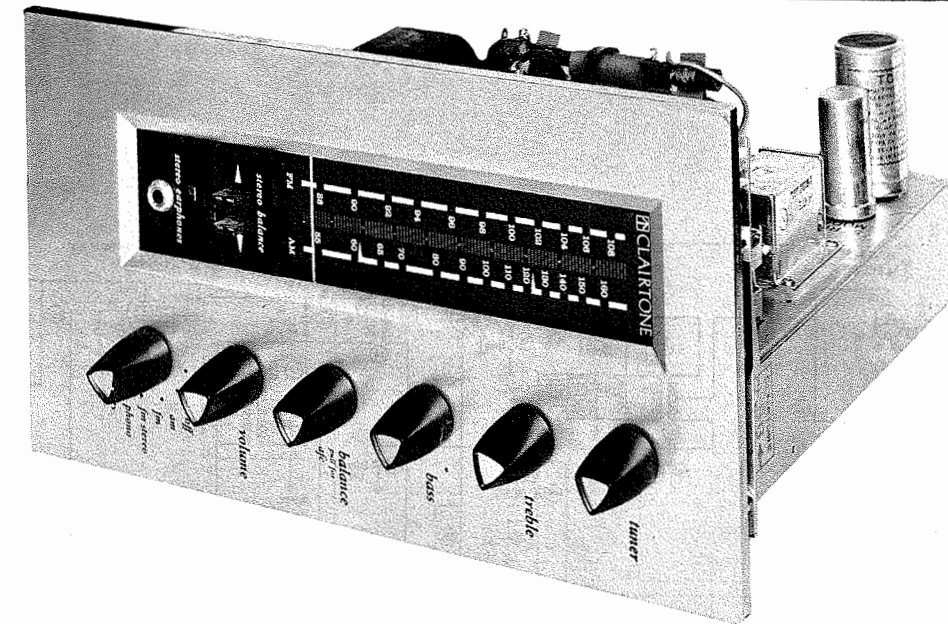


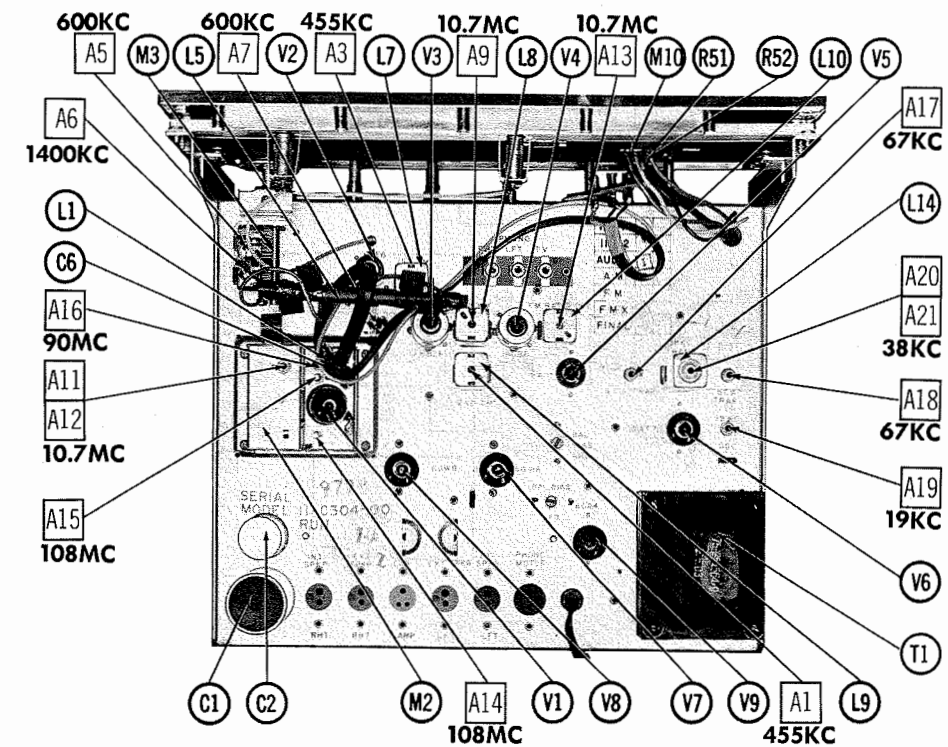
PHOTOFACT® Folder

CLAIRTONE  
CHASSIS C304



CLAIRTONE  
CHASSIS C304

TRADE NAME: Clairtone  
 SUPPLIER: For Current Address, See Master Index.  
 TYPE SET: 9 Tube AM-FM-FM Stereo Receiver  
 POWER SUPPLY: 110-120 Volts AC, 60 Cycles RATING: 80 Watts, .84 Amp. @ 117 Volts AC  
 TUNING RANGE: BROADCAST 550-1600KC FREQ. MOD. 88-108MC



