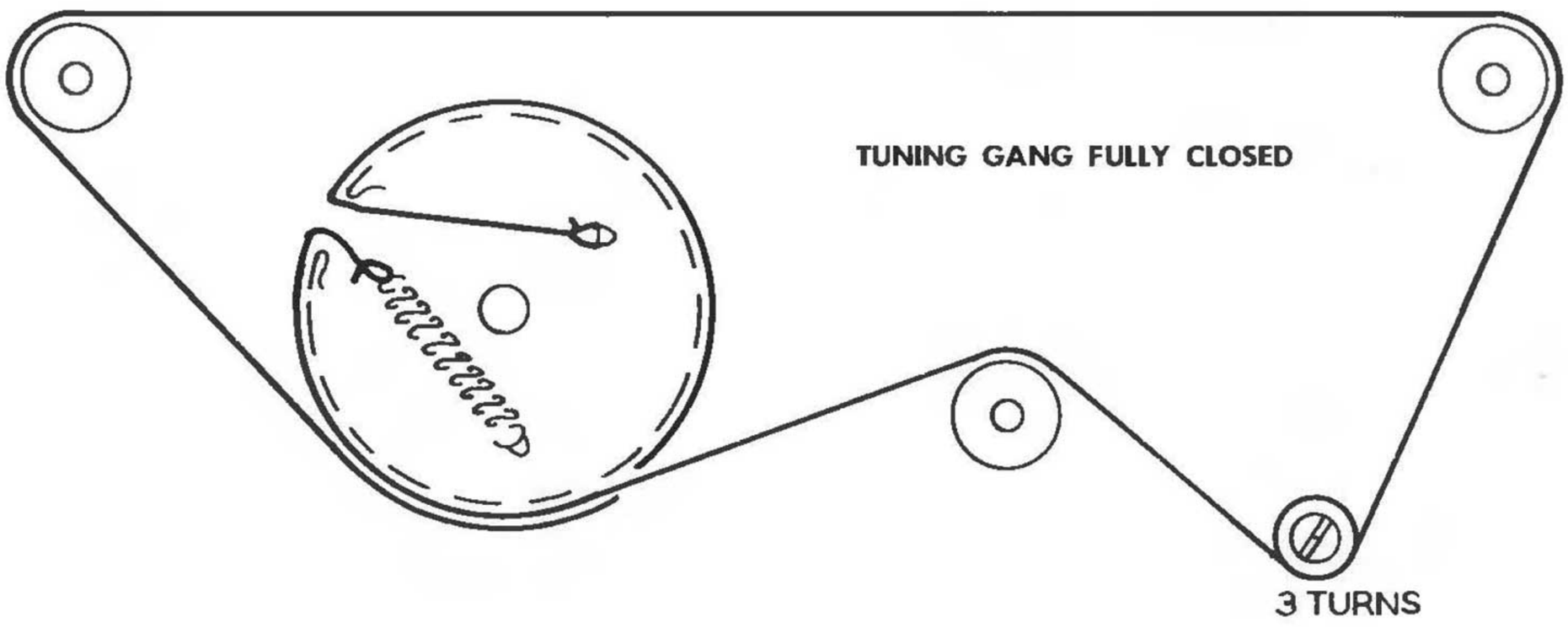
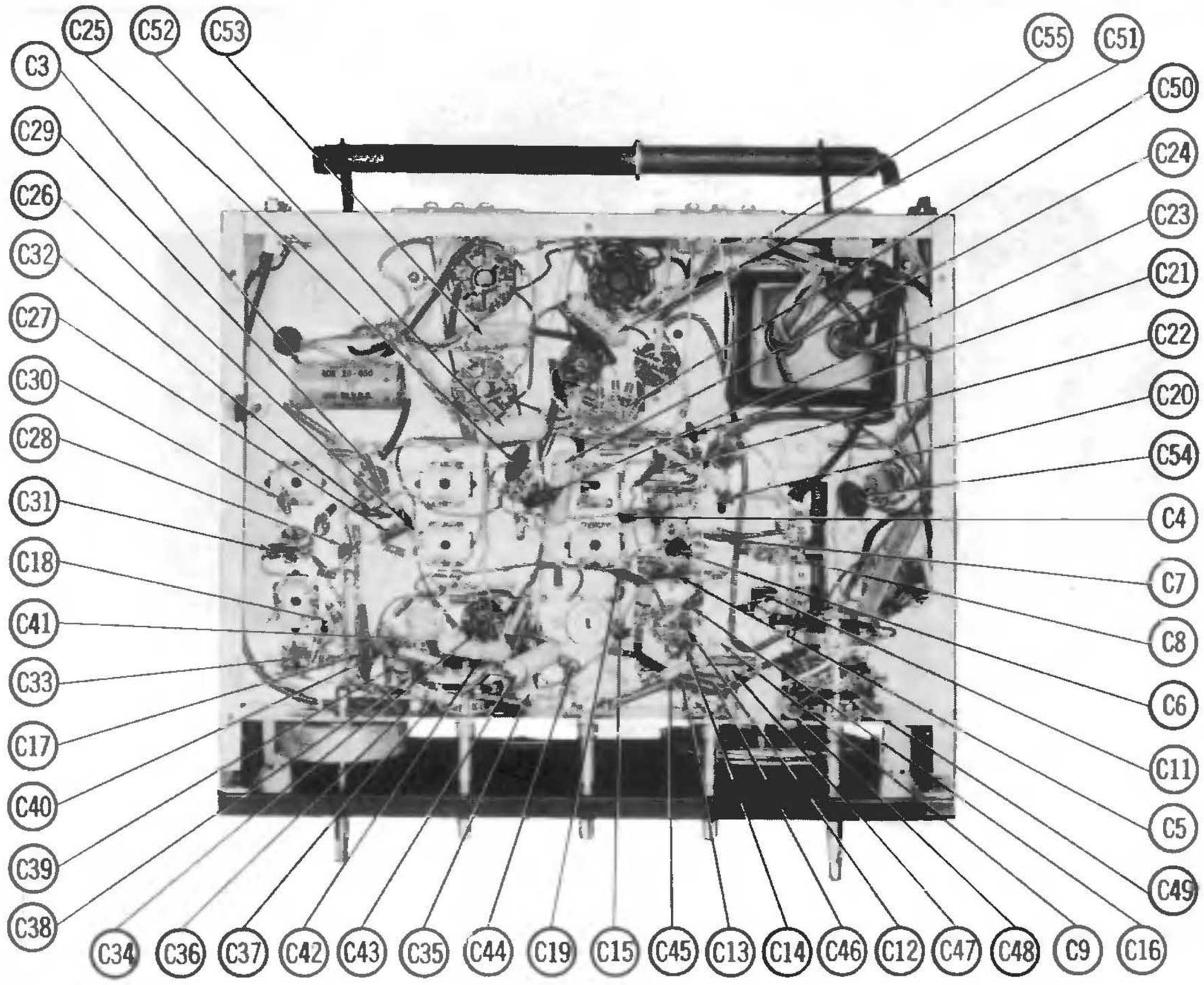
HARMAN-KARDON
MODEL D200

