

REPLACEMENT DATA			REMARKS
PART No.	OTHER IDENTIFICATION	MILLER PART No.	
B332 M(B)078 M(B)218 (1) M077			(1) Used in some versions.
M077 M427 IN209 I0017 I0015 I0026 I0015 I0015 I0004 I0015 I0004 I0060 I0060 I0004 I0001 I0119 (1) I0001 I0119 (1)			

REPLACEMENT DATA				NOTES
MFGR. PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
118E 118E168NEJ (1)				(1) Number on Unit.

REPLACEMENT DATA		NOTES
MFGR. PART No.	QUAM PART No.	
71-1334 71-1331 71-1334 71-1331	8C5PA 4A05245 8C5PA 4A05245	

NEEDLES				
REPLACEMENT DATA				NOTES
ASTATIC PART No.		ELECTRO-VOICE PART No.		
CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
413d N164sd	N164sd (1)	5573D	2428DS(1) 2420DS	
				(1) For respective replacement cartridge.

PART No.	NOTES
320147 1-3307 1-3059 2-1006	Changer Changer On-Off Power, On-Off AFC Function, AM-FM Stereo, Tape, Phono Matrix-Stereo  E-V/GAME Replacement Number 1499-34 WALSCO Replacement Number 1499-34

PARTS (When ordering specify model, chassis & color)

PART No.	ITEM	PART No.
27-3264 27-3228 27-3263 21P4016 21N4089	Push Button Knob AFC Knob - Tuning Knob - w/Indicator Record Well	21N4090 41-3053 41-3054 51-3073

TAPE PLAYER PARTS LIST AND DESCRIPTION  
(When ordering parts, state Model, Part Number, and Description.)

SEMICONDUCTORS (Select replacement transistor for best results)

ITEM No.	TYPE / MFGR. No. / PART No.	REPLACEMENT DATA						
		GENERAL ELECTRIC PART No.	INTERNATIONAL RECTIFIER PART No.	MALLORY PART No.	MOTOROLA PART No.	RCA PART No.	SPRAGUE PART No.	SYLVANIA PART No.
D1	1N4002	GE-504A	8D4 or 5A4D	PTC201 or PTC202	HEPRO052	SK3030 or SK3031	RT213 or RT214	ECG 116 or ECG 117
D2	1N4002	GE-504A	8D4 or 5A4D	PTC201 or PTC202	HEPRO052	SK3030 or SK3031	RT213 or RT214	ECG 116 or ECG 117
D3	1N4148 413 (1)	GE-300	D200	PTC202 PTC214	HEPRO602	SK3100	RT218	ECG 117
Q1	8C209C	GE-62	TR-21	PTC139	HEP55	SK3122	RT102	ECG 123A
Q2	8C20B	GE-20	TR-51	PTC123	HEP736	SK3122	RT102	ECG 123A
Q3	8C209C	GE-62	TR-21	PTC139	HEP55	SK3122	RT102	ECG 123A
Q4	8C20B	GE-20	TR-51	PTC123	HEP736	SK3122	RT102	ECG 123A

(1) Number on unit.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING	REPLACEMENT DATA					
		MFGR. PART No.	ARCO PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.
C1	4.7 25V		RME-A-G-005	EP30-5	PC5-50	VTT4R7A50	EV-1319
C4	22 6.3V		ME-2-B-020	EP6-25	PC20-50	MTV20CB50	EV-1224
C5	.47 25V				WBR1-500	TDC474M050EL	EV-1610
C6	4.7 25V		RME-A-G-005	EP30-5	PC5-50	VTT4R7A50	EV-1319
C9	22 6.3V		ME-2-B-020	EP6-25	PC20-50	MTV20CB50	EV-1224
C10	.47 25V				WBR1-500	TDC474M050EL	EV-1610
C11	220 25V		ME-G200	EP30-250	PC200-35	MTV200DE25	EV-1340
C12	1000 25V		RME-P-R-1000	FP30-1000	WBR1000-25	MTA1000G25	EV-1360

CAPACITORS

ITEM No.	RATING	MFGR. PART No.	REPLACEMENT DATA			
			ARCO/ELMENC0 PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.
C2	.560		CCD-561	DD-561	GP560	GP356
C3	.01 100V		1DP-1-103	CPR-10000J	DPHS6S1	EMF1A110
C7	.560		CCO-561	DD-561	GP560	GP356
C8	.01 100V		1DP-1-103	CPR-10000J	DPHS6S1	EMF1A110

TAPE HEADS

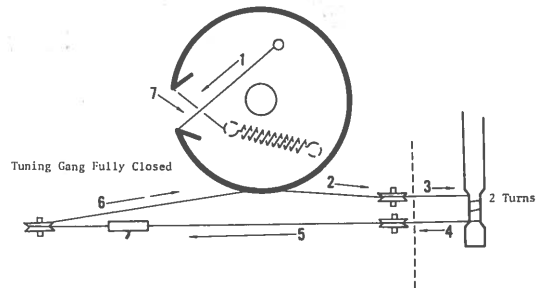
ITEM No.	MEASURED			MFGR. PART No.	NORTRONICS PART No.	DESCRIPTION
	INDUCTANCE	BIAS/ERASE VOLTS (RMS)	BIAS FREQ.			
H1	540mH			B.109708 (1)	5800 (2)	8-Track Stereo Play

(1) BSR Part Number.  
(2) Use original mounting.

MISCELLANEOUS

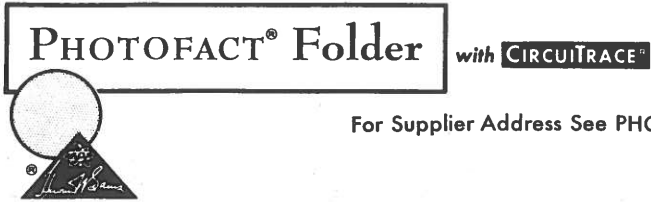
ITEM No.	PART NAME	PART No.	NOTES
L1	Solenoid	A.109813 (1)	Head Shift
M2	Motor	B.109530 (1)	Tape
S1	Switch	A.109939 (1)	Motor Power; Box Assembly (Actuated by insertion of tape)
S2	Switch	A.109939 (1)	Program Indicator; Assembly (Actuated by Head Shift Solenoid)
S3	Switch	A.109938 (1)	Manual Program Change; Assembly
S4	Switch	B.109798 (1)	Auto Program Change; Assembly (Actuated by Foil on tape)

(1) BSR Part Number



DIAL CORD STRINGING

SET 1477 FOLDER 5  
CONCERT HALL MODELS 99-3012LP/22LP/32LP/42LPQ,  
99-3301W/11WQ/41W/51WQ/62LP/71WQ/81WQ



MODEL

99-3012LP (171.3012LP)  
99-3022LP (171.3022LP)  
99-3032LP (171.3032LP)  
99-3042LPQ (171.3042LPQ)  
99-3301W (171.3301W)  
99-3311WQ (171.3311WQ)  
99-3341W (171.3341W)  
99-3351WQ (171.3351WQ)  
99-3362LP (171.3362LP)  
99-3371WQ (171.3371WQ)  
99-3381WQ (171.3381WQ)



MODEL 99-3012LP

RECORD CHANGER SERVICING

RECORD CHANGER BSR MODEL C129R-B-1

ADJUSTMENTS

TONE ARM SETDOWN

Adjust screw B1 so the needle sets down in the center of the lead-in groove on a 12-inch record. Turning the screw clockwise moves the set-down point outward.

TONE ARM HEIGHT

Adjust B2 so the top of the tone arm clears a 12-inch record on the center spindle shelf during the change cycle. Turning B2 clockwise decreases the lift-up height.

CLEANING

Use a cloth dampened with isopropyl alcohol to clean the driving surfaces of the idler wheel, motor shaft and inside rim of the turntable.

LUBRICATION

Apply light nonhardening grease to sliding cam surfaces and pivot points, light machine oil on the tone arm lift rod, idler wheel bearings, and motor bearings.

DO NOT lubricate turntable driving surface, the teeth on cycling gear or turntable hub.



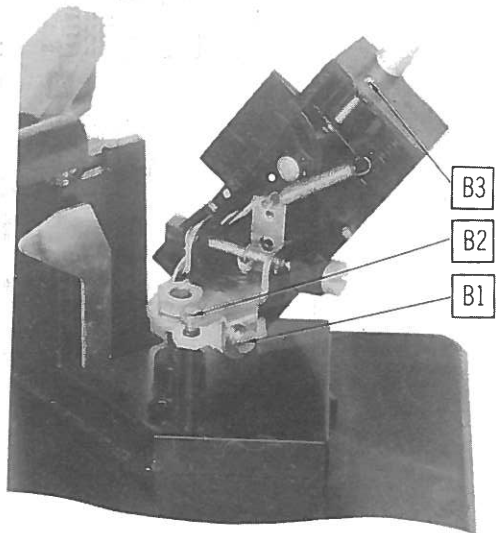
The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. 5PL1255

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DATE 4-75

SET 1477 FOLDER 5

CONCERT HALL MODELS 99-3012LP/22LP/32LP/42LPQ,  
99-3301W/11WQ/41W/51WQ/62LP/71WQ/81WQ



RADIO PARTS LIST AND DESCRIPTION  
(When ordering parts, state Model, Part Number, and Description.)

