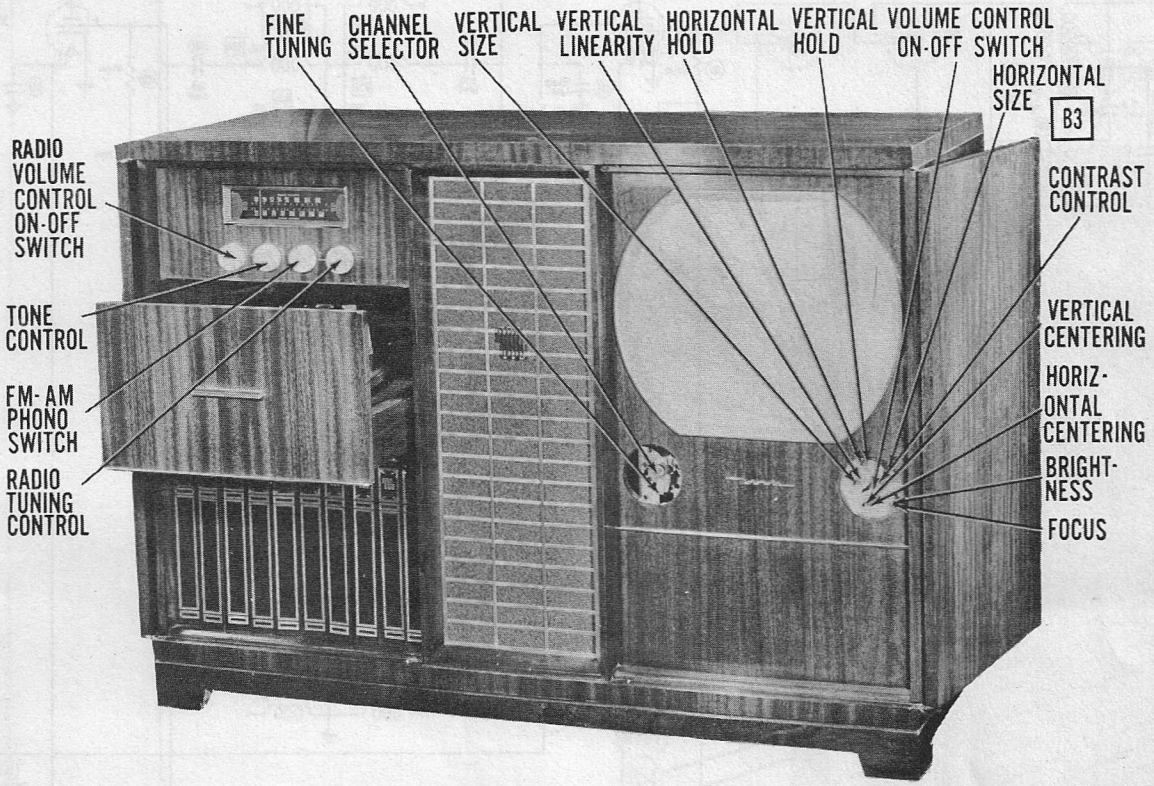
PHOTOFACT* Folder
*TRADE MARK

MOTOROLA MODELS 19F1, 19K1 (Ch. TS-67 & Radio Ch. HS-230)



MOTOROLA MODEL 19F1

TRADE NAME	Motorola, Models 19F1, 19K1 (Ch. TS-67 and Radio Ch. HS-230)
MANUFACTURER	Motorola Inc., 4545 Augusta Blvd., Chicago 51, Illinois
TYPE SET	TV-AM-FM-Phono Combination Receiver (Model 19K1 "TV Only")
TUBES	Thirty Three (Model 19F1), Twenty Four (Model 19K1)
POWER SUPPLY	110-120 Volts AC-60 Cycle
RATINGS	2.7 Amp. at 117 Volts AC, 1.3 Amp. at 117 Volts AC
TUNING RANGE—	TV Channels 2 thru 13, FM 88-108MC, AM 535-1620KC

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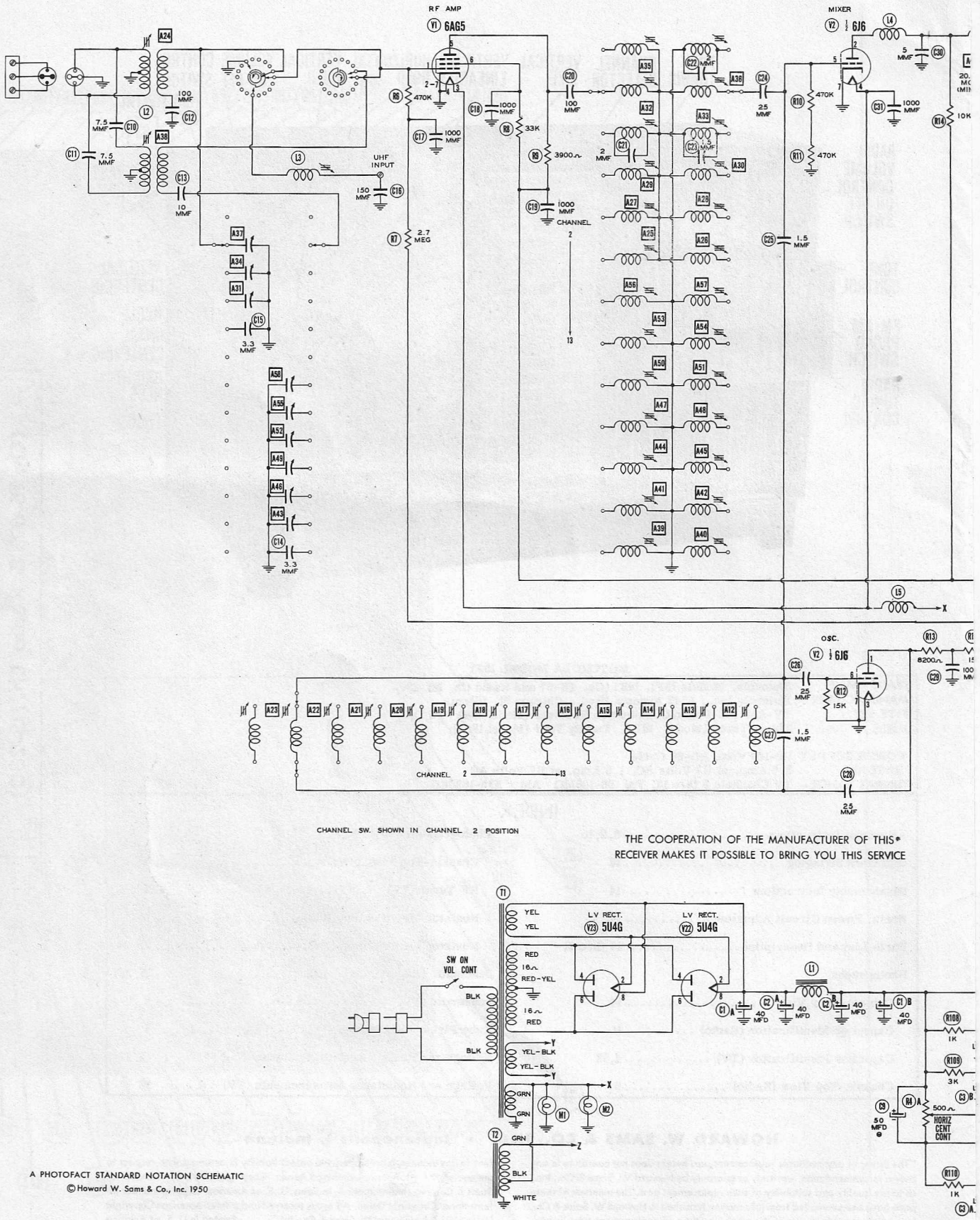
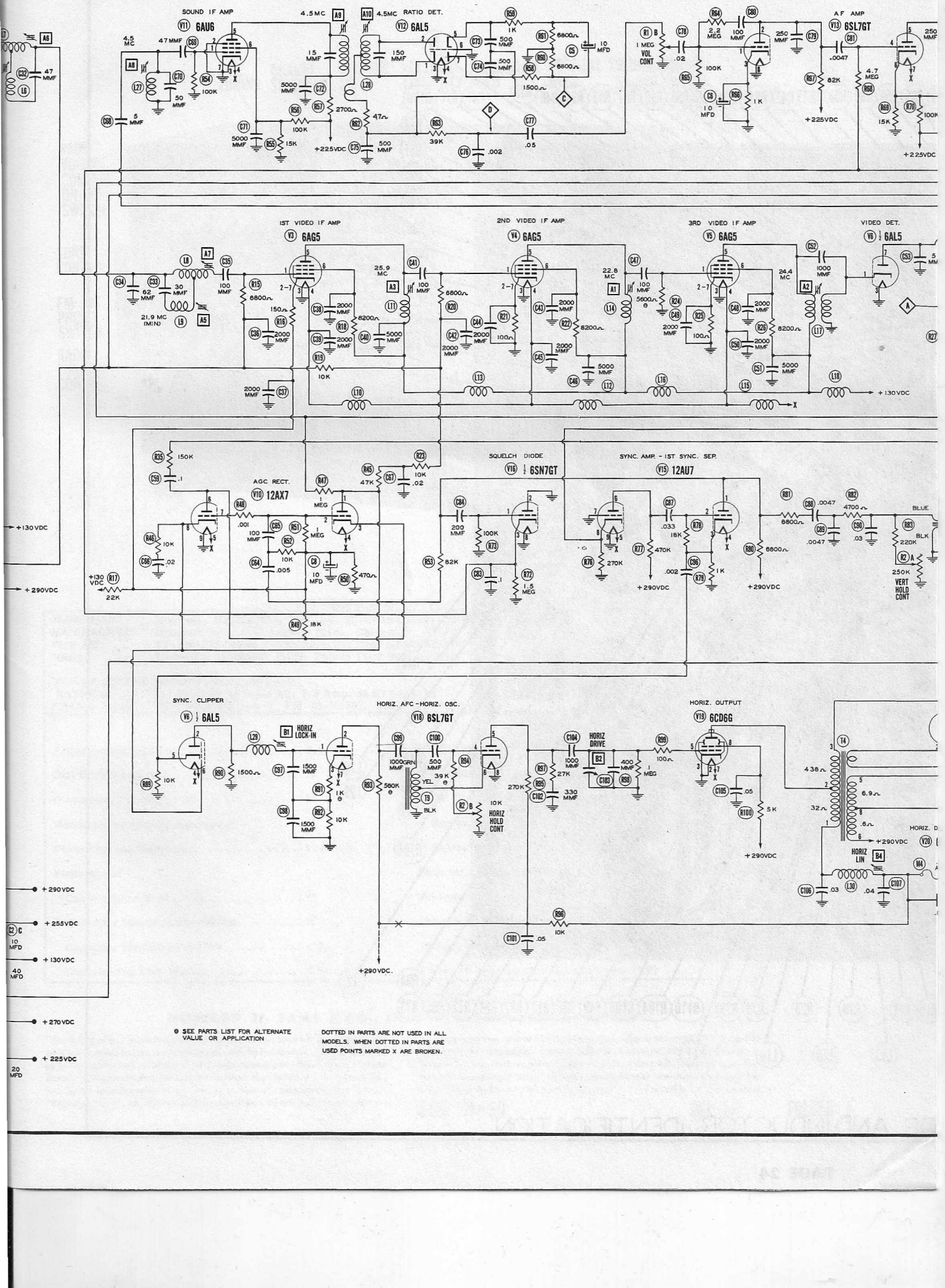
MOTOROLA MODELS 19F1, 19K1 (Ch. TS-67 & Radio Ch. HS-230)

