

center terminal to PC board.

[illegible]**TRANSFORMER (Power)**

ITEM No.	RATING		REPLACEMENT DATA				NOTES
	PRI.	SEC. 1	MFGR. PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
T1	120 VAC @ .22 AC.	32.5 VAC @ .7 AC.	T-088 7-353-TX (1)				(1) On Unit
	SEC. 2 11.5 VAC @ 0 .31 AC.	SEC. 3 6.50 VAC @ 2 AC.					

SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		MFGR. PART No.	QUAM PART No.	
SP1	4" x 6" PM 8 ohm	(151-56) (1)		(1) On Unit
SP2	4" x 6" PM 8 ohm	(151-56) (1)		

FUSE DEVICES

ITEM No.	DESCRIPTION	REPLACEMENT DATA							
		PART No.		BUSS PART No.		LITTELFUSE PART No.		WORKMAN PART No.	
		DEVICE	HOLDER	DEVICE	HOLDER	DEVICE	HOLDER	DEVICE	
CB1	Circuit Breaker Break Current, 1.25 A								
CB2	Circuit Breaker Break Current, 1.25 A								
F1	Fuse 2 A @ 125 V Quick Acting, Pigtail			GHV 2		318002			

PHONO CARTRIDGE & NEEDLES

ITEM No.	REPLACEMENT DATA						NOTES
	MFGR. PART No.		ASTATIC PART No.		ELECTRO-VOICE PART No.		
	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1 M2	SC7M2	ST17		N164sd	55730	2428SD 2428SD	

TAPE HEADS

ITEM No.	MEASURED			MFR. PART No.	NORTONICS PART No.	DESCRIPTION
	INDUCTANCE	BIAS/ERASE VOLTS (RMS)	BIAS FREQ.			
M3	440 mH				5800 (1)	8-Track Stereo Play

(1) Use original mounting.

(1) Use original mounting.

MISCELLANEOUS

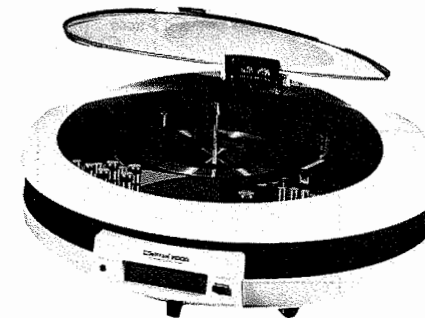
ITEM No.	PART NAME	PART No.	NOTES
L25	Solenoid		Head Shift
M4	Meter		Tuning
M5	Motor		Phono
M6	Motor		Tape
SW1	Switch		FM Auto Off/On
SW2	Switch		AM Off/On
SW3	Switch		Tape Off/On
SW4	Switch		Phono Off/On
SW5	Switch		Aux Off/On
SW6	Switch		AFC Off/On
SW7	Switch		Low Filter Off/On
SW8	Switch		High Filter Off/On
SW9	Switch		Loudness Off/On
SW10	Switch		Power Off/On
SW11	Switch		Speaker In/In-Out/Out
SW12	Switch		Manual Program Selector
SW13	Switch		Program Indicator
SW14	Switch		Auto Program Selector
SW15	Switch		Tape Motor
SW16	Switch		On Changer
	Idler Wheel		E-V/GAME Replacement No. 1496-34.
			HALSCO Replacement No. 1496-34.

PHOTOFACT® Folder

with CIRCUITRACE™

**WELTRON
MODEL 2005**

For Supplier Address See PHOTOFACT Index



RECORD CHANGER SERVICING

RECORD CHANGER -- BSR MODEL C141R.B1

ADJUSTMENTS

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.

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.

ANTI-SKATE

Adjust B5 to correspond with the "Needle Pressure". (Minimum of 2)

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

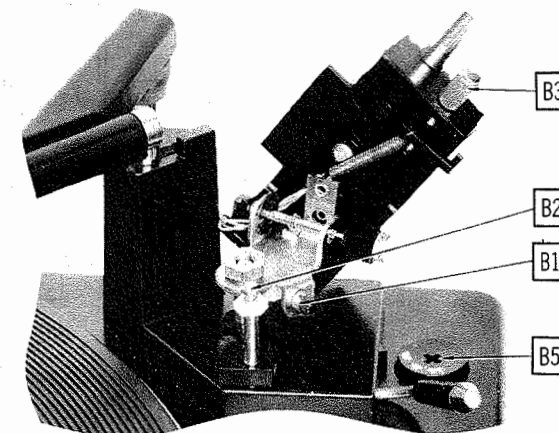
Apply light nonhardening grease to sliding cam surfaces and pivot points, light machine oil on the tone arm lift rod, idler wheel bearings, and motor bearings.

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

HOWARD W. SAMS & CO., INC. Indianapolis, Indiana 46206

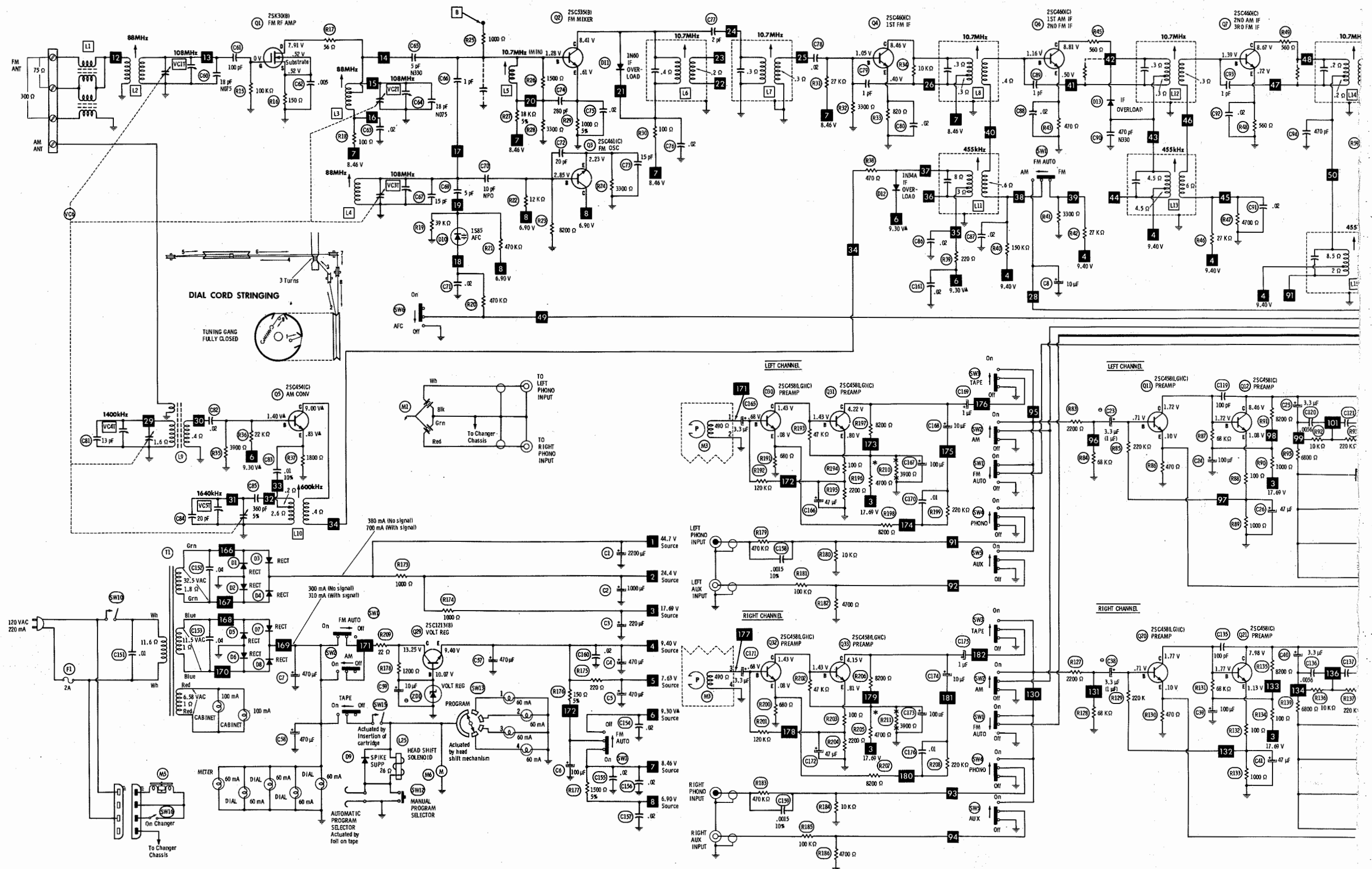
The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. 4PL950

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**WELTRON
MODEL 2005**

SET 1410 FOLDER 4



A PHOTOFAC STANDARD NOTATION SCHEMATIC
WITH CIRCUITRACE
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(When ordering parts, state Model, Part Number, and Description.)

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530	(Solid) Available in 12 Colors
Low-loss Shielded Lead (Interconnecting)	Use BELDEN No. 8524 8401	(Stranded) Available in 12 Colors or 8421

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.
01	V06	GE-504A	804 or 5A40	PTC201 or PTC202	HEPRO052	SK3030 or SK3031	RT213 or RT214	ECG 116 or ECG 117
02	V06	GE-504A	804 or 5A40	PTC201 or PTC202	HEPRO052	SK3030 or SK3031	RT213 or RT214	ECG 116 or ECG 117
03	V06	GE-504A	804 or 5A40	PTC201 or PTC202	HEPRO052	SK3030 or SK3031	RT213 or RT214	ECG 116 or ECG 117
04	V06	GE-504A	804 or 5A40	PTC201 or PTC202	HEPRO052	SK3030 or SK3031	RT213 or RT214	ECG 116 or ECG 117
05	V06	GE-504A	804 or 5A40	PTC201 or PTC202	HEPRO052	SK3030 or SK3031	RT213 or RT214	ECG 116 or ECG 117
06	V06	GE-504A	804 or 5A40	PTC201 or PTC202	HEPRO052	SK3030 or SK3031	RT213 or RT214	ECG 116 or ECG 117
07	V06	GE-504A	804 or 5A40	PTC201 or PTC202	HEPRO052	SK3030 or SK3031	RT213 or RT214	ECG 116 or ECG 117
08	V06	GE-504A	804 or 5A40	PTC201 or PTC202	HEPRO052	SK3030 or SK3031	RT213 or RT214	ECG 116 or ECG 117
09		GE-504A	804 or 5A40	PTC201 or PTC202	HEPRO053	SK3031 or SK3016	RT215 or RT216	ECG 116 or ECG 117
010	1S85 (B)	GE-90 (8)	0201 (8)	PTC206	HEPR2503(B)	SK3126 (8)		
011	1N60	1N60	1N60	PTC206	HEP135	SK3088		ECG 109
012	1N34A	1N34AS	1N34A	PTC207	HEP134	SK3087		ECG 109
013	1N60	1N60	1N60	PTC206	HEP135	SK3088		ECG 109
014	1N60	1N60	1N60	PTC206	HEP135	SK3088		ECG 109
015	1N34A	1N34AS	1N34A	PTC207	HEP134	SK3087		ECG 109
016	1N34A	1N34AS	1N34A	PTC207	HEP134	SK3087		ECG 109
017	1N60P	1N60 (7)	1N60 (7)	PTC206 (7)	HEP135 (7)	SK3088 (7)		ECG 110 (6)
018	1N60P							
019	1S2076	GE-300	0200	PTC214	HEPRO0602	SK3100	RT218	ECG 177
020	1S2076	GE-300	0200	PTC214	HEPRO0602	SK3100	RT218	ECG 177
021	1S2076	GE-300	0200	PTC214	HEPRO0602	SK3100	RT218	ECG 177
022	1S2076	GE-300	0200	PTC214	HEPRO0602	SK3100	RT218	ECG 177
023	1S2076	GE-300	0200	PTC214	HEPRO0602	SK3100	RT218	ECG 177
024	1S2076	GE-300	0200	PTC214	HEPRO0602	SK3100	RT218	ECG 177
025	V06	GE-504A	804 or 5A40	PTC201 or PTC202	HEPRO052	SK3030 or SK3031	RT213 or RT214	ECG 116 or ECG 117
IC1	1A3301							
Q1	25C530 (B)	GE-FET-2	FE-100	PTC152	HEFP0021	SK3116	RT175	ECG 132
Q2	25C535 (B)	GE-20	TR-24	PTC136	HEP56	SK3018	RT102	ECG 107
Q3	25C461 (C)	GE-20	TR-24	PTC136	HEP53	SK3018	RT108	ECG 107
Q4	25C460 (C)	GE-20	TR-24	PTC136	HEP53	SK3018	RT108	ECG 107
Q5	25C454 (C)	GE-20	TR-24	PTC136	HEP53	SK3018	RT102	ECG 123A
Q6	25C460 (C)	GE-20	TR-24	PTC136	HEP53	SK3018	RT108	ECG 107
Q7	25C460 (C)	GE-20	TR-24	PTC136	HEP53	SK3018	RT108	ECG 107
Q8	25C460 (C)	GE-20	TR-24	PTC136	HEP53	SK3018	RT108	ECG 107
Q9	25C460 (C)	GE-20	TR-24	PTC136	HEP53	SK3018	RT108	ECG 107
Q10	25C458 (C)	GE-20	TR-51	PTC121	HEP53	SK3124	RT100	ECG 123A
Q11	25C458 (LG)(C)	GE-20	TR-51	PTC121	HEP54	SK3124	RT100	ECG 123A
Q12	25C458 (C)	GE-20	TR-51	PTC121	HEP53	SK3124	RT100	ECG 123A
Q13	25C458 (C)	GE-20	TR-51	PTC121	HEP53	SK3124	RT100	ECG 123A
Q14	25C458 (C)	GE-20	TR-51	PTC121	HEP53	SK3124	RT100	ECG 123A
Q15	25C1213 (B							

