

MODELS A-50 & A-55

Five-Tube, Broadcast and 49M Band, A-C Receivers

ELECTRICAL SPECIFICATIONS

Voltage and Frequency Ratings	{105-125 Volts, 50-60 Cycles 105-125 Volts, 25-30 Cycles
Power Consumption	.80 Watts
Radiotrons and Functions.	(1) Type-6A7 First Detector and Oscillator (2) Type-6K7 I.F. Amplifier (3) Type-6B7 Second Detector, Audio Amplifier, A.V.C. (4) Type-41 Power Output (5) Type-80 Rectifier
Tuning Frequency Ranges	.540 to 1720 KC. and 2250 to 6850 KC.
Alignment Frequencies. .460 KC.(I.F.), (W.T.)	1720 KC.(R.F.& Oscillator)& 600 KC.(Oscillator)
Undistorted Output	1.75 Watts
Maximum Output	3.5 Watts
Loudspeaker	Electrodynamic

PHYSICAL SPECIFICATIONS

	<u>A-50</u>	<u>A-55</u>
Height	16 1/8 Inches . . .	37 1/4 Inches
Width	13 1/4 Inches . . .	21 1/2 Inches
Depth	9 1/4 Inches . . .	11 Inches

The chassis employed in these two receivers are identical. Such distinctions as:--Short-wave reception--Wave Trap--Superheterodyne circuit--all metal tube--Diode detection--Automatic volume control---Resistance coupled audio--Tone control--Airplane selector dial--and Electro-dynamic speaker, characterize the design.

Particular mounting methods are used for supporting the chassis to the cabinet to ex-

clude undesirable microphonic reaction between the speaker, and the Radiotrons and the variable tuning capacitor plates.

Antenna-ground screw terminals are used to simplify and insure positive connection of the input leads. The terminals are also arranged to permit convenient mounting of a "Double-Doublet" antenna transformer available from the manufacturer of these receivers for use with the highly efficient "General Electric All-Wave" Antenna.

DESCRIPTION OF ELECTRICAL CIRCUIT

Five radiotrons are associated in combination with a Superheterodyne circuit. Two of the Radiotrons are applied so as to obtain plural functions, thereby gaining more than the adequate results normally expected of a five-tube receiver. In the first stage of the circuit a Type-6A7 pentagrid converter tube is employed as detector and local oscillator, the related external high-frequency circuits consisting of a tuned antenna transformer with a short-wave tap, a 460

cycle Wave Trap and a three-winding oscillator coil assembly with changeover switches ganged to the antenna transformer s-w switch. Within the first detector tube, mixing of the signal and oscillator voltages is accomplished through electron coupling, the i-f appearing in the plate circuit.

The i-f system operates at 460 kc. as the basic frequency.

