



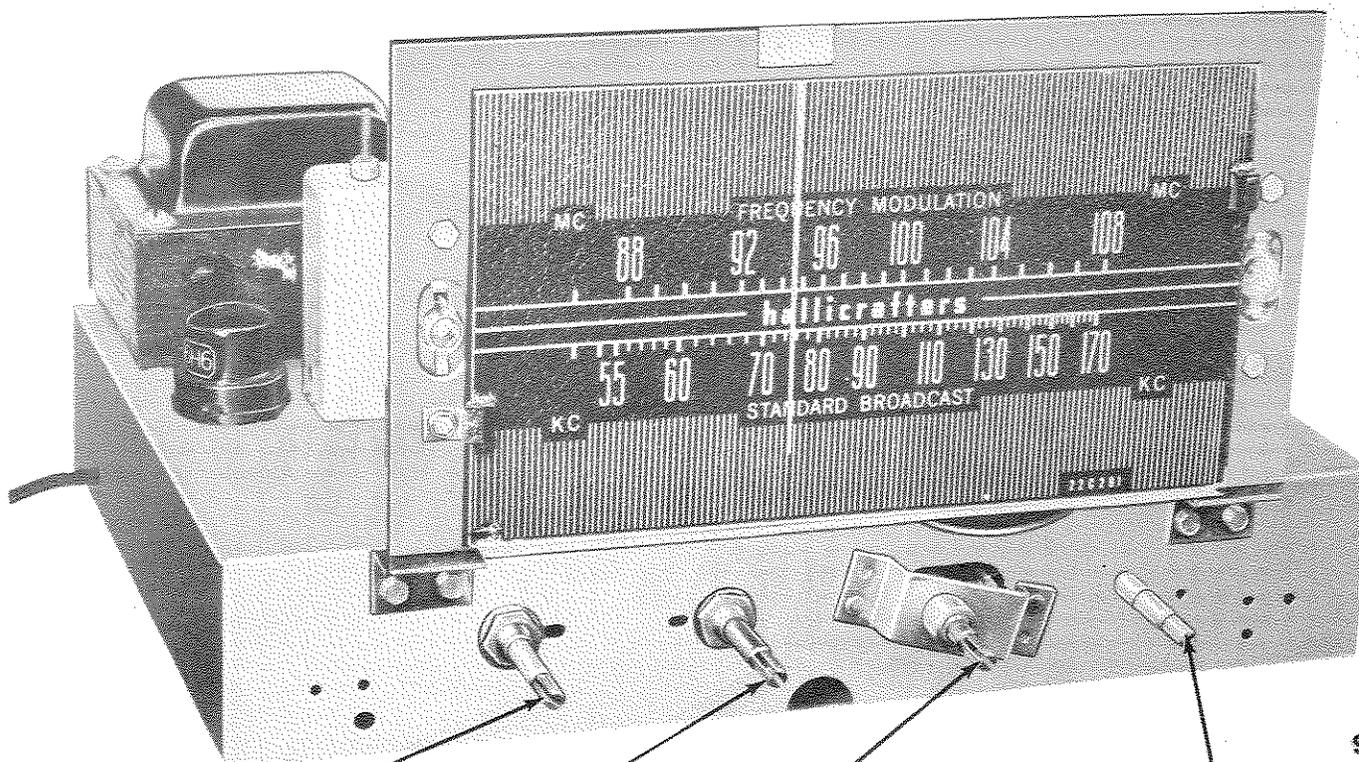
communications

**OPERATING and SERVICE
INSTRUCTIONS**

S-78

the hallicrafters co.

MANUFACTURERS OF RADIO AND ELECTRONIC EQUIPMENT, CHICAGO 24, U. S. A.



OFF-VOICE-NORMAL-
BASS-HI-FI

This is a combination power switch and tone control. In position one the receiver is completely turned off. To turn the receiver on, set this control at any of the four remaining positions, depending upon the tone qualities desired. Illumination of the dial indicates that the receiver is obtaining power from the wall outlet and ready for use. The tone control settings generally used are VOICE and NORMAL for speech and BASS and HI FI for musical entertainment.

Turn this control clockwise to increase volume and counter clockwise to decrease volume.

VOLUME

FM-BROADCAST-PHONO

This is the combination range and operation switch. In the FM (Frequency Modulation) position, the receiver tunes the 88 to 108 megacycle FM band; and in the BROADCAST position, the receiver operates as a standard broadcast receiver tuning the frequency range 540 to 1750 kilocycles. To use the receiver as a record player, set this switch at PHO and operate the volume and tone controls as for normal radio reception.

TUNING

The tuning control "tunes in" either BC or FM stations depending upon the setting of the range switch. The standard broadcast band dial is calibrated so that a zero must be added to the number appearing on the dial to obtain the station frequency in kilocycles. The frequencies of the FM stations are shown directly in megacycles. The frequencies of local stations are generally listed in local newspapers, BC stations in kilocycles and FM stations in megacycles. When tuning for the station, tune carefully and obtain top performance from your receiver.

92X1252

GENERAL SPECIFICATIONS

Mounting details illustrated on page 10.

Tubes Ten plus rectifier

Speaker Output 3.2 and 500 ohms.

Speaker Connection. Std. 5 pin socket.

Antenna Provisions for external antennas

Tuning Manual

Tuning Range Broadcast 540 kc - 1750 kc
Frequency
Modulation 88 mc - 108 mc

Intermediate Frequency 455 kc/10.7 mc.