(6) Matched Pair
(7) Two required - select matched pair.
(8) Varactor

ITEM No.	RATING	REPLACEMENT DATA					
		MFG. PART No.	ARCO PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.
C1	2200 63 V		ME-J1000	EASO-1000	880088A (1)		TVLP-1375
C2	1000 35 V		ME-G200	EP30-250	W8R1000-35	TC50100C	TVA-1316
C3	220 25 V			EP30-250	PC200-35	MTV2000E25	EV-1340
C4	470 16 V		RME-L-E-500	EP15-500	MTV500N15	EV-1250	
C5	470 10 V		RME-K-D-500	EP15-500	PC500-16	MTV500N15	EV-1150
C6	100 10 V		RME-E-O-100	EP15-100	PC100-10	MTV100C810	EV-1130
C7	470 16 V		RME-L-E-500	EP15-500	PC500-16	MTV500N15	EV-1250
C8	10 10 V		RME-A-E-001	EP15-10	PC10-25	VT110A25	EV-1222
C9	1 10 V		RME-A-D-010	EP15-10	PC1-25	MTV100C850	EV-1315
C10	10 10 V		RME-A-D-010	EP15-10	PC10-25	VT110A25	EV-1222
C11	10 10 V		RME-A-E-001	EP15-10	PC1-50	MTV1C850	EV-1315
C12	1 10 V		RME-A-E-003	EP15-5	PC5-50	VT33R450	EV-1318
C13	3.3 10 V		RME-A-E-003	EP15-5	PC5-50	VT33R450	EV-1318
C14	3.3 10 V		RME-A-E-003	EP15-5	PC5-50	VT33R450	EV-1318
C23	3.3 10 V		RME-A-E-003	EP15-5	PC5-50	VT33R450	EV-1318
C24	100 16 V		RME-E-E-100	EP15-100	PC100-16	MTV100C015	EV-1230
C25	3.3 10 V		RME-A-E-003	EP15-5	PC5-50	VT33R450	EV-1318
C26	47 6.3 V		RME-D-D-050	EP15-50	PC50-10	MTV100C815	EV-1226
C27	10 10 V		RME-A-D-010	EP15-10	PC10-25	VT110A25	EV-1222
C28	3.3 10 V		RME-A-E-003	EP15-5	PC5-50	VT33R450	EV-1318
C29	100 25 V		RME-G-G-100	EP30-100	PC100-25	MTV1000B25	EV-1330
C30	3.3 10 V		RME-A-E-003	EP15-5	PC5-50	VT33R450	EV-1318
C32	100 10 V		RME-E-O-100	EP15-100	PC100-10	MTV100C810	EV-1130
C33	220 25 V		ME-G200	EP30-250	PC200-35	MTV2000E25	EV-1340
C33	10 10 V		RME-A-D-010	EP15-10	PC10-25	VT110A25	EV-1222

ITEM No.	RATING	REPLACEMENT DATA					
		MFGR. Part No.	ARCO Part No.	CENTRALAB Part No.	CORNELL-DUBILIER Part No.	MALLYORY Part No.	SPRAGUE Part No.
C34	10 25 V		RME-B-G-010	EP30-10	PC10-25	VT110A25	EV-1322
C35	100 10 V		RME-E-0-100	EP15-100	PC100-10	MTV100C810	EV-1130
C36	100 10 V		RME-E-G-100	EP15-100	PC5-50	MTV100B25	EV-1330
C37	1000 35 V		ME-J1000	EASO-1000	WBR1000-35	TC50100	TWA-1316
C38	3.3 10 V		RME-A-E-003	EP15-5	PC5-50	VT33R3A50	EV-1318
C39	100 16 V		RME-E-E-100	EP15-100	PC100-16	MTV100CD15	EV-1230
C40	3.3 10 V		RME-A-E-003	EP15-5	PC5-50	VT33R3A50	EV-1318
C41	47 6.3 V		RME-O-0-050	EP15-50	PC50-10	MTV50CB15	EV-1226
C42	10 10 V		RME-A-0-010	EP15-10	PC10-25	VT110A25	EV-1222
C43	3.3 10 V		RME-A-E-003	EP15-5	PC5-50	VT33R3A50	EV-1318
C44	100 25 V		RME-G-6-100	EP30-100	PC100-25	MTV100DB25	EV-1330
C45	3.3 10 V		RME-A-E-003	EP15-5	PC5-50	VT33R3A50	EV-1318
C46	100 10 V		RME-E-G-100	EP15-100	PC100-10	MTV100C810	EV-1130
C47	220 25 V		ME-G200	EP30-250	PC200-35	MTV200OE25	EV-1340
C48	10 10 V		RME-A-0-010	EP15-10	PC10-25	VT110A25	EV-1222
C49	10 25 V		RME-B-G-010	EP30-10	PC10-25	VT110A25	EV-1322
C50	100 10 V		RME-E-0-100	EP15-100	PC100-10	MTV100C810	EV-1130
C51	100 25 V		RME-G-6-100	EP30-100	PC50-10	MTV100DB25	EV-1330
C52	1000 35 V		ME-J1000	EASO-1000	WBR1000-35	TC50100	TWA-1316
C53	220 25 V		ME-G200	EP30-250	PC200-35	MTV200OE25	EV-1340
C54	220 25 V		ME-G200	EP30-250	PC200-35	MTV200OE25	EV-1340
C55	100 10 V		RME-E-0-100	EP15-100	PC100-10	MTV100C810	EV-1130
C56	10 10 V		RME-A-0-010	EP15-10	PC10-25	VT110A25	EV-1222
C57	470 16 V		RME-L-E-500	EP15-500	PC50-16	MTV500QN15	EV-1250
C58	470 16 V		RME-L-E-500	EP15-500	PC300-16	MTV500QN15	EV-1250
C59	10 10 V		RME-B-E-010	EP15-10	PC10-25	VT110A25	EV-1222
C165	3.3 10 V		RME-A-E-003	EP15-5	PC5-50	VT33R3A50	EV-1318
C166	47 6.3 V		RME-O-0-050	EP15-50	PC50-10	MTV50CB15	EV-1226
C167	100 10 V		RME-E-0-100	EP15-100	PC100-10	MTV100C810	EV-1130
C168	10 10 V		RME-A-0-010	EP15-10	PC10-25	VT110A25	EV-1222
C169	1 10 V		RME-A-E-001	EP15-1	PC1-50	MTV1CB50	EV-1315
C171	3.3 10 V		RME-A-E-003	EP15-5	PC5-50	VT33R3A50	EV-1318
C172	47 6.3 V		RME-O-0-050	EP15-50	PC50-10	MTV50CB15	EV-1226
C173	100 10 V		RME-E-0-100	EP15-100	PC100-10	MTV100C810	EV-1130
C174	10 10 V		RME-A-0-010	EP15-10	PC10-25	VT110A25	EV-1222
C175	1 10 V		RME-A-E-001	EP15-1	PC1-50	MTV1CB50	EV-1315

(1) Disregard 500 uF @ 75 V section.

ITEM No.	RATING	MFG. PART No.	REPLACEMENT DATA				
			ARCO/ELMENCE PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.
C60	18	ND75	CCD-101	00-101		*	10TCN-Q18
C61	100		CCD-502	00-502	GP100	GP310	10TS-T10
C62	.005		CCD-203	00-203	GP5000	GP250	10TS-050
C63	.02					GP120	10TS-520
C64	18	N075	*			*	10TCN-Q18
C65	5	N330				*	10TCS-V50
C66	1		CCO-150	0TZ-15	NP015	CM0510	10TCC-V10
C67	15				NP05	CM0415	10TCC-Q15
C69	5				NP010	CM0410	10TCC-V50
C70	10	NFO	CCO-100	0TZ-10		GP120	10TCC-Q10
C71	.02		CCO-203	00-203		GP120	10TS-S20
C72	20		CCO-200	0TZ-20	NP020	CM0420	10TCC-Q20
C73	15		CCO-150	0TZ-15	NP015	CM0415	10TCC-Q15
C74	280		CCO-270	00-271	GP270	GP327	10TS-T27
C75	.02		CCO-203	00-203		GP120	10TS-120
C76	.02		CCO-203	00-203		GP120	10TS-520
C77	2			0TZ-2R2	NP02P2	CM0522	10TCC-V22
C78	.02		CCO-203	00-203		GP120	10TS-S20
C79	1					CM0510	10TCC-V10
C80	.02		CCD-203	00-203		GP120	10TS-S20
C81	13		CCO-120		NP012	CM0412	10TCC-Q12
C82	.02		CCO-203	00-203		GP120	10TS-S20
C83	.01	50 V	10P-1-103	00-1000J	OPMS651	EWFA110	225P10391W03
C84	20		CCO-200	0TZ-20	NP020	CM0420	10TCC-Q20
C85	360	5%	0M-19-361J	CPR-360J	CO15FO360J03	SX33	424ME3600J501
C86	.02		CCO-203	00-203		GP120	10TS-S20
C87	.02		CCO-203	00-203		GP120	10TS-S20
C88	.02		CCO-203	00-203		GP120	10TS-S20
C89	1					CM0510	10TCC-V10
C90	470	N330	*			*	10TCS-T47
C91	.02		CCD-203	00-203		GP120	10TS-S20
C92	.02		CCO-203	00-203		GP120	10TS-S20
C93	1					CM0510	10TCC-V10
C94	470		CCD-471	00-471	GP470	GP347	10TCC-V10
C95	100		CCO-101	00-101	GP100	GP310	10TS-T10
C96	.01	N075				*	
C97	.01	N075				*	
C98	.01		CCO-103	00-103	GP10000	JF110	10TS-S10
C99	.01	N075				*	
C100	.02		CCD-203	00-203		GP120	10TS-S20
C101	.02		CCO-203	00-203		GP120	10TS-S20
C102	.02		CCO-203	00-203		GP120	10TS-S20
C103	2			0TZ-2R2	NP02P2	CM0522	10TCC-V22
C104	10		CCO-100	0TZ-10	NP010	CM0410	10TCC-Q10
C105	.02		CCO-203	00-203		GP120	10TS-S20
C106	200	N075				*	10TCN-T20
C107	200	N075				*	10TCN-T20
C108	200	N075				*	10TCN-T20
C109	.04			00-403		GP140	
C110	.0015	50 V	10MF-1-152	CPR-1500J	OPMS6015	EWFA1215	1PB-015
C111	.0025	10%	0M-20-252J	CPR-2500J		SX225	424ME2401J501
C112	.01		0M-30-103J	CPR-10000J		SX110	
C113	.01	50 V	10P-1-103	CPR-10000J	OPMS651	EWFA110	225P10391W03
C114	.0068	50 V	10P-1-682	CPR-6800J	OPMS6068	EWFA1268	1PB-D68
C115	.01	50 V	10P-1-103	CPR-10000J	OPMS651	EWFA110	225P10391W03
C116	.01	50 V	10P-1-103	CPR-10000J	OPMS651	EWFA110	225P10391W03</

