

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 8193

MANUFACTURER'S SPECIFICATIONS

GENERAL

Number of channels	40 (AM, USB & LSB)
Operating Voltage	117V AC or 1.8V DC $\pm$ Ground
Frequency Range	26.965 to 27.405 MHz
Microphone	Dynamic, with plug-in connector, 500 Ω
Speaker	92 mm (3-1/2 inch.) round, dynamic, 8 Ω
Antenna Impedance	50 Ω
Dimensions (W x H x L)	360 x 140 x 270 mm (14-3/16 x 5-1/2 x 10-5/8 inch)
Weight	7.3 kg (16 lbs.)

RECEIVER

Certification	Part 15, Sub-Part C
Sensitivity	0.5 μ V for 10 dB $\frac{(s+n)}{n}$ (AM) 0.2 μ V for 10 dB $\frac{(s+n)}{n}$ (SSB)
Selectivity	5 kHz @ -6 dB (AM) 2.2 kHz @ -6 dB (SSB)
Adjacent Channel Rejection	-60 dB minimum
Clarifier Range	$\pm$ 1 kHz minimum
Spurious Rejection (Major Image)	50 dB minimum
Squelch Sensitivity (Threshold)	0.5 μ V minimum
Audio Output	3 Watts

TRANSMITTER

Compliance	FFC Data 8193, Part 95
Power Output	4 W, AM (maximum legal power) 12 W PEP, SSB (maximum legal power)
Harmonic Suppression	-60 dB minimum
Carrier Suppression	-40 dB minimum
Modulation	85% minimum guaranteed size wave (typically 95%)

Courtesy of the Manufacturer

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

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PAGE MODEL 8193

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 R526 for 13.80V at TP10.

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:

T1 thru T5, T8, T9, L10 9440

L2, L3 9300,9302,9304

L4, L12 8606,9091,9440

CT1 thru CT6 5000,8276,9089

SYNTHESIZER ALIGNMENT

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Input of frequency counter thru 10pF to TP3 (Q8 Emitter).	Ch. 19, AM Clarifier Midrange	CT1	Adjust for 10.240MHz.
Input of frequency counter thru 10pF to TP3 (Q8 Emitter).	Ch. 19, USB Clarifier Midrange	CT3	Adjust for 10.2415MHz.
Input of frequency counter thru 10pF to TP3 (Q8 Emitter).	Ch. 19, LSB Clarifier Midrange	CT2	Adjust for 10.2385MHz.
Input of oscilloscope to TP7 (T5 Secondary).	Ch. 19, AM	T5	Adjust for maximum RF (550mV p-p typical). (See Figure 1.)
Input of frequency counter thru 10pF to TP4 (Q9 Emitter).	Ch. 19, LSB	CT5	Adjust for 9.7875MHz.
Input of frequency counter thru 10pF to TP4 (Q9 Emitter).	Ch. 19, USB	CT4	Adjust for 9.7825MHz.
Input of DC meter to TP1 (Junction of R126 and R129).	Ch. 1, AM	L10	Adjust for 2.00 volts. Check for approximately 3.52 volts on channel 40.
Input of DC meter to TP1 (Junction of R126 and R129).	Ch. 1, AM, XMT		Check for 1.30 volts. Check for approximately 2.12 volts on channel 40.
Input of frequency counter thru 10pF to TP5 (L10 Secondary).	Ch. 1, AM		Check for 17.180MHz. Check all channels. (See Truth Chart for correct frequencies.)
Input of frequency counter thru 10pF to TP6 (IC8 Pin 9).	Ch. 1, AM, XMT		Check for 26.965MHz. Check all channels. (See Truth Chart for correct frequencies.)

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, Squelch MINIMUM, Clarifier Midrange, ANL Off, NB Off.

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Output of signal generator thru .01uF to TP8 (Q5 Base). 9.8MHz, 1000Hz @ 30% modulation.	Ch. 19, AM	T4	Adjust for maximum output.
Output of signal generator to antenna input. 27.185MHz, 1000Hz @ 30% modulation.	Ch. 19, AM	T1,T2,T3	Adjust for maximum output. Readjust T1 and T2 for maximum.

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, Squelch MINIMUM, Clarifier Midrange, ANL Off, NB Off.

TEST EQUIPMENT	TRANSCIVER	ADJUST	REMARKS
Output of signal generator to antenna input. 27.185MHz, 1000Hz @ 30% modulation. Output 500uV.	Ch. 19, AM Squelch Maximum	VR3	SQUELCH RANGE Adjust so squelch just breaks.
Output of signal generator to antenna input. 27.185MHz, 1000Hz @ 30% modulation. Output 100uV.	Ch. 19, AM	VR2	S METER Adjust for 9 on S 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	TRANSCIVER	ADJUST	REMARKS
Input of oscilloscope to TP9 (Q19 Base).	Ch. 19, AM, XMT	T8	Adjust for maximum RF output.
Input of RF wattmeter to antenna input.	Ch. 19, AM, XMT	T9,L4,L3,L2	Adjust for maximum RF output.
Input of RF wattmeter to antenna input.	Ch. 19, AM, XMT	L12	Adjust for 4.0 watts RF output maximum.

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	TRANSCIVER	ADJUST	REMARKS
Insert a 0-500mA DC meter at TP11 (Junction of L5 and C77).	Ch. 19, USB, XMT PWR Mic MINIMUM	VR14	FINAL BIAS Adjust for 80mA idle current.
Input of RF wattmeter to antenna input. Inject a 1000Hz, 10mV signal at Mic input.	Ch. 19, USB, XMT PWR Mic Maximum	VR11	SSB RF ALC Adjust for 12 watts RF output maximum.
Input of oscilloscope or modulation meter to antenna input. Inject a 1000Hz, 15mV signal at Mic input.	Ch. 19, AM, XMT PWR Mic Maximum	VR7	AM AMC Adjust for 100% modulation maximum. (See Figure 2.)
Input of RF wattmeter to antenna input.	Ch. 19, AM, XMT	VR9	RF METER Adjust so transmit power meter agrees with RF wattmeter.
Connect a 150-ohm, non-inductive, 5-watt dummy load to antenna connector.	Ch. 19, AM, XMT	CT6	SWR Adjust calibration control for CAL on calibration meter; adjust for 3 on SWR meter.

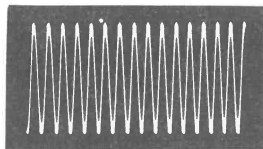


FIGURE 1

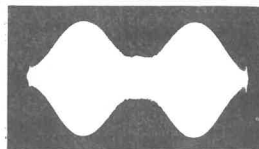
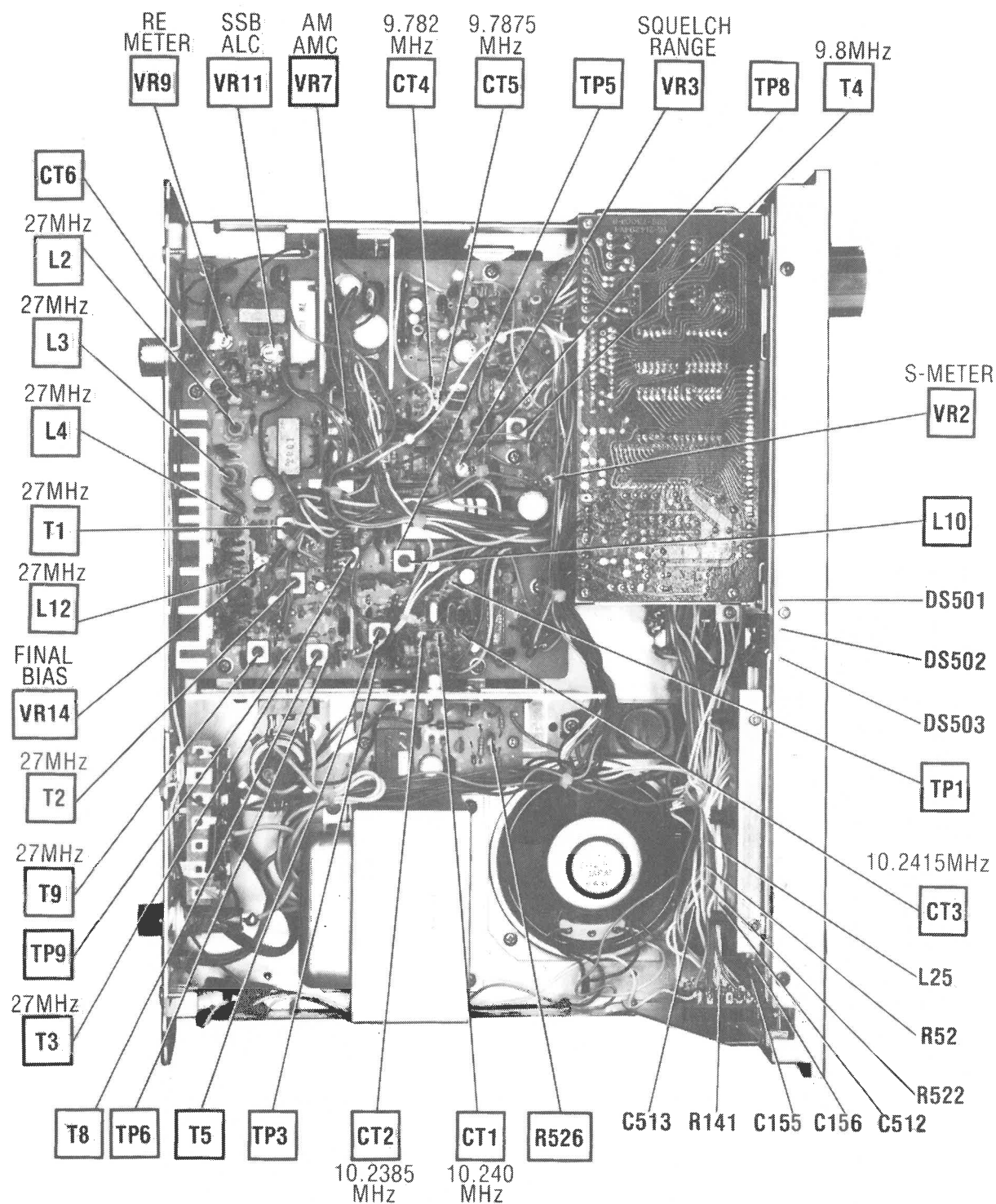


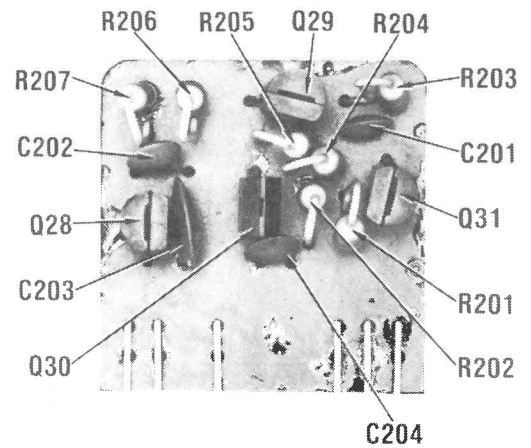
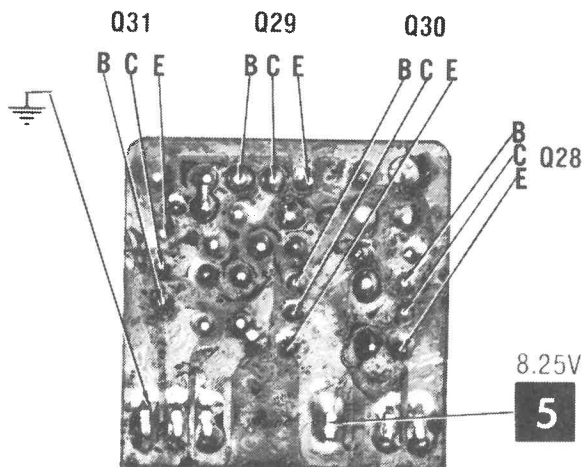
FIGURE 2

TRUTH CHART

C H A N N E L	0 = 0 Volts 1 = 5.84 Volts								VCO OUTPUT IN MHz AT TP5	VCO OUTPUT IN MHz AT TP6	
	PROGRAM DIVIDER										
	IC9 PINS										
	11	12	13	14	15	16					
1	0	0	0	0	0	0			17.180	26.965	
2	0	0	0	0	0	1			17.190	26.975	
3	0	0	0	0	1	0			17.200	26.985	
4	0	0	0	1	0	0			17.220	27.005	
5	0	0	0	1	0	1			17.230	27.015	
6	0	0	0	1	1	0			17.240	27.025	
7	0	0	0	1	1	1			17.250	27.035	
8	0	0	1	0	0	1			17.270	27.055	
9	0	0	1	0	1	0			17.280	27.065	
10	0	0	1	0	1	1			17.290	27.075	
11	0	0	1	1	0	0			17.300	27.085	
12	0	0	1	1	1	0			17.320	27.105	
13	0	0	1	1	1	1			17.330	27.115	
14	0	1	0	0	0	0			17.340	27.125	
15	0	1	0	0	0	1			17.350	27.135	
16	0	1	0	0	1	1			17.370	27.155	
17	0	1	0	1	0	0			17.380	27.165	
18	0	1	0	1	0	1			17.390	27.175	
19	0	1	0	1	1	0			17.400	27.185	
20	0	1	1	0	0	0			17.420	27.205	
21	0	1	1	0	0	1			17.430	27.215	
22	0	1	1	0	1	0			17.440	27.225	
23	0	1	1	1	0	1			17.470	27.255	
24	0	1	1	0	1	1			17.450	27.235	
25	0	1	1	1	0	0			17.460	27.245	
26	0	1	1	1	1	0			17.480	27.265	
27	0	1	1	1	1	1			17.490	27.275	
28	1	0	0	0	0	0			17.500	27.285	
29	1	0	0	0	0	1			17.510	27.295	
30	1	0	0	0	1	0			17.520	27.305	
31	1	0	0	0	1	1			17.530	27.315	
32	1	0	0	1	0	0			17.540	27.325	
33	1	0	0	1	0	1			17.550	27.335	
34	1	0	0	1	1	0			17.560	27.345	
35	1	0	0	1	1	1			17.570	27.355	
36	1	0	1	0	0	0			17.580	27.365	
37	1	0	1	0	0	1			17.590	27.375	
38	1	0	1	0	1	0			17.600	27.385	
39	1	0	1	0	1	1			17.610	27.395	
40	1	0	1	1	0	0			17.620	27.405	

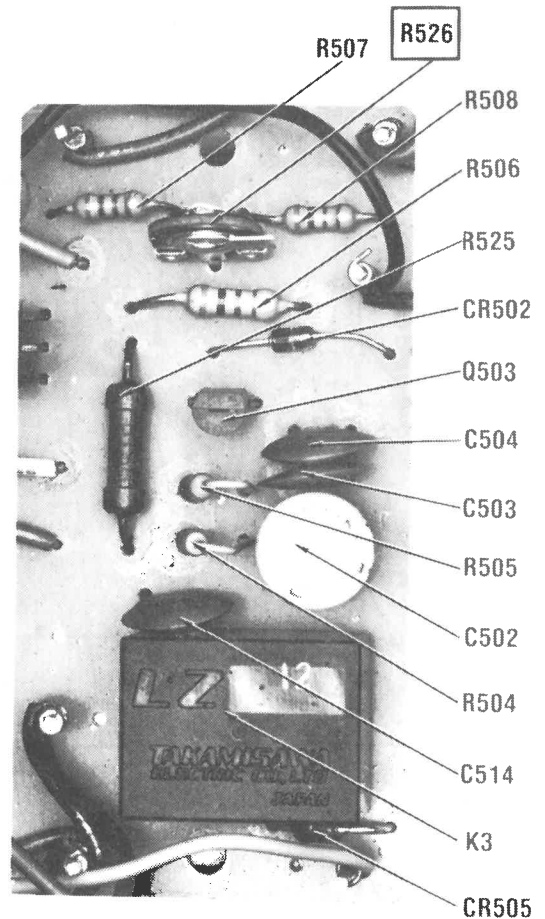
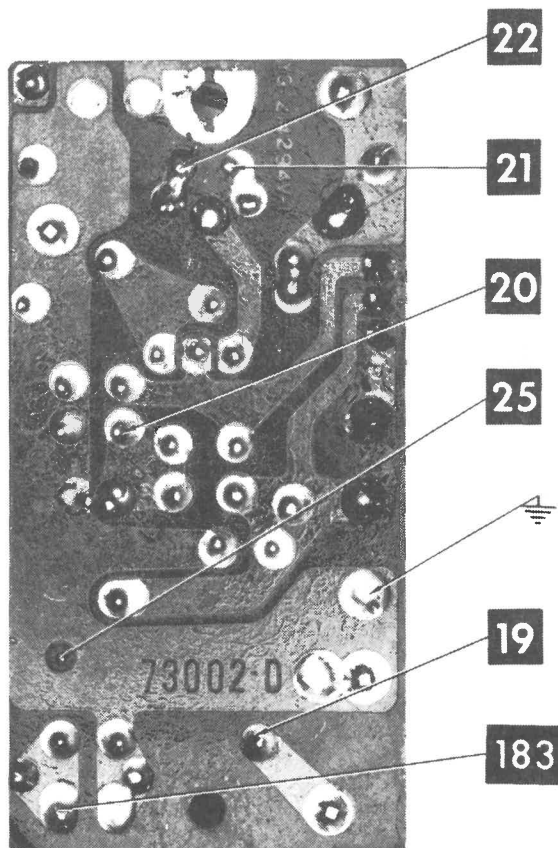


