

SAMS **PHOTOFACT[®]** **CB RADIO** **SERIES**



CB-249
249
FEBRUARY 1979

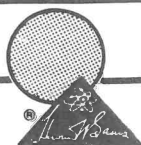


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HOWARD W. SAMS & CO., INC. Indianapolis, Indiana



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.



COBRA MODEL 148GTL

MODEL 148GTL

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

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→ DELETE

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 13.8 volts DC at TP12.
 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: GC ELECTRONICS:
 L1,L2,L4 thru L10,L12,L14,L19 thru L23,
 L30,L31,L45,L46,L47,L48,L59 9440
 L3,L13,L15 5000,5009,8276,8728,8728A
 L36,L38 5009,8728,8728A
 CT2 5000,8276

SYNTHESIZER ALIGNMENT

TEST EQUIPMENT	TRANSCIVER	ADJUST	REMARKS
Input of frequency counter to TP13 (IC1 Pin 8).	Ch. 19		Check for 10.240MHz.
Input of oscilloscope to TP10.	Ch. 19, AM	L21	Adjust for maximum RF (3.4V p-p typical). (See Figure 1.)
Input of DC meter to TP9.	Ch. 40, AM	L19	Adjust for 3.2 volts. Check for approximately 2.2 volts on Channel 1.
Input of oscilloscope to TP1.	Ch. 19, AM	L20	Adjust for maximum RF (190mV p-p typical). (See Figure 2.)
Input of frequency counter to TP1.	Ch. 1, AM	L23	Adjust for 34.7650MHz $\pm$ 20Hz. Check all channels. (See Truth Chart for correct frequencies.)
Input of frequency counter to TP1.	Ch. 1, USB	L59	Adjust for 34.7665MHz $\pm$ 20Hz. Check all channels. (See Truth Chart for correct frequencies.)
Input of frequency counter to TP1.	Ch. 1, LSB	L22	Adjust for 34.7635MHz $\pm$ 20Hz. Check all channels. (See Truth Chart for correct frequencies.)
Input of frequency counter to TP10.	Ch. 1, AM		Check for .790MHz. Check all channels. (See Truth Chart for correct frequencies.)
Input of frequency counter to TP15 (FET1 Gate 1).	Ch. 19, AM		Check for 7.3450MHz.
Input of frequency counter to TP3.	Ch. 19, USB	CT2	Adjust for 7.8015MHz +5Hz, -0Hz.
Input of frequency counter to TP3.	Ch. 19, LSB	L30	Adjust for 7.7985MHz +0Hz, -5Hz.
Input of frequency counter to TP14 (IC3 Pin 3).	Ch. 19, AM XMT	L31	Disconnect TP7 and TP8. Adjust for 7.8000MHz $\pm$ 5Hz.
Input of frequency counter to antenna input.	Ch. 19, AM XMT	VR5	Adjust for 27.185MHz.

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. Preset controls as follows, unless otherwise noted:
RF Gain Maximum, Voicelock Midrange, Squelch MINIMUM, NB/ANL Off.

TEST EQUIPMENT	TRANSCIVER	ADJUST	REMARKS
Output of signal generator thru .01uF to TP16 (TR15 Emitter). 7.8MHz, no modulation.	Ch. 19, USB	L14,L12,L10, L9,L8,L7	Adjust for maximum output.
Output of signal generator thru .01uF to TP15 (FET1 Gate 1). 455kHz, 1000Hz @ 30% modulation.	Ch. 19, AM	L15,L13,L3	Adjust for maximum output.
Output of signal generator thru .01uF to antenna input. 27.185MHz, 1000Hz @ 30% modulation.	Ch. 19, AM	L6,L5,L4	Adjust for maximum output.
Output of signal generator thru .01uF to antenna input. 27.185MHz, 1000Hz @ 30% modulation. Input of oscilloscope to TP17 (D2 Cathode).	Ch. 19, AM	L1,L2	Set generator for 10db signal to noise plus noise ratio of receiver. Inject a 100pps, 1uSec. pulse width signal at antenna input. Switch noise blanker to on and adjust for maximum pulse amplitude (8.2V peak typical). (See Figure 3.)

COBRA MODEL 148GTL

RECEIVER ADJUSTMENTS

Connect an AC VTVM or AF wattmeter across speaker voice coil.
Adjust volume control to obtain a suitable indication.
Preset controls as follows, unless otherwise noted:
RF Gain Maximum, Voicelock Midrange, Squelch MINIMUM, NB/ANL Off.

TEST EQUIPMENT	TRANSCIVER	ADJUST	REMARKS
Output of signal generator thru .01uF to antenna input. 27.185MHz, 1000Hz @ 30% modulation. Output 1000uV.	Ch. 19, AM Squelch Maximum	VR3	SQUELCH RANGE Adjust so squelch just breaks.
Output of signal generator thru .01uF to antenna input. 27.185MHz, 1000Hz @ 30% modulation. Output 100uV.	Ch. 19, AM	VR1	AM SIGNAL METER Adjust for 9 on signal scale of meter.
Output of signal generator thru .01uF to antenna input. 27.186MHz, no modulation. Output 100uV.	Ch. 19, USB	VR2	SSB SIGNAL METER Adjust for 9 on signal scale of meter.

TRANSMITTER ALIGNMENT

Connect a 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.

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Input of RF wattmeter to antenna input.	Ch. 19, AM	L47,L48,L46, L45,L38	Adjust for maximum RF output.
Input of spectrum analyzer or harmonic meter to antenna input.	Ch. 19, AM	L36	Adjust for MINIMUM at 54MHz (2nd harmonic).

TRANSMITTER ADJUSTMENTS

Connect a 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 RF wattmeter to antenna input. No modulation.	Ch. 19, USB Dynamike MINIMUM	VR4	CARRIER BALANCE Adjust for MINIMUM RF output.
Input of RF wattmeter to antenna input. Insert a 0-500mA DC meter at TP8. No modulation.	Ch. 19, USB Dynamike MINIMUM	VR9	DRIVER BIAS Adjust for 25mA.
Input of RF wattmeter to antenna input. Insert a 0-500mA DC meter at TP7. No modulation.	Ch. 19, USB Dynamike MINIMUM	VR8	FINAL BIAS Adjust for 50mA.
Input of RF wattmeter to antenna input. Inject a two-tone, 500mV signal at mic input.	Ch. 19, USB Dynamike Maximum	VR11	SSB ALC Adjust for 11.0 watts PEP RF output maximum.
Input of RF wattmeter to antenna input.	Ch. 19, AM Dynamike MINIMUM	VR10	AM CARRIER POWER Adjust for 4.0 watts RF output maximum.
Input of RF wattmeter to antenna input.	Ch. 19, AM	VR6	RF PWR METER Adjust so RF PWR meter agrees with RF wattmeter.

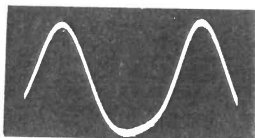


FIGURE 1

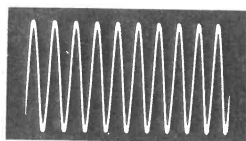


FIGURE 2

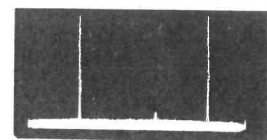
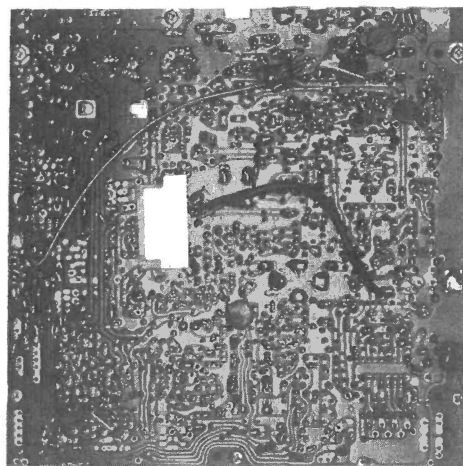


FIGURE 3

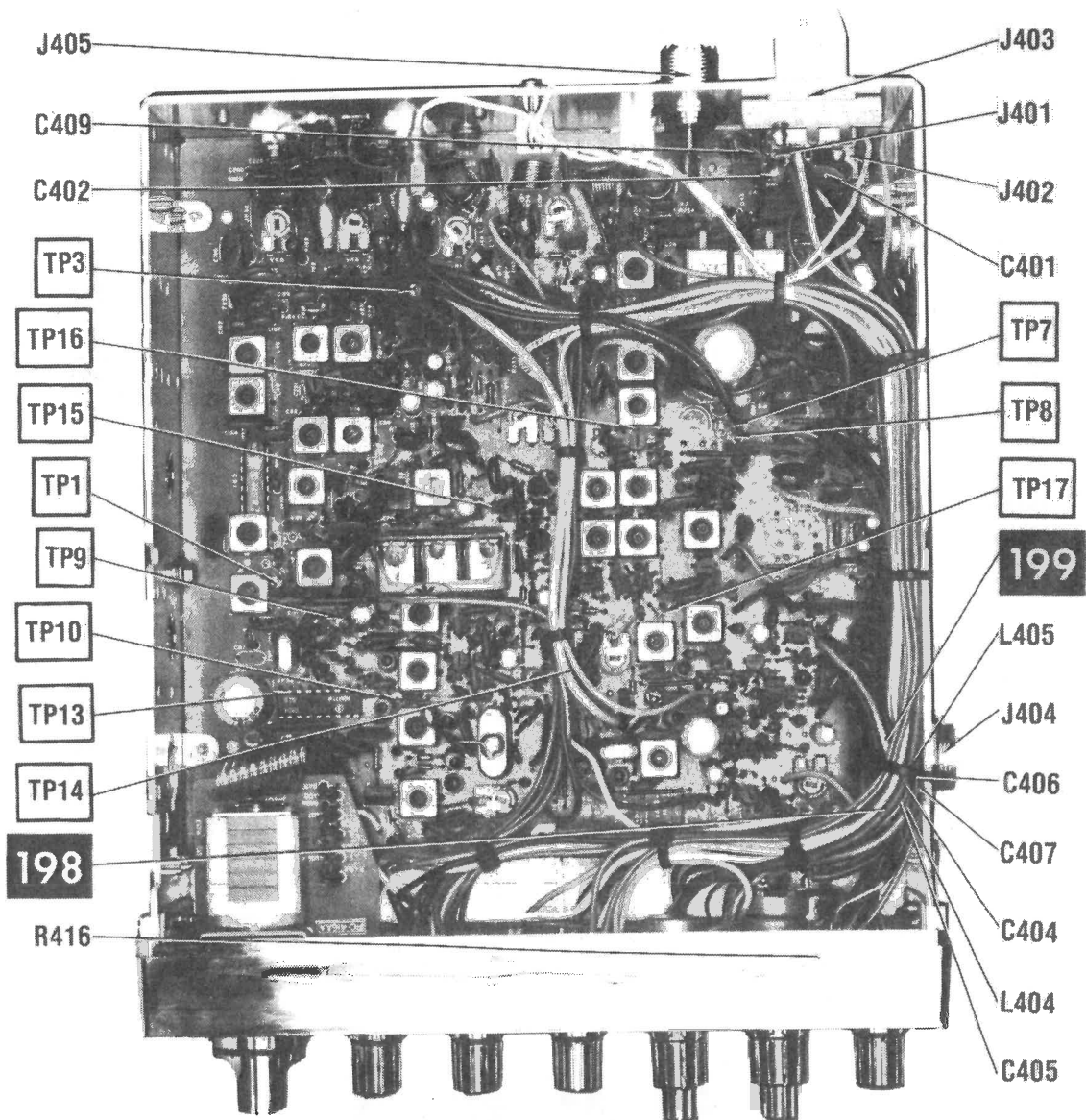
TRUTH CHART

C H A N N E L	1 = 8.00 Volts 0 = 0 to .50 Volts								AM REC SYNTH OUTPUT IN MHz AT TP1	USB REC SYNTH OUTPUT IN MHz AT TP1	LSB REC SYNTH OUTPUT IN MHz AT TP1	DIVIDER INPUT IN MHz AT TP10
	IC1 PROGRAM DIVIDER											
	PINS											
	10	11	12	13	14	15	16					
1	1	0	0	1	1	1	1		34.7650	34.7665	34.7635	.790
2	1	0	1	0	0	0	0		34.7750	34.7765	34.7735	.800
3	1	0	1	0	0	0	1		34.7850	34.7865	34.7835	.810
4	1	0	1	0	0	1	1		34.8050	34.8065	34.8035	.830
5	1	0	1	0	1	0	0		34.8150	34.8165	34.8135	.840
6	1	0	1	0	1	0	1		34.8250	34.8265	34.8235	.850
7	1	0	1	0	1	1	0		34.8350	34.8365	34.8335	.860
8	1	0	1	1	0	0	0		34.8550	34.8565	34.8535	.880
9	1	0	1	1	0	0	1		34.8650	34.8665	34.8635	.890
10	1	0	1	1	0	1	0		34.8750	34.8765	34.8735	.900
11	1	0	1	1	0	1	1		34.8850	34.8865	34.8835	.910
12	1	0	1	1	1	0	1		34.9050	34.9065	34.9035	.930
13	1	0	1	1	1	1	0		34.9150	34.9165	34.9135	.940
14	1	0	1	1	1	1	1		34.9250	34.9265	34.9235	.950
15	1	1	0	0	0	0	0		34.9350	34.9365	34.9335	.960
16	1	1	0	0	0	1	0		34.9550	34.9565	34.9535	.980
17	1	1	0	0	0	1	1		34.9650	34.9665	34.9635	.990
18	1	1	0	0	1	0	0		34.9750	34.9765	34.9735	1.000
19	1	1	0	0	1	0	1		34.9850	34.9865	34.9835	1.010
20	1	1	0	0	1	1	1		35.0050	35.0065	35.0035	1.030
21	1	1	0	1	0	0	0		35.0150	35.0165	35.0135	1.040
22	1	1	0	1	0	0	1		35.0250	35.0265	35.0235	1.050
23	1	1	0	1	1	0	0		35.0550	35.0565	35.0535	1.080
24	1	1	0	1	0	1	0		35.0350	35.0365	35.0335	1.060
25	1	1	0	1	0	1	1		35.0450	35.0465	35.0435	1.070
26	1	1	0	1	1	0	1		35.0650	35.0665	35.0635	1.090
27	1	1	0	1	1	1	0		35.0750	35.0765	35.0735	1.100
28	1	1	0	1	1	1	1		35.0850	35.0865	35.0835	1.110
29	1	1	1	0	0	0	0		35.0950	35.0965	35.0935	1.120
30	1	1	1	0	0	0	1		35.1050	35.1065	35.1035	1.130
31	1	1	1	0	0	1	0		35.1150	35.1165	35.1135	1.140
32	1	1	1	0	0	1	1		35.1250	35.1265	35.1235	1.150
33	1	1	1	0	1	0	0		35.1350	35.1365	35.1335	1.160
34	1	1	1	0	1	0	1		35.1450	35.1465	35.1435	1.170
35	1	1	1	0	1	1	0		35.1550	35.1565	35.1535	1.180
36	1	1	1	0	1	1	1		35.1650	35.1665	35.1635	1.190
37	1	1	1	1	0	0	0		35.1750	35.1765	35.1735	1.200
38	1	1	1	1	0	0	1		35.1850	35.1865	35.1835	1.210
39	1	1	1	1	0	1	0		35.1950	35.1965	35.1935	1.220
40	1	1	1	1	0	1	1		35.2050	35.2065	35.2035	1.230