ITEM No.	RATING	MFR. PART No.	REPLACEMENT		
			ARCO/ELMENCO PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.
C131	.22 50 V		4DP-5-224		DPMS4P22
C132	.100		CCO-101	00-101	GP100
C133	.100		CCO-101	00-101	GP100
C134	.1 50 V 10%		TOP-2-104		OPMS2P1
C135	.100		CCO-101	00-101	GP100
C136	.0056 50 V		1M0-1-562		DPMS6D56
C137	.022 50 V 10%		TOP-1-223		OPMS6S22
C138	.001		16P-2-102	0030-102	OPMS2001
C139	.15 50 V		4DP-4-154		OPMS4P15
C140	.100		CCO-101	00-101	GP100
C141	.0047 50 V		60P-1-472		DPMS6047
C142	.022 50 V		TOP-1-223		OPMS6S22
C143	.15 50 V		4DP-4-154		OPMS4P15
C144	.015 50 V 10%		TOP-1-153	00-153	OPMS6S15
C145	.022 50 V 10%		TOP-1-223		DPMS6S22
C146	.01 50 V 10%		TOP-1-103	CPR-10000J	OPMS6S1
C147	.22 50 V		4DP-5-224		OPMS4P22
C148	.100		CCO-101	00-101	GP100
C149	.100		CCO-101	00-101	GP100
C150	.1 50 V 10%		1DP-2-104		OPMS2P1
C151	.01 250 VAC				
C152	.04			00-403	
C153	.04		CCO-203	00-203	
C154	.02		CCO-203	00-203	
C156	.02		CCO-203	00-203	
C157	.02		CCO-203	00-203	
C158	.001 50 V		60P-1-102	CPR-1000J	DPMS601
C159	.001 50 V		60P-1-102	CPR-1000J	DPMS601
C160	.02		CCO-203	00-203	
C161	.02		CCO-203	00-203	
C170	.01 50 V		TOP-1-103	CPR-10000J	OPMS6S1
C176	.01 50 V		TOP-1-103	CPR-10000J	OPMS6S1
VC1T	Trimmer	(1)			
VC2T	Trimmer	(1)			
VC3T	Trimmer	(1)			
VC4T	Trimmer	(1)			
VC5T	Trimmer	(1)			
VC6	Tuning Gang				

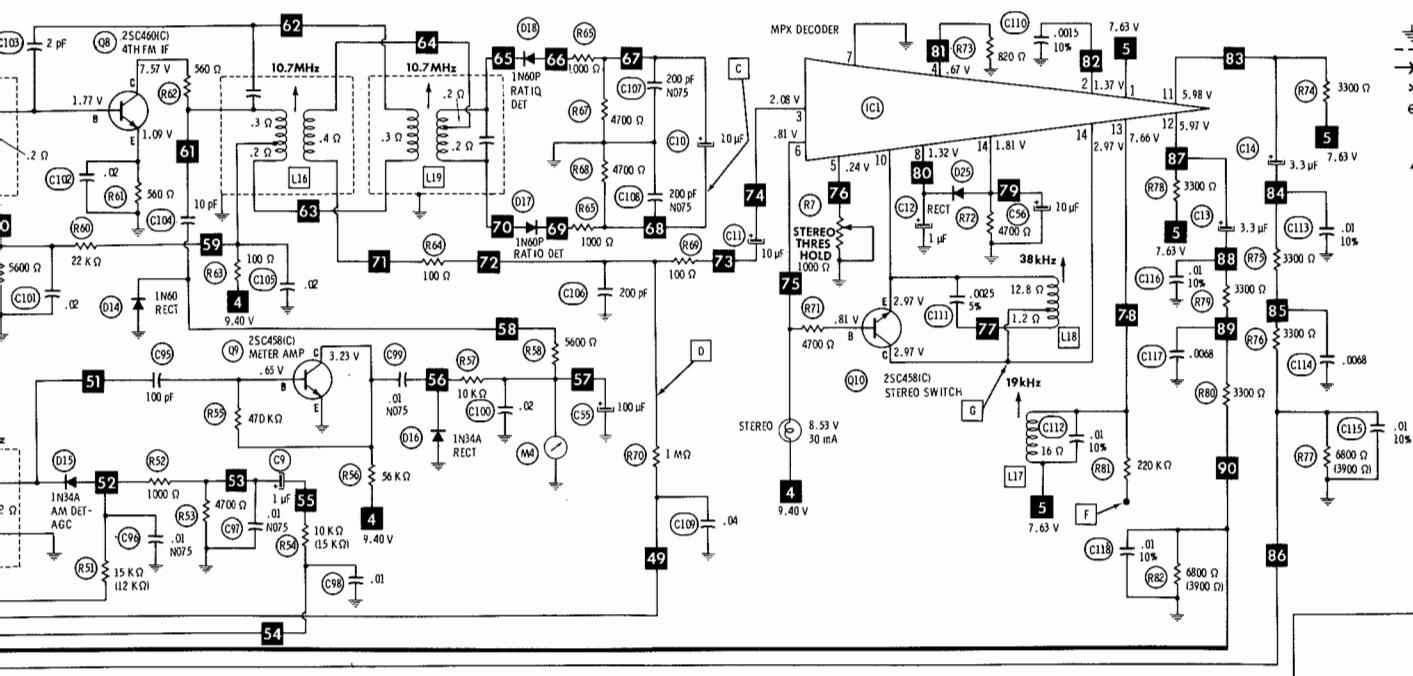
(1) Part of Tuning Gang
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

ITEM No.	RATING	REPLACEMENT DATA		ITEM No.	RATING	WORK PART No.
		WORKMAN PART No.	MFG. PART No.			
R119	220	1/2W, F11m		R164	22	1/2W, F11m
R120	22	1/2W, F11m		R165	220	1/2W, F11m
R121	220	1/2W, F11m		R167	.5	1W, WW
R123	.5	1W, WW		R168	.5	1W, WW
R124	.5	1W, WW		R169	10	1W, F11m
R125	10	1W, F11m		R170	8	5W, WW
R126	8	5W, WW		R173	1000	1/2W, F11m
R163	220	1/2W, F11m				

ITEM No.	FUNCTION	RESISTANCE	REPLACEMENT DATA			
			MFGR. PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS PART No.
R1	Balance	50 K				
R2a	Bass, Left	50 K				
R3	Bass, Right	50 K				
b	Bias, Left	20 K		T-20K (3) or TSV-25K (3)	C-253 (3)	X201R2
R4	Bias, Right	20 K		T-20K (3) or TSV-25K (3)	C-253 (3)	X201R2
R5	Bias, Left	1000		TSV-1K (3) or T-1000 (3)	C-102 (3)	X201R1
R6	Bias, Right	1000		TSV-1K (3) or T-1000 (3)	C-102 (3)	X201R1
R7	Stereo Threshold	1000		T-1000 (3) or TSV-1K (3) or T-1000 (3)	C-102 (3)	X201R1
R8a	Volume, Left	50 K, Tap @ 10 K				
b	Volume, Right	50 K, Tap @ 10 K				
R9a	Treble, Left	50 K				
b	Treble, Right	50 K				

(3) For horizontal mounting, bend the two outside terminals to fit PC board. Use jumper to connect

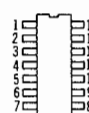
ITEM No.	USE	REPLACEMENT DATA			
		PART No.	MEISSNER PART No.	MILLER PART No.	
L1	Balun				
L2	FM Antenna				
L3	FM RF				
L4	FM Oscillator				
L5	RF Choke				
L6	FM Input IF		16-9030	2070	
L7	FM Interstage IF		16-9030	2070	
L8	FM Interstage IF		16-9032	2072	
L9	Loopstick				
L10	AM Oscillator				
L11	AM Interstage IF			8517	
L12	FM Interstage IF		16-9031	2071	
L13	AM Interstage IF			8517	
L14	FM Interstage IF		16-9032	2072	
L15	AM Detector AGC			8517	
L16	Ratio Detector (Pri.)				
L17	19 kHz Doubler				
L18	38 kHz Amp				
L19	Ratio Detector (Sec.)				



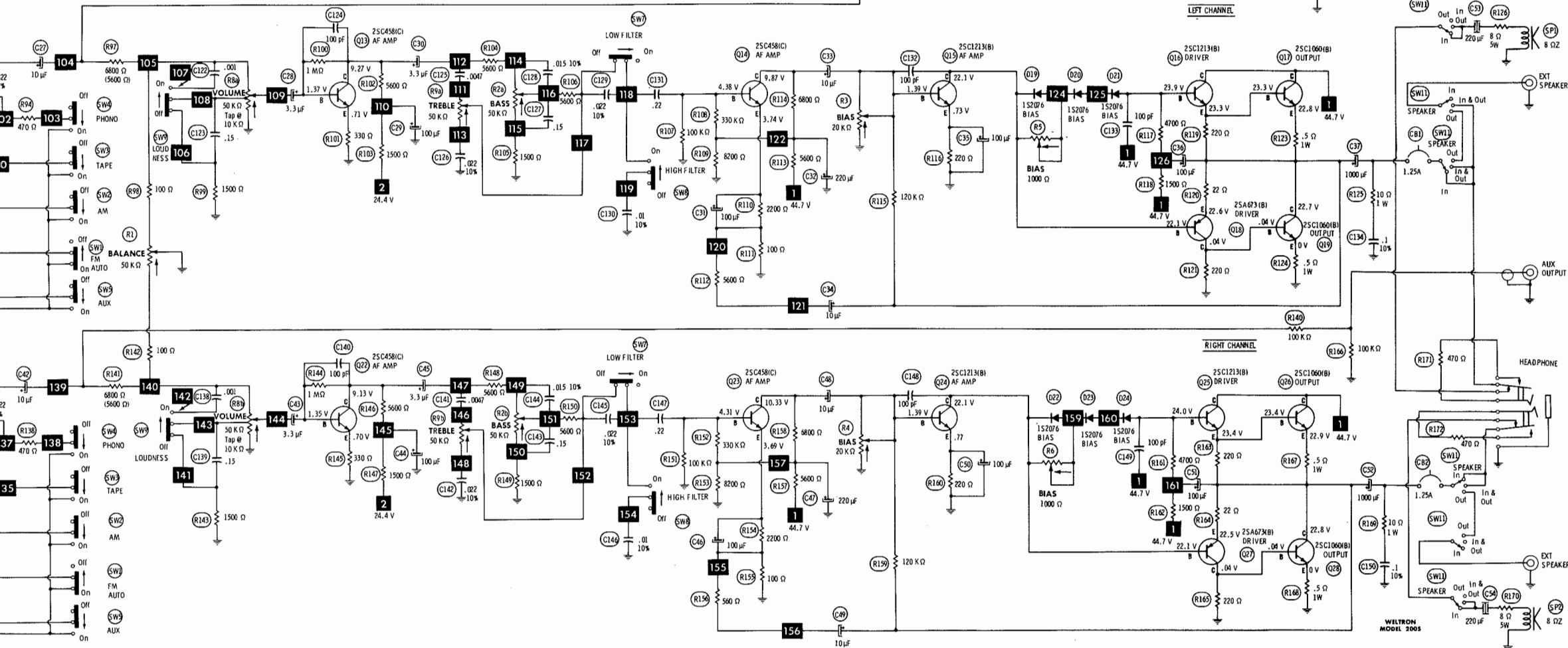
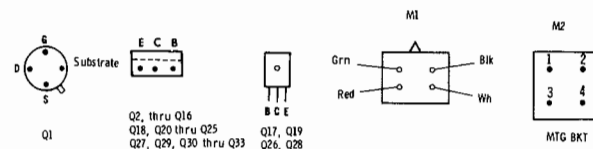
⊥ Denotes ground. (Voltage reference unless otherwise indicated).
 --- Indicates connection used in some versions.
 * Indicates connection not used in some versions.
 * Omitted in some versions.
 ⊙ See parts list.
 Measurements taken with switching in position shown unless otherwise indicated.
 ▲ Measured with switching in "AM" position.