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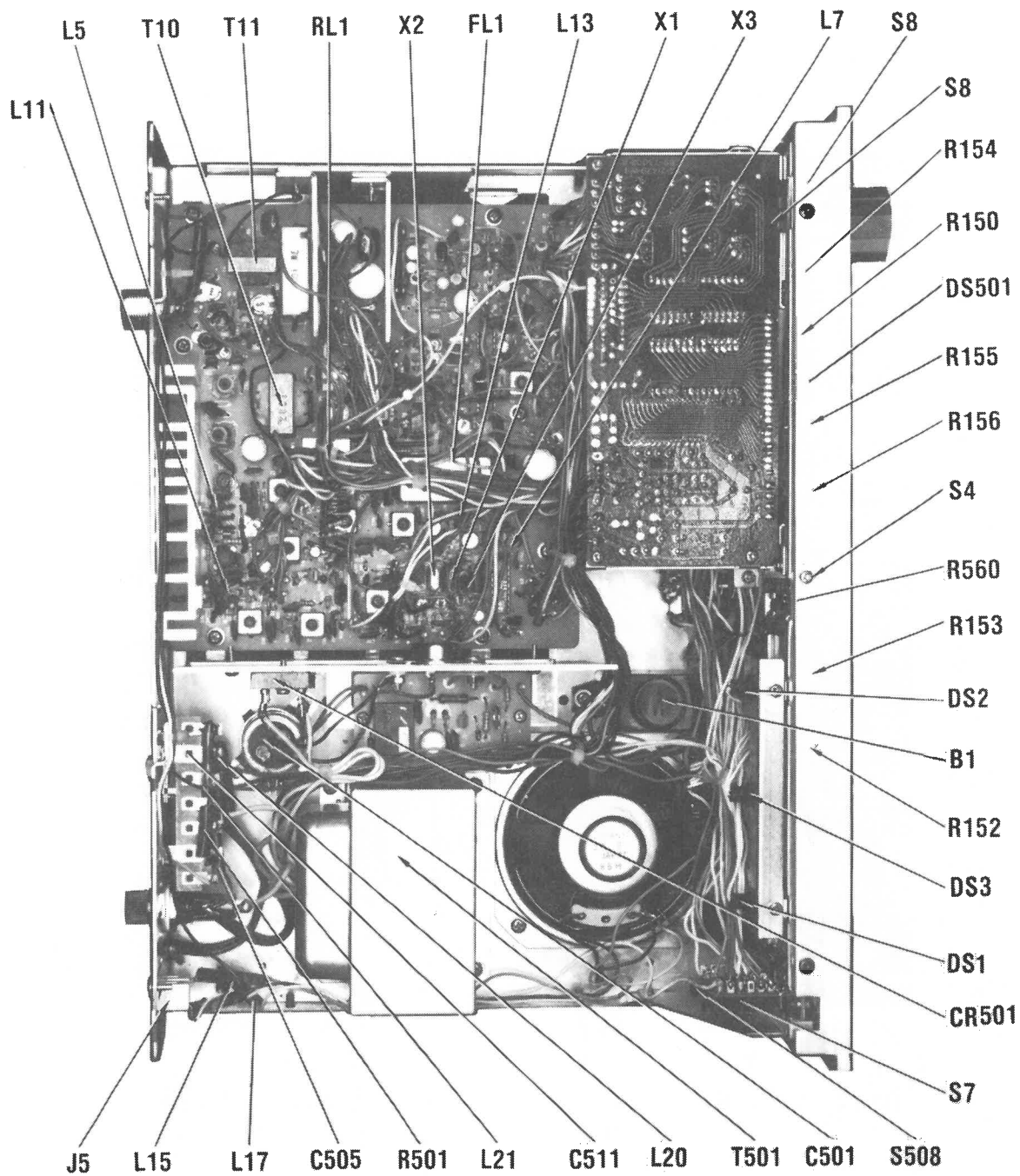


NOISE BLANKER BOARD

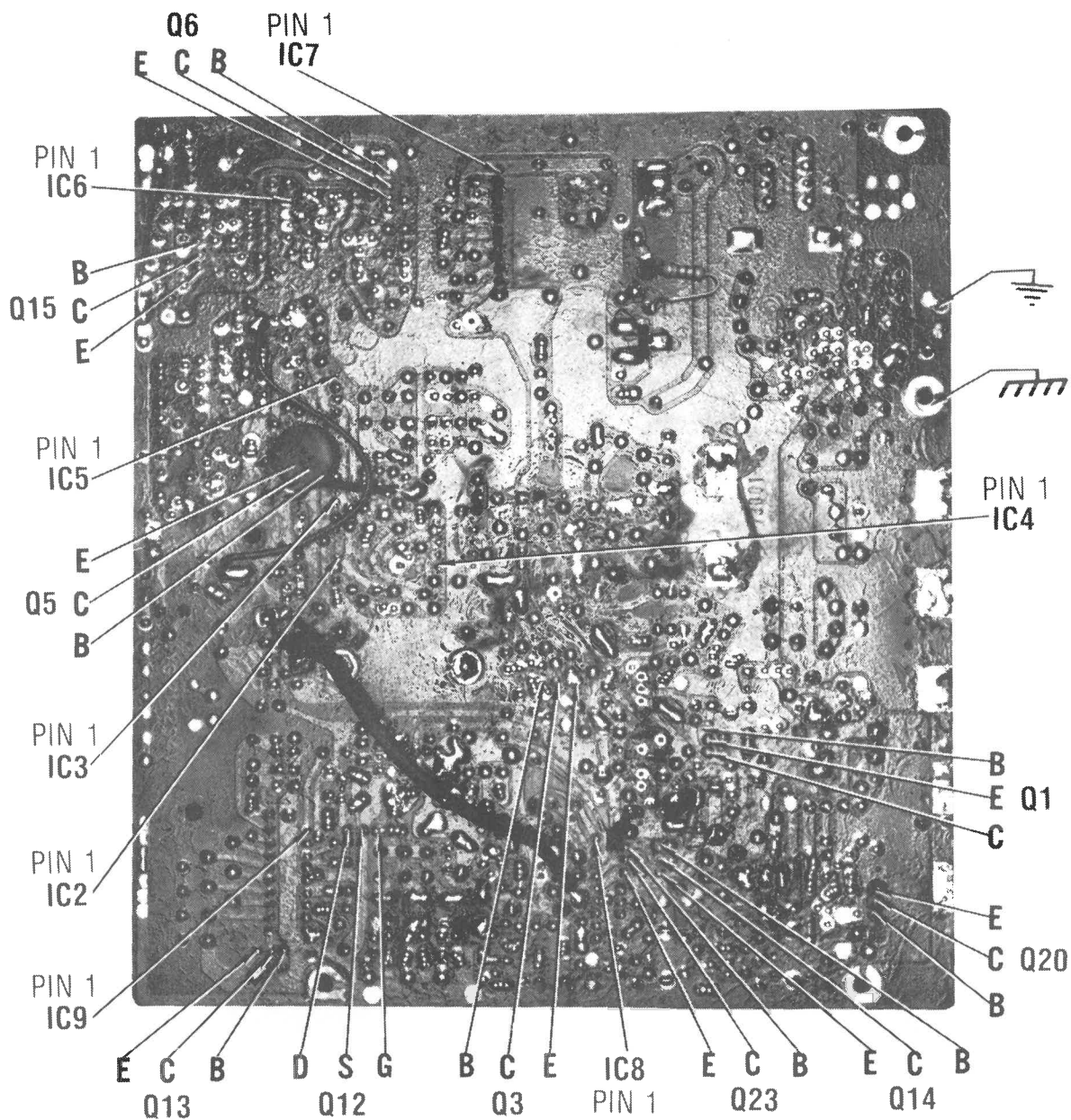
A Howard W. Sams **CIRCUITRACE®** Photo



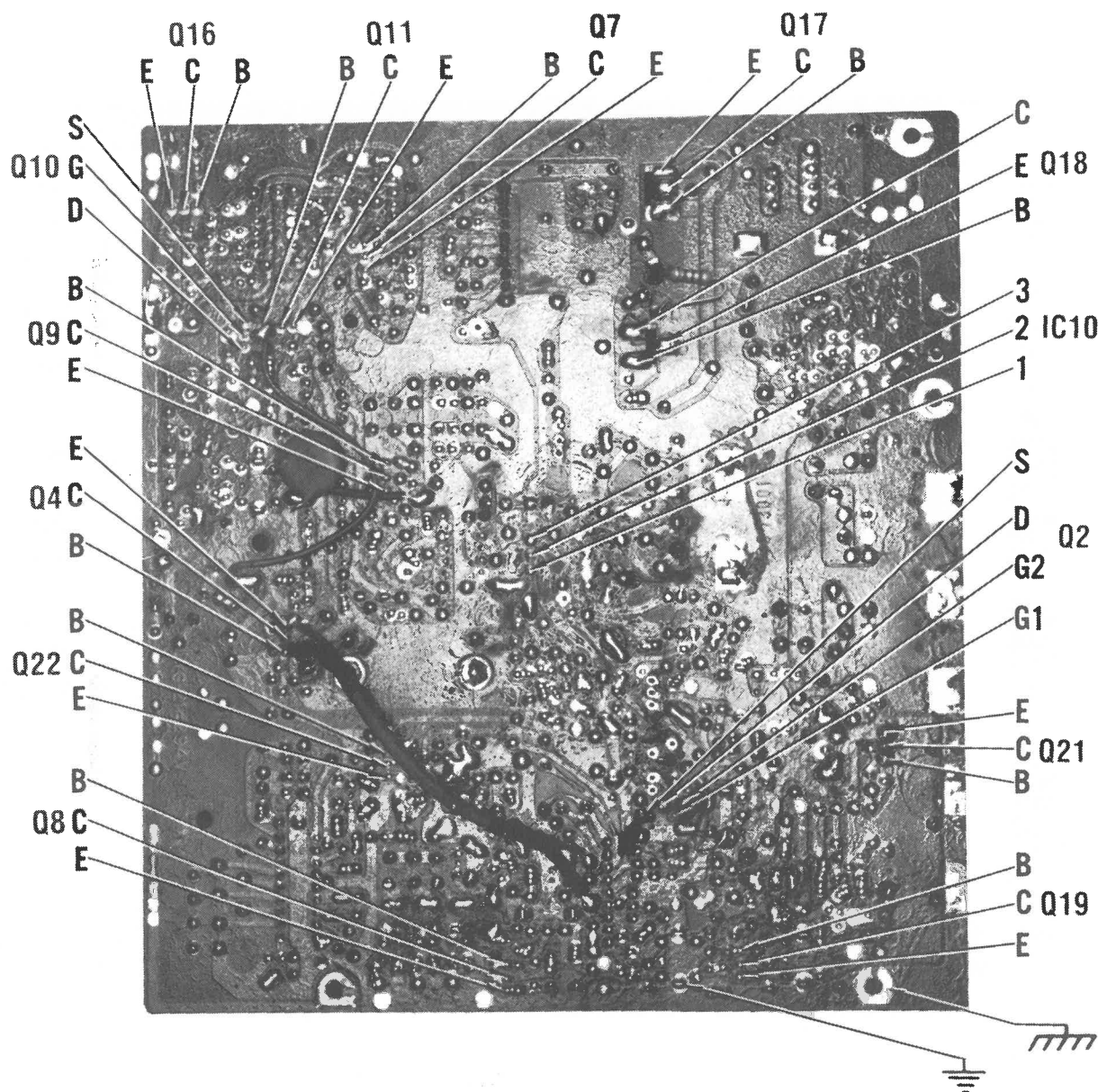
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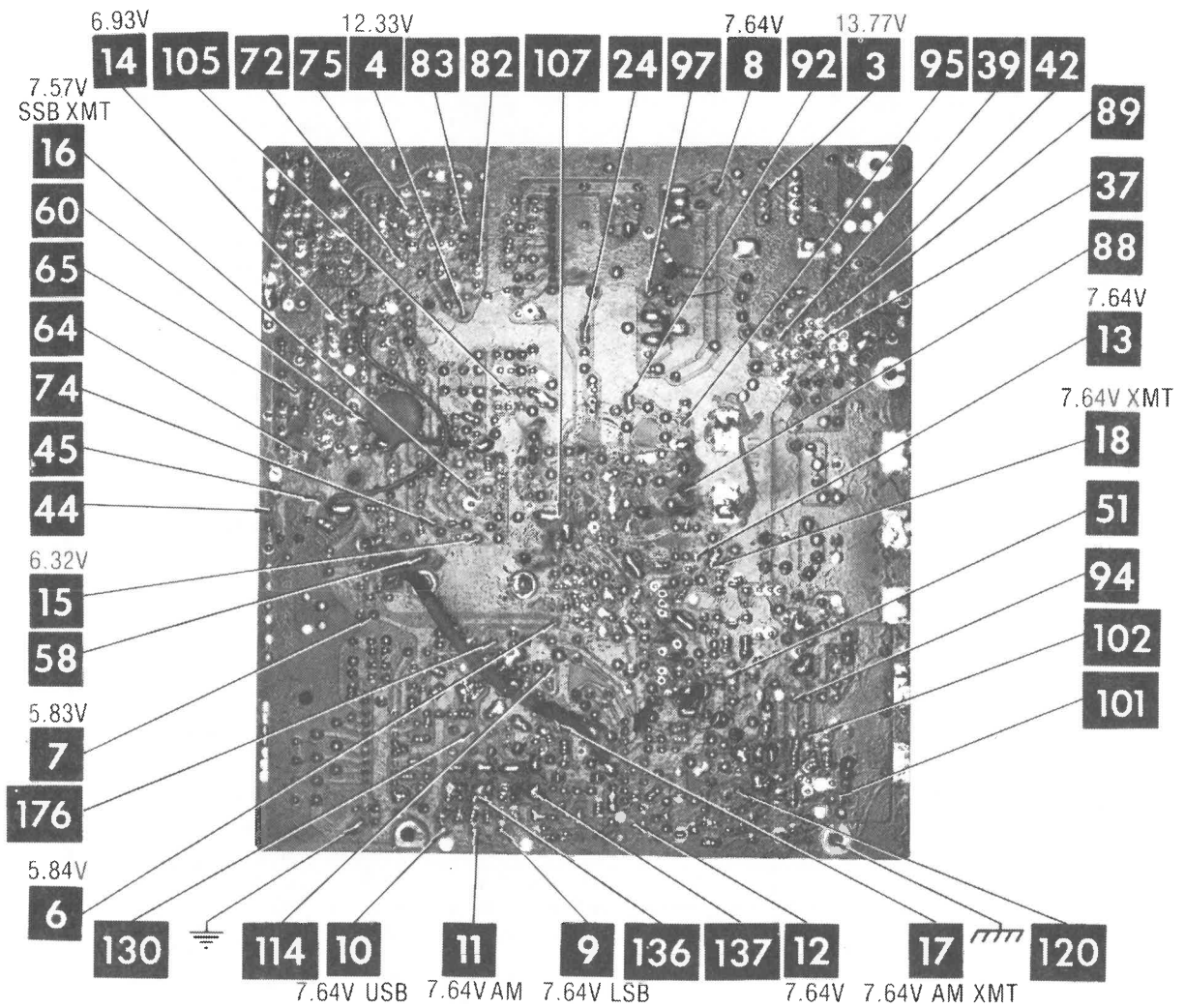
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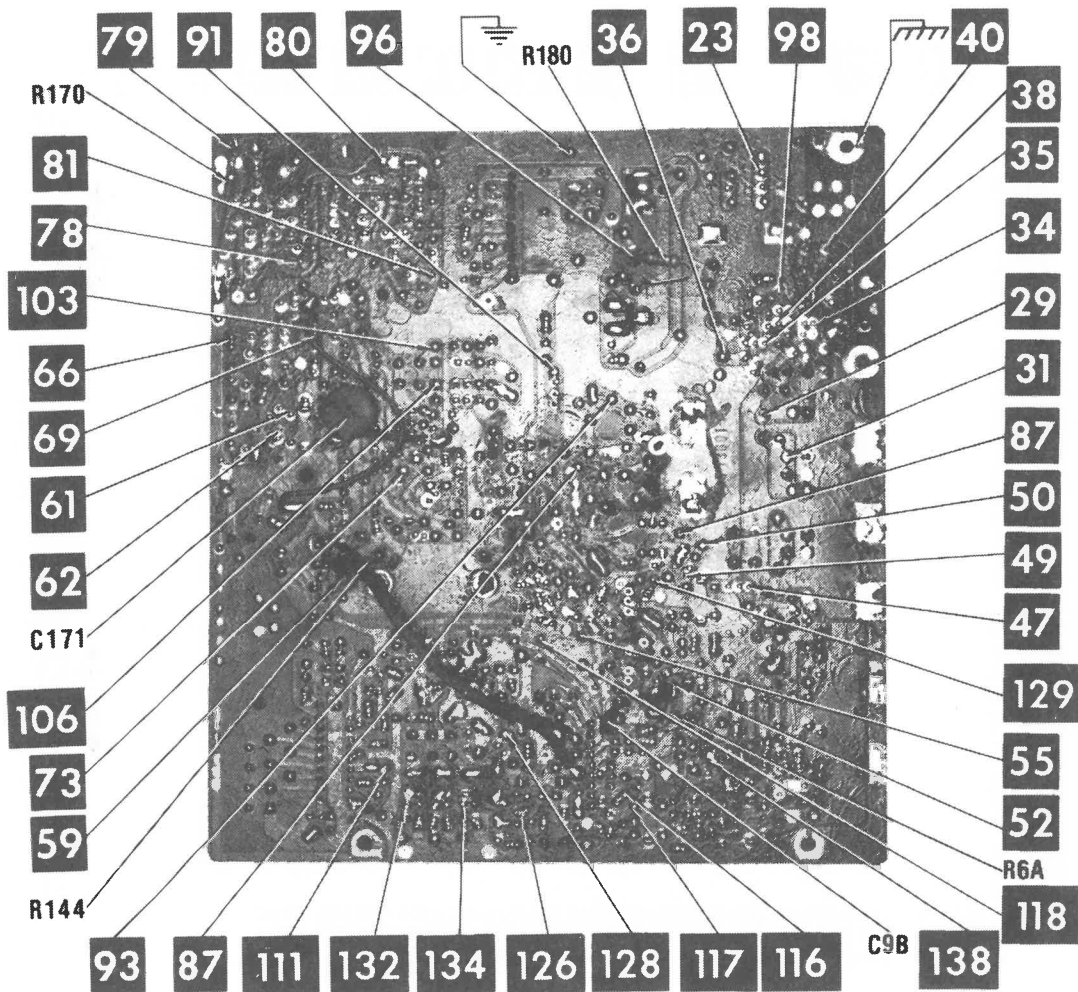
MAIN BOARD