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

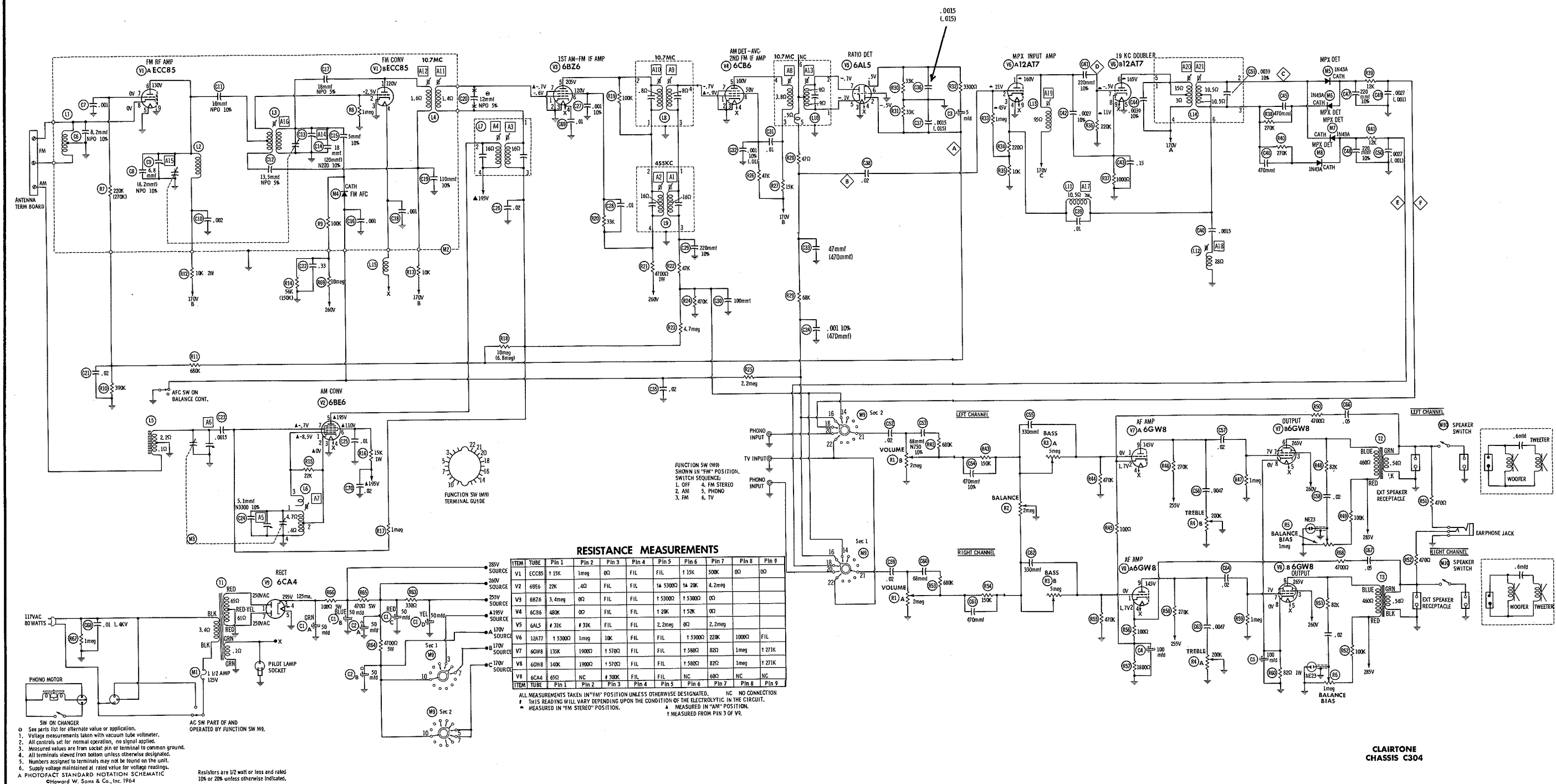


The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. MO869

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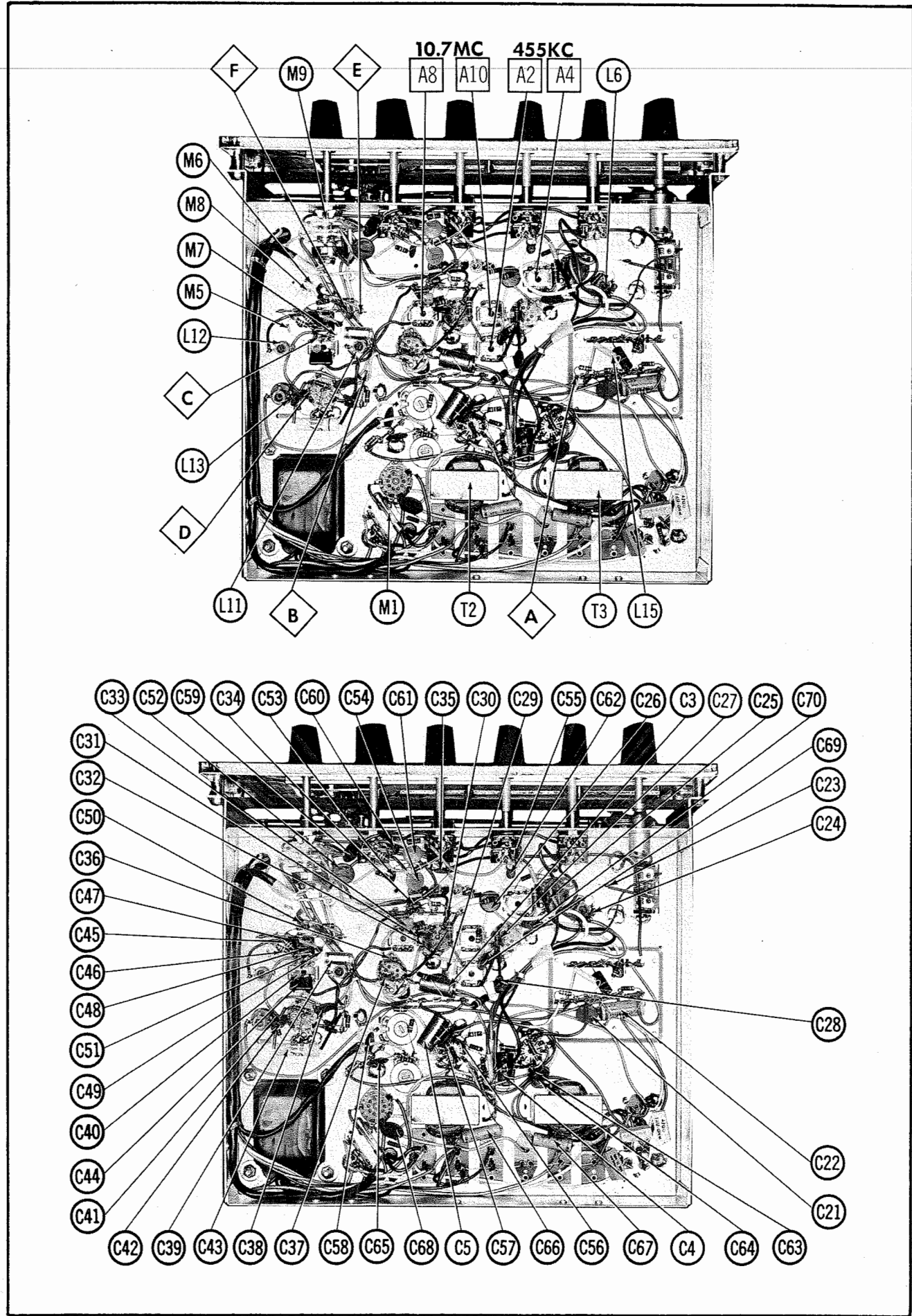
DATE 12-64 SET 728 FOLDER 7

CLAIRTONE  
CHASSIS C304



CLAIRTONE  
CHASSIS C304

FOLDER 7



ALIGNMENT INSTRUCTIONS

Maintain line voltage at 117 volts. Use only enough generator output to obtain a suitable indication. Allow a 15 minute warmup for receiver and equipment.  
CAUTION: Use isolation transformer, if available. If not, observe polarity when connecting test equipment.  
Suggested Alignment Tools: A1 thru A4, A8, A9, A10, A13 GENERAL CEMENT: 5087, 8727 WALSCO: 2515  
A5, A6, A14, A15 GENERAL CEMENT: 8868, 9087, 9089 WALSCO: 2528, 2541, 2587  
A7, A11, A12, A17 thru A21 GENERAL CEMENT: 8806, 8889, 9302 WALSCO: 2511, 2543, 2588  
A16 GENERAL CEMENT: 9296, 9300, 9302 WALSCO: 2510, 2511, 2547

AM ALIGNMENT — SELECTOR IN AM POSITION

Fashion loop of several turns of wire and connect generator across loop. Set volume control at maximum.

