this receiver should be measured with an A. C. Vacuum Tube Voltmeter of the high frequency type (uniform response up to 100 MC). A conventional "AM" type signal generator may be used but it must be capable of producing **fundamental** frequencies of 600 KC. and 98 MC—**avoid using a generator that produces the 98 MC. signal by means of harmonics.**

PROCEDURE: It is exceedingly important to adhere to the procedure outlined below since the accuracy of these measurements will be affected to a considerable extent by the failure to establish proper operating conditions.

1. Be sure that R.F., I.F. and Discriminator stages are carefully and accurately aligned by utilizing the alignment procedure given in this manual.
2. Connect Signal Generator as shown below. Note that generator connections differ for "AM" and "FM" measurements.
3. For "AM" measurements, set signal generator to 600 KC. and then carefully tune radio receiver to this signal by using an output meter to indicate peak output. If a local station interferes, set generator to a nearby frequency and re-tune the receiver.
4. For "FM" measurements, set signal generator to 98 MC. and then carefully tune radio receiver to this signal by using a D. C. Vacuum Tube Voltmeter as an output indicator—meter must be connected between pin #7 of 6AL5 tube and chassis. If a local station interferes, set generator to a nearby frequency and re-tune the receiver.
5. The values of stage gain which are given here were measured with a fixed bias of 3 volts on the control grids of all R.F. and I.F. tubes which are connected to the A.V.C. circuit. Therefore, these values are not intended to indicate the full capability of a stage but they will serve as a convenient basis for determining proper operation. In order to duplicate the fixed bias voltage, connect the negative terminal of a 3 volt battery to A.V.C. at terminal 7 of the 1st I.F. transformer and connect the positive battery lead to the receiver chassis.
6. R.F. and I.F. circuits are slightly de-tuned when contact is made with an instrument probe and this action, which is indicated by a change in the output meter reading, may seriously affect the gain measurement. Therefore, it is important to adjust the associated circuit trimmer for a maximum output meter reading and to set the input signal level to a convenient reference point on the gain measuring instrument while the probe is making contact. After removing the probe it is again necessary to adjust the trimmer so as to obtain the same output meter reading and thereby assure that the signal voltage at the specified point has not changed as a result of circuit de-tuning.

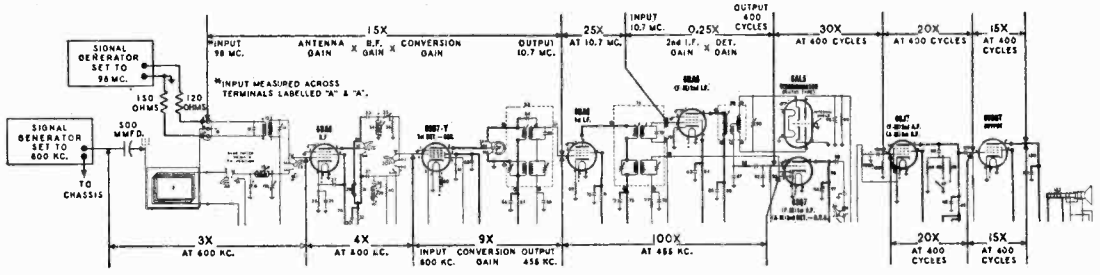


Fig. 11

DIFFERENCES in tube characteristics, tolerance of parts, adjustment of tuned circuits and variations in line voltage will influence stage gain. These factors should be given due attention in event the gain of a stage varies extensively from the values shown above.

MODELS A92CR3, A92CR6

STEWART-WARNER CORP.

BROADCAST BAND — "AM" — ALIGNMENT PROCEDURE

1. Disconnect leads from FM antenna terminal strip (labelled "A-G-A") at back of chassis; also disconnect speaker plug, AM loop antenna plug and phono plugs. Remove chassis from cabinet.

2. Remove AM loop antenna from cabinet and reconnect it to the plug at back of receiver chassis. Then wind one turn of insulated wire around frame of loop antenna so as to provide a means of coupling it to the signal generator. Connect one end of this coupling turn to receiver chassis and allow the other end to remain open until otherwise instructed in the following chart.

3. Remove Speaker from cabinet and reconnect plug to receiver chassis.

4. Connect an output meter across speaker voice coil or from plate of 6V6GT tube to chassis through a 0.1 Mfd. condenser.

5. Connect ground lead of signal generator to receiver chassis.

6. Set volume control to the maximum volume position and use a weak signal from the signal generator.

7. Space the loop antenna approximately the same distance from receiver chassis as when installed in the cabinet.

8. If alignment of both AM and FM channels is necessary, it is necessary to align the AM channel first; then align FM channel as instructed in preceding section.

9. R.F. leads from slug tuner assembly and push button switch should be dressed away from wave trap coil and close to chassis.

10. After alignment procedure is completed and chassis and loop antenna have been reinstalled in cabinet, arrange leads to loop so that they are separated from each other as much as possible—avoid twisting or taping these leads together.

DUMMY ANT. IN SERIES WITH SIGNAL GENERATOR	CONNECT HIGH SIDE OF SIGNAL GENERATOR TO	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POSITION	RECEIVER DIAL SETTING	TRIMMER OR SLUG NUMBER	TRIMMER DESCRIPTION	TYPE OF ADJUSTMENT
0.1 MFD. Condenser	Terminal K on tuner unit (see Fig. 13).	455 KC	"AM" Center Position	Any position where it does not affect the signal.	1-2	2nd I.F.	Adjust for maximum output. Then repeat adjustment.
					3-4	1st I.F.	
0.1 MFD. Condenser	Terminal K on tuner unit (see Fig. 13).	455 KC	"AM" Center Position	Any position where it does not affect the signal.	5	Wave Trap	Adjust for minimum output.
If positions of movable slugs in the slug tuner assembly have been disturbed (examine cement seal near top of threaded stem on each slug) or if a coil or slug has just been replaced in the tuner assembly, omit the next 5 instructions in this chart and start with the procedure entitled "Slug Tuner Adjustment Procedure—AM Section." Where the tuner assembly has not been disturbed, ignore this instruction and proceed with the next step.							
500 MMFD. Mica Condenser	Coupling turn on Loop Antenna frame.	535 KC	"AM" Center Position	Set Slug tuner assembly to fully closed position. Disregard position of dial pointer.	6	Oscillator Trimmer	Adjust for maximum output.
500 MMFD. Mica Condenser	Coupling turn on Loop Antenna frame.	1000 KC	"AM" Center Position	Tune to 1000 KC generator signal and check position of dial pointer. If it is set incorrectly, release clip on pointer and reposition to 1000 KC calibration mark. Note that the 1000 KC mark is located under the number "1". Exercise care to set pointer accurately.			
500 MMFD. Mica Condenser	Coupling turn on Loop Antenna frame.	1500 KC	"AM" Center Position	Tune to 1500 KC generator signal.	7	Antenna Trimmer	Note the difference between the dial pointer setting and the 1500 KC mark on the scale—do not disturb pointer position even if pointer does not coincide with 1500 KC mark. If the difference does not exceed 20 KC, adjust trimmer No. 7 for maximum output and proceed with next two instructions in this chart. Where the calibration error exceeds 20 KC it is advisable to omit the next two instructions in this chart and adjust the slug tuner as described in the following section.
500 MMFD. Mica Condenser	Coupling turn on Loop Antenna frame.	600 KC	"AM" Center Position	Tune to 600 KC generator signal.	8	Antenna Padder	Adjust for maximum output. Try to increase output by detuning padder and retuning receiver dial until maximum output is obtained.
Repeat adjustment of trimmers 7 and 8 until one no longer detunes the other. This completes the AM band alignment procedure. The following procedure should only be used where the conditions described under the heading are encountered.							

STEWART-WARNER CORP.

MODELS A92CR3, A92CR6

SLUG TUNER ADJUSTMENT PROCEDURE — AM SECTION

This procedure is to be used only where the positions of slugs in the slug tuner have been disturbed or in event of a coil or slug replacement, or where a serious calibration or tracking error is noted after attempting to align the receiver as described in the preceding section.

DUMMY ANT. IN SERIES WITH SIGNAL GENERATOR	CONNECT HIGH SIDE OF SIGNAL GENERATOR TO	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POSITION	RECEIVER DIAL SETTING	TRIMMER OR SLUG NUMBER	TRIMMER DESCRIPTION	TYPE OF ADJUSTMENT
500 MMFD. Mica Condenser	Coupling turn on Loop Antenna frame.	**535 KC**	**"AM"** Center Position	Set Slug tuner assembly to fully closed position. Disregard position of dial pointer.	**9**	Oscillator Tuning Slug	The object of this adjustment is to set slug #9 to a position where the oscillator coil reaches maximum inductance at 535 KC. That is accomplished by first backing off trimmer condenser #6 until its plates are well spaced (lowest capacity); then rotate slug #9 and note whether a peak can be obtained on the output meter. If a peak cannot be reached, turn trimmer condenser #6 to a slightly higher capacity setting and repeat adjustment of slug #9 for peak output. **When adjusting this slug, always approach the peak output setting by rotating the slug so that it is moving down into the coil form.** The correct setting of slug #9 is determined when a definite peak can be reached with trimmer #6 at the lowest capacity position that permits the coil and condenser to resonate at 535 KC.
500 MMFD. Mica Condenser	Coupling turn on Loop Antenna frame.	**1500 KC**	**"AM"** Center Position	Set Accurately to 1500 KC mark on scale.	**6**	Oscillator Trimmer	Adjust for maximum output.
500 MMFD. Mica Condenser	Coupling turn on Loop Antenna frame.	**535 KC**	**"AM"** Center Position	Set Slug tuner assembly to fully closed position.	**10**	Oscillator Padder Slug	Adjust to receive 535 KC signal and for maximum output.

Repeat adjustment of oscillator trimmer #6 at 1500 KC and oscillator padder slug at 535 KC until both points are correctly calibrated with the dial scale.

500 MMFD. Mica Condenser	Coupling turn on Loop Antenna frame.	**1500 KC**	**"AM"** Center Position	Tune to 1500 KC generator signal.	**7**	Antenna Trimmer	Adjust for maximum output.
500 MMFD. Mica Condenser	Coupling turn on Loop Antenna frame.	**1000 KC**	**"AM"** Center Position	Tune to 1000 KC generator signal.	**11**	Antenna Tuning Slug	Adjust for maximum output.
500 MMFD. Mica Condenser	Coupling turn on Loop Antenna frame.	**600 KC**	**"AM"** Center Position	Tune to 600 KC generator signal.	**8**	Antenna Padder	Adjust for maximum output. Try to increase output by detuning padder and retuning receiver dial until maximum output is obtained.

Repeat the three preceding adjustments until no further improvement can be made in output at 1500 KC, 1000 KC and 600 KC. Apply a coating of speaker cement at top of each tuning slug stem to prevent movement.

DIAL AND POINTER DRIVE CORD ARRANGEMENT

To string dial cord, turn the main drive drum to maximum **counter-clockwise** position and use following parts:

114955—Clip on end of cord
117057—Cord (7 feet)
119087—Ring for dial cord
113177—Tension Spring

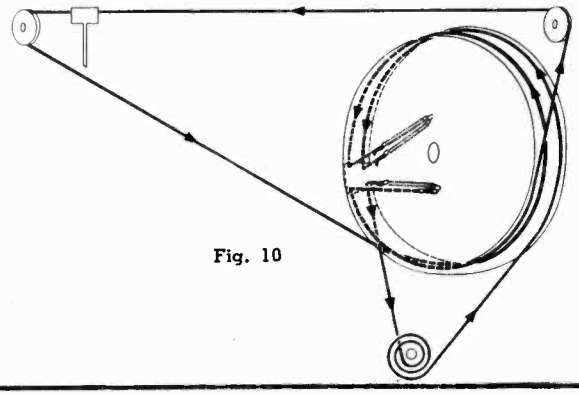


Fig. 10

MODELS A92CR3, A92CR6

STEWART-WARNER CORP.

FREQUENCY MODULATION — "FM" — ALIGNMENT PROCEDURE

INSTRUMENTS: Alignment of the FM circuits in this receiver may be accomplished with either a conventional AM type signal generator or an FM signal generator. The output indicator should be an oscilloscope or a vacuum tube voltmeter.

Although it is preferable to use an FM generator and an oscilloscope, reasonably accurate alignment is obtainable when using a conventional AM generator and vacuum tube voltmeter providing proper care is exercised in adjusting the discriminator circuit trimmer condenser.

IMPORTANT: If an AM signal generator is used, it should be capable of producing **fundamental** frequencies of 10.7 MC and 88 to 108 MC—avoid using an AM generator which produces signals in the 88 to 108 MC range by using harmonics higher than the second. Generators which are dependent upon third, fourth or fifth harmonics for output frequencies of 88 to 108 MC will generally produce undesirable spurious beat signals with the local oscillator in the receiver and alignment will be exceedingly difficult.

The following procedure is adaptable for use with either an AM or FM generator and oscilloscope or vacuum tube voltmeter—merely follow the instructions which are applicable to the instruments that are used.

1. If alignment of both AM and FM channels is required it is necessary to align the AM channel first, then align the FM channel as instructed in adjacent chart (AM alignment procedure is given on page 7). Do not attempt to reposition pointer by releasing it from clip on dial cord—this is done only during AM alignment.
2. Disconnect leads from FM antenna terminal strip (labelled "A-G-A") at back of chassis; also disconnect all other plugs on rear of chassis and remove chassis from cabinet. It is not necessary to remove the built in antennas.
3. Remove speaker from cabinet and reconnect plug to receiver chassis.
4. Examine underside of chassis and note whether a metal shield plate is covering components in the vicinity of the IF stages. Some chassis were equipped with this shield and it must be removed during alignment.
5. A specific setting of the receiver volume control is not required, however, it will be found convenient to leave it in the maximum volume position so that alignment signals will be audible even though the output indication is obtained by a V-T voltmeter or 'scope connected to points in the discriminator circuit.
6. Dress FM circuit leads as short and straight as possible, particularly those in the oscillator circuit. I.F. plate and grid leads should also be kept short and straight.
7. Alignment of receiver circuits may now be accomplished by using the procedure in the adjoining chart.

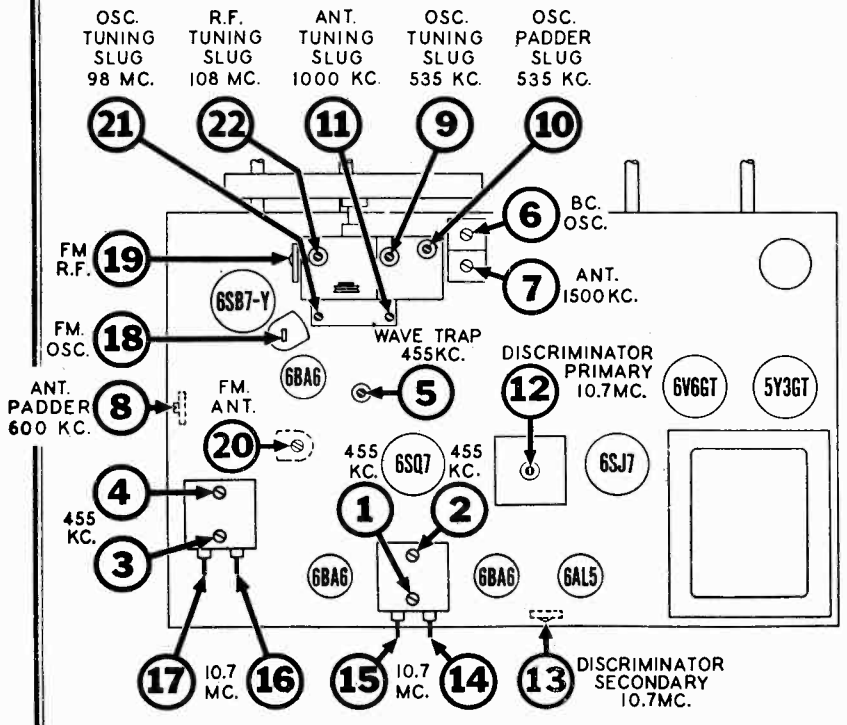


Fig. 12
TRIMMER LOCATION CHART

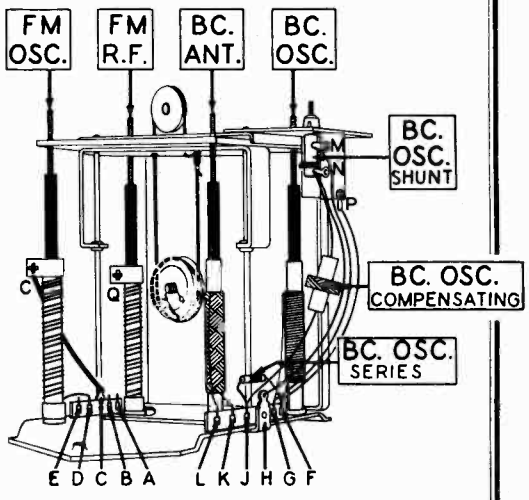
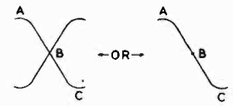


Fig. 13
SLUG TUNER ASSEMBLY

STEWART-WARNER CORP.

MODELS A92CR3, A92CR6

SIGNAL GENERATOR CONNECTIONS			OSCILLOSCOPE OR V-T VOLTMETER CONNECTIONS		RECEIVER				TYPE OF ADJUSTMENT AND OUTPUT INDICATION	
CONNECT HIGH SIDE OF SIGNAL GENERATOR TO	CONNECT GROUND LEAD OF SIGNAL GENERATOR TO	FREQUENCY & TYPE OF MODULATION	IF AN OSCILLOSCOPE IS USED, CONNECT IT AS FOLLOWS:	IF A V-T VOLTMETER IS USED, CONNECT IT AS FOLLOWS:	BAND SWITCH POSITION	DIAL SETTING	TRIMMER OR SLUG NUMBER	TRIMMER DESCRIPTION	ADJUSTMENT AND OUTPUT INDICATION WHEN USING A V-T VOLTMETER	ADJUSTMENT AND OUTPUT INDICATION WHEN USING AN OSCILLOSCOPE
Pin #1 of 6BA6 (FM) 2nd I.F. use a .01 MFD. condenser in series with generator lead.	Receiver chassis in vicinity of 6BA6 (FM) 2nd I.F. tube.	**10.7 MC** AM signal may be 400 cycle modulated or FM signal should preferably be modulated ±300 KC.	Connect vertical amplifier "high" lead in series with an 0.1 MFD. condenser to pin #6 of 6SQ7 tube. Connect scope ground lead to receiver chassis.	Connect common (or ground) terminal of meter to receiver chassis. D.C. probe lead of meter is then connected to pin #7 of the 6AL5 tube.	**FM** Maximum clockwise position	Any position where it does not affect the signal.	**12**	Discriminator Primary	Set meter to a low D.C. voltage range and adjust trimmer #12 for maximum meter reading. (This voltage will be negative.)	Set vertical amplifier of scope for maximum amplification. Where FM signal generator provides an output voltage for synchronization, connect this voltage to "sync" terminals of the scope. Then adjust setting of trimmer #13, before attempting to adjust trimmer #12, until a pattern similar to the following appears on the screen. If pattern does not remain stationary, operate sweep frequency control on scope and also "sync" control until desired result is obtained.  This double "S" curve pattern results when 'scope uses "Sawtooth" horizontal deflection voltage. This single "S" curve pattern results when 'scope uses properly phased "sine wave" horizontal deflection voltage. Adjust trimmer #12 for maximum amplitude and steepness of that portion of the curve between "A" and "C".
Same as above	Same as above	Same as above	Same as above	Before connecting V-T voltmeter, it is necessary to connect two 68,000 ohm resistors (**resistance of both units must compare within 1%**) in series from pin #7 of the 6AL5 tube to the chassis. Then connect common (or ground) terminal of V-T voltmeter to the junction of these two resistors. D.C. probe lead of meter is now connected to junction of resistor #89 (3300 ohms) and condenser #91 (.01 MFD.) which are in the discriminator output circuit.	Same as above	Same as above	**13**	Discriminator Secondary **Use an insulated phasing tool to adjust this trimmer.**	Set meter for operation on its lowest D.C. voltage range. Note that as trimmer #13 is rotated a point will be found where voltmeter will swing rather sharply from a positive to a negative reading or vice versa. Correct setting of trimmer #13 is obtained when meter reads zero as trimmer is moved through this point. The adjustment is somewhat critical and considerable care must be exercised to set the trimmer for a zero meter indication.	With the 'scope set up as described above, adjust trimmer #13 until the cross-over point "B" is centrally located in both the horizontal and vertical directions; in addition, the portion of the curve between "A" and "C" should be as linear (straight) as possible.
Recheck the two preceding adjustments to be sure that both trimmers are set as accurately as possible to obain the specified output indication on vacuum tube voltmeter or oscilloscope. Then disconnect and remove the two 68,000 ohm resistors that were used for the vacuum tube voltmeter connection in the 2nd step.										
Pin #1 of 6BA6 (FM) 1st I.F. tube; use a .01 MFD. condenser in series with generator lead.	Receiver chassis in vicinity of 6BA6 (FM) 1st I.F. tube.	Same as above	Same as above	Connect common (or ground) terminal of meter to receiver chassis. D.C. probe lead of meter is then connected to Pin #7 of the 6AL5 tube.	Same as above	Same as above	**14 and 15**	2nd I.F.	Adjust trimmers #14 and #15 for maximum meter reading.	With 'scope set up as described above, adjust trimmers #14 and #15 for maximum amplitude and steepness of that portion of the pattern between "A" and "C".
Terminal "B" on slug tuner unit (see Fig. 13); use a .01 MFD. condenser in series with generator lead.	Receiver chassis in vicinity of slug tuner unit.	Same as above	Same as above	Same as above	Same as above	Same as above	**16 and 17**	1st I.F.	Adjust trimmers #16 and #17 for maximum meter reading.	Adjust trimmers #16 and #17 for maximum amplitude and steepness of pattern as described above. If the enlarged pattern now indicates a lack of symmetry, readjust trimmer #13 for correct cross-over point.
If positions of movable slugs in the slug tuner assembly have been disturbed (examine cement seal near top of threaded stem on each slug) or if a coil or slug has just been replaced in the tuner assembly, omit the next 4 instructions in this chart and start with the procedure entitled "Slug Tuner Adjustment Procedure—FM Section." Where the tuner assembly has not been disturbed, ignore this instruction and proceed with the next step.										
Generator output leads must be connected to the two terminals labelled "A" on the "A-G-A" terminal strip at back of chassis. Connect "high" lead to one "A" terminal in **series with a 120 ohm resistor** and connect generator ground lead to the other "A" terminal **in series with a 150 ohm resistor.**		**98 MC** AM signal may be 400 cycle modulated or FM signal should preferably be modulated ±300 KC.	Same as above	Same as above	**FM** Maximum clockwise position	**98 MC**	**18**	Oscillator Trimmer	Set trimmer #18 to receive 98 MC. signal and adjust for maximum meter reading.	Adjust trimmer #18 to obtain the symmetrical pattern shown above. Correct setting of trimmer #18 is obtained when cross-over point in pattern is centrally located.
Same as above		Same as above	Same as above	Same as above	Same as above	**98 MC**	**19**	R.F. Trimmer	Adjust trimmer #19 for maximum meter reading.	Adjust trimmer #19 for maximum amplitude of pattern.
							16 and 17	1st I.F.	Recheck adjustment of these trimmers for maximum meter reading.	Recheck adjustment of these trimmers for maximum amplitude and symmetry of pattern.
Same as above		**90 MC** AM signal may be 400 cycle modulated or FM signal should preferably be modulated ±300 KC.	Same as above	Same as above	Same as above	Tune to 90 MC. generator signal.	**20**	Antenna Trimmer	Adjust trimmer #20 for maximum meter reading.	Adjust trimmer #20 for maximum amplitude of pattern.
Check calibration and tracking of receiver with input signals of 88 and 108 MC. If difference between dial pointer setting and 88 or 108 MC. calibration mark does not exceed ±0.4 MC. and R.F. circuit is tracking properly, then alignment may be considered satisfactory and no further adjustment is necessary. Where calibration error is greater than ±0.4 MC. it is advisable to adjust the slug tuner as described in the following section.										
SLUG TUNER ADJUSTMENT PROCEDURE — FM SECTION This procedure is to be used only where the positions of slugs in slug tuner have been disturbed or in event of a coil or slug replacement, or where a serious calibration or tracking error is noted after attempting to align the receiver as described in the preceding section.										
Same as above		**88 MC** AM signal may be 400 cycle modulated or FM signal should preferably be modulated ±300 KC.	Same as above	Same as above	Same as above	By means of tuning control knob, set dial pointer to 88 MC. mark on dial.	**18**	Oscillator Trimmer	Set trimmer #18 to receive 88 MC. signal.	Adjust trimmer #18 to obtain the symmetrical pattern shown above.
							19	R.F. Trimmer	Adjust trimmers #19 and #20 for maximum meter reading.	Adjust trimmers #19 and #20 for maximum amplitude of pattern.
							20	Antenna Trimmer		
Same as above		**98 MC**	Same as above	Same as above	Same as above	By means of tuning control knob, set dial pointer to 98 MC. mark on dial.	**21**	Oscillator tuning slug	Set slug #21 to receive 98 MC. signal and adjust for maximum meter reading.	Adjust slug #21 to obtain the symmetrical pattern shown above.
Same as above		**108 MC**	Same as above	Same as above	Same as above	By means of tuning control knob, set dial pointer to 108 MC. mark on dial.	—	—	Note heavy braided lead connection to osc. coil; adjust position of this braid until 108 MC. signal is received and meter reading is maximum. Coat braid with speaker cement after correct position is located.	Note heavy braided lead connection to osc. coil; adjust position of this braid until symmetrical pattern shown above is obtained. Coat braid with speaker cement after correct position is located.
							22	R.F. tuning slug	Adjust slug #22 for maximum meter reading.	Adjust slug #22 for maximum amplitude of 'scope pattern.
Repeat the three preceding adjustments until satisfactory calibration and tracking is obtained at 88 MC., 98 MC., and 108 MC. Apply a coating of speaker cement at top of each tuning slug stem to prevent movement.										

STEWART-WARNER CORP.

MODELS A92CR3, A92CR6

PARTS LIST

ORDER PARTS FROM YOUR STEWART-WARNER DISTRIBUTOR ONLY

DIA-GRAM NO.	PART NO.	DESCRIPTION
		CONDENSERS
5-A to E	502910	Condenser—trimmer assembly for P-B tuner
6	504659	Condenser—ceramic 39 Mmfd. 500 volt
12	504723	Condenser—mica 30 Mmfd. 500 volt
14	504663	Condenser—trimmer 5-20 Mmfd.
16	504956	Condenser—trimmer 390-550 Mmfd.
17-A, B	504712	Condenser—trimmer assembly A—50 to 120 Mmfd. B—220 to 340 Mmfd.
21	502261	Condenser—.01 Mfd. 600 volt
26	504447	Condenser—.05 Mfd. 150 volt
27	504724	Condenser—mica 1000 Mmfd. 500 volt
30	502261	Condenser—.01 Mfd. 600 volt
33	502929	Condenser—mica 47 Mmfd. 500 volt
35	502757	Condenser—trimmer; 6.5 to 35 Mmfd.
37	502931	Condenser—mica 100 Mmfd. 500 volt
38	504659	Condenser—ceramic 39 Mmfd. 500 volt
41	504725	Condenser—.02 Mfd. 200 volt
42	502153	Condenser—.05 Mfd. 200 volt
45	502150	Condenser—.004 Mfd. 600 volt
47	505069	Condenser—mica 200 Mmfd. 500 volt
50	505069	Condenser—mica 200 Mmfd. 500 volt
51	504905	Condenser—ceramic 5 Mmfd. 500 volt
52	502929	Condenser—mica 47 Mmfd. 500 volt
56	504733	Condenser—ceramic 15 Mmfd. 500 volt
57	502757	Condenser—trimmer; 6.5 to 35 Mmfd.
58	502929	Condenser—mica 47 Mmfd. 500 volt
62	502261	Condenser—.01 Mfd. 600 volt
64	504983	Condenser—ceramic 1.0 Mmfd. 500 volt
65	504982	Condenser—ceramic 39 Mmfd. 500 volt
66	502261	Condenser—.01 Mfd. 600 volt
68	502153	Condenser—.05 Mfd. 200 volt
70	502261	Condenser—.01 Mfd. 600 volt
72	502261	Condenser—.01 Mfd. 600 volt
75	504982	Condenser—ceramic 39 Mmfd. 500 volt
78	502931	Condenser—mica 100 Mmfd. 500 volt
81	504727	Condenser—mica 500 Mmfd. 500 volt
83	502261	Condenser—.01 Mfd. 600 volt
85	502261	Condenser—.01 Mfd. 600 volt
87	502202	Condenser—ceramic 150 Mmfd. 500 volt
90	504662	Condenser—trimmer 35-55 Mmfd.
91	502261	Condenser—.01 Mfd. 600 volt
92	502157	Condenser—.05 Mfd. 400 volt
94	504719	Condenser—electrolytic 4 Mfd. 450 volt
95	504937	Condenser—electrolytic 5 Mfd. 50 volt
98	502261	Condenser—.01 Mfd. 600 volt
101	502150	Condenser—.004 Mfd. 600 volt
105	505150	Condenser—electrolytic 16 Mfd. 400 volt
106, 107	502804	Condenser—.01 Mfd. 400 volt
108	502405	Condenser—.25 Mfd. 400 volt
111	505150	Condenser—electrolytic 16 Mfd. 400 volt
113	502261	Condenser—.01 Mfd. 600 volt
118	502271	Condenser—mica 260 Mmfd. 500 volt
120	504719	Condenser—electrolytic 4 Mfd. 450 volt
125	502152	Condenser—.02 Mfd. 400 volt
127-A,B,C	161193	Condenser—electrolytic A—20 Mfd. 450 volt B—15 Mfd. 450 volt C—10 Mfd. 25 volt
131	502479	Condenser—.006 Mfd. 600 volt
		RESISTORS
19	502132	Resistor—carbon 100,000 Ohms ¼ watt
20	502408	Resistor—carbon 68,000 Ohms ¼ watt
25	502794	Resistor—carbon 68 Ohms ¼ watt
28	502466	Resistor—carbon 33,000 Ohms 1 watt
31	504732	Resistor—carbon 10,000 Ohms 1 watt
32	502128	Resistor—carbon 2,200 Ohms ¼ watt
36	502130	Resistor—carbon 22,000 Ohms ¼ watt
40	502130	Resistor—carbon 22,000 Ohms ½ watt
43	504907	Resistor—carbon 560,000 Ohms ¼ watt
44	502134	Resistor—carbon 470,000 Ohms ¼ watt
61	502130	Resistor—carbon 22,000 Ohms ¼ watt
67	502128	Resistor—carbon 2,200 Ohms ¼ watt
69	502794	Resistor—carbon 68 Ohms ¼ watt
71	502466	Resistor—carbon 33,000 Ohms 1 watt
73	502128	Resistor—carbon 2,200 Ohms ¼ watt
76	502267	Resistor—carbon 680,000 Ohms ¼ watt
77	502131	Resistor—carbon 47,000 Ohms ¼ watt
79	502794	Resistor—carbon 68 Ohms ¼ watt
80	502133	Resistor—carbon 220,000 Ohms ¼ watt
82	502135	Resistor—carbon 2.2 Meg. ¼ watt
84	502466	Resistor—carbon 33,000 Ohms 1 watt
88	502128	Resistor—carbon 2,200 Ohms ¼ watt
89	502514	Resistor—carbon 3,300 Ohms ¼ watt
93	502136	Resistor—carbon 10 Meg. ¼ watt
96	502132	Resistor—carbon 100,000 Ohms ¼ watt
97	502892	Resistor—carbon 330,000 Ohms ¼ watt
99	502130	Resistor—carbon 22,000 Ohms ¼ watt
100-A, B	502148	Volume control 500,000 Ohms (with switch)
102	502468	Resistor—carbon 4.7 Meg. ¼ watt
103	502406	Resistor—carbon 1,500 Ohms ¼ watt
104	504731	Resistor—carbon 12,000 Ohms 2 watt
109	502135	Resistor—carbon 2.2 Meg. ¼ watt
110	504731	Resistor—carbon 12,000 Ohms 2 watt
114	502468	Resistor—carbon 4.7 Meg. ¼ watt
115	502131	Resistor—carbon 47,000 Ohms ¼ watt
116	502291	Resistor—carbon 4,700 Ohms ¼ watt
119	502133	Resistor—carbon 220,000 Ohms ¼ watt
121	502478	Resistor—carbon 1,000 Ohms ¼ watt
126	502134	Resistor—carbon 470,000 Ohms ¼ watt
128	504729	Resistor—carbon 130 Ohms 2 watt
129	504728	Resistor—carbon 11 Ohms ½ watt
130	502454	Resistor—wire wound 47 Ohms 1 watt
		COILS & TRANSFORMERS
1	504895	Antenna—FM ("Twin Lead" Assembly)
2	504902	Loop Antenna for AM
7, 8	502909	Coil less slug (975-1600 Kc.)
9, 10	502908	Coil less slug (650-1300 Kc.)
11	502907	Coil less slug (540-1000 Kc.)
	502911	Slug core for coils 502907, 502908, 502909
13	504692	Coil—FM antenna
15	505151	Coil—BC. antenna (less slug)
	505152	Tuning slug for BC. ant. coil (may have end colored yellow, green, blue or violet)
18	505041	Coil—BC. antenna (for push button)
29	504675	Coil—R.F. choke
34	505159	Coil—FM R.F. (less slug)
	505160	Tuning slug for FM R.F. coils (may have end colored black, grey, red or orange)
39	504670	Coil—wave trap (455 Kc.)
	504671	Slug core for wave trap
46	504673	R.F. choke (BC.)
48	505155	Coil—BC. oscillator; shunt (less slug)
	505156	Slug core for BC. osc. shunt coil (505155)
49	504675	Coil—R.F. choke (FM)
53	505153	Coil—BC. oscillator (less slug)
	505152	Tuning slug for BC. osc. coil (may have end colored yellow, green, blue or violet)
54	505157	Coil—BC. oscillator; series
55	505159	Coil—FM oscillator (less slug)
	505160	Tuning slug for FM osc. coil (may have end colored black, grey, red or orange)
59	505158	Coil—BC. oscillator; compensating
60	504675	Coil—R.F. choke (FM)
63	504645	Transformer—1st I.F.
74	504646	Transformer—2nd I.F.
86	504690	Transformer—discriminator
112	504643	Transformer—power
133	502994	Transformer—output for M-502302 speaker
	505029	Transformer—output for E-502302 speaker
	505394	Transformer—output for O-502302 speaker
		OTHER ELECTRICAL PARTS
3-A to F	504593	Switch—band
4	504596	Switch—push-button
22	502461	Crystal cartridge (Astatic L-71)
23	504201	Motor—for type "W"-504138 Record Changer 115 volt 60 cycle
	505273	Motor—for type "VM"-504932 Record Changer 115 volt 60 cycle
24	504203	Switch—"ON-OFF" for type "W"-504138 Record Changer
	505269	Switch—"ON-OFF" for type "VM"-504932 Record Changer
117	504592	Switch—tone
122, 123, 124	110629	Lamp—dial (Mazda #44) 6.3V 0.25 Amps.
132	502302	Speaker—electro-dynamic (10 inch)
		MISCELLANEOUS PARTS
	504840	Background for Dial
	116467	Base for mtg. electrolytic condenser
	117131	Bulls Eye for indicator light
	117315	Call Letter Tabs for push-buttons
	119989	Clamp for dial glass
	112745	Clip—for mtg. push-button ant. coil
	114955	Clip—retainer on end of dial cord
	501151	Clip—for mtg. push-button coils
	504691	Clip—coil mtg.; wave trap & B.C. oscillator shunt
	505368	Clip—for tube shield
	117057	Cord—dial drive (7 ft. required) per ft.
	504839	Dial Scale
	505417	Door—radio compartment; upper right (mahogany)
	505420	Door—record storage compartment; lower right (mahogany)
	505423	Door—record storage compartment; lower left (mahogany)
	505426	Drawer—record changer (Mahogany Model A92CR3 "W" Changer)
	505429	Drawer—record changer (Mahogany Model A92CR6 "VM" Changer)
	504831	Escutcheon for push-button
	505433	Handle—for upper door or drawer
	505432	Hinges—for all doors (supplied in pairs)
	504835	Knob—volume or tuning
	504837	Knob—tone or band
	505431	Knob—for record storage compartment doors
	502460	Needle—phonograph
	504711	Perm. tuning mechanism (less coils)
	500966	Plug—phono. pick-up cable
	501031	Plug—phono. motor cable
	504097	Plug—speaker
	504838	Pointer
	504833	Push-button
	505430	Rail for drawer (supplied in sets)
	119087	Ring for dial cord
	17843	Rubber grommets for mtg. FM coils
	85078	Rubber grommets for mtg. BC. coils
	113463	Rubber pad for mtg. chassis
	116584	Rubber spacer for mtg. dial scale
	112874	Screw—No. 10 x 1⅛ for mtg. chassis
	114914	Screw—No. 2 x ⅜"; for mtg. escutcheon
	504594	Shaft tuning
	505367	Shield—tube
	114876	Socket—octal base (rectifier)
	118617	Socket for dial lamp
	119791	Socket—octal base
	160039	Socket—phono. plug
	500051	Socket—loop antenna
	501182	Socket—phono. motor cable
	502210	Socket—speaker
	504595	Socket—pilot lamp (at base of cabinet)
	504597	Socket—miniature
	113177	Spring—dial cord tension
	504012	Spring for tuning slug drive cord
	504644	Terminal strip (A-G-A)
	500487	Washer—felt for knobs

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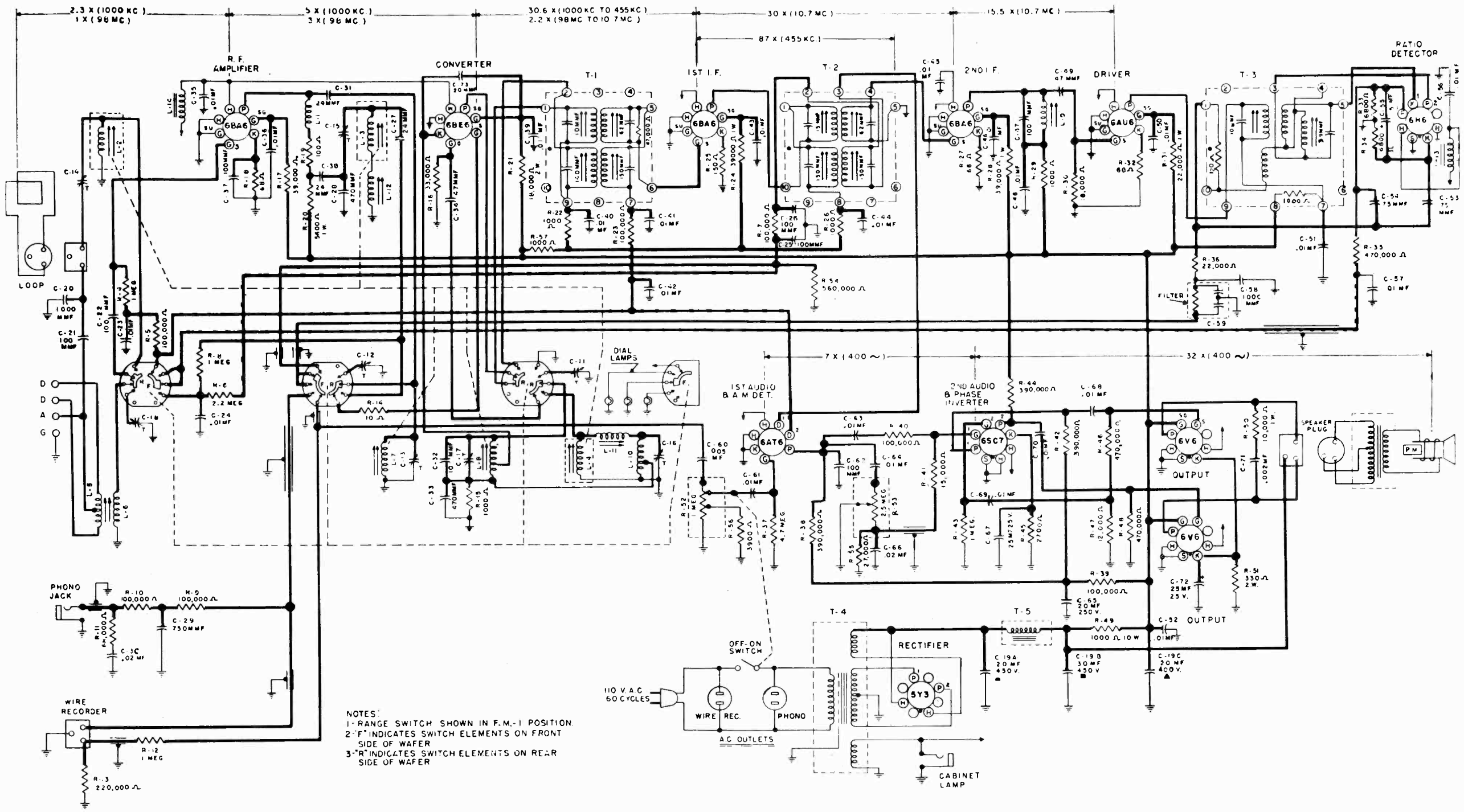
MODELS 1210M2-Y, 1210M2-M, 1210M2-W,
1210PG-M, 1210PG-W, 1210PL-M, series 10-11



NOTES:
1-RANGE SWITCH SHOWN IN F.M.-1 POSITION.
2-"F" INDICATES SWITCH ELEMENTS ON FRONT SIDE OF WAFER
3-"R" INDICATES SWITCH ELEMENTS ON REAR SIDE OF WAFER

SPECIFICATIONS

Voltage Rating	50-60 Cy. 105-125 V.
Type of Circuit	Superheterodyne
Tuning Range	Broadcast—540 KC.-1700 KC. FM. 1-88 MC.-108 MC. FM. 2-42 MC.-50 MC.
Input Power Rating	Radio 86 Watts, Phono 30 Watts
Intermediate Frequency	A.M. 455 KC, F.M. 10.7 MC.
Speaker Voice Coil Impedance at 400 Cycles	6-8 Ohms
Power Output	10 Watts

Resistors

Part No.	
28163	R-45
28165	R-56
28171	R-47
28173	R-30
28174	R-55
28186	R-38-42-44
28187	R-46
28188	R-54
149020	R-51
149057	R-21

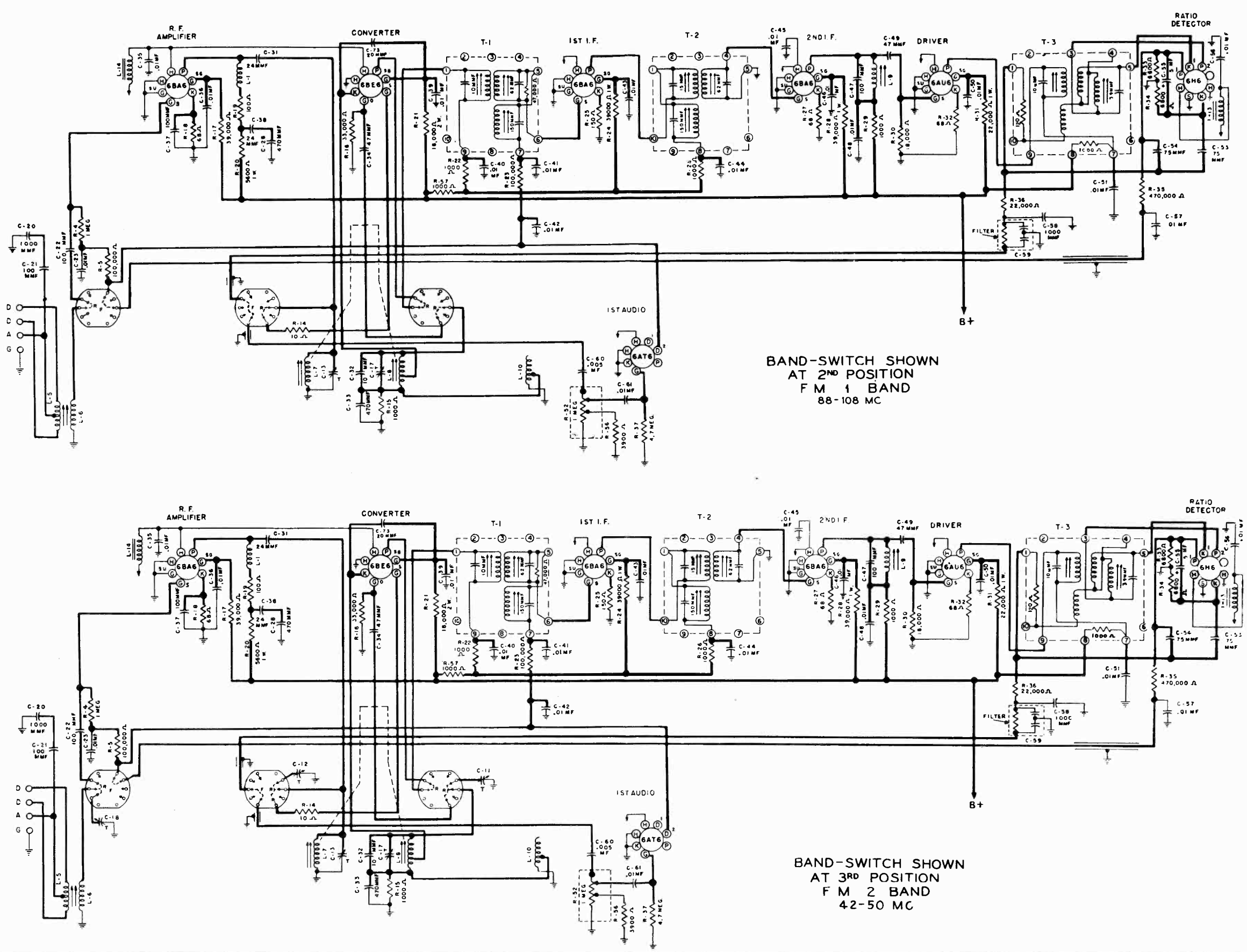
Description	Part No.	
2,700 Ohm, ½ W	149089	R-14
3,900 Ohm, ½ W	149094	R-18-27-32
12,000 Ohm, ½ W	149095	R-19
18,000 Ohm, ½ W	149096	R-25
27,000 Ohm, ½ W	149101	R-15-22-26-29-57
390,000 Ohm, ½ W	149108	R-41
470,000 Ohm, ½ W	149109	R-36
560,000 Ohm, ½ W	149110	R-16
330 Ohm, 2 W	149112	R-68
18,000 Ohm, 2 W	149113	R-5-7-9-10-23-39
10 Ohm, ½ W	149115	R-13
68 Ohm, ½ W	149117	R-35-48
100 Ohm, ½ W	149119	R-4-8-12-43
150 Ohm, ½ W	149121	R-6
1,000 Ohm, ½ W	149123	R-37
15,000 Ohm, ½ W	149126	R-49
22,000 Ohm, ½ W	149144	R-50
33,000 Ohm, ½ W	149146	R-31
68,000 Ohm, ½ W	149184	R-20
100,000 Ohm, ½ W	149189	R-17-24-28
220,000 Ohm, ½ W	149216	Voltage Divider
470,000 Ohm, ½ W	149239	R-33-34
1.0 Meg. ½ W		

2.2 Meg. ½ W	
4.7 Meg. ½ W	
10,000 Ohm, 10 W B Stick	
10,000 Ohm, 1 W	
22,000 Ohm, 1 W	
5,600 Ohm, 1 W	
39,000 Ohm, 1 W	
Voltage Divider	
6,800 Ohm, ½ W ±5%	

RECORD CHANGERS: M2 series uses Seeburg Model L, RCD. CH. 15-18; PG series uses Webster Model 56, RCD. CH. 15-10; PL series uses Seeburg Model K, RCD. CH. 15-2.