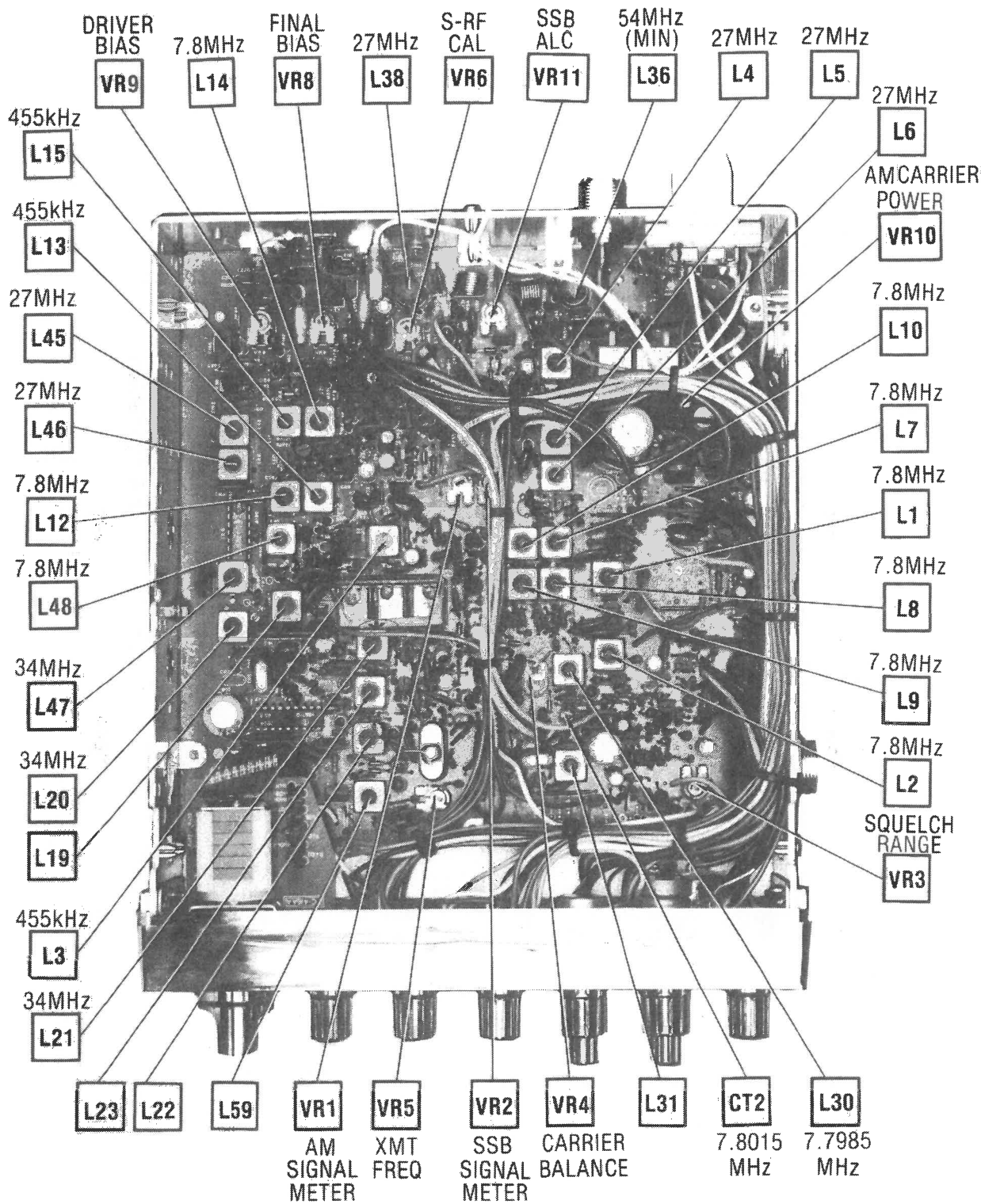
COBRA MODEL 148GTL



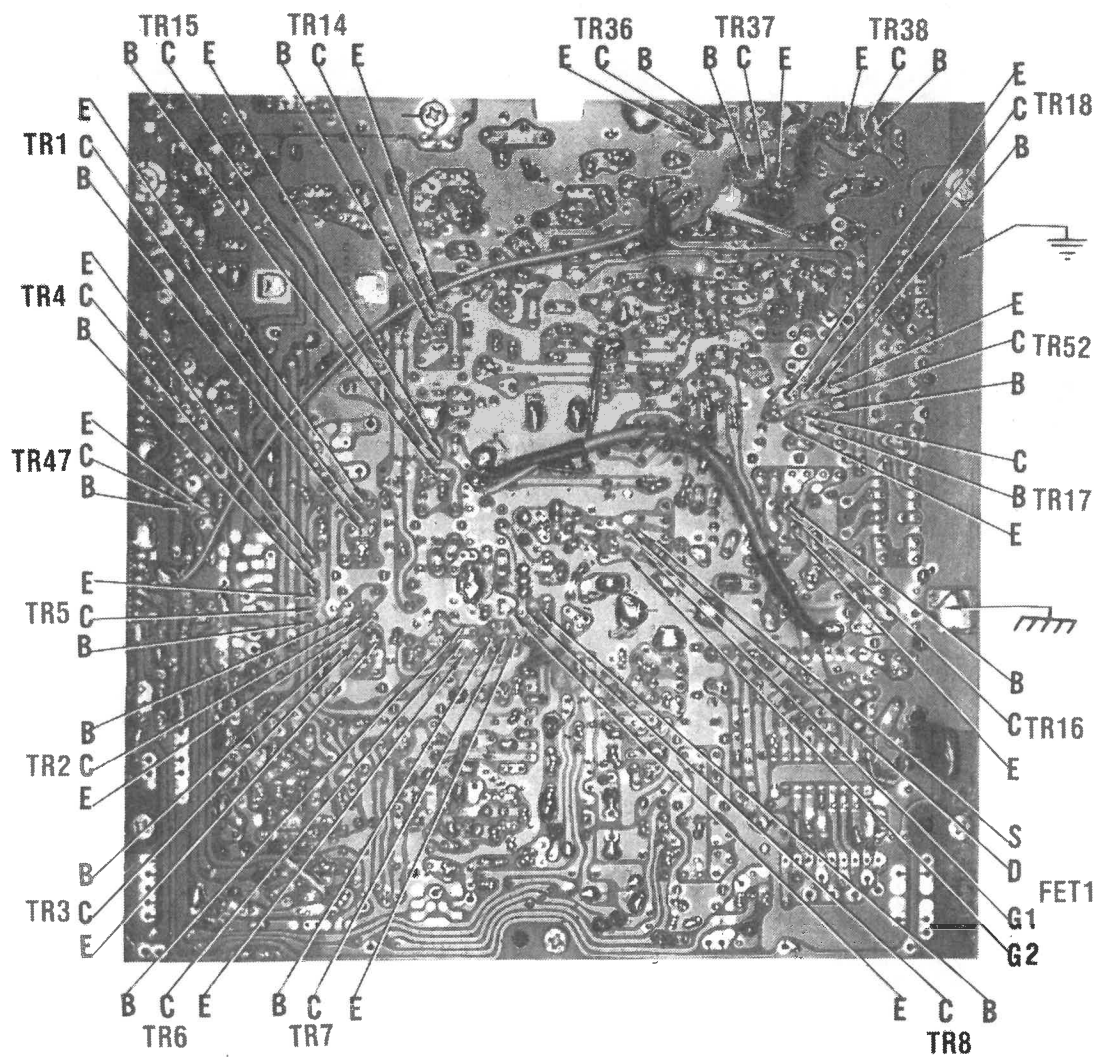
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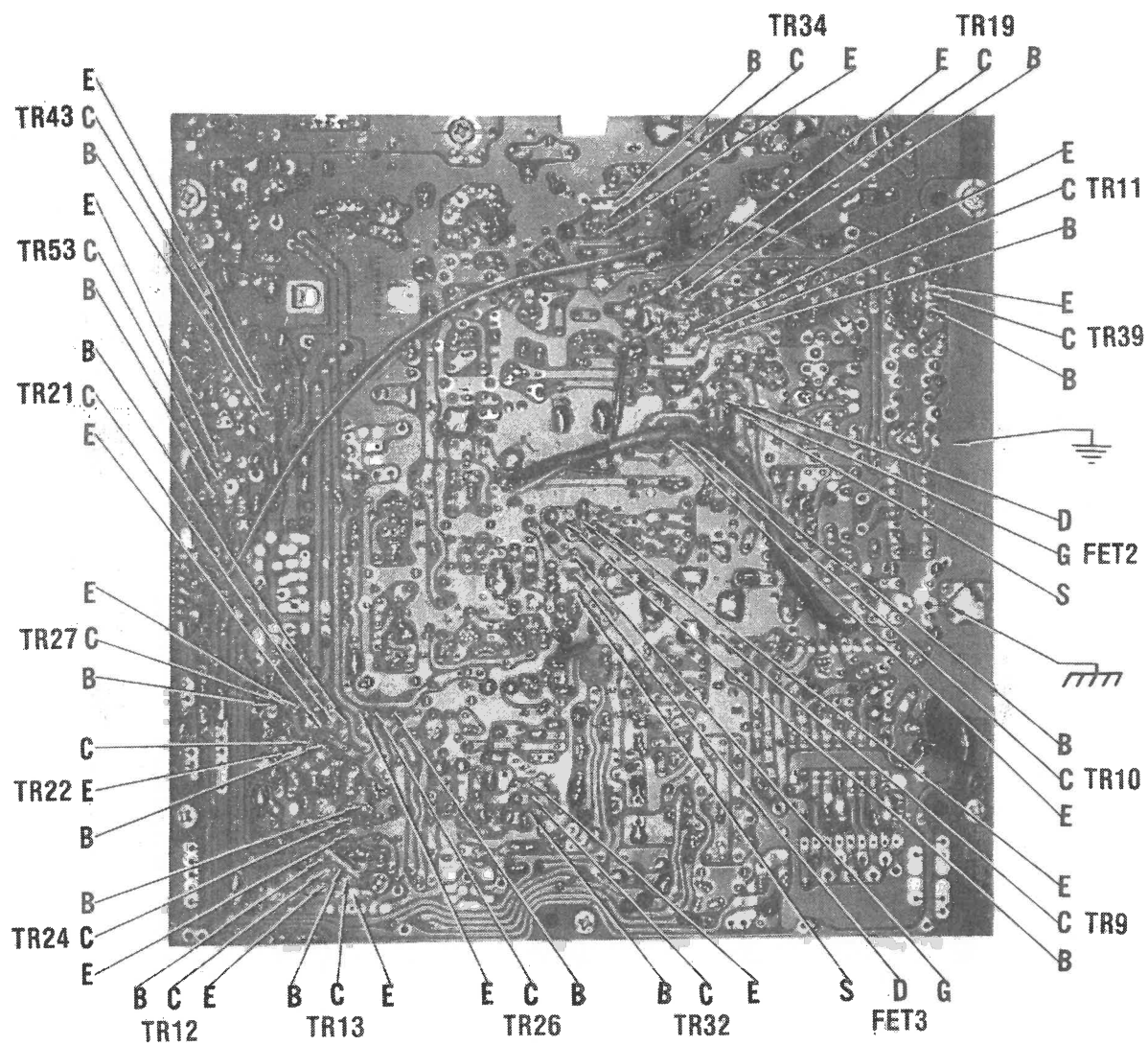
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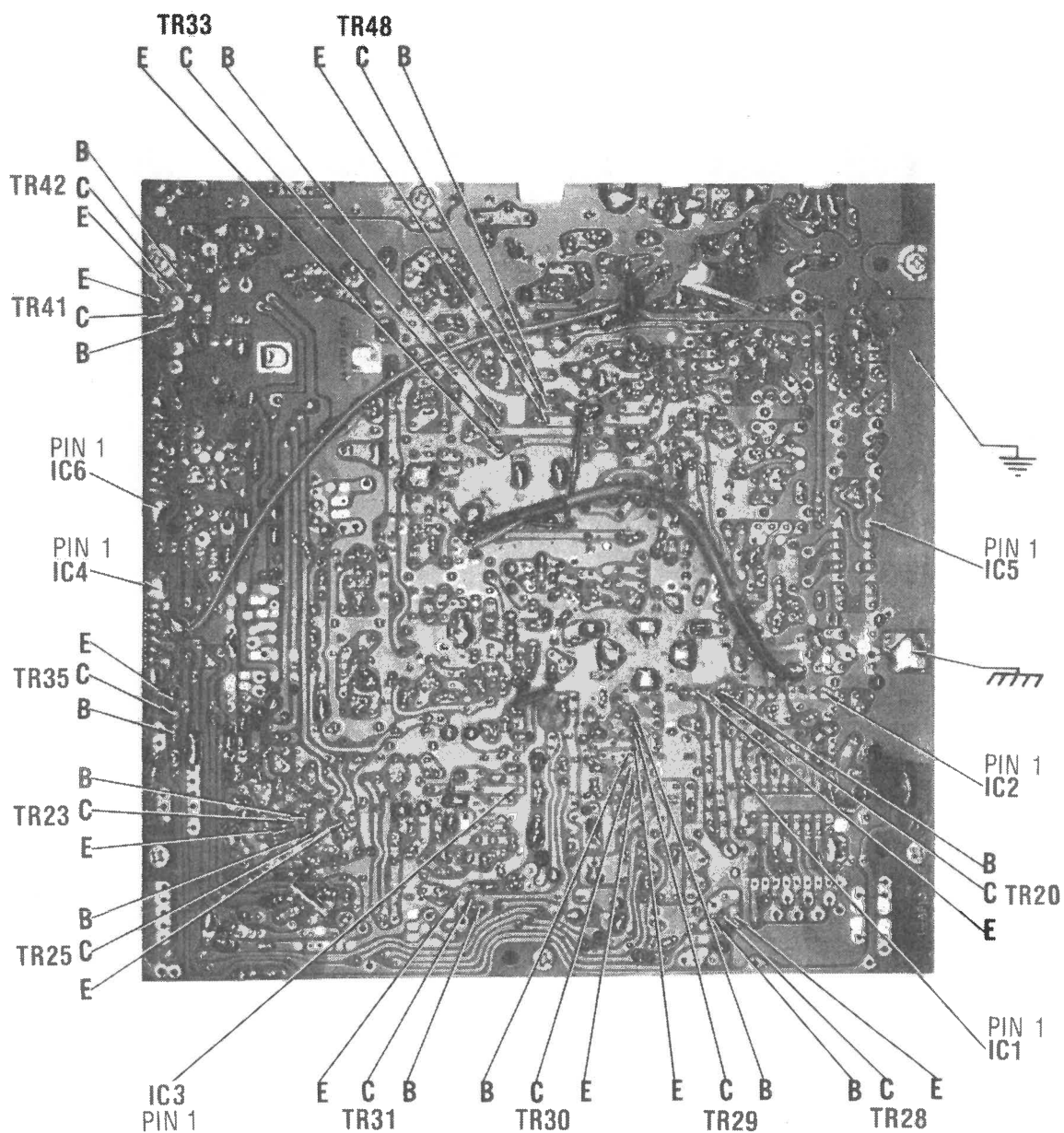
CHASSIS-BOTTOM



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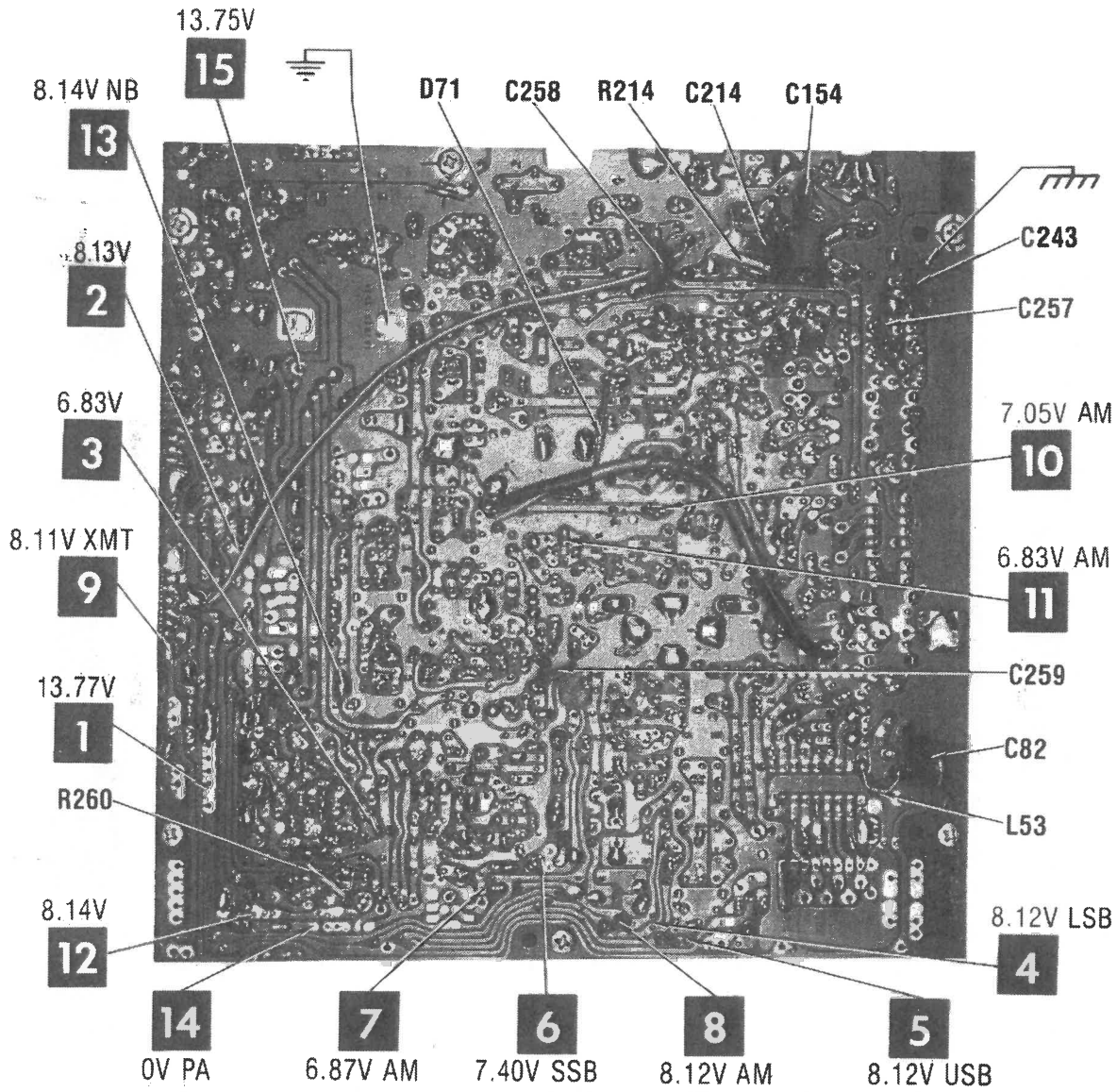


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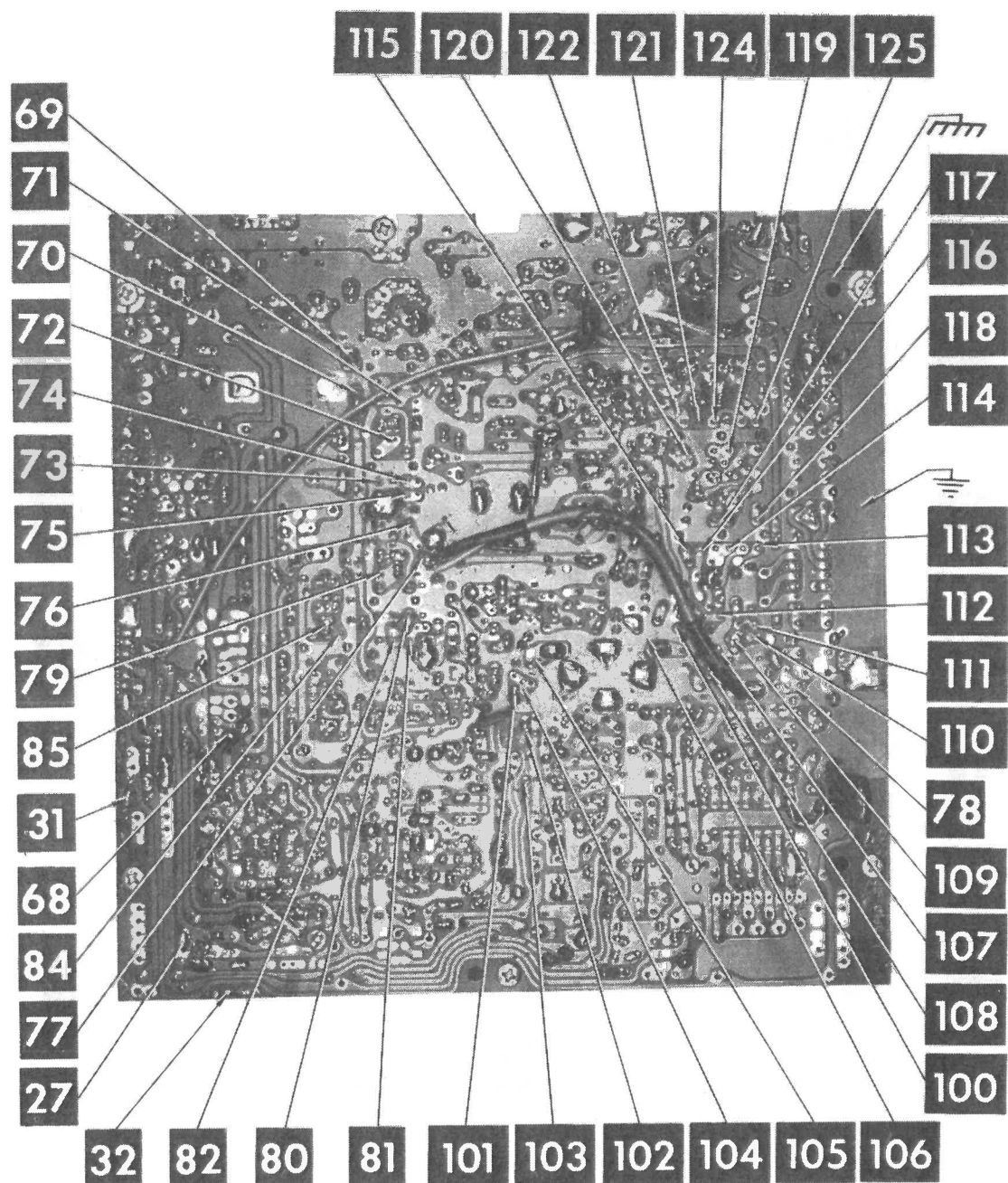
MAIN BOARD

X

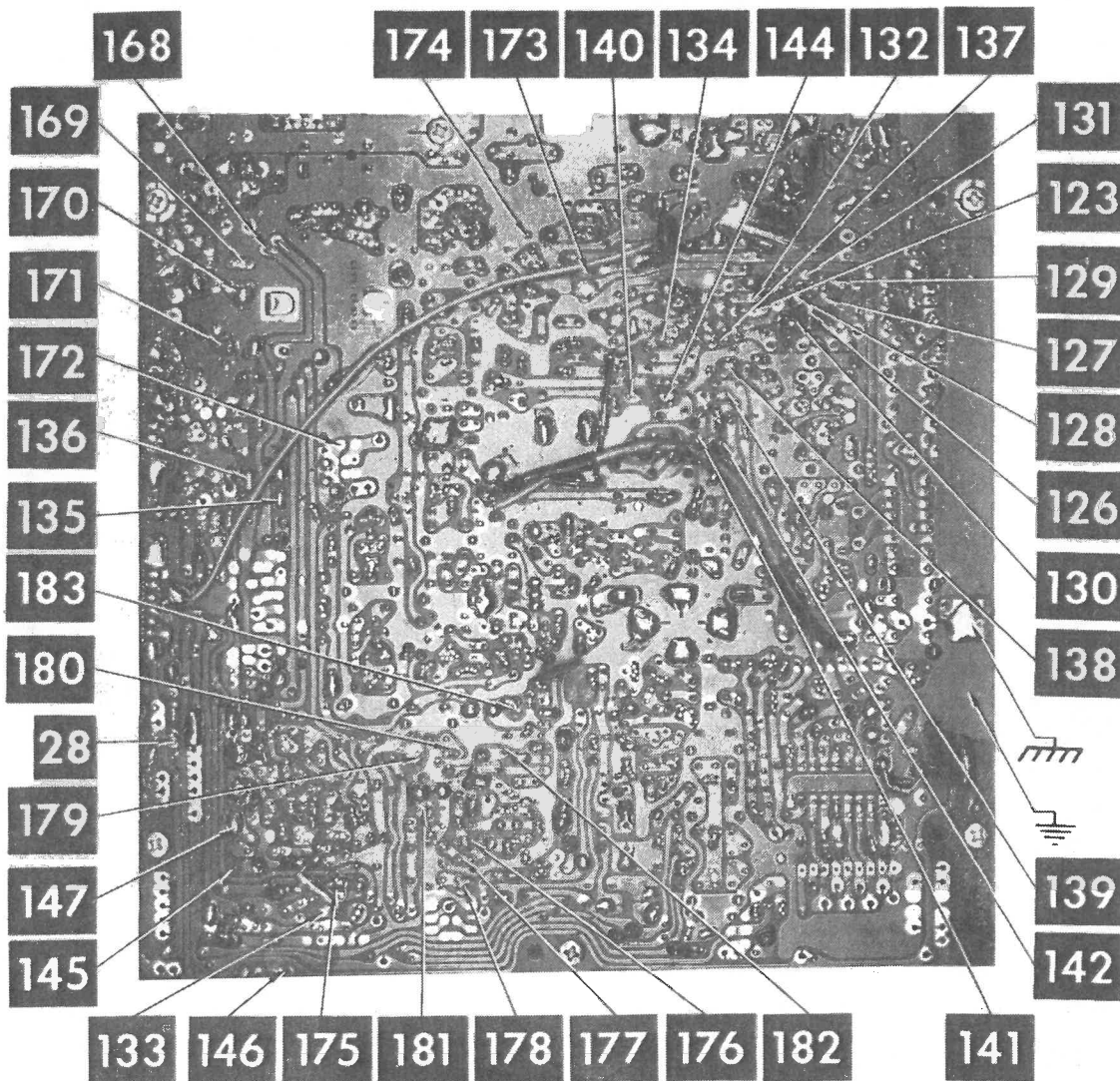


COBRA MODEL 148GTL

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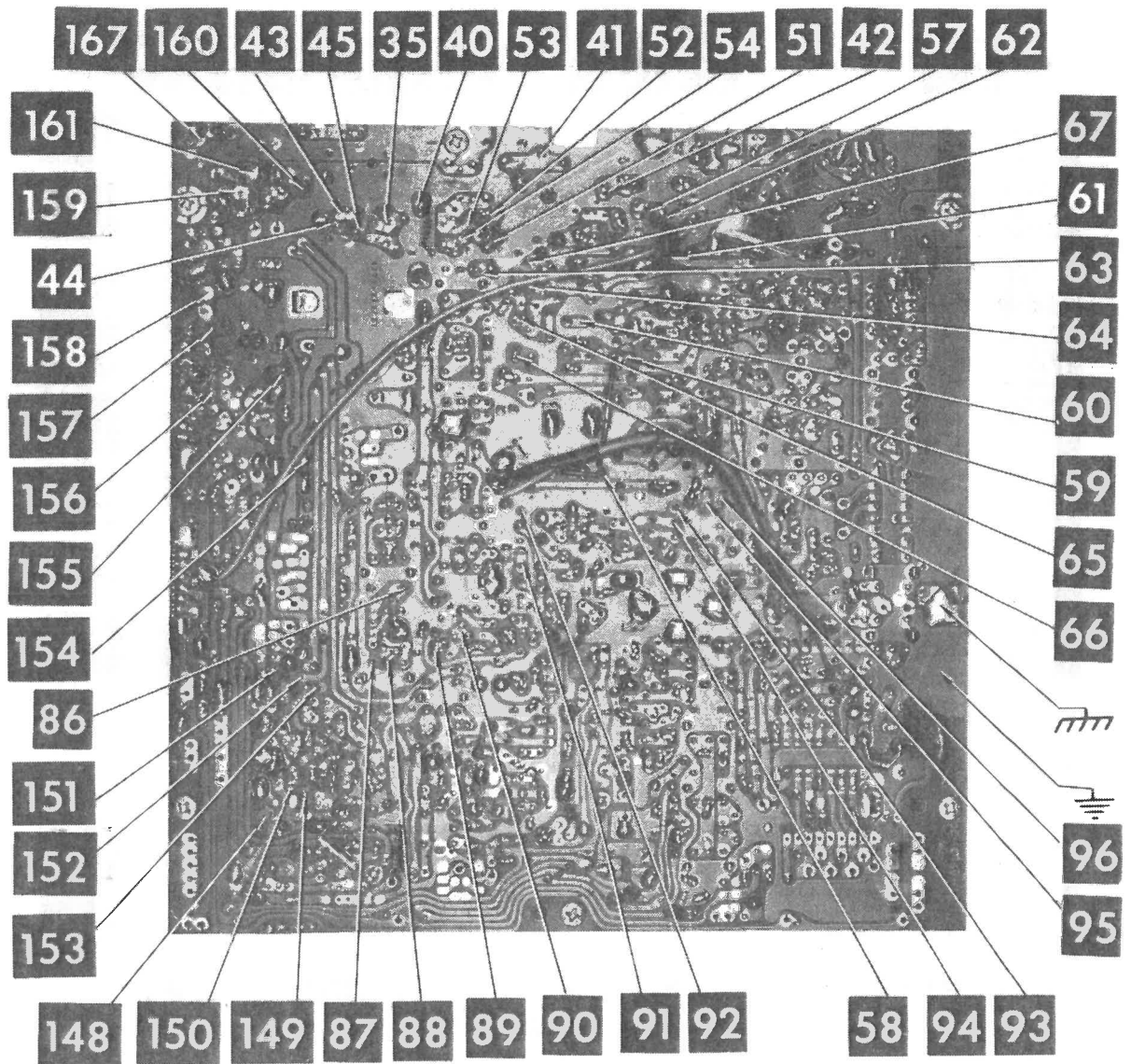