MAIN BOARD

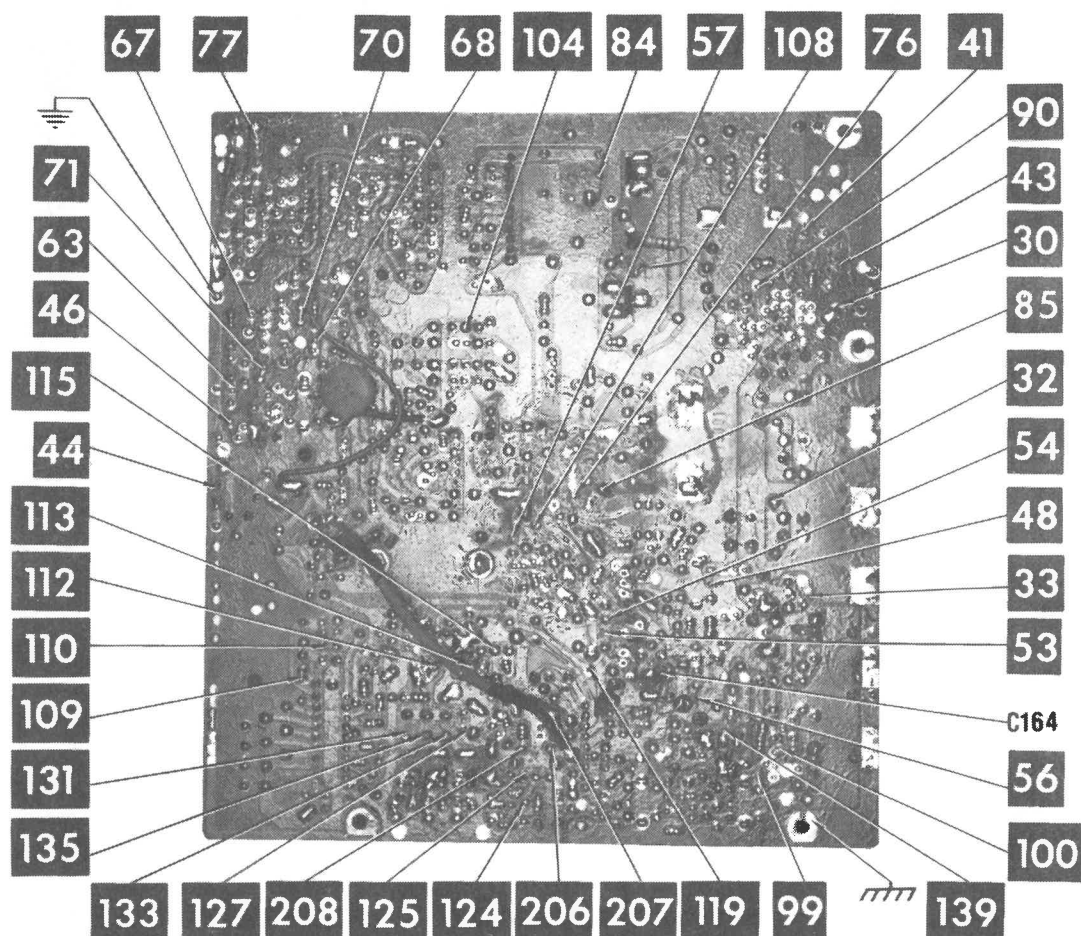


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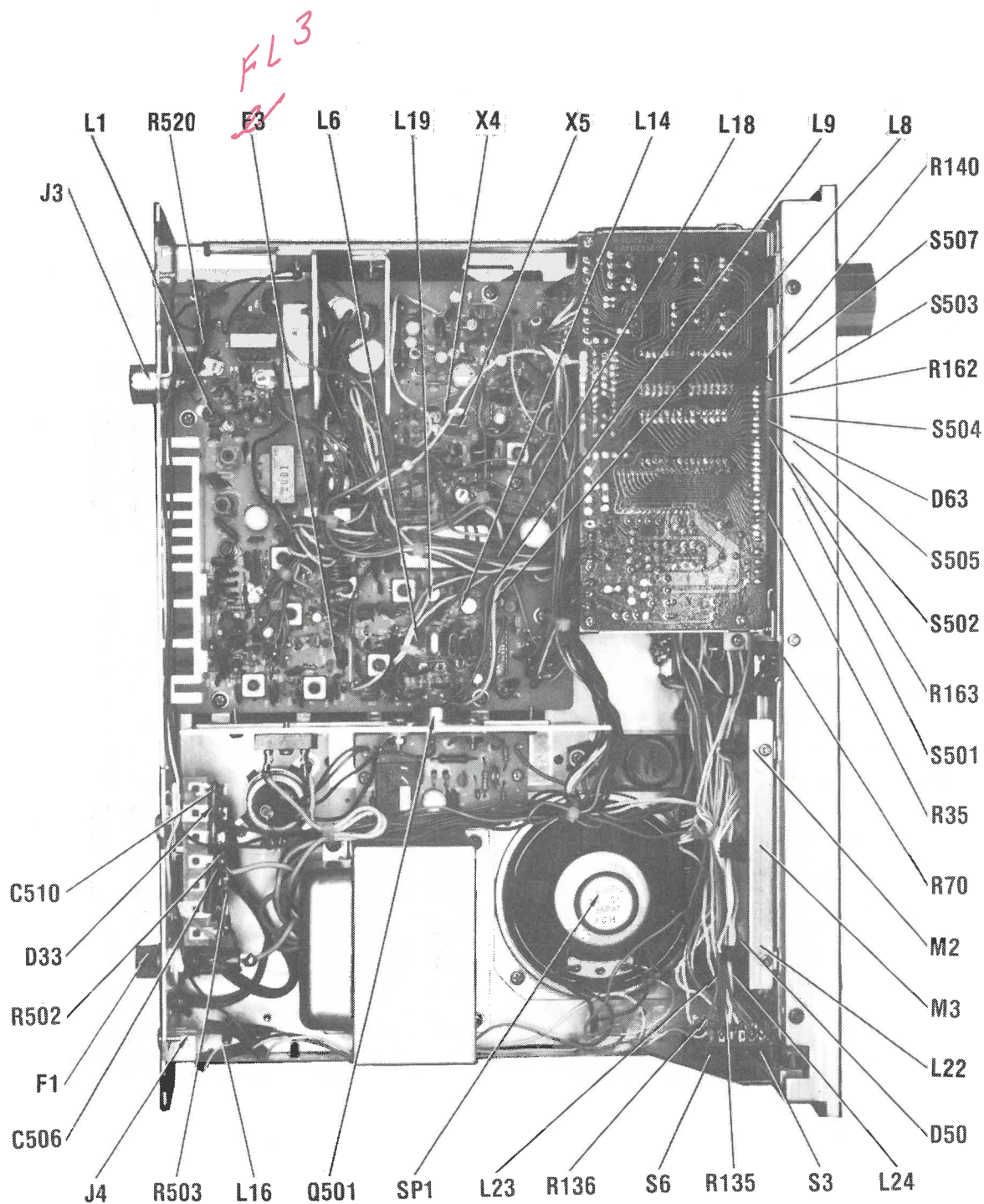


