

PHOTOFACT[®] with CIRCUITRACE[®]

For Supplier Address See PHOTOFACT Index

NOTE

Repair or adjustment of transmitter circuits must be under supervision of a person with first-or second-class radiotelephone license.

(Refer to FCC Rules and Regulations Part 95, Subpart C & D.)

The frequency of the transmitter should be checked periodically with a secondary frequency standard to insure proper and legal operation.

Best results will be obtained when adjusting the final RF output circuit if the antenna normally used is connected and the chassis is as nearly in the cabinet as possible.

Connect either 50-ohm dummy load or the normally used antenna system.



PRESIDENT MODEL WASHINGTON

MODEL Washington

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

© 1977 Howard W. Sams & Co., Inc. Printed in U. S. of America 7CF523

ALIGNMENT INSTRUCTIONS

CAUTION: Use isolation transformer or observe polarity when connecting test equipment. Maintain line voltage at 120V AC. Allow a 15-minute warm-up period. Adjustments made with 13.8-volt DC input. Connect low sides of test equipment to ground unless specified otherwise. Connect 50-ohm dummy load or antenna before keying transmitter.

Suggested Alignment Tools:

GC ELECTRONICS:

L27, L30, L32 5009
L1 thru L8, L16, L17, L24, L37, L39..... 9440
CT1 thru CT7 5000

SYNTHESIZER ALIGNMENT

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Input of RF VTVM to TP6.	Ch. 1, AM Clarifier - Mid Range	L24	Adjust for maximum.
Input of DC meter to TP7.	Ch. 1,	L17	Adjust for 2.0 volts.
Input of RF VTVM to TP8.	Ch. 19	L16	Adjust for maximum.
Input of frequency counter to TP8.	Ch. 19	CT6	Adjust for 34.9850MHz + 20Hz.
Input of frequency counter to TP8.	Ch. 19, USB	CT4	Adjust for 34.9875MHz + 20Hz.
Input of frequency counter to TP8.	Ch. 19, LSB	CT5	Adjust for 34.9825MHz +20Hz.
Input of frequency counter to TP8.	Ch. 19, LSB, Xmit	VR9	Adjust for 34.9825MHz + 20Hz.
Input of frequency counter to TP9.	Ch. 19, USB	CT2	Adjust for 7.8025MHz +5Hz -0Hz.
Input of frequency counter to TP9.	Ch. 19, LSB	CT3	Adjust for 7.7975 +0Hz -5Hz.

RECEIVER ALIGNMENT

Connect an AC VTVM or AF wattmeter across speaker voice coil. Adjust volume control to obtain a suitable indication.

SSB

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Output of signal generator thru .01uF to antenna jack. 27.186MHz, no modulation. Output .25uV.	Ch. 19, USB RF Gain - Max Clarifier - Mid Range Volume - Max.	L8, L7, L6, L5, L4, L3	Adjust for maximum output.
Output of signal generator thru .01uF to antenna jack. 27.186MHz, no modulation. Output .25uV.	Ch. 19	CT1	Adjust for .5 watts audio.

RECEIVER ALIGNMENT

Connect an AC VTVM or AF wattmeter across speaker voice coil. Adjust volume control to obtain a suitable indication.

AM

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Output of signal generator thru .01uF to antenna jack. 23.5MHz, no modulation. Output 200uV. Input of RF VTVM to TP5.	Ch. 19, AM RF Gain - Max. NB-On	L1, L2	Adjust for maximum.

RECEIVER ADJUSTMENTS

Connect an AC VTVM or AF wattmeter across speaker voice coil.
Adjust volume control to obtain a suitable indication.

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Output of signal generator thru .01uF to antenna jack. 27.186MHz, no modulation. Output 250uV.	Ch. 19, USB RF Gain - Max Volume - Max	VR2	RF GAIN RANGE Adjust VR2 for .5 volts audio.
Output of signal generator thru .01uF to antenna jack. 27.186MHz, no modulation. Output 100uV.	Ch. 19	VR1	S METER Adjust for 9 on S scale of meter.
Output of signal generator thru .01uF to antenna jack. 27.186MHz, no modulation. Output 500uV.	Ch. 19	VR3	SQUELCH RANGE Set squelch control VR404 fully clockwise. Adjust VR3 so that squelch just breaks.
Output of signal generator thru .01uF to antenna jack. 27.185MHz, 1000Hz @ 30% No modulation. Output .5uV.	Ch. 19	VR5	AM BALANCE Adjust VR5 for .5 watts audio.

TRANSMITTER ALIGNMENT

Connect an RF wattmeter and 50-ohm, 25-watt dummy load to antenna connector.

NOTE: Be sure to check transmit frequency and power on all active channels after alignment of transmitter.

See Page 4 for channel frequencies.

SSB

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Output of 2-tone generator to Mike input. 500Hz and 2400Hz at .5 volts.	Ch. 19, USB, Mike Gain - Max.	L39, L37, L32, L30	Adjust for maximum.
Output of 2-tone generator to Mike input. 599Hz and 2400Hz at .5 volts.	Ch. 19, LSB	CT7	Adjust CT7 for 11.5 watts.

TRANSMITTER ADJUSTMENTS

Connect an RF wattmeter and 50-ohm, 25-watt dummy load to antenna connector.

NOTE: Be sure to check transmit frequency and power on all active channels after alignment of transmitter.

See Page 4 for channel frequencies.

AM

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Input of spectrum analyzer to antenna jack.	Ch. 19	L27	Adjust for MINIMUM at 54MHz.

TRANSMITTER ADJUSTMENTS

Connect an RF wattmeter and 50-ohm, 25-watt dummy load to antenna connector.

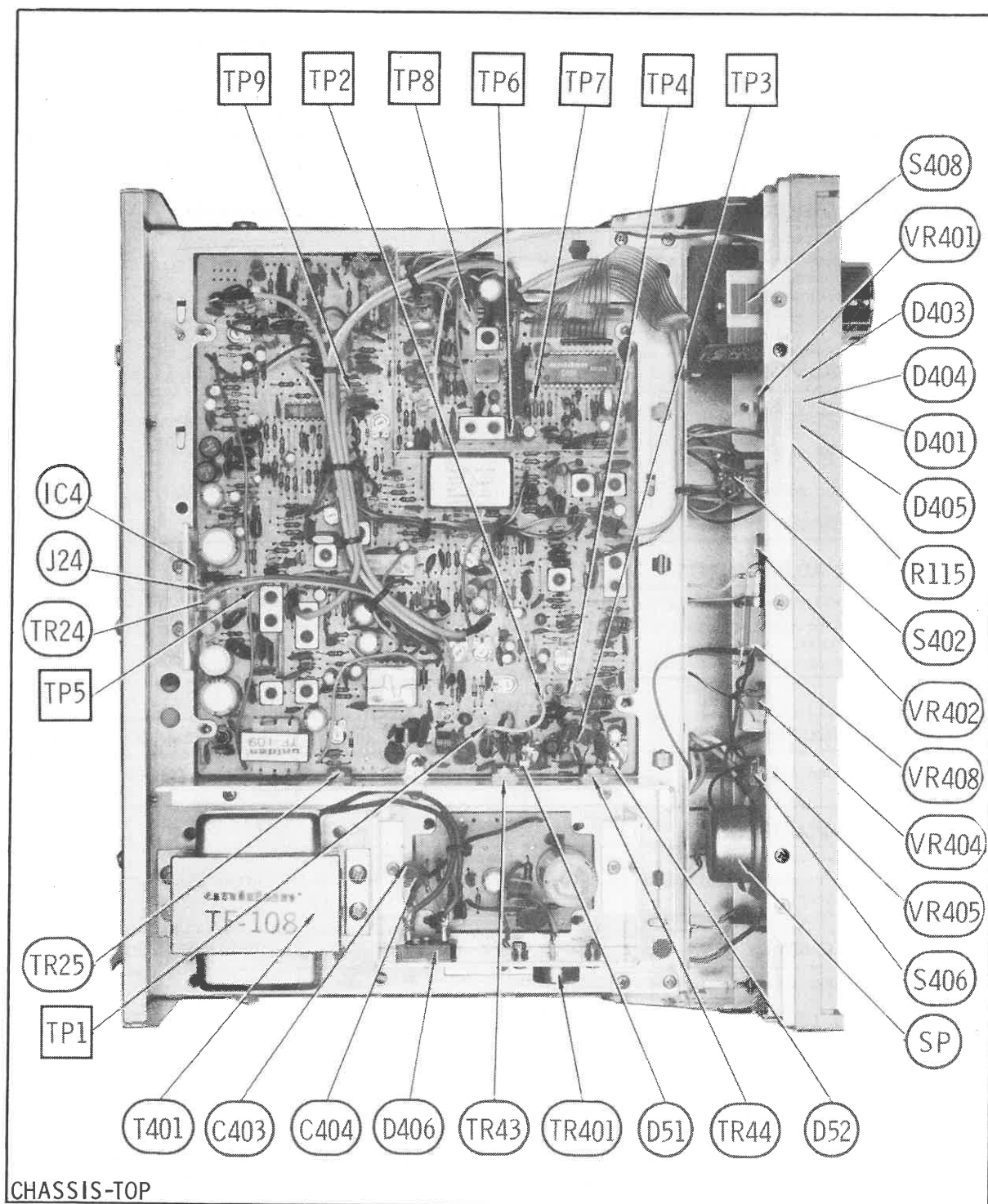
NOTE: Be sure to check transmit frequency and power on all active channels after adjustment of transmitter.

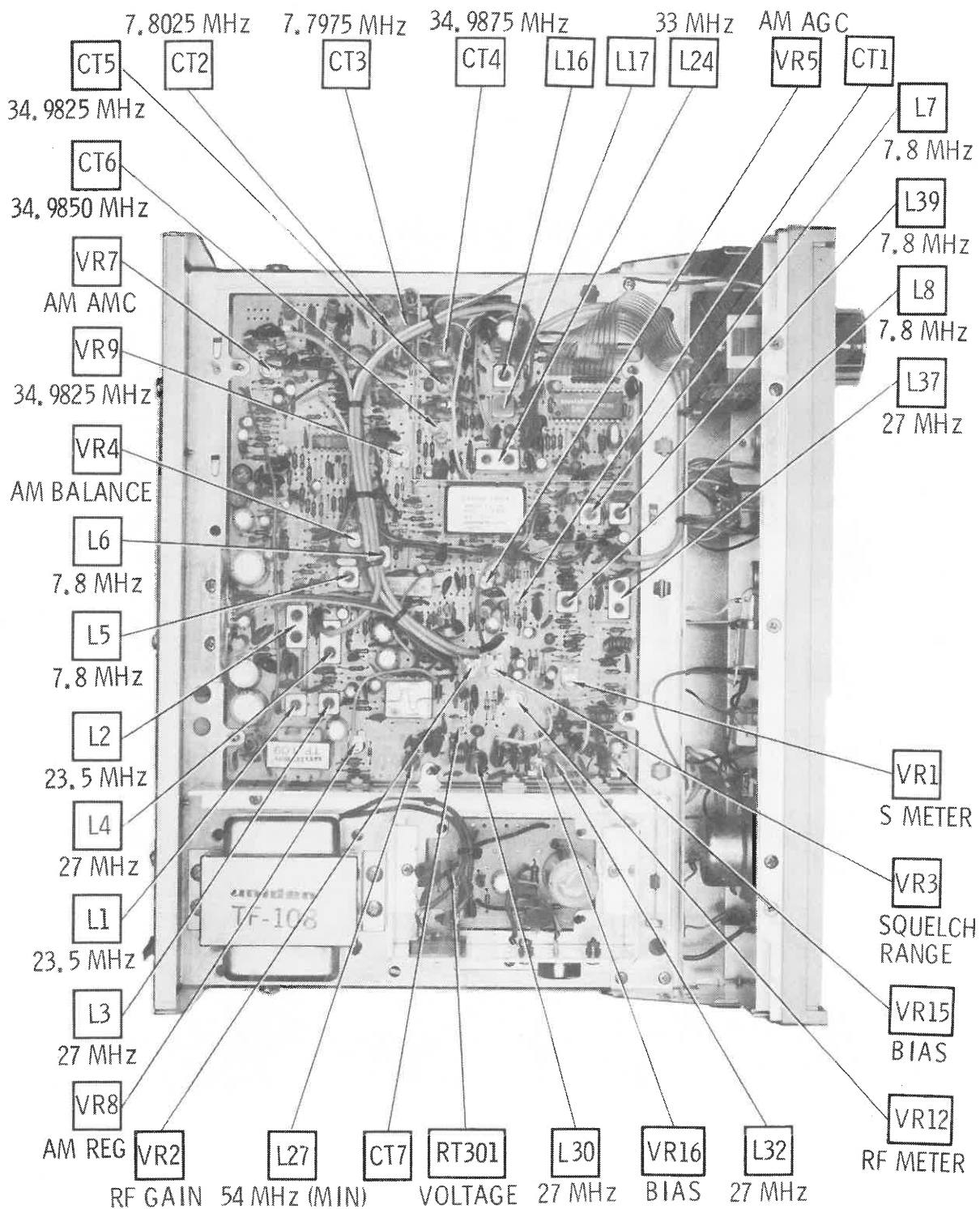
See Page 4 for channel frequencies.

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Input of DC meter to TP10.	Ch. 19	RT301	VOLT REG Voltage should not vary when keying transmitter.
DC current meter to TP3 and TP4. No modulation.	Ch. 19, USB	VR15	BIAS Adjust VR15 for 40mA $\pm$ 10mA
DC current meter to TP1 and TP2. No modulation.	Ch. 19, USB	VR16	BIAS Adjust VR16 for 70mA $\pm$ 10mA.
No Modulation	Ch. 19, USB	VR4	BALANCE Adjust for MINIMUM RF.

TRANSMITTER ADJUSTMENTS (Continued)

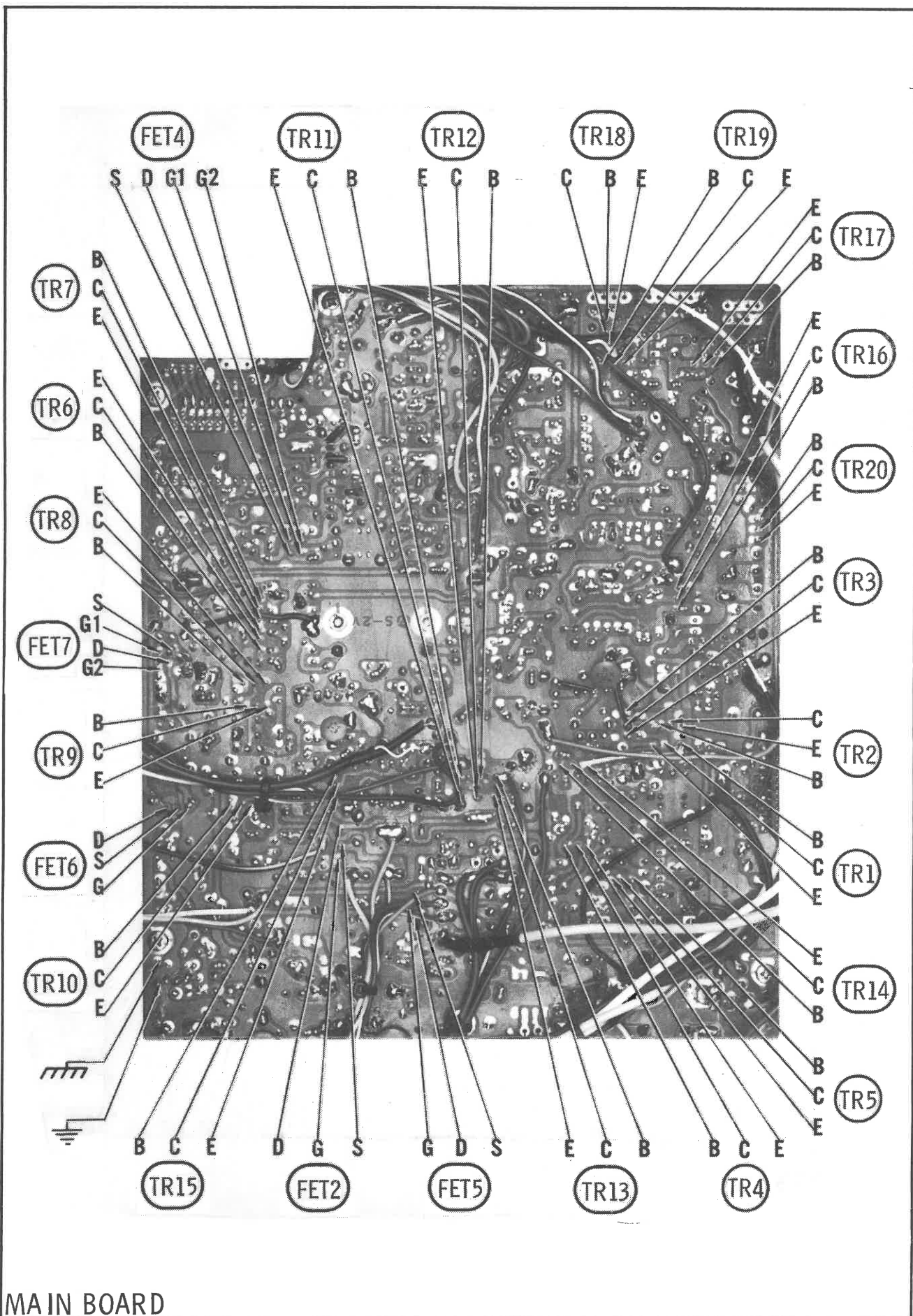
TEST EQUIPMENT	TRANSCIVER	ADJUST	REMARKS
No Modulation	Ch. 19, AM	VR8	AM REG Adjust VR8 for 3.8 watts.
No Modulation	Ch. 19, AM	VR12	RF PANEL METER Adjust VR12 for 3.8 watts on on RF scale of meter.
Modulation meter to antenna jack.	Ch. 19, AM. AMC-MAX	VR7	AM AMC Adjust signal for 50% modulation. Increase signal 630 times. Adjust VR7 for 95% modulation.



