

CABINET-REAR VIEW
DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

Remove all knobs and disconnect antenna leads. Remove six screws holding rear cover, slide rear cover back, disconnect power supply and remove cabinet back.

Disconnect CRT socket, HV anode lead and remove yoke. Disconnect ground wires. Remove three nuts holding tuner assembly and remove tuner assembly. Remove two screws holding control assembly.

Slide printed circuit board slightly out of cabinet. Disconnect speaker wires and remove printed circuit board control and tuner assemblies from cabinet.

PICTURE TUBE REMOVAL

Follow "Chassis Removal" procedure and lay set face down on a soft protective surface. Loosen tension band and remove four screws holding corner brackets and lift picture tube from cabinet. Do not lift picture tube by the neck.

SERVICING IN THE FIELD

CRT IMPLOSION PROTECTION AND CLEANING

Implosion protection is an integral part of the picture tube, cleaning accomplished without CRT removal.

FUSE DEVICES

A .4-amp fuse is used for low-voltage power-supply protection. (See photo, Cabinet-Rear View.)

A .5-amp fuse is used for AC line protection. (See photo, Chassis-Top View.)

VHF TUNER

Set fine tuning at the center of its range and adjust oscillator slug (one for each channel) for best sound and picture.

HORIZONTAL OSCILLATOR

Adjustment of the horizontal hold is accomplished by the proper setting of the horizontal hold coil. (See photo, Cabinet-Rear View.)

AGC

The AGC may be varied by an AGC control. (See Transistor Placement Chart.)

CENTERING

Centering is accomplished by proper adjustment of two magnetic rings located on the yoke rear cover.

SET 1398 FOLDER 3

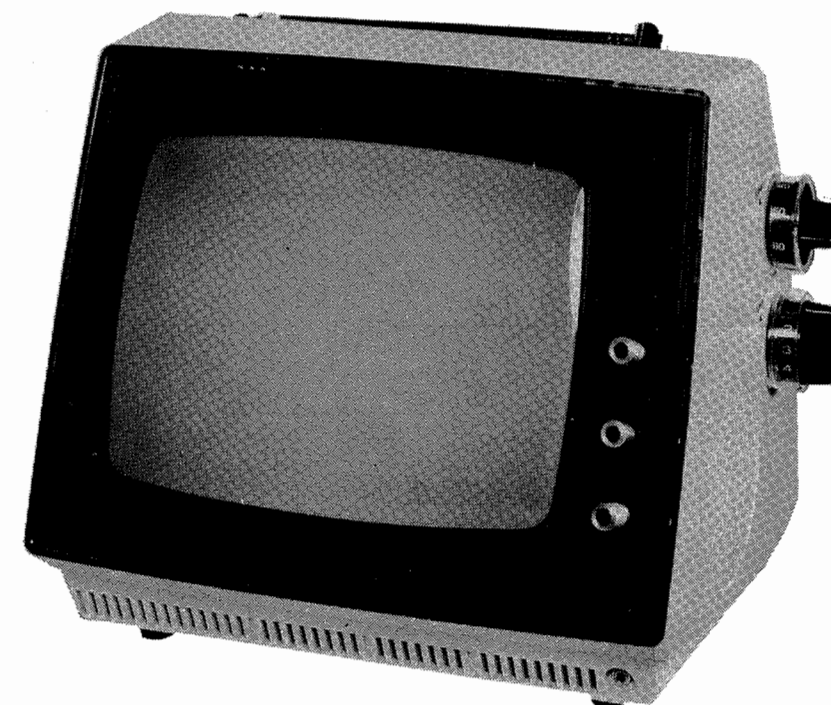
TOSHIBA MODEL
TO921 (Ch. TAT-6014)

PHOTOFACT® Folder

with **CIRCUITRACE**

For Supplier Address See PHOTOFACT Index

**TOSHIBA MODEL
TO921 (Ch. TAT-6014)**



TOSHIBA MODEL
TO921 (Ch. TAT-6014)

SET 1398 FOLDER 3

SAFETY PRECAUTIONS

Make sure line voltage does not exceed rating of set. Check high-voltage regulation and adjust to correct value.

Be sure shields and rear cover are in place and secure.

Beware of shock from high voltage or AC line. Discharge high voltage to HV cage only.

Use extreme care when handling picture tube. Do not bump, scratch, or exert undue strain.

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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. 4PC978

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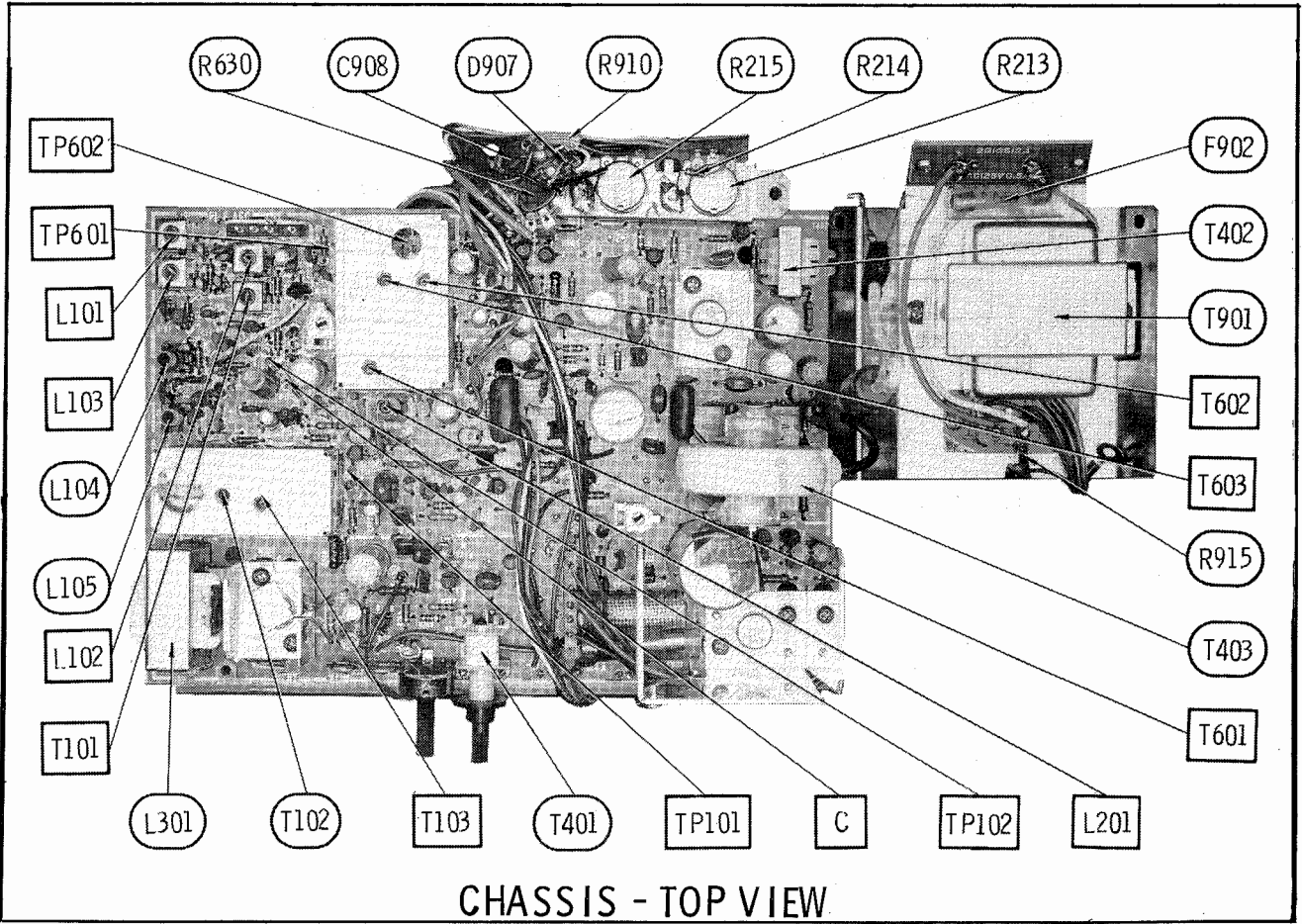
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SET 1398 FOLDER 3