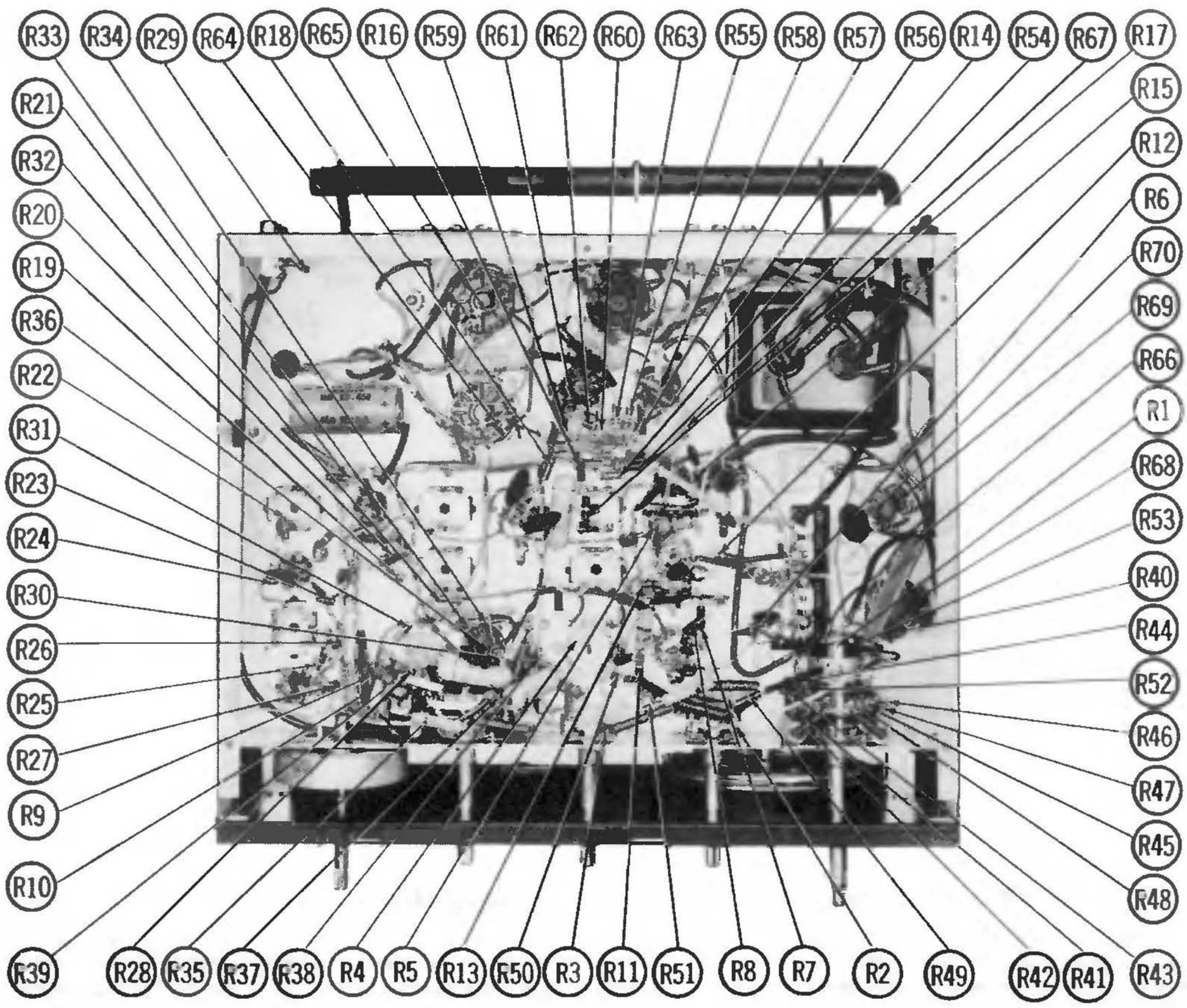
TYPE SET	AC Operated FM-AM Superheterodyne Receiver
TUBES	Thirteen
POWER SUPPLY	105-125 Volts AC - 60 Cycles RATING .82 Amp. @ 117 Volts AC
TUNING RANGE--BROADCAST	530KC - 1650KC FM 88MC - 108MC



