

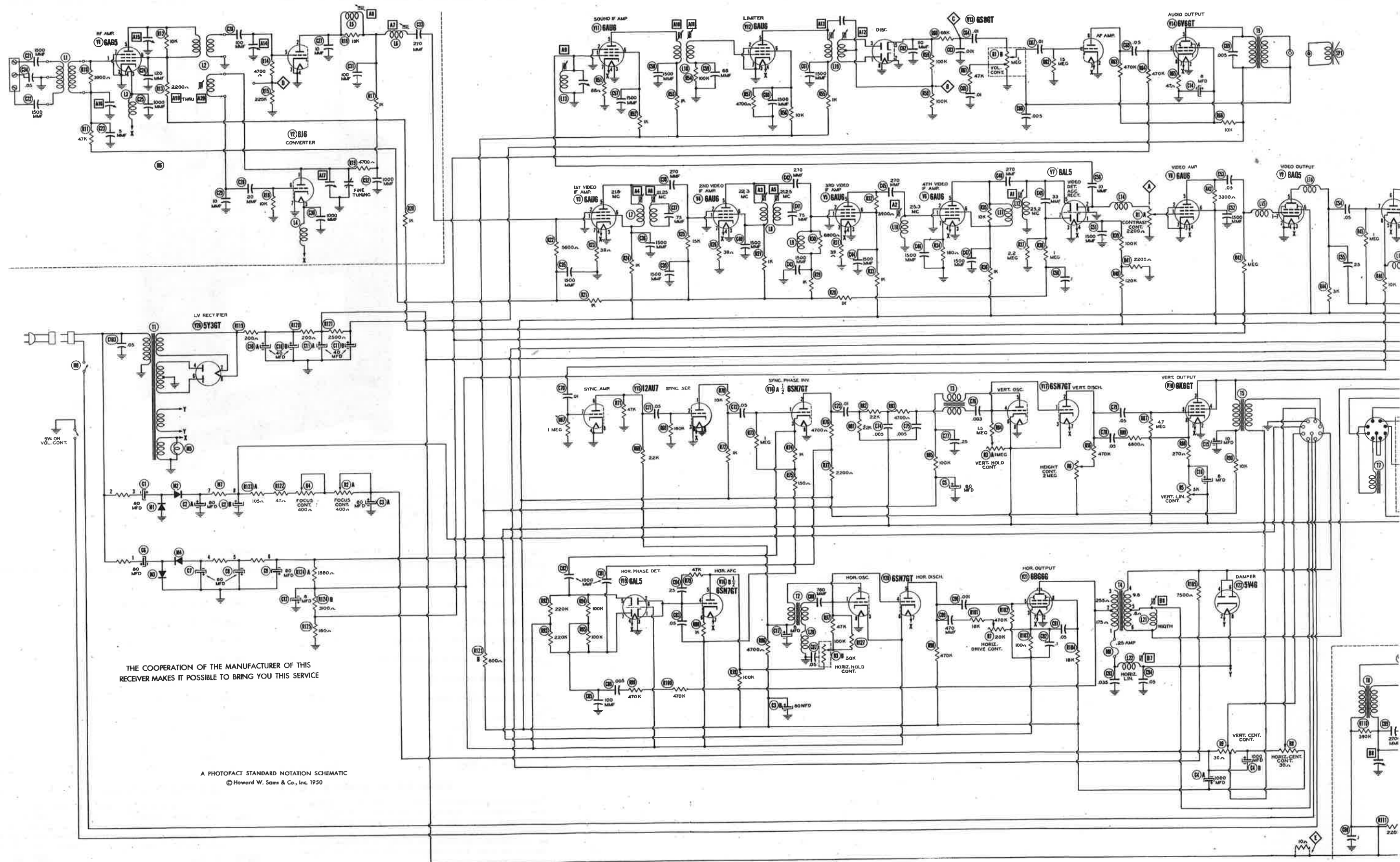
EMERSON
MODEL 609 (Ch. 120084-B)