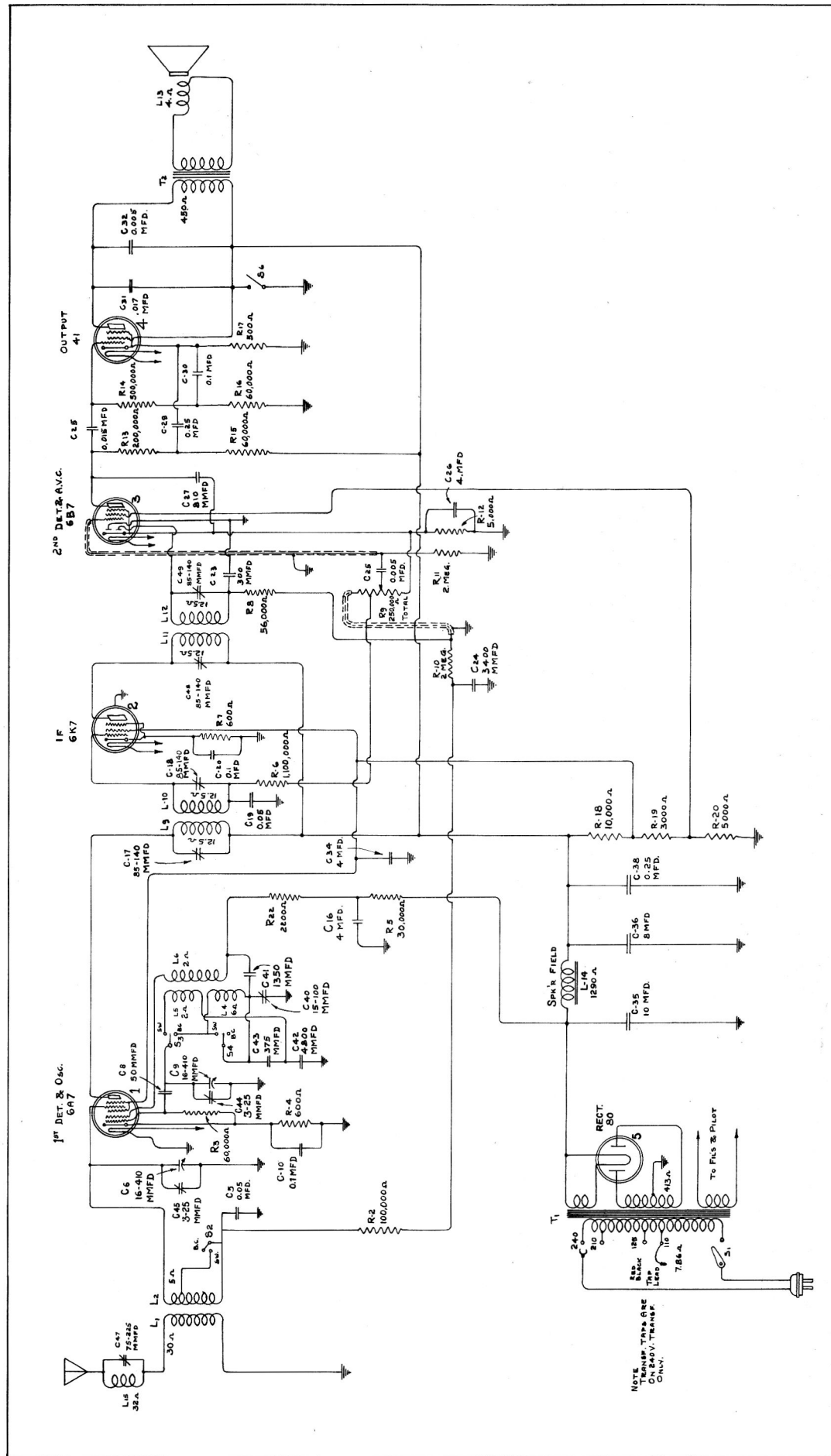


Figure 1 - Schematic Circuit Diagram

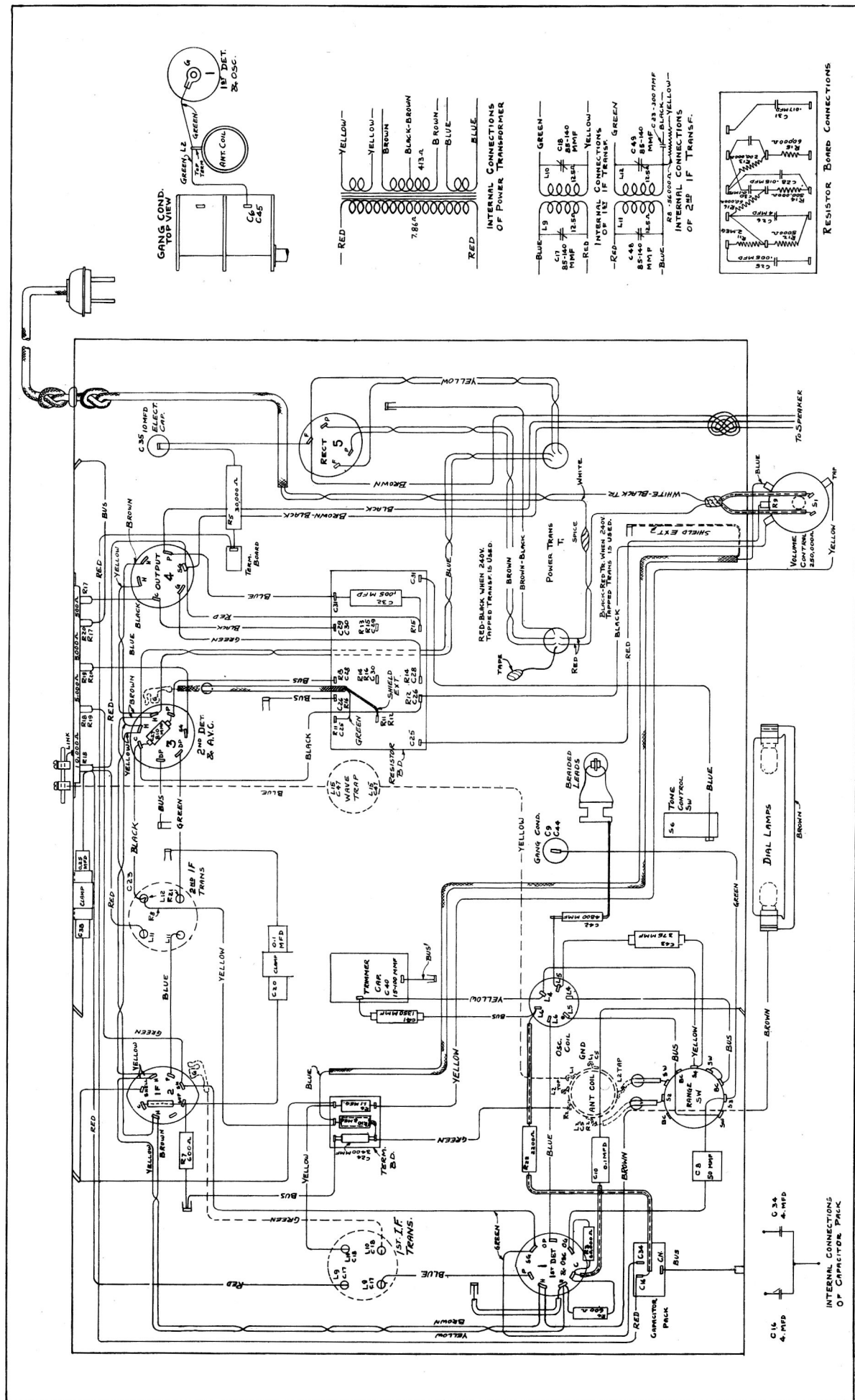


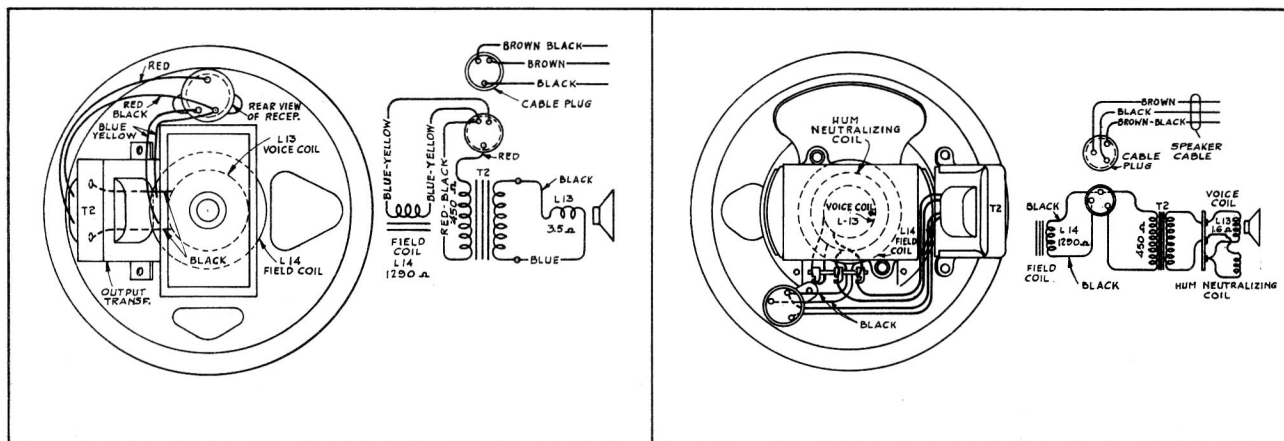
Figure 2 - Chassis Wiring Diagram

The combined second detector-audio amplifier-a.v.c. stage utilizes a Type-6B7, a duplex-diode pentode Radiotron. One diode connects directly to ground, the other is used for detection. Part of the detected signal is filtered to remove the audible fluctuations and is applied to the first and second stages as a means of providing automatic volume control. The audio component of the detected signal is amplified by the Type-6B7 and conveyed to a resistance-

capacitance coupling net work.

A power amplifier pentode, Type-41, is used in the output stage and is coupled by a transformer to the low impedance voice coil of the speaker.

Full-wave rectification is employed in the power-supply stage. The speaker field winding serves in the filter circuit as a reactor.



SERVICE DATA

(1) Line-up Capacitor Adjustments