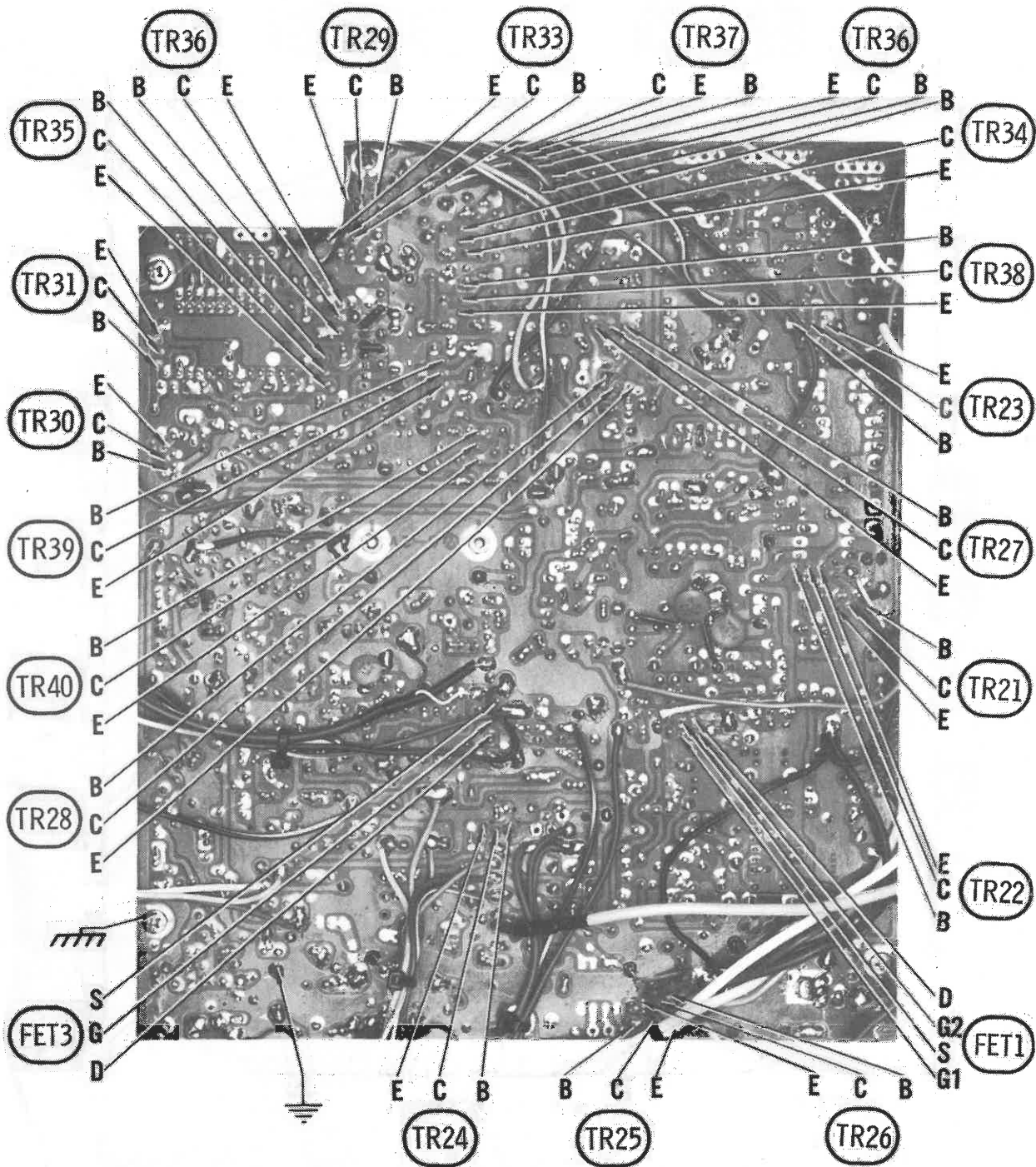


CHASSIS-TOP

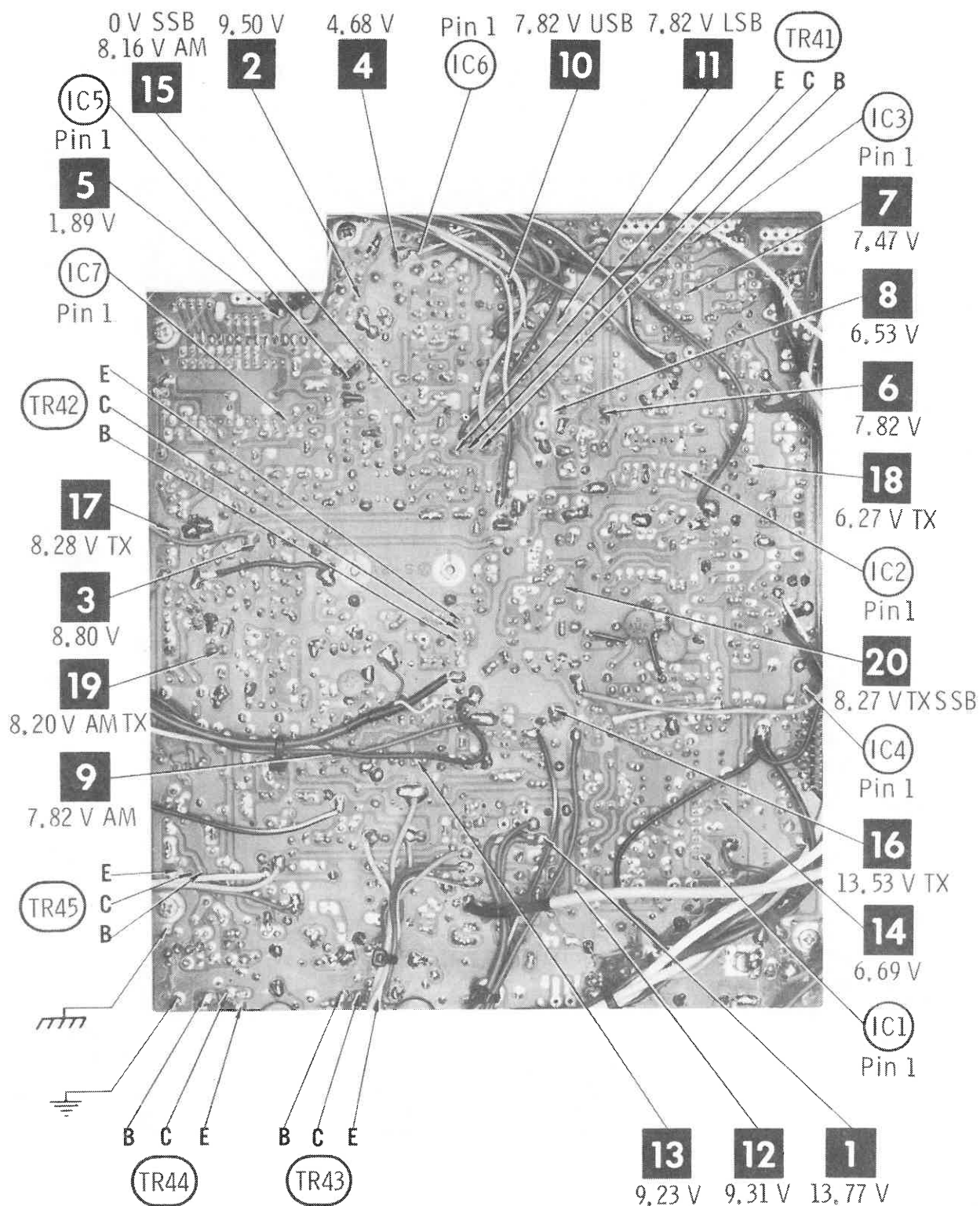




MAIN BOARD

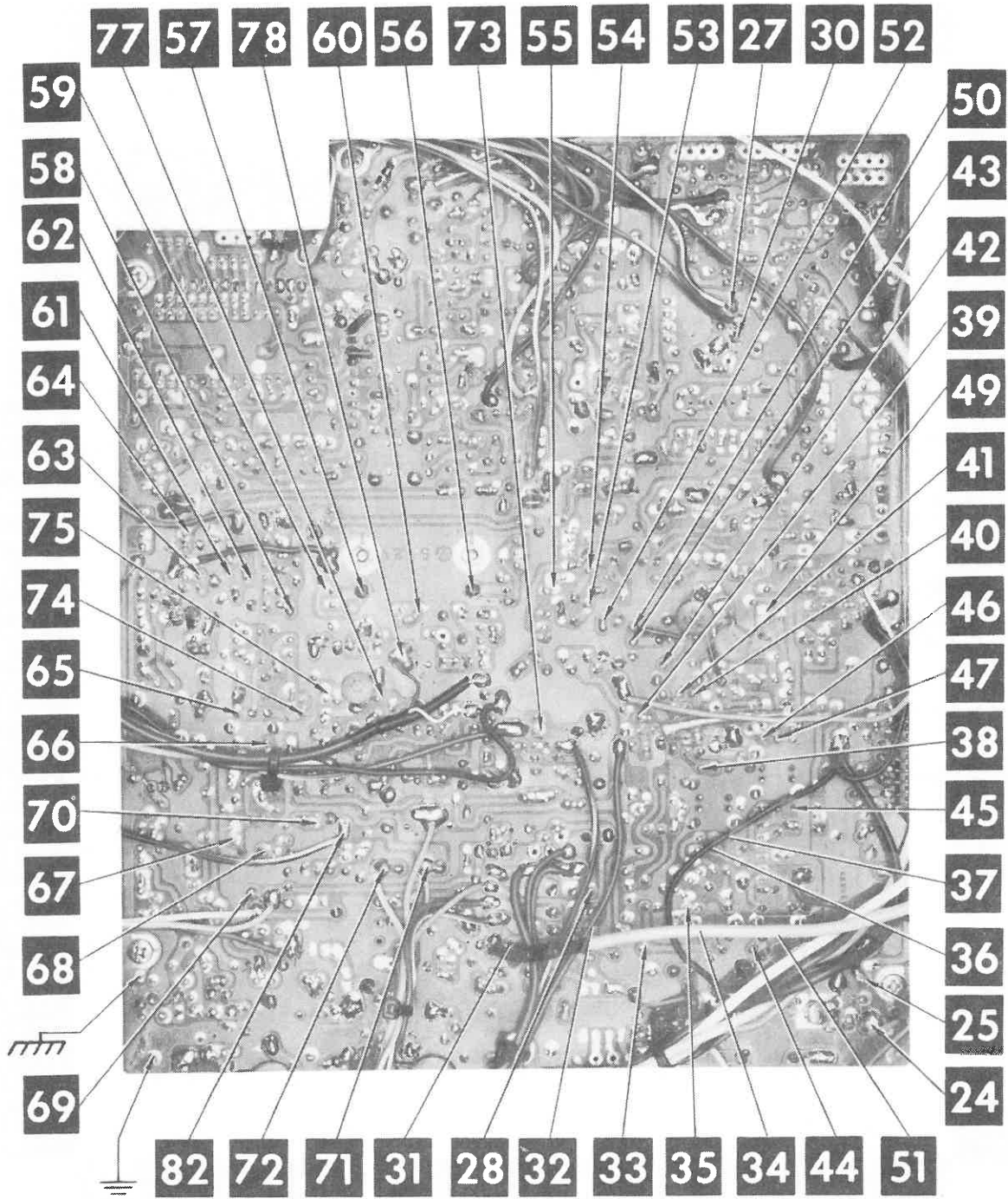


MAIN BOARD

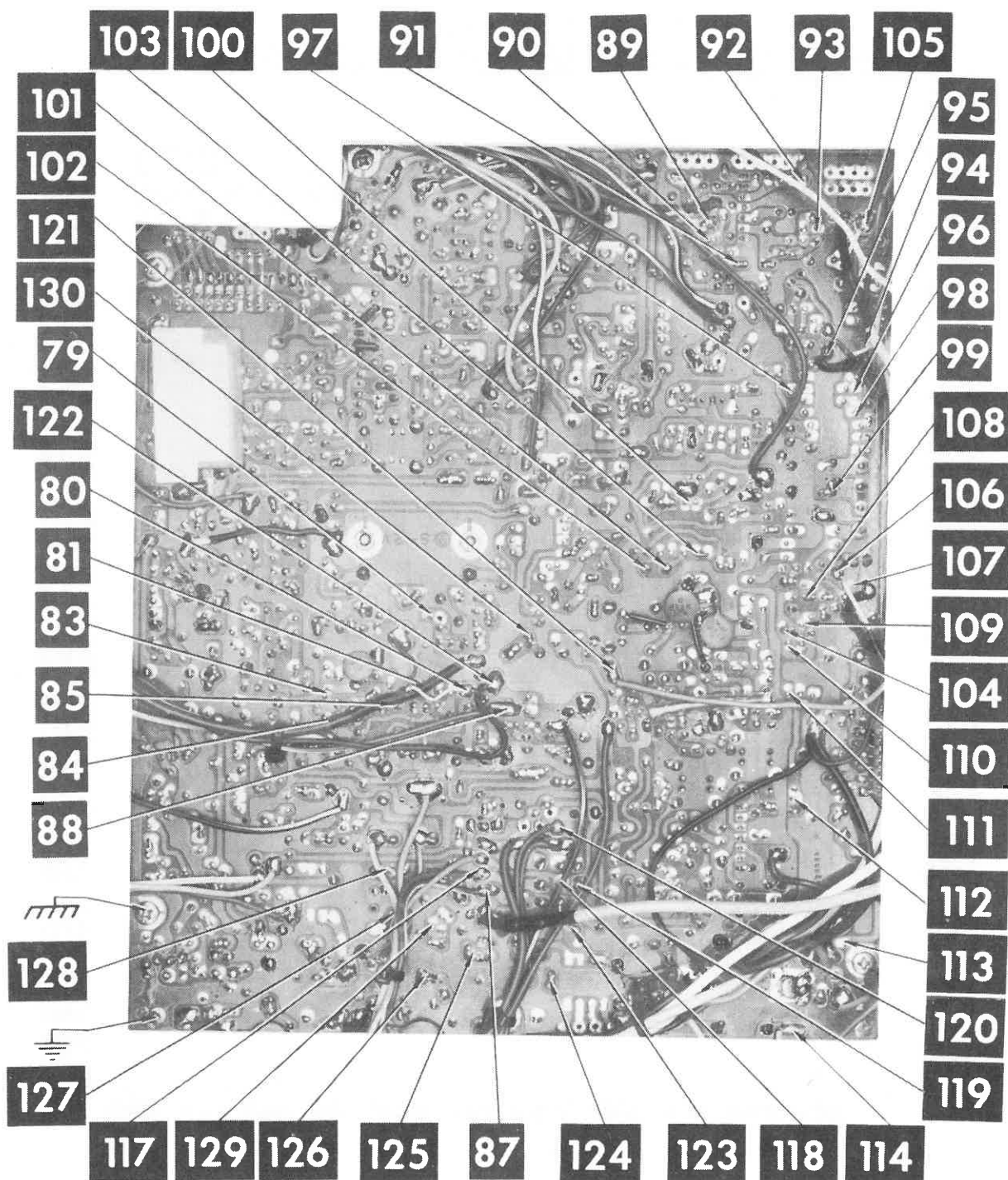


MAIN BOARD

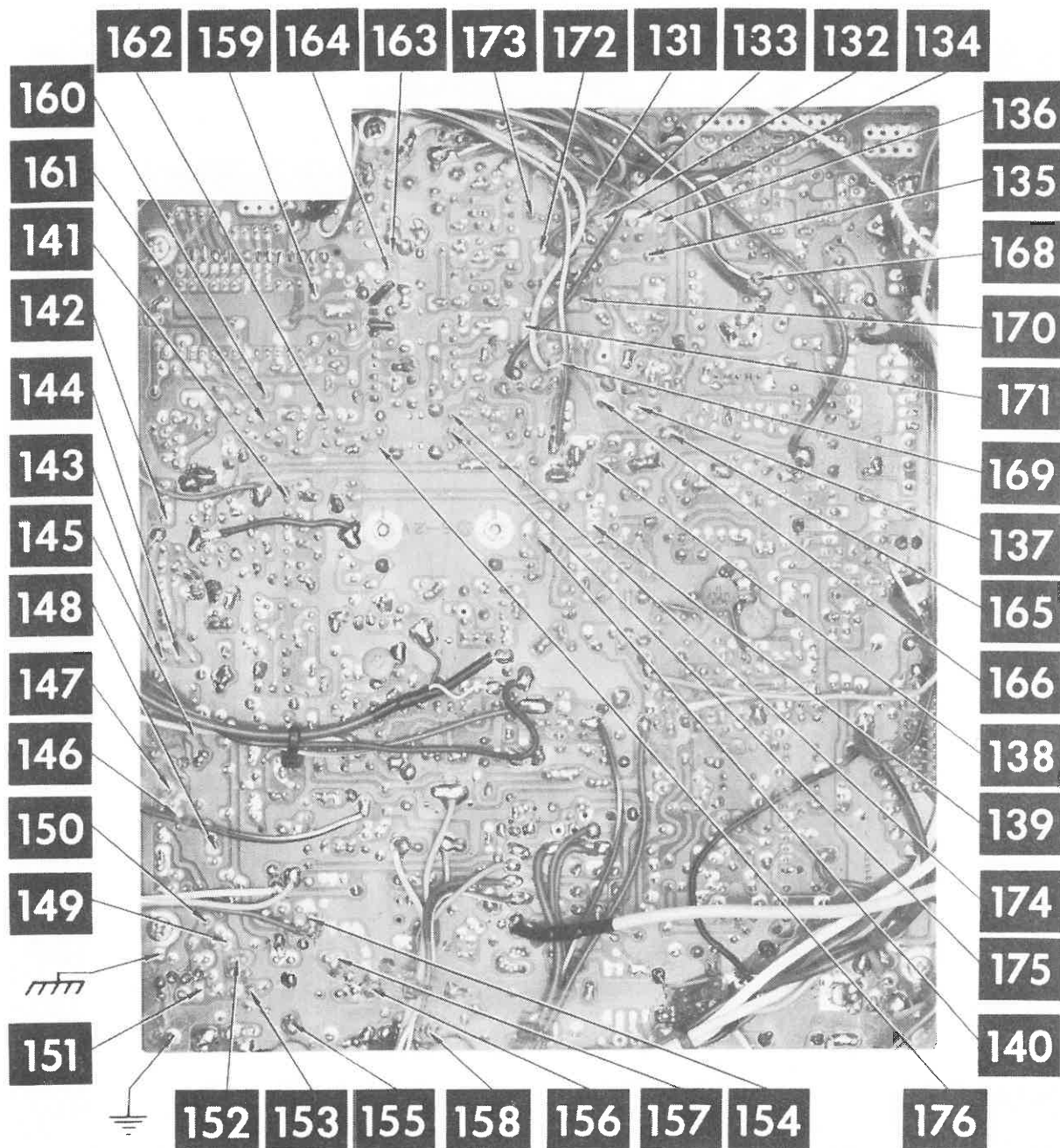