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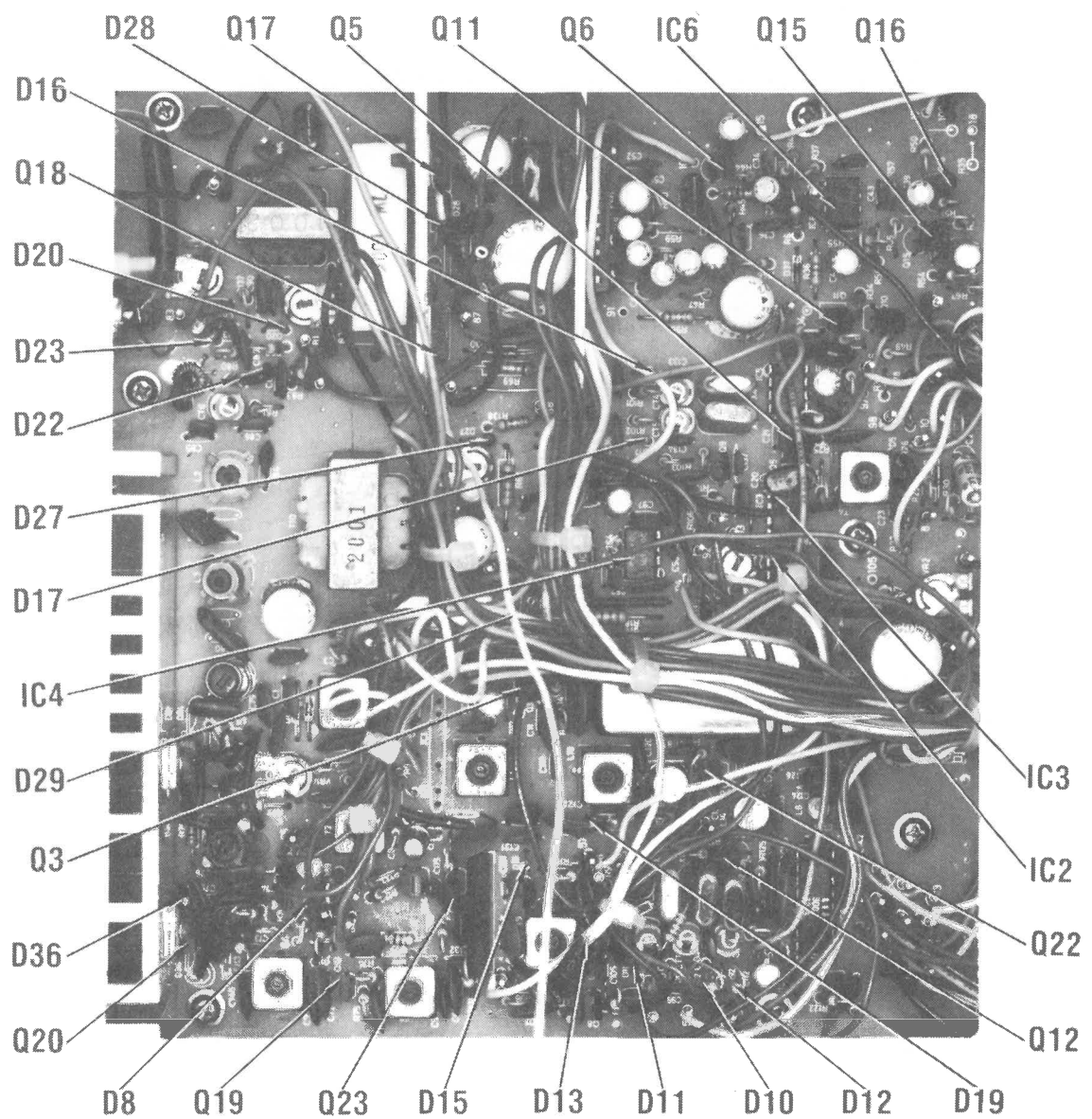
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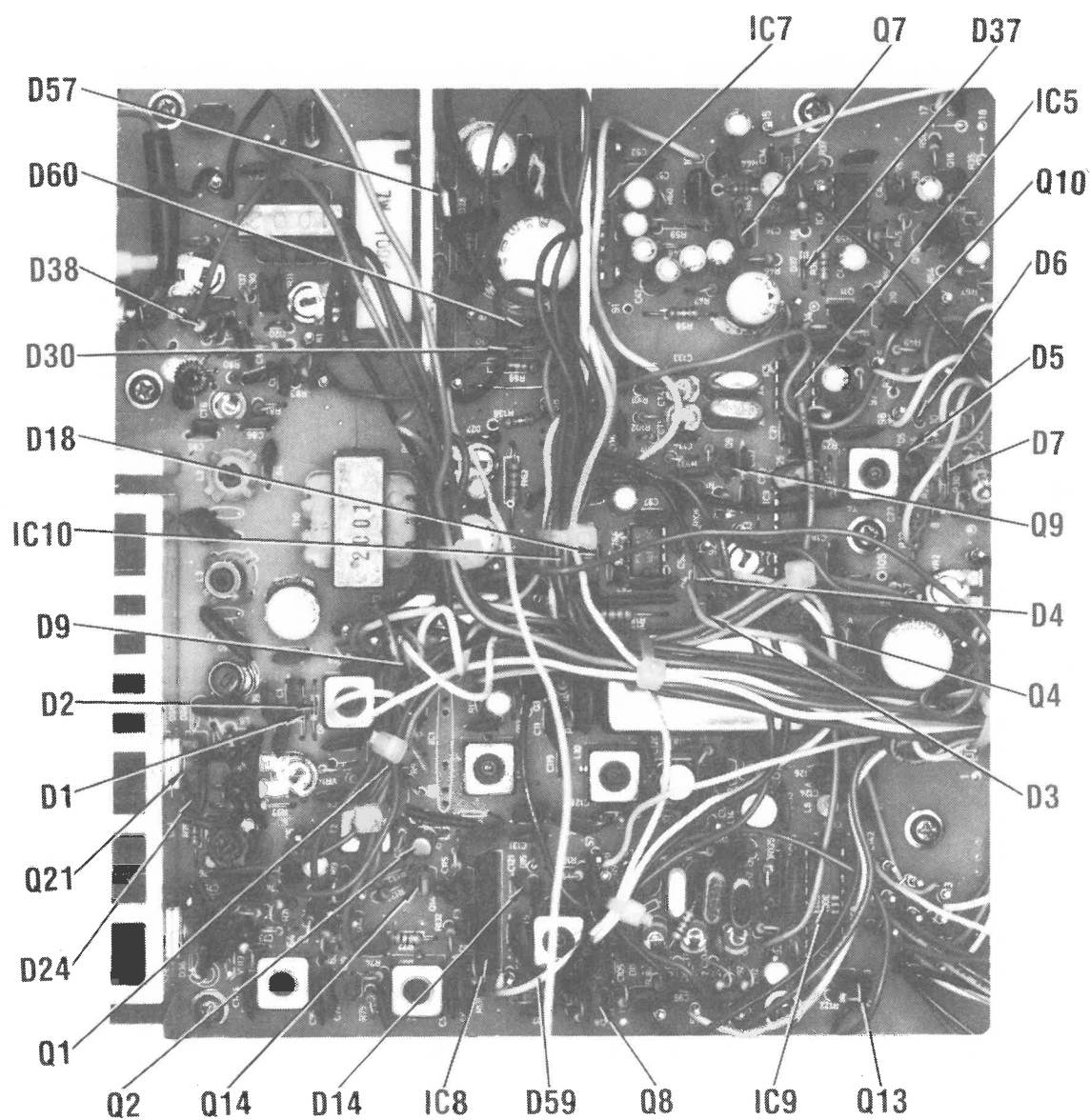
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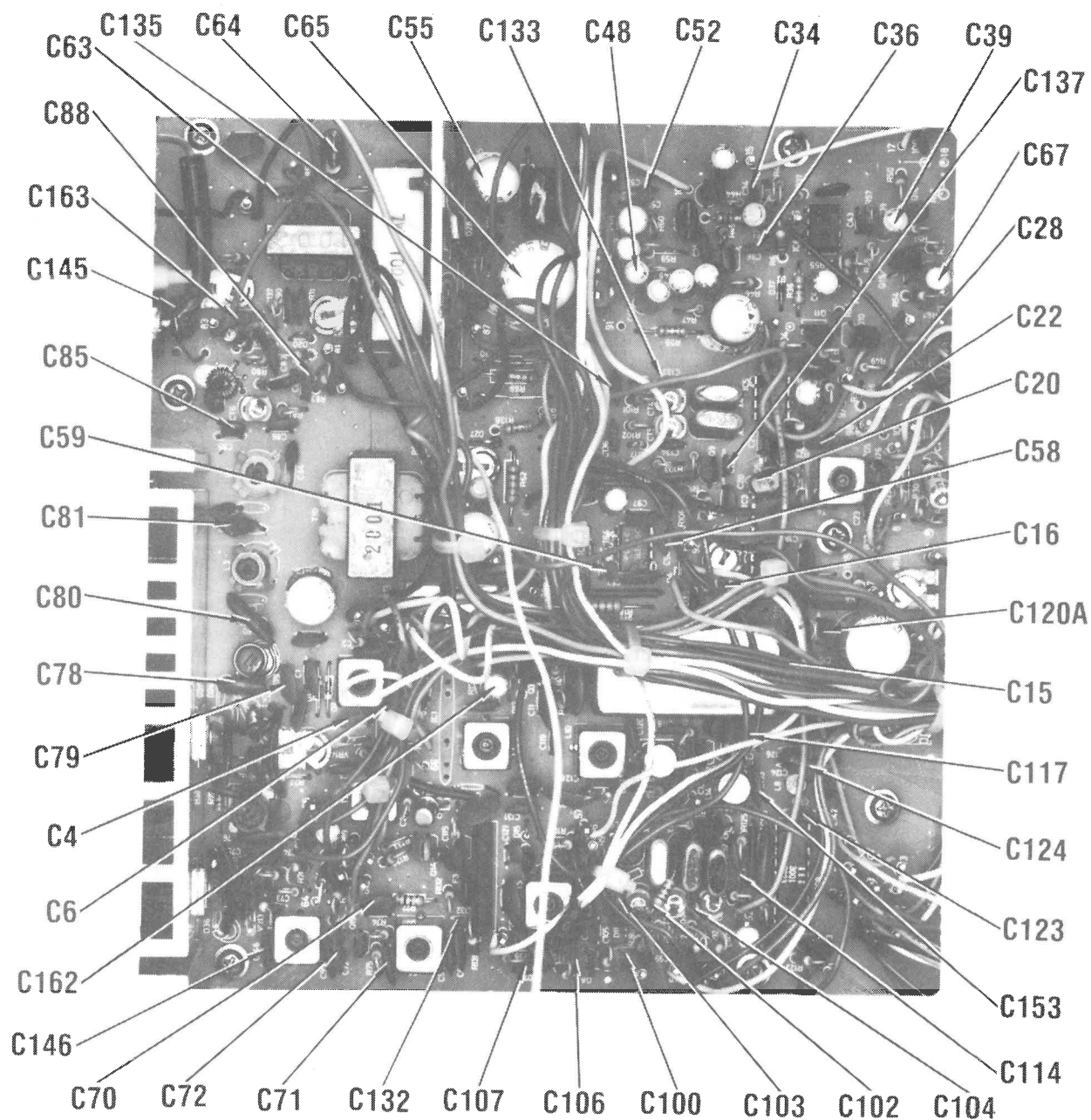
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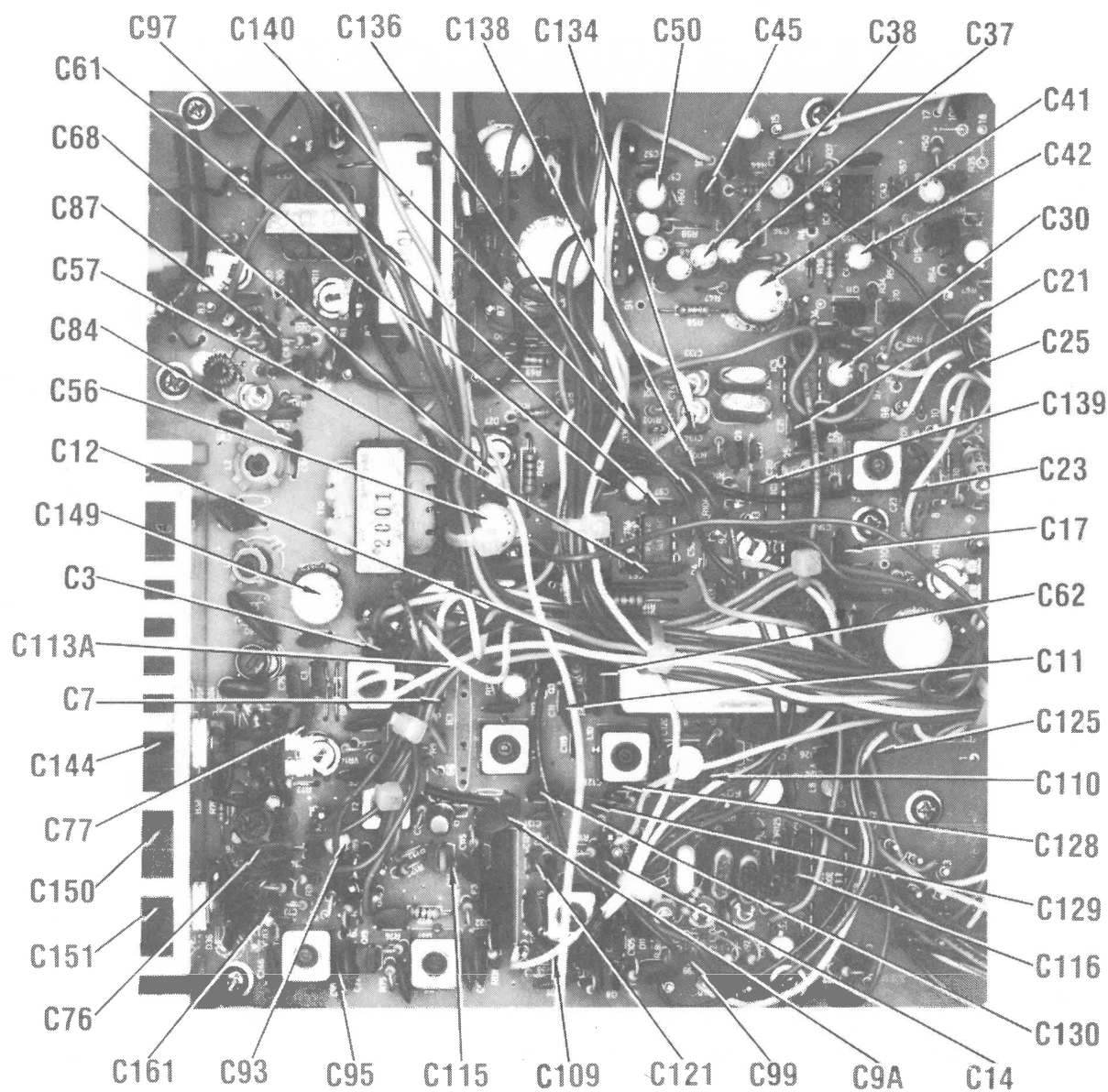
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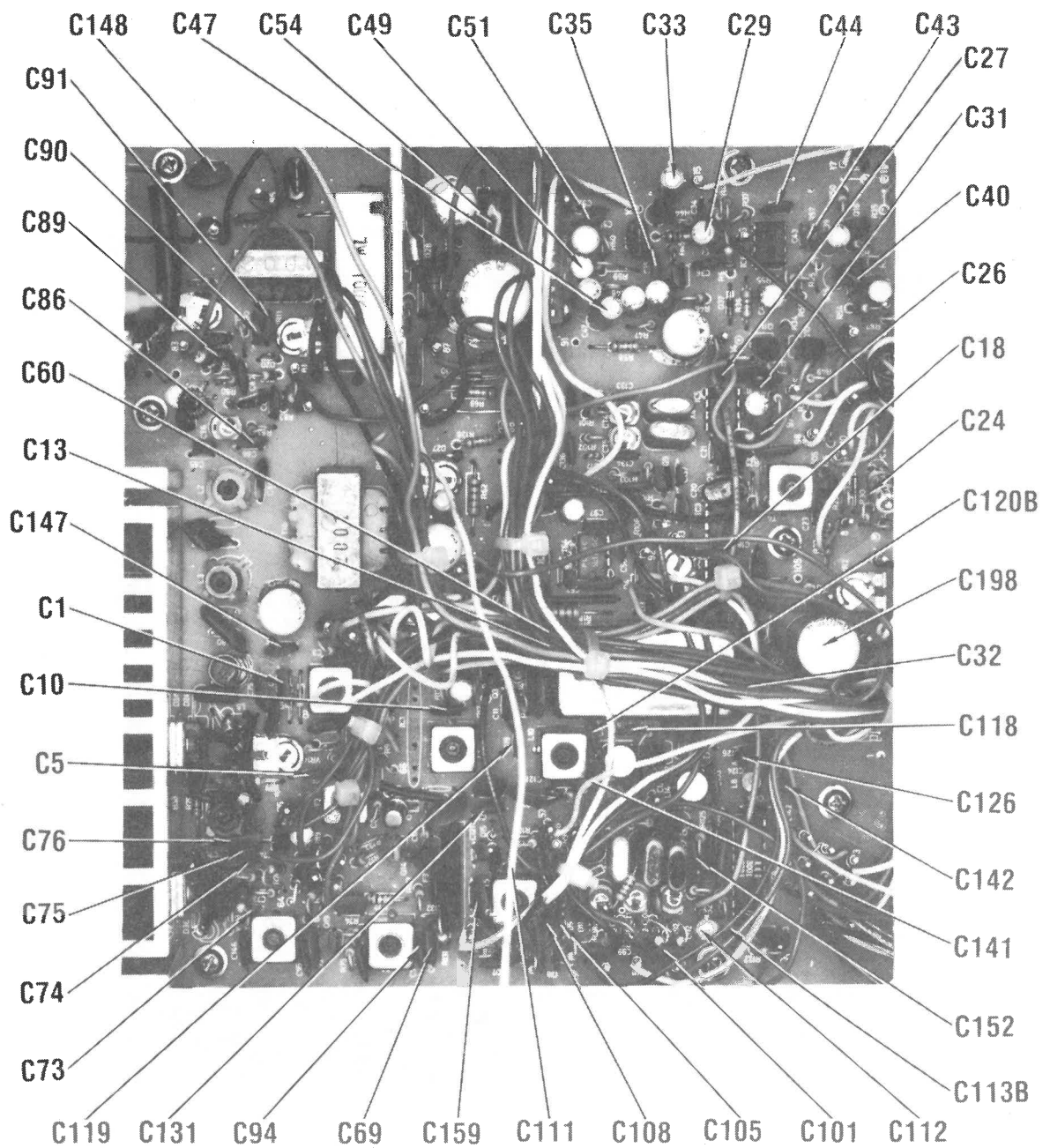
MA IN BOARD