Power Supply. 105-125 V. 50/60 cycles AC

Power Consumption 90 Watts

INSTALLATION

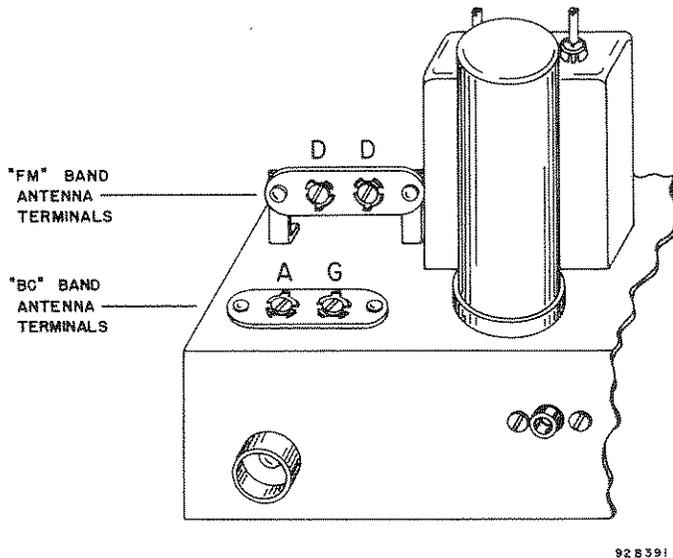


Fig. 2. Antenna terminal strip connections

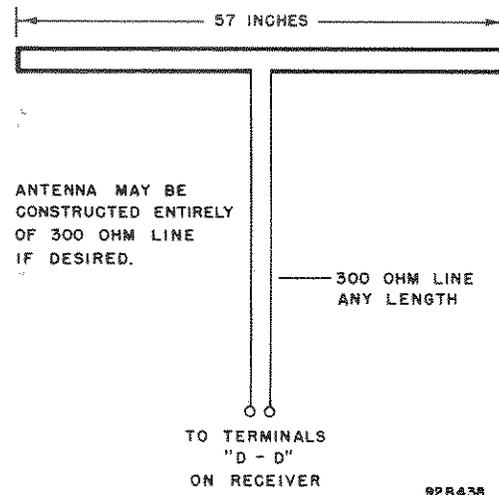


Fig. 3. Folded doublet antenna details.

When locating the receiver, avoid excessively warm locations such as are found near radiators or hot air registers. When placing the receiver with its back to the wall, leave about an inch or two of clearance between the back of the cabinet and the wall for proper ventilation.

There are three basic connections to be made, antenna, speaker, and power, to completely set up the receiver. All connections are located on the rear apron of the chassis.

ANTENNA - Terminals are provided for separate AM broadcast (BC) and FM broadcast (FM) antennas. The BC band antenna terminals are marked "A" and "G" and the FM band antenna terminals are identified by "D-D".

BC Antenna - The standard broadcast band antenna may consist of any single length of wire from approximately ten feet to fifty feet depending upon the local receiving conditions. Attach the wire to the "A" terminal of the antenna terminal strip. Erect outdoor antenna installations as high and as free from surrounding objects as possible. Erecting this type of antenna at right angles to local "man made" sources of static, (street car lines, power lines, etc.) is recommended for best results. An excessively long antenna will not necessarily be the most desirable antenna. Use the length that will provide adequate signal pick up.

For some installations it will be found desirable to connect a ground wire to the "G" terminal of the terminal strip. A radiator or water pipe will generally serve as a good ground connection.

FM Antenna - The antenna for FM reception may consist of any type of antenna that operates with a 300-ohm transmission line. If a commercial antenna is installed, be sure it uses a 300-ohm transmission line. The transmission line from the antenna is connected to terminals "D-D" on the receiver.

The simplest antenna which will provide satisfactory results, mounted either on the back of a console cabinet or outside the building, is the folded doublet. This antenna may be constructed from 300-ohm transmission line as shown in Fig. 3. Keep in mind that the doublet antenna response favors signals broadside to its length and should be erected with its length at right angles to the direction of reception. This is especially important where receiving conditions are poor and maximum antenna pickup is required.

POWER SOURCE - The receiver operates from a 105-125 V. 60 cycle AC source only. The receiver will not operate from a 115 V. direct current source or 25 cycle AC source directly. If in doubt as to the voltage and frequency rating of your power source, contact the local power company representative and avoid costly repairs. The nominal power consumption for this receiver is 90 watts.