This receiver must be in correct electrical alignment in order to obtain maximum efficiency and best quality of performance. The circuits should be re-aligned after each major service or repair operation, and whenever there are positive indications that the adjustments have deviated from normal by ordinary usage. These indications will be present together and will have the nature of: low sensitivity, poor tone quality and irregular double-peaked tuning.

A definite procedure must be applied in readjusting the line-up trimmers. The proper oscillator and indication equipment must also be used. Certain standard service instruments, which are useful for receiver adjustment, have been designed and made available by the manufacturer of this receiver. These are illustrated and described on page 2.

(2) I-F Tuning Adjustments

There are two i-f transformers associated in the intermediate amplifier system. These transformers are tuned by accessible trimmers. To obtain the correct alignment, proceed as follows:

- (a) Short circuit the antenna and ground terminals and tune the receiver so that no signal is received. Set the volume control to its maximum position. Ground the receiver.

- (b) Connect the output of the test oscillator between the first detector control grid and chassis ground. Attach an indicating meter, such as is illustrated on page 2, to the speaker circuit.
- (c) Place the external oscillator into operation at 460 kc. Adjust the output so that a slight registration occurs on the output indicator. The output should be set at as low a value as will give a convenient indication during adjustment; this requirement is important in that the a.v.c. action is voided by such a method. Adjust the secondary and primary trimmers (C18, C17, and C48, C49) of the i-f transformers for maximum receiver output.

R-F, Oscillator and Wave Trap Adjustments

Four trimmers are provided, two for adjustment at 1720 kc. one for oscillator line-up at 600 kc. and one for wave trap at 460 kc. No adjustments are required on the short-wave bands. Locations of the trimmers are shown on Figure 5. They should be adjusted in the following manner:

- (a) Connect the output of the modulated Full Range Oscillator to the antenna and ground terminals of the receiver. Set condenser gang at approximately

600 kc. Tune oscillator to 460 kc. and adjust wave trap for (*minimum*) signal.