"clarified schematics"

STROMBERG-CARLSON CO.



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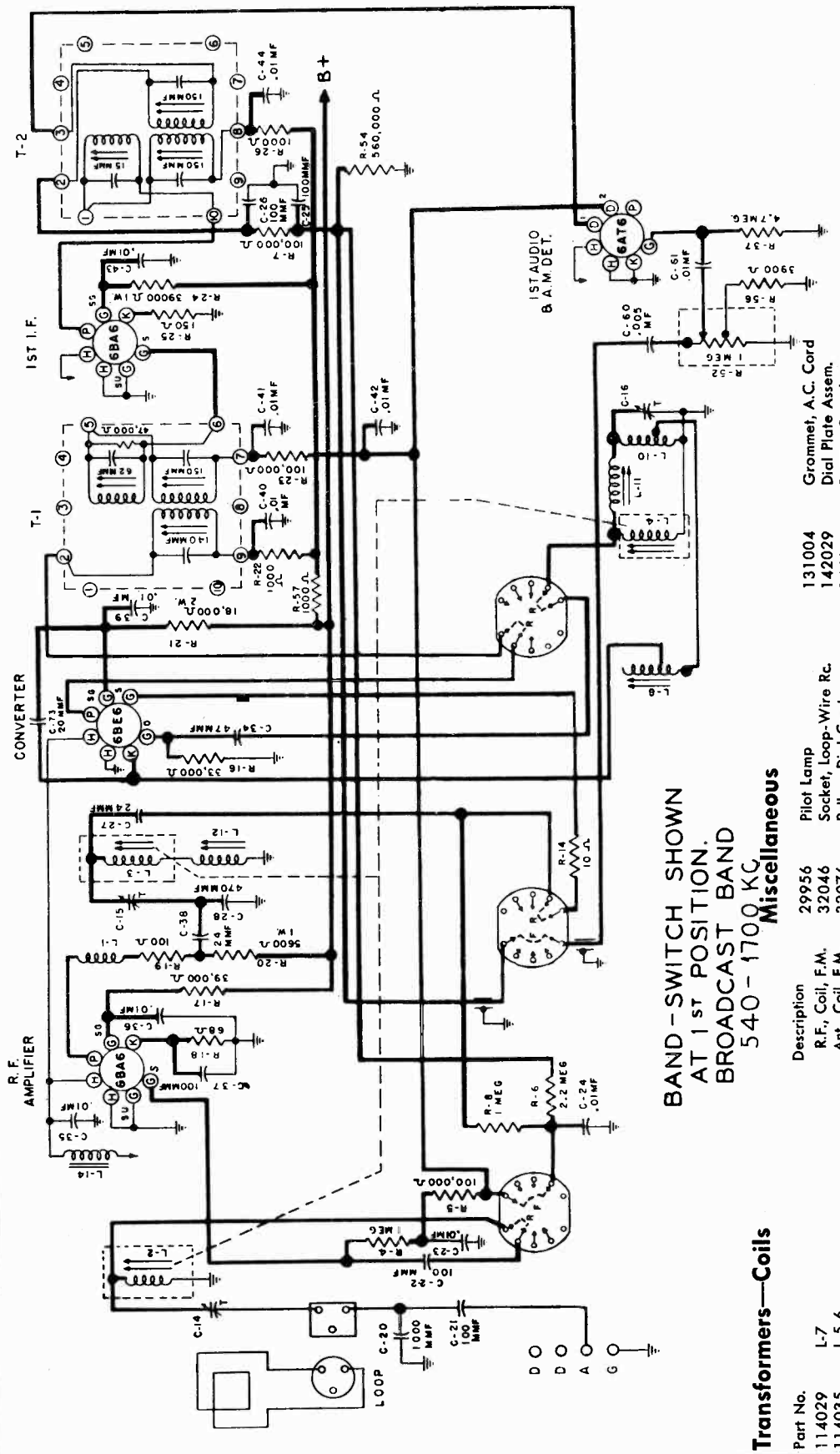
MODELS 1210 series



Transformers—Coils

Part No.		Description
114029	L-7	R.F., Coil, F.M.
114035	L-5-6	Ant., Coil, F.M.
114037	L-8	Osc. Coil, F.M.
114038	L-10	Osc. Coil, A.M.
114039	L-11	Osc. Trim. Coil, A.M.
114040	L-12	R.F. Trim. Coil, A.M.
114041	L-2-3-4	Ant., R.F., & Osc. Coils, A.M.
114328	T-2	I.F. 2nd
114329	L-9	I.F. 3rd
114332	T-1	I.F. 1st
114614	L-1	R.F. Choke
114618	L-13-14	R.F. Filament Choke
161006	T-5	Filter Choke
161226		Output Trans.
161228	T-3	Ratio Det. Trans.
161411	T-4	Power Trans.

Miscellaneous

Description	
Pilot Lamp	29956
Socket, Loop-Wire Rc.	32046
Pulley, Dial Cord	32076
Plug, Ant. Loop	32164
A.C. Cord	33218
Socket, Phono., Cab. Lamp	34421
Clip, Pulley	40546
Speaker	48997
Speaker Cone	48984
Speaker Plug.	81054
Chassis Mtg. Bracket	105112
Iron Core (I.F.)	118001
Dial Scale, F.M. 1	122016
Dial Scale, F.M. 2	122017
Dial Scale, A.M.	122018
Drive Cord Assem.	124013
Dial Frame Assem.	127012
Grommet, A.C. Cord	131004
Dial Plate Assem.	142029
Pointer, Broadcast	144011
Pointer, F.M.	144012
Shaft, Vol. Control	150031
Shaft, Tuning	150032
Tube Shield, Base (Min.)	151028
Tube Shield, (Min.)	151036
Socket, A.C. (2)	152026
Pilot Socket, F.M. 1	152031
Pilot Socket, A.M. 2	152032
Socket, Speaker	152033
Pilot Socket	152036
Coupling Spring, Vol.	156033
Ant. Binding Post	159023
Tuning Unit (Mechanical Assem.)	164005
Shield Assem.	167011

Controls—Switches—Knobs

Knobs	134038	
Tone Control	145028	R-52
Volume Control and Switch	145029	R-53
Range Switch	158020	

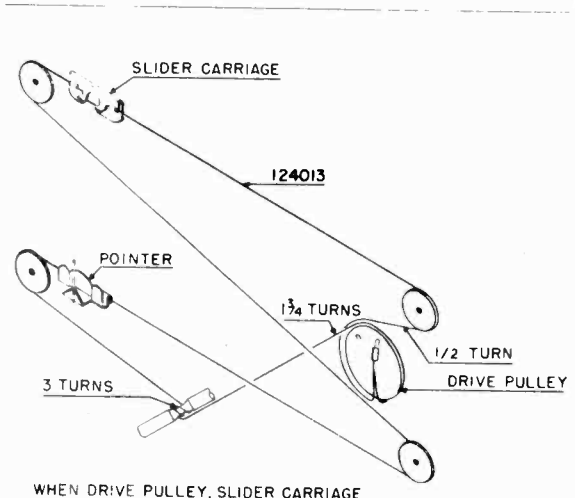
MODELS 1210 series STROMBERG-CARLSON CO.

ALIGNMENT PROCEDURE

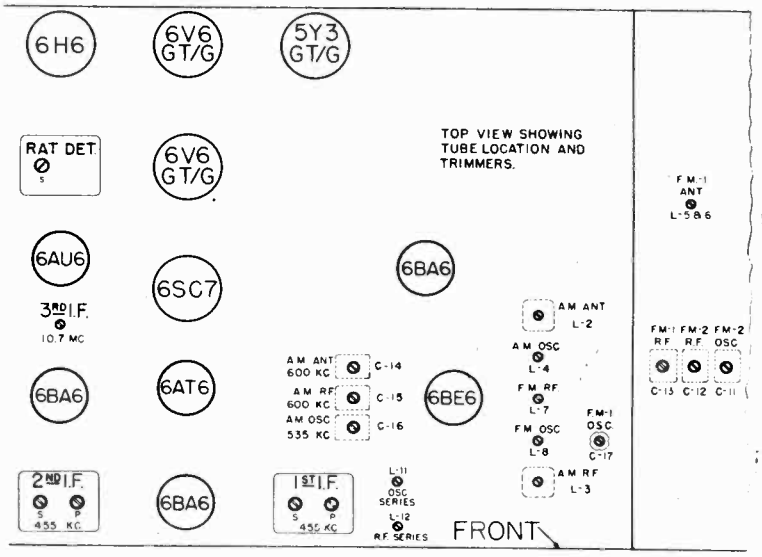
	Band and Pointer Setting	Input Generator Setting	Input and Dummy	VTM and Scope Input	Trimmer Adj. and Notes
			A.M. I.F. ALIGNMENT		
1	AM Low end of dial	455 kc. 400 cy. mod.	Junction C-17 and L-8. See location chart. 100 mmf. dummy	Junction R-12 and C-60 (See location chart)	Adj. Pri. and Sec. 1st and 2nd I.F. (Top of Chassis) for highest voltage on -3V DC Scale
2	"	455 kc. swept 15 kc.	"	"	Adj. same cores as above for best over-lapping curve on scope.
			F.M. I.F. ALIGNMENT		
FM 1	(1) Low end of dial	10.7 mc. 400 cyc. mod.	Junction C-17 and L-8. See location chart. 100 mmf. dummy	AVC buss (Green and White Wire)	Detune Sec. Ratio Det. (Top of Chassis). Adj. Pri. and Sec. 1st and 2nd I.F. Pri. Ratio Det. (Bottom of Chassis) and 3rd I.F. (L-9 Top of Chassis) on -3 VDC Scale for max. AVC voltage.
2*	"	10.7 mc. swept 150 kc.	"	Pin No. 6 Driver tube (screen) thru .01 capac.	Adj. same cores (as in step 1) for best overlapping curve on scope.
3*	"	"	"	Junction R-12 and C-60	Adj. Sec. of Ratio Det. for zero voltage. (Top of Chassis).
	*Repeat 2 and 3 if necessary				
			A.M. R.F. ALIGNMENT		
1	Broadcast Extreme Low Freq.	535 Kc. 400 cyc. mod.	Ant. term. 200 mmf. dummy	AVC Buss Green and White Wire	Adj. C-16 for max. AVC voltage
2	Extreme Hi Freq.	1700 Kc. 400 cyc. mod.	"	"	Adj. L-11 for max. AVC voltage
3	Repeat 1 and 2				
4	600 Kc	600 Kc. 400 cyc. mod.	"	"	Adj. C-15 for max. AVC voltage
5	1500 Kc	1500 Kc. 400 cyc. mod.	"	"	Adj. L-12 for max. AVC voltage
6	Repeat 4 and 5				
7	600 Kc	600 Kc. 400 cyc. mod.	"	"	Adj. C-14 for max. AVC voltage
			F.M. R.F. ALIGNMENT		
1	FM 1 Channel 260	100 Mc	Ant. term. (DD) 150 ohm series with each side of Gen.	AVC Buss Green and White Wire	CAUTION: Align FM-1 1st. 1. C-17 2. C-13 3. L-5 and 6 — Adjust for max. AVC Voltage. (All Trimmers)
2	FM 2 Channel 60	46 Mc.	"	"	1. C-11 2. C-12 3. C-18 — Adjust for max. AVC Voltage (All Trimmers)

CAUTION: Use low signal input especially for steps 2 and 3 of F.M. I.F. Alignment to avoid overloading.
Use dummy loop No. 114048 for A.M. R.F. Alignment
Use insulated aligning tool No. 80777 to prevent damage to iron cores.
Refer to Number 4, Vol. 1 Current Flash for suggested instrument use.
R.F. alignment procedure of iron core tuners is different from condenser tuners in that trimmers are adjusted at low frequency end and coils are adjusted at high frequency end of dial.
Recommended procedure is to align both I.F. channels if either channel requires it.

Dial Stringing Chart



WHEN DRIVE PULLEY, SLIDER CARRIAGE AND POINTER ARE IN POSITION SHOWN, CORES ARE COMPLETELY MESHED.



STROMBERG-CARLSON CO.

Capacitors

25484	C-30-66	.02 mf. 600 V.
27646	C-71	.002 mf. 600 V.
110019	C-14-15-16	Aligning
110020	C-11-12-13	Aligning
110022	C-18	Aligning
110023	C-17	Trimmer
110401	C-21-22-25-26-37-62	100 mmf.
110402	C-34-49	47 mmf.
110403	C-27-31-38	24 mmf.
110419	C-60	.005 500 V.
110420	C-23-24-35-36-39-40-41-42-43-44-45-46-48-50-51-52-56-57-61-63-64-68-69-70	.01 mf. 500 V.
110425	C-20-58	1,000 mmf.
110455	C-28-33	470 mmf.
110456	C-29	750 mmf.
110476	C-47	100 mmf.
110478	C-59	Diode Filter
110483	C-53-54	75 mmf.
110495	C-32	10 mmf.
110496	C-73	20 mmf.
111025	C-19	Electrolytic
111026	C-67-72	Electrolytic
111030	C-55	5 mfd.
111031	C-65	20 mf. 250 V.

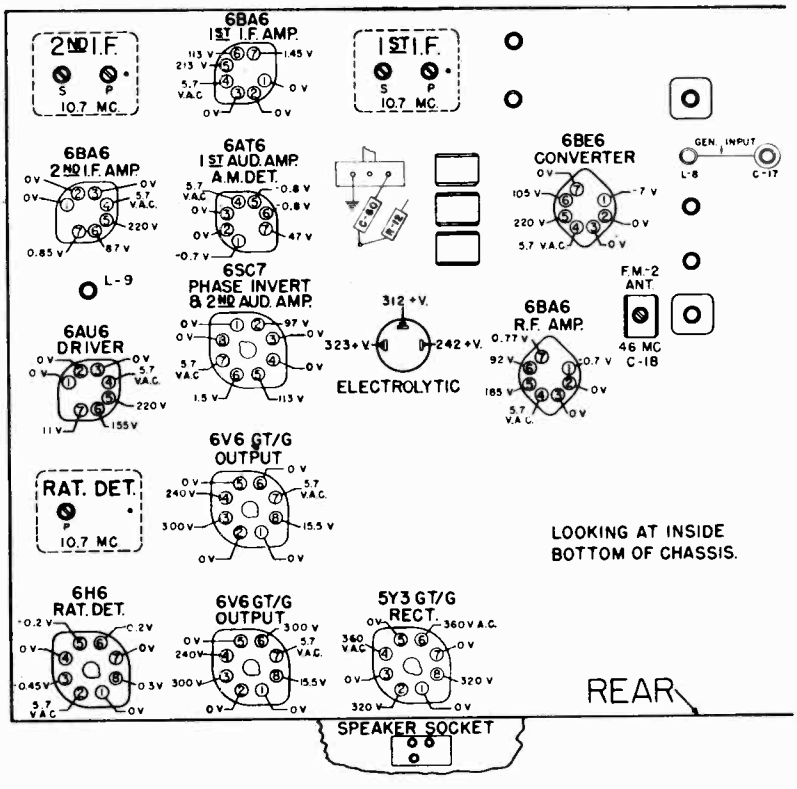
NOTE: Series 11 incorporates changes listed

	Part No.
Remove—R55—27,000 ohms	Not Replaced
Change—R-14 10 ohms—To 100,000 ohms	149113
Add—C74—100 mmf. across R-14	110401
Change—C 31 24 mmf.—To 100 mmf.	110401
Change—C 38 24 mmf.—To 47 mmf.	110402

NOTE—When ordering replacement parts always specify series number as well as model and part number. Series number is stamped on back of chassis.

Cabinet Parts

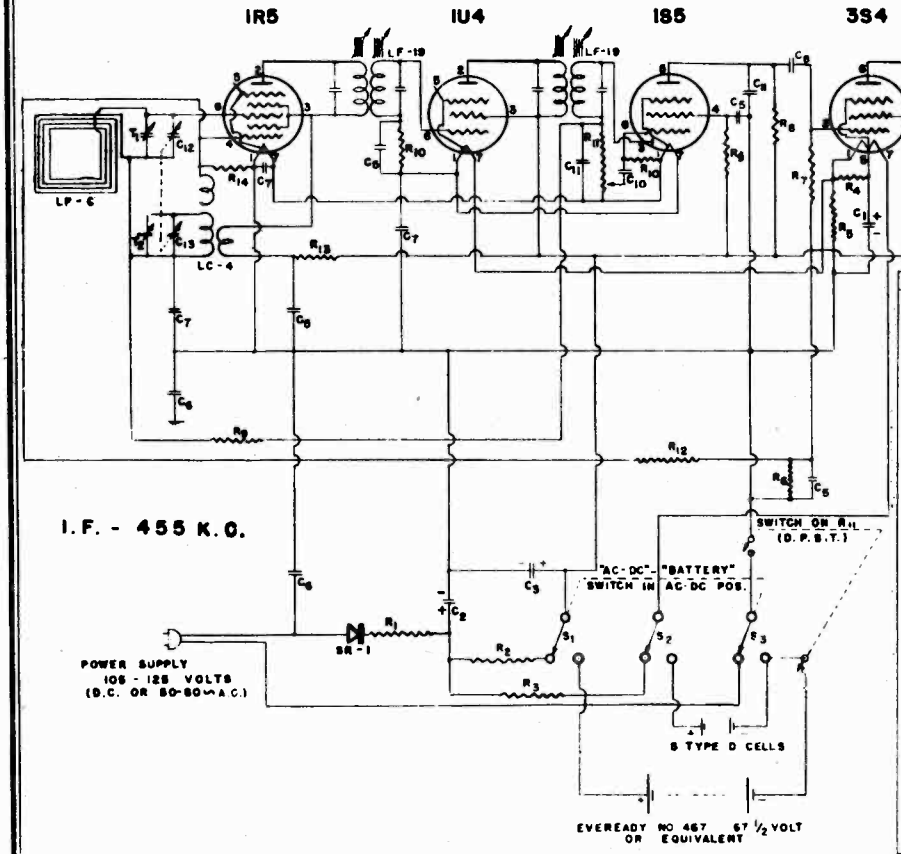
	PGM-W	PLM	M-2-Y,M-W	Description
37148	X			Door Pull
38442	X	X		Bullet Catch
39350	X			Grille Cloth
80681	X	X		Stophinge Assembly
108016			X	Phono Drawer and Track
108052	X			Phono Drawer and Track
108054		X		Phono Drawer and Track
125015			X	Dial Escutcheon
125016	X	X		Dial Escutcheon
125018			X	Escutcheon Speaker
130030		X		Grille Cloth
130031		X		Metal Grille
132009			X	Door Pull, concealed
132013			X	Bottom Hinge
132016			X	Bullet Catch
132021	X		X	Phono Track, left
132022	X		X	Phono Track, right
132053			X	Rt. Upper Hinge, Semi-concealed
132054			X	Lt. Lower Hinge, Semi-concealed
132059		X		Phono Track, Right
132060		X		Phono Track, Left
132061		X		Door Pull
132062		X		Rosette
132063		X		Stophinge, upper
132064		X		Stophinge, lower
132065			X	Door Pull (4)
132071		X		Door Knob
152009		X	X	Socket and Plug
801401	X	X	X	Lamp Cap



Measurements are made at 117V line, using electronic Voltmeter. Except where otherwise indicated, voltages are D.C. and are positive with respect to the reference point which is the chassis.

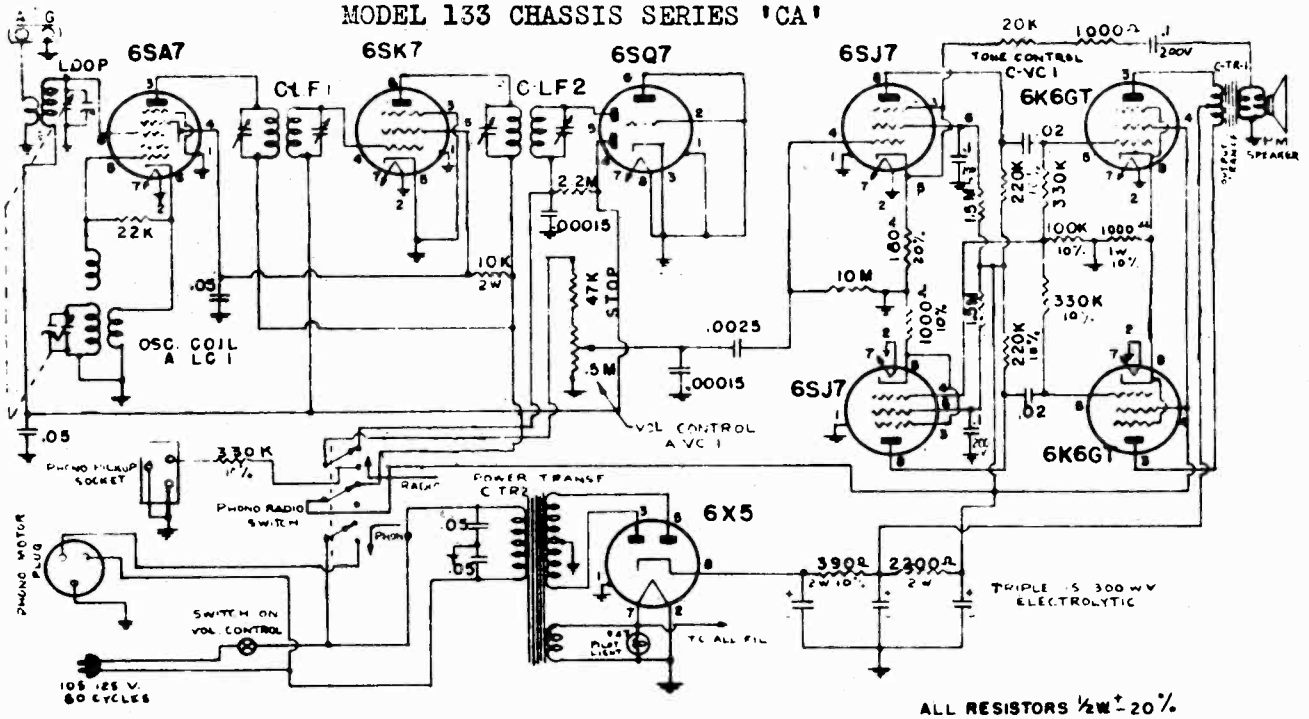
TELE-TONE RADIO CORP. MODEL 133, chassis CA
MODELS 145, 152, chassis R

MODELS 145, 152 CHASSIS SERIES 'R'



ITEM	DESCRIPTION	PART NUMBER
C_1	125 MFD. 10VOLT } ELECTROLYTIC	CE-12
C_2, C_3	25 MFD. 150 VOLT } CONDENSER	
C_4	.05 MFD. 400 VOLT PAPER CONDENSER	CP 503-1
C_5	.01 MFD. 150 VOLT PAPER CONDENSER	CP 103-2
C_6	.1 MFD. 200 VOLT PAPER CONDENSER	CP 104-2
C_7	.05 MFD. 180 VOLT PAPER CONDENSER	CP 503-2
C_8	.002 MFD. 180 VOLT PAPER CONDENSER	CP 202-1
C_9	.005 MFD. 400 VOLT PAPER CONDENSER	CP 502-2
C_{10}	.001 MFD. 180 VOLT PAPER CONDENSER	CP 102-1
C_{11}	.0001 MFD. 300 VOLT MICA CONDENSER	CM 101-1
C_{12}, C_{13}	VARIABLE CONDENSER	CV 10
LC-4	OSCILLATOR COIL	LC - 4
LF-19	I. F. TRANSFORMER	LF-19
LP-6	ANTENNA LOOP	LP-6
R_1	88 OHM 2 WATT 10% W.W. RESISTOR	RW 880-8
R_2	7500 OHM 1 WATT 10% RESISTOR	RC 752-8
R_3	2720 OHM 10 WATT 5% RESISTOR	RP - 1
R_4	470 OHM 1/2 WATT RESISTOR	RC 471-1
R_5	820 OHM 1/2 WATT 10 % RESISTOR	RC 821-2
R_6	270,000 OHM 1/2 WATT 10% RESISTOR	RC 274-2
R_7	2.2 MEG. 1/2 WATT RESISTOR	RC 225-1
R_8	1 MEG. 1/2 WATT RESISTOR	RC 105-1
R_9	3.3 MEG. 1/2 WATT RESISTOR	RC 335-1
R_{10}	10 MEG. 1/2 WATT RESISTOR	RC 106-1
R_{11}	1 MEG POTENTIOMETER WITH SWITCH	VC - 6
R_{12}	1 MEG 1/2 WATT 10% RESISTOR	RC 105-2
R_{13}	15,000 OHM 1/2 WATT RESISTOR	RC 153-1
R_{14}	100,000 OHM 1/2 WATT 10% RESISTOR	RC 104-2
S_1, S_2, S_3	3 POLE SINGLE THROW SWITCH	SW - 3
SP-41	SPEAKER	SP - 41
TR-7	OUTPUT TRANSFORMER	TR-7
SR-1	SELENIUM RECTIFIER	SR-1
T_1, T_2	TRIMMERS ON VARIABLE	

MODEL 133 CHASSIS SERIES 'CA'



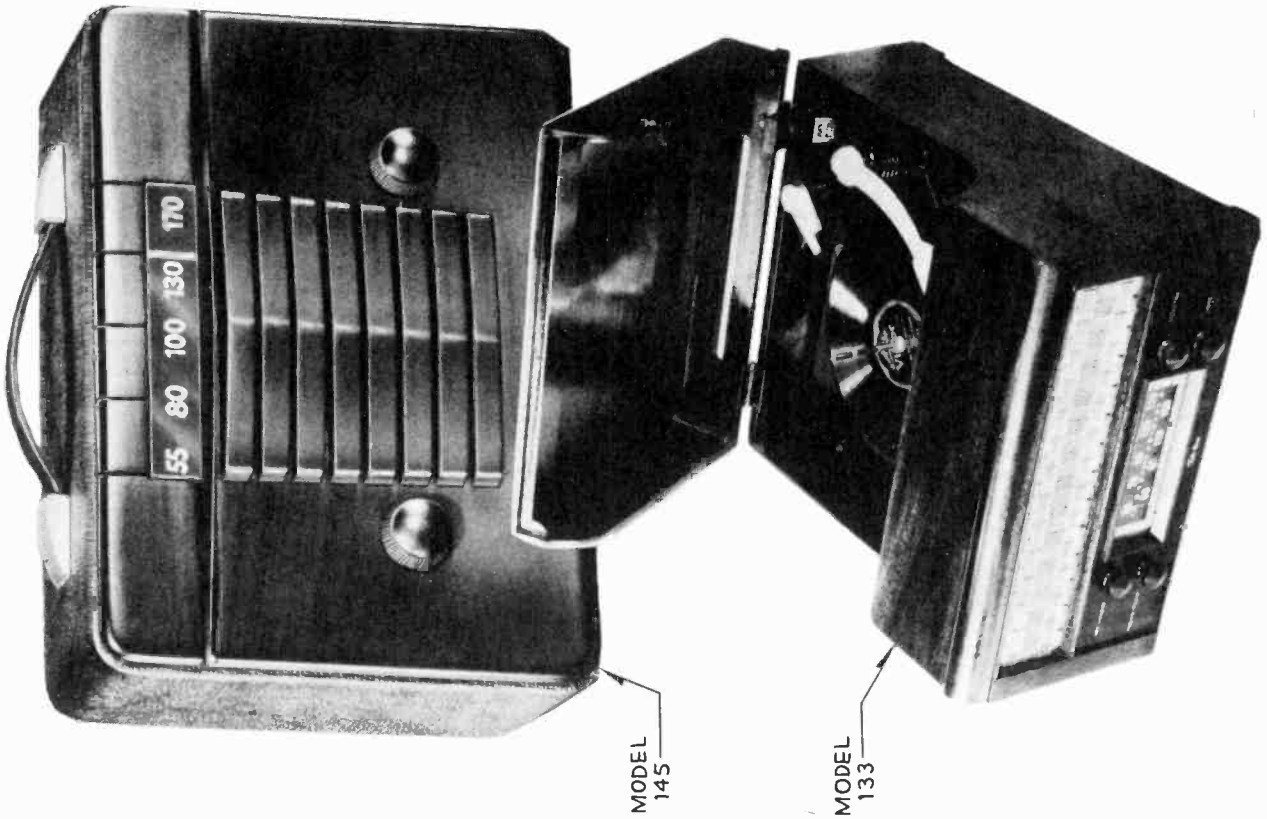
I.F.-455 K.C.
FREQ. RANGE - 1700 KC - 530 KC
ALIGN AT - 1500 KC
TRACK AT - 600 & 1000 KC

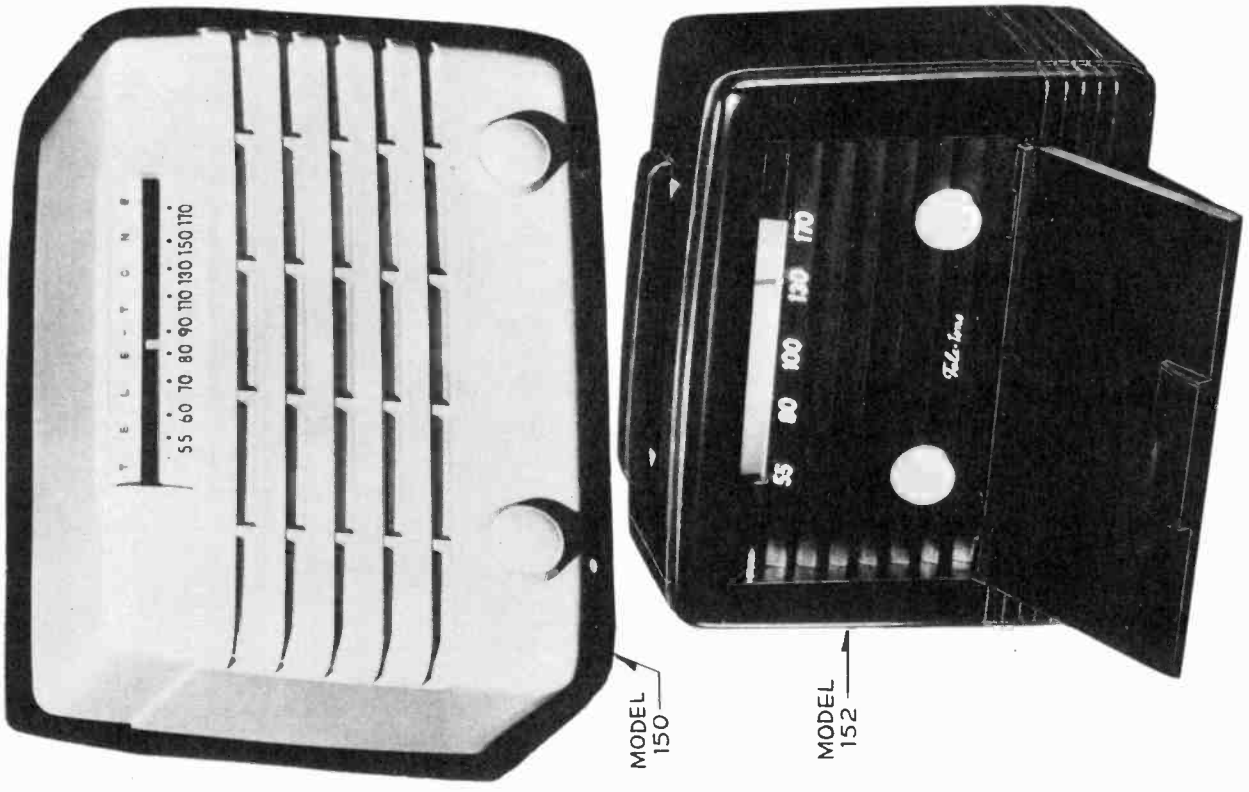
ALL RESISTORS 1/2W ± 20% UNLESS SPECIFIED
Ω : OHMS
K : THOUSAND Ω
M : MILLION Ω
ALL CONDENSERS IN MICRO FARAD @ 400 V.D.C. UNLESS SPECIFIED

RECORD CHANGER: GI Model 205, RCD. CH. 15-5

MODEL 133
MODEL 145
MODEL 150
MODEL 152

TELE-TONE RADIO CORP.

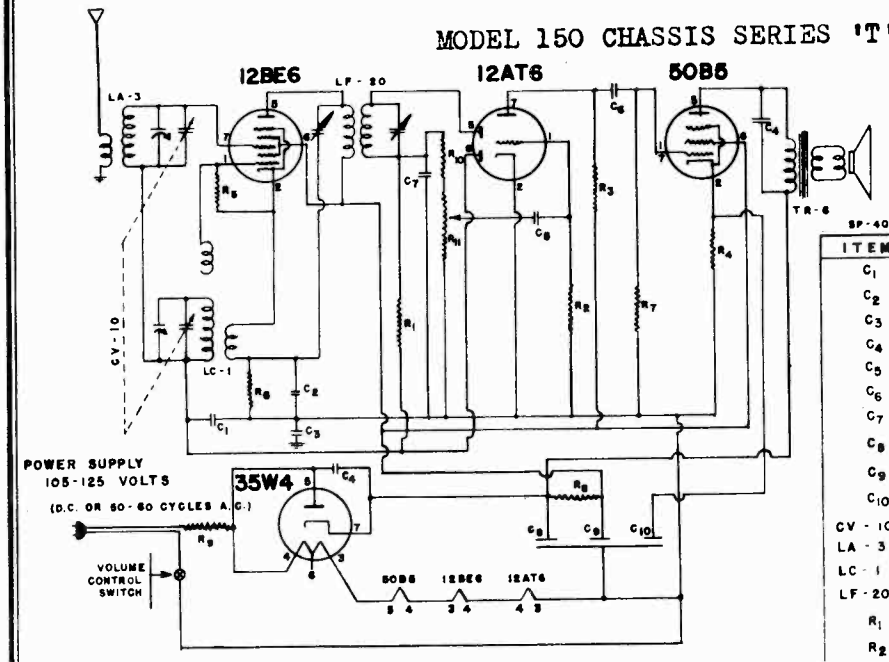




TELE-TONE RADIO CORP.

MODEL 150, chassis T
MODEL 152, chassis W

MODEL 150 CHASSIS SERIES 'T'



I.F. - 455 K.C.

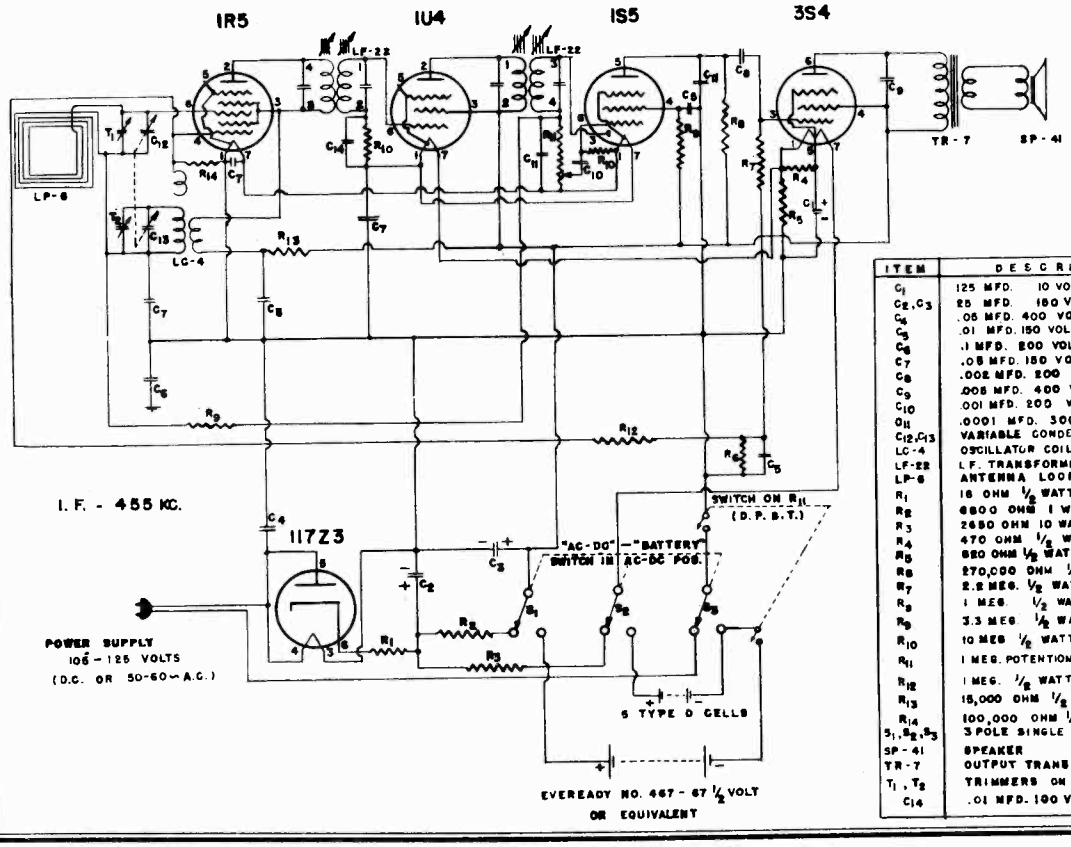
FREQ. RANGE 530-1700 K.C.

ALIGN AT 1500 K.C.

TRACK AT 600 K.C.

ITEM	DESCRIPTION	PART NO.
C_1	.05 MFD - 200 VOLT PAPER CONDENSER	CP 503-3
C_2	.01 MFD - 150 VOLT PAPER CONDENSER	CP 103-2
C_3	.05 MFD-400 VOLT PAPER CONDENSER	CP 503-3
C_4	.02 MFD-400 VOLT PAPER CONDENSER	CP 203-1
C_5	.002 MFD-400 VOLT PAPER CONDENSER	CP 202-2
C_6	.005 MFD-200 VOLT PAPER CONDENSER	CP 502-3
C_7	150 MMF-500 VOLT MICA CONDENSER	CM 151-1
C_8	40 MFD-150 VOLT	GE-13
C_9	20 MFD-150 VOLT (ELECTROLYTIC CONDENSER)	GE-13
C_{10}	20 MFD-15 VOLT	GE-13
CV-10	VARIABLE CONDENSER	CV-10
LA-3	ANTENNA COIL	LA-3
LC-1	OSCILLATOR COIL	LC-1
LF-20	I.F. TRANSFORMER	LF-20
R_1	2.2 MEG. 1/2 WATT RESISTOR	RC 225-1
R_2	10 MEG. 1/2 WATT RESISTOR	RC 106-1
R_3	330,000 OHMS 1/2 WATT RESISTOR	RC 334-1
R_4	150 OHMS 1/2 WATT RESISTOR	RC 151-1
R_5	22,000 OHMS 1/2 WATT RESISTOR	RC 223-1
R_6	.82 OHMS 1/2 WATT RESISTOR 10%	RC 820-2
R_7	470,000 OHMS 1/2 WATT RESISTOR	RC 474-1
R_8	2200 OHMS 1 WATT RESISTOR	RC 222-4
R_9	33 OHMS 2 WATT WIRE RESISTOR 10%	RW 330-8
R_{10}	100,000 OHMS 1/2 WATT RESISTOR	RC 104-1
R_{11}	1 MEG. VOLUME CONTROL & S.P.S.T. SW.	VC-6
SP-40	SPEAKER	SP-40
TR-6	OUTPUT TRANSFORMER	TR-6

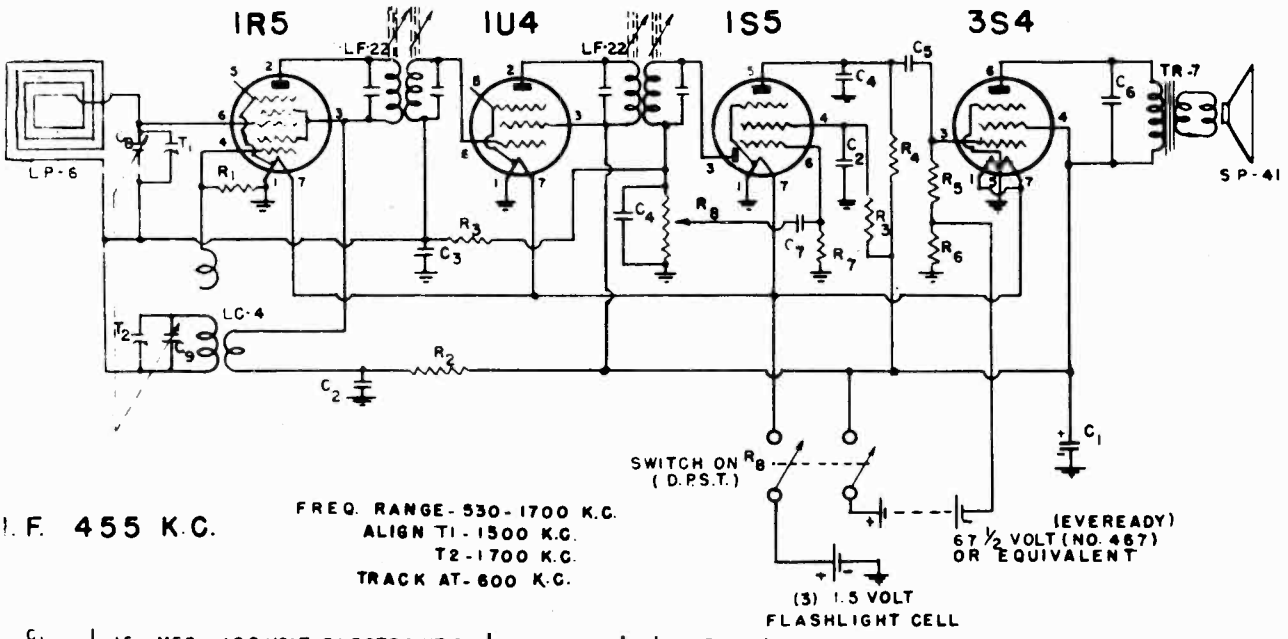
MODEL 152 CHASSIS SERIES 'W'



ITEM	DESCRIPTION	PART NUMBER
C_1	125 MFD. 10 VOLT (ELECTROLYTIC)	GE-12
C_2, C_3	25 MFD. 150 VOLT (CONDENSER)	
C_4	.05 MFD. 400 VOLT PAPER COND.	CP 503-3
C_5	.01 MFD. 150 VOLT PAPER COND.	CP 103-2
C_6	.1 MFD. 200 VOLT PAPER COND.	CP 104-2
C_7	.05 MFD. 150 VOLT PAPER COND.	CP 503-2
C_8	.002 MFD. 200 VOLT PAPER COND.	CP 202-3
C_9	.005 MFD. 400 VOLT PAPER COND.	CP 502-2
C_{10}	.001 MFD. 200 VOLT PAPER COND.	CP 102-3
C_{11}	.0001 MFD. 300 VOLT MICA COND.	CM 101-1
C_{12}, C_{13}	VARIABLE CONDENSER	CV 10
LC-4	OSCILLATOR COIL	LC-4
LF-22	I.F. TRANSFORMER	LF-22
LP-6	ANTENNA LOOP	LP-6
R_1	18 OHM 1/2 WATT RESISTOR	RC 180-1
R_2	6800 OHM 1 WATT 10% RESISTOR	RC 682-8
R_3	2650 OHM 10 WATT 5% RESISTOR	RP-3
R_4	470 OHM 1/2 WATT RESISTOR	RC 471-1
R_5	820 OHM 1/2 WATT 10% RESISTOR	RC 821-2
R_6	270,000 OHM 1/2 WATT 10% RESISTOR	RC 274-2
R_7	2.2 MEG. 1/2 WATT RESISTOR	RC 225-1
R_8	1 MEG. 1/2 WATT RESISTOR	RC 105-1
R_9	3.3 MEG. 1/2 WATT RESISTOR	RC 335-1
R_{10}	10 MEG 1/2 WATT RESISTOR	RC 106-1
R_{11}	1 MEG. POTENTIOMETER WITH SWITCH	VC-6
R_{12}	1 MEG. 1/2 WATT 10% RESISTOR	RC 105-2
R_{13}	15,000 OHM 1/2 WATT RESISTOR	RC 153-1
R_{14}	100,000 OHM 1/2 WATT RESISTOR 10%	RC 104-2
S_1, S_2, S_3	3 POLE SINGLE THROW SWITCH	SW-10
SP-41	SPEAKER	SP-41
TR-7	OUTPUT TRANSFORMER	TR-7
T_1, T_2	TRIMMERS ON VARIABLE	
C_{14}	.01 MFD. 190 VOLT PAPER COND.	CP 103-4

MODEL 156, chassis U

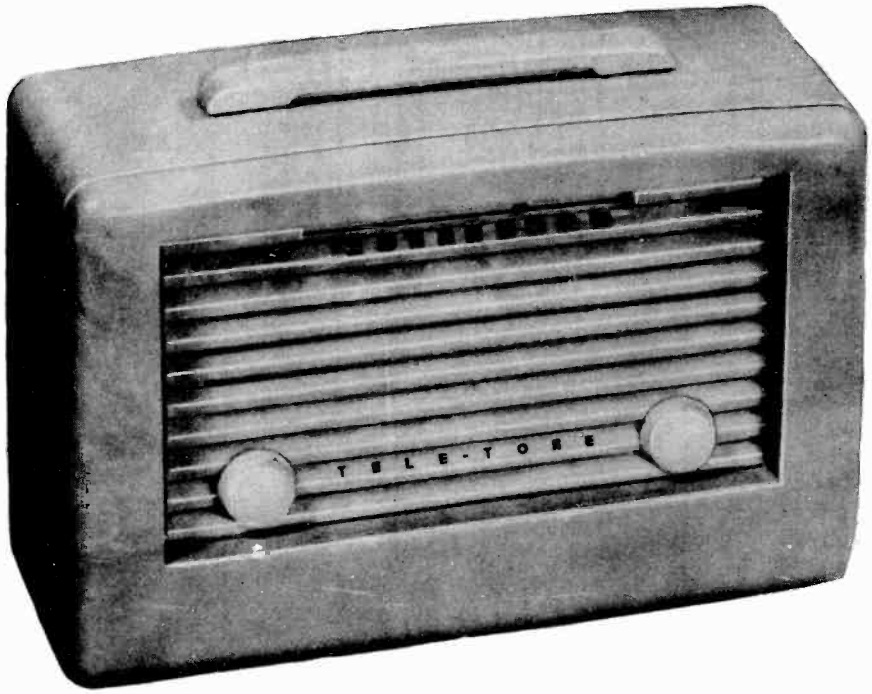
TELE-TONE RADIO CORP.