GENERATOR FREQUENCY	DIAL SETTING	INDICATOR	ADJUST	REMARKS
1. 455KC (400% Mod.)	Tuning gang fully open.	Output Meter across Voice coil.	A1, A2, A3, A4	Adjust for maximum. Repeat until no further improvement can be made.
2. 1800KC	"	"	A5	Adjust for maximum.
3. 1400KC	Tune to signal.	"	A6	"
4. 600KC	"	"	A7	Rock tuning gang and adjust for maximum. Repeat steps 2 thru 4 until no further improvement can be made.

FM ALIGNMENT USING AM SIGNAL GENERATOR — SELECTOR IN FM POSITION

High side to ungrounded shield over FM converter tube, low side to ground.

GENERATOR FREQUENCY	DIAL SETTING	INDICATOR	ADJUST	REMARKS
5. 10.7MC (Unmod.)	Point of non-interference.	DC probe of VTVM to point A; common to ground.	A8, A9, A10, A11, A12	Adjust for maximum.
6. "	"	DC probe to point B; common to ground.	A13	Adjust for zero reading. A positive or negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR — SELECTOR IN FM POSITION

High side to ungrounded shield over FM converter, low side to ground. Use only enough marker signal to obtain indication. Use 60% frequency modulated signal with 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

GENERATOR FREQUENCY	DIAL SETTING	INDICATOR	ADJUST	REMARKS
5. 10.7MC (450KC Swp.)	Point of non-interference	Vert. amp. of Scope to point A; low side to ground.	A8, A9, A10, A11, A12	Disconnect stabilizing capacitor C 3. Adjust for maximum gain and symmetry of response similar to Fig. 1 with marker as shown. Reconnect C 3.
6. "	"	Vert. amp. to point B; low side to ground.	A13	Adjust A 13 (Secondary) to place marker at center of crossover lines similar to Fig. 2. Adjust A 8 (Primary) for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

Connect generator across antenna terminals with 120Ω carbon resistors in series with each lead.

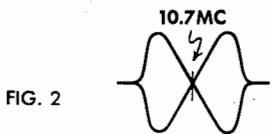
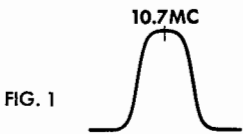
GENERATOR FREQUENCY	DIAL SETTING	INDICATOR	ADJUST	REMARKS
7. 108MC	Set at high end.	DC probe of VTVM to point A; common to ground.	A14, A15	Adjust for maximum.
8. 90MC	Tune to signal.	"	A16	Rock tuning and adjust for maximum. Repeat steps 7 and 8 until no further improvement can be made.

FM STEREO MULTIPLEX ALIGNMENT USING FM STEREO SIGNAL GENERATOR (± .0001% ACCURACY)

Connect high side of generator to B, low side to ground.

GENERATOR FREQUENCY	INDICATOR	ADJUST	REMARKS
9. 67KC	Vert. amp. of Scope thru a 1 meg to point C; low side to ground.	A17, A18	Adjust for MINIMUM.
10. 19KC	Vert. amp. thru 47K to point D; low side to ground.	A19	Adjust for maximum.
11. "	Vert. amp. thru 47K to point E; low side to ground.	A20, A21	Adjust maximum for 38KC response.
12. Modulated Left Channel	Vert. amp. to point F; low side to ground.	A19, A20, A21	Adjust for minimum. Requires only a slight adjustment.
13. Modulated Right Channel	Vert. amp. to point F; low side to ground.		Check for minimum. Make compromise adjustment of A19, A20, A21 if necessary.

To align multiplex section using an air signal, first make sure FM section is properly aligned. Tune in a strong FM stereo signal. Follow steps 9 thru 13 above except in step 9 adjust to eliminate whistle or interference.