RESISTANCE MEASUREMENTS

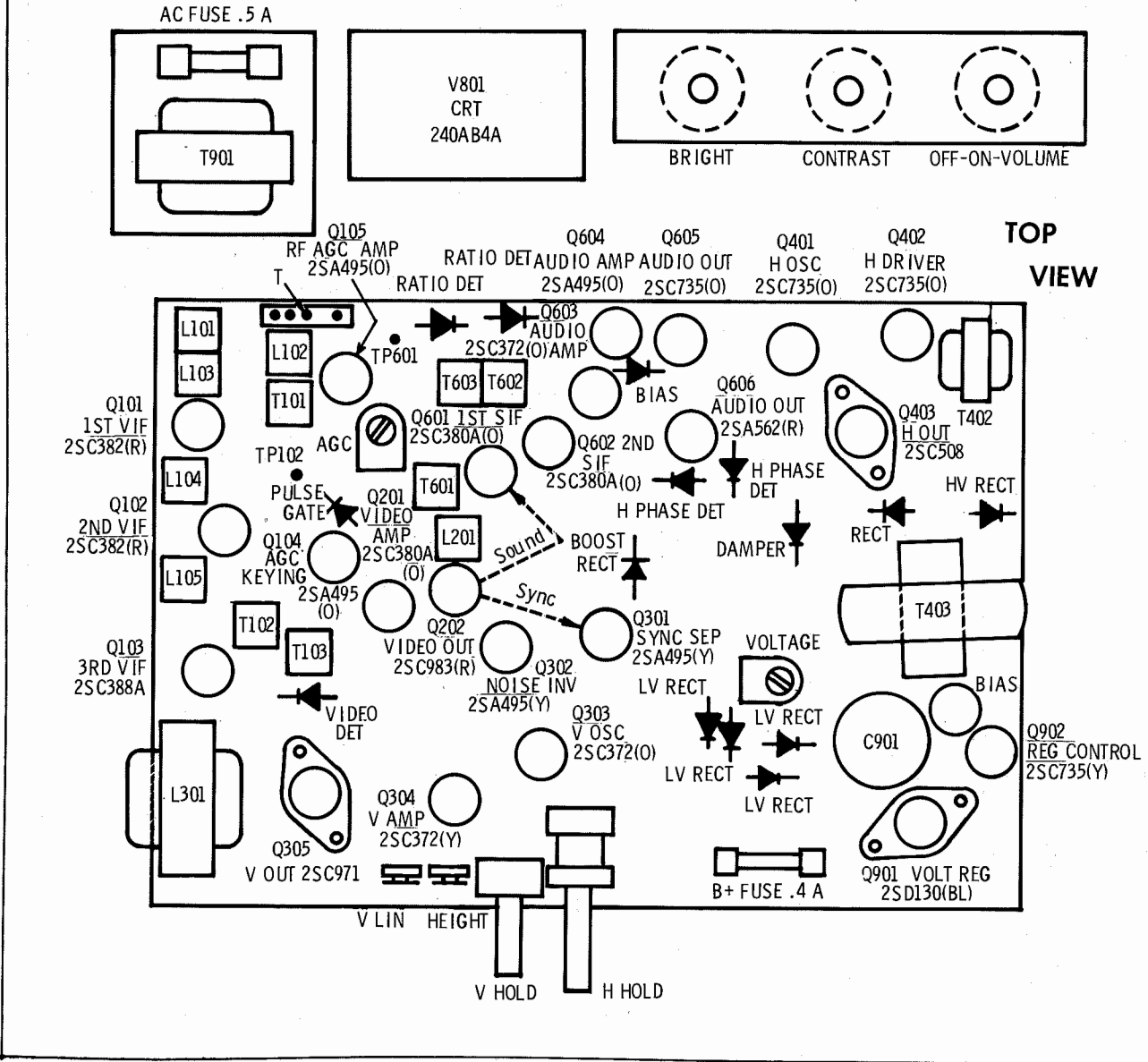
ITEM	PIN 1	PIN 2	PIN 3	PIN 4	PIN 5	PIN 6	PIN 7	PIN 8	PIN 9	PIN 10	PIN 11	PIN 12	PIN 13
V801	NC	220 K	100 Ω	75 Ω	10 K	140 K	0 Ω						
MEASUREMENTS BELOW TAKEN WITH METER HAVING .08V MAX BETWEEN PROBE TIPS													
ITEM	E	B	C		ITEM	E	B	C		ITEM	E	B	C
					Q301	120 Ω	36 K	1700 Ω		Q601	0 Ω	470 Ω	3000 Ω
Q101	180 Ω	6800 Ω	450 Ω		Q302	120 Ω	10 K	4600 Ω		Q602	2670 Ω	3000 Ω	450 Ω
Q102	680 Ω	1700 Ω	120 Ω		Q303	0 Ω	50 K	22 K		Q603	INF ■	40 K	3400 Ω
Q103	330 Ω	2200 Ω	120 Ω		Q304	560 Ω	22 K	300 Ω		Q604	120 Ω	3400 Ω	4 meg ■
Q104	250 Ω	1500 Ω	30 meg ■		Q305	2.2 Ω	560 Ω	120 Ω		Q605	INF ■	4 meg ■	120 Ω
Q105	300 Ω	450 Ω	3000 Ω		Q401	40 Ω	15 K	650 Ω		Q606	INF ■	750 Ω	0 Ω
Q201	470 Ω	3200 Ω	120 Ω		Q402	0 Ω	190 Ω	120 Ω		Q901	120 Ω	INF ■	135 Ω
Q202	628 Ω	470 Ω	150 K		Q403	0 Ω	.4 Ω	INF ■		Q902	0 Ω	300 ▲	INF ■

▲ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
■ READING DEPENDS UPON POLARITY OF METER CONNECTIONS.



CHASSIS - TOP VIEW

TRANSISTOR PLACEMENT CHART



TV ALIGNMENT INSTRUCTIONS

Use an isolation transformer, or observe polarity, and maintain voltage at 120VAC.
Allow a 20-minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: GC ELECTRONICS
L101,L102,L103,L201,T101,T103,T601,T602,T603.....9440
VHF IF Output.....9296,9297,9300

VIDEO IF ALIGNMENT

Set the channel selector to highest unused channel. Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection. Use only enough generator output to provide a usable indication. Note: Response may vary slightly from that shown. Connect a +2.2 volt bias to TP102, low side to ground. (On Board) Remove white lead from point C.

CONNECT SCOPE	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	REMARKS
Vertical input to TP101, low side to ground. (On Board)	Thru .001mfd to TP102, on VHF tuner, low side to ground.	44MHz (10MHz Sweep)	39.75MHz 41.25MHz 47.25MHz	Adjust L103 for minimum. Adjust L101 for minimum. Adjust L102 for minimum. Figure 1
"	"	"	39.75MHz 41.25MHz 42.17MHz 44.00MHz 45.75MHz 47.25MHz	Adjust T101 for maximum 44.00MHz. Adjust T103 for proper tilt. Adjust VHF IF output coil for maximum 44.00MHz, affects overall response. Figure 2

4.5MHz TRAP ALIGNMENT

Tune in a strong TV signal and set the contrast at maximum. Adjust the fine tuning until a beat pattern is visible on the screen. Adjust L201 for MINIMUM beat interference.

SOUND IF ALIGNMENT

Temporarily connect two 100K resistors in series from TP601 to ground (used for alignment only). Select any non-interfering channel.

SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CONNECT VTVM	REMARKS
Thru .01mfd to TP101, low side to ground.	4.5MHz (Unmod)	DC probe to TP601, low side to ground.	Adjust T602 and T601 for maximum.
"	"	DC probe to junction of 100 K resistors, low side to TP602.	Adjust T603 A positive or negative reading will be obtained on either side of the correct setting. Remove the two 100K alignment resistors.

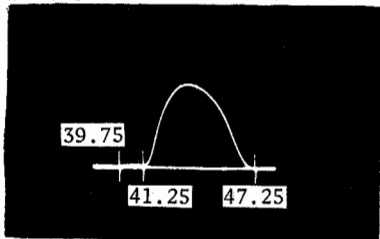


FIGURE 1

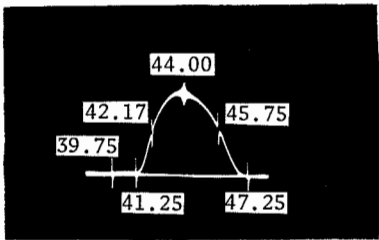
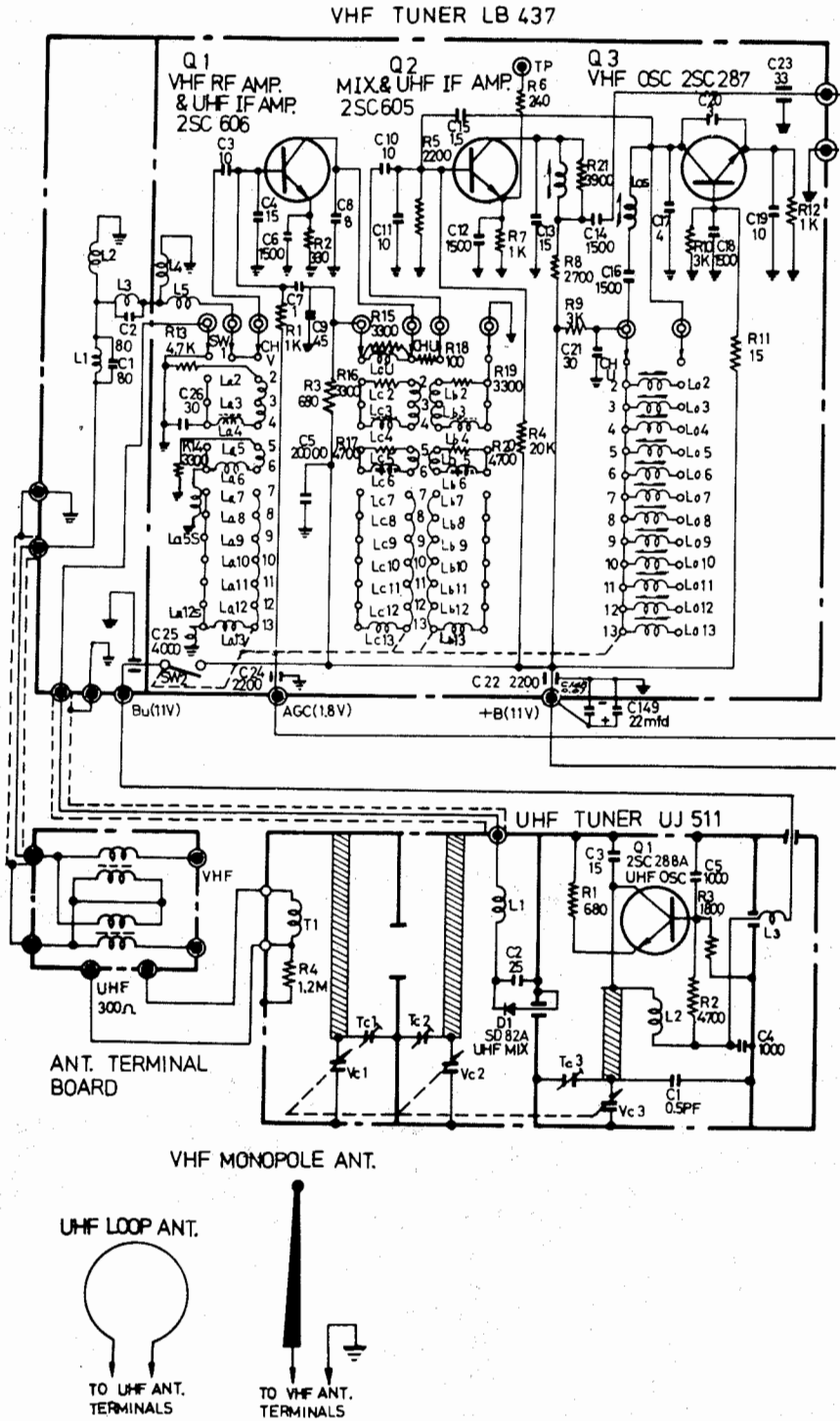


