



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.



Model Centurion PLL40

MANUFACTURER'S SPECIFICATIONS

General

Solid State Devices

Transistors - 37

FETs - 6

Diodes - 45

Varicap - 2

Integrated Circuits (IC) - 7

Speaker, self-contained, 8 ohms, 2 W.

Microphone, Dynamic, 600 ohms, with phone plug and Press-to-Talk switch.

Channel Selector, 40 channel, Illuminated

Meter, Signal Strength and RF Power Indicator

Antenna Connector, 50 ohms, Coaxial

Receiver

Sensitivity at 10 db S + N/N -

AM 0.25 μ V

SSB 0.15 μ V

Image Rejection at 30.8 MHz - 80 db

I.F. Frequencies -

1st I.F. 7.8 MHz

2nd I.F. 455 kHz

Squelch Sensitivity -

Threshold 0.15 μ V

Maximum (Stop) 500 μ V

Adjacent Channel Selectivity -

Better than 50 db

Cross Modulation - 60 db

Audio Output, 10% Distortion - 3.8 W

Audio Bandwidth (1 kHz / 0 db) - 3 db down

400 to 3000 Hz

Hum and Noise with no Signal -

3.8 mV

"S" Meter Sensitivity for - a reading of S9

150 μ V

Current Drain - No Signal

AC 40 W

DC 700 mA

Maximum Audio Output

AC 60 W

DC 1.6 Amperes

Transmitter

RF Power Output -

AM 3.8 to 4.0 W

SSB - (PEP) 9.0 to 12 W

Modulation Capability - 90 %

Frequency Range - 26.965 through 27.405 MHz

Spurious Signal Suppression - 60 db or better

Microphone Output for 100% - Modulation

4 mV

AM Mode

Current Drain at 13.8 Vdc -

No Modulation

AC 65 W

DC 1.8 Amperes

Maximum Modulation -

AC 100 W

DC 2.2 Amperes

Courtesy of the Manufacturer

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

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COURIER MODEL Centurion PLL40

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.
Adjust RT301 for 13.80 volts at TP11.
Connect low sides of test equipment to ground unless specified otherwise.
Connect 50-ohm dummy load or antenna before keying transmitter.
Connect microphone.

Suggested Alignment Tools:

L1 thru L7, L24, L26, L27, L6 thru L9(PLL) 9440
L12, L15, L19 8606, 9091, 9440
L28, L29, FT1 5000, 5009, 8276, 8728, 8728A, 9089
CT1(PLL), CT2(PLL), CT3(PLL) 5000, 8276, 9089

SYNTHESIZER ALIGNMENT

TEST EQUIPMENT	TRANSCIEVER	ADJUST	REMARKS
Input of frequency counter to TP6 (IC2(PLL) Pin 1).	Ch. 19		Check for 10.240MHz.
Input of frequency counter to TP7 IC2(PLL) Pin 8).	Ch. 19	CT1(PLL)	Adjust for 5.120MHz.
Input of frequency counter to TP2(PLL) (L9(PLL) Secondary).	Ch. 19, AM Clarifier Midrange	CT2(PLL)	Adjust for 33.8535MHz.
Input of frequency counter to TP2 (PLL) (L9(PLL) Secondary).	Ch. 19, LSB Clarifier Midrange	CT3(PLL)	Adjust for 33.8565MHz.
Input of oscilloscope to TP2(PLL) (L9(PLL) Secondary).	Ch. 19, AM	L8, L9(PLL)	Adjust for maximum RF. (600mV p-p typical). (See Figure 1.)
Input of DC meter to TP1(PLL) (IC1(PLL) Pin 4).	Ch. 1, AM	L7(PLL)	Adjust for 2.00 volts. Check channel 40 for approximately 2.75 volts.
Input of oscilloscope to TP8 (L6(PLL) Secondary).	Ch. 19, AM	L6(PLL)	Adjust for maximum RF. (1.80 volts typical). (See Figure 2.)
Input of frequency counter to TP3 (TR4 Emitter).	Ch. 19, AM		Check for 7.3435MHz.
Input of frequency counter to TP9 (L8 Secondary).	Ch. 19, USB	CT1	Adjust for 7.8015MHz.
Input of frequency counter to TP9 (L8 Secondary).	Ch. 19, LSB	CT2	Adjust for 7.7985MHz.
Input of oscilloscope to TP9 (L8 Secondary).	Ch. 19, USB	L8	Adjust for maximum RF. (2.10 volts typical). (See Figure 3.)

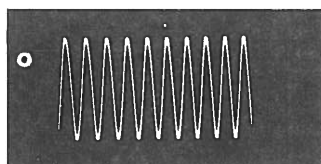


Figure 1

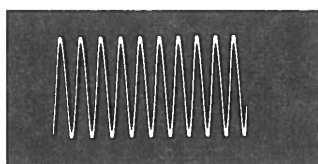


Figure 2

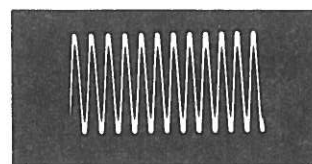


Figure 3

RECEIVER ALIGNMENT

Connect an AC VTVM or AF wattmeter across speaker voice coil.
 Adjust volume control to obtain a suitable indication.
 Set generator output low enough to prevent AGC limiting.
 RF Gain maximum, Clarifier Midrange, Squelch MINIMUM, Blanker Off, CB/PA CB, Tone High.

SSB

TEST EQUIPMENT	TRANSCIVER	ADJUST	REMARKS
Output of signal generator to TP10 (TR5 Base). 455kHz, 1000Hz @ 30% modulation.	Ch. 19, AM	L28, L29, FT1	Adjust for maximum audio output.
Output of signal generator to antenna input. 27.185MHz, 1000Hz @ 30% modulation.	Ch. 19, AM	L3, L4, L5	Adjust for maximum audio output. Readjust L28, L29 and FT1 for maximum.
Output of signal generator to antenna input. 27.185MHz, USB 1000Hz, @ 30% modulation.	Ch. 19, USB	L6, L7	Adjust for maximum audio output.
Input of oscilloscope to TP14 (TR1 Base). Inject a 100pps, 1uSec pulse width signal at antenna input.	Ch. 19 Blanker On	L1, L2	Adjust for maximum pulse amplitude. (2.2 volts peak typical) (See Figure 4.)

RECEIVER ADJUSTMENTS

Connect an AC VTVM or AF wattmeter across speaker voice coil.
 Adjust volume control to obtain a suitable indication.
 Set generator output low enough to prevent AGC limiting.
 RF Gain Maximum, Clarifier Midrange, Squelch MINIMUM, Blanker Off, CB/PA CB, Tone High.

TEST EQUIPMENT	TRANSCIVER	ADJUST	REMARKS
Output of signal generator to antenna input. 27.185MHz, USB 1000Hz @ 30% modulation.	Ch. 19, USB	RT21	SSB SENS Adjust for maximum audio output.
Output of signal generator to antenna input. 27.185MHz, 1000Hz @ 30% modulation. Output 2uV.	Ch. 19, AM Volume Maximum	RT2	AGC Adjust for 5.80 volts RMS (4.2 watts) audio output.
Output of signal generator to antenna input. 27.185MHz, 1000Hz @ 30% modulation. Output 10uV.	Ch. 19, AM Volume Maximum RF Gain MINIMUM	RT1	RF GAIN RANGE Adjust for 4.30 volts RMS (2.3W) audio output.
Output of signal generator to antenna input. 27.185MHz, 1000Hz @ 30% modulation. Output 100uV.	Ch. 19, AM Squelch Maximum	RT12	AM SQUELCH RANGE Adjust so squelch just breaks.
Output of signal generator to antenna input. 27.185MHz, USB, 1000Hz @ 30% modulation. Output 1000uV.	Ch. 19, USB Squelch Maximum	RT11	SSB SQUELCH RANGE Adjust so squelch just breaks.
Output of signal generator to antenna input. 27.185MHz, 1000Hz @ 30% modulation. Output 100uV.	Ch. 19, AM	RT4	AM S METER Adjust for 9 on AM S Scale of meter.
Output of signal generator to antenna input. 27.185MHz, USB, 1000Hz @ 30% modulation. Output 100uV.	Ch. 19, USB	RT6	SSB S METER Adjust for 9 on SSB S Scale of meter.

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
Input of RF wattmeter to antenna input. Inject a 2400Hz, 10mV signal at mic input.	Ch. 19, USB XMT	L26, L24, L19, L15	Adjust for maximum RF output.
Input of spectrum analyzer or harmonic meter to antenna input.	Ch. 19, AM XMT	L12	Adjust for MINIMUM at 54MHz. (2nd Harmonic)

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
Insert a 0-150mA DC meter at TP12 (Junction of L16 and L17).	Ch. 19, USB XMT	RT20	FINAL BIAS Adjust for 35mA.
Insert a 0-150mA DC meter at TP13 (Junction of L20 and C148).	Ch. 19, USB XMT	RT22	DRIVER BIAS Adjust for 20mA.
Input of RF wattmeter to antenna input.	Ch. 19, AM XMT	RT14	AM POWER Adjust for 4.0 watts RF output.
Input of oscilloscope or modulation meter to antenna input. Inject a 1000Hz, 10mV signal at mic input.	Ch. 19, AM XMT	RT9	ALC Adjust for 100% modulation maximum. (See Figure 5.)
Input of RF wattmeter to antenna input.	Ch. 19, USB XMT No modulation.	RT8	BALANCER Adjust for MINIMUM RF output.
Input of RF wattmeter to antenna input. Inject a 2400Hz, 10mV signal at mic input.	Ch. 19, USB XMT	CT3	SSB RF ALC Adjust for 12 watts RF output maximum.
Input of RF wattmeter to antenna input.	Ch. 19, AM XMT	RT15	TX METER Adjust so AM PWR meter agrees with RF wattmeter.
Input of frequency counter to antenna input.	Ch. 19, AM XMT	RT19	TX FREQ Adjust for 27.185MHz.

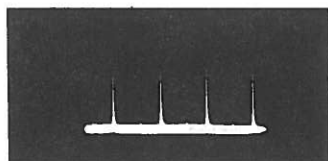


Figure 4

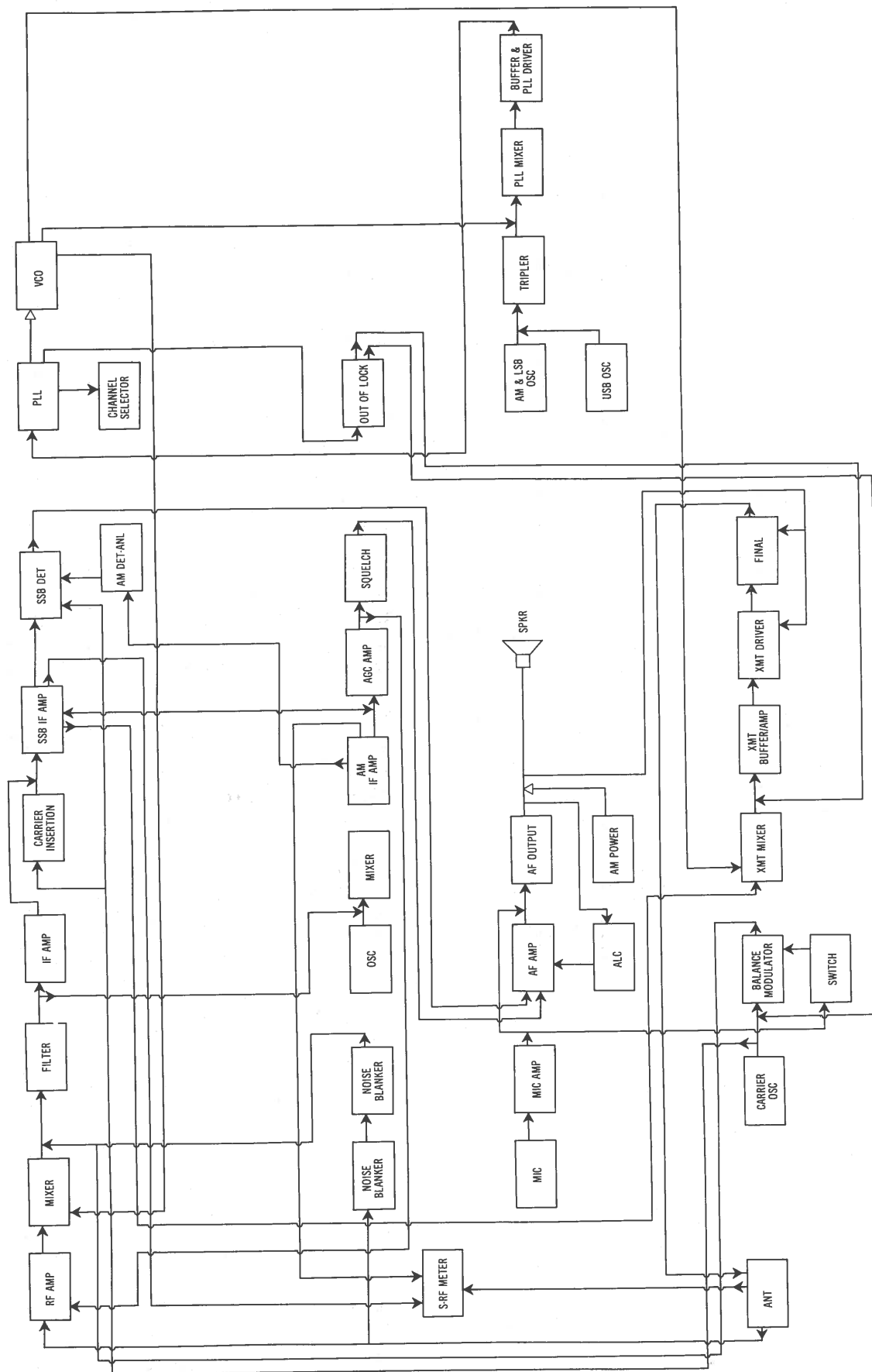


Figure 5

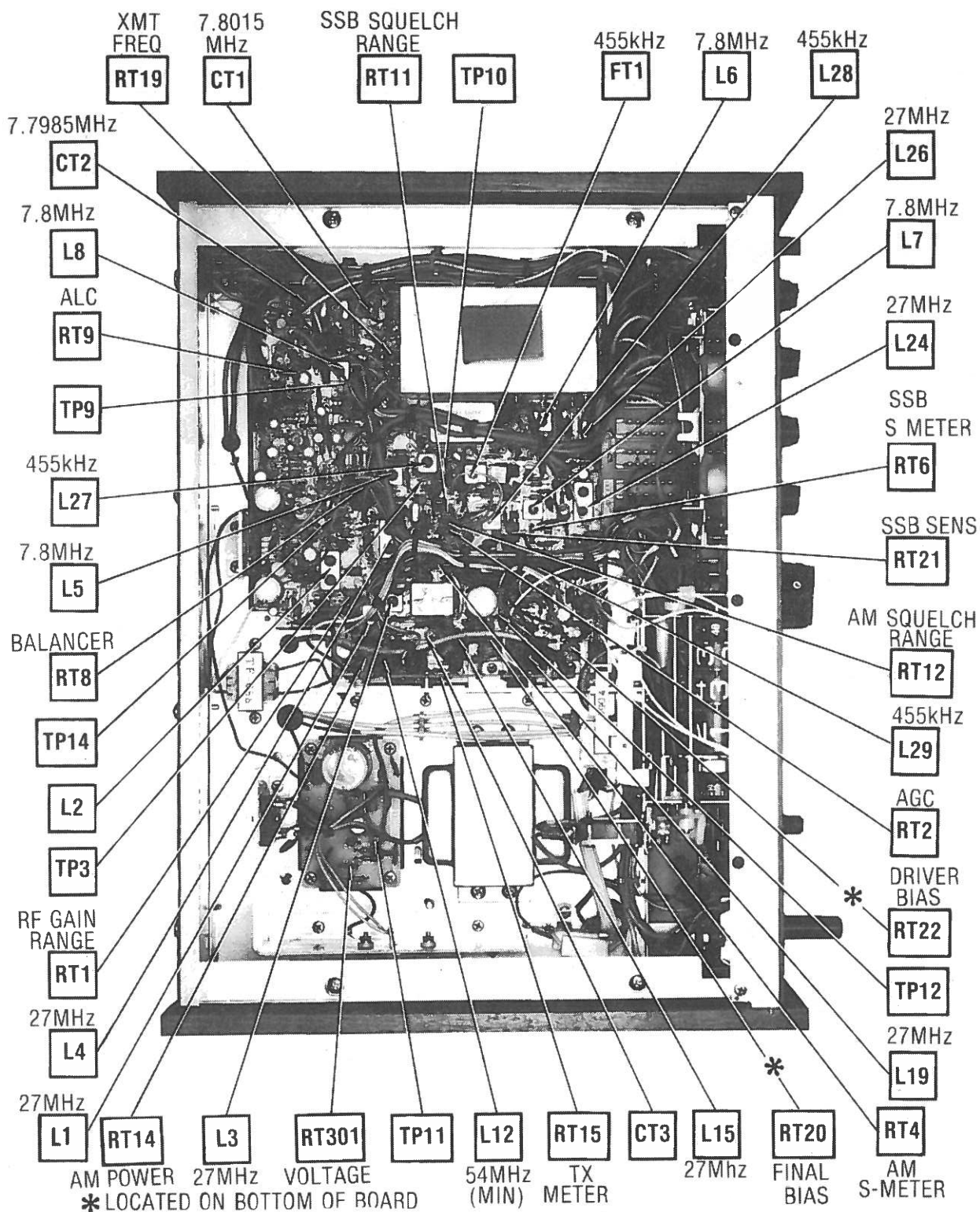
TRUTH CHART

C H A N N E L	1 = 4.88V 0 = 0V								AM, LSB VCO OUTPUT IN MHz AT TP8	USB VCO OUTPUT IN MHz AT TP8	VCO OUTPUT IN MHz AT TR2 (PLL) Collector
	IC2 (PLL) PINS										
	21	20	18	17	16	15	14	13			
1	0	1	0	1	0	0	0	1	34.7635	34.7665	.910
2	0	1	0	1	0	0	1	0	34.7735	34.7765	.920
3	0	1	0	1	0	0	1	1	34.7835	34.7865	.930
4	0	1	0	1	0	1	0	1	34.8035	34.8065	.950
5	0	1	0	1	0	1	1	0	34.8135	34.8165	.960
6	0	1	0	1	0	1	1	1	34.8235	34.8265	.970
7	0	1	0	1	1	0	0	0	34.8335	34.8365	.980
8	1	0	0	0	0	0	0	0	34.8535	34.8565	1.000
9	1	0	0	0	0	0	0	1	34.8635	34.8665	1.010
10	1	0	0	0	0	0	1	0	34.8735	34.8765	1.020
11	1	0	0	0	0	0	1	1	34.8835	34.8865	1.030
12	1	0	0	0	0	1	0	1	34.9035	34.9065	1.050
13	1	0	0	0	0	1	1	0	34.9135	34.9165	1.060
14	1	0	0	0	0	1	1	1	34.9235	34.9265	1.070
15	1	0	0	0	1	0	0	0	34.9335	34.9365	1.080
16	1	0	0	1	0	0	0	0	34.9535	34.9565	1.100
17	1	0	0	1	0	0	0	1	34.9635	34.9665	1.110
18	1	0	0	1	0	0	1	0	34.9735	34.9765	1.120
19	1	0	0	1	0	0	1	1	34.9835	34.9865	1.130
20	1	0	0	1	0	1	0	1	35.0035	35.0065	1.150
21	1	0	0	1	0	1	1	0	35.0135	35.0165	1.160
22	1	0	0	1	0	1	1	1	35.0235	35.0265	1.170
23	1	0	1	0	0	0	0	0	35.0535	35.0565	1.200
24	1	0	0	1	1	0	0	0	35.0335	35.0365	1.180
25	1	0	0	1	1	0	0	1	35.0435	35.0465	1.190
26	1	0	1	0	0	0	0	1	35.0635	35.0665	1.210
27	1	0	1	0	0	0	1	0	35.0735	35.0765	1.220
28	1	0	1	0	0	0	1	1	35.0835	35.0865	1.230
29	1	0	1	0	0	1	0	0	35.0935	35.0965	1.240
30	1	0	1	0	0	1	0	1	35.1035	35.1065	1.250
31	1	0	1	0	0	1	1	0	35.1135	35.1165	1.260
32	1	0	1	0	0	1	1	1	35.1235	35.1265	1.270
33	1	0	1	0	1	0	0	0	35.1335	35.1365	1.280
34	1	0	1	0	1	0	0	1	35.1435	35.1465	1.290
35	1	0	1	1	0	0	0	0	35.1535	35.1565	1.300
36	1	0	1	1	0	0	0	1	35.1635	35.1665	1.310
37	1	0	1	1	0	0	1	0	35.1735	35.1765	1.320
38	1	0	1	1	0	0	1	1	35.1835	35.1865	1.330
39	1	0	1	1	0	1	0	0	35.1935	35.1965	1.340
40	1	0	1	1	0	1	0	1	35.2035	35.2065	1.350