- (b) Check the position of the dial pointer. It should set exactly on the radial line, adjacent to the dial reading of 540 when the tuning capacitor plates are at full mesh. After correcting the dial pointer, place the receiver in operation and set the selector at 1720 kc. (600 trimmer should be set at approximately half way) advance the volume control to maximum and turn the range switch to its broadcast position.
- (c) Adjust the frequency of the external oscillator to 1720 kc. and regulate its output until a perceptible indication appears on the output indicator. This indication should be held at a minimum during the adjustments. The trimmers C44 and C45 should then be tuned to the point giving peak receiver output.
- (d) Retune the test oscillator, setting

its frequency to 540 kc. Turn the receiver selector control to maximum. Then adjust the low-frequency trimmer C40 until 540 signal is just audible. It is advisable to repeat the 1720 kc. adjustment of the oscillator trimmer C44 in order to correct for any change caused by the tuning of C40.

Radiotron Socket Voltages

The various normal operating voltages are given on Figure 5. As specified, they are referred to the chassis ground. Accuracy of measurements will be a function of the internal resistance of the voltmeter used. It is advisable to employ a meter having at least 1000 ohms per volt, and for each reading use the highest range which will give an acceptably accurate reading. General deviations from the values given, due to line voltage difference, should not be taken as indicating a defective condition. The erratic departure from normal of a single value or group of values should form the basis of circuit diagnosis.

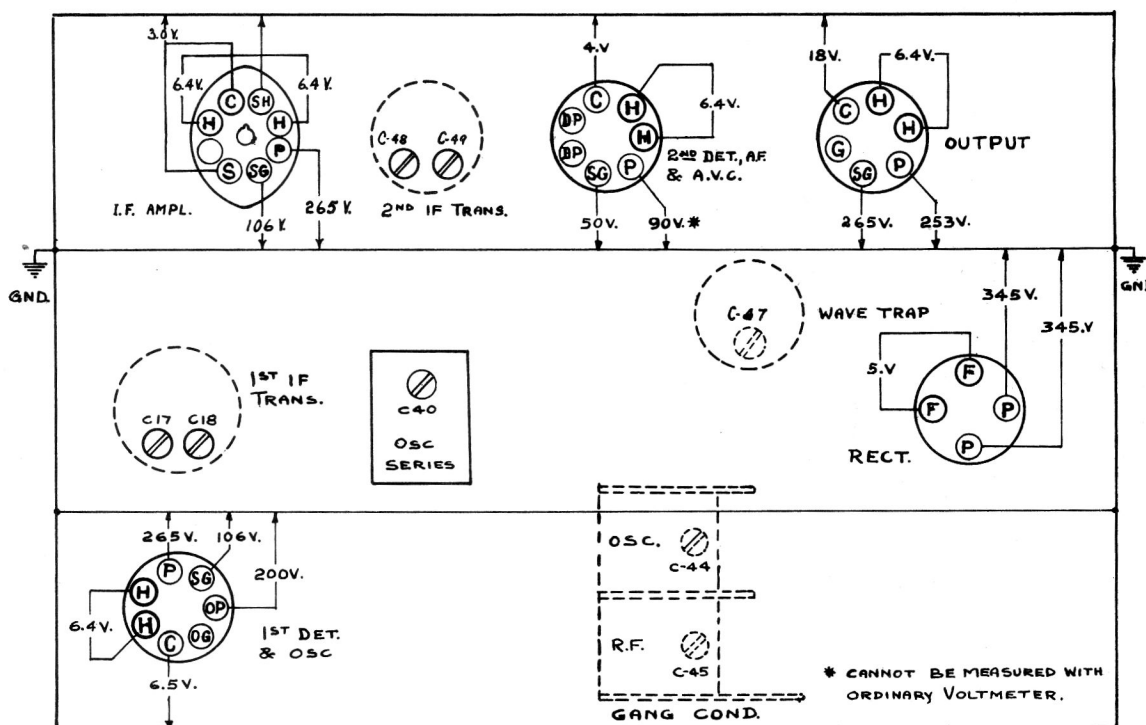


Figure 5—Trimmer Locations and Radiotron Socket Voltages
(Measured at 115 volts line supply--Maximum Volume Control--No Signal)

REPLACEMENT PARTS—MODELS A-50 & A-55

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