WIRING DATA

General-use Unshielded Hook-up Wire .....	Use BELDEN No. 8528 (Solid) Available in 12 Colors 8522 (Stranded) Available in 12 Colors
Power Cord .....	Use BELDEN No. 17106 (Plastic) or 17126 (Rubber) - 6 Ft. 17109 (Plastic) or 17129 (Rubber) - 9 Ft.
Low-loss Shielded Lead (Interconnecting) .	Use BELDEN No. 8401 or 8421
Phono Pick-up Arm Cable .....	Use BELDEN No. 8430 (Two-Conductor-Unshielded) 8429 (Two-Conductor-Shielded) 8419 (Three-Conductor-Shielded)

SEMICONDUCTORS (Select replacement transistor for best results)

ITEM No.	TYPE / MFR. No. / PART No.	REPLACEMENT DATA						
		GENERAL ELECTRIC PART No.	INTERNATIONAL RECTIFIER PART No.	MALLORY PART No.	MOTOROLA PART No.	RCA PART No.	SPRAGUE PART No.	SYLVANIA PART No.
0101	1N60	1N60	1N60	PTC206	HEP135	SK3088		ECG 109
0102	152139 (8)	GE-90 (8)	0201 (8)	PTC206	HEP135(8)	SK3126 (8)		ECG 109
0103	1N60	1N60	1N60	PTC206	HEP135	SK3088		ECG 110 (6)
0104	1N60	1N60 (7)	1N60 (7)	PTC206 (7)	HEP135 (7)	SK3088 (7)		
0105	1N60							
0106	1N60	1N60	1N60	PTC206	HEP135	SK3088		ECG 109
0107	1N60	1N60	1N60	PTC206	HEP135	SK3088		ECG 109
0108	1N60	1N60	1N60	PTC206	HEP135	SK3088		ECG 109
0301	1N60	1N60 (7)	1N60 (7)	PTC206 (7)	HEP135 (7)	SK3088 (7)		ECG 110 (6)
0302	1N60							
0303	1N60	1N60	1N60	PTC206	HEP135	SK3088		ECG 109
0304	1N60	1N60 (7)	1N60 (7)	PTC206 (7)	HEP135 (7)	SK3088 (7)		ECG 110 (6)
0306	1N60							
0305	1N60	1N60 (7)	1N60 (7)	PTC206 (7)	HEP135 (7)	SK3088 (7)		ECG 110 (6)
0307	1N60							
0501	KB162	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	ECG 177
0502	KB162	GE-300	O200	PTC214	HEPR0602	SK3100	RT218	ECG 177
0503	15334	GEZD-9.1	Z-1210	PTC505	HEP20412	SK3060	RT240	ECG 139
0504	9 v. Zener							
0505	SR1K-2	GE-504A	804 or 5A40	PTC201 or PTC202	HEPR0052	SK3030 or SK3031	RT213 or RT214	ECG 116 or ECG 117
0505	SR1K-2	GE-504A	804 or 5A40	PTC201 or PTC202	HEPR0052	SK3030 or SK3031	RT213 or RT214	ECG 116 or ECG 117
0101	25C784(R)	GE-20	TR-21	PTC132	HEP56	SK3018	RT108	ECG 107
0102	25C784(R)	GE-20	TR-21	PTC132	HEP56	SK3018	RT108	ECG 107
0103	25C380(Y)	GE-20	TR-24	PTC121	HEP56	SK3018	RT108	ECG 107
0104	25C380(Y)	GE-20	TR-24	PTC121	HEP56	SK3018	RT108	ECG 107
0105	25C380(Y)	GE-20	TR-24	PTC121	HEP56	SK3018	RT108	ECG 107
0106	25C371(O)	GE-20	TR-33	PTC121	HEP50	SK3080	RT102	ECG 107
0301	25C373	GE-62	(1R)25C373	PTC139	HEP55	SK3122	RT102	ECG 199
0302	25C373	GE-62	(1R)25C373	PTC139	HEP55	SK3122	RT102	ECG 199
0303	25C373	GE-62	(1R)25C373	PTC139	HEP55	SK3122	RT102	ECG 199
0304	25C373	GE-62	(1R)25C373	PTC139	HEP55	SK3122	RT102	ECG 199
0501	25C732(GR)	GE-20	TR-21	PTC139	HEP737	SK3122	RT100	ECG 199
0502	25C732(GR)	GE-20	TR-21	PTC139	HEP737	SK3122	RT100	ECG 199
0503	25A495(O)	GE-21	TR-30	PTC103	HEP52	SK3114	RT115	ECG 159
0504	25A495(O)	GE-21	TR-30	PTC103	HEP52	SK3114	RT115	ECG 159
0505	25A495(O)	GE-21	TR-30	PTC103	HEP52	SK3114	RT115	ECG 159
0505	25A495(O)	GE-21	TR-30	PTC103	HEP52	SK3114	RT115	ECG 159
0505	25C735(Y)	GE-10	TR-21	PTC136	HEP50003	SK3124	RT102	ECG 123A
0506	25C735(Y)	GE-10	TR-21	PTC136	HEP50003	SK3124	RT102	ECG 123A
0507	25A496(Y) (9)	GE-58	TR-56	PTC111	HEP5006	SK3083		ECG 185
0508	25A496(Y) (9)	GE-58	TR-56	PTC111	HEP5006	SK3083		ECG 185
0509	25C496(Y) (9)	GE-57	TR-55	PTC110	HEP5000	SK3054		ECG 184
0510	25C496(Y) (9)	GE-57	TR-55	PTC110	HEP5000	SK3054		ECG 184

- (1) Used in some versions.  
(6) Matched Pair  
(7) Two required - select matched pair.  
(8) Varactor  
(9) Half of complementary pair (Q507 and Q509, Q508 and Q510).

ELECTROLYTIC CAPACITORS

ITEM No.	RATING	REPLACEMENT DATA					
		MFR. PART No.	ARCO PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.
C125	10 16V	1203106	RME-B-E-010	EP15-10	PC10-25	VTT10A25	EV-1222
C127	220 16V	1203227	ME-6-E-200	EP15-250	PC200-16	MTV2000E15	EV-1240
C139	.47 16V NP	1203106					
C142	10 16V	1221474	RME-B-E-010	EP15-10	PC10-25	VTT10A25	EV-1222
C301	47 50V	1204475					
C309	4.7 25V	1204475	RME-A-G-005	EP30-5	WBR1-500	VT14R7A50	EV-1610
C319	10 50V	1221106	RME-O-J-010	EP50-10	PC5-50	MTV10C850	EV-1622
C501	.47 16V NP	1220009					
C502	.47 16V NP	1220009					
C505	10 16V	1203106	RME-B-E-010	EP15-10	PC10-25	VTT10A25	EV-1222
C506	10 16V	1203106	RME-E-E-100	EP15-100	PC100-16	MTV100C015	EV-1230
C507	10 16V	1203106	RME-B-E-010	EP15-10	PC10-25	VTT10A25	EV-1222
C508	220 16V	1203227	RME-E-E-100	EP15-100	PC100-16	MTV100C015	EV-1230
C509	10 16V	1203106	ME-6-E-200	EP15-250	PC200-16	MTV2000E15	EV-1240
C510	220 16V	1203227	RME-B-E-010	EP15-10	PC10-25	VTT10A25	EV-1222
C513	10 16V	1203106	ME-6-E-200	EP15-250	PC200-16	MTV2000E15	EV-1240
C514	100 16V	1203107	RME-B-E-010	EP15-10	PC10-25	VTT10A25	EV-1222
C517	470 16V	1203477	RME-E-E-100	EP15-100	PC100-16	MTV100C015	EV-1230
C518	470 16V	1203477	RME-L-E-500	EP15-500	PC500-16	MTV5000D15	EV-1250
C519	470 16V	1203477	RME-L-E-500	EP15-500	PC500-16	MTV5000D15	EV-1250
C520	1500 25V	1204158					
C521	220 16V	1203227	ME-6-E-200	EP15-250	PC200-16	MTV2000E15	EV-1240
C522	220 16V	1203227	ME-6-E-200	EP15-250	PC200-16	MTV2000E15	EV-1240
C540	8 25VNP						
C541	8 25VNP						