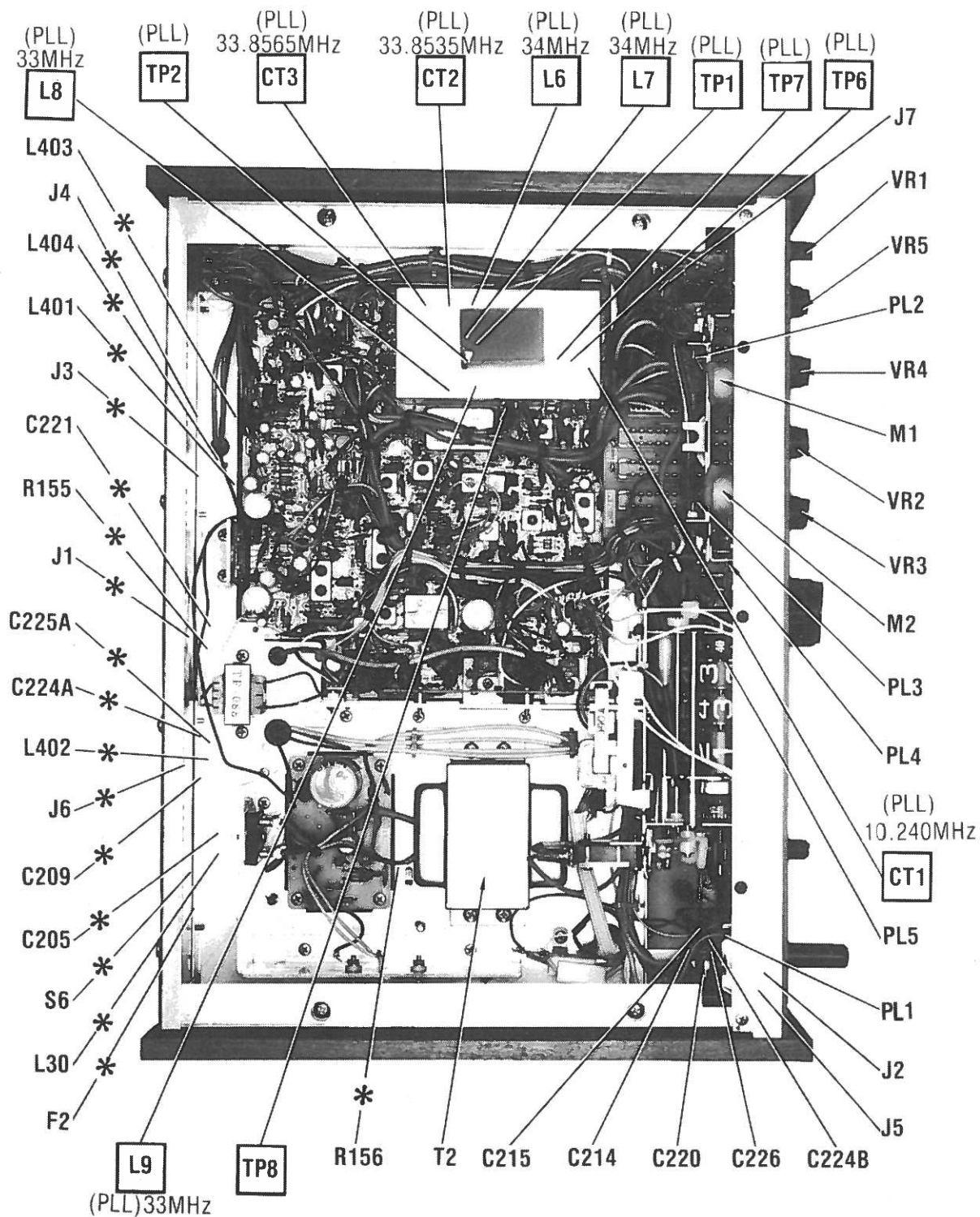
COURIER MODEL Centurion PLL40



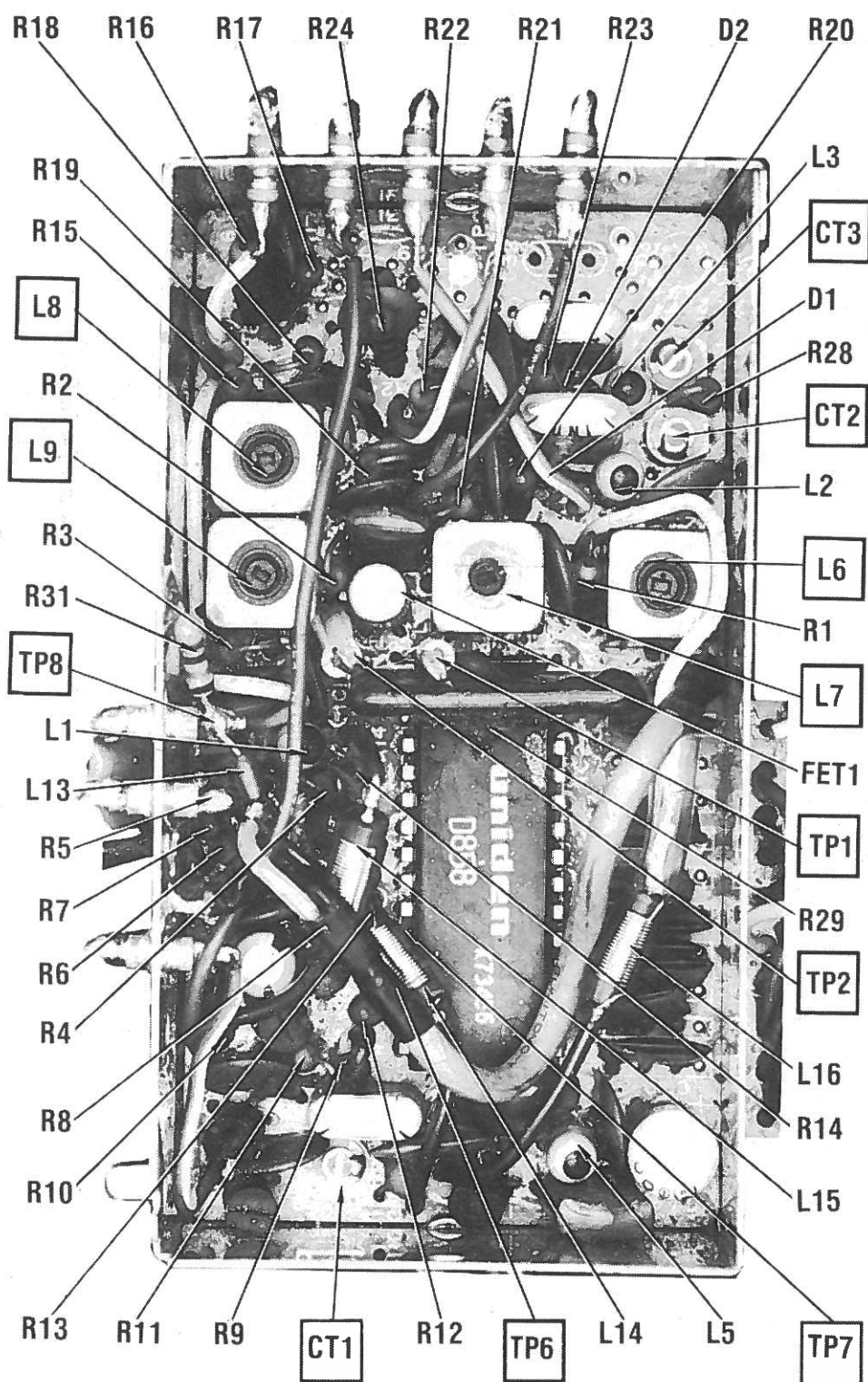
BLOCK DIAGRAM



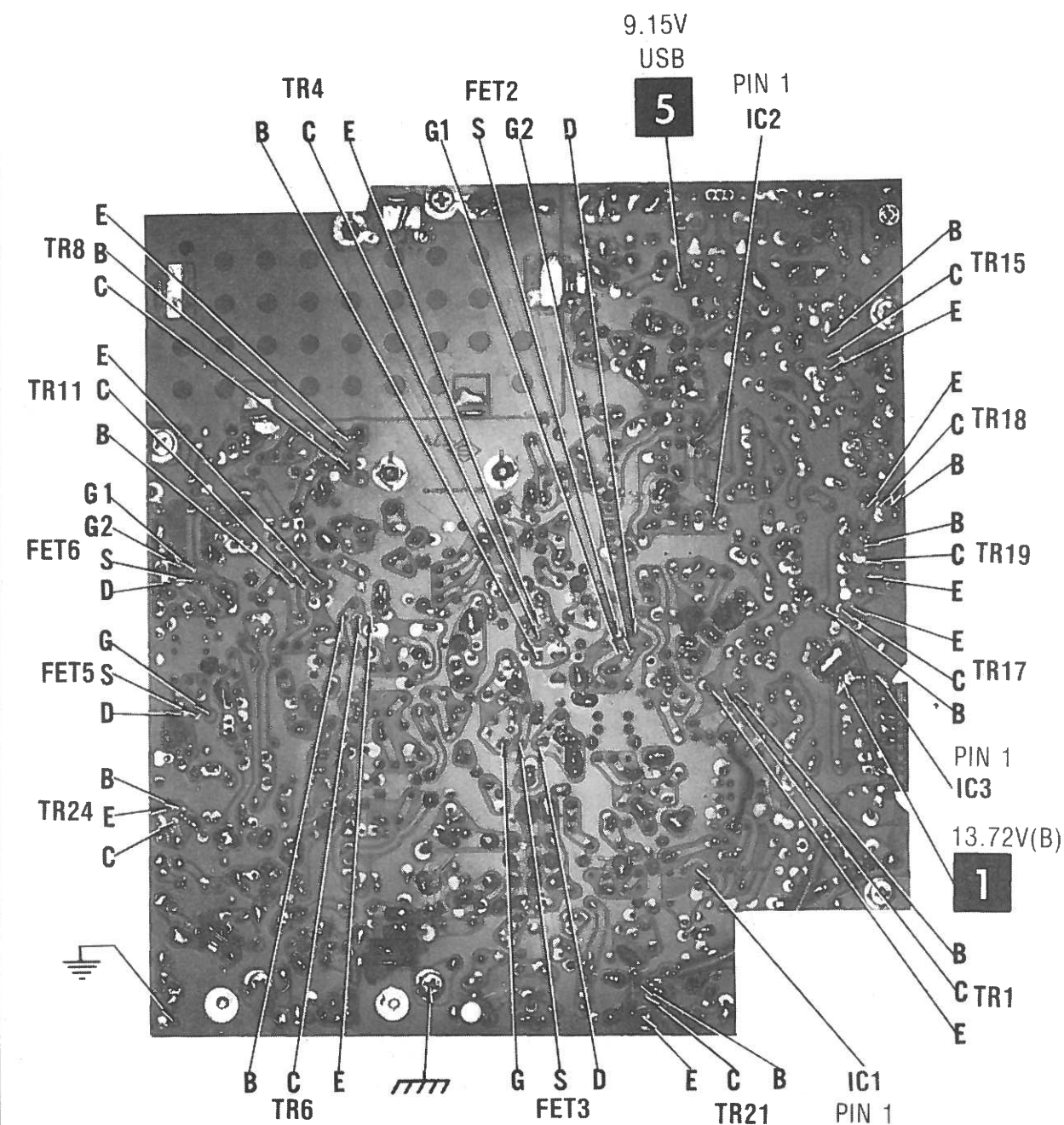
CHASSIS-OVERALL



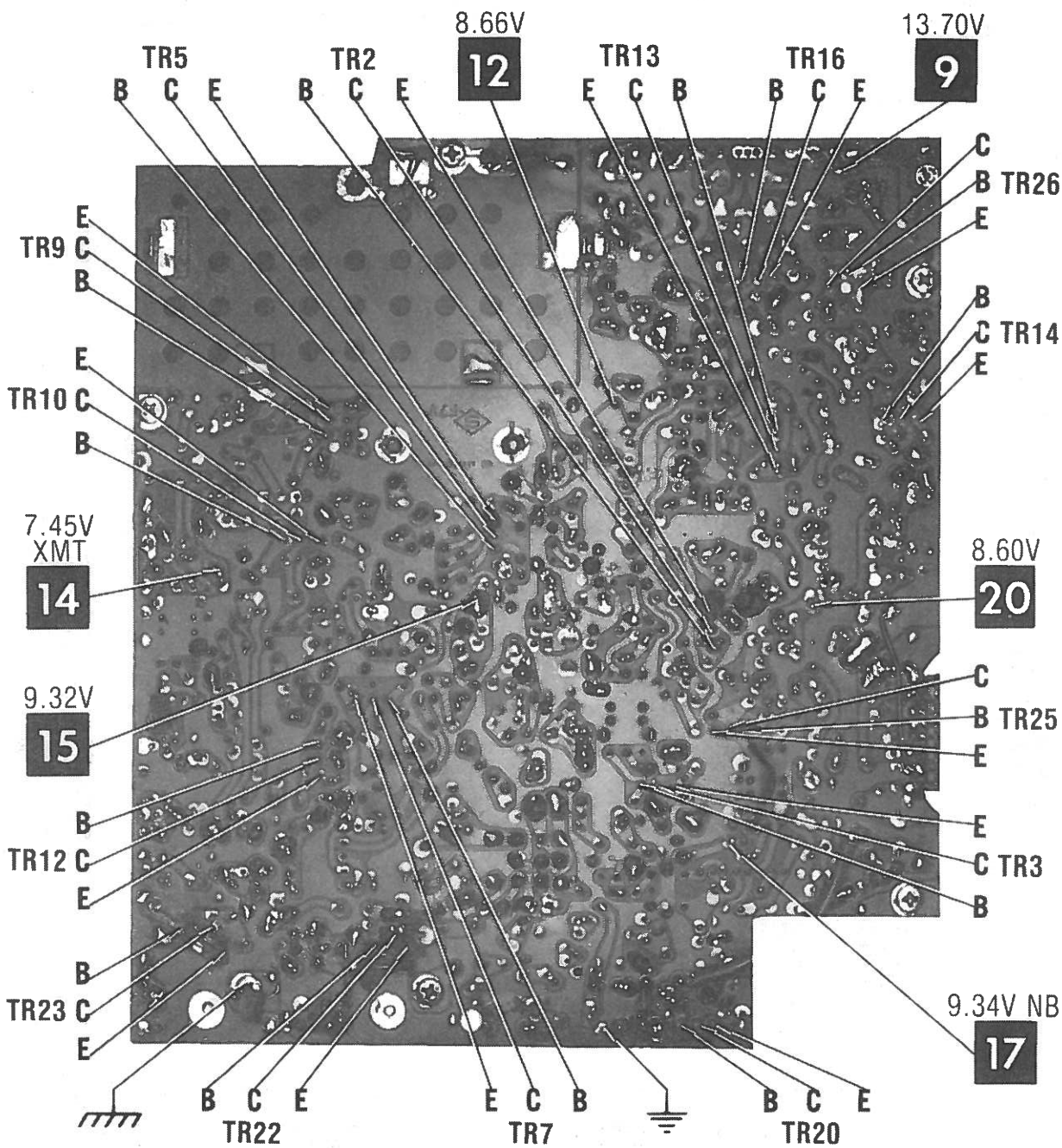
CHASSIS-OVERALL



PLL BOARD

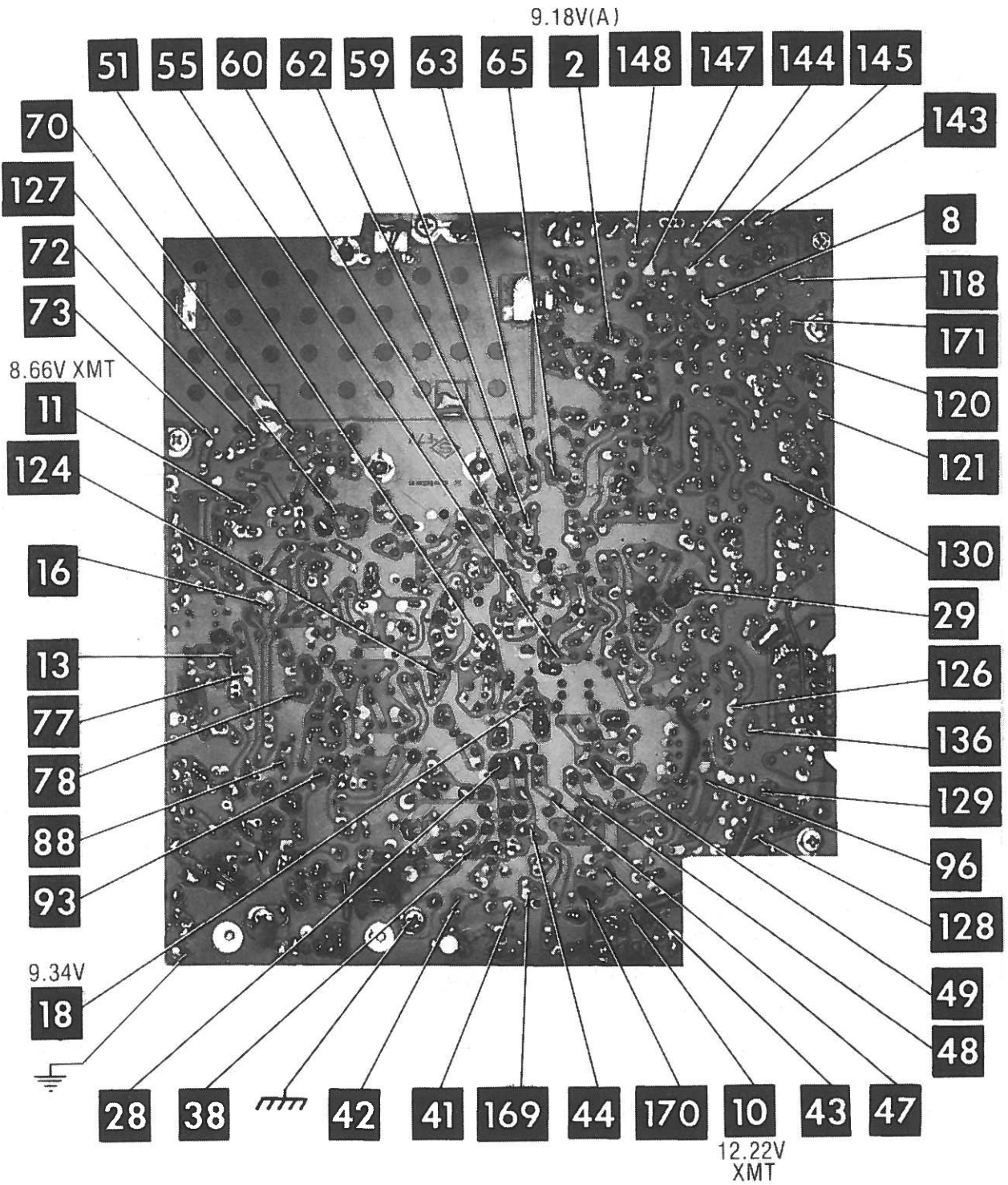


MAIN BOARD

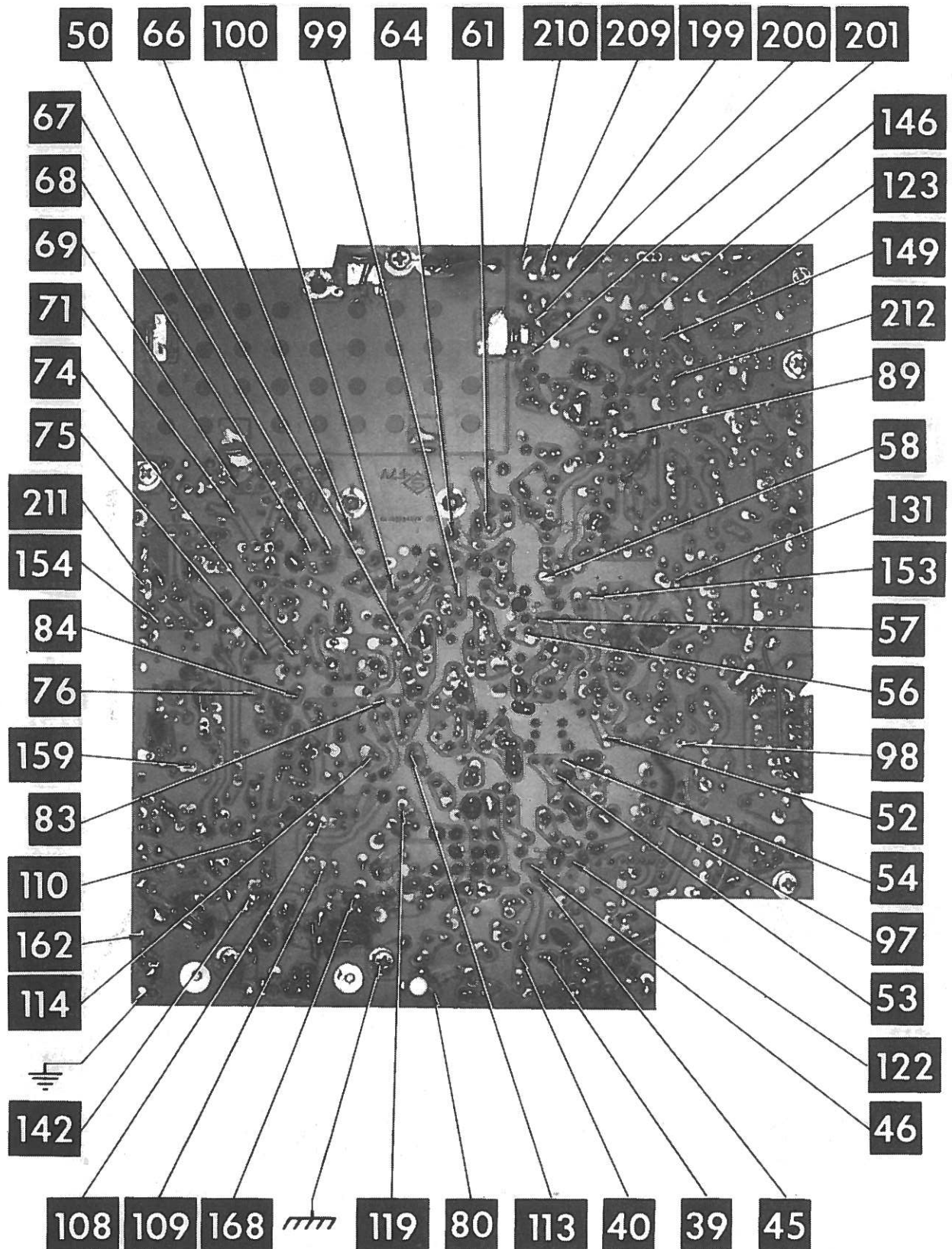


COURIER MODEL Centurion PLL40

MAIN BOARD