RESIDENT MODEL WASHINGTON



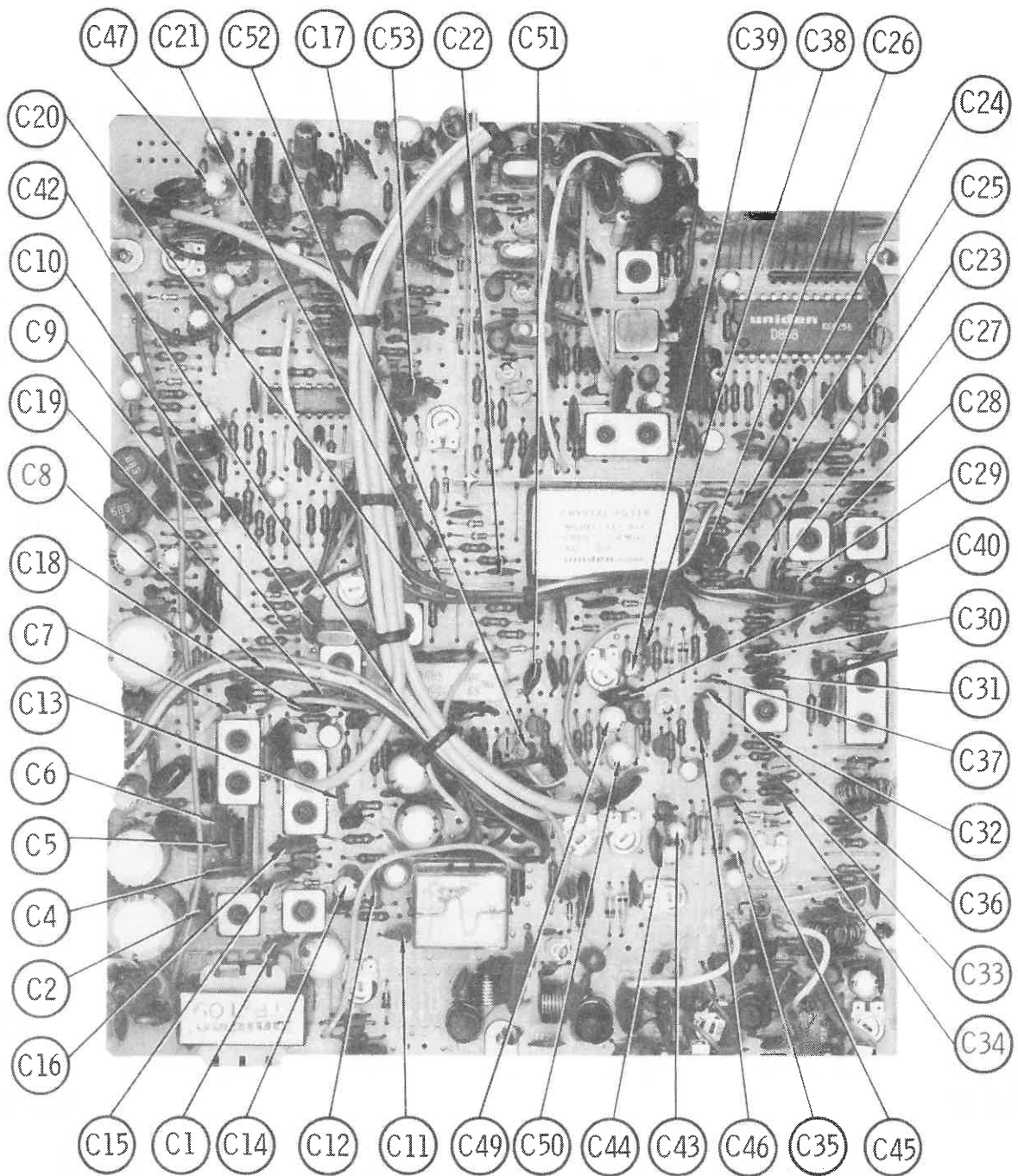
MAIN BOARD



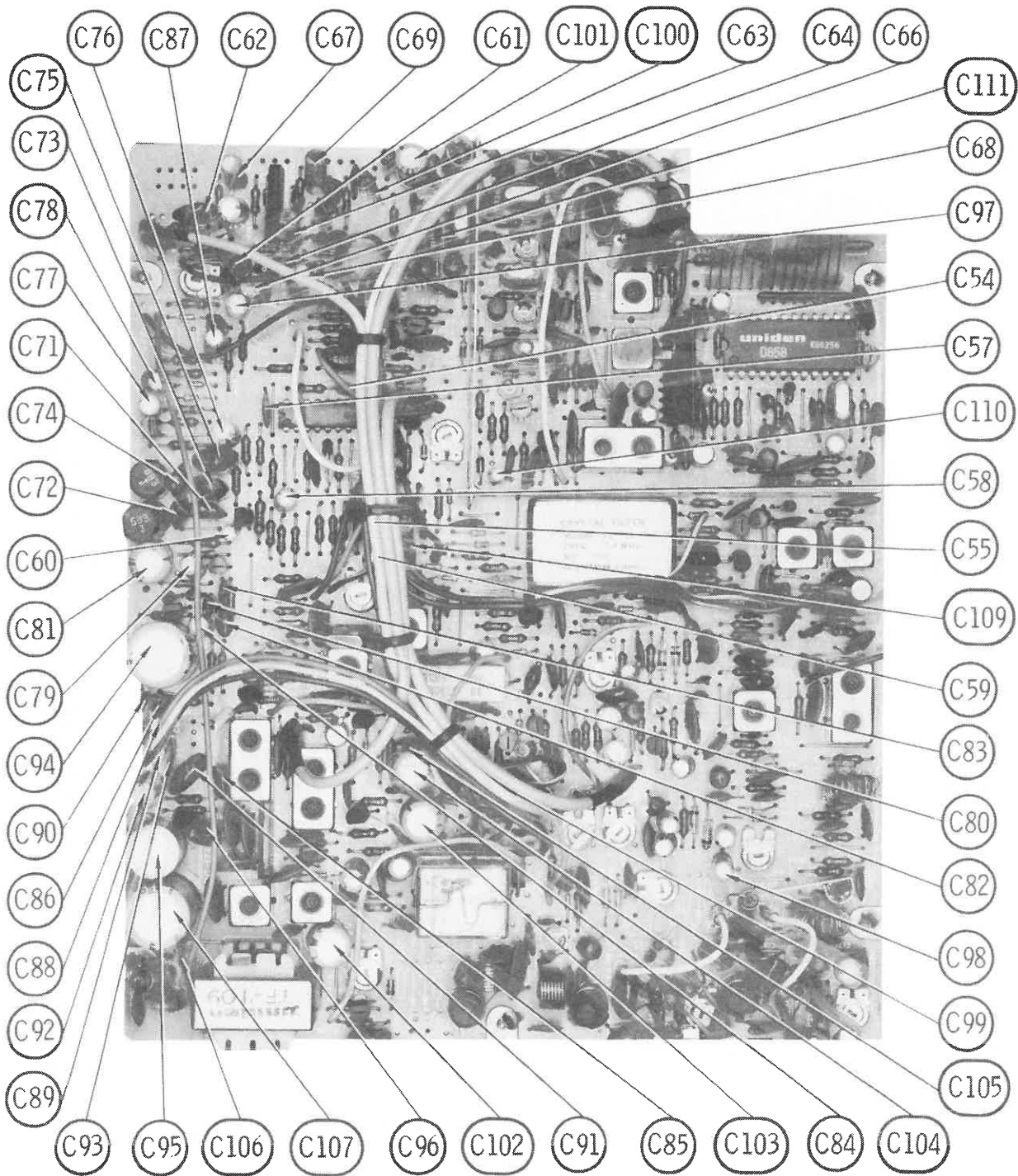
MAIN BOARD



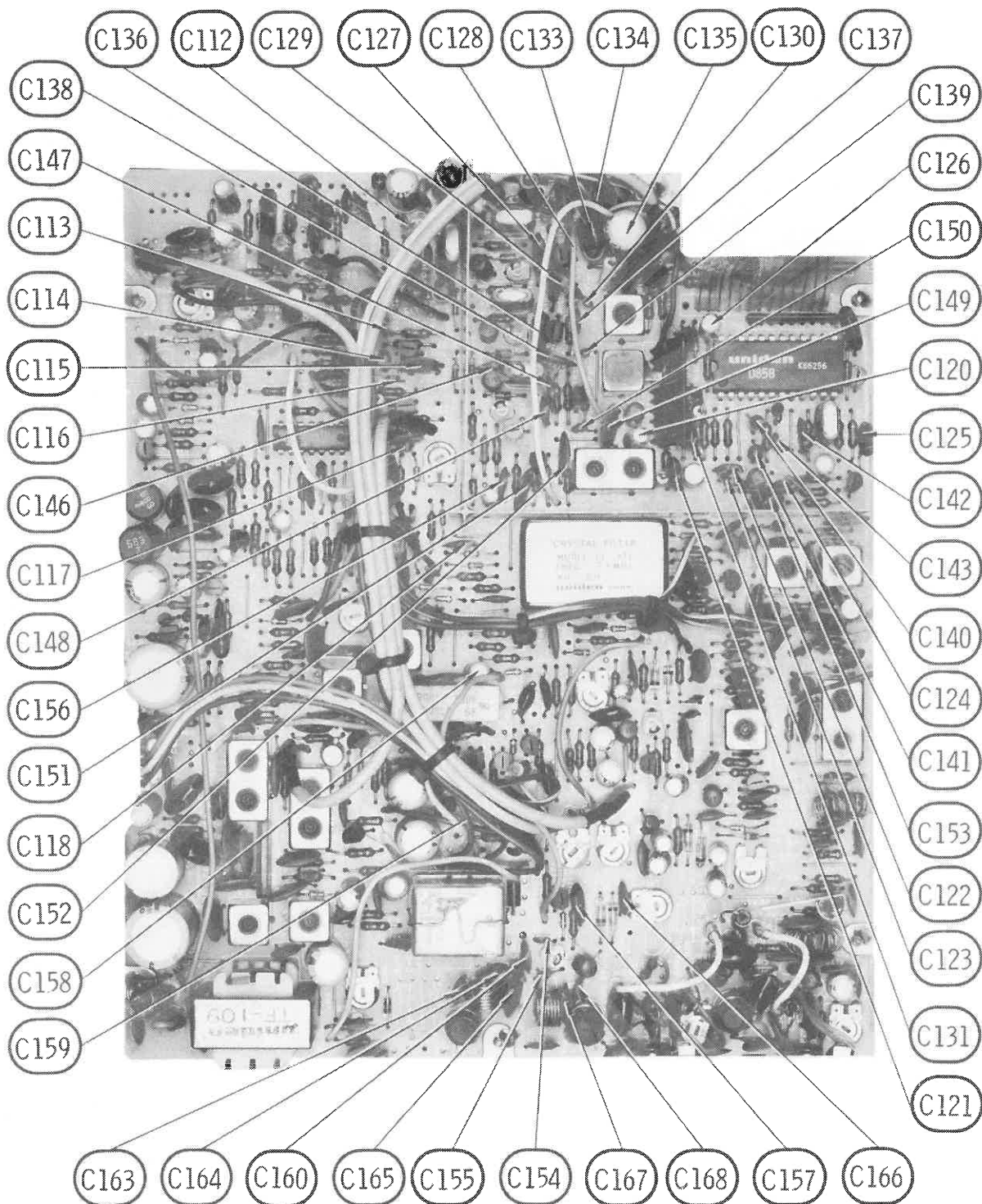
MAIN BOARD



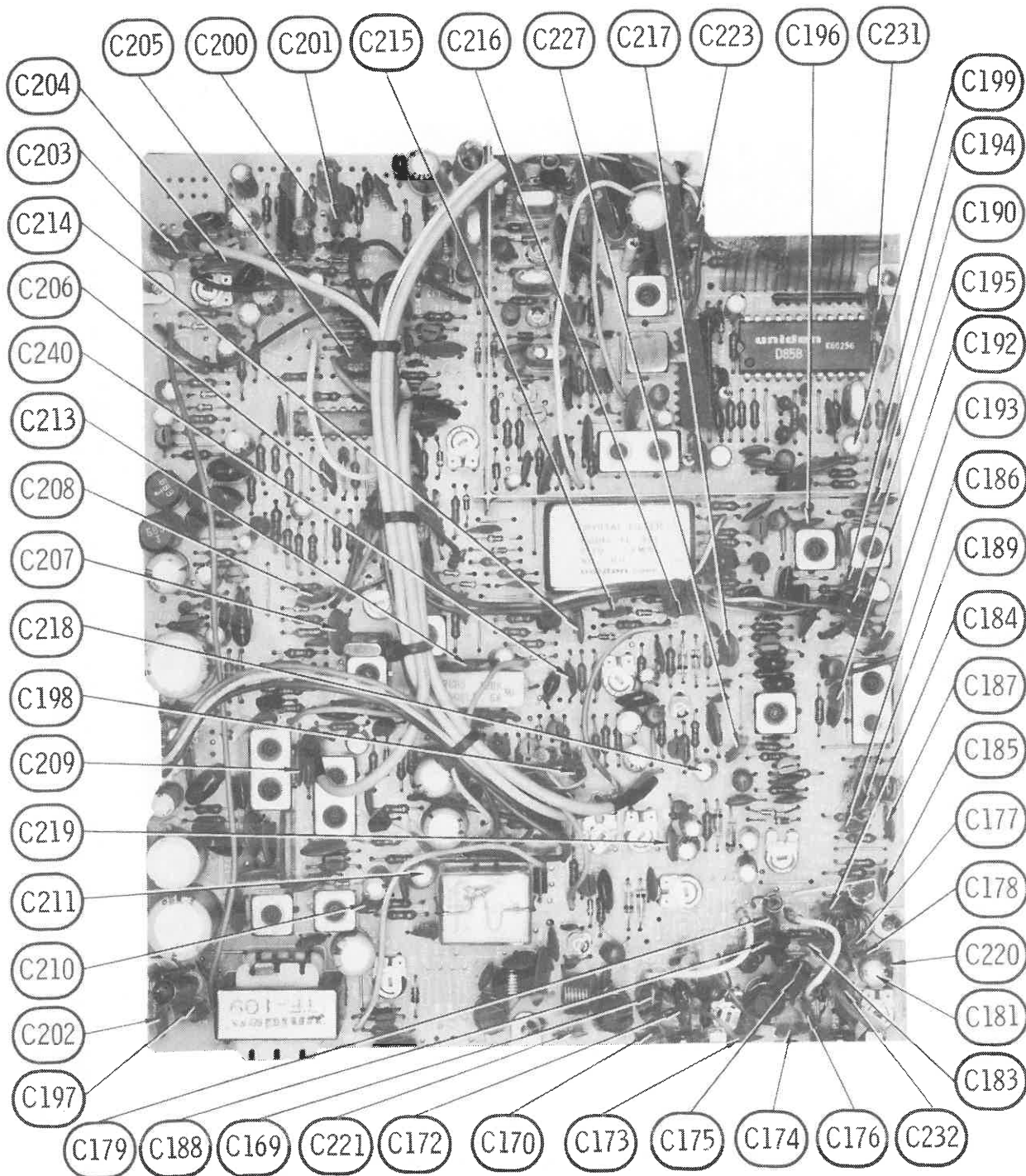