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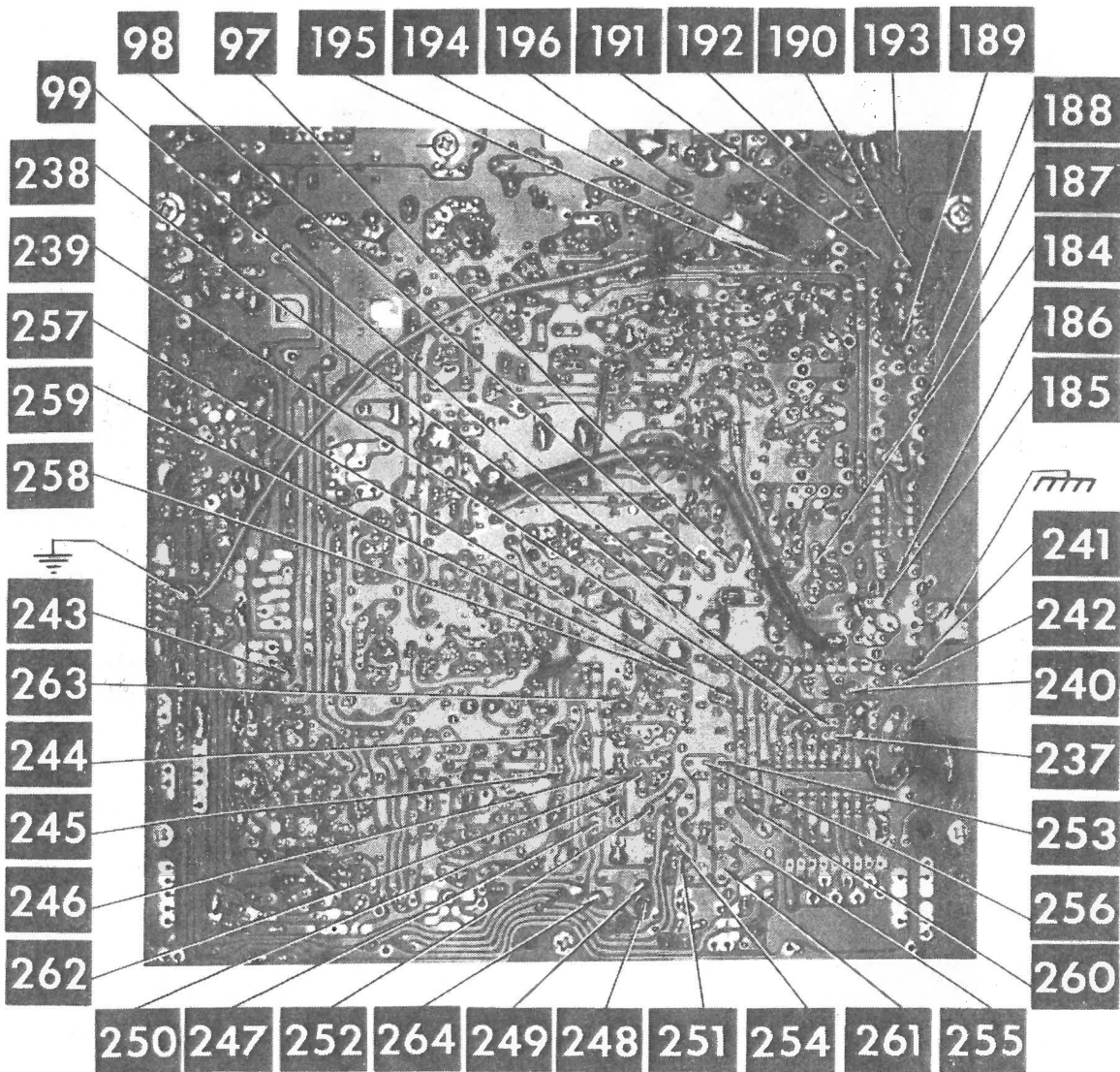
COBRA MODEL 148GTL

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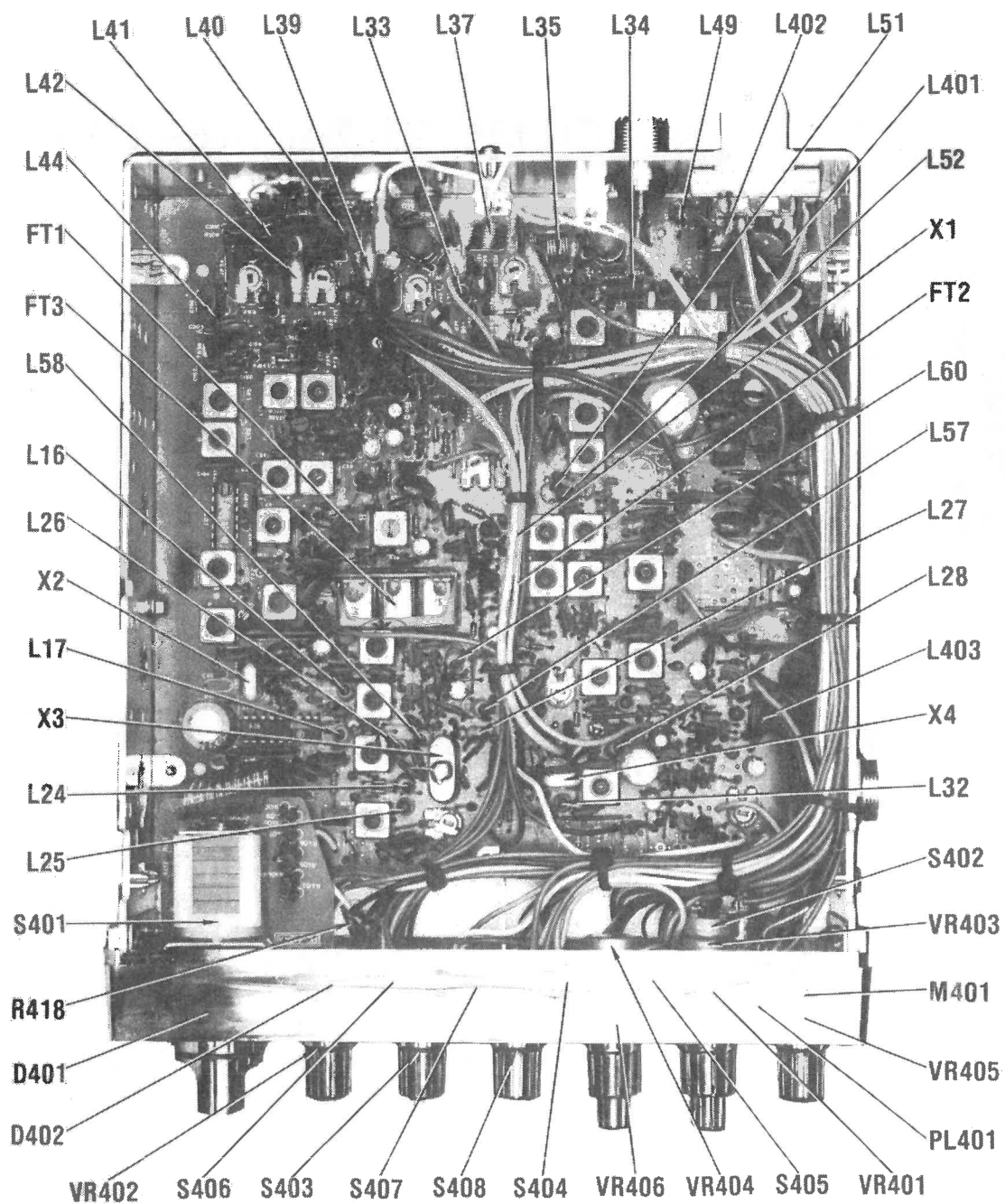