HOWARD W. SAMS & CO., INC. • Indianapolis 1, Indiana

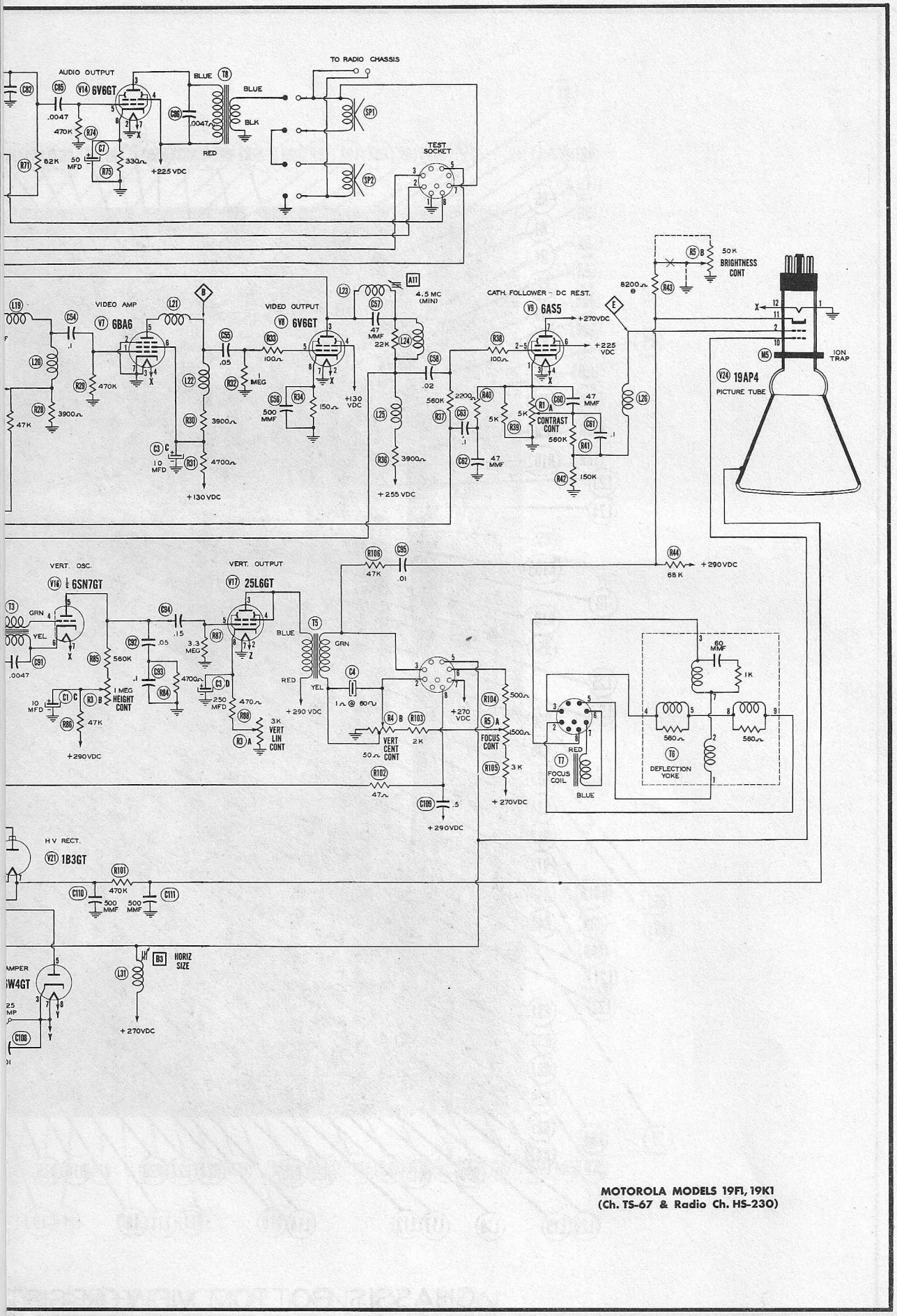
DATE 11-50 SET 111 FOLDER 9





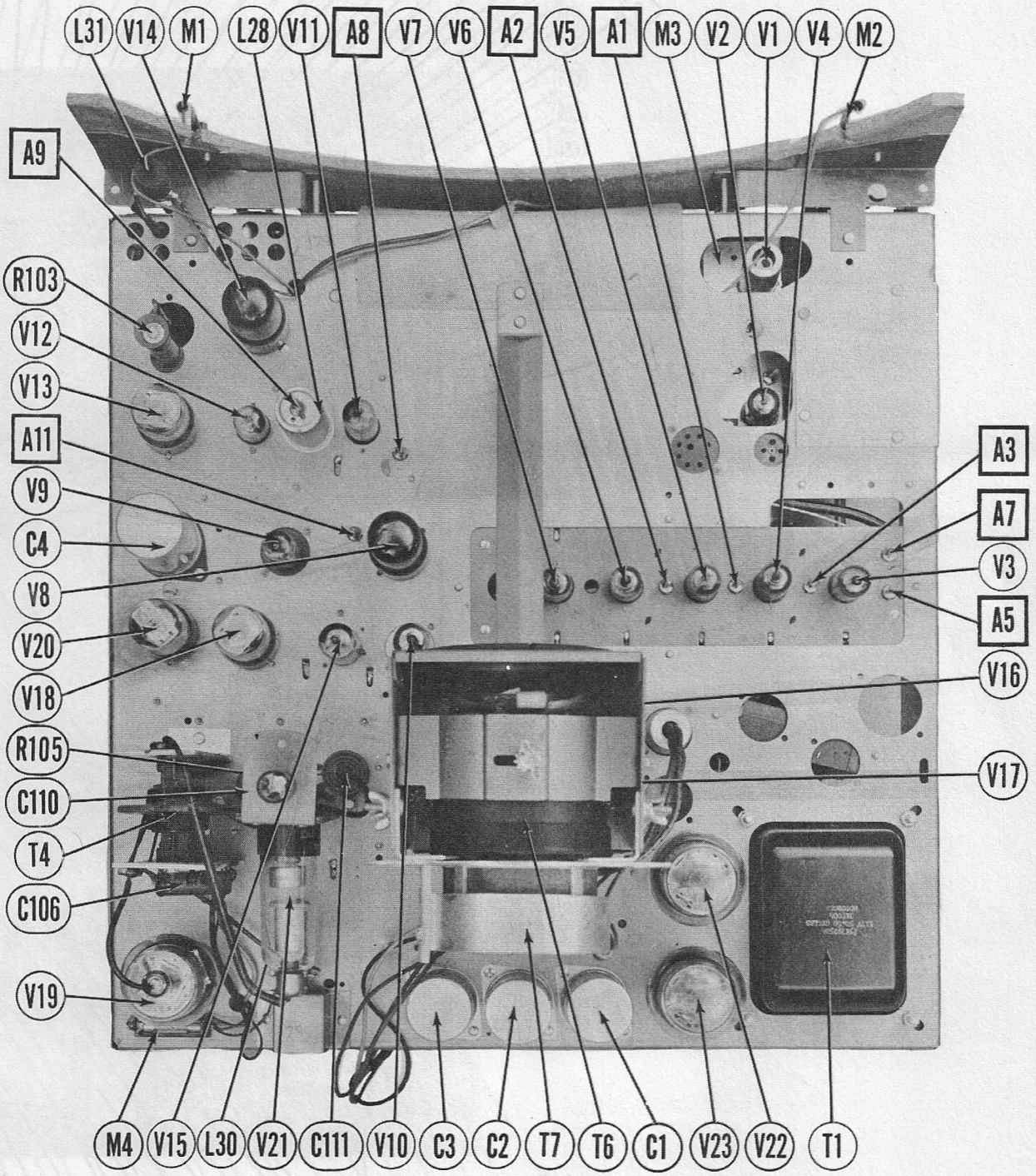
⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DOTTED IN PARTS ARE NOT USED IN ALL MODELS. WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN.

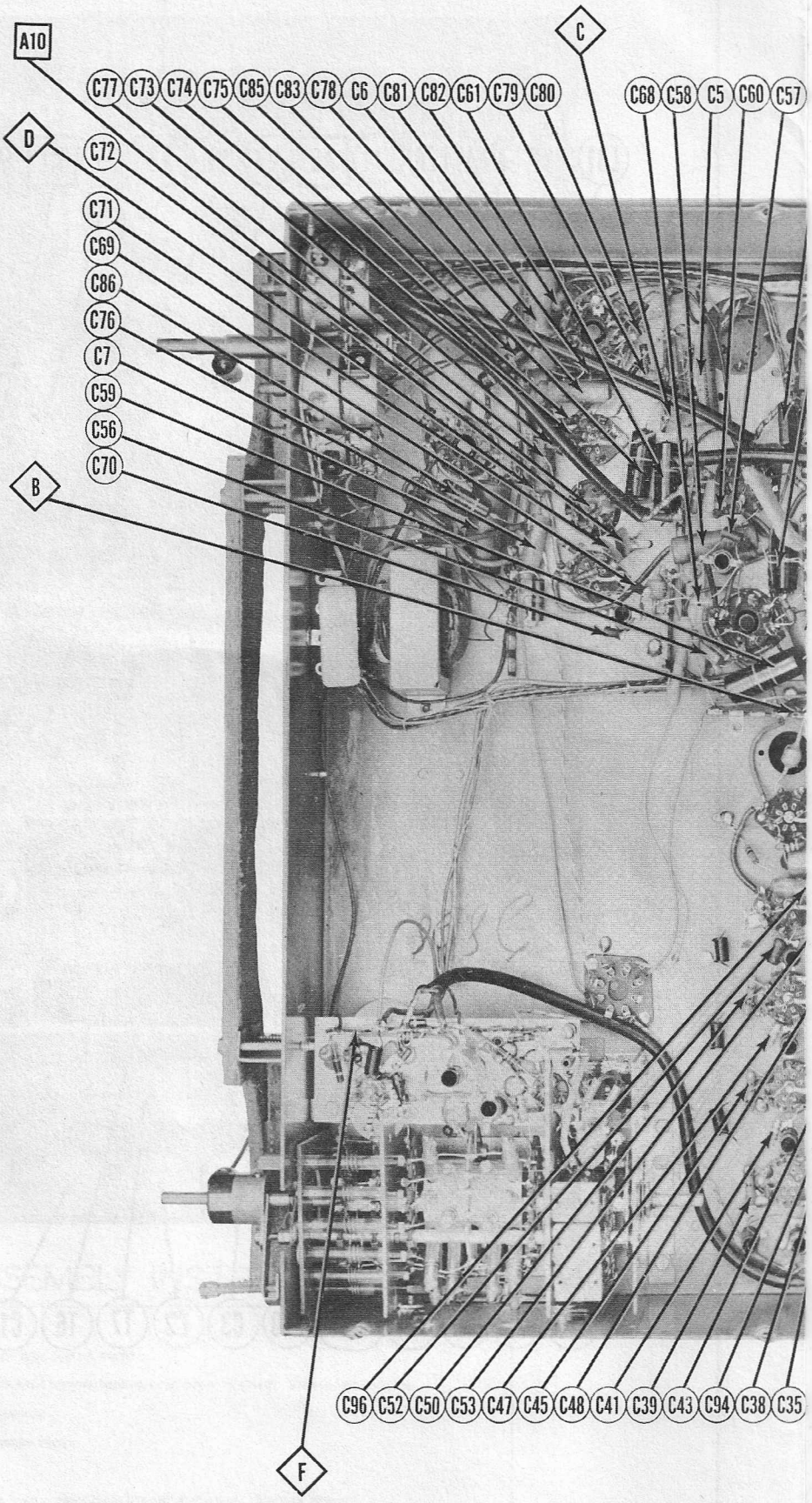


MOTOROLA MODELS 19F1, 19K1
(Ch. TS-67 & Radio Ch. HS-230)

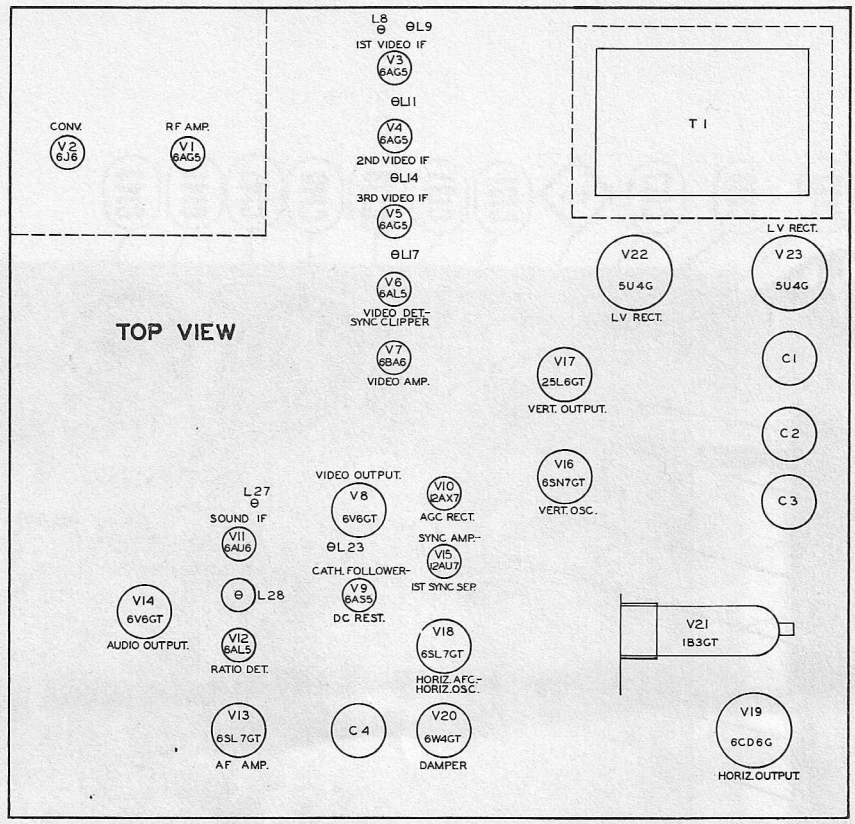
MOTOROLA MODELS 19F1, 19K1
(Ch. TS-67 & Radio Ch. HS-230)