MAIN BOARD



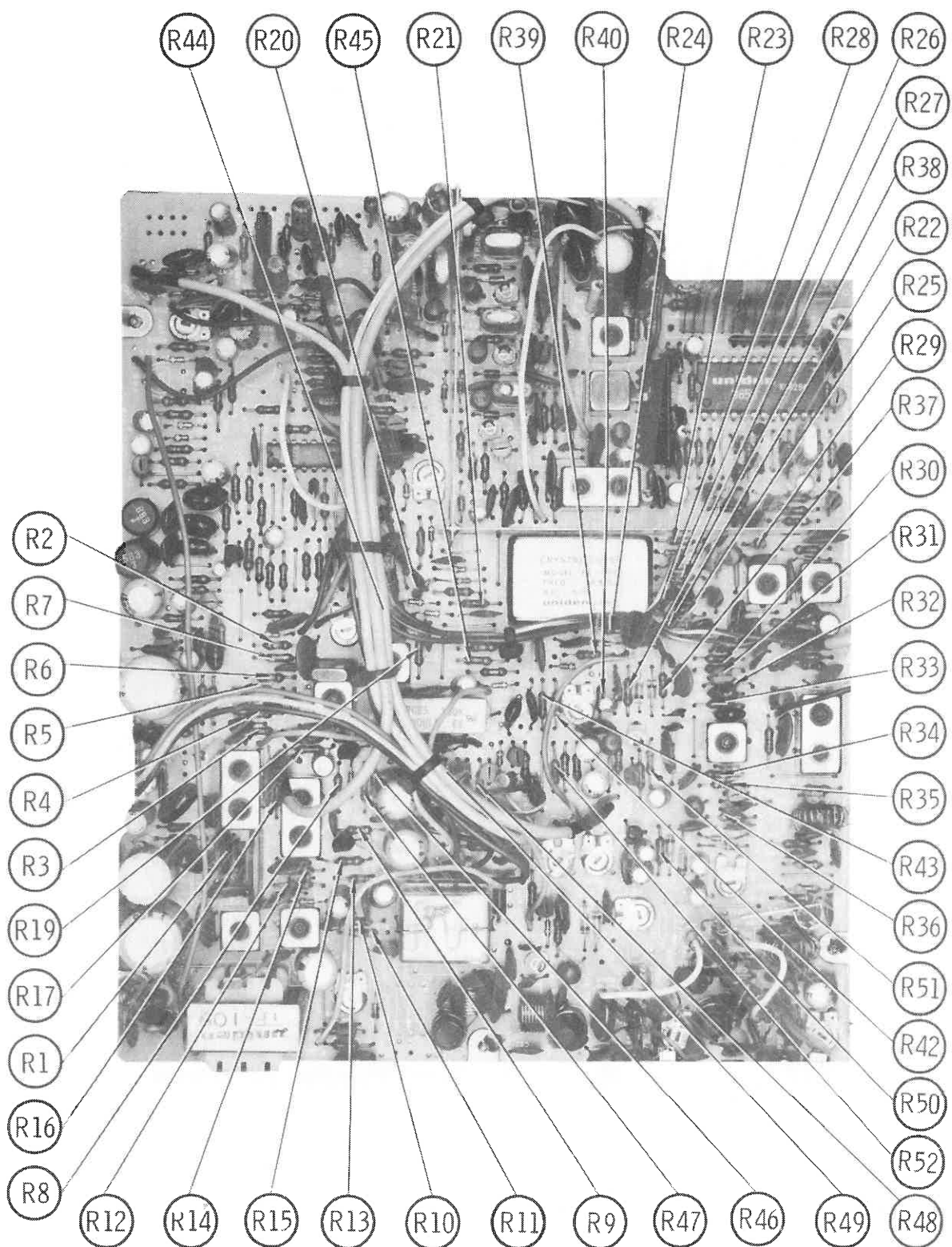
MAIN BOARD



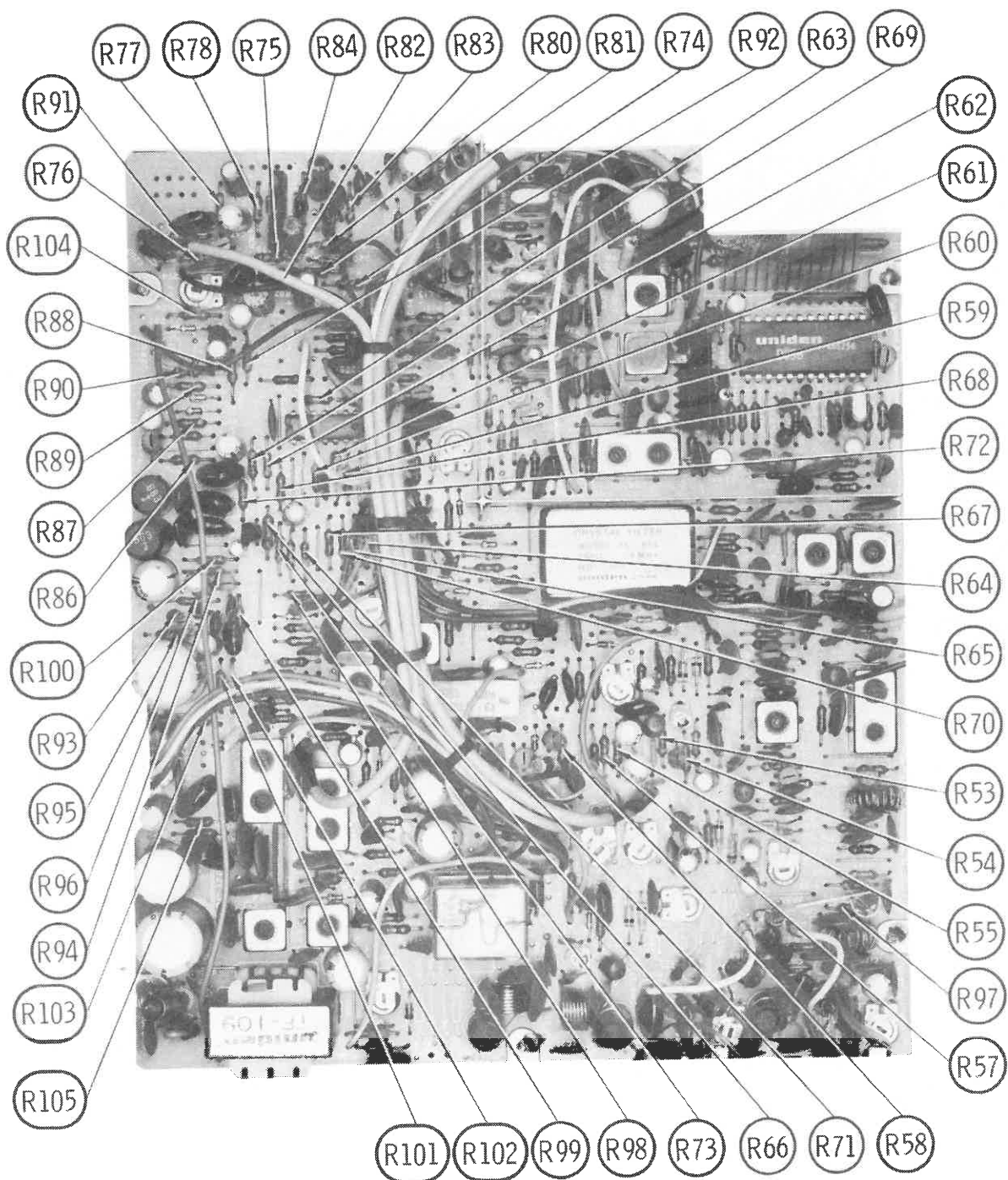
MAIN BOARD



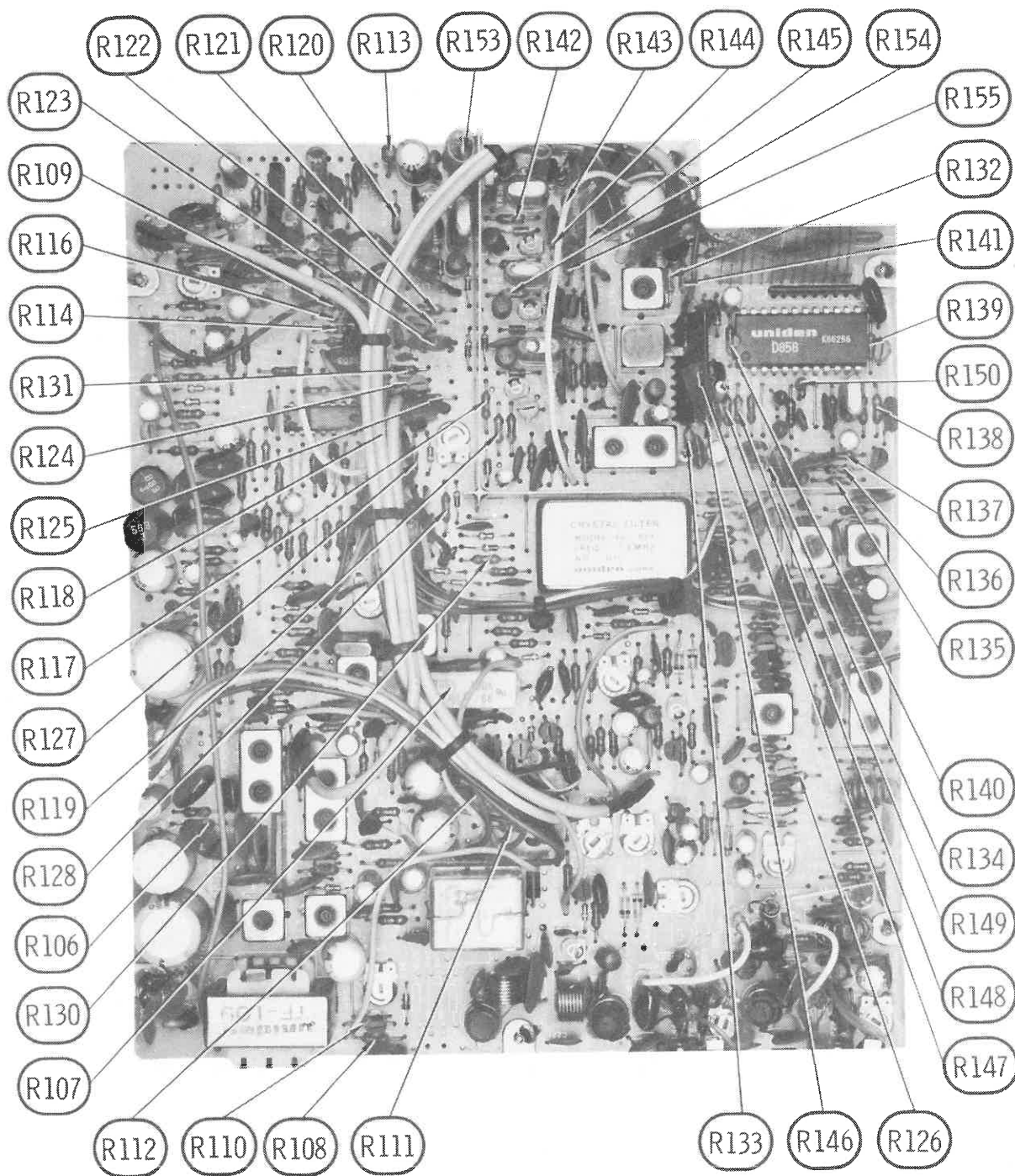
MAIN BOARD



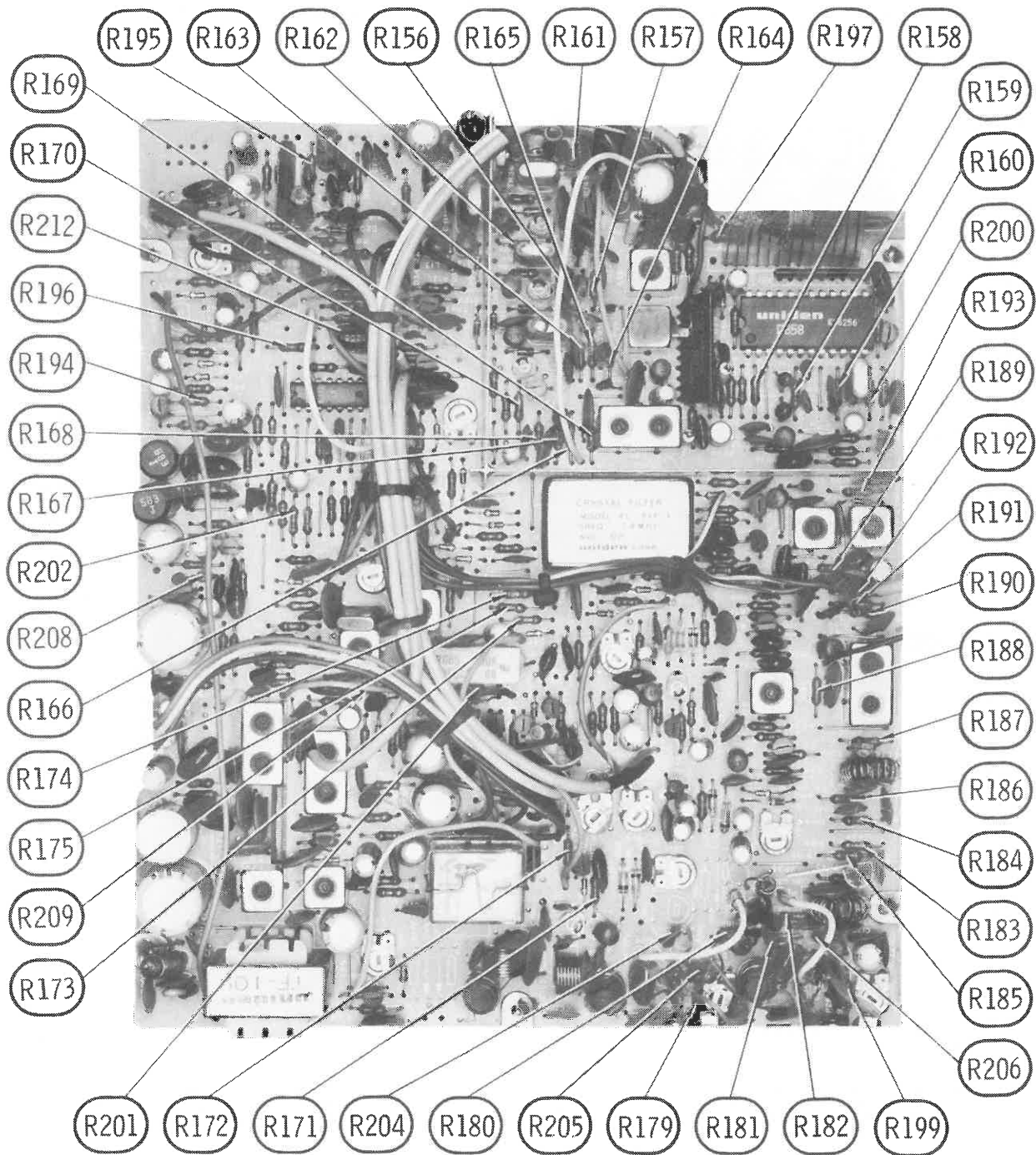
MAIN BOARD