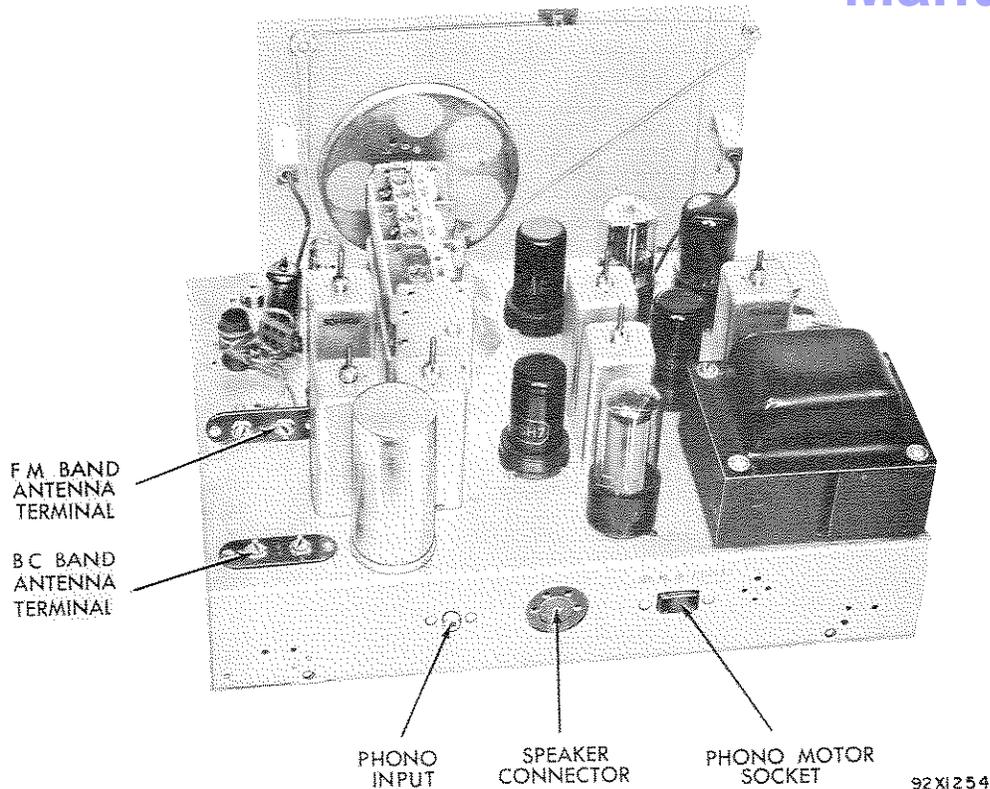


Fig. 4. Component location, rear view

SPEAKER CONNECTIONS

The speaker connector is located on the rear apron of the receiver. Connection is to be made through a standard 5 pin tube socket. The receiver is designed to operate into either a 3.2 ohm or a 500 ohm speaker load. For detailed information on making connections for either load refer to the schematic diagram. If a matching transformer is used in connection with the speaker load it should be capable of handling approximately 10 watts of audio power.

RECORD PLAYER CONNECTION

A shielded type receptacle is provided at the rear chassis apron to accommodate a record player pickup cable connector. Any record player employing a crystal cartridge or high level magnetic pickup in its tone arm may be used with the receiver. A utility receptacle is provided at the rear apron of the receiver to accommodate the power plug of the record player. The use of this receptacle will permit the record player to be turned off with the receiver.

TUBE REPLACEMENT

The types of tubes required and their relative position in the receiver are shown in the illustration, Fig. 6. When installing a replacement tube, insert the center guide pin into the center hole of the tube socket; rotate the tube until the key on the guide pin drops into the notch in the socket hole; and push down until the base of the tube rests firmly on the socket. A slightly different technique must be used on the miniature tubes. They have seven small pins which have to be lined up with the socket holes before pushing into place. Handle with care as all tubes are considered fragile and do not tolerate much mechanical abuse.

DIAL LAMP REPLACEMENT

Refer to Fig. 6 for the location of the two dial lamps used in the receiver. To gain access to defective lamps, unclip the dial lamp socket by compressing the side springs. The socket may then be brought out into the open to change the defective lamp.

SERVICE OR OPERATING QUESTIONS

For further details regarding operation or servicing of the receiver, contact your dealer directly. Make no service shipments directly to the factory before first writing for authorization and instructions. The factory cannot accept responsibility for unauthorized shipments.

RESTRINGING DIAL CORD

Restring the dial drive with 30 lb. test dial cord. Tie one end to the tension spring and follow the sequence outlined in Fig. 5. Stretch the tension spring and tie the end of the cord securely to the spring as shown.

Set the tuning condenser at maximum capacity (closed), attach the pointer to the string and line it up with the left hand index mark on the dial scale.

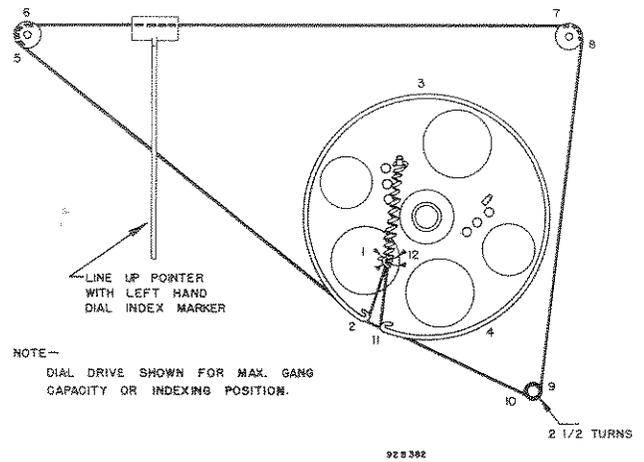


Fig. 5. Dial cable stringing procedure.