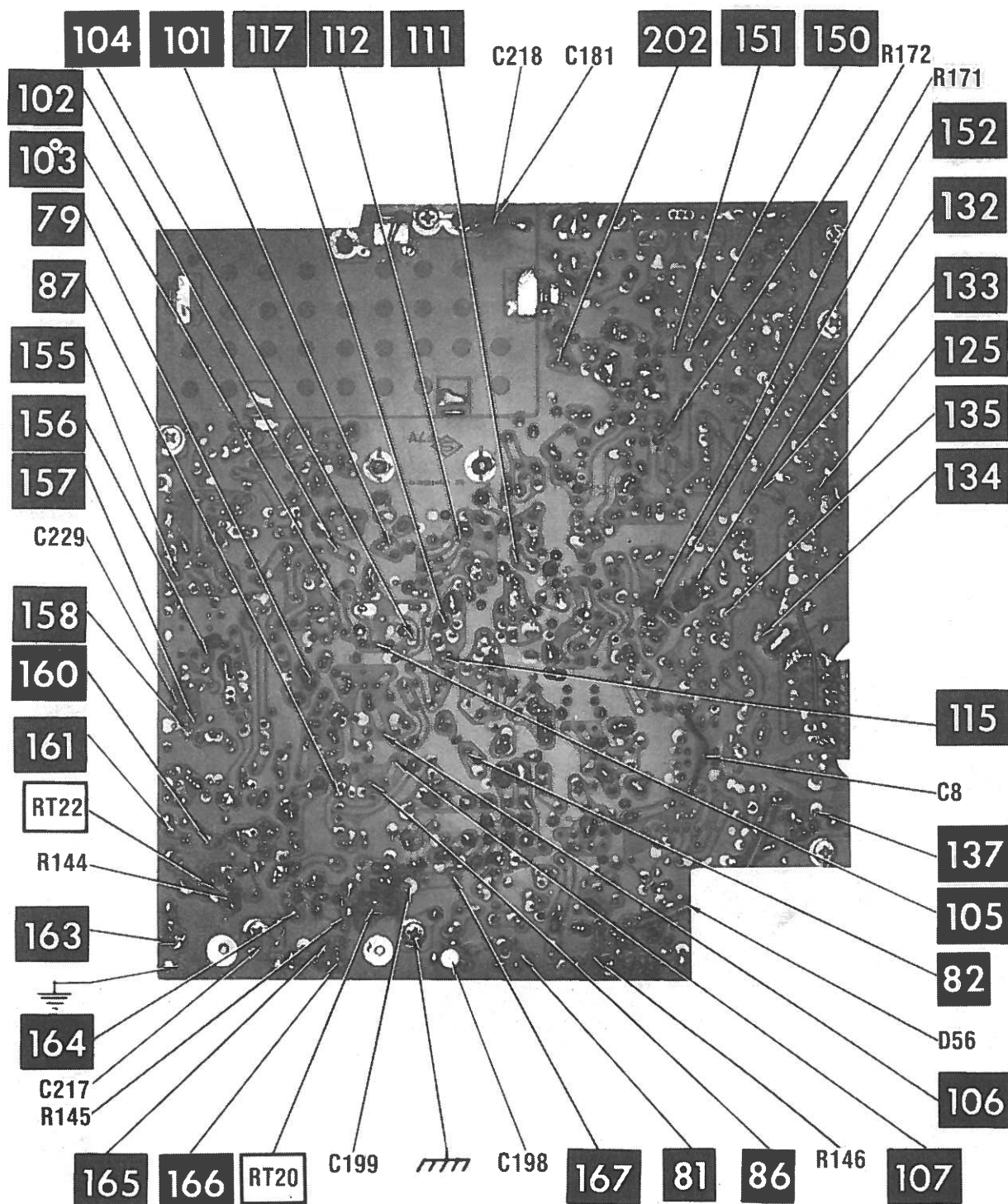


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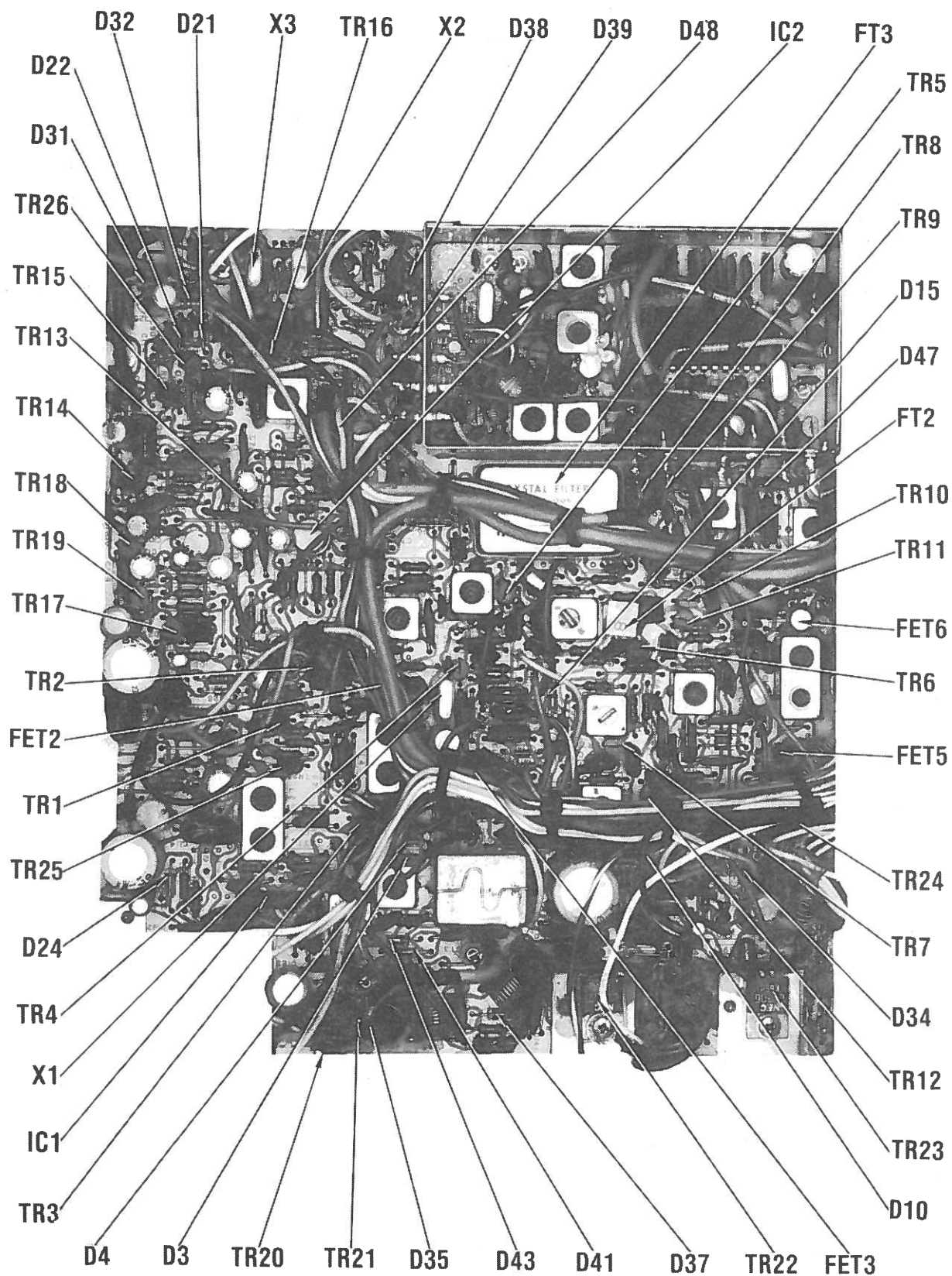


COURIER MODEL Centurion PLL40

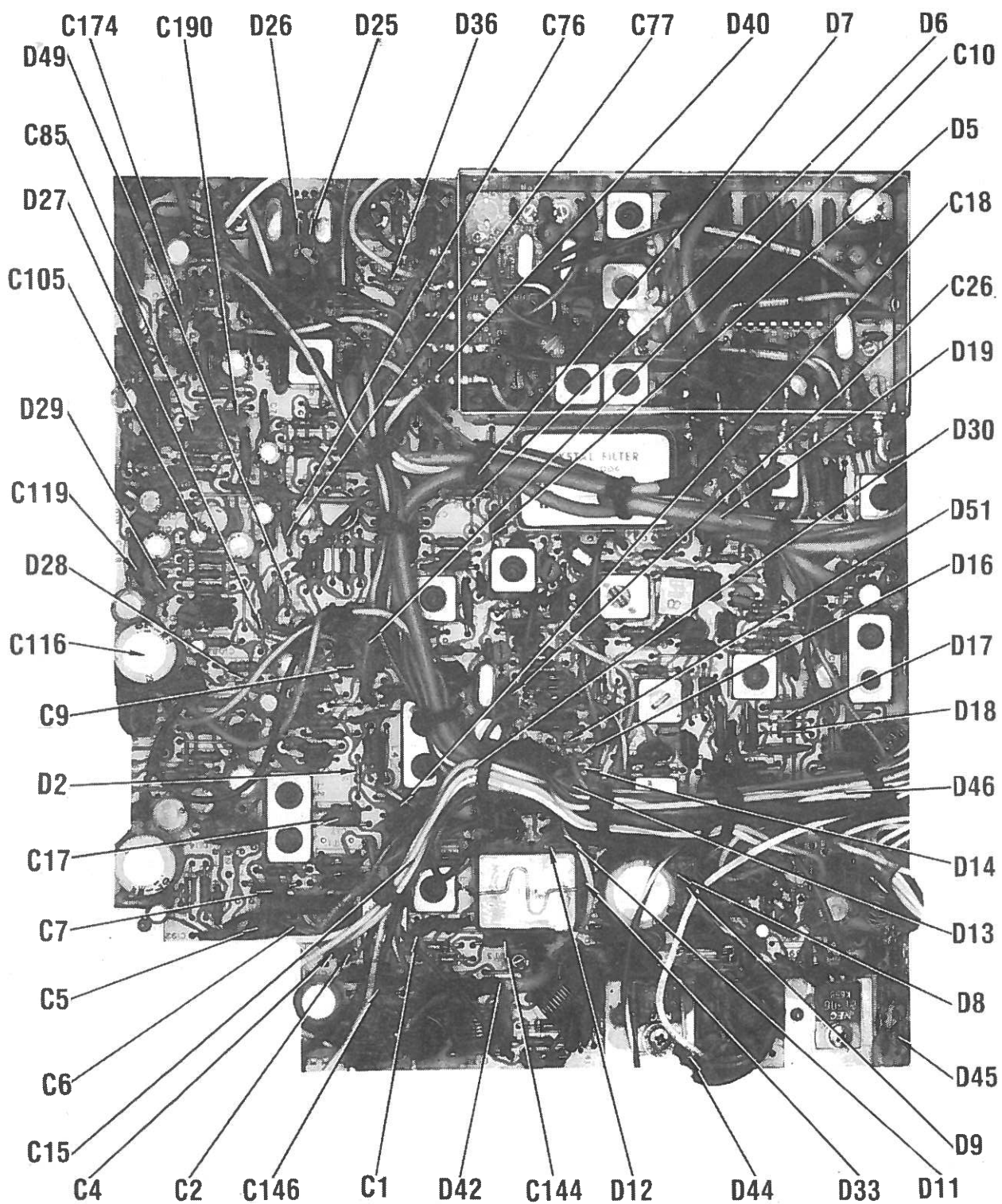
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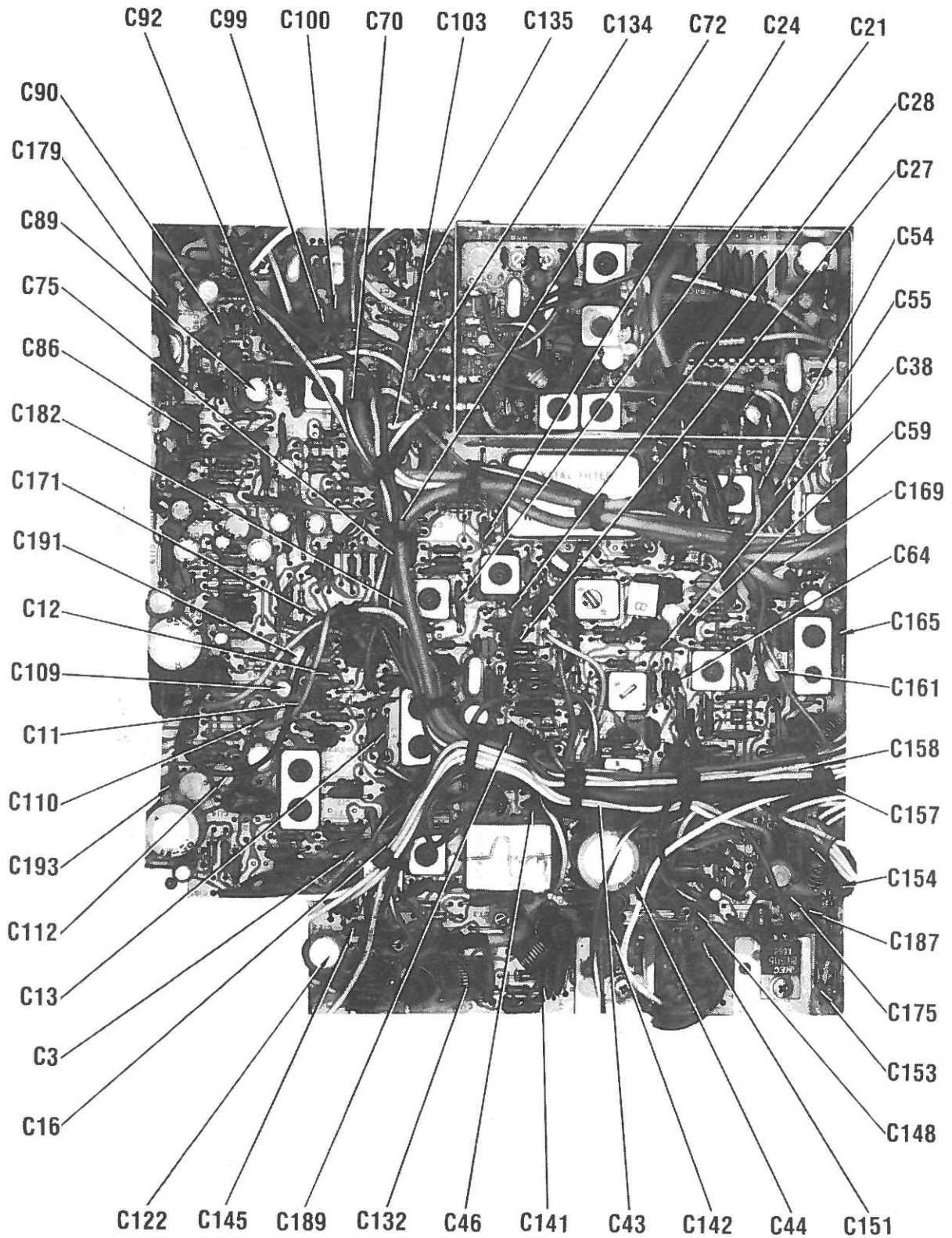
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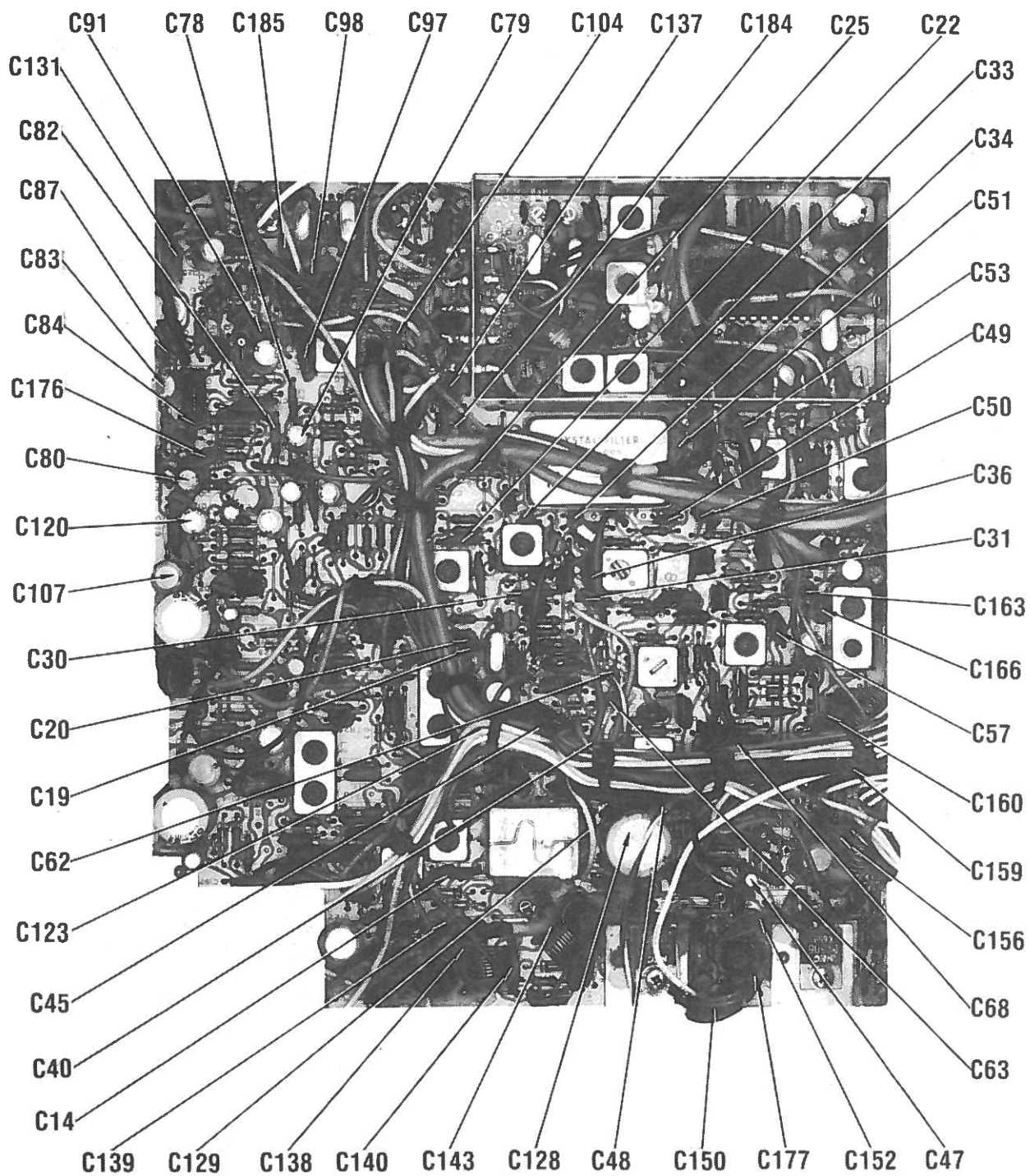
MA IN BOARD