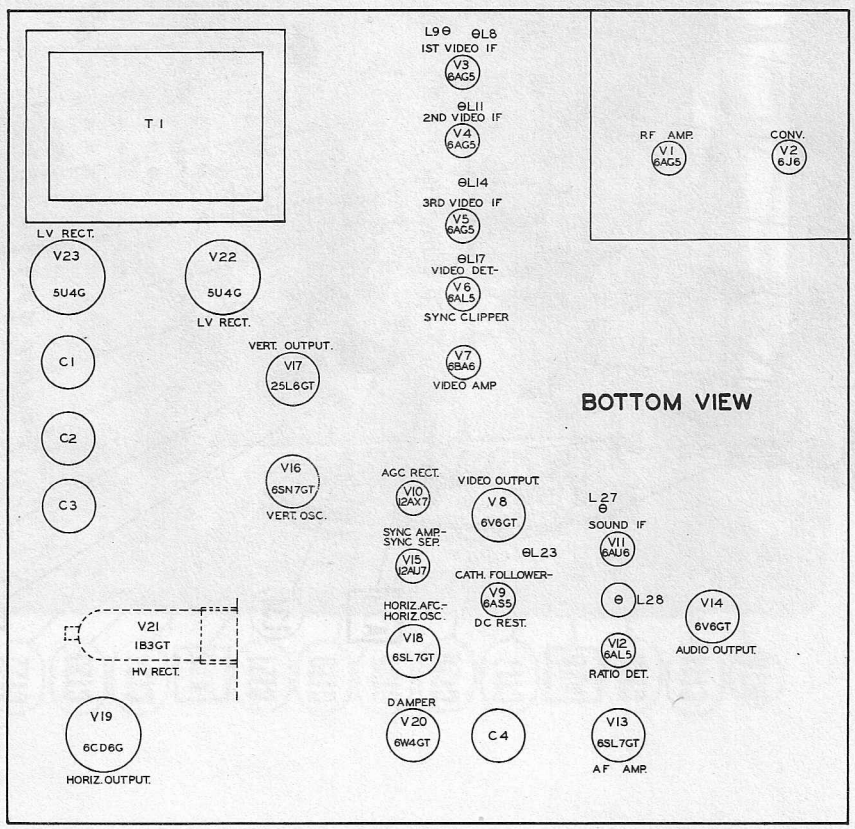


TV CHASSIS TOP VIEW

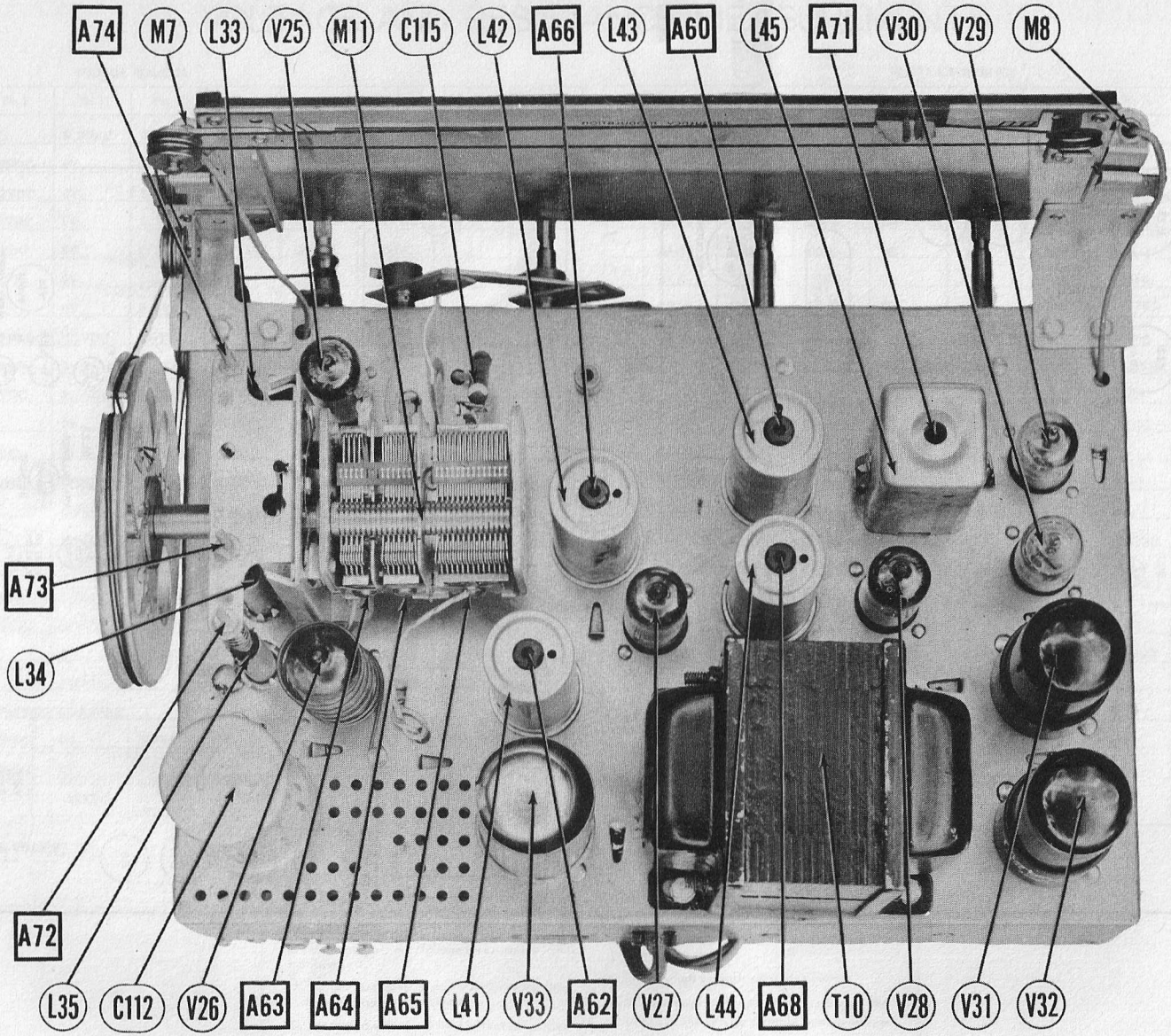


CHASSIS BOTTOM VIEW-CAPACITOR

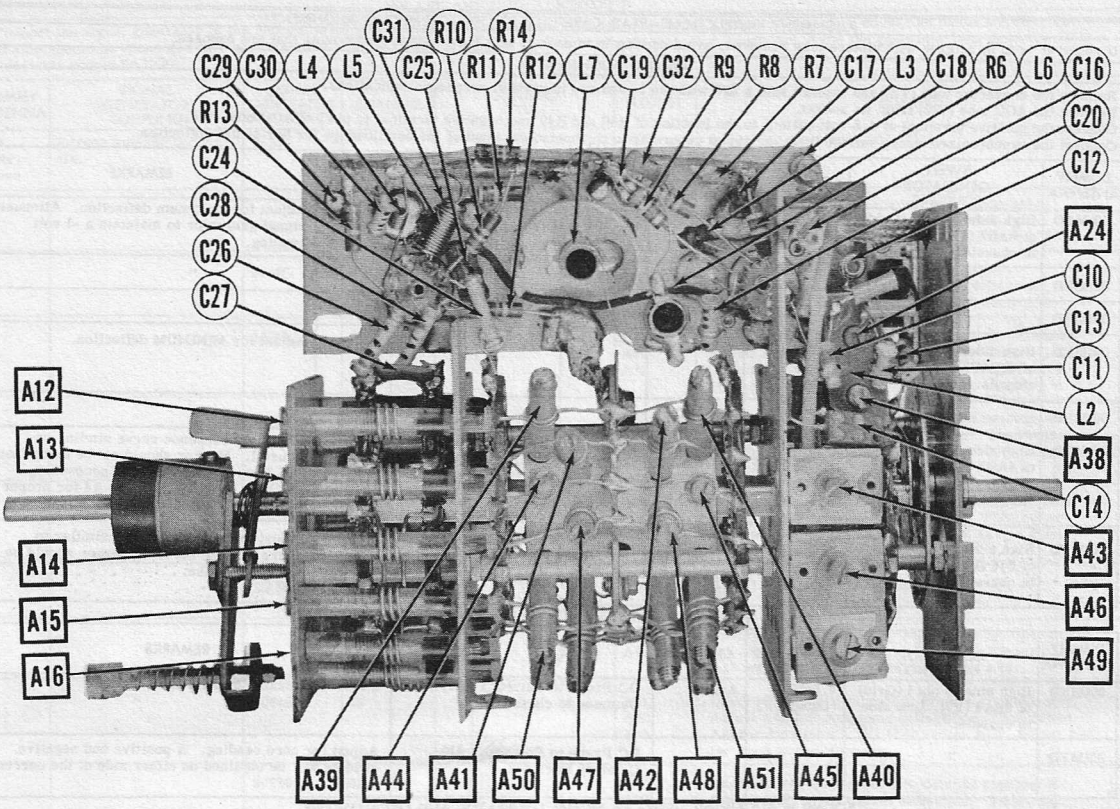




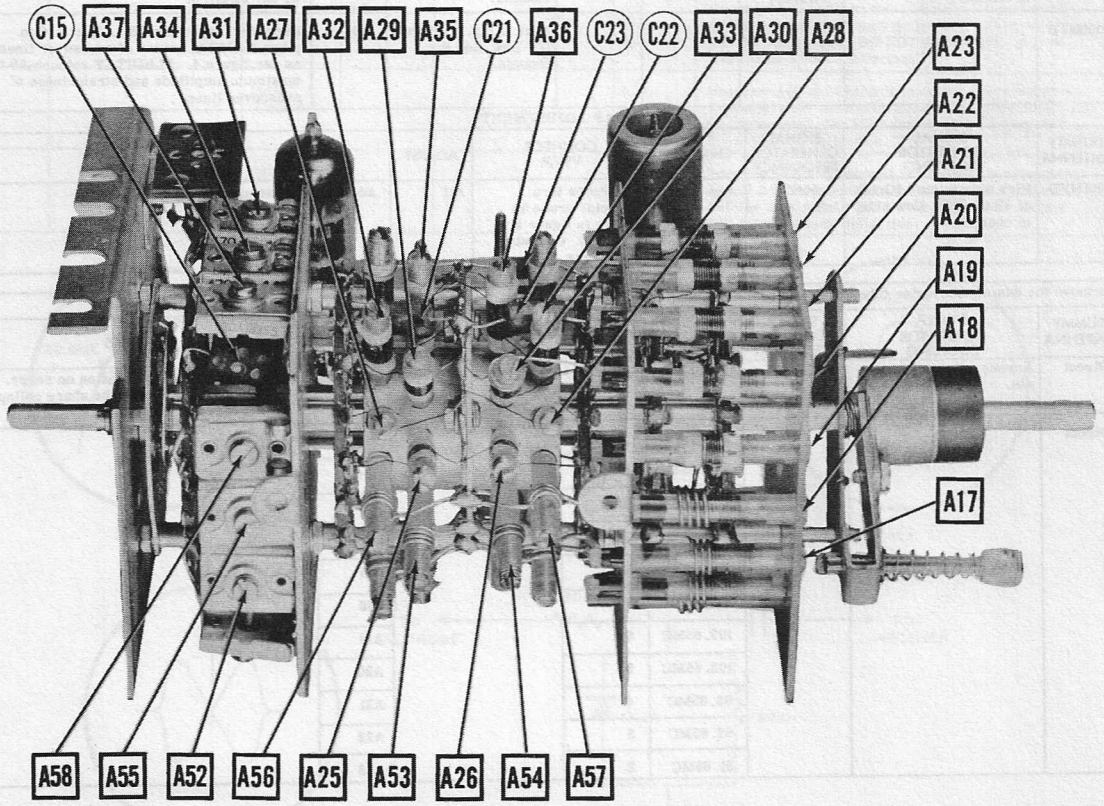
TUBE PLACEMENT CHART



RADIO CHASSIS-TOP VIEW



TV RF TUNER



TV RF TUNER

TV ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

If receiver is to be aligned with picture tube removed, avoid coming in to contact with high voltage components that are exposed.

VIDEO IF ALIGNMENT

Remove the converter tube (V2) and replace with a 6J6 with pin 1 removed to prevent erroneous indications.
Remove the AGC tube (V10) from its socket.
Connect the positive terminal of 4.5 volt battery to the junction of R50 and R49 and negative terminal to pin 1 of AGC tube (V10).
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.001MFD	High side to pin 1 (Grid) of 6AG5 (V3). Low side to chassis.	Not used	22.8MC	Any	Use VTVM. DC Probe to Point (A). Common to chassis.	A1	Adjust for maximum deflection. Attenuate signal generator to maintain a -1 volt reading.
2.	.001MFD	"	"	24.4MC	"	"	A2	"
3.	.001MFD	"	"	25.9MC	"	"	A3	"
4.	.001MFD	High side to pin 5 (Grid) of 6J6 (V2). Low side to chassis.	"	20.4MC	"	"	A4	Adjust for MINIMUM deflection.
5.	.001MFD	"	"	21.9MC	"	"	A5	"
6.	.001MFD	High side to pin 1 (Grid) of 6AG5 (V3). Low side to chassis.	24MC (10MC SWP)	21.9MC 22.8MC 26.4MC	"	Vert. Amp. to Point (B). Low side to chassis.		Check for response curve similar to figure 1. Marker should not be more than 30% from top of curve. If necessary, SLIGHTLY retouch A1 thru A4 for proper response.
7.	.001MFD	High side to pin 5 (Grid) of 6J6 (V2). Low side to chassis.	"	20.4MC 21.9MC 22.8MC 26.4MC	"	"	A6, A7	Adjust for response curve similar to figure 2. The 26.4MC marker should be at 50% response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
8.	.001MFD	High side to pin 1 (Grid) of 6BA6 (V7). Low side to chassis.	4.5MC (Unmod.)	Any	DC Probe to Point (C). Common to chassis.	A8, A9	Adjust for maximum deflection.
9.	.001MFD	"	"	"	DC Probe to Point (D). Common to chassis.	A10	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60 ∿ modulation and 450KC sweep. Use 120 ∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	.001MFD	High side to pin 1 (Grid) of 6BA6 (V7). Low side to chassis.	4.5MC (450KC Sweep)	4.5MC	Any	Vert. Amp. to Point (C). Low side to chassis.	A8, A9	Disconnect stabilizer capacitor C5. Adjust for maximum amplitude and symmetry as per figure 3.
9.	.001MFD	"	"	"	"	Vert. Amp. to Point (D). Low side to chassis.	A10	Reconnect capacitor C5. Adjust A10 to place 4.5MC at center of crossover lines as per figure 4. SLIGHTLY retouch A9 for maximum amplitude and straightness of crossover lines.

4.5MC TRAP ADJUSTMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	.001MFD	High side to pin 1 (Grid) of 6BA6 (V7). Low side to chassis.	4.5MC	Any	DC Probe thru detector probe as shown in figure 5 to Point (E). Common to chassis.	All	Adjust for minimum deflection.

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace with original 6J6 in its socket.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	Direct	Across antenna terminals.	Not used	237.65MC	13	Vert. Amp. to Point (F). Low side to chassis.	A12	Adjust for zero beat indication on scope. Zero beat is indicated by the sharp collapsing of pattern.
12.	Direct	"	"	231.65MC	12	"	A13	"
				225.65MC	11		A14	
				219.65MC	10		A15	
				213.65MC	9		A16	
				207.65MC	8		A17	
				201.65MC	7		A18	
				109.65MC	6		A19	
				103.65MC	5		A20	
				93.65MC	4		A21	
				87.65MC	3		A22	
				81.65MC	2		A23	

TV ALIGNMENT INSTRUCTIONS (CONT.)

RF AND ANTENNA ALIGNMENT

Connect the signal generator to the antenna terminals through two resistors. The low side of the generator should be connected through 150Ω. The high side should be connected through a resistor of 150Ω minus the signal generator impedance. For instance, if the the generator impedance is .50Ω, the resistor should be 100Ω.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
13.	See instr. above	Across antenna terminals.	86MC	6	DC Probe to Point (A). Common to chassis.	A24	Adjust for maximum deflection.
14.	"	"	"	"	"	A25, A26	Unscrew A25 until the circuit is considerably detuned. Adjust A26 for maximum deflection. Then adjust A25 for maximum. DO NOT retune A26.
15.	"	"	80MC	5	"	A27, A28	Unscrew A27 until circuit is considerably detuned. Adjust A28 for maximum deflection. Then adjust A27 for maximum. DO NOT retune A28.
16.	"	"	70MC	4	"	A29, A30, A31	Unscrew A29 until circuit is detuned considerably. Adjust A30 for maximum deflection. Then adjust A29 for maximum. Do not retune A30. Adjust A31 for maximum deflection.
17.	"	"	64MC	3	"	A32, A33, A34	Unscrew A32 until circuit is detuned considerably. Adjust A33 for maximum deflection. Then adjust A32 for maximum. DO NOT retune A33. Adjust A34 for maximum deflection.
18.	"	"	58MC	2	"	A35, A36, A37	Unscrew A35 until circuit is detuned considerably. Adjust A36 for maximum deflection. Then adjust A35 for maximum. DO NOT retune A36. Adjust A37 for maximum deflection.
19.	"	"	214MC (Unmod.)	13	"	A38	Adjust for maximum deflection.
20.	"	"	"	"	"	A39, A40	Unscrew A39 until circuit is detuned considerably. Adjust A40 for maximum deflection. Then adjust A39 for maximum. DO NOT retune A40.
21.	"	"	208MC	12	"	A41, A42, A43	Unscrew A41 until circuit is detuned considerably. Adjust A42 for maximum deflection. Then adjust A41 for maximum. DO NOT retune A42. Adjust A43 for maximum deflection.
22.	"	"	202MC	11	"	A44, A45, A46	Unscrew A44 until circuit is detuned considerably. Adjust A45 for maximum deflection. Then adjust A44 for maximum. DO NOT retune A45. Adjust A46 for maximum deflection.
23.	"	"	196MC	10	"	A47, A48, A49	Unscrew A47 until circuit is detuned considerably. Adjust A48 for maximum deflection. Then adjust A47 for maximum. DO NOT retune A48. Adjust A49 for maximum deflection.
24.	"	"	190MC	9	"	A50, A51, A52	Unscrew A50 until circuit is detuned considerably. Adjust A51 for maximum deflection. Then adjust A50 for maximum. DO NOT retune A51. Adjust A52 for maximum deflection.
25.	"	"	184MC (Unmod.)	8	"	A53, A54, A55	Unscrew A53 until circuit is detuned considerably. Adjust A54 for maximum deflection. Then adjust A53 for maximum. DO NOT retune A54. Adjust A55 for maximum deflection.
26.	"	"	178MC	7	"	A56, A57, A58	Unscrew A56 until circuit is detuned considerably. Adjust A57 for maximum deflection. Then adjust A56 for maximum. DO NOT retune A57. Adjust A58 for maximum deflection.

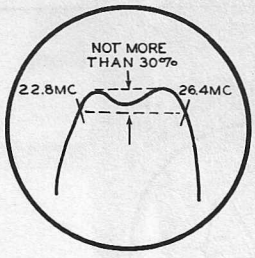


FIG. 1

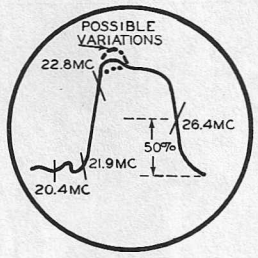


FIG. 2

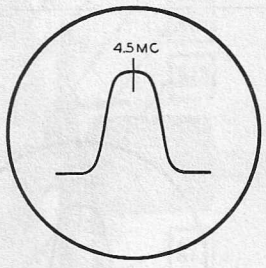


FIG. 3

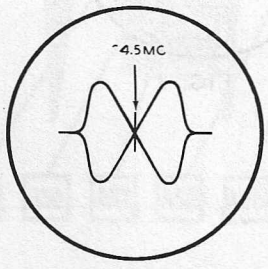


FIG. 4

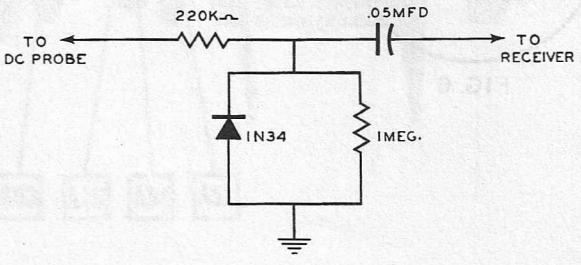


FIG. 5

RADIO ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning gang fully closed and set pointer to calibration mark at the left of "55" at the low frequency end of dial.

