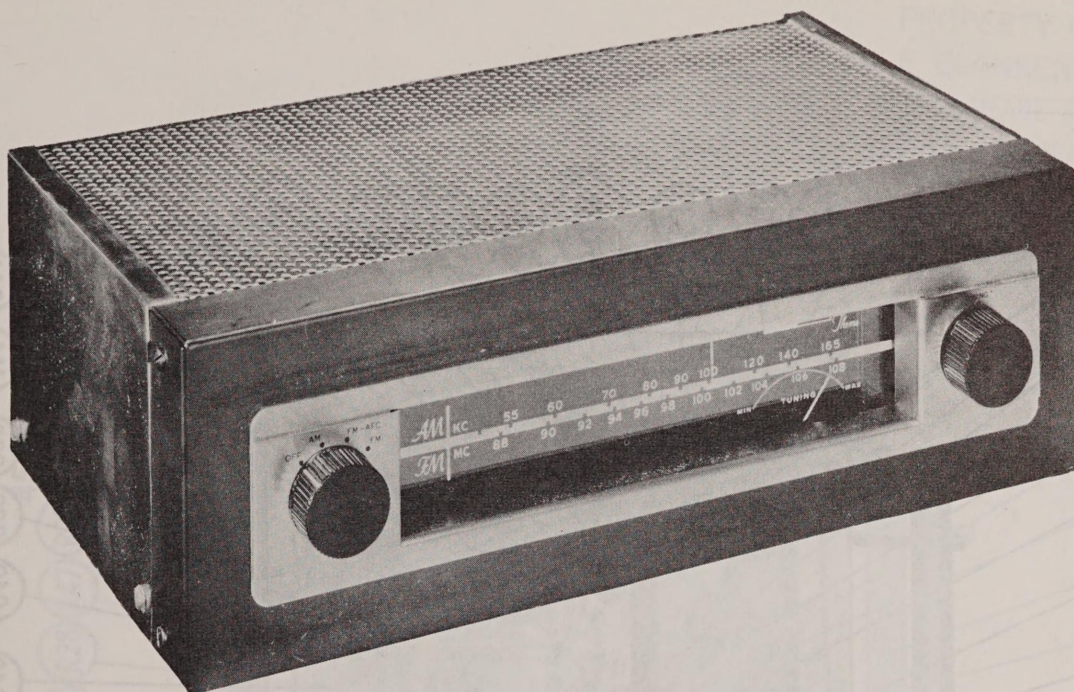




HARMAN KARDON
MODEL A-310

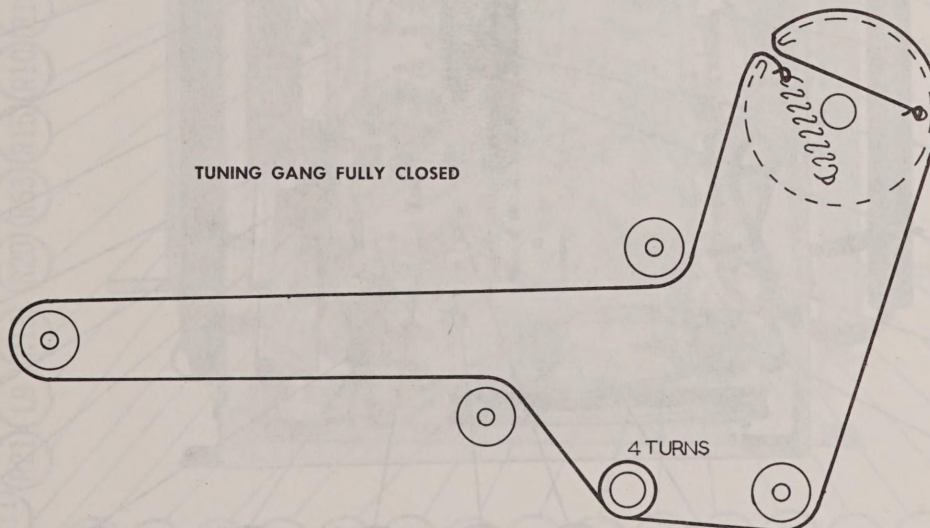


PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

TRADE NAME	Harman-Kardon Model A-310		
MANUFACTURER	Harman-Kardon, Inc., 520 Main St., Westbury, L. I., N. Y.		
TYPE SET	AC Operated FM-AM Superheterodyne Tuner		
TUBES	Twelve		
POWER SUPPLY	110-120 Volts AC - 60 Cycles	RATING	.35 Amp. @ 117 Volts AC
TUNING RANGE--BROADCAST	530KC - 1650KC	FM	88MC - 108MC