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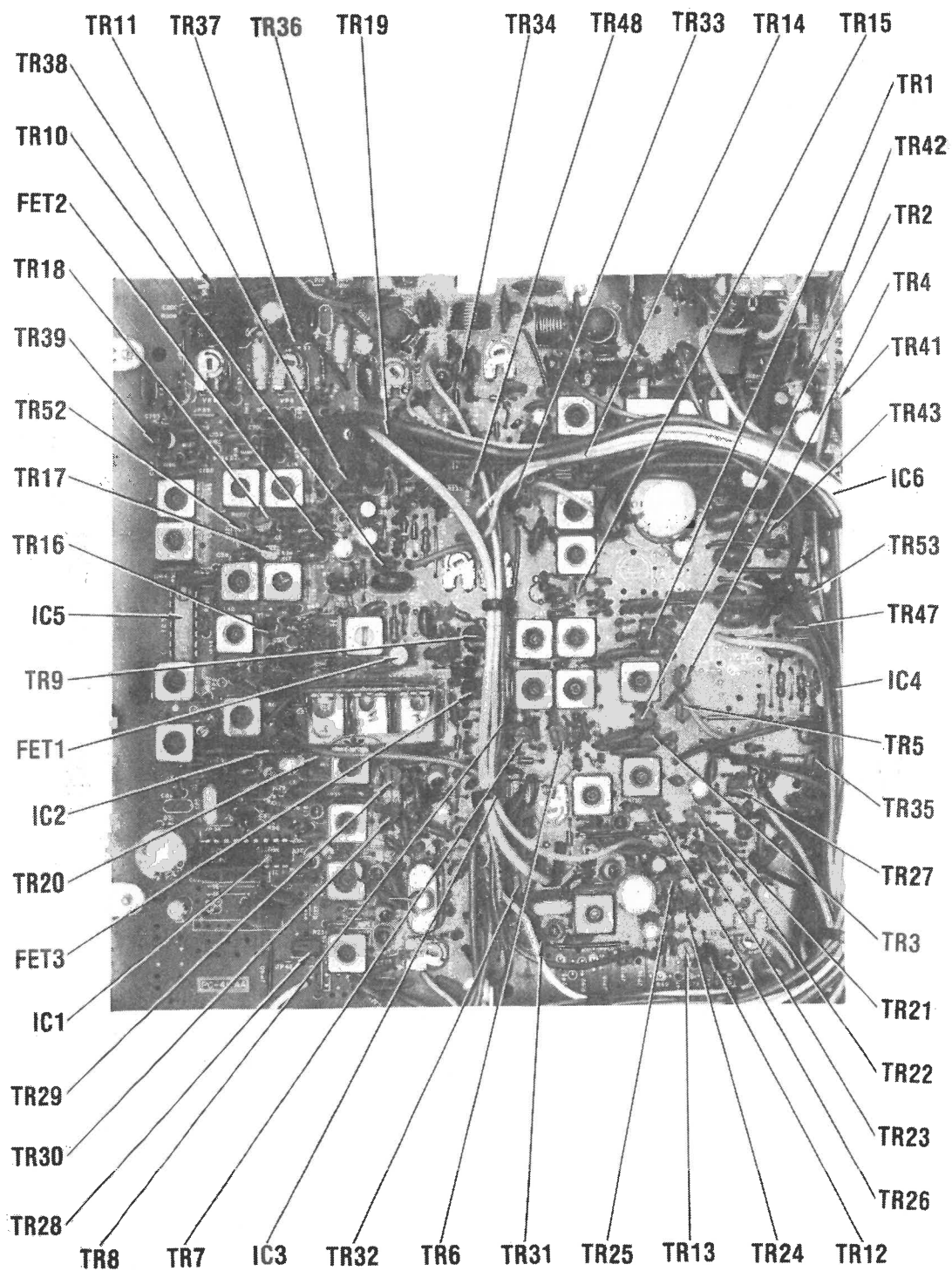
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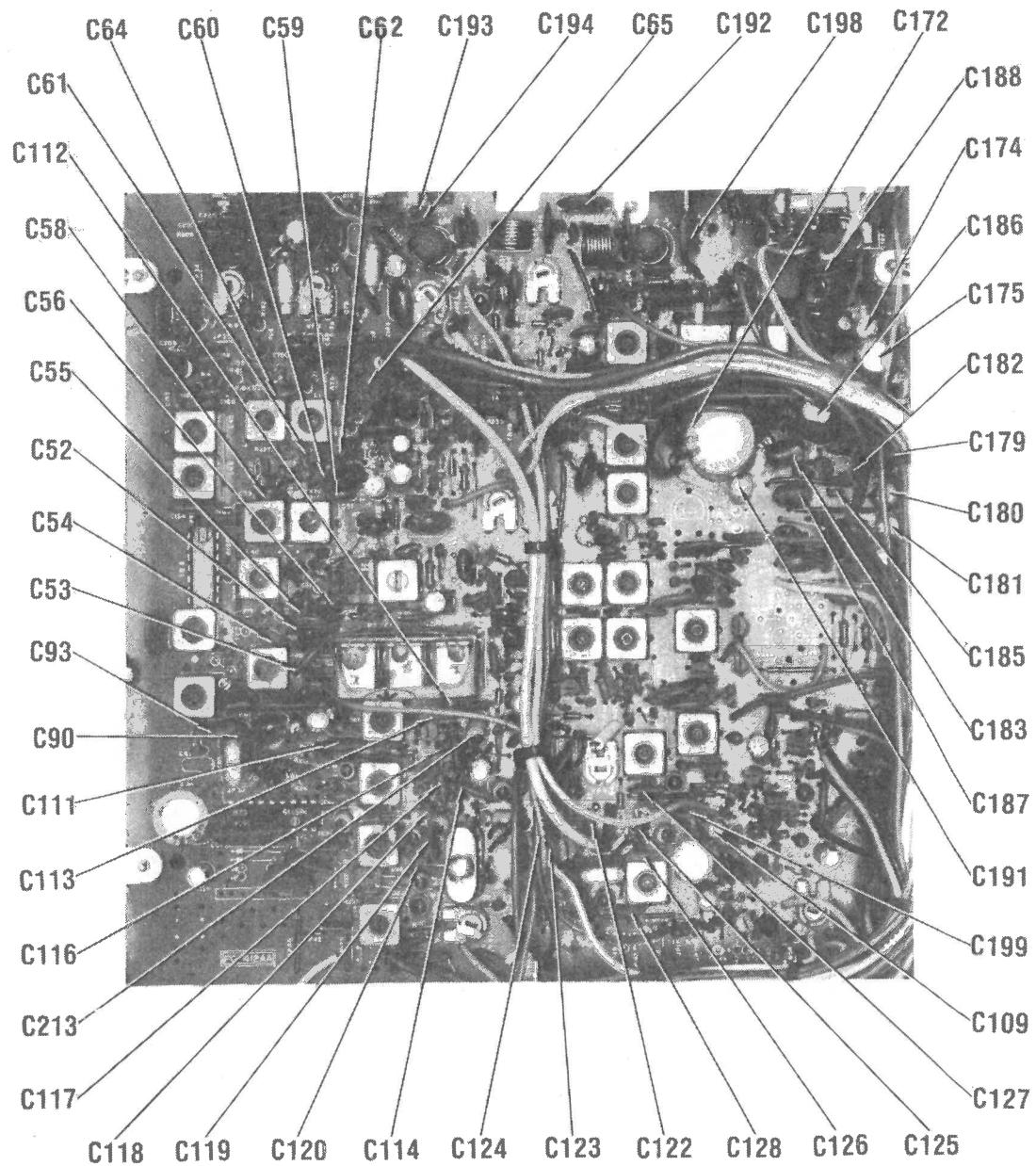
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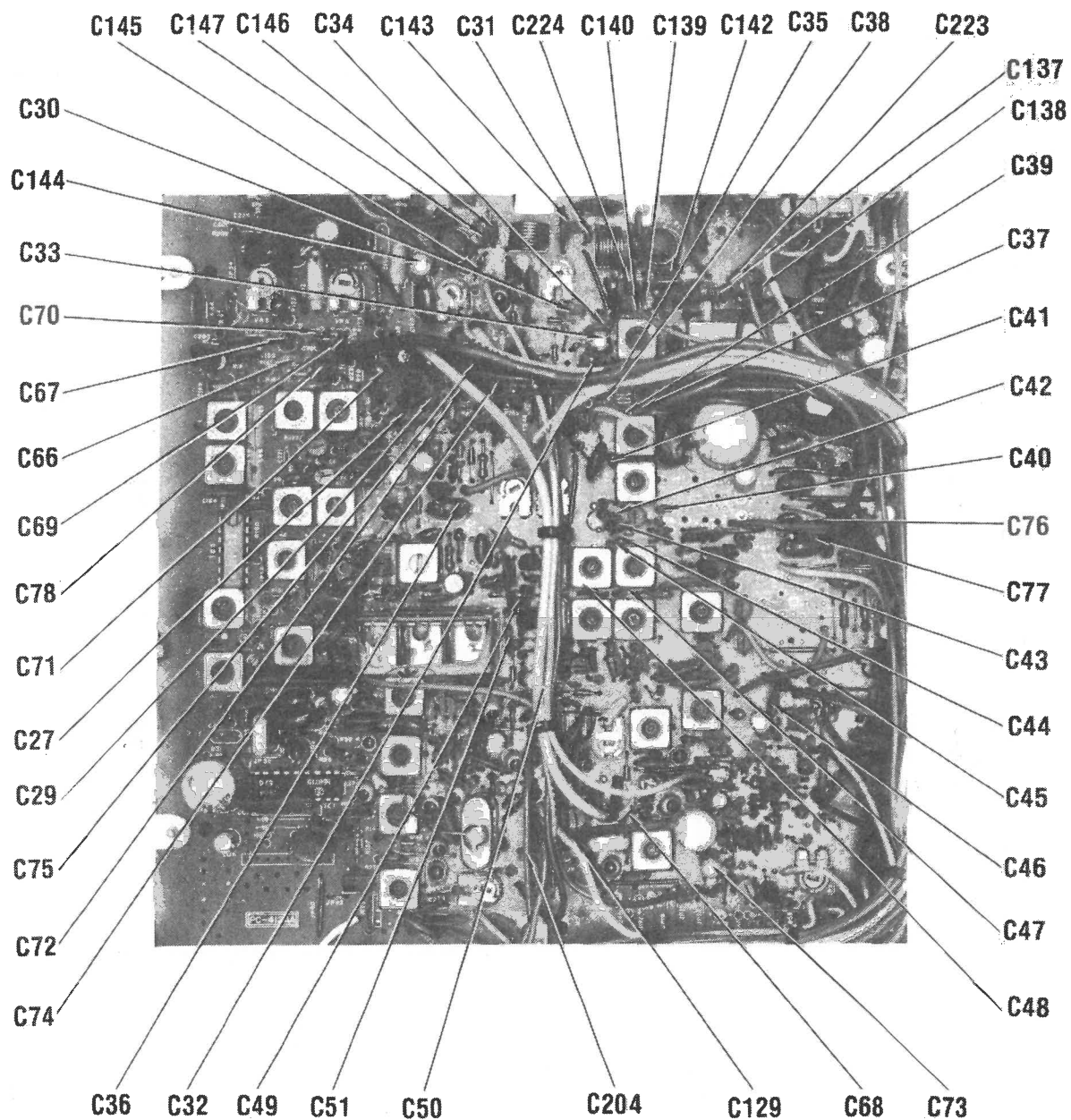
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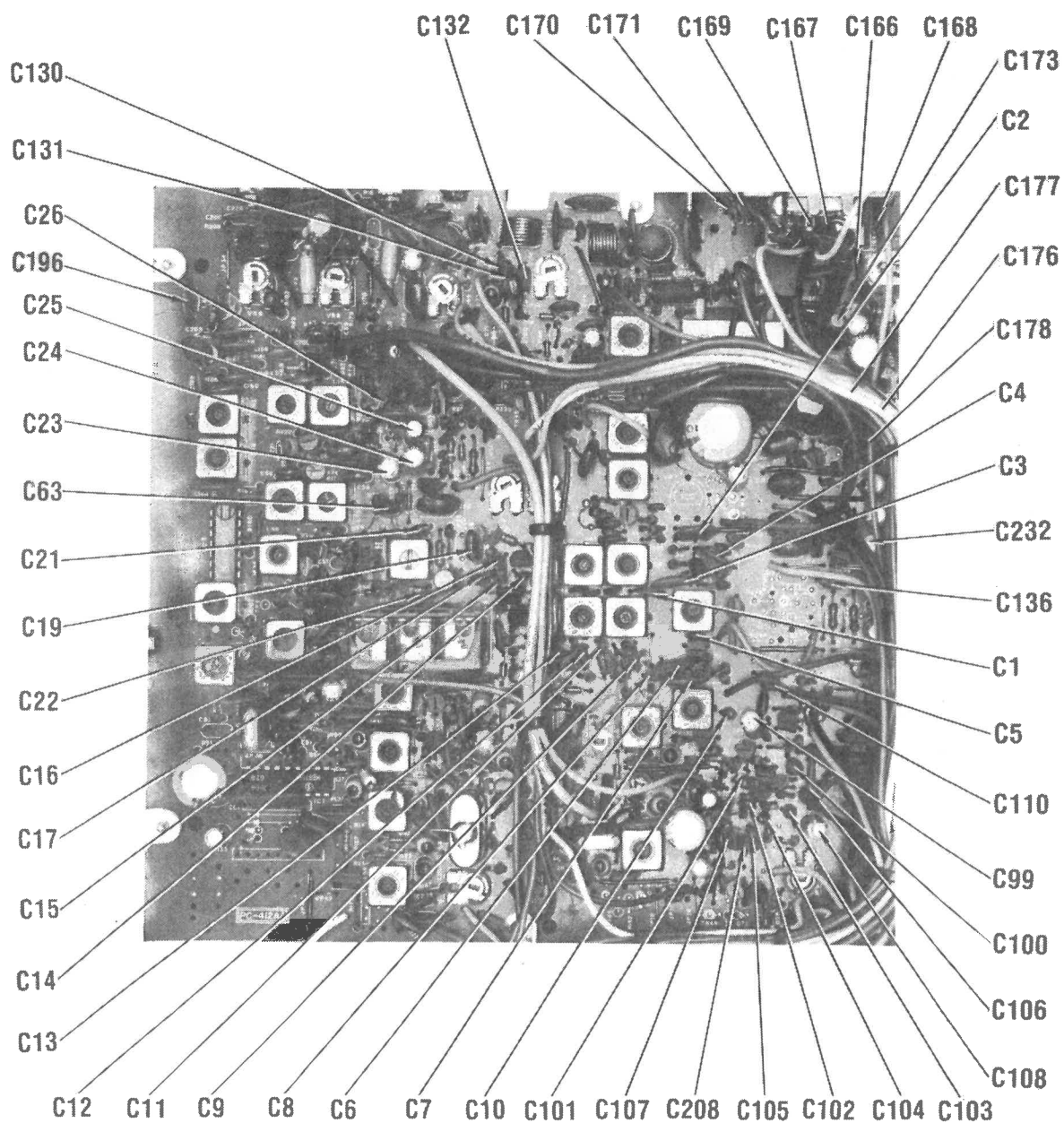
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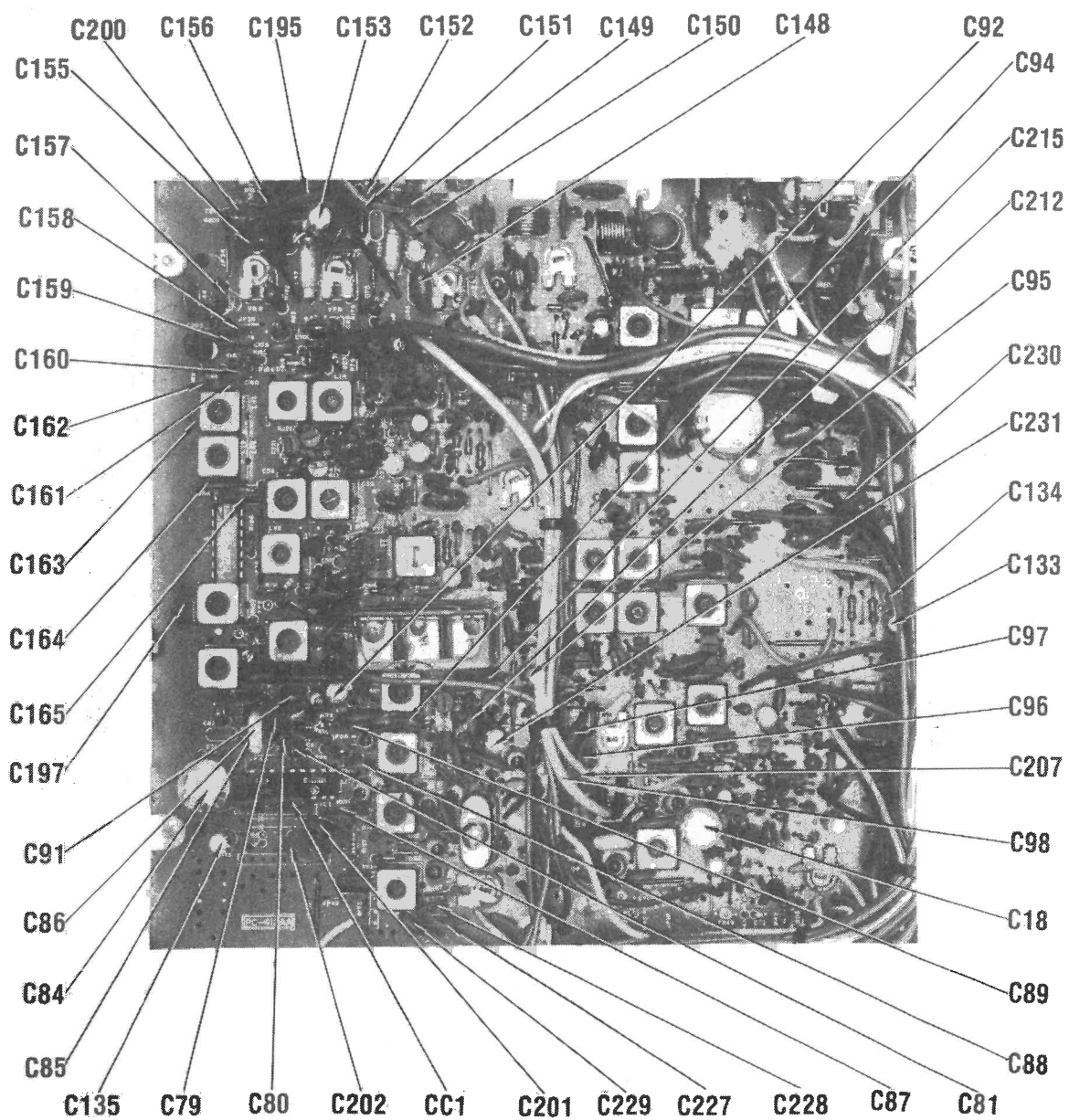
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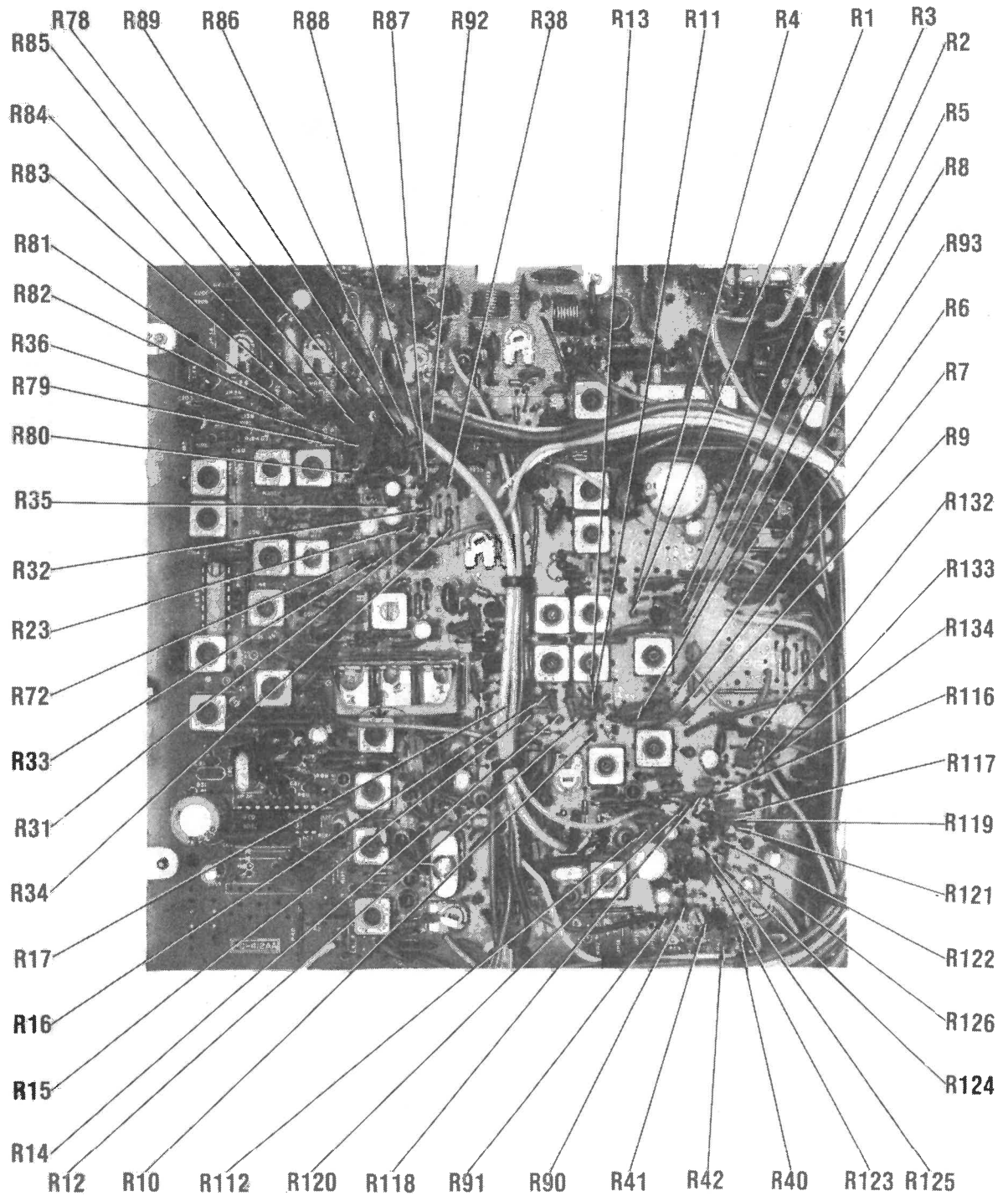
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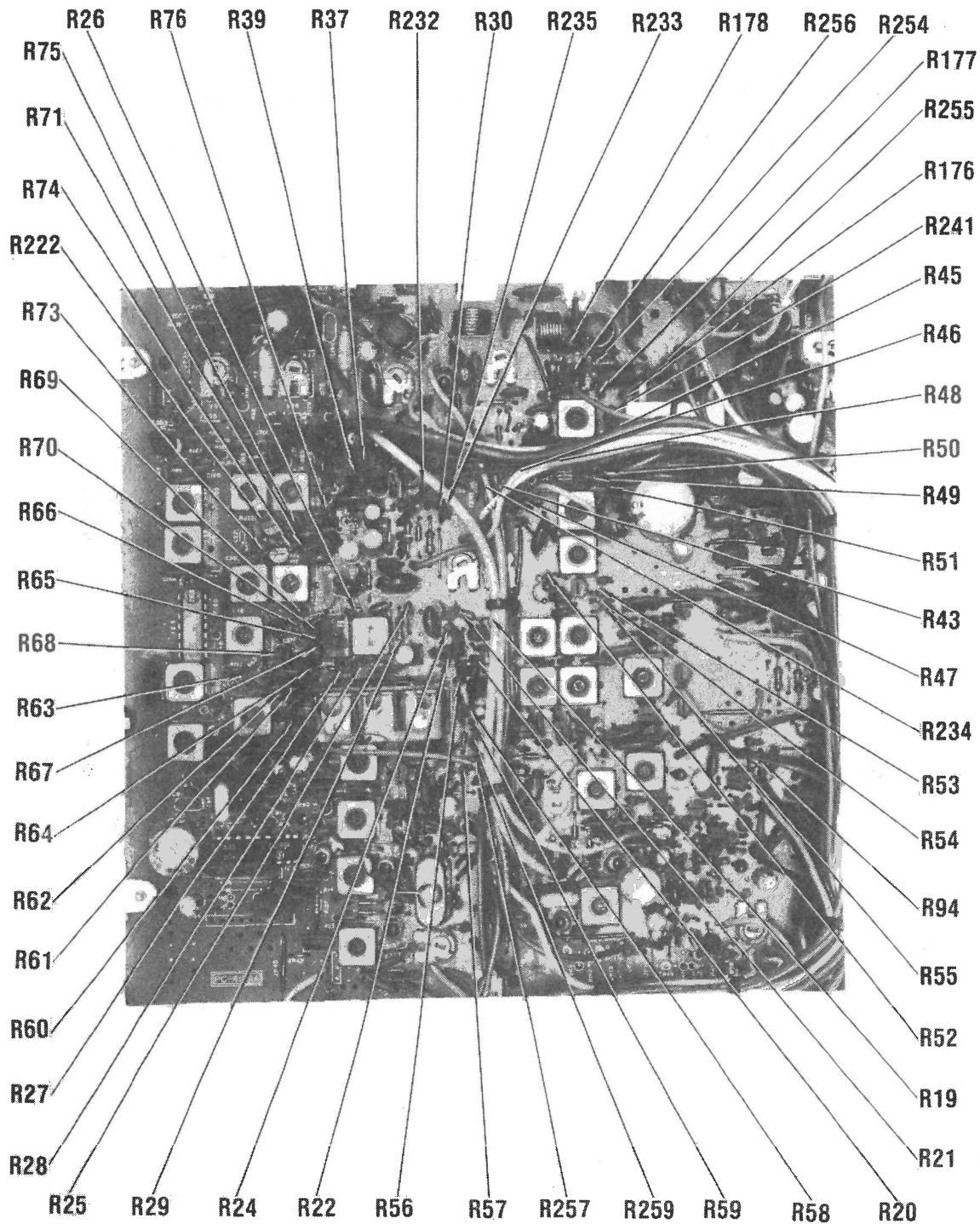
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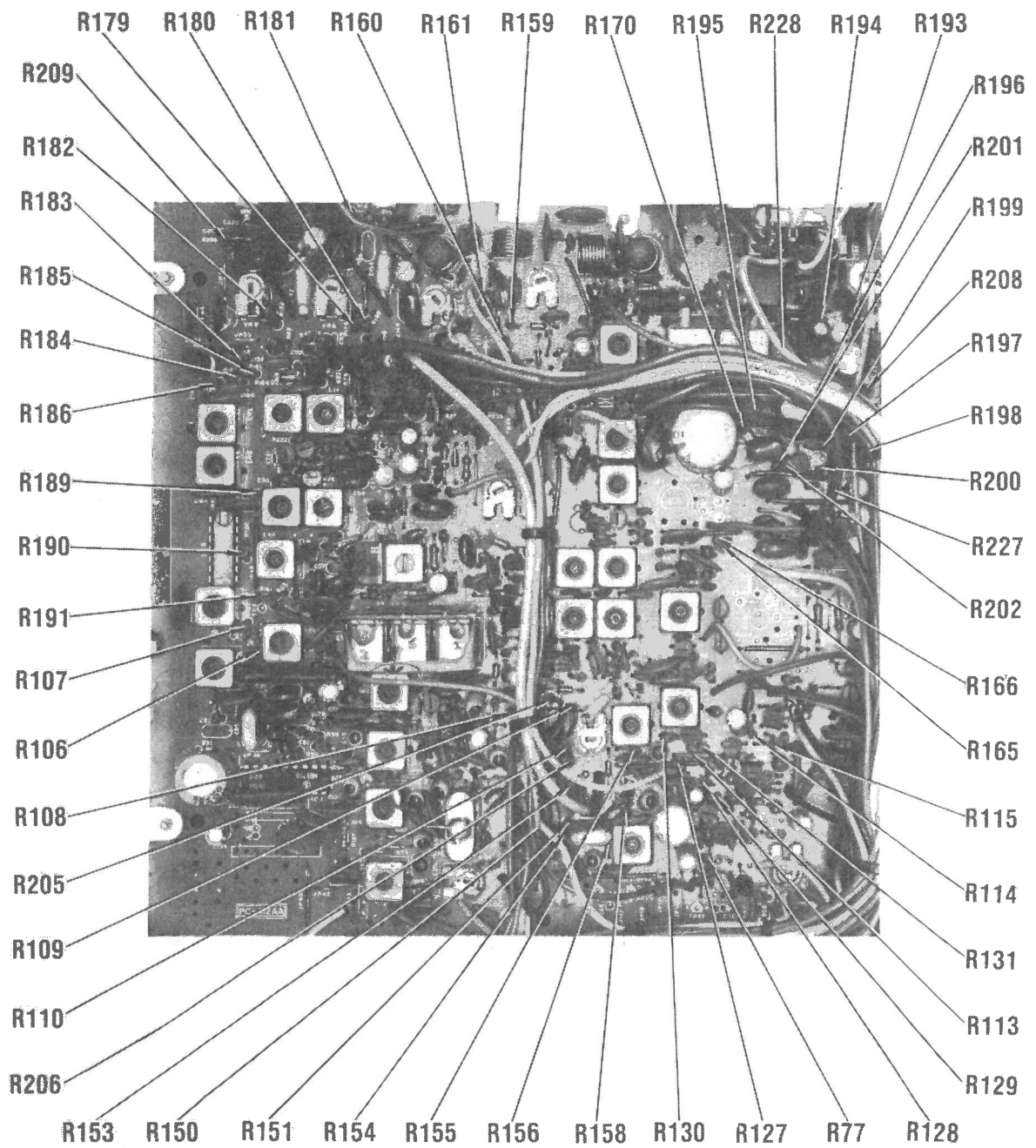
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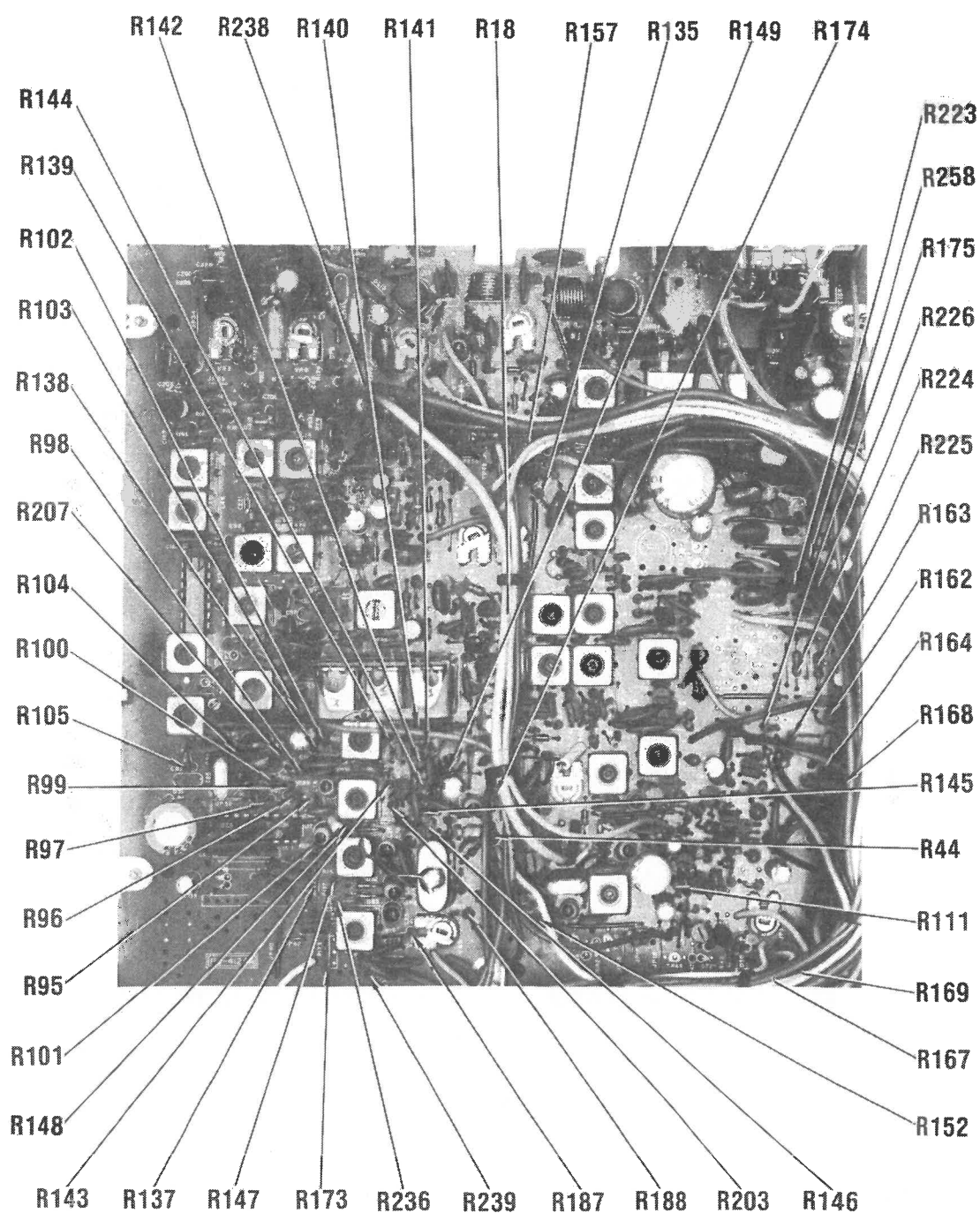
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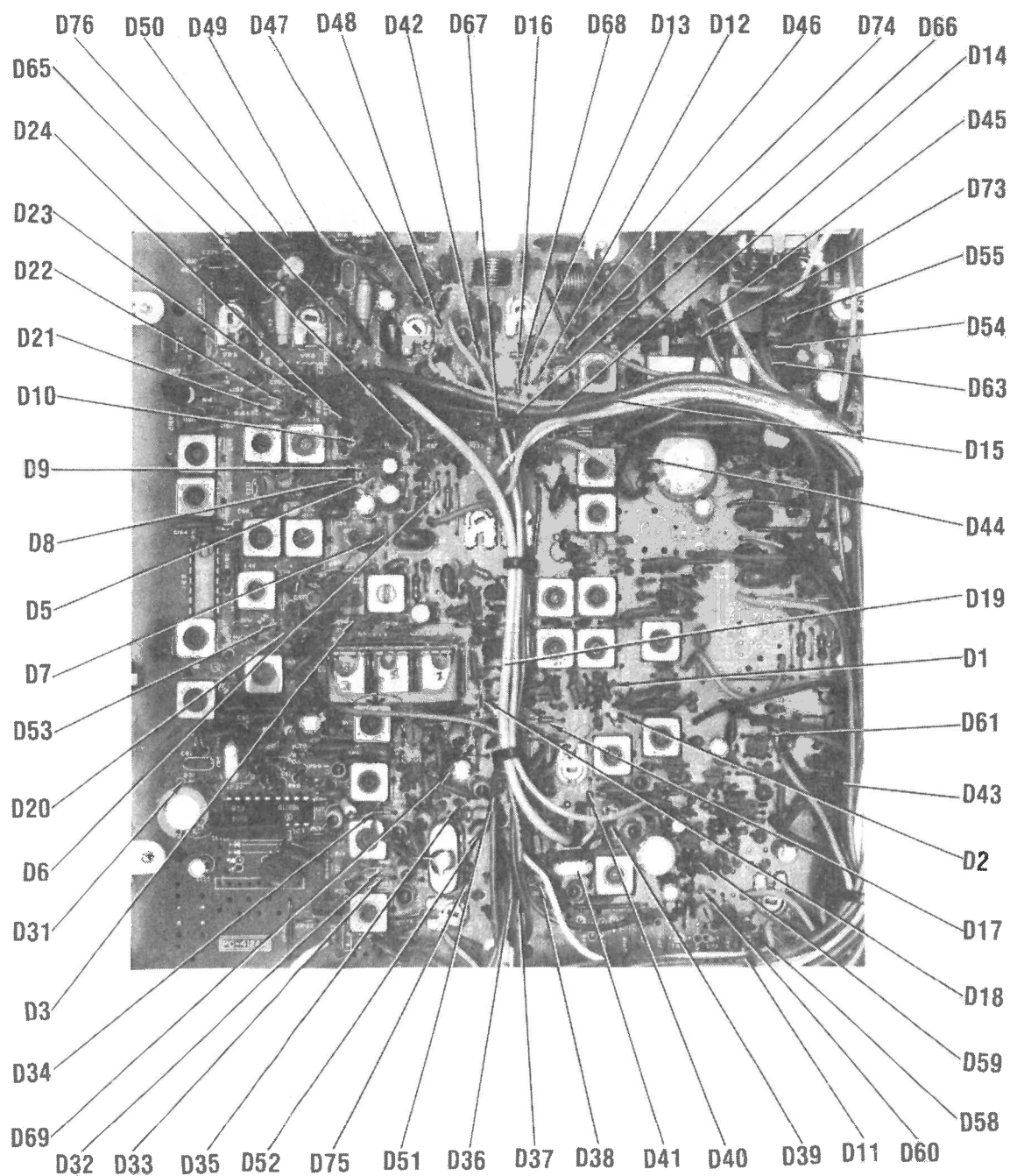
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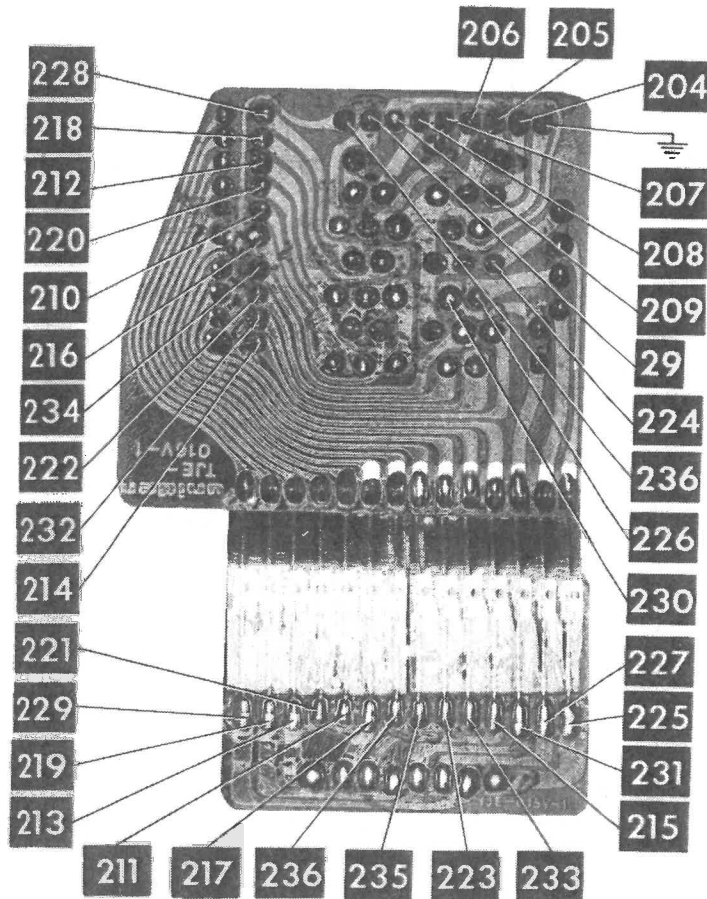
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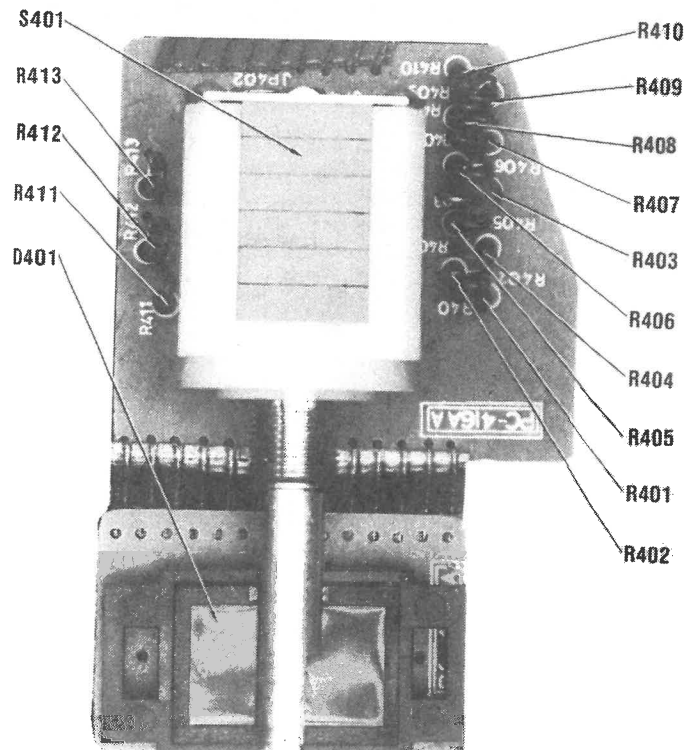
MAIN BOARD