AM ALIGNMENT

Loop should be maintained in same relative position to chassis as when receiver is in cabinet. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
27.	.1MFD	High side to pin 7 (Grid) of 6BA7 (V26). Low side to chassis.	455KC (400 ∿ Mod.)	AM (fully CCW)	Tuning gang fully open	Across voice coil	A59, A60, A61, A62	Adjust for maximum output.
28.	.1MFD	"	1620KC	"	"	"	A63	"
29.		Loop	1400KC	"	Tune for max. output	"	A64, A65	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (± 1%) resistors in series from Point G to chassis. The junction of these two resistors is alignment Point ⟨I⟩ as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
30.	.001MFD	High side to pin 7 (Grid) of 6BA7 (V26). Low side to chassis.	10.7MC (Unmod.)	FM (1st position CW)	Tuning gang fully open	DC Probe to Point ⟨G⟩. Common to chassis.	A66, A67, A68, A69, A70	Adjust for maximum deflection. Attenuate signal generator to maintain a maximum -3 volts reading.
31.	.001MFD	"	"	"	"	DC Probe to Point ⟨H⟩. Common to Point ⟨I⟩	A71	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60 ∿ modulation and 450KC sweep. Use 120 ∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
30.	.001MFD	High side to pin 7 (Grid) of 6BA7 (V26). Low side to chassis.	10.7MC (450KC Sweep)	FM (1st position CW)	Tuning gang fully open	Vert. Amp. to Point ⟨G⟩. Low side to chassis.	A66, A67, A68, A69, A70	Disconnect stabilizer capacitor C113. Adjust for maximum amplitude and symmetry as per figure 6.
31.	.001MFD	"	"	"	"	Vert. Amp. to Point ⟨H⟩. Low side to chassis.	A71	Reconnect capacitor C113. Adjust A71 to place 10.7MC at center of crossover lines as per figure 7. SLIGHTLY retouch A70 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
32.	270Ω	High side thru 270Ω to "FM" antenna terminal.	105MC	FM (1st position CW)	105MC on dial	DC Probe to Point ⟨G⟩. Common to chassis.	A72	Adjust for maximum deflection.
33.	Turn tuning gang fully closed and turn A73 and A74 counter-clockwise until cores are at the bottom of pipe, then turn clockwise two turns.							
34.	270Ω	High side thru 270Ω to "FM" antenna terminals.	90MC	FM (1st position CW)	Tune for max. deflection	DC Probe to Point ⟨G⟩. Common to chassis.	A75, A76	Adjust for maximum deflection.
35.	270Ω	"	105MC	"	"	"	A73, A74	Adjust for maximum deflection. Repeat steps 34 and 35 until no further improvement can be made.

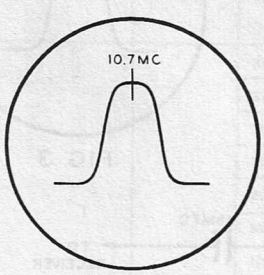


FIG. 6

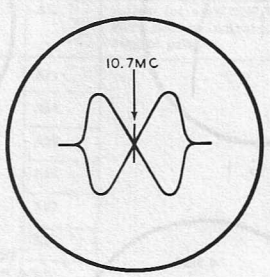


FIG. 7

RADIO CHASSIS-BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	-.7VDC	0V.	6.3VAC	0V.	110VDC	70VDC	0V.		
V 2	6J6	115VDC	100VDC	0V.	6.3VAC	-2.4VDC	§-6.4VDC	0V.		
V 3	6AG5	1VDC	4.2VDC	0V.	6.3VAC	130VDC	125VDC	4.2VDC		
V 4	6AG5	1.4VDC	1.8VDC	0V.	6.3VAC	130VDC	105VDC	1.8VDC		
V 5	6AG5	0V.	.4VDC	0V.	6.3VAC	130VDC	125VDC	.4VDC		
V 6	6AL5	0V.	-.1VDC	0V.	6.3VAC	.8VDC	1.6VDC	-.1VDC		
V 7	6BA6	-.6VDC	0V.	0V.	6.3VAC	50VDC	80VDC	0V.		
V 8	6V6GT	0V.	6.3VAC	155VDC	130VDC	0V.	0V.	0V.	4.6VDC	
V 9	6AS5	42VDC	4.8VDC	0V.	6.3VAC	4.8VDC	225VDC	270VDC		
V 10	12AX7	1.6VDC	.6VDC	3.5VDC	6.3VAC	6.3VAC	3.5VDC	.6VDC	1.6VDC	0V.
V 11	6AU6	-.5VDC	0V.	0V.	6.3VAC	225VDC	25VDC	0V.		
V 12	6AL5	-.1VDC	.1VDC	0V.	6.3VAC	.6VDC	0V.	-.6VDC		
V 13	6SL7GT	0V.	150VDC	1VDC	.5VDC	225VDC	27VDC	6.3VAC	0V.	
V 14	6V6GT	0V.	0V.	210VDC	225VDC	0V.	0V.	6.3VAC	13VDC	
V 15	12AU7	175VDC	17VDC	17VDC	6.3VAC	6.3VAC	235VDC	0V.	17VDC	0V.
V 16	6SN7GT	-.7VDC	0V.	5VDC	-25VDC -15VDC	125VDC 70VDC	0V.	6.3VAC	0V.	
V 17	25L6GT	0V.	25VAC	275VDC	275VDC	0V.	35VDC 0V.	0V.	18VDC 40VDC	
V 18	6SL7GT	-.1VDC	250VDC	5.6VDC	-25VDC -20VDC	160VDC	0V.	6.3VAC	0V.	
V 19	6CD6G	0V.	0V.	0V.	-30VDC	-27VDC	160VDC	6.3VAC	150VDC	TOP CAP *
V 20	6W4GT	0V.	0V.	570VDC	0V.	285VDC	0V.	570VDC	570VDC	
V 21	1B3GT	* DO NOT MEASURE.								
V 22	5U4G	120VDC	300VDC	0V.	300VAC	0V.	300VAC	0V.	300VDC	
V 23	5U4G	0V.	300VDC	0V.	300VAC	0V.	300VAC	0V.	300VDC	
V 24	19AP4	0V.	0V.	PIN 10 285VDC	PIN 11 33VDC 135VDC	PIN 12 6.3VAC				

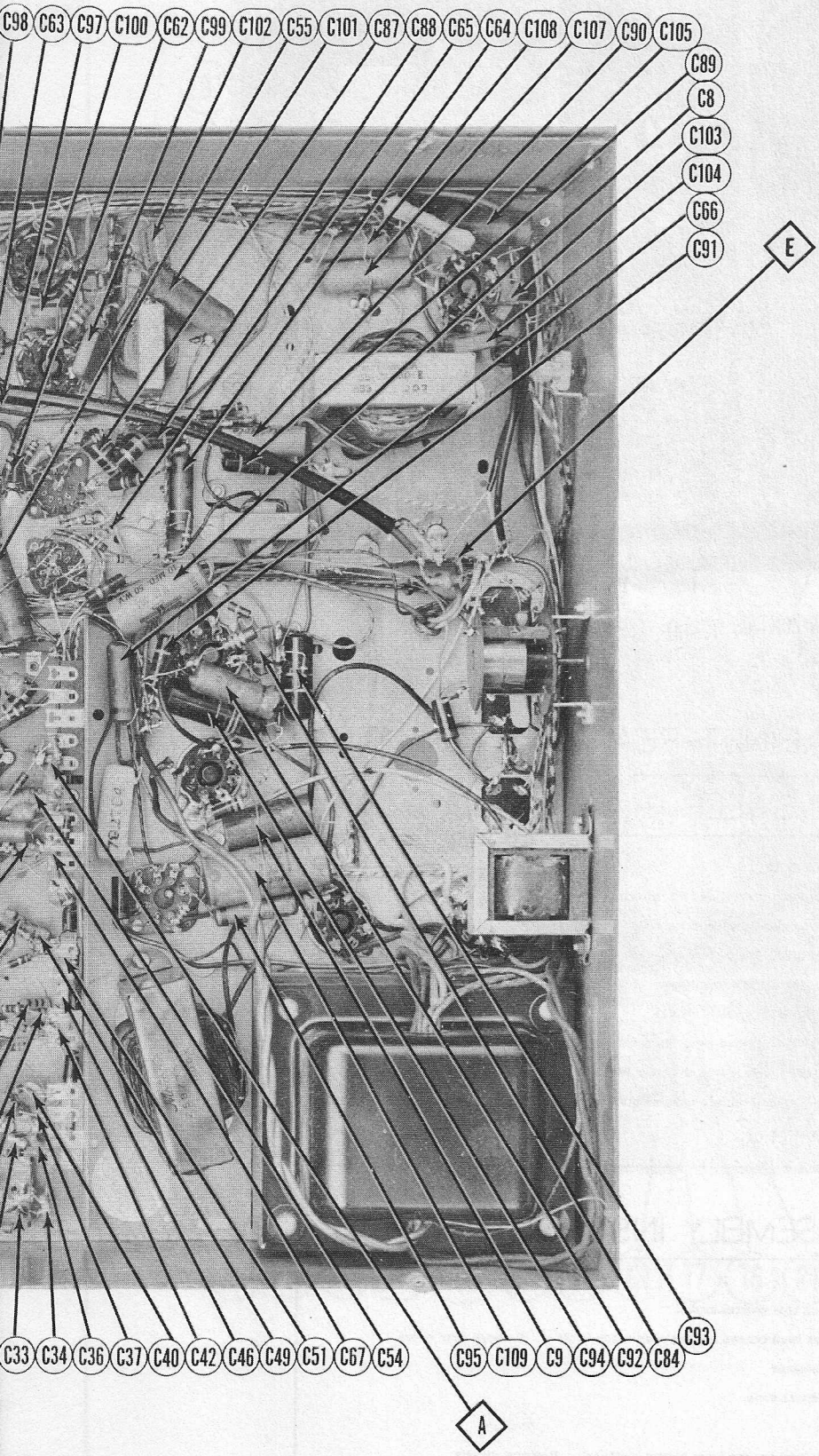
§ TAKEN WITH VACUUM TUBE VOLTMETER.
* DO NOT MEASURE.

RESISTANCE READINGS

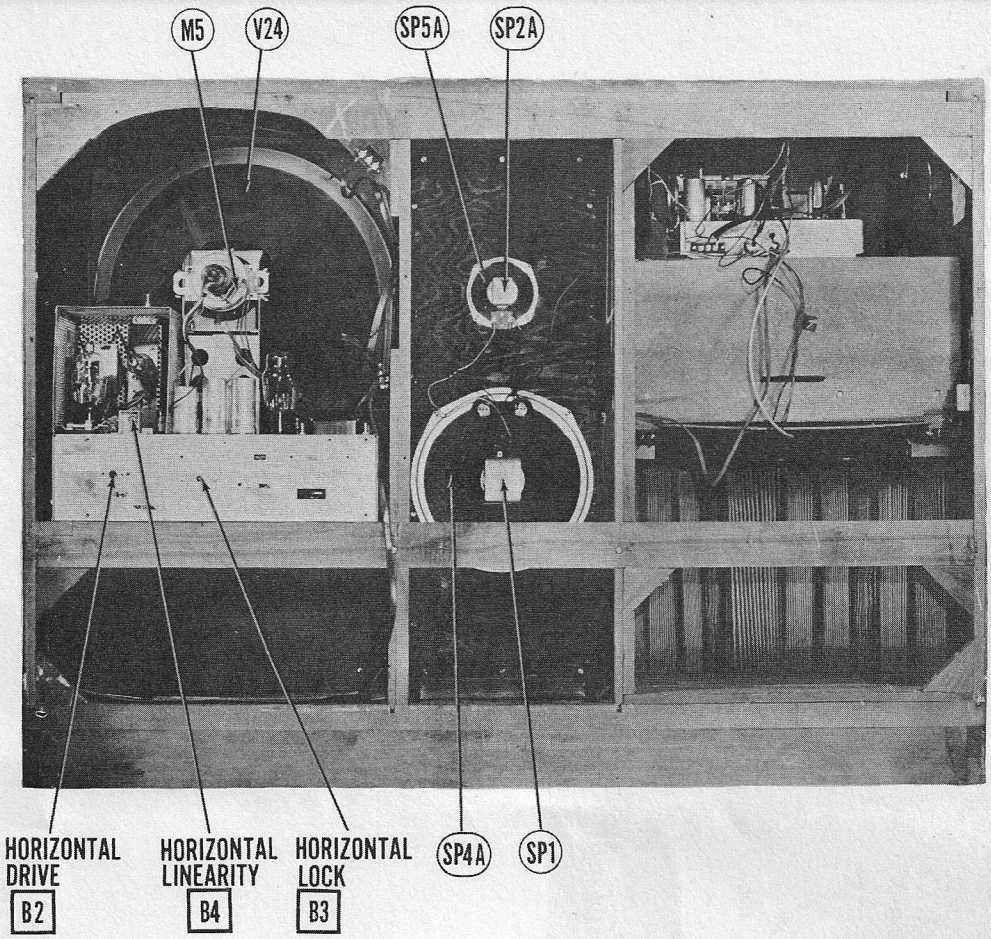
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	4.3 Meg.	0Ω	.1Ω	0Ω	†6.9KΩ	†36KΩ	0Ω		
V 2	6J6	†23KΩ	†13KΩ	0Ω	.1Ω	940KΩ	15KΩ	0Ω		
V 3	6AG5	1.1 Meg.	620Ω	0Ω	.1Ω	†3KΩ	†11KΩ	620Ω		
V 4	6AG5	1.1 Meg.	100Ω	0Ω	.1Ω	†3KΩ	†11KΩ	100Ω		
V 5	6AG5	5.6KΩ	100Ω	0Ω	.1Ω	†3KΩ	†11KΩ	100Ω		
V 6	6AL5	.4Ω	1.5KΩ	0Ω	.1Ω	10KΩ	1 Meg.	3.9KΩ		
V 7	6BA6	470KΩ	0Ω	0Ω	.1Ω	†12KΩ	†7.7KΩ	0Ω		
V 8	6V6GT	0Ω	.1Ω	†5KΩ	†3KΩ	1 Meg.	1 Meg.	0Ω	150Ω	
V 9	6AS5	2.5KΩ	830KΩ	0Ω	.1Ω	830KΩ	†1.2KΩ	†100Ω		
V 10	12AX7	1 Meg.	1 Meg.	18KΩ	.1Ω	.1Ω	18KΩ	1.1 Meg.	1 Meg.	0Ω
V 11	6AU6	100KΩ	0Ω	0Ω	.1Ω	†3.9KΩ	†14KΩ	0Ω		
V 12	6AL5	Inf.	Inf.	0Ω	.1Ω	7.8KΩ	0Ω	8.3KΩ		
V 13	6SL7GT	100KΩ	†83KΩ	1000Ω	6.2 Meg.	†83KΩ	15KΩ	.1Ω	0Ω	
V 14	6V6GT	0Ω	0Ω	†1.8KΩ	†1.2KΩ	470KΩ	Inf.	.1Ω	330Ω	
V 15	12AU7	†6.8KΩ	19KΩ	1000Ω	.1Ω	.1Ω	†470KΩ	0Ω	270KΩ	0Ω
V 16	6SN7GT	100KΩ	0Ω	1.5 Meg.	220KΩ 470KΩ	†600KΩ †1.6 Meg	53Ω	.1Ω	0Ω	
V 17	25L6GT	Inf.	4.4Ω	†640Ω	†640Ω	3.3 Meg.	3000Ω 2Ω	0Ω	3.5KΩ 470Ω	
V 18	6SL7GT	1.5KΩ	#570KΩ	11KΩ	39KΩ 49KΩ	#280KΩ	8.5Ω	.1Ω	0Ω	
V 19	6CD6G	Inf.	0Ω	0Ω	1 Meg.	1 Meg.	#280KΩ	.1Ω	†5KΩ	TOP CAP #60Ω
V 20	6W4GT	Inf.	Inf.	Inf.	Inf.	†50Ω	Inf.	#0Ω	#.2Ω	
V 21	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP #450Ω
V 22	5U4G	30KΩ	3000Ω	Inf.	16Ω	Inf.	16Ω	Inf.	3000Ω	
V 23	5U4G	Inf.	3000Ω	Inf.	16Ω	Inf.	16Ω	Inf.	3000Ω	
V 24	19AP4	0Ω	150KΩ	PIN 10 †45Ω	PIN 11 30KΩ 7.5KΩ	PIN 12 .1Ω				

† MEASURED FROM PIN 2 OF V23.
# MEASURED FROM PIN 3 OF V20.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



AND ALIGNMENT IDENTIFICATION



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

HORIZONTAL OSCILLATOR ADJUSTMENTS

Turn the set on and tune in a TV station preferably a test pattern.

Turn the horizontal hold control to the mid-position of its range.

Adjust the horizontal lock-in slug (B1) until the picture will remain in synchronization over the entire range of the hold control, with the possible exception of the extreme positions.

