

PHOTOFACT[®]

CB RADIO SERIES



CB-230
230
NOVEMBER 1978



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WARD 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.



MODEL 3-5814B

MANUFACTURER'S SPECIFICATIONS

GENERAL

CHANNELS: 40 channels - PLL digital logic channel synthesizer circuitry

POWER REQUIREMENT: Consumption - 22 watts; Current drain - 1.6 amps (100% mod.) at 13.8 Volt DC

POWER SUPPLY: 12 Volts DC normal (Positive or Negative ground)

SEMICONDUCTORS: integrated circuits, transistor and diodes.

OPERATING TEMPERATURE RANGE: -30 to +50°C.

MICROPHONE: Dynamic with push-to-talk switch, 500 ohm.

BUILT-IN SPEAKER: 8 ohms impedance; 92mm (3½ inches) in size.

CONTROLS/FEATURES: Volume with ON-OFF switch, Microphone Gain, Channel selector, instant channel 9 switch, RF Gain control, P.A./CB switch, Noise Blanker + ANL switch, TX (transmit) light, Antenna warning light, S/Rf meter (receive-transmit), and Meter switch, crystal filter after 1st IF for superior adjacent channel selectivity.

CONNECTORS: External speaker jack 3.5mm (8 ohms impedance), SO239 type antenna receptacle to match PL-259 coax plug (50 ohms impedance), PA Speaker Jack 3.5mm (8 ohms impedance), 12-volt DC power jack, separate power cable that allows quick disconnect, MIC Jack.

RECEIVER

SENSITIVITY: Better than 0.5uv for 500 MW audio output at MIN Squelch setting.

FREQUENCY COVERAGE: 26.965 to 27.405 MHz.

ADJACENT CHANNEL SELECTIVITY: Better than 55db.

AUDIO OUTPUT POWER: @ 10% DIST. better than 3.0 watts.

SPURIOUS REJECTION: Better than 50db.

IF FREQUENCIES: 455 KHz, 10.695 MHz.

SQUELCH RANGE (SENSITIVITY): 0.5 to 2000 uv nominal

IMAGE REJECTION RATIO: Better than 60db.

TRANSMITTER

FREQUENCY RESPONSE: 400 Hz to 2.5 kHz.

FREQUENCY COVERAGE: 26.965 to 27.405 MHz.

TRANSMIT POWER OUTPUT: 4 watts maximum as limited by FCC Regulations at 13.8 Volts DC.

MODULATION: Capable of 100% factory pre-set limit. 85-100%.

FREQUENCY TOLERANCE: Better than $\pm .004\%$ MAX.

Courtesy of the Manufacturer

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

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8CE945

GENERAL ELECTRIC MODEL 3-5814B

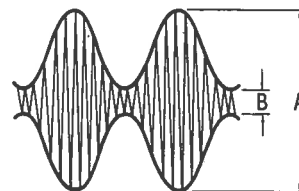
ALIGNMENT INSTRUCTIONS

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

Suggested Alignment Tools:

GC ELECTRONICS:

L1, L2, T1 thru T6, T12 9440
L7, L11, L12 9300, 9302, 9304
T8, T9, T10 5000, 5009, 8276, 8728, 8728A
L14, T7 5000, 5009, 8276, 8728, 8728A
CT1 5000, 8276