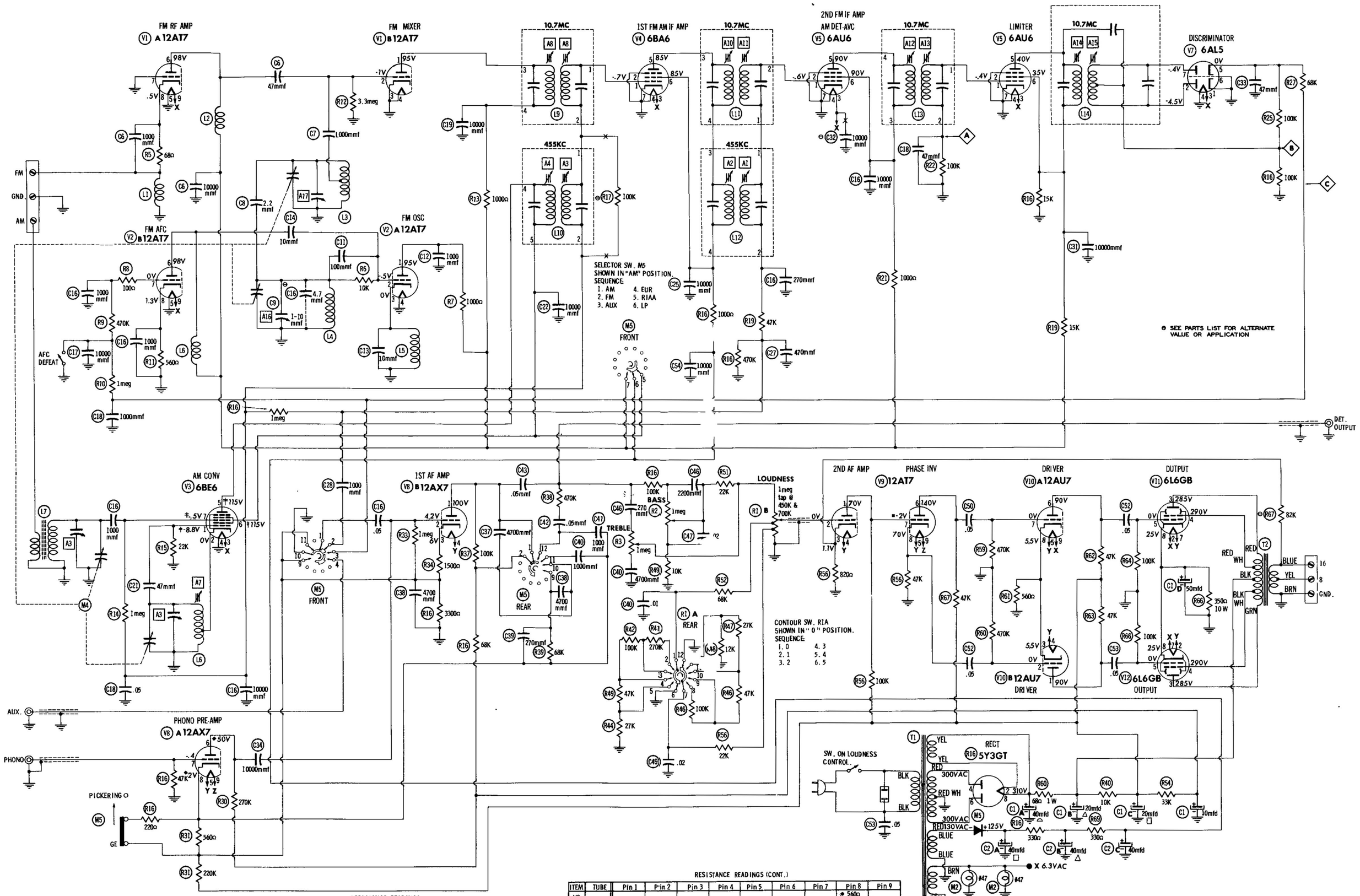
DIAL CORD STRINGING



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AT7	†1700Ω	3.3Meg	0Ω	0Ω	0Ω	†660Ω	0Ω	68Ω	.1Ω
V2	12AT7	†1700Ω	10K	.6Ω	0Ω	0Ω	†660Ω	1.7Meg	560Ω	.1Ω
V3	6BE6	22K	.4Ω	.1Ω	0Ω	††660Ω	††660Ω	2.5Meg		