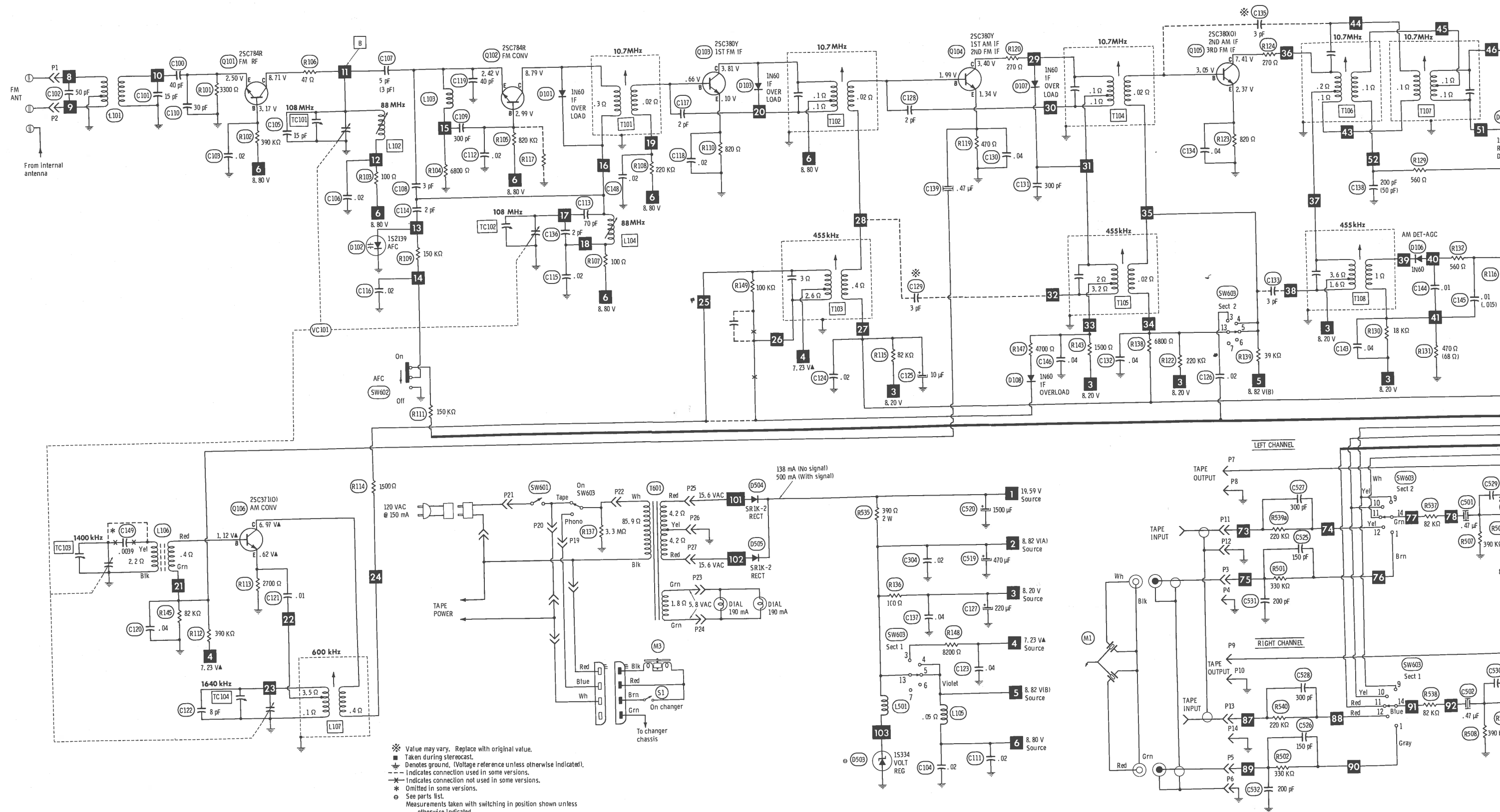
CAPACITORS

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA				
			ARCO/ELMENCO PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.
C100	40						
C101	15						
C102	50						
C103	.02						
C104	.02						
C105	15						
C106	.02						
C107	5						
C108	3						
C109	300						
C110	30						
C111	.02						
C112	.02						
C113	.02						
C114	2						
C115	.02						
C116	.02						
C117	2						
C118	.02						
C119	40						
C120	.04						
C121	.01 50V						
C122	8						
C123	.04						
C124	.02						
C126	.02						
C128	2						
C129	3						
C130	.04						
C131	300						
C132	.04						
C133	.04						
C134	.04						
C135	2						
C136	2						
C137	.04						
C138	200						
C140	200						
C141	200						
C143	.04						
C144	.01 50V						
C145	.01 50V						
C146	.04						
C147	.02						
C148	.02						
C149	.0039						
C302	470 50V 5%						
C303	100 50V 5%						
C304	.02						
C305	.0047 50V 10%						
C306	.022 50V						
C307	.1 50V						
C308	.0022 50V 10%						
C310	500						
C311	500						
C312	500						
C313	500						
C314	.0018						
C316	.01 50V						
C317	.01 50V						
C318	.01 50V						
C319	.001						
C504	.001						
C511	.001						
C512	.001						
C525	150						
C526	150						
C528	300						
C529	40						
C530	40						
C531	200						
C532	200						
C601	.047 50V						
C602	.047 50V						
C603	.056 50V						
C604	.056 50V						
C607	.068 50V						
C608	.068 50V						
C609	.0033						
C610	.0033						
TC101	Trimmer	(1)					
TC102	Trimmer	(1)					
TC103	Trimmer	(1)					
TC104	Trimmer	(1)					
VC101	Tuning Gang	1290112					

(1) Part of Tuning Gang VC101.

CONTROLS (All wattages 1/2 watt, or less, unless listed)

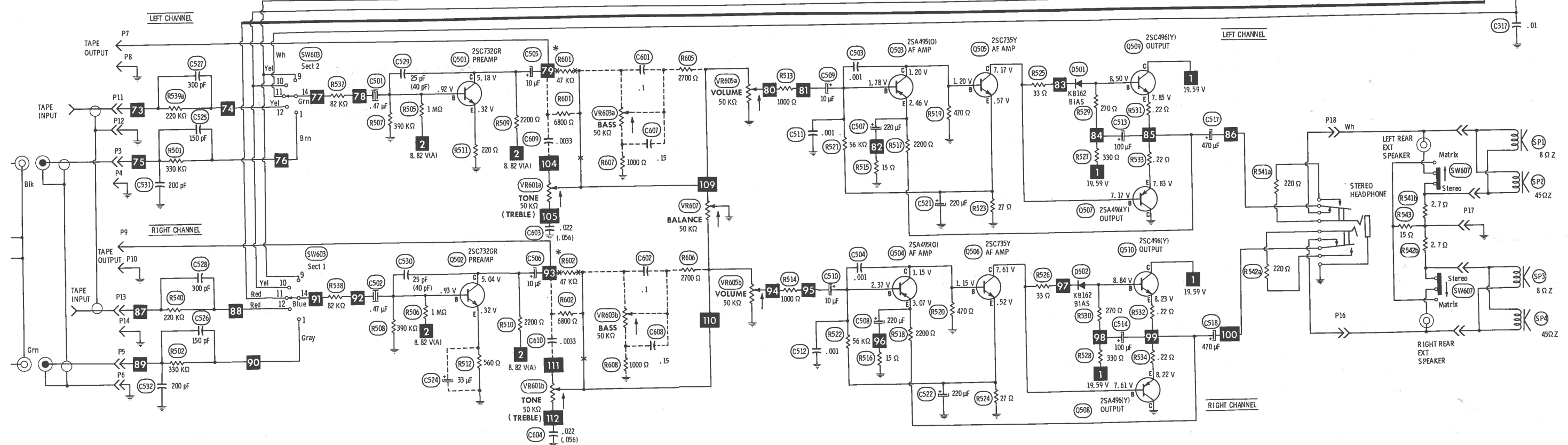
ITEM No.	FUNCTION	RESIST-ANCE	REPLACEMENT DATA				
			MFRG. PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS—IRC PART No.	MALLORY PART No.
R126	Detector Balance	3000	1390175	TSV-5K(2) or T-5000 (2)	C-502 (2)	X201R302B (2)	HTC33L1 (2)
VR301	Separation	3000	1390175	TSV-5K (2) or T-5000 (2)	C-502 (2)	X201R302B (2)	HTC33L1 (2)
VR601a b	Tone, Left Tone, Right	50K 50K	139N163	F2-50K (1), R2-50K, SSK100, CPL-2		BUI(1), CF63, CR62, SS1, SS7A, DC1	P54A, 3014 (1), RU54A, CS3500
VR601a b	Treble, Left Treble, Right	50K 50K	139N163 (6)	F2-50K (1), R2-50K, SSK100, CPL-2		BUI(1), CF63, CR62, SS1, SS7A, OC1	P54A, 3014 (1), RU54A, CS3500
VR603a b	Bass, Left Bass, Right	50K 50K	139N163 (6)	F2-50K (1), R2-50K, SSK100, CPL-2		BUI(1), CF63, CR62, SS1, SS7A, OC1	P54A, 3014 (1), RU54A,CS3500
VR605a b	Volume, Left Volume, Right	50K 50K	139N269	F2-50K (1), R2-50K, SSK100, CPL-2		BUI(1), CF63, CR62, SS1, SS7A, OC1	P54A, 3014(1), RU54A, CS3500
VR607	Balance	50K	139N130	F1-50K(1), SSK100	A47-50K-S(1), K55-3 or [NP-50K-S(1), UP-C-400]	BUI(1), CF12, SS1, DC1	RU54L, SL3G, SL1500 or [U454L(1),SK1000] or U35 (1)