$$\text{Modulation Ratio} = \frac{A - B}{A + B} \times 100 (\%)$$

FIGURE 1

SYNTHESIZER ALIGNMENT

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Input of frequency counter to TP1 (Q10 Base).	Ch. 19	CT1	Adjust for 10.240MHz $\pm$ 50Hz.
Input of oscilloscope to TP2 (T1 Secondary).	Ch. 19	T1	Adjust for maximum RF.
Input of DC meter to TP8.	Ch. 1	L1	Adjust for 3.60 volts $\pm$.1 volt. Check for approximately 1.90 volts on Channel 40.
Input of frequency counter to TP3 (IC1 Pin 2).	Ch. 1		Check for 3.300MHz. Check all channels. (See Truth Chart for correct frequencies.)
Input of oscilloscope to TP4 (T2 Secondary).	Ch. 19	L2, T2	Adjust for maximum RF.
Input of frequency counter to TP4 (T2 Secondary).	Ch. 1		Check for 37.660MHz. Check all channels. (See Truth Chart for correct frequencies.)
Input of frequency counter to TP5 (Q2 Emitter).	Ch. 19, XMT		Check for 10.695MHz.
Input of frequency counter to TP6 (IC3 Pin 9).	Ch. 1, 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 the following as indicated, unless otherwise noted. RF Gain Maximum, Squelch MINIMUM, NB Off, ANL Off, CHAN. 9 Off.

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Output of signal generator thru .01uF to TP1 (Q10 Base). 455kHz, 1000Hz @ 30% modulation.	Ch. 19	T10, T9, T8	Adjust for maximum RF.
Output of signal generator thru .01uF to antenna input. 27.185MHz, 1000Hz @ 30% modulation.	Ch. 19	T7, L14, T12, T6, T5	Adjust for maximum output. Readjust T8, T9 and T10 for maximum.

RECEIVER ADJUSTMENTS

Connect an AC VTVM or AF wattmeter across speaker voice coil.
Adjust volume control to obtain a suitable indication.
Preset the following as indicated, unless otherwise noted:
RF Gain Maximum, NB Off, ANL Off, CHAN. 9 Off.

TEST EQUIPMENT	TRANSCIVER	ADJUST	REMARKS
Output of signal generator thru .01uF to antenna input. 27.185MHz, 1000Hz @ 30% modulation. Output 500uV.	Ch. 19 Squelch Maximum	RV1	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	RV3	RX SIGNAL METER Adjust for 9 on RX signal scale of meter.