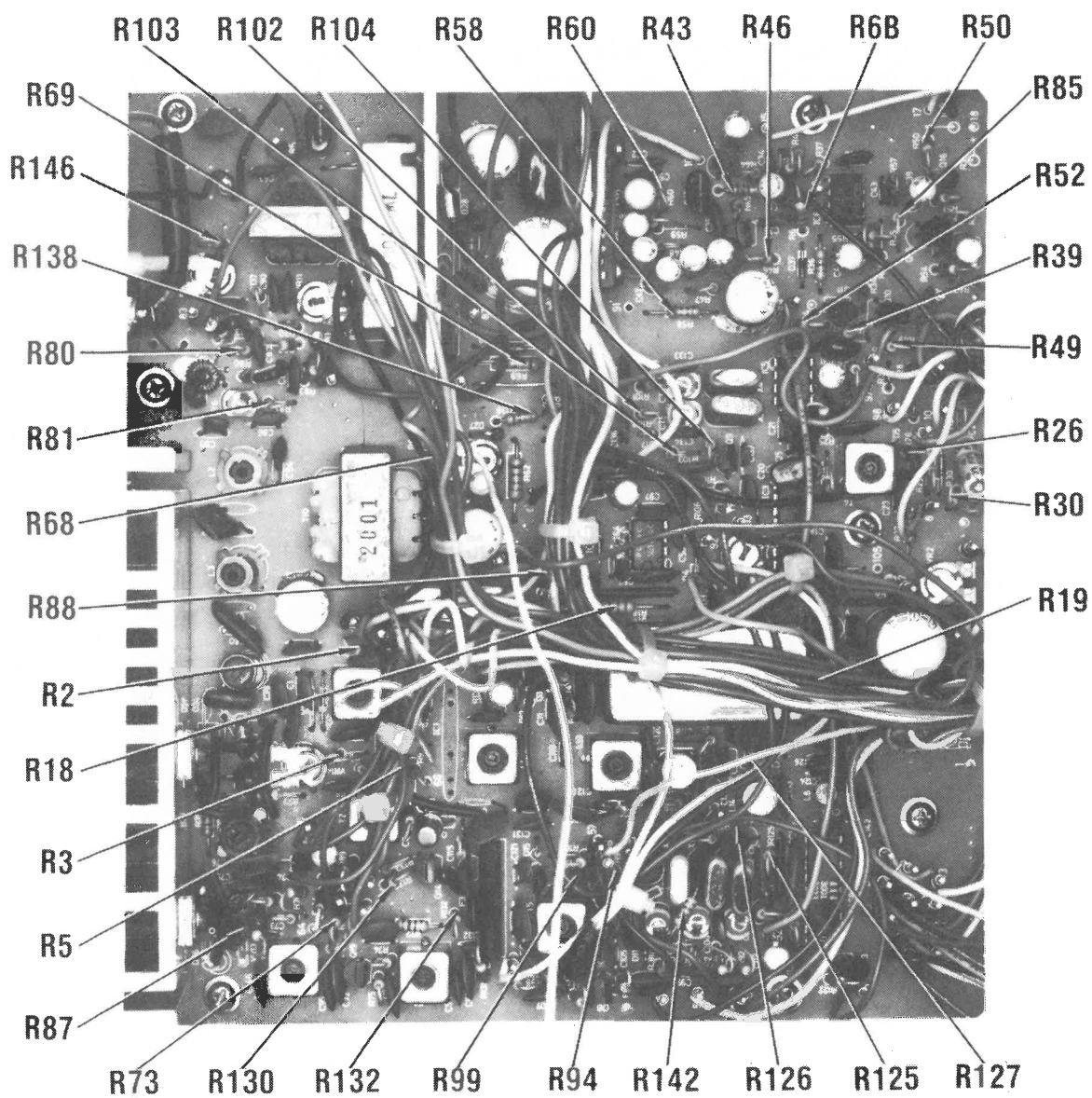
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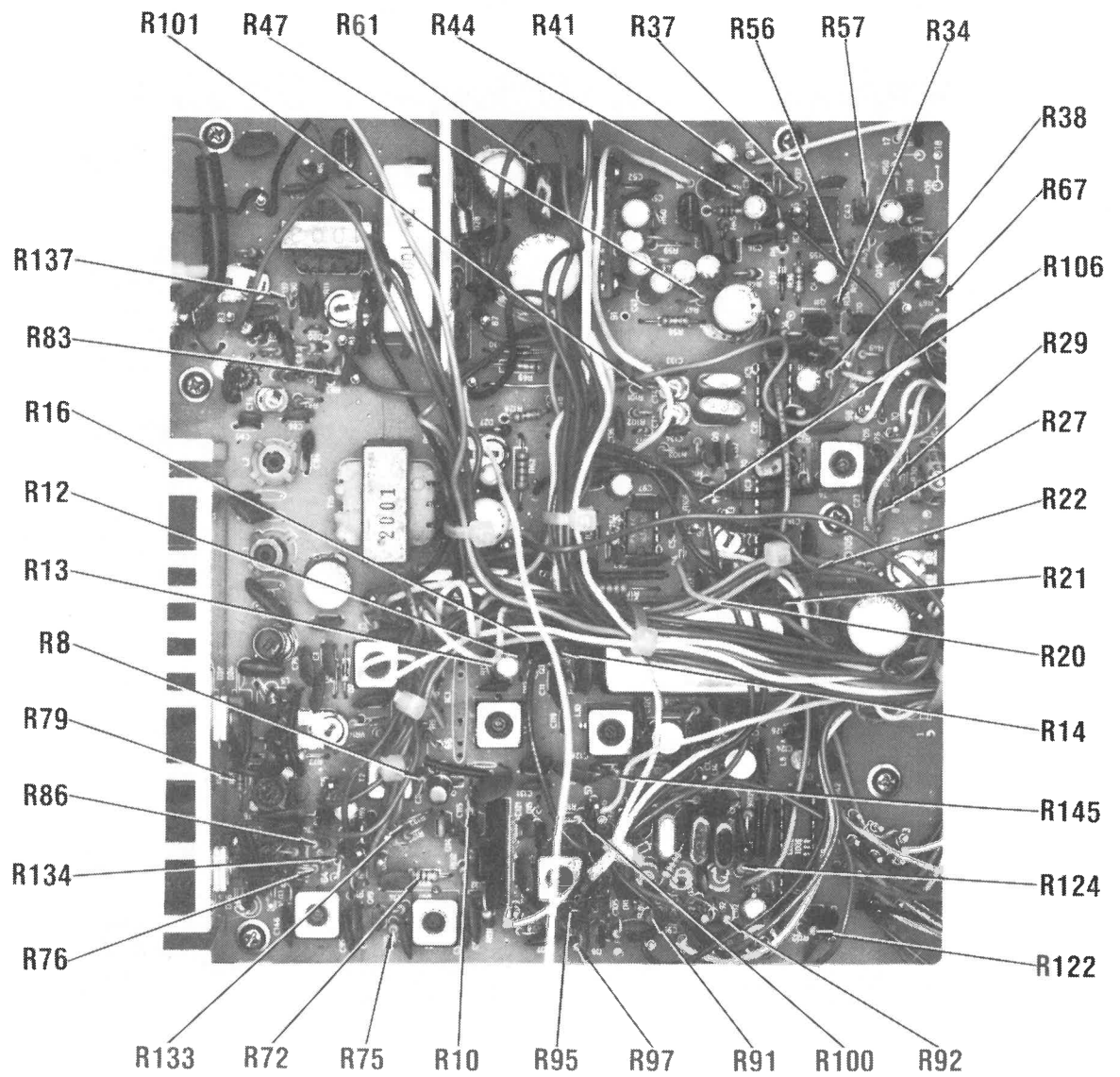
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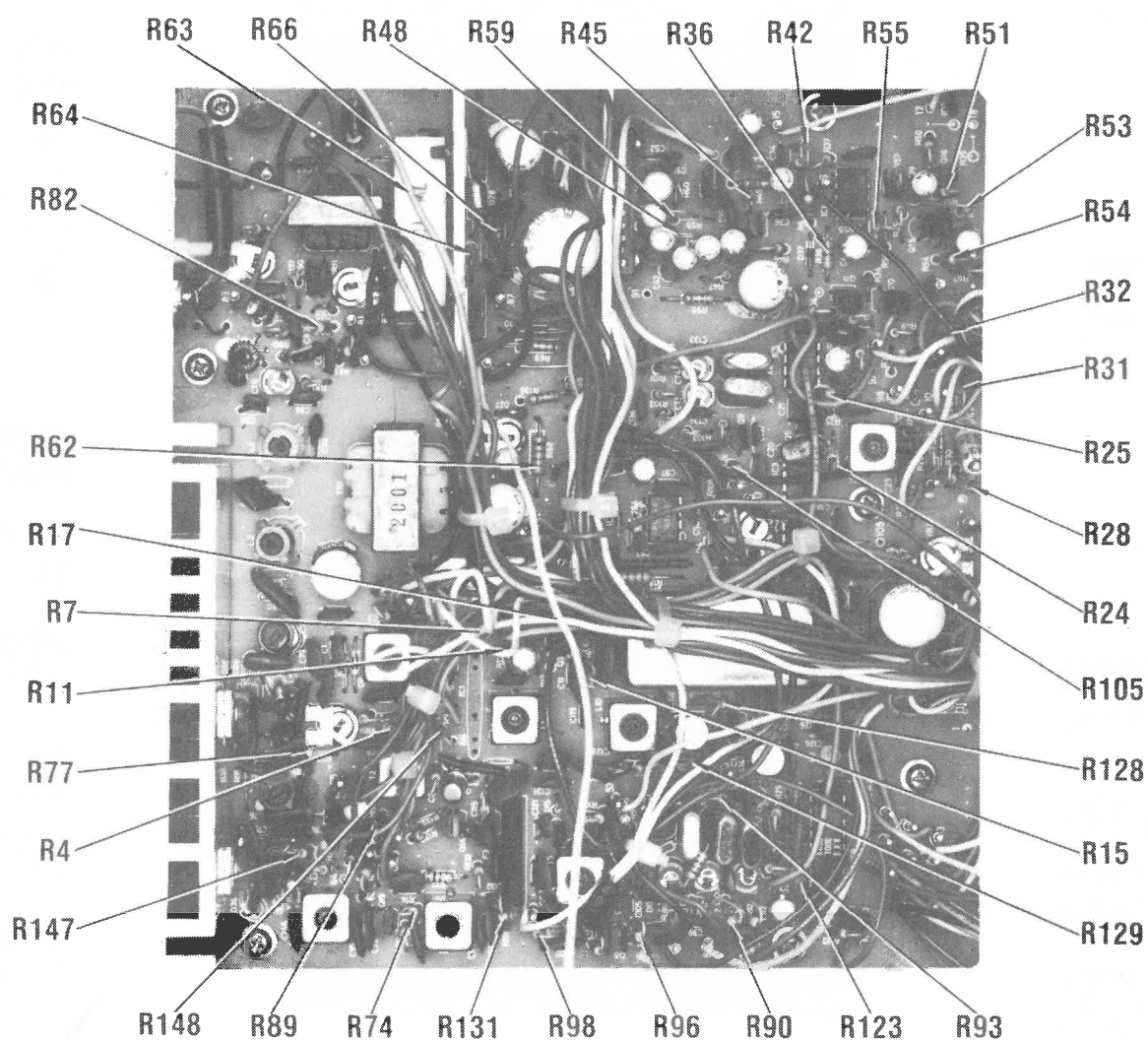
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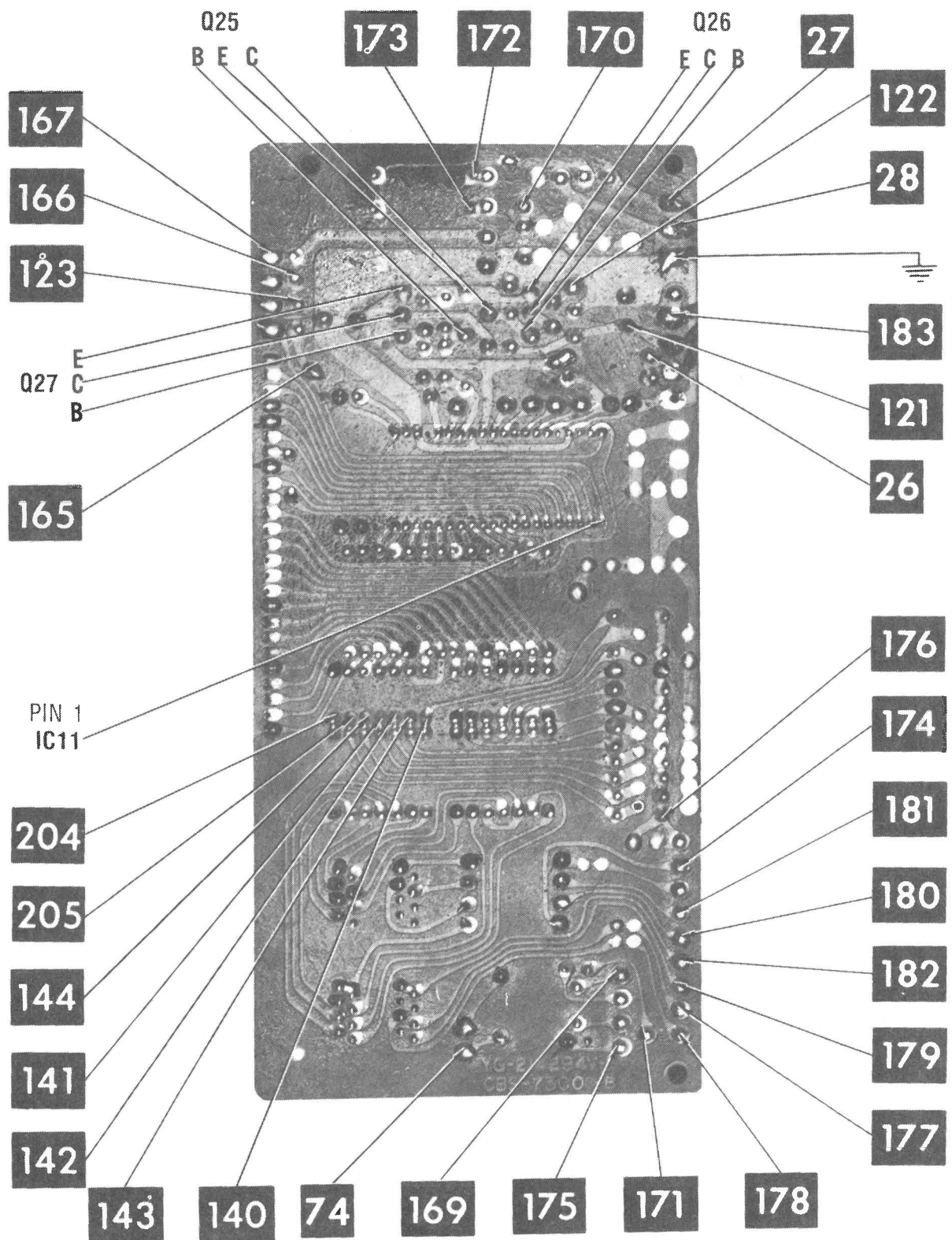
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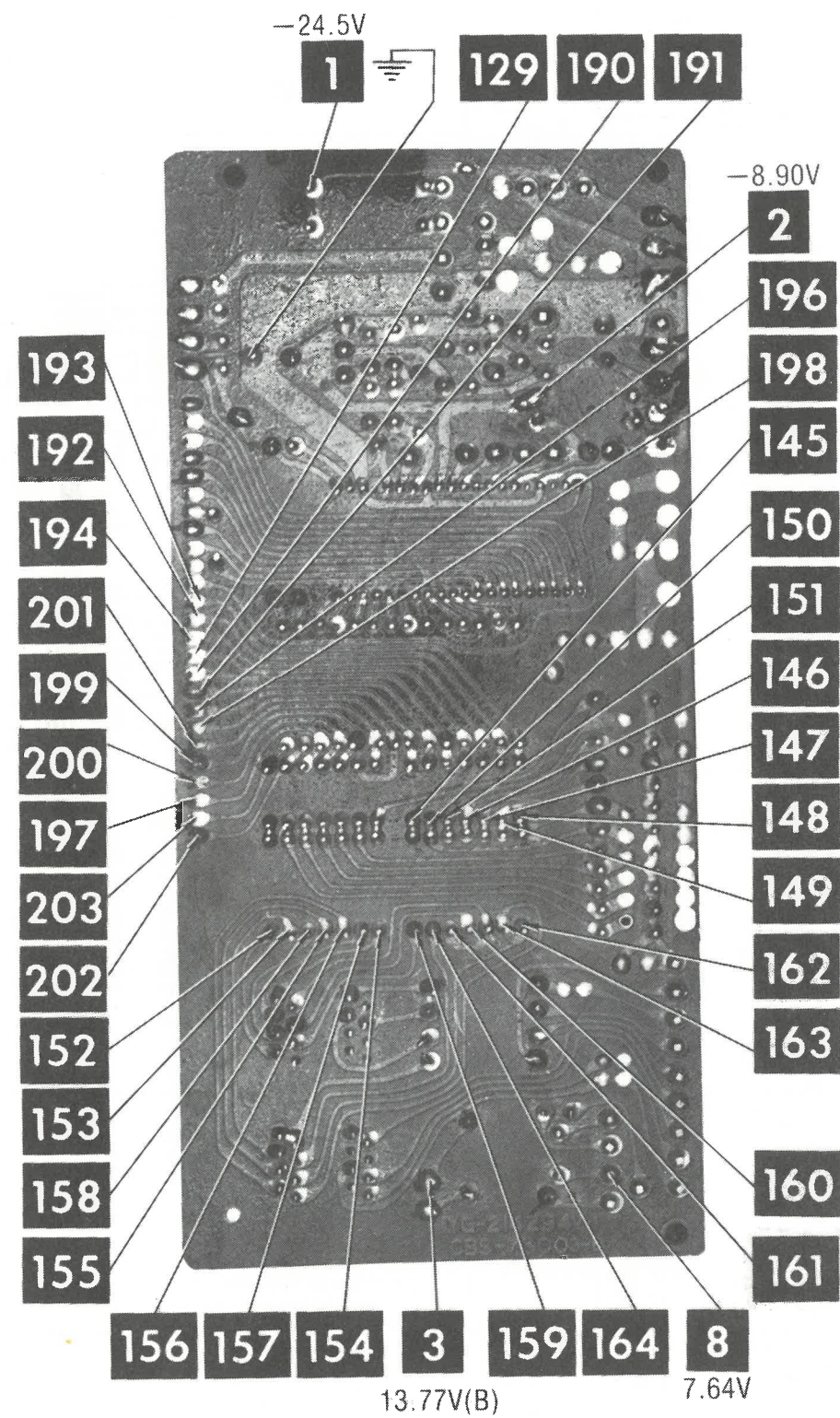
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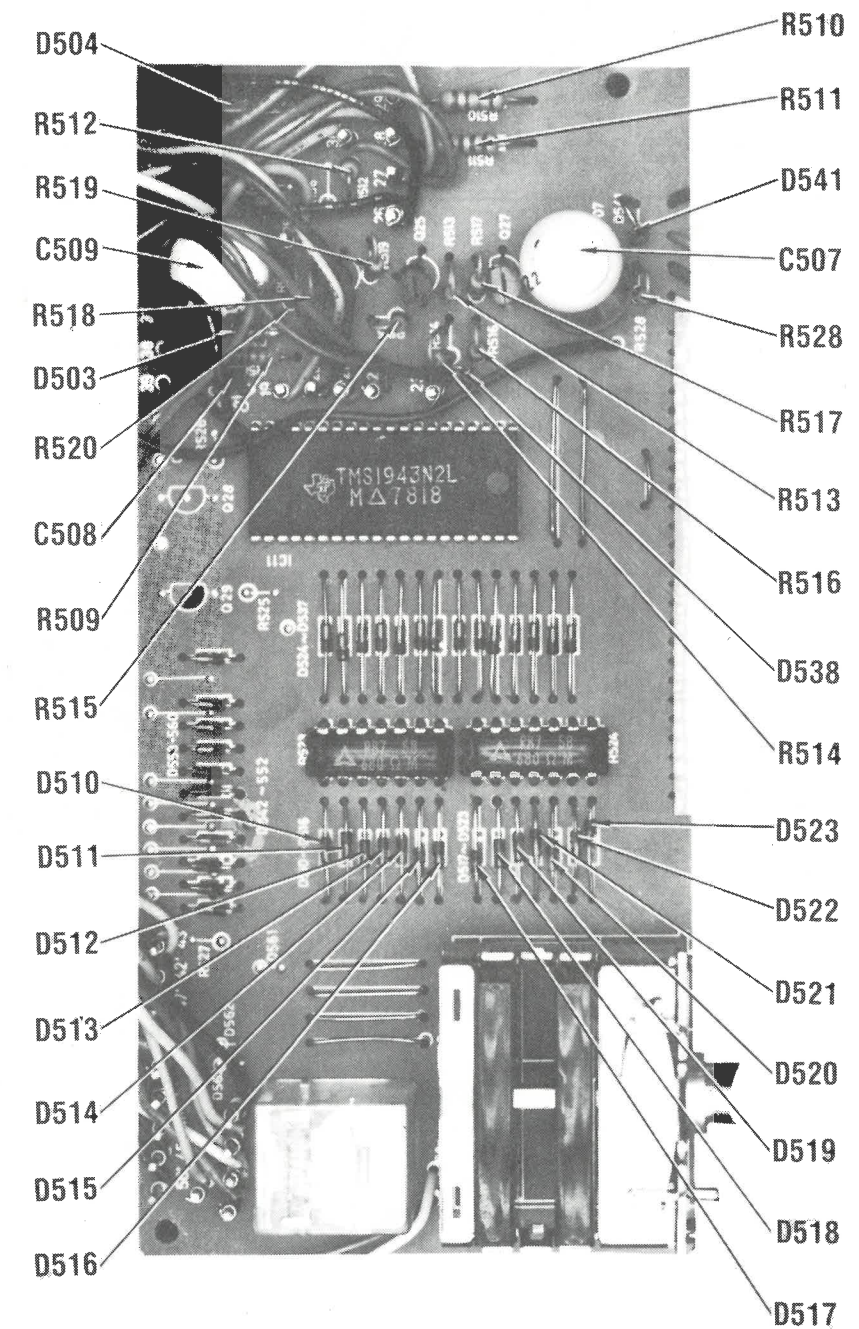
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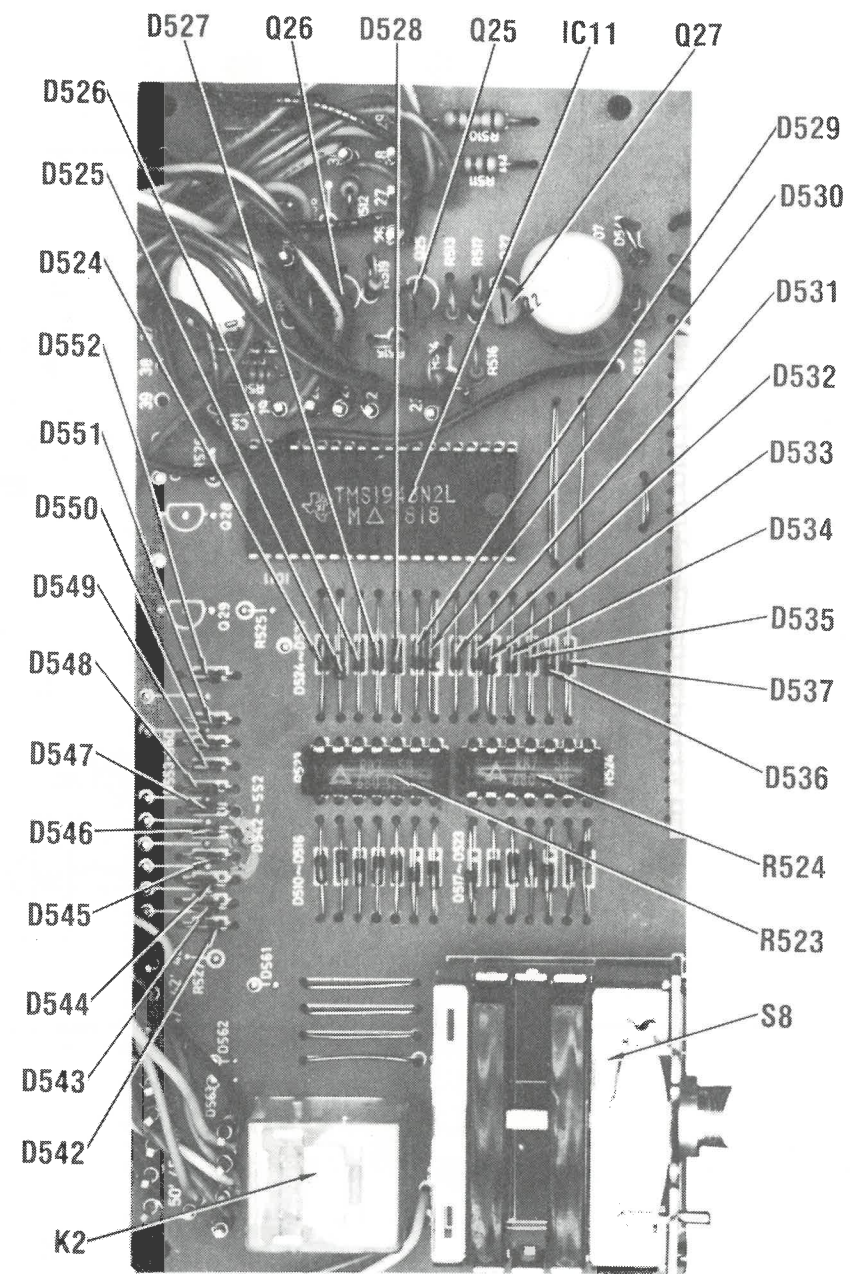
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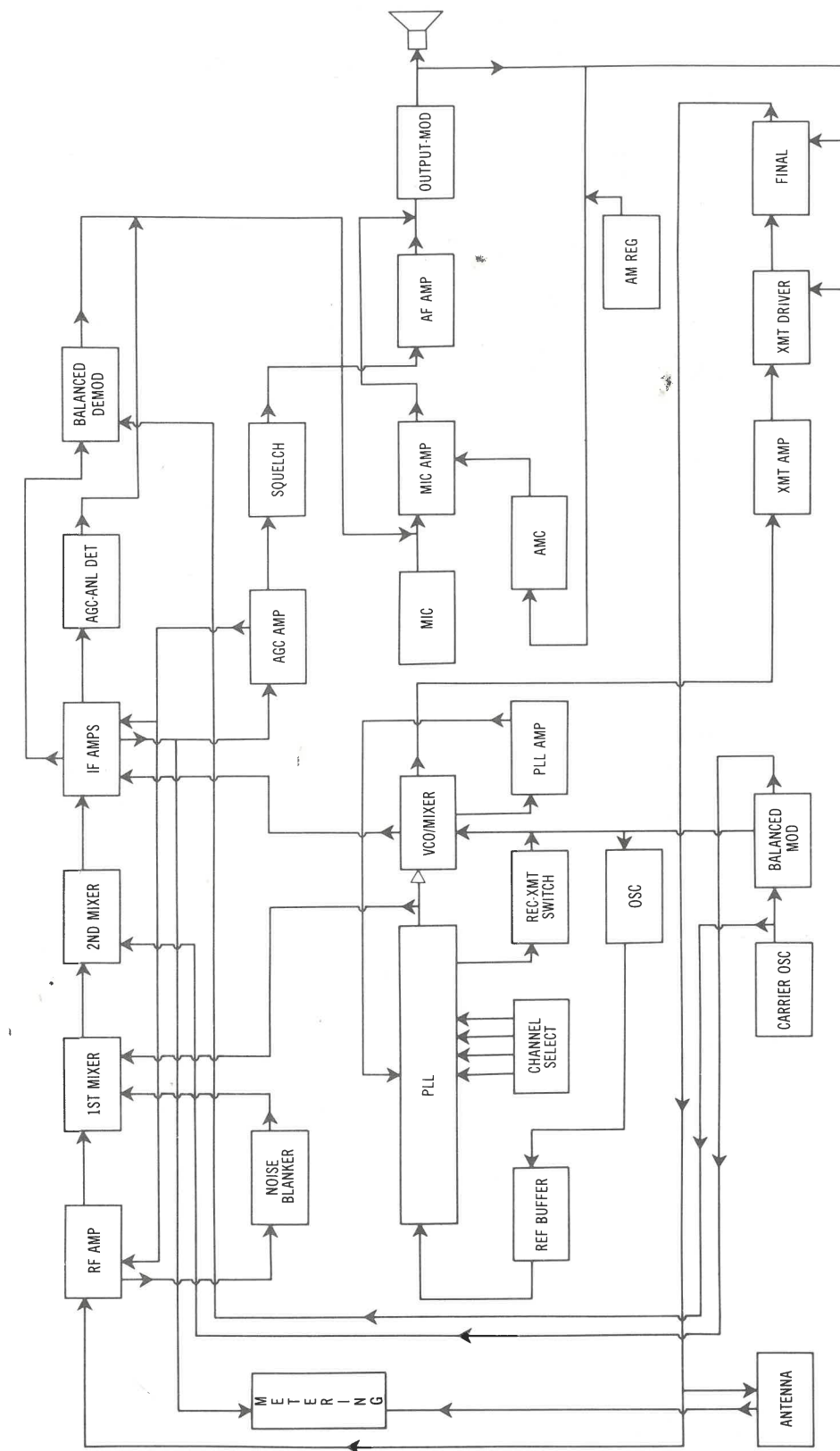
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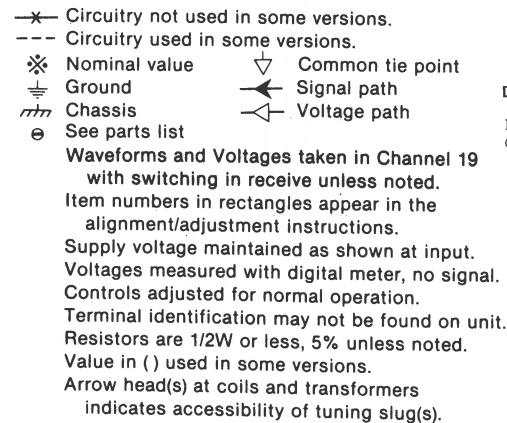
CLOCK BOARD