V4	6BA6	1.5Meg	0Ω	.1Ω	0Ω	†1700Ω	†1700Ω	0Ω		
V5	6AU6	520K	0Ω	.1Ω	0Ω	†1700Ω	†1700Ω	0Ω		
V6	6AU6	100K	0Ω	.1Ω	0Ω	†16K	†16K	0Ω		
V7	6AL5	0Ω	100K	.1Ω	0Ω	200K	0Ω	100K		

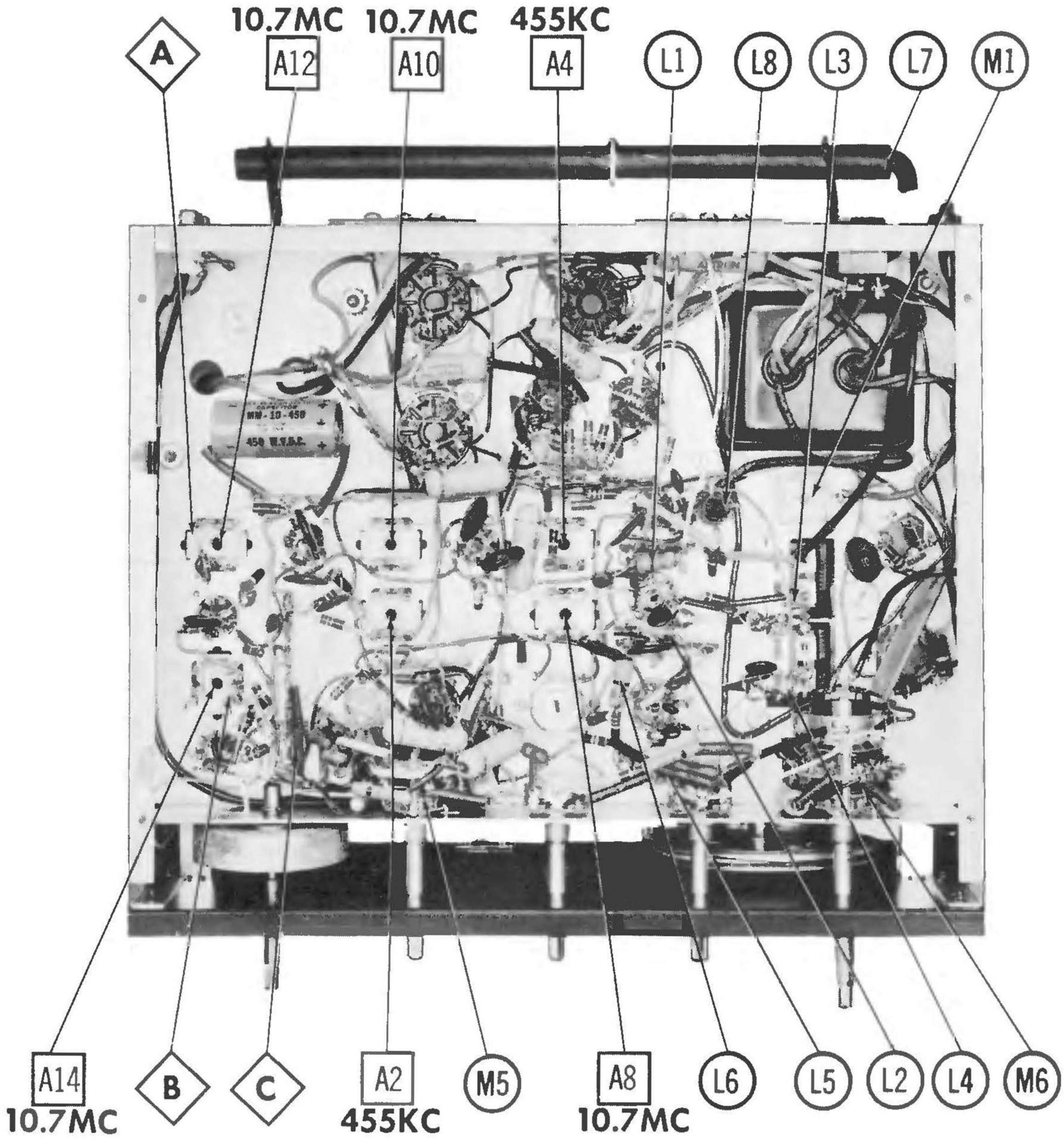
RESISTANCE READINGS (CONT.)