Values shown in () are used in some applications.
 Resistors are 1/2W or less, 10% or 20%, unless otherwise indicated.
 Supply voltage maintained at rated value for measurements.
 Voltage and resistance measured with VTVM or equivalent meter,
 no signal applied and controls adjusted for normal operation.
 Arrow on control indicates direction of advance.
 Numbers assigned to terminals may not be found on the unit.
 Transistor resistances vary widely. No resistance measurements taken.

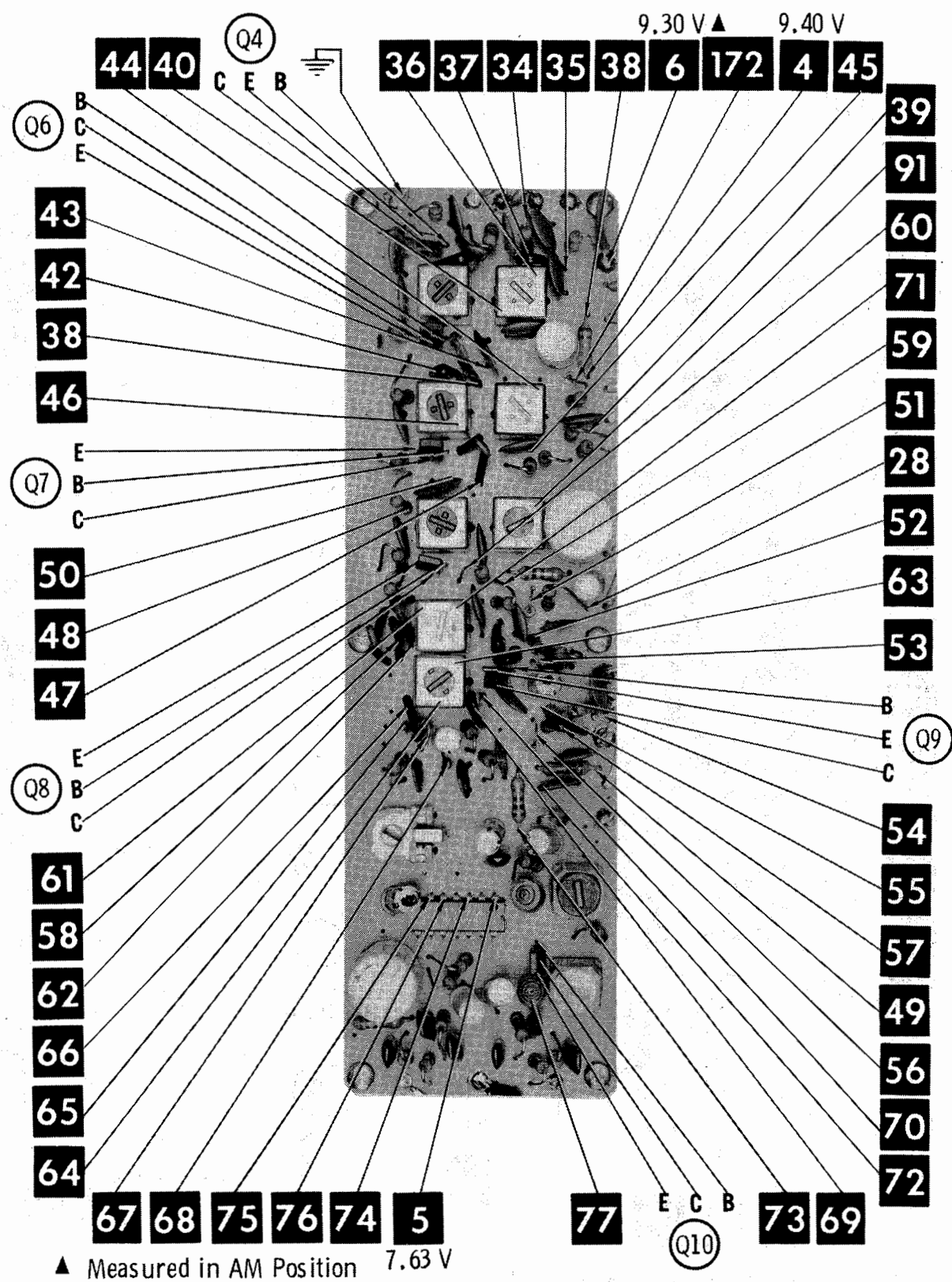
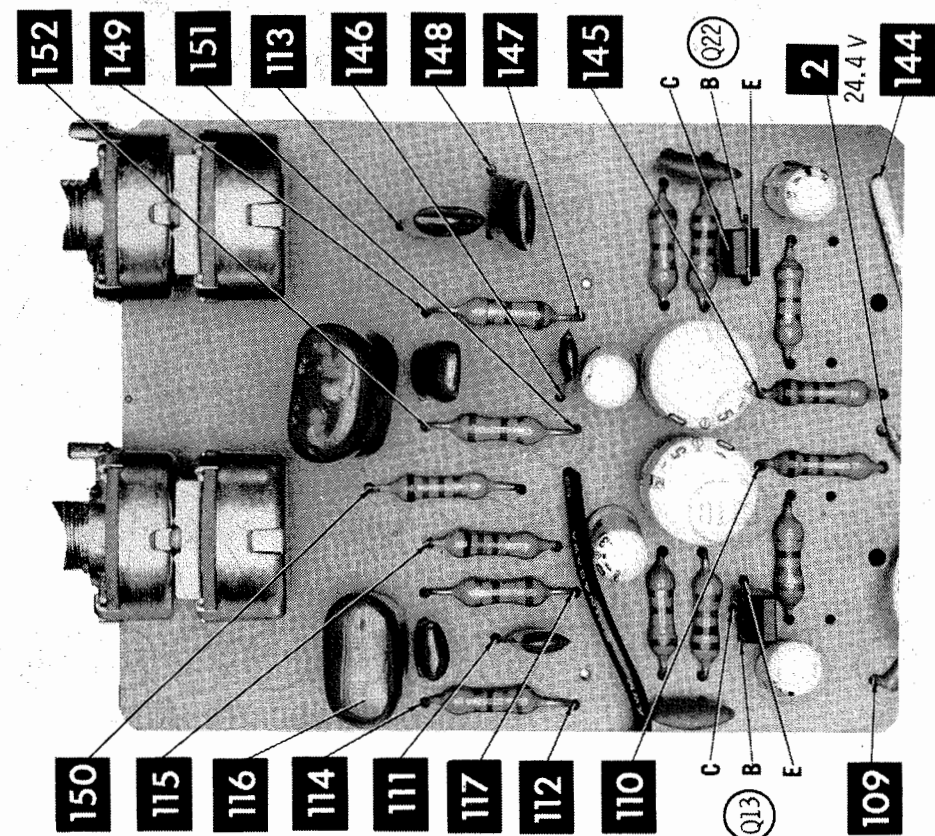
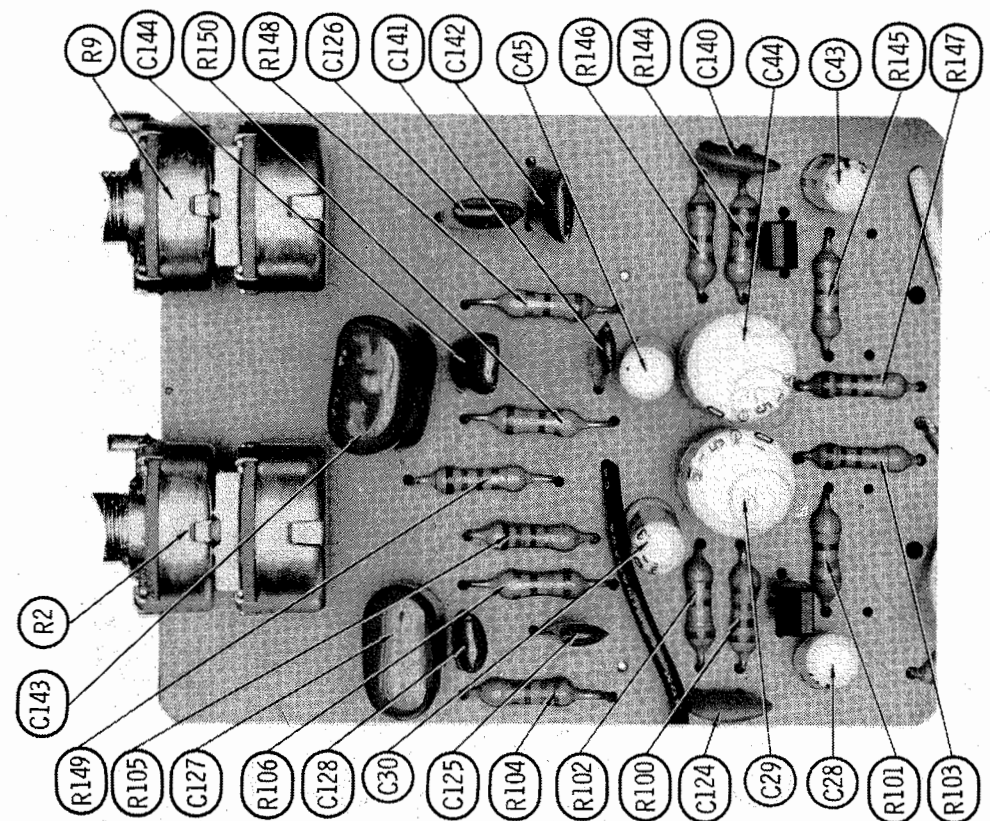
IC1 (Top view)