TRANSMITTER ALIGNMENT

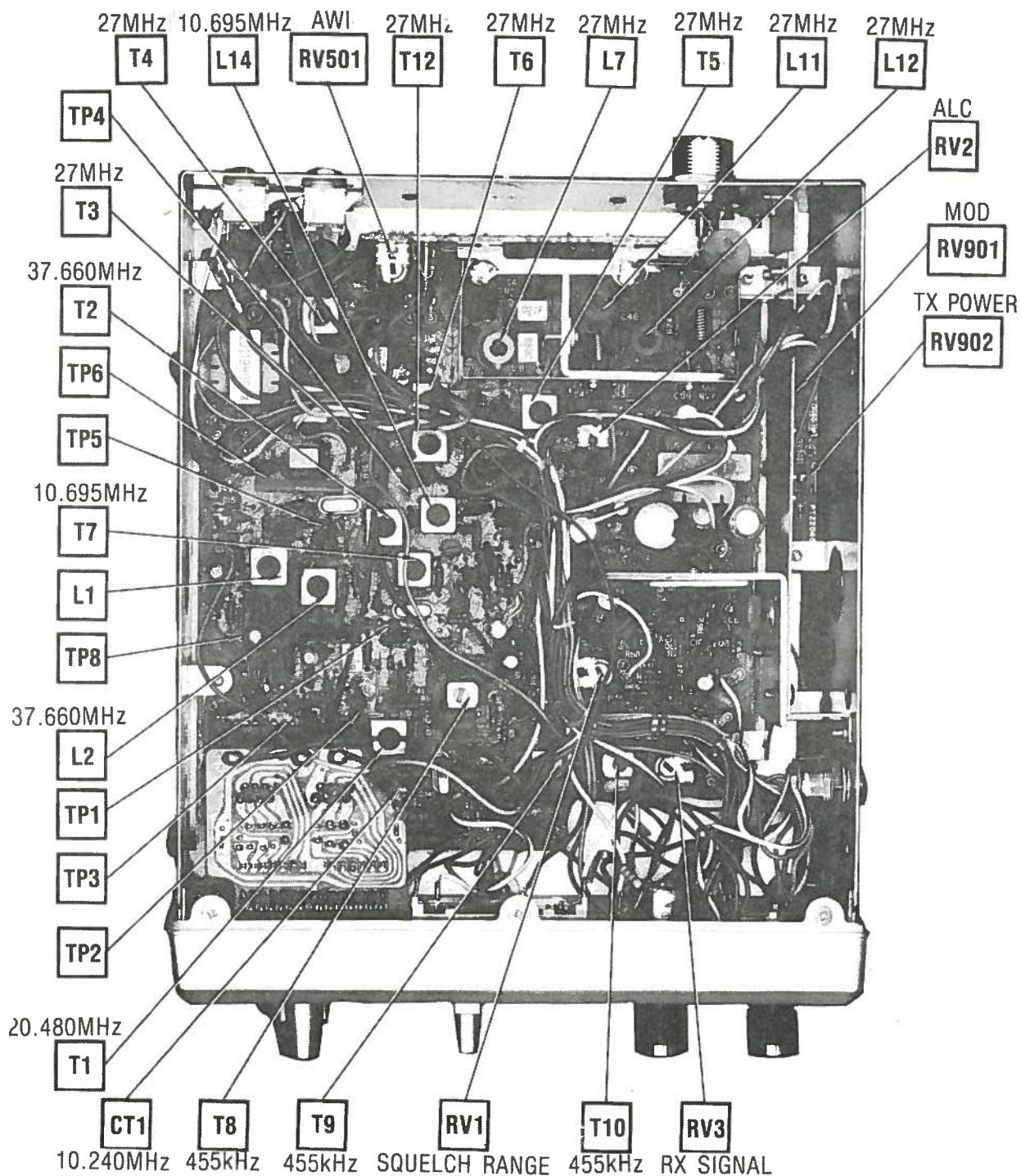
Connect a 50-ohm, 25-watt dummy load to antenna connector.
NOTE: Be sure to check transmit frequency and power on all active channels after alignment of transmitter.
See page 4 for channel frequencies.

TEST EQUIPMENT	TRANSCIVER	ADJUST	REMARKS
Input of RF wattmeter to antenna input.	Ch. 19 Meter Switch TX/RX	T3, T4	Adjust for maximum RF output.
Input of RF wattmeter to antenna input.	Ch. 19 Meter Switch TX/RX	L7, L11, L12	Adjust for 4.0 watts RF output maximum.