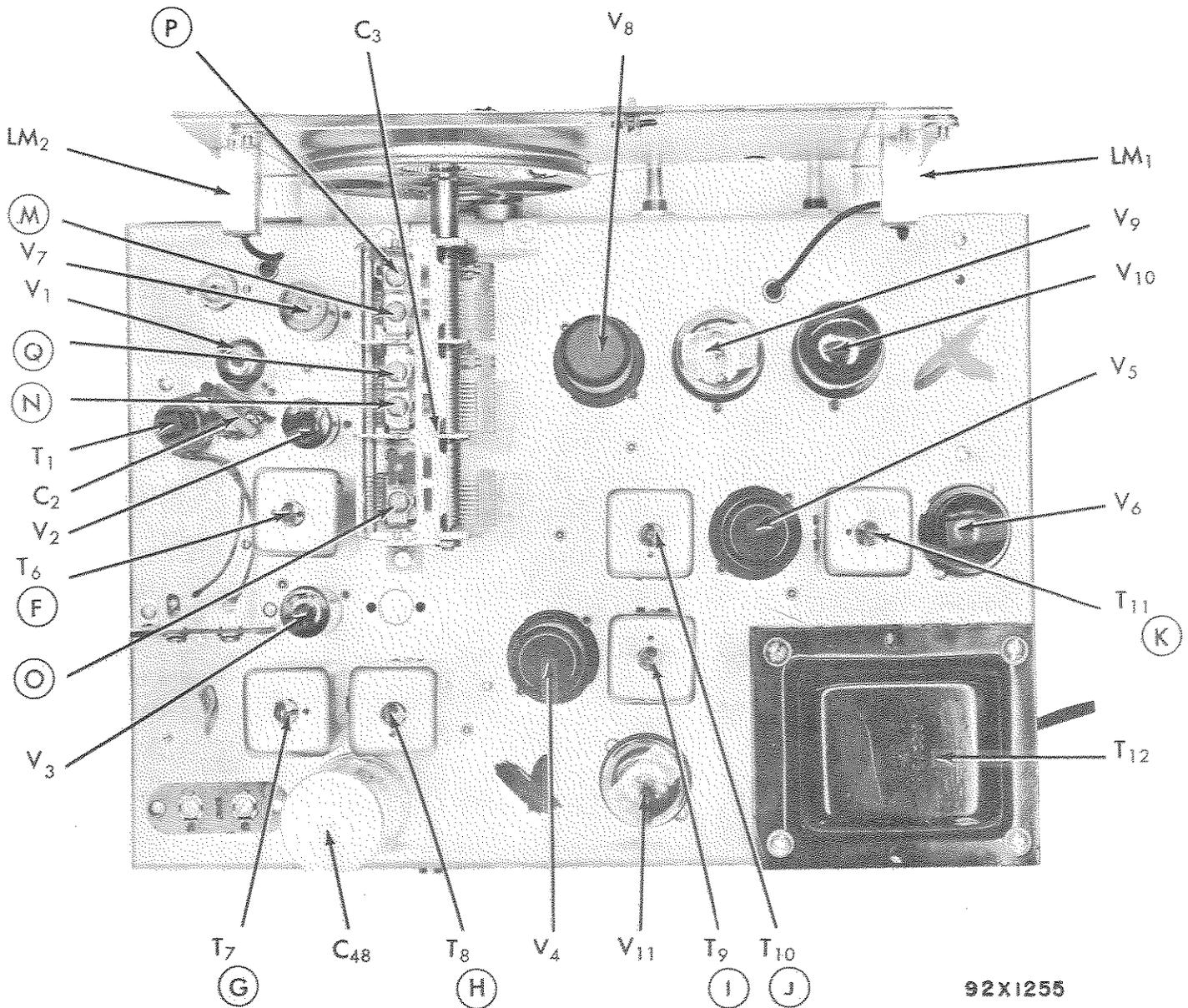


Fig. 6. Top view alignment points & component locations

ALIGNMENT PROCEDURE

The receiver is equipped with AUTOMATIC FREQUENCY CONTROL on the FM band to compensate for oscillator drift and improve the tuning function on the FM band. The correction factor is approximately 5 times: AFC takes hold 250 kc before the station frequency is reached and releases before tuning 500 kc beyond the station frequency when receiving a 1000 microvolt signal.

The standard RMA dummy specified in the alignment chart consists 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.

When making the alignment adjustments set the tone control at NORMAL and the volume control at maximum volume. Use just enough signal generator output to obtain the results indicated on the chart.

ALIGNMENT CHART

Step	Dummy Antenna	Signal Generator Coupling	Signal Generator Frequency	Band Switch Pos.	Radio Dial Setting	Adjust	Remarks
1	0.01 mfd. cap	To high cap. stator of center section.	455 kc	"BC"	1000 kc	A,B,C,D, E	Adjust for max. audio output. Keep audio output below 500 MW to avoid AVC action.
2	0.01 mfd. cap. in series with a 4700 ohm carbon resistor.	To low cap. stator of center section.	10.7 mc	"FM"	90 mc	F,G,H,I, J,K	Adjust for max. voltage as measured between pin #3 of 6H6 and ground with an electronic volt meter. Adjust signal generator output for approx. 2 volts DC at this point.
3	0.01 mfd cap.	See step 2.	10.7 mc	"FM"	90 mc	L	Adjust for zero voltage as measured between the junction of R27 and R28 and ground with an electronic volt meter.
4.	Std RMA dummy	To terminals "A" and "G" on terminal strip TS-2.	1500 kc	"BC"	1500 kc	*M,N,O	Adjust for max. output as in step 1.
5.	Two 150 ohm carbon resistors	To terminals "D-D" on terminal strip TS-1.	105 mc	"FM"	105 MC	*P,Q	Adjust for max. voltage as measured across R54 with an electronic volt meter. Adjust signal generator output for approx. 1 volt DC at this point.

*NOTE - Calibration adjustments.