HORIZONTAL DRIVE, SIZE AND LINEARITY ADJUSTMENTS

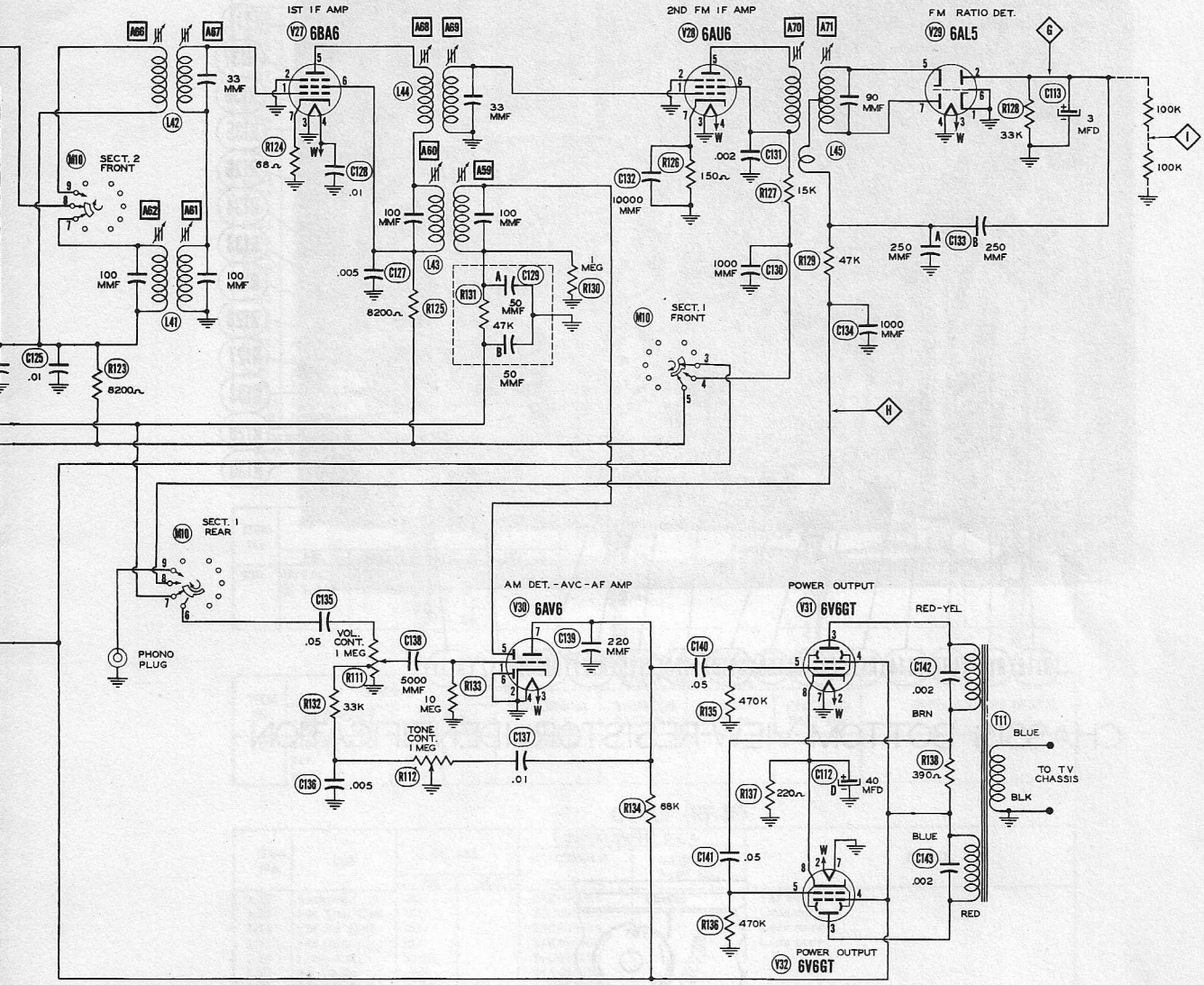
Turn the horizontal drive trimmer (B2) clockwise as far as possible without crowding the right side of the picture.

Adjust the horizontal size slug (B3) until picture fills the mask horizontally.

Adjust the horizontal linearity slug (B4) until picture is symmetrical from left to right. A slight readjustment of B2 may be necessary to obtain optimum results.

DISASSEMBLY INSTRUCTIONS

1. Remove three push-on type control knobs.
2. Remove nine 1/4" hex head screws holding rear cover in place. Remove rear cover.
3. Disconnect built-in antenna.
4. Remove antenna terminal strip.
5. Disconnect speaker.
6. Remove six 1/4" hex head screws from bottom of chassis. Remove chassis.
7. Remove eight 3/8" hex nuts holding both speaker to cabinet. Remove speakers.



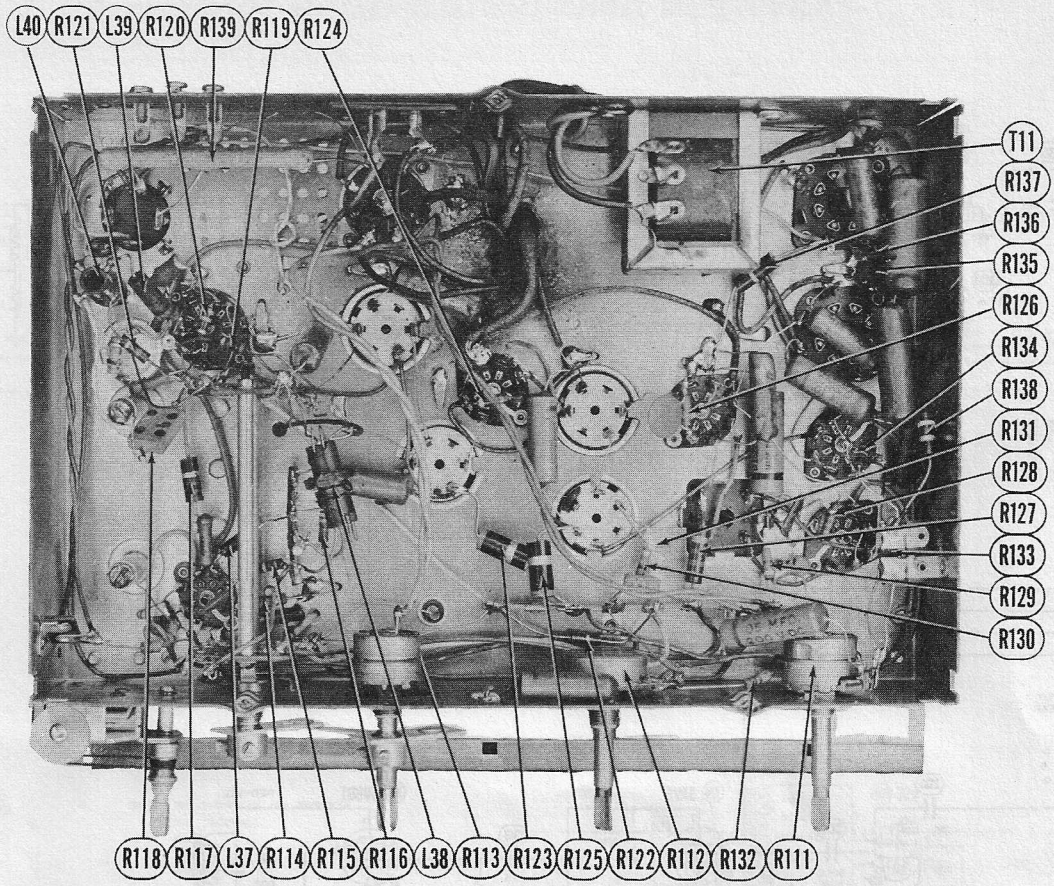
RESISTANCE READINGS

Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
6AU6	†0Ω ▲5.3 Meg.	0Ω	0Ω	.1Ω	†830Ω	†47KΩ	120Ω		
6BA7	†8.5KΩ	47KΩ	2.2Ω	.1Ω	0Ω	0Ω	†22KΩ ▲3Meg.	0Ω	†8.5KΩ
6BA6	14.9Ω	0Ω	0Ω	.1Ω	†8.5KΩ	†8.5KΩ	68Ω		
6AU6	.9Ω	0Ω	0Ω	.1Ω	††15KΩ	††15KΩ	150Ω		
6AL5	0Ω	33KΩ	.1Ω	0Ω	Inf.	0Ω	Inf.		
6AV6	10 Meg.	0Ω	.1Ω	0Ω	1 Meg.	0Ω	†68KΩ		
6V6GT	20Ω	.1Ω	†920Ω	†360Ω	470KΩ	†700Ω	0Ω	220Ω	
6V6GT	Inf.	.1Ω	†530Ω	†360Ω	470KΩ	Inf.	0Ω	220Ω	
7Z4	0Ω	Inf.	85Ω	Inf.	Inf.	85Ω	120KΩ	.1Ω	

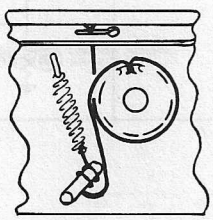
† MEASURED FROM PIN 7 OF V33.

ACTURER OF THIS
YOU THIS SERVICE

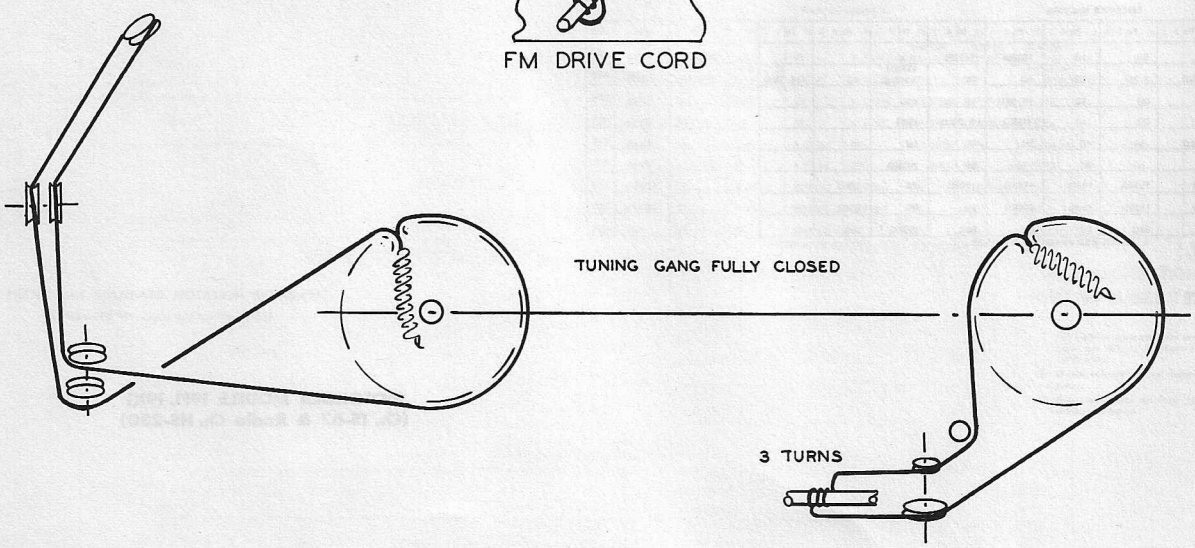
maintained at 117 volts for
ings.
erance on component values
ble a variation of ±15% in
resistance readings.
rol at maximum, no signal ap-
tage measurements.



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



FM DRIVE CORD



RADIO DIAL CORD STRINGING

TV PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	NOTES
		MOTOROLA PART No.	STANDARD REPLACEMENT		
V1	RF Amp.	6AG5	6AG5	7BD	
V2	Converter	6J6	6J6	7BF	
V3	1st Video IF	6AG5	6AG5	7BD	
V4	2nd Video IF	6AG5	6AG5	7BD	
V5	3rd Video IF	6AG5	6AG5	7BD	
V6	Video Det. -Sync. Clipper	6AL5	6AL5	6BT	
V7	Video Amp.	6BA6	6BA6	7BK	
V8	Video Output	6V6GT	6V6GT	7AC	
V9	Cath. Follower-DC Rest.	6AS5	6AS5	7CV	
V10	AGC Rect.	12AX7	12AX7	9A	
V11	Sound IF Amp.	6AU6	6AU6	7BK	
V12	Ratio Det.	6AL5	6AL5	6BT	
V13	AF Amp.	6SL7GT	6SL7GT	8BD	
V14	Audio Output	6V6GT	6V6GT	7AC	
V15	Sync. Amp. -1st Sync. Sep.	12AU7	12AU7	9A	
V16	Vert. Osc.	6SN7GT	6SN7GT	8BD	
V17	Vert. Output	25L6GT	25L6GT	7AC	
V18	Hor. AFC-Hor. Osc.	6SL7GT	6SL7GT	8BD	
V19	Hor. Output	6CD6G	6CD6G	5BT	
V20	Hor. Damper	6W4GT	6W4GT	4CG	
V21	HV Rect.	1B3GT	1B3GT	3C	
V22	LV Rect.	5U4G	5U4G	5T	
V23	LV Rect.	5U4G	5U4G	5T	
V24	Picture Tube	19AP4	19AP4	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	40	400	23A790829	AFH882J		UPT44145		TVL-3785	◓ Filter
B	40	400							■ Filter
C	10	400							▲ Vert. Osc. Dec.
C2A	40	400	23A790829	AFH882J		UPT44145		TVL-3785	◓ Filter
B	40	400							■ Filter
C	10	400							▲ Filter
C3A	20	350	23A792690	AF4H8G2D5B		UPT316			◓ Filter
B	40	300							■ Filter
C	10	150							▲ Decoupling
D	250	50							Vert. Output Cath.
C4	1Ω @ 60 ∿	3VNP	23A90027	E4A117				TVL-1015	Vert. Cent. Cont. Byp.
C5	10	50	23A90205						Stabilizing Cap.
C6	10	50	23A90205						1st AF Amp. Cath.
C7	50	25	23A790904	PRS25/50		BR502A		TVA-1206	Output Cath.
C8	10	50	23A90205	PRS50/10		BR105		TVA-1304	AGC Filter
C9	50	25	8R9857	PRS25/50		BR502A		TVA-1206	Hor. Cent. Cont. Byp. *
C10	7.5		21K790454	SI8.2NPO	TCZ-6.8		NPOK-8.2	19C19	Ant. Coupling
C11	7.5		21K790454	SI8.2NPO	TCZ-6.8		NPOK-8.2	19C19	Ant. Coupling
C12	100		21K470736	SI100N750	TCN-100		N750L-100	29C16	Fixed Padder
C13	10		21K790455	SI10	D6-100		GP1K-10	19C19	Fixed Padder
C14	3.3	500	21K790416	SI3.3NPO	TCZ-3.3		NPOK-3.3		Fixed Trimmer
C15	3.3	500	21K790416	SI3.3NPO	TCZ-3.3		NPOK-3.3		Fixed Trimmer
C16	150		21K791589	SI150	D6-151		GP2K-150	19C12	UHF Isolation
C17	1000		21K478410	SI1000	D6-102		GP2L-001	19C1	AGC Filter
C18	1000		21K478410	SI1000	D6-102		GP2L-001	19C1	RF Screen
C19	1000		21K478410	SI1000	D6-102		GP2L-001	19C1	RF Bypass
C20	100		21K470736	SI100	D6-101		GP1K-100	19C11	RF Coupling
C21	2	500	21K471216						Fixed Trimmer
C22	2	500	21K471216						Fixed Trimmer
C23	1.5	500	21R2751	SI1.5NPO	TCZ-1.5		NPOK-1.5		Fixed Trimmer
C24	25		21A470738	SI25	D6-250		GP1K-25	19C27	RF Coupling
C25	1.5	500	21R2751	SI1.5NPO	TCZ-1.5		NPOK-1.5		Osc. Coupling
C27	25		21A470738	SI25	D6-250		GP1K-25	19C27	Osc. Grid Cap.
C27	1.5		21A789121						Fixed Trimmer
C28	25		21A470738	SI25	D6-250		GP1K-25	19C27	Osc. Feedback
C29	1000		21K478410	SI1000	D6-101		GP2L-001	19C1	RF Bypass
C30	5		21K86819				N150K-5		Fixed Trimmer
C31	1000		21K478410	SI1000	D6-102		GP2L-001	19C1	Conv. Fil.
C32	47		21K77373	SI47	D6-470		GP1K-47	19C25	Fixed Trimmer
C33	30		21R31493				N150K-30		Fixed Trimmer
C34	62		21R791726		TCN-62		N750L-62		Fixed Trimmer
C35	100		21A38224	SI100	D6-101		GP1K-100	19C11	IF Coupling
C36	2000		21K790963	SI2000	D6-202	1W5D2	GP2M-002	29C2	AGC Filter
C37	2000		21K790963	SI2000	D6-202	1W5D2	GP2M-002	29C2	RF Bypass
C38	2000		21K790963	SI2000	D6-202	1W5D2	GP2M-002	29C2	1st V. IF Screen
C39	2000		21K790963	SI2000	D6-202	1W5D2	GP2M-002	29C2	1st V. IF Fil.
C40	5000		21A470789	BPD-005	DD-502	1D5D5	811-005	29C1	1st V. IF Dec.
C41	100		21A38224	SI100	D6-101	5W5T1	GP1K-100	19C11	IF Coupling
C42	2000		21K790963	SI2000	D6-202	1W5D2	GP2M-002	29C2	AGC Filter
C43	2000		21K790963	SI2000	D6-202	1W5D2	GP2M-002	29C2	2nd V. IF Screen
C44	2000		21K790963	SI2000	D6-202	1W5D2	GP2M-002	29C2	2nd V. IF Cath.
C45	2000		21K790963	SI2000	D6-202	1W5D2	GP2M-002	29C2	2nd V. IF Fil.
C46	5000		21A470789	BPD-005	DD-502	1D5D5	811-005	29C1	2nd V. IF Dec.
C47	100		21A38224	SI100	D6-101	5W5T1	GP1K-100	19C11	IF Coupling
C48	2000		21K790963	SI2000	D6-202	1W5D2	GP2M-002	29C2	3rd V. IF Screen
C49	2000		21K790963	SI2000	D6-202	1W5D2	GP2M-002	29C2	3rd V. IF Cath.
C50	2000		21K790963	SI2000	D6-202	1W5D2	GP2M-002	29C2	3rd V. IF Fil.
C51	5000		21A470789	BPD-005	DD-502	1D5D5	811-005	29C1	3rd V. IF Dec.
C52	1000		21K478410	SI1000	D6-102	1W5D1	GP2L-102	19C1	IF Coupling
C53	5		21K86819	SI5	TCZ-4.7	5W5V5	GP1K-5	MS-55	V. Diode Filter
C54	.1	200	8R9854	P288-1	DF-104	PTE4P1		2TM-1	Video Coupling
C55	.05	600	8R9873	P688-05	DF-503	PTE6S5		6TM-15	Video Coupling
C56	500	500	21R6551	1468-0005	D6-501	5W5T5	GP2K-500	1FM-35	2nd V. Amp. Cath.
C57	47		21K77373	SI47	D6-470	5W5Q5	GP1K-47	19C25	Fixed Trimmer
C58	.02	600	8R9811	P688-02	DF-203	PTE6S2		6TM-12	Video Coupling
C59	.1	400	8R9862	P488-1	DF-104	PTE4P1		4TM-1	Video Coupling