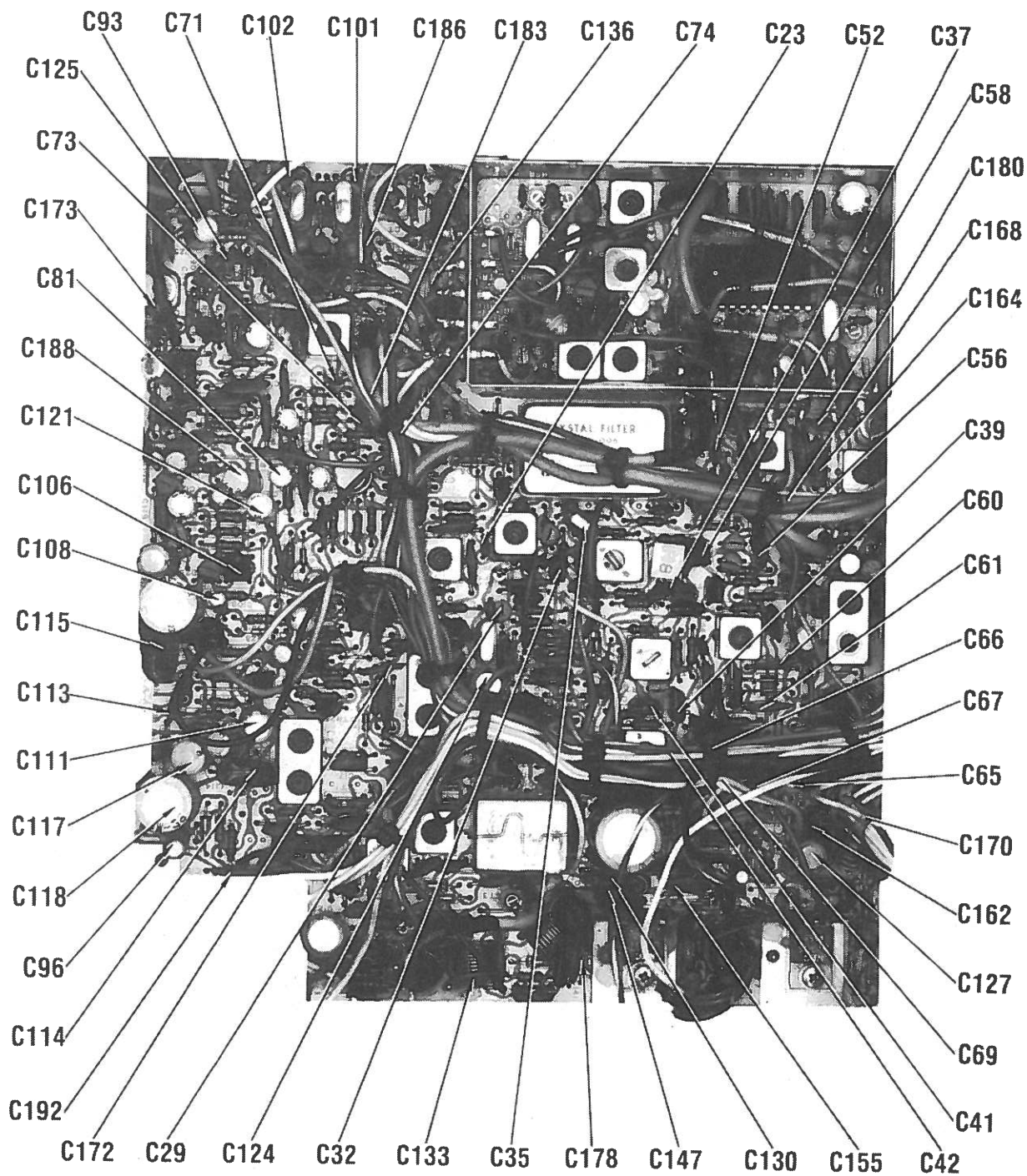
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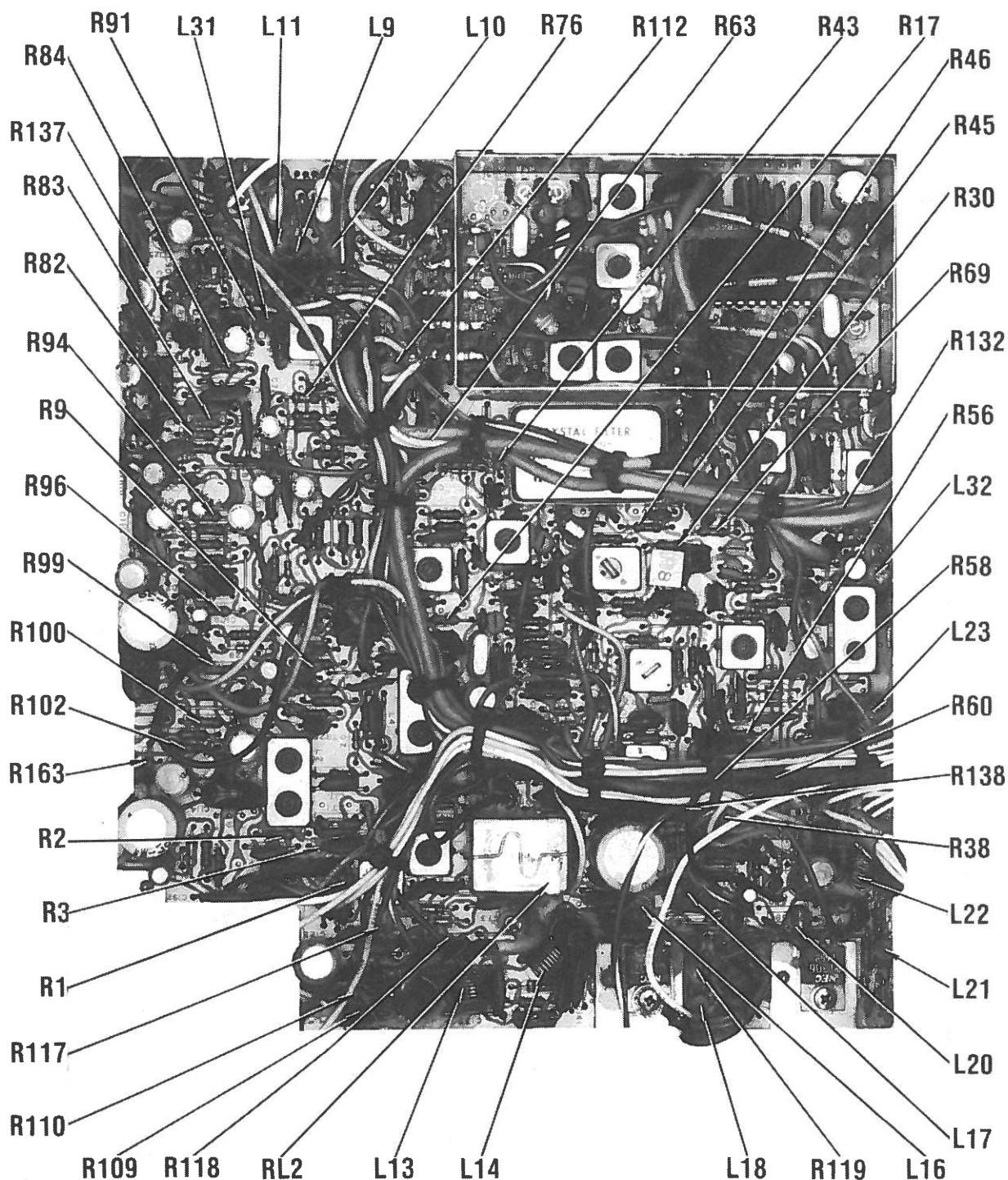
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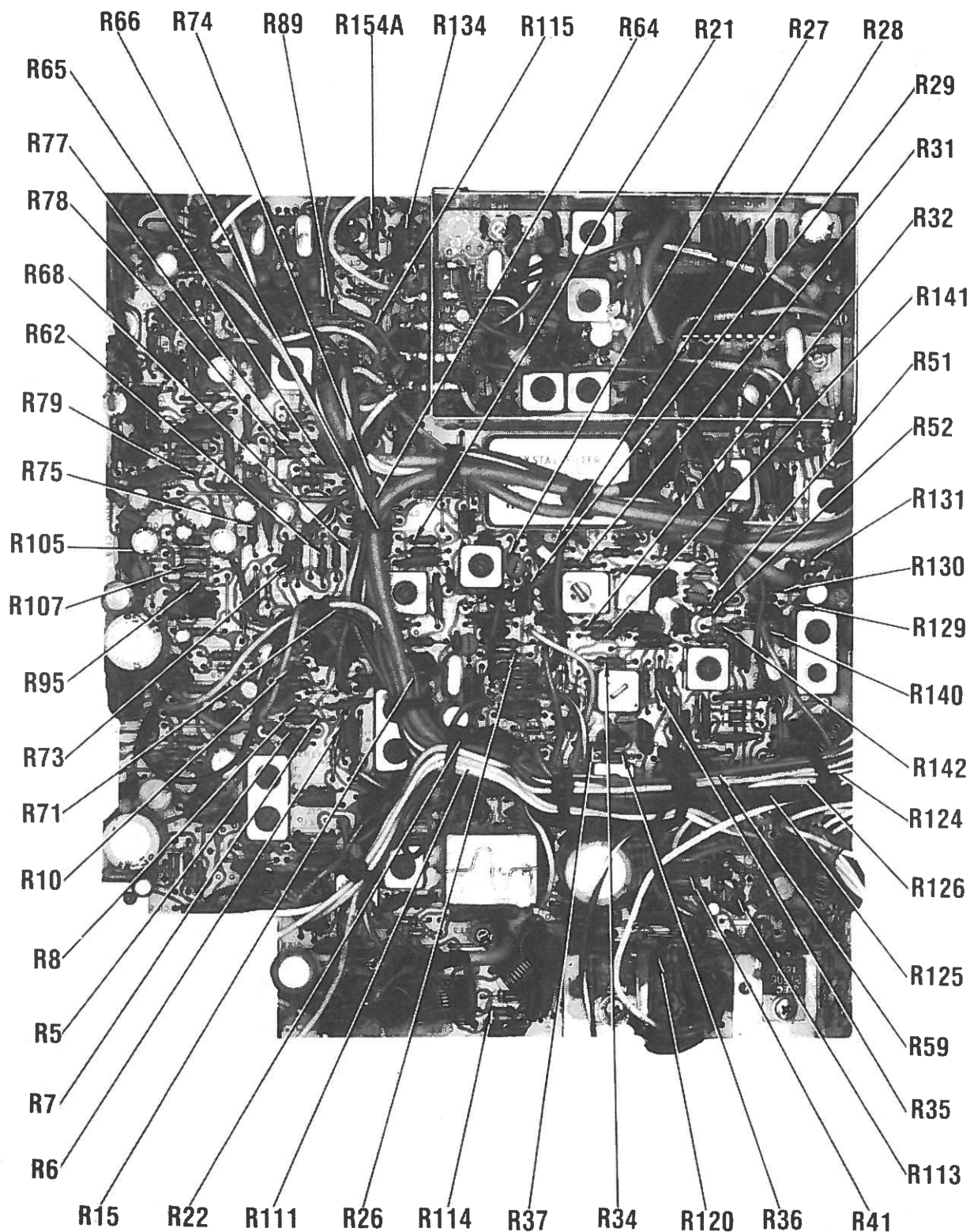
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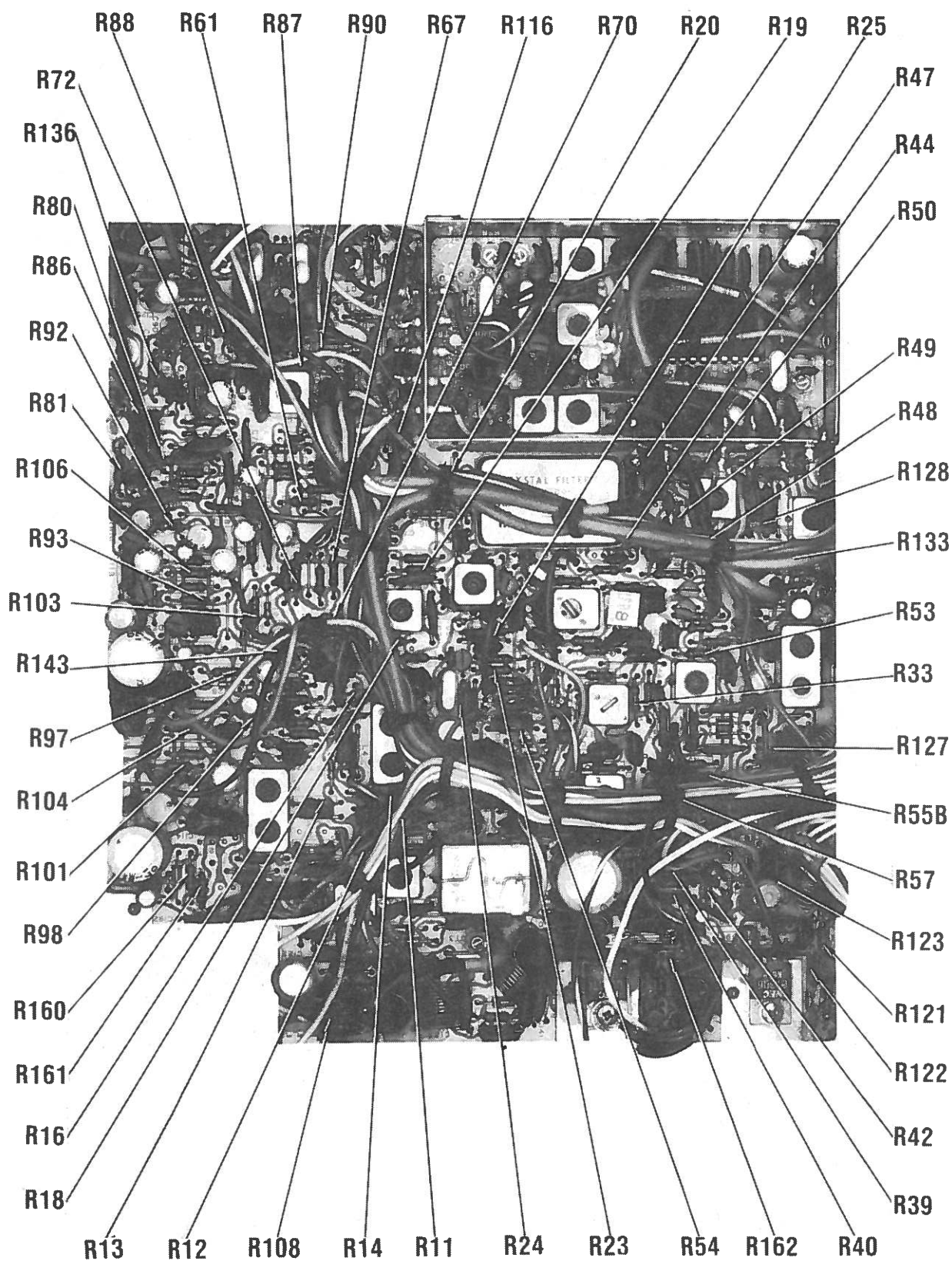
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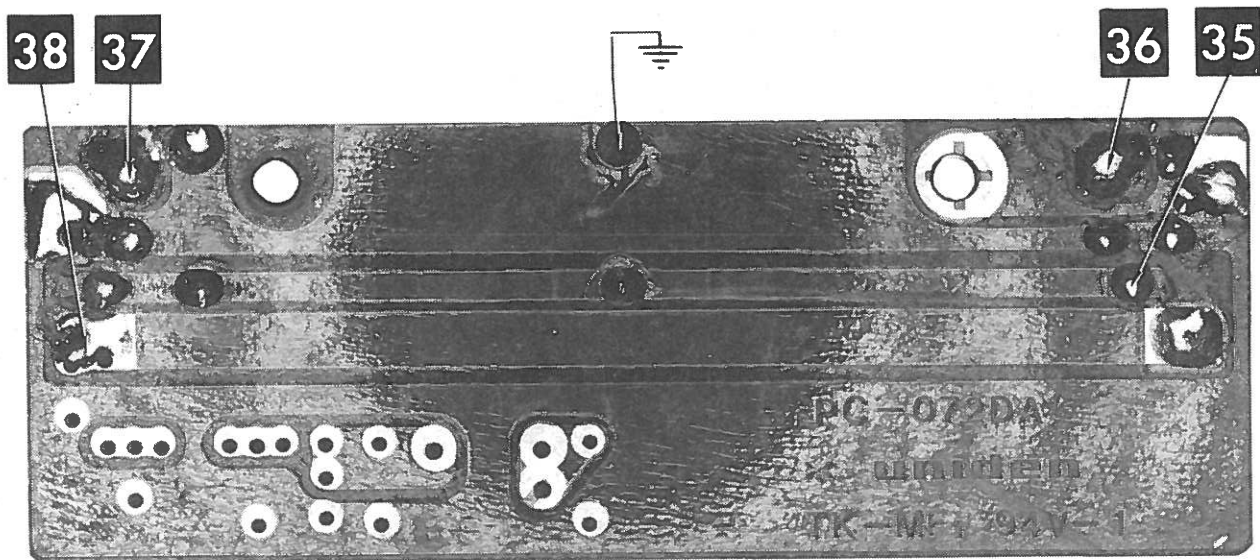
MAIN BOARD