HARMAN KARDON
MODEL A-310

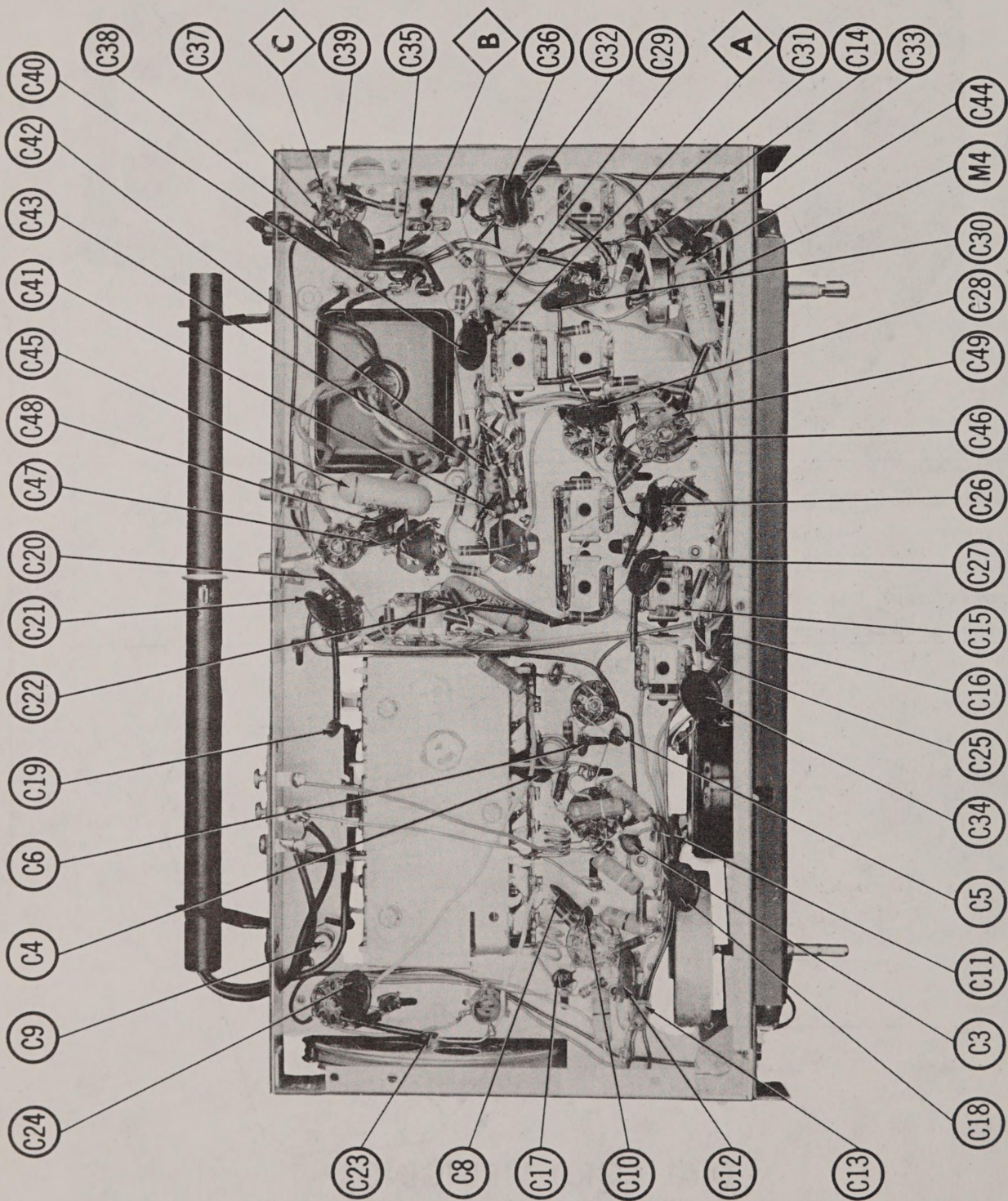
TUNING GANG FULLY CLOSED



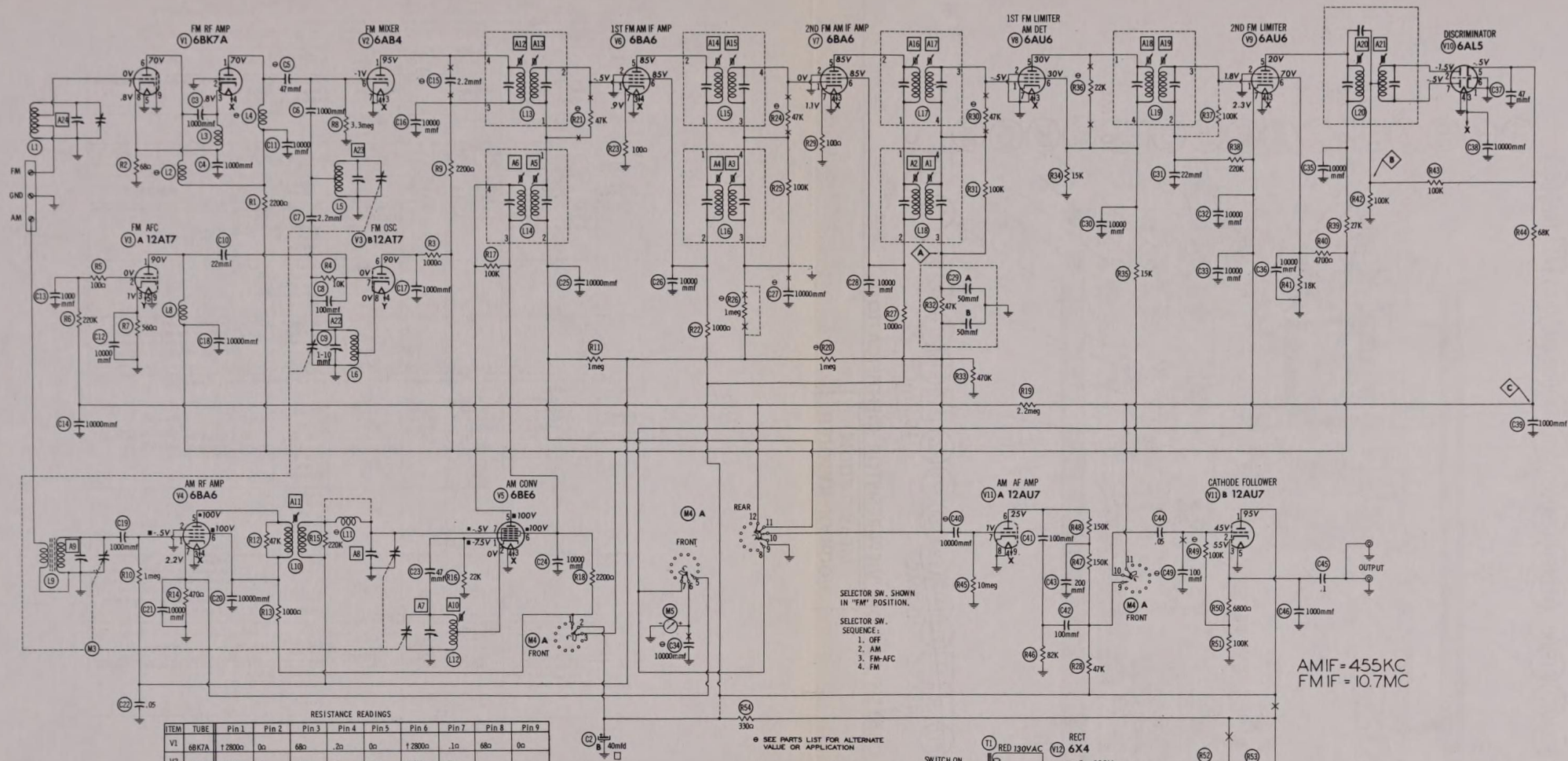
DIAL CORD STRINGING

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

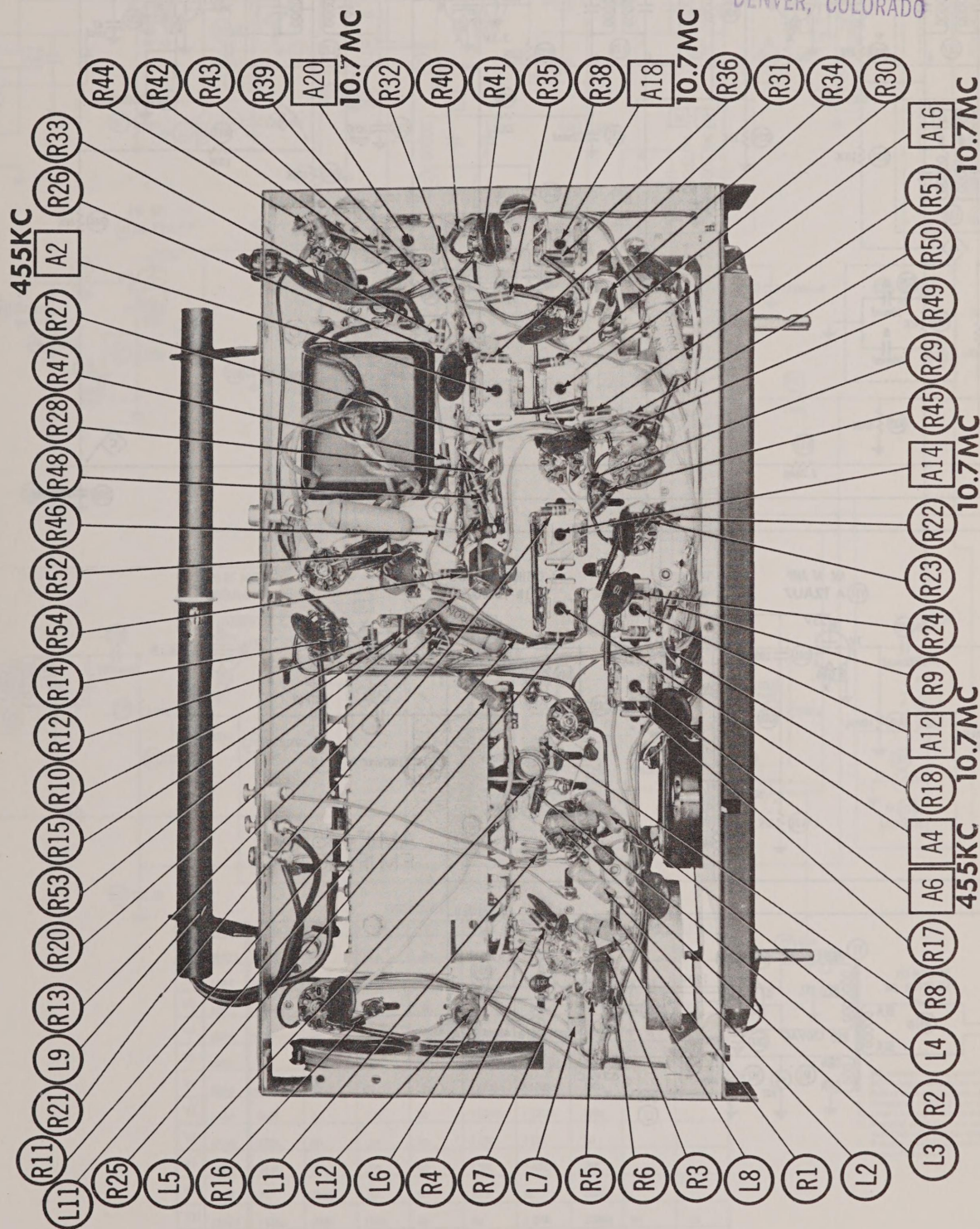
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CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

HARMAN-KARDON
MODEL A-310

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 alignment 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 (V5). Low side to chassis.	455KC (400% Mod)	AM	Tuning gang fully open.	Across output terminals.	A1, A2, A3, A4, A5, A6	Adjust for maximum deflection.
2. 200MMF	Across AM antenna terminals.	1500KC	"	1500KC	"	A7, A8, A9	"
3. "	"	600KC	"	600KC	"	A10, A11	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Use 100K resistor in series with DC probe.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4. .01MFD	High side to pin 6 (grid) of 6AB4 (V2). Low side to chassis.	10.7MC (unmod)	FM	Point of non-interference.	DC probe thru 100K to point (A) Common to chassis.	A12, A13, A14, A15, A16, A17	Adjust for maximum deflection.
5. "	"	"	"	"	DC probe thru 100K to point (B) Common to chassis.	A18, A19, A20	"
6. "	"	"	"	"	DC probe thru 100K to point (C) Common to chassis.	A21	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.