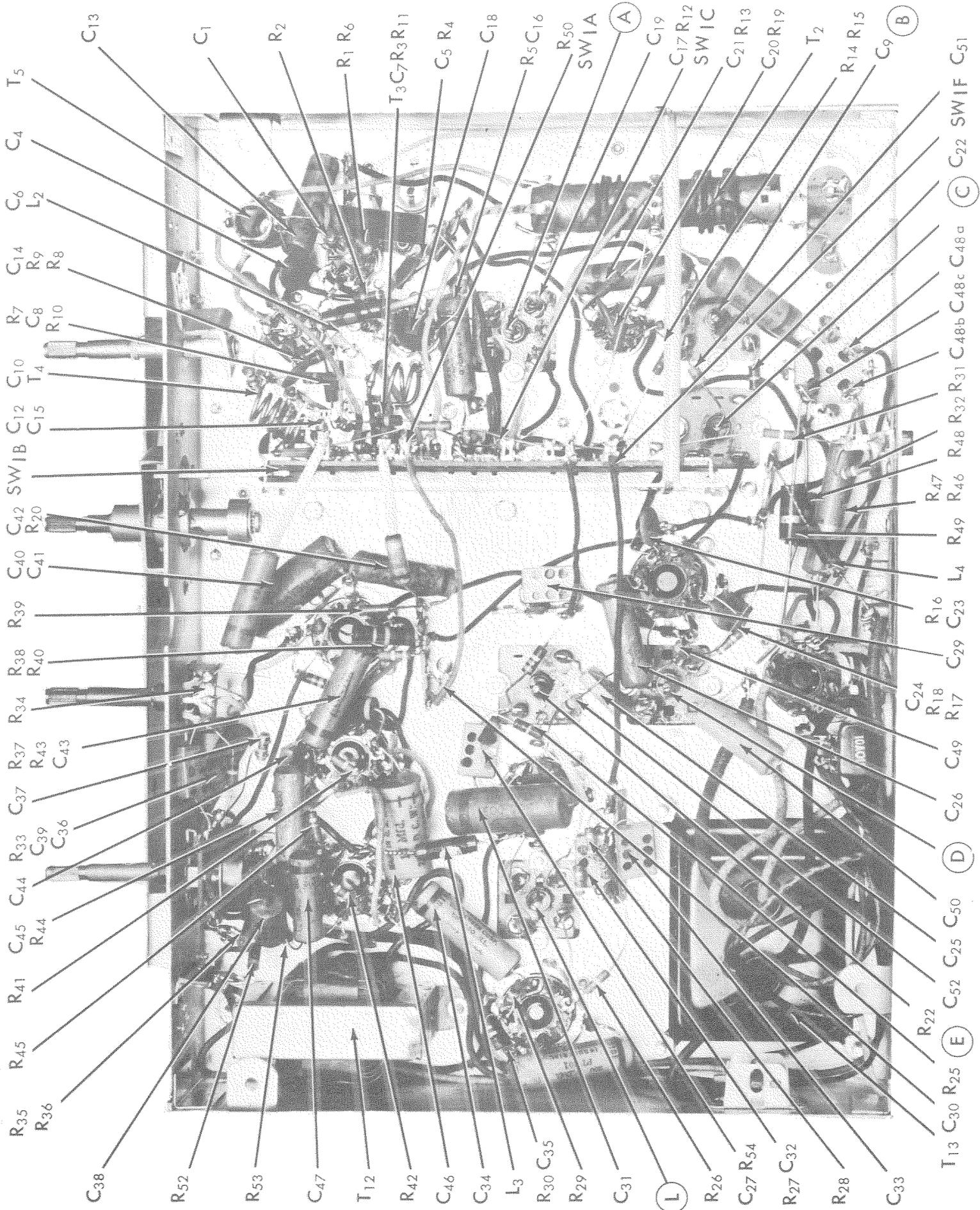


Fig. 7. Bottom view alignment points & component locations

92X1253

SERVICE PARTS LIST

Ref. No.	Description	Hallicrafter's Part Number
CONDENSERS		
C-1,7,15,19	100 mmf. 500 V., ceramic	47B20101M5
C-2	100 mmf. 500 V., mica	CM20A101M
C-3	Tuning condenser, 5 sections	48C196
C-4,5,14,17,18,20,23,24	.005 mfd. 450 V., ceramic	47A168
C-6	33 mmf. 500 V., ceramic	CC20UK330K
C-8	3.3 mmf. 500 V., bakelite	47A160-5
C-9,34,35	.05 mfd. 200 V., tubular paper	46AU503J
C-10,12	47 mmf. 500 V., ceramic	CC20UK470M
C-11	7 mmf. 500 V., ceramic	CC20UK070K
C-13,21,26,36,43,45	.01 mfd. 600 V., tubular paper	46AZ103F
C-16	.02 mfd. 200 V., tubular paper	46AU203J
C-22	4.7 mmf. 500 V., bakelite	47A160-6
C-25	12 mmf. 500 V., mica	CM20A120K
C-27	47mmf. 500 V., mica	CM20A470M
C-29,32,33	150 mmf. 500 V., mica	CM20A151M
C-30,37,49	1000 mmf. 500 V., ceramic	47B20102M5
C-31,41	.05 mfd. 600 V., tubular paper	46AY503J
C-38	.03 mfd. 200 V., tubular paper	46AU303J
C-39	68 mmf. 500 V., mica	CM20A680M
C-40	.003 mfd. 600 V., tubular paper	46AZ302J
C-42	.005 mfd. 600 V., tubular paper	46AZ502J
C-44	220 mmf. 500 V., mica	CM20A221M
C-46	10 mfd. 25 V., electrolytic	45A121
C-47	.002 mfd. 600 V., tubular paper	46AZ202J
C-48	60-20-20 mfd. 450 V., electrolytic	45B113
C-50	.01 mfd. 600 V., molded paper	46AG103J
C-51,52	1 mmf. 500 V., bakelite	47A160-2

RESISTORS

R-1,13	1 megohm $\frac{1}{2}$ watt, carbon	RC20AE105M
R-2,14,17,27,28	47,000 ohms $\frac{1}{2}$ watt, carbon	RC20AE473M
R-3,5,26,31	220,000 ohms $\frac{1}{2}$ watt, carbon	RC20AE224M
R-4,15	470 ohms $\frac{1}{2}$ watt, carbon	RC20AE471M
R-6	4700 ohms 2 watts, carbon	RC40AE472M
R-7	10 ohms $\frac{1}{2}$ watt, carbon	RC20AE100M
R-8,25	22,000 ohms $\frac{1}{2}$ watt, carbon	RC20AE223M
R-9	150 ohms $\frac{1}{2}$ watt, carbon	RC20AE151M
R-10	220 ohms $\frac{1}{2}$ watt, carbon	RC20AE221M
R-11,33,54	100,000 ohms $\frac{1}{2}$ watt, carbon	RC20AE104M
R-12,32,40,41,42	470,000 ohms $\frac{1}{2}$ watt, carbon	RC20AE474M
R-16	270 ohms $\frac{1}{2}$ watt, carbon	RC20AE271K
R-18,53	1000 ohms $\frac{1}{2}$ watt, carbon	RC20AE102M
R-19,39	2.2 megohms $\frac{1}{2}$ watt, carbon	RC20AE225M
R-20	68,000 ohms $\frac{1}{2}$ watt, carbon	RC20AE683M
R-22	330,000 ohms $\frac{1}{2}$ watt, carbon	RC20AE334M
R-29,30	100,000 ohms $\frac{1}{2}$ watt, carbon	RC20AE104K
R-34	Volume control, 2 megohms (tapped)	25B623
R-35,36,44,50	6800 ohms $\frac{1}{2}$ watt, carbon	RC20AE682M
R-37	330 ohms $\frac{1}{2}$ watt, carbon	RC20AE331K
R-38	100,000 ohms 1 watt, carbon	RC30AE104K
R-43	300 ohms 2 watt, carbon	RC40AE301J
R-45	12,000 ohms $\frac{1}{2}$ watt, carbon	RC20AE123K
R-46,47	1200 ohms 2 watt, carbon	RC40AE122K
R-48,49	1500 ohms 2 watt, carbon	RC40AE152K
R-52	15,000 ohms 1/2 watt carbon	RC20AE153K