TRADE NAME	Emerson Model 609 (Ch. 120084-B)	
MANUFACTURER	Emerson Radio and Phono. Corp., 111 Eighth Ave., New York 11, New York	
TYPE SET	Projection Type Television Receiver	
TUBES	Twenty Seven	
POWER SUPPLY	110-120 Volts AC-60 Cycle	RATING 2.17 Amp. at 117 Volts AC
TUNING RANGE	Channels 2 thru 13	
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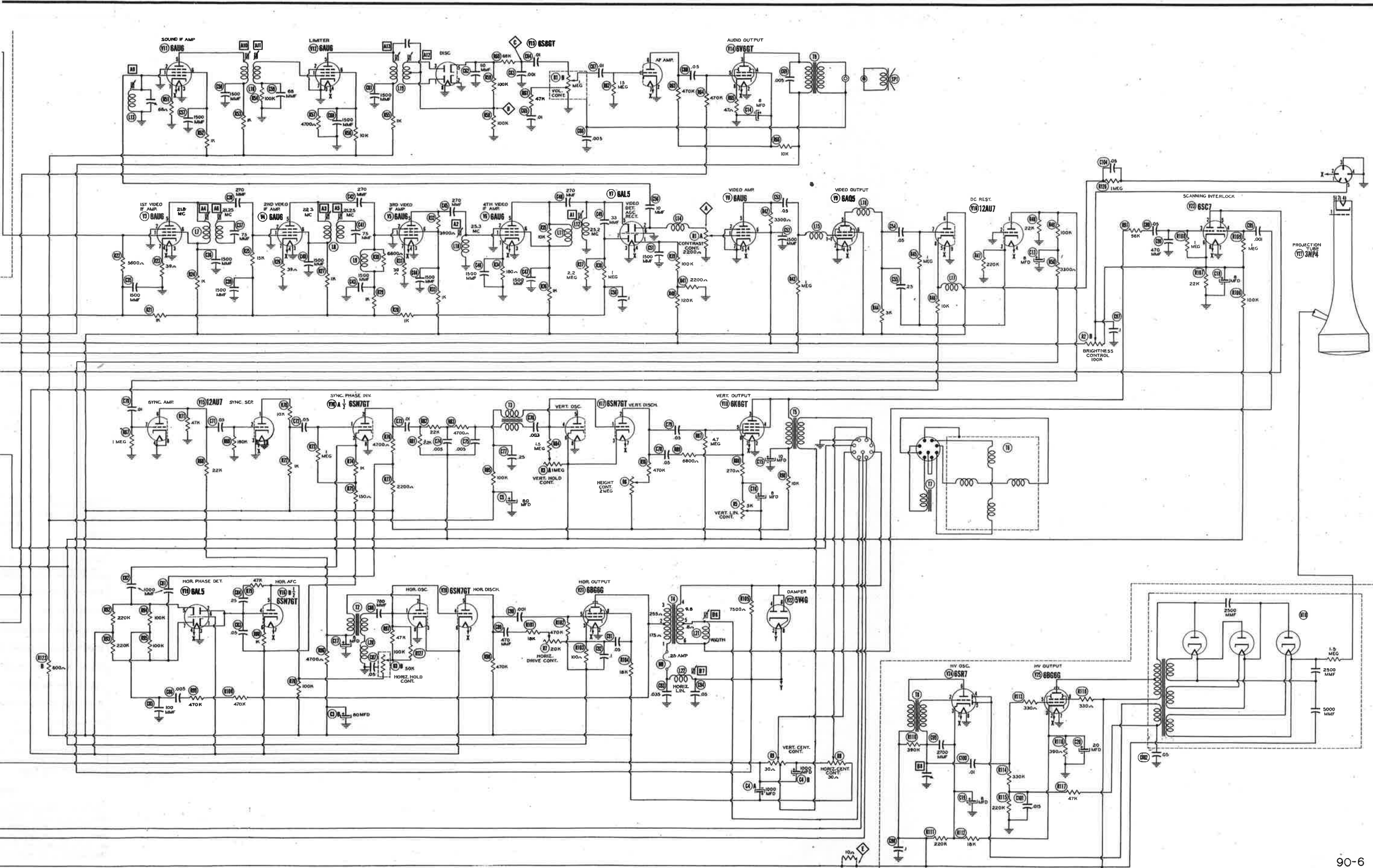
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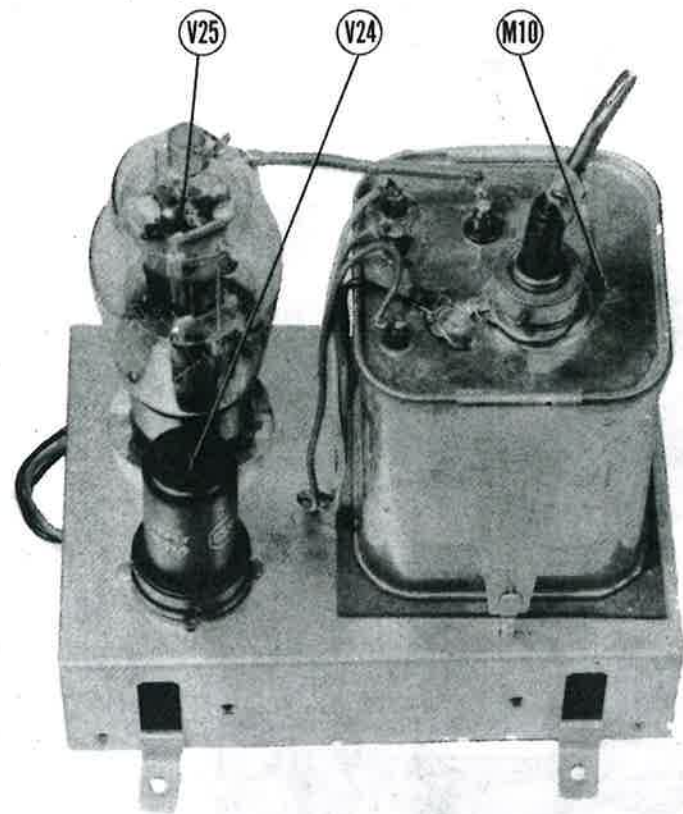
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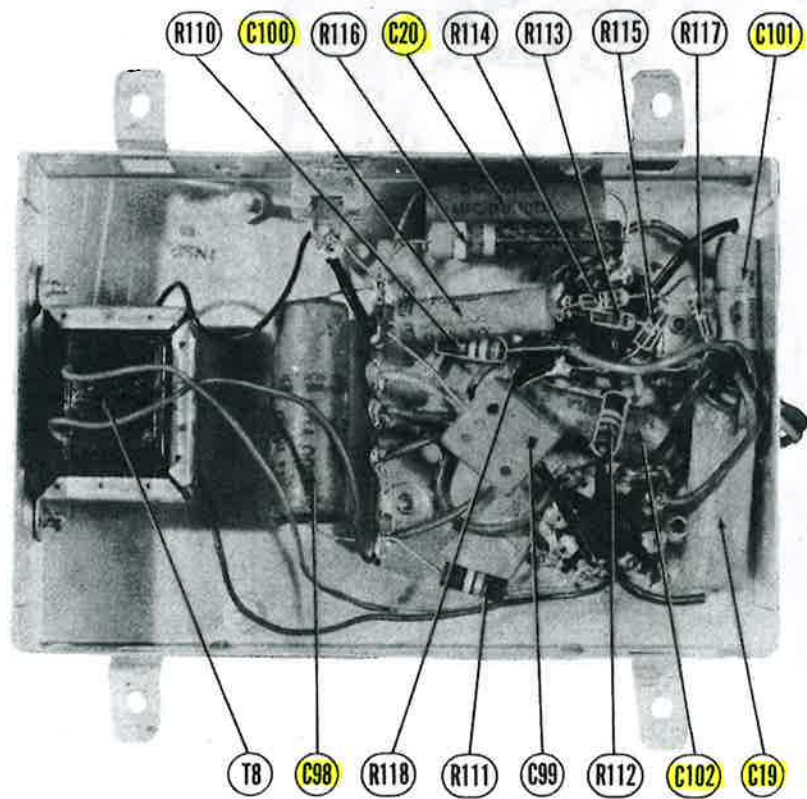
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFAC STANDARD NOTATION SCHEMATIC
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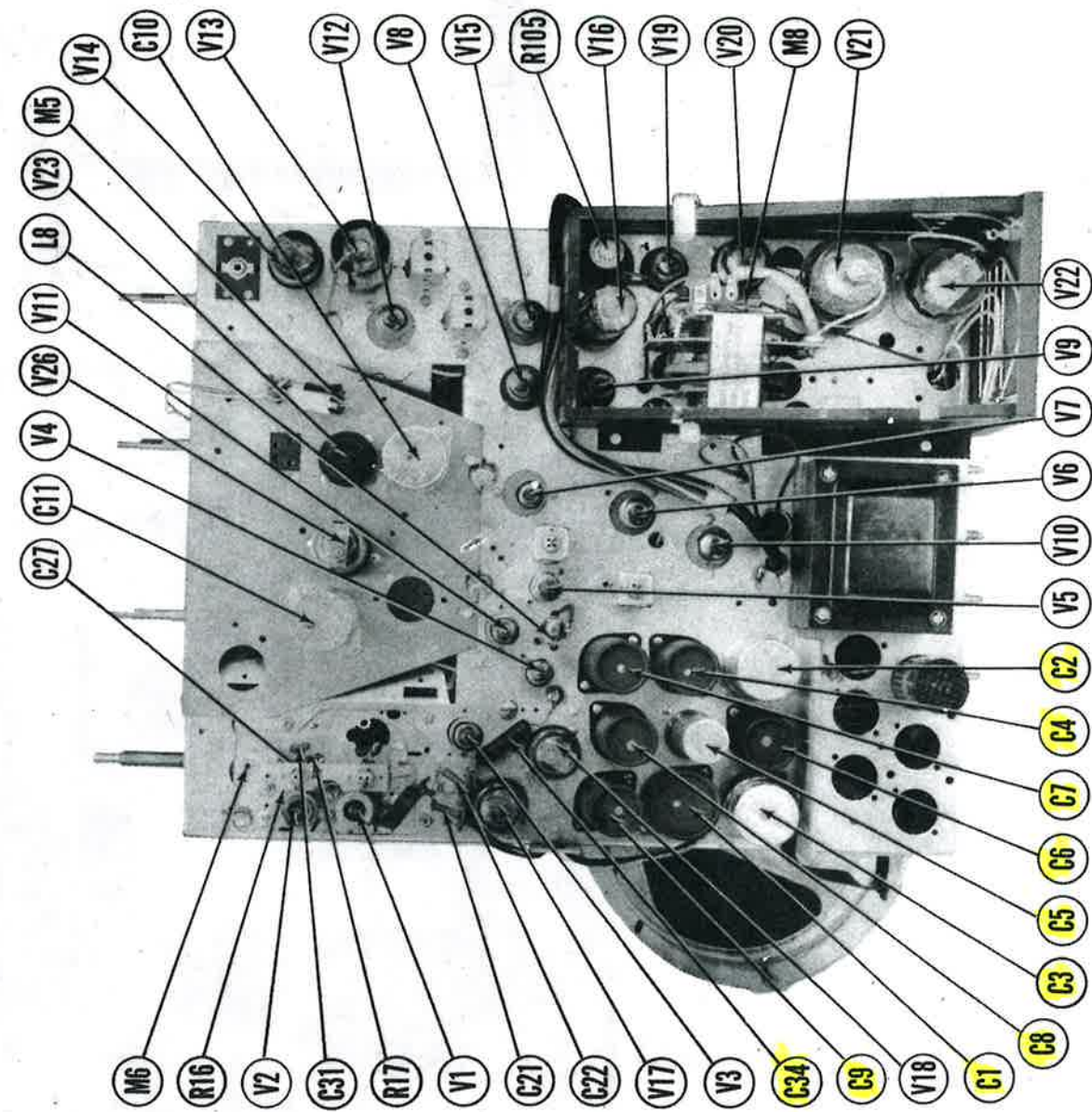