Use 100K resistor in series with vert. amp.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4. .01MFD	High side to pin 6 (grid) of 6AB4 (V2). Low side to chassis.	10.7MC (450KC Swp)	FM	Point of non-interference.	Vert. amp. thru 100K to point (A) Low side to chassis.	A12, A13, A14, A15, A16, A17	Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
5. "	"	"	"	"	Vert. amp. thru 100K to point (B) Low side to chassis.	A18, A19, A20	"
6. "	"	"	"	"	Vert. amp. thru 100K to point (C) Low side to chassis.	A21	Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A20 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

Use 100K resistor in series with DC probe.

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.	A22, A23, A24	Adjust for maximum deflection.
8. "	"	90MC	"	90MC	"	"	"

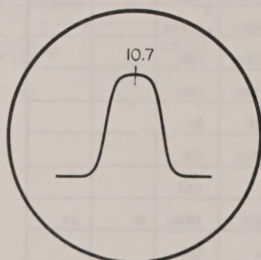


FIG. 1

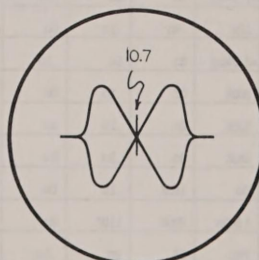


FIG. 2

PARTS LIST AND DESCRIPTIONS TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	FM RF Amplifier	6BK7A	
V2	FM Mixer	6AB4	
V3	FM AFC-Osc.	12AT7	
V4	AM RF Amplifier	6BA6	
V5	AM Converter	8BE6	
V6	1st IF Amplifier	6BA6	

ELECTROLYTIC CAPACITORS

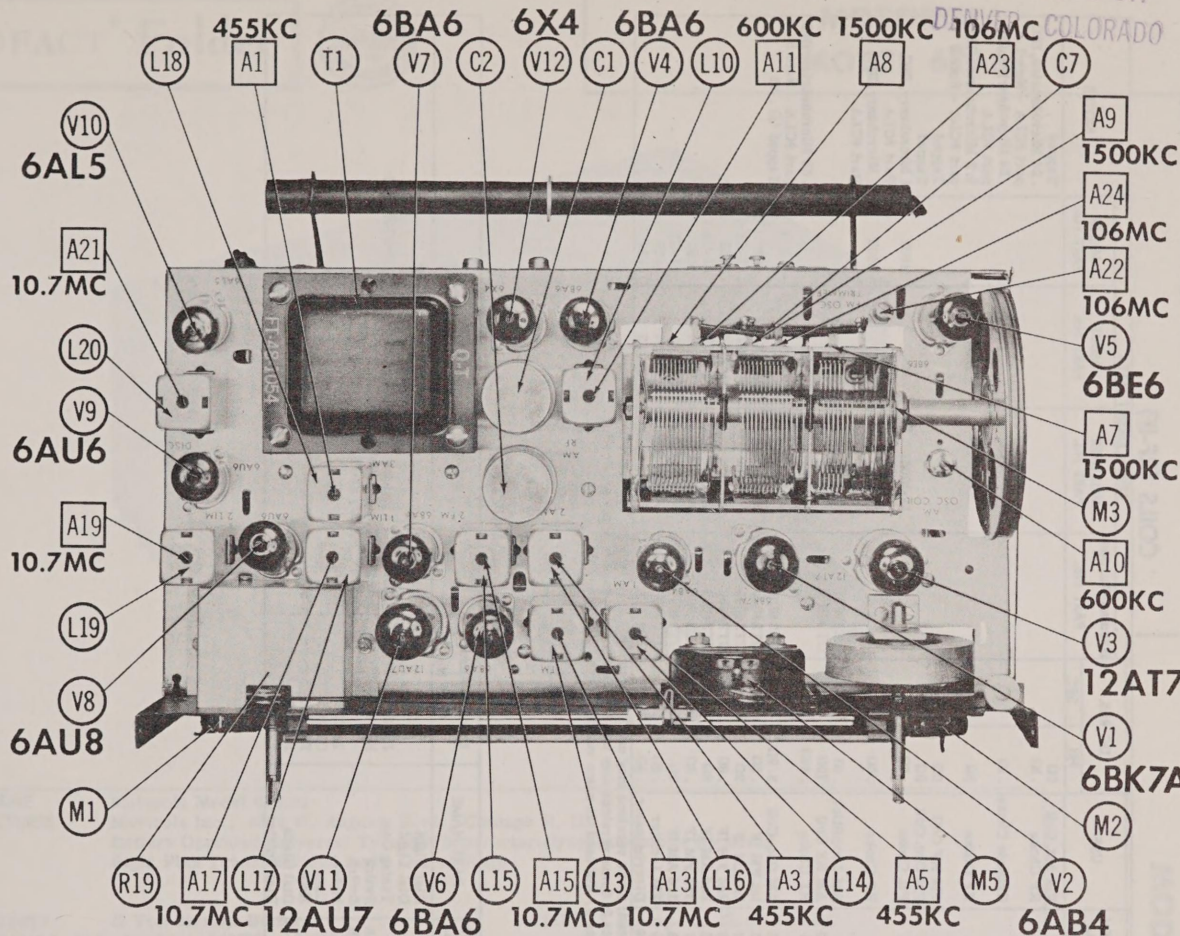
ITEM No.	RATING		REPLACEMENT DATA			
	CAP.	VOLT.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.
C1A	40	150	JE22637	AFH2-14	AFH2-14	JE22637
C2A	40	150	JE22637	AFH2-14	AFH2-14	JE22637