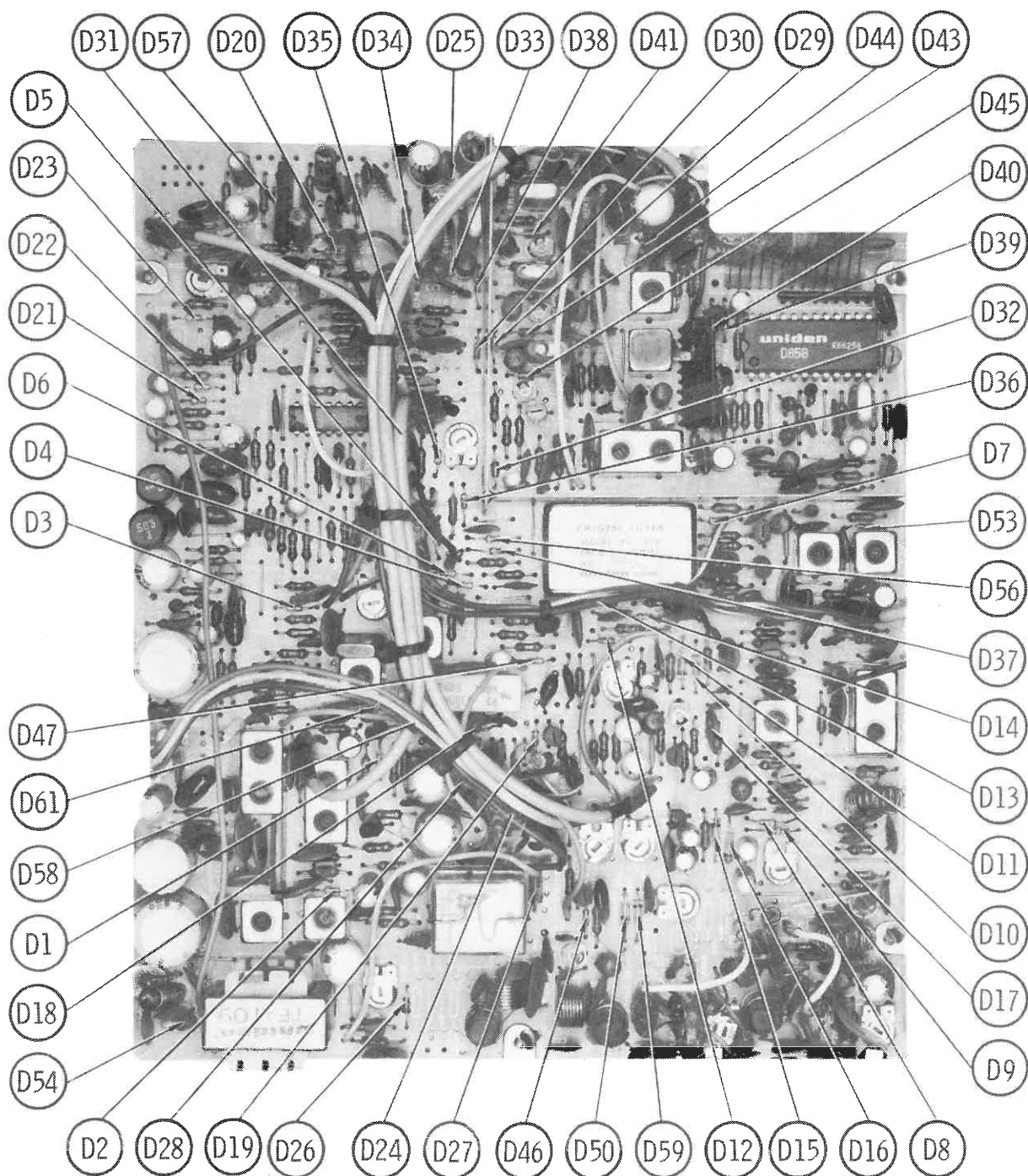
MAIN BOARD



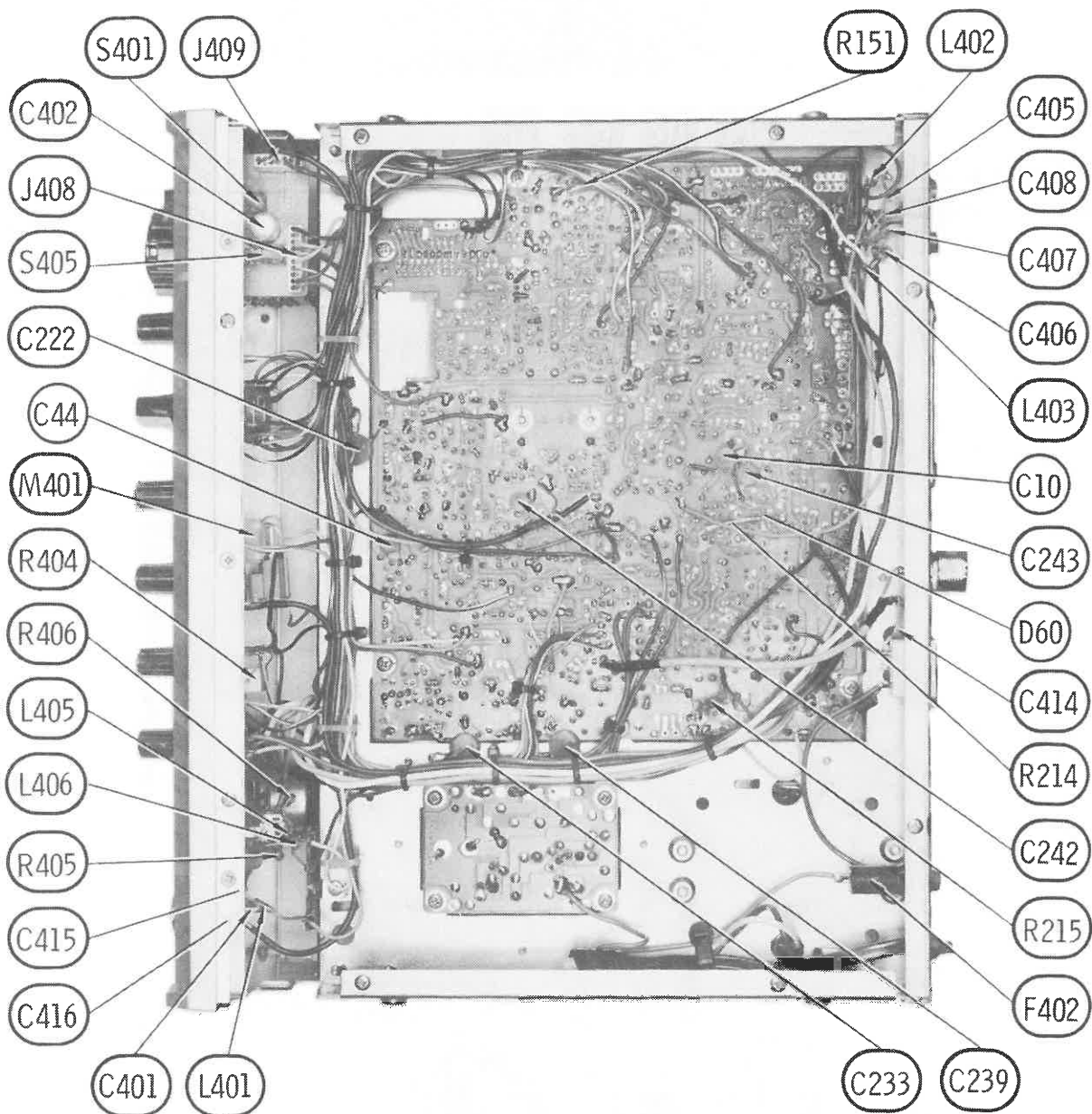
MAIN BOARD



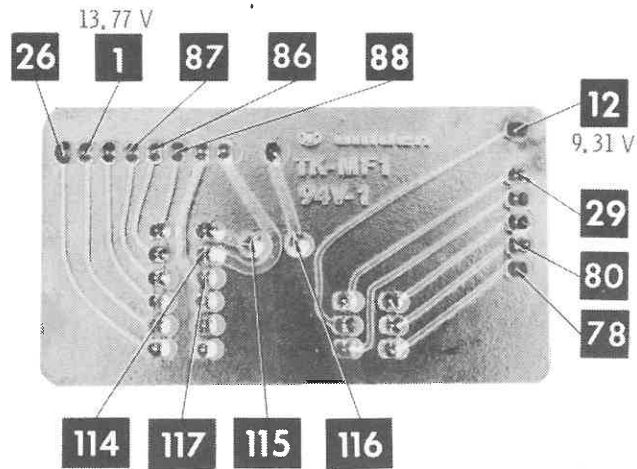
MAIN BOARD



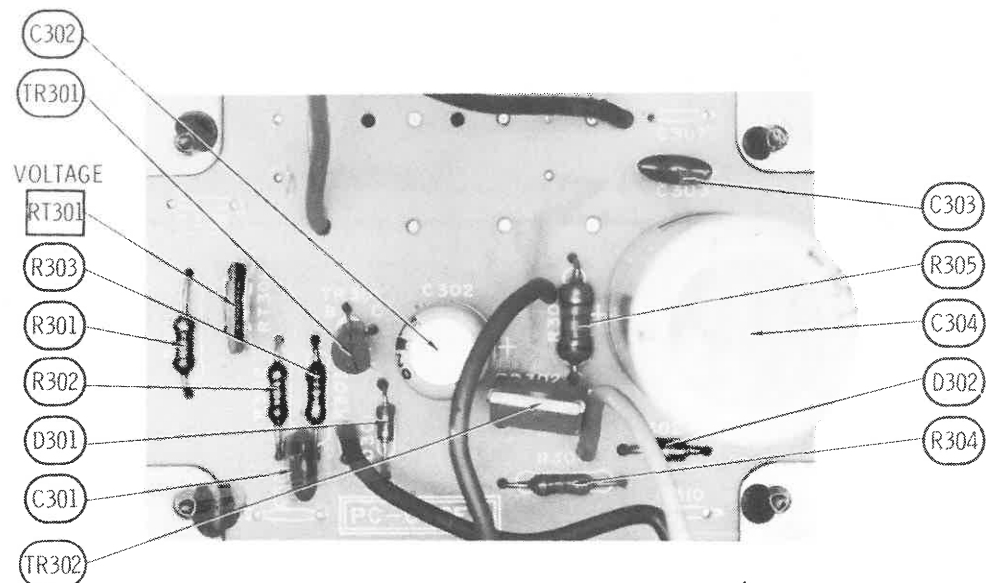
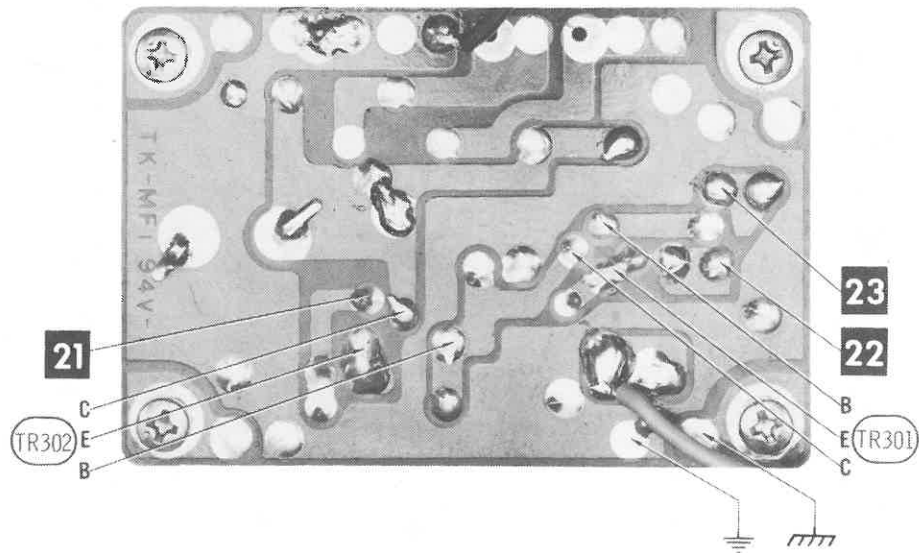
MAIN BOARD