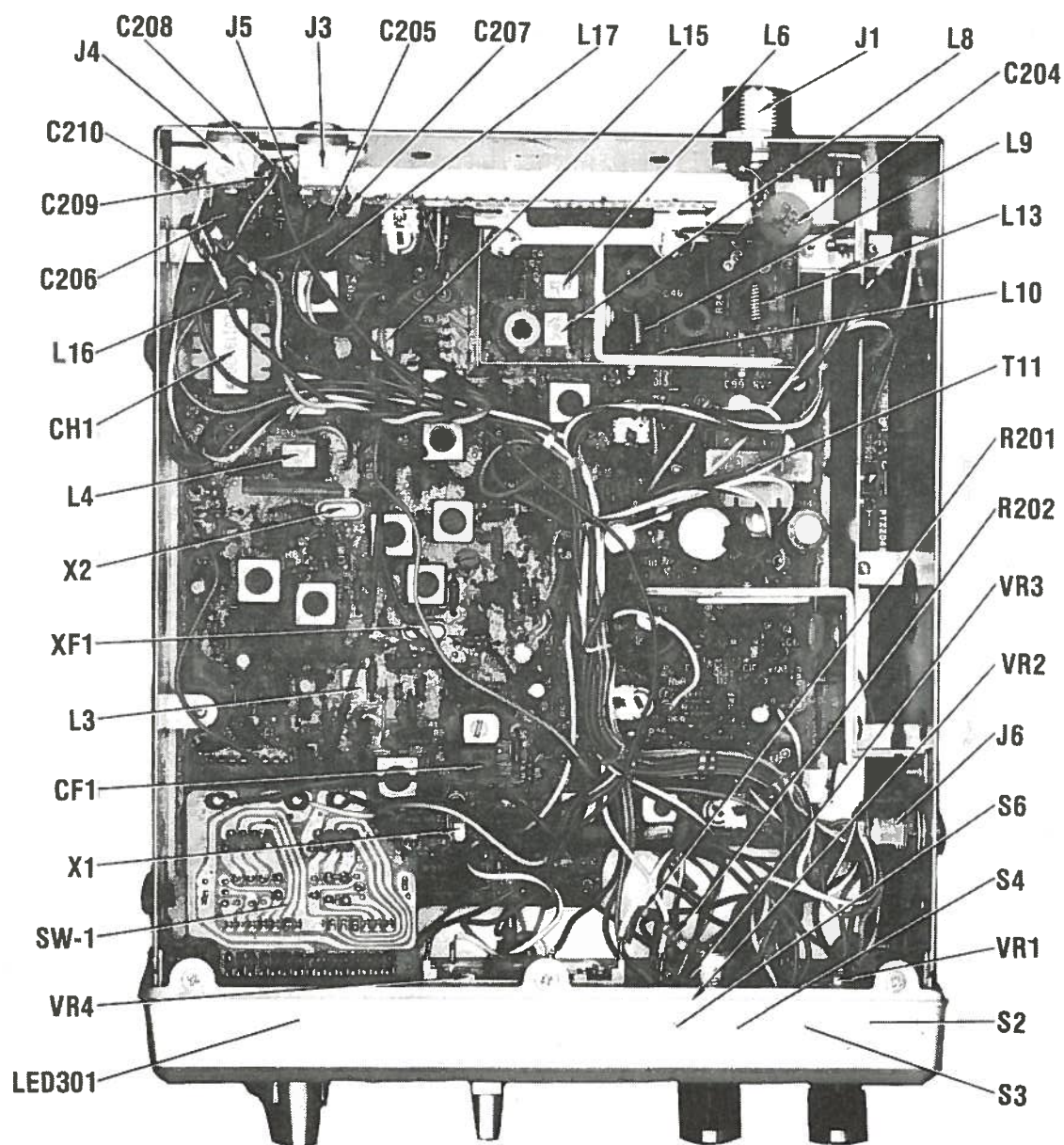
TRANSMITTER ADJUSTMENTS

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
Input of oscilloscope or modulation meter to antenna input. Inject a 1000Hz, 8mV signal at Mic input.	Ch. 19 Mic Power Amp Boost Meter Switch MOD/RX	RV2	ALC Adjust for 90% modulation maximum. (See Figure 1.)
Input of RF wattmeter to antenna input.	Ch. 19 Meter Switch TX/RX	RV902	TX POWER METER Adjust so TX Power Meter agrees with RF wattmeter.
Input of oscilloscope or modulation meter to antenna input. Inject a 1000Hz signal at Mic input and modulate to 50%.	Ch. 19 Mic Power Amp Boost Meter Switch MOD/RX	RV901	MOD METER Adjust for 50% on Mod scale of meter.
Connect a 250 ohm, non-inductive resistor to antenna input.	Ch. 19	RV501	AWI Adjust so AWI light just turns on.