CAPACITORS (CONT.)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C60	47		21K77373	SI47	D6-470	5W5Q5	GP1K-47	19C25	Video Coupling
C61	.1	200	8R9854	P288-1	DF-104	PTE4P1		2TM-1	Video Coupling
C62	47		21K77373	SI47	D6-470	5W5Q5	GP1K-47	19C25	Voltage Divider
C63	.1	200	8R9854	P288-1	DF-104	PTE4P1		2TM-1	Sync. Coupling
C64	.005	600	8R9869	P688-005	D6-502	PTE6D5	811-005	6TM-25	Sync. Coupling
C65	100		21A38224	SI100	D6-101	5W5T1	GP1K-100	19C11	Sync. Coupling
C66	.02	200	8R9851	P488-02	DF-203	PTE4S2		2TM-12	AGC Filter
C67	.02	200	8R9851	P488-02	DF-203	PTE4S2		2TM-12	AGC Filter
C68	5		21K86819	SI5	TCZ-4.7	5W5V5	GP1K-5	MS-55	S. IF Coupling
C69	47		21K77373	SI47	D6-470	5W5Q5	GP1K-47	19C25	S. IF Coupling
C70	50		21K77373	SI50	D6-500	5W5Q5	GP1K-50	19C28	Fixed Trimmer
C71	5000		21A470789	BPD-005	DD-502	1D5D5	811-005	29C1	S. IF Screen
C72	5000		21A470789	BPD-005	DD-502	1D5D5	811-005	29C1	S. IF Plate Dec.
C73	500		21R6551	SI500	D6-501	5W5T5	GP2K-500	19C32	Diode Load Cap. †
C74	500		21R6551	SI500	D6-501	5W5T5	GP2K-500	19C32	Diode Load Cap. †
C75	500		21R6551	SI500	D6-501	5W5T5	GP2K-500	19C32	RF Bypass
C76	.002	600	8R9867	P688-002	D6-202	PTE6D2	GP2M-002	6TM-22	De-emphasis
C77	.05	200	8R9853	P288-05	DF-503	PTE4S5		2TM-15	Audio Coupling
C78	.02	200	8R9867	P488-02	DF-203	PTE4S2		2TM-15	Audio Coupling
C79	250		21B482295	SI250	D6-251	5W5T25	GP2K-250	1FM-325	1st AF Amp. Plate
C80	100		21A38224	SI100	D6-101	5W5T1	GP1K-100	19C11	AF Feedback
C81	.0047	600	8R9869	P688-0047	D6-472	PTE6D5	GP2M-0047	6TM-472	Audio Coupling
C82	250		21B482295	SI250	D6-251	5W5T25	GP2K-250	1FM-325	2nd AF Amp. Plate
C83	.1	200	8R9854	P288-1	DF-104	PTE6P1		2TM-1	Squelch Filter
C84	200	500	21R6629	1468-0002	D6-201	5W5T2	GP2K-200	1FM-32	Hor. Sync. Coupling
C85	.0047	600	8R9869	P688-0047	D6-472	PTE6D5	GP2M-0047	6TM-472	Audio Coupling
C86	.0047	600	8R9869	P688-0047	D6-472	PTE6D5	GP2M-0047	6TM-472	Output Plate
C87	.033	400	8R9872	P488-033		PTE6S3		6TM-13	Sync. Coupling
C88	.0047	600	8R9869	P688-0047	D6-472	PTE6D5	GP2M-0047	6TM-472	Vert. Sync. Coupling
C89	.0047	600	8R9869	P688-0047	D6-472	PTE6D5	GP2M-0047	6TM-472	Integrator Net.
C90	.03	600	8R9872	P688-03		PTE6S3		6TM-13	Integrator Net.
C91	.0047	600	8R9868	P688-0047	D6-472	PTE6D5	GP2M-0047	6TM-472	Fixed Trimmer
C92	.05	400	8R9861	P488-05	DF-503	PTE4S5		4TM-15	Vert. Discharge
C93	.1	400	8R9862	P488-1	DF-104	PTE4P1		4TM-1	Vert. Discharge
C94	.15	400	8R9863	P488-15		GT4P2		4TM-154	Vert. Sweep Coup.
C95	.01	600	8R9870	P688-01	D6-103	PTE6S1	811-01	6TM-11	Vert. Sweep Coup.
C96	.002	600	8R9867	P688-002	D6-202	PTE6D2	GP2M-002	6TM-22	Hor. Sync. Coupling
C97	1500	500	21R6711	1467-0015	D6-152	1W5D15	GP2L-0015	1FM-215	Hor. AFC Grid
C98	1500	500	21R6711	1467-0015	D6-152	1W5D15	GP2L-0015	1FM-215	Hor. AFC Cath.
C99	1000	500	21R6663	1468-001	D6-102	1W5D1	GP2L-001	1FM-21	Hor. AFC Coupling
C100	500	500	21R6551	1468-0005	D6-501	5W5T5	GP2K-500	1FM-35	Hor. Osc. Grid
C101	.05	600	8R9873	P688-05	DF-503	PTE6S5		6TM-15	Hor. Osc. Dec.
C102	330	4000	21K2754	1468-00035	D6-331	5W5T3	GP2K-330	1FM-335	Hor. Discharge
C103	400	500	21R6664	1468-0004	D6-401	5W5T4	GP2K-390	1FM-34	Hor. Discharge
C104	1000	500	21R6663	1468-001	D6-102	1W5D1	GP2L-001	1FM-21	Hor. Sweep Coup.
C105	.05	600	8R9873	P688-05	DF-503	PTE6S5		6TM-15	Hor. Output Screen
C106	.03	600	8R9872	P688-03		PTE6S3		6TM-13	Damper Filter
C107	.04	600	8K400028	P688-04		PTE6S4		6TM-14	Damper Filter
C108	.01	600	8R9870	P688-01	D6-103	PTE6S1	811-01	6TM-11	Fuse Bypass
C109	.5	200	8R9857	P288-5		GT2P5		2TM-5	Hor. Sweep Coup.
C110	500	20K	21A790833	HV20C	TV3-502				HV Filter
C111	500	20K	21A790833	HV20C	TV3-502				HV Filter

* Some models use .5MFD in this application. Mfgr's Part No. 8R9857.
† When either items C73 or C74 are replaced, replace with capacitors of equal value.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA MOTOROLA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	5000Ω	2	18B790843				Contrast control-Wire Wound-front
B	1 Meg.	½					Volume control and switch-rear
				Concentrikit			
R2A	250KΩ	½		B11-130 *			Vert. hold control-front
B	10KΩ	½	18A790838	B11-116 *	RTV-79		Horiz. hold control-rear
C	Shaft End			E-190 *			Attach per instr. in "Concentrikit".
R3A	3000Ω	2	18A792688		RTV-172		Vert. linearity control-Wire Wound-front
B	1 Meg.	½					Vert. size control-rear
R4A	500Ω	4	18A792687		RTV-171		Horiz. centering -Wire Wound-front
B	50Ω	2					Vert. centering-Wire Wound-rear
R5A	1500Ω	4	18A792689		RTV-173		Focus control-Wire Wound-front
B	50KΩ	½					Brightness control-rear

* Additional parts to be used with "Concentrikit".
Cut off bushing if 1/4" length is necessary.

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA MOTOROLA PART No.	IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ARE ± 10% UNLESS OTHERWISE STATED
R6	470KΩ 20%	½	6R6377		RF Amp. Grid
R7	2.7 Meg.	½	6R488136		AGC Network
R8	33KΩ	½	6R6410		RF Amp. Screen
R9	3900Ω	½	6R5659	BTS-3900	RF Amp. Plate
R10	470KΩ 20%	½	6R6377		Conv. Grid
R11	470KΩ 20%	½	6R6377		Conv. Grid
R12	15KΩ	½	6R6477		Osc. Grid
R13	8200Ω	½	6R2004		Osc. Plate
R14	10KΩ	½	6R6320		Conv. Plate
R15	6800Ω	½	6R6428		1st Video IF Amp. Grid
R16	150Ω	½	6R6373	BTS-150	1st Video IF Amp. Cathode
R17	22KΩ	1	6R6341		Voltage Divider
R18	8200Ω	½	6R2004		1st Video IF Amp. Screen
R19	10KΩ 20%	½	6R6054		AGC Network
R20	6800Ω	½	6R6428		2nd Video IF Amp. Grid
R21	100Ω 20%	½	6R6326	BTS-100	2nd Video IF Amp. Cathode
R22	8200Ω	½	6R2004		2nd Video IF Amp. Screen
R23	10KΩ 20%	½	6R6054		AGC Network
R24	5600Ω	½			3rd Video IF Amp. Grid-See Note 1
R25	100Ω 20%	½	6R6326	BTS-100	3rd Video IF Amp. Cathode
R26	8200Ω	½	6R2004		3rd Video IF Amp. Screen
R27	47KΩ 20%	½	6R6056	BTS-47K	Series Test Point
R28	3900Ω	½	6R5659	BTS-3900	Video Det. Diode Load
R29	470KΩ	½	6R6032	BTS-470K	Video Amp. Grid
R30	3900Ω	½	6R5659	BTS-3900	Video Amp. Plate

RESISTORS (CO

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA MOTOROLA PART No.	IRC PART No.
R31	4700Ω	2	6R5671	BTB-4700
R32	1 Meg. 20%	½	6R6004	BTS-1 Meg.
R33	100Ω 20%	½	6R6018	
R34	150Ω	½	6R6373	BTS-150
R35	150KΩ	½	6R6398	BTS-150K
R36	3900Ω	5	17K790901	
R37	560KΩ	1	6R5697	BTS-560K
R38	100Ω 20%	½	6R6018	
R39	5000Ω	5	17K791597	1 3/4A-5000
R40	2200Ω	½	6R6069	BTS-2200
R41	560KΩ	1	6R5697	BTA-560K
R42	150KΩ	½	6R6398	BTS-150K
R43	8200Ω	½	6R5644	BTS-8200
R44	68KΩ	2	6R2079	BTB-68K
R45	47KΩ	½	6R6056	BTS-47K
R46	10KΩ 20%	½	6R6054	BTS-10K
R47	1 Meg. 20%	½	6R6004	BTS-1 Meg.
R48	100KΩ 20%	½	6R6075	BTS-100K
R49	18KΩ	½	6R5591	BTS-18K
R50	470Ω 20%	½	6R3949	BTS-470
R51	1 Meg. 20%	½	6R6004	BTS-1 Meg.
R52	10KΩ	½	6R6320	BTS-10K
R53	82KΩ	1	6R5644	BTA-82K
R54	100KΩ 20%	½	6R6075	
R55	15KΩ 20%	½	6R2119	
R56	100KΩ 20%	½	6R6075	
R57	2700Ω	½	6R5577	BTS-2700
R58	1500Ω	½	6R6038	BTS-1500
R59	1000Ω	½	6R6229	BTS-1000
R60	6800Ω	½	6R6428	BTS-6800
R61	6800Ω	½	6R6428	BTS-6800
R62	47Ω	½	6R2108	
R63	39KΩ	½	6R6487	BTS-39K
R64	2.2 Meg. 20%	½	6R3927	BTS-2.2 Meg.
R65	100KΩ 20%	½	6R6075	BTS-47K
R66	1000Ω 20%	½	6R6229	BTS-1000
R67	82KΩ	1	6R5644	BTA-82K
R68	4.7 Meg. 20%	½	6R2122	BTS-4.7 Meg.
R69	15KΩ	½	6R6477	BTS-15K
R70	100KΩ	½	6R6031	BTS-100K
R71	82KΩ	1	6R5644	BTA-82K
R72	1.5 Meg.	½	6R6460	BTS-1.5 Meg.
R73	100KΩ 20%	½	6R6075	BTS-100K
R74	470KΩ 20%	½	6R6032	BTS-470K
R75	330Ω	1	6R6254	BTA-330
R76	270KΩ	½	6R6414	BTS-270K
R77	470KΩ 20%	½	6R6032	BTS-470K
R78	18KΩ	½	6R5591	BTS-18K
R79	1000Ω	½	6R6229	BTS-1000
R80	6800Ω	2	6R5690	BTB-6800
R81	6800Ω	½	6R6428	BTS-6800
R82	4700Ω 20%	½	6R6039	BTS-4700
R83	220KΩ 20%	½	6R6407	BTS-220K
R84	4700Ω	½	6R6080	BTS-4700
R85	560KΩ	1	6R5697	BTA-560K
R86	47KΩ	½	6R6056	BTS-47K
R87	3.3 Meg.	½	6R6497	BTS-3.3 Meg.
R88	470Ω 20%	1	6R5593	BTA-470
R89	10KΩ 20%	½	6R6054	BTS-10K
R90	1500Ω	½	6R6038	BTS-1500
R91	10000Ω 20%	½		BTS-1000
R92	10KΩ	½	6R6320	BTS-10K
R93	560KΩ	1		BTA-560K
R94	39KΩ	½		BTS-39K
R95	270KΩ	1	6R6491	BTA-270K
R96	10KΩ	½	6R6054	BTS-10K
R97	27KΩ	½	6R6434	BTS-27K
R98	1 Meg. 20%	½	6R6004	BTS-1 Meg.
R99	100Ω 20%	½	6R6326	
R100	5000Ω	5	17K791597	1 3/4A-5000
R101	470KΩ 20%	½	6R6032	
R102	47Ω	1	6R5583	BW-½-47
R103	2000Ω	25	17K890906	2 1/2DA-2000
R104	500Ω	5	17K792704	1 3/4A-500
R105	3000Ω	10	17K790900	1 3/4A-3000
R106	47KΩ	½	6R6048	BTS-47K
R107	15KΩ	1	6R6431	BTA-15K
R108	1000Ω	2	6R476004	BTB-1000
R109	3000Ω	10	17K790900	1 3/4A-3000
R110	1000Ω	2	6R476004	BTB-1000

Note 1. Some models use a 8200Ω resistor in this applicatio
Note 2. Some models use a 12KΩ resistor in this application
Note 3. Some models use a 3300Ω resistor in this applicatio
Note 4. Some models use a 47KΩ resistor in this applicatio
Note 5. Some models use a 43KΩ resistor in this applicatio

TRANSFORM

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	MOTOROLA PART No.
T1	117VAC @ 2.7A	600VCT .410ADC	5VAC @ 6A	6.3VAC @ 1.2A SEC. 4 6.3VAC @ 11A	25K792564

TRANSFORM

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	MOTOROLA PART No.
T2	6.3VAC @ 1.3A Tap @ 2.5VAC @ .3A				25B792709

SCRIPTIONS (Continued)

(ONT.)