A PHOTOFAC STANDARD NOTATION SCHEMATIC

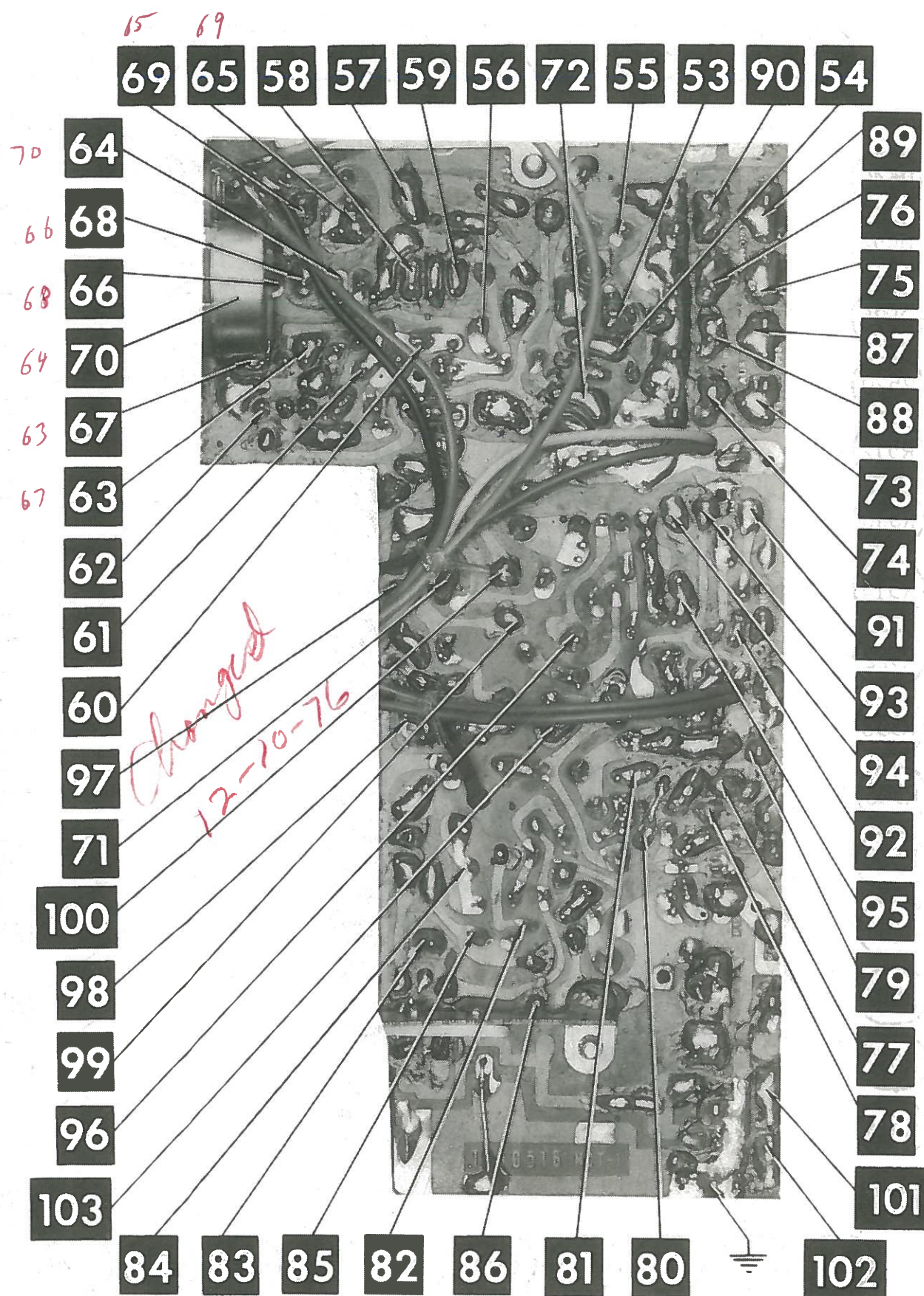
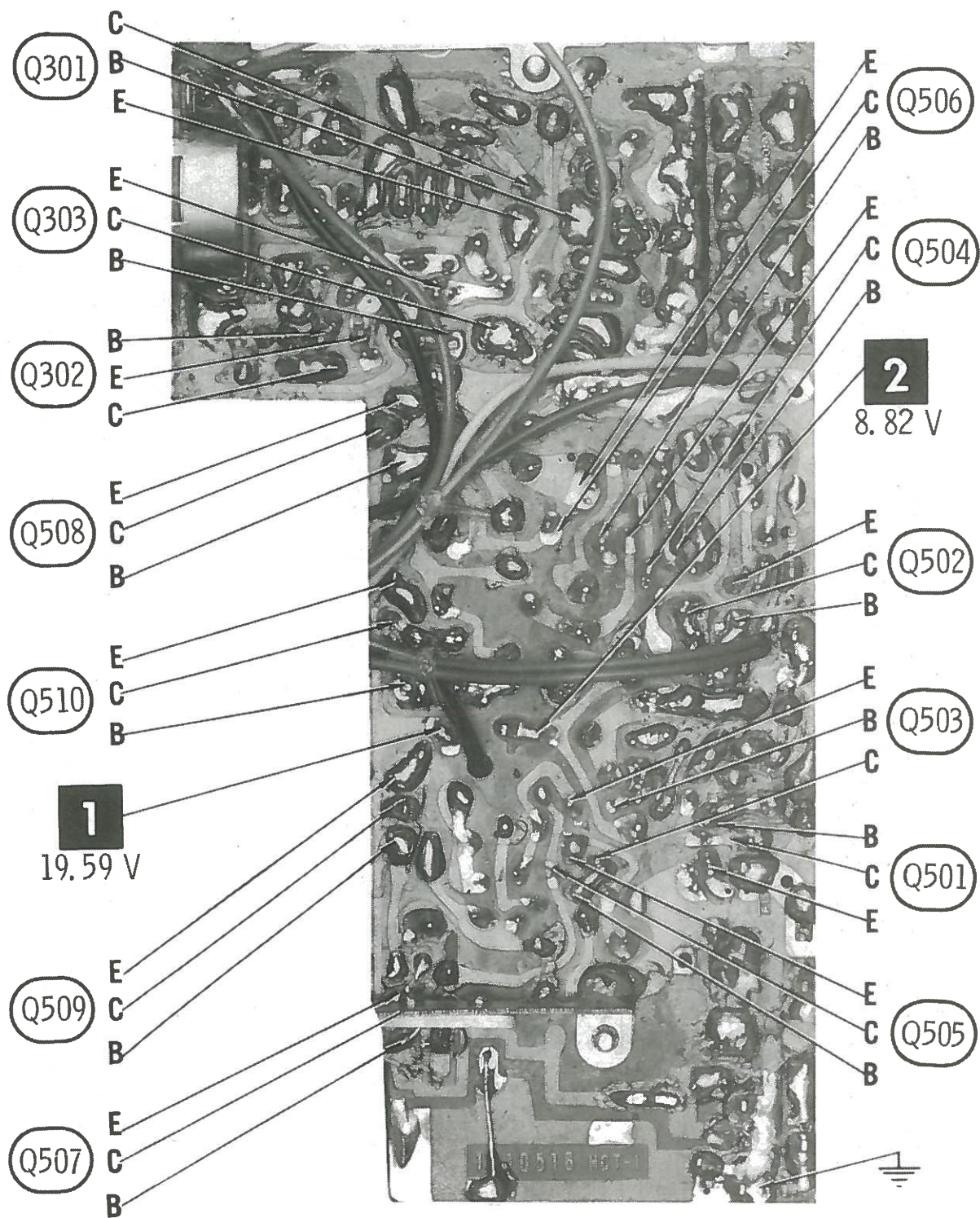
WITH CIRCUITRACE

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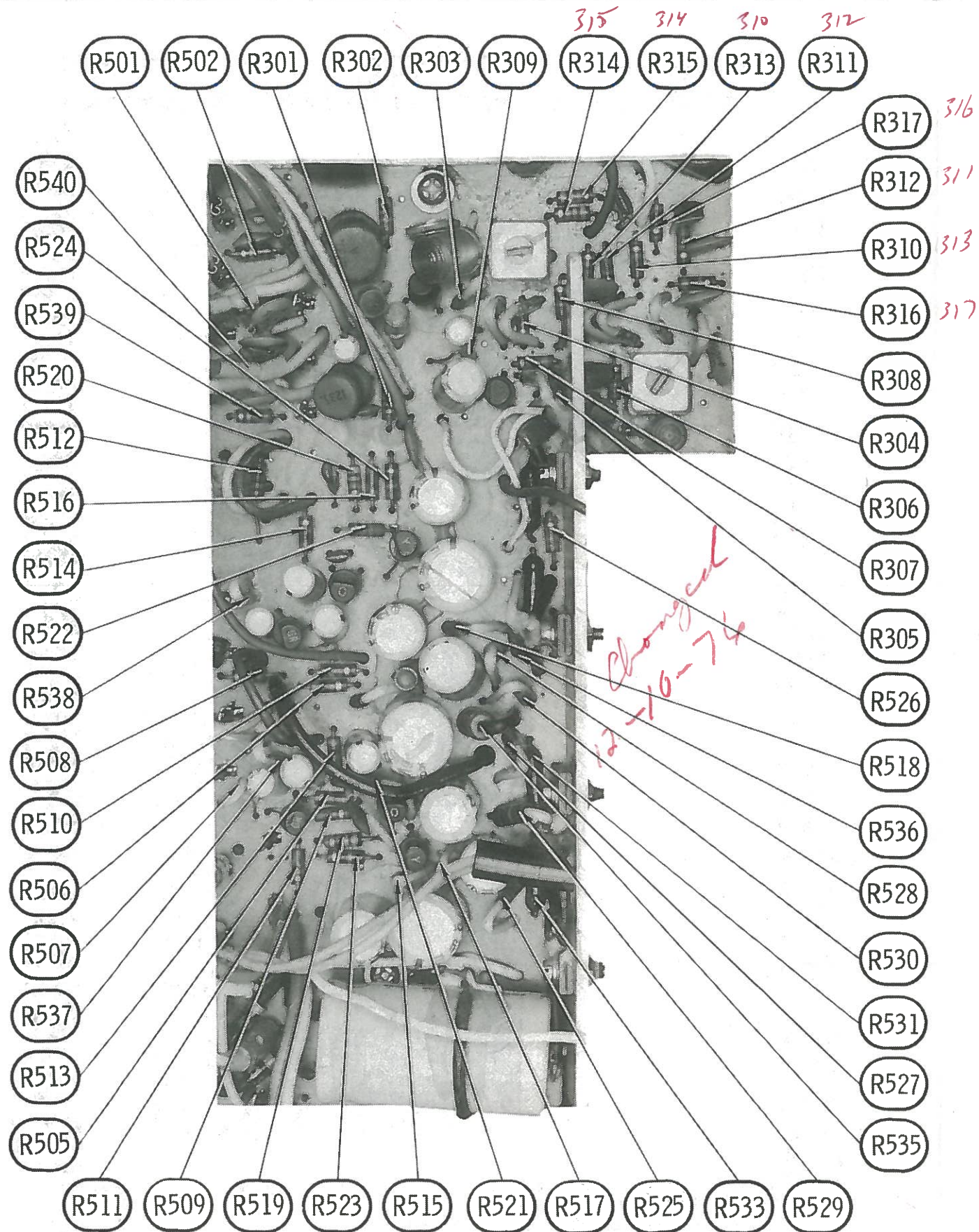
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99-3301W/11WQ/41W/51WQ/62LP/71WQ/81WQ**