HIGH VOLTAGE SUPPLY-TOP VIEW



HIGH VOLTAGE SUPPLY-BOTTOM VIEW



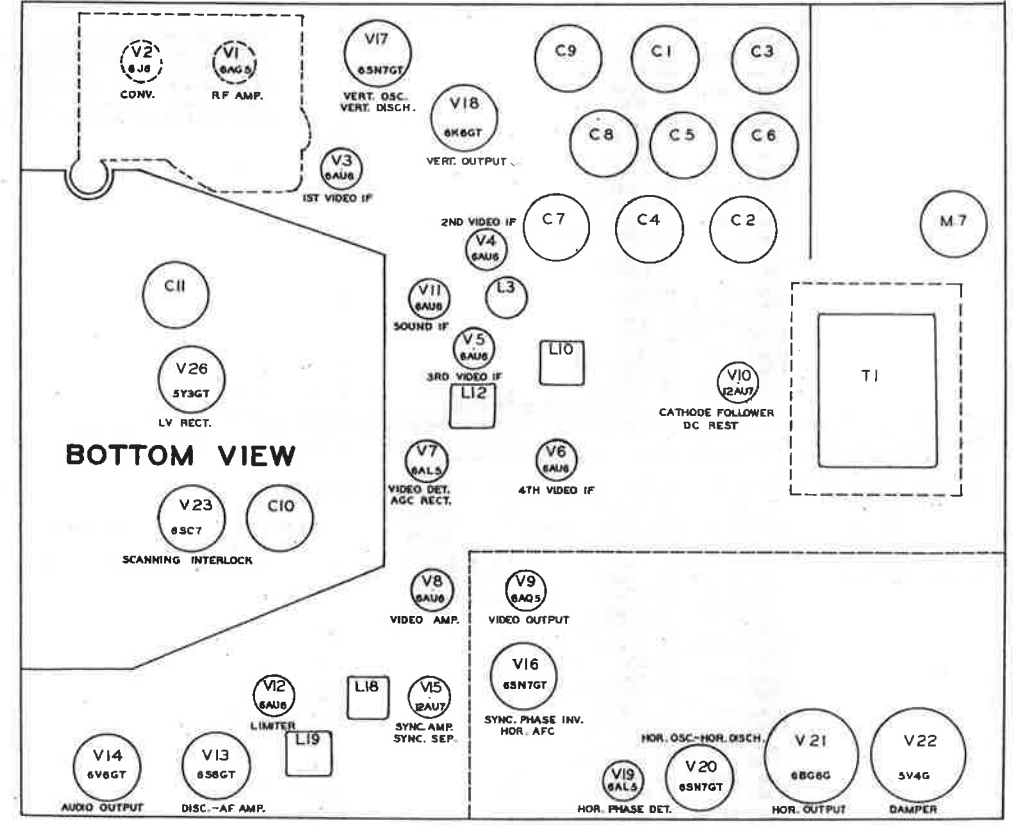
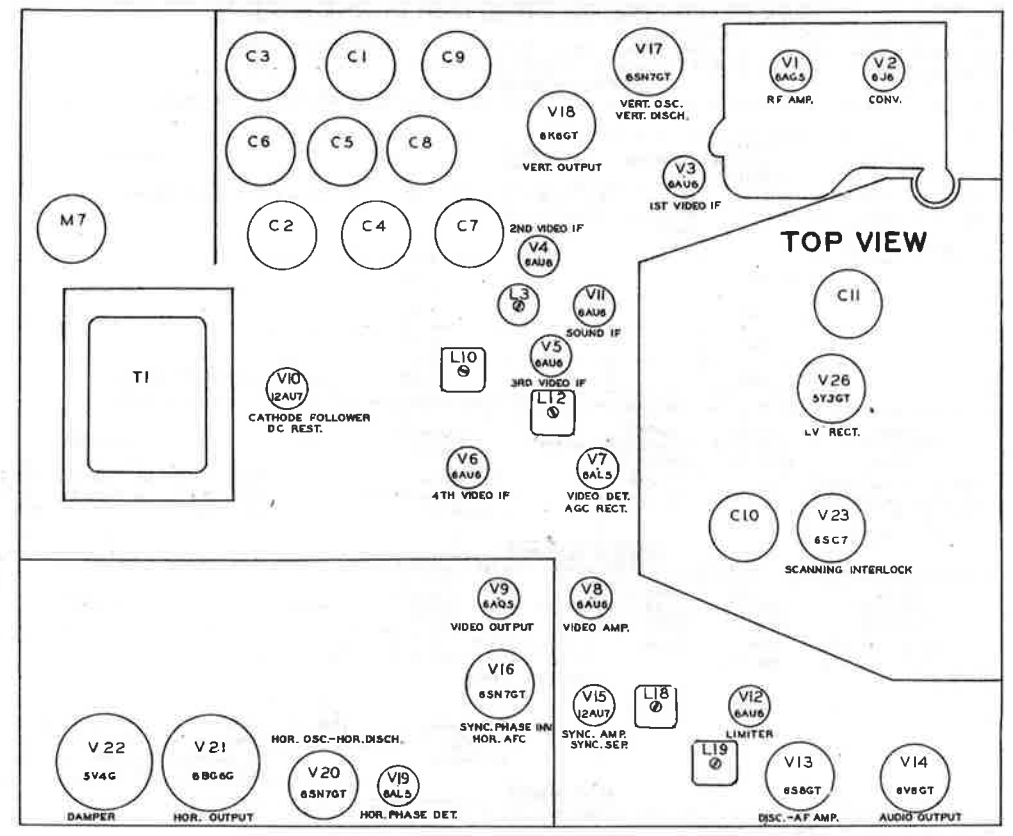
VOLTAGE AND RESISTANCE MEASUREMENTS

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	3.2 Meg.	0Ω	.1Ω	0Ω	13.5KΩ	13.5KΩ	0Ω	0Ω	Pin 9
V 2	6J6	17KΩ	72.8KΩ	.1Ω	0Ω	220KΩ	10KΩ	0Ω	0Ω	
V 3	6AU6	3.2 Meg.	0Ω	0Ω	.1Ω	11.3KΩ	11.3KΩ	39Ω	0Ω	
V 4	6AU6	3.2 Meg.	0Ω	0Ω	.1Ω	11.3KΩ	11.3KΩ	39Ω	0Ω	
V 5	6AU6	3.2 Meg.	0Ω	0Ω	.1Ω	11.3KΩ	11.3KΩ	39Ω	0Ω	
V 6	6AU6	2Ω	0Ω	0Ω	.1Ω	11.3KΩ	11.3KΩ	39Ω	0Ω	
V 7	6AL5	100KΩ	2.2KΩ	0Ω	.1Ω	22	0Ω	2.2 Meg.	0Ω	
V 8	6AU6	12Ω	0Ω	0Ω	.1Ω	14KΩ	11000Ω	0Ω	0Ω	
V 9	6AQ5	1 Meg.	0Ω	.1Ω	0Ω	13.5KΩ	1320Ω	1 Meg.	0Ω	
V 10	12AU7	135KΩ	0Ω	220KΩ	.1Ω	.1Ω	1320Ω	1.2 Meg.	0Ω	
V 11	6AU6	4.5Ω	0Ω	0Ω	.1Ω	12KΩ	12KΩ	68Ω	0Ω	
V 12	6AU6	100KΩ	0Ω	0Ω	.1Ω	12KΩ	10KΩ	0Ω	0Ω	TOP CAP 15 Meg.
V 13	6SN7GT	100KΩ	0Ω	100KΩ	Inf.	200KΩ	480KΩ	.1Ω	0Ω	
V 14	6Y6GT	0Ω	0Ω	43KΩ	470KΩ	180Ω	180Ω	.1Ω	47Ω	
V 15	12AU7	112KΩ	180KΩ	0Ω	0Ω	0Ω	120KΩ	1 Meg.	0Ω	
V 16	6SN7GT	1 Meg.	17.2KΩ	4.8KΩ	Inf.	1100KΩ	4KΩ	.1Ω	0Ω	
V 17	6SN7GT	1.5 Meg.	1470KΩ	4.8KΩ	1.5 Meg.	1400KΩ	4.8KΩ	.1Ω	0Ω	
V 18	6K6GT	Inf.	0Ω	110KΩ	110KΩ	4.7 Meg.	18KΩ	.1Ω	11KΩ	
V 19	6AL5	Inf.	Inf.	0Ω	.1Ω	150KΩ	3.2KΩ	150KΩ	0Ω	
V 20	6SN7GT	150KΩ	15KΩ	3.2KΩ	150KΩ	1470KΩ	3.2KΩ	.1Ω	0Ω	
V 21	6B6AG	Inf.	0Ω	4.9KΩ	Inf.	470KΩ	4.8KΩ	.1Ω	110KΩ	TOP CAP 17.5KΩ
V 22	5Y4G	Inf.	17.5KΩ	Inf.	1280Ω	Inf.	1290Ω	Inf.	17.5KΩ	
V 23	68C7	0Ω	4400Ω	1 Meg.	1 Meg.	4400Ω	15KΩ	0Ω	.1Ω	
V 24	68R7	0Ω	480KΩ	17KΩ	270KΩ	270KΩ	4500Ω	.1Ω	0Ω	
V 25	6B6AG	580KΩ	.1Ω	390Ω	220KΩ	580KΩ	270KΩ	0Ω	4700Ω	TOP CAP 100KΩ
V 26	5Y3GT	Inf.	100KΩ	Inf.	62Ω	Inf.	60Ω	Inf.	100KΩ	
V 27	3NP4	1 Meg.	.1Ω	0Ω	0Ω	11KΩ	11KΩ	0Ω	0Ω	

† MEASURED FROM PIN 7 OF V1.
‡ MEASURED FROM PIN 8 OF V26.

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 panel controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.

§ TAKEN WITH VACUUM TUBE VOLTMETER.
* MEASURED FROM PIN 6 OF V20.
† MEASURED FROM PIN 6 OF V17.
‡ DO NOT MEASURE.



TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use an isolation transformer to protect the test equipment.
The projection unit need not be removed, if an adaptor cable is used to complete the focus and deflection circuits.
The high voltage shock hazard may be eliminated by removing the horizontal oscillator tube (V20).

VIDEO IF ALIGNMENT

Remove the channel 13 segment of the converter section of the tuner turret, and turn the channel selector switch to channel 13 to disable the local oscillator.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1. Direct	High side to ungrounded tube shield floating over converter tube (V2). Low side to chassis.	25.2MC (Unmod.)	13 (see note above)	DC Probe to Point \diamond . Common to chassis.	A1	Adjust for maximum deflection.
2. Direct	"	25.3MC	"	"	A2	"
3. Direct	"	22.3MC	"	"	A3	"
4. Direct	"	21.8MC	"	"	A4	"
5. Direct	"	21.25MC	"	"	A5, A6	Adjust for MINIMUM deflection.