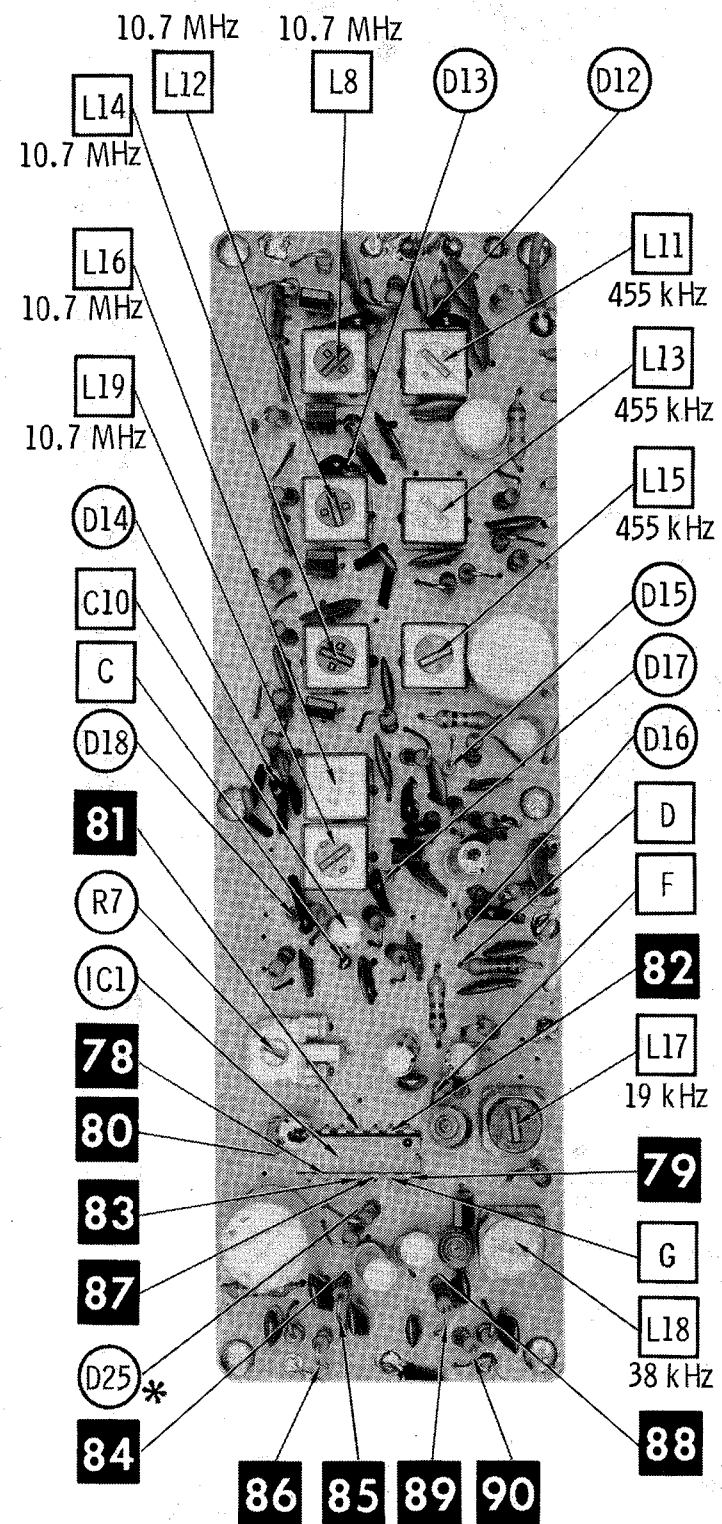


Terminal Guides

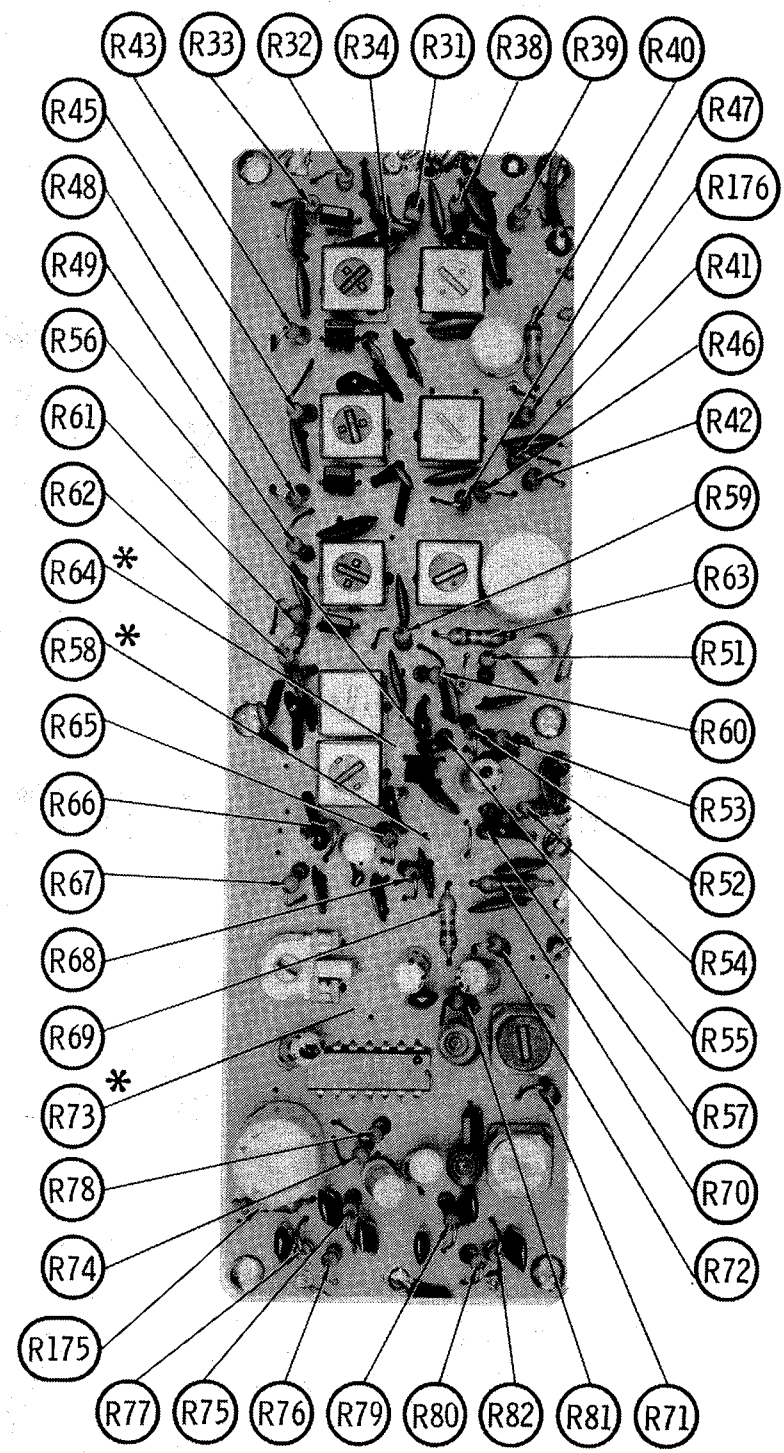
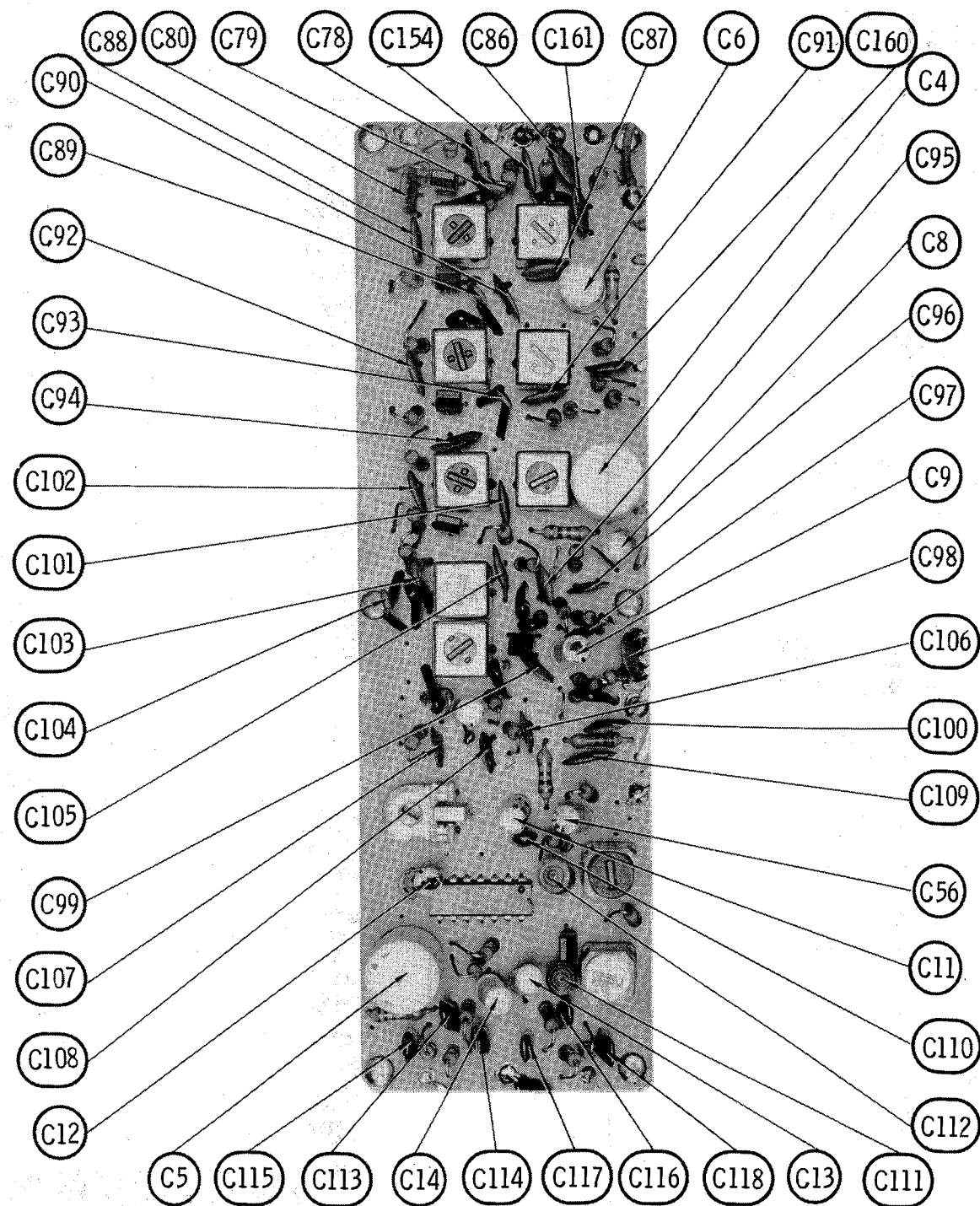