MAIN BOARD



COBRA MODEL 148GTL

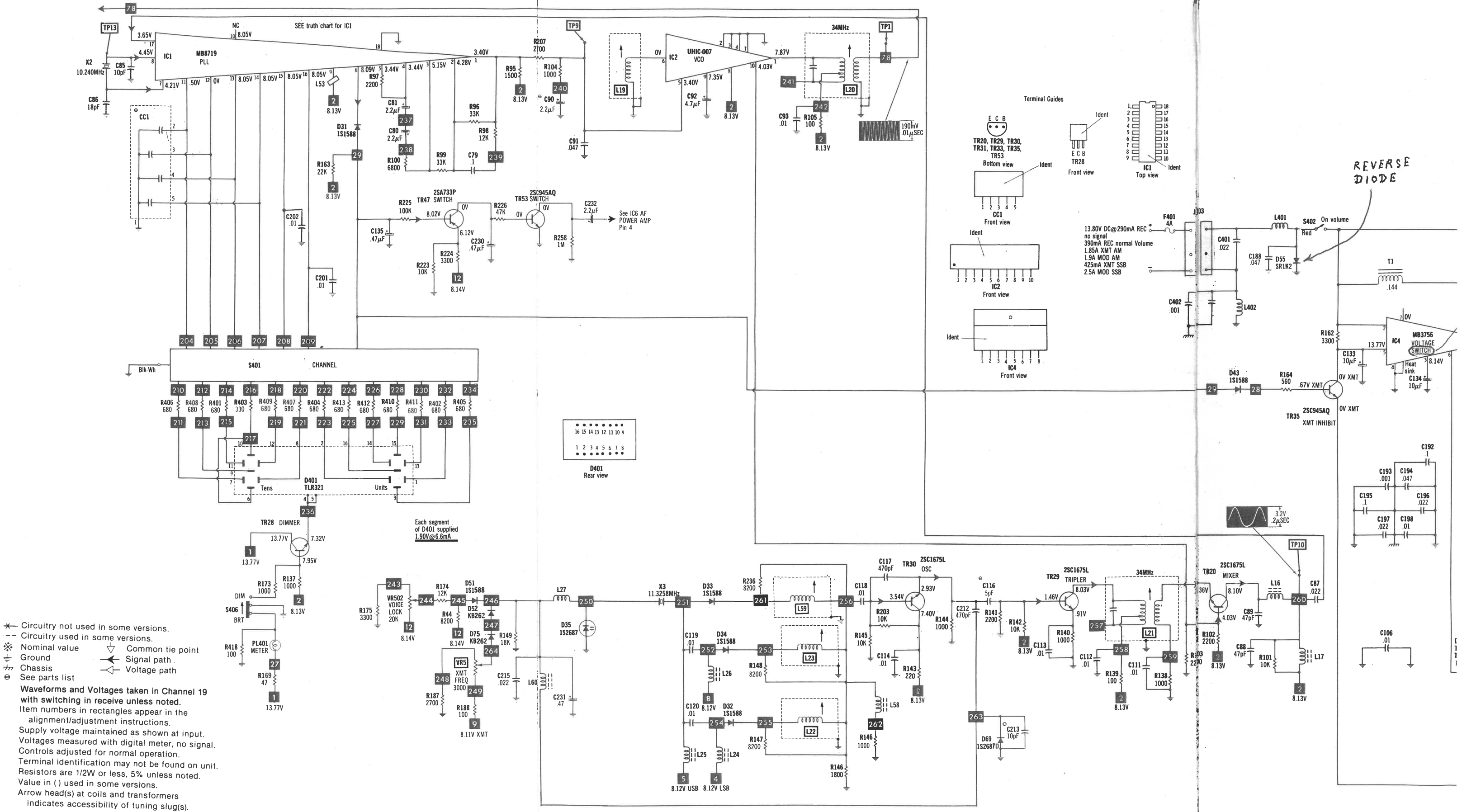


CH. SELECTOR & LED BOARD



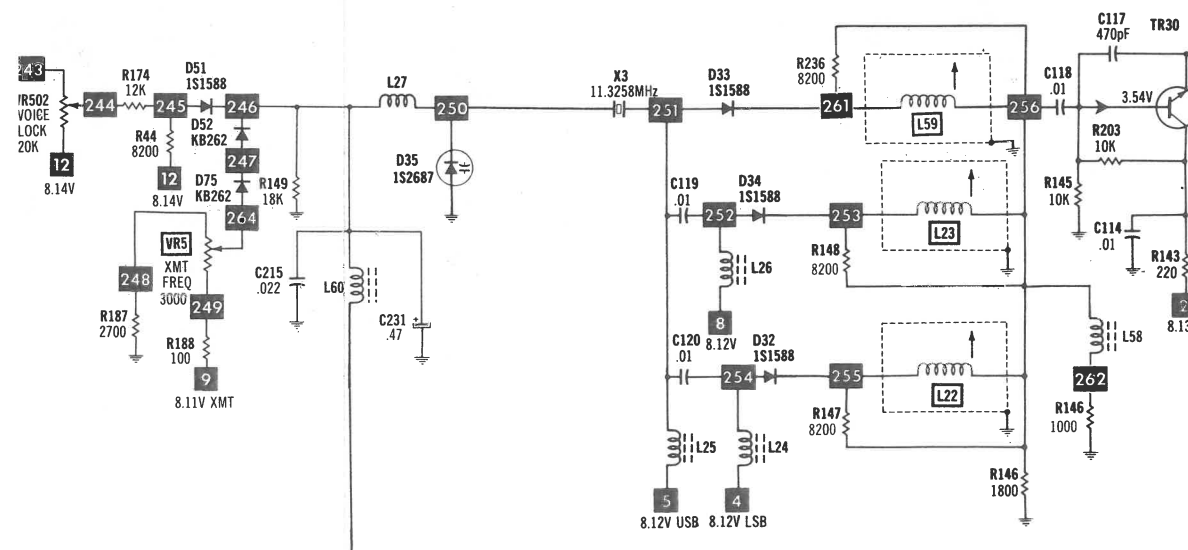
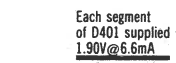


MAIN SCHEMATIC

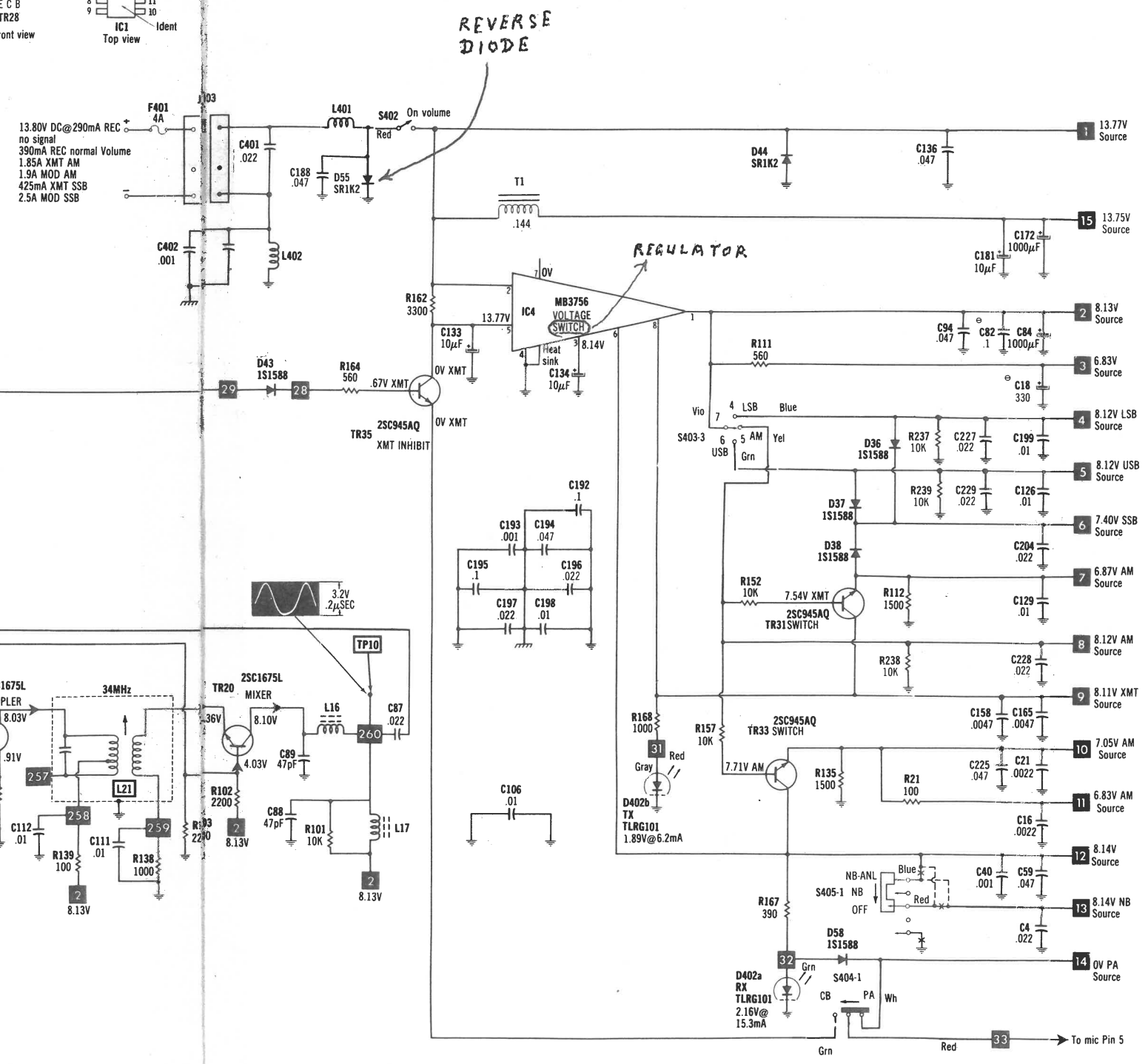
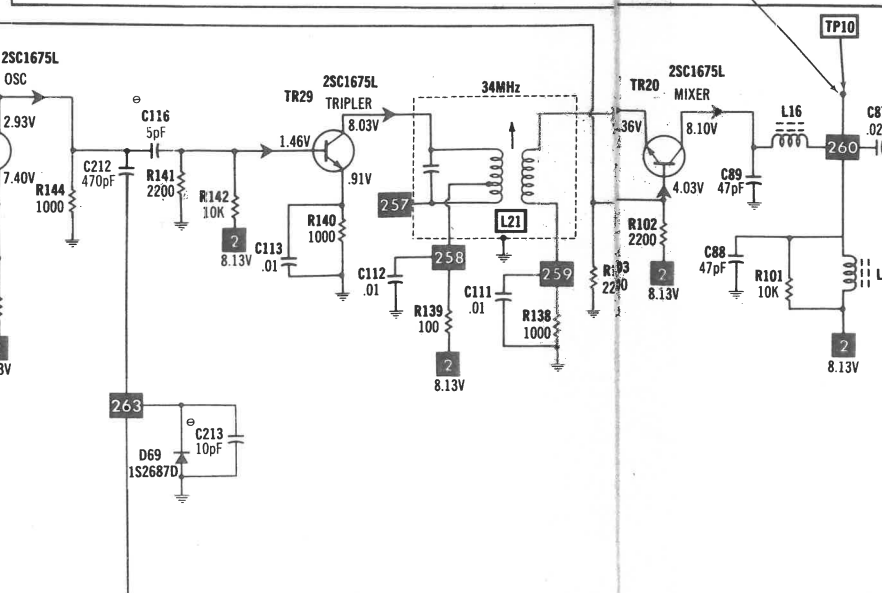
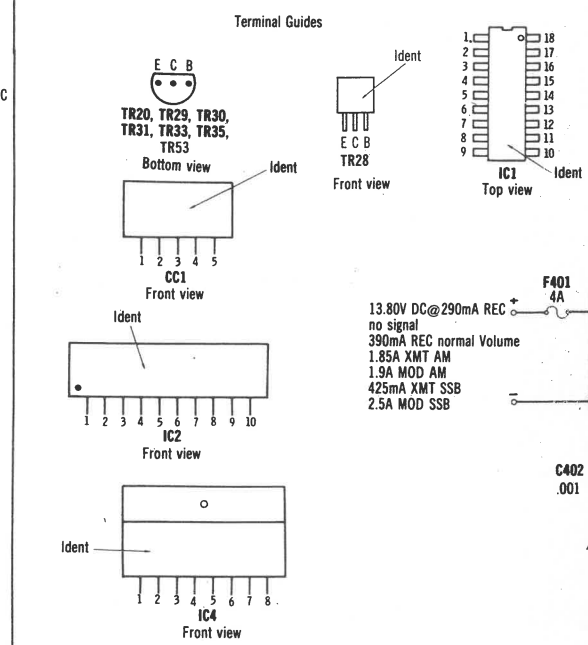


* Circuitry not used in some versions.
 - - - Circuitry used in some versions.
 ✱ Nominal value
 ⏏ Ground
 ⚡ Chassis
 Ⓜ See parts list
 ⚡ Common tie point
 ⚡ Signal path
 ⚡ Voltage path
 Waveforms and Voltages taken in Channel 19 with switching in receive unless noted. Item numbers in rectangles appear 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).