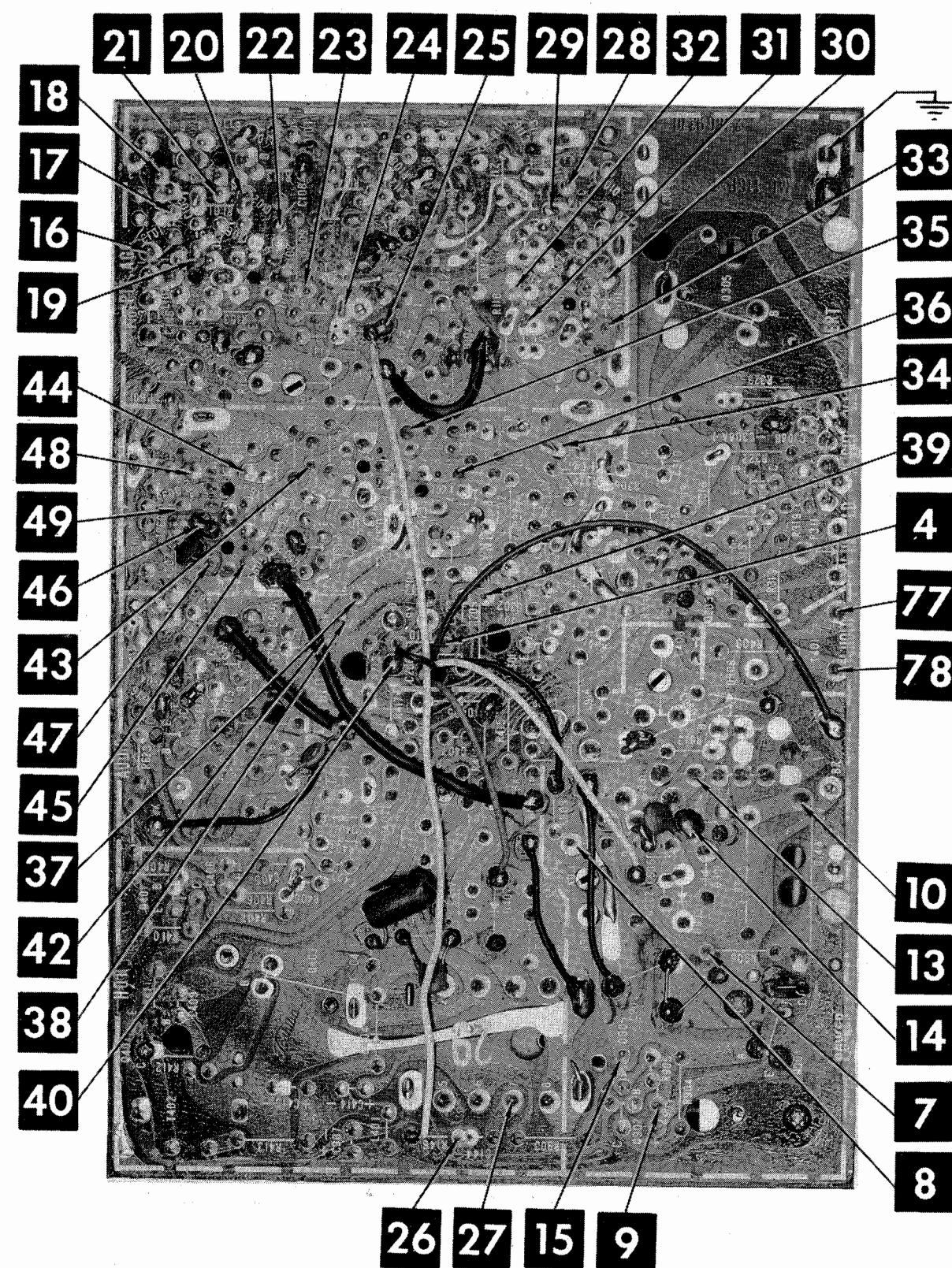
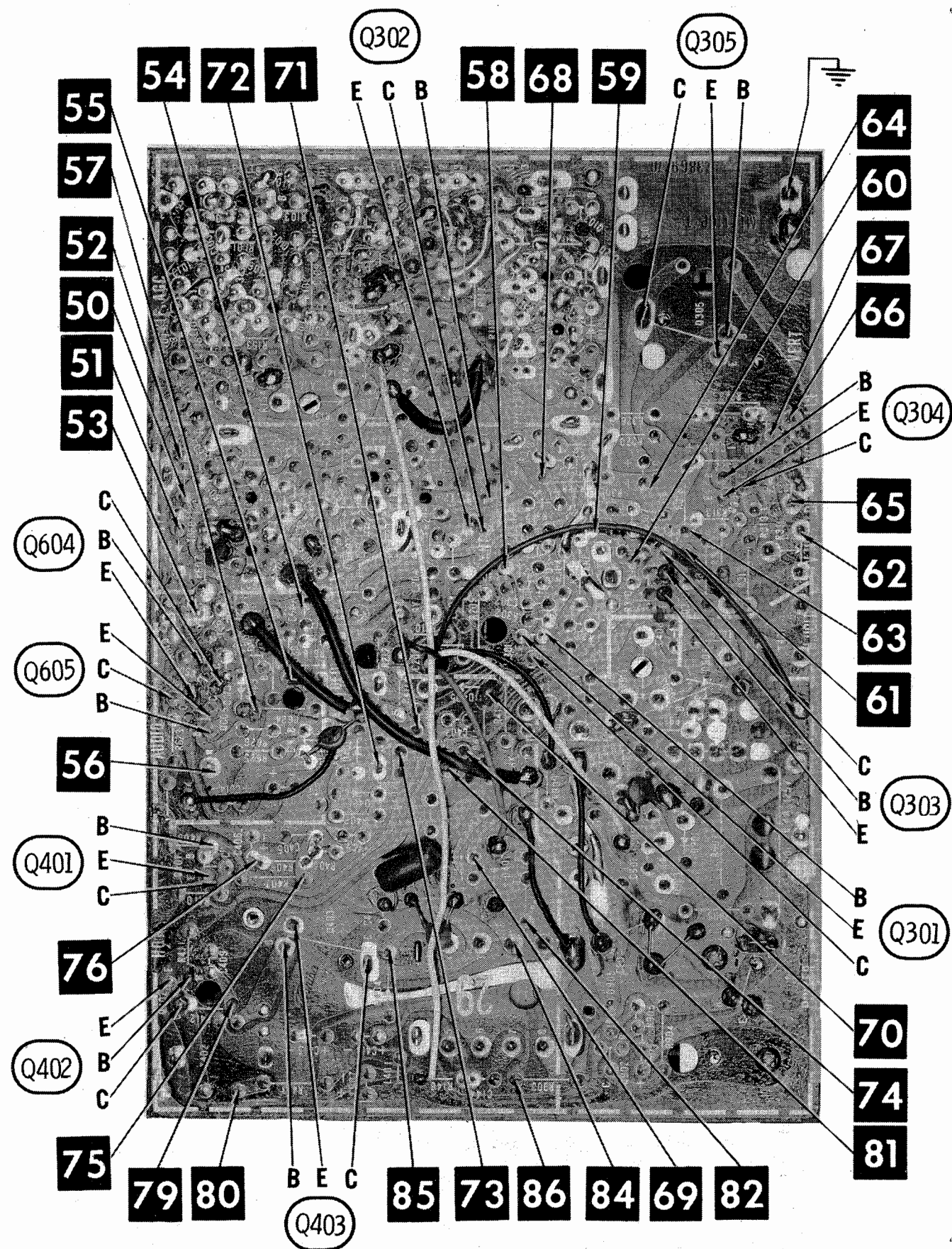
FIGURE 2

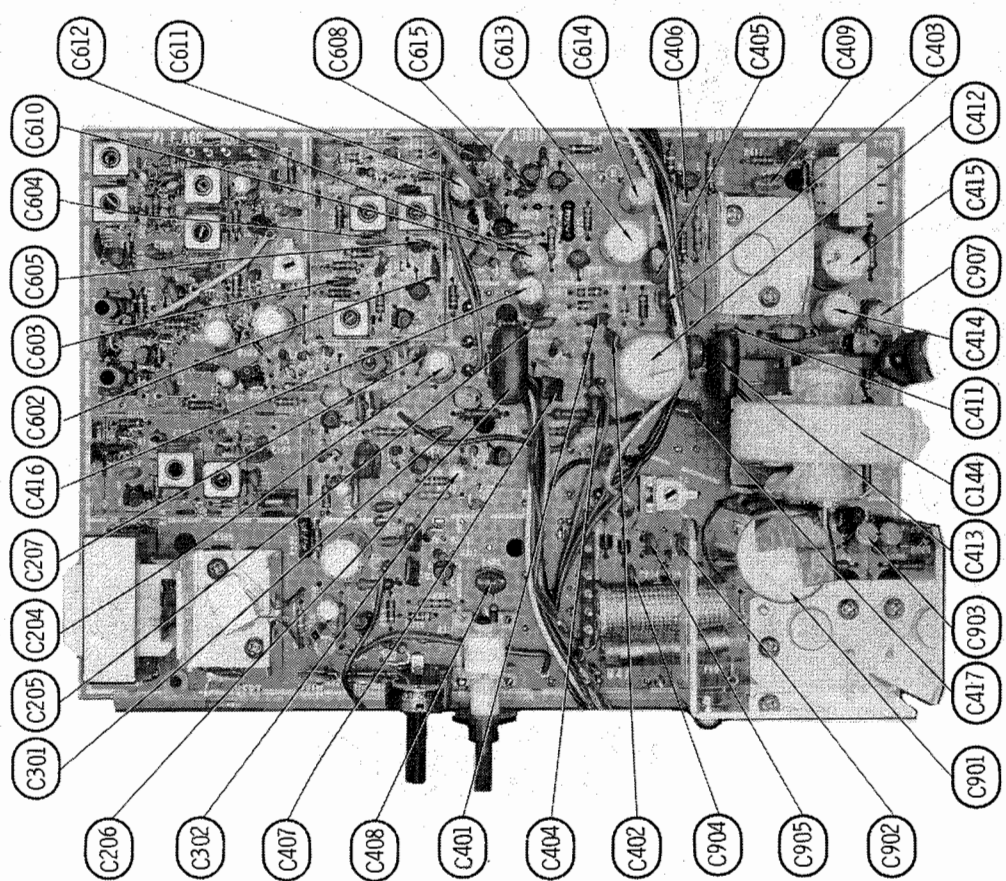
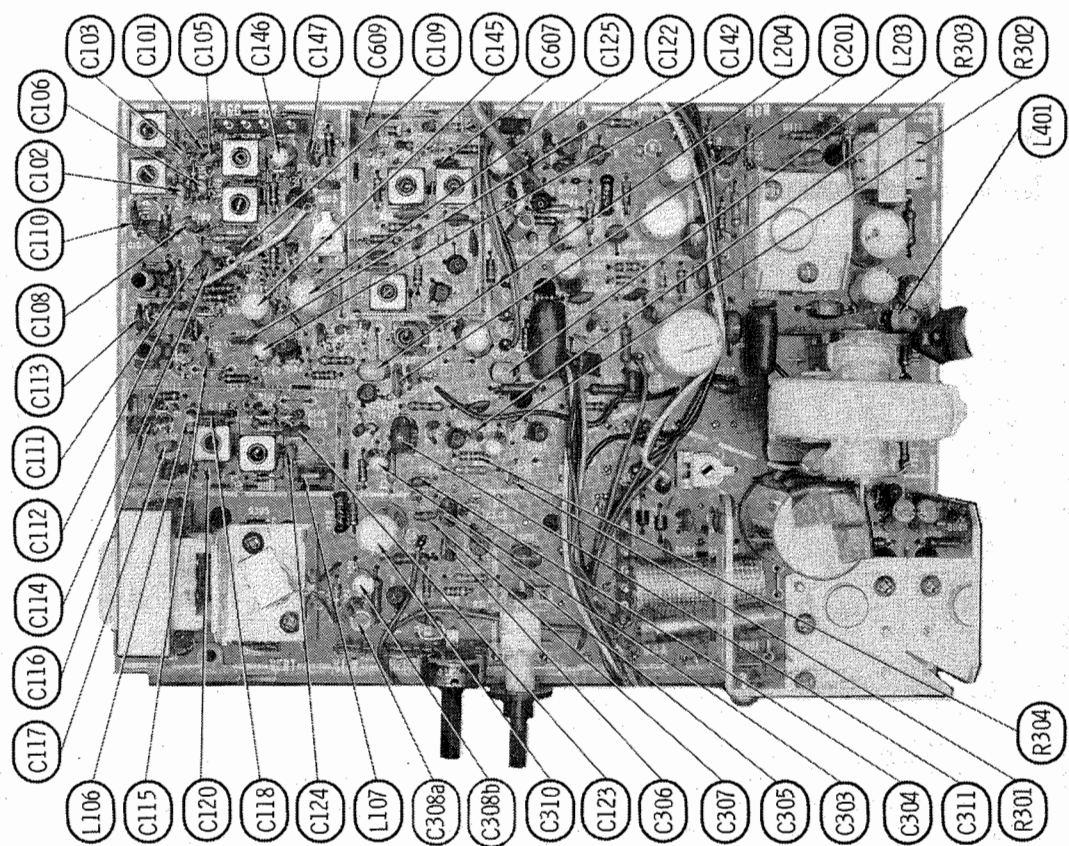
B+ ADJUSTMENT