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V8	12AX7	††110K	1Meg	4800Ω	1Ω	7Ω	††315K	47K	♦ 560Ω 3400Ω	7Ω
V9	12AT7	††110K	340K	820Ω	7Ω	7Ω	††57K	††110K	47K	7Ω
V10	12AU7	††57K	470K	560Ω	7Ω	7Ω	††57K	470K	560Ω	7Ω
V11	6L6GB	TP	7Ω	††220Ω	††90Ω	100K	TP	7Ω	350Ω	
V12	6L6GB	TP	7Ω	††195Ω	††85Ω	100K	TP	7Ω	350Ω	
V13	5Y3GT	TP	20K	NC	170Ω	TP	160Ω	TP	20K	

ALL MEASUREMENTS TAKEN IN FM POSITION UNLESS OTHERWISE DESIGNATED.

- ♦ MEASURED IN "AM" POSITION.
- ♦ MEASURED IN "EUR" POSITION.
- † MEASURED FROM OUTPUT OF M1.
- ■ MEASURED FROM PIN 8 OF V9.
- †† MEASURED FROM PIN 8 OF V13.
- TP TIE POINT
- NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.



CHASSIS BOTTOM VIEW INDUCTOR AND ALIGNMENT IDENTIFICATION

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

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 alignmeut screwdriver for adjusting.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.01MFD	High side to pin 7(grid) of 6BE6 (V3). Low side to chassis.	455KC (400~ Mod)	AM	Tuning gang fully open.	Across output terminals.	A1, A2, A3, A4	Adjuat for maximum deflection.
2.	200MMF	Across AM antenna terminals.	1500KC	"	1500KC	"	A5, A6	"
3.	"	"	600KC	"	600KC	"	A7	Adjuat for maximum deflection while rocking tuatng gang.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	.01MFD	High side to pin 2 (grid) of 12AT7 (V2). Low side to chassis.	10.7MC (unmod)	FM	Point of non-interference.	DC probe thru 100K to point (A). Common to chassis.	A8, A9, A10, A11, A12, A13	Adjust for maximum deflection.
5.	"	"	"	"	"	DC probe thru 100K to point (B). Commoa to chassis.	A14	"
6.	"	"	"	"	"	DC probe thru 100K to point (C). Common to chassis.	A15	Adjuat 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	8AND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	.01MFD	High side to pin 2 (grid) of 12AT7 (V2). Low side to chassis.	10.7MC (450KC Swp)	FM	Poiat of non-ioterference.	Vert. amp.to point (A). Low side to chassis.	A8, A9, A10, A11, A12, A13	Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
5.	"	"	"	"	"	Vert. amp. to point (B). Low side to chassis.	A14	"
6.	"	"	"	"	"	Vert. amp. to point (C). Low side to chassis.	A15	Adjust so that 10.7MC occurs at ceater of crossover lines similar to Fig. 2. SLIGHTLY retouch A14 for maximum amplitude and straighiness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7.	270Ω carbon resistor	High side thru 270Ω to FM antenna terminal. Low side to chassis.	106MC	FM	106MC	DC probe thru 100K to point (A). Common to chassis.	A15, A16	Adjust for maximum deflection.