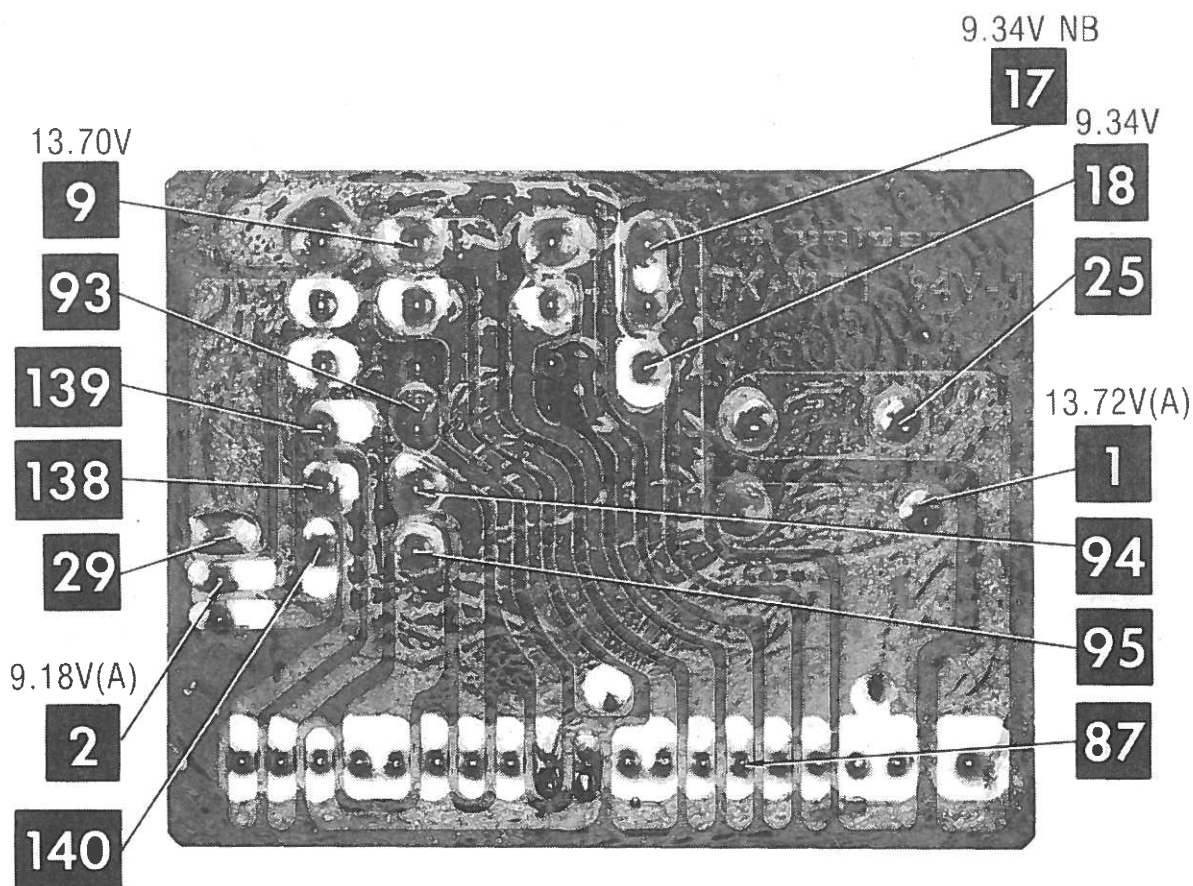
MAIN BOARD



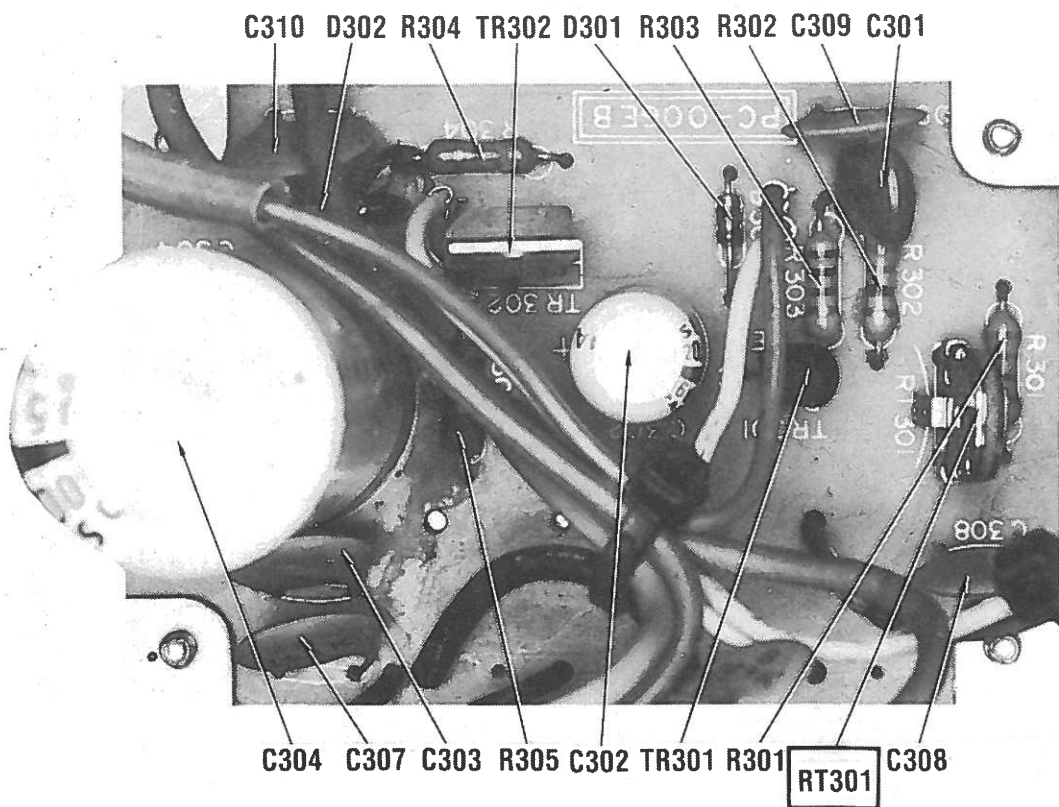
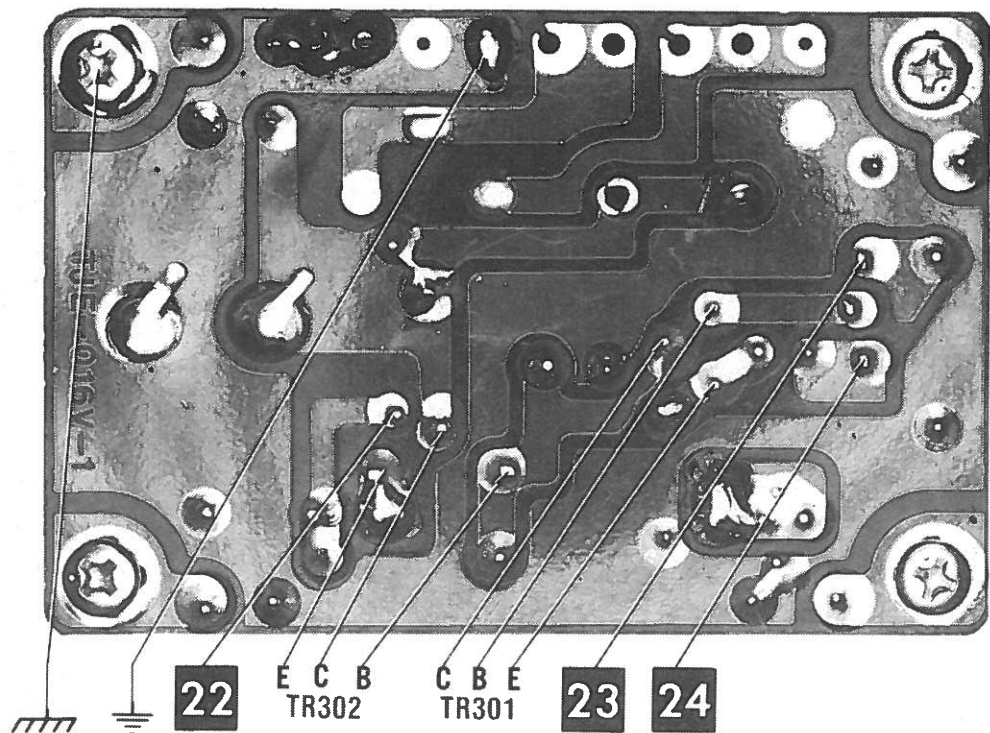
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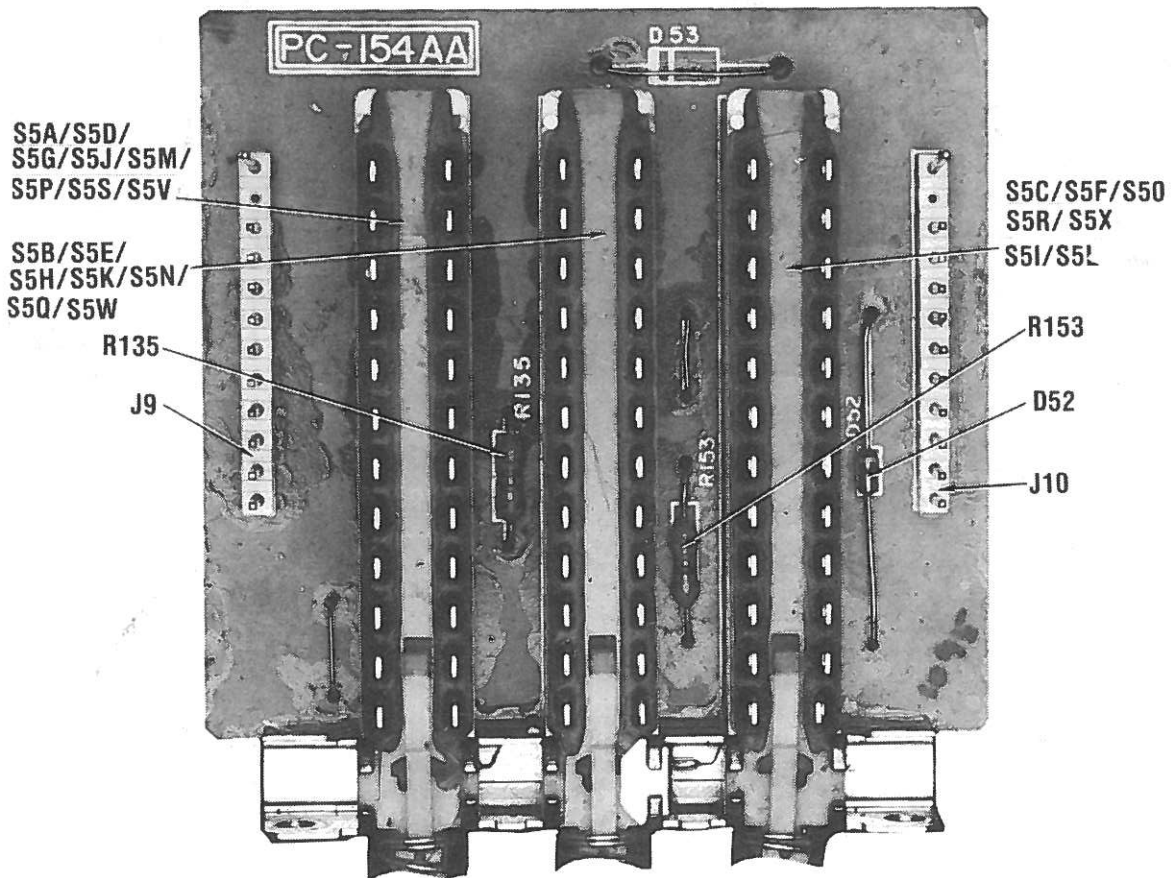
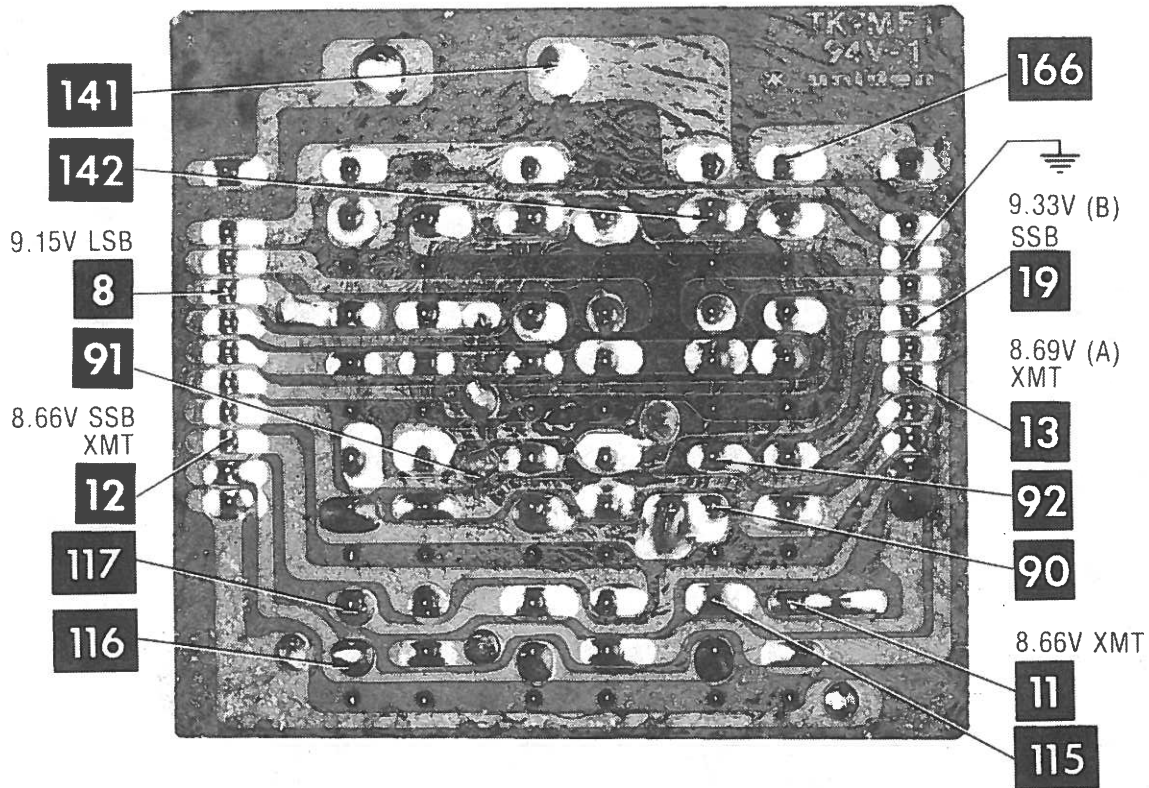
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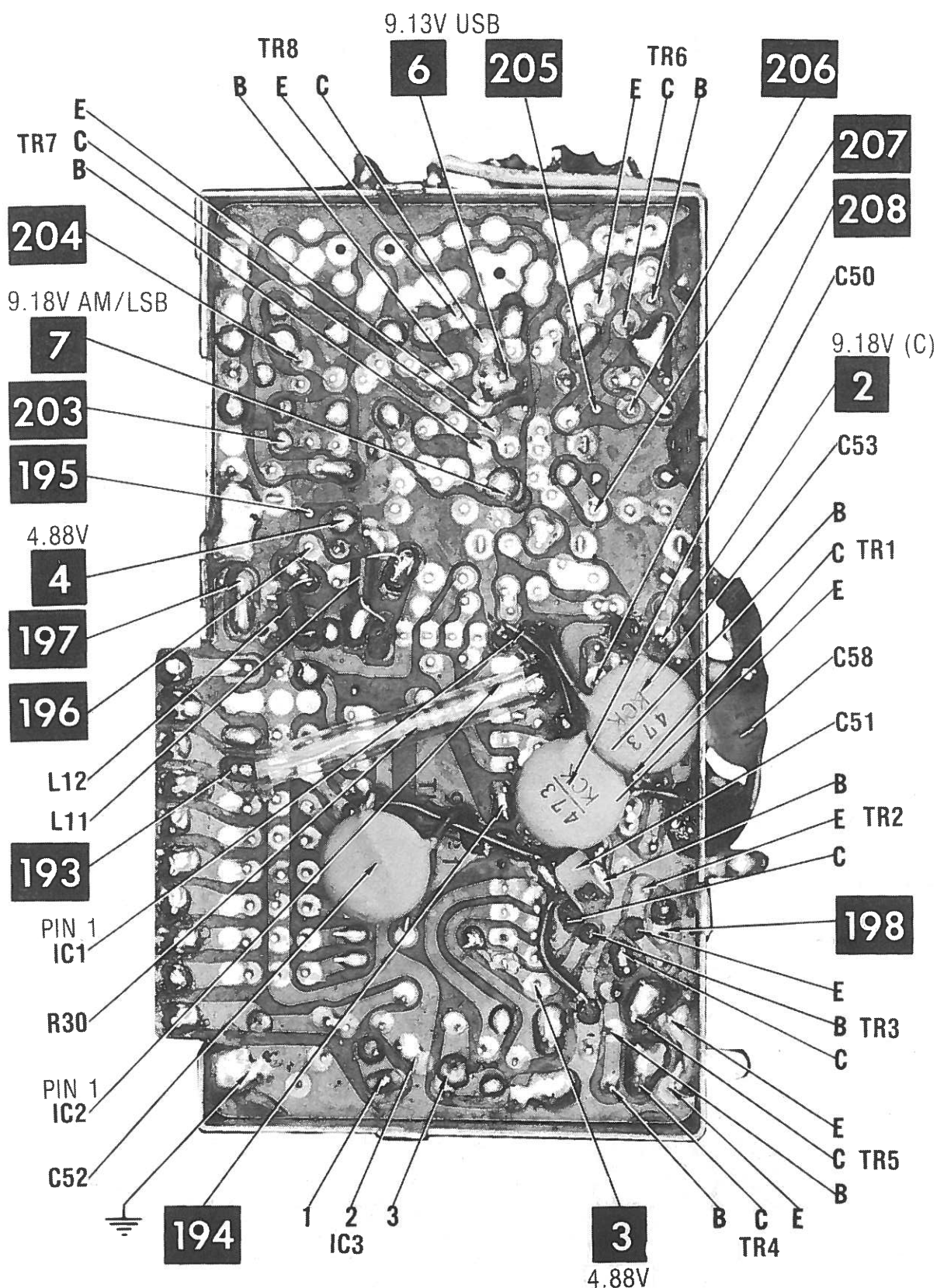
FUNCTION SWITCH BOARD