Connect VTVM to emitter of Q901, low side to ground. Adjust R907 for +12 V \pm .5 V @ 120VAC.

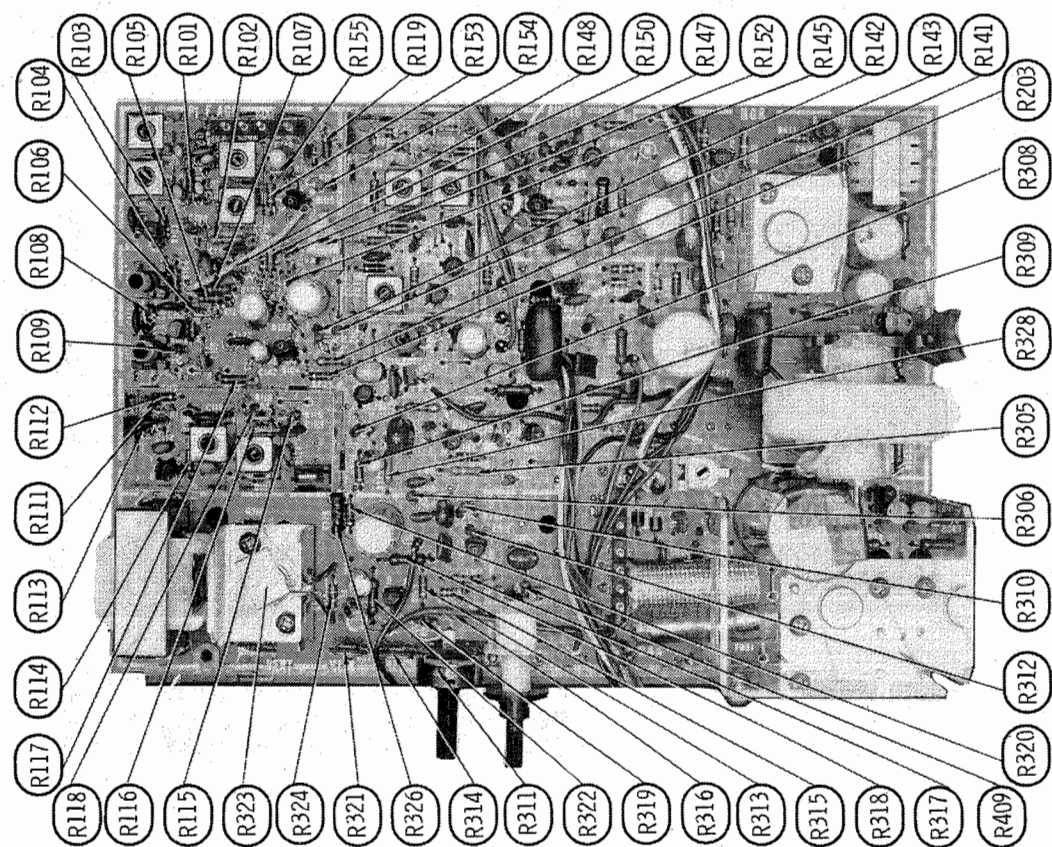
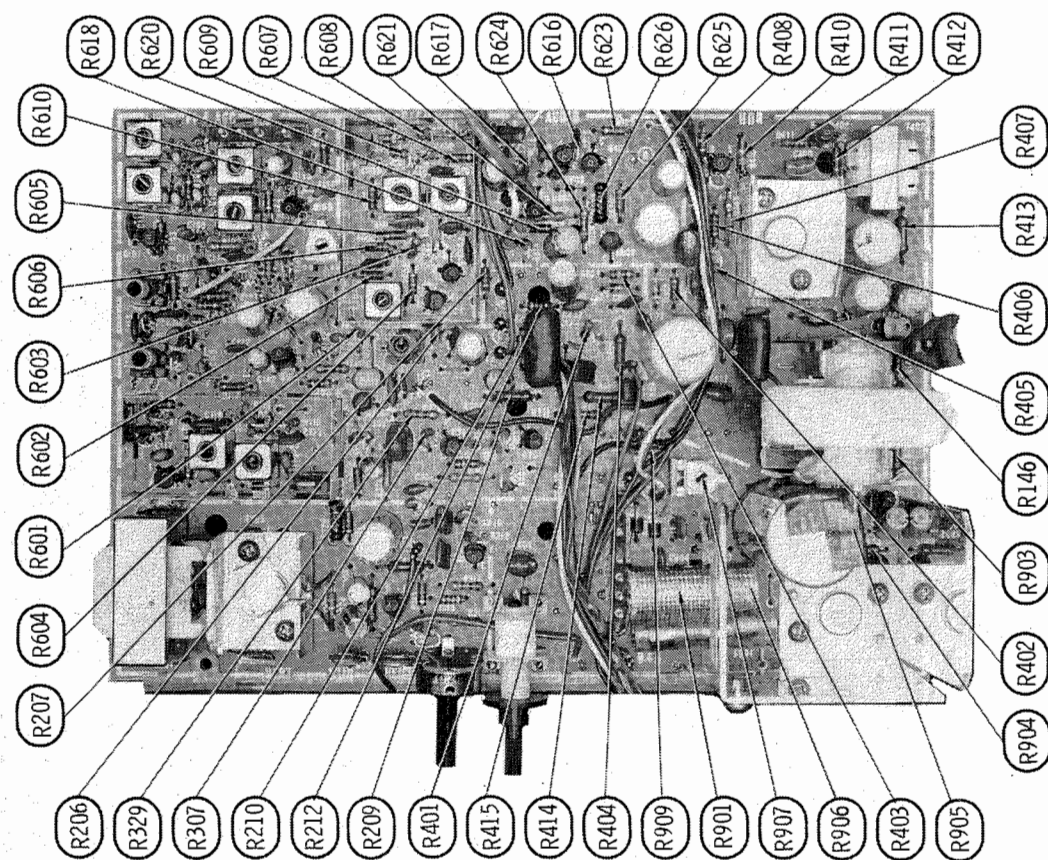