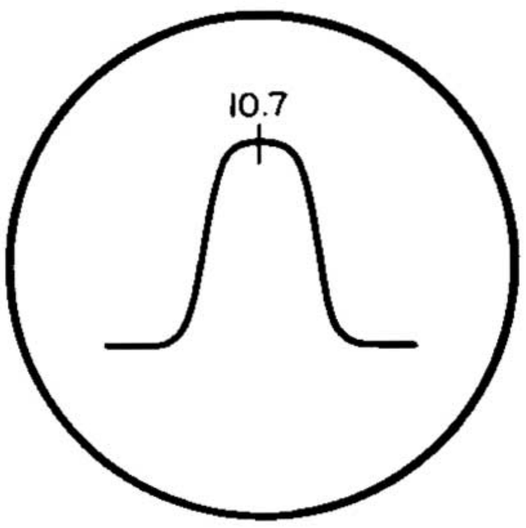


FIG. 1

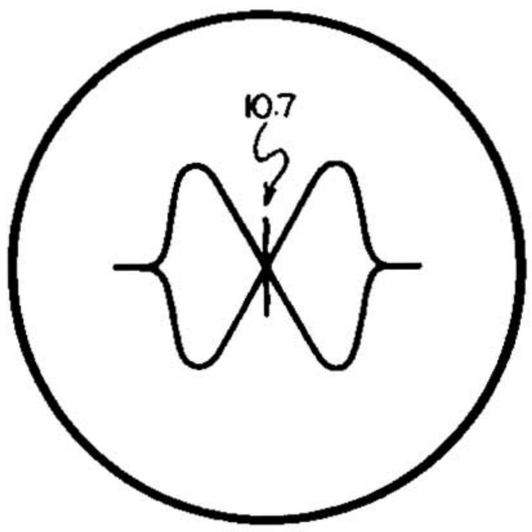


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	FM RF Amp. -FM Mixer	12AT7	
V2	FM Osc. -FM AFC	12AT7	
V3	AM Converter	6BE6	
V4	1st IF Amplifier	6BA8	
V5	2nd FM IF Amplifier-AM Detector-AVC	8AU6	
V6	Limiter	8AU6	
V7	Discriminator	6AL5	
V8	Phono Preamp. -AF Amp.	12AX7	
V9	AF Amp. -Phase Inv.	12AT7	
V10	Driver	12AU7	
V11	Output	6L6GB	
V12	Output	6L6GB	
V13	Rectifier	5Y3GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Harman-Kardon PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	●40	350	JE25911	AFH4-51	D044	FP419.87	TMQ-56	Q-210	R2231*
B	■20	350							
C	▲20	350							
D	50	25							
C2A	■40	150	JE20835	AFH3-10	C009	FP212	TMT-9	D-060	
B	▲40	150				TC46		FM-1540	
C	40	150							
C3	10	450		PRS450V10	BR1045	TC72	TD-10-450	FM-4510	TVA-1705

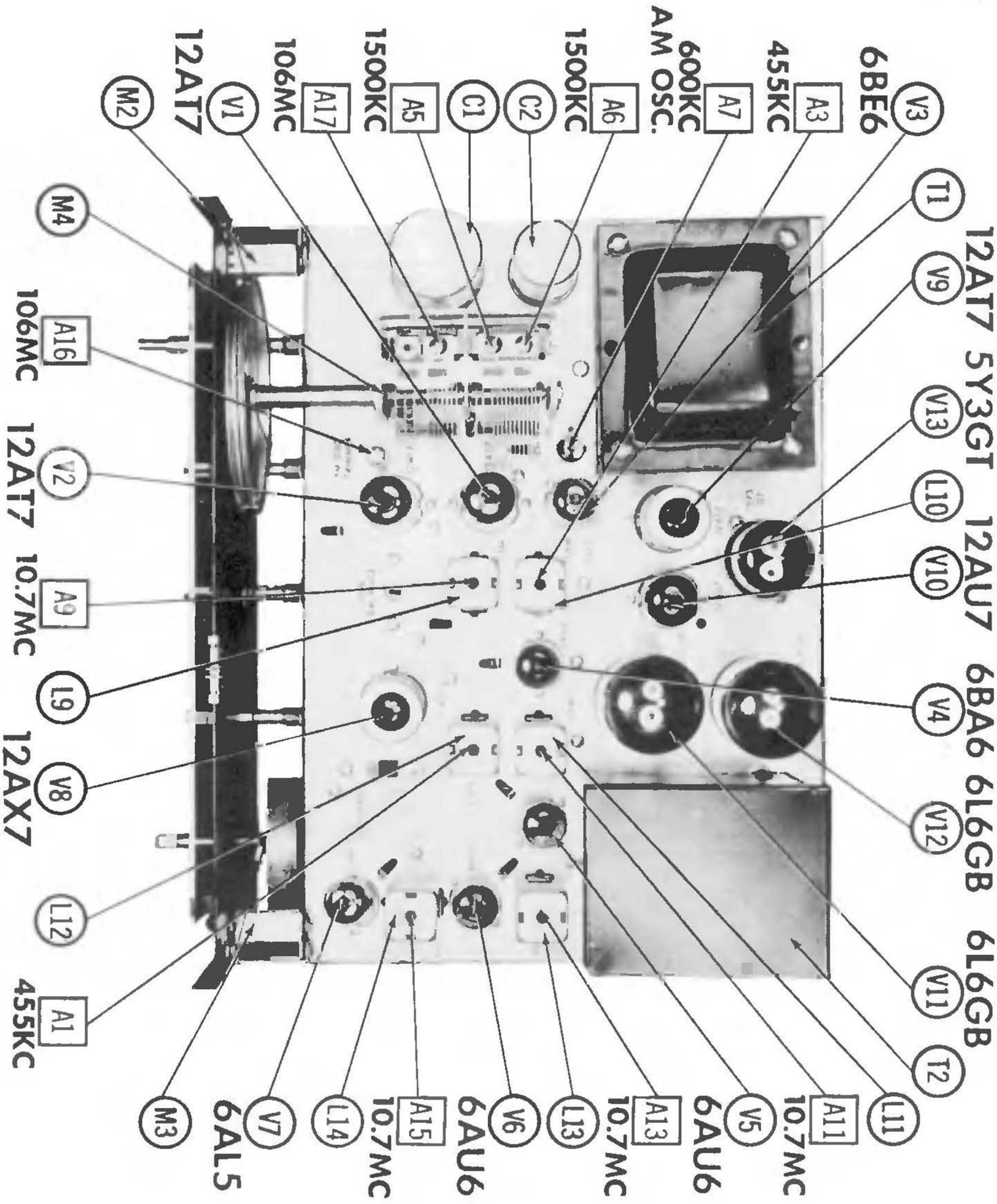
* Non catalog item.