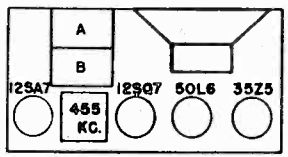


I.F. 455 K.C.

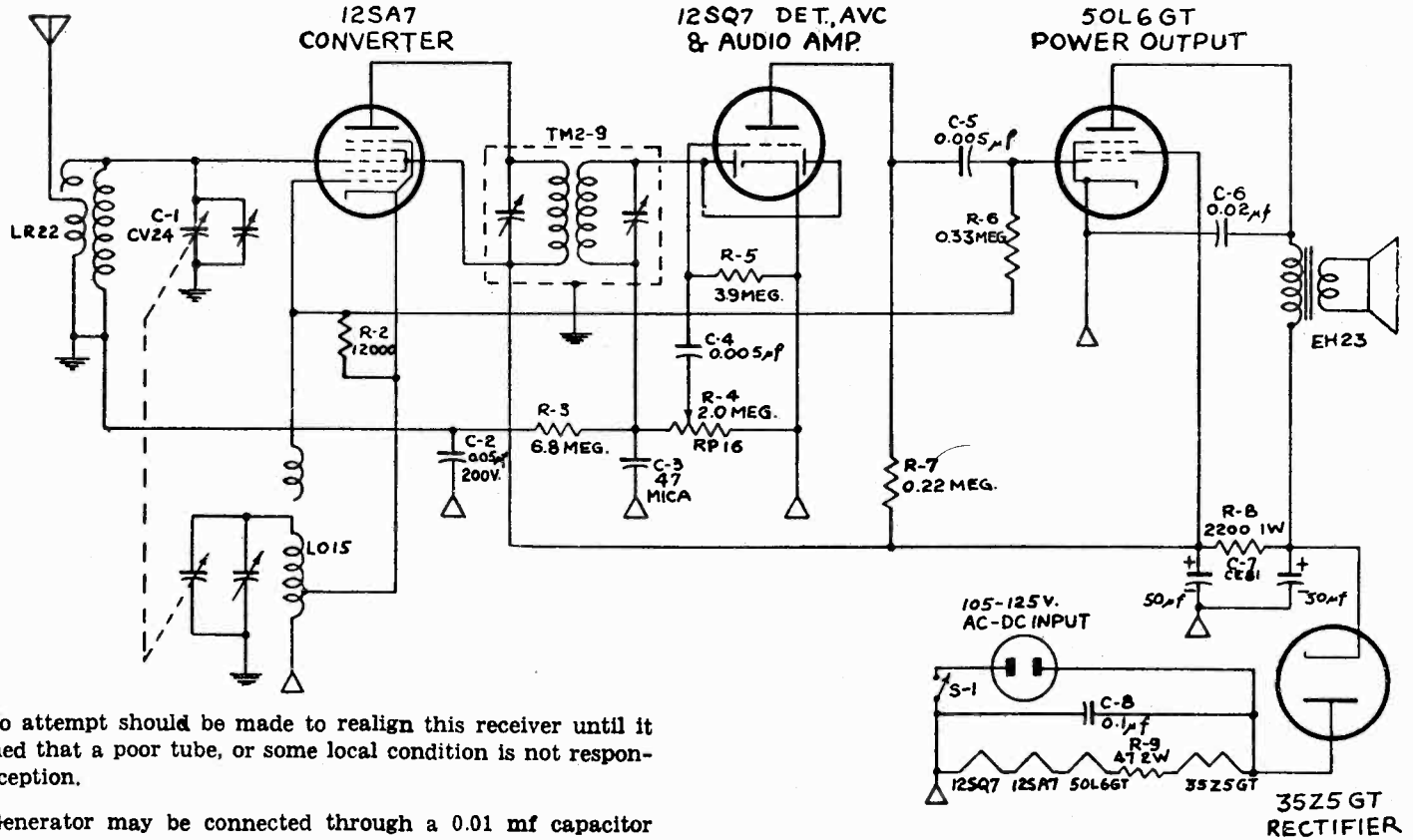
FREQ. RANGE - 530 - 1700 K.C.
ALIGN T1 - 1500 K.C.
T2 - 1700 K.C.
TRACK AT - 600 K.C.

C_1	16 MFD. 100 VOLT ELECTROLYTIC	CE-14
C_2	.01 MFD. 200 VOLT PAPER COND.	CP-103-3
C_3	.05 MFD. 200 VOLT PAPER COND.	CP-503-4
C_4	.0001 MFD. 500 VOLT MICA COND.	CM-101-2
C_5	.002 MFD. 200 VOLT PAPER COND.	CP-202-2
C_6	.005 MFD. 400 VOLT PAPER COND.	CP-502-1
C_7	.001 MFD. 200 VOLT PAPER COND.	CP-102-3
LC-4	OSCILLATOR COIL	LC-4
LF-22	I.F. TRANSFORMER	LF-22
LP-6	ANTENNA LOOP	LP-6
R_1	100,000 OHM ½ WATT RESISTOR	RC-104-1
R_2	15,000 OHM ½ WATT RESISTOR	RC-153-1
R_3	3.3 MEG. ½ WATT RESISTOR	RC-335-1
R_4	1 MEG. ½ WATT RESISTOR	RC-105-1
R_5	2.2 MEG. ½ WATT RESISTOR	RC-225-1
R_6	820 OHM ½ WATT RESISTOR 10%	RC-821-2
R_7	10 MEG. ½ WATT RESISTOR	RC-106-1
SP-41	SPEAKER	SP-41
R_8	1 MEG. POTENTIOMETER WITH SWITCH	VC-6
TR-7	OUTPUT TRANSFORMER	TR-7
C8, C9	VARIABLE CONDENSER	CV-10
T1, T2	TRIMMERS ON VARIABLE	





LOCATION OF TUBES



Alignment: No attempt should be made to realign this receiver until it has been determined that a poor tube, or some local condition is not responsible for faulty reception.

The Signal Generator may be connected through a 0.01 mf capacitor (used as dummy antenna) to the lug of RF section of tuning capacitor. Connect ground clip of generator to a convenient B-minus point such as one of the switch terminals on the back of the volume control. An output meter may be clipped directly across the voice coil lugs. Align the IF trimmers to 455 kc using least possible input from signal generator to avoid developing A. V. C. voltage which would make the tuning adjustments very broad.

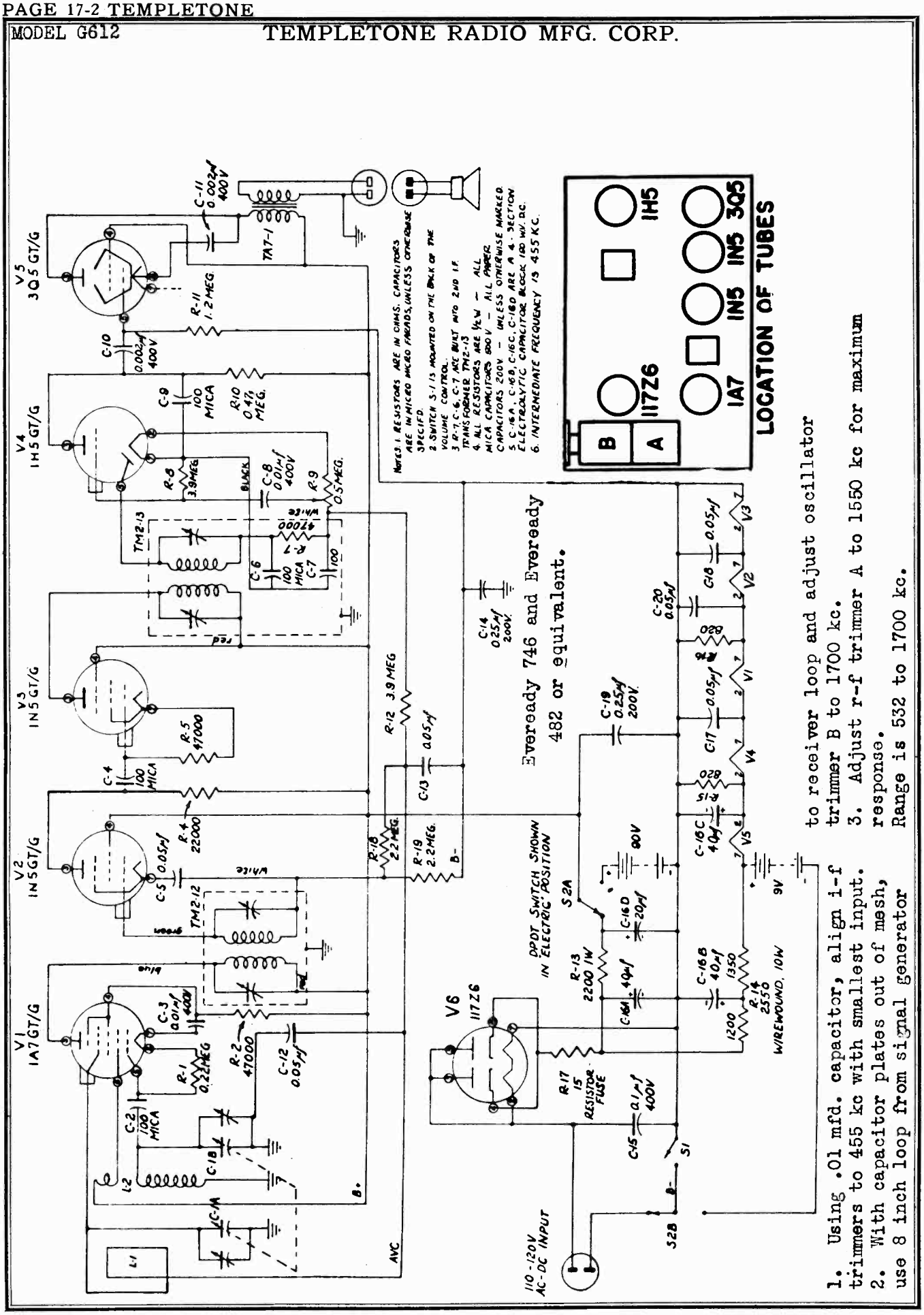
To align RF trimmer, remove the 0.01 mf capacitor and connect the signal generator hot lead to a 68 mmf mica condenser. Connect the dummy antenna thus formed to the antenna lug on the antenna coil (lug to which the antenna hank is soldered). Again, use the least possible input from the signal generator. With the tuning capacitor plates completely out of mesh, and pointed at extreme clockwise position, adjust the oscilator trimmer on front section of tuning capacitor to 1700 kc. Readjust both signal generator and tuning capacitor to 1550 kc and adjust the RF trimmer on rear section for maximum response.

NOTES:

1. RESISTORS ARE IN OHMS AND ARE ½ WATT; CAPACITORS ARE 400V AND IN μμf UNLESS OTHERWISE SPECIFIED.
2. SWITCH S-1 IS MOUNTED ON REAR OF VOLUME CONTROL.
3. SYMBOL Δ DENOTES B- AND SYMBOL ⏚ DENOTES CHASSIS.
4. I.F. FREQUENCY IS 455Kc.
5. TUNING RANGE IS 532Kc. TO 1700Kc.

MODEL G612

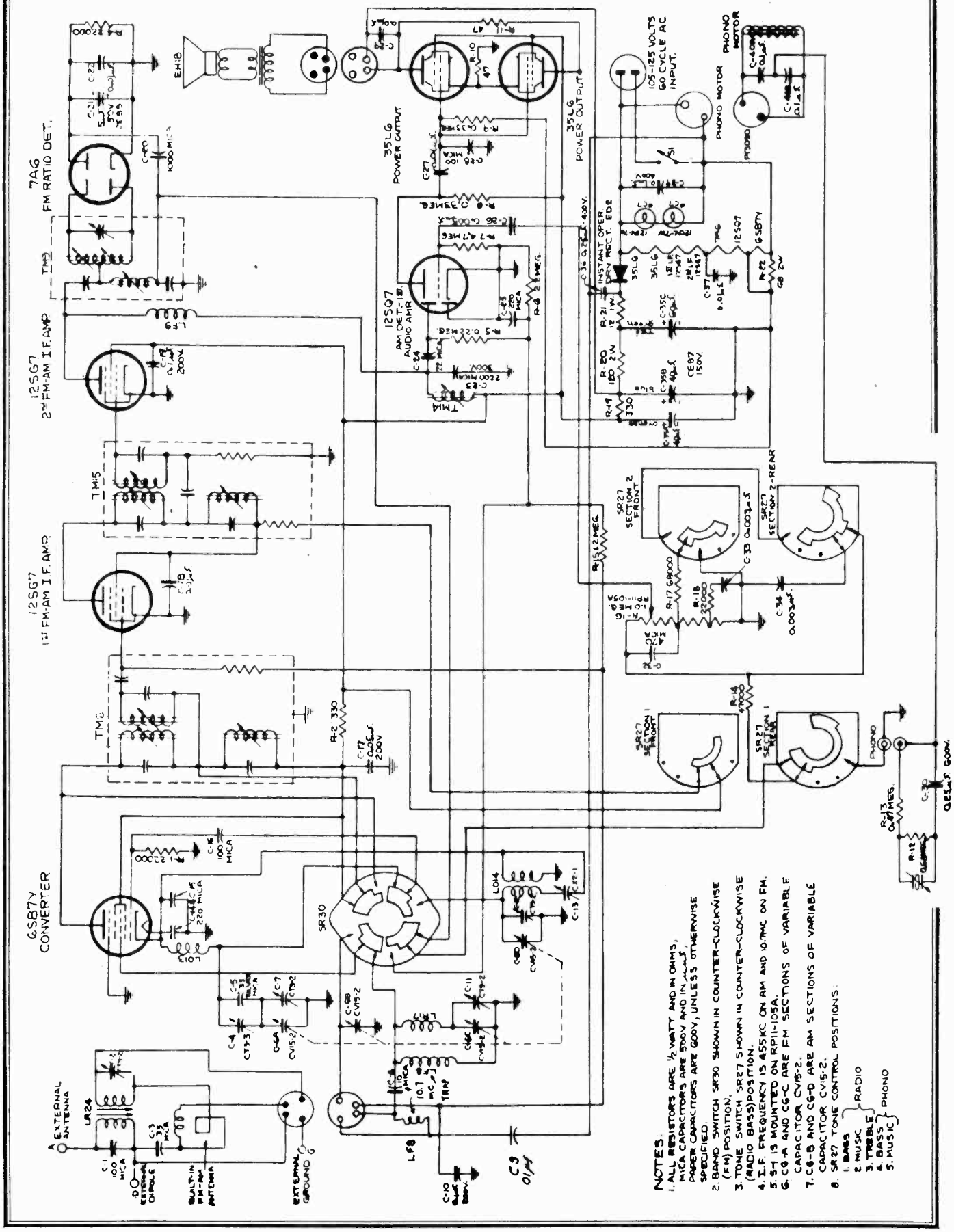
TEMPLETONE RADIO MFG. CORP.



NOTES: 1. RESISTORS ARE IN OHMS. CAPACITORS ARE IN MICRO MICRO FARADS, UNLESS OTHERWISE SPECIFIED.
2. SWITCH S-1 IS MOUNTED ON THE BACK OF THE VOLUME CONTROL.
3. R-7, C-6, C-7 ARE BUILT INTO 2ND I.F. TRANSFORMER TM2-13
4. ALL RESISTORS ARE ½W — ALL MICA CAPACITORS 600 V — ALL PAPER CAPACITORS 200V — UNLESS OTHERWISE MARKED.
5. C-16A, C-16B, C-16C, C-16D ARE A 4-SECTION ELECTROLYTIC CAPACITOR BLOCK 150 WV. D.C.
6. INTERMEDIATE FREQUENCY IS 455 KC.

1. Using .01 mfd. capacitor, align i-f trimmers to 455 kc with smallest input.
2. With capacitor plates out of mesh, use 8 inch loop from signal generator to receiver loop and adjust oscillator trimmer B to 1700 kc.
3. Adjust r-f trimmer A to 1550 kc for maximum response.
Range is 532 to 1700 kc.

TEMPLETONE RADIO MFG. CORP. MODEL G725

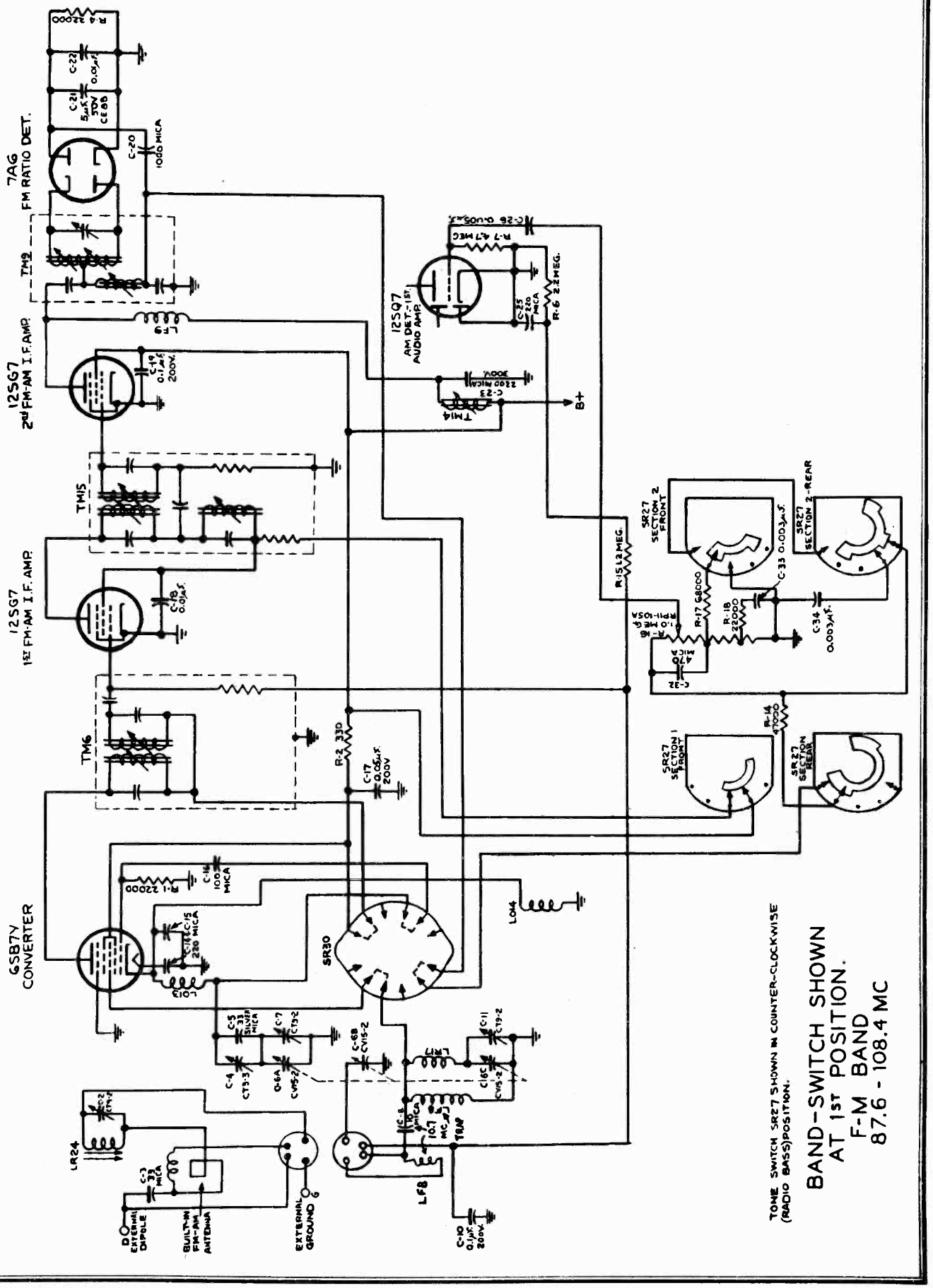


NOTES.
1. ALL RESISTORS ARE ½ WATT AND IN OHMS, MICA CAPACITORS ARE 500V AND IN μμF, PAPER CAPACITORS ARE 600V, UNLESS OTHERWISE SPECIFIED.
2. BAND SWITCH SR30 SHOWN IN COUNTER-CLOCKWISE (FM) POSITION.
3. TONE SWITCH SR27 SHOWN IN COUNTER-CLOCKWISE (RADIO BASS) POSITION.
4. I.F. FREQUENCY IS 455KC ON AM AND 10.7MC ON FM.
5. S1-S7 IS MOUNTED ON RP11-105A.
6. C6-A AND C6-C ARE FM SECTIONS OF VARIABLE CAPACITOR CV15-2.
7. C6-B AND C6-D ARE AM SECTIONS OF VARIABLE CAPACITOR CV15-2.
8. SR27 TONE CONTROL POSITIONS.
   1. BASS
   2. MUSIC } RADIO
   3. TREBLE
   4. BASS
   5. MUSIC } PHONO

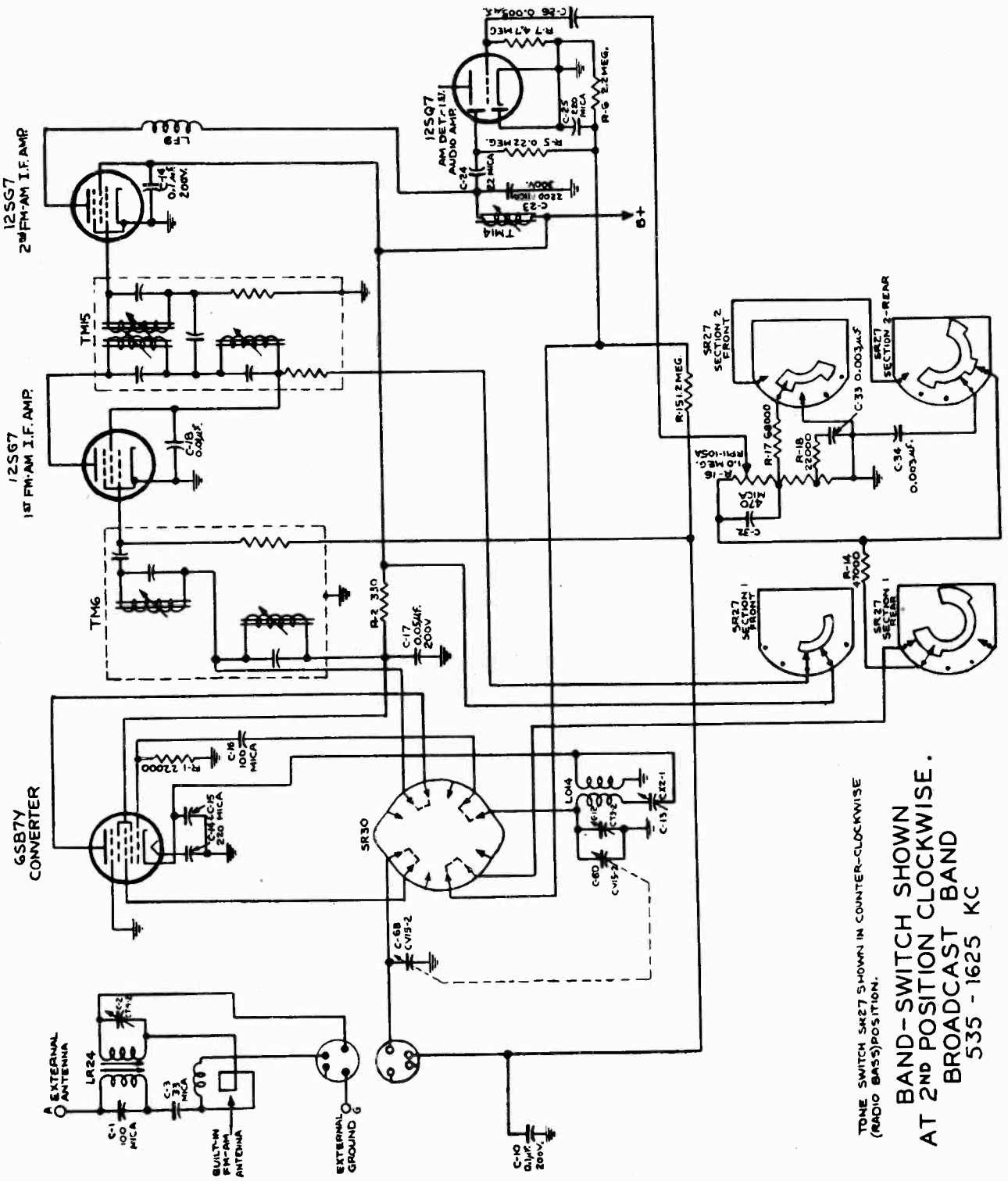
"clarified schematics"

MODEL G725

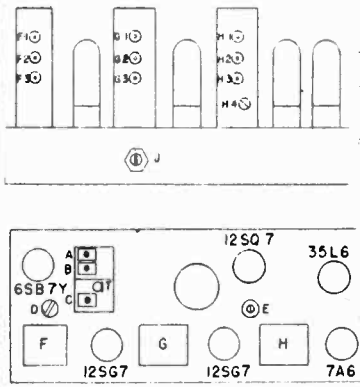
TEMPLETONE RADIO MFG. CORP.



TEMPLETONE RADIO MFG. CORP. MODEL G725



ALIGNMENT PROCEDURE:



Dummy Antenna	Signal Generator Connection	Signal Generator Frequency	Band Switch Position	Radio Dial Setting	Adjust	Remarks
0.01 MFD	Terminal T	455 KC AM	Broadcast	1625 KC	E G-1 F-1	Adjust for maximum output Repeat for fine adjustment
0.01 MFD	Pin 4 of 12SG7 2nd FM-AM IF with FM Signal Gen.	10.7 MC FM	FM	108 MC	H-2	Adjust for maximum output (Broad adjustment)
0.01 MFD	"	10.7 MC FM	FM	108 MC	H-4	Adjust for maximum output
0.01 MFD	"	10.7 MC AM	FM	108 MC	H-1 or H-3	Adjust whichever is required for minimum output
						Repeat last two steps for fine adjustment until settings for maximum FM output coincide with settings for minimum AM output.
0.01 MFD	Pin 8 of 6SB7Y Converter	10.7 MC FM	FM	108 MC	G-3 — G-2	Adjust for maximum output
0.01 MFD		"	FM	108 MC	F-3 — F-2	Adjust for maximum output
						Repeat last two steps for fine adjustment
			Broadcast	535 KC	Pointer	Adjust pointer to reference mark
100 MMFD	"A" Post on Cabinet	600 KC AM	"	600 KC	J and Core on Ant. Coil in Cab.	Adjust for maximum output
"	"	1550 KC AM	"	1550 KC	B and trimmer on Ant. Coil	Adjust for maximum output
300 OHM Resistor	"	92 MC FM	FM	92 MC	D	Adjust for maximum output
"	"	106 MC FM	FM	106 MC	A and C	Adjust for maximum output

Alignment: No attempt should be made to realign this receiver until it has been determined that a poor tube or some local condition is not responsible for faulty reception. The following is a list of the minimum equipment necessary to realign this receiver.

In the following alignment procedure the high side of the signal generator is connected to the terminal indicated in the "Signal Generator Coupling" column below. The ground side of the signal generator is connected directly to the chassis. The output meter should be connected across the voice coil of the speaker for all measurements.

1—AM signal generator covering 455 KC, 600 KC, 1550 KC and 10.7 MC

2—FM signal generator covering 10.7 MC, 92 MC and 106 MC

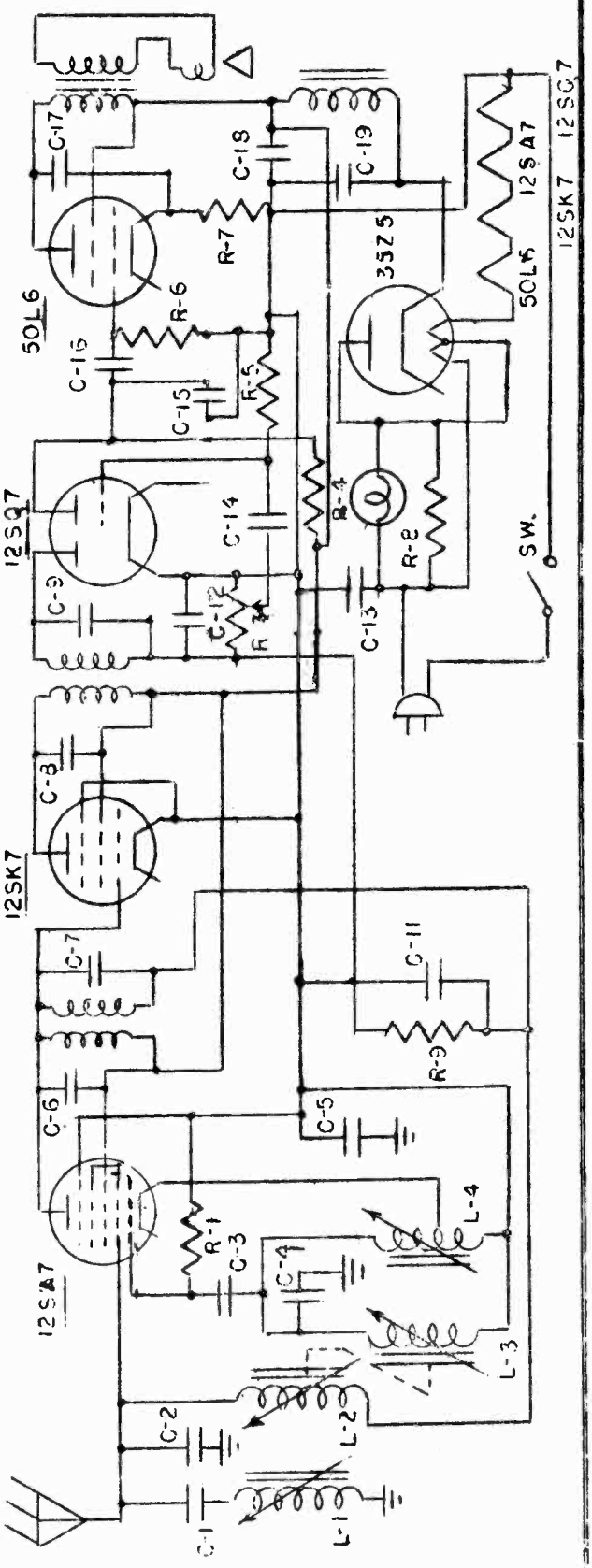
3—Output meter, rectifier type, approximately 0 to 2 volts RMS

4—Dummy antennas
100MMFD Mica Capacitor
300 Ohm Resistor
0.01 MFD Capacitor

In adjusting the radio frequency trimmers and padders it is advisable to "rock" the variable capacitor gang slightly across the signal being delivered by the signal generator until that particular signal has been accurately peaked.

TRADIO

SCHEMATIC DIAGRAM FOR TRADIO MODEL L5



C-1 25 MMF CERAMIC
C-2 TRIMMER
C-3 250 MMF MICA
C-4 TRIMMER
C-5 0.1 PAPER
C-6 TRIMMER,
C-7 TRIMMER

C-8 TRIMMER
C-9 TRIMMER
C-11 0.1 PAPER
C-12 250 MMF MICA
C-13 0.1 PAPER
C-14 .005 MF PAPER
C-15 500 MMF MICA

C-16 0.01 MF PAPER
C-17 0.02 MF PAPER
C-18 20 MF ELECTROLYTIC
C-19 20 MF ELECTROLYTIC
R-1 20 K 10% ½W
R-6 500 K 10% ½W
R-4 500 10% ½W
R-5 4.7 MEG 20% ½W

R-3 500 10% ½W
R-7 180 OHM 10% ½W
R-8 220 OHM 20% ½W
R-9 3.3 MEG 20% ½W

L-1 WAVE TRAP
L-2 PERMEABILITY TUNER
L-3 PERMEABILITY TUNER
L-4 OSC COIL

TRADIO

1. I. F. Alignment

   A. Set signal generator at 455 k.c.

   B. Connect output meter across voice coil.

   C. Put a .1 MFD condenser in series with the output side of signal generator.

   D. Connect other end of this condenser to grid of 12SA7 (Pin #8).

   E. Connect ground of signal generator to A.C. switch on volume control.

   F. Turn both volume controls to maximum volume.

   G. Adjust screw on bottom and screw on top of I.F. transformers for maximum output on meter.

2. Wave Trap Alignment

   A. Connect a 200 MMFD condenser in series with the signal generator.

   B. Connect other end of condenser to antenna.

   C. With signal generator set at 455 k.c., tune wave trap for MINIMUM output.

3. R. F. Alignment

   A. Set signal generator at 1600 k.c.

   B. Put 200 MMFD condenser in series with output side of signal generator. Connect other side of 200 MMFD condenser to antenna of receiver. Set dial to 1600 k.c.

   C. Tune ocillator trimmer on tuning unit. (This trimmer is on outside edge of tuning unit furthest away from speaker). Adjust this trimmer for maximum output.

   D. Adjust trimmer nearest speaker for maximum output.

4. Tracking

   A. Set tuning dial of receiver at 600 k.c.

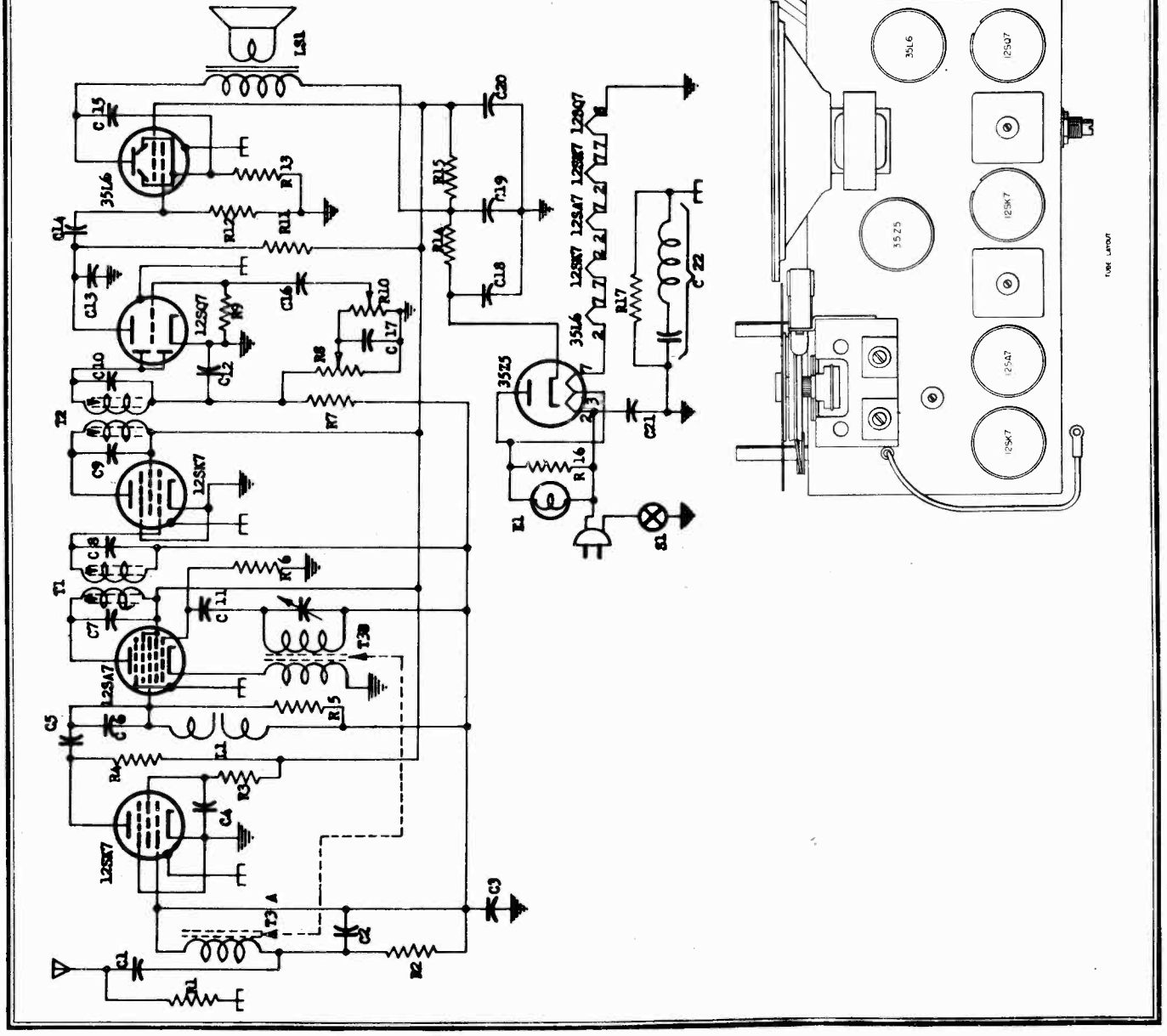
   B. Set signal generator at 600 k.c. and adjust slug in center of tuning unit for maximum output.

TRADIO

C1----------Condenser----------150 mmfd.
C2,C6----------Condenser----------25 mmfd.
C3----------Condenser----------.05 mfd. 400V.
C4,C15----------Condenser----------.02 mfd. 400V.
C5,C7,C8,C9,C10--Condenser----------100 mmfd.
C11----------Condenser----------45 to 50 mmfd. Mica
C12,C17----------Condenser----------250 to 300 mmfd.
C13----------Condenser----------500 mmfd.
C14----------Condenser----------.01 mfd. 400V.
C16----------Condenser----------.005 mfd. 600V. D.C.
C18,C19,C20----------Condenser----------20-20-20 150V. D.C.
C21----------Condenser----------.1 mfd. 400V. D.C.
C22----------Condenser----------(Modified for line ground)

R1----------Resistor----------470K to .5 meg. 1/2 W
R2,R5,R17----------Resistor----------220K 1/2 W
R3----------Resistor----------33K 1/2 W
R4----------Resistor----------4700 ohms. 1/2 W
R6----------Resistor----------20K 1/2 W
R7----------Resistor----------.5 to 3.5 meg. 1/2 W
R8----------Resistor----------500K Pot.
R9----------Resistor----------4.7 to 5.1 meg. 1/2 W
R10----------Resistor----------500K (With switch)
R11,R12----------Resistor----------470K to .5 meg. 1/2 W
R13----------Resistor----------180 ohms. 1/2 W
R14----------Resistor----------180 to 220 ohms.1/2 W
R15----------Resistor----------1000 to 1500 ohms. 1/2 W
R16----------Resistor----------220 ohms. 1/2 W

T1----------I. F. Transformer--Lavoie #1268-86
T2----------I. F. Transformer--Lavoie #1268-86
T3----------Tuner----------
L1----------Wave trap----------Lavoie #1268-98
LS1----------5" P. M. Speaker---Lavoie #1268-88
1268-89
S1----------Switch----------Part of R10
E1----------Pilot Lamp----------



1. I. F. Alignment

   A. Set signal generator at 455 k.c.

   B. Connect output meter across voice coil.

   C. Put a .1 MFD condenser in series with the signal generator.

   D. Connect other end of this condenser to grid of the 12SA7 (Pin #8).

   E. Connect ground of signal generator to A.C. switch on the volume control.

   F. Turn both volume controls to maximum volume.

   G. Adjust screw on bottom and screw on top of I.F. transformers for maximum output on meter.

2. Wave Trap Alignment

   A. On certain LU-6 sets the wave trap is situated directly behind the tuning unit. These traps are tunable. Wave trap alignment on these sets is the same as given for Model L-5. Note: On certain LU-6 chassis, the wave trap is not situated directly behind the tuning unit. These sets are fix-tuned and do not have to be adjusted.

3. R. F. Alignment

   A. Chassis' bottom plate must be on.

   B. Set signal generator at 1630 k.c.

   C. Put 200 MMFD condenser in series with signal generator.

   D. Connect other end of this condenser to antenna of receiver.

   E. Set tuning dial at 1630 k.c.

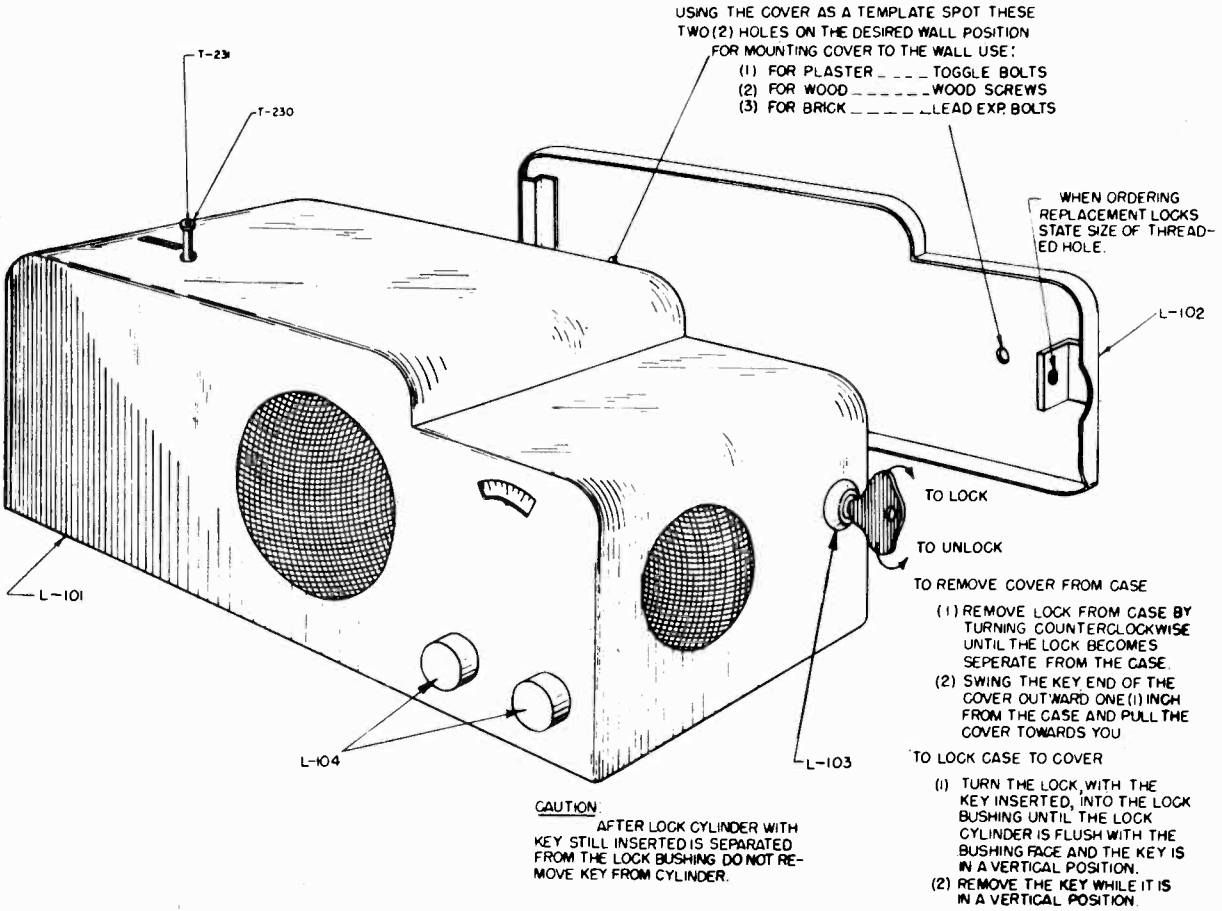
   F. Tune ocillator trimmer on top of tuning unit nearest speaker (#9-345) for maximum output.