CLOCK BOARD

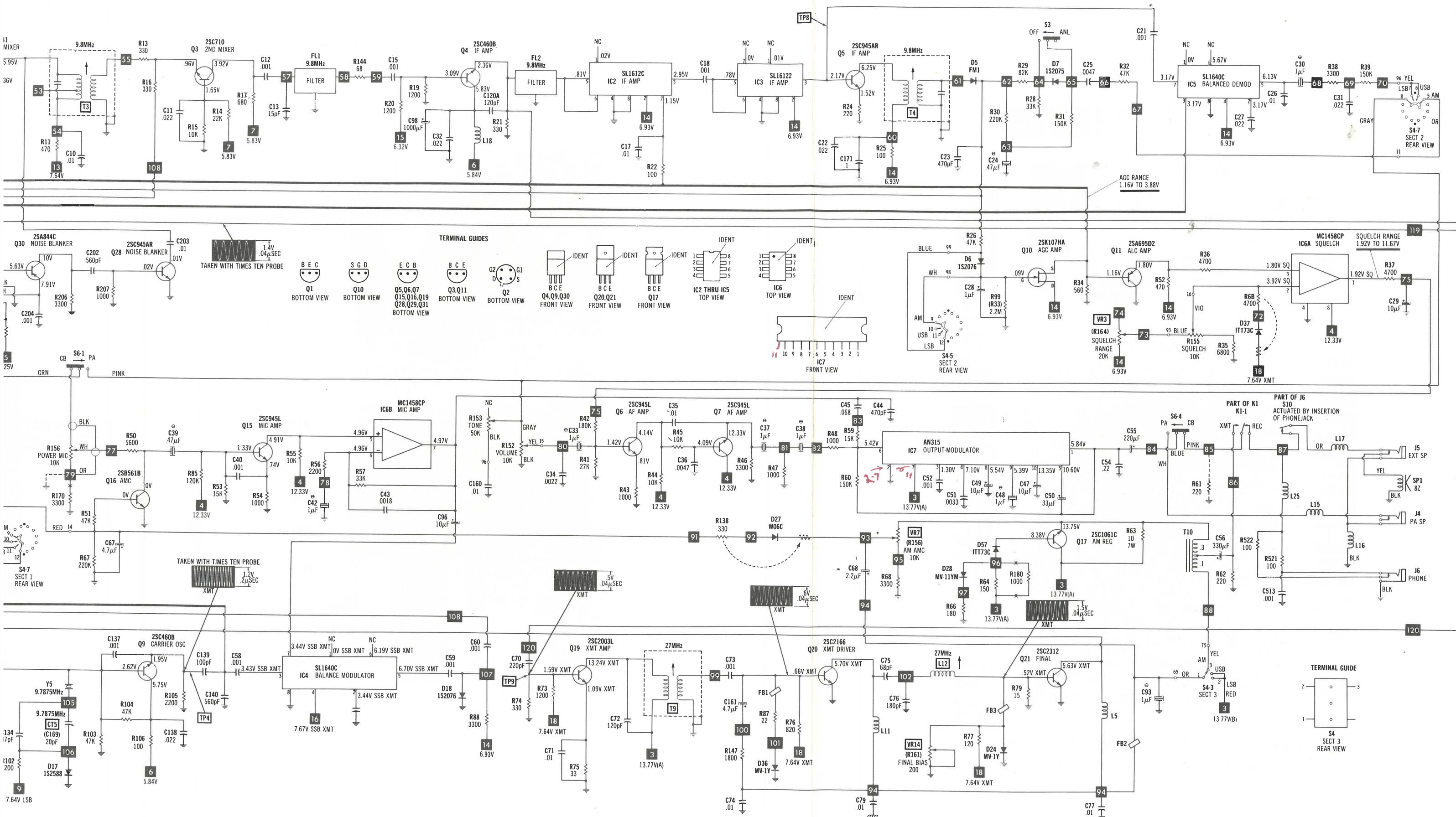


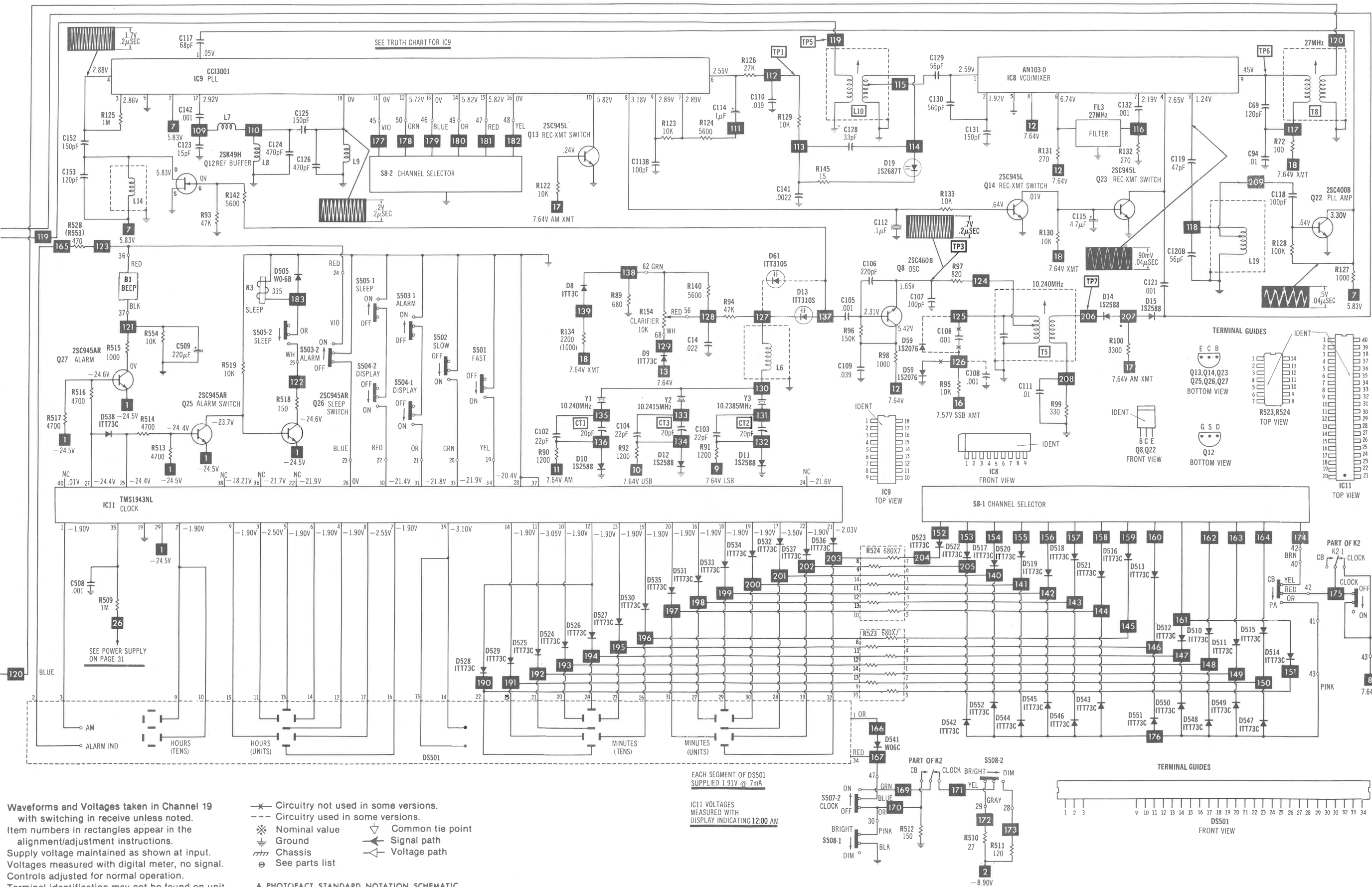
BLOCK DIAGRAM



POWER SUPPLY SCHEMATIC







CLOCK & PLL SCHEMATIC

PARTS LIST AND DESCRIPTION

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

WIRING DATA

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. 9466 (3 conductor-1 shielded)(6 ft.)(AWG28)
AC Power Cord	Use BELDEN No. 17109 (9 ft.)(2 conductors)

SEMICONDUCTORS (Select replacement transistor for best results)

ITEM No.	TYPE No.	MFR. PART No.	REPLACEMENT DATA							
			GENERAL ELECTRIC PART No.	MALLORY PART No.	RAYTHEON PART No.	RCA PART No.	SYLVANIA PART No.	THORDARSON PART No.	WORKMAN PART No.	ZENITH PART No.
CR501	S5VB10	IP20-0450	GEBR-206	PTC204(4)	REN 156(4)	SK3051/156(4)	ECG5313	TM156(4)	WEP1044	212-Z9000(4)
CR502	W2061	IP20-0062		ZM6, 2B		SK3779/5013A	ECG5013A	TM5013	WEP1414/5013	103-Z9008
CR505	W06B	IP20-0440	GE-504A	PTC201	REN 116	SK3311	ECG116	TM116	WEP156	212-76-02
D1	1S2588	IP20-0441	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D2	1S2588	IP20-0441	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D3	1TT73C	IP20-0442	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D4	1TT73C	IP20-0442	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D5	FM-1	IP20-0118	1N34AS	PTC207	REN 109	SK3087	ECG109	TM109/**	WEP134/109	103-Z9001
D6	1S2076	IP20-0422	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D7	1S2075K	IP20-0274	GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062/177	103-131
D8	1TT73C	IP20-0442	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D9	1TT73C	IP20-0442	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D10	1S2588	IP20-0441	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D11	1S2588	IP20-0441	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D12	1S2588	IP20-0441	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D13	1TT310S	IP20-0151	GE-90	PTC214	REN 614	SK3081	ECG614	TM614	WEP200/614	103-219
D14	1S2588	IP20-0441	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D15	1S2588	IP20-0441	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D16	1S2588	IP20-0441	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D17	1S2588	IP20-0441	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D18	1S2076	IP20-0422	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D19	1S2687T	IP20-0443			REN 612		ECG612	TM612		103-176
D20	1S2076	IP20-0422	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D22	1N60P	IP20-0016	1N60	PTC206	REN 109	SK3088	ECG109	TM109/**	WEP134/109	103-Z9001
D23	1N60P	IP20-0016	1N60	PTC206	REN 109	SK3088	ECG109	TM109/**	WEP134/109	103-Z9001
D24	WV1Y	IP20-0444		PTC301	REN 601	SK3463/601	ECG601	TM601		
D27	W06B	IP20-0440	GE-504A	PTC201	REN 116	SK3311	ECG116	TM116	WEP156	212-76-02
D28	WV11YM	IP20-0445		PTC302	REN 116	SK3864/605	ECG605	TM605		
D29	W06B	IP20-0440	GE-504A	PTC201	REN 116	SK3311	ECG116	TM116	WEP156	212-76-02
D30	W2075	IP20-0446		ZM7, 5B		SK3781/5015A	ECG5015A	TM5015	WEP1416/5015	103-Z9002
D33	SV3V-10	IP20-0439	GE-512	PTC204	REN 156	SK3051/156	ECG156	TM156	WEP4008/156	212-Z9000
D36	WV1Y	IP20-0444		PTC301	REN 601	SK3463/601	ECG601	TM601		
D37	1TT73C	IP20-0442	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D38	1N60P	IP20-0016	1N60	PTC206	REN 109	SK3088	ECG109	TM109/**	WEP134/109	103-Z9001
D57	1TT73C	IP20-0442	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D59	1S2076	IP20-0422	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D60	1TT73C	IP20-0442	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D61	1TT310S	IP20-0151	GE-90	PTC214	REN 614	SK3081	ECG614	TM614	WEP200/614	103-219
D503	W06B	IP20-0440	GE-504A	PTC201	REN 116	SK3311	ECG116	TM116	WEP156	212-76-02
D504	SV2C10R	IP20-0451	GE-510(2)	PTC205(2)	REN 125(2)	SK3081/125(2)	ECG125(2)	TM125(2)	WEP170/125(2)	903-334(2)
D505	W06B	IP20-0440	GE-504A	PTC201	REN 116	SK3311	ECG116	TM116	WEP156	212-76-02
D510	1TT73C	IP20-0442	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D511	1TT73C	IP20-0442	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D512	1TT73C	IP20-0442	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D513	1TT73C	IP20-0442	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D514	1TT73C	IP20-0442	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D515	1TT73C	IP20-0442	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D516	1TT73C	IP20-0442	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D517	1TT73C	IP20-0442	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D518	1TT73C	IP20-0442	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D519	1TT73C	IP20-0442	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D520	1TT73C	IP20-0442	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D521	1TT73C	IP20-0442	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D522	1TT73C	IP20-0442	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D523	1TT73C	IP20-0442	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D524	1TT73C	IP20-0442	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D525	1TT73C	IP20-0442	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D526	1TT73C	IP20-0442	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D527	1TT73C	IP20-0442	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D528	1TT73C	IP20-0442	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D529	1TT73C	IP20-0442	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D530	1TT73C	IP20-0442	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D531	1TT73C	IP20-0442	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D532	1TT73C	IP20-0442	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D533	1TT73C	IP20-0442	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D534	1TT73C	IP20-0442	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D535	1TT73C	IP20-0442	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D536	1TT73C	IP20-0442	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D537	1TT73C	IP20-0442	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D538	1TT73C	IP20-0442	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D541	W06C	IP20-0440	GE-504A	PTC201	REN 116	SK3311	ECG116	TM116	WEP156	212-76-02
D542	1TT73C	IP20-0442	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131