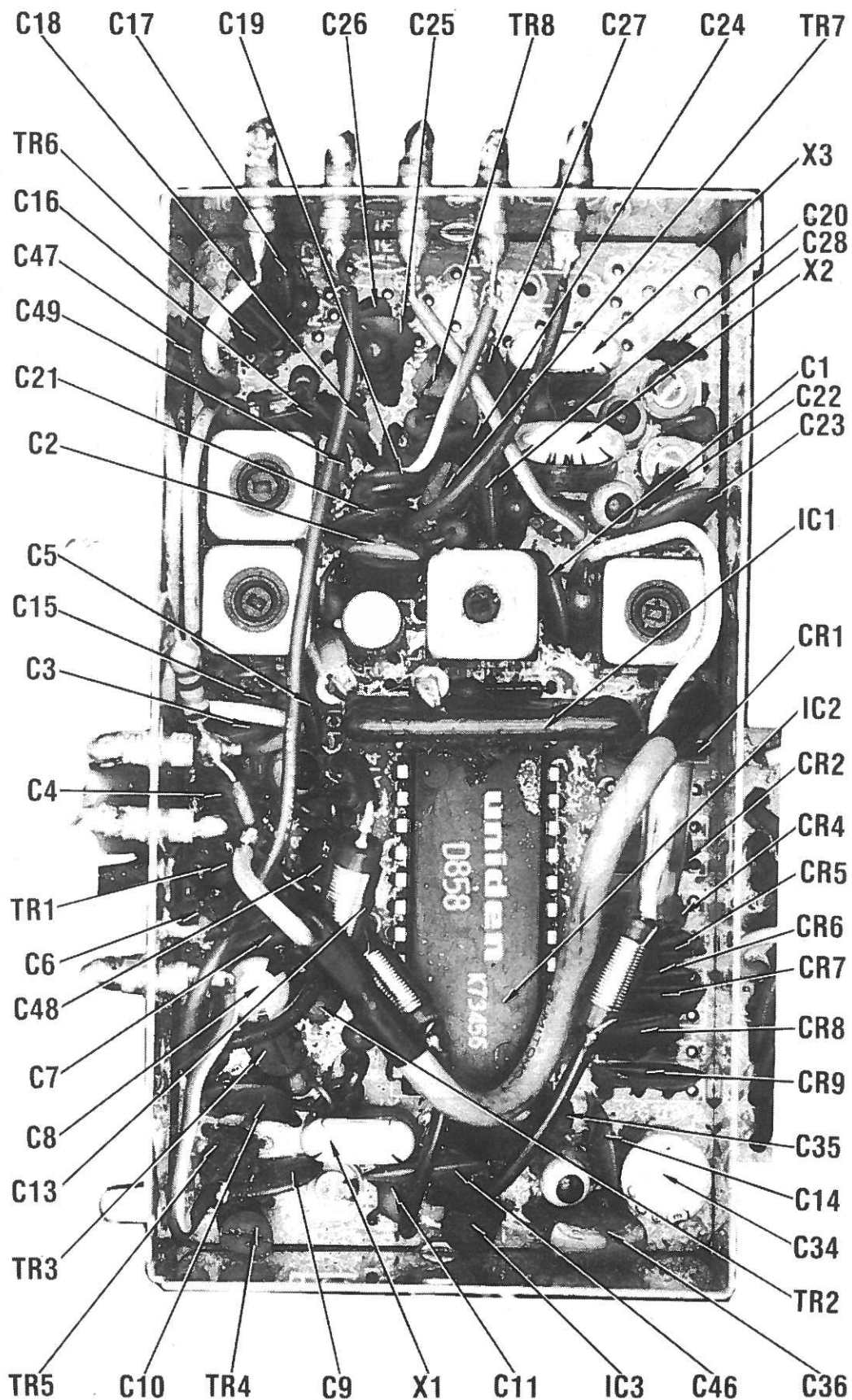
POWER SUPPLY BOARD



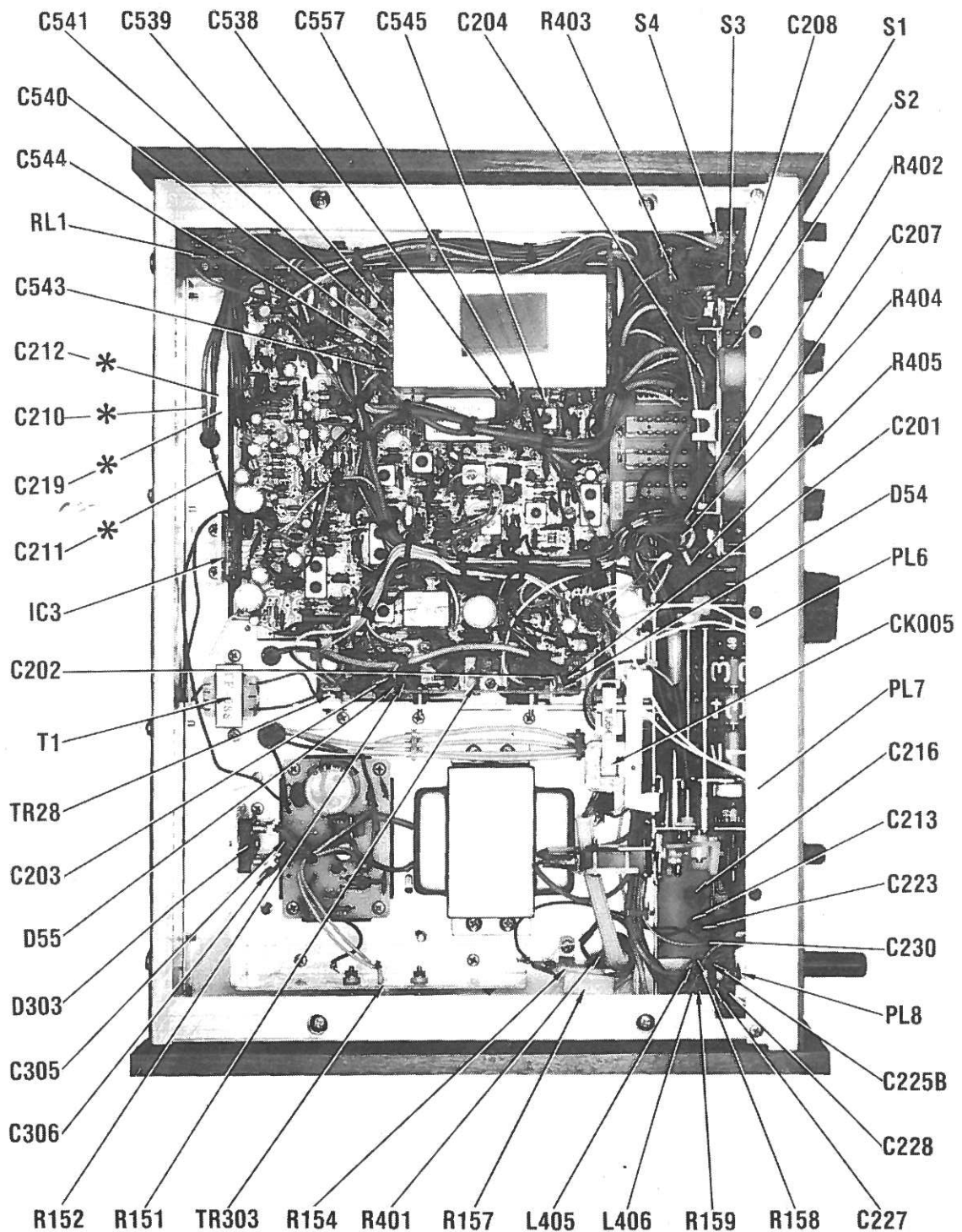
MODE SWITCH BOARD



PLL BOARD



PLL BOARD



* LOCATED ON BOTTOM OF CHASSIS

CHASSIS-OVERALL

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

Cable (Speaker) (Unshielded).....	Use BELDEN No. 8782 (AWG24) (4 colors)
Shielding Strap.....	Use BELDEN No. 8660 (3/16" width)
Hook-up Wire (General Use).....	Use BELDEN No. 8524 (AWG22) (13 colors)
Hook-up Wire (Shielded).....	Use BELDEN No. 8401 (Braided Shield) (1 conductor) (AWG25)
	Use BELDEN No. 8421 (Spiral Shield) (1 conductor) (AWG25)
	Use BELDEN No. 8737 (Spiral Shield) (2 conductor) (AWG22)
Coax (Transmission Line)	Use BELDEN No. 8216 (RG-174/U, 50 ohms)
Microphone Cable (Coiled)	Use BELDEN No. 8497 (3 conductor-1 shielded) (6 ft.) (AWG22)
Microphone Cable (Coiled)	Use BELDEN No. 9466 (3 conductor-1 shielded) (6 ft.) (AWG28)
Microphone Cable (Coiled)	Use BELDEN No. 9468 (3 conductor-1 shielded) (6 ft.) (AWG31)
AC Power Cord (Black)	Use BELDEN No. 17236 (6 ft.) (3 conductors)
AC Power Cord (Black)	Use BELDEN No. 17238 (8 ft.) (3 conductors)
AC Power Cord (Gray)	Use BELDEN No. 17237 (6 ft.) (3 conductors)
AC Power Cord (Gray)	Use BELDEN No. 17239 (8 ft.) (3 conductors)

ITEM No.	TYPE No.	MFG. PART No.	REPLACEMENT DATA						
			GENERAL ELECTRIC PART No.	MALLORY PART No.	RCA PART No.	SYLVANIA PART No.	THORDARSON PART No.	WORKMAN PART No.	ZENITH PART No.
MAIN BOARD									
D2	1S2473	1042-15	GE-514	PTC214	SK3100/519	ECG519	TM519	WEP925/519	103-131
D3	1S2473	1042-15	GE-514	PTC214	SK3100/519	ECG519	TM519	WEP925/519	103-131
D4	1S2473	1042-15	GE-514	PTC214	SK3100/519	ECG519	TM519	WEP925/519	103-131
D5	1S2473	1042-15	GE-514	PTC214	SK3100/519	ECG519	TM519	WEP925/519	103-131
D6	1S2473	1042-15	GE-514	PTC214	SK3100/519	ECG519	TM519	WEP925/519	103-131
D7	1S2473	1042-15	GE-514	PTC214	SK3100/519	ECG519	TM519	WEP925/519	103-131
D8	1N60 1N60P	1042-13	1N60 1N60	PTC206 PTC206	SK3088 SK3088	ECG109 ECG109	TM109 TM109	WEP134/109	103-Z9001
D9	1N60 1N60P	1042-13	1N60 1N60	PTC206 PTC206	SK3088 SK3088	ECG109 ECG109	TM109 TM109	WEP134/109	103-Z9001
D10	1S2473K	2056-12	GE-514	PTC214	SK3100/519	ECG519	TM519	WEP925/519	103-131
D11	1N60 1N60P	1042-13	1N60 1N60	PTC206 PTC206	SK3088 SK3088	ECG109 ECG109	TM109 TM109	WEP134/109	103-Z9001
D12	1N60 1N60P	1042-13	1N60 1N60	PTC206 PTC206	SK3088 SK3088	ECG109 ECG109	TM109 TM109	WEP134/109	103-Z9001
D13	1N60 1N60P	1042-13	1N60 1N60	PTC206 PTC206	SK3088 SK3088	ECG109 ECG109	TM109 TM109	WEP134/109	103-Z9001
D14	1S2473	1042-15	GE-514	PTC214	SK3100/519	ECG519	TM519	WEP925/519	103-131
D15	1N60 1N60P	1042-13	1N60 1N60	PTC206 PTC206	SK3088 SK3088	ECG109 ECG109	TM109 TM109	WEP134/109	103-Z9001
D16	1S2473	1042-15	GE-514	PTC214	SK3100/519	ECG519	TM519	WEP925/519	103-131
D17	1N60 1N60P	1042-13	1N60 1N60	PTC206 PTC206	SK3088 SK3088	ECG109 ECG109	TM109 TM109	WEP134/109	103-Z9001
D18	1N60 1N60P	1042-13	1N60 1N60	PTC206 PTC206	SK3088 SK3088	ECG109 ECG109	TM109 TM109	WEP134/109	103-Z9001
D19	1S2473	1042-15	GE-514	PTC214	SK3100/519	ECG519	TM519	WEP925/519	103-131
D20	1N60 1N60P	1042-13	1N60 1N60	PTC206 PTC206	SK3088 SK3088	ECG109 ECG109	TM109 TM109	WEP134/109	103-Z9001
D21	1S2473	1042-15	GE-514	PTC214	SK3100/519	ECG519	TM519	WEP925/519	103-131
D22	1S2473	1042-15	GE-514	PTC214	SK3100/519	ECG519	TM519	WEP925/519	103-131
D24	1N60 1N60P	1042-13	1N60 1N60	PTC206 PTC206	SK3088 SK3088	ECG109 ECG109	TM109 TM109	WEP134/109	103-Z9001
D25	1S2473	1042-15	GE-514	PTC214	SK3100/519	ECG519	TM519	WEP925/519	103-131
D26	1S2473	1042-15	GE-514	PTC214	SK3100/519	ECG519	TM519	WEP925/519	103-131
D27	1S2473	1042-15	GE-514	PTC214	SK3100/519	ECG519	TM519	WEP925/519	103-131
D28	1S2473	1042-15	GE-514	PTC214	SK3100/519	ECG519	TM519	WEP925/519	103-131
D29	1S2473	1042-15	GE-514	PTC214	SK3100/519	ECG519	TM519	WEP925/519	103-131
D30	CZ092	1042-18	GEZD-9.1	ZB9.1A	SK3060/139A	ECG139A	TM139A	WEP1109/139	103-272
D31	SR1K-2	1042-17	GE-504A	PTC201	SK3311	ECG116	TM116	WEP156	212-76-02
D32	SR1K-2	1042-17	GE-504A	PTC201	SK3311	ECG116	TM116	WEP156	

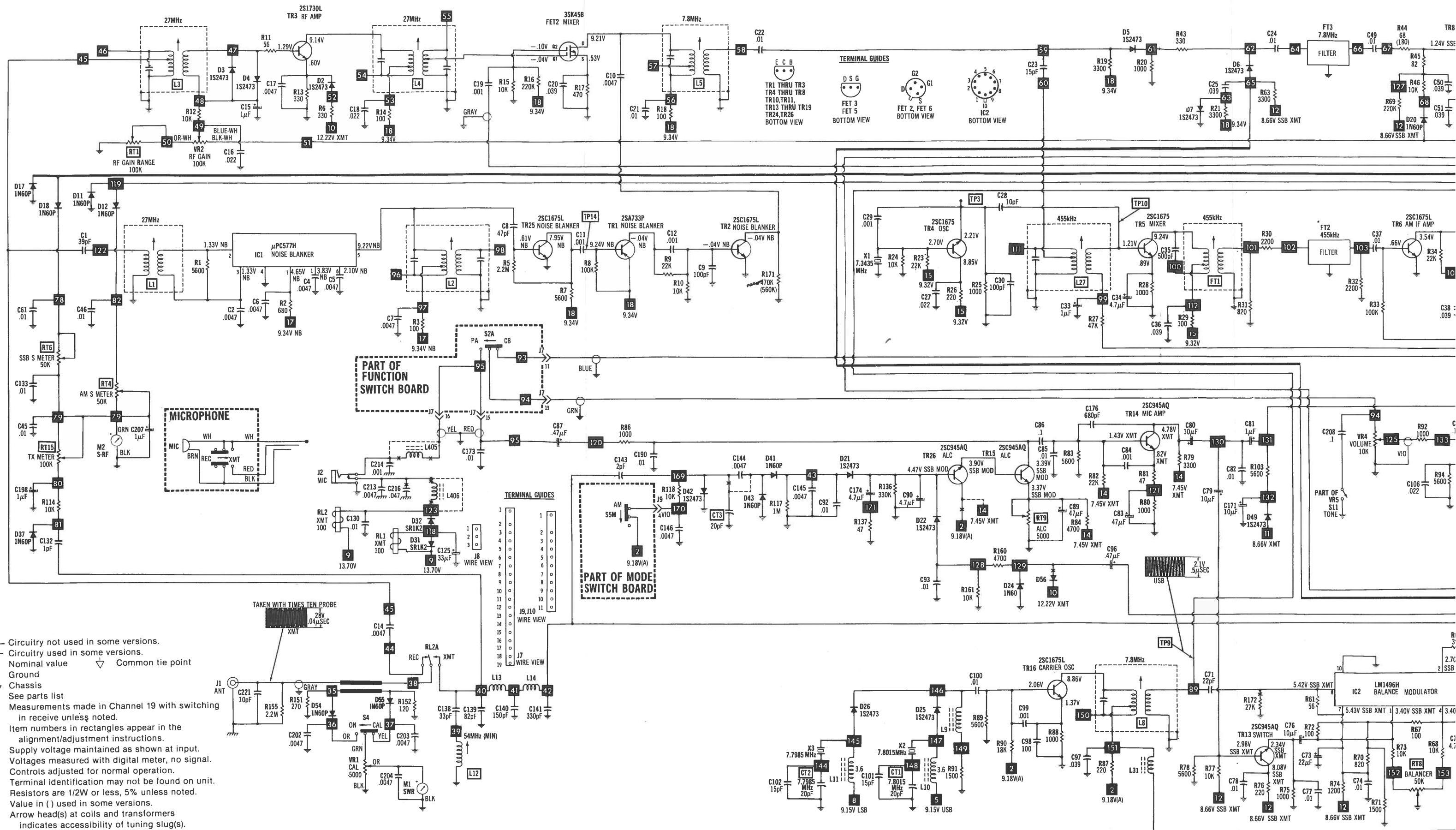
PARTS LIST AND DESCRIPTION (CONTINUED)

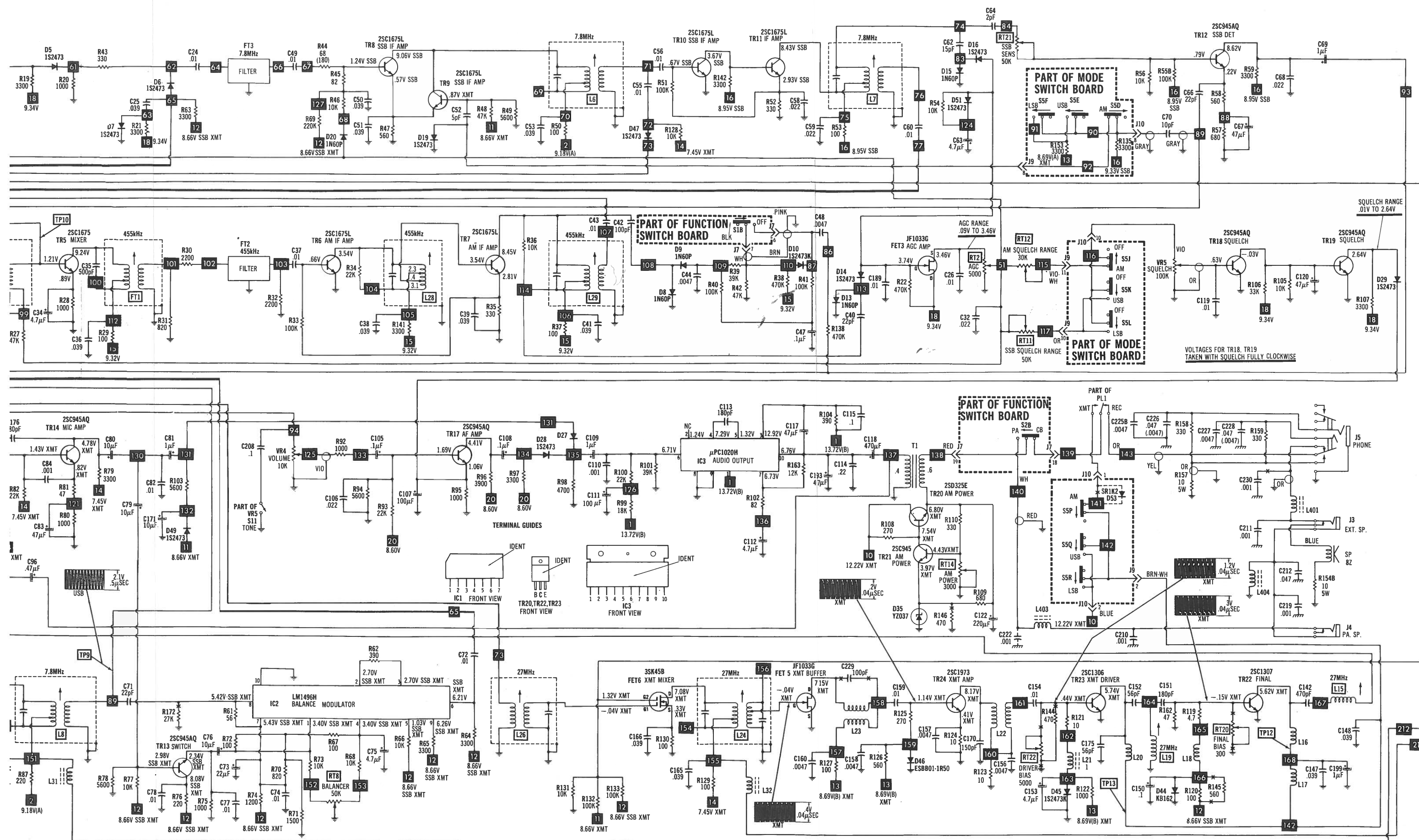
(When ordering parts, state Model, Part Number, and Description.)