CHASSIS-BOTTOM



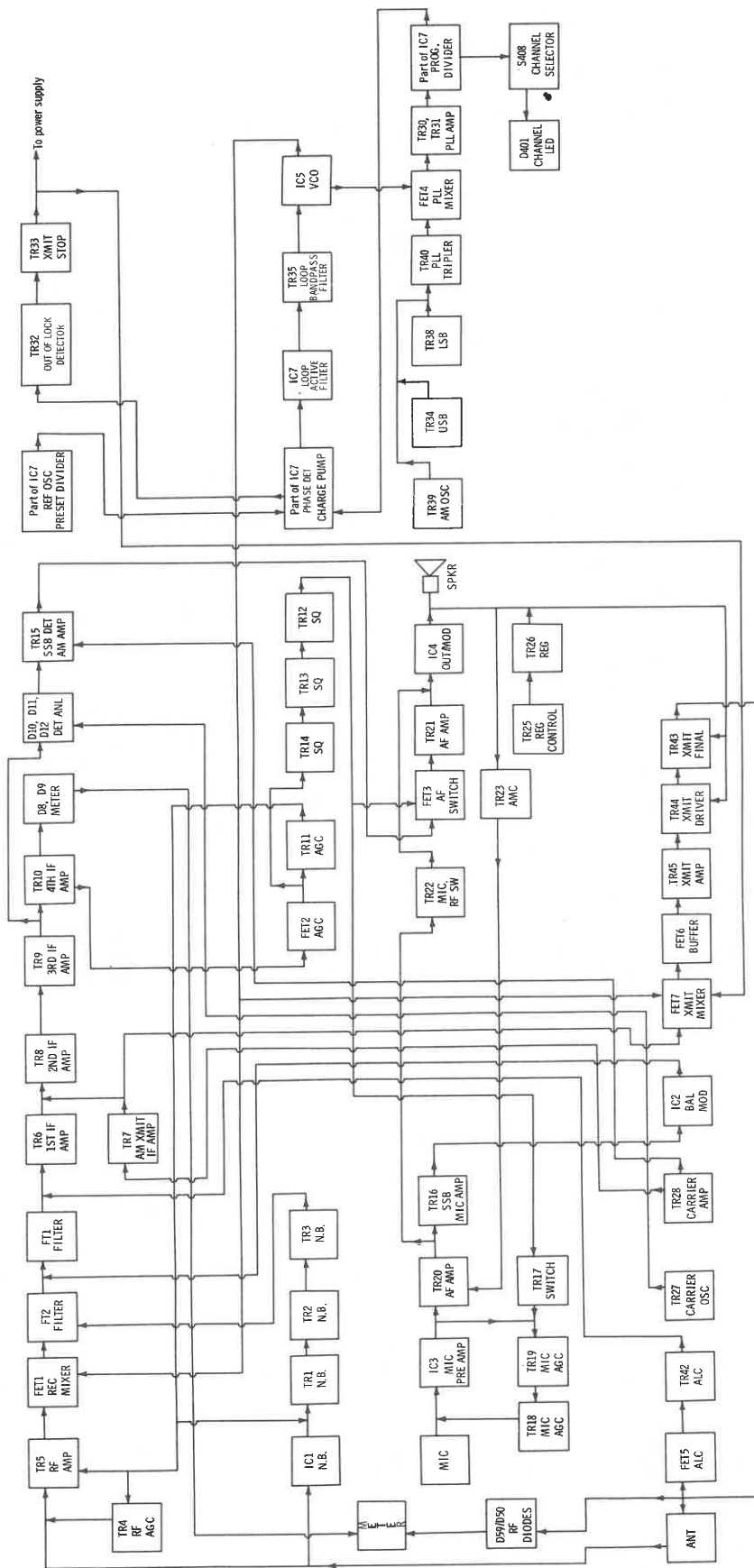
SWITCH BOARD



POWER SUPPLY BOARD

BLOCK DIAGRAM

PRESIDENT MODEL WASHINGTON





PARTS LIST AND DESCRIPTION

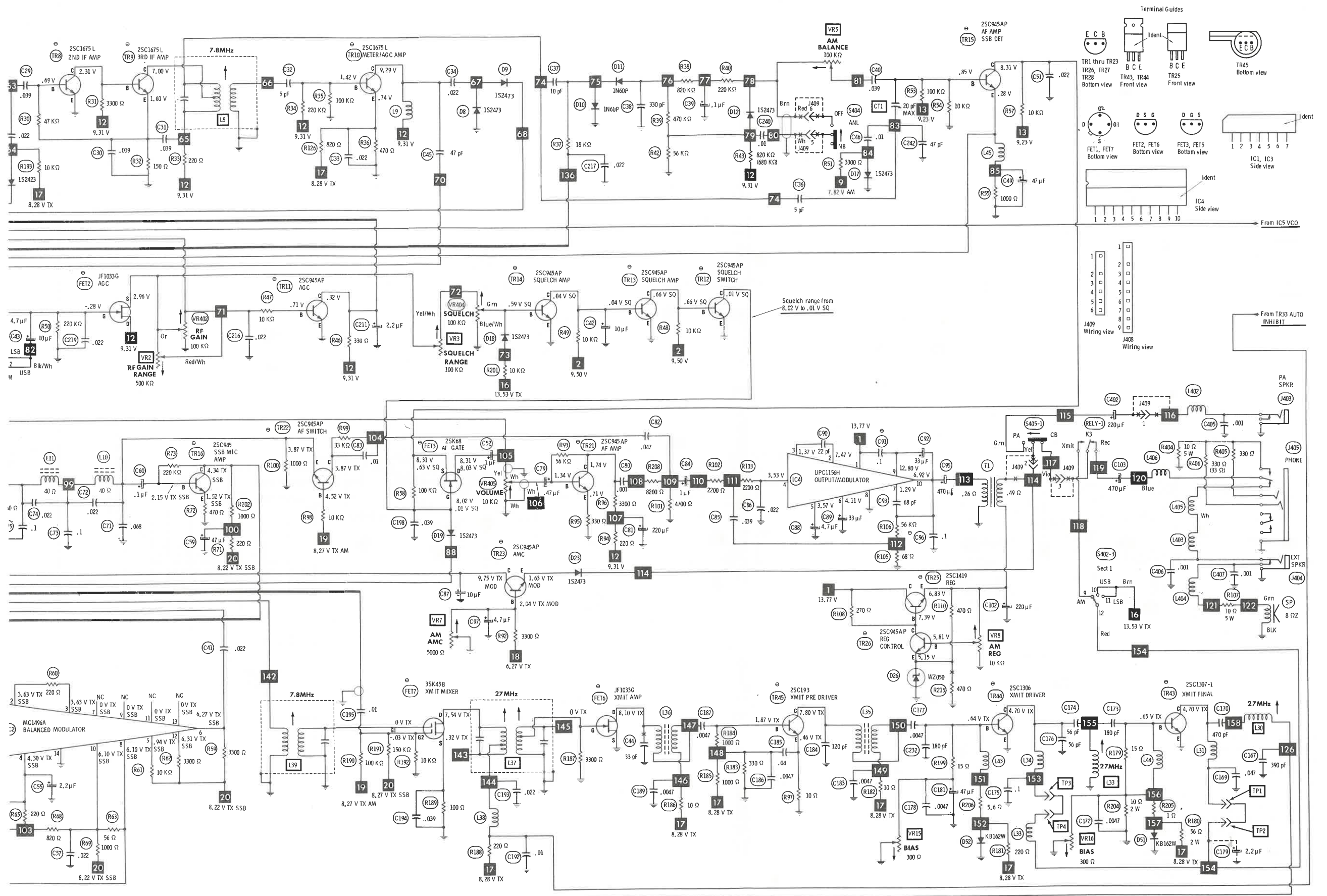
(When ordering parts, state Model, Part Number, and Description.)

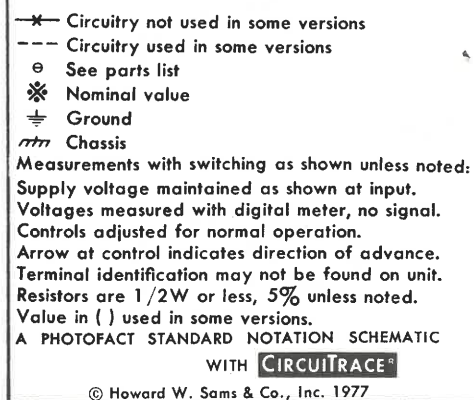
WIRING DATA

General-use Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in 13 Colors 8524 (Stranded) Available in 13 Colors
Power Cord, 2-Wire	Use BELDEN No. 17106 (Plastic) -6 feet 17109 (Plastic) -9 feet
Shielded Antenna Lead	Use BELDEN No. 8214 Lowest-loss (RG-8/U Type) 8237 Low-loss (RG-8/U) 8240 (Solid) Miniature (RG-58/U) 8259 (Stranded) Miniature (RG-58A/U)
Coiled Microphone Cable	Use BELDEN No. 8497 3-Conductor (1 shielded for Press-to-Talk) Neoprene

SEMICONDUCTORS (Select replacement transistor for best results)

ITEM No.	TYPE No.	MFR. PART No.	REPLACEMENT DATA							
			GENERAL ELECTRIC PART No.	IR WORKMAN PART No.	MALLORY PART No.	MOTOROLA PART No.	RAYTHEON PART No.	RCA PART No.	SPRAGUE PART No.	SYLVANIA PART No.
D1	1S2473	2000-317	GE-300	D200	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG519
D2	1S2473	2000-317	GE-300	D200	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG519
D3	1S2473	2000-317	GE-300	D200	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG519
D4	1S2473	2000-317	GE-300	D200	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG519
D5	1S2473	2000-317	GE-300	D200	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG519
D6	1S2473	2000-317	GE-300	D200	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG519
D7	1S2473	2000-317	GE-300	D200	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG519
D8	1S2473	2000-317	GE-300	D200	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG519
D9	1S2473	2000-317	GE-300	D200	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG519
D10	1N60P	2000-318	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D11	1N60P	2000-318	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D12	1S2473	2000-317	GE-300	D200	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG519
D13	1S2473	2000-317	GE-300	D200	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG519
D14	1S2473	2000-317	GE-300	D200	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG519
D15	1N60P	2000-318	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D16	1N60P	2000-318	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D17	1S2473	2000-317	GE-300	D200	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG519
D18	1S2473	2000-317	GE-300	D200	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG519
D19	1S2473	2000-317	GE-300	D200	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG519
D20	1S2473	2000-317	GE-300	D200	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG519
D21	1S2473	2000-317	GE-300	D200	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG519
D22	1S2473	2000-317	GE-300	D200	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG519
D23	1S2473	2000-317	GE-300	D200	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG519
D24	CZ092	2000-327	GEZD-9.1	Z1209	ZB9.1A	HEPZ0412	RE 114	SK3060	RT-240	ECG139
D25	BZ075	2000-324	GEZD-7.5		ZB7.5B		RE 111		RT-239	ECG138
D26	WZ050	2000-321	GEZD-5.1						RT-235	
D27	SRIK2	2000-320	GE-504A	5A40	PTC201	HEPRO052	RE 49	SK3030	RT-213	ECG116
D28	CZ092	2000-327	GEZD-9.1	Z1209	ZB9.1A	HEPZ0412	RE 114	SK3060	RT-240	ECG139
D29	1S2473	2000-317	GE-300	D200	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG519
D30	1S2473	2000-317	GE-300	D200	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG519
D31	WZ061	2000-329	GEZD-6.2		ZB6.2B		RE 109		RT-237	ECG137
D32	WZ061	2000-322	GEZD-6.2		ZB6.2B		RE 109		RT-237	ECG137
D33	1S2473	2000-317	GE-300	D200	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG519
D34	1S2473	2000-317	GE-300	D200	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG519
D35	1S2473	2000-317	GE-300	D200	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG519
D36	1S2473	2000-317	GE-300	D200	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG519
D37	1S2473	2000-317	GE-300	D200	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG519
D38	1S2473	2000-317	GE-300	D200	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG519
D39	1S2473	2000-317	GE-300	D200	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG519
D40	1S2473	2000-317	GE-300	D200	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG519
D41	1S2687D	2000-323	GE-90	D201		HEPR2503	RE 195	SK3126	RT-262	
D43	1S2687D	2000-323	GE-90	D201		HEPR2503	RE 195	SK3126	RT-262	
D44	CZ092	2000-327	GEZD-9.1	Z1209	ZB9.1A	HEPZ0412	RE 114	SK3060	RT-240	ECG139
D45	1S2687D	2000-323	GE-90	D201		HEPR2503	RE 195	SK3126	RT-262	
D46	1S2473	2000-317	GE-300	D200	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG519
D47	1S2473	2000-317	GE-300	D200	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG519
D50	1N60P	2000-318	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D51	KB162W	2000-331			PTC301					
D52	KB162W	2000-331			PTC301					
D53	1S2473	2000-317	GE-300	D200	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG519
D54	SRIK2	2000-320	GE-504A	5A40	PTC201	HEPRO052	RE 49	SK3030	RT-213	ECG116
D56	1S2473	2000-317	GE-300	D200	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG519
D57	1S2473	2000-317	GE-300	D200	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG519
D58	1S2473	2000-317	GE-300	D200	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG519
D59	1N60P	2000-318	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D60	1S2473	2000-317	GE-300	D200	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG519
D61	1S2473	2000-317	GE-300	D200	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG519
D301	WZ061	2000-328	GEZD-6.2		ZB6.2B		RE 109		RT-237	ECG137
D302	BZ162	2000-326	GEZD-16		ZB16B		RE 122		RT-246	ECG5075
D406	SSVB10	2000-330								
FET1	3SK45B	2000-102	GE-FET-4	WEP905	PTC181	HEPF2004	RE 199	SK3050	RT-181	ECG222
FET2	3SK45 (1)		GE-FET-4	WEP905	PTC181	HEPF2004	RE 199	SK3050	RT-181	ECG222
	JF1033G		GE-FET-2	FE-100	PTC161	HEPF0021	RE 45	SK3116	RT-175	ECG312
	JF1033	2000-105 (1)	GE-FET-2	FE-100	PTC161	HEPF0021	RE 45	SK3116	RT-175	ECG312
	2N2338B(1)		GE-FET-2	FE-100	PTC161	HEPF0021	RE 45	SK3116	RT-175	ECG312
FET3	2SK19 (1)		GE-FET-2	FE-100	PTC161	HEPF0021	RE 45	SK3116	RT-175	ECG312
	2SK33 (1)		GE-FET-2	FE-100	PTC161	HEPF0021	RE 45	SK3116	RT-175	ECG312
	2SK68		GE-FET-1	FE-100	PTC151	HEPF0010	RE 46	SK3112	RT-176	ECG133
	2SK68A,M	2000-104 (1)	GE-FET-1	FE-100	PTC151	HEPF0010	RE 46	SK3112	RT-176	ECG133
FET4	2SK30A(1)		GE-FET-1	FE-100	PTC151	HEPF0010	RE 46	SK3112	RT-176	ECG133
	3SK45B		GE-FET-4	WEP905	PTC181	HEPF2004	RE 199	SK3050	RT-181	ECG222
	3SK45-B-09	2000-103 (1)	GE-FET-4	WEP905	PTC181	HEPF2004	RE 199	SK3050	RT-181	ECG222
	3N201 (1)		GE-FET-4	WEP905	PTC181	HEPF2004	RE 199	SK3050	RT-181	ECG222
FET5	3SK45 (1)		GE-FET-4	WEP905	PTC181	HEPF2004	RE 199	SK3050	RT-181	ECG222
	3SK40 (1)		GE-FET-4	WEP905	PTC181	HEPF2004	RE 199	SK3050	RT-181	ECG222
	3SK41 (1)		GE-FET-4	WEP905	PTC181	HEPF2004	RE 199	SK3050	RT-181	ECG222
	2SK68		GE-FET-1	FE-100	PTC151	HEPF0010	RE 46	SK3112	RT-176	ECG133
	2SK68A,M	2000-104 (1)	GE-FET-1	FE-100	PTC151	HEPF0010	RE 46	SK3112	RT-176	ECG133





PARTS LIST AND DESCRIPTION (CONTINUED)

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

SEMICONDUCTORS (Select replacement transistor for best results) (cont)

ITEM No.	TYPE No.	MFR. PART No.	REPLACEMENT DATA							
			GENERAL ELECTRIC PART No.	IR WORKMAN PART No.	MALLORY PART No.	MOTOROLA PART No.	RAYTHEON PART No.	RCA PART No.	SPRAGUE PART No.	SYLVANIA PART No.
FET6	2SK30A(1)	2000-105 (1)	GE-FET-1	FE-100	PTC151	HEPF0010	RE 46	SK3112	RT-176	ECG133
	JF1033G		GE-FET-2	FE-100	PTC161	HEPF0021	RE 45	SK3116	RT-175	ECG312
	2N2338(1)		GE-FET-2	FE-100	PTC161	HEPF0021	RE 45	SK3116	RT-175	ECG312
	2SK19 (1)		GE-FET-2	FE-100	PTC161	HEPF0021	RE 45	SK3116	RT-175	ECG312
	2SK33 (1)		GE-FET-2	FE-100	PTC161	HEPF0021	RE 45	SK3116	RT-175	ECG312
FET7	3SK45B	2000-102	GE-FET-4	WEP905	PTC181	HEPF2004	RE 199	SK3050	RT-181	ECG222
	3SK45 (1)		GE-FET-4	WEP905	PTC181	HEPF2004	RE 199	SK3050	RT-181	ECG222
IC1	UPC577H	2000-007	GEIC-140	WEP939			RE 341-M			ECG1082
IC2	MC1496A									
	UC1496A	2000-009 (1)								
	LM1496N(1)									
IC3	UPC592H2	2000-006								
IC4	UPC1156H									
IC5	UHC005	2000-011								
IC6	UPC78L05									
IC7	UPD858	2000-008								
	UPD858C									
	KM858C(1)	2000-001 (1)								
TR1	2SC945AP	2000-210	GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
	2SC945(1)		GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
TR2	2SA733P	2000-218	GE-65	TR-31	PTC103 *	HEPS0022 *	RE 26 *	SK3025 *	RT-303	ECG159 *
	2SA733(1)		GE-65	TR-31	PTC103 *	HEPS0022 *	RE 26 *	SK3025 *	RT-303	ECG159 *
TR3	2SC945AP	2000-210	GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
	2SC945(1)		GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
TR4	2SC945AP	2000-210	GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
	2SC945(1)		GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
TR5	2SC1730L	2000-214	GE-17	TR-24	PTC136	HEPS0025	RE 9	SK3018	RT-107	ECG107
	2SC1730(1)		GE-17	TR-24	PTC136	HEPS0025	RE 9	SK3018	RT-107	ECG107
TR6	2SC1675L	2000-213	GE-213	TR-33	PTC139 *	HEPS0025 *	RE 13 *	SK3124	RT-308	ECG229 *
	2SC1675(1)		GE-213	TR-33	PTC139 *	HEPS0025 *	RE 13 *	SK3124	RT-308	ECG229 *
TR7	2SC1675L	2000-213	GE-213	TR-33	PTC139 *	HEPS0025 *	RE 13 *	SK3124	RT-308	ECG229 *
	2SC1675(1)		GE-213	TR-33	PTC139 *	HEPS0025 *	RE 13 *	SK3124	RT-308	ECG229 *
TR8	2SC1675L	2000-213	GE-213	TR-33	PTC139 *	HEPS0025 *	RE 13 *	SK3124	RT-308	ECG229 *
	2SC1675(1)		GE-213	TR-33	PTC139 *	HEPS0025 *	RE 13 *	SK3124	RT-308	ECG229 *
TR9	2SC1675L	2000-213	GE-213	TR-33	PTC139 *	HEPS0025 *	RE 13 *	SK3124	RT-308	ECG229 *
	2SC1675(1)		GE-213	TR-33	PTC139 *	HEPS0025 *	RE 13 *	SK3124	RT-308	ECG229 *
TR10	2SC1675L	2000-213	GE-213	TR-33	PTC139 *	HEPS0025 *	RE 13 *	SK3124	RT-308	ECG229 *
	2SC1675(1)		GE-213	TR-33	PTC139 *	HEPS0025 *	RE 13 *	SK3124	RT-308	ECG229 *
TR11	2SC945AP	2000-210	GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
	2SC945(1)		GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
TR12	2SC945AP	2000-210	GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
	2SC945(1)		GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
TR13	2SC945AP	2000-210	GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
	2SC945(1)		GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
TR14	2SC945AP	2000-210	GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
	2SC945(1)		GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
TR15	2SC945AP	2000-210	GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
	2SC945(1)		GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
TR16	2SC945AP	2000-210	GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
	2SC945(1)		GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
TR17	2SA733P	2000-218	GE-65	TR-31	PTC103 *	HEPS0022 *	RE 26 *	SK3025 *	RT-303	ECG159 *
	2SA733(1)		GE-65	TR-31	PTC103 *	HEPS0022 *	RE 26 *	SK3025 *	RT-303	ECG159 *
TR18	2SC945AP	2000-210	GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
	2SC945(1)		GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
TR19	2SA733P	2000-218	GE-65	TR-31	PTC103 *	HEPS0022 *	RE 26 *	SK3025 *	RT-303	ECG159 *
	2SA733(1)		GE-65	TR-31	PTC103 *	HEPS0022 *	RE 26 *	SK3025 *	RT-303	ECG159 *
TR20	2SC945AP	2000-210	GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
	2SC945(1)		GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
TR21	2SC945AP	2000-210	GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
	2SC945(1)		GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
TR22	2SC945AP	2000-210	GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
	2SC945(1)		GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
TR23	2SC945AP	2000-210	GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
	2SC945(1)		GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
TR24	2SC1419B	2000-220	GE-66	TR-76	PTC167	HEPS0027	RE 21	SK3054	RT-197	ECG152
	2SC1419(1)		GE-66	TR-76	PTC167	HEPS0027	RE 21	SK3054	RT-197	ECG152
TR25	2SC1419B	2000-220	GE-66	TR-76	PTC167	HEPS0027	RE 21	SK3054	RT-197	ECG152
	2SC1419(1)		GE-66	TR-76	PTC167	HEPS0027	RE 21	SK3054	RT-197	ECG152
TR26	2SC945AP	2000-210	GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
	2SC945(1)		GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
TR27	2SC1675L	2000-213	GE-213	TR-33	PTC139 *	HEPS0025 *	RE 13 *	SK3124	RT-308	ECG229 *
	2SC1675(1)		GE-213	TR-33	PTC139 *	HEPS0025 *	RE 13 *	SK3124	RT-308	ECG229 *
TR28	2SC1675L	2000-213	GE-213	TR-33	PTC139 *	HEPS0025 *	RE 13 *	SK3124	RT-308	ECG229 *
	2SC1675(1)		GE-213	TR-33	PTC139 *	HEPS0025 *	RE 13 *	SK3124	RT-308	ECG229 *
TR29	2SC945L	2000-210	GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
	2SC945AP		GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
	(1)									
	2SC945(1)		GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
	2SC828(1)		GE-61 *	(IR)2SC828A	PTC121 *	HEPS0015 *	RE 192	SK3122	RT-302	ECG199
	2SC1740(1)		GE-210 *	(IR)2SC945	PTC121 *	HEPS0009 *	RE 13 *	SK3124	RT-107A	ECG199
	2SC458(1)		GE-62	(IR)2SC458B	PTC139 *	HEPS0015 *	RE 192	SK3124	RT-187	ECG123A *
	2SC900(1)		GE-61 *	(IR)2SC644	PTC139 *	HEPS0015 *	RE 13 *	SK3122	RT-302	ECG199
	2SC372(1)		GE-61 *	(IR)2SC372	PTC139 *	HEPS0015 *	RE 13 *	SK3122	RT-308	ECG123A *
TR30	2SC1675L	2000-213	GE-213	TR-33	PTC139 *	HEPS0025 *	RE 13 *	SK3124	RT-308	ECG229 *
	2SC1675(1)		GE-213	TR-33	PTC139 *	HEPS0025 *	RE 13 *	SK3124	RT-308	ECG229 *
TR31	2SC1675L	2000-213	GE-213	TR-33	PTC139 *	HEPS0025 *	RE 13 *	SK3124	RT-308	ECG229 *
	2SC1675(1)		GE-213	TR-33	PTC139 *	HEPS0025 *	RE 13 *	SK3124	RT-308	ECG229 *
TR32	2SC945AP	2000-210	GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
	2SC945(1)		GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
TR33	2SC945AP	2000-210	GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
	2SC945(1)		GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
TR34	2SC1675L	2000-213	GE-213	TR-33	PTC139 *	HEPS0025 *	RE 13 *	SK3124	RT-308	ECG229 *
	2SC1675(1)		GE-213	TR-33	PTC139 *	HEPS0025 *	RE 13 *	SK3124	RT-308	ECG229 *
TR35	2SC458C	2000-203	GE-210 *	(IR)2SC458B	PTC121 *	HEPS0009 *	RE 13 *	SK3124	RT-187	ECG123A *
	2SC458 (1)		GE-210 *	(IR)2SC458B	PTC121 *	HEPS0009 *	RE 13 *	SK3124	RT-187	ECG123A *