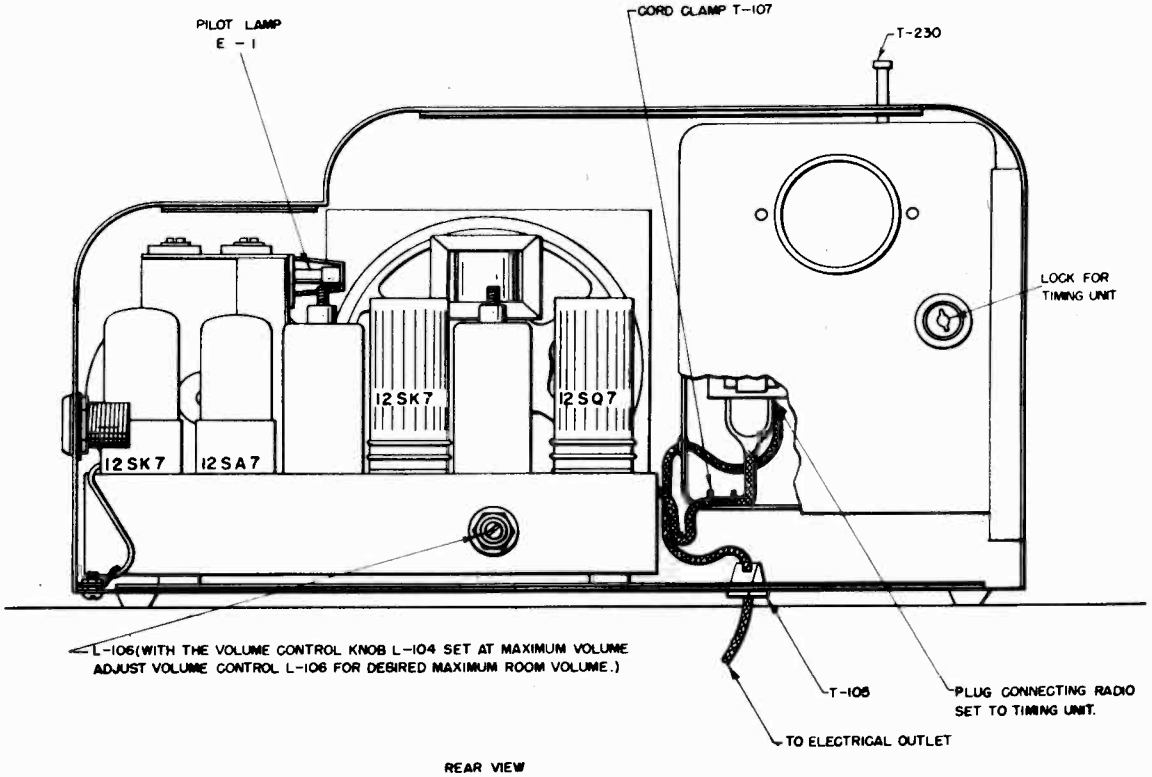
   G. Adjust trimmer furthest away from speaker for maximum output.

4. Tracking

   A. Set tuning dial of receiver at 600 k.c.

   B. Set signal generator at 600 k.c. and adjust slug in centor of tuning unit for maximum output.

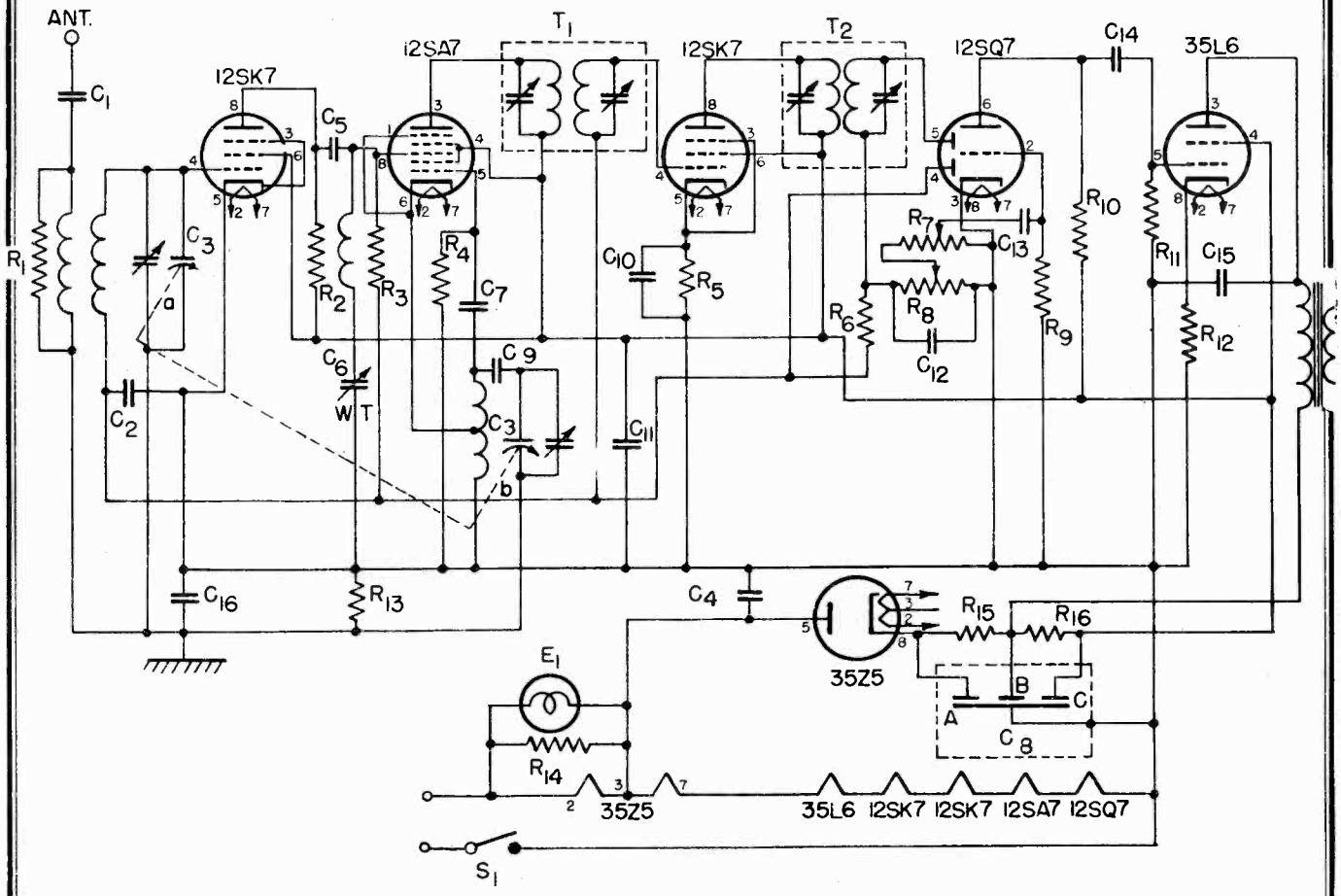




REAR VIEW

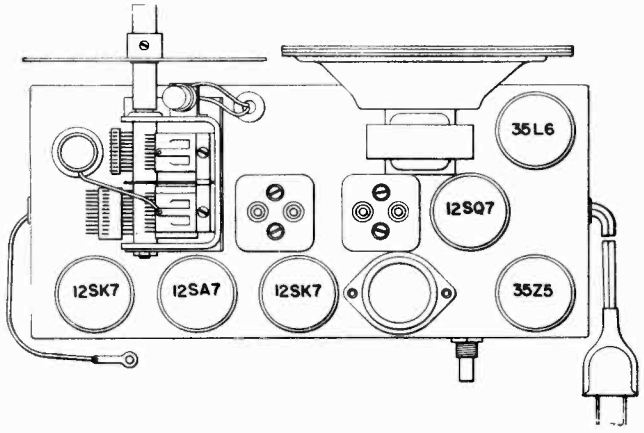
MODEL T-U6-1

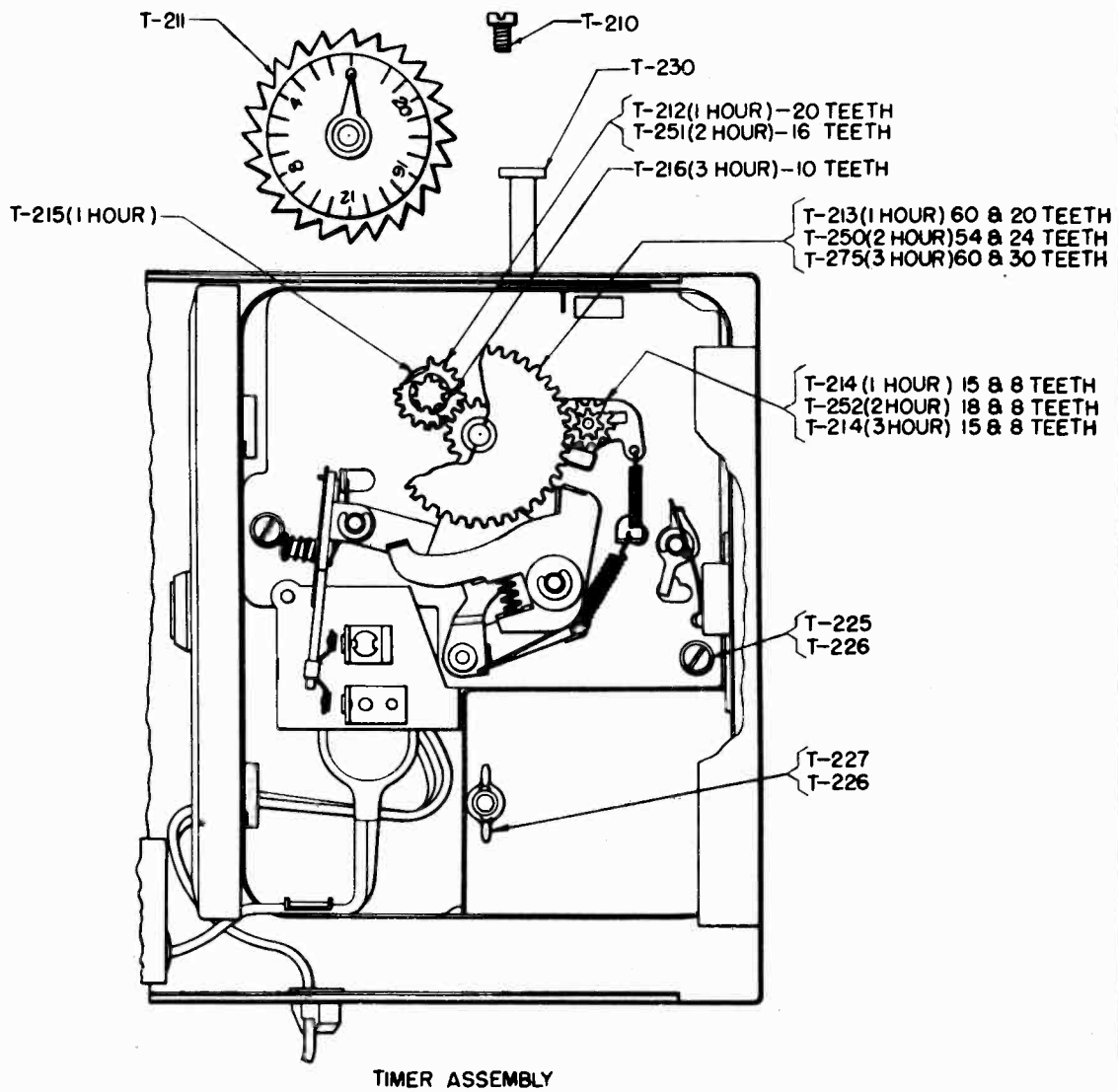
TRADIO



R-1	RESISTOR	15,000	OHMS	C-1	CONDENSER	250 MMF.	
R-2		6,800		C-2		.05 MF.	
R-3		100,000		C-3		VAR. AIR, 360 MMF.	
R-4		22,000		C-4		.05 MF.	
R-5		100		C-5		100 MMF.	
R-6		1 MEG.		C-6		VAR.	
R-7		VAR.-.5 MEG.		C-7		100 MMF	
R-8		VAR.-.5 MEG.		C-8		A 30 MF B 40 MF C 20 MF	
R-9		3.9MEG.		C-9		.01 MF	
R-10		220,000		C-10		.05 MF	
R-11		470,000		C-11		.05 MF	
R-12		130		C-12		250 MMF	
R-13		220,000		C-13		.005 MF	
R-14		30		C-14		.01 MF	
R-15		200		C-15		.03 MF	
R-16	RESISTOR	910	OHMS	C-16	CONDENSER	.1 MF	

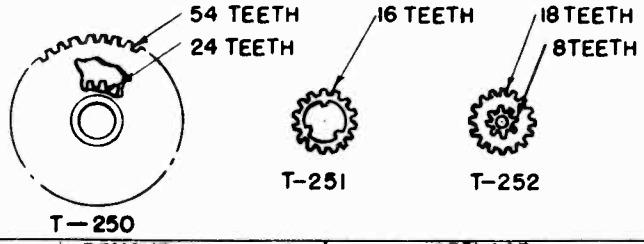
E-1	LAMP - 47
LS-1	SPEAKER P.M.
T-1	I.F. TRANSFORMER (INPUT) 455 K.C.
T-2	I.F. TRANSFORMER (OUTPUT) 455 K.C.
S-1	SWITCH (ON VOL. CONT.)





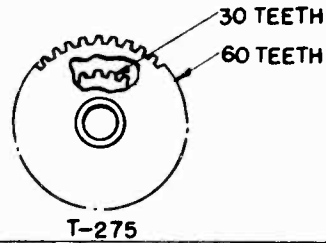
TIMER ASSEMBLY
(T-210 & T-211 REMOVED TO SHOW 1 HOUR GEAR SETUP)

FROM 1 TO 2 HOUR ASSEMBLY



REMOVE	REPLACE
T-210	T-251(COLLAR DOWN)
T-211	T-252(8 TOOTH GEAR UP)
T-213	T-250(LARGE GEAR UP)
T-212	T-211
T-214	T-210
T-215	

FROM 1 TO 3 HOUR ASSEMBLY



REMOVE	REPLACE
T-210	T-275 LARGE GEAR UP
T-211	T-211
T-213	T-210
T-212	
T-215	

TRADIO

1. The meter contacts R&S may not close properly.

2. Coins may be jammed in the coin chute.
   (A) The easiest way to "free" jammed coins is to open the meter and pry them out of the chute with the blade of a screwdriver or the point of an ice pick. Use caution in prying the coins free so that the chute is not deformed in the prying operation.

3. The dial group parts T-211 may not be functioning properly
   (A) If the various parts of the dial group are not operating smoothly, the meter switch may open, even though the account may be prepaid one or more periods. The remedy for this condition is to replace the dial group, which can be done easily in the field. The defective dial should be returned to the factory for repairs.

4. The Meter Switch Contacts May Be Badly Burned
   (A) If the switch contacts R&S cannot be dressed well enough to insure proper closing the parts should be replaced.

5. The Line Fuses May Be Blown.

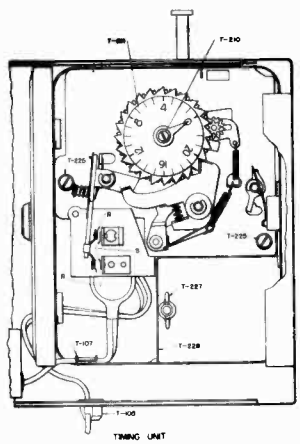
6. The Line Switch May Be Open.
   (A) Someone unknown to the party registering the service call may have opened the line switch. Be sure to check to see that the switch is closed.

7. The Timing Gears May Be Jammed.
   (A) See Fig-4 on Timing Gears

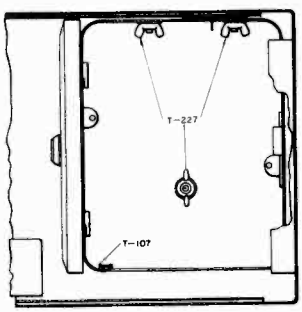
8. The Meter May Be Collecting Too Much Money.
   (A) The Meter May Have Incorrect Timing Gears. (See Fig. 4)
   (B) The cycles of the line may be greater than those of the meter motor. For example, if a 25 cycle meter is connected to a 60 cycle line, the meter will run 2.4 times as fast as a 60 cycle meter. Therefore, the payments will be cancelled out too rapidly. The cycles of the meter are shown on the name plate.

HOW TO REMOVE THE TIMING UNIT FROM THE CASE

1. Remove coin partition T-228 from the timing unit case.
2. Remove the screws T-225 (2).
3. Remove Screw T-231 and collar T-230. (Fig. 1).
4. Remove the line clamp T-107 and unplug the cord from the timing unit.
5. Remove the timing unit from the case.
6. Remove the screws connecting the electrical outlet line to the timing unit.
7. The timing unit may be replaced in the case by reversing the above steps.



TIMING UNIT

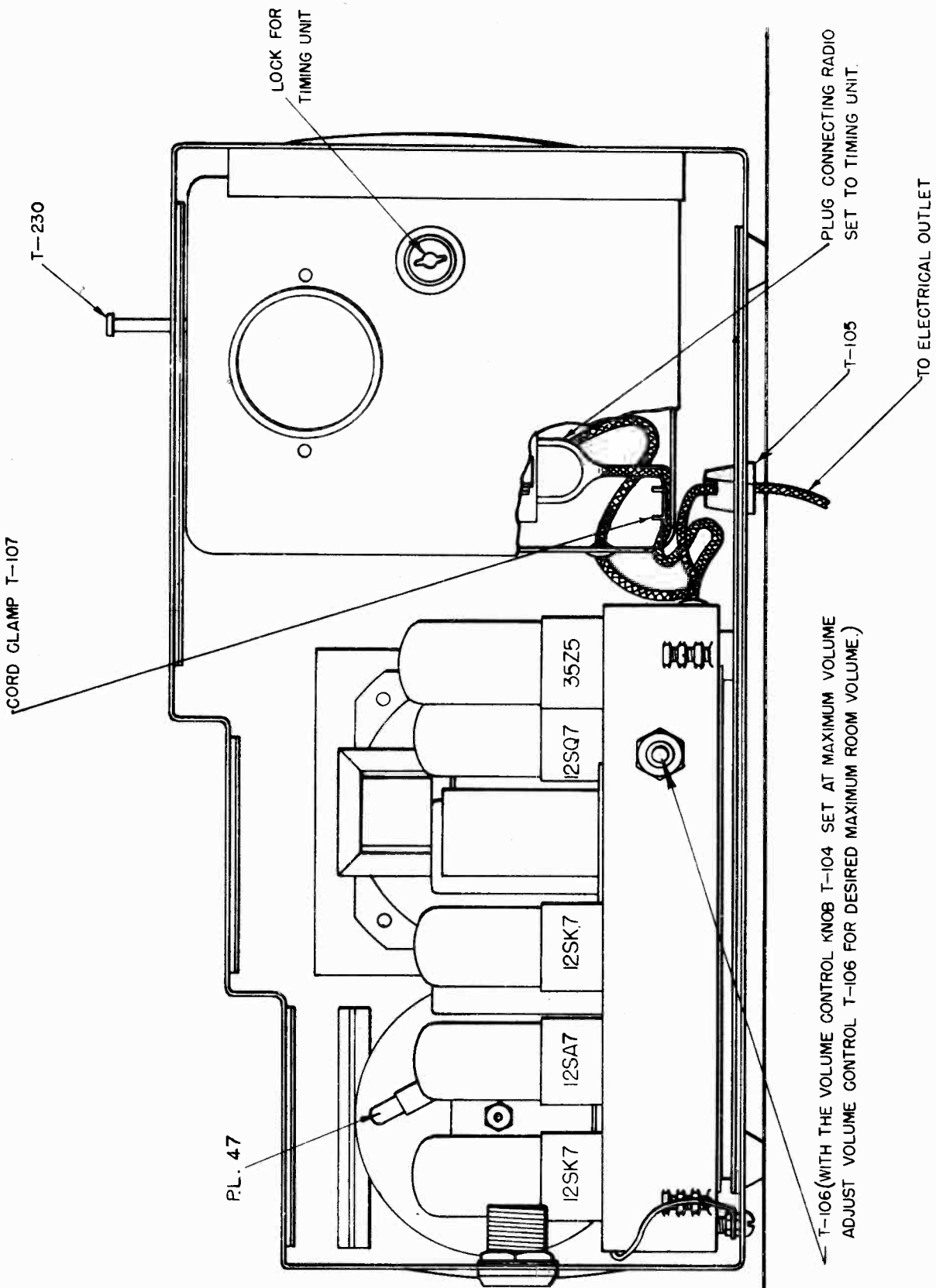


FOR REMOVING THE TIMING UNIT CASE FROM THE CABINET REMOVE T-227(3). NOTE—THIS WING NUT MUST BE IN A VERTICAL POSITION AFTER TIGHTENING SO THAT COIN PARTITION T-228 MAY BE INSERTED.

TIMING CASE MOUNTING & CABINET

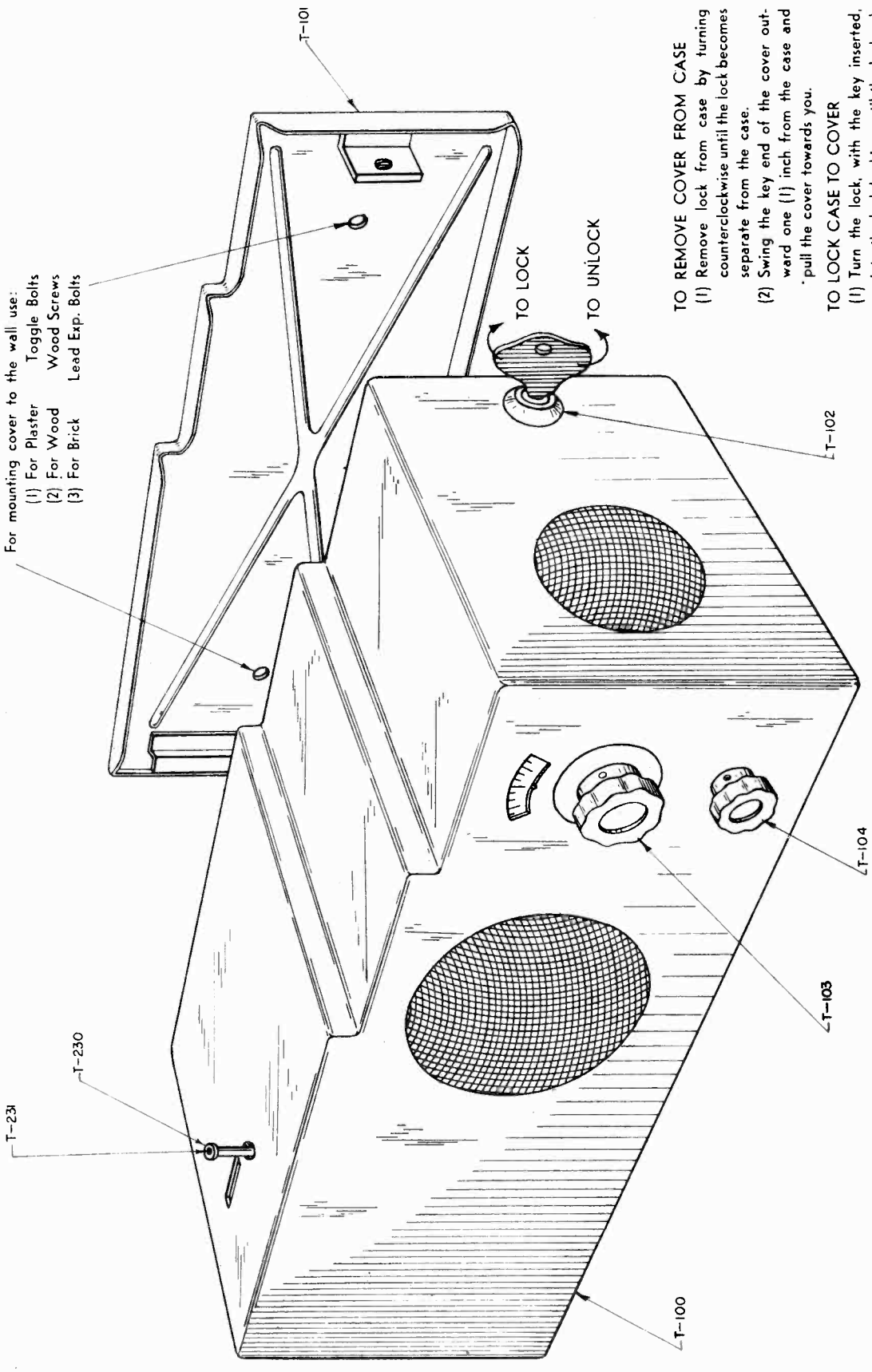
TRADIO

MODEL T-U6-1



MODEL T-U6-1

TRADIO

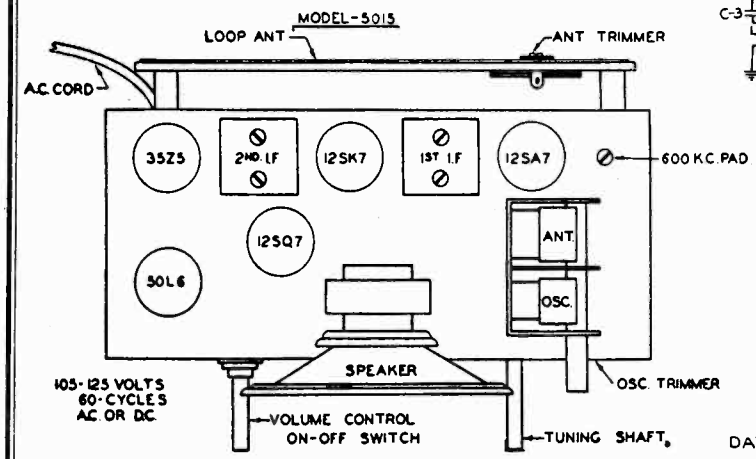


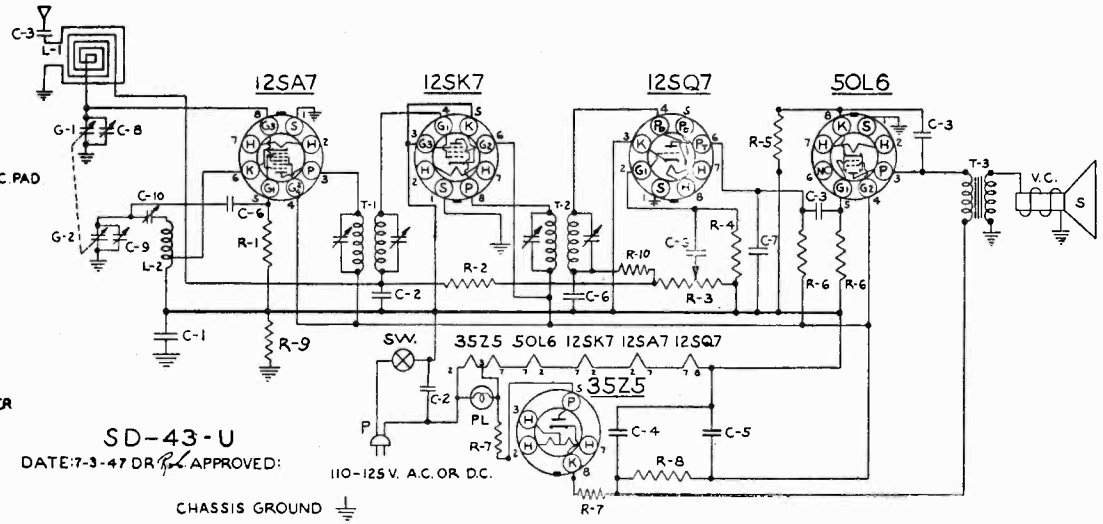
Using the cover as a template spot these two (2) holes on the desired wall position.
For mounting cover to the wall use:
(1) For Plaster Toggle Bolts
(2) For Wood Wood Screws
(3) For Brick Lead Exp. Bolts

TO REMOVE COVER FROM CASE
(1) Remove lock from case by turning counterclockwise until the lock becomes separate from the case.
(2) Swing the key end of the cover outward one (1) inch from the case and pull the cover towards you.

TO LOCK CASE TO COVER
(1) Turn the lock, with the key inserted, into the lock bushing until the lock cylinder is flush with the bushing face and the key is in a vertical position.
(2) Remove the key while it is in a vertical position.

CAUTION:
After lock cylinder with key still inserted is separated from the lock bushing do not remove key from cylinder.





PART NO.		DESCRIPTION
1R-9	R-1	22,000 Ω RESISTOR ½W 20%
1R-23	R-2	3.3 MEG. RESISTOR ½W 20%
VC-4	R-3	1 MEG. VOL. CONTROL & SW.
1R-13	R-4	2.2 MEG. RESISTOR ½W 20%
1R-14	R-5	150 Ω RESISTOR ½W 20%
1R-11	R-6	470M Ω RESISTOR ½W 20%
1R-17	R-7	33 Ω RESISTOR ½W 20%
1R-25	R-8	2,200 Ω RESISTOR 1W 10%
PC-8	C-1	.1 MFD. COND.-400V.
PC-5	C-2	.05 MFD. COND.-400V.
PC-7	C-3	.01 MFD. COND.-400V.
EC-12	C-4	40 MFD. 150 V. ELECTROLYTIC
	C-5	20 MFD.
MC-2	C-6	100 MMFD. MICA COND.
MC-5	C-7	500 MMFD. MICA COND.
1R-10	R-10	47M Ω 1/2 W 20 %
TC-7	C-8	ANTENNA TRIMMER COND.
TC-6	C-9	OSC. TRIMMER COND.
TC-9	C-10	OSC. PADDING COND.
1R-20	R-9	220M Ω RESISTOR ½W 20%
GC-1	G-1	GANG CONDENSER
	G-2	
LL-4	L-1	LOOP ANTENNA
LO-7	L-2	OSC. COIL
LI-1	T-1	INPUT I.F. TRANSFORMER
LI-2	T-2	OUTPUT I.F. TRANSFORMER
	T-3	OUTPUT SPKR. TRANSFORMER
SPK-6	V.C.	VOICE COIL
	S	P.M. SPEAKER
PB-1	PL	No. 47 PILOT BULB
	SW.	A.C. SW. ON VOL. CONTROL
CO-1	P	LINE CORD
TU-3	——	12SA7 GT 12SK7 GT 12SQ7 GT 50L6 GT 35Z5 GT

ALIGNMENT

Remove chassis from cabinet for alignment.

A Signal Generator is required having the following frequencies: 455 KC, 1400 KC, 1720 KC. An output meter should be connected across the speaker.

The receiver volume control should be turned to maximum during the I.F. and all subsequent alignments to keep the AVC from working and giving false readings. Keep the generator output as low as possible to prevent overloading.

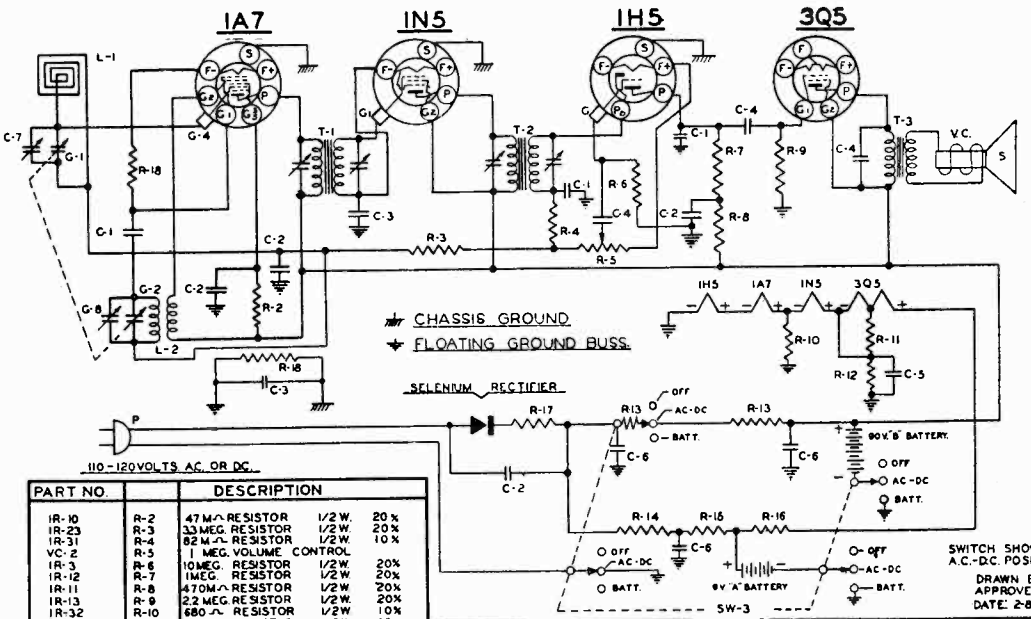
FIRST STEP: Connect the hot lead from the generator to the ANT. section of the gang condenser, through a .1 MFD condenser. The ground lead from the generator must be connected to the floating ground buss under the chassis. Turn the gang condenser to complete minimum capacity. Adjust the generator to 455KC and adjust the trimmers of the 1st and 2nd I.F. transformers until a maximum reading is noted on the output meter.

SECOND STEP: With the leads from the generator still connected in the same manner, adjust the Signal Generator to 1720 KC. The OSC. trimmer is located on the front of the chassis. Adjust this trimmer until the 1720 KC signal is tuned in.

THIRD STEP: Remove the hot lead of the generator from the ANT section of the gang condenser. Connect this lead to the primary of the loop antenna through a 200 MMFD condenser. Adjust the Signal Generator to 1400 KC. Rotate the tuning control until this signal is tuned in. The ANT trimmer is located on the top of the ANT. section of the gang condenser. Adjust this trimmer until a maximum reading is noted on the output meter. No further adjustment should be necessary, unless the set has been damaged, as the coils and condenser in this receiver have been specially handled at the factory to insure proper alignment at the lower frequencies.

MODEL 5027

TRAV-LER RADIO CORP.



PART NO.		DESCRIPTION
1R-10	R-2	47 M Ω RESISTOR 1/2 W. 20%
1R-23	R-3	33 MEG. RESISTOR 1/2 W. 20%
1R-31	R-4	82 M Ω RESISTOR 1/2 W. 10%
VC-2	R-5	1 MEG. VOLUME CONTROL
1R-3	R-6	10 MEG. RESISTOR 1/2 W. 20%
1R-12	R-7	1 MEG. RESISTOR 1/2 W. 20%
1R-11	R-8	470 M Ω RESISTOR 1/2 W. 20%
1R-13	R-9	2.2 MEG. RESISTOR 1/2 W. 20%
1R-32	R-10	680 Ω RESISTOR 1/2 W. 10%
1R-33	R-11	270 Ω RESISTOR 1/2 W. 10%
1R-21	R-12	330 Ω RESISTOR 1/2 W. 10%
1R-39	R-13	620 Ω RESISTOR 1/2 W. 5%
WR-3A	R-14	1050 Ω } CANDOHM RESISTOR
	R-15	1050 Ω }
	R-16	40 Ω
1R-35	R-17	82 Ω WIREWOUND RESISTOR. 2W. 10%
1R-20	R-18	220M Ω RESISTOR 1/2W. 20%
MC-2	C-1	100MMFD. CONDENSER. (MICA)
PC-5	C-2	.05 MFD. CONDENSER. 400V.
PC-8	C-3	.1MFD. CONDENSER 400V.
PC-6	C-4	.005 MFD. CONDENSER 600V.

PART NO.		DESCRIPTION
EC-6	C-5	70 MFD. 10V. ELECTROLYTIC
EC-4	C-6	40-40-40-150V. ELECTROLYTIC
TC-7	C-7	ANTENNA TRIMMER
	G-8	OSC. TRIMMER
GC-4	G-1	GANG CONDENSER
	G-2	
LL-10	L-1	LOOP ANNTENNA
LO-8	L-2	OSC. COIL
LI-3	T-1	INPUT I.F. TRANSFORMER
LI-4	T-2	OUTPUT I.F. TRANSFORMER
CO-1	P	LINE CORD

PART NO		DESCRIPTION
SPK-5	T-3	OUTPUT SPEAKER TRANSFORMER
	VC	VOICE COIL
	S	P.M. SPEAKER.
SW-5	SW-3	4 POLE 3 POSITION
SR-1	—	SELENIUM RECTIFIER
TU-11	—	1A7- 1N5 - 1H5 - 3Q5
"A" BATTERY		9 VOLTS
"B" BATTERY		90 VOLTS.

Remove chassis from cabinet for alignment.

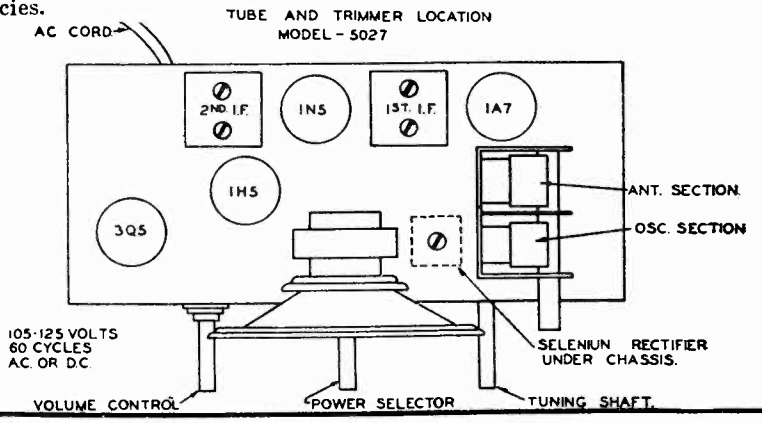
A Signal Generator is required having the following frequencies: 455 KC, 1400 KC, 1650 KC. An output meter should be connected across the speaker.

The volume control of the receiver should be turned to maximum during the I. F. and all subsequent alignment and the generator output as low as possible to prevent the A. V. C. from working and giving false readings.

FIRST STEP: Connect the hot lead from the generator to the ANT. section of the gang condenser through a .1 MFD. condenser. The ground lead from the generator must be connected to "B" minus under the chassis. Turn the gang condenser to complete minimum capacity. Set the generator to 455 KC. Adjust the trimmers of the first and second I. F. transformers until a maximum reading is noted on the output meter.

SECOND STEP: With the leads from the generator still connected in the same manner, adjust the Signal Generator to 1650 KC. Adjust the OSC. trimmer until the 1650 KC signal is tuned in. The gang condenser must be at complete minimum capacity for this adjustment.

THIRD STEP: Remove the generator leads from the gang condenser and replace the chassis in the cabinet. Loosely couple the generator to the receiver loop by making a complete turn of wire over the outside of the cabinet. With the receiver and generator set at 1400 KC, increase the generator output. Adjust the ANT. trimmer through the hole which is provided in the top of the cabinet until a maximum signal is noted on the output meter. The ANT. trimmer hole in the top of the cabinet is covered by a small plug button. Replace this button after adjustment has been made. No further adjustment should be made as the coils and gang condenser in this receiver have been specially handled at the factory to insure proper alignment at the lower frequencies.



MODEL 5028

BATTERY SUPPLIERS

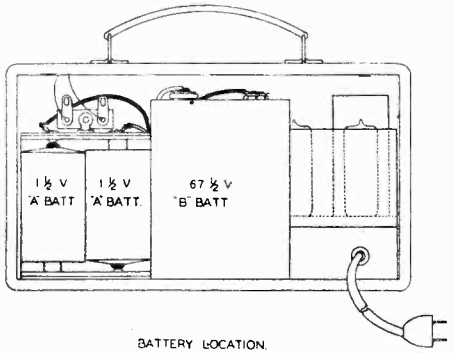
The batteries for this receiver may be purchased from any reliable dealer.

For proper operation this receiver requires two "A" batteries and one "B" battery.

The "A" batteries are size "D" flashlight cells and are made by all battery manufacturers.

The "B" battery is a 67½ volt battery and is made by the following manufacturers:

Eveready	67½	vlt.	#467
Burgess	67½	vlt.	#XX45
General	67½	vlt.	#W45A
Ray-O-Vac	67½	vlt.	#4367



BATTERY LOCATION.

BATTERY SERVICING

To replace the batteries in this receiver:

Remove the back.

To the left, looking into the rear of the cabinet is the "A" or flashlight battery container. To the right is the "B" or 67½ volt battery.

To replace the "A" batteries, pull the old batteries out of the container. Replace with fresh batteries, making sure the batteries are inserted according to the diagram on the inside of the container.

To replace the "B" battery, disconnect the snap fastener connectors. Replace with a fresh battery and snap the connectors into place. Replace the battery in the cabinet as shown in Fig. No. 1, making sure that the connector end faces the top of the cabinet.

After the batteries have been installed, replace the back, making sure that the two washers in the bottom of the back fit into the slot near the bottom edge of the cabinet.

MODEL 5027

BATTERY SUPPLIERS

The batteries for this receiver may be purchased from any reliable radio dealer.

For proper operation of this receiver, you must use, two (2) 4½ Volt "A" batteries, and two (2) 45 Volt "B" batteries.

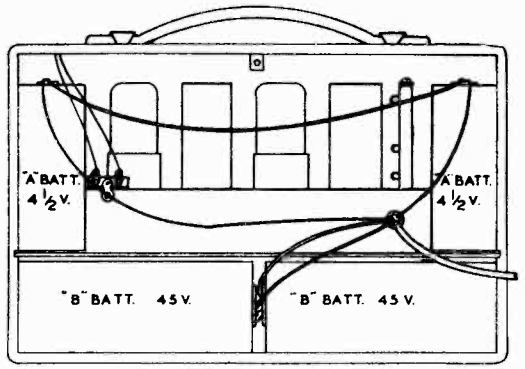
The following is a table of manufacturers and their battery type number.

"B" BATTERIES
(2 Required)

Mfgr.	Volts		Type No.
Burgess	45	"B"	M30
General	45	"B"	W30B
Bright Star	45	"B"	3033
Usalite	45	"B"	640
Rayovac	45	"B"	P7830
Eveready	45	"B"	482

"A" BATTERIES
(2 Required)

Burgess	4½	"A"	G3
General	4½	"A"	3H3
Bright Star	4½	"A"	361
Usalite	4½	"A"	683
Rayovac	4½	"A"	P83A
Eveready	4½	"A"	746



BATTERY LOCATION

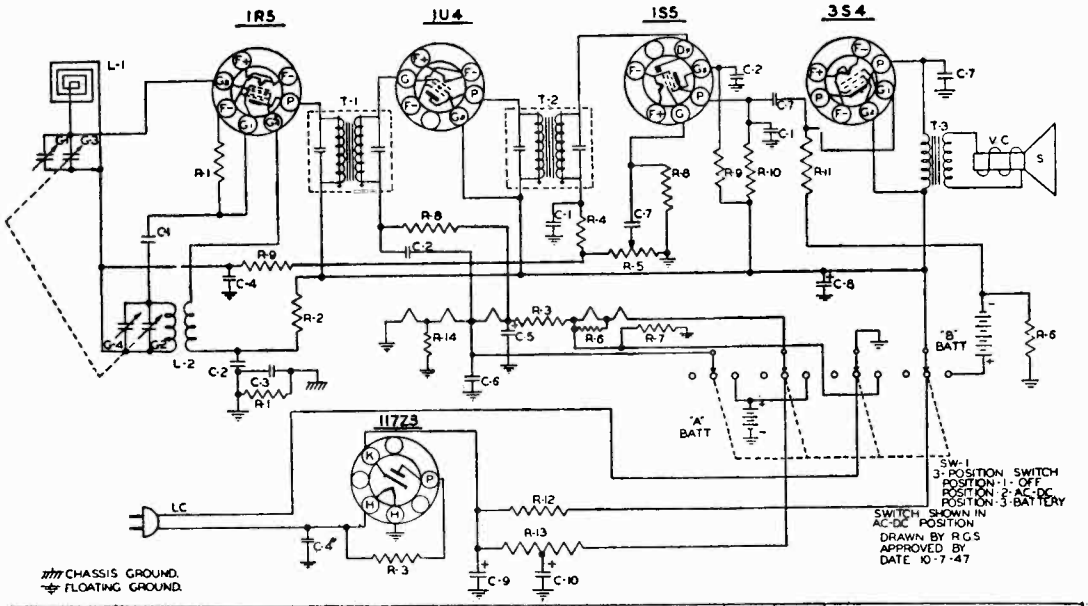
BATTERY SERVICING

To replace batteries, loosen and remove the two screws at the left and right hand corners of the cabinet back. Remove the back and pull out the plug from each battery. Never pull on the wires connected to the plugs as they may break. Always grasp the plug form between the fingers, or use a flat blade to pry out the plug. Observe with care the position of the batteries and plugs when replacing. Be sure that batteries and plugs are replaced as shown in the "Battery Location" diagram. (Figure No. 1)

After the batteries have been installed, replace the back. Make sure that the two wires from the loop antenna are held in place between the brackets of the cabinet and the back by the two fastening screws.