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
6. Direct	High side to ungrounded tube shield floating over converter tube (V2). Low side to chassis.	23MC (10MC SWP)	21.75MC 25.75MC	13	Vert. Amp. to Point \diamond . Low side to chassis.	A7, A8	Adjust A7 and A8 to place markers as shown in Fig 1. If necessary retouch A1 thru A6 to obtain response curve similar to Fig 1.

SOUND IF ALIGNMENT

Use frequency modulated signal with 80% modulation and 450KC sweep. Use 120V sawtooth voltage in scope for horizontal deflection.

DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7. .01MFD	High side to pin 2 (plate) of 6AL5 (V7). Low side to chassis.	4.5MC (1MC SWP)	4.5MC	Any channel not used locally	Vert. Amp. to Point \diamond . Low side to chassis.	A9, A10, A11	Adjust for maximum amplitude and symmetry as per Fig 2.
8. .01MFD	"	"	"	"	Vert. Amp. to Point \diamond . Low side to chassis.	A12, A13	Adjust A12 so 4.5MC occurs at center of crossover lines as per Fig 2. Adjust A13 for maximum amplitude and straightness of crossover lines.

RF ALIGNMENT

The sweep generator output lead should be terminated with its characteristic impedance usually 50 ohms.
Replace the channel 13 segment of the tuner turret.

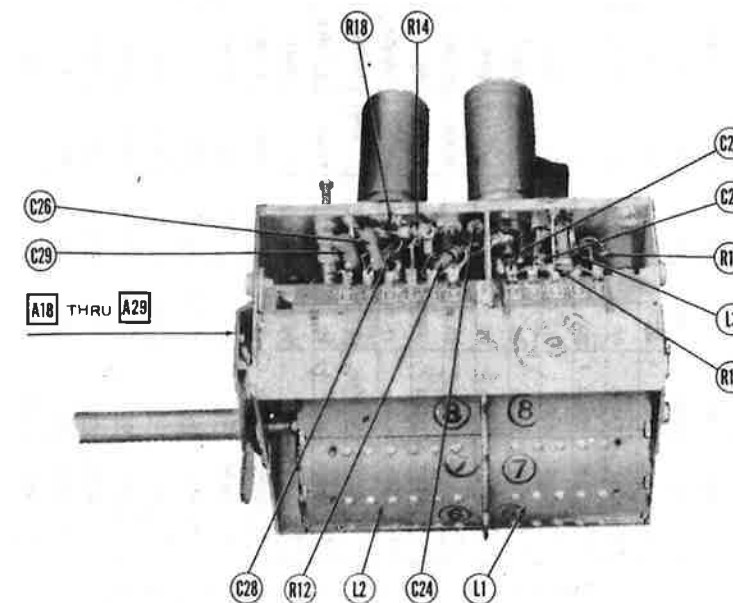
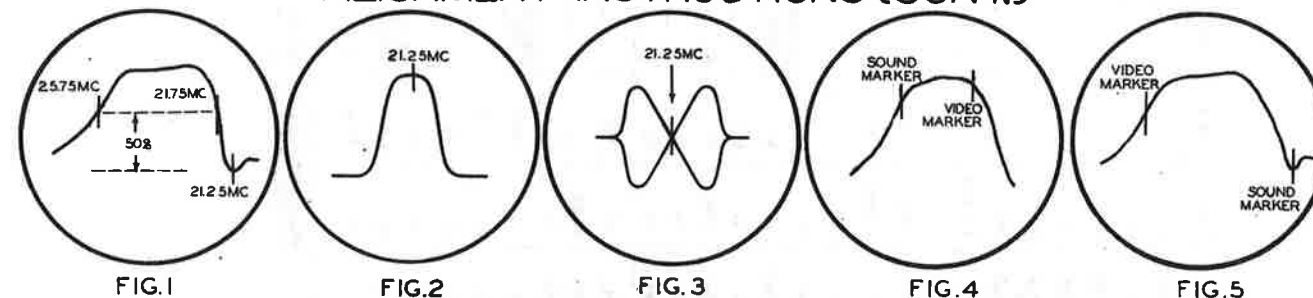
DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9. Two 1200 carbon res.	Across antenna terminals with 1200 in each lead.	207MC (10MC SWP)	205.25MC 209.75MC	12	Vert. Amp. to Point \diamond . Low side to chassis.	A14, A15, A16	Adjust for response curve similar to Fig 4 with markers above 70%.
10. "	"	213MC (10MC SWP)	211.25MC 215.75MC	13	"		Check all channels for response curve similar to Fig 4. If markers are below 70% on any channel make slight adjustment of A14, A15, and A16 with channel selector set for that channel. Recheck all channels to see that they have not been seriously affected.
		201MC (10MC SWP)	199.25MC 203.75MC	11			
		195MC (10MC SWP)	193.25MC 197.75MC	10			
		189MC (10MC SWP)	187.25MC 191.75MC	9			
		183MC (10MC SWP)	181.25MC 185.75MC	8			
		177MC (10MC SWP)	175.25MC 179.75MC	7			
		85MC (10MC SWP)	83.25MC 87.75MC	6			
		79MC (10MC SWP)	77.25MC 81.75MC	5			
		69MC (10MC SWP)	67.25MC 71.75MC	4			
		63MC (10MC SWP)	61.25MC 65.75MC	3			
		57MC (10MC SWP)	55.25MC 59.75MC	2			

OSCILLATOR ALIGNMENT

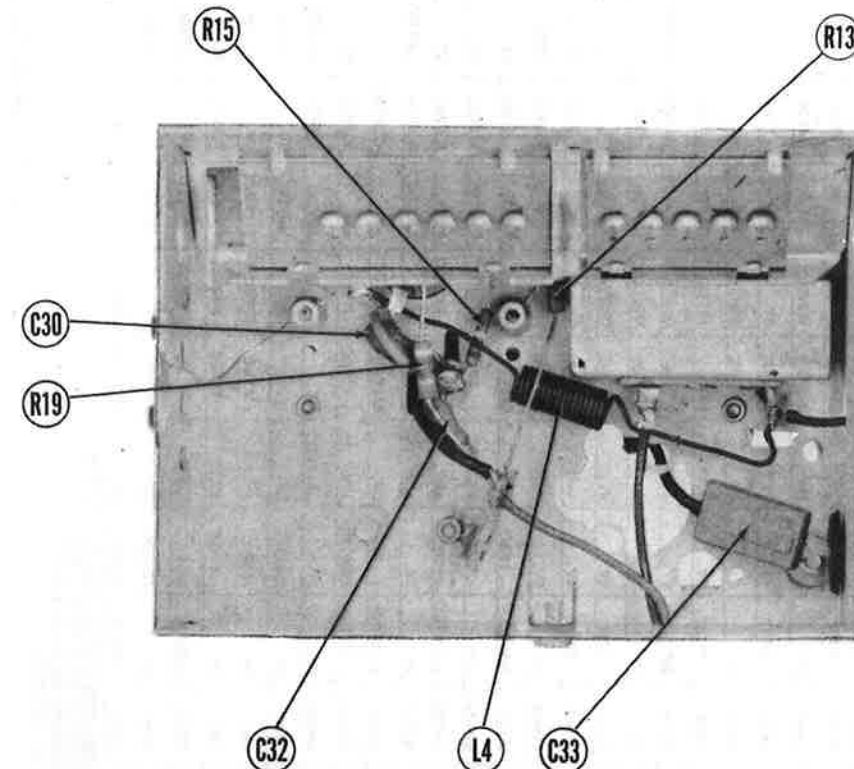
The overall oscillator circuit adjustment A17 is pre-set at the factory and should not be adjusted in the field.
The individual channels oscillator adjustments are reached through a hole just to the right of the channel selector switch. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Set the fine tuning control to the mid-position of its range.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11. Two 1200 carbon res.	Across antenna terminals with 1200 in each lead.	213MC (10MC SWP)	211.25MC 215.75MC	13	Vert. Amp. to Point \diamond . Low side to chassis.	A18	Adjust to place markers as shown in Fig 5.
		207MC (10MC SWP)	205.25MC 209.75MC	12		A19	
		201MC (10MC SWP)	199.25MC 203.75MC	11		A20	
		195MC (10MC SWP)	193.25MC 197.75MC	10		A21	
		189MC (10MC SWP)	187.25MC 191.75MC	9		A22	
		183MC (10MC SWP)	181.25MC 185.75MC	8		A23	
		177MC (10MC SWP)	175.25MC 179.75MC	7		A24	
		85MC (10MC SWP)	83.25MC 87.75MC	6		A25	
		79MC (10MC SWP)	77.25MC 81.75MC	5		A26	
		69MC (10MC SWP)	67.25MC 71.75MC	4		A27	
		63MC (10MC SWP)	61.25MC 65.75MC	3		A28	
		57MC (10MC SWP)	55.25MC 59.75MC	2		A29	

ALIGNMENT INSTRUCTIONS (CONT.)