TRANSFORMERS AND COILS

T-1	Transformer, FM, antenna stage	51B1021
T-2	Transformer, BC, mixer stage	51B1059
T-3	Transformer, FM, mixer stage	51B1022
T-4	Transformer, FM, osc. stage	51B1073
T-5	Transformer, BC, osc. stage	51B1020
T-6	Transformer, 1st I.F.	50B409
T-7,9	Transformer, 2nd I.F. and AM Detector & FM limiter	50B407

SERVICE PARTS LIST (Cont.)

Ref. No.	Description	Hallicrafter's Part Number
TRANSFORMERS AND COILS (Cont.)		
T-8,10	Transformer, 2nd I.F. and AM Detector & FM limiter	50B408
T-11	Transformer, FM, detector stage	50B410
T-12	Transformer, audio output	55B158
T-13	Transformer, power	52C152
L-2	Plate choke for tube V1	53B124
L-3	Filament choke for tubes V5 & 6	53B123
L-4	Filament choke for tubes V1,2,3, & 7	53A136

SWITCHES

SW-1	Band switch assembly	60B318
SW-2	Switch, tone control	60B319

PLUGS AND SOCKETS

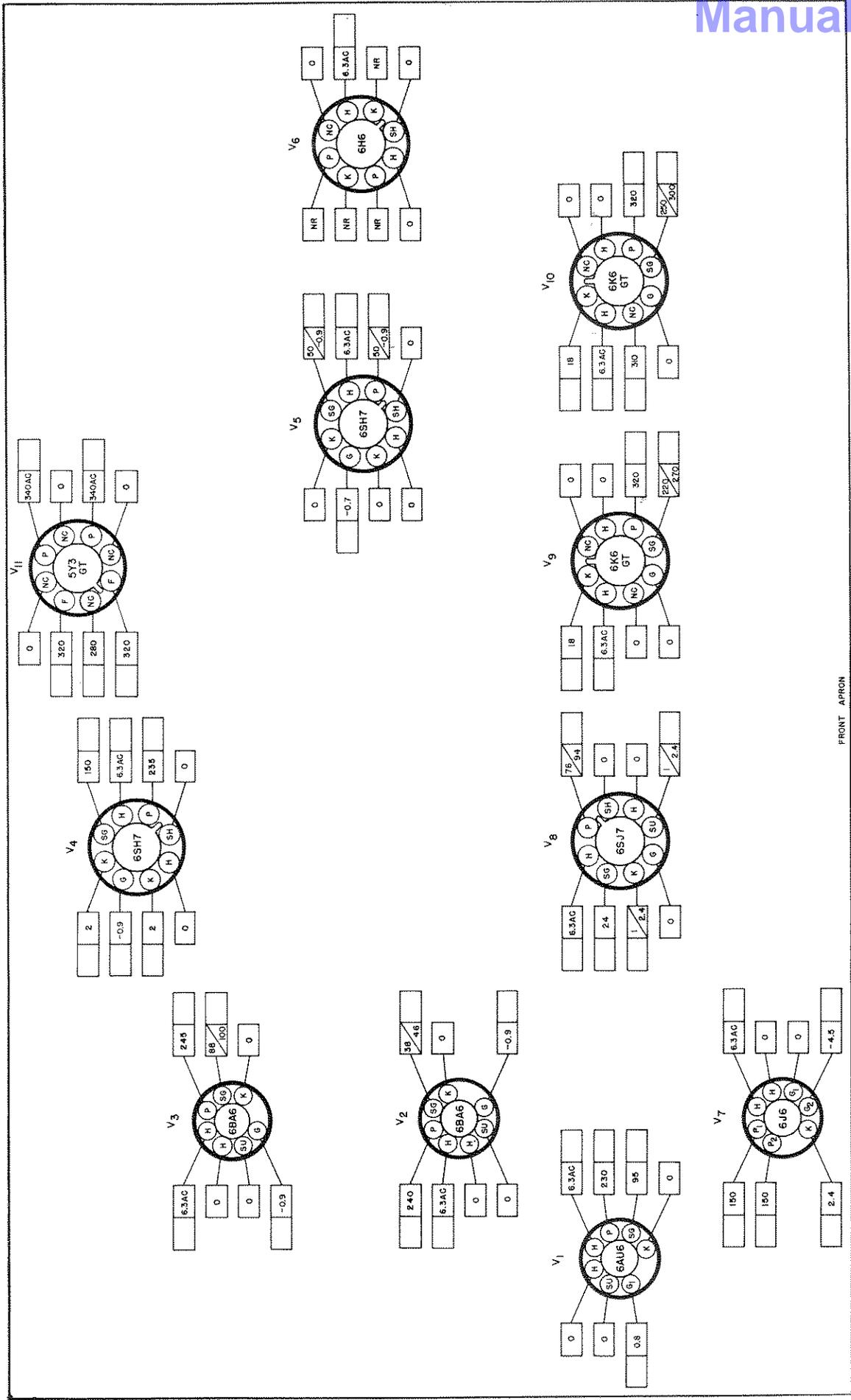
PL-1	Line cord and plug	87A078
SO-2	Receptacle, television, phono	36A029
SO-3	Receptacle, speaker	6A277
SO-4	Receptacle, phono motor	10A015
	Socket, octal (tube)	6A296
	Socket, miniature (tube)	6A297
	Socket & bracket, dial light	86A062