MODEL 5028

TRAV-LER RADIO CORP.



PART NO		DESCRIPTION	PART NO		DESCRIPTION	PART NO		DESCRIPTION
IR-20	R-1	220M RESISTOR 1/2W 20 %	PC-3	C-6	.1 MFD. CONDENSER 200 W.V.	L1-5	T-1	INPUT I.F. TRANSFORMER
IR-37	R-2	10M RESISTOR 1/2W 20 %	PC-6	C-7	.005MFD CONDENSER 600 W.V.	L1-5	T-2	OUTPUT I.F. TRANSFORMER
IR-17	R-3	33 RESISTOR 1/2 W 20 %	EC-14	C-8	40 MFD.		T-3	SPEAKER OUTPUT TRANSFORMER
IR-31	R-4	82M RESISTOR 1/2W 10 %		C-9	40 MFD. 150 W.V. ELECTROLYTIC	SPK-8	V.C.	VOICE COIL
VC-11	R-5	1MEG. VOLUME CONTROL		C-10	20 MFD.		S	3½ P.M. SPEAKER
IR-33	R-6	270 RESISTOR 1/2W 10 %						
IR-39	R-7	620 RESISTOR 1/2 W 5 %		G-1	ANT. TRIMMER	TU-31	—	11Z3-1R5-1U4-1S5-3S4
IR-3	R-8	10MEG RESISTOR 1/2 W 20 %	GC-6X	G-2	GANG CONDENSER			
IR-23	R-9	3.3MEG RESISTOR 1/2W 20 %		G-3			A BATT	2 "D" SIZE 1½ VOLT FLASHLITE CELLS
IR-12	R-10	1MEG RESISTOR 1/2 W 20 %		G-4	OSC. TRIMMER		B BATT	1-67½ VOLT BATTERY
IR-13	R-11	2.2MEG RESISTOR 1/2W 20 %						
IR-40	R-12	3500 RESISTOR 1 W 10 %						
WR-7	R-13	1050-1050 CANDOHM RESISTOR SW 5%						
IR-1	R-14	470 RESISTOR 1/2 20 %	LL-14	L-1	LOOP ANTENNA			
			LO-8	L-2	OSC. COIL			
MC-2	C-1	100MMFD. MICA CONDENSER						
PC-7	C-2	.01MFD. CONDENSER 400W.V.	CO-1	LC	LINE CORD			
PC-9	C-3	.1 MFD. CONDENSER 400W.V.	SW-8	SW-1	4 POLE-3 POSITION SWITCH			
PC-5	C-4	.05 MFD. CONDENSER 400W.V.						
EC-6	C-5	20MFD. 10W.V. ELECTROLYTIC						

Remove chassis from cabinet for alignment.

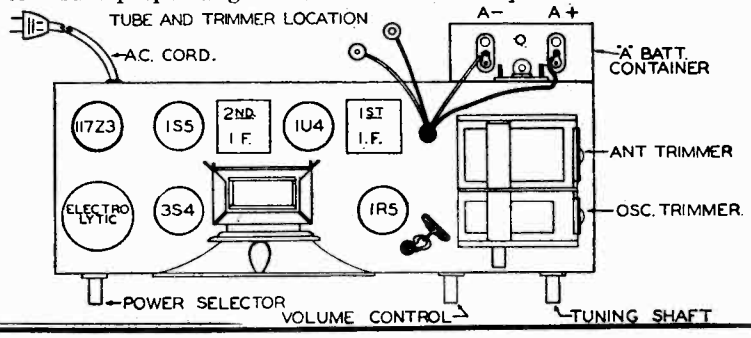
A Signal Generator is required having the following frequencies: 455 KC, 1400 KC, 1650 KC. An output meter should be connected across the speaker.

The volume control of the receiver should be turned to maximum during the I. F. and all subsequent alignment and the generator output as low as possible to prevent the A. V. C. from working and giving false readings.

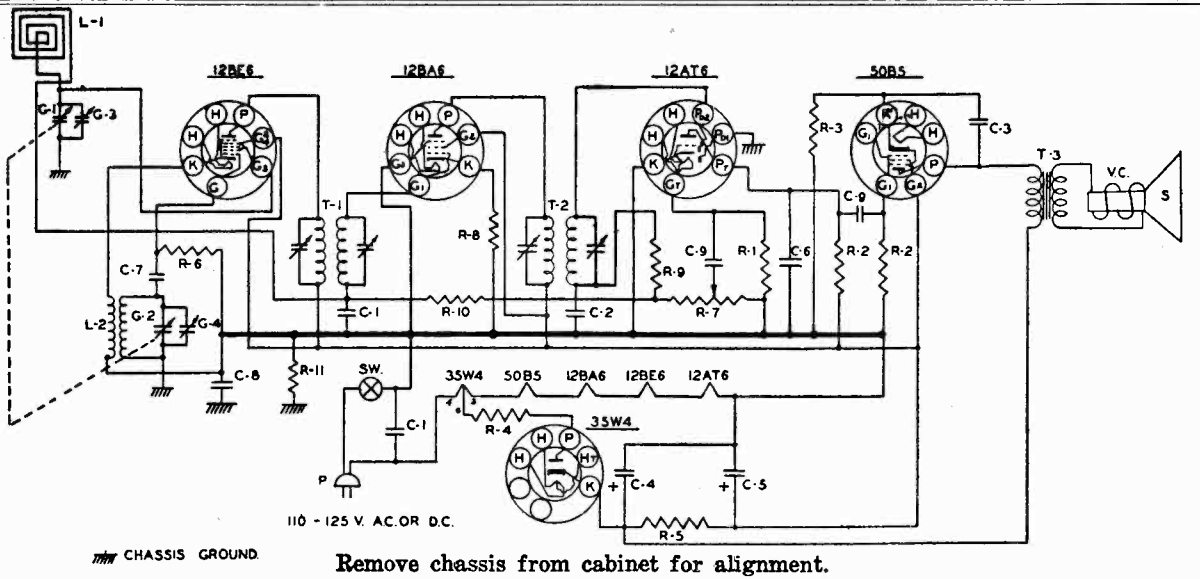
FIRST STEP: Connect the hot lead from the generator to the ANT. section of the gang condenser through a .1 MFD. condenser. The ground lead from the generator must be connected to "B" minus under the chassis. Turn the gang condenser to complete minimum capacity. Set the generator to 455 KC. Adjust the movable iron cores in the IF cans. These IF adjustments are made in the top and in the bottom of the can under the chassis. Adjust the cores until a maximum reading is noted on the output meter.

SECOND STEP: With the leads from the generator still connected in the same manner, adjust the Signal Generator to 1650 KC. Adjust the OSC. trimmer until the 1650 KC signal is tuned in. The gang condenser must be at complete minimum capacity for this adjustment.

THIRD STEP: Remove the generator leads from the gang condenser and replace the chassis in the cabinet. Loosely couple the generator to the receiver loop by making a complete turn of wire over the outside of the cabinet. With the receiver and generator set at 1400 KC, increase the generator output. Adjust the ANT. trimmer through the hole which is provided in the end of the cabinet until a maximum signal is noted on the output meter. The ANT. trimmer hole in the side of the cabinet is covered by a small plug button. Replace this button after adjustment has been made. No further adjustment should be made as the coils and gang condenser in this receiver have been specially handled at the factory to insure proper alignment at the lower frequencies.



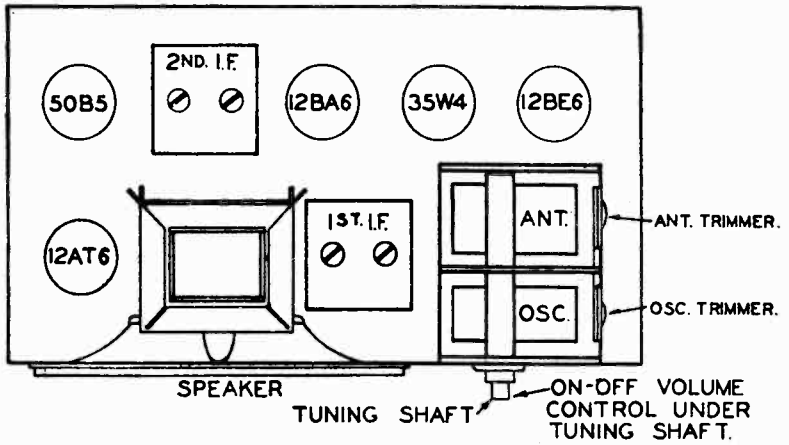
PART NO.		DESCRIPTION
IR-13	R-1	2.2 MEG RESISTOR 1/2 W. 20 %
IR-11	R-2	470M RESISTOR 1/2 W. 20 %
IR-14	R-3	150 RESISTOR 1/2 W. 20 %
IR-17	R-4	33 RESISTOR 1/2 W. 20 %
IR-25	R-5	2200 RESISTOR 1 W. 10 %
IR-16	R-6	33 M RESISTOR 1/2 W 20 %
VC-8	R-7	1 MEG. VOLUME CONTROL
GC-7	G-1, G-2	GANG CONDENSER
	G-3	ANT. TRIMMER COND.
IR-36	R-8	100 RESISTOR 1/2 W 20 %
IR-18	R-9	47 M RESISTOR 1/2 W 20 %
	G-4	OSC. TRIMMER COND.
PC-5	C-1	.05 MFD. CONDENSER 400 V.
MC-2	C-2	.0001 MFD. MICA. CONDENSER 20 %
PC-7	C-3	.01 MFD. CONDENSER 400 V.
EC-12	C-4	40 MFD. 150 V. ELECTROLYTIC CONDENSER
	C-5	20 MFD.
MC-5	C-6	.0005 MFD. CONDENSER 20 %
MC-4	C-7	.000056 MFD. MICA 20 %
PC-8	C-8	.1 MFD. CONDENSER 400 V.
LL-9	L-1	LOOP ANTENNA
IR-23	R-10	3.3 MEG. RESISTOR 1/2 W. 20 %
PC-6	C-9	.005 MFD. CONDENSER 600 V.
LO-13	L-2	OSC. COIL
LI-6	T-1	INPUT TRANSFORMER
LI-7	T-2	OUTPUT TRANSFORMER
	T-3	OUTPUT SPK. TRANFORMER.
SPK-10	V.C.	VOICE COIL
	S	P.M. SPEAKER
IR-20	R-11	220M RESISTOR 1/2 W. 20 %
	SW	A.C. SW. ON VOLUME CONTROL
CO-1	P	LINE CORD
TU-18	—	12BE6 - 12BA6 - 12AT6 50B5 - 35W4



Remove chassis from cabinet for alignment.

DATE: 5-28-47
DRAWN BY: R.G.S.
APPROVED:

TUBE AND TRIMMER LOCATION



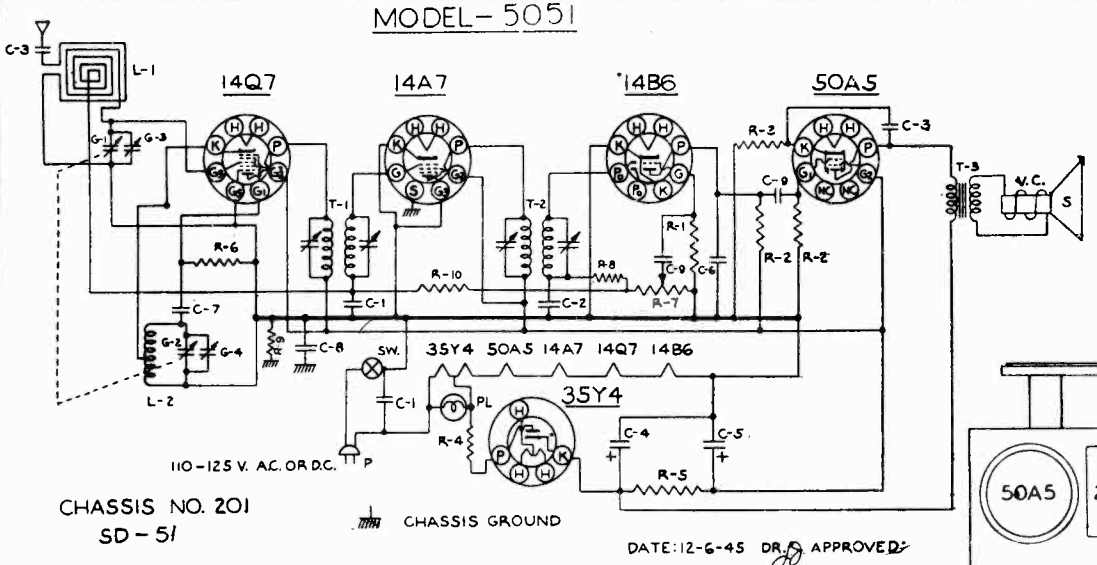
A Signal Generator is required having the following frequencies: 455 KC, 1400 KC, 1650 KC. An output meter should be connected across the speaker.

The volume control of the receiver should be turned to maximum during the I. F. and all subsequent alignment and the generator output as low as possible to prevent the A. V. C. from working and giving false readings.

FIRST STEP: Connect the hot lead from the generator to the ANT. section of the gang condenser through a .1 MFD. condenser. The ground lead from the generator must be connected to "B" minus under the chassis. Turn the gang condenser to complete minimum capacity. Set the generator to 455 KC. Adjust the trimmers of the first and second I. F. transformers until a maximum reading is noted on the output meter.

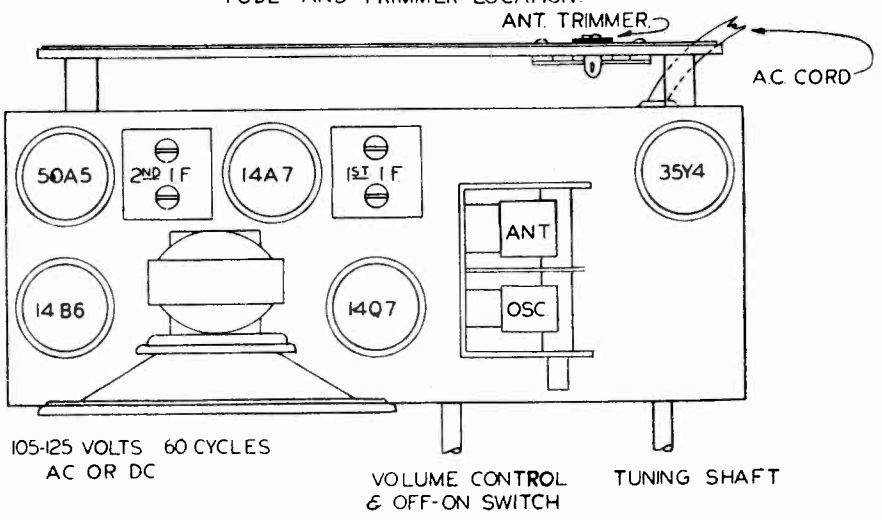
SECOND STEP: With the leads from the generator still connected in the same manner, adjust the Signal Generator to 1650 KC. Adjust the OSC. trimmer until the 1650 KC signal is tuned in. The gang condenser must be at complete minimum capacity for this adjustment.

THIRD STEP: Remove the generator leads from the gang condenser and replace the chassis in the cabinet. Loosely couple the generator to the receiver loop by making a complete turn of wire over the outside of the cabinet. With the receiver and generator set at 1400 KC, increase the generator output. Adjust the ANT. trimmer through the hole which is provided in the end of the cabinet until a maximum signal is noted on the output meter. The ANT. trimmer hole in the side of the cabinet is covered by a small plug button. Replace this button after adjustment has been made. No further adjustment should be made as the coils and gang condenser in this receiver have been specially handled at the factory to insure proper alignment at the lower frequencies.



PART NO.		DESCRIPTION
LO-11	L-2	OSC. COIL
L1-1	T-1	INPUT I.F. TRANSFORMER
L1-2	T-2	OUTPUT I.F. TRANSFORMER
	T-3	OUTPUT SPK. TRANSFORMER
SPK.-4	V.C.	VOICE COIL
	S	PM. SPEAKER
PB-1	PL	#47 PILOT BULB
	SW.	A.C. SW. ON VOL. CONTROL
CO-1	P	LINE CORD
TU-6	—	14Q7 14A7 14B6 50A5 35Y4
IR-23	R-10	3.3MEG. 1/2W 20%
PC-6	C-9	.005MFD. 600 V

TUBE AND TRIMMER LOCATION



PART NO.		DESCRIPTION
IR-13	R-1	2.2 MEG RESISTOR 1-2 W 20%
IR-11	R-2	470M RESISTOR 1-2 W 20%
IR-14	R-3	150 RESISTOR 1-2 W 20%
IR-4	R-4	47 RESISTOR 1-2 W 20%
IR-15	R-5	2200 RESISTOR 1-2 W 20%
IR-16	R-6	33 M RESISTOR 1-2 W 20%
VC.-3	R-7	1 MEG. VOLUME CONTROL
GC-4	G-1	GANG CONDENSER
	G-2	
TC-7	G-3	ANT. TRIMMER COND.
IR-10	R-8	47M 1/2W 20%

PART NO.		DESCRIPTION
	G-4	OSC. TRIMMER COND.
PC-5	C-1	.05 MFD. COND. 400 V.
MC-2	C-2	.0001 MFD. MICA COND. 20%
PC-7	C-3	.01 MFD. COND. 400 V.
EC-12	C-4	40 MFD. 150 V. ELECTROLYTIC CONDENSER
	C-5	20 MFD.
MC-5	C-6	.00005 MFD. COND. 20%
MC-4	C-7	.000056 MFD. MICA 20%
PC-9	C-8	.1 MFD. COND. 400 V.
LL-6	L-1	LOOP ANTENNA
IR-20	R-9	220M 1/2W 20%

ALIGNMENT

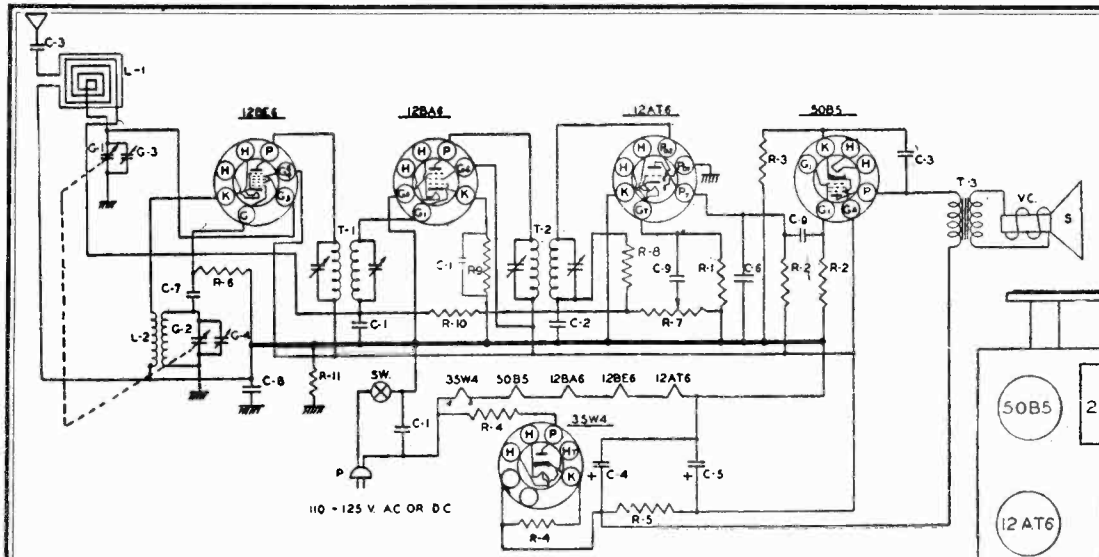
Remove chassis from cabinet for alignment.

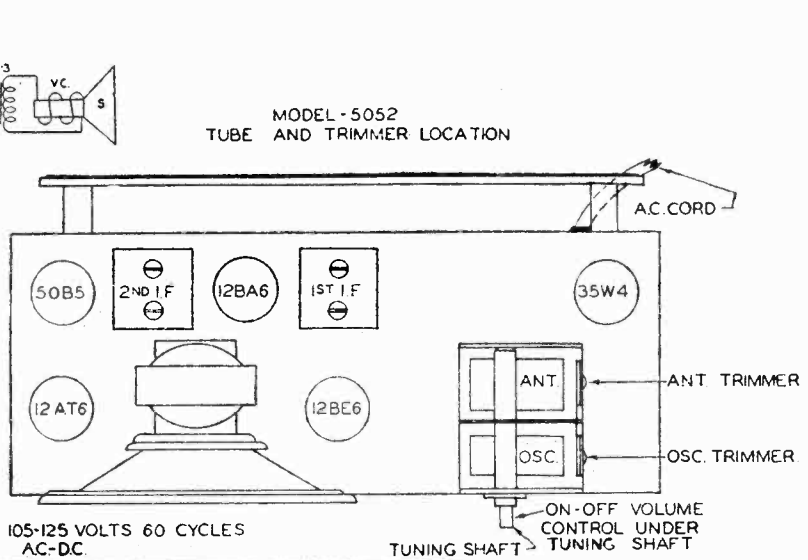
A Signal Generator is required having the following frequencies: 455 KC, 1400 KC, 1720 KC. An output meter should be connected across the speaker.

FIRST STEP: Connect the hot lead from the generator to the ANT. section of the gang condenser, through a .1 MFD condenser. The ground lead from the generator must be connected to the metal frame of the gang condenser. Turn the gang condenser to complete minimum capacity. Adjust the generator to 455KC and adjust the trimmers of the 1st and 2nd I.F. transformers until a maximum reading is noted on the output meter.

SECOND STEP: With the leads from the generator still connected in the same manner, adjust the Signal Generator to 1720 KC. The OSC. trimmer is located on the front of the chassis between the volume and tuning controls. Adjust this trimmer until the 1720 KC signal is tuned in.

THIRD STEP: Remove the hot lead of the generator from the ANT section of the gang condenser. Connect this lead to the antenna lead wire that projects from the back of the loop antenna through a 200 MMFD condenser. Adjust the Signal Generator to 1400 KC. Rotate the tuning control until this signal is tuned in. The ANT trimmer is located on the back of the loop antenna. Adjust this trimmer until a maximum reading is noted on the output meter. No further adjustment should be necessary, unless the set has been damaged, as the coils and condenser in this receiver have been specially handled at the factory to insure proper alignment at the lower frequencies.





PART NO.		DESCRIPTION	PART NO.		DESCRIPTION	PART NO.		DESCRIPTION.
1R-13	R-1	2.2 MEG. RESISTOR 1/2 W. 20 %		C-4	OSC. TRIMMER COND.	LO-13	L-2	OSC. COIL
1R-11	R-2	470M RESISTOR 1/2 W. 20 %	PC-5	C-1	.05 MFD. CONDENSER 400 V.	LI-6	T-1	INPUT TRANSFORMER
1R-14	R-3	150 RESISTOR 1/2 W. 20 %	MC-2	C-2	.0001 MFD. MICA CONDENSER 20 %	LI-7	T-2	OUTPUT TRANSFORMER
1R-17	R-4	33 RESISTOR 1/2 W. 20 %	PC-7	C-3	.01 MFD. CONDENSER 400 V.		T-3	OUTPUT SPK. TRANFORMER
1R-25	R-5	3200 RESISTOR 1 W. 10 %	EC-12	C-4	40 MFD. } 150 V. ELECTROLYTIC	SPK-10	V.C.	VOICE COIL
1R-16	R-6	33 M RESISTOR 1/2 W. 20 %		C-5	20 MFD. } CONDENSER		S	P.M. SPEAKER
VC-9	R-7	1 MEG. VOLUME CONTROL	MC-5	C-6	.0005 MFD. CONDENSER 20 %	1R-20	R-11	220M RESISTOR 1/2 W. 20 %
GC-7	G-1	GANG CONDENSER	MC-4	C-7	.000058 MFD. MICA 20 %		SW 1	AC SW. ON VOLUME CONTROL
	G-2		PC-8	C-8	.1 MFD. CONDENSER 400 V.	CO-1	P	LINE CORD
	G-3	ANT. TRIMMER COND.	LL-12	L-1	LOOP ANTENNA	TU-18	—	12BE6 - 12BA6 - 12AT6
1R-19	R-8	100M RESISTOR 1/2 W. 20 %	1R-23	R-10	3.3 MEG. RESISTOR 1/2 W. 20 %			50B5 - 35W4
1R-38	R-9	100 RESISTOR 1/2 W. 20	PC-6	C-9	.005 MFD. CONDENSER 600 V.			

ALIGNMENT AND SERVICE DATA

Remove chassis from cabinet for alignment.

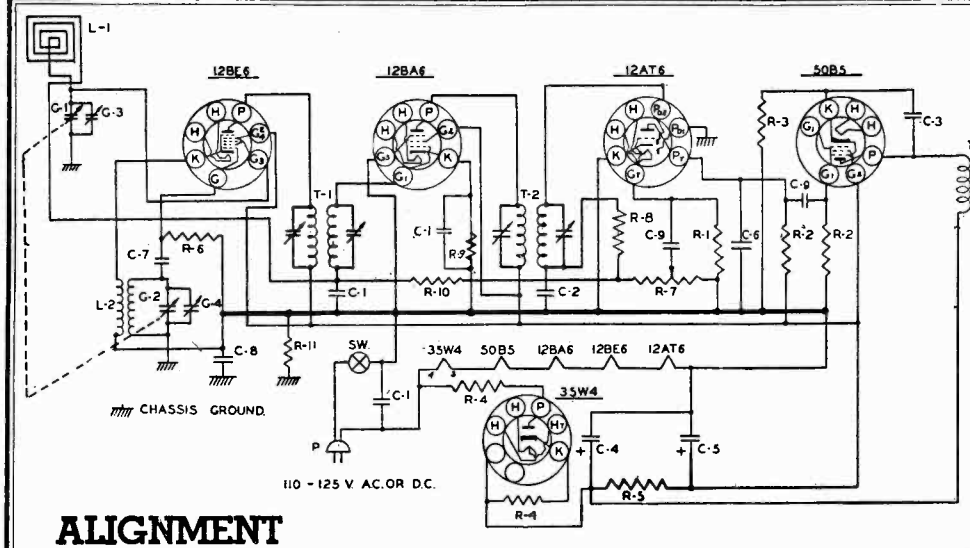
A Signal Generator is required having the following frequencies: 455 KC, 1400 KC, 1650 KC. An output meter should be connected across the speaker.

The volume control of the receiver should be turned to maximum during the I. F. and all subsequent alignment and the generator output as low as possible to prevent the A. V. C. from working and giving false readings.

FIRST STEP: Connect the hot lead from the generator to the ANT. section of the gang condenser through the .1 MFD. condenser. The ground lead from the generator must be connected to "B" minus under the chassis. Turn the gang condenser to complete minimum capacity. Set the generator to 455 KC. Adjust the trimmers of the first and second I. F. transformers until a maximum reading is noted on the output meter.

SECOND STEP: With the leads from the generator still connected in the same manner, adjust the Signal Generator to 1650 KC. Adjust the OSC. trimmer until the 1650 KC signal is tuned in. The gang condenser must be at complete minimum capacity for this adjustment.

THIRD STEP: Remove the generator leads from the gang condenser. Loosely couple the generator to the receiver loop by using a complete turn of wire. With the receiver and generator set at 1400 KC, increase the generator output. Adjust the ANT. trimmer until a maximum signal is noted on the output meter. No further adjustment should be made as the coils and gang condenser in this receiver have been specially handled at the factory to insure proper alignment at the lower frequencies.



PART NO.		DESCRIPTION	PART NO		DESCRIPTION
IR-13	R-1	2.2 MEG RESISTOR 1/2 W. 20 %		G-4	OSC. TRIMMER COND.
IR-11	R-2	470M RESISTOR 1/2 W. 20 %	PC-5	C-1	.05 MFD. CONDENSER 400 V.
IR-14	R-3	150 RESISTOR 1/2 W. 20 %	MC-2	C-2	.0001 MFD. MICA CONDENSER 20 %
IR-17	R-4	33 RESISTOR 1/2 W. 20 %	PC-7	C-3	.01 MFD. CONDENSER 400 V.
IR-25	R-5	2200 RESISTOR 1 W. 10 %	EC-12	C-4	40 MFD. } 150 V. ELECTROLYTIC
IR-16	R-6	33 M RESISTOR 1/2 W. 20 %		C-5	20 MFD. } CONDENSER
VC-9	R-7	1 MEG. VOLUME CONTROL	MC-5	C-6	.0005 MFD. CONDENSER 20 %
GC-7	G-1	GANG CONDENSER	MC-4	C-7	.000056 MFD. MICA 20 %
	G-2		PC-8	C-8	.1 MFD. CONDENSER 400 V.
	G-3	ANT. TRIMMER COND.	LL-15	L-1	LOOP ANTENNA
IR-19	R-8	100M RESISTOR 1/2 W. 20 %	IR-23	R-10	3.3 MEG. RESISTOR 1/2 W. 20 %
IR-36	R-9	100 RESISTOR 1/2 W. 20	PC-6	C-9	.005 MFD. CONDENSER 600 V.

PART NO.		DESCRIPTION.
LO-13	L-2	OSC. COIL
LI-6	T-1	INPUT TRANSFORMER
LI-7	T-2	OUTPUT TRANSFORMER
	T-3	OUTPUT SPK. TRANFORMER.
SPK-10	V.C.	VOICE COIL
	S	P.M. SPEAKER
IR-20	R-11	220M RESISTOR 1/2 W. 20 %
	SW	A.C. SW. ON VOLUME CONTROL
CO-1	P	LINE CORD
TU-18	—	12BE6 - 12BA6 - 12AT6 50B5 - 35W4

ALIGNMENT

Remove chassis from cabinet for alignment.

A Signal Generator is required having the following frequencies: 455 KC, 1400 KC, 1650 KC. An output meter should be connected across the speaker.

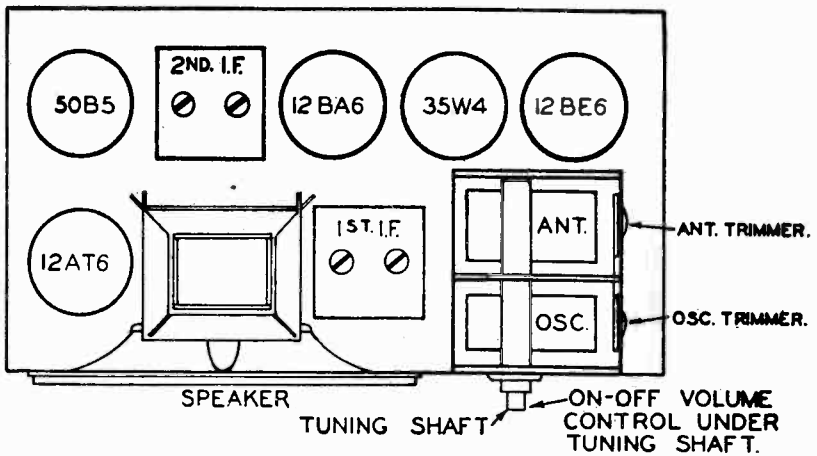
The volume control of the receiver should be turned to maximum during the I. F. and all subsequent alignment and the generator output as low as possible to prevent the A. V. C. from working and giving false readings.

FIRST STEP: Connect the hot lead from the generator to the ANT. section of the gang condenser through a .1 MFD. condenser. The ground lead from the generator must be connected to "B" minus under the chassis. Turn the gang condenser to complete minimum capacity. Set the generator to 455 KC. Adjust the trimmers of the first and second I. F. transformers until a maximum reading is noted on the output meter.

SECOND STEP: With the leads from the generator still connected in the same manner, adjust the Signal Generator to 1650 KC. Adjust the OSC. trimmer until the 1650 KC signal is tuned in. The gang condenser must be at complete minimum capacity for this adjustment.

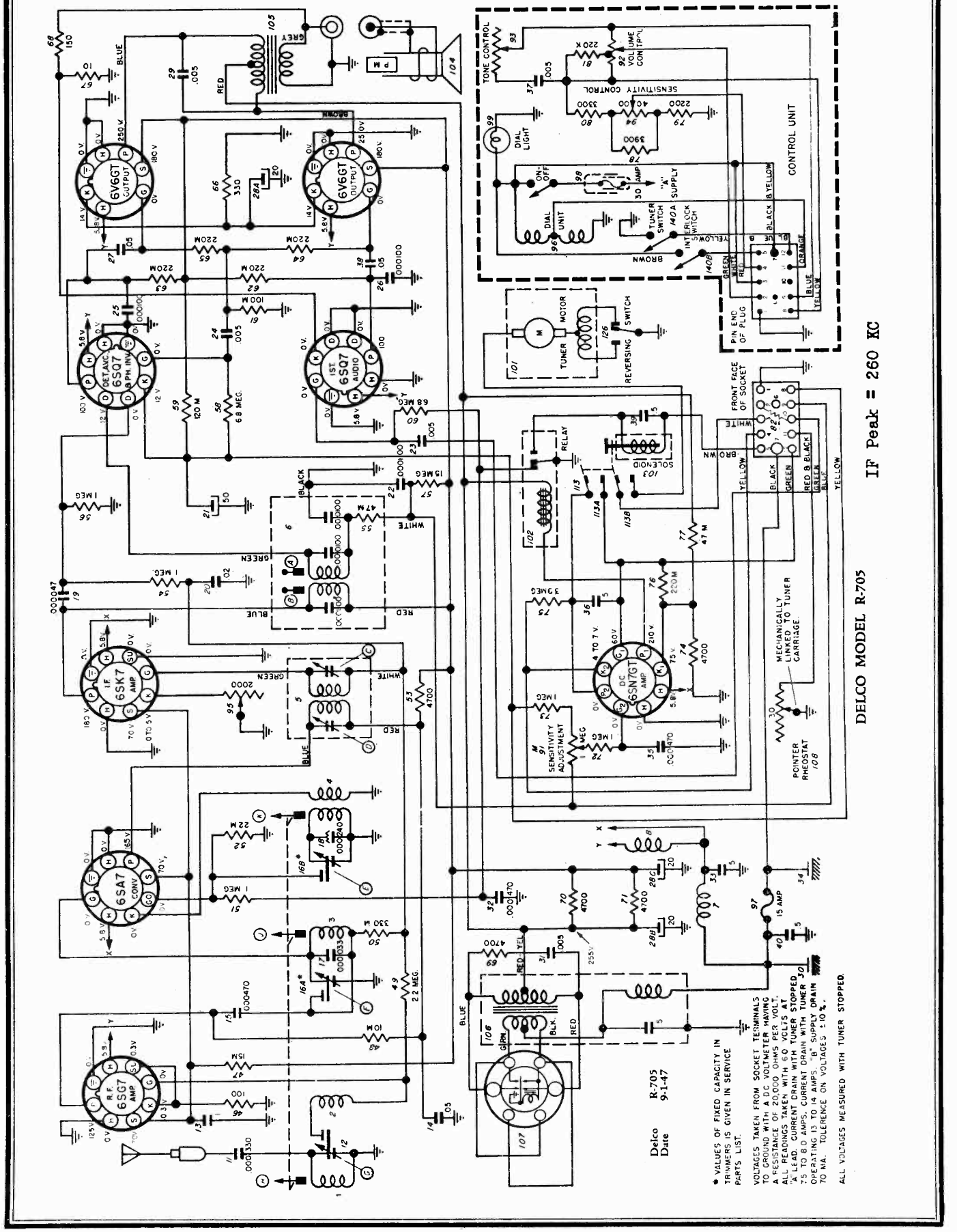
THIRD STEP: Remove the generator leads from the gang condenser and replace the chassis in the cabinet. Loosely couple the generator to the receiver loop by making a complete turn of wire over the outside of the cabinet. With the receiver and generator set at 1400 KC, increase the generator output. Adjust the ANT. trimmer until a maximum signal is noted on the output meter. No further adjustment should be made as the coils and gang condenser in this receiver have been specially handled at the factory to insure proper alignment at the lower frequencies.

TUBE AND TRIMMER LOCATION



UNITED MOTORS SERVICE
DIV. OF GENERAL MOTORS CORP.

MODEL R-705



MODEL R-705

UNITED MOTORS SERVICE
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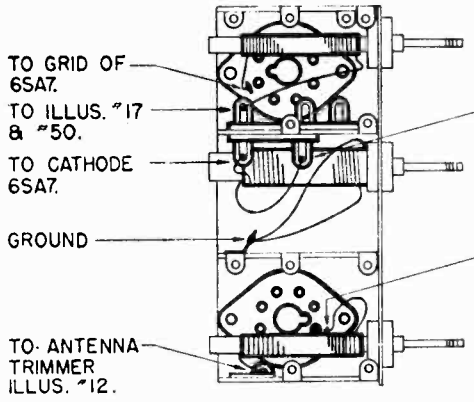


COIL CONNECTIONS

MOUNTING—Universal.

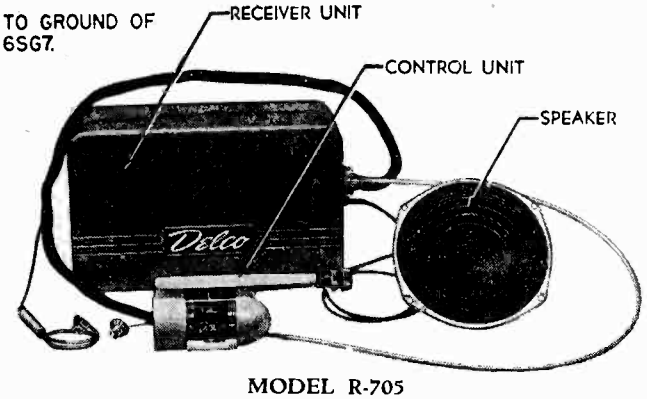
TUBES—Eight Plus a Synchronous Vibrator.

SPEAKER—7" Round Permanent Magnet.

TUNING—Manual and Electronic.

ANTENNA TRIMMER COMPENSATION—.000050 - .000110 Mfd.

TUNING RANGE—550-1600 KC.



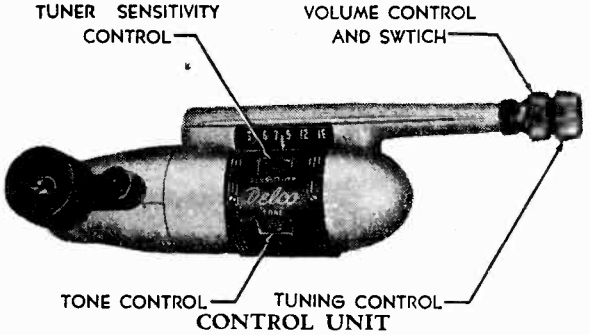
MODEL R-705

PUSH BUTTON SETUP

No pushbutton setup is required, however a tuner sensitivity adjustment can be made to regulate the minimum number of stations selected by the electronic tuner.

ALIGNMENT PROCEDURE

Output Meter Connections	Across Voice Coil
Generator Ground	To Chassis
Dummy Antenna	In Series With Generator
Volume Control Position	Maximum
Tone Control Position	Treble



CONTROL UNIT

Steps	Series Condenser or Dummy Antenna	Connect Signal Generator to	Signal Generator Frequency	Tune Receiver To	Adjust Screws In Order
1	0.1 MFD	6SA7 Grid (Pin #8)	260	High Frequency End of Band	A, B, C, D
2	.000068 MFD	Antenna Connector	1615 KC	Maximum Withdrawal of Cores	*E, F, G
3	.000068 MFD	Antenna Connector	1430 KC	Signal Generator	H, J
4	.000068 MFD	Antenna Connector	1615 KC	Maximum Withdrawal of Cores	F, G
5	.000068 MFD	Antenna Connector	1430 KC	Signal Generator	H, J

*Before making this adjustment, check setting of Oscillator Core "K" with Cores at maximum withdrawal. The stud end of Core "K" should be 1" from end of coil form.

SPECIAL INSTRUCTIONS

The 2nd I. F. Coil Secondary Trimmer "A" should be adjusted so that, with the Sensitivity Control, Illus. #94 with minimum sensitivity, all the way to the left, the signal strength necessary to stop the tuner will be the same when approaching the signal from either end of the band. Adjusting Trimmer "A" counterclockwise will increase the tuner sensitivity when decreasing frequency.

When the radio is installed, adjust the Trimmer "G" to match the car antenna at approximately 1400 KC.

TUNER SENSITIVITY ADJUSTMENT

With a small screw driver adjust the tuner sensitivity adjuster, Illus. #91, so that with the tuner sensitivity control, Illus. #94 turned all the way to the left the tuner will stop only on the strong stations in your locality.