## PARTS LIST AND DESCRIPTION

## TUBES

* AMPEREX			* GENERAL ELECTRIC			* RCA			* SYLVANIA		
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE	ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	FM RF Amp-FM Conv.	ECC85	V6	MPX Input Amp-38KC Amp.	12AT7						
V2	AM Conv.	6BE6	V7	AF Amp.-Output	6GW8						
V3	AM IF Amp.-1st FM IF Amp.	6BZ6	V8	AF Amp.-Output	6GW8						
V4	AM Det-AVC-2nd FM IF Amp.	6CB6	V9	Rectifier	6CA4						
V5	Ratio Detector	6AL5									

## ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA							
	CAP.	VOLT.	PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	GENERAL INSTRUMENT PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	50	300	32-25499-4	AFH4-04-50	DDO177	XC4-84	TMQ-4298	WP422	TVL-4635.3	
B	50	300								
C	50	300								
D	50	300								
C2A	50	300	32-254599-11	AFH2-40-50	AAO390	XC1-5	TMS-1630	PPF217.89	TVLS-2631.5*	
B	50	300			BR50-350	QT1-16	TD-50-450			
C	50	300			NLW5-50	MT1-3	MLV5-50	TT50X5	TE-1303	
C3	5	50	32-254587-2	PTT90	NLW100-12	MT1-18	MLV100-6	TT6X100	TL-1102	
C4	100	8		PTT30	NLW100-12	MT1-19	MLV100-10	TT12X100	TL-1135	
C5	100	10	32-254587-12	PTT46	NLW100-12	MT1-19	MLV100-10			

\* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

## FIXED CAPACITORS

ITEM No.	RATING		REMARKS	REPLACEMENT DATA						
				AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCOR PART No.	MALLORY PART No.	SPRAGUE PART No.	
C6	8.2	NPO 10%		NPO-DI-8.2	DD-102	BYA10D1	CCD-102	B210	10TCC-V82	
C7	.001		(.8.2) †	BPD-001	DTZ-6R8	C10V68C	CCD-102	CNO588	5HK-D10	
C8	8.5	NPO 10%		NPO-DI-8.8			CCD-102		10TCC-V88	
C9										
C10	.002			BPD-002	DD-202	BYA10D2	CCD-202	B220	5HK-D20	
C11	10	NPO 10%		NPO-DI-10	DTZ-10	C10Q1C	CCD-202	CNO410	10TCC-Q10	
C12	13.5	NPO 5%								
C13										
C14	18	N220 10%	(20) †	DI-5	DD-050	LA10V5-SL	CCD-050	GP550	10TCR-Q18	
C15	5	10%		BPD-001	DD-102	BYA10D1	CCD-102	B210	10TCC-V50	
C16	.001			DI-100	TCZ-18	LA10T12-S3	CCD-102	CNO418	10TCC-Q18	
C17	18	NPO 5%		BPD-001	DD-102	BYA10D1	CCD-102	B210	5HK-D10	
C18	.001			DI-120	DD-121	LA10T12-S3	CCD-121	GP312	10TCC-Q12	
C19	110	10%	①	DI-100	TCZ-12	LA10T1-S3	CCD-101	GP310	5GA-T10	
C20	12	NPO 5%		BPD-02	DD-203	BYA6S2	CCD-203	B120	5HK-S10	
C21	.02			P288N-33	DD-152	WMF1P33	1DP-4-334	PVC1033	2PS-P33	
C22	.33	20V		BPD-0015	DD-152	LA10D15-C4	CCD-152	B215	10TCC-D15	
C23	.0015									
C24	5.1	N3300 10%		BPD-01	DD-103	BYA10S1	CCD-103	B110	5HK-S10	
C25	.01			BPD-02	DD-203	BYA6S2	CCD-203	B120	5HK-S20	
C26	.02			DI-1000	DD-102	JB6D1	CCD-102	GP410	10TS-D10	
C27	.001	10%		BPD-01	DD-103	BYA10S1	CCD-103	GP322	10TS-T22	
C28	.01			DI-220	DD-221	LA10T12-S3	CCD-221	GP322	10TS-T22	
C29	220	10%		DI-100	DD-101	LA10T1-S3	CCD-101	GP310	5GA-T10	
C30	100			BPD-01	DD-103	BYA10S1	CCD-103	B110	5HK-S10	
C31	.01		(.01) †	DI-1000	DD-102	JB6D1	CCD-102	GP210	10TS-D10	
C32	.001	10%	(.470) †	DI-47	DD-470	LA10Q47-S3	CCD-470	GP447	10TS-Q47	
C33	47	10%	(.470) †	DI-1000	DD-102	JB6D1	CCD-102	GP210	10TS-D10	
C34	.001	10%		BPD-02	DD-203	BYA6S2	CCD-203	B120	5HK-S20	
C35	.02			BPD-0015	DD-152	LA10D15-C4	CCD-152	B215	10TS-D15	
C36	.0015		(.015) †	BPD-0015	DD-152	LA10D15-C4	CCD-152	B215	10TS-D15	
C37	.0015		(.015) †	BPD-0015	DD-203	BYA6S2	CCD-203	B120	5HK-S20	
C38	.02			BPD-02	DD-203	BYA6S2	CCD-203	B120	5HK-S20	
C39	.01			CPR-10000J	DD-203	CD19F103J	DM-30-103J	MS-11	10TS-T22	
C40	.0015			CPR-1500J	DD-221	CD19F152J	DM-19-152J	GP322	10TS-T22	
C41	220	10%		DI-220	DD-221	LA10T12-S3	CCD-221	GP322	10TS-T22	
C42	.0027	10%		ADM-19-272	DD-221	LA10T12-S3	CCD-221	GP322	10TS-T22	
C43	.15	25V		P288N-15	CPR-2700J	CD19F272J	DM-19-272K	PVC1015	2PS-P15	
C44	.0039	10%		ADM-20-392	CPR-3900J	CD19F392J	DM-19-392K	JF239	MS-239	
C45	470			BPD-00047	DD-471	BYA10T47	CCD-471	B347	10TS-T47	
C46	470			BPD-00047	DD-471	BYA10T47	CCD-471	B347	10TS-T47	
C47	220	10%		DI-220	DD-221	LA10T12-S3	CCD-221	GP322	10TS-T22	
C48	220	10%		DI-220	DD-221	LA10T12-S3	CCD-221	GP322	10TS-T22	
C49	.0027		(.001) †	DI-2700	DD-272	LA10D27-C4	CCD-272	GP227	5GA-D27	
C50	.0027		(.001) †	DI-2700	DD-272	LA10D27-C4	CCD-272	GP227	5GA-D27	
C51	.0039	10%		ADM-20-392	CPR-3900J	CD19F392J	DM-19-392K	JF239	MS-239	
C52	.02			BPD-02	DD-203	BYA6S2	CCD-203	CNT488	10TCU-Q68	
C53	88	N750 10%		DTN-68	DD-471	JB6T47	CCD-471	GP347	10TS-T47	
C54	470	10%		DI-470	DD-331	LA10T33-C4	CCD-331	GP333	5GA-T33	
C55	330			BPD-0047	DD-472	BYA10D47	CCD-472	B247	5HK-D47	
C56	.0047			BPD-02	DD-203	BYA6S2	CCD-203	B120	5HK-S20	
C57	.02			BPD-02	DD-203	BYA6S2	CCD-203	B120	5HK-S20	
C58	.02			BPD-02	DD-203	BYA6S2	CCD-203	B120	5HK-S20	
C59	.02			BPD-02	DD-203	BYA6S2	CCD-203	B120	5HK-S20	
C60	.68			DI-68	DD-680	LA10Q68-S3	CCD-680	GP468	5GA-Q68	
C61	470			BPD-00047	DD-471	BYA10T47	CCD-471	B347	10TS-T47	
C62	330			DI-330	DD-331	LA10T33-C4	CCD-331	GP333	5GA-T33	
C63	.0047			BPD-0047	DD-472	BYA10D47	CCD-472	B247	5HK-D47	
C64	.02			BPD-02	DD-203	BYA6S2	CCD-203	B120	5HK-S20	
C65	.02			BPD-02	DD-203	BYA6S2	CCD-203	B120	5HK-S20	
C66	.05	200V		P288N-05	DF-503	PM2S5	4DP-3-503	PVC215	2TM-S50	
C67	.05	200V		P288N-05	DF-503	PM2S5	4DP-3-503	PVC215	2TM-S50	
C68	.01	1.4KV		DAC-27	DD18-103	HVE18S1	16DP-3-103	UAC110	BL-S10	
C69	.01			BPD-01	DD-103	BYA10S1	CCD-103	B110	5HK-S10	
C70	.02			BPD-02	DD-203	BYA6S2	CCD-203	B120	5HK-S20	

† Alternate Value.