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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.	RAYTHEON PART No.	RCA PART No.	SYLVANIA PART No.	THORDARSON PART No.	WORKMAN PART No.	ZENITH PART No.
D543	1TT73C	IP20-0442	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D544	1TT73C	IP20-0442	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D545	1TT73C	IP20-0442	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D546	1TT73C	IP20-0442	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D547	1TT73C	IP20-0442	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D548	1TT73C	IP20-0442	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D549	1TT73C	IP20-0442	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D550	1TT73C	IP20-0442	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D551	1TT73C	IP20-0442	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
D552	1TT73C	IP20-0442	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
IC2	SL1612C	IP20-0427								
IC3	SL1612C	IP20-0427								
IC4	SL1640C	IP20-0428								
IC5	SL1640C	IP20-0428								
IC6	MC1458CP	IP20-0430	GEIC-220	PTC763		SK3465/778A	ECG778	TM778	WEP2053/778	221-Z9034
	MC1458	IP20-0430	GEIC-220	PTC763		SK3465/778A	ECG778	TM778	WEP2053/778	221-Z9034
IC7	AN315	IP20-0281					ECG1240	TM1240		221-Z9067
IC8	AN103-0				REN 1192	SK3445/1192	ECG1192	TM1192	WEP2120/1192	221-Z9061
	AN103	IP20-0429			REN 1192	SK3445/1192	ECG1192	TM1192	WEP2120/1192	221-Z9061
	TA7310P				REN 1192	SK3445/1192	ECG1192	TM1192	WEP2120/1192	221-Z9061
IC9	3001									
	CC13001	IP20-0431								
IC10	78L06	IP20-0253					ECG988	TM988		
IC11	TM51943N2L	IP20-0447								
Q1	25C1856	IP20-0436	GE-86*	PTC136*	REN 123A*	SK3132	ECG123A*	TM123A*	WEP736/123A*	121-Z9000A*
	35K41		GE-FET-4	PTC182*	REN 222	SK3065/222	ECG222	TM222	WEP905/222	121-826
	35K41L	IP20-0218	GE-FET-4	PTC182*	REN 222	SK3065/222	ECG222	TM222	WEP905/222	121-826
Q3	25C710		GE-211*	PTC132*	REN 123AP*	SK3356	ECG123AP*	TM123AP**	WEP710	121-Z9000A*
	25C710C	IP20-0002	GE-211*	PTC132*	REN 123AP*	SK3356	ECG123AP*	TM123AP**	WEP710	121-Z9000A*
	25C460		GE-61*	PTC136*	REN 107	SK3122	ECG107	TM107**	WEP460	121-522*
Q4	25C460B	IP20-0179	GE-61*	PTC136*	REN 107	SK3122	ECG107	TM107**	WEP460	121-522*
	25C839		GE-61*	PTC132*	REN 123A*	SK3124/289	ECG123A*	TM123A**	WEP1945	121-Z9000A*
	25C829		GE-20*	PTC139*	REN 229*	SK3122	ECG229*	TM229**	WEP829	121-Z9021*
	25C945AR		GE-212	PTC121*	REN 199	SK3124/289	ECG199	TM199**	WEP1945	121-972*
	25C945L	IP20-0434	GE-212	PTC121*	REN 199	SK3124/289	ECG199	TM199**	WEP1945	121-972*
	25C945Q	IP20-0434	GE-212	PTC121*	REN 199	SK3124/289	ECG199	TM199**	WEP1945	121-972*
Q6	25C945L	IP20-0434	GE-212	PTC121*	REN 199	SK3124/289	ECG199	TM199**	WEP1945	121-972*
	25C9450	IP20-0434	GE-210	PTC121*	REN 199	SK3124/289	ECG199	TM199**	WEP1945	121-972*
	25C458		GE-210	PTC121*	REN 289	SK3124/289	ECG289	TM289**	WEP458	121-Z9065
Q7	25C945L	IP20-0434	GE-212	PTC121*	REN 199	SK3124/289	ECG199	TM199**	WEP1945	121-972*
	25C9450	IP20-0434	GE-212	PTC121*	REN 199	SK3124/289	ECG199	TM199**	WEP1945	121-972*
	25C458		GE-210	PTC121*	REN 289	SK3124/289	ECG289	TM289**	WEP458	121-Z9065
Q8	25C460B	IP20-0179	GE-61*	PTC136*	REN 107	SK3122	ECG107	TM107**	WEP460	121-522*
	25C839		GE-61*	PTC132*	REN 107	SK3122	ECG107	TM107**	WEP460	121-522*
Q9	25C460B	IP20-0179	GE-61*	PTC132*	REN 123A*	SK3124/289	ECG123A*	TM123A**	WEP1945	121-Z9000A*
	25C460		GE-61*	PTC136*	REN 107	SK3122	ECG107	TM107**	WEP460	121-522*
	25C839		GE-61*	PTC132*	REN 107	SK3122	ECG107	TM107**	WEP460	121-522*
	25C839		GE-61*	PTC132*	REN 123A*	SK3124/289	ECG123A*	TM123A**	WEP1945	121-Z9000A*
Q10	25K107HA		GE-FET-1	PTC151*	REN 133*	SK3112	ECG133*	TM133*	WEP801/133*	921-1019*
	25K107-4	IP20-0433	GE-FET-1	PTC151*	REN 133*	SK3112	ECG133*	TM133*	WEP801/133*	921-1019*
	25K107		GE-FET-1	PTC151*	REN 133*	SK3112	ECG133*	TM133*	WEP801/133*	921-1019*
Q11	25A695D2	IP20-0112	GE-272*	PTC141*	REN 298*	SK3450/298*	ECG298*	TM298*	WEP915/298*	121-Z9046*
	25A695		GE-272*	PTC141*	REN 298*	SK3450/298*	ECG298*	TM298*	WEP915/298*	121-Z9046*
	25A673		GE-269	PTC103*	REN 290	SK3114/290	ECG290	TM290	WEP911/290	121-Z9003*
Q12	25K49H	IP20-0432	GE-FET-2	PTC161	REN 132*	SK3834/132	ECG312*	TM312*	WEP920/312*	921-1067*
	25K49		GE-FET-2	PTC161	REN 132*	SK3834/132	ECG312*	TM312*	WEP920/312*	921-1067*
Q13	25C945L		GE-212	PTC121*	REN 199	SK3124/289	ECG199	TM199**	WEP1945	121-972*
	25C945R	IP20-0245	GE-212	PTC121*	REN 199	SK3124/289	ECG199	TM199**	WEP1945	121-972*
	25C458		GE-210	PTC121*	REN 289	SK3124/289	ECG289	TM289**	WEP458	121-Z9065
Q14	25C945L	IP20-0434	GE-212	PTC121*	REN 199	SK3124/289	ECG199	TM199**	WEP1945	121-972*
	25C9450	IP20-0434	GE-212	PTC121*	REN 199	SK3124/289	ECG199	TM199**	WEP1945	121-972*
	25C458		GE-210	PTC121*	REN 289	SK3124/289	ECG289	TM289**	WEP458	121-Z9065
Q15	25C945L	IP20-0434	GE-212	PTC121*	REN 199	SK3124/289	ECG199	TM199**	WEP1945	121-972*
	25C9450	IP20-0434	GE-212	PTC121*	REN 199	SK3124/289	ECG199	TM199**	WEP1945	121-972*
	25C458		GE-210	PTC121*	REN 289	SK3124/289	ECG289	TM289**	WEP458	121-Z9065
Q16	25B561B	IP20-0419	GE-244	PTC177	REN 298	SK3450/298	ECG298	TM298	WEP915/298	121-Z9045
	25B561		GE-244	PTC177	REN 298	SK3450/298	ECG298	TM298	WEP915/298	121-Z9045
Q17	25C1061C	IP20-0007	GE-66	PTC167	REN 152	SK3054/196	ECG152	TM152**	WEP745/152	121-987-03
	25C1061		GE-66	PTC167	REN 152	SK3054/196	ECG152	TM152**	WEP745/152	121-987-03
Q18	25C1419C	IP20-0435	GE-66	PTC167	REN 152	SK3197/235	ECG152	TM152	WEP745/152	121-987-03
	25C1419		GE-66	PTC167	REN 152	SK3197/235	ECG152	TM152	WEP745/152	121-987-03
Q19	25C2003L	IP20-0437	GE-20*	PTC121*	REN 123AP	SK3449/297	ECG123AP*	TM123AP*	WEP736/123A*	121-Z9000A*
	25C2003		GE-20*	PTC121*	REN 123AP	SK3449/297	ECG123AP*	TM123AP*	WEP736/123A*	121-Z9000A*
	25C2086		GE-47*	PTC143*	REN 293*	SK3842	ECG293*	TM293*	WEP914/297	121-Z9066
Q20	25C2166	IP20-0321	GE-215	PTC186	REN 235	SK3197/235	ECG235	TM235	WEP785/235	121-Z9039
Q21	25C2312	IP20-0438	GE-215	PTC186	REN 235	SK3197/235	ECG235	TM235	WEP785/235	121-Z9039
Q22	25C460B	IP20-0179	GE-61*	PTC136*	REN 107	SK3122	ECG107	TM107**	WEP460	121-522*
	25C460		GE-61*	PTC136*	REN 107	SK3122	ECG107	TM107**	WEP460	121-522*
	25C829		GE-20*	PTC139*	REN 229*	SK3122	ECG229*	TM229**	WEP829	121-Z9021*
Q23	25C945L	IP20-0434	GE-212	PTC121*	REN 199	SK3124/289	ECG199	TM199**	WEP1945	121-972*
	25C458		GE-210	PTC121*	REN 289	SK3124/289	ECG289	TM289**	WEP458	121-Z9065
Q25	25C945AR		GE-212	PTC121*	REN 199	SK3124/289	ECG199	TM199**	WEP1945	121-972*
	25C945		GE-212	PTC121*	REN 199	SK3124/289	ECG199	TM199**	WEP1945	121-972*
Q26	25C945AR		GE-212	PTC121*	REN 199	SK3124/289	ECG199	TM199**	WEP1945	121-972*
	25C945		GE-212	PTC121*	REN 199	SK3124/289	ECG199	TM199**	WEP1945	121-972*
Q27	25C945AR		GE-212	PTC121*	REN 199	SK3124/289	ECG199	TM199**	WEP1945	121-972*
	25C945		GE-212	PTC121*	REN 199	SK3124/289	ECG199	TM199**	WEP1945	121-972*

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.	RAYTHEON PART No.	RCA PART No.	SYLVANIA PART No.	THORDARSON PART No.	WORKMAN PART No.	ZENITH PART No.
Q28	2SC945AR	IP20-0449	GE-212	PTC121*	REN 199	SK3124/289	ECG199	TM199/**	WEP1945	121-972*
Q29	2SC1675L		GE-213	PTC132*	REN 229*	SK3122	ECG229*	TM229*	WEP773	121-29021*
Q30	2SA844C		GE-244*	PTC103*	REN 129*	SK3114/290	ECG129*	TM129*	WEP564	121-29005
Q31	2SC1675L		GE-213	PTC132*	REN 229*	SK3122	ECG229*	TM229*	WEP773	121-29021*
Q501	2SD188A 2SD188R		GE-75 GE-75	PTC118 PTC118	REN 130 REN 130	SK3027/130 SK3027/130	ECG130 ECG130	TM130 TM130	WEP704/130 WEP704/130	121-29011 121-29011
Q502	2SD414Q 2SD414	IP20-0448								
Q503	2SC458C 2SC458	IP20-0267	GE-210 GE-210	PTC121* PTC121*	REN 289 REN 289	SK3124/289 SK3124/289	ECG289 ECG289	TM289/** TM289/**	WEP458 WEP458	121-29065 121-29065

* Lead configuration may vary from original.

/** Also available as exact type replacement.

(2) Two required.

(4) Four required.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING	REPLACEMENT DATA				
		MFR. PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
					Q-LINE	GENERAL LINE
C24	.47 NP 50V	IP22-0126	WNP1-50	TCN501A	QEN1-20	TVAN-1560
C28	1 25V	IP22-0049		TDC105M035EL		SD35-19
C29	10 16V	IP22-0062	PC10-25	VTT10B25	QV1-41	EV-1222
C30	1 NP 50V	IP22-0064	WNP1-50	TCN501A	QEN1-20	TVAN-1560
C33	1 NP 50V	IP22-0064	WNP1-50	TCN501A	QEN1-20	TVAN-1560
C37	1 NP 50V	IP22-0064	WNP1-50	TCN501A	QEN1-20	TVAN-1560
C38	1 NP 50V	IP22-0064	WNP1-50	TCN501A	QEN1-20	TVAN-1560
C39	.47 NP 50V	IP22-0126	WNP1-50	TCN501A	QEN1-20	TVAN-1560
C41	220 16V	IP22-0148	PC250-25	VTT220H16	QV1-117	EV-1240
C42	1 NP 50V	IP22-0064	WNP1-50	TCN501A	QEN1-20	TVAN-1560
C47	10 16V	IP22-0062	PC10-25	VTT10B25	QV1-41	EV-1222
C48	1 NP 50V	IP22-0064	WNP1-50	TCN501A	QEN1-20	TVAN-1560
C49	10 16V	IP22-0062	PC10-25	VTT10B25	QV1-41	EV-1222
C50	33 16V	IP22-0226	PC30-25	VTT33D25	QV1-63	EV-1325
C55	220 16V	IP22-0148	PC250-25	VTT220H16	QV1-117	EV-1240
C56	330 16V	IP22-0237	WBR300-35	VTT330H16	QV1-133	EV-1245
C65	2200 16V	IP22-0043	WBR2000-16	TC1520C	QEI-643	TVA-1175.3
C67	4.7 25V	IP22-0003	PC5-50	VTT4R7B50	QV1-31	EV-1619.1
C68	2.2 50V	IP22-0188	PC2-100	VTT2R2A50	QV1-21	EV-1617.1
C93	1 NP 50V	IP22-0064	WNP1-50	TCN501A	QEN1-20	TVAN-1560
C112	.1 NP 50V	IP22-0023	WNP1-50	TCN501A	QEN1-20	TVAN-1560
C113A	4.7 25V	IP22-0003	PC5-50	VTT4R7B50	QV1-31	EV-1619.1
C114	1 10V			TDC105M035EL		SD35-19
C115	4.7 10V	IP22-0249		TDC475M010EL	QDT1-48	SD10-4R79
C149	100 16V	IP22-0008	PC100-16	VTT100E16	QV1-95	EV-1231
C161	4.7 16V	IP22-0250		TDC686M025FL	QDT1-55	SD25-6R89
C162	10 16V	IP22-0062	PC10-25	VTT10B25	QV1-41	EV-1222
C198	1000 16V	IP22-0051	PC1000-16	VTT1000M16	QV1-183	EV-1261
C501	3300 35V		BB00728	FP061.1		TVLU-1129
C502	22 35V		PC30-50	VTT226G3	QV1-59	EV-1524
C507	220 35V		WBR250-50	VTT220K35	QV1-121	EV-1440
C509	220 25V		PC250-25	VTT220K25	QV1-119	EV-1340

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CAPACITORS

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA			
			CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
					Q-LINE	GENERAL LINE
C1	68 N220 100%	IP22-0242	NP06P8	*		10TCR-Q68
C3	.01			MAG5011		
C4	.01			MAG5011		
C5	.01			MAG5011		
C6	5			CNO568		10TCC-V68
C7	.01			MAG5011		
C9A	100 N220 10%	IP22-0243	NP015 MGP025	*		10TCR-T10
C98	.01			MAG5011		
C10	.01			MAG5011		
C11	.022			MAG5011		
C12	.001			GP210	QCT2-41	10TS-D10
C13	15 NPO 10%		NP015 MGP025	CNO415		10TCC-Q15
C14	.022			TA125		TG-S25
C15	.001			GP210	QCT2-41	10TS-D10
C16	.01			MAG5011		
C17	.01			MAG5011		
C18	.001		WMF05P1 MGP025 GP470	GP210	QCT2-41	10TS-D10
C20	.1 50V			EWFO5010	QFT2-215	1FT-P10
C21	.001			GP210	QCT2-41	10TS-D10
C22	.022			TA125		TG-S25
C23	470			GP347	QCT2-35	10TS-T47

PARTS LIST AND DESCRIPTION (CONTINUED)