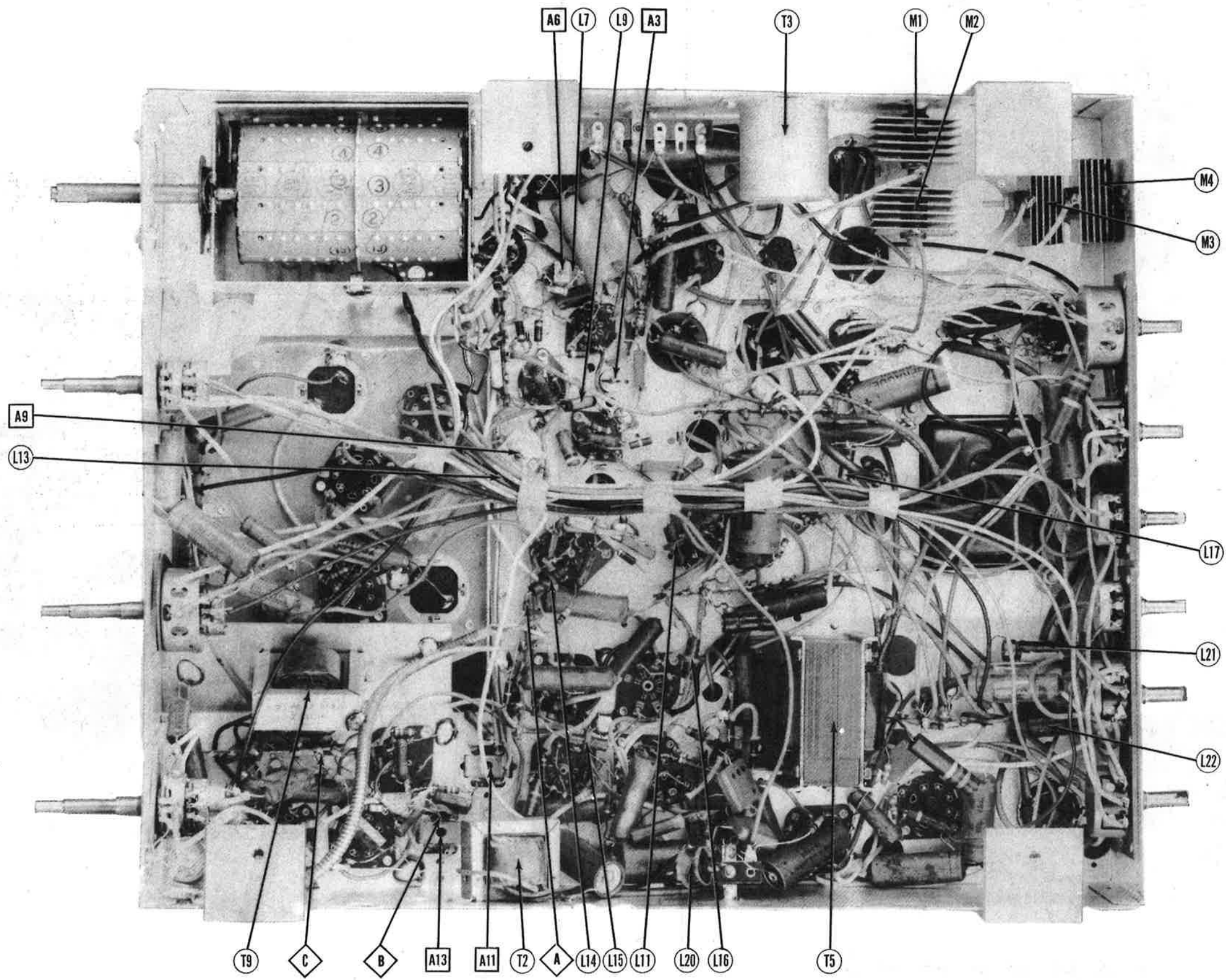


RF TUNER-TOP VIEW



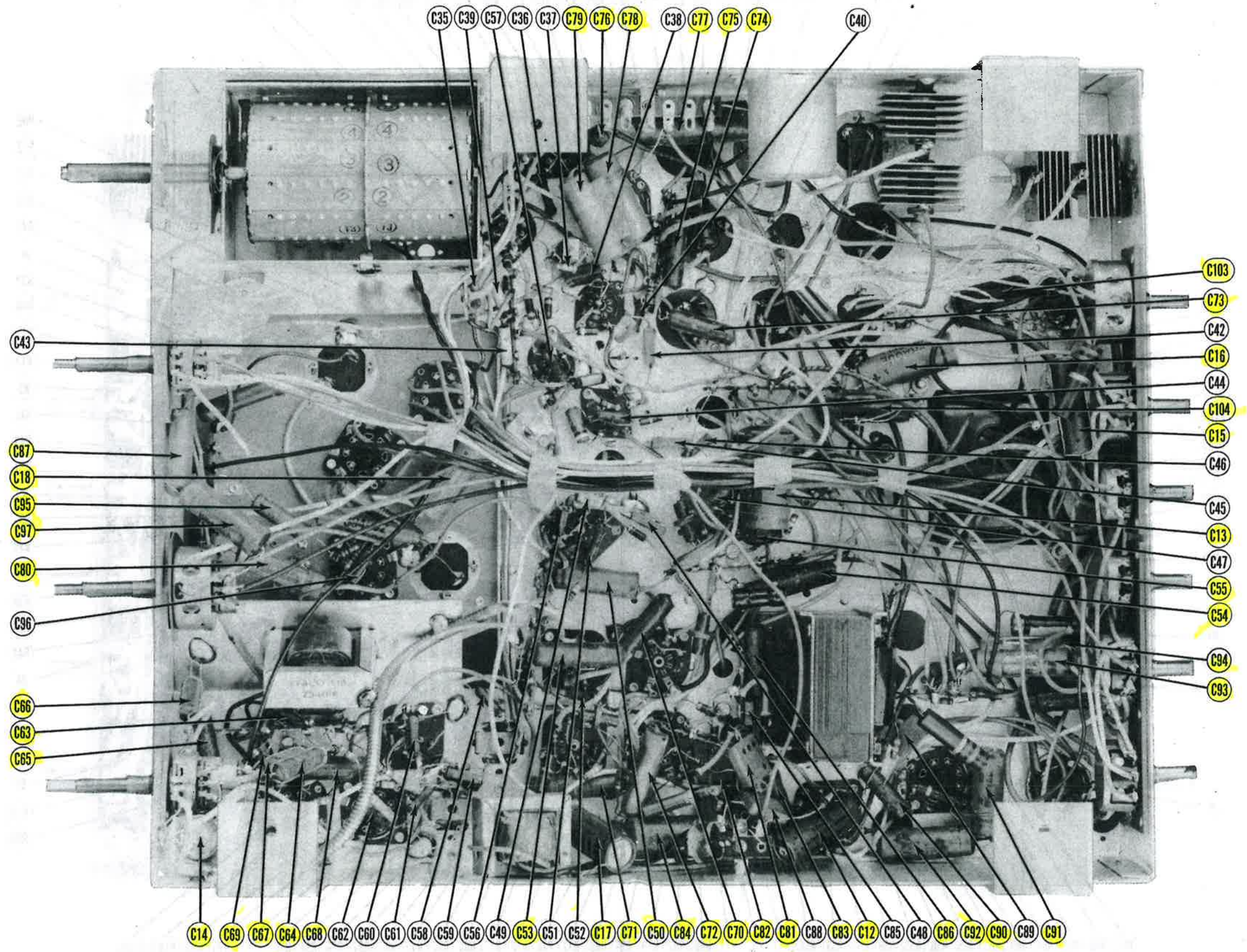
RF TUNER-BOTTOM VIEW

EMERSON
MODEL 609 (Ch. 120084-B)



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

EMERSON
18-480001-01 90A J350M



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

EMERSON
MODEL 609 (Ch. 120084-B)

PARTS LIST AND DESCRIPTIONS (Continued)
TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	EMERSON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC at 1.12A	730VCT .070ADC	5VAC at 2A	5VAC at 2A SEC. 4 6.3VAC at 10A	730014			

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING		REPLACEMENT DATA				NOTES
	DC RESISTANCE PRI.	DC RESISTANCE SEC.	EMERSON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
T2	3.7Ω	9.5Ω	730014	A-8110	A-3002		Hor. Block Osc. Trans. Vert. Block Osc. Trans. Hor. Output Trans.
T3	162Ω	1350Ω	738004	A-8121	A-4000		
T4	430Ω	SEC. 1	738012 or 738013	A-8117 ⊕			
	Tap. at 175Ω	10.4Ω Tap. at .6Ω					
T5	580Ω	7.1Ω	738010	A-8115	A-3085	T80-1	Vert. Output Trans. Hor. Deflection Coil Vert. Deflection Coil Focus Coil
T6A	15Ω		Part of Proj. unit				
T6B	80Ω		Part of Proj. unit				
T7	290Ω		Part of Proj. unit				
T8	145Ω	120Ω	Part of HV unit				HV Block Osc. Trans.