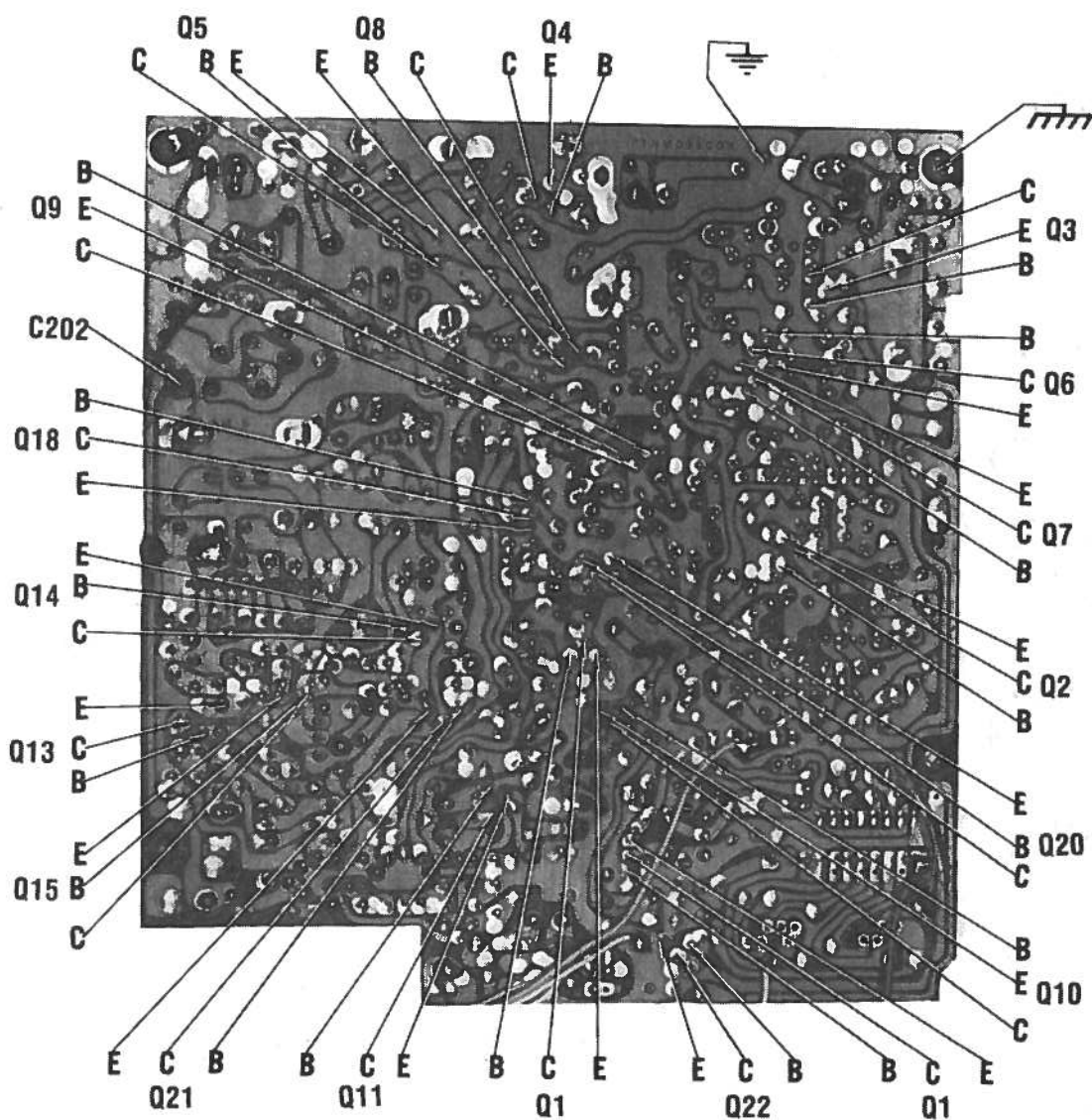
CHASSIS BOTTOM



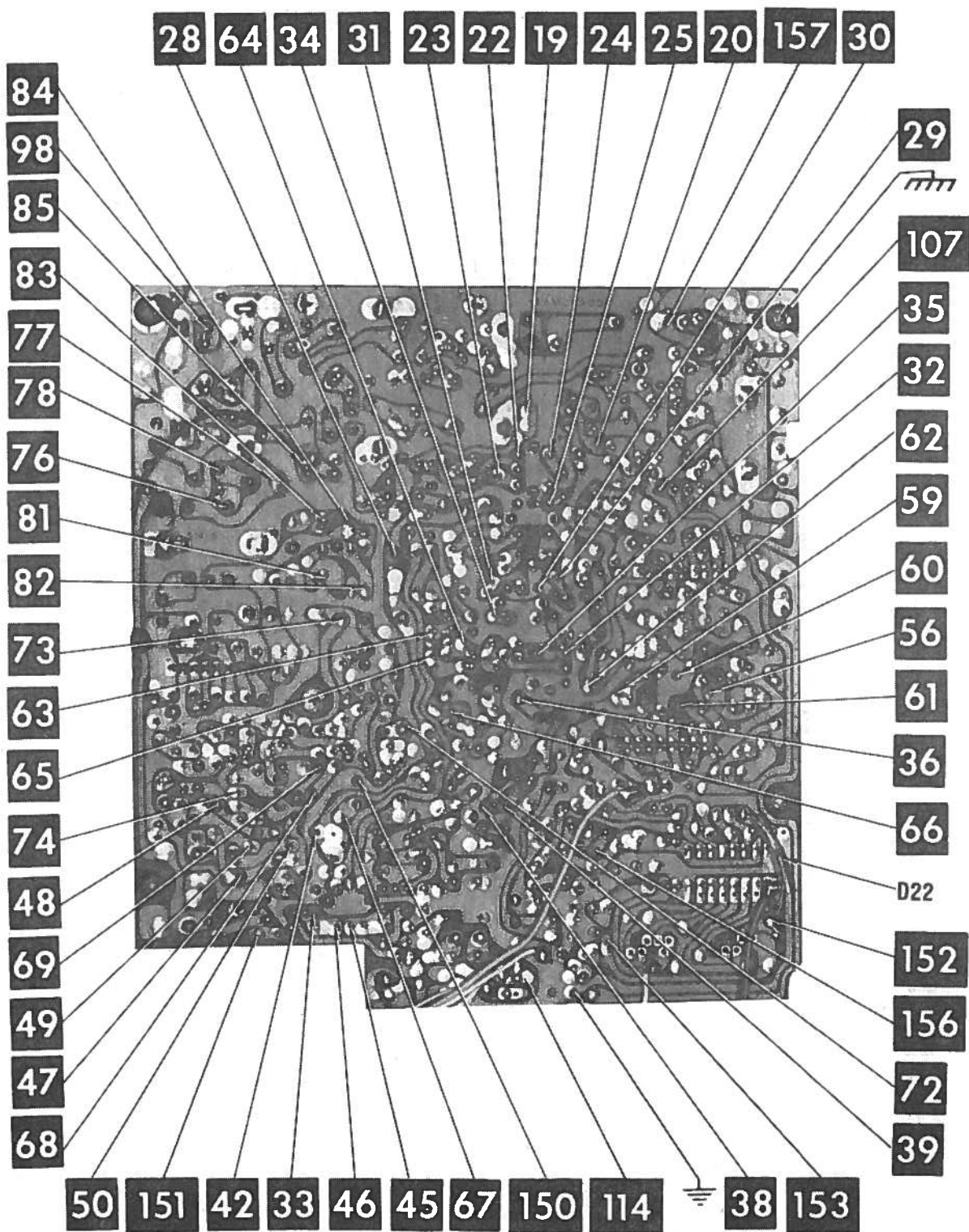
CHASSIS BOTTOM