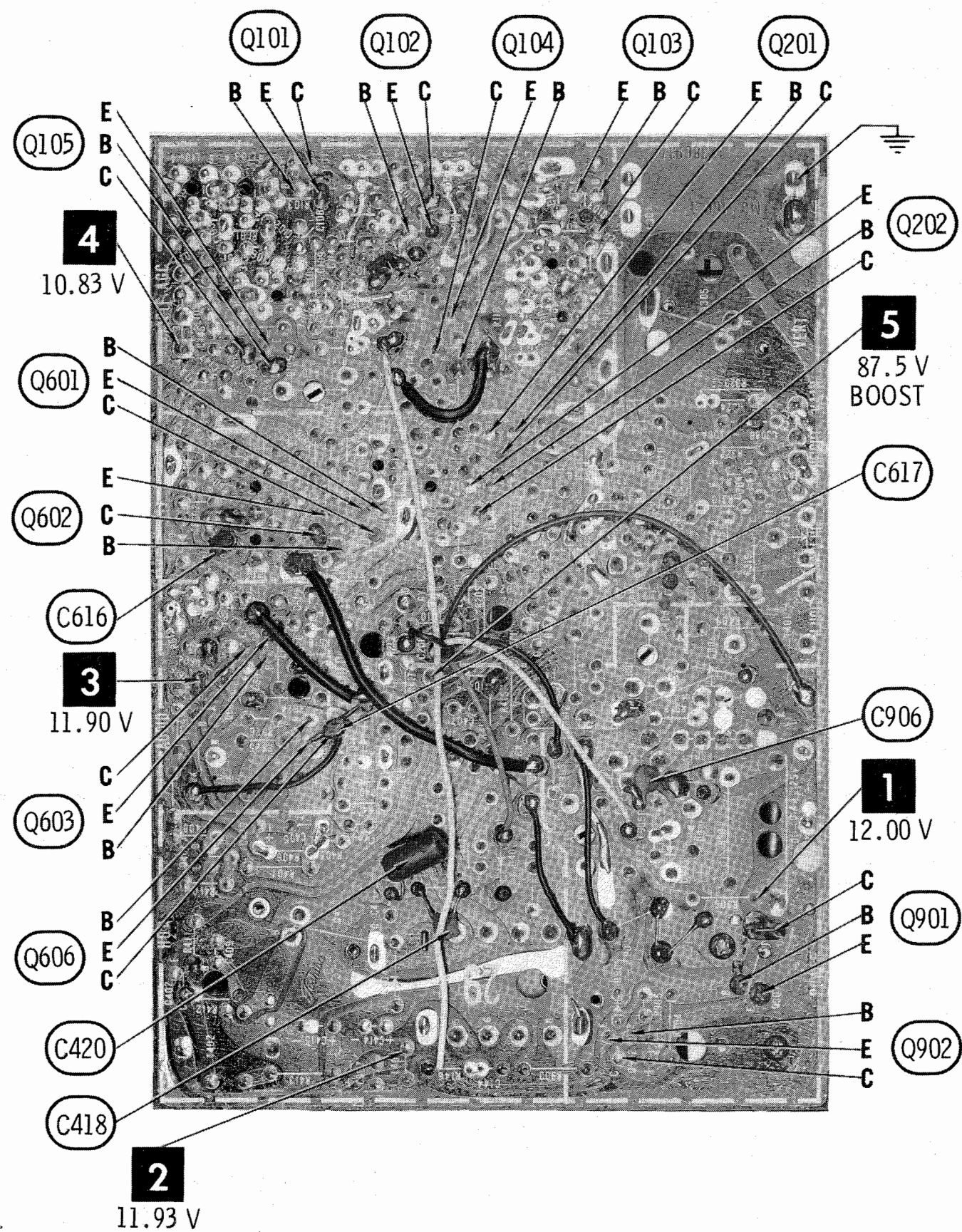
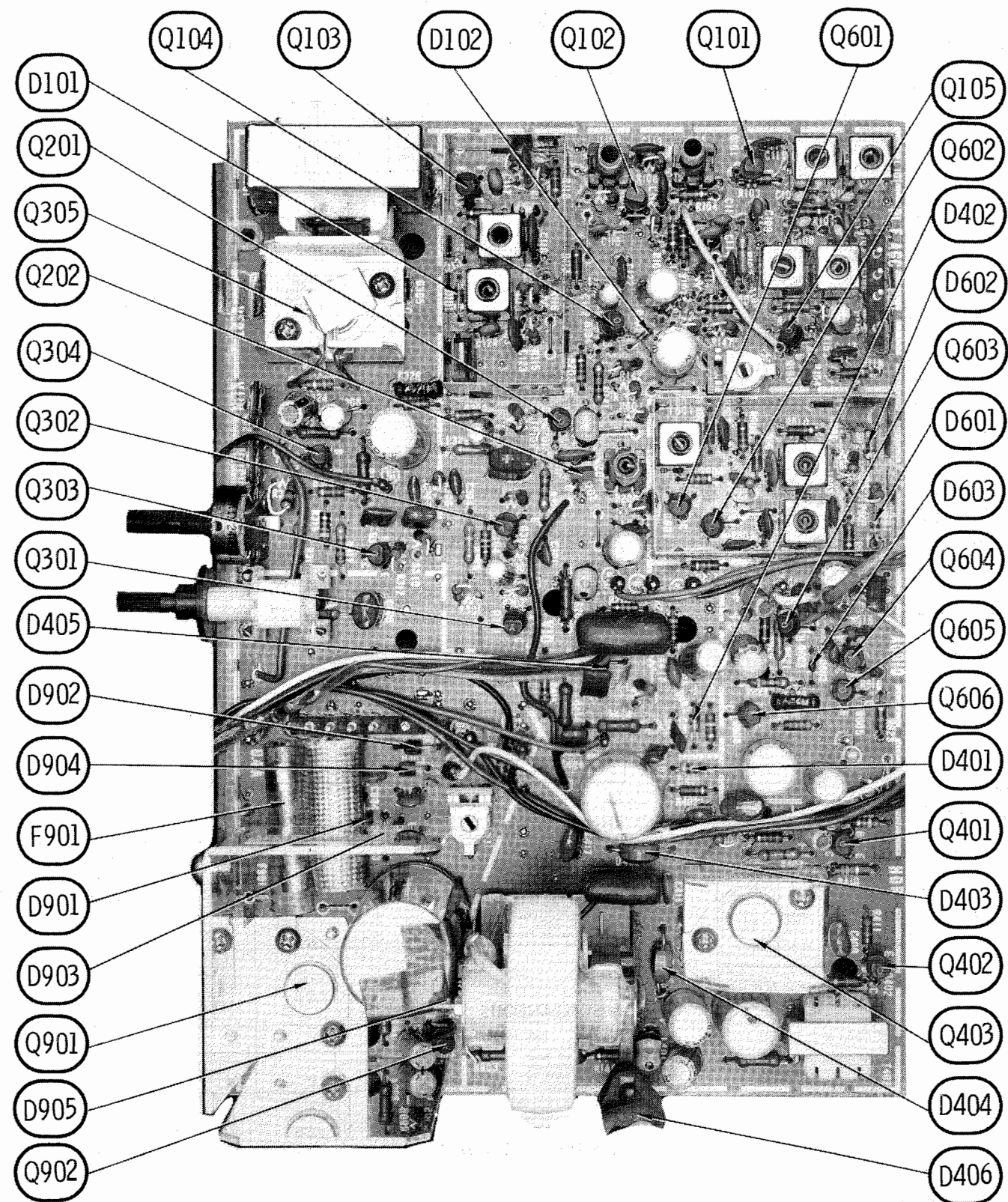
Courtesy of the Manufacturer





MAIN BOARD





MAIN BOARD

A Howard W. Sams CIRCUITRACE® Photo

PARTS LIST AND DESCRIPTION

(When ordering parts, state Model, Part Number, and Description.)