IDENTIFICATION CODES
Video Amp. Decoupling
Video Output Grid
Parasitic Suppressor
Video Output Cathode
Isolation
Video Output Plate-Wire Wound
Cathode Follower Amp. Grid
Parasitic Suppressor
Contrast Control Shunt-Wire Wound
Phase Correction
Voltage Divider
Picture Tube Grid
Voltage Divider-See Note 2
Voltage Divider
AGC Network
AGC Network
Series Test Point
Voltage Divider
AGC Rect. Cathode
AGC Rect. Cathode
AGC Rect. Grid
Voltage Divider
Isolation
Sound IF Amp. Grid
Voltage Divider
Sound IF Amp. Screen
Sound IF Amp. Plate Decoupling
Balancing
Balancing
Ratio Det. Diode Load
Ratio Det. Diode Load
Parasitic Suppressor
De-emphasis
Tone Compensation
AF Amp. Grid
AF Amp. Cathode
AF Amp. Plate
AF Amp. Grid
AF Amp. Cathode
Voltage Divider
AF Amp. Plate
Squelch Rect. Load
Squelch Rect. Load
Audio Output Grid
Audio Output Cathode
Sync. Amp. Cathode
Sync. Amp. Plate
Sync. Sep. Grid
Sync. Sep. Cathode
Sync. Sep. Plate
Integrator
Integrator
Vert. Osc. Grid
Vert. Peaking
Vert. Osc. Plate
Vert. Osc. Plate Decoupling
Vert. Output Grid
Vert. Output Cathode
Sync. Clipper Cathode
Sync. Clipper Plate
Horiz. AFC Cathode-See Note 3
Horiz. AFC Cathode
Horiz. AFC Plate-See Note 4
Horiz. Osc. Grid-See Note 5
Horiz. Osc. Plate
Decoupling
Horiz. Peaking
Horiz. Output Grid
Parasitic Suppressor
Horiz. Output Screen-Wire Wound
HV Filter
Centering Network
Series Focus Control-Wire Wound
Focus Coil Shunt-Wire Wound
Focus Coil Shunt-Wire Wound
Feedback
Decoupling
Filter
Filter-Wire Wound
Decoupling

ER (POWER)

	REPLACEMENT DATA		
	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.

ER (FILAMENT)

	REPLACEMENT DATA		
	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA MOTOROLA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
T3	53Ω	225Ω	25B790914	A-8111	A-3000 ⑤	TBO-1	Vert. Block Osc. Trans.
T4	470Ω	7.5Ω	24C792691		HVO-6		Hor. Output Trans.
	Tap ⓐ	Tap ⓐ					
	32Ω	.6Ω					
		SEC. 2					
		0Ω					
T5	600Ω	12Ω	25K792710		A-3038	TSO-2 ⑥	Vert. Output Trans.
T6A	13Ω		24C792699	DY-7	MD-70F		Hor. Deflection Coil
B	62Ω		24K792714 ④				Vert. Deflection Coil
T7	1400Ω		24B792775				Focus Coil
T8	20Ω CT		25B790916				Hor. Osc. Coil

④ Alternate deflection yoke.
⑤ Drill one new mounting hole.
⑥ Drill new mounting holes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA MOTOROLA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T9	6000Ω	7.8Ω	560Ω	.8Ω	25B790698	A-3824	A-2904 ①	RO-6 ①	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS FIELD RES.	RATINGS V. C. IMP.	REPLACEMENT DATA MOTOROLA PART No.	JENSEN PART No.	QUAM PART No.	INSTALLATION NOTES
SP1	PM	4.4Ω	50C791631		12A4A	② Alternate for SP2A
SP2A	PM	3.4Ω	50C790701		5A07	③ Alternate for SP3A
B	PM		50C791430 ②		12A31	
SP3A	PM	3.5Ω	50C791173			
B	PM	3.5Ω	50C790699 ③			
	CONE DIA.	V. C. DIA.				
SP4	11 3/8"	1"				
SP5A	4 1/2"	9/16"				
B						
SP6A	9 3/4"	1"				
B						

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA MOTOROLA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
L1	.410ADC	40Ω	1.8 Henries	25B790952				

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA MOTOROLA PART No.	MEISSNER PART No.	NOTES
L2	TV Ant. Trans. Assembly	.1Ω	.1Ω	1X790492		Includes 2 trans., C10, C11, C12, C13
L3	UHF Ant. Coil	.1Ω		24K485432		
L4	RF Choke	0Ω		24A791082		
L5	Fil. Choke	0Ω		24A791081		
L6	Adj. Channel Video Trap	.1Ω		24B791592		
L7	1st Video IF	.2Ω		24K700104		
L8	1st Video IF Coupling	.2Ω		24K700104		
L9	Sound Trap	.1Ω		24B791592		
L10	Fil. Choke	0Ω		24A791081		
L11	2nd Video IF	.1Ω		24B790849		
L12	Fil. Choke	0Ω		24A791081		
L13	RF Choke	0Ω		24A791081		
L14	3rd Video IF	.1Ω		24B790849		
L15	Fil. Choke	0Ω		24A791081		
L16	RF Choke	0Ω		24A791081		
L17	4th Video IF	.4Ω	.4Ω	24B790852		
L18	RF Choke	0Ω		24A791081		
L19	Peaking	5Ω		24K790854		Blue dot
L20	Peaking	6.5Ω		24K790856		Yellow dot
L21	Peaking	5Ω		24K790854		Blue dot
L22	Peaking	6.5Ω		24K790856		Yellow dot
L23	4.5 MC Trap	1.4Ω		24B790851		
L24	Peaking	5Ω		24K790855		Wound on 22KΩ resistor, red dot
L25	Peaking	6.5Ω		24K790856		Yellow dot
L26	Peaking	1.9Ω		24B790853		Orange dot
L27	Sound IF	1.4Ω		24B790851		
L28	Ratio Det. Trans.	3Ω	.3Ω	24B790125		
L29	Horiz. Freq. Lock-In Coil	200Ω		24B790890		
L30	Horiz. Lin.	20Ω		24K792820		Less core and clip
L31	Horiz. Size	50Ω		24K792722		Less core and clip

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA MOTOROLA PART No.		NOTES
M1	Bayonet	6-8	.15	Brown	65X11854		Type #47
M2	Bayonet	6-8	.15	Brown	65X11854		Type #47

TV PARTS LIST AND DESCRIPTIONS (Continued)

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M3	RF Tuner	1X790700	
M4	Fuse	65K20987	.25A 250V Type 3AG
M5	Ion Trap	24K791477	
	Built-In TV Antenna Assembly	1X791759	Complete with double loop, 4 capacitors, coil and connecting cables.
	Safety Glass	61C792086	
	Knob	36B790997	Channel selector
	Knob	36B790999	TV volume
	Knob	36K791630	With dot indicator (Radio)
	Knob	36B790569	Without dot indicator (Radio)
	Escutcheon	1X790842	Channel, complete with locking lever and spring
	Escutcheon	1X790014	Volume, complete with locking lever and spring
	Escutcheon	13C791478	Radio dial

RADIO PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	NOTES
		MOTOROLA PART No.	STANDARD REPLACEMENT		
V25	RF Amp.	6AU6	6AU6	7BK	
V26	Converter	6BA7	6BA7	8CT	
V27	1st IF Amp.	6BA6	6BA6	7BK	
V28	2nd FM IF Amp.	6AU6	6AU6	7BK	
V29	FM Ratio Det.	6AL5	6AL5	6BT	
V30	AM DET. -AVC- AF Amp.	6AV6	6AV6	7BT	
V31	Power Output	6V6GT	6V6GT	7AC	
V32	Power Output	6V6GT	6V6GT	7AC	
V33	Rect.	7Z4	7Z4	5AB	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C112A	40	300	23B690975	AFH888G4D		UPT44430		TVL-4739	▲ Filter
B	40	250				C4			■ Filter
C	40	250							▲ Filter
D	40	25							Output Cath.
C113	3	50	23K690543	PRS150/4		BBR4-50		TVA-1303	Stabilizing Cap.
C114	5		21K70720	SI5	TCZ-4.7	5W5V5	GP1K-5	MS-55	Ant. Coupling
C115	220		21K77375	SI220	D6-221	5W5T25	GP2K-220	19C13	Ant. Coupling
C116	.05	200	8R9821	P288-05	DF-503	PTE4S5		2TM-15	AVC Filter
C117	10000		21K482726	BPD-01	DD-103	PTE4S1	811-01	36C1	RF Screen
C118	100		21B77286	SI100	D6-101	5W5T1	GP1K-100	19C11	RF Cath.
C119	100		21B77286	SI100	D6-101	5W5T1	GP1K-100	19C11	Fixed Trimmer
C120	100		21B77286	SI100	D6-101	5W5T1	GP1K-100	19C11	RF Coupling
C121	100	500	21R6554	1468-0001	D6-101	5W5T1	GP1K-100	1FM-31	RF Coupling
C122	24		21K28816	SI25	D6-250	5W5Q25	GP1K-25	19C27	Osc. Grid Cap.
C123	85		21K691203				N750L-85		Fixed Trimmer
C124	100		21B77286	SI100	D6-101	5W5T1	GP1K-100	19C11	Conv. Dec.
C125	.01	400	8R9809	P488-01	D6-103	PTE4S1	811-01	4TM-11	Conv. Dec.
C126	1000		21K478410	SI1000	D6-102	1W5D1	GP2L-001	19C11	Conv. Fil.
C127	.005	600	8R9813	P688-005	D6-502	PTE6D5	811-005	6TM-25	1st IF Dec.
C128	.01	400	8R9809	P488-01	D6-103	PTE4S1	811-01	4TM-11	1st IF Fil.
C129A	50		§	SI50	D6-500	5W5Q5	GP1K-50	19C28	Diode RF Filter
B	50			SI50	D6-500	5W5Q5	GP1K-50	19C28	Diode RF Filter
C130	1000		21K478410	SI1000	D6-102	1W5D1	GP2L-001	19C1	RF Bypass
C131	.002	400	8R9824	P688-002	D6-202	PTE6D2	GP2M-002	6TM-22	2nd IF Dec.
C132	10000		21K482726	BPD-01	DD-103	PTE4S1	811-01	36C1	2nd IF Cath.
C133A	250		21B484337	SI250	D6-251	5W5T25	GP2K-250	1FM-325	Diode Load Cap. †
B	250			SI250	D6-251	5W5T25	GP2K-250	1FM-325	Didde Load Cap. †
C134	1000		21K478410	SI1000	D6-102	1W5D1	GP2L-001	19C1	De-emphasis
C135	.05	200	8R9821	P288-05	DF-503	PTE4S5		2TM-15	Audio Coupling
C136	.005	600	8R9813	P688-005	D6-502	PTE6D5	811-005	6TM-25	Tone Compensation
C137	.01	400	8R9809	P488-01	D6-103	PTE4S1	811-01	4TM-11	Tone Compensation
C138	5000		21K691125	BPD-005	DD-502	1D5D5	811-005	29C1	Audio Coupling
C139	220		21K77375	SI220	D6-221	5W5T25	GP2K-220	19C13	AF Amp. Plate
C140	.05	400	8K470606	P488-05	DF-503	PTE4S5		4TM-15	Audio Coupling
C141	.05	400	8K470606	P488-05	DF-503	PTE4S5		4TM-15	Audio Coupling
C142	.002	400	8R9824	P688-002	D6-202	PTE6D2	GP2M-002	6TM-22	Output Plate
C143	.002	400	8R9824	P688-002	D6-202	PTE6D2	GP2M-002	6TM-22	Output Plate

† When either items C133A or C133B are replaced, replace both with capacitors of equal value.
§ Items C129A, C129B, and R131 are combined into one unit. Mfgr's Part No. 21K690980.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESIST-ANCE	WATTS	MOTOROLA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	
R111A	1 Meg.	½	18K691192	Q13-137X	AK-98	ANT-73	Volume control-tapped at 250KΩ
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Attach to R111A per instructions
C	Switch		Not Req.	76-1	SWB	K-155	Attach to R111A per instructions
R112A	1 Meg.	½	18K77399	Q14-137		AN-68	Tone control
B	Shaft		Not Req.	Not Req.		AK-4	Attach to R112A per instructions

RADIO **PARTS LIST AND DESCRIPTIONS (Continued)**

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	MOTOROLA PART No.	IRC PART No.	
R113	1 Meg.	½	6R6004	BTS-1 Meg.	RF Amp. Grid
R114	120Ω	½	6R5551	BTS-120	RF Amp. Cathode
R115	47KΩ	½	6R6048	BTS-47K	RF Amp. Screen
R116	470Ω	½	6R3949	BTS-470	RF Amp. Plate
R117	3.3Ω	1			Parasitic Suppressor-See Note 6
R118	22KΩ	½	6R6028	BTS-22K	Conv. Grid
R119	8.2 Meg.	½	6R5585	BTS-8.2 Meg.	AVC Network
R120	47KΩ	½	6R6048	BTS-47K	Osc. Grid
R121	1500Ω	½	6R6038	BTS-1500	Parasitic Suppressor
R122	3.3 Meg.	½	6R6497	BTS-3.3 Meg.	AVC Network
R123	8200Ω	2	6R5725	BTB-8200	Conv. Decoupling
R124	68Ω	½		BTS-68	FM-AM-IF Amp. Cathode
R125	8200Ω	2	6R5725	BTB-8200	FM-AM-IF Amp. Decoupling
R126	150Ω	½		BTS-150	2nd FM-AM-IF Amp. Cathode
R127	15KΩ	1	6R6431	BTA-15K	2nd FM-AM-IF Amp. Decoupling
R128	33KΩ	½	6R6410	BTS-33K	Ratio Det. Diode Load
R129	47KΩ	½	6R6048	BTS-47K	De-emphasis
R130	1 Meg.	½	6R6046	BTS-1 Meg.	Det. Diode Load
R131	47KΩ	½	§		Diode Filter
R132	33KΩ	½	6R6410	BTS-33K	Tone Compensation
R133	10 Meg.	½			AF Amp. Grid
R134	68KΩ	½		BTS-68K	AF Amp. Plate
R135	470KΩ	½	6R6032	BTS-470K	Output Grid
R136	470KΩ	½	6R6032	BTS-470K	Output Grid
R137	220Ω	1	6R6389	BTA-220	Output Cathode
R138	390Ω	1	6R5598	BTA-390	Output Plate
R139A	180Ω	3	17A690973		Filter-Wire Wound
B	180Ω				Filter-Wire Wound