PLL & CH. SELECTOR SCHEMATIC



PLL & CH. SELECTOR SCHEMATIC



POWER SUPPLY SCHEMATIC

PARTS LIST AND DESCRIPTION

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

WIRING DATA

General-use Hook-up Wire (available in 5 colors)	BELDEN No. 8523	Coiled Microphone Cable	
Shielded Hook-up Wire (spiral wrapped)	BELDEN No. 8421	3-conductor (1 shielded)	23AWG BELDEN No. 9471 (5')
(braided)	BELDEN No. 8401		BELDEN No. 8497 (6')
Speaker Cable (available in 4 colors)	BELDEN No. 8782		BELDEN No. 9472 (7-1/2')
Bonding Strap	BELDEN No. 8672		28AWG BELDEN No. 9466 (6')
AC Power Cord	(6') BELDEN No. 17106		31AWG BELDEN No. 9468 (10')
	(9') BELDEN No. 17109	4-conductor (unshielded)	23AWG BELDEN No. 8415 (6')
		5-conductor (1 shielded)	28AWG BELDEN No. 9467 (6')
			BELDEN No. 9465 (7-1/2')

SEMICONDUCTORS (Select replacement transistor for best results)

ITEM No.	TYPE No.	MFR. PART No.	REPLACEMENT DATA									
			GENERAL ELECTRIC PART No.	MALLORY PART No.	MOTOROLA PART No.	RAYTHEON PART No.	RCA PART No.	SPRAGUE PART No.	SYLVANIA PART No.	THORDARSON PART No.	WORKMAN PART No.	ZENITH PART No.
D1	1N60P	150-006-9-001	1N60	PTC206	HEPR9135	REN 109	SK3088	RT-263	ECG109	TM109/**	WEP134	103-29001
D2	1N60P	150-006-0-001	1N60	PTC206	HEPR9135	REN 109	SK3088	RT-263	ECG109	TM109/**	WEP134	103-29001
D3	1S1588	151-051-9-001	1N60	PTC206	HEPR9135	REN 109	SK3088	RT-263	ECG109	TM109/**	WEP134	103-29001
	1S2473		GE-514	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2472		GE-514	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S953		GE-300	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
D5	1S1588	151-051-9-001	GE-514	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
	1S2473		GE-514	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2472		GE-514	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S953		GE-300	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
D6	1S1588	151-051-9-001	GE-514	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
	1S2473		GE-514	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2472		GE-514	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S953		GE-300	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
D7	1S1588	151-051-9-001	GE-514	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
	1S2473		GE-514	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2472		GE-514	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S953		GE-300	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
D8	1S1588	151-051-9-001	GE-514	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
	1S2473		GE-514	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2472		GE-514	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S953		GE-300	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
D9	1S1588	151-051-9-001	GE-514	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2473		GE-514	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2472		GE-514	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S953		GE-300	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
D10	1N60P	150-006-9-001	1N60	PTC206	HEPR9135	REN 109	SK3088	RT-263	ECG109	TM109/**	WEP134	103-29001
D11	1S1588	151-051-9-001	1N60	PTC206	HEPR9135	REN 109	SK3088	RT-263	ECG109	TM109/**	WEP134	103-29001
	1S2473		GE-514	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2472		GE-514	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S953		GE-300	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
D12	MC301	151-072-9-001	GE-300	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
	1S2186		GE-300	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
	BA243		GE-300	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
	BA244		GE-300	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
D13	MC301	151-072-9-001	GE-300	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
	1S2186		GE-300	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
	BA243		GE-300	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
	BA244		GE-300	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
D14	1S1588	151-051-9-001	GE-514	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2473		GE-514	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2472		GE-514	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S953		GE-300	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
D15	1S1588	151-051-9-001	GE-514	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2473		GE-514	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2472		GE-514	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S953		GE-300	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
D16	1S1588	151-051-9-001	GE-514	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2473		GE-514	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2472		GE-514	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S953		GE-300	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
D17	1S1588	151-051-9-001	GE-514	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2473		GE-514	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2472		GE-514	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S953		GE-300	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
D18	1S1588	151-051-9-001	GE-514	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2473		GE-514	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2472		GE-514	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S953		GE-300	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
D19	1S1588	151-051-9-001	GE-514	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2473		GE-514	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2472		GE-514	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S953		GE-300	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
D20	1S1588	151-051-9-001	GE-514	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2473		GE-514	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2472		GE-514	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S953		GE-300	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
D21	1N60P	150-006-9-001	1N60	PTC206	HEPR9135	REN 109	SK3088	RT-263	ECG109	TM109/**	WEP134	103-29001
D22	1N60P	150-006-9-001	1N60	PTC206	HEPR9135	REN 109	SK3088	RT-263	ECG109	TM109/**	WEP134	103-29001
D23	1S1588	151-051-9-001	1N60	PTC206	HEPR9135	REN 109	SK3088	RT-263	ECG109	TM109/**	WEP134	103-29001
	1S2473		GE-514	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2472		GE-514	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S953		GE-300	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
D24	1S1588	151-051-9-001	GE-514	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
	1S2473		GE-514	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2472		GE-514	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S953		GE-300	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
D31	1S1588	151-051-9-001	GE-514	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2473		GE-514	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2472		GE-514	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S953		GE-300	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
D32	1S1588	151-051-9-001	GE-514	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2473		GE-514	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2472		GE-514	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S953		GE-300	PTC214	HEPR9137	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131

COBRA MODEL 148GTL

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

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

REPLACEMENT DATA			

COBRA MODEL 148GTL

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.	MOTOROLA PART No.	RAYTHEON PART No.	RCA PART No.	SPRAGUE PART No.	SYLVANIA PART No.	THORDARSON PART No.	WORKMAN PART No.	ZENITH PART No.
TR10	2SC945AQ	176-062-9-001	GE-212	PTC121*	HEPS0015*	REN 199	SK3124	RT-107A	ECG199	TM199/**	WEP1945	121-972
	2SC945A		GE-212	PTC121*	HEPS0015*	REN 199	SK3124	RT-107A	ECG199	TM199/**	WEP1945	121-972
	2SC458		GE-210	PTC121*	HEPS0009*	REN 289	SK3122	RT-187	ECG289	TM289/**	WEP458	121-29000A*
	2SC372		GE-61*	PTC121*	HEPS0015*	REN 123A*	SK3444	RT-308	ECG123A*	TM123A/**	WEP372	121-29000A*
	2SC900		GE-62	PTC139*	HEPS0015*	REN 199	SK3124	RT-302	ECG199	TM199/**	WEP66	121-972
TR11	2SC828	176-062-9-001	GE-61*	PTC139*	HEPS0015*	REN 199	SK3444	RT-302	ECG199	TM199/**	WEP828	121-972
	2SC1740		GE-62	PTC121*	HEPS0015*	REN 123A*	SK3122	RT-109*	ECG123A*	TM123A*	WEP736*	121-29000A*
	2SC1675L		GE-213	PTC132*	HEPS0025*	REN 229*	SK3122	RT-308	ECG229*	TM229*	WEP773	121-29021
	2SC1675		GE-213	PTC132*	HEPS0025*	REN 229*	SK3122	RT-308	ECG229*	TM229*	WEP773	121-29021
	2SC460		GE-61*	PTC136*	HEPS0014*	REN 107	SK3122	RT-134	ECG107	TM107/**	WEP460	121-29000*
TR12	2SC839	176-062-9-001	GE-61*	PTC132*	HEPS0015*	REN 123A*	SK3444	RT-308	ECG123A*	TM123A/**	WEP1945	121-29000A*
	2SC1674		GE-61	PTC132*	HEPS0010*	REN 229*	SK3246	RT-308	ECG229*	TM229*	WEP784	121-29021
	2SC1730		GE-17*	PTC136*	HEPS0025*	REN 107	SK3124	RT-107A	ECG316*	TM316*	WEP535	121-972*
	2SC945AQ		GE-212	PTC121*	HEPS0015*	REN 199	SK3124	RT-107A	ECG199	TM199/**	WEP1945	121-972
	2SC458		GE-210	PTC121*	HEPS0009*	REN 289	SK3122	RT-187	ECG289	TM289/**	WEP458	121-29000A*
TR13	2SC372	177-020-9-002	GE-61*	PTC121*	HEPS0015*	REN 123A*	SK3444	RT-308	ECG123A*	TM123A/**	WEP372	121-29000A*
	2SC900		GE-62	PTC139*	HEPS0015*	REN 199	SK3124	RT-302	ECG199	TM199/**	WEP66	121-972
	2SC828		GE-61*	PTC139*	HEPS0015*	REN 199	SK3444	RT-302	ECG199	TM199/**	WEP828	121-972
	2SC1740		GE-62	PTC121*	HEPS0015*	REN 123A*	SK3122	RT-109*	ECG123A*	TM123A*	WEP736*	121-29000A*
	2SA733P		GE-48	PTC127	HEPS0019*	REN 294	SK3138	RT-303	ECG294	TM294/**	WEP911	121-952
TR14	2SA733	176-081-9-002	GE-48	PTC127	HEPS0019*	REN 294	SK3138	RT-303	ECG294	TM294/**	WEP911	121-952
	2SA495		GE-221*	PTC103*	HEPS0013*	REN 159*	SK3114	RT-303	ECG159*	TM159/**	WEP495	121-29003
	2SA564		GE-65	PTC103*	HEPS0019*	REN 234	SK3114	RT-303	ECG234	TM234	WEP564	121-879
	2SC1674L		GE-61	PTC132*	HEPS0010*	REN 229*	SK3246	RT-308	ECG229*	TM229*	WEP784	121-29021
	2SC1674		GE-61	PTC132*	HEPS0010*	REN 229*	SK3246	RT-308	ECG229*	TM229*	WEP784	121-29021
TR15	2SC1730	176-062-9-001	GE-213	PTC132*	HEPS0025*	REN 229*	SK3122	RT-308	ECG229*	TM229*	WEP773	121-29021
	2SC1342		GE-17*	PTC136*	HEPS0025*	REN 107	SK3124	RT-107A	ECG316*	TM316*	WEP535	121-972*
	2SC1856		GE-61*	PTC132	HEPS0014*	REN 229*	SK3018*	RT-108A*	ECG229*	TM229*	WEP784	121-29021
	2SC710		GE-86	PTC121	HEPS0010	REN 123A	SK3018	RT-107	ECG123A	TM123A	WEP56	121-522
	2SC930		GE-211*	PTC132	HEPS0016*	REN 123A*	SK3122	RT-308*	ECG123A*	TM123A/**	WEP710	121-29000A
TR16	2SC1675L	176-062-9-001	GE-60*	PTC132*	HEPS0016*	REN 229	SK3018	RT-308	ECG229*	TM229/**	WEP380	121-29021*
	2SC1675		GE-213	PTC132*	HEPS0025*	REN 229*	SK3122	RT-308	ECG229*	TM229*	WEP773	121-29021
	2SC460		GE-61*	PTC136*	HEPS0014*	REN 107	SK3122	RT-134	ECG107	TM107/**	WEP460	121-29000*
	2SC839		GE-61*	PTC132*	HEPS0015*	REN 123A*	SK3444	RT-308	ECG123A*	TM123A/**	WEP1945	121-29000A*
	2SC1674		GE-61	PTC132*	HEPS0010*	REN 229*	SK3246	RT-308	ECG229*	TM229*	WEP784	121-29021
TR17	2SC1730	176-062-9-001	GE-17*	PTC136*	HEPS0025*	REN 107	SK3124	RT-107A	ECG316*	TM316*	WEP535	121-972*
	2SC1675		GE-213	PTC132*	HEPS0025*	REN 229*	SK3122	RT-308	ECG229*	TM229*	WEP773	121-29021
	2SC460		GE-61*	PTC136*	HEPS0014*	REN 107	SK3122	RT-134	ECG107	TM107/**	WEP460	121-29000*
	2SC839		GE-61*	PTC132*	HEPS0015*	REN 123A*	SK3444	RT-308	ECG123A*	TM123A/**	WEP1945	121-29000A*
	2SC1674		GE-61	PTC132*	HEPS0010*	REN 229*	SK3246	RT-308	ECG229*	TM229*	WEP784	121-29021
TR18	2SC1730	176-073-9-001	GE-213	PTC132*	HEPS0025*	REN 229*	SK3122	RT-308	ECG229*	TM229*	WEP773	121-29021
	2SC1675		GE-213	PTC132*	HEPS0025*	REN 229*	SK3122	RT-308	ECG229*	TM229*	WEP773	121-29021
	2SC460		GE-61*	PTC136*	HEPS0014*	REN 107	SK3122	RT-134	ECG107	TM107/**	WEP460	121-29000*
	2SC839		GE-61*	PTC132*	HEPS0015*	REN 123A*	SK3444	RT-308	ECG123A*	TM123A/**	WEP1945	121-29000A*
	2SC1674		GE-61	PTC132*	HEPS0010*	REN 229*	SK3246	RT-308	ECG229*	TM229*	WEP784	121-29021
TR19	2SC945AQ	176-062-9-000	GE-17*	PTC136*	HEPS0025*	REN 107	SK3124	RT-107A	ECG316*	TM316*	WEP535	121-972*
	2SC945A		GE-212	PTC121*	HEPS0015*	REN 199	SK3124	RT-107A	ECG199	TM199/**	WEP1945	121-972
	2SC458		GE-210	PTC121*	HEPS0009*	REN 289	SK3122	RT-187	ECG289	TM289/**	WEP458	121-29000A*
	2SC372		GE-61*	PTC121*	HEPS0015*	REN 123A*	SK3444	RT-308	ECG123A*	TM123A/**	WEP372	121-29000A*
	2SC900		GE-62	PTC139*	HEPS0015*	REN 199	SK3124	RT-302	ECG199	TM199/**	WEP66	121-972
TR20	2SC828	176-065-9-001	GE-61*	PTC139*	HEPS0015*	REN 199	SK3444	RT-302	ECG199	TM199/**	WEP828	121-972
	2SC1740		GE-62	PTC121*	HEPS0015*	REN 123A*	SK3122	RT-109*	ECG123A*	TM123A*	WEP736*	121-29000A*
	2SC1675L		GE-213	PTC132*	HEPS0025*	REN 229*	SK3122	RT-308	ECG229*	TM229*	WEP773	121-29021
	2SC1675		GE-213	PTC132*	HEPS0025*	REN 229*	SK3122	RT-308	ECG229*	TM229*	WEP773	121-29021
	2SC460		GE-61*	PTC136*	HEPS0014*	REN 107	SK3122	RT-134	ECG107	TM107/**	WEP460	121-29000*
TR21	2SC839	176-062-9-001	GE-61*	PTC132*	HEPS0015*	REN 123A*	SK3444	RT-308	ECG123A*	TM123A/**	WEP1945	121-29000A*
	2SC1674		GE-61	PTC132*	HEPS0010*	REN 229*	SK3246	RT-308	ECG229*	TM229*	WEP784	121-29021
	2SC1730		GE-17*	PTC136*	HEPS0025*	REN 107	SK3124	RT-107A	ECG316*	TM316*	WEP535	121-972*
	2SC945AQ		GE-212	PTC121*	HEPS0015*	REN 199	SK3124	RT-107A	ECG199	TM199/**	WEP1945	121-972
	2SC945A		GE-210	PTC121*	HEPS0009*	REN 289	SK3122	RT-187	ECG289	TM289/**	WEP458	121-29000A*
TR22	2SC458	176-062-9-001	GE-210	PTC121*	HEPS0009*	REN 289	SK3122	RT-187	ECG289	TM289/**	WEP458	121-29000A*
	2SC372		GE-61*	PTC121*	HEPS0015*	REN 123A*	SK3444	RT-308	ECG123A*	TM123A/**	WEP372	121-29000A*
	2SC900		GE-62	PTC139*	HEPS0015*	REN 199	SK3124	RT-302	ECG199	TM199/**	WEP66	121-972
	2SC828		GE-61*	PTC139*	HEPS0015*	REN 199	SK3444	RT-302	ECG199	TM199/**	WEP828	121-972
	2SC1740		GE-62	PTC121*	HEPS0015*	REN 123A*	SK3122	RT-109*	ECG123A*	TM123A*	WEP736*	121-29000A*
TR23	2SC945AQ	176-062-9-001	GE-212	PTC121*	HEPS0015*	REN 199	SK3124	RT-107A	ECG199	TM199/**	WEP1945	121-972
	2SC945A		GE-212	PTC121*	HEPS0015*	REN 199	SK3124	RT-107A	ECG199	TM199/**	WEP1945	121-972
	2SC458		GE-210	PTC121*	HEPS0009*	REN 289	SK3122	RT-187	ECG289	TM289/**	WEP458	121-29000A*
	2SC372		GE-61*	PTC121*	HEPS0015*	REN 123A*	SK3444	RT-308	ECG123A*	TM123A/**	WEP372	121-29000A*
	2SC900		GE-62	PTC139*	HEPS0015*	REN 199	SK3124	RT-302	ECG199	TM199/**	WEP66	121-972
TR24	2SC828	176-062-9-001	GE-61*	PTC139*	HEPS0015*	REN 199	SK3444	RT-302	ECG199	TM199/**	WEP828	121-972
	2SC1740		GE-62	PTC121*	HEPS0015*	REN 123A*	SK3122	RT-109*	ECG123A*	TM123A*	WEP736*	121-29000A*
	2SC945AQ		GE-212	PTC121*	HEPS0015*	REN 199	SK3124	RT-107A	ECG199	TM199/**	WEP1945	121-972
	2SC945A		GE-212	PTC121*	HEPS0015*	REN 199	SK3124	RT-107A	ECG199	TM199/**	WEP1945	121-972
	2SC458		GE-210	PTC121*	HEPS0009*	REN 289	SK3122	RT-187	ECG289	TM289/**	WEP458	121-29000A*
TR25	2SC372	177-020-9-002	GE-61*	PTC121*	HEPS0015*	REN 123A*	SK3444	RT-308	ECG123A*	TM123A/**	WEP372	121-29000A*
	2SC900		GE-62	PTC139*	HEPS0015*	REN 199	SK3124	RT-302	ECG199	TM199/**	WEP66	121-972
	2SC828		GE-61*	PTC139*	HEPS0015*	REN 199	SK3444	RT-302	ECG199	TM199/**	WEP828	121-972
	2SC1740		GE-62	PTC121*	HEPS0015*	REN 123A*	SK3122	RT-109*	ECG123A*	TM123A*	WEP736*	121-29000A*
	2SA733P		GE-48	PTC127	HEPS0019*	REN 294	SK3138	RT-303	ECG294	TM294/**	WEP911	121-952
TR26	2SA733	177-020-9-002	GE-48	PTC127	HEPS0019*	REN 294	SK3138	RT-303	ECG294	TM294/**	WEP911	121-952
	2SA495		GE-221*	PTC103*	HEPS0013*	REN 159*	SK3114	RT-303	ECG159*	TM159/**	WEP495	121-29003
	2SA564		GE-65	PTC103*	HEPS0019*	REN 234	SK3114	RT-303	ECG234	TM234	WEP564	121-879