⊕ Do not use high voltage tap or HV Filament winding.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		EMERSON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T9	4800Ω	4Ω	320Ω	.6Ω	734018	A-3849	A-2902	RO-9 ⊕	⊕ Drill one new mounting hole.

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	EMERSON PART No.	MEISSNER PART No.	
L1	Ant. Coils	0Ω				Part of tuner.
L2	RF Plate, Mixer Grid & Osc. Coils	0Ω				Part of tuner.
L3	Fil. Choke	0Ω				Part of tuner.
L4	Fil. Choke	0Ω				Part of tuner.
L5	1st Video IF	0Ω		720056		Part number includes L6.
L6	Video Coupling	0Ω				
L7	2nd Video IF	.2Ω	0Ω	720042		
L8	3rd Video IF	.2Ω		720042		
L9	RF Choke	.3Ω		705014		20 microhenries.
L10A	4th Video IF	.2Ω		720078		
L11	Peaking	4.2Ω		720079		45 microhenries, white identification dot.
L12A	5th Video IF	.2Ω		708097		
L12B	5th Video IF	.2Ω		720078		
L13	Sound Trap	4.2Ω		720079		45 microhenries, white identification dot.
L14	Peaking	4.2Ω		708097		45 microhenries, yellow identification dot.
L15	Peaking	8Ω		708094		125 microhenries, green identification dot.
L16	Peaking	8Ω		708094		125 microhenries, green identification dot.
L17	RF Choke	.3Ω		705014		20 microhenries
L18	Sound IF	2.2Ω	2.2Ω	720081		
L19A	Disc. Trans.	1.8Ω	1.8Ω	708017		
L19B	Disc. Trans.			708018		
L20	RF Choke	50Ω		705009		3 millihenries
L21	Width Cont.	.3Ω		708082		
L22	Hor. Linearity	40Ω		708003		

SELENIUM RECTIFIER

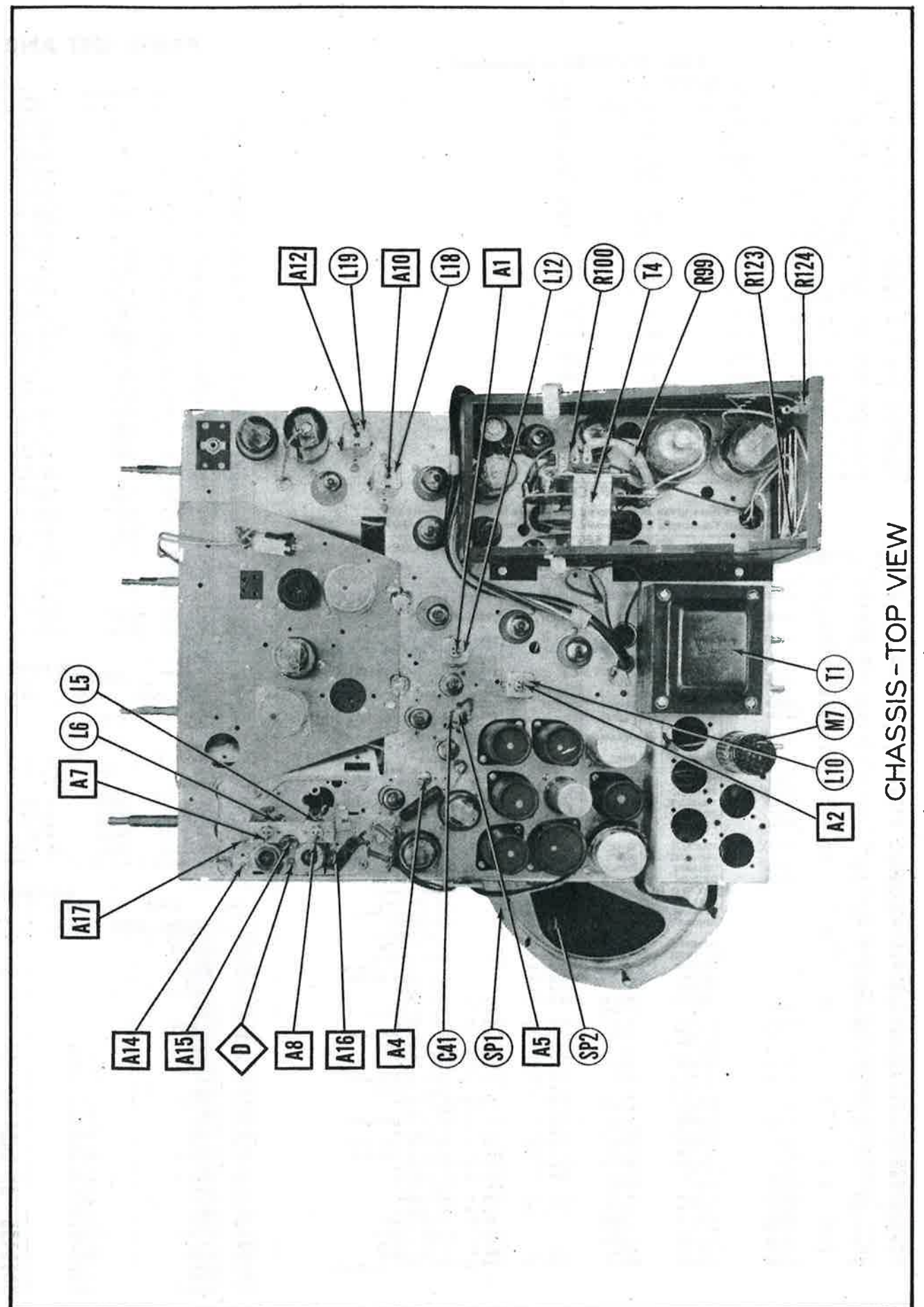
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	CURRENT	EMERSON PART No.	SYLVANIA PART No.		
M1	.220A	817004	NF-5		
M2	.220A	817004	NF-5		
M3	.150A	817005	NE-5		
M4	.150A	817005	NE-5		

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					EMERSON PART No.		
M5	Bayonet	6-8	.15	Brown	807000		Type #47