§ Items C129A, C129B and R131 are combined into one unit obtainable under Mfgr's Part No. 21K690980.
Note 6. Not used in all models.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	MOTOROLA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T10	117VAC @ 1.3A	500VCT .093ADC	7VAC Tap @ 6.3VAC @ 4.2A		25B691035			

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		MOTOROLA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T11	2400Ω per plate	7.8Ω	170Ω per plate	.4Ω	25B690898				

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	MOTOROLA PART No.	MEISSNER PART No.	
L32	Antenna	0Ω		24K690985		FM Built-In
L33	FM Ant. Coil	0Ω		24C690584		Less core
L34	FM RF Coil	0Ω		24C690584		Less core
L35	FM Osc.	0Ω		24K690996		Less core
L36	Loop Ant.	2.8Ω		24C690896		
L37	RF Choke	.2Ω		24A484025		
L38	AM RF Coil	2.8Ω	5Ω	24B690899		
L39	RF Choke	2.5Ω		24K780128		
L40	AM Osc. Coil	14Ω		24B690976	14-1060	
L41	1st AM IF	14Ω	14Ω	24B482863		Less shield
L42	1st FM IF	2Ω	.9Ω	24B690540		Less shield
L43	2nd AM IF	14Ω	14Ω	24B482865		Less shield
L44	2nd FM IF	5Ω	.9Ω	24B690541		Less shield
L45	Ratio Det. Trans.	2Ω	.1Ω	24B690542		

PHONO CARTRIDGE and NEEDLE

ITEM No.	REPLACEMENT DATA					REMARKS
	MOTOROLA PART No.	ASTATIC PART No.		SHURE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M6		AC-AG-J	A-AG(J)	W26B	A66U	

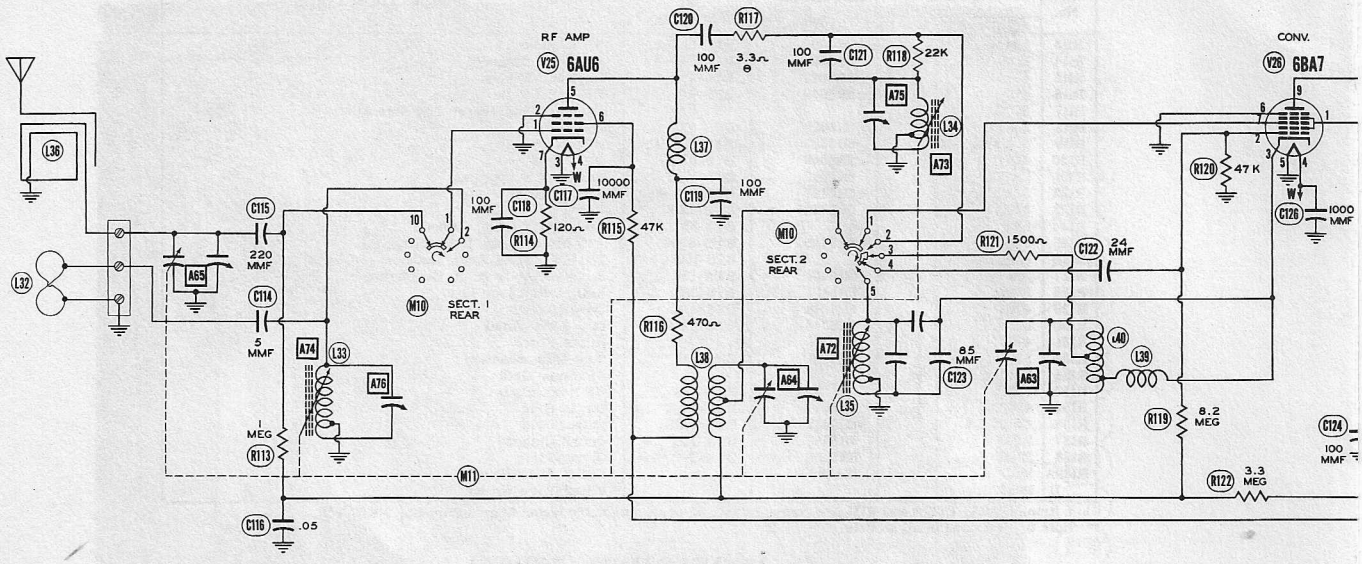
ASTATIC AND SHURE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED.

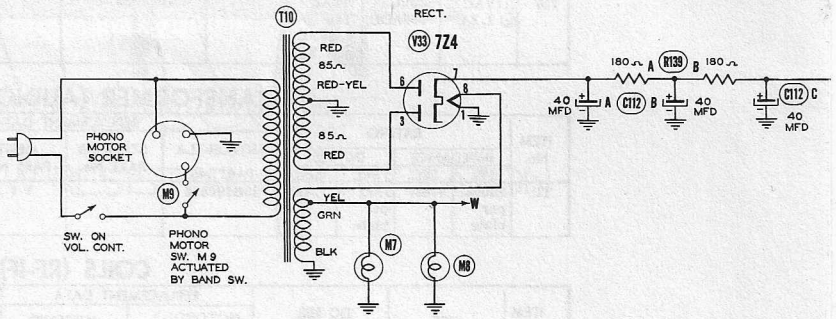
DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					MOTOROLA PART No.		
M7	Bayonet	6-8	.15	Brown	65X11854		Type #47
M8	Bayonet	6-8	.15	Brown	65X11854		Type #47

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M9	Switch	40A691922	Phono motor
M10	Switch	40B690977	Function (AM-FM-Phono)
M11	Tuning Cap.	19B690978	(21 - 454 MMF, 26 - 234 MMF, 13 - 186 MMF)





BAND SW. SHOWN IN AM POSITION

SWITCH SEQUENCE

AM

FM

PHONO

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

IF = 455 KC AM

IF = 10.7 MC FM

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V25	6AU6	▲-.2VDC	0V.	0V.	6.3VAC	†210VDC ▲215VDC	†110VDC ▲150VDC	§.8VDC ▲.6VDC		
V26	6BA7	100VDC	§§-2.7VDC §▲-5VDC	.1VDC	6.3VDC	0V.	0V.	§-.5VDC ▲-.2VDC	0V.	100VDC
V27	6BA6	0V.	0V.	0V.	6.3VAC	90VDC	90VDC	.9VDC		
V28	6AU6	†0V.	0V.	0V.	6.3VAC	†105VDC	†105VDC	§ 1VDC		
V29	6AL5	0V.	§-1VDC	6.3VAC	0V.	§-1.3VDC	0V.	§-1.3VDC		
V30	6AV6	-.5VDC	0V.	6.3VAC	0V.	▲-.6VDC	0V.	130VDC		
V31	6V6GT	0V.	6.3VAC	205VDC	220VDC	0V.	210VDC	0V.	13VDC	
V32	6V6GT	0V.	6.3VAC	215VDC	220VDC	0V.	0V.	0V.	13VDC	
V33	7Z4	0V.	0V.	250VAC	0V.	0V.	250VAC	250VDC	7VAC	

§ TAKEN WITH VACUUM TUBE VOLTMETER

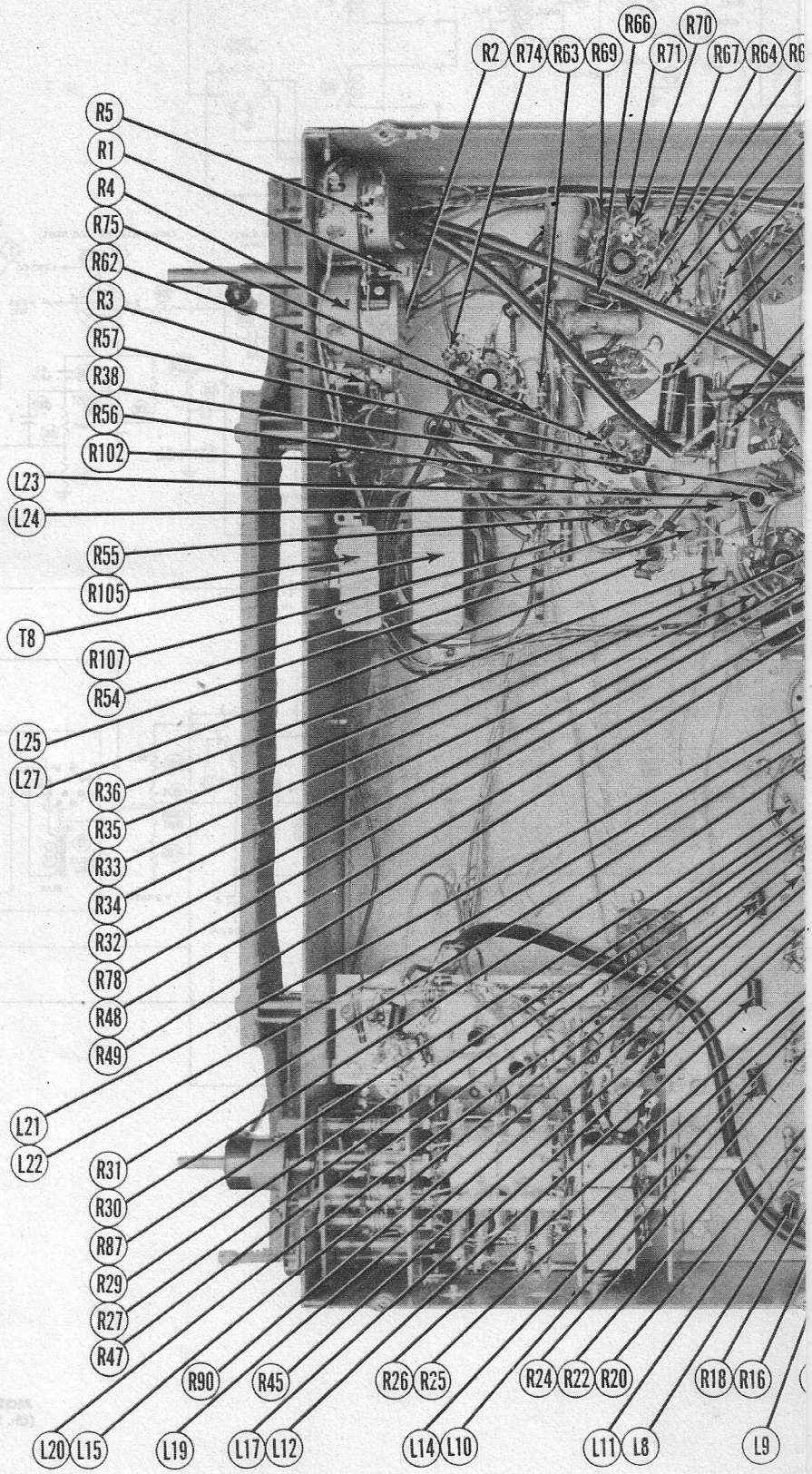
† TAKEN IN "FM" POSITION.
▲ TAKEN IN "AM" POSITION.

THE COOPERATION OF THE MANUF
RECEIVER MAKES IT POSSIBLE TO BRING

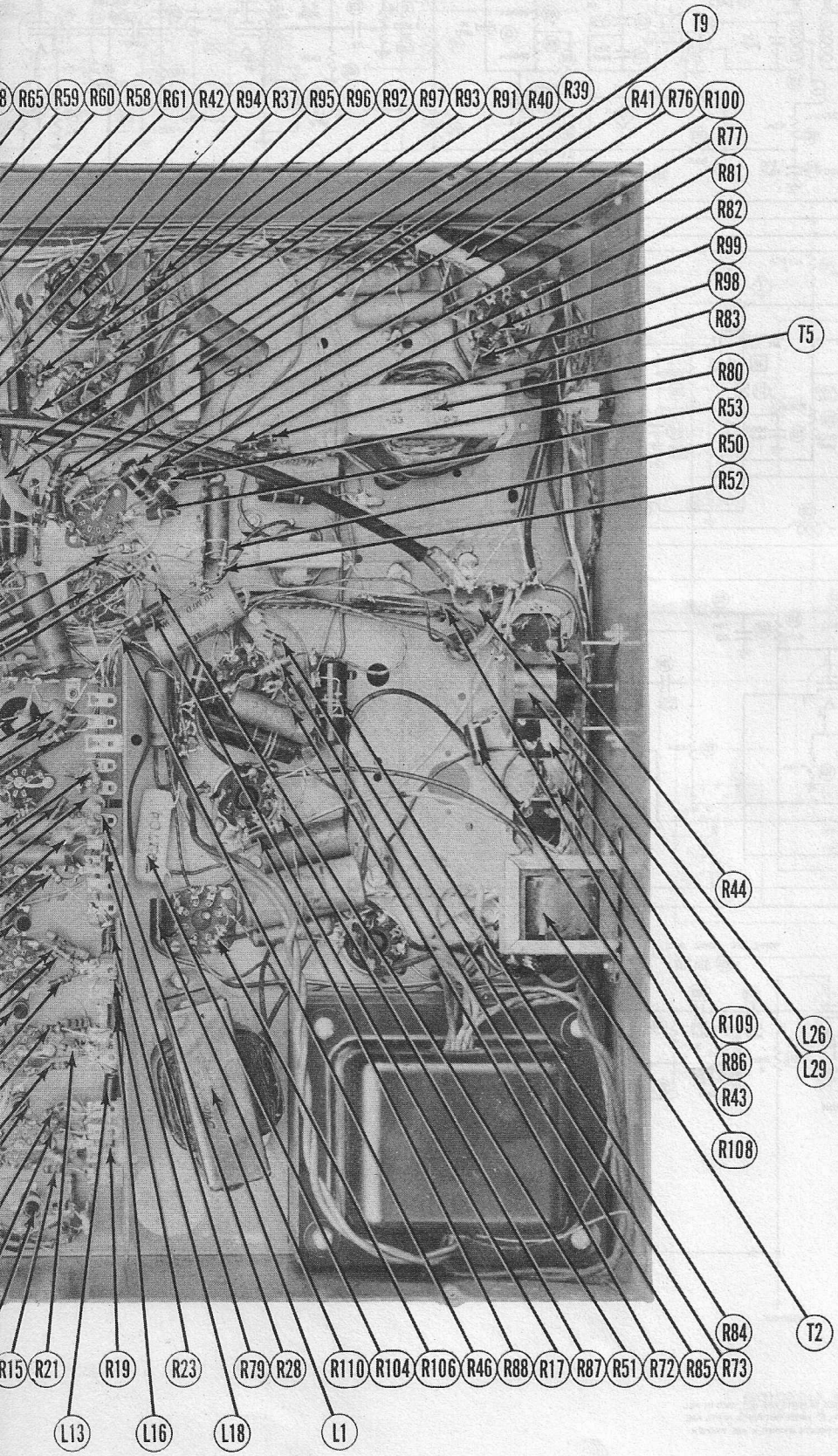
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage voltage rea
5. Nominal to makes poss voltage and
6. Volume con plied for v

A PHOTOFACT STANDARD NOTATION SCHEMATIC

RADIO CHA



CHASSIS BOTTOM VIEW-RESIST



OR AND INDUCTOR IDENTIFICATION