① Not used in some versions.  
\* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

## CONTROLS

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

ITEM No.	USE	RESISTANCE	REPLACEMENT DATA				
			Clairtone PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.
R1A	Volume, Right	2meg	33-254595-24	F2-2meg, R2-2meg, SF208, CPL-2 or (B-76, SR-76)	DA-2meg-Z, R-2meg-Z, FS-3	B13-139, B13-139, SK1, QCM or (BU3, CF27, CR22, SS1, SS7A, DC1)*	FA26A, RU28A, CS3500
B	Volume, Left	2meg					
R2	Balance, AFC Switch	2meg	33-270736-2	F1-2meg, SPU304, KR-8	C47S-2meg-S, FS-3	B11-139, SK7 or (BU3, CF19, SS10, K)*	PP26T16① or (RUP26T16①) SL35, SL250
R3A	Bass, Left	5meg	33-254595-22	F3-5meg, R3-5meg, SF208, CPL-2		B17-141, B17-141, SK1, QCM or (BU3, CF56, CR47, SS1, SS7A, DC1)*	FD56R, RU56R, CS3500
B	Bass, Right	5meg					
R4A	Treble, Right	200K	33-254595-23	F2-250K, R2-250K, SF208, CPL-2 or (B-51, SR-51)	DA-250K-Z, R-250K-Z, FS-3	B13-130, B13-130, SK1, QCM or (BU3, CF23, CR18, SS1, SS7A, DC1)*	FA254A, RU254A, CS3500
B	Treble, Left	200K					
R5	Balance Bias-Left	1meg	33-270321-2	TT-69 or (F1-1meg, SN010)	B47-1meg-S	B11-137, TM4 or (BU11, CF17, SS9)	TA18L or (RU18L, SL37, SN1000) or (UA16L, SN1000)
R6	Balance Bias-Right	1meg	33-270321-2	TT-69 or (F1-1meg, SN010)	B47-1meg-S	B11-137, TM4 or (BU11, CF17, SS9)	TA16L or (RU16L, UA16L, SN1000)

\* "SNAPTROL"  
① Do not use Tap.

## RESISTORS (Power and Special)

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN PART No.	REMARKS			IRC PART No.	WORKMAN PART No.	REMARKS
R64	4700Ω 5W	PW5-4500	5W-SQ-4500		R66	100Ω 5W	PW5-100	5W-SQ-100	
R65	470Ω 5W	PW5-500	5W-SQ-470						

## COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		Clairtone PART No.	MERIT PART No.	HILLER PART No.	STANCOR PART No.	WORKMAN PART No.	
L1	FM Ant.						
L2	FM RF						
L3	FM Osc.						
L4	1st FM IF	83A270881-1	BC-419	2007	RTC-8915	TC574	
L5	Loopstick	83A254592-7	BC-393	69-Osc.	RTC-8646	T504	
L6	AM Osc.	1655-6	BC-352	12-C1	RTC-8632	T607	
L7	1st AM IF	K1009	FM-254	1463	RTC-8599	T633	
L8	2nd FM IF	1655-6	BC-353	12-C2	RTC-8633	T608	
L9	2nd AM IF	K1008	FM-255	1465	RTC-8600	T635	
L10	Ratio Detector	83A270536-1					
L11	67KC Trap	83A270537-1					
L12	67KC Trap	83A270484-1					
L13	19KC	83A270494-1					
L14	38KC						
L15	File Choke (23 Turns)						

## TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA					NOTES
	PRI.	SEC. 1	SEC. 2	Clairtone PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
T1	117VAC @ .84A	500VCT @ .125ADC	6.3VAC @ 4.6A	75-254564-9			26R112 ②	R-127A ③	① Drill New Mounting hole(s). ② Cut & Tape 5VAC @ 3.8A & 3VAC @ 3.8A Tap.

## TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	Clairtone PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
T2	8300Ω	8-8Ω	75-254634-7	A-4107	A-3823	24S07	S-53X	
T3	8300Ω	8-8Ω	75-254634-7	A-4107	A-3823	24S07	S-53X	

## FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA						
			Clairtone PART No.		LITTELFUSE PART No.		BUSS PART No.		
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER	
M1	3AG	1½A @ 125V S/B P/T			31501.5 (1½A @ 125V, S/B-Pigtail)			MDV 1½	