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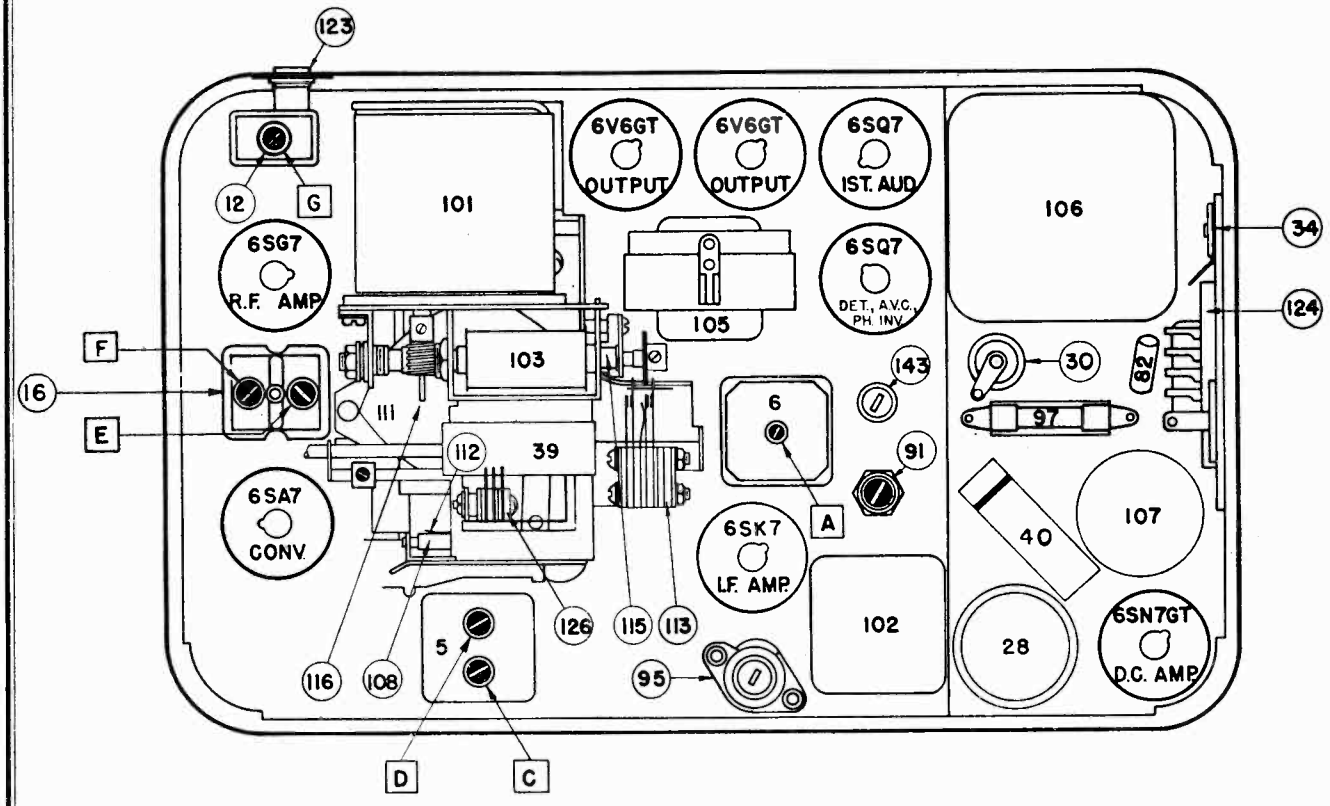
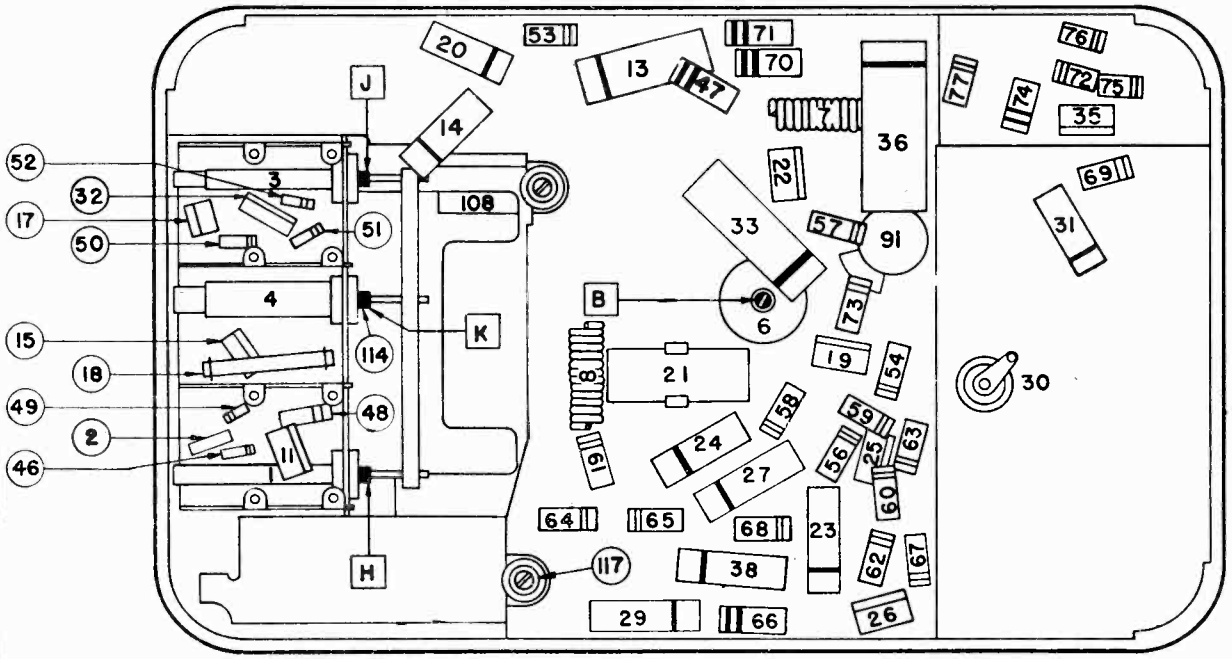
MODEL R-705



RECEIVER UNIT PARTS LAYOUT — TUBE VIEW



RECEIVER UNIT PARTS LAYOUT — CHASSIS VIEW

MODEL R-705

UNITED MOTORS SERVICE
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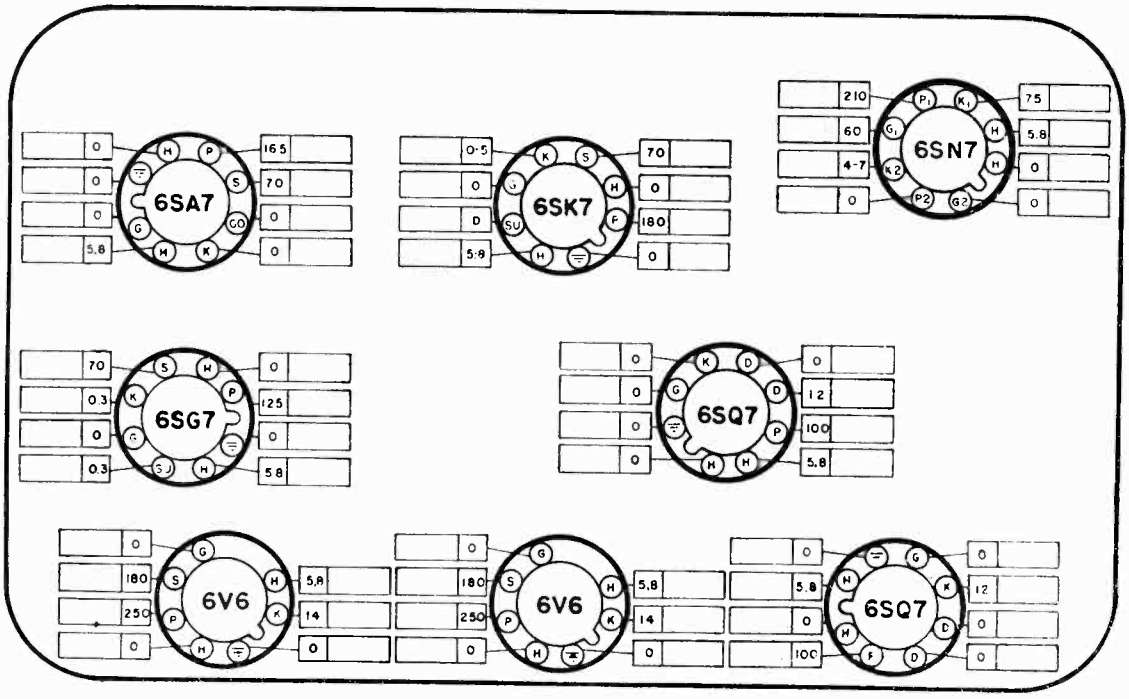
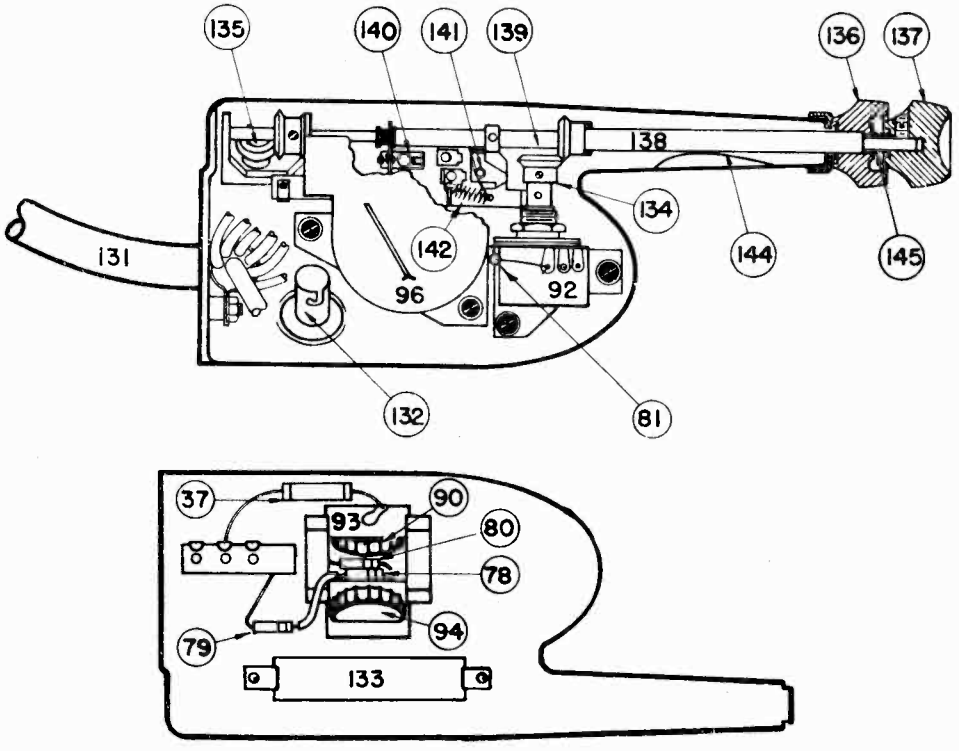
TUBE SOCKET VOLTAGE CHART

The tube socket voltages, as measured at the factory, and under the conditions shown on the schematic diagram on page 3, are shown below. The blank spaces are provided so the serviceman may fill in actual voltage readings as taken with his own equipment. A normal operating radio should be used for these measurements.



Voltages measured from socket terminals to ground. Voltmeter resistance ..... ohms per volt. All readings taken with ..... volts at "A" lead. "A" current drain tuner stopped 7.5 to 8 amps with 6 volts input. "A" current drain tuner operating 13 to 14 amps with 6 volts input. "B" current drain 70 MA with 6 volts input. Voltage tolerance ±10%.



CONTROL UNIT PARTS LAYOUT

UNITED MOTORS SERVICE
DIV. OF GENERAL MOTORS CORP.

MODEL R-705

SERVICE PARTS LIST

Illus. No.	Production Part No.	Service Part No.	Description
			ELECTRICAL PARTS
			COILS
1	7256246	7256246	Antenna
2	7240251	7240251	Antenna Choke
3	7256246	7256246	R. F.
4	7256244	7256244	Oscillator
5	7256218	7256218	1st I. F.
6	7256371	7256371	2nd I. F.
7	7241708	7241708	"A" Spark Choke
8	7241708	7241708	Hash Choke
			CONDENSERS
11	7232957	G 331	.0000330 Mfd Molded
12	7256093	7256093	Antenna Trimmer—Fixed Capacity .000200 Mfd
13	1207908	E 104	.1 Mfd 400 V. Tubular
14	7230892	E 503	.05 Mfd 400 V. Tubular
15	7238879	G 471	.000470 Mfd Molded
16	7242454	7242454	Dual Trimmer
16A			R. F. Section—Fixed Capacity .000300 Mfd
16B			Oscillator Section—Fixed Capacity .000100 Mfd
17	1217735	G 330	.000033 Mfd Molded
18	7256349	7256349	.000240 Mfd Compensating
19	7233313	G 470	.000047 Mfd Molded
20	7236107	E 203	.02 Mfd 200 V. Tubular
21	1217140	J 500	40 Mfd 25 V. Electrolytic
22	1210275	G 101	.000100 Mfd Molded
23	7230767	E 502	.005 Mfd 600 V. Tubular
24	7230767	E 502	.005 Mfd 600 V. Tubular
25	1210275	G 101	.000100 Mfd Molded
26	1210275	G 101	.000100 Mfd Molded
27	7230892	E 503	.05 Mfd 600 V. Tubular
28	7241198	7241198	3 Section Electrolytic
28A			20 Mfd 25 V.
28B			20 Mfd 400 V.
28C			20 Mfd 400 V.
29	7230593	H 502	.005 Mfd 1000 V. Tubular
30	1217946	1217946	Double Chassis Plate Condenser
31	7257451	7257451	.005 Mfd 3000 V. Tubular
32	7238879	G 471	.000470 Mfd Molded
33	7242885	E 504	.5 Mfd 600 V. Tubular (Factory 200 V.)
34	1217848	1217848	Chassis Plate Condenser (Included in Illus. #124)
35	7238879	G 471	.000470 Mfd Molded
36	7236621	E 504	.5 Mfd 600 V. Tubular (Factory 200 V.)
37	7237946	E 502	.005 Mfd 600 V. Tubular (Factory 400 V.)
38	7230892	E 503	.05 Mfd 600 V. Tubular
39	7242885	E 504	.5 Mfd 600 V. Tubular (Factory 100 V.)
40	7242885	E 504	.5 Mfd 600 V. Tubular (Factory 100 V.)
			RESISTORS
46	1213217	A 101	100 Ohms ½ W. Insulated
47	7233653	C 153	15,000 Ohms 2 W. Insulated
48	1211085	B 103	10,000 Ohms 1 W. Insulated
49	1214563	A 225	2.2 Megohms ½ W. Insulated
50	1214557	A 334	330,000 Ohms ½ W. Insulated
51	1213282	A 105	1 Megohm ½ W. Insulated
52	1214550	A 223	22,000 Ohms ½ W. Insulated
53	1214547	A 472	47,000 Ohms ½ W. Insulated
54	1213282	A 105	1 Megohm ½ W. Insulated
55	1214553	A 473	47,000 Ohms ½ W. Insulated
56	1213282	A 105	1 Megohm ½ W. Insulated
57	1213289	A 156	15 Megohms ½ W. Insulated
58	1215563	A 685	6.8 Megohms ½ W. Insulated
59	1213271	A 124	120,000 Ohms ½ W. Insulated
60	1215563	A 685	6.8 Megohms ½ W. Insulated
61	1213270	A 104	100,000 Ohms ½ W. Insulated
62	1214555	A 224	220,000 Ohms ½ W. Insulated
63	1214555	A 224	220,000 Ohms ½ W. Insulated
64	1214555	A 224	220,000 Ohms ½ W. Insulated
65	1214555	A 224	220,000 Ohms ½ W. Insulated
66	1214572	C 331	330 Ohms 2 W. Insulated
67	1215107	A 100	10 Ohms ½ W. Insulated
68	1213220	A 151	150 Ohms ½ W. Insulated
69	1216126	B 472	4,700 Ohms 1 W. Insulated
70	7256311	C 472	4,700 Ohms 2 W. Insulated
71	7256311	C 472	4,700 Ohms 2 W. Insulated
72	1213282	A 105	1 Megohm ½ W. Insulated
73	1213282	A 105	1 Megohm ½ W. Insulated
74	7256311	C 472	4,700 Ohms 2 W. Insulated
75	1214565	A 395	3.9 Megohm ½ W. Insulated
76	1214555	A 224	220,000 Ohms ½ W. Insulated
77	1216157	B 473	47,000 Ohms ½ W. Insulated
78	1214546	A 392	3,900 Ohms ½ W. Insulated
79	1214545	A 222	2,200 Ohms ½ W. Insulated
80	1213481	A 332	3,300 Ohms ½ W. Insulated
81	1214555	A 224	220,000 Ohms ½ W. Insulated
82	7237835	A 221	220 Ohms ½ W. Insulated

UNITED MOTORS SERVICE
DIV. OF GENERAL MOTORS CORP.

SERVICE PARTS LIST (Continued)

Illus. No.	Production Part No.	Service Part No.	Description
			TUBE COMPLEMENT
	7237752	5222	6SA7
	1216123	5226	6SG7
	1214292	5230	6SK7GT
	1217376	5258	6SN7GT
	1213793	5241	6V6GT
	1214293	5232	6SQ7GT
			MISCELLANEOUS ELECTRICAL PARTS
91	7256287	7256287	Adjuster—Tuner Sensitivity
92	7256085	7256085	Control—Volume and Switch
93	7256425	7256425	Control—Tone
94	7256424	7256424	Control—Tuner Sensitivity
95	7256255	7242204	Control—Radio Sensitivity
96	1517002	1517002	Dial Indicating Unit
97	120151	120151	Fuse—15 Amperes
98	120114	120114	Fuse—30 Amperes
99	187189	187189	Lamp—Dial Light (Mazda #44)
101	7256429	7256429	Motor Assembly
102	7256216	7256216	Relay—SPDT
103	7256021	7256021	Solenoid
104	7255955	7255955	Speaker—7" PM Round
105	7256628	7256628	Transformer—Output
106	7256293	7256293	Transformer—Power
107	7255853	8642	Vibrator
108	7256317	7256317	Rheostat and Bracket—Pointer
			MECHANICAL PARTS
			CHASSIS
111	7256090	7256090	Cam and Gear
112	7255811	7255811	Contact—Sliding
113	1217947	1217947	Contact Assy.—Solenoid
113A			Motor Switch
113B			Disabling Switch
114	7256112	7256112	Core—Iron
115	7255791	7255791	Core—Solenoid
116	7256016	7256016	Gear and Disc
	7256022	7256022	Gear and Clutch Disc—Worm (Located Under Ill. 103)
117	1216462	1216462	Grommet—Tuner Mtg.
	7256089	7256089	Guide Bar Assy.—Core
123	7256256	7256256	Socket—Antenna
124	7256195	7256195	Socket Plate—Cable
	7236279	7236279	Socket—Octal Tube
	7255857	7255857	Socket—Vibrator
	7256281	7256281	Spring—Slide Return (Located Under Illus. #111)
126	7256284	7256284	Switch—Motor Reversing
143	7256155	7256155	Screw—Captive
			CONTROL UNIT
131	7256277	7256277	Cable—Control
132	1217945	1217945	Dial Light Socket—Less Lamp
133	7256054	7256054	Dial Glass
134	1217942	1217942	Gear
135	1217944	1217944	Gear and Bracket Assy.
136	7256126	7256126	Knob—Volume Control and Switch
137	1217941	1217941	Knob—Tuning Control
138	7256198	7256198	Shaft and Gear—Volume Control
139	1217943	1217943	Shaft and Collar—Tuning Control
140	7256086	7256086	Switch Assembly
140A			Tuner Switch
140B			Interlock
141	7256278	7256278	Spring
142	7256280	7256280	Spring
144	7255988	7255988	Spring—Control Shaft
145	7256291	7256291	Spring—Knob
			INSTALLATION PARTS
	7256296	7256296	Cable—Speaker
	1849161	6016	Condenser—"A" Lead
	1866865	6015	Condenser—Generator
	1217969	1217969	Fuse Holder
	7256391	7256391	Flexible Drive Shaft
	1207818	1207818	Suppressor—Distributor

The mechanical mounting parts for the control unit and speaker are listed under the following adapter packages:

Adapter Package 4415
1941-1942-1946-1947 Chevrolet and Pontiac

Adapter Package 4416
1941-1942-1946-1947 Buick and Oldsmobiles
1940 Chevrolet, Pontiac and Oldsmobile

Adapter Package 4417
1940 Chrysler, Dodge and Plymouth
1941 Chrysler, Plymouth and DeSoto
1946 Dodge Custom, DeSoto Custom, Plymouth and Chrysler
1942 DeSoto, Chrysler and Plymouth
1947 Chrysler, DeSoto Deluxe and Custom, Plymouth and Dodge Custom

Adapter Package 4418
1942-1946-1947 Ford and Mercury

Adapter Package 4419
1942-1946-1947 Packard

Adapter Package 4420
1946-1947 Studebaker

Adapter Package 4421
1942-1946-1947 Hudson

Adapter Package 4422
1946 DeSoto Deluxe
1941-1942 Dodge
1947 Dodge Deluxe

Adapter Package 4423
1946-1947 Kaiser and Frazer

UNITED MOTORS SERVICE
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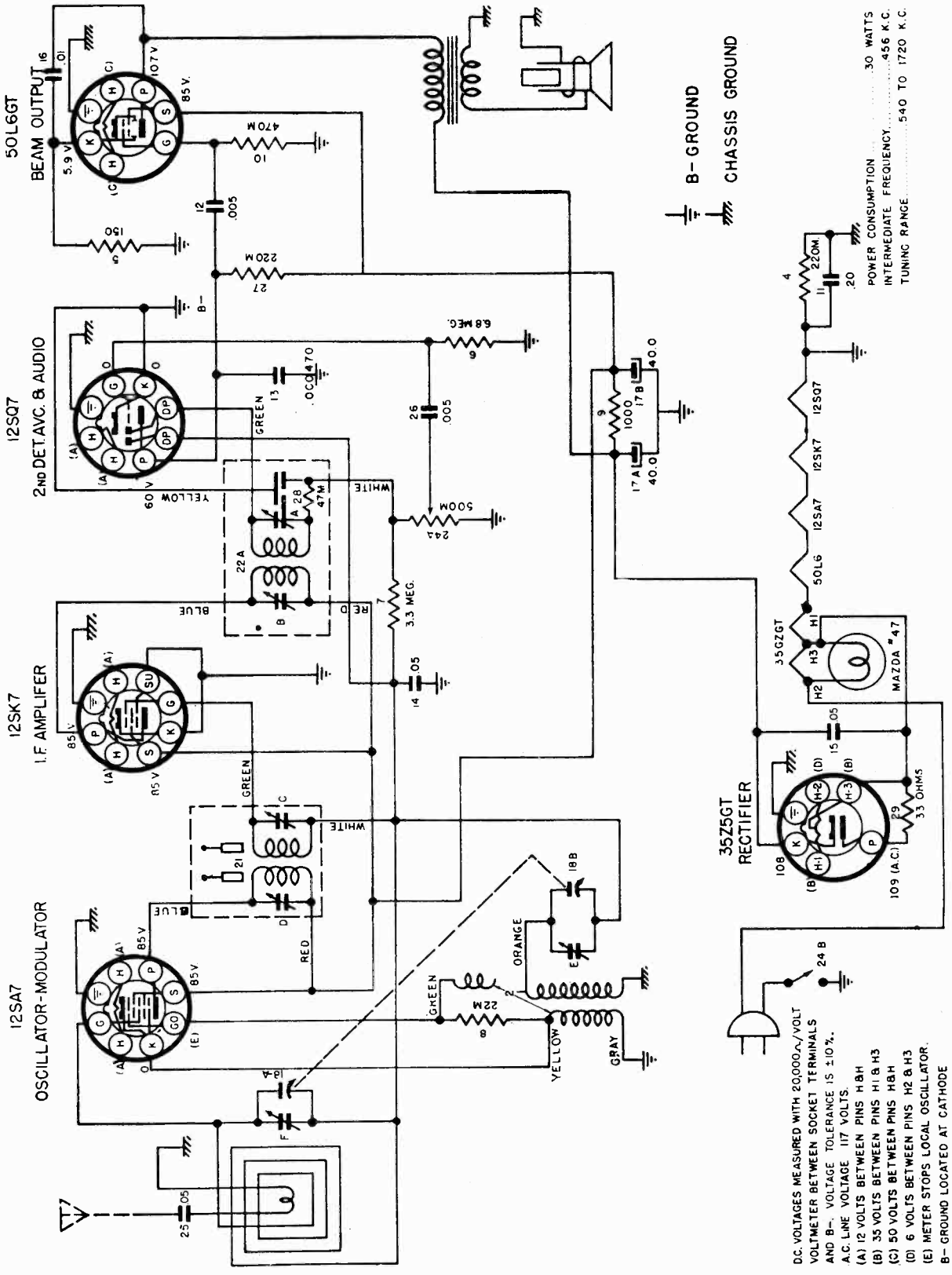
MODELS R1230, R1230A, R1231, R1231A, R1232



MODELS R1230, R1230A, R1231, R1231A, R1232

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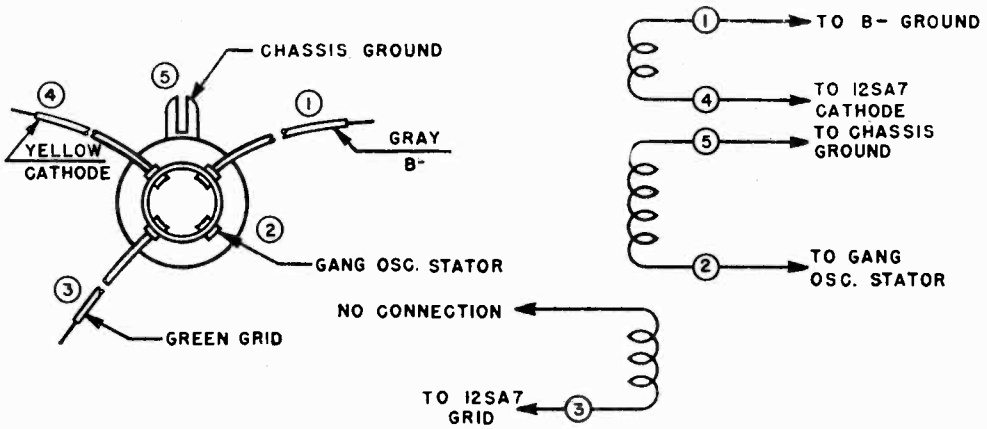
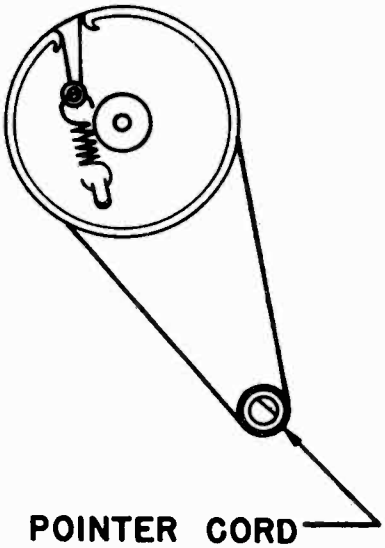
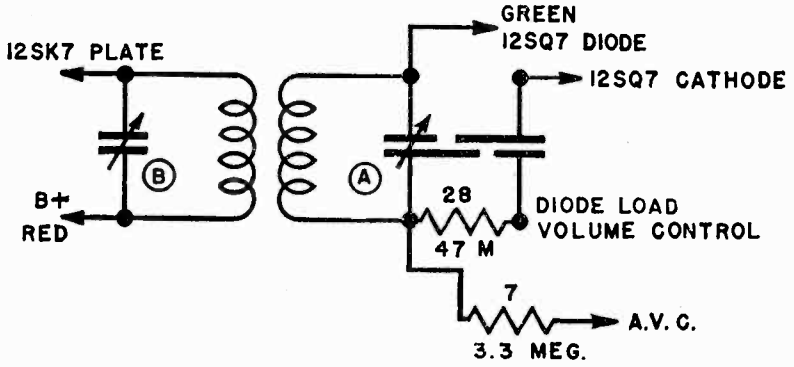


OSCILLATOR COIL



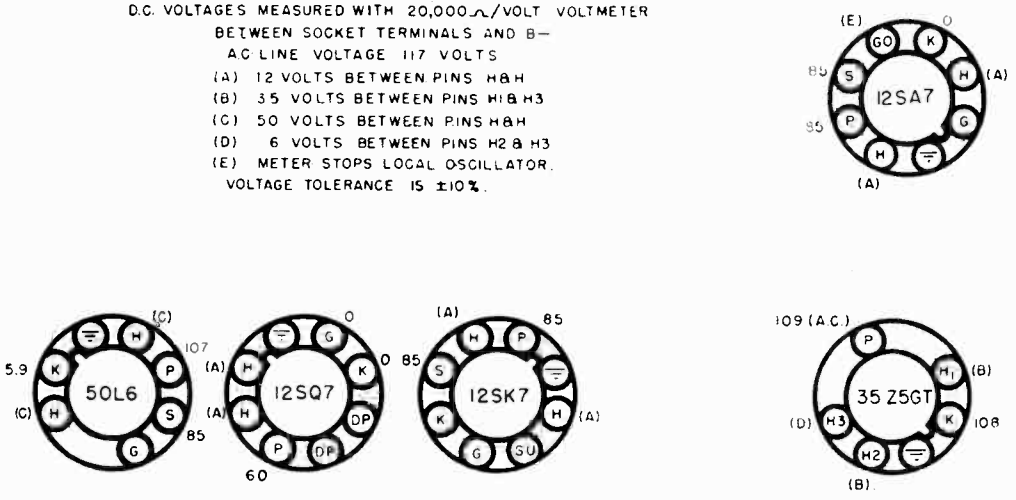
DIAL STRING DRAWING



SECOND I. F. TRANSFORMER
PART #22 UNSHIELDED
MODELS R-1230, R-1231 and R-1232

BOTTOM VIEW OF CHASSIS

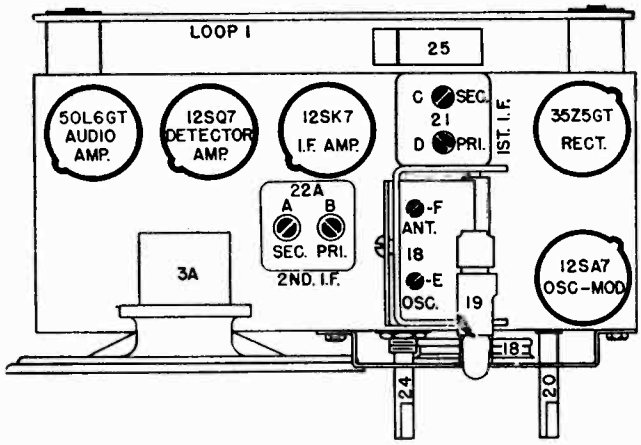
D.C. VOLTAGES MEASURED WITH 20,000Ω/VOLT VOLTMETER
BETWEEN SOCKET TERMINALS AND B−
A.C. LINE VOLTAGE 117 VOLTS
(A) 12 VOLTS BETWEEN PINS H&H
(B) 35 VOLTS BETWEEN PINS H1&H3
(C) 50 VOLTS BETWEEN PINS H&H
(D) 6 VOLTS BETWEEN PINS H2&H3
(E) METER STOPS LOCAL OSCILLATOR.
VOLTAGE TOLERANCE IS ±10%.



TUBE SOCKET VOLTAGE CHART

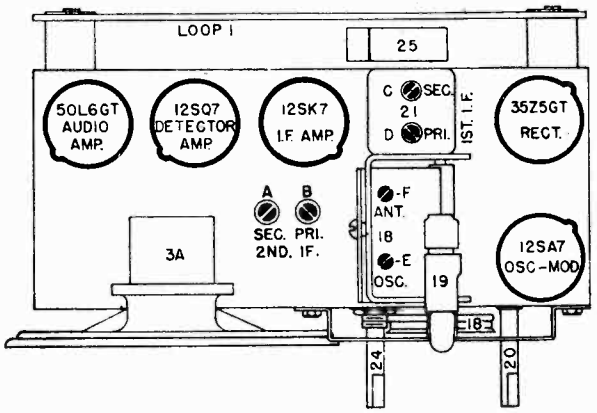
UNITED MOTORS SERVICE
DIV. OF GENERAL MOTORS CORP.

MODELS R1230, R1230A, R1231, R1231A, R1232



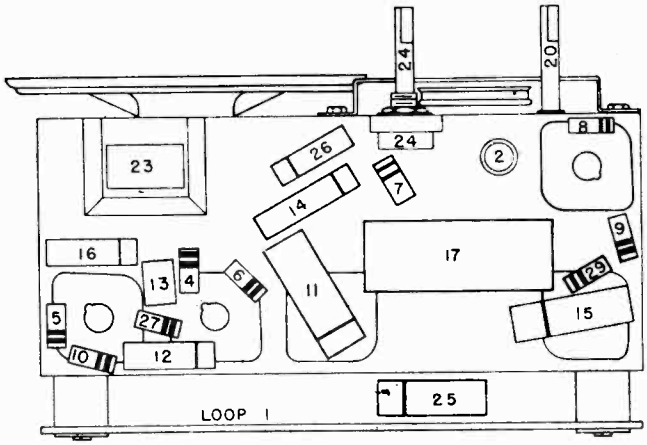
PARTS LAYOUT - TUBE VIEW

MODELS R-1230A, R-1231A AND R-1232A



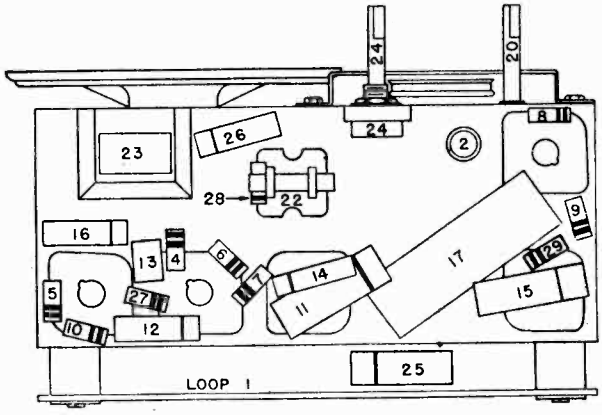
PARTS LAYOUT - TUBE VIEW

MODELS R-1230, R-1231 AND R-1232



PARTS LAYOUT - CHASSIS VIEW

MODELS R-1230A, R-1231A AND R-1232A



PARTS LAYOUT - CHASSIS VIEW

MODELS R-1230, R-1231 AND R-1232

ALIGNMENT PROCEDURE

Output Meter Connections ..... Across Voice Coil Winding
Generator Ground ..... To Chassis through .01 MFD
Dummy Antenna ..... In Series with generator
Volume Control Position ..... Fully on

Steps	Series Condenser or Dummy Antenna	Connect Signal Generator To	Adjust Signal Generator To	Turn Radio Dial To	Adjust Trimmers
1	0.1 Mfd.	12SA7 Grid (Pin #8) Ground Generator to B– (not chassis)	456 KC	Quiet Point near H. F. end	A-B (2nd IF Trans) C-D (1st IF Trans)
2	.000200 Mfd.	Ant. lead	1720 KC	1720 KC	E (Osc.)
3	.000200 Mfd.	Ant. lead	1400 KC	1400 KC	F (Ant.)

MODELS R1230, R1230A, R1231, R1231A, R1232

UNITED MOTORS SERVICE
DIV. OF GENERAL MOTORS CORP.

SERVICE PARTS LIST

Illus. No.	Service Part No.	Description
		ELECTRICAL PARTS
		COILS
1	1217593	Antenna Assembly - Loop and Back Cover
2	1216518	Oscillator
21	1216504	1st I. F.
22	1216980	2nd I. F. (Includes Illus. No. 7 and 28) Unshielded - Mounted on under side of chassis
22A	1217594	2nd I. F. (Includes Illus. No. 28) Shielded - Mounted on top of chassis
		CONDENSERS
11	E204	.20 Mfd. 400V Tubular
12	E502	.005 Mfd. 600V Tubular
13	G471	.000470 Mfd. Molded
14	E503	.05 Mfd. 600V Tubular
15	E503	.05 Mfd. 600V Tubular
16	E103	.01 Mfd. 600V Tubular
17	J908	2 Section Electrolytic
17A		40 Mfd. 150V
17B		40 Mfd. 150V
18	1217391	Condenser and Pulley Parts Package Condenser and Pulley Grommet (3) Spacer Sleeve (3) Screw (3)
25	E503	.05 Mfd. 600V Tubular
26	E502	.005 Mfd. 600V Tubular
		RESISTORS
4	A224	220,000 Ohms ½ W Insulated
5	A151	150 Ohms ½ W Insulated
6	A685	6.8 Megohms ½ W Insulated
7	A335	3.3 Megohms ½ W Insulated
8	A223	22,000 Ohms ½ W Insulated
9	B102	1,000 Ohms 1 W Insulated
10	A474	470,000 Ohms ½ W Insulated
27	A224	220,000 Ohms ½ W Insulated
28	A473	47,000 Ohms ½ W Insulated (Used only on sets utilizing volume controls without a stop.)
29	A330	33 Ohms ½ W Insulated
		TUBE COMPLEMENT
	1213809	12SA7
	1213812	12SK7
	1213813	12SQ7
	1214366	50L6GT
	1213848	35Z5GT - Rectifier
		MISCELLANEOUS ELECTRICAL PARTS
24	1216477	Control - Volume and Switch
24A		Volume Control
24B		Switch
	1216512	Cord - Universal Power
	435433	Lamp - Dial Light (Mazda #47)
3	1216563	Speaker - 5" P. M. (Bracket #1217406 is necessary when replacing original 4" speakers)
23	1216571	Transformer - Output

UNITED MOTORS SERVICE
DIV. OF GENERAL MOTORS CORP.

MODELS R1230, R1230A, R1231, R1231A, R1232

SERVICE PARTS LIST (Cont.)

Illus. No.	Service Part No.	Description
		MECHANICAL PARTS
		MISCELLANEOUS CHASSIS PARTS
	1217406	Bracket - Speaker Mounting (For 5" Speakers)
	1216559	Clip - Condenser
	1212233	Cord - Universal Dial Drive
	1217210	Dial and Dial Plate - Dial, Dial Plate and Bracket Assy. (Model R-1232)
	1217213	Dial and Dial Plate - Dial, Dial Plate and Bracket Assy. (Models R-1230, R-1230A)
	1217421	Dial and Dial Plate - Dial, Dial Plate and Bracket Assy. (Models R-1231, R-1231A)
	1216831	Pointer - Dial
20	1216479	Shaft - Tuning
	1217366	Spacer (Use with Tuning Shaft)
	1217323	Spring - Drive Cord Tension
19	1217819	Socket - Dial Light, Less Lamp
	7236279	Socket - Octal Tube
	1216508	Washer - "C" (Use with Tuning Shaft)
		MISCELLANEOUS CABINET PARTS
	1216715	Cabinet - Ivory - Models R-1230, R-1230A (Includes Crystal)
	1216827	Cabinet - Walnut - Model R-1232 (Includes Crystal)
	1216714	Cabinet - Brown - Models R-1231, R-1231A (Includes Crystal)
	1216660	Crystal - Dial (Models R-1230, R-1230A, R-1231, R-1231A)
	1216811	Crystal - Dial (Model R-1232)
	1216825	Knob - Ivory - Volume and Tuning (Models R-1230, R-1230A)
	1216826	Knob - Brown - Volume and Tuning (Models R-1231, R-1231A, R-1232)

GENERAL:

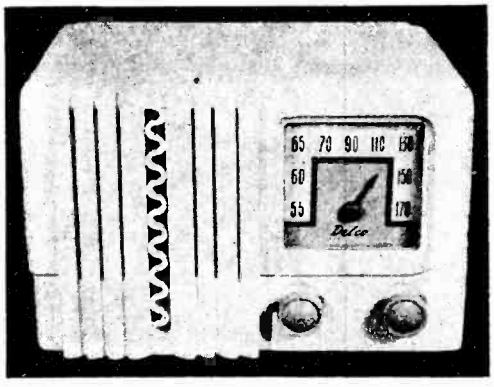
Tubes	5
Speaker	5" PM
Tuning	Manual
Tuning Range	540 to 1720 KC
Intermediate Frequency	456 KC
Power Supply	105/125 volts AC-DC
Power Consumption	30 Watts

Model R-1232—Walnut Wood Cabinet

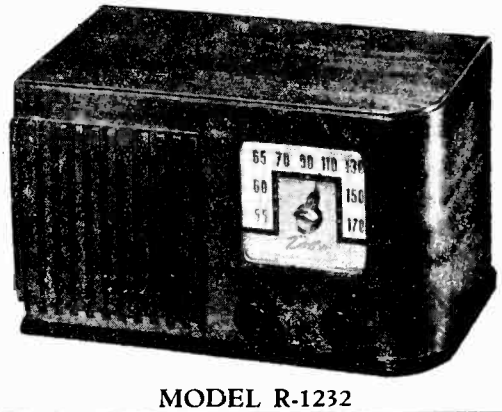
Models R-1231 and R-1231A—Brown Plastic Cabinet

Models R-1230 and R-1230A—White or Ivory Plastic Cabinet

The same chassis is used in all of the five different models listed in this bulletin. Models R-1230A and R-1231A are equipped with a shielded Second I. F. Transformer which is mounted on the upper side of the chassis whereas Models R-1230, R-1231 and R-1232 are equipped with an unshielded Second I. F. which is mounted on the under side of the chassis.



MODELS R-1230, R-1231, R-1230A and R-1231A



MODEL R-1232

MODELS R1251, R1252
all production runs

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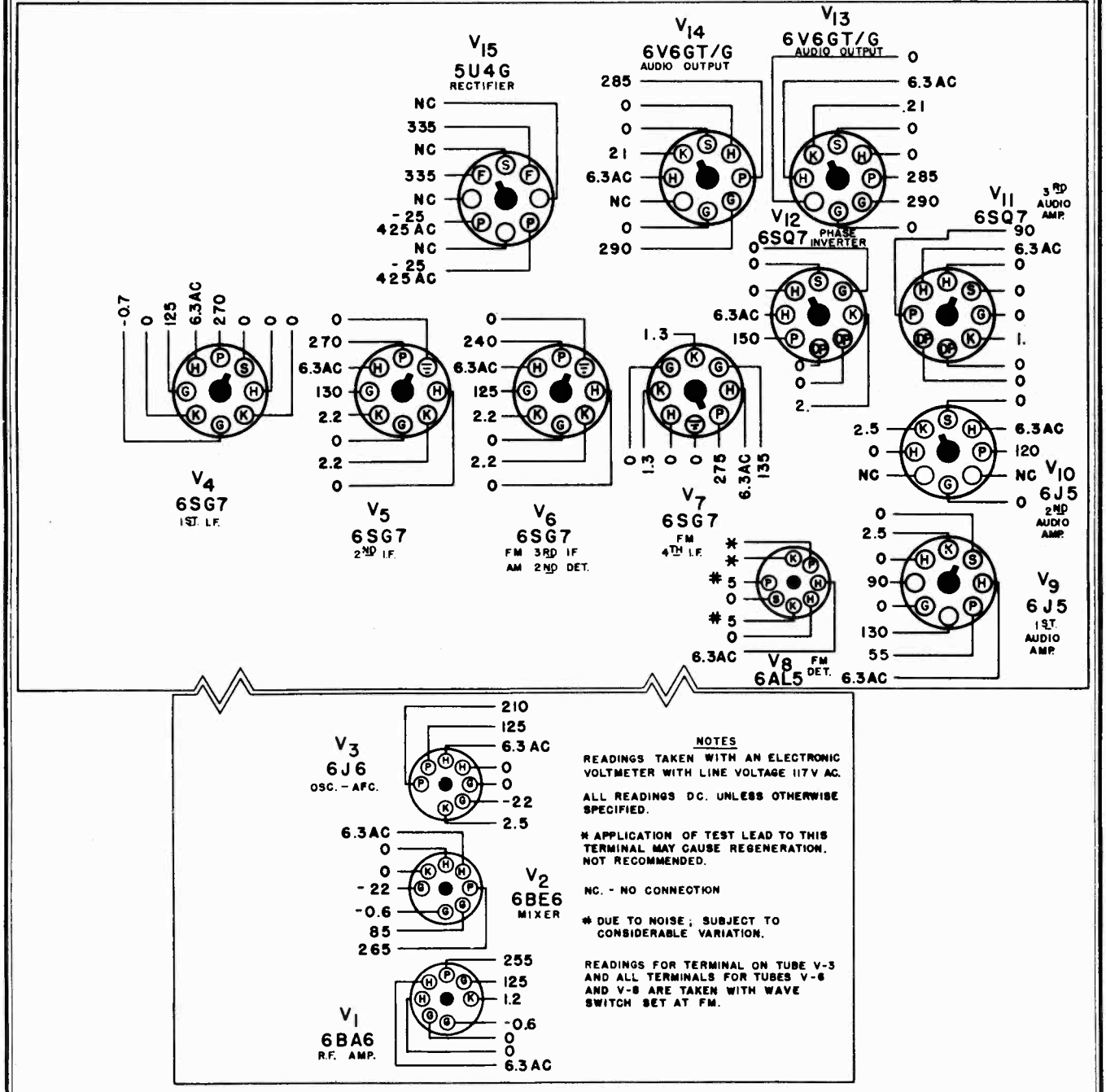
BOTTOM VIEW OF CHASSIS



NOTES

READINGS TAKEN WITH AN ELECTRONIC VOLTMETER WITH LINE VOLTAGE 117 V AC.

ALL READINGS DC. UNLESS OTHERWISE SPECIFIED.

* APPLICATION OF TEST LEAD TO THIS TERMINAL MAY CAUSE REGENERATION. NOT RECOMMENDED.

NC. - NO CONNECTION

DUE TO NOISE; SUBJECT TO CONSIDERABLE VARIATION.

READINGS FOR TERMINAL ON TUBE V-3 AND ALL TERMINALS FOR TUBES V-6 AND V-8 ARE TAKEN WITH WAVE SWITCH SET AT FM.

Tube voltage chart.

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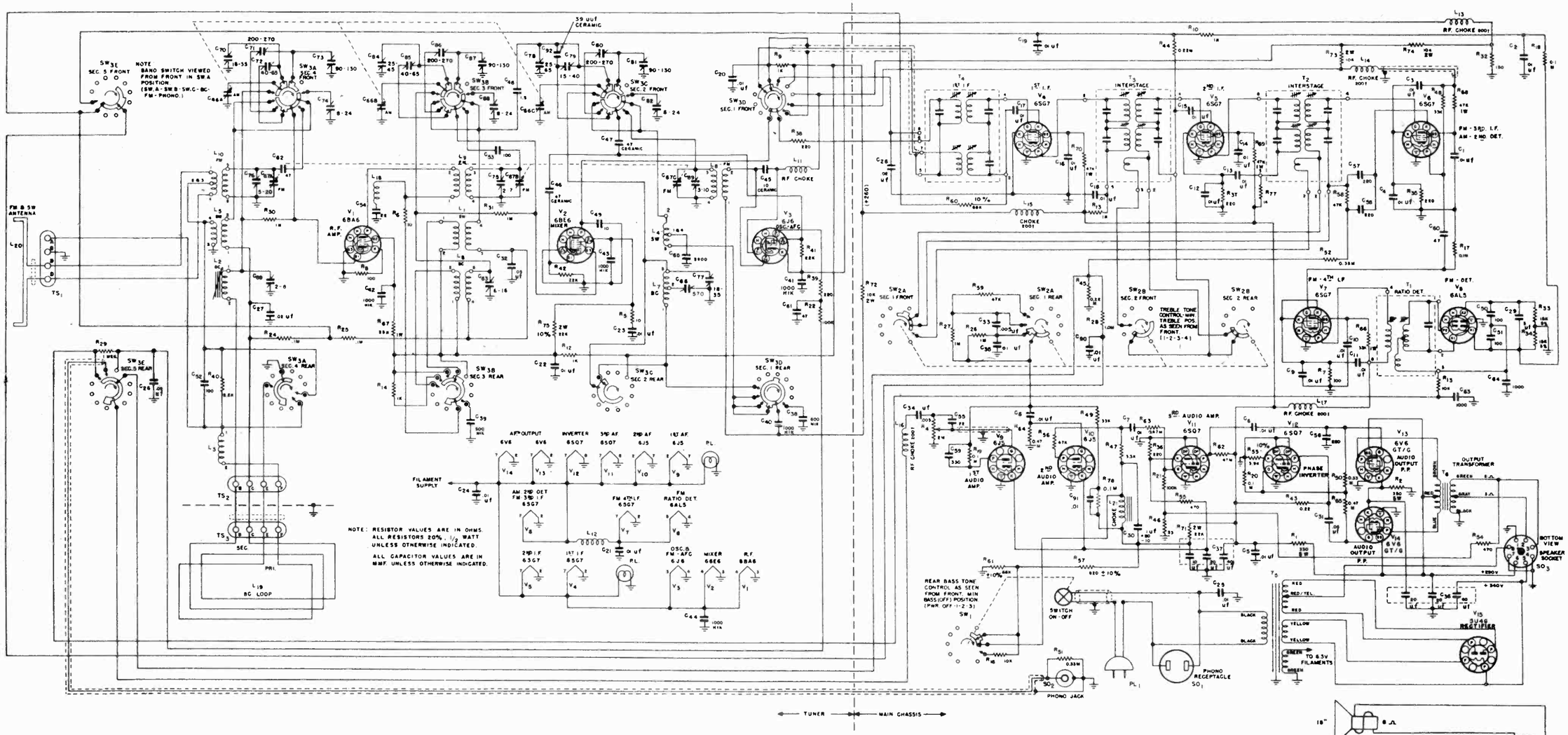

BOTTOM VIEW OF SPEAKER PLUGS

GENERAL:

Tubes.....Fifteen

Speaker.....15" PM

Antennas.....Built-in loop, "AM"
Built-in dipole, "FM"

Provision for external Antennas.