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.	
C3	1000			BPD-001	DD-102	K069	Note 1
C4	1000			BPD-001	DD-102	K069	
C5	47			BPD-000047	DD-470	G333	Note 2
C6	1000			BPD-001	DD-102	K069	
C7	2.2			NP0A-S12.2	TCZ-2R2	T205	Note 2
C8	2.2			NP750-D100	TCN-100	TN22	
C9	1-10			NP750-D122	TCN-22	TN06	Note 2
C10	22			BPD-01	DD-103	K082	
C11	10000			BPD-01	DD-103	K082	Note 2
C12	10000			BPD-01	DD-103	K082	
C13	1000			BPD-01	DD-103	K082	Note 2
C14	10000			BPD-01	DD-103	K082	
C15	2.2			NP0-S12.2	TCZ-2R2	T205	Note 2
C16	10000			BPD-01	DD-103	K082	
C17	1000			BPD-01	DD-103	K082	Note 2
C18	10000			BPD-01	DD-103	K082	
C19	1000			BPD-01	DD-103	K082	Note 2
C20	10000			BPD-01	DD-103	K082	
C21	10000			BPD-01	DD-103	K082	Note 2
C22	.05	200		BPD-05	DD-503	CUR285	
C23	47			BPD-000047	DD-470	G333	Note 2
C24	10000			BPD-01	DD-103	K082	
C25	10000			BPD-01	DD-103	K082	Note 2
C26	10000			BPD-01	DD-103	K082	
C27	10000			BPD-01	DD-103	K082	Note 2
C28	10000			BPD-01	DD-103	K082	
C29A	50			BPD-01	TPC-52	TPH11M3	Note 2
C30	10000			BPD-01	DD-103	K082	
C31	22			S122	D6-220	K082	Note 2
C32	10000			BPD-01	DD-103	K082	
C33	10000			BPD-01	DD-103	K082	Note 2
C34	10000			BPD-01	DD-103	K082	
C35	10000			BPD-01	DD-103	K082	Note 2
C36	10000			BPD-01	DD-103	K082	
C37	47			BPD-000047	DD-470	G333	Note 2
C38	10000			BPD-01	DD-103	K082	
C39	10000			BPD-01	DD-103	K082	Note 2
C40	10000			BPD-01	DD-103	K082	
C41	100			NP0-S1100	D6-101	TZ30	Note 3
C42	100			NP0-S1100	D6-101	TZ30	
C43	200			1469-0002	D6-201	TZ30	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	VOLT	REPLACEMENT DATA						NOTES
			HARMON-KARDON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNFILL DUBINIER PART No.	ERIE PART No.	MALLORY PART No.	
C44	.05	200		BPD-05	DF-503	CUB255	GP2L-102	PT415	2TM-S5
C45	.1	200		P288N-1	DF-104	CUB2P1		PT401	2TM-F1
C46	10000			SI1000	DD-102	TP52	811-01	UC-521	5HR-D1
C47	10000			SI1000	DD-103	K982	811-01	DC511	5HR-S1
C48	10000			BPD-01	DD-103	K982	811-01	DC511	5HR-S1
C49	100			SI100	DD-101	TP34		UC-531	5GA-T1

† Items C29A, C29B and R32 are combined in one unit.