Replacement parts shown may be superseded by the availability of newly introduced replacements.
Have your local distributor check Sams COUNTER FACTS® for the most up-to-date replacement.

PICTURE TUBE

ITEM No.	REPLACEMENT DATA				NOTES
	MFGR. PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SYLVANIA PART No.	
V801	240AB4A				

SEMICONDUCTORS

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.	
D101	1N60	1N60	1N60	PTC206	HEP135	SK3088		ECG 109	
D102	1S1555	GE-300	D200	PTC214	HEPR0602	SK3100		ECG 177	
D401	1N60	1N60 (7)	1N60 (7)	PTC206 (7)	HEP135 (7)	SK3088 (7)		ECG 110 (6)	
D402	1N60								
D403	F6-2N	GE-511	D172	PTC216	HEPR3012	SK3130		ECG 506	
D404	F6-2Na	GE-504A	804 or 5A40	PTC201 or PTC202	HEPR0052	SK3030 or SK3031	RT213 or RT214	ECG 116 or ECG 117	
D405	8B-4	GE-504A	804 or 5A40	PTC201 or PTC202	HEPR0052	SK3030 or SK3031	RT213 or RT214	ECG 116 or ECG 117	
D406	US15/1b								
D601	1N60	1N60 (7)	1N60 (7)	PTC206 (7)	HEP135 (7)	SK3088 (7)		ECG 110 (6)	
D602	1N60								
D603	S3016R								
D901	1002	GE-504A	804 or 5A40	PTC201 or PTC202	HEPR0052	SK3030 or SK3031	RT213 or RT214	ECG 116 or ECG 117	
	1S1885 (1)	GE-504A	804 or 5A40	PTC201 or PTC202	HEPR0052	SK3030 or SK3031	RT213 or RT214	ECG 116 or ECG 117	
D902	1002	GE-504A	804 or 5A40	PTC201 or PTC202	HEPR0052	SK3030 or SK3031	RT213 or RT214	ECG 116 or ECG 117	
	1S1885 (1)	GE-504A	804 or 5A40	PTC201 or PTC202	HEPR0052	SK3030 or SK3031	RT213 or RT214	ECG 116 or ECG 117	
D903	1002	GE-504A	804 or 5A40	PTC201 or PTC202	HEPR0052	SK3030 or SK3031	RT213 or RT214	ECG 116 or ECG 117	
	1S1885 (1)	GE-504A	804 or 5A40	PTC201 or PTC202	HEPR0052	SK3030 or SK3031	RT213 or RT214	ECG 116 or ECG 117	
D904	1002	GE-504A	804 or 5A40	PTC201 or PTC202	HEPR0052	SK3030 or SK3031	RT213 or RT214	ECG 116 or ECG 117	
	1S1885 (1)	GE-504A	804 or 5A40	PTC201 or PTC202	HEPR0052	SK3030 or SK3031	RT213 or RT214	ECG 116 or ECG 117	
D905	1S1717 (12 V Zener)	GE-504A	Z-1212	PTC201 or PTC202	HEPR0052	SK3030 or SK3031	RT213 or RT214	ECG 116 or ECG 117	
D907	1002	GE-504A	804 or 5A40	PTC201 or PTC202	HEPR0052	SK3030 or SK3031	RT213 or RT214	ECG 116 or ECG 117	
	1S1885 (1)	GE-504A	804 or 5A40	PTC201 or PTC202	HEPR0052	SK3030 or SK3031	RT213 or RT214	ECG 116 or ECG 117	
Q101	25C382(R,BN)	GE-61	TR-33	PTC132	HEP56	SK3018	RT108	ECG 107	
Q102	25C382(R,BN)	GE-61	TR-33	PTC132	HEP56	SK3018	RT108	ECG 107	
Q103	25C388A	GE-61	TR-33	PTC121	HEP734	SK3018	RT108	ECG 107	
Q104	25A495(O)	GE-21	TR-30	PTC103	HEP52	SK3114	RT115	ECG 159	
Q105	25A495(O,R)	GE-21	TR-30	PTC103	HEP52	SK3114	RT115	ECG 159	
Q201	25C380A(O,R)	GE-20	TR-24	PTC136	HEP56	SK3018	RT108	ECG 107	
Q202	25C383(O,R,S)	GE-18	TR-32	PTC117	HEP712	SK3044	RT110	ECG 171	
Q301	25A495(Y)	GE-21	TR-30	PTC103	HEP52	SK3118	RT115	ECG 159	
Q302	25A495(Y)	GE-21	TR-30	PTC103	HEP52	SK3118	RT115	ECG 159	
Q303	25C372(O)	GE-20	TR-24	PTC139	HEP55	SK3018	RT102	ECG 123A	
Q304	25C372(Y)	GE-20	TR-24	PTC139	HEP55	SK3018	RT102	ECG 123A	
Q305	25C735(O)	GE-10	TR-24	PTC136	HEP53	SK3124	RT102	ECG 123A	
Q401	25C735(O)	GE-10	TR-24	PTC136	HEP53	SK3124	RT102	ECG 123A	
Q402	25C735(O)	GE-10	TR-24	PTC136	HEP53	SK3124	RT102	ECG 123A	
Q403	25C508	GE-45	TR-81	PTC112	HEP241	SK3026	RT128	ECG 175	
Q601	25C380A(O)	GE-20	TR-24	PTC136	HEP56	SK3018	RT108	ECG 107	
Q602	25C380A(O)	GE-20	TR-24	PTC136	HEP56	SK3018	RT108	ECG 107	
Q603	25C372(O,Y)	GE-21	TR-30	PTC103	HEP52	SK3118	RT115	ECG 159	
Q604	25A495(O,Y)	GE-21	TR-30	PTC103	HEP52	SK3118	RT115	ECG 159	
Q605	25C735(O,Y)	GE-63 (9)	TR-24 (9)	PTC143 (9)	HEP33002 (9)	SK3024 (9)	RT128 (9)	ECG 128 (9)	
Q606	25A552(O,R)	GE-69 (9)	TR-39 (9)	PTC143 (9)	HEP33003 (9)	SK3025 (9)	RT128 (9)	ECG 128 (9)	
Q901	250130(BL,Y)	GE-23	TR-57	PTC112	HEP703	SK3026	RT128	ECG 175	
Q902	25C735(Y)	GE-10	TR-24	PTC136	HEP53	SK3124	RT102	ECG 123A	