Tuning.....Manual and mechanical pushbuttons..5 P.B. for "AM" and 5 P.B. for "FM."

Tuning Range.....(BC) 540 kc —1700 kc
(A) 15 mc— 18 mc
(B) 9 mc— 12 mc
(C) 5.8 mc— 18 mc
(FM) 88 mc— 108 mc

Intermediate Frequency.....455 kc "BC" and "SW"

Intermediate Frequency.....10.7 mc "FM"

Power Supply.....105-125 V. 60 cycle AC

Power Consumption.....180 watts (Radio only)

Record Changer.....See Bulletin 15D-505

RECORD CHANGER: Seeburg Model L, RCD. CH. 15-18

"clarified schematics"

MODELS R1251, R1252, X
MODELS R1251, R1252, XX, XXX

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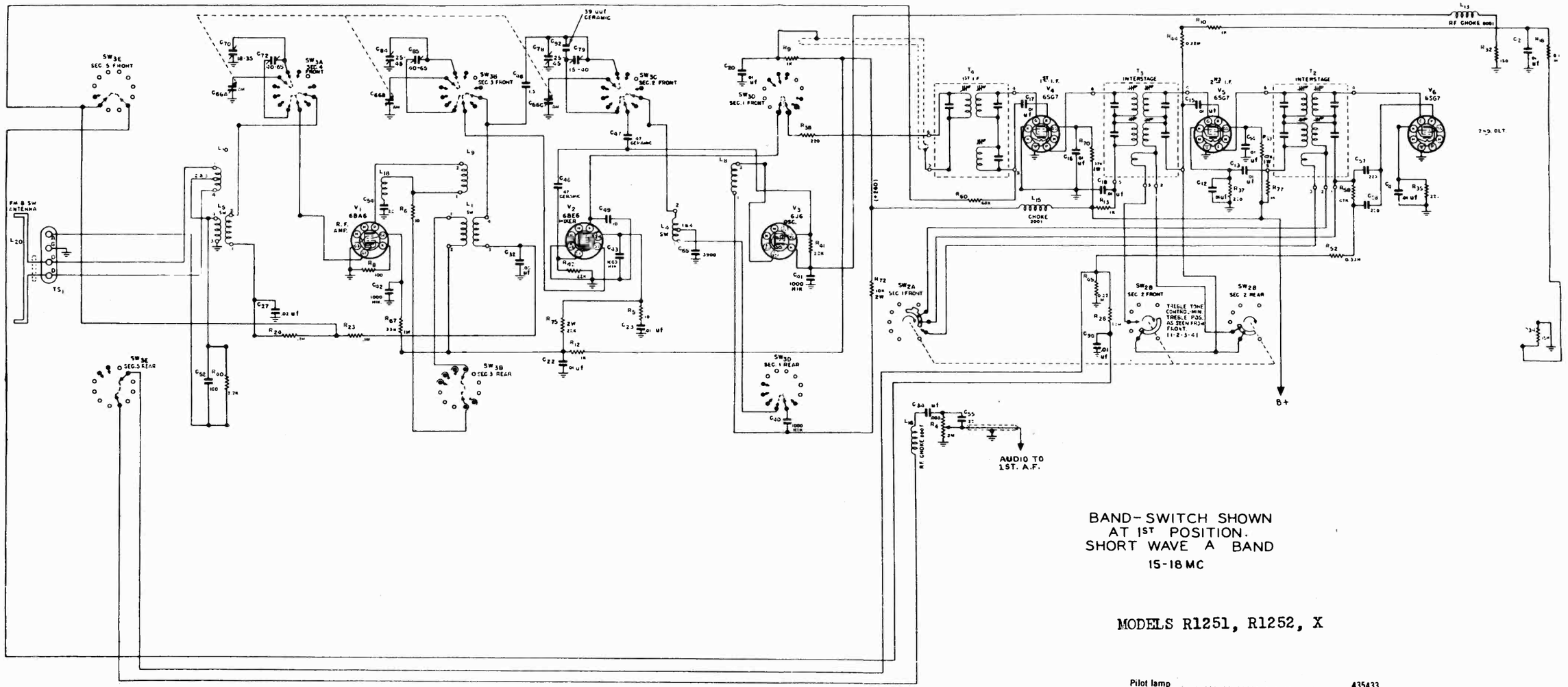

BAND-SWITCH SHOWN AT 1ST POSITION.
SHORT WAVE A BAND
15-18 MC

MODELS R1251, R1252, X

SERVICE PARTS LIST

Illustration No.	Description	Delco Service Part No.
	RESISTORS	
R9, 10, 11, 12, 13, 14, 77	1000 ohm, ½ W	A102
R15, 16	10,000 ohm ½ W	A103
R17, 18, 19, 20, 21, 22, 23, 24, 25, 78	100,000 ohm ½ W	A104
R26, 27, 28, 29, 30, 31	1 meg, ½ W.	A105
R32	150 ohm ½ W	A151
R33, 34	15,000 ohm ½ W	A153
R35, 36, 37, 38, 39	220 ohm, ½ W	A221
R40	2200 ohm, ½ W	A222
R41, 42	22,000 ohm, ½ W	A223
R43, 44, 45	220,000 ohm, ½ W	A224
R46	33 ohm, ½ W	A330
R47, 48	3300 ohm, ½ W	A332
R49	33,000 ohm, ½ W	A333
R50, 51, 52	330,000 ohm, ½ W	A334
R53	3900 ohm, ½ W (10%)	A392
R54, 55	470 ohm, ½ W	A471
R56	4700 ohm, ½ W	A472
R57	820 ohm, ½ W	A821
R58, 59	47,000 ohm, ½ W	A473
R60, 61	68,000 ohm, ½ W	A683
R62, 63, 64, 65	470,000 ohm, ½ W	A474
R66, 67	33,000 ohm, 1 W	B333
R68, 69, 70	7,000 ohm, 1 W	B473
R71	68,000 ohm, 1 W	B683
R72, 73, 74	10,000 ohm, 2 W	C103
R75	22,000 ohm, 2 W	C223
	MISCELLANEOUS	
SW1	Bass, on and off, complete	1217638
SW2	Treble, complete	1217637
SW3	Band switch, 5 sec. 6 pos.	1217636
	Phono motor receptacle	1217633
	Phono pick-up jack	1217634
	Speaker socket	1217684
	Octal socket, (tube)	1217684
	Miniature socket	1217683
	Pilot light socket and bracket, L.H.	1217629
	Pilot light socket and bracket, R. H.	1217628
	Pointer carriage	1217653
	Tube shield spring retainer	1217685
	Shield base	1217688
	Dial cord	85451
	Line cord and plug	1217618
	Pilot lamp	435433
	Pointer, FM	1217676
	Pointer, AM	1217677
	Insert, pointer, FM	1217664
	Insert, pointer, AM	1217665
	Push-button	1217666
	Speaker, PM, 15"	1217678
	Knob, with index	1217626
	Knob	1217627
	Push-button insert	1217631
	Call letters	1217632
	Record changer	See Bulletin 15D505
	Dial glass, Control Knob Index	1217829
	Dial glass, calibrated	1217828
	Escutcheon	1217830

All production runs

	TUBES	
V15	5U4G Rectifier	5117
V8	6AL5 FM Freq. detector	5251
V1	6BA6 RF amplifier	5252
V2	6BE6 1st detector	5253
V9, 10	6J5 1st and 2nd audio amp.	5187
V3	6J6 H.F. osc. and FM AFC	5254
V4, 5, 6, 7	6SG7 1st and 2nd I.F., AM 2nd det., FM 3rd and 4th I.F.	5226
V13, 14	6V6GT/G push pull audio amp.	5241
V12, 11	6SQ7 Inverter and 3rd audio amp.	5231

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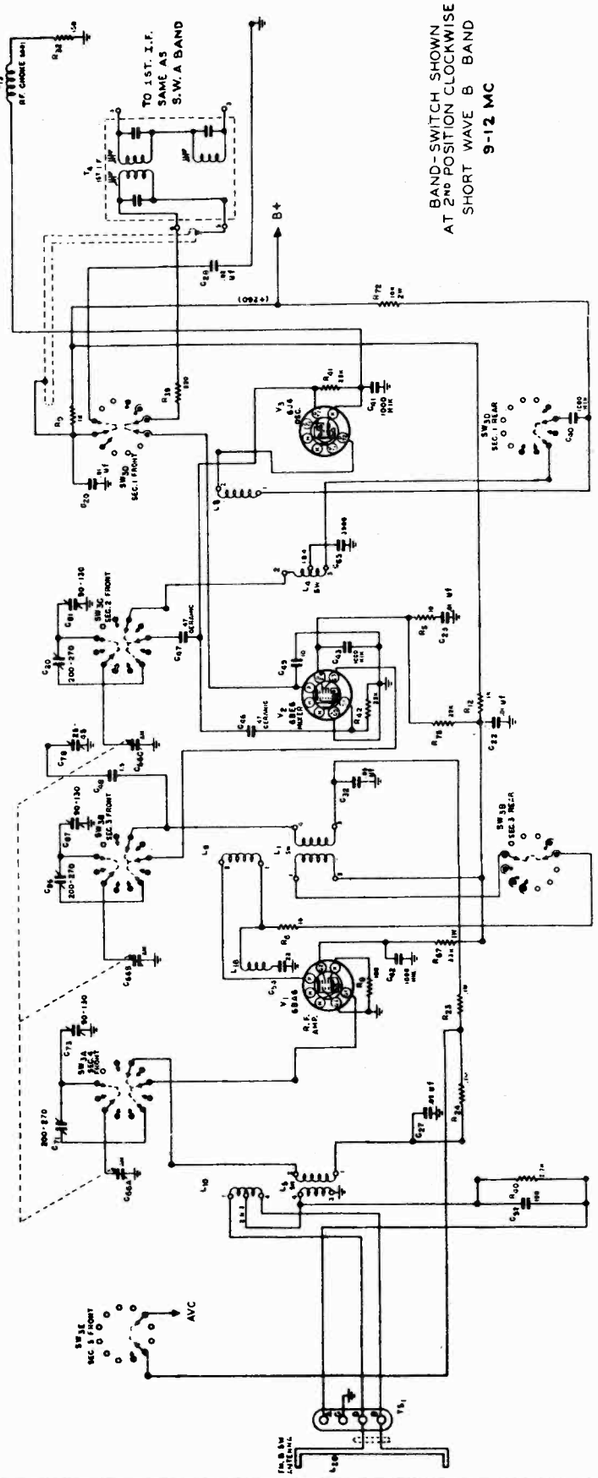

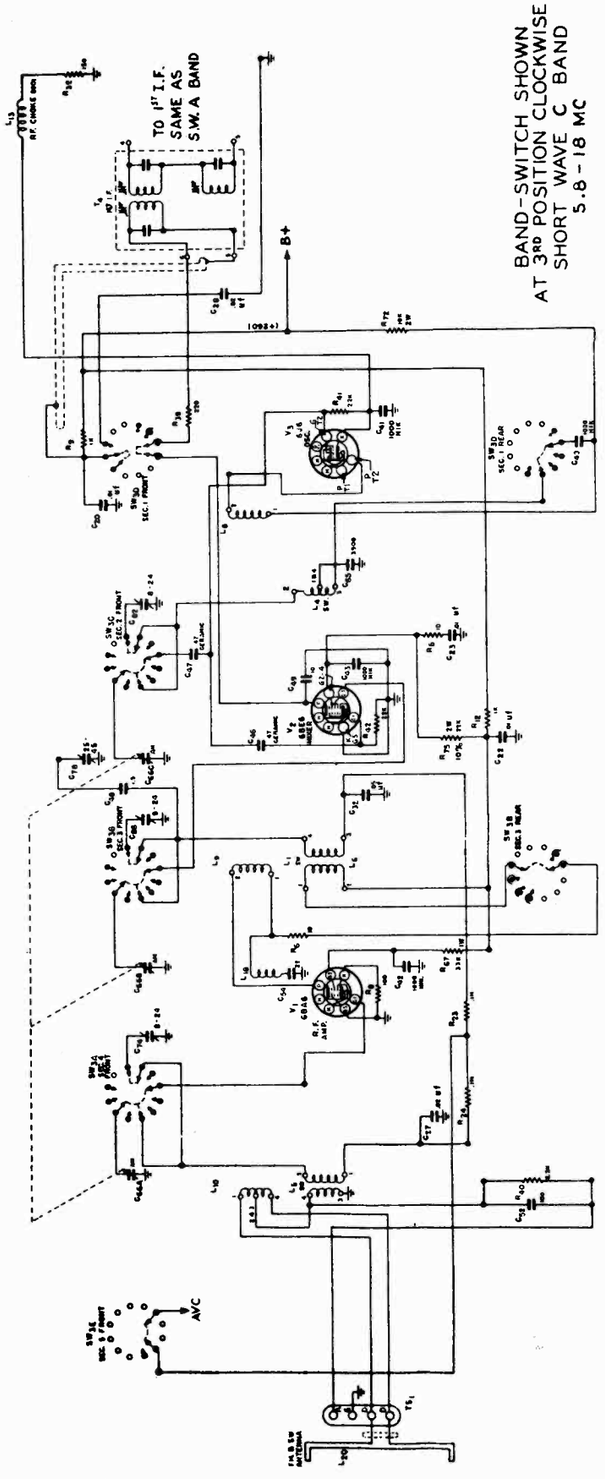

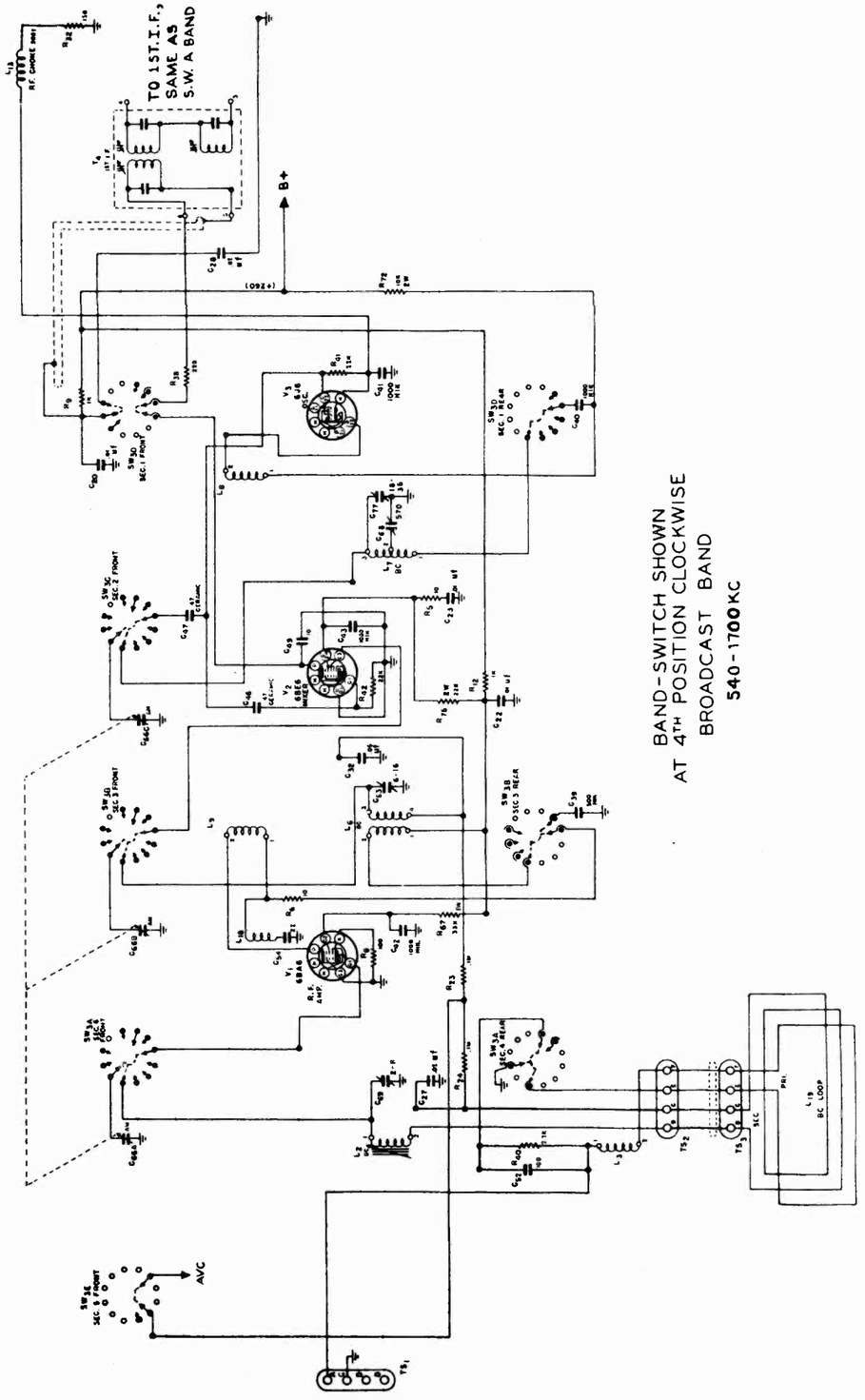

"clarified schematics"

MODELS R1251, R1252, X

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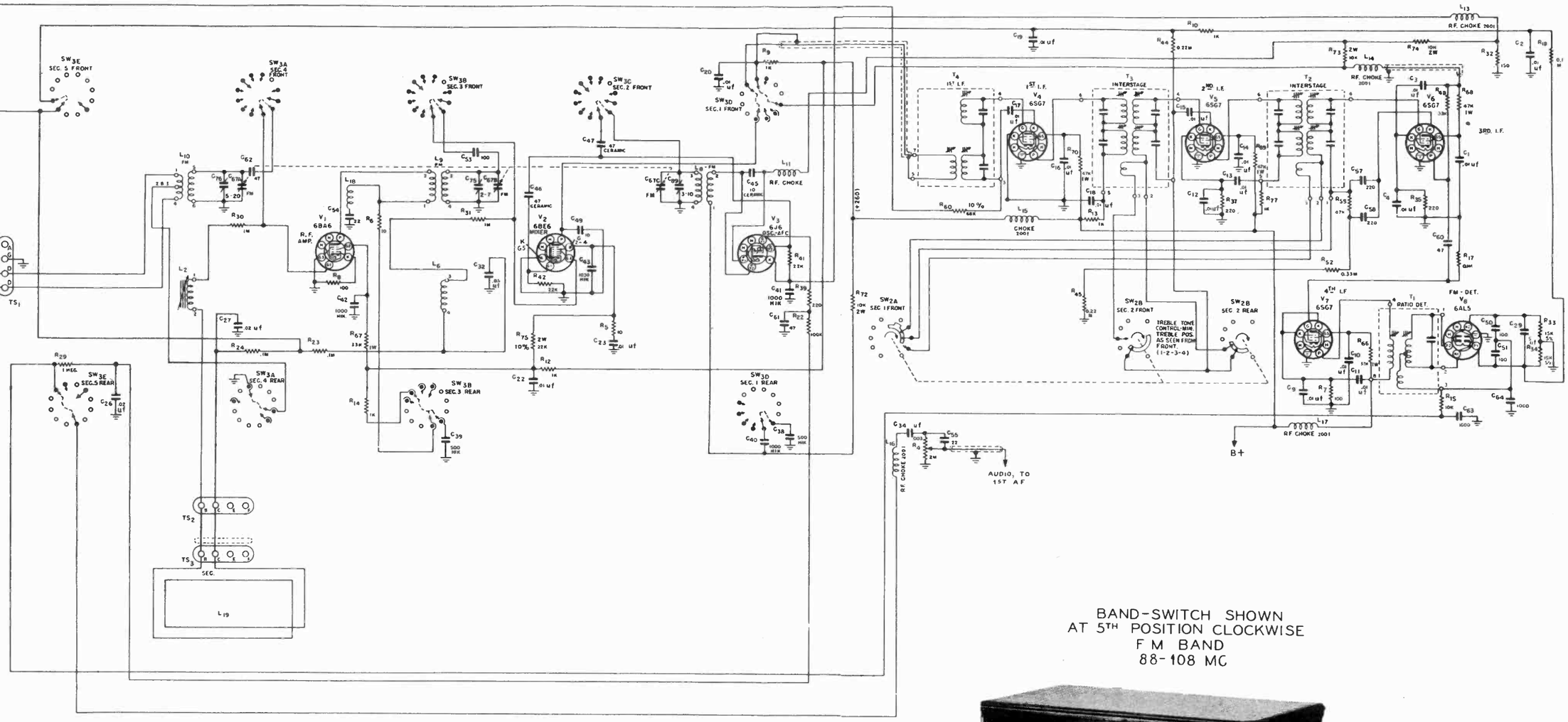
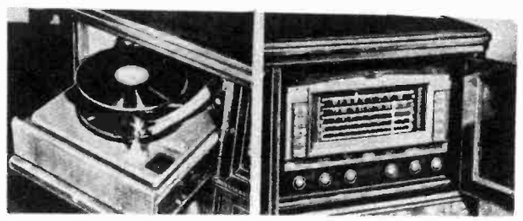
DIV. OF GENERAL MOTORS CORP.





BAND-SWITCH SHOWN
AT 5TH POSITION CLOCKWISE
F M BAND
88-108 MC

UNITED MOTORS SERVICE
DIV. OF GENERAL MOTORS CORP.

MODELS R1251, R1252,
all production runs

ALIGNMENT PROCEDURE

Removal of the receiver chassis from the cabinet requires the use of other calibration means than the dial glass. Calibration strips mounted on the pointer rails are provided for alignment purposes.

In order to see these calibration strips, it is necessary that the dial plate (brown metal cover) be removed in the following order:

1. Pull out dial pointers.
2. Remove seven self-tapping screws holding dial plate to chassis.
3. Remove the Right hand and Left hand Dial lamp assemblies fastened by one self-tapping screw each.
4. Remove dial plate.

With the variable condensers fully "closed," the right hand side of the pointer carriage will be indexed to "0" on the calibration strips (see fig. 3).

Proceed with the alignment of the receiver as indicated on the alignment chart.

NOTE: This receiver has AUTOMATIC FREQUENCY CONTROL employed on the "FM" band in order to compensate for discrepancies in P.B. tuning and frequency drift. Its characteristics are such that the "take hold" point is greater than 100 kc plus or minus the frequency of an input signal of .01 volts. The "release" point is approximately 350 kc, plus or minus the frequency of an input signal of .01 volts.

Standard RMA dummy consisting of a 200 mmf condenser in series with a 20 uh r-f choke which is shunted by a 400 mmf condenser in series with a 400 ohm carbon resistor.

ALIGNMENT PROCEDURE

Steps	*Signal Generator Thru .01 Mfd to:*	*Sig. Gen. Tuned to:*	*Calibration Strip No.*	*Adjust the Following Slugs/Trimmers for:*
"AM" i.f.	1. 2nd i.f. control grid	455 kc	55	S3 and S6, Max. output
	2. 1st i.f. control grid	455 kc	55	S2 and S5, Max. output
	3. 1st Det. control grid	455 kc	55	S1 and S4, Max. output
NOTE: Set "Bass" control at No. 1, and "Treble" control at No. 4, read output for maximum AVC voltage, using a VTVM or 20,000 ohms/volt meter connected to pin No. 7 of the 6AL5 ratio detector tube to ground.				
"FM" i.f.	4. 2nd i.f. control grid	10.7 mc	55	S9, S12, S13 Max. output
	5. 1st i.f. control grid	10.7 mc	55	S8 & S11 Max. output
	6. 1st Det. control grid	10.7 mc	55	S7, S10 Max. output
NOTE: For ratio detector alignment, clip output meter to C-34 leading to audio control potentiometer and ground.				
	7. 1st Det. control grid	10.7 mc	55	S14 for "0" audio voltage
	8. Standard RMA dummy ant. to:	1500 kc	82	"F," Calibration
	9. "A" "G"	1500 kc	82	"H," Max. output
	10. "A" "G"	1500 kc	82	"I," Max. output
	11. "A" "G"	600 kc	15.5	"G," Calibration
	12. "A" "G"	600 kc	15.5	S15, Max. output
	13. "A" "G"	12 mc	91.5	"C," Calibration
	14. "A" "G"	12 mc	91.5	"J," Max. output
	15. "A" "G"	12 mc	91.5	"K," Max. output
	16. "A" "G"	9 mc	6.5	"D," Calibration
	17. "A" "G"	9 mc	6.5	"L," Max. output
	18. "A" "G"	9 mc	6.5	"M," Max. output
	19. "A" "G"	18 mc	94.5	"A," Calibration
	20. "A" "G"	18 mc	94.5	"N," Max. output
	21. "A" "G"	18 mc	94.5	"O," Max. output
	22. "A" "G"	15 mc	7.5	"B," Calibration
	23. "A" "G"	15 mc	7.5	"P," Max. output
	24. "A" "G"	15 mc	7.5	"Q," Max. output
	25. "A" "G"	16 mc	84	"E," Calibration
	26. "A" "G"	16 mc	84	"R," Max. output
	27. "A" "G"	16 mc	84	"S," Max. output
	28. Two 150 ohm resistors to: "D" "D"	108 mc	83.5	"T," Calibration
	29. "D" "D"	108 mc	83.5	"U," Max. output
	30. "D" "D"	108 mc	83.5	"V," Max. output

MODELS R1251, R1252
all production runs

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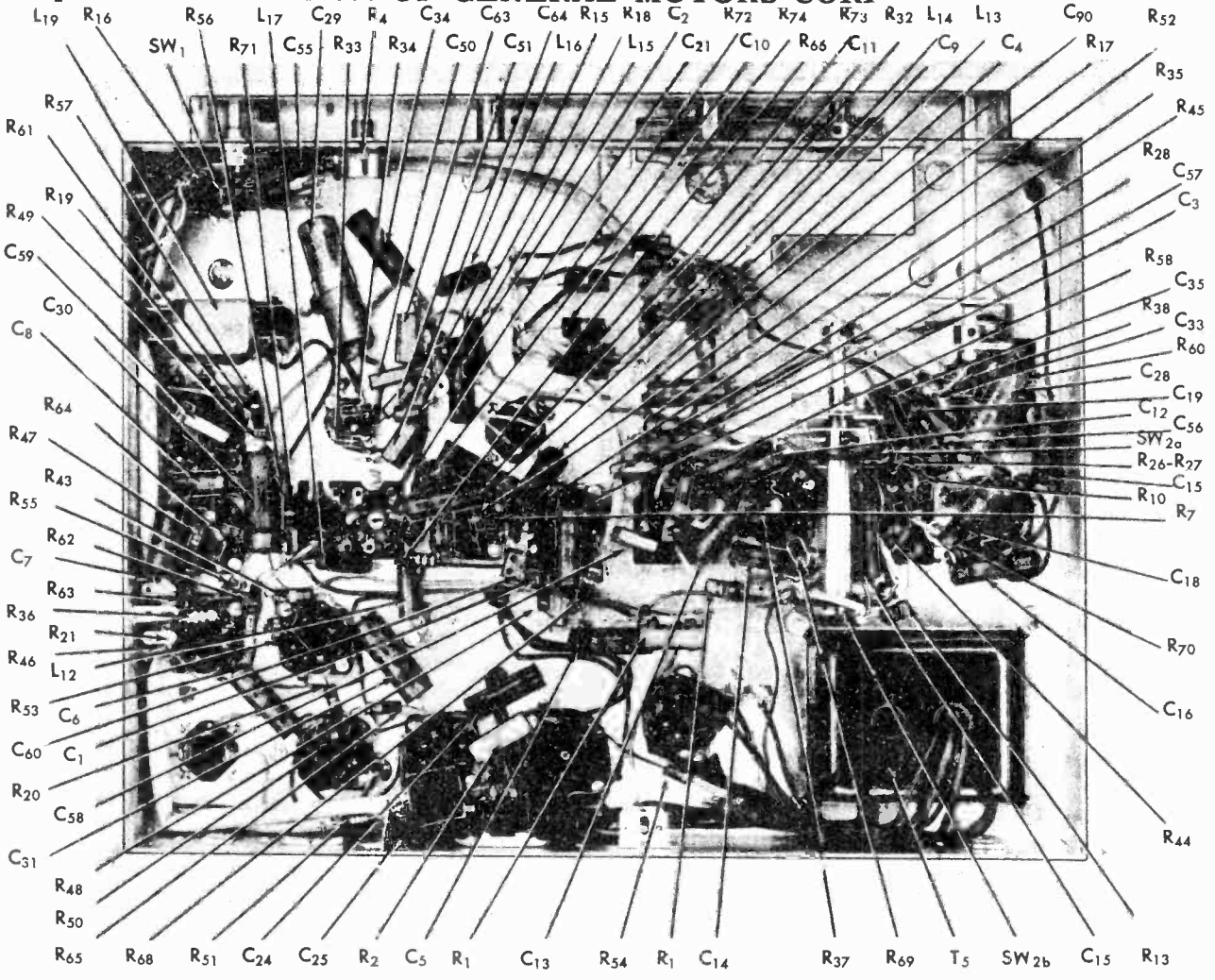
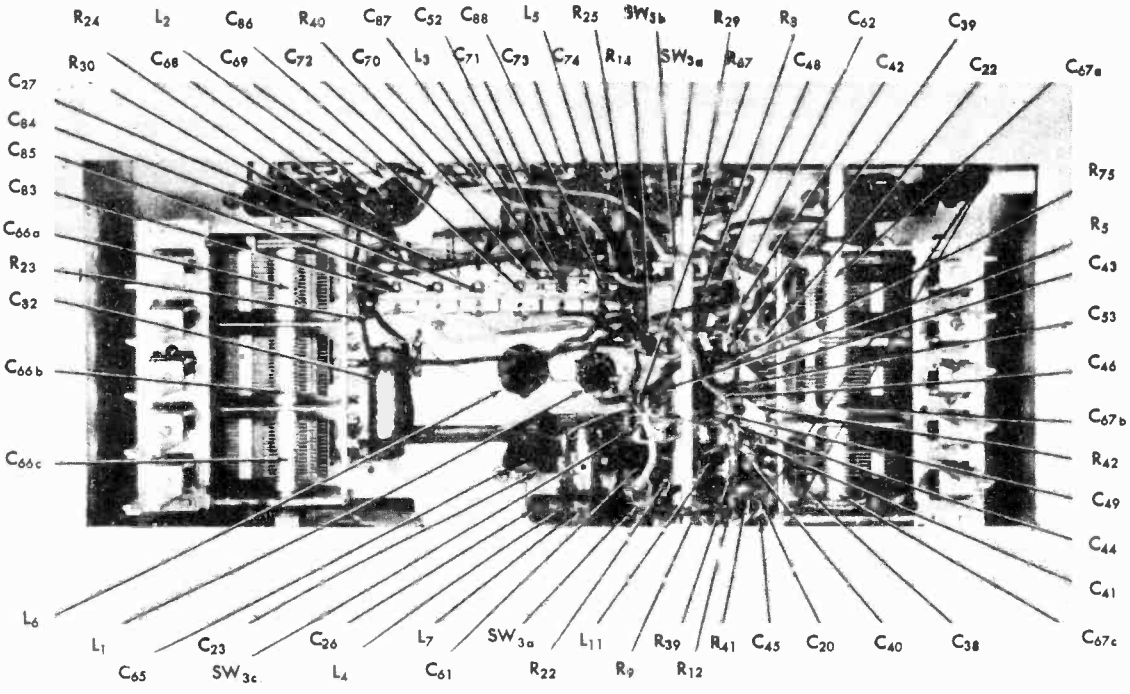


Bottom view of receiver showing component location.



Back view of R.F. chassis showing component location.

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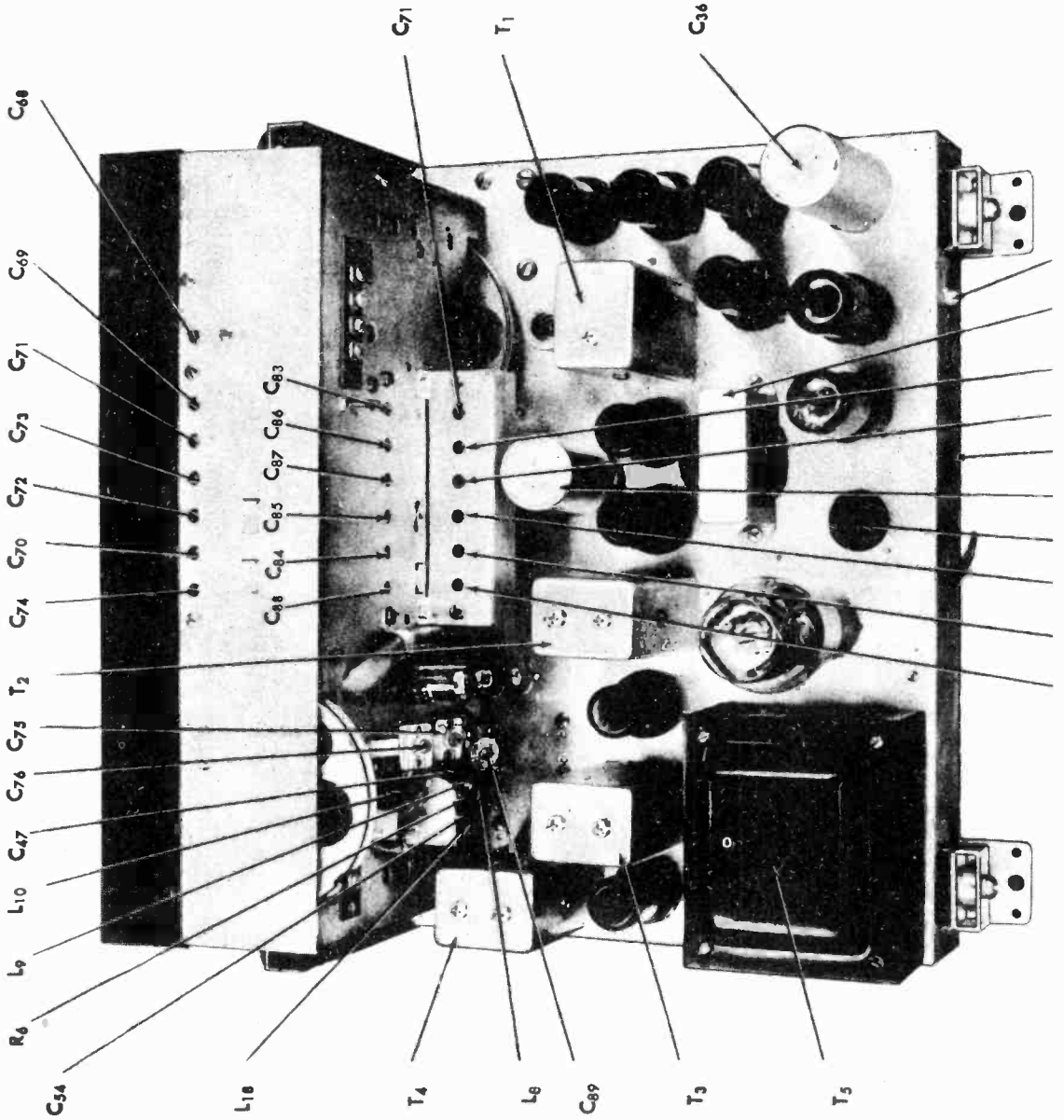
MODELS R1251, R1252
all production runs



Top view showing component location.

MODELS R1251, R1252
all production runs

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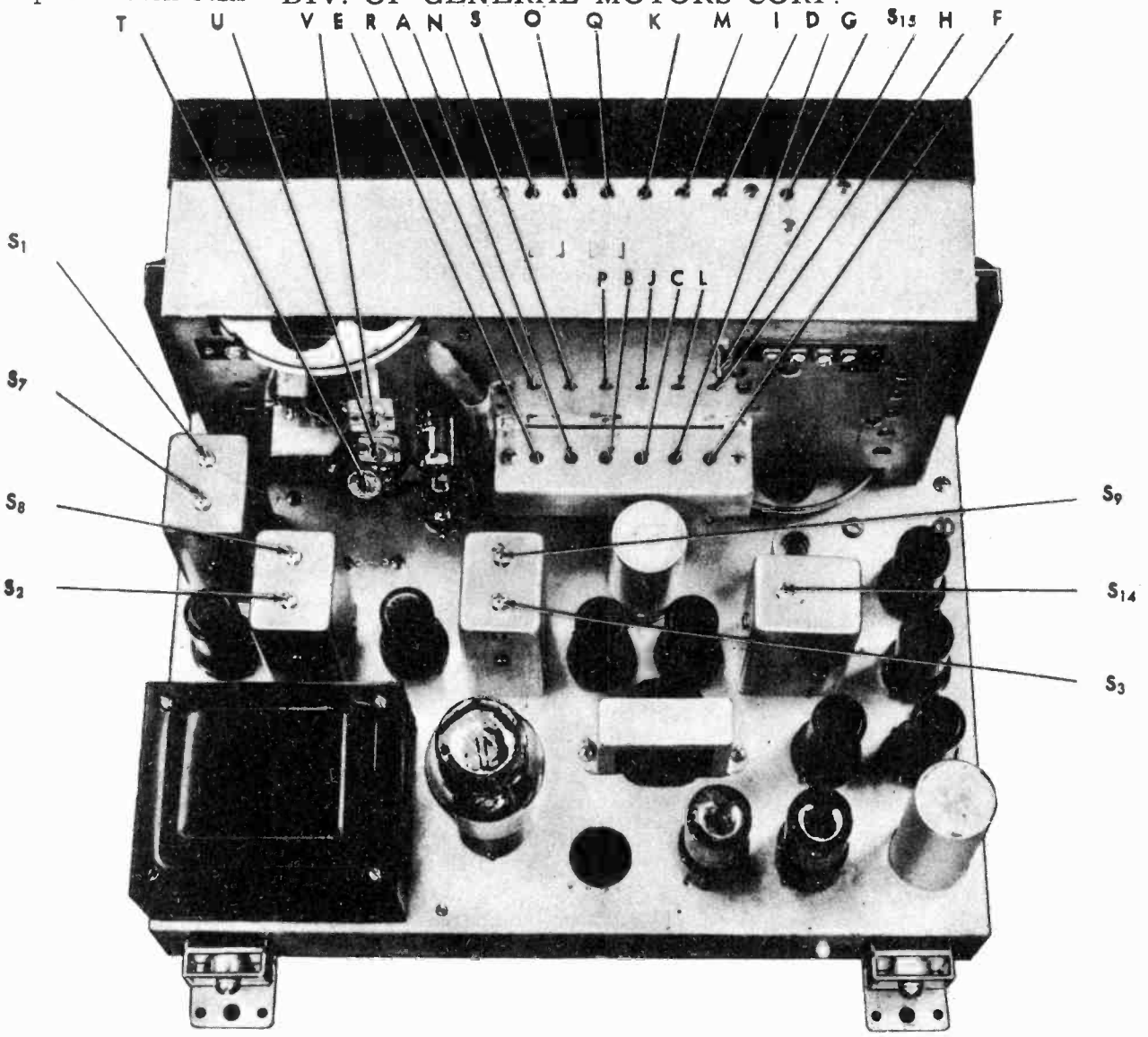
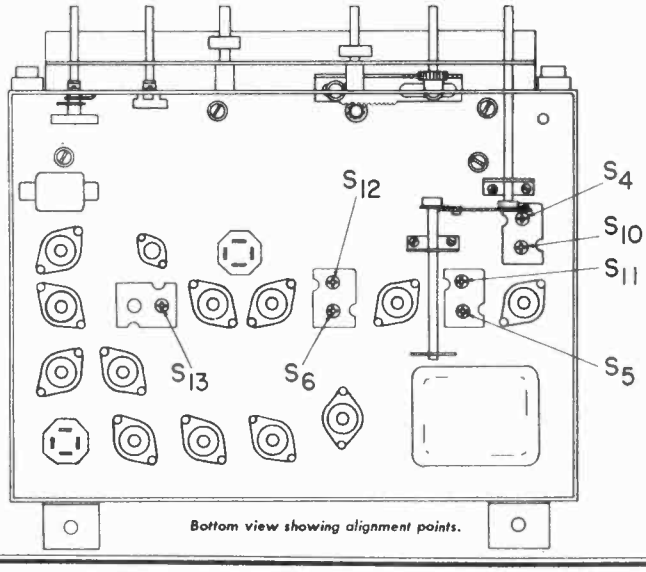


Top view showing alignment points.



Bottom view showing alignment points.

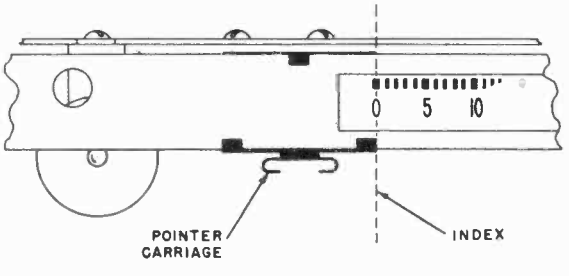


Fig. 3. Calibration strip detail.

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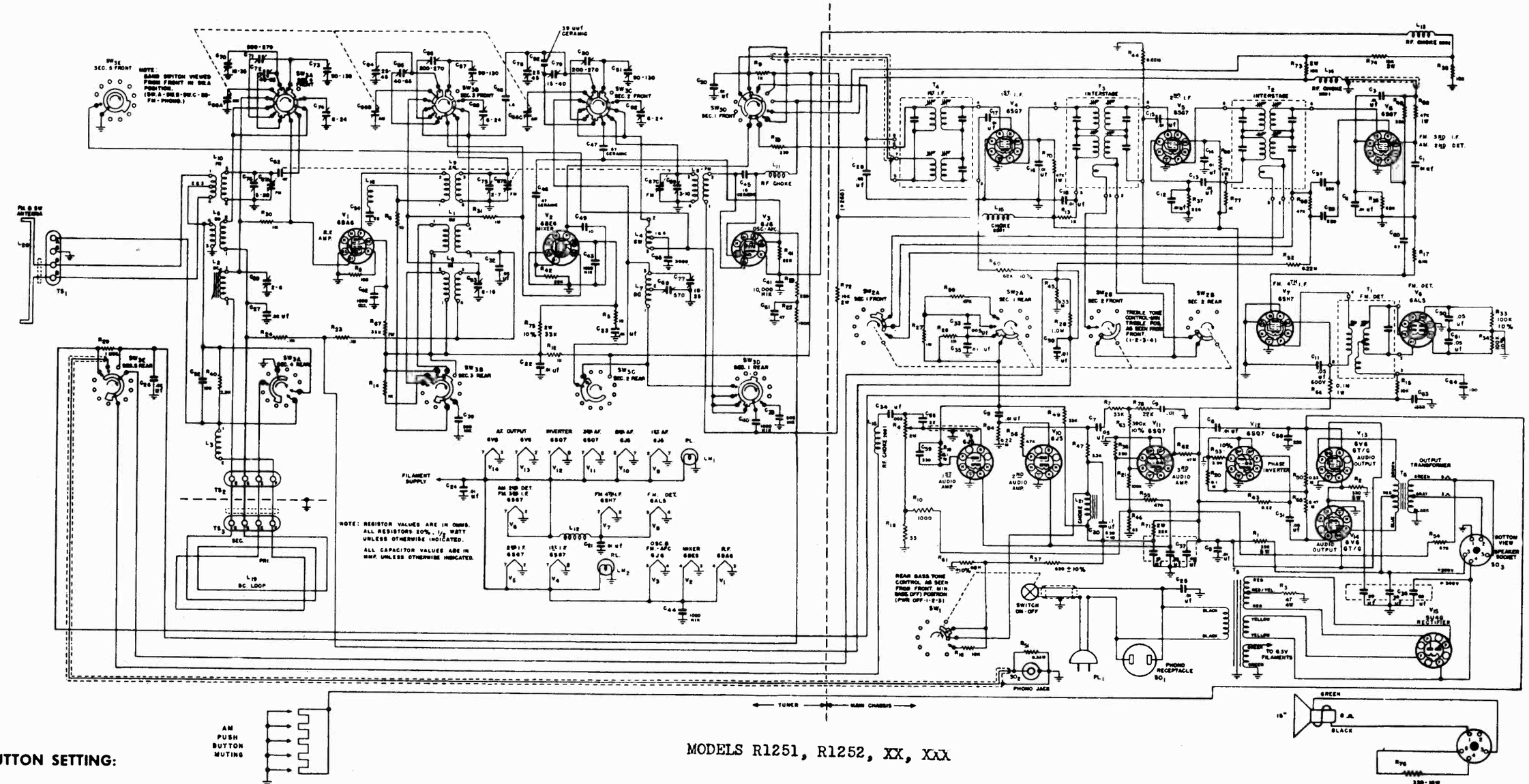

MODELS R1251, R1252, XX, XXX

BUTTON SETTING:

1. Select any one pushbutton.
2. Pull translucent insert straight out.
3. Insert screw driver blade through large hole of pushbutton into slot of locking screw. (See Fig. 1).
4. Loosen locking screw about one-half turn. (Not more than one full turn.)
5. With pushbutton depressed, carefully tune in desired station with the manual control.
6. With the manual control held firm, tighten the locking screw.