PARTS LIST AND DESCRIPTION (CONTINUED)

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

SEMICONDUCTORS (Select replacement transistor for best results) (cont)

ITEM No.	TYPE No.	MFR. PART No.	REPLACEMENT DATA							
			GENERAL ELECTRIC PART No.	IR WORKMAN PART No.	MALLORY PART No.	MOTOROLA PART No.	RAYTHEON PART No.	RCA PART No.	SPRAGUE PART No.	SYLVANIA PART No.
TR36	2SC1419B	2000-220	GE-66	TR-76	PTC167	HEPS5027	RE 21	SK3054	RT-197	ECG152
TR37	2SC1417(1)		GE-66	TR-76	PTC167	HEPS5027	RE 21	SK3054	RT-197	ECG152
	2SA719P	2000-222 (1)	GE-21 *	TR-28 *	PTC103 *	HEPS0012 *	RE 26 *	SK3114	RT-305	ECG290
TR38	2SC1675L	2000-213	GE-213	TR-33	PTC139 *	HEPS0025 *	RE 13 *	SK3124	RT-308	ECG229 *
	2SC1675(1)		GE-213	TR-33	PTC139 *	HEPS0025 *	RE 13 *	SK3124	RT-308	ECG229 *
TR39	2SC1675L	2000-213	GE-213	TR-33	PTC139 *	HEPS0025 *	RE 13 *	SK3124	RT-308	ECG229 *
	2SC1675(1)		GE-213	TR-33	PTC139 *	HEPS0025 *	RE 13 *	SK3124	RT-308	ECG229 *
TR40	2SC1675L	2000-213	GE-213	TR-33	PTC139 *	HEPS0025 *	RE 13 *	SK3124	RT-308	ECG229 *
	2SC1675(1)		GE-213	TR-33	PTC139 *	HEPS0025 *	RE 13 *	SK3124	RT-308	ECG229 *
TR41	2SC945AP	2000-210	GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
	2SC945 (1)		GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
TR42	2SC945AP	2000-210	GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
	2SC945 (1)		GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
TR43	2SC1307-1	2000-212	GE-216	WEP1307	PTC186		RE 201	SK3197	RT-158	ECG236
	2SC1307(1)		GE-216	WEP1307	PTC186		RE 201	SK3197	RT-158	ECG236
TR44	2SC1306	2000-211	GE-215	WEP1306	PTC186		RE 203	SK3197	RT-146	ECG235
TR45	2SC1973	2000-215	GE-335	WEP922						ECG315
TR301	2SC945AP	2000-210	GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
	2SC945 (1)		GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
TR302	2SC1419B	2000-220	GE-66	TR-76	PTC167	HEPS5027	RE 21	SK3054	RT-197	ECG152
	2SC1419(1)		GE-66	TR-76	PTC167	HEPS5027	RE 21	SK3054	RT-197	ECG152
TR401	2SC1777		GE-14	TR-59	PTC140	HEPS7004	RE 19	SK3027	RT-131	ECG130
	2SC1618B	2000-221 (1)	GE-14	TR-59	PTC140	HEPS7004	RE 19	SK3027	RT-131	ECG130
	2SC1618(1)		GE-14	TR-59	PTC140	HEPS7004	RE 19	SK3027	RT-131	ECG130
	2SD188 (1)		GE-14	TR-59	PTC140	HEPS7004	RE 19	SK3027	RT-131	ECG130

* Lead configuration may vary from original.

(1) Used in some versions.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING	REPLACEMENT DATA				
		MFR. PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
					Q-LINE	GENERAL LINE
C14	33 10V	1800-323	PC30-25	VTT33B10	QV1-61	EV-1125
C35	1 50V	1800-302	PC1-50	VTT1A50	QV1-11	EV-1615
C39	1 16V	1800-501		TDC104M050EL	QDT1-2	SD50-R109
C42	10 16V	1800-306	PC10-25	VTT10B25	QV1-41	EV-1222
C43	10 16V	1800-306	PC10-25	VTT10B25	QV1-41	EV-1222
C44	4.7 25V	1800-304	PC5-50	VTT4R7B50	QV1-27	EV-1319
C47	47 10V	1800-324	PC50-16	VTT47D16	QV1-73	EV-1226
C49	47 10V	1800-324	PC50-16	VTT47D16	QV1-73	EV-1226
C50	47 10V	1800-324	PC50-16	VTT47D16	QV1-73	EV-1226
C52	1 16V	1800-501		TDC104M050EL	QDT1-2	SD50-R109
C55	2.2 25V	1800-303	PC2-100	VTT2R2A50	QV1-19	EV-1517
C58	1 50V	1800-302	PC1-50	VTT1A50	QV1-11	EV-1615
C59	47 10V	1800-324	PC50-16	VTT47D16	QV1-73	EV-1226
C60	1 16V	1800-501		TDC104M050EL	QDT1-2	SD50-R109
C63	10 16V	1800-306	PC10-25	VTT10B25	QV1-41	EV-1222
C66	47 10V	1800-324	PC50-16	VTT47D16	QV1-73	EV-1226
C67	4.7 25V	1800-304	PC5-50	VTT4R7B50	QV1-27	EV-1319
C68	4.7 25V	1800-304	PC5-50	VTT4R7B50	QV1-27	EV-1319
C69	10 16V	1800-306	PC10-25	VTT10B25	QV1-41	EV-1222
C76	47 10V	1800-324	PC50-16	VTT47D16	QV1-73	EV-1226
C77	47 50V	1800-301	PC1-50	VTT47A63	QV1-3	EV-1610
C78	47 50V	1800-301	PC1-50	VTT47A63	QV1-3	EV-1610
C79	47 50V	1800-301	PC1-50	VTT47A63	QV1-3	EV-1610
C81	220 16V	1800-314	PC250-25	VTT220H16	QV1-117	EV-1240
C84	1 50V	1800-302	PC1-50	VTT1A50	QV1-11	EV-1615
C87	4.7 25V	1800-304	PC5-50	VTT4R7B50	QV1-27	EV-1319
C88	4.7 25V	1800-304	PC5-50	VTT4R7B50	QV1-27	EV-1319
C89	33 16V	1800-307	PC30-25	VTT33D25	QV1-63	EV-1325
C92	33 16V	1800-307	PC30-25	VTT33D25	QV1-63	EV-1325
C94	1000 16V	1800-328	PC1000-16	VTT1000L16	QV1-183	EV-1260
C95	470 10V	1800-309	PC500-16	VTT470K16	QV1-149	EV-1150
C97	4.7 25V	1800-304	PC5-50	VTT4R7B50	QV1-27	EV-1319
C98	1 50V	1800-302	PC1-50	VTT1A50	QV1-11	EV-1615
C99	10 16V	1800-306	PC10-25	VTT10B25	QV1-41	EV-1222
C101	100 10V	1800-310	PC100-10	VTT100E10	QV1-93	EV-1130
C102	220 10V	1800-325	PC250-10	VTT220F10	QV1-115	EV-1140
C103	470 10V	1800-327	PC500-16	VTT470K16	QV1-149	EV-1150
C104	330 10V	1800-326	WBR300-35	VTT330G10	QV1-131	EV-1145
C107	1000 16V	1800-328	PC1000-16	VTT1000L16	QV1-183	EV-1260
C110	1 16V	1800-501		TDC104M050EL	QDT1-2	SD50-R109
C120	10 16V	1800-306	PC10-25	VTT10B25	QV1-41	EV-1222
C126	1 50V	1800-302	PC1-50	VTT1A50	QV1-11	EV-1615
C135	220 10V	1800-325	PC250-10	VTT220F10	QV1-115	EV-1140
C140	10 6.3V	1800-602		TDC106M025FL	QDT1-64	SD25-109
C141	10 6.3V	1800-602		TDC106M025FL	QDT1-64	SD25-109
C158	1 50V	1800-302	PC1-50	VTT1A50	QV1-11	EV-1615
C179	2.2 6.3V	1800-603				
C181	47 10V	1800-324	PC50-16	VTT47D16	QV1-73	EV-1226
C199	1 50V	1800-302	PC1-50	VTT1A50	QV1-11	EV-1615

PRESIDENT MODEL WASHINGTON

PARTS LIST AND DESCRIPTION (CONTINUED)

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

ELECTROLYTIC CAPACITORS (cont)

ITEM No.	RATING	REPLACEMENT DATA				
		MFR. PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
					Q-LINE	GENERAL LINE
C211	2.2 25V	1800-303	PC2-100	VTT2R2A50	QV1-19	EV-1517
C218	4.7 25V	1800-304	PC5-50	VTT4R7B50	QV1-27	EV-1319
C302	220 16V	1800-314	PC250-25	VTT220H16	QV1-117	EV-1240
C304	3300 25V	1800-329	WBR3000-35	TC2530		
C402	220 10V	1800-325	PC250-10	VTT220F10	QV1-115	EV-1140

CAPACITORS

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA				
			CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
						Q-LINE	GENERAL LINE
C1	39 NPO 5%				CN0439		10TCC-Q39
C2	.01 10%	1800-078					
C4	.01 10%	1800-078					
C5	.01 10%	1800-078					
C6	.01 10%	1800-078					
C7	.001		DD-102G	GP1000	GP210	QC2-81	5GA-D10
C8	100		DD-101	GP100	GP310		10TS-T10
C9	.0022		DD-222		GP222	QC2-97	5GA-D22
C10	.0047 10%	1800-077					
C11	.0047 10%	1800-077					
C12	.0047 10%	1800-077					
C13	.0047 10%	1800-077					
C15	.01 10%	1800-078					
C16	.01 10%	1800-078					
C17	.01 10%			WMF1S1	EWFA1A110	QF1-91	1PB-S10
C18	.049 10%				M192P3939R8		192P3939R8
C19	.022		DC-203	MGP02	TA120	QC2-157	TG-S20
C20	.022		DC-203	MGP02	TA120	QC2-157	TG-S20
C21	.022		DC-203	MGP02	TA120	QC2-157	TG-S20
C22	.022		DC-203	MGP02	TA120	QC2-157	TG-S20
C23	.022 10%			DPMS2S22	EWFA1A122	QF1-127	1PB-S22
C24	56 NPO 10%				CN0456		10TCC-Q56
	.001	(1)	DD-102G	GP1000	GP210	QC2-81	5GA-D10
C25	.039 10%				M192P3939R8		192P3939R8
C26	.039 10%				M192P3939R8		192P3939R8
C27	.039 10%				M192P3939R8		192P3939R8
C28	.022		DC-203	MGP02	TA120	QC2-157	TG-S20
C29	.039 10%				M192P3939R8		192P3939R8
C30	.039 10%				M192P3939R8		192P3939R8
C31	.039 10%				M192P3939R8		192P3939R8
C32	5 NPO		DTZ-4R7	NPO4P7	CN0547		10TCC-V47
C33	.022		DC-203	MGP02	TA120	QC2-157	TG-S20
C34	.022		DC-203	MGP02	TA120	QC2-157	TG-S20
C36	5 NPO		DTZ-4R7	NPO4P7	CN0547		10TCC-V47
C37	10 NPO		DTZ-10	NPO10	CN0410		10TCC-Q10
C38	330 10%		DD-331	GP330	GP333		10TS-T33
C40	.039 10%				M192P3939R8		192P3939R8
C44	33 NPO 5%		DTZ-33	NPO33	CN0433		10TCC-Q33
C45	47 5%		DTZ-47	NPO47	CN0447		10TCC-Q47
C46	.01 10%	1800-078					
C51	.022 10%			DPMS2S22	EWFA1A122	QF1-127	1PB-S22
C53	.01 10%	1800-078					
C54	33 NPO 5%		DTZ-33	NPO33	CN0433		10TCC-Q33
C57	.022		DC-203	MGP02	TA120	QC2-157	TG-S20
C61	.047				EWFA1A147	QF1-171	1PB-S47
C62	.047				EWFA1A147	QF1-171	1PB-S47
C64	.039 10%				M192P3939R8		192P3939R8
C71	.068 10%			DPMS6S82	PVC6182		6PS-S82
C72	.022 10%			DPMS2S22	EWFA1A122	QF1-127	1PB-S22
C73	.1 10%			DPMS2P1	EWFA1A010	QF1-215	1PB-P10
C74	.022 10%			DPMS2S22	EWFA1A122	QF1-127	1PB-S22
C75	.1 10%			WMF1S68	EWFA1A168	QF1-195	1PB-S68
C80	.01 10%			DPMS2S22	EWFA1A122	QF1-127	1PB-S22
C82	.047				EWFA1A147	QF1-171	1PB-S47
C83	.01 10%			WMF1S1	EWFA1A110	QF1-91	1PB-S10
C85	.039 10%				M192P3939R8		192P3939R8
C86	.022 10%			DPMS2S22	EWFA1A122	QF1-127	1PB-S22
C90	22 NPO 5%		DTZ-22	NPO22	CN0422		10TCC-Q22
C91	.1 10%	1800-077(1)		DPMS2P1	EWFA1A010	QF1-215	1PB-P10
	.0047						
C93	.68 NPO 5%		DTZ-68	NPO68	CN0468		10TCC-Q68
C96	.1 10%	1800-077(1)		DPMS2P1	EWFA1A010	QF1-215	1PB-P10
	.0047						
C100	.022		DC-203	MGP02	TA120	QC2-157	TG-S20
C105	.022		DC-203	MGP02	TA120	QC2-157	TG-S20
C106	.022		DC-203	MGP02	TA120	QC2-157	TG-S20
C109	.022		DC-203	MGP02	TA120	QC2-157	TG-S20
C111	18 NPO 5%				CN0418		10TCC-Q18
C112	18 NPO 5%				CN0418		10TCC-Q18
C113	.001 10%		DD-102		GP210		10TS-D10