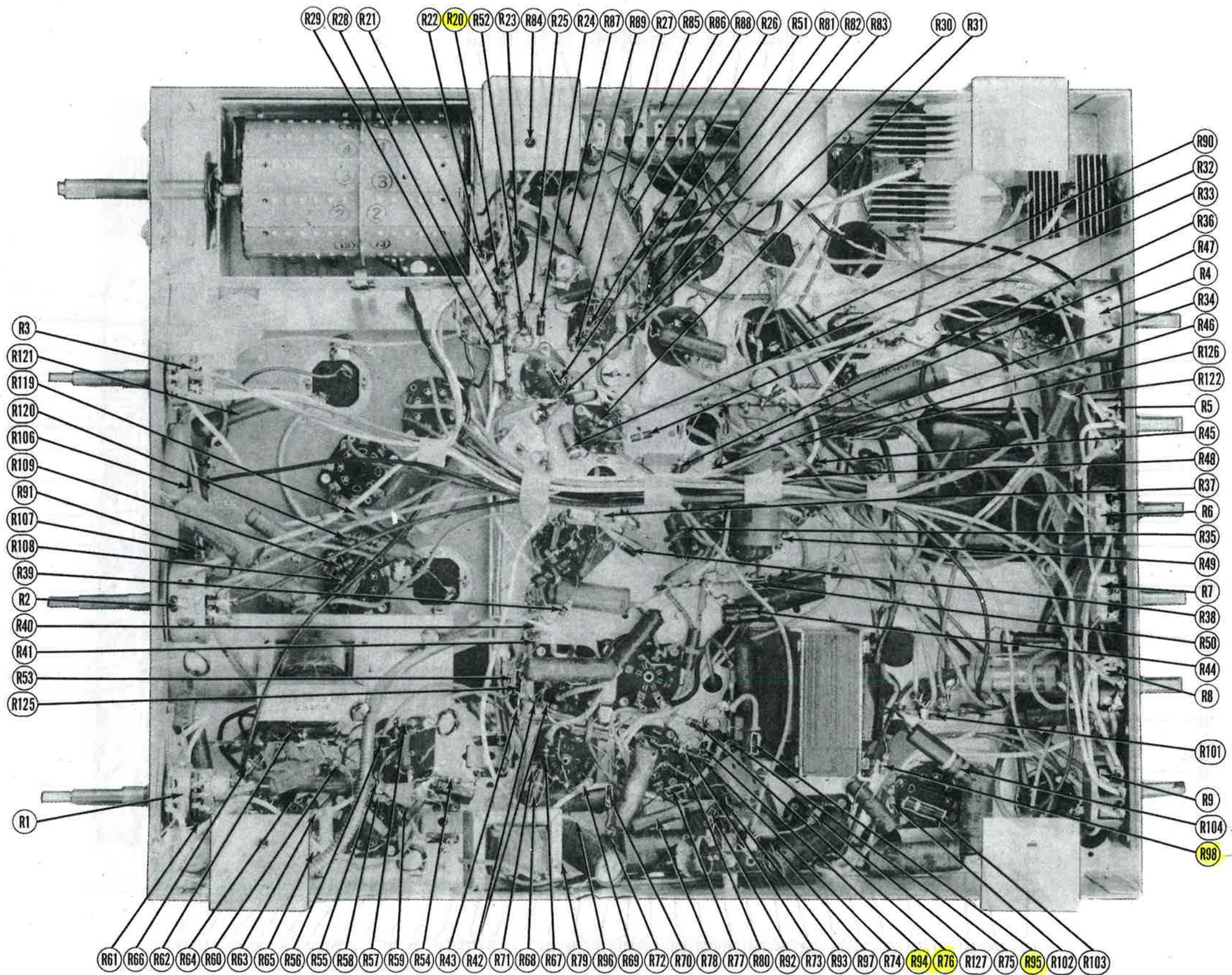
MISCELLANEOUS

ITEM No.	PART NAME	EMERSON PART No.	NOTES
M6	RF Tuner	470462	
M7	Ballast Tube	397023	Type AGC .25A
M8	Fuse	808060	Microswitch
M9	Switch	510046	Includes trans., 3-EY51 rectifier, filter, capacitors and resistor.
M10	HV Trans. Assembly	140227	
	Cabinet	560075	
	Cabinet Back	470419	
	High Voltage Unit	470421	
	Projection Unit	635013	
	Mirror	450018	
	Screen	520103	Channel selector
	Escutcheon	585039	Includes cable assembly for 3NP4
	Socket	450044	Fine tuning
	Knob	450041B	Volume, brightness, Hor. hold
	Knob	450045	Contrast, focus, Vert. hold
	Knob	450048B	Channel selector (with hole)
	Knob	450042B	Channel selector
	Striker	410505	Striker for M9
	Trimmer	900044	Sound trap (3-35MMF)
	Trimmer		HV Blocking Osc. (110-580MMF) MICA



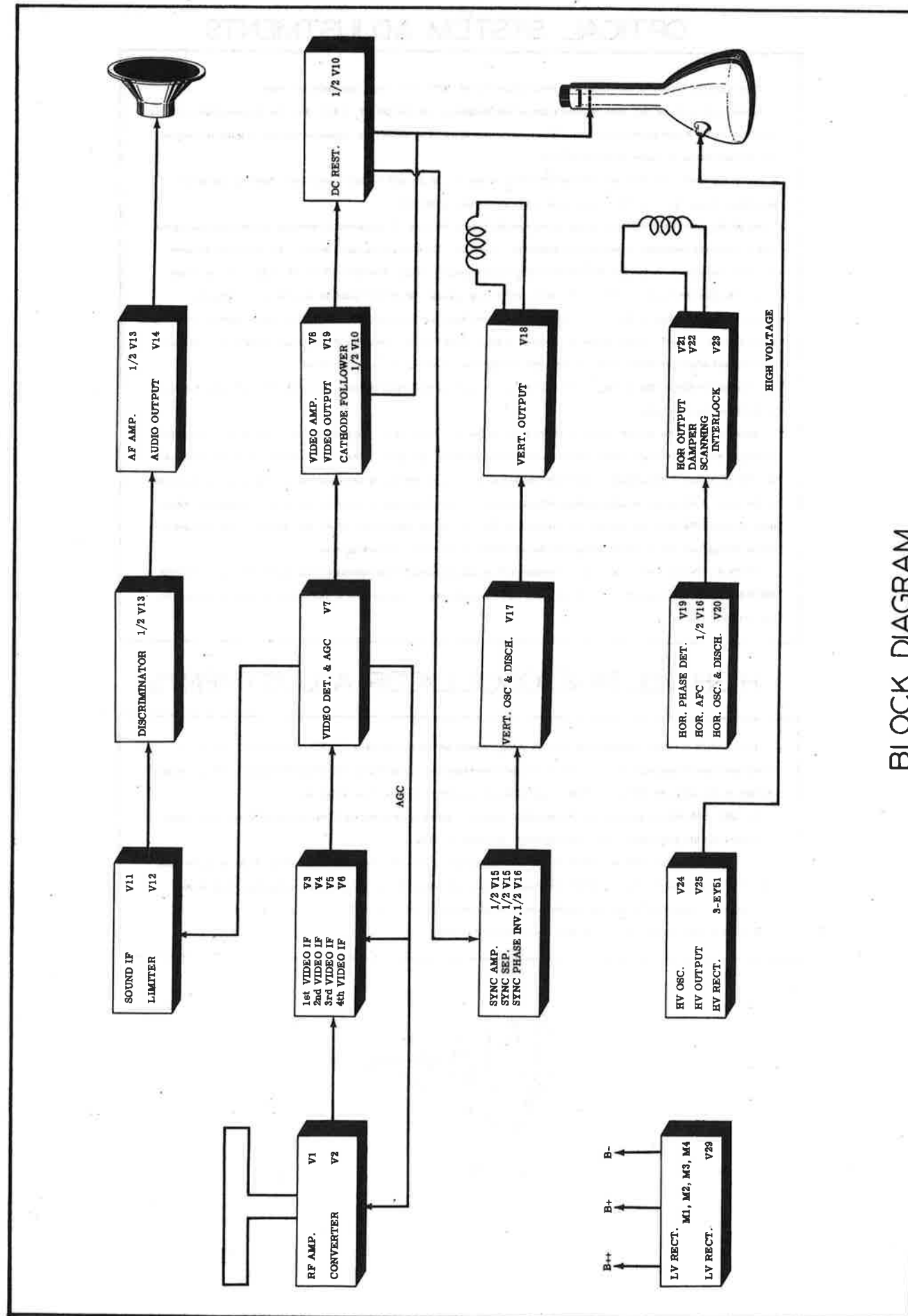
EMERSON
MODEL 609 (Ch. 120C84-B)
VIEW TOP - SISSACH

MODEL 609 (Ch. 120084-B)
EMERSON

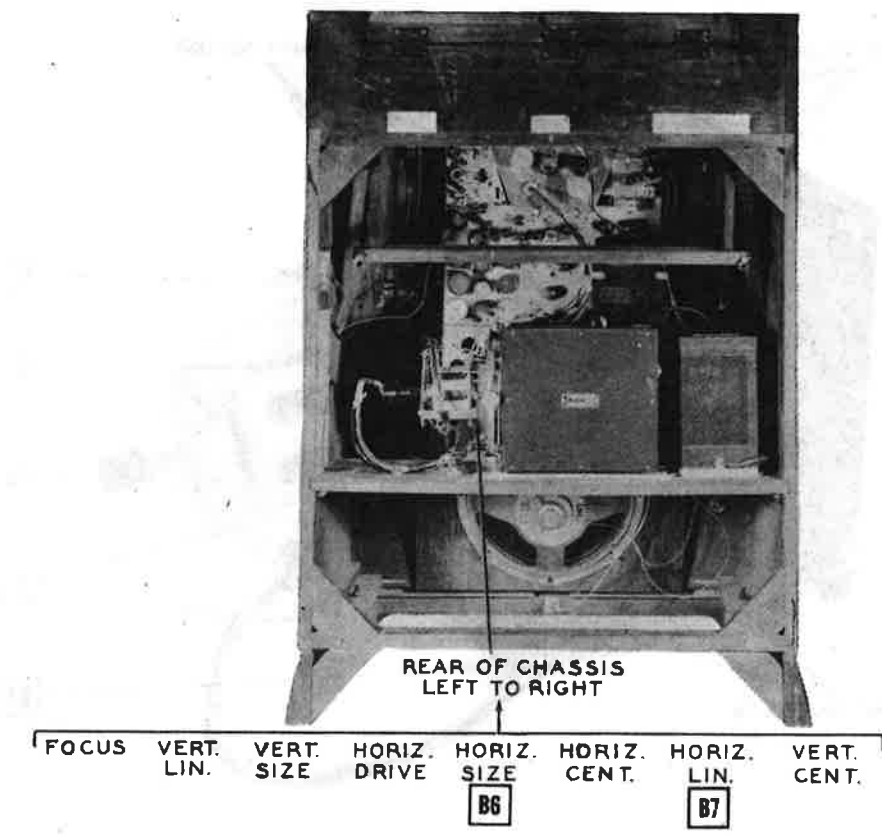


CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

MODEL 609 (Ch. 120084-B)