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

ITEM No.	TYPE No.	MFG. PART No.	REPLACEMENT DATA						
			GENERAL ELECTRIC PART No.	MALLORY PART No.	RCA PART No.	SYLVANIA PART No.	THORDARSON PART No.	WORKMAN PART No.	ZENITH PART No.
D301	WZ061	1074-123	GEZD-6.2	ZM6.2B	SK3779/5013A	ECG5013A	TM5013A	WEP1414/5013	103-Z9008
D302	BZ162	1074-121	GEZD-16	ZB16B	SK3751/5075A	ECG5075A	TM5075A	WEP1160/5075A	103-Z9013
FET2	3SK45B	2065-55	GE-FET-4	PTC182*	SK3065/222	ECG222	TM222	WEP905/222	121-826
FET3	JF1033G		GE-FET-2	PTC152	SK3116	ECG312*	TM312*	WEP920/312*	921-1067*
	JF1033	2056-75	GE-FET-2	PTC152	SK3116	ECG312*	TM312*	WEP920/312*	921-1067*
	2SK33		GE-FET-2	PTC161	SK3834/132	ECG312*	TM312*	WEP920/312*	921-1067*
FET5	JF1033G		GE-FET-2	PTC152	SK3116	ECG312*	TM312*	WEP920/312*	921-1067*
	JF1033	2056-75	GE-FET-2	PTC152	SK3116	ECG312*	TM312*	WEP920/312*	921-1067*
	2SK33		GE-FET-2	PTC161	SK3834/132	ECG312*	TM312*	WEP920/312*	921-1067*
FET6	3SK45B		GE-FET-4	PTC182*	SK3065/222	ECG222	TM222	WEP905/222	121-826
	3SK45		GE-FET-4	PTC182*	SK3065/222	ECG222	TM222	WEP905/222	121-826
IC1	UPC577H	2056-04	GEIC-140		SK3461/1082	ECG1082	TM1082	WEP939/1082	
	UPC577		GEIC-140		SK3461/1082	ECG1082	TM1082	WEP939/1082	
IC2	LM1496H	2056-05			SK3233/973	ECG973	TM973	WEP2067/973	221-Z9098
	LM1496				SK3233/973	ECG973	TM973	WEP2067/973	221-Z9098
IC3	UPC1020H	2056-06	GEIC-196	PTC810	SK3243/1160	ECG1160	TM1160	WEP2258/1160	
	UPC1020		GEIC-196	PTC810	SK3243/1160	ECG1160	TM1160	WEP2258/1160	
TR1	2SA733P	2056-10	GE-48	PTC127	SK3114/290	ECG159*	TM159*	WEP62/159*	121-Z9067
	2SA733		GE-48	PTC127	SK3114/290	ECG159*	TM159*	WEP62/159*	121-Z9067
TR2	2SC1675L	2046-03	GE-213	PTC132*	SK3124/289	ECG123AP*	TM123AP*	WEP773	121-Z9021*
	2SC1675		GE-213	PTC132*	SK3124/289	ECG123AP*	TM123AP*	WEP773	121-Z9021*
TR3	2SC1730L	2056-08	GE-17*	PTC136*	SK3293/107	ECG316*	TM316*	WEP535/107	121-Z9093
	2SC1730		GE-17*	PTC136*	SK3293/107	ECG316*	TM316*	WEP535/107	121-Z9093
TR4	2SC1675L	2046-03	GE-213	PTC132*	SK3124/289	ECG123AP*	TM123AP*	WEP773	121-Z9021*
	2SC1675		GE-213	PTC132*	SK3124/289	ECG123AP*	TM123AP*	WEP773	121-Z9021*
TR5	2SC1675L	2046-03	GE-213	PTC132*	SK3124/289	ECG123AP*	TM123AP*	WEP773	121-Z9021*
	2SC1675		GE-213	PTC132*	SK3124/289	ECG123AP*	TM123AP*	WEP773	121-Z9021*
TR6	2SC1675L	2046-03	GE-213	PTC132*	SK3124/289	ECG123AP*	TM123AP*	WEP773	121-Z9021*
	2SC1675		GE-213	PTC132*	SK3124/289	ECG123AP*	TM123AP*	WEP773	121-Z9021*
TR7	2SC1675L	2046-03	GE-213	PTC132*	SK3124/289	ECG123AP*	TM123AP*	WEP773	121-Z9021*
	2SC1675		GE-213	PTC132*	SK3124/289	ECG123AP*	TM123AP*	WEP773	121-Z9021*
TR8	2SC1675L	2046-03	GE-213	PTC132*	SK3124/289	ECG123AP*	TM123AP*	WEP773	121-Z9021*
	2SC1675		GE-213	PTC132*	SK3124/289	ECG123AP*	TM123AP*	WEP773	121-Z9021*
TR9	2SC1675L	2046-03	GE-213	PTC132*	SK3124/289	ECG123AP*	TM123AP*	WEP773	121-Z9021*
	2SC1675		GE-213	PTC132*	SK3124/289	ECG123AP*	TM123AP*	WEP773	121-Z9021*
TR10	2SC1675L	2046-03	GE-213	PTC132*	SK3124/289	ECG123AP*	TM123AP*	WEP773	121-Z9021*
	2SC1675		GE-213	PTC132*	SK3124/289	ECG123AP*	TM123AP*	WEP773	121-Z9021*
TR11	2SC1675L	2046-03	GE-213	PTC132*	SK3124/289	ECG123AP*	TM123AP*	WEP773	121-Z9021*
	2SC1675		GE-213	PTC132*	SK3124/289	ECG123AP*	TM123AP*	WEP773	121-Z9021*
TR12	2SC945AQ	2056-07	GE-212	PTC121*	SK3124/289	ECG199	TM199	WEP1945	121-972*
	2SC945		GE-212	PTC121*	SK3124/289	ECG199	TM199	WEP1945	121-972*
TR13	2SC945AQ	2056-07	GE-212	PTC121*	SK3124/289	ECG199	TM199	WEP1945	121-972*
	2SC945		GE-212	PTC121*	SK3124/289	ECG199	TM199	WEP1945	121-972*
TR14	2SC945AQ	2056-07	GE-212	PTC121*	SK3124/289	ECG199	TM199	WEP1945	121-972*
	2SC945		GE-212	PTC121*	SK3124/289	ECG199	TM199	WEP1945	121-972*
TR15	2SC945AQ	2056-07	GE-212	PTC121*	SK3124/289	ECG199	TM199	WEP1945	121-972*
	2SC945		GE-212	PTC121*	SK3124/289	ECG199	TM199	WEP1945	121-972*
TR16	2SC1675L	2046-03	GE-213	PTC132*	SK3124/289	ECG123AP*	TM123AP*	WEP773	121-Z9021*
	2SC1675		GE-213	PTC132*	SK3124/289	ECG123AP*	TM123AP*	WEP773	121-Z9021*
TR17	2SC945AQ	2056-07	GE-212	PTC121*	SK3124/289	ECG199	TM199	WEP1945	121-972*
	2SC945		GE-212	PTC121*	SK3124/289	ECG199	TM199	WEP1945	121-972*
TR18	2SC945AQ	2056-07	GE-212	PTC121*	SK3124/289	ECG199	TM199	WEP1945	121-972*
	2SC945		GE-212	PTC121*	SK3124/289	ECG199	TM199	WEP1945	121-972*
TR19	2SC945AQ	2056-07	GE-212	PTC121*	SK3124/289	ECG199	TM199	WEP1945	121-972*
	2SC945		GE-212	PTC121*	SK3124/289	ECG199	TM199	WEP1945	121-972*
TR20	2SD325E	2055-32	GE-28	PTC110	SK3197/235	ECG186	TM186	WEP745/152	121-Z9008
	2SD325		GE-28	PTC110	SK3197/235	ECG186	TM186	WEP745/152	121-Z9008
TR21	2SC945AQ	2056-07	GE-212	PTC121*	SK3124/289	ECG199	TM199	WEP1945	121-972*
	2SC945		GE-212	PTC121*	SK3124/289	ECG199	TM199	WEP1945	121-972*
TR22	2SC1307	2057-04	GE-216	PTC186	SK3239/236	ECG236	TM236	WEP840/236	121-Z9040
	2SC1307-1		GE-216	PTC186	SK3239/236	ECG236	TM236	WEP840/236	121-Z9040
TR23	2SC1306	1042-08	GE-215	PTC186	SK3239/236	ECG235	TM235	WEP785/235	121-Z9039
	2SC2020		GE-215	PTC186	SK3239/236	ECG235	TM235	WEP785/235	121-Z9039
TR24	2SC1973	2059-09	GE-285*	PTC143*	SK3849/293	ECG293	TM293	WEP912/293	121-Z9066
TR25	2SC1675L	2046-03	GE-213	PTC132*	SK3124/289	ECG123AP*	TM123AP*	WEP773	121-Z9021*
	2SC1675		GE-213	PTC132*	SK3124/289	ECG123AP*	TM123AP*	WEP773	121-Z9021*
TR26	2SC945AQ	2056-07	GE-212	PTC121*	SK3124/289	ECG199	TM199	WEP1945	121-972*
	2SC945		GE-212	PTC121*	SK3124/289	ECG199	TM199	WEP1945	121-972*
TR28	2SD325E	2055-32	GE-28	PTC110	SK3197/235	ECG186	TM186	WEP745/152	121-Z9008
	2SD325		GE-28	PTC110	SK3197/235	ECG186	TM186	WEP745/152	121-Z9008
TR301	2SC945AQ	2056-07	GE-212	PTC121*	SK3124/289	ECG199	TM199	WEP1945	121-972*
	2SC945		GE-212	PTC121*	SK3124/289	ECG199	TM199	WEP1945	121-972*
TR302	2SC1096	2057-05	GE-28	PTC110	SK3248	ECG186A	TM186A	WEP1096	121-Z9008
	2SC1096-3ZM		GE-28	PTC110	SK3248	ECG186A	TM186A	WEP1096	121-Z9008
MODE INDICATOR BOARD									
D52	1S2473	1042-15	GE-514	PTC214	SK3100/519	ECG519	TM519	WEP925/519	103-131
D53	SRIK-2	1042-17	GE-504A	PTC201	SK3311	ECG116	TM116	WEP156	212-76-02
PLL BOARD									
D1	1S2687	2058-39			SK3325/612	ECG612			103-176
	1S2686				SK3325/612	ECG612			103-176
D2	1S2687	2058-39			SK3325/612	ECG612			103-176
	1S2686				SK3325/612	ECG612			103-176
FET1	3SK45B	2065-55	GE-FET-4	PTC182*	SK3065/222	ECG222	TM222	WEP905/222	121-826
	3SK45		GE-FET-4	PTC182*	SK3065/222	ECG222	TM222	WEP905/222	121-826

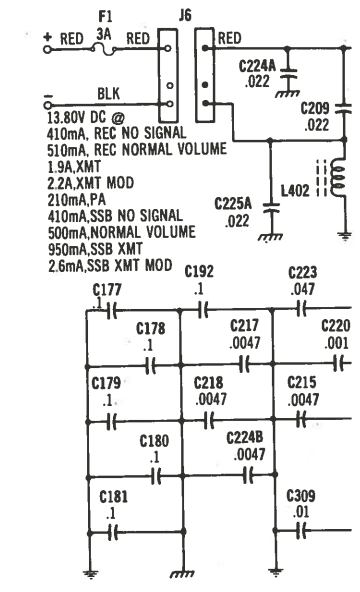
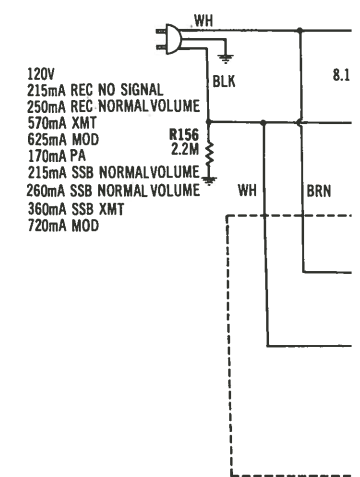
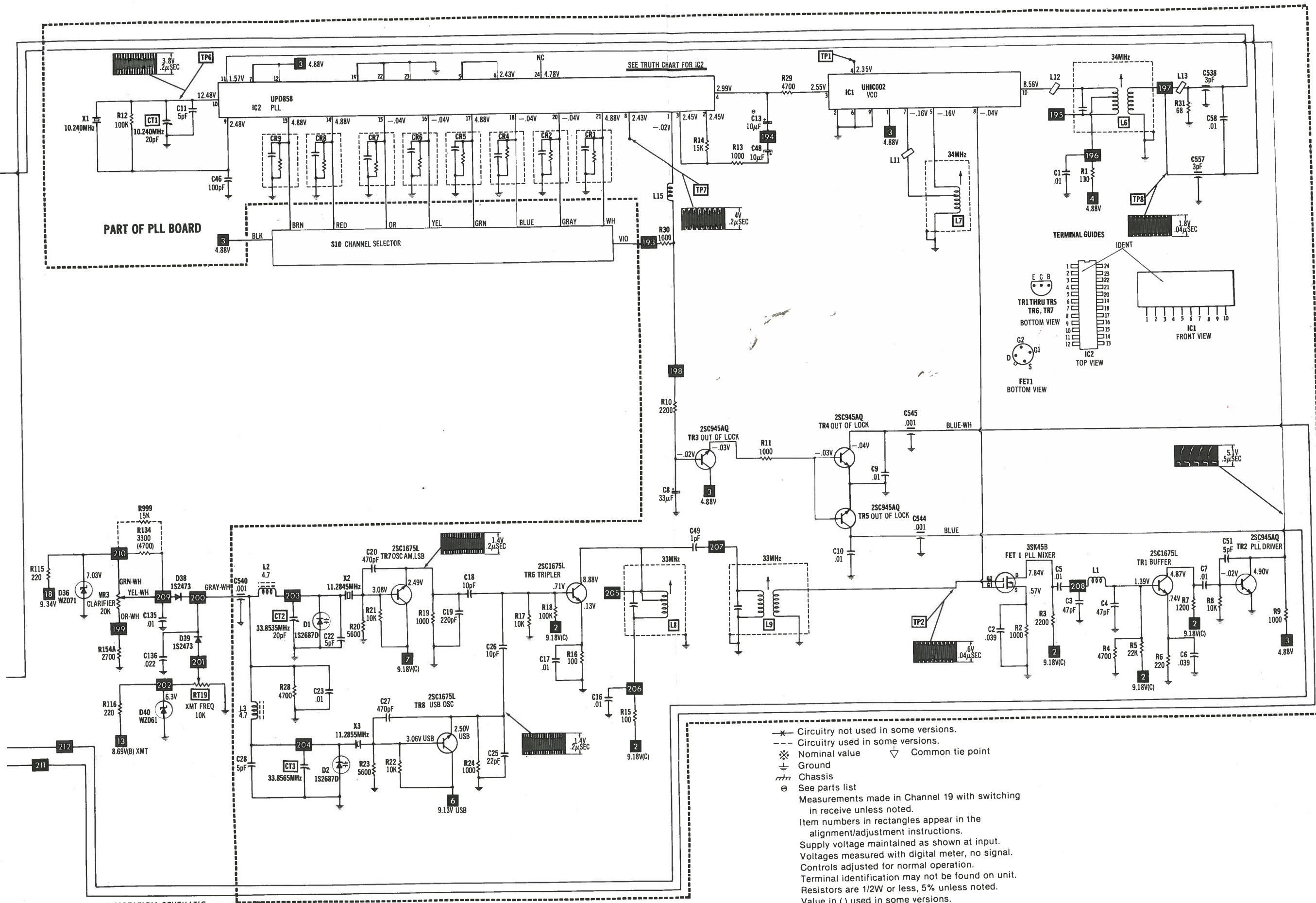
BOLD LISTING INDICATES LOCATION OF PART





MAIN SCHEMATIC

COURIER MODEL Centurion PLL40



A PHOTOFAC STANDARD NOTATION SCHEMATIC
WITH **CIRCUITRACE**
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PLL SCHEMATIC

- ✖ Circuitry not used in some versions.
 - Circuitry used in some versions.
 - ⊗ Nominal value ▽ Common tie point
 - ⊥ Ground
 - ⏏ Chassis
 - ⊙ See parts list
- Measurements made in Channel 19 with switching in receive unless noted.
Item numbers in rectangles appear in the alignment/adjustment instructions.
Supply voltage maintained as shown at input.
Voltages measured with digital meter, no signal.
Controls adjusted for normal operation.
Terminal identification may not be found on unit.
Resistors are 1/2W or less, 5% unless noted.
Value in () used in some versions.
Arrow head(s) at coils and transformers indicates accessibility of tuning slug(s).

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.	MALLORY PART No.	RCA PART No.	SYLVANIA PART No.	THORDARSON PART No.	WORKMAN PART No.	ZENITH PART No.
IC1	UHIC-002	2056-104							
IC2	UPD858					ECG1198	TM1198	WEP2127/1198	
	UPD858C	2056-105				ECG1198	TM1198	WEP2127/1198	
IC3	78L05AV	2065-52	GEVR-100		SK3462/977	ECG977	TM977		221-Z9044
	78L05		GEVR-100		SK3462/977	ECG977	TM977		221-Z9044
TR1	2SC1675L	2046-03	GE-213	PTC132*	SK3124/289	ECG123AP*	TM123AP*	WEP773	121-Z9021*
	2SC1675		GE-213	PTC132*	SK3124/289	ECG123AP*	TM123AP*	WEP773	121-Z9021*
TR2	2SC1675L	2046-03	GE-213	PTC132*	SK3124/289	ECG123AP*	TM123AP*	WEP773	121-Z9021*
	2SC1675		GE-213	PTC132*	SK3124/289	ECG123AP*	TM123AP*	WEP773	121-Z9021*
TR3	2SC945AQ	2056-07	GE-212	PTC121*	SK3124/289	ECG199	TM199	WEP1945	121-972*
	2SC945		GE-212	PTC121*	SK3124/289	ECG199	TM199	WEP1945	121-972*
TR4	2SC945AQ	2056-07	GE-212	PTC121*	SK3124/289	ECG199	TM199	WEP1945	121-972*
	2SC945		GE-212	PTC121*	SK3124/289	ECG199	TM199	WEP1945	121-972*
TR5	2SC945AQ	2056-07	GE-212	PTC121*	SK3124/289	ECG199	TM199	WEP1945	121-972*
	2SC945		GE-212	PTC121*	SK3124/289	ECG199	TM199	WEP1945	121-972*
TR6	2SC1675L	2046-03	GE-213	PTC132*	SK3124/289	ECG123AP*	TM123AP*	WEP773	121-Z9021*
	2SC1675		GE-213	PTC132*	SK3124/289	ECG123AP*	TM123AP*	WEP773	121-Z9021*
TR7	2SC1675L	2046-03	GE-213	PTC132*	SK3124/289	ECG123AP*	TM123AP*	WEP773	121-Z9021*
	2SC1675		GE-213	PTC132*	SK3124/289	ECG123AP*	TM123AP*	WEP773	121-Z9021*
TR8	2SC1675L	2046-03	GE-213	PTC132*	SK3124/289	ECG123AP*	TM123AP*	WEP773	121-Z9021*
	2SC1675		GE-213	PTC132*	SK3124/289	ECG123AP*	TM123AP*	WEP773	121-Z9021*
CHASSIS									
D303	SSVB	2057-08	GEBR-206	PTC204(4)	SK3061/156(4)	ECG5313	TM516(4)	WEP1044	212-Z9000(4)
TR303	2SD188L		GE-75	PTC118	SK3297/280	ECG130	TM130	WEP704/130	121-Z9011
	2SD188		GE-75	PTC118	SK3297/280	ECG130	TM130	WEP704/130	121-Z9011

* Lead configuration may vary from original.

(4) Four required.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING	REPLACEMENT DATA			
		MFRG. PART No.	MALLORY PART No.	SPRAGUE PART No.	
				Q-LINE	GENERAL LINE
PLL BOARD					
C8	33 10V	1001-68	VTT33B10		EV-1225
C13	10 6.3V		TDC106M025FL	QDT1-64	SD25-109
	4.7 100V	2057-62			
C34	100 10V	170-21-9	VTT100D10	QV1-93	EV-1131
C48	10 6.3V		TDC106M025FL	QDT1-64	SD25-109
MAIN BOARD					
C15	1 25V	2056-101	TDC105M035EL	QDT1-25	SD35-19
C33	1 25V	2056-101	TDC105M035EL	QDT1-25	SD35-19
C34	4.7 10V	2056-102	TDC475M010EL	QDT1-48	SD10-4R79
C47	1 25V	1042-122	TDC104M050EL	QDT1-2	SD50-R109
C63	4.7 10V	2056-102	TDC475M010EL	QDT1-48	SD10-4R79
C65	47 10V	170-31-1	VTT47D16	QV1-73	EV-1226
C67	47 10V	170-31-1	VTT47D16	QV1-73	EV-1226
C69	1 50V	1011-40	VTT1A50	QV1-11	EV-1615
C73	22 16V	1074-38	VTT22B16	QV1-55	EV-1224
C75	4.7 25V	1042-130	VTT47R7B50	QV1-31	EV-1619.1
C76	10 16V	1042-129	VTT10B25	QV1-41	EV-1222
C79	10 16V	1042-129	VTT10B25	QV1-41	EV-1222
C80	10 16V	1042-129	VTT10B25	QV1-41	EV-1222
C81	1 50V	1011-40	VTT1A50	QV1-11	EV-1615
C83	47 10V	170-31-1	VTT47D16	QV1-73	EV-1226
C87	.47 35V	2095-30	TDC474M050EL	QDT1-19	SD50-R479
C89	47 10V	170-31-1			
C90	4.7 10V	2056-102	TDC475M010EL	QDT1-48	SD10-4R79
C96	.47 50V				
C103	47 10V	170-31-1	VTT47D16	QV1-73	EV-1226
C105	1 25V	1042-122	TDC104M050EL	QDT1-2	SD50-R109
C107	100 10V	170-21-9	VTT100D10	QV1-93	EV-1131
C108	1 25V	1042-122	TDC104M050EL	QDT1-2	SD50-R109
C109	1 50V	1011-40	VTT1A50	QV1-11	EV-1615
C111	100 10V	170-21-9	VTT100D10	QV1-93	EV-1131
C112	4.7 10V	170-31-1	VTT47D16	QV1-73	EV-1226
C116	470 16V	1042-124	VTT470K16	QV1-151	EV-1251
C117	47 16V	1042-128	VTT47D16	QV1-73	EV-1226
C118	470 16V	1042-124	VTT470K16	QV1-151	EV-1251
C120	47 10V	170-31-1	VTT47D16	QV1-73	EV-1226
C121	47 10V	170-31-1	VTT47D16	QV1-73	EV-1226
C122	220 16V	1000-26	VTT220H16	QV1-117	EV-1240
C124	100 10V	170-21-9	VTT100D10	QV1-93	EV-1131
C125	33 16V	1000-24	VTT33D25	QV1-63	EV-1325
C127	100 10V	170-21-9	VTT100D10	QV1-93	EV-1131
C128	1000 16V	170-82-9	VTT100M16	QV1-183	EV-1261
C153	4.7 10V	2056-102	TDC475M010EL	QDT1-48	SD10-4R79
C161	47 10V	170-31-1	VTT47D16	QV1-73	EV-1226
C171	10 16V	1042-129	VTT10B25	QV1-41	EV-1222
C174	4.7 10V	2056-102	TDC475M010EL	QDT1-48	SD10-4R79
C183	47 10V	170-31-1	VTT47D16	QV1-73	EV-1226
C188	47 10V	170-31-1	VTT47D16	QV1-73	EV-1226
C191	47 10V	170-31-1	VTT47D16	QV1-73	EV-1226
C193	4.7 16V	2095-31	TDC685M006EL	QDT1-54	SD6-6R89
C198	1 50V	1011-40	VTT1A50	QV1-11	EV-1615
C199	1 50V	1011-40	VTT1A50	QV1-11	EV-1615
C207	1 50V	1011-40	VTT1A50	QV1-11	EV-1615
C302	220 16V	1000-26	VTT220H16	QV1-117	EV-1240
C304	3300 25V	1037-13			EV-1490

BOLD LISTING INDICATES LOCATION OF PART

PARTS LIST AND DESCRIPTION (CONTINUED)