FIXED CAPACITORS

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

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	Harman-Kardon PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C4	1000			BPD-001	DD-102	K069	601-001	DC521	5HK-D1	
C5	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C6	47			N750-DI47	TCN-47	N033	N750K-470	NT-5447	5TCU-Q47	
C7	1000			BPD-001	DD-102	K069	801-001	DC521	5HK-D1	
C8	2.2			NP0-SI2.2	TCZ-2R2	Z006	NP0A-2R2		5TCCB-V22	
C9	1-10									
C10	4.7			NP0-SI4.7	TCZ-4R7	Z010	NP0A-4R7	ZT-5547	5TCCB-V47	Note 1
C11	100			N750-DI100	TCN-100	N042	N750L-101	NT-531	5TCU-T1	
C12	1000			BPD-001	DD-102	K069	801-001	DC521	5HK-D1	
C13	10			N750-DI10	TCN-10	N018	N750A-100	NT-541	5TCU-Q1	
C14	10			N750-DI10	TCN-10	N018	N750A-100	NT-541	5TCU-Q1	
C15	1000			BPD-001	DD-102	K069	801-001	DC521	5HK-D1	
C16	1000			BPD-001	DD-102	K069	801-001	DC521	5HK-D1	
C17	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C18	1000			BPD-001	DD-102	K069	801-001	DC521	5HK-D1	
C19	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C20	1000			BPD-001	DD-102	K069	801-001	DC521	5HK-D1	
C21	47			NP0-DI47	TCN-47	N033	N750K-470	NT-5447	5TCU-Q47	
C22	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C23	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C24	.05	200		BPD-05	DF-503	CUB2S5		PT415	2TM-S5	
C25	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C26	270			SI270	D8-271	TP41	GP2K-271	UC-5327	5GA-T27	
C27	470			BPD-00047	DD-471	K060	GP2K-471	UC-5347	5GA-T47	
C28	1000			BPD-001	DD-102	K069	801-001	DC521	5HK-D1	
C29	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C30	47			BPD-000047	DD-470	G033	831-470	UC-5447	5GA-Q47	
C31	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C32	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	Note 1
C33	47			N750-DI47	TCN-47	N033	N750K-470	NT-5447	5TCU-Q47	
C34	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C35	.05	200		BPD-05	DF-503	CUB2S5		PT415	2TM-S5	
C38	4700			SI4700	D6-472	TP63	GP2-333-472	UC-5247	5GA-D47	
C37	4700			SI4700	D6-472	TP63	GP2-333-472	UC-5247	5GA-D47	
C38	4700			SI4700	D6-472	TP63	GP2-333-472	UC-5247	5GA-D47	
C39	270			SI270	D6-271	TP41	GP2K-271	UC-5327	5GA-T27	
C40	1000			SI1000	D8-102	K069	GP2L-102	UC-521	5HK-D1	
C41	1000			SI1000	D6-102	K069	GP2L-102	UC-521	5HK-D1	
C42	.05	200		BPD-05	DF-503	CUB2S5		PT415	2TM-S5	
C43	.05	200		BPD-05	DF-503	CUB2S5		PT415	2TM-S5	
C44	270			SI270	D6-271	TP41	GP2K-271	UC-5327	5GA-T27	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA Harman-Kardon PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C45	4700			SI4700	D6-472	TP63	GP2-333-472	UC-5247	5GA-D47	
C46	2200			SI2200	D6-222	TP57	GP2-333-222	UC-5222	5GA-D22	
C47	.02	200		BPD-02	DF-203	CUB2S2	817-02	PT412	2TM-S2	
C48	.01	200		BPD-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C49	.02	200		BPD-02	DF-203	CUB2S2	817-02	PT412	2TM-S2	
C50	.05	400		BPD-05	DF-503	CUB4S5		PT415	4TM-S5	
C51	.05	400		BPD-05	DF-503	CUB4S5		PT415	4TM-S5	
C52	.05	400		BPD-05	DF-503	CUB4S5		PT415	4TM-S5	
C53	.05	400		BPD-05	DF-503	CUB4S5		PT415	4TM-S5	
C54	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C55	.05	600		BPD-05	DF-503	CUB6S5		PT615	6TM-S5	

Note 1: Not used in some versions.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Harman-Kardon PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	Switch		RV24721					Contour
B	1Meg	½						Londness, Tap@ 450K & 700K
C	Switch							Power On-Off
R2A	1Meg	½	RV33697	AB-70	A47-1Meg-Z	Q13-137	U-53	Bass
B	Shaft			AK-4	KSS-3	Not Req.	Not Req.	Attach to R2A
R3A	1Meg	½	RV33897	AB-70	A47-1Meg-Z	Q13-137	U-53	Treble
B	Shaft			AK-4	KSS-3	Not Req.	Not Req.	Attach to R3A
R4	50Ω	2						Hum Balance-Wire-wound