BLOCK DIAGRAM



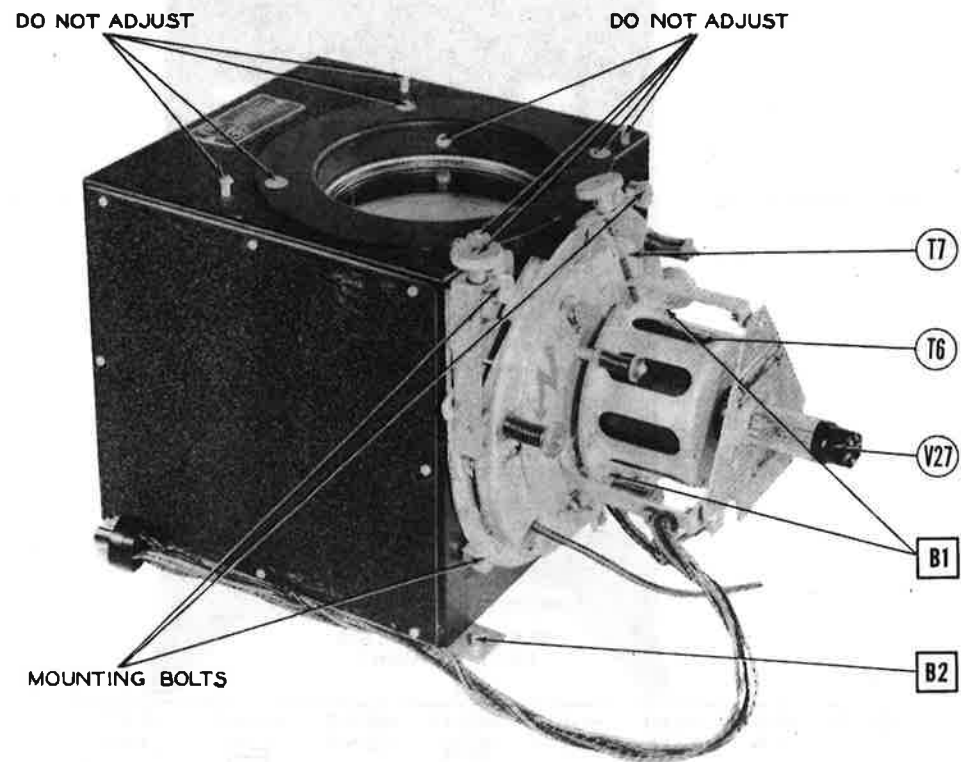
CABINET-REAR VIEW
DISASSEMBLY INSTRUCTIONS

1. Remove four push-on type control knobs.
2. Remove ten phillips head screws holding rear cover. Remove cover.
3. Remove projection tube base socket.
4. Remove projection tube yoke plug from TV chassis.
5. Remove plug from TV chassis leading to HV chasis.
6. Remove six 1/4" hex head bolts holding projection tube assembly.
7. Remove four 1/4" hex head bolts holding HV chasis. Remove projection tube assembly and HV chasis together.
8. Remove speaker plug.
9. Remove cabinet lamp socket.
10. Remove two phillips head screws holding antenna terminal strip.
11. Remove two phillips head screws holding power interlock plug.
12. Remove two 1/4" hex head bolts holding automatic off-on switch to cabinet.
13. Remove two wing nuts from inside front panel. Swing panel open.
14. Support TV chassis. Remove four 7/16" hex head bolts holding TV chassis. Remove chassis.
15. Remove four 5/16" hex nuts holding speaker. Remove speaker.

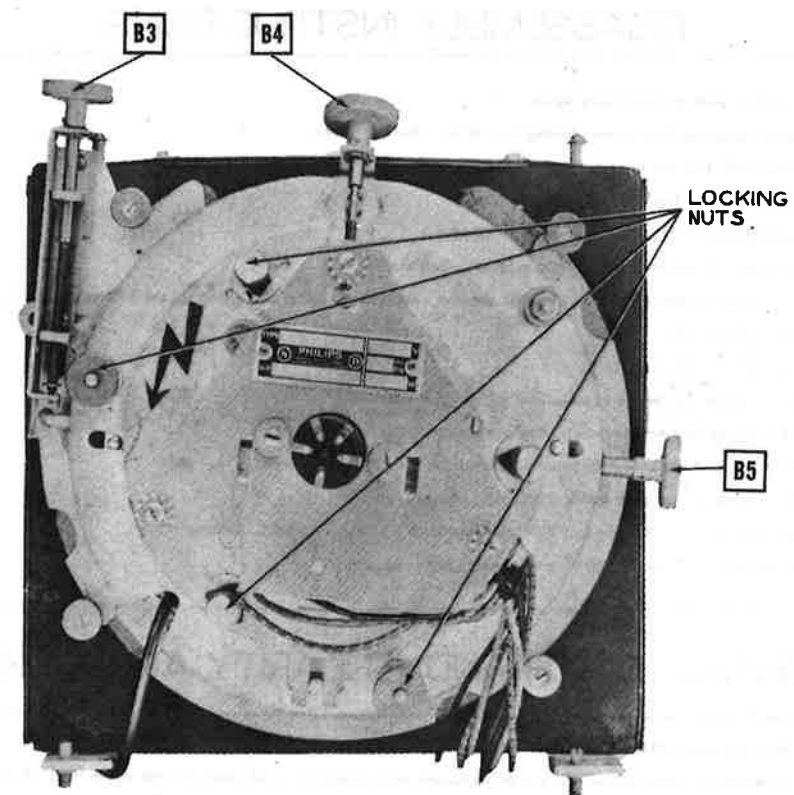
HORIZONTAL WIDTH AND LINEARITY ADJUSTMENTS

Adjust the width slug (B6) until the picture fills the mask horizontally.

Adjust the horizontal linearity slug (B7) and the horizontal drive control for best linearity from left to right. If the horizontal drive control is changed, readjustment of B6 may be necessary.



PROJECTION UNIT



DEFLECTION AND FOCUS COIL ASSEMBLY

OPTICAL SYSTEM ADJUSTMENTS

This operation should be necessary only when replacing the 3NP4 or the focus and deflection coils.

Before turning on the set, turn both the contrast and brightness control full off. After about one minute slowly advance the controls for a medium bright raster. (If a spot or line appears on the screen, immediately turn brightness control full off and determine cause of sweep failure).

Adjust the focus control for the best possible focus on the face of the tube. This is necessary since no amount of mechanical focusing can correct a defocused image on the face of the tube.

Adjust the centering controls to center picture on the face of the tube. If mechanical centering is required in addition to the electrical centering, adjust the two centering screws B1. While adjusting these screws, be careful not to force the focus coil against the neck of the tube by tilting it excessively in either direction. With the raster centered on the face of the tube the image should be centered on the viewing screen. Many test patterns have wedges or arrows which indicate the edges of the picture. If a pattern having these marks is being received, they can be used for checking the centering. If picture is not properly centered on the viewing screen loosen the three mounting bolts of the projection unit and adjust the three leveling screws B2 to center the pattern on the viewing screen.

If the pattern tilts on the screen, loosen the four mounting bolts and rotate the mounting assembly slightly as required. Tighten the mounting bolts.

Check to see that the pattern is still in sharp focus on the face of the tube. The picture should also be in focus on the viewing screen. If it is not, loosen the five locking nuts about one turn each. Adjust the overall focusing adjustment B3 to focus the center of the picture. Adjust the horizontal focusing adjustment B4 for equal focus in the areas on each side of the center. Adjust the vertical focusing adjustment B5 for equal focus above and below the center. After each adjustment of B4 and B5 check the overall focus adjustment B3. By careful adjustment of B3, B4, and B5, the entire pattern can be brought into focus. After completing the adjustments tighten the five locking nuts.

CAUTION- The screws on top of the projection unit are adjustments for the optical system inside the unit and **UNDER NO CIRCUMSTANCES** should they be disturbed. These adjustments or replacement of the optical parts must be done at the factory.

HIGH VOLTAGE OSCILLATOR ADJUSTMENTS

The blocking oscillator frequency in the high voltage supply should be maintained at 1000 ± 70 cycles. Unless a component that determines frequency has been altered or replaced, adjustment is not usually necessary. The frequency should be checked if the 6SR7 tube (V24) or any of the associated parts have been replaced.

The 1000 cycle adjustment controls the oscillator frequency which determines the filament supply of the three sealed rectifiers but has little effect on current regulation and voltage output.

Insert a 10Ω resistor in the B+ lead as shown on the schematic and connect the vertical amplifier of the scope between point E and the chassis. Feed a 1000 cycle signal from an audio generator to the horizontal sweep amplifier of the oscilloscope. Adjust B8 for a single stable Lissajous pattern as shown in figure 6.

Be sure to remove the 10Ω resistor after the adjustment is made.

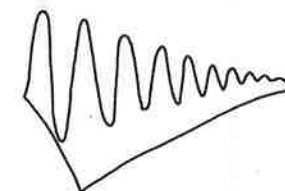


FIG. 6