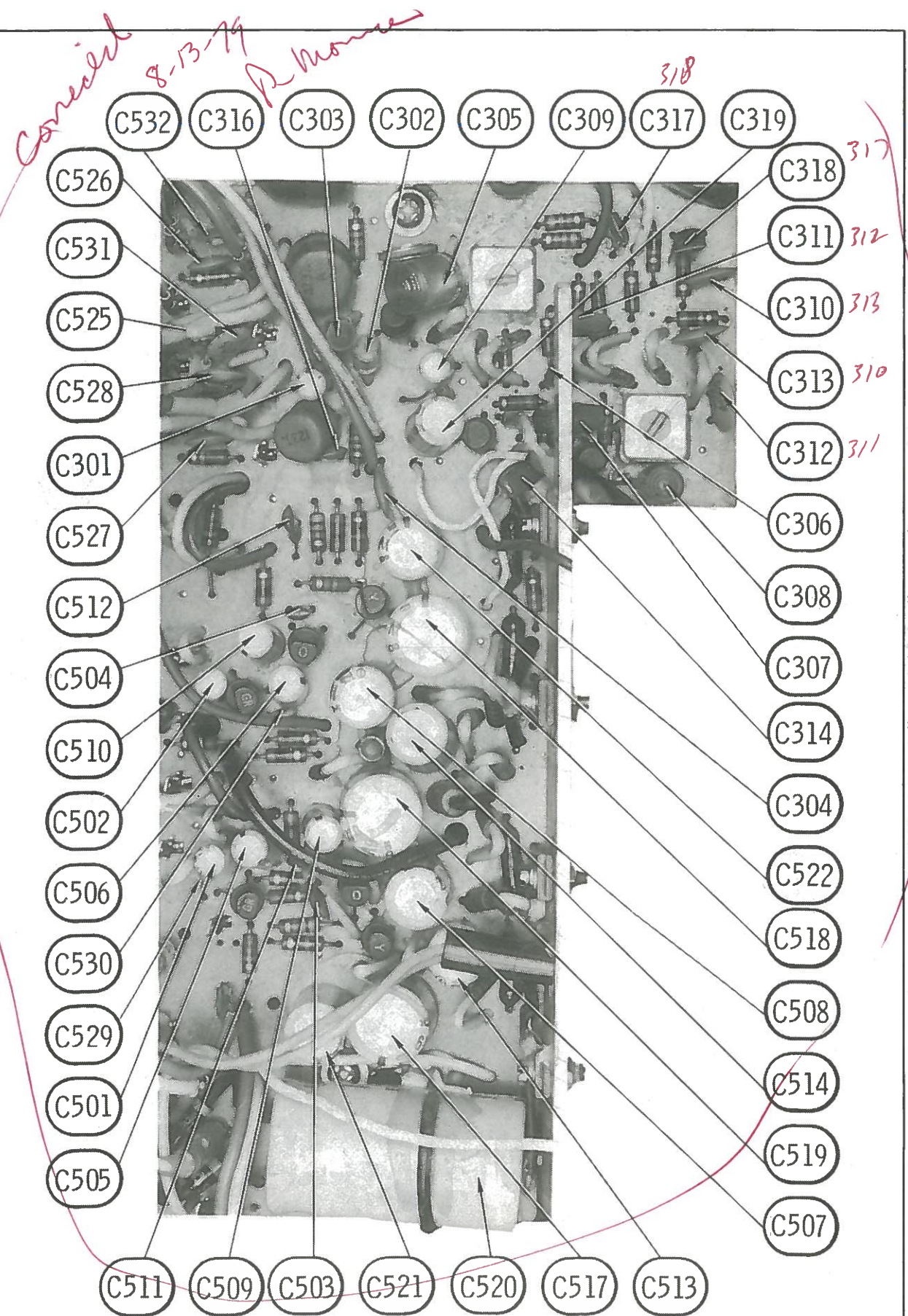


MULTIPLEX-AUDIO BOARD A Howard W. Sams CIRCUITRACE Photo

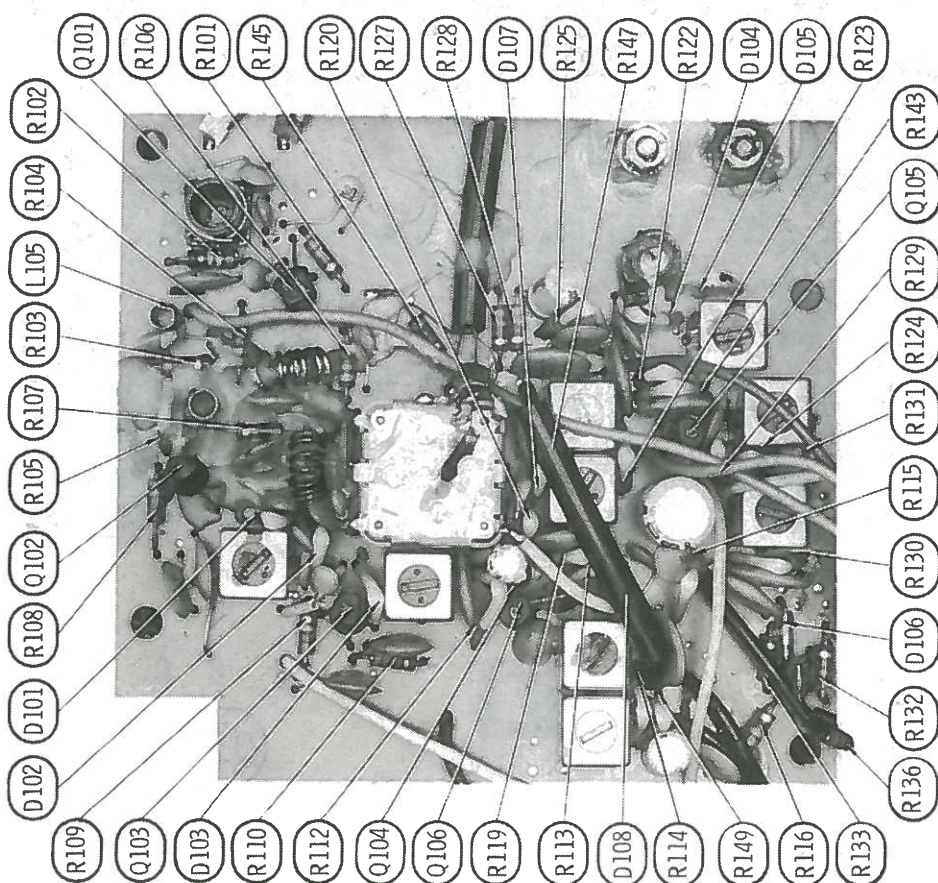
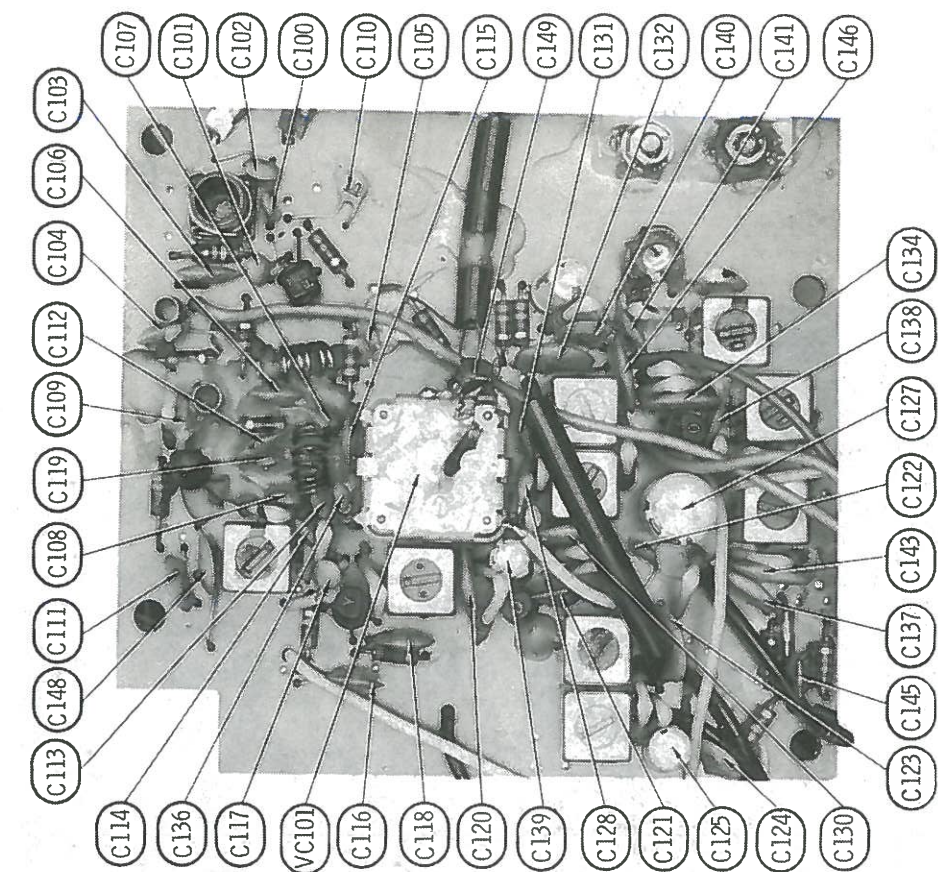