PARTS LIST AND DESCRIPTION (CONTINUED)

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

CAPACITORS (cont)

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA				
			CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
						Q-LINE	GENERAL LINE
C114	.001 10%		DD-102		GP210		10TS-D10
C115	100 NPO 10%		DTZ-100	NP0100	CN0310		10TCC-T10
C116	10 NPO		DTZ-10	NP010	CN0410		10TCC-Q10
C117	1.5 NPO		DTZ-1R5	NP01P5	CN0515		10TCC-V15
C118	.022		DC-203	MGP02	TA120	QC2-157	TG-S20
C121	.039 10%				M192P3939R8		192P3939R8
C122	47 NPO 5%		DTZ-47	NP047	CN0447		10TCC-Q47
C123	47 NPO 5%		DTZ-47	NP047	CN0447		10TCC-Q47
C124	.01 10%	1800-078					
C125	270		DD-271	GP270	GP327		10TS-T27
C127	470		DD-471	GP470	GP347		10TS-T47
C128	220		DD-221		GP322		10TS-T22
C129	.01 10%	1800-078					
C130	10 NPO		DTZ-10	NP010	CN0410		10TCC-Q10
C131	.01 10%			WMF1S1	EWFA1A110	QF1-91	1PB-S10
C133	.1 10%			DPMS2P1	EWFA1A010	QF1-215	1PB-P10
C134	.1 10%			DPMS2P1	EWFA1A010	QF1-215	1PB-P10
C136	220		DD-221		GP322		10TS-T22
C137	220		DD-221		GP322		10TS-T22
C138	.01 10%	1800-078					
C139	10 NPO		DTZ-10	NP010	CN0410		10TCC-Q10
C142	68 NPO 5%		DTZ-68	NP068	CN0468		10TCC-Q68
C143	7		DTZ-6R8	NP06P8	CN0568		10TCC-V68
C146	.0022		DD-222		GP222	QC2-97	5GA-D22
C147	470		DD-471	GP470	GP347		10TS-T47
C148	220		DD-221		GP322		10TS-T22
C149	.01 10%	1800-078					
C150	10 NPO		DTZ-10	NP010	CN0410		10TCC-Q10
C151	.01 10%	1800-078					
C152	.01 10%	1800-078					
C153	.047						
C154	10 NPO		DTZ-10	NP010	EWFA1A147	QF1-171	1PB-S47
C155	1 NPO				CN0410		10TCC-Q10
C156	.022		DC-203	MGP02	CN0510		10TCC-V10
C157	.039 10%				TA120	QC2-157	TG-S20
C159	.0047 10%		DD-472	GP4700	M192P3939R8		192P3939R8
C160	.0047 10%		DD-472	GP4700	GP247		5GA-D47
C163	39 NPO 5%				GP247		5GA-D47
C164	68 NPO 5%		DTZ-68	NP068	CN0439		10TCC-Q39
C165	220 NPO 10%		DD-221		CN0468		10TCC-Q68
C166	.0047 10%	1800-077			GP322		10TS-T22
C167	390 N750 10%		DTN-390				10TCU-T39
C168	.5 NPO	1800-002					
C169	.047 10%				EWFA1A147	QF1-171	1PB-S47
C170	470 N750 10%		DTN-470				10TCU-T47
C172	.0047 10%	1800-077					
C173	180 NPO 10%		DTZ-180				10TCC-T18
C174	56 NPO 5%				CN0456		10TCC-Q56
C175	.1 10%			DPMS2P1	EWFA1A010	QF1-215	1PB-P10
C176	56 NPO 5%				CN0456		10TCC-Q56
C177	.0047 10%	1800-077					
C178	.0047 10%	1800-077					
C183	.0047 10%	1800-077					
C184	120 NPO 10%		DTZ-120		CN0312		10TCC-T12
C185	.0047 10%	1800-077					
C186	.0047 10%	1800-077					
C187	.0047 10%	1800-077					
C188	.1 10%			DPMS2P1	EWFA1A010	QF1-215	1PB-P10
C189	.0047 10%	1800-077(1)					
C190	.01 10%	1800-077					
C192	.01 10%	1800-078					
C193	.022		DC-203	MGP02	TA120	QC2-157	TG-S20
C194	.039 10%				M192P3939R8		192P3939R8
C195	.01 10%	1800-078					
C196	.022		DC-203	MGP02	TA120	QC2-157	TG-S20
C197	.022		DC-203	MGP02	TA120	QC2-157	TG-S20
C198	.039 10%				M192P3939R8		192P3939R8
C200	.01 10%			WMF1S1	EWFA1A110	QF1-91	1PB-S10
C201	.01 10%			WMF1S1	EWFA1A110	QF1-91	1PB-S10
C202	.022		DC-203	MGP02	TA120	QC2-157	TG-S20
C203	.022		DC-203	MGP02	TA120	QC2-157	TG-S20
C204	.01 10%	1800-078					
C205	.01 10%	1800-078					
C206	.022		DC-203	MGP02	TA120	QC2-157	TG-S20
C207	.01 10%	1800-078					
C208	.01 10%	1800-078					
C209	.01 10%	1800-078					
C210	.01 10%	1800-078					
C213	.1		DC-104	MGP1	TA010	QC2-233	TG-P10
C214	.01 10%	1800-078					
C215	.022		DC-203	MGP02	TA120	QC2-157	TG-S20
C216	.022		DC-203	MGP02	TA120	QC2-157	TG-S20
C217	.022		DC-203	MGP02	TA120	QC2-157	TG-S20
C219	.022		DC-203	MGP02	TA120	QC2-157	TG-S20
C220	.022		DC-203	MGP02	TA120	QC2-157	TG-S20
C221	.022		DC-203	MGP02	TA120	QC2-157	TG-S20
C222	.1		DC-104	MGP1	TA010	QC2-233	TG-P10
C223	.022		DC-203	MGP02	TA120	QC2-157	TG-S20
C227	.022		DC-203	MGP02	TA120	QC2-157	TG-S20
C231	.047				EWFA1A147	QF1-171	1PB-S47
C232	180 N220 10%	1800-413			*		10TCR-T18
C233	.1		DC-104	MGP1	TA010	QC2-233	TG-P10
C239	.1		DC-104	MGP1	TA010	QC2-233	TG-P10

PRESIDENT MODEL WASHINGTON

PARTS LIST AND DESCRIPTION (CONTINUED)

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

CAPACITORS (cont)

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA				
			CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
						Q-LINE	GENERAL LINE
C240	.01 10%	1800-077	DTZ-47	WMF1S1 NP047	EWF1A110 CN0447 M192P3939R8 M192P3939R8 EWF1A147	QF1-91 DTCC-Q47 QF1-171	1PB-S10 192P3939R8 192P3939R8 1PB-S47
C242	47 NPO 5%						
C243	.0047 10%						
C301	.039 10%						
C303	.039 10%						
C401	.047	1800-078	DD-102G	GP1000	GP210	QC2-81	5GA-D10
C403	.01 10%						
C404	.01 10%						
C405	.001						
C406	.001						
C407	.001	1800-078	DD-102G	GP1000	GP210	QC2-81	5GA-D10
C408	.001						
C414	.02						
C415	.001						
C416	.001						
CC1	.01	1800-103(2)	DD-102G	GP1000	GP210	QC2-81	5GA-D10
CC2	.01						
CT1	20						
CT2	20						
CT3	20						
CT4	20	1800-203	DC-203	MGP02	TA120	QC2-157	TG-S20
CT5	20						
CT6	20						
CT7	20						
CT8	20						

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

(1) Used in some versions.

(2) Consists of four .01 capacitors.

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

ITEM No.	FUNCTION	RESIST-ANCE	REPLACEMENT DATA				
			MFR. PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	MALLORY PART No.	TRW PART No.
RT301	Voltage	300	1900-206	T-300	C-500	MTC32L1	X201R351B
VR1	S Meter	20K	1900-209 (6)				
VR2	S Meter	25K	1900-209 (6)				
VR3	RF Gain Range	500K	1900-212				
VR4	Squelch Range	100K	1900-211				
VR5	Balance	50K	1900-210				
VR6	AM Balance	100K	1900-211				
VR7	AMC	5000	1900-207				
VR8	AM Reg	10K	1900-208				
VR9	34.9825MHz	5000	1900-207				
VR12	RF Meter	100K	1900-211				
VR15	Bias	300	1900-206				
VR16	Bias	300	1900-206				
VR401	Clarifier	20K	1900-105 RV-049 (5)	F1-25K (1), SSK012	A47-20K-S (1), KSS-3 or [NP-20K-S(1), UP-C-400]	RU253L, SL36, SL1500 or UA24L (1), SK750]	BU1 (1),CF62, SS1, DC1
VR402	RF Gain	100K	1900-214	F1-100K(1), SSK012	A47-100K-S(1), KSS-3 or [NP-100K-S (1), UP-C-400]	RU15L,SL36,SL1500 or [UA15L (1), SK750]	BU1 (1), CF13, SS1, DC1
VR404	S Squelch	100K	1900-214	F1-100K(1), SSK012	A47-100K-S(1), KSS-3 or [NP-100K-S(1), UP-C-400]	RU15L, SL36, SL1500 or [UA15L (1), SK750]	BU1 (1),CF13, SS1, DC1
VR405	Volume/Switch	10K	1900-213	F2-10K (1), SSK012, KR-1	A47-10K-Z(1), KSS-3,SWE-12 or [NP-10K-Z, UP-C-400,NWE-12]	RU14A, SL36, SL1500, US41 or [UA14A (1),SK750, US26]	BU1 (1), CF61, SS1, GC
VR408	Mike Gain	20K	1900-105 RV-049 (5)	F1-25K (1), SSK012	A47-20K-S (1), KSS-3 or [NP-20K-S (1), UP-C-400]	RU253L, SL36, SL1500 or [UA24L (1),SK750]	BU1 (1), CF62, SS1, DC1

(1) Enlarge mounting hole.

(5) Number on unit.

(6) Alternate part, may be used in some versions.

RESISTORS (Power and Special)

ITEM No.	RATING	REPLACEMENT DATA		ITEM No.	RATING	REPLACEMENT DATA	
		WORKMAN PART No.	MFR. PART No.			WORKMAN PART No.	MFR. PART No.
RR1	4700		1800-104 (1)	R404	10 5W	5W-SQ10	1900-086
R107	10 5W	5W-SQ10	1900-086				

(1) Consists of eight 4700-ohm resistors.

PARTS LIST AND DESCRIPTION (CONTINUED)

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

COILS (RF-IF)

ITEM No.	FUNCTION	REPLACEMENT DATA			REMARKS
		PART No.	OTHER IDENTIFICATION	MILLER PART No.	
L1	Noise Blanker (23.5MHz)	2200-001	LA-029-6824		
L2	Noise Blanker (23.5MHz)	2200-025	LA-155-6834		
L3	Rec Antenna (27MHz)	2200-024	LA-125-6734		
L4	Rec. RF (27MHz)	2200-026	LA-156-6914		
L5	Rec. Mixer (7.8MHz)	2200-043	LA-178-6914		
L6	Rec. Mixer (7.8MHz)	2200-029			
L7	IF (7.8MHz)	2200-002			
L8	IF (7.8MHz)	2200-023			
L9	RF Choke (470uH)	2200-040			
L10	RF Choke (56mH)	2200-041			
L11	RF Choke (60mH)	2200-042			
L12	RF Choke (470uH)	2200-040			
L13	RF Choke (470uH)	2200-040			
L14	RF Choke (470uH)	2200-040			
L16	VCO	2200-028	LA-160-6832		
L17	VCO Adj.	2200-031	LA-191-6924		
L18	RF Choke (470uH)	2200-040			
L19	RF Choke (100uH)	2200-202			
L20	RF Choke (470uH)	2200-040			
L21	RF Choke (470uH)	2200-040			
L22	RF Choke (470uH)	2200-040			
L23	RF Choke (470uH)	2200-040			
L24	Tripler (33MHz)	2200-030	LA-190-6014		
L25	RF Choke (470uH)	2200-040			
L27	TVI Trap (54MHz)	2200-032			
L28	RF Choke	2200-038			
L29	RF Choke	2200-038			
L30	Final Amp (27MHz)	2200-034			
L31	RF Choke	2200-036			
L32	Xmit Driver (27MHz)	2200-032			
L33	RF Choke	2200-036			
L34	RF Choke	2200-036			
L35	Xmit Pre Driver	2200-037			
L36	Xmit Amp	2200-037			
L37	Xmit Mixer (27MHz)	2200-027	LA-157-6934		
L38	RF Choke (470uH)	2200-040			
L39	IF (7.8MHz)	2200-002	LA-038-6914		
L40	RF Choke	2200-035			
L43	RF Choke (1uH)	2200-039			
L44	RF Choke (1uH)	2200-039			
L45	RF Choke (470uH)	2200-040			
L401	RF Choke (10uH)	2200-019			
L402	RF Choke (10uH)	2200-019			
L403	RF Choke (10uH)	2200-019			
L404	RF Choke (10uH)	2200-019			
L405	RF Choke (10uH)	2200-019			
L406	RF Choke (10uH)	2200-019			

PRESIDENT MODEL WASHINGTON

TRANSFORMER (Audio Output)

ITEM No.	IMPEDANCE		REPLACEMENT DATA			NOTES
	PRI.	SEC.	MFGR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T1	5.12	8	2200-003 TF-109 (1)			(1) Number on unit.

TRANSFORMER (Power)

ITEM No.	RATING		REPLACEMENT DATA			NOTES
	PRI.	SEC. 1	MFGR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T401	120V AC @ 760mA AC	20V AC @ 5.4A AC	2600-004 TF108 (1)			(1) Number on unit

SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		MFGR. PART No.	QUAM PART No.	
SP1	2 5/8" x 4" PM 8 Ohms	3100-004		

PARTS LIST AND DESCRIPTION (CONTINUED)

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

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
F401	3A Fast Acting	2800-003	1100-816	AGC3	HDJ	312003	150145	FG3-2
F402	3A Fast Acting	2800-003		AGC3	HKP	312003	342012AL	FG3-2

MICROPHONE

ITEM No.	REPLACEMENT DATA				CONNECTION DATA						
	MFR. PART No.	GC PART No.	GC NOISE CANCEL	GC POWER	GC CONNECTOR	GC Red	GC Shield	GC Yellow	GC Blue	GC White	GC Black
MIKE	3200-002	18-032	18-034	18-010	18-092	2	4	3	NC	NC	1

CRYSTALS

ITEM No.	CRYSTAL FREQUENCY IN MHz	MFR. PART No.	CTS KNIGHTS PART No.	CHANNEL	ITEM No.	CRYSTAL FREQUENCY IN MHz	MFR. PART No.	CTS KNIGHTS PART No.	CHANNEL
X1	7.8025	2100-004	CC35W78025	Carrier Osc	X4	11.2842	2100-006	CB35W112842	LSB Osc
X2	7.7975	2100-005	CC35W77975	Carrier Osc	X5	10.2400	2100-009		Ref Osc
X3	11.2858	2100-008	CB35W112858	USB Osc	X6	11.2850	2100-007	CD35W112850	AM Osc

MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
D401	Led	2200-306	Channel Indicator
D403	Led	2200-306	LSB Indicator
D404	Led	2200-306	USB Indicator
D405	Led	2200-306	AM Indicator
D407	LED	2200-306	XMIT Indicator
FT1	Filter		7.8MHz (FL-001)
FT2	Filter		7.8MHz (FL-046)
J401	Jack	1200-001	Antenna
J402	Jack	1100-013	Mike
J403	Jack	1100-001	PA Spkr
J404	Jack	1100-001	Ext Spkr
J405	Jack	1100-014	Phone
J406	Jack	1400-102	Power Supply
S401	Switch	3000-004	NB
S402	Switch	3000-103	AM/USB/LSB
S404	Switch	3000-004	ANL
S405	Switch	3000-004	PA/CB
S406	Switch		Power (Part of Volume Control)
S408	Switch	3000-105	Channel Selector
	Flat Cable		(WF-006, 3.5 - 120 - 3.5)
	Printed Circuit Board	3500-007	Main (PC-176AA)
	Printed Circuit Board	3500-009	Power Supply (PC-006EB)
	Printed Circuit Board	3500-008	Channel Switch (PC-205AA) Flexible
	Printed Circuit Board	3500-010	Push Switch (PC-179AA)

CABINETS & CABINET PARTS (When ordering specify model, chassis & color)

ITEM	PART No.	ITEM	PART No.
Chassis, Front	3300-508	Mike Hanger	3300-401
Chassis	3300-004	Knob, Channel Selector	1300-004
Panel, Front	3400-509	Pushbutton, Control	1300-003
Digital Window	3400-102		