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

CAPACITORS

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA		
			MALLORY PART No.	SPRAGUE PART No.	
				Q-LINE	GENERAL LINE
PLL BOARD					
C1	.01 50V		MAG5011		
C2	.039 50V 10%		M192P3939R8	QFT2-159	1FT-S39
C3	47 50V 5%		CN0447	QCC2-26	10TCC-Q47
C4	47 50V 5%		CN0447	QCC2-26	10TCC-Q47
C5	.01 50V		MAG5011		
C6	.039 50V 10%		M192P3939R8	QFT2-159	1FT-S39
C7	.01 50V		MAG5011		
C9	.01 50V		MAG5011		
C10	.01 50V		MAG5011		
C11	5pF 50V $\pm$.25	2056-136	CN0568		
C14	.01 50V		MAG5011		
C15	.01 50V		MAG5011		
C16	.01 50V		MAG5011		
C17	.01 50V		MAG5011		
C18	10 50V 5%		CN0410	QCC2-15	10TCC-Q10
C19	220 50V 10%				10TCC-T22
C20	470 50V 10%		GP347	QCT2-35	10TS-T47
C21	.01 50V		MAG5011		
C22	5pF 50V $\pm$.25	2056-136	CN0568		
C23	.01 50V		MAG5011		
C24	.01 50V		MAG5011		
C25	22 50V 10%				
C26	10 50V 5%		CN0410	QCC2-15	10TCC-Q10
C27	470 50V 10%		GP347	QCT2-35	10TS-T47
C28	5pF 50V $\pm$.25	2056-136	CN0568		
C35	.1 50V 10%		M192P1049R8	QFT2-215	1FT-P10
C36	.1 50V 10%		M192P1049R8	QFT2-215	1FT-P10
C46	100 50V 5%		CN0310		10TCC-T10
C47	.01 50V		MAG5011		
C49	1pF 50V $\pm$.25	2056-118	CN0510		
C50	.047 50V		EWFI1A147	QF1-171	1PB-S47
C51	5pF 50V $\pm$.25	2056-136	CN0568		
C52	.047 50V		EWFI1A147	QF1-171	1PB-S47
C53	.047 50V		EWFI1A147	QF1-171	1PB-S47
C58	.01 50V		MAG5011		
C537	3pF Feed Thru				
C538	3pF Feed Thru	CZ-023			
C539	.001 Feed Thru	CZ-006			
C540	.001 Feed Thru	CZ-006			
C541	.001 Feed Thru	CZ-006			
C543	.001 Feed Thru	CZ-006			
C544	.001 Feed Thru	CZ-006			
C545	.001 Feed Thru	CZ-006			
C557	3pF Feed Thru	CZ-023			
CT1	20pF Trimmer	1042-53			
CT2	20pF Trimmer	1042-53			
CT3	20pF Trimmer	1042-53			
MAIN BOARD					
C1	39 50V 5%		CN0439		10TCC-Q39
C2	.0047 50V		GP247		5GA-D47
C3	.0047 50V		GP247		5GA-D47
C4	.0047 50V		GP247		5GA-D47
C5	.0047 50V		GP247		5GA-D47
C6	.0047 50V		GP247		5GA-D47
C7	.0047 50V		GP247		5GA-D47
C8	47 50V 5%		CN0447	QCC2-26	10TCC-Q47
C9	100 50V 5%		CN0310		10TCC-T10
C10	.0047 50V		GP247		5GA-D47
C11	.001 50V		GP210	QCT2-41	10TS-D10
C12	.001 50V		GP210	QCT2-41	10TS-D10
C13	.01 50V		MAG5011		
C14	.0047 50V		GP247		5GA-D47
C16	.022 50V 10%		M192P2239R8	QFT2-127	1FT-S22
C17	.0047 50V		GP247		5GA-D47
C18	.022 50V 10%		M192P2239R8	QFT2-127	1FT-S22
C19	.001 50V		GP210	QCT2-41	10TS-D10
C20	.039 50V 10%		M192P3939R8	QFT2-159	1FT-S39
C21	.01 50V		MAG5011		
C22	.01 50V		MAG5011		
C23	15 50V 5%		CN0415		10TCC-Q15
C24	.01 50V 10%		M192P1039R8	QFT2-91	1FT-S10
C25	.039 50V 10%		M192P3939R8	QFT2-159	1FT-S39
C26	.01 50V		MAG5011		
C27	.022 50V 10%		M192P2239R8	QFT2-127	1FT-S22
C28	10 50V 5%		CN0410	QCC2-15	10TCC-Q10
C29	.001 50V 10%		M192P10292	QFT2-1	1FT-D10
C30	100 50V 5%		CN0310		10TCC-T10
C31	.039 50V 10%		M192P3939R8	QFT2-159	1FT-S39
C32	.022 50V 10%		M192P2239R8	QFT2-127	1FT-S22
C35	500 50V 10%		SX351	QW1-43	MWB-511
C36	.039 50V 10%		M192P3939R8	QFT2-159	1FT-S39
C37	.01 50V 10%		M192P1039R8	QFT2-91	1FT-S10
C38	.039 50V 10%		M192P3939R8	QFT2-159	1FT-S39
C39	.039 50V 10%		M192P3939R8	QFT2-159	1FT-S39
C40	22 50V 5%		CN0422		10TCC-Q22
C41	.039 50V 10%		M192P3939R8	QFT2-159	1FT-S39
C42	100 50V				
C43	.01 50V		MAG5011		
C44	.0047 50V 10%		M192P4729R8	QFT2-63	1FT-D47
C45	.01 50V		MAG5011		
C46	.01 50V		MAG5011		
C48	.0047 50V 10%				
C49	.01 50V 10%		M192P1039R8	QFT2-91	1FT-S10
C50	.039 50V 10%		M192P3939R8	QFT2-159	1FT-S39
C51	.039 50V 10%		M192P3939R8	QFT2-159	1FT-S39
C52	5pF 50V $\pm$.25	2056-136	CN0568		
C53	.039 50V 10%		M192P3939R8	QFT2-159	1FT-S39

BOLD LISTING INDICATES LOCATION OF PART

PARTS LIST AND DESCRIPTION (CONTINUED)

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

CAPACITORS (cont)

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA		
			MALLORY PART No.	SPRAGUE PART No.	
				Q-LINE	GENERAL LINE
C54	.01 50V	2095-33	MAG5011		
C55	.01 50V		MAG5011		
C56	.01 50V		MAG5011		
C57	.022 50V 10%		M192P2239R8	QFT2-127	1FT-S22
C58	.022 50V 10%		M192P2239R8	QFT2-127	1FT-S22
C59	.022 50V 10%		M192P2239R8	QFT2-127	1FT-S22
C60	.01 50V		MAG5011		
C61	.01 50V		MAG5011		
C62	15 50V 5%		CN0415		10TCC-Q15
C64	2pF 50V $\pm$.25		CN0522		
C66	2pF 50V $\pm$.25	2095-33	CN0522		
	22 50V 5%		CN0422		10TCC-Q22
C68	.022 50V 10%	2042-53	M192P2239R8	QFT2-127	1FT-S22
C70	10 50V 5%		CN0410	QCC2-15	10TCC-Q10
C71	22 50V 5%		CN0422		10TCC-Q22
C72	.01 50V		MAG5011		
C74	.01 50V		MAG5011		
C77	.01 50V		MAG5011		
C78	.01 50V		MAG5011		
C82	.01 50V				
C84	.001 50V 10%		M192P10292	QFT2-1	1FT-D10
C85	.01 50V		MAG5011		
C86	.1	2042-53			
C91	.022 50V 10%		M192P2239R8	QFT2-157	1FT-S22
C92	.01 50V				
C93	.01 50V				
C97	.039 50V 10%		M192P3939R8	QFT2-159	1FT-S39
CT1	Trimmer 20pF				
CT2	Trimmer 20pF				
CT3	Trimmer 20pF				
C98	100 50V 5%		CN0310		10TCC-T10
C99	.001 50V 10%		M192P10292	QFT2-1	1FT-D10
C100	.01 50V	2056-118	MAG5011		
C101	15 50V 5%		CN0415		10TCC-Q15
C102	15 50V 5%		CN0415		10TCC-Q15
C104	.01 50V		MAG5011		
C106	.022 50V 10%		M192P2239R8	QFT2-127	1FT-S22
C110	.001 50V 10%		M192P10292	QFT2-1	1FT-D10
C113	180 50V 10%				10TCC-T18
C114	.22 50V 10%		M192P2249R8	QFT2-253	1FT-P22
C115	.1 50V 10%		M192P1049R8	QFT2-215	1FT-P10
C119	.01 50V		MAG5011		
C123	.01 50V	2056-118	MAG5011		
C129	.01 50V		MAG5011		
C130	.01 50V		MAG5011		
C131	.01 50V		MAG5011		
C132	1pF 50V $\pm$.25		CN0510		
C133	.01 50V		MAG5011		
C134	.022 50V		M192P2239R8		192P2239R8
C135	.01 50V		MAG5011		
C136	.022 50V		M192P2239R8		192P2239R8
C137	.01 50V		MAG5011		
C138	33 50V 5%	2056-118	CN0433	QCC2-22	10TCC-Q33
C139	82 50V 5%		CN0482		10TCC-Q82
C140	150 50V 10%		CN0315		10TCC-T15
C141	330 50V 10%		GP333	QCT2-33	10TS-T33
C142	470 50V 10%		GP347	QCT2-35	10TS-T47
C143	2pF 50V $\pm$.25				
C144	.0047 50V				
C145	.0047 50V		GP247		5GA-D47
C146	.0047 50V				
C147	.039 50V 10%		M192P3939R8	QFT2-159	1FT-S39
C148	.039 50V 10%		M192P3939R8	QFT2-159	1FT-S39
C150	.1 50V	2056-118	MAG5001		
C151	180 50V 10%				
C152	56 50V 5%		CN0456		10TCC-Q56
C154	.01 50V		MAG5011		
C155	.01 50V		MAG5011		
C156	.0047 50V		GP247		5GA-D47
C157	.0047 50V		GP247		5GA-D47
C158	.0047 50V		GP247		5GA-D47
C159	.01 50V		MAG5011		
C160	.0047 50V		GP247		5GA-D47
C162	.039 50V 10%	2056-118	M192P3939R8	QFT2-159	1FT-S39
C163	.039 50V 10%		M192P3939R8	QFT2-159	1FT-S39
C164	.01 50V		MAG5011		
C165	.039 50V 10%		M192P3939R8	QFT2-159	1FT-S39
C166	.039 50V 10%		M192P3939R8	QFT2-159	1FT-S39
C168	.01 50V		MAG5011		
C169	.01 50V		MAG5011		
C170	150 50V 10%		CN0315		10TCC-T15
C172	.01 50V		MAG5011		
C173	.01 50V 10%		M192P1039R8	QFT2-91	1FT-S10
C175	56 50V 5%	2056-118	CN0456		10TCC-Q56
C176	680 50V 10%		GP368		10TS-T68
C177	.1 50V		MAG5001		
C178	.1 50V		MAG5001		
C179	.1 50V		MAG5001		
C180	.1 50V		MAG5001		
C181	.1 50V		MAG5001		
C182	.01 50V		MAG5011		
C184	.01 50V		MAG5011		
C185	.022 50V		M192P2239R8		192P2239R8
C186	.022 50V	2056-118	M192P2239R8		192P2239R8
C187	.022 50V 10%		M192P2239R8	QFT2-127	1FT-S22
C189	.01 50V 10%		M192P1039R8	QFT2-91	1FT-S10
C190	.01 50V				
C192	.1 50V		MAG5001		
C201	.0047 50V		GP247		5GA-D47
C202	.0047 50V		GP247		5GA-D47
C203	.0047 50V		GP247		5GA-D47
C204	.0047 50V		GP247		5GA-D47

COURIER MODEL Centurion PLL40

PARTS LIST AND DESCRIPTION (CONTINUED)

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

CAPACITORS (cont)

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA		
			MALLORY PART No.	SPRAGUE PART No.	
				Q-LINE	GENERAL LINE
C205	Feed Thru .001				
C206	.0047 50V		GP247		5GA-D47
C208	.1 50V		MAG5001		
C209	.022 50V		M192P2239R8		192P2239R8
C210	.001 50V		GP210	QCT2-41	10TS-D10
C211	.001 50V		GP210	QCT2-41	10TS-D10
C212	.047 50V		EWFA147	QF1-171	1PB-S47
C213	.0047 50V		GP247		5GA-D47
C214	.001 50V		GP210	QCT2-41	10TS-D10
C215	.0047 50V				
C216	.047 50V		EWFA147	QF1-171	1PB-S47
C217	.0047 50V		GP247		5GA-D47
C218	.0047 50V		GP247		5GA-D47
C219	.001 50V 10%		GP210	QCT2-41	10TS-D10
C220	.001 50V		GP210	QCT2-41	10TS-D10
C221	10 50V				
C222	.001 50V		GP210	QCT2-41	10TS-D10
C223	.047 50V				
C224	.0047 50V 5%		CN0410	QCC2-15	10TCC-Q10
C224A	.022				
C224B	.004				
C225	.0047B 50V		GP247		5GA-D47
C225A	.022				
C226	.047 50V		EWFA147	QF1-171	1PB-S47
C227	.0047 50V		GP247		5GA-D47
C228	.047 50V		EWFA147	QF1-171	1PB-S47
C229	100 50V				
C230	.001 50V		GP210	QCT2-41	10TS-D10
C301	.039 50V 10%		M192P3939R8	QFT2-159	1FT-S39
C303	.01 50V		MAG5011		
C305	.01 50V		MAG5011		
C306	.01 50V		MAG5011		
C307	.01 50V		MAG5011		
C308	.01 50V				
C309	.01 50V		MAG5011		
C310	.01 50V		MAG5011		

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

ITEM No.	FUNCTION	RESISTANCE	REPLACEMENT DATA		
			MFR. PART No.	MALLORY PART No.	TRW PART No.
RT1	RF Gain Range	100K		RVA0911V104(2)	X260R104B(2)
RT2	AGC	5000		RVA0911V502	X260R502B
RT4	AM S Meter	50K		RVA0911V503(2)	X260R503B(2)
RT6	SSB S Meter	50K		RVA0911V503(2)	X260R503B(2)
RTB	Balancer	50K		RVA0911V503	X260R503B
RT9	ALC	5000		RVA0911V502(2)	X260R502B(2)
RT11	SSB Squelch Range	50K		RVA0911V503(2)	X260R503B(2)
RT12	AM Squelch Range	30K		RVA0911V503V(2)	X260R503B(2)
RT14	AM Power	3000		RVA0911V502(2)	X260R502B(2)
RT15	TX Meter	100K		RVA0911V104(2)	X260R104B(2)
RT19	XMT Frequency	10K		RVA0911V103	X260R103B
RT20	Final Bias	300		MTC32L1(2)	X201R351B(2)
RT21	SSB Sens	50K		RVA0911V503(2)	X260R503B(2)
RT22	Driver Bias	5000		RVA0911V502(2)	X260R502B(2)
RT301	Voltage	200		MTC22L1	X201R251B
VR1	CAL	5000	1074-21	UA53L, SH1000	BU1, CF8, SS1, DC1
VR2	RF Gain	100K	1042-96	U41	BU1, CF13, SS5, DC1
VR3	Clarifier	20K	2065-20	U26	BU1, CF62, SS5, DC1
VR4	Volume	10K	1074-18	U18	BU1, CF61, SS5, DC1
VR5	Squelch/Switch	100K	1074-19		BU1, CF13, SS20, K

(2) Cut off one of the end terminals and bend to fit P.C. Board.

RESISTORS (Power and Special)

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		MFR. PART No.	SPRAGUE/ Q-LINE PART No.	WORKMAN PART No.			MFR. PART No.	SPRAGUE/ Q-LINE PART No.	WORKMAN PART No.
R154	10 10% 5W WW		243E1005	24-3030	R157	10 10% 5W WW		243E1005	24-3030

COILS (RF-IF)

ITEM No.	FUNCTION	REPLACEMENT DATA			REMARKS
		PART No.	OTHER IDENTIFICATION	MILLER PART No.	
PLL BOARD					
L1	PLL Mixer (100uH)	1079-09		9250-104	
L2	RF Choke (470uH)	1079-08		9250-474	
L3	RF Choke (470uH)	1079-08			
L5	RF Choke (470uH)	1079-08		9250-474	
L6	PLL (34MHz)	2056-108			
L7	VCO (34MHz)	2056-109			
L8	Tripler (33MHz)	2056-108			
L9	Tripler (33MHz)	2056-107			
L14	RF Choke			4594	
L15	RF Choke			4594	
L16	RF Choke			4594	
MAIN BOARD					
FT1	AM IF (455kHz)	1042-49		CBS603-4TCC	
L1	Noise Blanker (27MHz)	1080-11		CBS740-T	
L2	Noise Blanker	2056-16			

PARTS LIST AND DESCRIPTION (CONTINUED)

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

COILS (RF-IF) (cont)

ITEM No.	FUNCTION	REPLACEMENT DATA			REMARKS
		PART No.	OTHER IDENTIFICATION	MILLER PART No.	
L3	RF Amp (27MHz)	2056-15			
L4	RF Amp (27MHz)	2056-17			
L5	Mixer (7.8MHz)	1042-29		CBS512-7TC	
L6	IF Amp (7.8MHz)	1042-29		CBS512-7TC	
L7	IF Amp (7.8MHz)	2056-14		CBS511-7TC	
L8	Carrier Osc (7.8MHz)	1042-29		CBS512-7TC	
L9	RF Choke (470uH)	1079-08		9250-474	
L10	RF Choke (470uH)	1079-08		9250-474	
L11	RF Choke (470uH)	1079-08		9250-474	
L12	TVI Trap (54MHz)	1079-06		CB304	
L13	PI Filter	2056-22			
L14	PI Filter	2056-22			
L15	Final (27MHz)	1045-24		CB305	
L16	RF Choke	1080-25		4594	
L17	RF Choke	1080-25		4594	
L18	RF Choke (1uH)	2056-23			
L19	XMT Driver (27MHz)	1079-06		CB304	
L20	RF Choke	1080-25		4594	
L21	RF Choke (1uH)	2056-23			
L22	XMT Amp	2056-21			
L23	XMT Buffer	2056-21			
L24	XMT Mixer (27MHz)	2056-18			
L26	XMT Mixer (27MHz)	1042-29		CBS512-7TC	
L27	AM IF (455kHz)	2056-14		CBS511-7TC	
L28	AM IF (455kHz)	2056-19			
L29	AM IF (455kHz)	1080-17		8535	
L30	RF Choke	2056-20			
L31	RF Choke (100uH)	1079-09		9250-104	
L32	RF Choke (100uH)	2079-09		9250-104	
L401	RF Choke				
L402	RF Choke	2056-20			
L403	RF Choke				
L404	RF Choke				
L405	RF Choke				
L406	RF Choke				

TRANSFORMER (Audio Output/ MODULATOR)

ITEM No.	IMPEDANCE		REPLACEMENT DATA			NOTES
	PRI.	SEC.	MFGR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T1	7.6	12.8	2056-24			TF-088 on Unit.

TRANSFORMER (Power)

ITEM No.	RATING		REPLACEMENT DATA			NOTES
	PRI.	SEC. 1	MFGR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T2	120V AC @ 720mA AC	18.96V AC @ 4.2A AC	2057-09			On Unit TF-086.

SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		MFGR. PART No.	QUAM PART No.	
SP	3" X 5" CM, 8 Ohm	1074-10	35A05Z8	

FUSE DEVICES

ITEM No.	DESCRIPTION	REPLACEMENT DATA				
		PART No.		BUSS PART No.		WORKMAN PART No.
		DEVICE	HOLDER	DEVICE	HOLDER	DEVICE
F1	3A Quick-Acting	2058-28	2095-79	AGC3	HRK	FG3-2
F2	3A Quick-Acting	2058-28	2095-78	AGC3	HKP	FG3-2

MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
PLL BOARD			
L11	Ferrite Bead		LD-077
L12	Ferrite Bead		LD-077
L13	Ferrite Bead		LD-077
X1	Crystals	2049-05	10.240MHz
X2	Crystals	2056-95	11.2845MHz
X3	Crystals	2056-96	11.2855MHz
MAIN BOARD			
FT2	Ceramic Filter	1042-50	FL-020
FT3	Crystal Filter	1042-84	FL-006
J1	Jack		Antenna
J3	Jack		External Speaker
J4	Jack		PA Speaker
J5	Jack		Phone
J6	Jack		DC Power

BOLD LISTING INDICATES LOCATION OF PART

PARTS LIST AND DESCRIPTION (CONTINUED)

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

MISCELLANEOUS (cont)

ITEM No.	PART NAME	PART No.	NOTES
M	Motor		Clock, Motor
M1	Meter		SWR
M2	Meter		S/R
PL1	Pilot Lamp	2057-35	400MM UL Lead Wire
PL2	Pilot Lamp	2057-36	250MM UL Lead Wire
PL3	Pilot Lamp	2057-37	250MM UL Lead Wire
PL4	Pilot Lamp	2057-38	250MM UL Lead Wire
PL5	Pilot Lamp	2057-38	250MM UL Lead Wire
PL6	Pilot Lamp	2057-39	250MM UL Lead Wire
PL7	Pilot Lamp	2057-39	250MM UL Lead Wire
PL8	Pilot Lamp	2057-40	400MM UL Lead Wire
RL1	Relay		XMT 100
RL2	Relay		XMT 100
S1	Switch	2057-22	(PWR/N.B./PA-CB)
S2	Switch	2057-22	(PWR/N.B./PA-CB)
S3	Switch	2057-22	(PWR/N.B./PA-CB)
S4	Switch	2057-23	(CAL-SWR)
S5	Switch	2057-21	(Mode Sw)
S6	Switch	2057-24	(AC-DC)
S10	Switch	2056-27	Channel
X1	Crystals	1042-81	7.3435MHz
X2	Crystals	1042-83	7.8015MHz
X3	Crystals	1042-82	7.7985MHz
	Microphone	2056-32	

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

ITEM	PART No.	ITEM	PART No.
Knob, CAL	1074-138	Knob, for Clock (B)	1074-70
Knob, Channel	1074-67	Knob, Volume	1074-68
Knob, for Clock (A)	1074-69	Knob, Power On/Off	1074-92