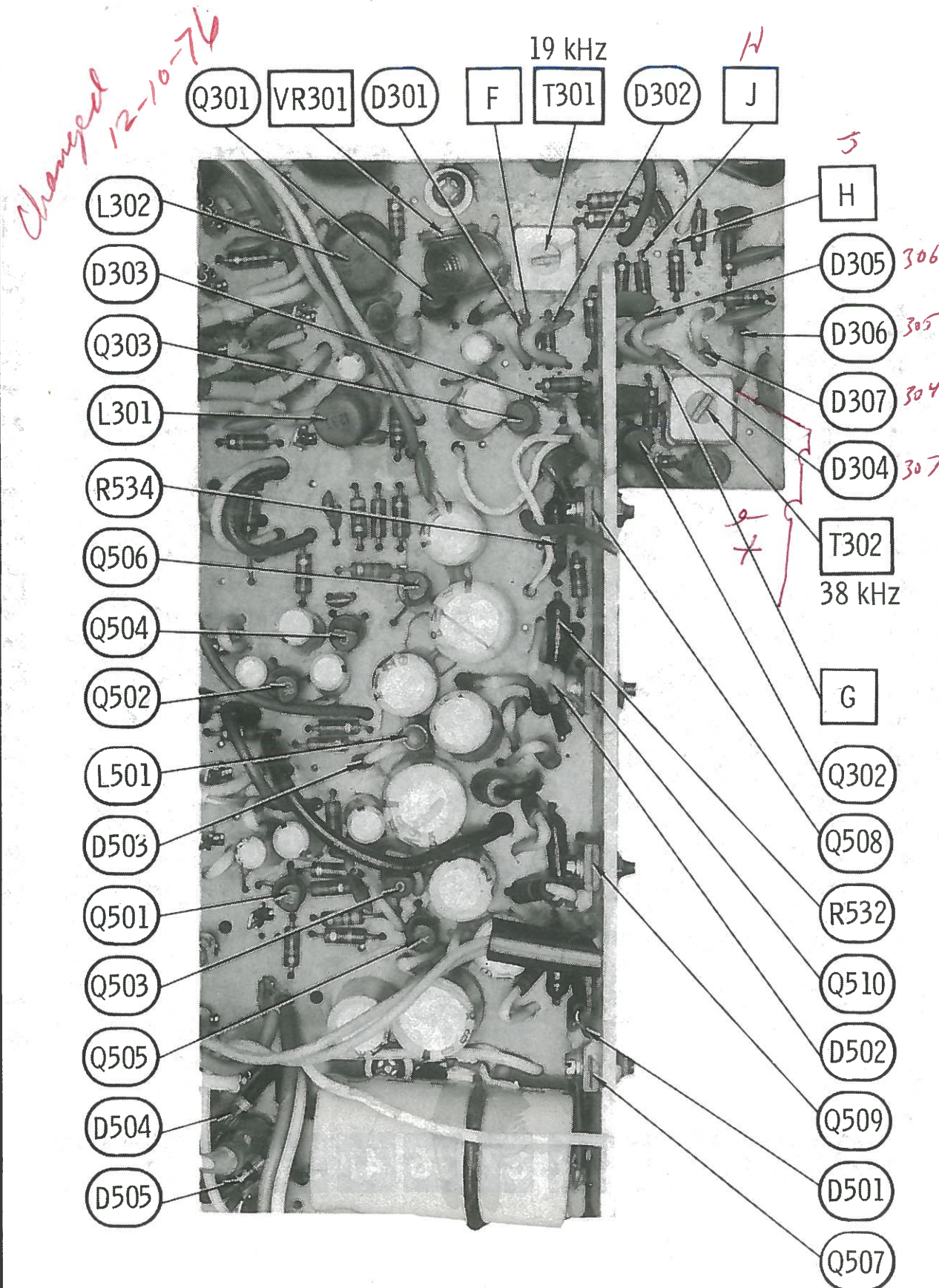
MULTIPLEX-AUDIO BOARD





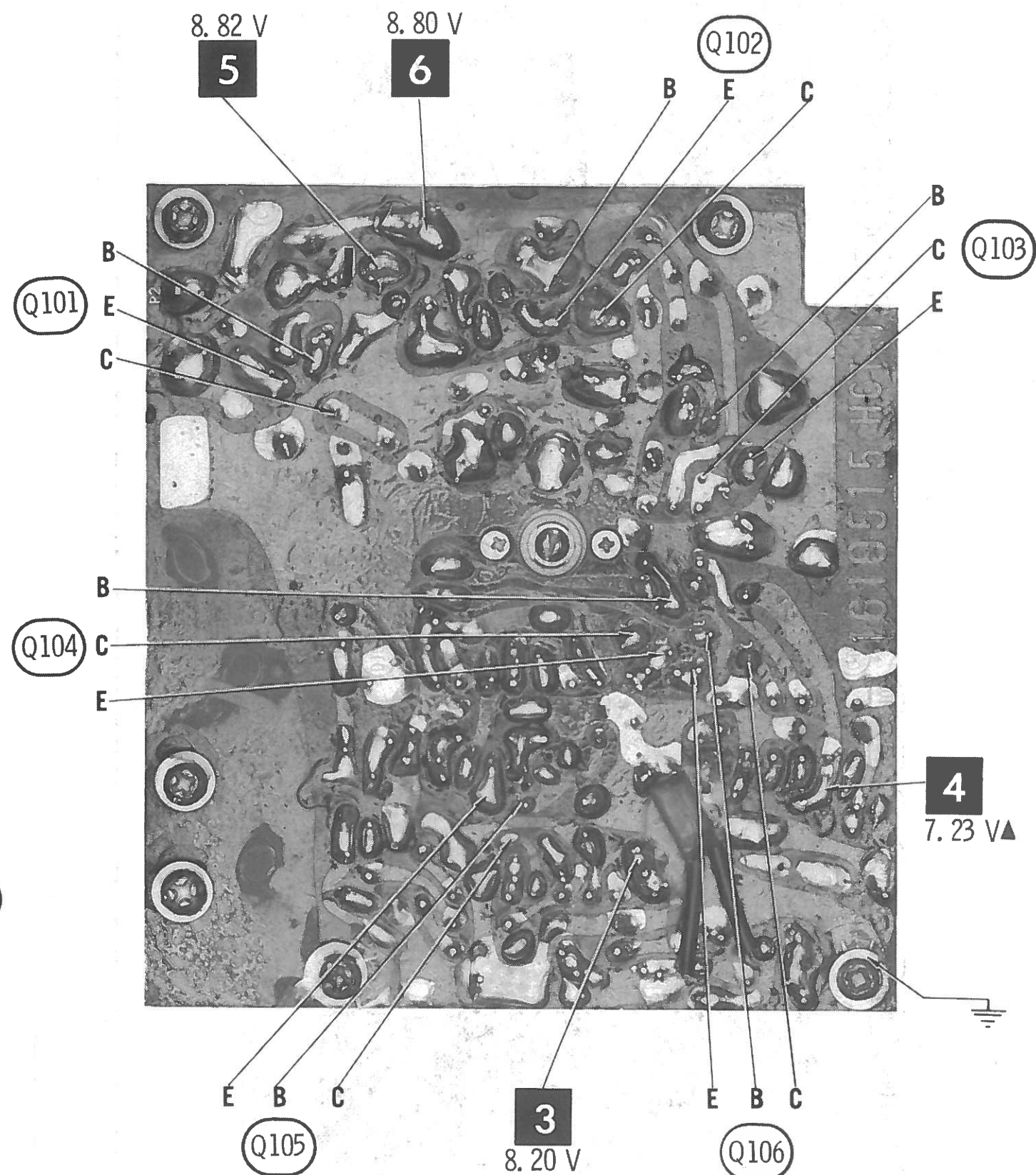
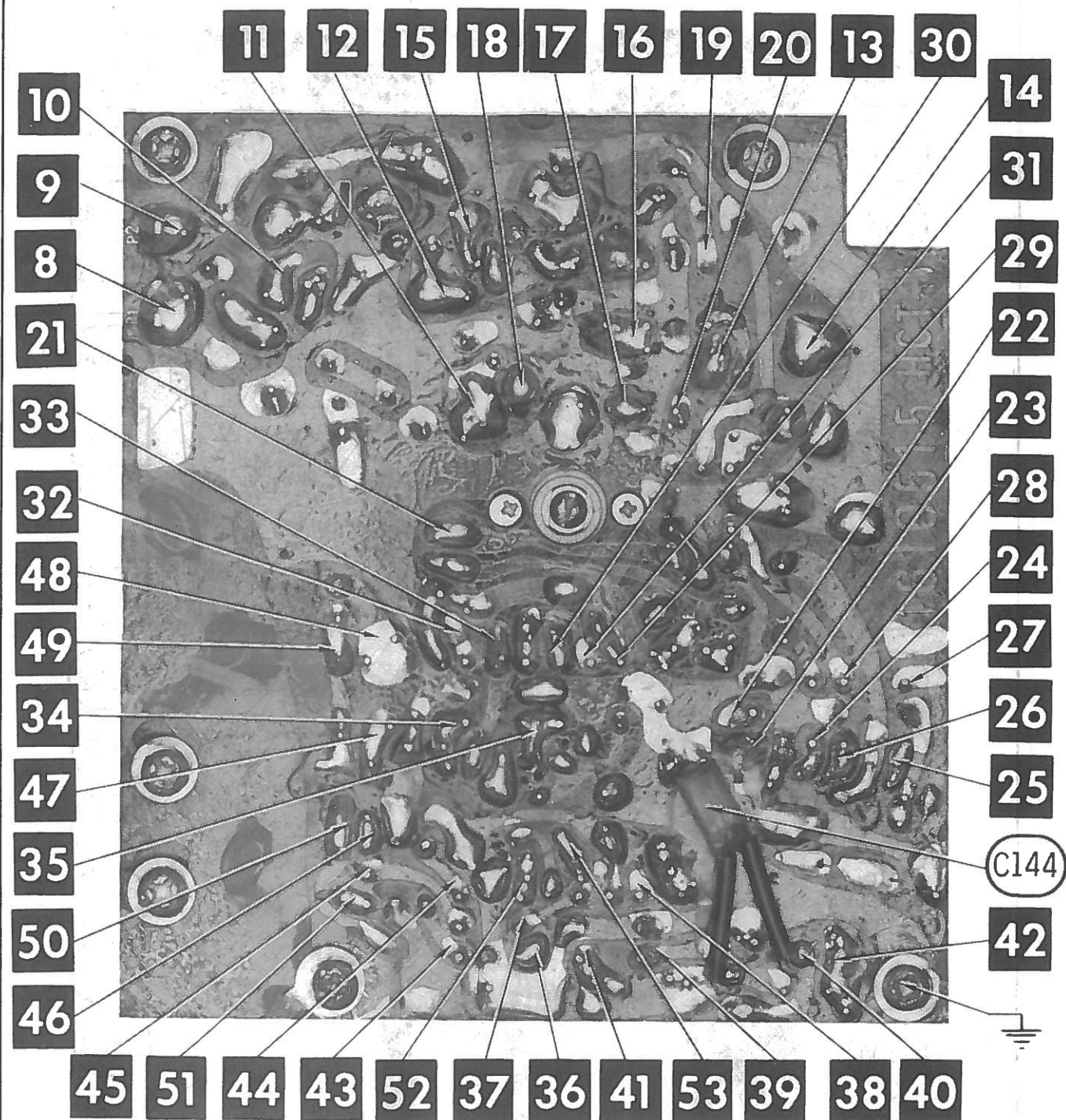