TUBES, RECTIFIERS AND LAMPS

V-1	6AU6 antenna	90X6AU6
V-2,3	6BA6 mixer, 1st I.F.	90X6BA6
V-4,5	6SH7 2nd I.F., limiter	90X6SH7
V-6	6H6 discriminator	90X6H6
V-7	6J6 osc. & AFC	90X6J6
V-8	6SJ7 audio amp.	90X6SJ7
V-9,10	6K6GT power amp.	90X6K6GT
V-11	5Y3GT rectifier	90X5Y3GT
LM-1,2	Lamp, 6-8 V., 250 Ma., Mazda #44	39A003

MISCELLANEOUS

	Shaft, tuning	74A247
	Pulley, idler	28A052-6
	Switch, cam	77A261
	Drive pin	74A246
	Collar	77A267
	Bushing	77A266
	Bracket, dial plate mtg.	67A793
	Dial plate	63B332
	Dial background (paper)	32A446
	Dial glass (calibrated)	22C201
	Clip (for dial glass 22C201)	76A390
	Rubber spacer, for dial clip	16A126
	Pointer	82A147
	Dial cord	38A019
	Spring, dial cord	75A012
	Dial glass (clear)	22B205
	Clip (for dial glass 22B205)	76A331
	Escutcheon (Model S-55)	7C067-1
	Escutcheon (Model S-56)	7C067
	Knob, tone and range controls (Model S-55)	15B077-4
	Knob, tone and range controls (Model S-56)	15B068-3
	Knob, tuning and volume controls (Model S-55)	15B068-4
	Knob, tuning and volume controls (Model S-56)	15B077-3
TS-1	Terminal strip, antenna (Marked D-D)	87A379
TS-2	Terminal strip, antenna (Marked A-G)	88A327
	Line cord lock	76A299
	Mounting foot, rubber	16A007



FRONT APRON
BOTTOM VIEW OF CHASSIS

- NOTES -
1. SOCKET VIEWS ARE BOTTOM VIEWS.
 2. ALL VOLTAGES MEASURED BETWEEN TUBE SOCKET TERMINALS AND CHASSIS.
 3. LINE VOLTAGES SHOWN WERE MEASURED WITH A 20000 OHM/VOLTMETER AND AT ZERO SIGNAL.
 4. ALL VOLTAGES SHOWN WERE MEASURED WITH A 20000 OHM/VOLTMETER AND AT ZERO SIGNAL.
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 9. ALL VOLTAGES SHOWN WERE MEASURED WITH A 20000 OHM/VOLTMETER AND AT ZERO SIGNAL.

Fig. 8. Tube socket voltage chart

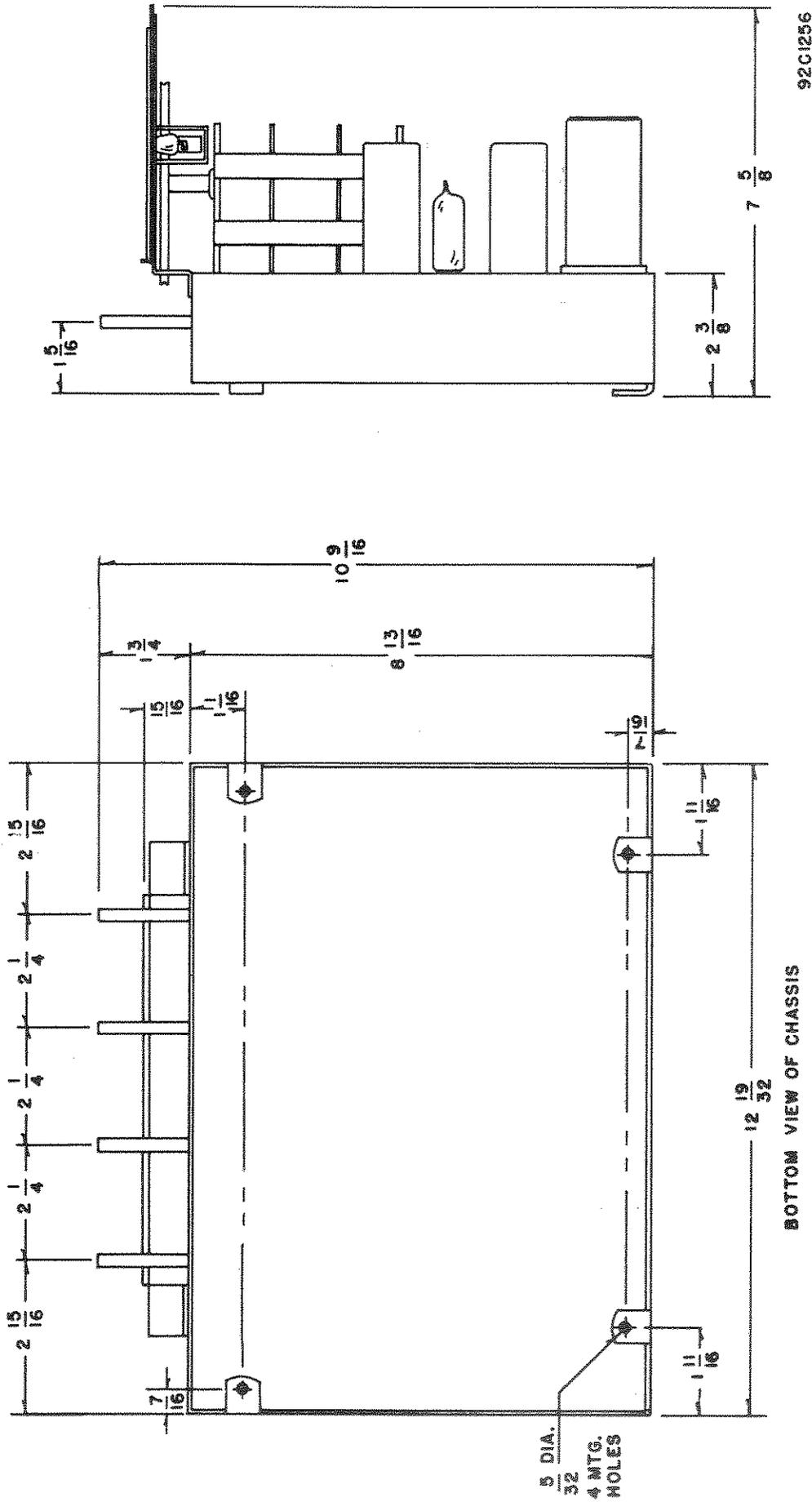


Fig. 9. Mounting dimensions.