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA Harman-Kardon PART No.	IRC PART No.	NOTES
R5	66Ω			BTS-68	
R6	10K			BTS-10K	
R7	1000Ω			BTS-1000	
R8	100Ω			BTS-100	
R9	470K			BTS-470K	
R10	1Meg			BTS-1Meg	
R11	560Ω			BTS-560	
R12	3.3Meg			BTS-3.3Meg	
R13	1000Ω			BTS-1000	
R14	1Meg			BTS-1Meg	
R15	22K			BTS-22K	
R16	1Meg			BTS-1Meg	
R17	100K			BTS-100K	Note 1
R18	1000Ω			BTS-1000	
R19	47K			BTS-47K	
R20	470K			BTS-470K	
R21	1000Ω			BTS-1000	
R22	100K			BTS-100K	
R23	15K			BTS-15K	
R24	15K			BTS-15K	
R25	100K			BTS-100K	
R26	100K			BTS-100K	
R27	68K			BTS-68K	
R28	220Ω			BTS-220	
R29	47K			BTS-47K	
R30	270K			BTS-270K	
R31	560Ω			BTS-560	
R32	220K			BTS-220K	
R33	1Meg			BTS-1Meg	
R34	1500Ω			BTS-1500	
R35	3300Ω			BTS-3300	
R36	68K			BTS-68K	
R37	100K			BTS-100K	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA Harman-Kardon PART No.	IRC PART No.	NOTES
R38	470K			BTS-470K	
R39	68K			BTS-68K	
R40	10K			BTS-10K	
R41	270K			BTS-270K	
R42	100K			BTS-100K	
R43	47K			BTS-47K	
R44	27K			BTS-27K	
R45	100K			BTS-100K	
R46	47K			BTS-47K	
R47	27K			BTS-27K	
R48	12K			BTS-12K	
R49	10K			BTS-10K	
R50	100K			BTS-100K	
R51	22K			BTS-22K	
R52	68K			BTS-68K	
R53	22K			BTS-22K	
R54	33K			BTS-33K	
R55	100K			BTS-100K	
R56	820Ω			BTS-820	
R57	47K			BTS-47K	
R58	47K			BTS-47K	
R59	470K			BTS-470K	
R60	470K			BTS-470K	
R61	560Ω			BTS-560	
R62	47K			BTS-47K	
R63	47K			BTS-47K	
R64	100K			BTS-100K	
R65	100K			BTS-100K	
R66	350Ω	10		1 3/4A-350	
R67	82K			BTS-82K	Note 2
R68	68Ω	1		BTA-68	
R69	330Ω			BTS-330	
R70	330Ω			BTS-330	

Note 1: Not used in some versions.
Note 2: Some versions use 56K in this application.

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	Harman-Kardon PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @ .82A	615VCT @ .087A	5VAC @ 2A	6.3VAC @ 2.3A	FT421060					
			SEC. 4	SEC. 5						
			6.3VAC @ 2.62A	132VAC @ .029A						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Harman-Kardon PART No.	Halldorson PART No.	Merit PART No.	Stoncor PART No.	Thordarson PART No.	Triad PART No.	
T2	6000Ω	16Ω tap @ 6Ω	FT421061						

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	Harman-Kardon PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	RF Choke	.6Ω			19-1000		4602	1 Microhenry, IRC part #CLA
L2	RF Choke	3Ω						3.3 Microhenries, IRC part #CLA
L3	FM RF Coil	0Ω						
L4	FM Osc. Coil	0Ω						
L5	Cathode Choke	.6Ω			19-1000		4602	1 Microhenry, IRC part #CLA
L6	RF Choke	.6Ω			19-1000		4602	1 Microhenry, IRC part #CLA
L7	AM Loop Stick	.1Ω	.4Ω	GL421119				
L8	AM Osc. Coil	4Ω		GL24601				Tapped @ .4Ω
L9	1st FM IF	.6Ω	.6Ω	GT24605	16-3487	FM-254	1463	
L10	1st AM IF	16Ω	16Ω	GT24610	16-6758	BC-352	12-C1	
L11	2nd FM IF	.7Ω	.7Ω	GT24606	16-3487	FM-254	1463	
L12	2nd AM IF	16Ω	16Ω	GT24610	16-6758	BC-353	12-C2	
L13	3rd FM IF	.6Ω	.6Ω	GT24605	16-3467	FM-254	1463	
L14	Discriminator	.7Ω	.6ΩCT	GT461423	17-3494	FM-253	1464	

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	Harman-Kardon PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1	.052A	Z20690	1263A	RS065Q	6S65	8J1	65	

MISCELLANEOUS

ITEM No.	PART NAME	Harman-Kardon PART No.	NOTES
M2	Dial Light		#47
M3	Dial Light		#47
M4	Tuning Cap.	JV471083	4 Gang (AM Sections: 20-527MMF, 28-200MMF)
M5	Switch	ER421069	Selector & Record Compensation (Rotary, Wafer Type)
M6	Switch	ES26798	GE-Pickering (SPST - Slide Type)
	Knob	P24779	Contonr Switch
	Knob	P24780	Control (3 used)
	Knob	P24781	Tuning
	Knob	P24782	On-Off-Loudness
	Dial Glass	P421064	
	Dial Pointer	Z24773	