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.	MOTOROLA PART No.	RAYTHEON PART No.	RCA PART No.	SPRAGUE PART No.	SYLVANIA PART No.	THORDARSON PART No.	WORKMAN PART No.	ZENITH PART No.
TR26	2SC945AQ	176-062-9-001	GE-212	PTC121*	HEPS0015*	REN 199	SK3124	RT-107A	ECG199	TM199/**	WEP1945	121-972
	2SC945A		GE-212	PTC121*	HEPS0015*	REN 199	SK3124	RT-107A	ECG199	TM199/**	WEP1945	121-972
	2SC458		GE-210	PTC121*	HEPS0009*	REN 289	SK3122	RT-187	ECG289	TM289/**	WEP458	121-29000A*
	2SC372		GE-61*	PTC121*	HEPS0015*	REN 123A*	SK3444	RT-308	ECG123A*	TM123A/**	WEP372	121-29000A*
	2SC900		GE-62	PTC139*	HEPS0015*	REN 199	SK3124	RT-302	ECG199	TM199/**	WEP66	121-972
	2SC828		GE-61*	PTC139*	HEPS0015*	REN 199	SK3444	RT-302	ECG199	TM199/**	WEP828	121-972
	2SC1740		GE-62	PTC121*	HEPS0015*	REN 123A*	SK3122	RT-109*	ECG123A*	TM123A/**	WEP736*	121-29000A*
TR27	2SA733P	177-020-9-002	GE-48	PTC127	HEPS0019*	REN 294	SK3138	RT-303	ECG294	TM294/**	WEP911	121-952
	2SA733		GE-48	PTC127	HEPS0019*	REN 294	SK3138	RT-303	ECG294	TM294/**	WEP911	121-952
	2SA495		GE-221*	PTC103*	HEPS0013*	REN 159*	SK3114	RT-303	ECG159*	TM159/**	WEP495	121-29003
	2SA564		GE-65	PTC103*	HEPS0019*	REN 234	SK3114	RT-303	ECG234	TM234	WEP564	121-879
	2SC496-0		GE-57	PTC163	HEPS5000	REN 295	SK3253	RT-162	ECG295	TM295/**	WEP913	121-29002
	2SC496		GE-57	PTC163	HEPS5000	REN 295	SK3253	RT-162	ECG295	TM295/**	WEP913	121-29002
	2SC1846		GE-336	PTC904	HEPS3001*	REN 289	SK3124	RT-114*	ECG289	TM289	WEP910	121-883
TR29	2SD471	176-065-9-001	GE-268	PTC144*	HEPS0025*	REN 229*	SK3122	RT-308	ECG229*	TM229*	WEP773	121-29021
	2SC1675L		GE-213	PTC132*	HEPS0025*	REN 229*	SK3122	RT-308	ECG229*	TM229*	WEP773	121-29021
	2SC1675		GE-213	PTC132*	HEPS0025*	REN 229*	SK3122	RT-308	ECG229*	TM229*	WEP773	121-29021
	2SC460		GE-61*	PTC136*	HEPS0014*	REN 107	SK3122	RT-134	ECG107	TM107/**	WEP460	121-29000*
	2SC839		GE-61*	PTC132*	HEPS0015*	REN 123A*	SK3444	RT-308	ECG123A*	TM123A/**	WEP1945	121-29000A*
	2SC1674		GE-61	PTC132*	HEPS0010*	REN 229*	SK3246	RT-308	ECG229*	TM229*	WEP784	121-29021
	2SC1730		GE-17*	PTC136*	HEPS0025*	REN 107	SK3124	RT-107A	ECG316*	TM316*	WEP535	121-972*
TR30	2SC945AQ	176-062-9-001	GE-212	PTC121*	HEPS0015*	REN 199	SK3124	RT-107A	ECG199	TM199/**	WEP1945	121-972
	2SC945A		GE-212	PTC121*	HEPS0015*	REN 199	SK3124	RT-107A	ECG199	TM199/**	WEP1945	121-972
	2SC458		GE-210	PTC121*	HEPS0009*	REN 289	SK3122	RT-187	ECG289	TM289/**	WEP458	121-29000A*
	2SC372		GE-61*	PTC121*	HEPS0015*	REN 123A*	SK3444	RT-308	ECG123A*	TM123A/**	WEP372	121-29000A*
	2SC900		GE-62	PTC139*	HEPS0015*	REN 199	SK3124	RT-302	ECG199	TM199/**	WEP66	121-972
	2SC828		GE-61*	PTC139*	HEPS0015*	REN 199	SK3444	RT-302	ECG199	TM199/**	WEP828	121-972
	2SC1740		GE-62	PTC121*	HEPS0015*	REN 123A*	SK3122	RT-109*	ECG123A*	TM123A/**	WEP736*	121-29000A*
TR31	2SC1675L	176-065-9-001	GE-213	PTC132*	HEPS0025*	REN 229*	SK3122	RT-308	ECG229*	TM229*	WEP773	121-29021
	2SC1675		GE-213	PTC132*	HEPS0025*	REN 229*	SK3122	RT-308	ECG229*	TM229*	WEP773	121-29021
	2SC460		GE-61*	PTC136*	HEPS0014*	REN 107	SK3122	RT-134	ECG107	TM107/**	WEP460	121-29000*
	2SC839		GE-61*	PTC132*	HEPS0015*	REN 123A*	SK3444	RT-308	ECG123A*	TM123A/**	WEP1945	121-29000A*
	2SC1674		GE-61	PTC132*	HEPS0010*	REN 229*	SK3246	RT-308	ECG229*	TM229*	WEP784	121-29021
	2SC1730		GE-17*	PTC136*	HEPS0025*	REN 107	SK3124	RT-107A	ECG316*	TM316*	WEP535	121-972*
	2SC945AQ		GE-212	PTC121*	HEPS0015*	REN 199	SK3124	RT-107A	ECG199	TM199/**	WEP1945	121-972
TR32	2SC945A	176-065-9-001	GE-212	PTC121*	HEPS0015*	REN 199	SK3124	RT-107A	ECG199	TM199/**	WEP1945	121-972
	2SC458		GE-210	PTC121*	HEPS0009*	REN 289	SK3122	RT-187	ECG289	TM289/**	WEP458	121-29000A*
	2SC372		GE-61*	PTC121*	HEPS0015*	REN 123A*	SK3444	RT-308	ECG123A*	TM123A/**	WEP372	121-29000A*
	2SC900		GE-62	PTC139*	HEPS0015*	REN 199	SK3124	RT-302	ECG199	TM199/**	WEP66	121-972
	2SC828		GE-61*	PTC139*	HEPS0015*	REN 199	SK3444	RT-302	ECG199	TM199/**	WEP828	121-972
	2SC1740		GE-62	PTC121*	HEPS0015*	REN 123A*	SK3122	RT-109*	ECG123A*	TM123A/**	WEP736*	121-29000A*
	2SC1675L		GE-213	PTC132*	HEPS0025*	REN 229*	SK3122	RT-308	ECG229*	TM229*	WEP773	121-29021
TR33	2SC1675	176-062-9-001	GE-213	PTC132*	HEPS0025*	REN 229*	SK3122	RT-308	ECG229*	TM229*	WEP773	121-29021
	2SC460		GE-61*	PTC136*	HEPS0014*	REN 107	SK3122	RT-134	ECG107	TM107/**	WEP460	121-29000*
	2SC839		GE-61*	PTC132*	HEPS0015*	REN 123A*	SK3444	RT-308	ECG123A*	TM123A/**	WEP1945	121-29000A*
	2SC1674		GE-61	PTC132*	HEPS0010*	REN 229*	SK3246	RT-308	ECG229*	TM229*	WEP784	121-29021
	2SC1730		GE-17*	PTC136*	HEPS0025*	REN 107	SK3124	RT-107A	ECG316*	TM316*	WEP535	121-972*
	2SC945AQ		GE-212	PTC121*	HEPS0015*	REN 199	SK3124	RT-107A	ECG199	TM199/**	WEP1945	121-972
	2SC945A		GE-212	PTC121*	HEPS0015*	REN 199	SK3124	RT-107A	ECG199	TM199/**	WEP1945	121-972
TR34	2SC458	176-062-9-001	GE-210	PTC121*	HEPS0009*	REN 289	SK3122	RT-187	ECG289	TM289/**	WEP458	121-29000A*
	2SC372		GE-61*	PTC121*	HEPS0015*	REN 123A*	SK3444	RT-308	ECG123A*	TM123A/**	WEP372	121-29000A*
	2SC900		GE-62	PTC139*	HEPS0015*	REN 199	SK3124	RT-302	ECG199	TM199/**	WEP66	121-972
	2SC828		GE-61*	PTC139*	HEPS0015*	REN 199	SK3444	RT-302	ECG199	TM199/**	WEP828	121-972
	2SC1740		GE-62	PTC121*	HEPS0015*	REN 123A*	SK3122	RT-109*	ECG123A*	TM123A/**	WEP736*	121-29000A*
	2SC1675L		GE-213	PTC132*	HEPS0025*	REN 229*	SK3122	RT-308	ECG229*	TM229*	WEP773	121-29021
	2SC1675		GE-213	PTC132*	HEPS0025*	REN 229*	SK3122	RT-308	ECG229*	TM229*	WEP773	121-29021
TR35	2SC460	176-065-9-001	GE-61*	PTC136*	HEPS0014*	REN 107	SK3122	RT-134	ECG107	TM107/**	WEP460	121-29000*
	2SC839		GE-61*	PTC132*	HEPS0015*	REN 123A*	SK3444	RT-308	ECG123A*	TM123A/**	WEP1945	121-29000A*
	2SC1674		GE-61	PTC132*	HEPS0010*	REN 229*	SK3246	RT-308	ECG229*	TM229*	WEP784	121-29021
	2SC1730		GE-17*	PTC136*	HEPS0025*	REN 107	SK3124	RT-107A	ECG316*	TM316*	WEP535	121-972*
	2SC945AQ		GE-212	PTC121*	HEPS0015*	REN 199	SK3124	RT-107A	ECG199	TM199/**	WEP1945	121-972
	2SC945A		GE-212	PTC121*	HEPS0015*	REN 199	SK3124	RT-107A	ECG199	TM199/**	WEP1945	121-972
	2SC458		GE-210	PTC121*	HEPS0009*	REN 289	SK3122	RT-187	ECG289	TM289/**	WEP458	121-29000A*
TR36	2SC372	176-062-9-001	GE-61*	PTC121*	HEPS0015*	REN 123A*	SK3444	RT-308	ECG123A*	TM123A/**	WEP372	121-29000A*
	2SC900		GE-62	PTC139*	HEPS0015*	REN 199	SK3124	RT-302	ECG199	TM199/**	WEP66	121-972
	2SC828		GE-61*	PTC139*	HEPS0015*	REN 199	SK3444	RT-302	ECG199	TM199/**	WEP828	121-972
	2SC1740		GE-62	PTC121*	HEPS0015*	REN 123A*	SK3122	RT-109*	ECG123A*	TM123A/**	WEP736*	121-29000A*
	2SC1675L		GE-213	PTC132*	HEPS0025*	REN 229*	SK3122	RT-308	ECG229*	TM229*	WEP773	121-29021
	2SC1675		GE-213	PTC132*	HEPS0025*	REN 229*	SK3122	RT-308	ECG229*	TM229*	WEP773	121-29021
	2SC460		GE-61*	PTC136*	HEPS0014*	REN 107	SK3122	RT-134	ECG107	TM107/**	WEP460	121-29000*
TR37	2SC839	176-065-9-001	GE-61*	PTC132*	HEPS0015*	REN 123A*	SK3444	RT-308	ECG123A*	TM123A/**	WEP1945	121-29000A*
	2SC1674		GE-61	PTC132*	HEPS0010*	REN 229*	SK3246	RT-308	ECG229*	TM229*	WEP784	121-29021
	2SC1730		GE-17*	PTC136*	HEPS0025*	REN 107	SK3124	RT-107A	ECG316*	TM316*	WEP535	121-972*
	2SC945AQ		GE-212	PTC121*	HEPS0015*	REN 199	SK3124	RT-107A	ECG199	TM199/**	WEP1945	121-972
	2SC945A		GE-212	PTC121*	HEPS0015*	REN 199	SK3124	RT-107A	ECG199	TM199/**	WEP1945	121-972
	2SC458		GE-210	PTC121*	HEPS0009*	REN 289	SK3122	RT-187	ECG289	TM289/**	WEP458	121-29000A*
	2SC372		GE-61*	PTC121*	HEPS0015*	REN 123A*	SK3444	RT-308	ECG123A*	TM123A/**	WEP372	121-29000A*
TR38	2SC900	176-062-9-001	GE-62	PTC139*	HEPS0015*	REN 199	SK3124	RT-302	ECG199	TM199/**	WEP66	121-972
	2SC828		GE-61*	PTC139*	HEPS0015*	REN 199	SK3444	RT-302	ECG199	TM199/**	WEP828	121-972
	2SC1740		GE-62	PTC121*	HEPS0015*	REN 123A*	SK3122	RT-109*	ECG123A*	TM123A/**	WEP736*	121-29000A*
	2SC1675L		GE-213	PTC132*	HEPS0025*	REN 229*	SK3122	RT-308	ECG229*	TM229*	WEP773	121-29021
	2SC1675		GE-213	PTC132*	HEPS0025*	REN 229*	SK3122	RT-308	ECG229*	TM229*	WEP773	121-29021
	2SC460		GE-61*	PTC136*	HEPS0014*	REN 107	SK3122	RT-134	ECG107	TM107/**	WEP460	121-29000*
	2SC839		GE-61*	PTC132*	HEPS0015*	REN 123A*	SK3444	RT-308	ECG123A*	TM123A/**	WEP1945	121-29000A*
TR39	2SC1674	176-065-9-001	GE-61	PTC132*	HEPS0010*	REN 229*	SK3246	RT-308	ECG229*	TM229*	WEP784	121-29021
	2SC1730		GE-17*	PTC136*	HEPS0025*	REN 107	SK3124	RT-107A	ECG316*	TM316*	WEP535	121-972*
	2SC945AQ		GE-212	PTC121*	HEPS0015*	REN 199	SK3124	RT-107A	ECG199	TM199/**	WEP1945	121-972
	2SC945A		GE-212	PTC121*	HEPS0015*	REN 199	SK3124	RT-107A	ECG199	TM199/**	WEP1945	121-972
	2SC458		GE-210	PTC121*	HEPS0009*	REN 289	SK3122	RT-187	ECG289	TM289/**	WEP458	121-29000A*
	2SC372		GE-61*	PTC121*	HEPS0015*	REN 123A*	SK3444	RT-308	ECG123A*	TM123A/**	WEP372	121-29000A*
	2SC900		GE-62	PTC139*	HEPS0015*	REN 199	SK3124	RT-302	ECG199	TM199/**	WEP66	121-972
TR40	2SC828	176-062-9-001	GE-61*	PTC139*	HEPS0015*	REN 199	SK3444	RT-302	ECG199	TM199/**	WEP828	121-972
	2SC1740		GE-62	PTC121*	HEPS00							

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.	MOTOROLA PART No.	RAYTHEON PART No.	RCA PART No.	SPRAGUE PART No.	SYLVANIA PART No.	THORDARSON PART No.	WORKMAN PART No.	ZENITH PART No.
TR53	2SC458	176-062-9-001	GE-210	PTC121*	HEPS0009*	REN 289	SK3122	RT-187	ECG289	TM289/**	WEP458	121-Z9000A*
	2SC372		GE-61*	PTC121*	HEPS0015*	REN 123A*	SK3444	RT-308	ECG123A*	TM123A*/**	WEP372	121-Z9000A*
	2SC900		GE-62	PTC139*	HEPS0015*	REN 199	SK3124	RT-302	ECG199	TM199/**	WEP66	121-972
	2SC828		GE-61*	PTC139*	HEPS0015*	REN 199	SK3444	RT-302	ECG199	TM199/**	WEP828	121-972
	2SC1740		GE-62	PTC121*	HEPS0015*	REN 123A*	SK3122	RT-109*	ECG123A*	TM123A*	WEP736*	121-Z9000A*
	2SC945AQ		GE-62	PTC121*	HEPS0015*	REN 199	SK3124	RT-107A	ECG199	TM199/**	WEP1945	121-972
	2SC945A		GE-212	PTC121*	HEPS0015*	REN 199	SK3122	RT-107A	ECG199	TM199/**	WEP1945	121-972
	2SC458		GE-212	PTC121*	HEPS0015*	REN 289	SK3122	RT-187	ECG289	TM289/**	WEP458	121-Z9000A*
	2SC372		GE-210	PTC121*	HEPS0009*	REN 123A*	SK3444	RT-308	ECG123A*	TM123A*/**	WEP372	121-Z9000A*
	2SC900		GE-61*	PTC139*	HEPS0015*	REN 199	SK3124	RT-302	ECG199	TM199/**	WEP66	121-972
	2SC828		GE-62	PTC139*	HEPS0015*	REN 199	SK3444	RT-302	ECG199	TM199/**	WEP828	121-972
	2SC1740		GE-61*	PTC139*	HEPS0015*	REN 123A*	SK3122	RT-109*	ECG123A*	TM123A*	WEP736*	121-Z9000A*

* Lead configuration may vary from original.

/** Also available as exact type replacement.

ELECTROLYTIC CAPACITORS

ELECTROLYTIC CAPACITORS							
REPLACEMENT DATA							
ITEM No.	RATING	MFR. PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.		
					Q-LINE	GENERAL LINE	
C10	.22 35V	027-035-9-002	WBR300-35*	TDC224M050EL	QDT1-10	SD50-R229	
C18	330 10V	022-160-9-002		VT330G10	QV1-131	EV-1145	
C23	.47 10V			027-038-9-002	TDC476M020GL	QDT1-98	SD20-479
C24	.47 50V	027-038-9-002	TDC474M050EL	QDT1-19	SD50-R479		
	4.7 25V		027-038-9-002	TDC475M010EL	QDT1-48	SD10-4R79	
C25	.47 25V	027-038-9-002	PC1-50	TDC474M050EL	QDT1-19	SD50-R479	
C28	.47 50V	027-038-9-002		TDC474M050EL	QDT1-19	SD50-R479	
C29	.47 50V	022-157-9-001		VTTR47A63	QV1-3	EV-1610	
	.47 35V	027-038-9-002	PC1-50	TDC474M050EL	QDT1-19	SD50-R479	
	2.2 16V	027-035-9-001		TDC225M050FL	QDT1-37	SD50-2R29	
C33	1 50V	022-157-9-002		VT1A50	QV1-11	EV-1615	
C62	1 25V	027-035-9-003	PC1-50	TDC105M035EL	QDT1-89	SD35-19	
C67	1 25V	027-035-9-003		TDC336M010FL		EV-1224	
C72	33 10V	022-163-9-001		VT22B16		QV1-55	SD10-339
	22 10V	022-163-9-001	PC25-25	VT22B16	QV1-55	EV-1224	
C73	47 6.3V	022-160-9-002	PC25-25	TDC476M020GL	QDT1-98	SD20-479	
C74	47 10V		027-031-9-001	PC50-16	VTT47D16	QV1-73	EV-1226
C80	2.2 25V		027-031-9-001	PC1000-16	TDC225M035FL	QV1-179	SD35-2R29
C81	2.2 25V	027-031-9-001	TDC225M035FL		SD35-2R29		
C84	1000 10V	022-171-9-003	VT1100L10		EV-1160		
C90	2.2 25V	027-038-9-001	PC5-50	TDC225M035FL	QDT1-19	SD35-2R29	
	.47 10V			022-157-9-003	TDC474M050EL	SD50-R479	
C92	4.7 25V			022-160-9-002	VTTR47B50	QV1-27	EV-1319
C95	47 10V	022-158-9-002	PC50-16	VT47D16	QV1-73	EV-1226	
C99	2.2 25V	022-163-9-001	PC2-100	VT22A50	QV1-19	EV-1517	
C100	22 6.3V	027-035-9-001	PC1-50	TDC226M015FL	QDT1-82	SD15-229	
C101	.1 35V	027-035-9-001		TDC104M050EL	QDT1-2	SD50-R109	
C103	10 6.3V	022-157-9-004		TDC106M025FL	QDT1-64	SD25-109	
	.47 50V	022-157-9-001	PC1-50	QV1-3	EV-1610		
C104	.47 35V	027-038-9-002		VTTR47A63	QDT1-19	SD50-R479	
C108	.47 50V	022-157-9-001		PC1-50	QV1-3	EV-1610	
C109	10 16V	022-157-9-004	PC10-25	VT110B25	QV1-41	EV-1222	
C133	10 16V	022-157-9-004	PC10-25	VT110B25	QV1-41	EV-1222	
C134	10 16V	022-157-9-004	PC10-25	VT110B25	QV1-41	EV-1222	
C135	.47 50V	022-157-9-001	PC1-50	VTTR47A63	QV1-3	EV-1610	
C144	1 50V	022-157-9-002	PC1-50	VT1A50	QV1-11	EV-1615	
C153	47 10V	022-160-9-002	PC50-16	VT47D16	QV1-73	EV-1226	
C172	1000 25V	022-171-9-004	WBR1000-25*	VT1100M25	QV1-185	EV-1360	
C173	10 16V	022-157-9-004	PC10-25	VT110B25	QV1-41	EV-1222	
C174	1 50V	022-157-9-002	PC1-50	VT1A50	QV1-11	EV-1615	
C175	470 10V	022-076-9-008	PC500-16	VT470K16	QV1-149	EV-1150	
C176	47 10V	022-160-9-002	PC50-16	VT47D16	QV1-73	EV-1226	
C179	22 6V	027-035-9-004	PC5-50	TDC226M015FL	QDT1-82	SD15-229	
C180	4.7 25V	022-157-9-003		VTTR47B50	QV1-27	EV-1319	
C181	10 25V	022-171-9-001		PC10-25	VT110B25	QV1-43	EV-1322
C184	.1 25V	027-035-9-001	PC250-10	VT220F10	QV1-115	EV-1140	
C186	220 10V	022-171-9-002			VT1A50	QV1-11	EV-1615
C191	1 50V	022-157-9-002			PC1-50	QV1-3	EV-1610
C230	.47 50V	022-157-9-001	PC1-50	VTTR47A63	QV1-3	EV-1610	
C231	.47 50V	022-157-9-001	PC1-50	VTTR47A63	QV1-3	EV-1610	
C232	2.2 25V	022-158-9-002	PC2-100	VT22R2A50	QV1-19	EV-1517	

* Axial replacement for radial device.

CAPACITORS

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA				
			CENTRALAB PART No.	CORNEILL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
						Q-LINE	GENERAL LINE
C1	33 NPO 50V 5%	82 N750 50V	DTZ-33	NP033	CN0433	10TCC-Q33	
C2	.022 50V		DC-253	MGP025	TA125	TG-S25	
C3	.022 50V		DC-253	MGP025	TA125	TG-S25	
C4	.022 50V		DC-253	MGP025	TA125	TG-S25	
C5	.001 50V		DD-102	MGP025	GP210	10TS-D10	
C6	.022 50V		DC-253		TA125	TG-S25	
C7	.022 50V		DC-253	MGP025	TA125	TG-S25	
C8	.001 50V		DD-102	NP082	GP210	10TS-D10	
C9	82 N750 50V		DTZ-82		CN7482	10TCU-Q82	
C11	.001 50V	100 N750 50V 10%		N100	CN0482	10TCC-Q82	
	.001 50V	DD-102			GP210	10TS-D10	
C12	100 N750 50V 10%	DTN-100	MGP025	CN7310	10TCU-T10		
C13	.022 50V	DC-253		TA125	TG-S25		
C14	.001 50V 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
C15	100 N750 50V 10%		DTN-100	N100	CN7310		10TCU-T10
C16	.022 50V		DC-253	MGP025	TA125		TG-S25
C17	100 N750 50V 10%		DTN-100	N100	CN7310		10TCU-T10
C19	.047 50V 10%	025-121-9-006		DPMS2S47	M192P4739R8	QFT2-171	1FT-S47
C20	.047 50V 10%	025-121-9-006		DPMS2S47	M192P4739R8	QFT2-171	1FT-S47
C21	.022 50V 10%	025-121-9-003		DPMS2S22	M192P2239R8	QFT2-127	1FT-S22
C22	.022 50V		DC-253	MGP025	TA125		TG-S25
C26	39 NPO 50V 5%				CN0439		10TCC-Q39
C27	.022 50V		DC-253	MGP025	TA125		TG-S25
C30	.0047		DD-472	GP4700	GP247		5GA-D47
	.001 50V		DD-102		GP210		10TS-D10
C31	12 NPO 50V 5%				CN0412		10TCC-Q12
C32	.0047		DD-472	GP4700	GP247		5GA-D47
	.001 50V		DD-102		GP210		10TS-D10
C34	.0047		DD-472	GP4700	GP247		5GA-D47
	.001 50V		DD-102		GP210		10TS-D10
C35	.001 50V		DD-102		GP210		10TS-D10
C36	.1		CK-104		MAG5001		10TS-D10
C37	.001 50V		DD-102		GP210		10TS-D10
C38	4 NPO 50V	020-190-9-031					
C39	.001 50V		DD-102		GP210		10TS-D10
C40	.001		DD-102		GP210		10TS-D10
	56 NPO 50V 5%				CN0456		10TCC-Q56
C41	2 NPO 50V		DTZ-2R2	NP02P2	CN0522		10TCC-V22
C42	.001 50V		DD-102		GP210		10TS-D10
C43	.001 50V		DD-102		GP210		10TS-D10
C44	.001 50V		DD-102		GP210		10TS-D10
C45	100 10%		DTZ-100	NP0100	CN0310		10TCC-T10
	100 N750 50V 10%		DTN-100	N100	CN7310		10TCU-T10
C46	.022 50V 10%	025-121-9-003		DPMS2S22	M192P2239R8	QFT2-127	1FT-S22
	.01 50V 10%	025-121-9-002		WMF1S1	M192P1039R8	QFT2-91	1FT-S10
C47	2 NPO 50V		DTZ-2R2	NP02P2	CN0522		10TCC-V22
C48	5 NPO 50V	020-204-9-003			*		10TCC-V50
	2 NPO 50V		DTZ-2R2	NP02P2	CN0522		10TCC-V22
C49	.022 50V 10%	025-121-9-003		DPMS2S22	M192P2239R8	QFT2-127	1FT-S22
C50	.022 50V		DC-253	MGP025	TA125		TG-S25
C51	.022 50V		DC-253	MGP025	TA125		TG-S25
C52	.022 50V		DC-253	MGP025	TA125		TG-S25
C53	.022 50V		DC-253	MGP025	TA125		TG-S25
C54	.022 50V		DC-253	MGP025	TA125		TG-S25
C55	.022 50V 10%	025-121-9-003		DPMS2S22	M192P2239R8	QFT2-127	1FT-S22
C56	.047 50V 10%	025-121-9-006		DPMS2S22	M192P4739R8	QFT2-171	1FT-S47
C57	.047 50V 10%	025-121-9-006		DPMS2S22	M192P4739R8	QFT2-171	1FT-S47
C58	.022 50V 10%	025-121-9-003		DPMS2S22	M192P2239R8	QFT2-127	1FT-S22
C59	.047 50V 10%	025-121-9-006		DPMS2S22	M192P4739R8	QFT2-171	1FT-S47
C60	.047 50V 10%	025-121-9-006		DPMS2S22	M192P4739R8	QFT2-171	1FT-S47
C61	.022		DC-253	MGP025	TA125		TG-S25
	.047 50V 10%	025-121-9-006		DPMS2S22	M192P4739R8	QFT2-171	1FT-S47
C63	.022 50V 10%	025-121-9-003		DPMS2S22	M192P2239R8	QFT2-127	1FT-S22
C64	220 N750 50V 10%		DTN-220	N220	CN7322		10TCU-T22
C65	5 NPO 50V	020-204-9-003			*		10TCC-V50
	.001 50V		DD-102		GP210		10TS-D10
C66	220 N750 50V 10%		DTN-220	N220	CN7322		10TCU-T22
C68	15 NPO 50V 5%		DTZ-15	NP015	CN0415		10TCC-Q15
C69	.0022 50V 10%	030-041-9-003		DPMS6D22	M192P2229R8	QFT2-27	1FT-D22
C70	.001 50V 10%	025-074-9-003		DPMS6D1	M192P10292	QFT2-1	1FT-D10
C71	.001 50V 10%	025-074-9-003		DPMS6D1	M192P10292	QFT2-1	1FT-D10
C75	.047 50V 10%	025-121-9-006		DPMS2S47	M192P4739R8	QFT2-171	1FT-S47
C76	.01 50V 10%	025-121-9-002		WMF1S1	M192P1039R8	QFT2-91	1FT-S10
	.022 50V 10%	025-121-9-002		DPMS2S22	M192P2239R8	QFT2-127	1FT-S22
C77	.1 50V 10%	025-121-9-001		WMF05P1	M192P1049R8	QFT2-215	1FT-P10
C78	.01 50V 10%	025-121-9-002		WMF1S1	M192P1039R8	QFT2-91	1FT-S10
C79	.1 50V 10%	025-121-9-002		WMF05P1	M192P1049R8	QFT2-215	1FT-P10
C82	.1 50V 10%	025-121-9-001		WMF05P1	M192P1049R8	QFT2-215	1FT-P10
	.01 50V 10%	025-121-9-002		WMF1S1	M192P1039R8	QFT2-91	1FT-S10
C83	.047 50V 10%	025-121-9-006		DPMS2S47	M192P4739R8	QFT2-171	1FT-S47
C85	10 NPO 50V +5%		DTZ-10	NP010	CN0410		10TCC-Q10
C86	18 NPO 50V 5%				CN0418		10TCC-Q18
C87	.022 50V		DC-253	MGP025	TA125		TG-S25
C88	47 NPO 50V 10%		DTZ-47	NP047	CN0447		10TCC-Q47
C89	47 NPO 50V 10%		DTZ-47	NP047	CN0447		10TCC-Q47
C91	.047 50V 10%	025-121-9-006		DPMS2S47	M192P4739R8	QFT2-171	1FT-S47
C93	.01 50V		UK50-103		MAG5011		
C94	.047 50V 10%	025-121-9-006		DPMS2S47	M192P4739R8	QFT2-171	1FT-S47
	.1 50V 10%	025-121-9-001		WMF05P1	M192P1049R8	QFT2-215	1FT-P10
C96	.01 50V		UK50-103		MAG5011		
C97	.01 50V		UK50-103		MAG5011		
C98	10 NPO 50V		DTZ-10	NP010	CN0410		10TCC-Q10
	4 NPO 50V	020-190-9-031					
C102	.0047 50V 10%	025-126-9-001		WMF1D47	M192P4729R8	QFT2-63	1FT-D47
C105	.0022 50V 10%	030-041-9-003		DPMS6D22	M192P2229R8	QFT2-27	1FT-D22
	.01 50V 10%	025-121-9-002		WMF1S1	M192P1039R8	QFT2-91	1FT-S10
C106	.01 50V		UK50-103		MAG5011		
C107	.01 50V 10%	025-121-9-002		WMF1S1	M192P1039R8	QFT2-91	1FT-S10
C110	.01 50V 10%	025-121-9-002		WMF1S1	M192P1039R8	QFT2-91	1FT-S10
C111	.01 50V		UK50-103		MAG5011		
C112	.01 50V		UK50-103		MAG5011		
C113	.01 50V		UK50-103		MAG5011		
C114	.01 50V		UK50-103		MAG5011		
C115	220 N330 50V 10%	020-180-9-019			*		10TCS-T22
C116	5 NPO	020-204-9-003			*		10TCC-V50
	10 NPO 50V 5%		DTZ-10	NP010	CN0410		10TCC-Q10
C117	470 N750 50V 5%		DTN-470				10TCU-T47
C118	.001 50V 10%	025-121-9-002		WMF1S1	M192P1039R8	QFT2-91	1FT-S10
C119	.01 50V		UK50-103		MAG5011		
C120	.01 50V		UK50-103		MAG5011		
C121	10 NPO 50V 5%		DTZ-10	NP010	CN0410		10TCC-Q10
C122	100 N220 50V 10%	020-204-9-010			*		10TCR-T10
C123	220 N750 10%		DTN-220	N220	CN7322		10TCU-T22
	.001 50V 10%	025-074-9-003		DPMS6D1	M192P10292	QFT2-1	1FT-D10