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MODEL 2005





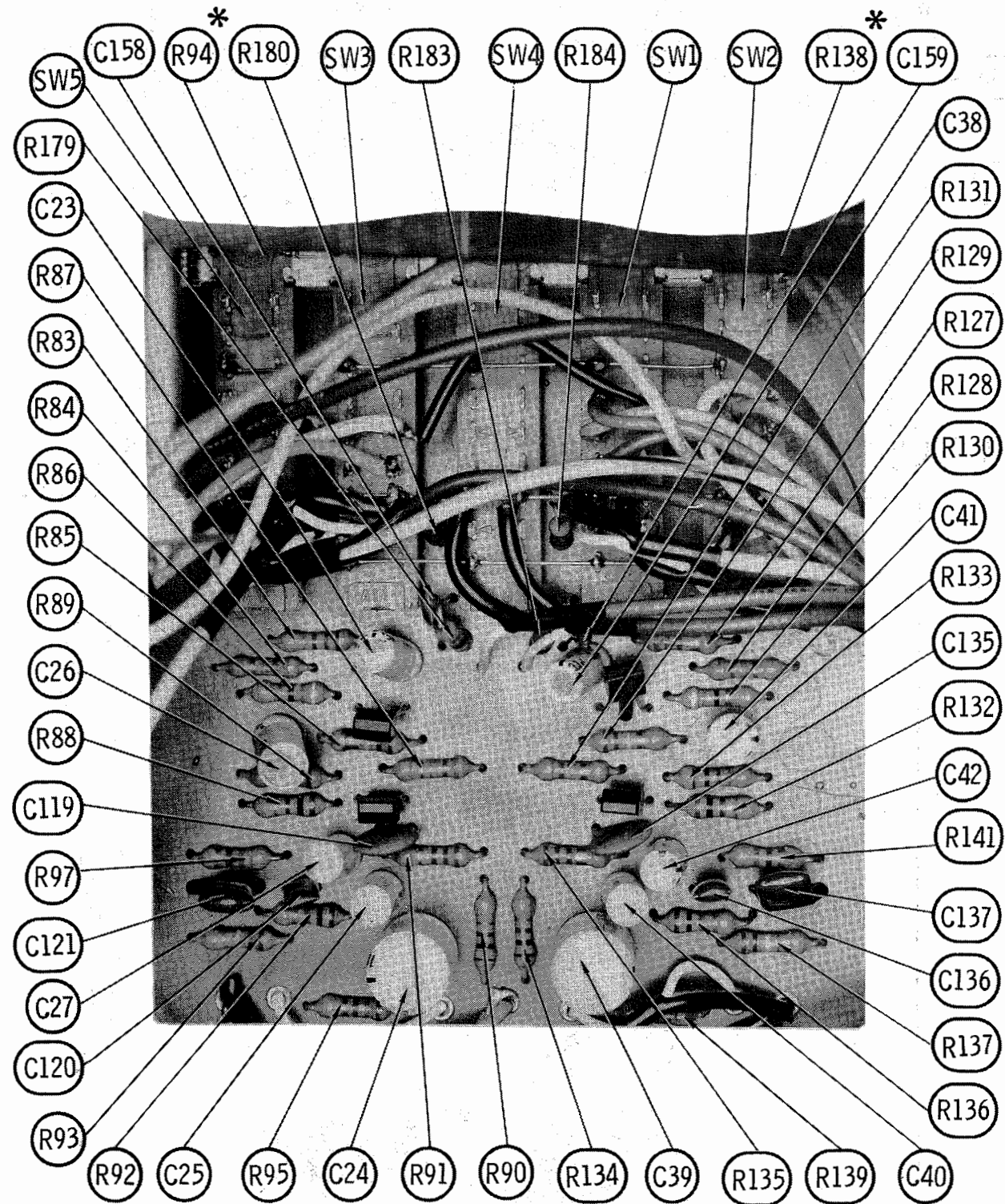
* COMPONENT LOCATED UNDER BOARD



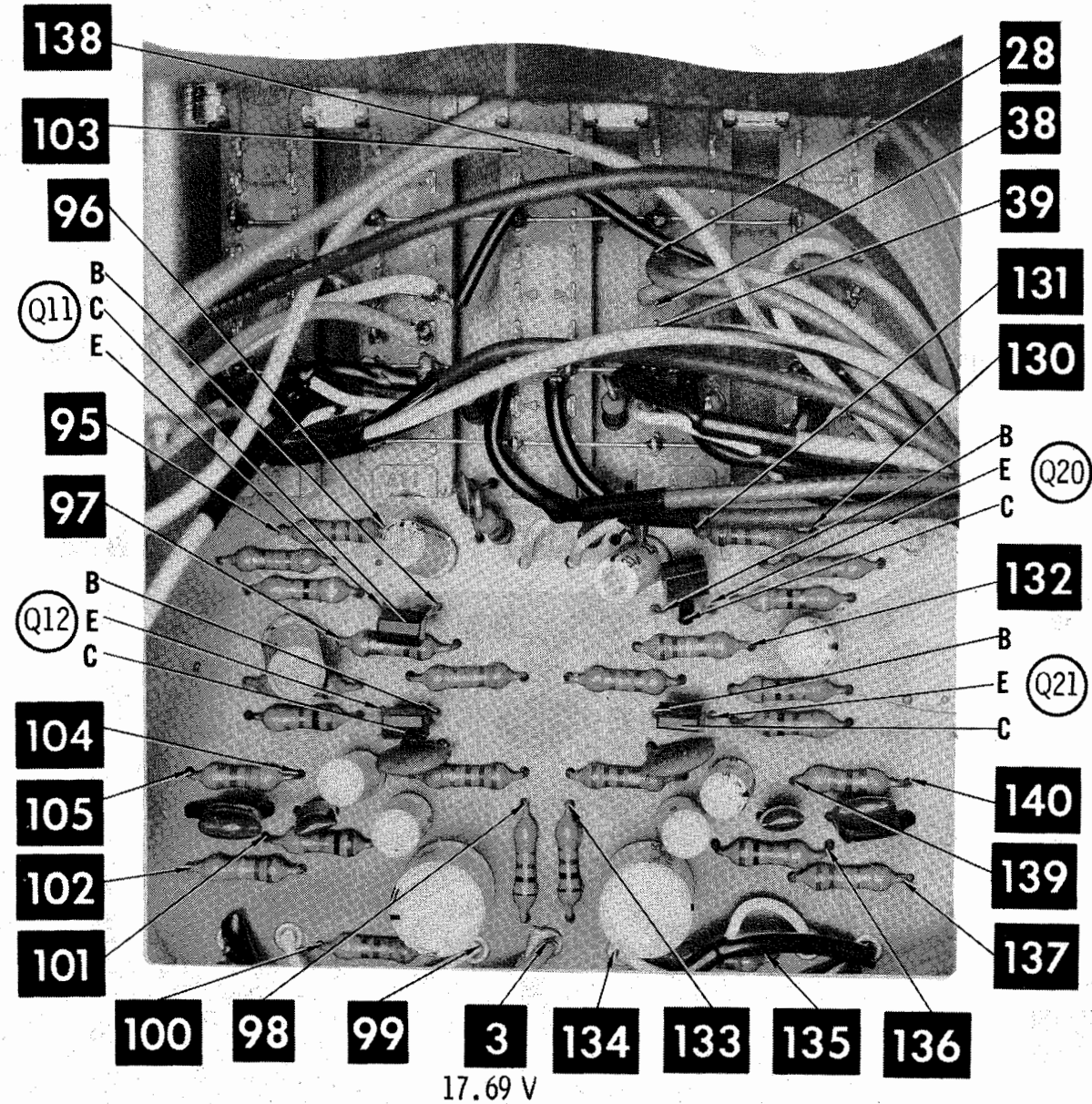
* COMPONENT LOCATED UNDER BOARD

WELTRON
MODEL 2005

FOLDER 4



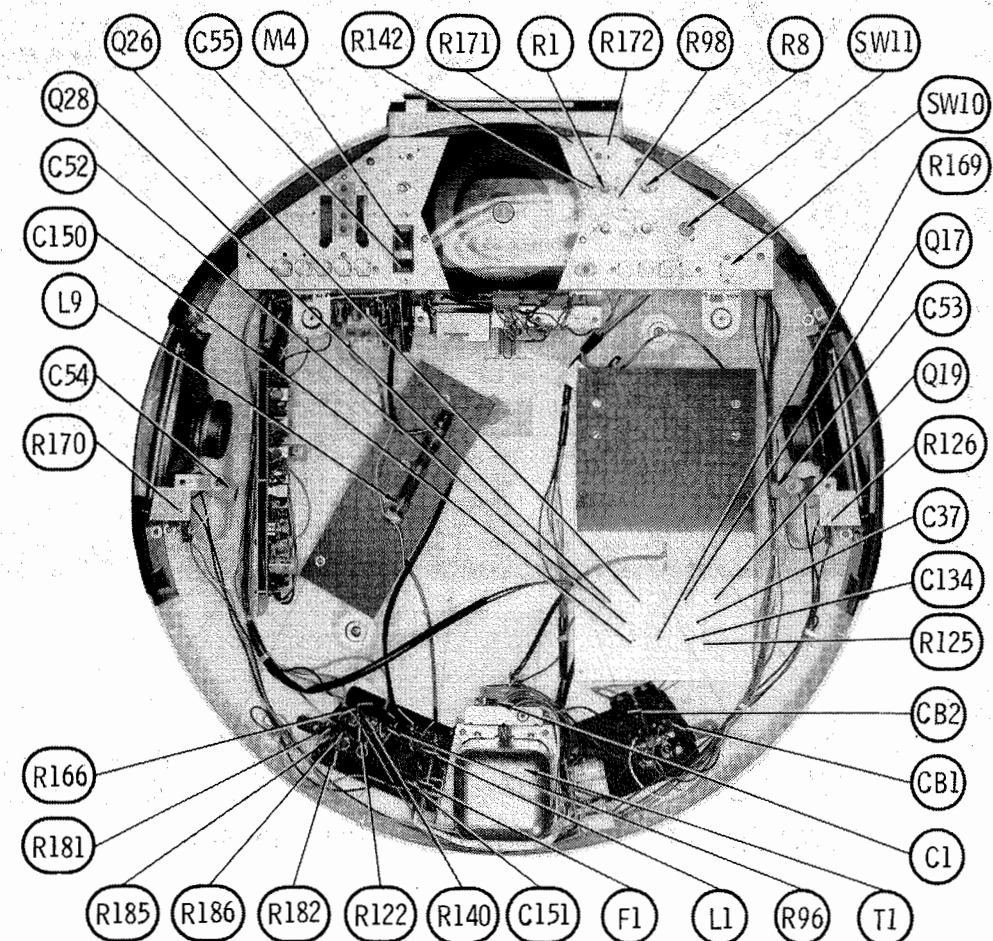
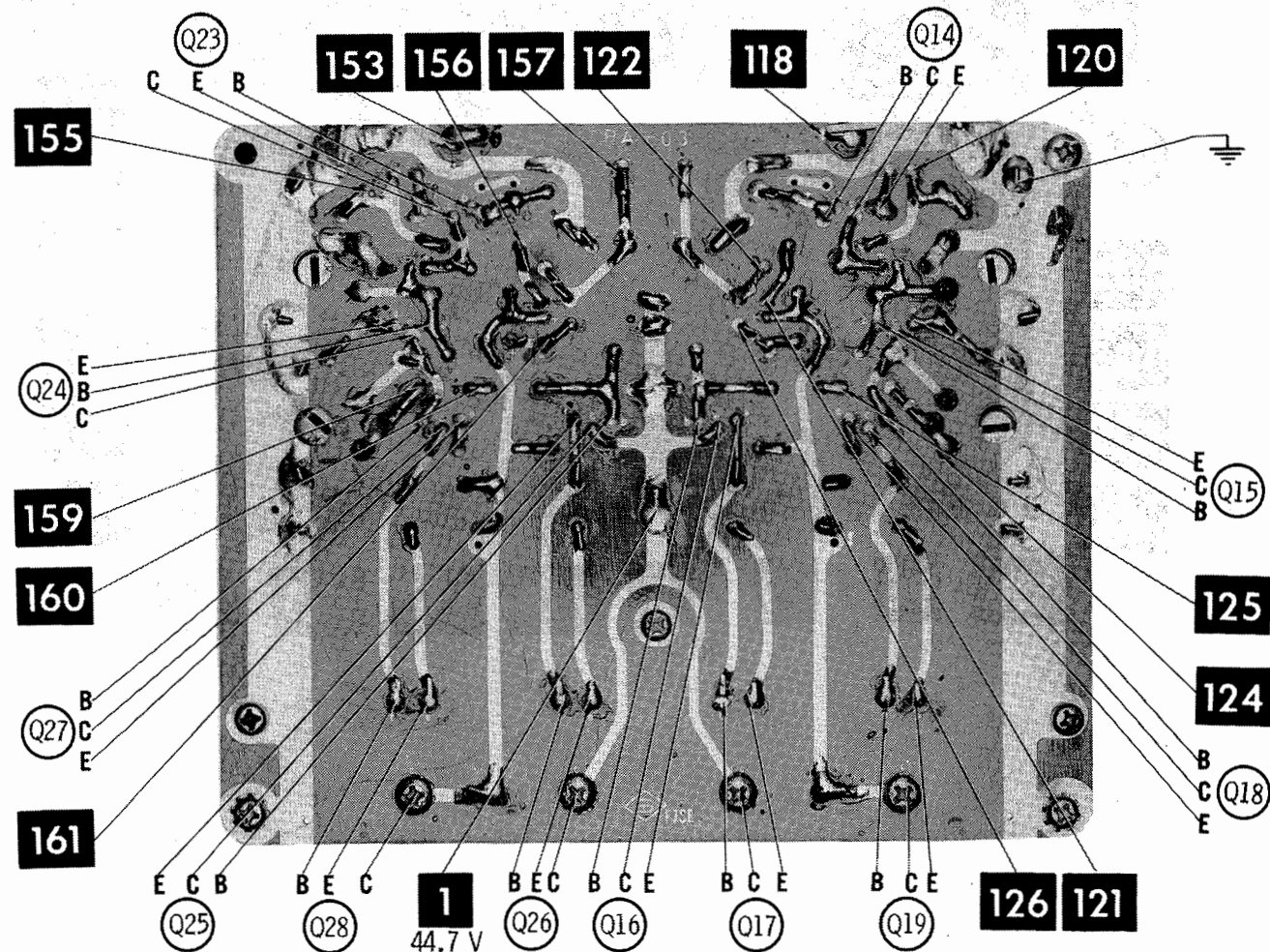
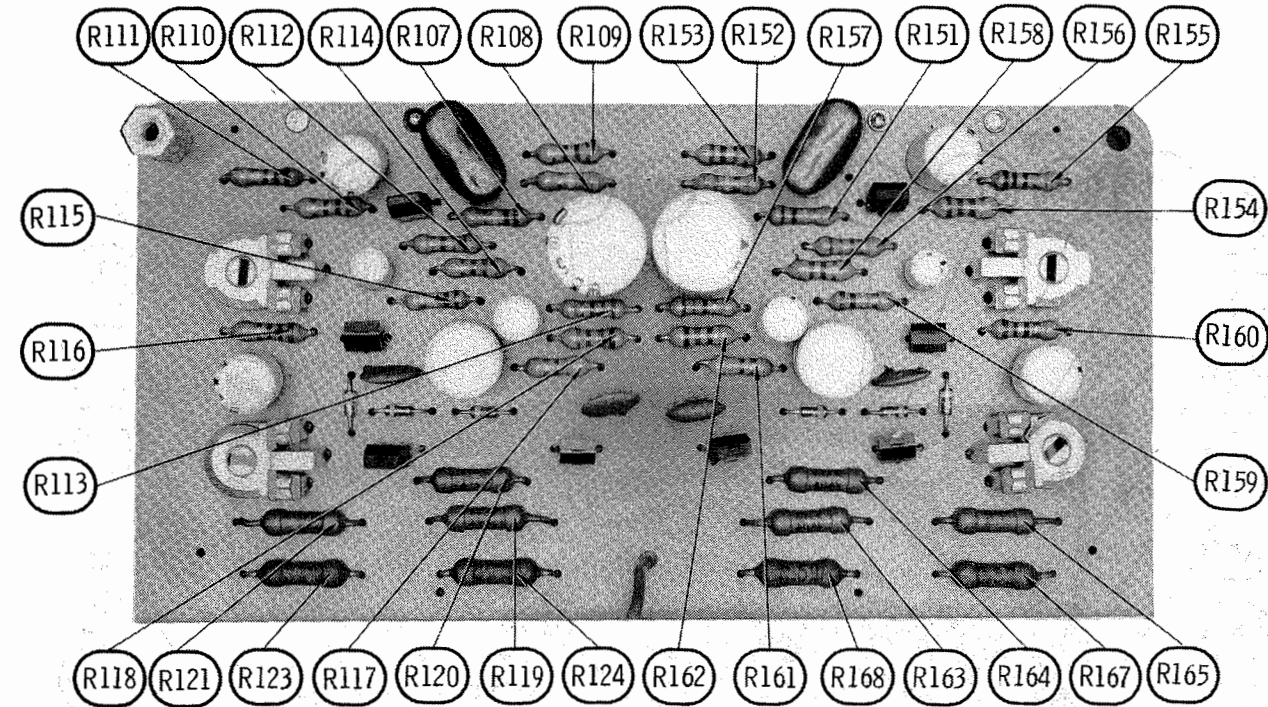
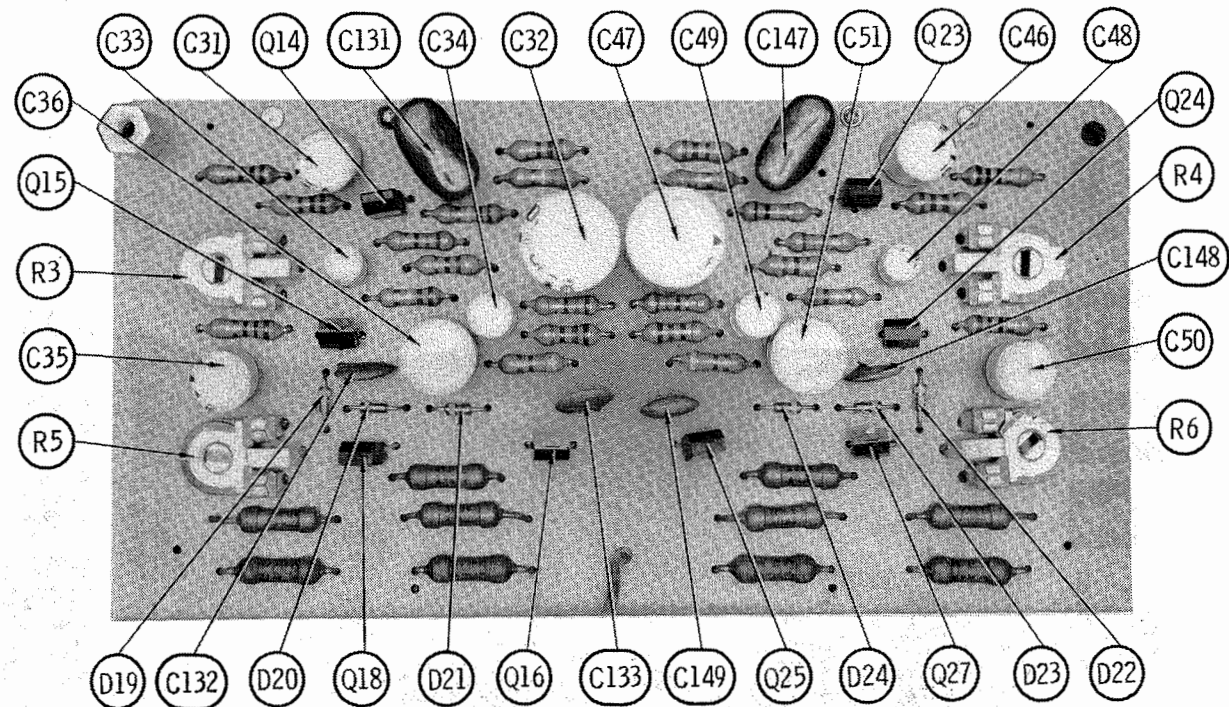
* COMPONENTS LOCATED UNDER BOARD