Note 1: Some versions may use 10MMMF in this application.

Note 2: Not used in some versions.

Note 3: Some versions may use 5000MMMF in this application.

RESISTORS

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

ITEM No.	RATING OHMS	WATT	REPLACEMENT DATA		NOTES
			HARMON-KARDON PART No.	IRC PART No.	
R1	2200Ω				
R2	68Ω		BTS-2200		
R3	1000Ω		BTS-68		
R4	10K		BTS-1000		
R5	100K		BTS-10K		
R6	220K		BTS-100		
R7	560Ω		BTS-220K		
R8	3.3Meg		BTS-47K		
R9	2200Ω		BTS-3.3Meg		
R10	1Meg		BTS-560		
R11	1Meg		BTS-2200		
R12	47K		BTS-1Meg		
R13	1000Ω		BTS-47K		
R14	470Ω		BTS-1000		
R15	220K		BTS-470		
R16	22K		BTS-220K		
R17	100K		BTS-100K		
R18	2.2Meg		BTS-2200		
R19	1Meg		BTS-1Meg		
R20	47K		BTS-47K		
R21	1000Ω		BTS-1000		
R22	1000Ω		BTS-100		
R23	100K		BTS-47K		
R24	47K		BTS-100K		
R25	100K		BTS-1Meg		
R26	1Meg		BTS-100K		
R27	1000Ω				
R28	47K				
R29	100K				
R30	47K				
R31	100K				
R32	47K				
R33	470K				
R34	15K				
R35	15K				
R36	22K				
R37	100K				
R38	220K				
R39	27K				
R40	4700Ω				
R41	18K				
R42	100K				
R43	100K				
R44	68K				
R45	10Meg				
R46	62K				
R47	150K				
R48	150K				
R49	100K				
R50	6800Ω				
R51	100K				
R52	330Ω				
R53	330Ω				
R54	330Ω				

† Items R32, C29A and C29B are combined in one unit.

Note 1: Not used in some versions.

Note 2: Some versions use 470K resistor in this application.

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	DC RES.		HARMON-KARDON PART No.	REPLACEMENT DATA		NOTES
		PRI.	SEC.		MEISSNER PART No.	MILLER PART No.	
L1	FM Ant. Coil	0Ω					Tapped
L2	RF Choke	.1Ω					.24 Microhenries, IRC part #CLA - Note 1
L3	Cathode Choke	.1Ω					.24 Microhenries, IRC part #CLA
L4	RF Choke	3Ω					3.3 Microhenries, IRC part #CLA - Note 2
L5	FM RF Coil	0Ω					Tapped
L6	FM Osc. Coil	0Ω					Tapped
L7	Fil. Choke	.5Ω					1 Microhenry, IRC part #CLA
L8	RF Choke	.5Ω			19-1000	4602	1 Microhenry, IRC part #CLA
L9	AM LoopStick	.1Ω					.88 Microhenries, IRC part #CLA Note 3
L10	AM RF Coil	70Ω					Tapped @ .40
L11	RF Choke	.4Ω					
L12	AM Osc. Coil	3.9Ω					
L13	1st FM IF	.8Ω					
L14	2nd FM IF	.8Ω					
L15	2nd AM IF	.8Ω					
L16	3rd FM IF	.8Ω					
L17	3rd AM IF	.8Ω					
L18	FM Limiter	.8Ω					
L19	Discriminator	.8Ω					
L20	Discriminator	.8Ω					

Note 1: Some versions may use 1 Microhenry choke in some applications.

Note 2: Some versions may use 3 Microhenries choke in some applications.

Note 3: Not used in some versions.

MISCELLANEOUS

ITEM No.	PART NAME	HARMON-KARDON PART No.	NOTES
M1	Dial Light	#47	
M2	Dial Light	#47	
M3	Tuning Cap	JV531175	6 Gang (AM Sections: 10-555MMF, 10-555MMF, 10-200MMF)
M4	Switch	ER481199	Selector (Rotary, Water Type)
M5	Switch	Z481200	On-Off (Power) SPST
	Meter	C28803	Tuning
	Cage	P20778	Control (2 used)
	Knob	P481092	
	Dial Pointer	Z24773	

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA		
	PRI.	SEC. 1	SEC. 2	HARMON-KARDON PART No.	Merit PART No.	Thorndarson PART No.
T1	117VAC @ .35A	280VCT @ .051A	6.3VAC @ .4A	FT481054		