COBRA MODEL 148GTL

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
C124	.022 50V	020-204-9-003	UL-253	MGP025	TA125		TG-S25
C125	5 NPO 50V $\pm$.5				*		10TCC-V50
C126	.01 50V		UK50-103		MAG5011		
C127	82 NPO 50V 5%		DTZ-82	NP082	CN0482		10TCC-Q82
C128	27 NPO 50V 5%				CN0427		10TCC-Q27
C129	.01 50V	025-121-9-006	UK50-103		MAG5011		
C130	1 NPO 50V $\pm$.25				CN0510		10TCC-V10
C131	10 NPO 50V 5%		DTZ-10	NP010	CN0410		10TCC-Q10
C132	.0047 50V		DD-472	GP4700	GP247	QFT2-171	5GA-D47
C136	.047 50V 10%			DPMS2S47	M192P4739R8		1FT-S47
C137	.5 NPO 50V $\pm$.25	020-209-9-001					
C138	.0047 50V		DD-472	GP4700	GP247		5GA-D47
C139	.001	020-209-9-001	DD-102		GP210		10TS-D10
C140	.5						
C141	.0047 50V		DD-472	GP4700	GP247		5GA-D47
C142	82 NPO 50V 5%		DTZ-82	NP082	CN0482		10TCC-Q82
C143	100 NPO 50V 5%		DTZ-100	NP0100	CN0310		10TCC-T10
C142	27 NPO 50V 5%	020-204-9-011			CN0427		10TCC-Q27
C143	39 NPO 50V 5%				CN0439		10TCC-Q39
C143	180 N220 50V 10%				*		10TCR-T18
C145	3 NPO		DTZ-3R3	NP03P3	CN0533		10TCC-V33
C146	1 NPO 50V $\pm$.25				CN0510		10TCC-V10
C146	390 N750 50V 10%	025-121-9-001	DTN-390				10TCU-T39
C147	47 NPO 50V 10%		DTZ-47	NP047	CN0447	QFT2-215	10TCC-Q47
C148	.1 50V 10%			WMF05P1	M192P1049R8		1FT-P10
C149	120 N220 50V 10%				*		10TCR-T12
C150	120 NPO 50V 10%		DTZ-120		CN0312		10TCC-T12
C151	330 N750 50V 5%	025-121-9-006	DTN-330	N330	CN7333		10TCU-T33
C152	.0047 50V		DD-472	GP4700	GP247		5GA-D47
C152	470 N750 50V 5%		DTN-470				10TCU-T47
C154	.047		UK50-503		MAG5015		
C155	.047 50V 10%			DPMS2S47	M192P4739R8	QFT2-171	1FT-S47
C155	.1	025-121-9-001	CK-104		MAG5001		
C156	.1 50V 10%			WMF05P1	M192P1049R8	QFT2-215	1FT-P10
C156	390 N750 5%		DTN-390				10TCU-T39
C157	330 N750 50V 5%		DTN-330	N330	CN7333		10TCU-T33
C158	.0047 50V		DD-472	GP4700	GP247		5GA-D47
C158	.0047 50V	025-121-9-001	DD-472	GP4700	GP247		5GA-D47
C159	.0047 50V		DD-472	GP4700	GP247		5GA-D47
C160	.0047 50V		DD-472	GP4700	GP247		5GA-D47
C161	330 N750 50V 10%		DTN-330	N330	CN7333		10TCU-T33
C162	47 NPO 50V 10%		DTZ-47	NP047	CN0447		10TCC-Q47
C163	2 NPO	025-074-9-003	DTZ-2R2	NP02P2	CN0522		10TCC-V22
C163	1.5 NPO 50V $\pm$.25		DTZ-1R5	NP01P5	CN0515		10TCC-V15
C164	.01 50V		UK50-103		MAG5011		
C165	.0047 50V		DD-472	GP4700	GP247		5GA-D47
C166	.0047 50V		DD-472	GP4700	GP247		5GA-D47
C167	.0047 50V	025-121-9-001	DD-472	GP4700	GP247		5GA-D47
C168	.0047 50V		DD-472	GP4700	GP247		5GA-D47
C169	.0047 50V		DD-472	GP4700	GP247		5GA-D47
C170	.001 50V		DD-102		GP210		10TS-D10
C171	.0047 50V		DD-472	GP4700	GP247		5GA-D47
C177	.1 50V 10%	025-121-9-001		WMF05P1	M192P1049R8	QFT2-215	1FT-P10
C178	.001 50V 10%	025-074-9-003		DPMS6D1	M192P10292	QFT2-1	1FT-D10
C182	.022 50V 10%	025-121-9-003		DPMS2S22	M192P2239R8	QFT2-127	1FT-S22
C183	.1 50V 10%	025-121-9-001		WMF05P1	M192P1049R8	QFT2-215	1FT-P10
C185	.001	025-074-9-003	DD-102		GP210		10TS-D10
C187	.001 50V 10%			DPMS6D1	M192P10292	QFT2-1	1FT-D10
C188	.1 50V 10%			WMF05P1	M192P1049R8	QFT2-215	1FT-P10
C188	.047 50V		UK50-503		MAG5015		
C192	.1 50V		CK-104		MAG5001		
C193	.001	025-121-9-001	DD-102		GP210		10TS-D10
C193	.0047		DD-472	GP4700	GP247		5GA-D47
C194	.047		UK50-503		MAG5015		
C195	.022 50V		DC-253	MGP025	TA125		TG-S25
C195	.1 50V		CK-104		MAG5001		
C196	.022	025-121-9-001	DC-253	MGP025	TA125		TG-S25
C197	.0047		DD-472	GP4700	GP247		5GA-D47
C197	.022 50V		DC-253	MGP025	TA125		TG-S25
C198	.01 50V		UK50-103		MAG5011		
C199	.01 50V		UK50-103		MAG5011		
C200	.0047 50V	025-121-9-001	DD-472	GP4700	GP247		5GA-D47
C201	.01 50V		UK50-103		MAG5011		
C202	.01 50V		UK50-103		MAG5011		
C203	33 NPO 50V 5%		DTZ-33	NP033	CN0433		10TCC-Q33
C204	.022 50V		DC-253	MGP025	TA125		TG-S25
C207	47 NPO 10%	025-121-9-001	DTZ-47	NP047	CN0447		10TCC-Q47
C208	.001		DD-102		GP210		10TS-D10
C212	470 N750 5%		DTN-470				10TCU-T47
C213	10 N750		DTN-10	N10	CN7410		10TCU-Q10
C214	.01 10%			WMF1S1	M192P1039R8	QFT2-91	1FT-S10
C215	.022	025-121-9-001	DC-253	MGP025	TA125		TG-S25
C221	.01		UK50-103		MAG5011		
C223	.0047		DD-472	GP4700	GP247		5GA-D47
C224	.0047		DD-472	GP4700	GP247		5GA-D47
C225	.047 10%		DPMS2S47		M192P4739R8	QFT2-171	1FT-S47
C226	100	025-121-9-001	DTZ-100	NP0100	CN0310		10TCC-T10
C227	.022		DC-253	MGP025	TA125		TG-S25
C228	.022		DC-253	MGP025	TA125		TG-S25
C229	.022		DC-253	MGP025	TA125		TG-S25
C243	33 NPO 5%		DTZ-33	NP033	CN0433		10TCC-Q33
C258	.047 10%	025-121-9-001	DD-472	DPMS2S47	M192P4739R8	QFT2-171	1FT-S47
C257	.0047 10%		DD-472	GP4700	GP247		5GA-D47
C259	.022		DC-253	MGP025	TA125		TG-S25
C401	.022 50V		DC-253	MGP025	TA125		TG-S25
C402	.001 50V		DD-102		GP210		10TS-D10
C403	.001 50V	025-121-9-001	DD-102		GP210		10TS-D10
C404	.001 50V		DD-102		GP210		10TS-D10
C405	.001 50V		DD-102		GP210		10TS-D10
C406	.001 50V		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.
C407	.001 50V		DD-102		GP210	10TS-D10
C409	.01 50V		UK50-103		MAG5011	
CC1	Capacitor Array	527-077-9-002 (1)				
CT1	20	028-051-9-001				
CT2	20	028-051-9-001				

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
(1) Consists of four capacitors.

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

ITEM No.	FUNCTION	RESIST-ANCE	REPLACEMENT DATA			
			MFR. PART No.	CENTRALAB PART No.	MALLORY PART No.	TRW PART No.
VR1	AM Signal Meter	3000	008-323-9-001			U260R502B
	AM Signal Meter	20K	008-316-9-003			U260R253B
VR2	SSB Signal Meter	3000	008-323-9-001			U260R502B
	SSB Signal Meter	20K	008-316-9-003			U260R253B
VR3	Squelch Range	1000	008-334-9-001			U260R102B
VR4	Carrier Balance	10K	008-342-9-002			U260R103B
VR5	XMT Frequency	3000	008-323-9-001			U260R502B
VR6	S/RF Cal	100K	008-316-9-001			U260R104B
VR8	Final Bias	5000	008-316-9-004			U260R502B
VR9	Driver Bias	500	008-342-9-001			U260R502B
VR10	AM Carrier Power	5000	008-316-9-004			U260R502B
VR11	SSB ALC	10K	008-342-9-002			U260R103B
VR401	Squelch	100K	008-349-9-003(18)			
VR403	Volume/Power Switch	10K				
VR402	Voicelock	20K	008-349-9-001			
VR404	RF Gain	1000	008-347-9-005(19)			
VR406	SWR/Cal	3000				
VR405	Dynamike	1000	008-349-9-002			

(18) Includes VR401, VR403 and Power Switch.
(19) Includes VR404 and VR406.

COILS (RF-IF)

ITEM No.	FUNCTION	REPLACEMENT DATA			REMARKS
		PART No.	OTHER IDENTIFICATION	MILLER PART No.	
L1	Noise Blanker (7.8MHz)	060-018-9-001	LA-038	CBS512-7TC	
L2	Noise Blanker (7.8MHz)	060-025-9-010	LA-179		
L3	IF Filter (455kHz)	060-022-9-001	LA-163		
L4	Rec RF (27MHz)	060-030-9-015	LA-261		
L5	RF Amp (27MHz)	060-030-9-014	LA-260		
L6	RF Amp (27MHz)	060-030-9-013	LA-259		
L7	Mixer (7.8MHz)	060-030-9-012	LA-258		
L8	Mixer (7.8MHz)	060-030-9-011	LA-257		
L9	Filter (7.8MHz)	060-031-9-005	LA-268		
L10	SSB IF Amp (7.8MHz)	060-031-9-006	LA-269		
L11	RF Choke (100uH)	041-087-9-002	LZ-012		
L12	SSB IF Amp (7.8MHz)	060-031-9-007	LA-270		
L13	AM IF Amp (455kHz)	060-031-9-009	LA-272		
L14	SSB IF Amp (7.8MHz)	060-031-9-008	LA-271		
L15	AM IF Amp (455kHz)	060-031-9-001	LA-264		
L16	RF Choke (100uH)	041-087-9-002	LZ-012		
L17	RF Choke (470uH)	041-088-9-004	LZ-012		
L18	RF Choke (470uH)	041-088-9-004	LZ-012		
L19	PLL	060-030-9-002	LA-216		
L20	VCO (34MHz)	060-030-9-001	LA-195		
L21	Tripler (34MHz)	060-030-9-010	LA-256		
L22	Synthesizer Oscillator (34.7635MHz)	060-031-9-010	LA-273		
L23	Synthesizer Oscillator (34.7650MHz)	060-031-9-004	LA-267		
L24	LSB RF Choke (470uH)	041-088-9-004	LZ-012		
L25	USB RF Choke (470uH)	041-088-9-004	LZ-012		
L26	RF Choke (470uH)	041-088-9-004	LZ-012		
L27	Pi Filter (470uH)	041-088-9-004	LZ-012		
L28	RF Choke (470uH)	041-088-9-004	LZ-012		
L29	RF Choke (470uH)	041-088-9-004	LZ-012		
L30	VCO (7.7985MHz)	060-031-9-003	LA-266		
L31	VCO (7.8000MHz)	060-031-9-002	LA-265		
L32	RF Choke (470uH)	041-088-9-004	LZ-012		
L33	RF Choke (100uH)	041-087-9-002	LZ-012		
L35	Antenna Matching	044-043-9-008	LE-051		
L36	54MHz Trap	041-088-9-001	LC-019	CB305	
L37	Pi Filter (27MHz)	044-043-9-008	LE-051		
L38	Loading Final (27MHz)	041-088-9-001	LC-019	CB305	
L39	RF Choke	044-053-9-003	LD-098		
L42	RF Choke	044-053-9-003	LD-098		
L44	RF Choke	044-053-9-002	LD-096		
L45	Predriver (27MHz)	060-030-9-008	LA-254		
L46	Predriver (27MHz)	060-030-9-006	LA-220		
L47	XMT Mixer (34MHz)	060-025-9-008	LA-160		
L48	XMT Mixer (7.8MHz)	060-030-9-005	LA-219		
L50	RF Choke (470uH)	041-088-9-004	LZ-012		
L57	RF Choke				
L58	RF Choke				
L59	Synthesizer Oscillator (34.7665MHz)				
L60	RF Choke				
L403	RF Choke	044-048-9-002	LD-089		

COBRA MODEL 148GTL

PARTS LIST AND DESCRIPTION (CONTINUED)

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

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000~)	MFGR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T1	2.6A	.194	2.25mH	046-023-9-001 TF-151(1)			(1) Number on unit.

SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		MFGR. PART No.	QUAM PART No.	
SP401	3 1/2" PM, 8 Ohms	580-027-9-001	3A05Z8	

FUSE DEVICES

ITEM No.	DESCRIPTION	REPLACEMENT DATA					
		PART No.		BUSS PART No.		LITTELFUSE PART No.	
		DEVICE	HOLDER	DEVICE	HOLDER	DEVICE	HOLDER
F401	4A Quick Acting	194-005-9-001		AGC4	HDJ	311004	150145

MICROPHONE

ITEM No.	REPLACEMENT DATA				CONNECTION DATA						
	MFGR. PART No.	GC PART No.	GC NOISE CANCEL	GC POWER	GC CONNECTOR	GC Red	GC Shield	GC Yellow	GC Blue	GC White	GC Black
MIC	562-024-9-001	18-032	18-034	18-010		1	2	5	3	NC	4

MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
D401	LED	158-014-9-001	Channel Indicator Readout (Each segment 1.90V @ 6.6mA)
D402a	LED	158-020-9-001	Receive Indicator (2.16V @ 15.3mA)
D402b	LED	158-020-9-001	Transmit Indicator (1.89V @ 6.2mA)
FT1	Filter	143-005-9-002	455KHz
FT2	Filter	143-006-9-002	7.8MHz
FT3	Filter	143-010-9-001	7.8005MHz
J401	Jack	773-086-9-001	PA
J402	Jack	773-086-9-001	Extension
J403	Jack	762-020-9-001	DC Power
J404	Jack	773-092-9-001	Microphone
J405	Jack	772-036-9-001	Antenna
L34	Ferrite Bead	044-043-9-006	
L40	Ferrite Bead	044-048-9-003	
L41	Ferrite Bead	044-053-9-004	
L43	Ferrite Bead	044-048-9-003	
L49	Ferrite Bead	763-084-9-001	
L51	Ferrite Bead	763-084-9-001	
L52	Ferrite Bead	763-084-9-001	
L53	Ferrite Bead	763-084-9-001	
L401	Ferrite Bead	044-043-9-002	
L402	Ferrite Bead	044-043-9-002	
L404	Ferrite Bead	763-084-9-001	
L405	Ferrite Bead	763-084-9-001	
M401	Meter	320-099-9-001	S/R/F/SWR
PL401	Lamp		Meter
S401	Switch	083-241-9-002	Channel Selector
S402	Switch		Power On/Off (Part of Volume Control)
S403	Switch	083-241-9-001	USB/AM/LSB
S404	Switch	084-064-9-001	PA/CB
S405	Switch	084-064-9-002	Off/NB/NB-ANL
S406	Switch	084-064-9-001	Dim/Bright
S407	Switch	084-064-9-001	Tone, Low/Hi
S408	Switch	083-241-9-001	SWR/CAL/S-RF
X1	Crystal	135-026-9-002	7.3450MHz
X2	Crystal	133-014-9-001	10.240MHz
X3	Crystal	135-026-9-003	11.3258MHz
X4	Crystal	135-026-9-001	7.8MHz
	Printed Circuit Board	302-337-9-001	Main
	Printed Circuit Board	302-338-9-001	Channel Selector Switch
	Printed Circuit Board	302-339-9-001	Channel Display
	Printed Circuit Board	302-312-9-001	Microphone

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

ITEM	PART No.	ITEM	PART No.
Case, Bottom	272-134-9-002	Knob, RF Gain	271-059-9-001
Case, Top	272-134-9-001	Knob, SWR CAL	751-147-9-002
Case, Holder	272-134-9-003	Knob, S-RF/CAL/SWR	751-095-9-002
Holder, LED Display, Rear	753-009-9-002	Knob, LSB/AM/USB	751-095-9-002
Knob, Channel Selector	751-151-9-001	Knob, Voicelock	751-095-9-002
Knob, Volume	271-059-9-001	Knob, Dynamike	751-095-9-002
Knob, Squelch	751-147-9-002	Panel, Front	255-154-9-001