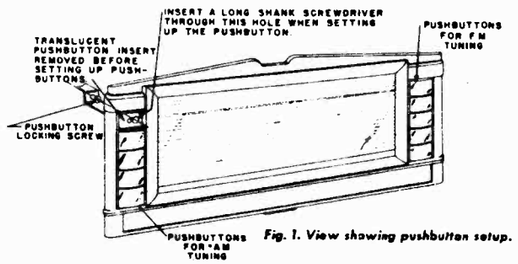

Fig. 1. View showing pushbutton setup.

INSERTING CALL LETTERS INTO TRANSLUCENT INSERT ASSEMBLY:

1. Slide out metal insert fron translucent insert assembly. (See Fig. 2).
2. Insert Call letter tab.
3. Replace metal insert.
4. Replace translucent insert assembly into pushbutton.

All production runs

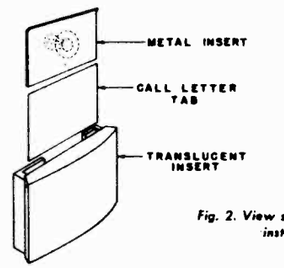

Fig. 2. View showing call letter installation.

RECORD CHANGER: Seeburg Model L, RCD. CH. 15-18

"clarified schematics"

MODELS R1251, R1252, X
MODELS R1251, R1252, XX, XXX

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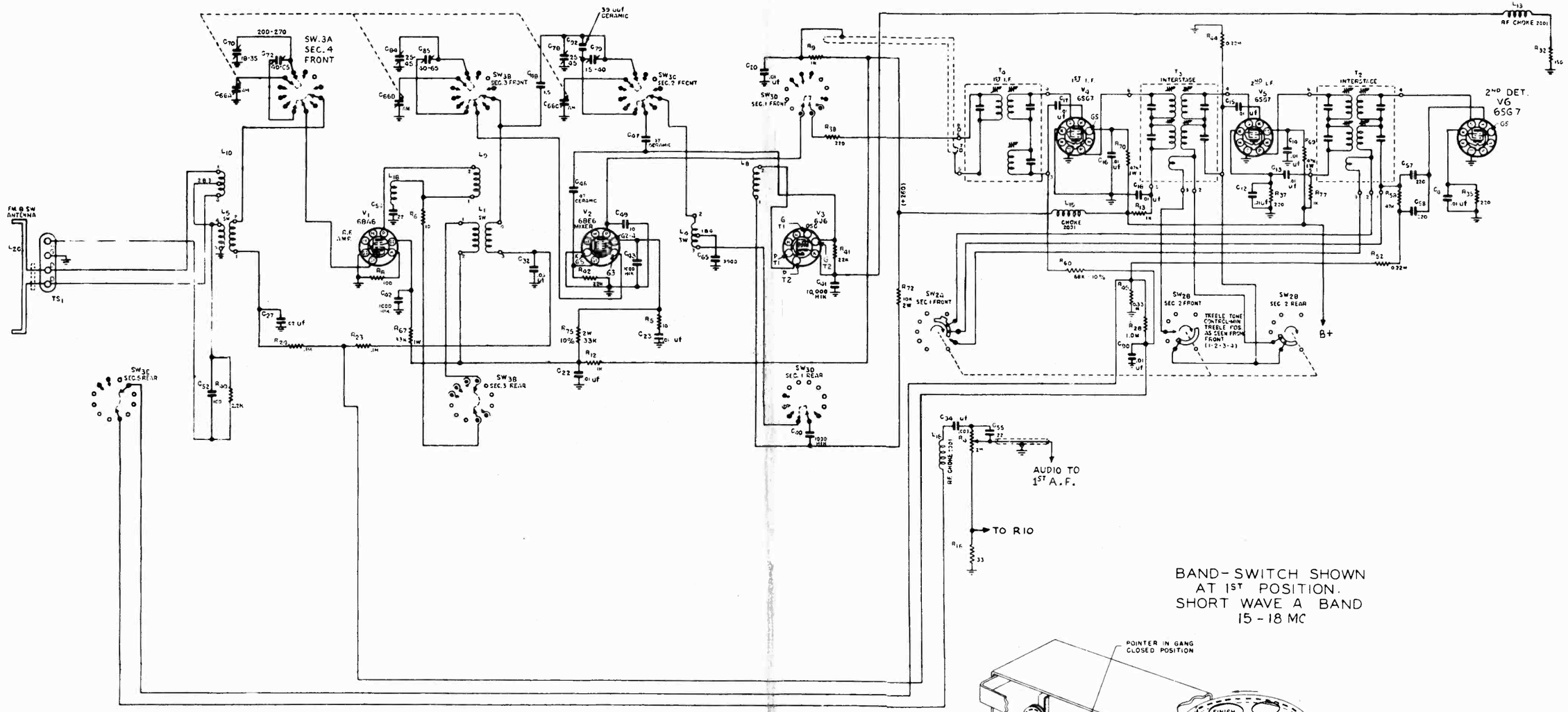

BAND-SWITCH SHOWN AT 1ST POSITION. SHORT WAVE A BAND 15 - 18 MC

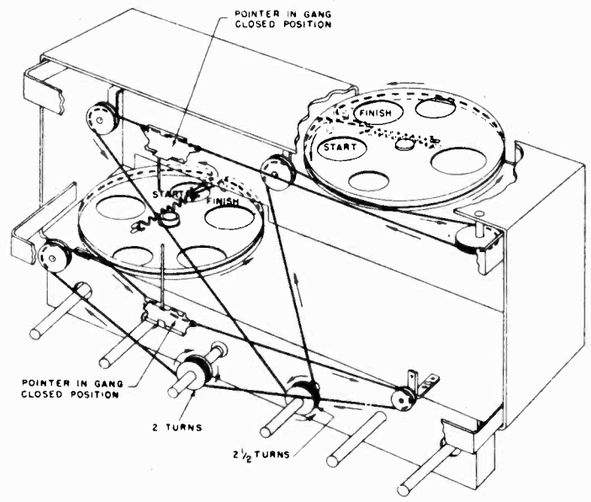

Fig. 7. Dial cable stringing procedure.

DIAL CORD STRINGING INSTRUCTIONS

For restringing the "FM" gang and dial, cut a 5 ft. piece of 9 lb. test dial cord and proceed as indicated in Fig. 7.

For restringing the "AM" gang and dial, cut a 4½ ft. piece of dial cord and proceed as indicated in Fig. 7.

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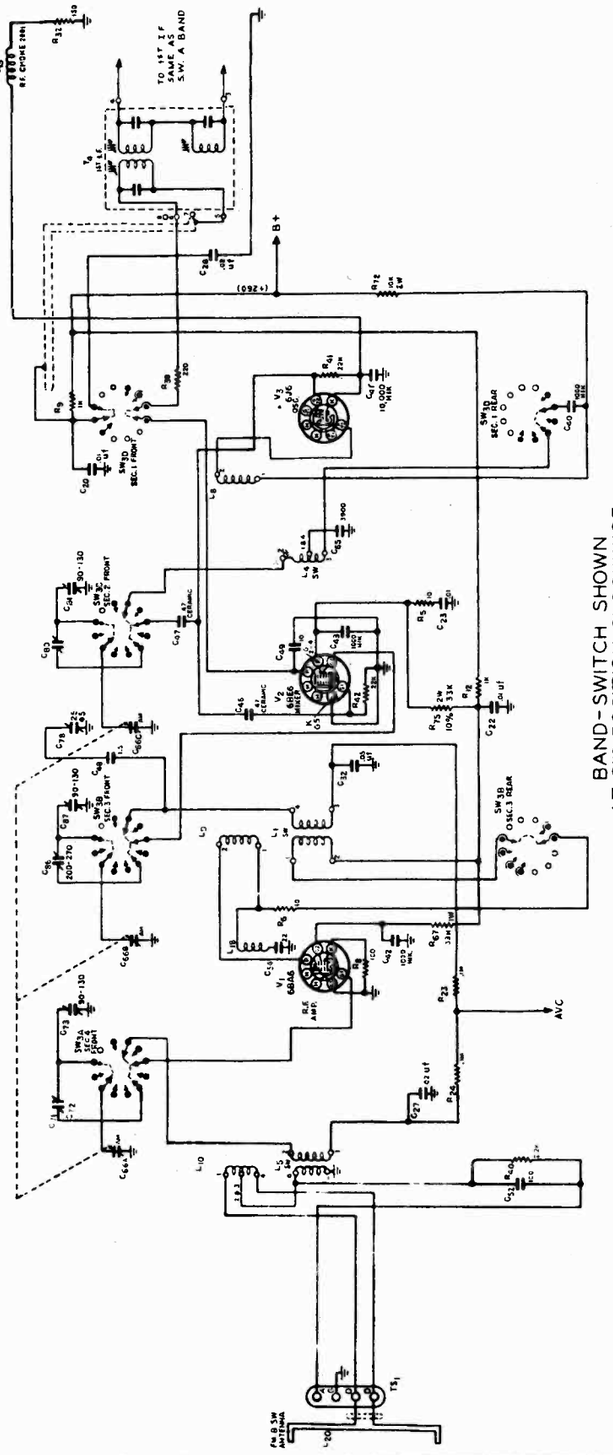

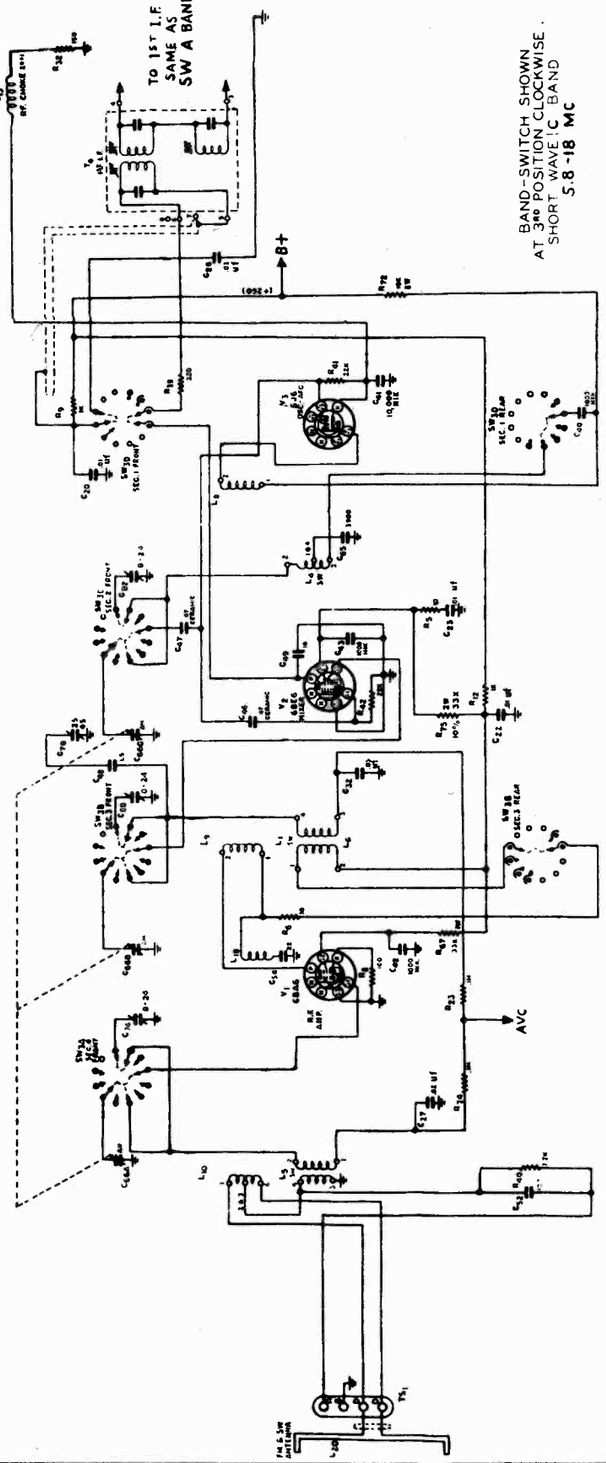

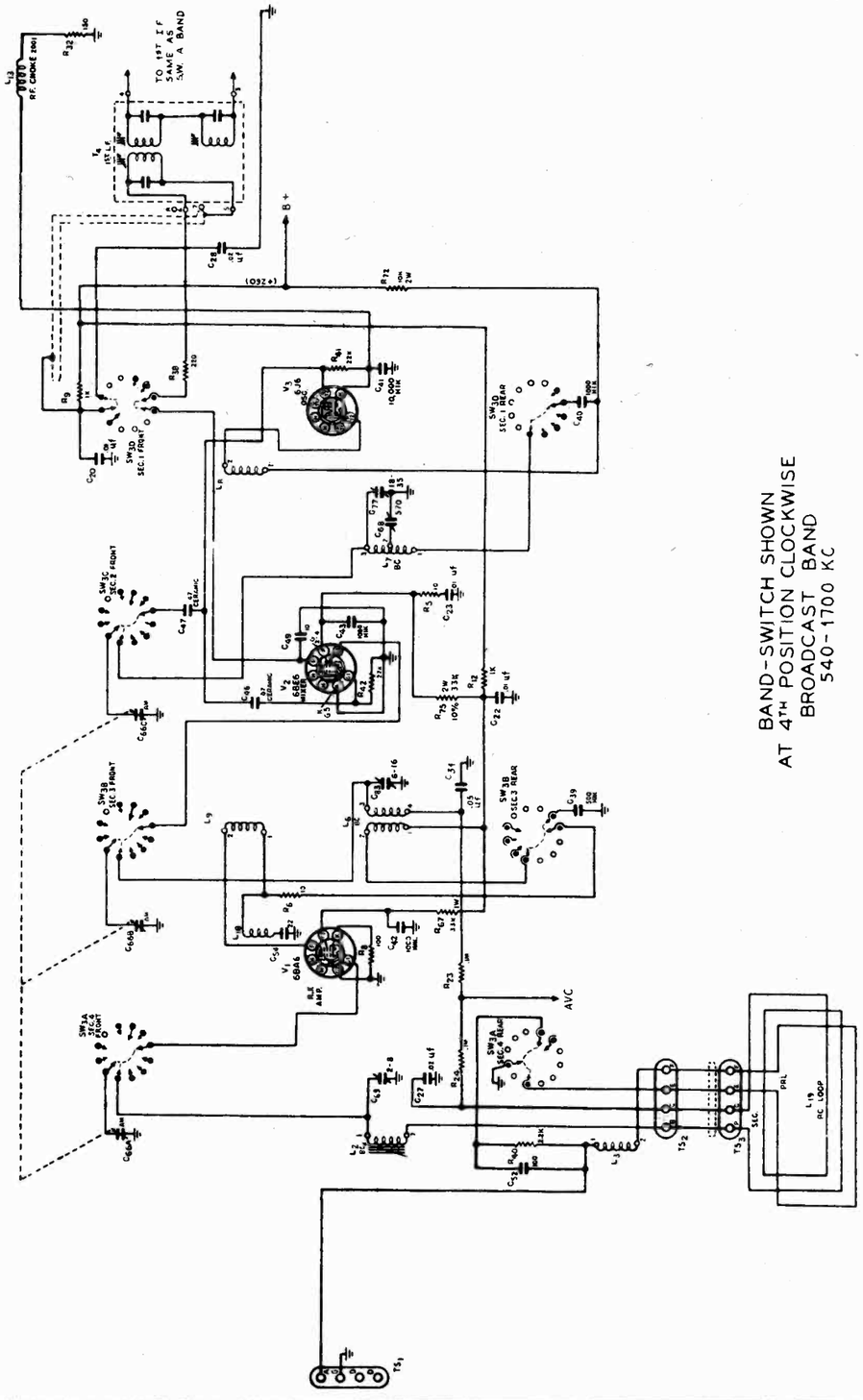

"clarified schematics"

MODELS R1251, R1252, X
MODELS R1251, R1252, XX, XXX

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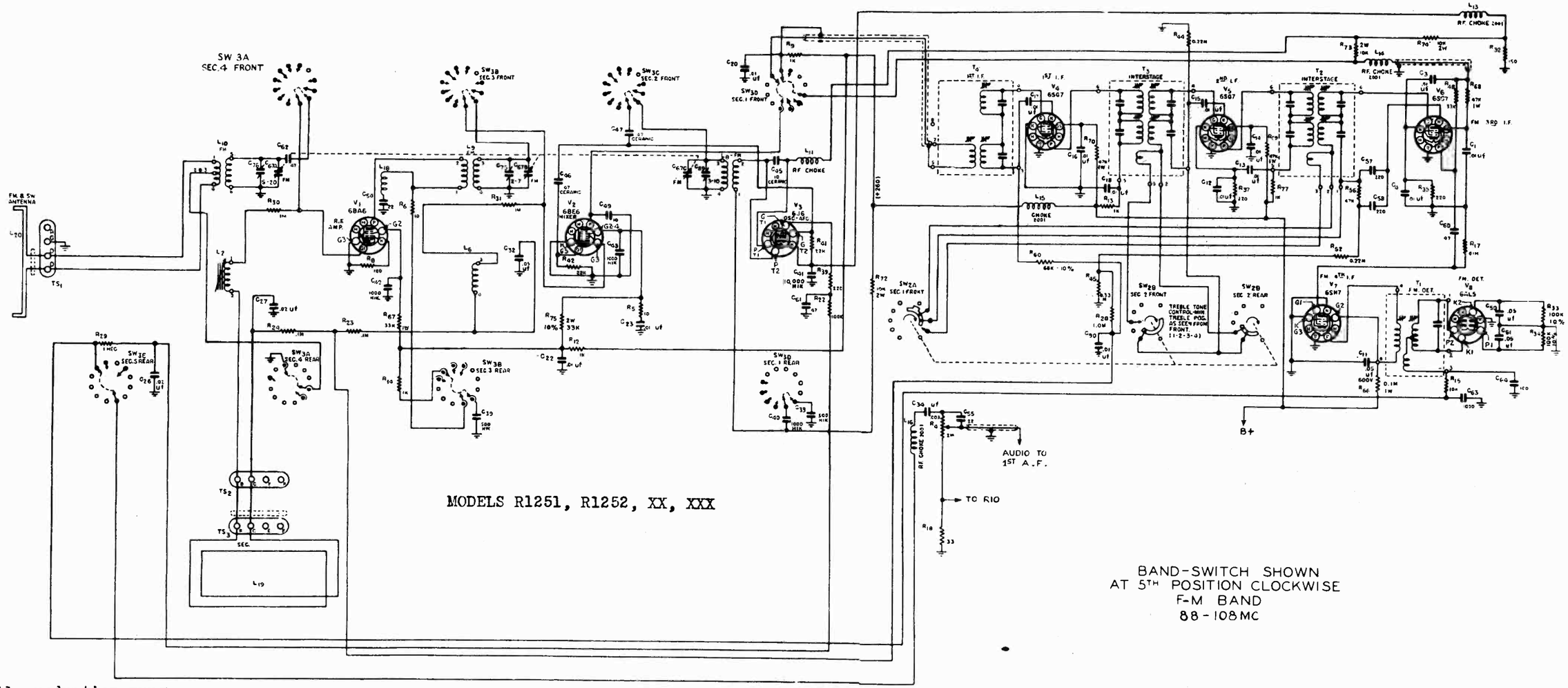

MODELS R1251, R1252, XX, XXX

BAND-SWITCH SHOWN
AT 5TH POSITION CLOCKWISE
F-M BAND
88 - 108MC

All production runs

SERVICE PARTS LIST

Illustration No.	Description	Delco Part No.
	CABINET PARTS	
	Mahogany	1217814
	Walnut	1217813
	TRANSFORMERS AND COILS	
T1	Freq. detector trans. FM	1217635
T2, 3	Interstage I.F. trans.	1217639
T4	1st I.F. trans.	1217640
L1	R.F. Coil, short wave	1217641
L2	Loading coil, ant., BC	1217642
L3	Loop loading coil	1217643
L4	Osc. coil, short wave	1217644
L5	Ant. coil, short wave	1217645
L6	R.F. Coil, B.C.	1217646
L7	Osc. coil, B.C.	1217647
L8	Osc. coil, FM	1217648
L9	R.F. coil, FM	1217718
L10	Ant. coil, FM	1217649
L11	Plate choke	1217613
L12	Filament choke	1217615
L13, 14, 15, 16, 17	R.F. choke	1217614
L18	R.F. choke	1217780
L19	BC-SW loop ant.	1217679
L20	FM dipole ant.	1217775
T5	Power transformer	1217600
T6	Output transformer	1217599
L21	Audio choke	1217650
	CONDENSERS	
C1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 90, 91.	.01 mfd. 600 v. tubular	E103
C26, 27, 28	.02 mfd 600 v. tubular	E203
C30	.1 mfd 200 v. tubular	E104
C31, 32	.05 mfd 600 v. tubular	E503
C33	.002 mfd 600 v. tubular	E202
C34, 35	.003 mfd 600 v. tubular	E302
C38, 39	500 uuf ceramic	1217712
C40, 41, 42, 43, 44, 16	1000 uuf ceramic	1217713
C45	10 uuf ceramic	1217714
C46, 47	47 uuf ceramic	1217715
C48	1.5 uuf "Gimmick," wire	Not Supplied
C49	10 uuf 500 v. mica, 10%	G100
C50, 51, 52, 53	100 uuf 500 v. mica	G101
C54	22 uuf 500 v. mica, 10%	G220
C55	22 uuf 500 v. mica	G220
C56, 57, 58	220 uuf 500 v. mica	G221
C59	330 uuf 500 v. mica	G331
C60, 61, 62	47 uuf 500 v. mica	G470
C63 64	1000 uuf 500 v. mica.	G102
C65	3900 uuf 500 v. mica	G392
C36	60-20 mfd 450 v. electrolytic 20 mfd 30 v. electrolytic	1217710
C37	40-10 mfd 450 v. electrolytic 20 mfd 30 v. electrolytic	1217711
C29	5 mfd. 50 v. electrolytic	J051
C68	570 uuf, trimmer	1217703
C75	Trimmer, FM, RF	1217705
C89	Trimmer, FM, Osc.	1217706
C76	Trimmer, FM, Ant.	1217707
C69, 70, 71, 72, 73, 74	Trimmer assembly, ant.	1217704
C77, 78, 79, 80, 81, 82	Trimmer assembly, Osc.	1217708
C83, 84, 85, 86, 87, 88	Trimmer assembly, RF	1217709
C67a-b-c	Variable condenser, "FM"	1217715
C66a-b-c	Variable Condenser, "AM"	1217717
C92	39 uuf. Ceramic	5255
	RESISTORS	
R1, 2	330 ohm. 5W WW	1217700
R76	330 ohm 10 W WW	1217831
R3	200 ohm 5W WW	1217701
R4	2 meg. volume control.	1217702
R5, 6	10 ohm. 1/2 W	A100
R7, 8	100 ohm. 1/2 W	A101

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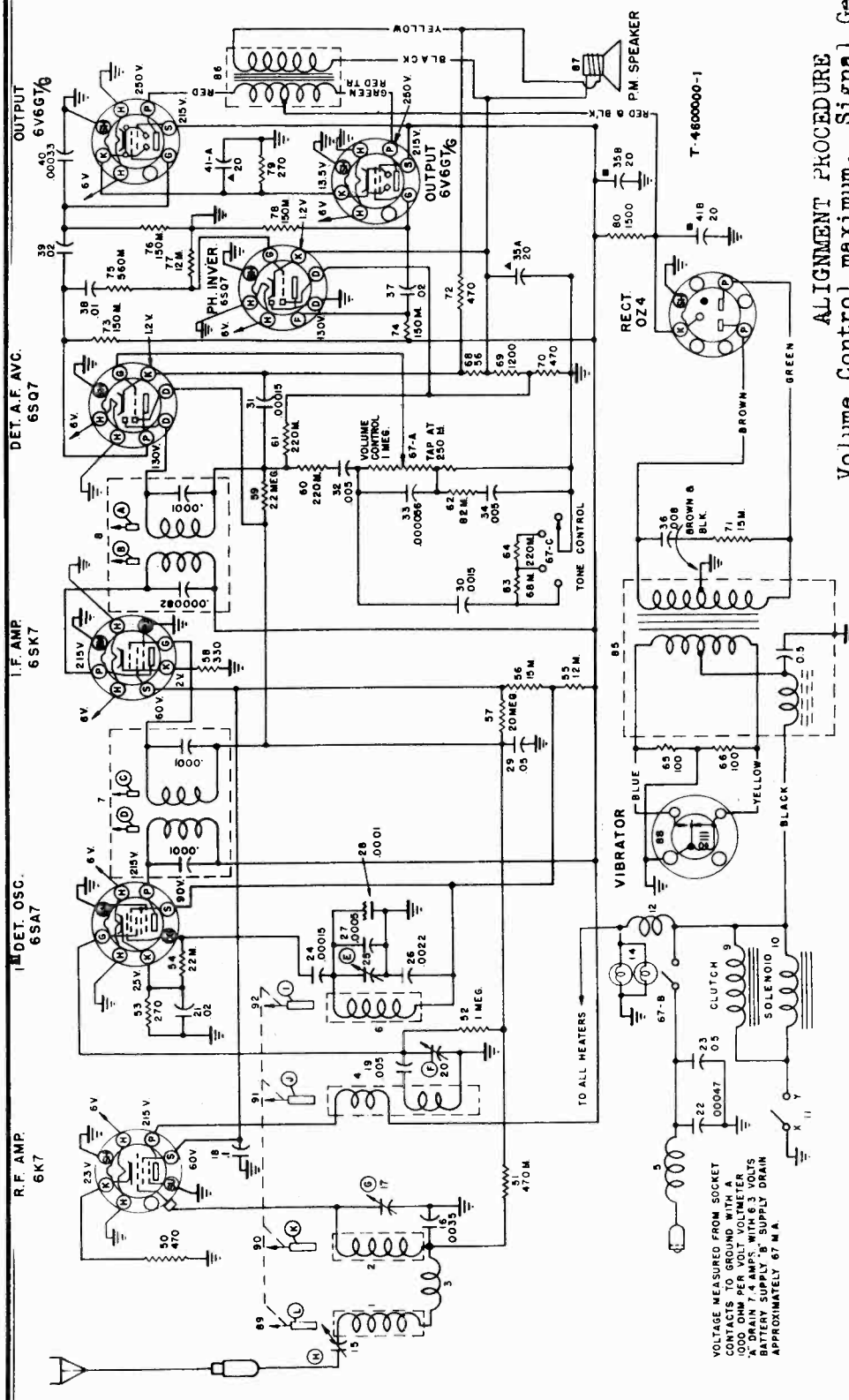

ALIGNMENT PROCEDURE

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

*Before making this adjustment, turn set screws, I, J, K, L several turns in a counter clockwise direction until the threaded stud extends 5/8" through the core bar (Illus.94). The purpose of this adjustment is to completely remove the tuning cores from the coils for the initial trimmer adjustments.

Adjust trimmer (H) to match car antenna (1,200 K.C.) when radio is installed.

Adjust Screws in Order	Tune Receiver To	Signal Generator Frequency	Connect to	Series Condenser Dummy Antenna
A, B	No Broadcast Signal	260 K.C.	6SK7 Grid	.1 Mfd.
C, D	No Broadcast Signal	260 K.C.	6SA7 Grid	.1 Mfd.
E, F, G, H	Extreme High Freq. End	1,645 K.C.	Antenna	*.000072
I, J, K, L	Extreme High Freq. End	1,620 K.C.	Antenna	.000072
J, K, L	Signal Generator	1,200 K.C.	Antenna	.000072
F, G, H	Signal Generator	600 K.C.	Antenna	.000072
J, K, L	Signal Generator	1,200 K.C.	Antenna	.000072

MODEL 984172, Pontiac

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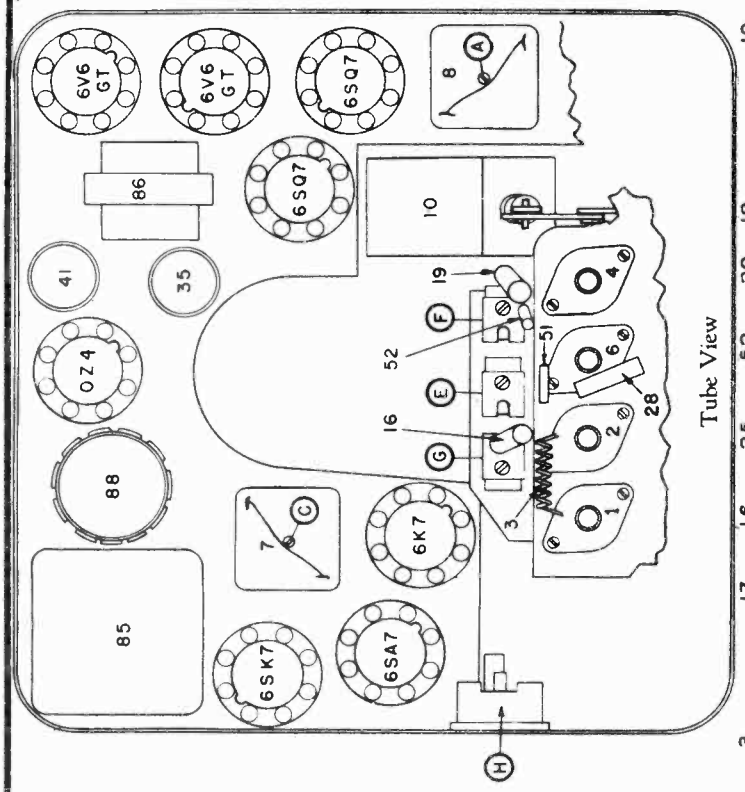

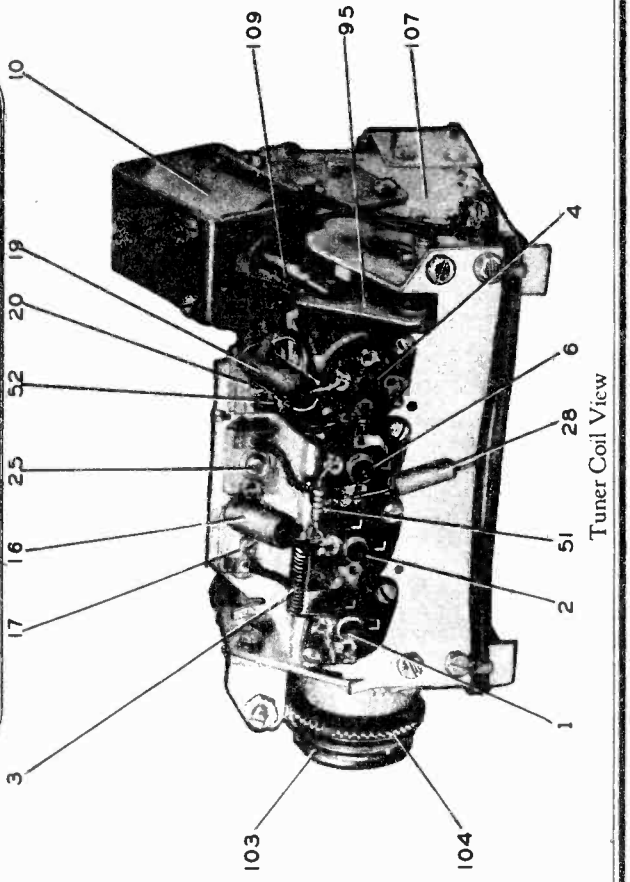

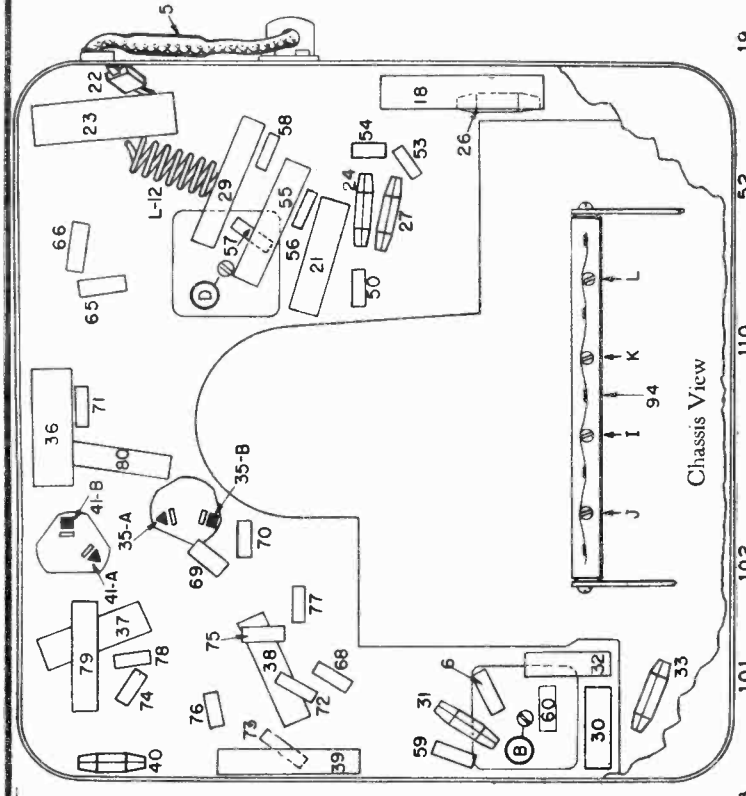

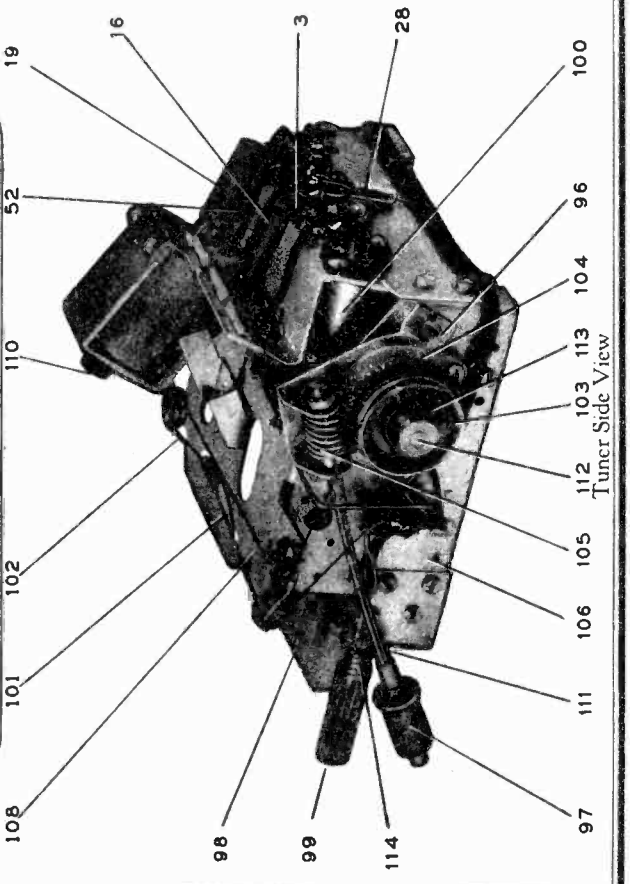

UNITED MOTORS SERVICE
DIV. OF GEN. MOTORS CORP.

MODEL 984172, Pontiac

SERVICE PARTS LIST

Coils

Ill. No.	Service Part No.	Description
1	1215800	Antenna (less shield can)
2	1215800	Antenna (less shield can)
3	1215801	Antenna choke
4	1215802	R.F. (less shield can)
5	1215803	"A" lead and choke assembly
6	1215804	Oscillator (less shield can)
7	1214491	First I.F. transformer
7A		I.F. coil assemblies
7B		.0001 mfd. mica
8	1214492	Second I.F. transformer
8A		I.F. coil assemblies
8B		.000082 mfd., mica
8C		.0001 mfd., mica
9	1214463	Clutch
10	1216431	Solenoid

Condensers

15	1214494	Antenna trimmer and bracket
16	7232954	.0035 mfd., 700 volts, tubular
17	1214456	8-80 mmfd.—trimmer
18	1207908	0.1 mfd., 400 volts—tubular
19	7230912	.005 mfd., 800 volts—tubular
20	1214456	8-80 mmfd.—trimmer
21	1212099	.02 mfd., 600 volts—tubular
22	1214168	.00047 mfd.—mica
23	7232403	0.5 mfd., 150 volts—tubular
24	7230893	.00015 mfd.—moulded mica
25	1214456	8-80 mmfd.—trimmer
26	7236159	.0022 mfd.—silvered mica, moulded
27	7236160	.00051 mfd.—silvered mica, moulded
28	1216120	.0001 mfd.—ceramic
29	7230592	.05 mfd., 600 volts—tubular
30	1214167	.0015 mfd., 1,500 volts—tubular
31	7230893	.00015 mfd.—moulded mica
32	7230912	.005 mfd., 800 volts—tubular
33	1215077	.000056 mfd.—moulded mica
34	7230912	.005 mfd., 800 volts—tubular
35	1216122	Electrolytic
35A		20 mfd., 25 volts
35B		20 mfd., 350 volts
36	1215191	.008 mfd., 1,500 volts—tubular
37	1212099	.02 mfd., 600 volts—tubular
38	1208600	.01 mfd., 600 volts—tubular
39	1212099	.02 mfd., 600 volts—tubular
40	7232957	.00033 mfd.—moulded mica
41	1216122	Electrolytic
41A		20 mfd., 25 volts
41B		20 mfd., 350 volts

Resistors

50	1213486	470 ohms, ½ watt
51	1210470	500,000 ohms, ½ watt
52	1209885	1 meg., ½ watt
53	1211188	270 ohms, ½ watt
54	1210882	20,000 ohms, ½ watt
55	1212491	12,000 ohms, 2 watt
56	1211089	15,000 ohms, ½ watt
57	7242581	20 meg., ¼ watt
58	1211220	300 ohms, ½ watt
59	1211164	2 meg., ½ watt
60	1210119	200,000 ohms, ½ watt
61	1210119	200,000 ohms, ½ watt
62	1210832	75,000 ohms, ½ watt
63	1210832	75,000 ohms, ½ watt
64	1210119	200,000 ohms, ½ watt
65	1211002	100 ohms, 1 watt
66	1211002	100 ohms, 1 watt
67	1215806	Volume control, tone control, and power switch
67A		Volume control
67B		Power switch
67C		Tone control
68	1212288	50 ohms, ½ watt
69	1211038	1,200 ohms, ½ watt
70	1213486	470 ohms, ½ watt
71	1211091	15,000 ohms, 1 watt
72	1213486	470 ohms, ½ watt
73	1211163	150,000 ohms, ½ watt
74	1211163	150,000 ohms, ½ watt
75	7232592	600,000 ohms, ½ watt
76	1211163	150,000 ohms, ½ watt
77	7231810	12,000 ohms, ½ watt
78	1211163	150,000 ohms, ½ watt
79	1216117	270 ohms, 2 watt
80	1216125	1,500 ohms, 2 watt

Miscellaneous Electrical Parts

85	1215807	Vibrator transformer
85A		Transformer coil and core
85B		0.5 mfd., 100 volts—tubular
85C		Reactor
86	1214488	Output transformer
87	1216432	Dynamic speaker, 6⅜ in. x 9¼ in. Elliptical
87A	1215838	Cone and voice coil
87B	1215839	Dust cap
88	8542	Vibrator
89, 90, 91	1215809	Tuning core—Color code YELLOW
89, 90, 91	1215810	Tuning core—Color code GREEN
89, 90, 91	1215811	Tuning core—Color code RED
92		

Tuner Mechanical Parts

	145635	Ball—For worm gear
94	1214461	Bar—Coil core draw
	1214484	Bar—Contact latch
	1214458	Bar—Rocker and gear
95	1216434	Bar—Solenoid draw and link
96	1215812	Bracket—Clutch and bearing assembly
	1214481	Bracket—Push button guide
97	1214478	Bushing—Tuning shaft
98	1215813	Button—Push
99	1215814	Button—Set-up
100	1215815	Can—Coil shield
101	1215816	Cord—Pointer cord and long link
102	1214508	Cord—Pointer cord and short link
	1216435	Dial—Tuning
	7235945	Disc—Rubber disc for clutch
103	1214468	Drum—Drive drum and clutch disc (rubber)
	1215818	Escutcheon—Dial
104	1216092	Gear—Drive gear and clutch friction disc assembly
105	1214842	Gear—Worm gear—less set screw
	1215819	Grommet—Rubber grommet for antenna or R.F. coils
	1215820	Grommet—Rubber grommet for oscillator coil
	1214462	Link—Coil draw bar
	1216436	Nut—Locknut for solenoid pole piece
	1214821	Nut—Locknut for worm gear bearing screw
	1309864	Nut—Mounting nut for tuning shaft bushing
	1215821	Pawl—Switch finger
106	1215822	Plate—L.H. end
107	1215823	Plate—R.H. end
108	1215824	Plate—Bottom plate with pulleys
	1216437	Plate—Dial back
	1216438	Plate—Front bearing
	1214444	Plate—Rear bearing
	1214460	Plate—Set-up button stop plate and switch rear contact
109	1216439	Plunger—Solenoid plunger and stud
	1215826	Pointer—Dial pointer and holder
110	1216440	Pole Piece—Solenoid
	1214822	Retainer—Solenoid draw bar retaining clip
	1214503	Retainer—Tuning dial
	1215827	Rod—Push rod and cam assembly
	132688	Screw—Dial back plate mounting
	1214845	Screw—Dial escutcheon
	1215121	Screw—Set screw for drive drum
	127555	Screw—Set screw for worm gear
	7240316	Screw—Set screw for worm gear bearing
	1214483	Shaft—Contact latch bar, and switch finger pawl shaft
111	1214477	Shaft—Flexible tuning shaft—less bushing
	1214469	Shaft—Solenoid draw bar
	1214464	Shell—Clutch coil cover
	1214486	Shield—Light shield
112	1215828	Spindle—Clutch spindle and gear assembly
	1214466	Spring—Clutch
	1214843	Spring—Coil draw bar link
	1214831	Spring—Coil draw bar
	1214825	Spring—Contact latch bar
113	1216208	Spring—Pointer cord
	1214482	Spring—Push button retaining spring strip
	1216441	Spring—Push rod return
	1215235	Spring—Rocker bar gear
114	1216118	Spring—Set-up button
	1216442	Spring—Solenoid draw bar
	1214824	Spring—Switch finger pawl
	7236121	Spring—Tension spring for drive gear
	1216209	Spring—Tension spring for rocker bar
	7236001	Washer—"C" washer for flexible shaft
	1214835	Washer—Felt washer for push rods
	7235892	Washer—Fibre washer for worm gear thrust
	1214837	Washer—Flat washer for solenoid draw bar
	1214823	Washer—Spring washer for worm gear thrust

Tubes

7232770	6K7—R.F.
7237886	6SA7—First Detector—Oscillator
7237887	6SK7—I.F.
7237888	6SQ7—Second Detector—A.F.—A.V.C.
7237888	6SQ7—Phase Inverter
1213637	6V6GT—Output
1213637	6V6GT—Output
7237180	0Z4—Rectifier

Miscellaneous Mechanical Parts

1860926	Bushing—Bushing and ferrule for "A" lead connector
1215829	Case—Complete receiver case
1214495	Connector—"A" lead connector and bracket
1215830	Cover—Vibrator "hash" cover
1215831	Gasket—Sponge rubber gasket for speaker cover
115273	Lamp—Dial lamp—Mazda No. 51
1309864	Nut—⅜ in. x 28 in. nut for volume control bushing
1213439	Socket—Tube
1215196	Socket—Vibrator
1214497	Spacer—Spacing collar for volume control shaft

Installation Parts

1215832	Package No. 1—Instrument Panel Hardware
505629	Bolt—¼ in. x 20 x ⅝ in. hex head (1)
7235968	Nut—⅜ in. x 28 in. x ⅛ in. hex (2)
1299232	Washer—¼-in. (plain) (1)
121753	Washer—Shakeproof (1)
1216443	Package No. 2—Panel Parts
508921	Card—Owner's instruction and warranty card (1)
508865	Marker—Station call letter markers (1)
508583	Plate—Control finish plate (1)
1215834	Package No. 3—Knob Kit
507510	Knob—Dummy (1)
507511	Knob—Tone control (1)
507505	Knob—Tuning and volume control (2)
505630	Washer—Felt washer (1)
7238755	Washer—Spring washer (1)
1215835	Package No. 4—"A" Lead and Fuse
106653	Fuse—20 ampere (1)
504842	Lead—"A" lead assembly (1)
1845913	Tube—Fuse insulating (1)
1215836	Package No. 5—Suppressor and Condenser Kit
1853686	Adapter—Suppressor (1)
1882758	Condenser—Ammeter (1)
1879777	Condenser—Generator (1)
509129	Insulator—Distributor Suppressor (1)
144722	Screw—No. 7 x ⅜ S.T. hex head (1)
1207821	Suppressor—Distributor (1)