RF-IF BOARD



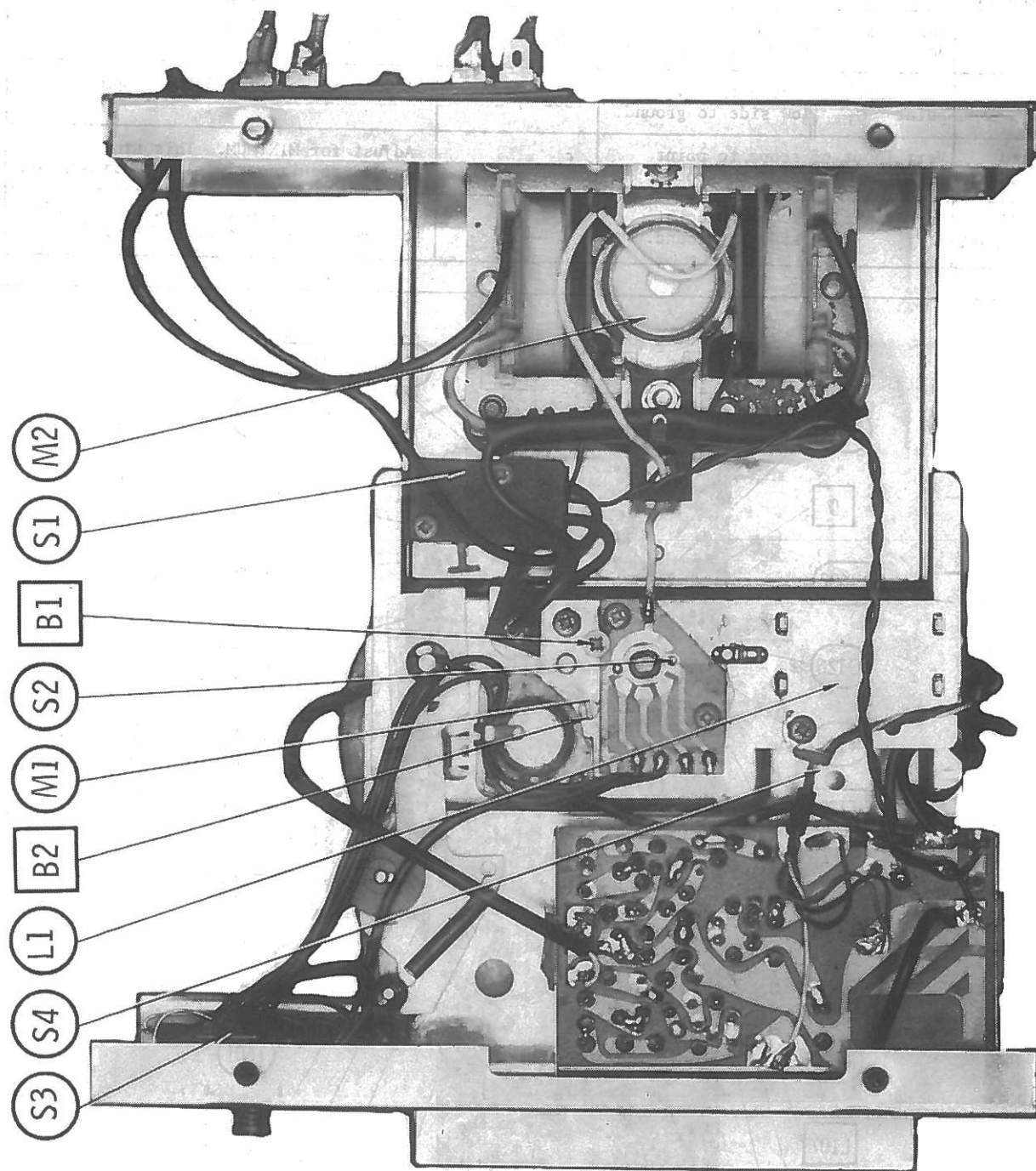
MULTIPLEX-AUDIO BOARD



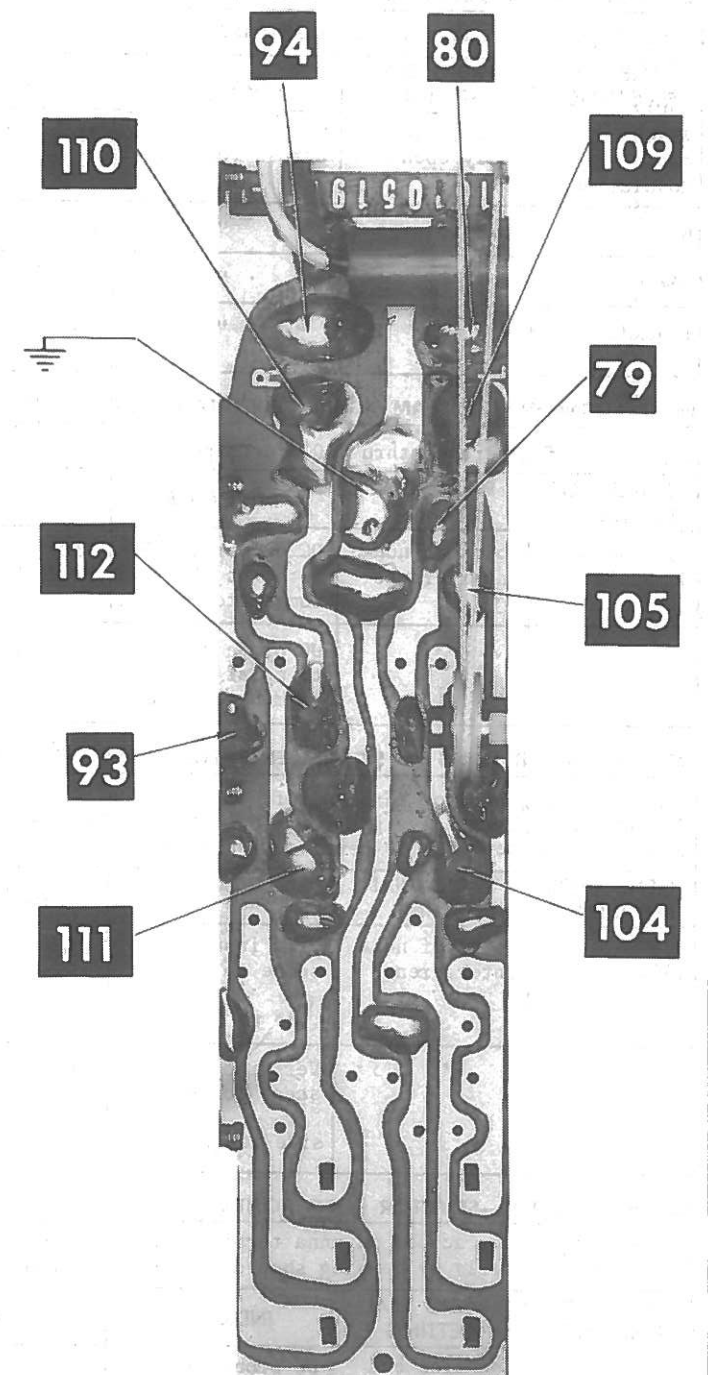
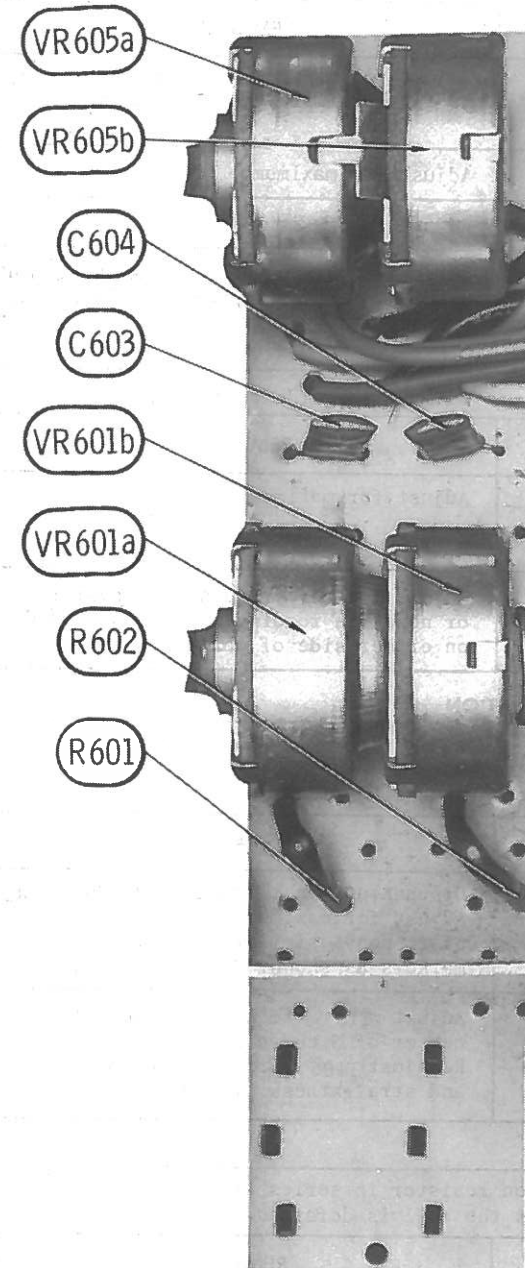


▲ Measured in AM position.





TAPE MECHANICAL



TONE BOARD

A Howard W. Sams CIRCUITRACE<sup>®</sup> Photo

CONCERT HALL MODELS 99-3012LP/22LP/32LP/42LPQ,  
99-3301W/11WQ/41W/51WQ/62LP/71WQ/81WQ

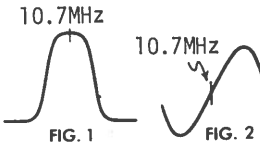
FOLDER 5



ALIGNMENT INSTRUCTIONS

CAUTION: Use isolation transformer or observe polarity when connecting test equipment. Maintain line voltage at 120VAC. Allow a 15-minute warm-up period. Use only enough generator output to obtain a suitable indication. Suggested Alignment Tools:

L107, T101 thru T108 .....GC ELECTRONICS 8728



AM ALIGNMENT—SELECTOR IN AM POSITION

Connect generator across loop fashioned of several turns of wire. Set volume at maximum.

GENERATOR FREQUENCY	RADIO DIAL SETTING	INDICATOR	ADJUST	REMARKS
455kHz 400-hertz Modulation	Tuning gang fully open	Output meter across voice coil	T108, T105, T103	Adjust for maximum. Repeat until no further improvement is noted.
600kHz	Tune to signal	"	L107	Adjust for maximum.
1640kHz	"	"	TC104	Adjust for maximum.
1400kHz	"	"	TC103	Adjust for maximum. Repeat AM alignment until no further improvement is noted.

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

High side of generator thru .001mfd to point B, low side to ground.

GENERATOR FREQUENCY	RADIO DIAL SETTING	INDICATOR	ADJUST	REMARKS
10.7MHz Unmodulated	Point of non- interference	DC probe of VTVM to point C, common to ground.	T106, T104, T102, T101	Adjust for maximum.
"	"	DC probe of VTVM to point D, common to ground.	T107, R126	Adjust for zero reading. A positive or negative reading will be obtained on either side of correct setting.

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

High side of generator thru .001mfd to point B, low side to ground. Use only enough marker signal for indication. Use 60-hertz frequency modulated signal with 450kHz sweep. Use 60-hertz sawtooth voltage in scope for horizontal deflection.

GENERATOR FREQUENCY	RADIO DIAL SETTING	INDICATOR	ADJUST	REMARKS
10.7MHz 450kHz Sweep	Point of non- interference	Vert input of scope to point C, low side to ground.	T106, T104, T102, T101	Disconnect stabilizing capacitor C 142. Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. Reconnect C 142.
"	"	Vert input of scope to point D, low side to ground.	T107, R126	Adjust T107 to place marker at center of S curve similar to Fig. 2. Readjust T106 for maximum amplitude and straightness of line.

FM RF ALIGNMENT—SELECTOR IN FM POSITION

Connect generator across antenna terminals with 120-ohm carbon resistor in series with each lead. Adjustment of coils by bending should not be attempted unless the coil is deformed or replaced.