WELTRON
MODEL 2005

FOLDER 4

A Howard W. Sams CIRCUITRACE® Photo



ALIGNMENT INSTRUCTIONS

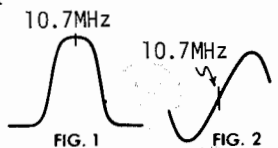
CAUTION: Use isolation transformer or observe polarity when connecting test equipment. Maintain line voltage at 120VAC. Allow a 15-minute warm-up period. Use only enough generator output to obtain a suitable indication.

Suggested Alignment Tools:

GC ELECTRONICS

L5, L6, L7, L8, L11 thru L19 ... 8728

L2, L3, L4, L10 9440



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	L15,L13,L11	Adjust for maximum. Repeat until no further improvement is noted.
600kHz	Tune to signal	"	L10	Adjust for maximum.
1640kHz	"	"	VC5T	Adjust for maximum.
1400kHz	"	"	VC4T	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.	L16,L14,L12, L8,L7,L6	Adjust for maximum.
"	"	DC probe of VTVM to point D, common to ground.	L19	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.	L16,L14,L12, L8,L7,L6	Disconnect stabilizing capacitor C10. Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. Reconnect C10.
"	"	Vert input of scope to point D, low side to ground.	L19	Adjust L19 to place marker at center of S curve similar to Fig. 2. Readjust L16 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.	L4,L3,L2	Adjust for maximum.
108MHz Unmodulated	Tune to signal	"	VC3T,VC2T, VC1T	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.	L17	Adjust for maximum.
19kHz	Vert input of scope thru 47K to point G low side to ground.	L18	Adjust for maximum 38kHz response.

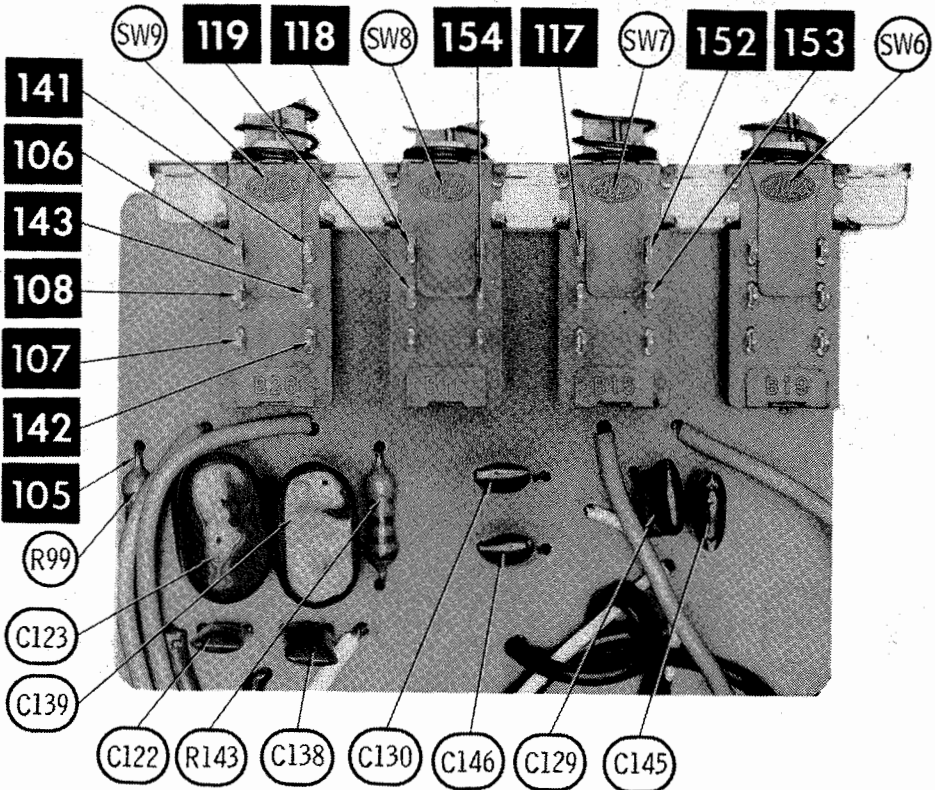
TRAP: Connect Scope and Signal Generator from Point B to ground. Adjust L5 for MINIMUM at 10.7MHz.

STEREO THRESHOLD (R7)

Tune in a weak stereo station and adjust R7 for best stereo reception.