- (1) Used in some versions.
(6) Matched Pair.
(7) Two required - select matched pair.
(9) Complementary Pair.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING	REPLACEMENT DATA					
		MFGR. PART No.	ARCO PART No.	CENTRALAB PART No.	CORNEILL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.
C125	220 16 V	ME-6-E-200	EA15-250	PC200-16	MTV2000E15	EV-1240	
C142	22 10 V	ME-2-E-020	EP15-25	PC20-50	VTT22A16	EV-1224	
C145	22 16 V	ME-2-E-020	EP15-25	PC20-50	VTT22A16	EV-1224	
C146	22 10 V	ME-2-E-020	EP15-25	PC20-50	VTT22A16	EV-1224	
C149	22 16 V	ME-2-E-020	EP15-25	PC20-50	VTT22A16	EV-1224	
C204	100 6.3 V	RME-E-0-100	EP15-100	PC100-10	MTV100C810	EV-1130	
C302	47 50 V			WBR1-500	TDC474MOS0EL	EV-1610	
C303	47 50 V			WBR1-500	TDC474MOS0EL	EV-1610	
C308A	2.2 16 V 10%	RME-A-E-002	EP15-2	WBR2-50	VTT2R2A50	EV-1317	
C308B	2.2 16 V 10%	RME-A-E-002	EP15-2	WBR2-50	VTT2R2A50	EV-1317	
C310	330 16 V	ME-8-E-250	EA15-250	WBR300-35	MTA300G50	EV-1245	
C406	3.3 35 V	ME-2-J-003		WBR-500	TVS033	EV-1618	
C412	3.3 25 V NP			TCN503A	TVAN-1302.1	EV-1240	
C414	220 16 V	ME-6-E-200	EA15-250	PC200-16	MTV2000E15	EV-1240	
C415	470 16 V	RME-L-E-500	EA15-500	PC500-16	MTV5000N15	EV-1250	
C416	1 160 V	ME-3-R-001		WBR1-500	TT250X18	TV-1434	
C603	10 10 V	RME-A-D-010	EP15-10	PC10-25	VTT10A25	EV-1222	
C610	10 10 V	RME-A-D-010	EP15-10	PC10-25	VTT10A25	EV-1222	
C611	47 16 V	RME-E-E-050	EP15-50	PC50-16	MTV50C815	EV-1226	
C612	47 10 V	RME-D-0-050	EP15-50	PC50-16	MTV50C815	EV-1226	
C613	330 16 V	ME-8-E-250	EA15-250	WBR300-35	MTA300G50	EV-1245	
C614	100 10 V	RME-E-0-100	EP15-100	PC100-10	MTV100C810	EV-1130	
C901	3000 25 V			TC50300	TV-1214	EV-1224	
C903	22 16 V	ME-2-E-020	EP15-25	PC20-50	VTT22A16	EV-1224	
C907	47 16 V	RME-E-E-050	EP15-50	PC50-16	MTV50C815	EV-1226	

CAPACITORS

ITEM No.	RATING	MFGR. PART No.	REPLACEMENT DATA				
			ARCO/ELMENDO PART No.	CENTRALAB PART No.	CORNEILL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.
C101	56	5%	CCD-560	DD-560		GP456	10TS-Q56
C102	10	N220	*			*	10TCR-Q10
C103	12	N220 5%	*			*	10TCR-Q12
C105	5	N220	*			*	10TCR-150
C106	5	N220	*			*	10TCR-450
C108	15		CCD-150	DTZ-15	NP015	CN0415	10TCC-Q15
C109	.01		CCD-103	DD-103	GP10000	JF110	10TS-S10
C110	.01		CCD-103	DD-103	GP10000	JF110	10TS-S10
C111	33	5%	CCD-330	DTZ-33	NP033	CN0433	10TS-S10
C112	.01		CCD-103	DD-103	GP10000	JF110	10TS-S10
C113	.01		CCD-103	DD-103	GP10000	JF110	10TS-S10
C114	68	5%		DTZ-68		CN0468	10TCC-068
C115	27	5%	CCD-270	DD-103	NP027	CN0427	10TCC-Q27
C116	.01		CCD-103	DD-103	GP10000	JF110	10TS-S10
C117	2			DTZ-282	NP0222	CN0522	10TCC-282
C118	.022		CCD-203	DD-203		GP120	10TS-S20
C120	2.5						
C122	.01		CCD-103	DD-103	GP10000	JF110	10TS-S10
C123	.01		CCD-103	DD-103	GP10000	JF110	10TS-S10
C124	10	5%	CCD-100	DTZ-10	NP010	CN0410	10TCC-010
C144	.022 50 V	10%	10P-1-223		DPMS6522	EMF1A122	22SP22391W03
C147	.0047		CCD-472	DD-4726	GP4700	JF247	10TS-047
C148	.01		CCD-103	DD-103	GP10000	JF110	10TS-S10
C201	220	5%	CCD-221	DD-221	GP220	GP322	10TS-T22
C205	.1, .001	10%	CCD-102	DD-102	GP1000	GP210	10TS-010
C206	.1 200 V	10%	20P-3-104		DPMS2P1	EMF2010	2PS-P10
C207	.0015	10%	60P-1-152		CPR-1500J	DPMS6015	6PS-D15
C210	.01						
C301	560	10%	CCD-561	DD-561	GP560	GP356	10TS-T56
C304	.022 50 V	10%	10P-1-223		DPMS6522	EMF1A122	22SP22391W03
C305	.047 50 V	10%	10P-2-473		DPMS6547	EMF1A147	22SP47391W03
C306	.022	10%	40P-2-223		DPMS6522	EMF1A122	4PS-S22
C307	.022 50 V	10%	10P-1-223		DPMS6522	EMF1A122	22SP22391W03
C309	.039 200 V	10%	40P-3-393		DPMS6539	PVC6139	19SP39392
C311	.1 50 V	10%	10P-2-104		DPMS2P1	EMF1A010	22SP10491W03
C401	.0033	10%	60P-1-332		DPMS6033	GP5-033	6PS-033
C402	.0027	10%	60P-1-272		CPR-2700J	DPMS6027	PVC16227
C403	.022 50 V	10%	10P-1-223		DPMS6522	EMF1A122	22SP22391W03
C404	.022 50 V	10%	10P-1-223		DPMS6522	EMF1A122	22SP22391W03
C405	.1 50 V	10%	10P-2-104		DPMS2P1	EMF1A010	22SP10491W03
C407	.022 50 V	10%	10P-1-223		DPMS6522	EMF1A122	22SP22391W03
C408	.068 50 V	5%	40P-3-683		DPMS6568	EMF1A168	4PS-S68
C409	.056 50 V	5%	10P-2-563		DPMS6556	EMF1A156	22SP56391W03
C411	390	10%	CCD-391	DD-391	GP390	GP339	10TS-T39
C413	.039 200	10%	40P-3-393		DPMS6539	PVC6139	19SP39392
C417	.047 50 V	10%	10P-2-473		DPMS6547	EMF1A147	22SP47391W03
C418	470	10%	CCD-471	DD-471	GP470	GP347	10TS-T47
C420	.015 200 V	10%	40P-1-153		DPMS6515	EMF1A115	4PS-S15
C602	.01		CCD-103	DD-103	GP10000	JF110	10TS-S10
C603	.01		CCD-103	DD-103	GP10000	JF110	10TS-S10
C604	56	N470 5%					
C605	.01		CCD-103	DD-103	GP10000	JF110	10TS-056
C607	.01		CCD-103	DD-103	GP10000	JF110	10TS-S10
C608	.0027	10%	60P-1-272		CPR-2700J	PVC16227	6PS-027
C615	.0018	10%	160P-2-182		CPR-1800J	EMF1A218	6PS-D18
C616	.01		CCD-103	DD-103	GP10000	JF110	10TS-S10
C617	.1		CC-104			T4010	T5-P10
C902	.0047		CCD-472	DD-4726	GP4700	JF247	10TS-047
C904	.0047		CCD-472	DD-4726	GP4700	JF247	10TS-047
C905	.0047		CCD-472	DD-4726	GP4700	JF247	10TS-047
C906	.0047		CCD-472	DD-4726	GP4700	JF247	10TS-047
C908	.0047		CCD-472	DD-4726	GP4700	JF247	10TS-047