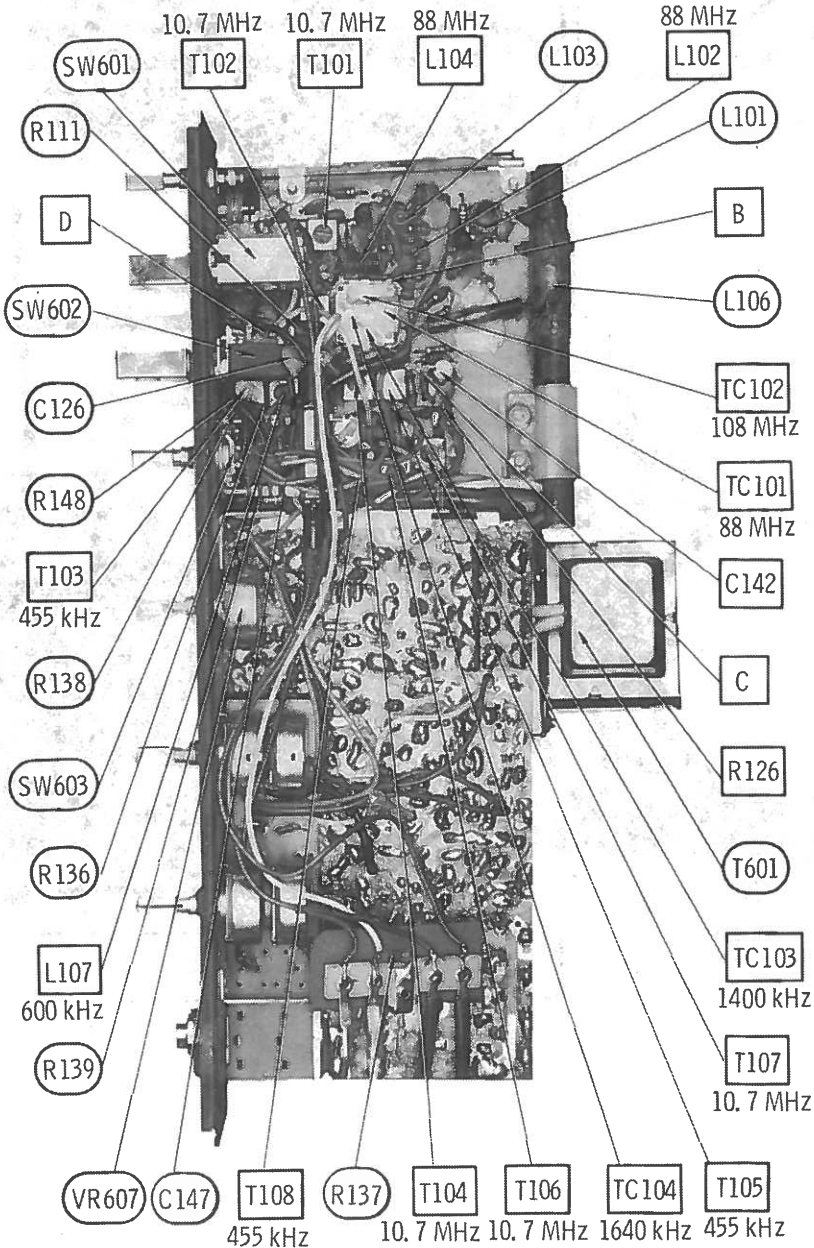
GENERATOR FREQUENCY	RADIO DIAL SETTING	INDICATOR	ADJUST	REMARKS
88MHz Unmodulated	Low freq end	DC probe of VTVM to point C, common to ground.	L104, L102	Adjust for maximum.
108MHz Unmodulated	Tune to signal	"	TC102, TC101	Adjust for maximum. Repeat FM RF steps until no further improvement is noted.

ALIGNMENT INSTRUCTIONS (Continued)

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

High side of generator thru 47K to point D, low side to ground.

GENERATOR FREQUENCY	INDICATOR	ADJUST	REMARKS
19kHz	Vert input of scope thru 47K to point F, low side to ground.	T301	Adjust for maximum.
19kHz	Vert input of scope thru 47K to point G, low side to ground.	T302	Adjust for maximum 38kHz response.
Modulated Left Channel	Vert input of scope to point H, low side to ground.	VR301	Adjust for MINIMUM. This step should require only slight adjustment.
Modulated Right Channel	Vert input of scope to point J, low side to ground.		Check for MINIMUM. If necessary, make compromise adjustment of VR301.

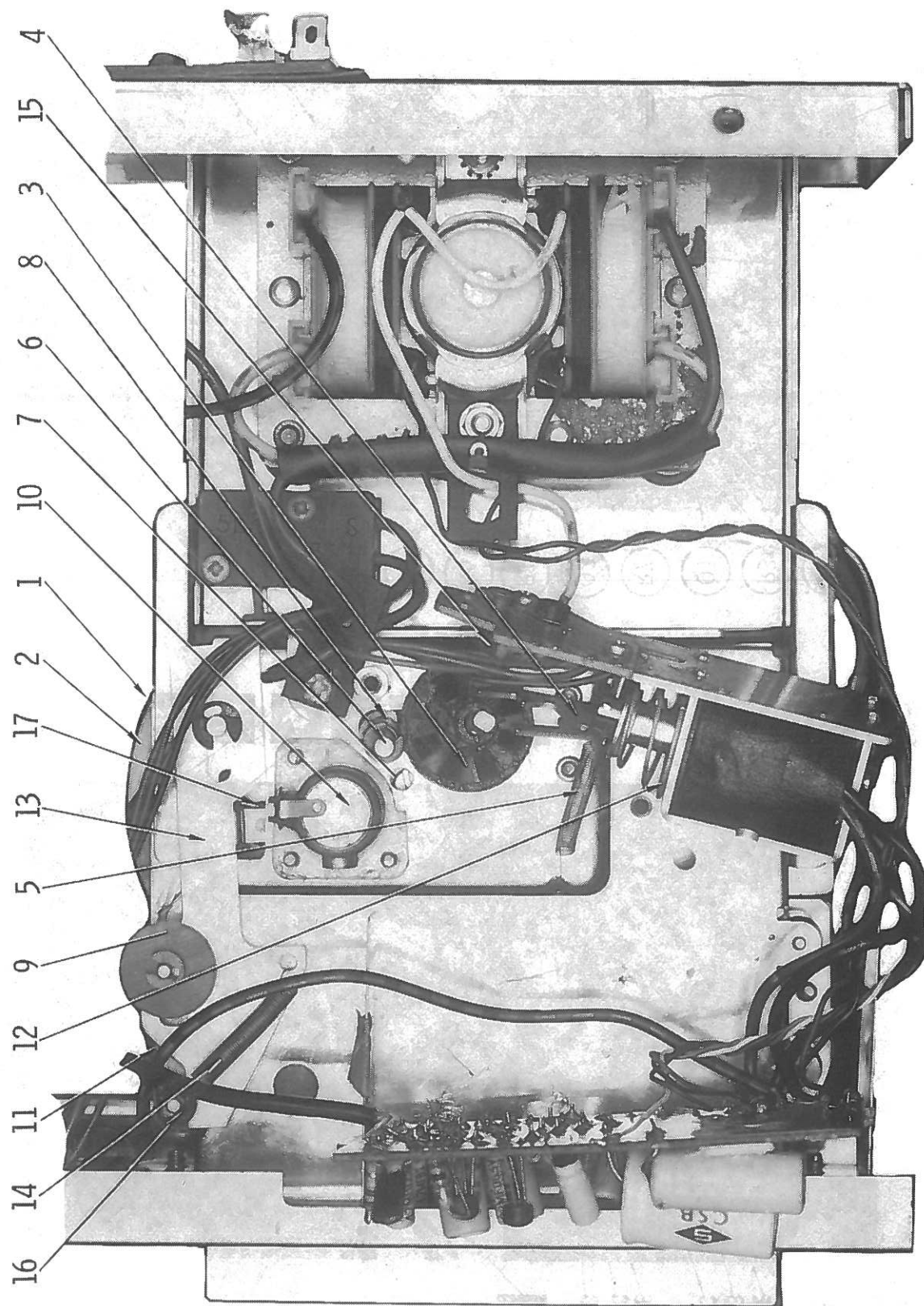


CHASSIS-TOP VIEW

CONCERT HALL MODELS 99-3012LP/22LP/32LP/42LPQ,  
99-3301W/11WQ/41W/51WQ/62LP/71WQ/81WQ

FOLDER 5





TAPE MECHANICAL

### CLEANING

Clean all tape contact surfaces with a soft, lint-free material and head cleaner or methyl alcohol. Use alcohol to remove oil and grease from all driving surfaces.

CAUTION: Avoid getting head cleaner on any plastic surface.

### LUBRICATING

Bearings are oil-less type and do not need lubrication. Lubricate bushings lightly with #20 machine oil. Use a light film of nonhardening grease on cam surfaces.

### HEAD DEMAGNETIZING

Demagnetize head when unit is serviced. Avoid using magnetic materials near head.

### ADJUSTMENTS

ADJUST	REMARKS
Head Height	Play a test cartridge, follow instructions with cartridge, and adjust B1 for proper response.
Head Azimuth	Connect an AC VTVM across right output. Play a test cartridge and adjust B2 for maximum.

### TROUBLE CHART

SYMPTOM	REMARKS
Capstan does not rotate.	Belt (1) dirty, worn, or broken. Assembly (10) binding. Motor defective or not supplied with power.
Track-shift mechanism inoperative.	Switch (S4) dirty. Cam (3) binding or worn. Pawl (4) worn. Arm (6) binding. Solenoid (L1) defective or not supplied with power. Cartridge defective. Spring (5) broken or loose.
Wow or Flutter.	Belt (1) dirty or worn. Capstan dirty or binding. Cartridge defective. Motor defective.
Sound weak or distorted.	Head dirty, misaligned, or defective. Cartridge defective. Amplifiers defective.
Tape is pulled from cartridge.	Cartridge defective. Capstan dirty or scored.

### MECHANICAL PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION
1*	A.109586*	Flywheel Belt*	10	B.109801	Capstan Bearing Assembly
2	A.109927	Flywheel	11	B.109602	Cartridge Detent Arm
3	A.109792	Track Changing Cam	12	A.109585	Solenoid Spring
4	A.109599	Pawl	13	B.109799	Switch Slide
5	A.109725	Pawl Spring	14	A.106073	Switch Slide Spring
6	A.109796	Head Mounting Arm	15		Head Height Plate
7	A.109782	Azimuth Spring	16	A.109582	Cartridge Detent Roller
8	A.109726	Head Arm Spring	17	A.109582	Switch Slide Roller
9	A.109587	Cartridge Detent Spring			

\* Flywheel Belt - E-V/GAME Replacement Number 1407-30.  
BSR Part Numbers