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

CAPACITORS

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA			
			CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
					Q-LINE	GENERAL LINE
C25	.0047		GP4700	GP247		5GA-D47
C26	.01			MAG5011		
C27	.022		MGP025	TA125		TG-S25
C31	.022 50V 10%		DPMS2S22	M192P2239R8	QFT2-127	1FT-S22
C32	.022		MGP025	TA125		TG-S25
C34	.0022			GP222	QCT2-46	10TS-D22
C35	.01			MAG5011		
C36	.0047		GP4700	GP247		5GA-D47
C40	.001			GP210	QCT2-41	10TS-D10
C43	.0018 10%		GP1800	GP218	QCT2-44	10TS-D18
C44	470		GP470	GP347	QCT2-35	10TS-T47
C45	.068 50V 10%		WMF1S68	EWFI1A168	QF1-195	1PB-S68
C51	.0033		GP3300	GP233	QC2-107	5GA-D33
C52	.001			GP210	QCT2-41	10TS-D10
C54	.22 50V		WMF05P22	EMF05022	QFT2-253	1FT-P22
C57	.022		MGP025	TA125		TG-S25
C58	.001			GP210	QCT2-41	10TS-D10
C59	.001			GP210	QCT2-41	10TS-D10
C60	.001			GP210	QCT2-41	10TS-D10
C61	.022		MGP025	TA125		TG-S25
C62	.1			MAG5001		
C63	.01			MAG5011		
C64	.1 50V		WMF05P1	EWFO5010	QFT2-215	1FT-P10
C69	120 N220 10%	IP22-0245		*		10TCR-T12
C70	220 N750 10%		N220	CN7322		10TCU-T22
C71	.01			MAG5011		
C72	120 N220 10%	IP22-0245		*		10TCR-T12
C73	.001			GP210	QCT2-41	10TS-D10
C74	.01			MAG5011		
C75	68 N220 10%	IP22-0242		*		10TCR-Q68
C76	180 N220 10%	IP22-0247		*		10TCR-T18
C77	.01			MAG5011		
C78	330 10%		CD15FD331J03	SX333	QW1-39	MWB-331
C79	.01 10%			MAG5011		
C80	390 10%		CD15FD391J03	SX339	QW1-41	MWB-391
C81	120 10%		CD15FD121J03	SX312	QW1-29	MWA-121
C84	.33		CD15ED330J03	SX433	QW1-15	MWA-330
C85	.51		CD15ED510J03		QW1-20	MWA-510
C86	100 N750 10%		N100	CN7310		10TCU-T10
C87	.01			MAG5011		
C88	.01			MAG5011		
C89	.001			GP210	QCT2-41	10TS-D10
C90	.01			MAG5011		
C91	.01			MAG5011		
C94	.01			MAG5011		
C95	.01			MAG5011		
C97	.01			MAG5011		
C99	.01			MAG5011		
C100	.01			MAG5011		
C101	.01			MAG5011		
C102	22 N220 10%			*		10TCR-Q22
C103	22 N220 10%			*		10TCR-Q22
C104	22 N220 10%			*		10TCR-Q22
C105	.001			GP210	QCT2-41	10TS-D10
C106	220 N750 10%		N220	CN7322		10TCU-T22
C107	100 N220 10%	IP22-0243		*		10TCR-T10
C108	.001			GP210	QCT2-41	10TS-D10
C109	.039			GP140		5GA-S40
C110	.039			GP140		5GA-S40
C111	.01			MAG5011		
C113B	100		GP100	GP310	QCT2-24	10TS-T10
C116	.1			MAG5001		
C117	68		GP68	GP468	QCT2-24	10TS-Q68
C118	100		GP100	GP310		10TS-T10
C119	47 N750 10%		N47	CN7447		10TCU-Q47
C120A	120 N750 10%					10TCU-T12
C120B	56 N220 10%	IP22-0241		*		10TCR-Q56
C121	.001			GP210	QCT2-41	10TS-D10
C123	15 NPO 10%		NP015	CN0415		10TCC-Q15
C124	470		GP470	GP347	QCT2-35	10TS-T47
C125	150 N750 10%		N150	CN7315		10TCU-T15
C126	470		GP470	GP347	QCT2-35	10TS-T47
C128	33 N470 10%	IP22-0239		*		10TCT-Q33
C129	56 NPO 10%			CN0456		10TCC-Q56
C130	560 10%			GP356		10TS-T56
C131	150 N750 10%		N150	CN7315		10TCU-T15
C132	.001			GP210	QCT2-41	10TS-D10
C133	47 N750 10%		N47	CN7447		10TCU-Q47
C134	47 N750 10%		N47	CN7447		10TCU-Q47
C135	.01			MAG5011		
C136	.01			MAG5011		
C137	.001			GP210	QCT2-41	10TS-D10
C138	.022		MGP025	TA125		TG-S25
C139	100 N750 10%		N100	CN7310		10TCU-T10

PARTS LIST AND DESCRIPTION (CONTINUED)

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

CAPACITORS (cont)

ITEM No.	RATING	MFG. PART No.	REPLACEMENT DATA			
			CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
					Q-LINE	GENERAL LINE
C140	560	IP22-0245	MGP025	GP356	QCT2-46 QCT2-41	10TS-T56
C141	.0022			GP222		10TS-D22
C142	.001			GP210		10TS-D10
C144	.01			MAG5011		
C145	.01			MAG5011		
C146	.01			MAG5011		
C147	.01			MAG5011		
C148	.022			TA125		TG-S25
C150	.01			MAG5011		
C151	.01			MAG5011		
C152	150 N750 10%		N150	MAG5011		10TCU-T15
C153	120 N220 10%			CN7315		10TCR-T12
C155	.001			*		10TS-D10
C156	.001			GP210	QCT2-41 QCT2-41	10TS-D10
C159	.022			GP210		10TS-D10
C163	.01			TA125		TG-S25
C164	.01			MAG5011		
C171	.1			MAG5011		
C201	.001			MAG5001		
C202	560			GP210	QCT2-41	10TS-D10
C203	.01			GP356		10TS-T56
C204	.001			MAG5011		
C503	.022		MGP025 MGP025	GP210		10TS-D10
C504	.022			TA125		TG-S25
C505	.001 125V			TA125		TG-S25
C506	.001 125V			GP210	QCT2-41 QCT2-41 QFT2-1 QCT2-41 QCT2-41 QCT2-41 QCT2-41	10TS-D10
C508	.001 50V			DPMS6D1		10TS-D10
C510	.001			EWFA210		1FT-D10
C511	.001			GP210		10TS-D10
C512	.001			GP210		10TS-D10
C513	.001			GP210		10TS-D10
C514	.022			GP210		10TS-D10
CT1	20 Trimmer	IP22-0229	MGP025	TA125		TG-S25
CT2	20 Trimmer	IP22-0229				
CT3	20 Trimmer	IP22-0229				
CT4	20 Trimmer	IP22-0229				
CT5	20 Trimmer	IP22-0229				
CT6	20 Trimmer	IP22-0229				

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

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

ITEM No.	FUNCTION	RESISTANCE	REPLACEMENT DATA		
			MFG. PART No.	MALLORY PART No.	TRW PART No.
R150	RF Gain	10K	IP24-0106	RU14L,SL36,SL1500	BU1(1),CF9,SS6A
R152	Volume	50K	IP24-0107	RU54A,SL36,SL1500	BU1(1),CF63,SS6A
R153	Tone	50K	IP24-0108	RU54L,SL36,SL1500	BU1,CF12,SS6A
R154	Clarifier	10K	IP24-0110	RU14L,SL36,SL1500	BU1(1),CF9,SS6A
R155	Squelch	10K	IP24-0106	RU14L,SL36,SL1500	BU1(1),CF9,SS6A
R156	Power Mic	10K	IP24-0106	RU14L,SL36,SL1500	BU1(1),CF9,SS6A
R159A	Calibration	5000	IP24-0109	P53L,3014(1),RU53L,	BU1(1),CF8,CR4,SS7A,
R159B	Calibration	5000		CS3500	SS6A
R526	Voltage	200	IP24-0104	MTC22L1	X201R251B
VR2	S Meter	20K	IP24-0093	MTC24L1	U260R253B
(R151)					
VR3	Squelch Range	20K	IP24-0093	MTC24L1	U260R253B
(R164)					
VR7	AM AMC	10K	IP24-0100	RVA0911H103	U260R103B
(R156)					
VR9	RF Meter	10K	IP24-0100	RVA0911H103	U260R103B
(R158)					
VR11	SSB ALC	10K	IP24-0100	RVA0911H103	U260R103B
(R157)					
VR14	Final Bias	200	IP24-0099		
(R161)					

(1) Enlarge mounting hole.

PARTS LIST AND DESCRIPTION (CONTINUED)

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

RESISTORS (Power and Special)

ITEM No.	RATING	REPLACEMENT DATA		ITEM No.	RATING	REPLACEMENT DATA	
		MFR. PART No.	WORKMAN PART No.			MFR. PART No.	WORKMAN PART No.
R63 R523	10 7W 10% Resistor Array	IP24-0105(1)		R524	Resistor Array	IP24-0105(1)	

(1) Consists of seven 680-ohm resistors.

COILS (RF-IF)

ITEM No.	FUNCTION	REPLACEMENT DATA			REMARKS
		PART No.	OTHER IDENTIFICATION	MILLER PART No.	
L1	RF Choke	IP21-0502			
L2	Antenna Matching (27MHz)	IP21-0489			
L3	Pi Filter (27MHz)	IP21-0490			
L4	Loading Final (27MHz)	IP21-0491			
L5	RF Choke (3.3uH)	IP21-0486			
L6	RF Choke (10uH)	IP21-0488			
L7	RF Choke (22uH)	IP21-0498	220	9330-32	
L8	RF Choke (1uH)	IP21-0473	010	70F106A1	
L9	RF Choke (1uH)	IP21-0473	010	70F106A1	
L10	VCO	IP21-0501	ETC147225		
L11	RF Choke (3.3uH)	IP21-0486			
L12	Xmt Driver (27MHz)	IP21-0492			
L13	RF Choke (22uH)	IP21-0498	220	9330-32	
L14	RF Choke	IP21-0487	ETC1093		
L15	RF Choke (3.3uH)	IP21-0486			
L16	RF Choke (3.3uH)	IP21-0486			
L17	RF Choke (3.3uH)	IP21-0486			
L18	RF Choke (22uH)	IP21-0498	220	9330-32	
L19	PLL (3.3uH)	IP21-0486	ETC1093		
L20	RF Choke (3.3uH)	IP21-0486			
L21	RF Choke (3.3uH)	IP21-0486			
L22	RF Choke (3.3uH)	IP21-0486			
L23	RF Choke (3.3uH)	IP21-0486			
L24	RF Choke				
L25	RF Choke				
T1	Receive Antenna (27MHz)	IP21-0500	ETC20113		
T2	RF Amp (27MHz)	IP21-0493	ETC20107	CBS759-TC	
T3	IF (9.8MHz)		ETC15062	CBS508-1TC	
T4	IF (9.8MHz)	IP21-0495	CPS1021		
T5	Oscillator (10.240MHz)		ETC15062	CBS508-1TC	
T8	Mixer (27MHz)	IP21-0496	ETC15063		
T9	Xmt Amp (27MHz)	IP21-0496	ETC15063		

TRANSFORMER (Power)

ITEM No.	RATING		REPLACEMENT DATA			NOTES
	PRI.	SEC. 1	MFR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T501	120V AC @ 800mA AC	16.50V AC @ 4.6A AC	IP21-0503			
	SEC. 2	SEC. 3				
	22.6V AC CT @ 140mA AC 19.24V AC @ 25mA					

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.	
T11	3.2A	.096	1.3mH	IP21-0501	TR509		

TRANSFORMER (Driver)

ITEM No.	TURNS RATIO			REPLACEMENT DATA			NOTES
	PRI.	SEC. 1	SEC. 2	MFGR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T10	1	1.4		IP21-0497			

SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		MFGR. PART No.	QUAM PART No.	
SP1	3 1/2" PM, 8 Ohms			

FUSE DEVICES

ITEM No.	DESCRIPTION	REPLACEMENT DATA							
		PART No.		BUSS PART No.		LITTELFUSE PART No.		WORKMAN PART No.	
		DEVICE	HOLDER	DEVICE	HOLDER	DEVICE	HOLDER	DEVICE	DEVICE
F1 F2	1.5A Quick Acting 3A Quick Acting	IP35-0016	IP35-0015	AGC1 1/2 AGC3	HKP HRK	31201.5 312003	342014A 150145	FG1 1/2-2 FG3-2	

PARTS LIST AND DESCRIPTION (CONTINUED)

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

MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
B1	Buzzer	IP30-0679	
DS1	LED	IP28-0054	Xmt (LN29RP) (1.96V @ 10mA)
DS2	Lamp	IP28-0020	SWR Meter (13.76V @ 50mA)
DS3	Lamp	IP28-0020	CAL Meter (13.76V @ 50mA)
DS4	Lamp	IP28-0020	Signal Xmt (13.76V @ 50mA)
DS501	LED	IP28-0055	Channel Indicator-Hours, tens; Hours, units; Minutes, tens; Minutes, units; AM, Alarm Indicator. (Each segment supplied with 1.91V @ 7mA).
DS502	LED	IP28-0054	USB (1.99V @ 10mA) (LN29RP)
DS503	LED	IP28-0054	AM (1.99V @ 10mA) (LN29RP)
DS504	LED	IP28-0054	LSB (1.99V @ 10mA) (LN29RP)
FL1	Filter	IP31-0129	9.8MHz (Crystal)
FL2	Filter	IP31-0130	9.8MHz, SEF-9.8MA (Ceramic)
FL3	Filter	IP31-0131	27MHz, EFC-S27MT1 (Ceramic)
J3	Jack	IP26-0028	Antenna
J4	Jack	IP26-0034	PA Speaker
J5	Jack	IP26-0034	External Speaker
J6	Jack	IP26-0056	Phone
K1	Relay	IP32-0017	Xmt (339 Ohms)
K2	Relay	IP32-0017	Clock (141 Ohms)
K3	Relay	IP32-0017	Sleep (335 Ohms)
M1	Meter	IP27-0020	Signal Xmt
M2	Meter	IP27-0021	SWR
M3	Meter	IP27-0022	Calibration
P8	Plug	IP26-0014	Microphone (4 Pin)
S1	Switch	IP25-0100	Power
S2	Switch	IP25-0099	AC/DC
S3	Switch	IP25-0101	An1/Off
S4	Switch	IP32-0019	AM/LSB/USB
S6	Switch	IP25-0101	PA/CB
S7	Switch	IP25-0101	NB
S8	Switch	IP32-0018	Channel Selector
S501	Switch	IP25-0102	Fast
S502	Switch	IP25-0102	Slow
S503	Switch	IP25-0102	Alarm
S504	Switch	IP25-0102	Display
S505	Switch	IP25-0102	Sleep
S507	Switch	IP25-0102	Clock
S508	Switch	IP25-0101	Bright/Dim
Y1	Crystal	IP31-0124	10.240MHz
Y2	Crystal	IP31-0125	10.2415MHz
Y3	Crystal	IP31-0126	10.23815MHz
Y4	Crystal	IP31-0127	9.7825MHz
Y5	Crystal	IP31-0128	9.7875MHz
	Cord	IP35-0018	AC, W/Plug
	Cord	IP35-0017	Inline Fuse Holder Assembly
	Microphone	IP29-0021	W/4-Pin Connector

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

ITEM	PART No.	ITEM	PART No.
Case, Top	IP30-0665	Knob, Channel	IP30-0667
Case, Bottom	IP30-0675	Knob, Push Button	IP30-0671
Cover, Channel Knob	IP30-0669	Knob, Square	IP30-0666
Cover, VR Knob	IP30-0670	Knob, Square Bottom	IP30-0677
Escutcheon	IP30-0676	Knob, VR	IP30-0668
Foot, Rubber (4 Used)	IP30-0678	Panel, Front	IP30-0663
		Plate, Acryl	IP30-0664

CHANNEL	CENTER FREQUENCY	LOWER FREQUENCY LIMIT		UPPER FREQUENCY LIMIT
1	26.965000	26.963651	to	26.966348
2	26.975000	26.973651	to	26.976348
3	26.985000	26.983650	to	26.986349
4	27.005000	27.003649	to	27.006350
5	27.015000	27.013649	to	27.016350
6	27.025000	27.023648	to	27.026351
7	27.035000	27.033648	to	27.036351
8	27.055000	27.053647	to	27.056352
9	27.065000	27.063646	to	27.066353
10	27.075000	27.073646	to	27.076353
11	27.085000	27.083645	to	27.086354
12	27.105000	27.103644	to	27.106355
13	27.115000	27.113644	to	27.116355
14	27.125000	27.123643	to	27.126356
15	27.135000	27.133643	to	27.136356
16	27.155000	27.153642	to	27.156357
17	27.165000	27.163641	to	27.166358
18	27.175000	27.173641	to	27.176358
19	27.185000	27.183640	to	27.186359
20	27.205000	27.203639	to	27.206360
21	27.215000	27.213639	to	27.216360
22	27.225000	27.223638	to	27.226361
23	27.255000	27.253637	to	27.256362
24	27.235000	27.233638	to	27.236361
25	27.245000	27.243637	to	27.246362
26	27.265000	27.263636	to	27.266363
27	27.275000	27.273636	to	27.276363
28	27.285000	27.283635	to	27.286364
29	27.295000	27.293635	to	27.296364
30	27.305000	27.303634	to	27.306365
31	27.315000	27.313634	to	27.316365
32	27.325000	27.323633	to	27.326366
33	27.335000	27.333633	to	27.336366
34	27.345000	27.343632	to	27.346367
35	27.355000	27.353632	to	27.356367
36	27.365000	27.363631	to	27.366368
37	27.375000	27.373631	to	27.376368
38	27.385000	27.383630	to	27.386369
39	27.395000	27.393630	to	27.396369
40	27.405000	27.403629	to	27.406370