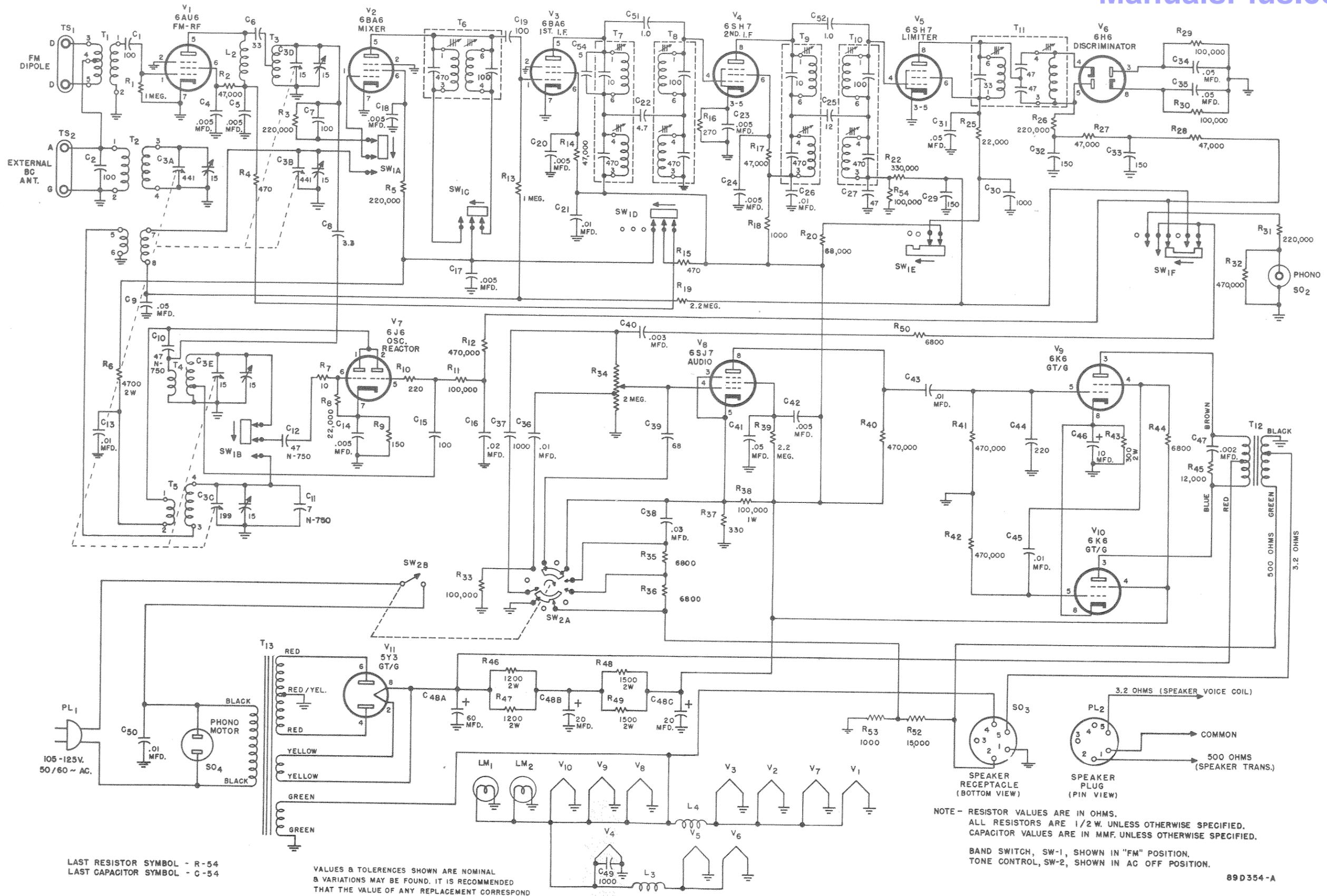


Fig. 10. Schematic diagram.

Fig. 9. Mounting dimensions.

Warranty

"The Hallicrafter's Company warrants each new radio product manufactured by it to be free from defective material and workmanship and agrees to remedy any such defect or to furnish a new part in exchange for any part of any unit of its manufacture which under normal installation, use and service discloses such defect, provided the unit is delivered by the owner to our authorized radio dealer, wholesaler, from whom purchased, or, authorized service center, intact, for examination, with all transportation charges prepaid within ninety days from the date of sale to original purchaser and provided that such examination discloses in our judgment that it is thus defective.

This warranty does not extend to any of our radio products which have been subjected to misuse, neglect, accident, incorrect wiring not our own, improper installation, or to use in violation of instructions furnished by us, nor extend to units which have been repaired or altered outside of our factory or authorized service center, nor to cases where the serial number thereof has been removed, defaced or changed, nor to accessories used therewith not of our own manufacture.

Any part of a unit approved for remedy or exchange hereunder will be remedied or exchanged by the authorized radio dealer or wholesaler without charge to the owner.

This warranty is in lieu of all other warranties expressed or implied and no representative or person is authorized to assume for us any other liability in connection with the sale of our radio products."

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Form No. 94X622