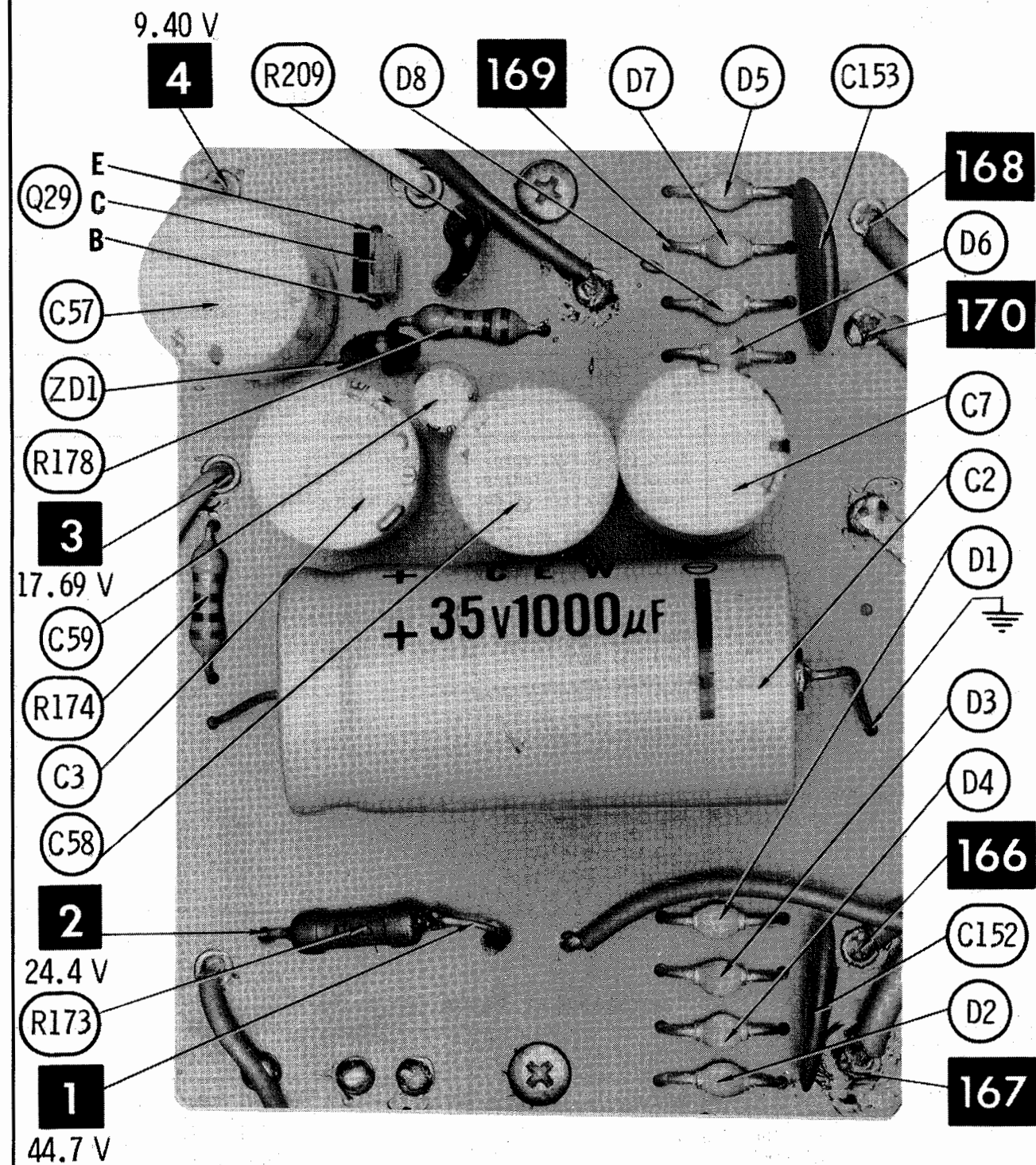
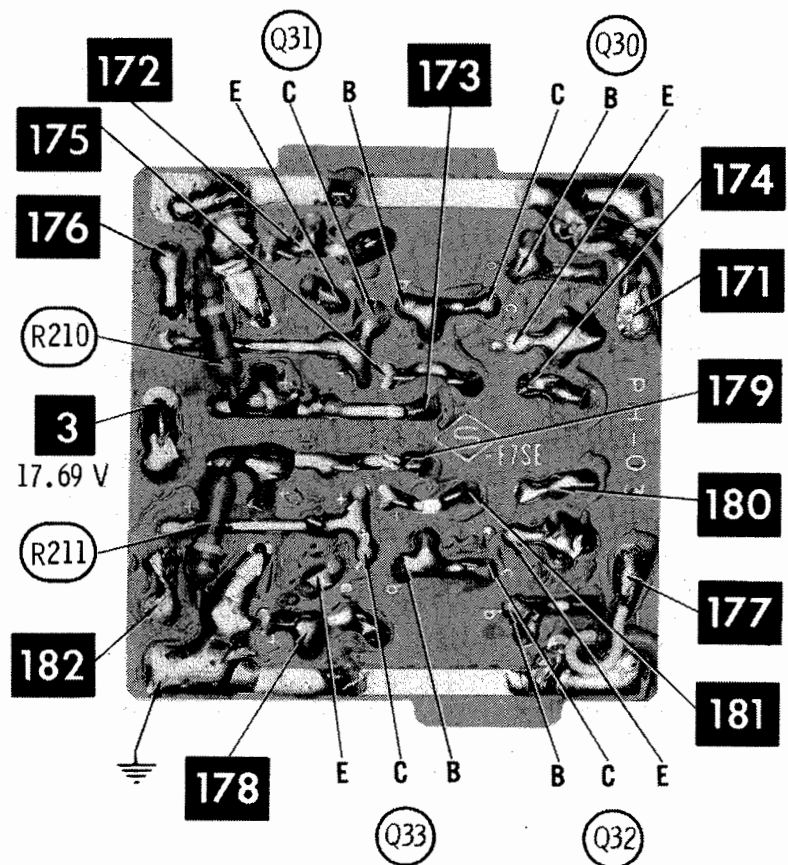
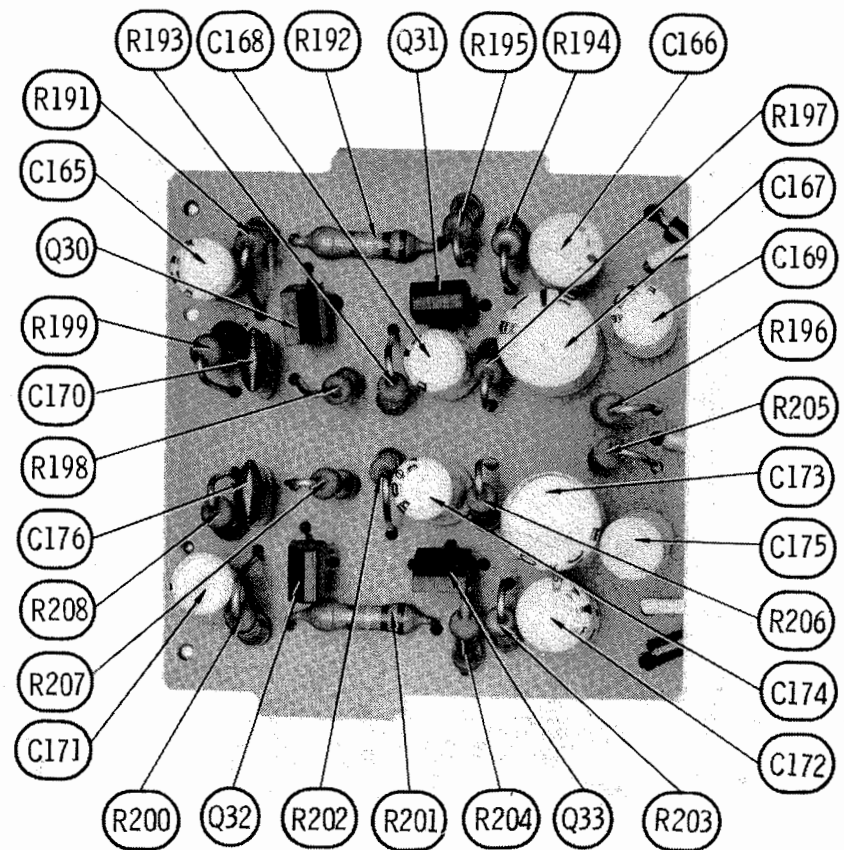
BIAS ADJUST (R3, R4, R5, R6)

With no signal, adjust R3 (R4) for 1.39 V at base of Q15 (Q24). Adjust R5 (R6) for 22.1 V at base of Q18 (Q27).



WELTRON
MODEL 2005

FOLDER 4



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.

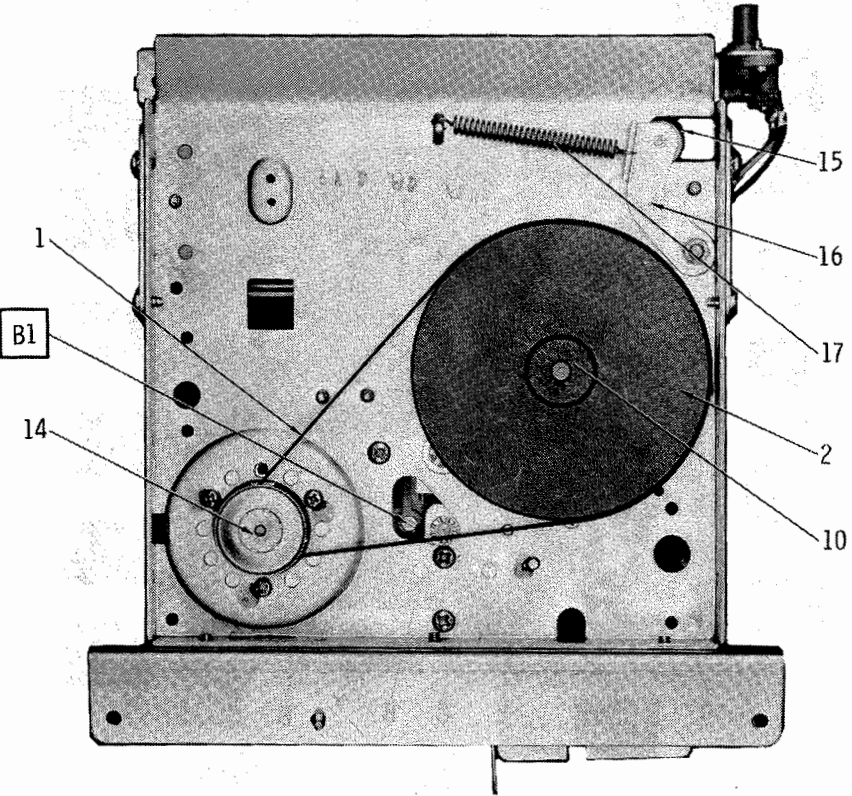
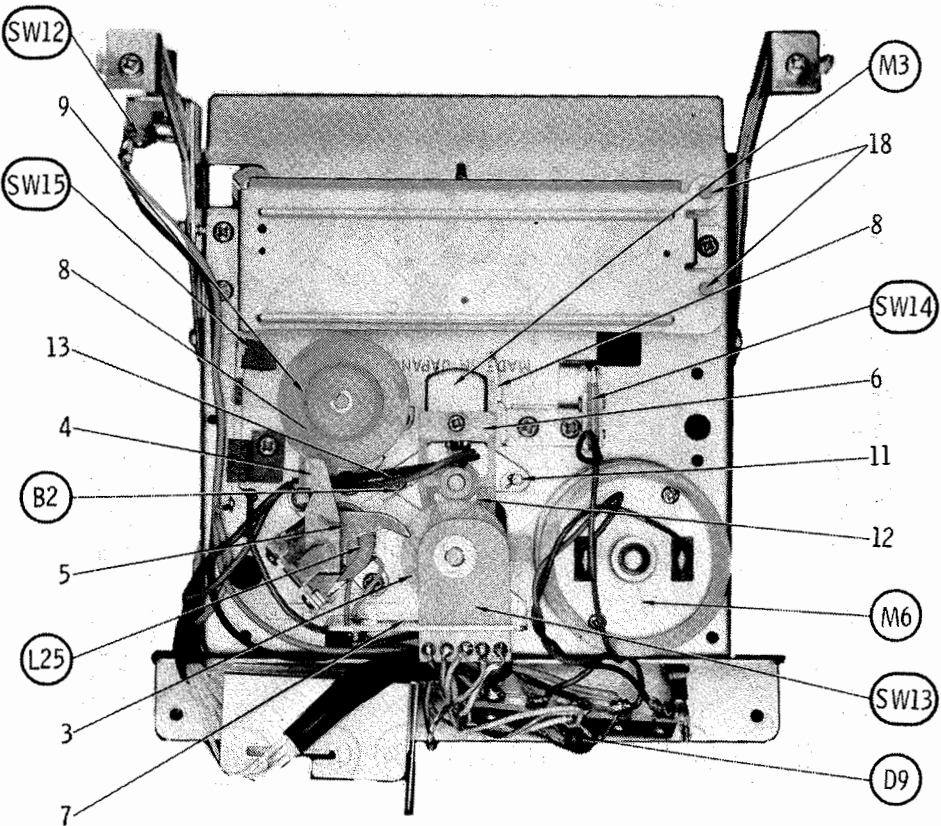
TROUBLE CHART

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 (SW13) dirty Cam (3) binding or worn. Pawl (4) worn. Arm (6) binding. Solenoid (L25) defective or not supplied with power. Cartridge defective. Pawl (5) worn.
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*	*	Flywheel Drive Belt *	10		Flywheel Housing Assembly
2		Flywheel	11		Head Shift Plate
3		Track Changing Cam	12		Head Shift Plate Spring
4		Push Pawl	13		Azimuth Spring
5		Pull Pawl	14		Motor Pulley
6		Head Mounting Arm	15		Lock Lever Roller
7		Track Changing Cam Spring	16		Lock Lever
8		Tape Guide	17		Lock Lever Spring
9		Track Change Actuator Cam	18		Cartridge Roller (2 used)

* Flywheel Drive Belt -- E-V/GAME Replacement No. 1407-77.



WELTRON
MODEL 2005

FOLDER 4