TRUTH CHART

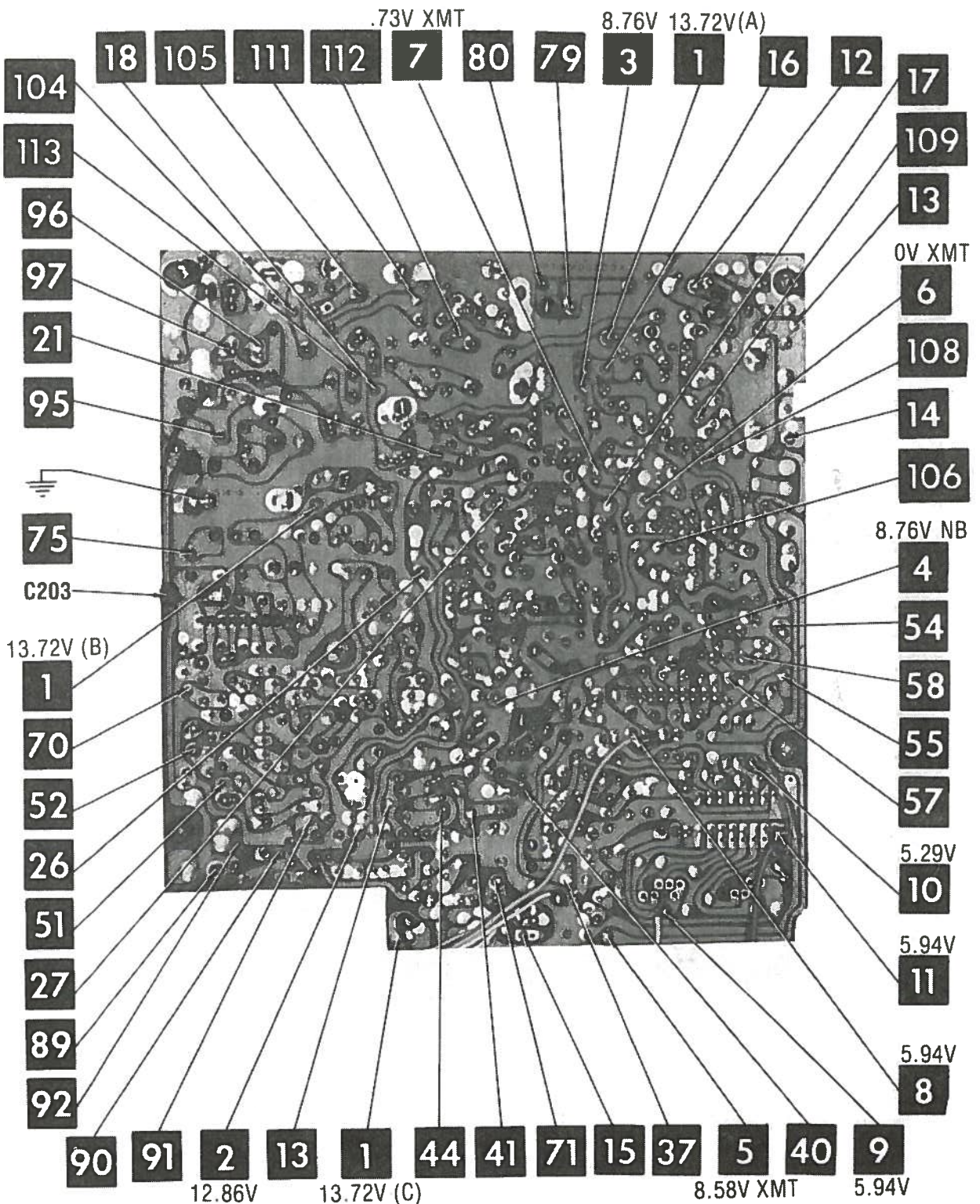
CHANNEL	1 = 5.95 Volts 0 = 0 Volts								DIVIDER INPUT IN MHz AT	REC SYNTHESIZER VCO OUTPUT IN MHz AT	XMIT SYNTHESIZER OUTPUT IN MHz AT
	PROGRAM DIVIDER										
	PINS										
	9	10	11	12	13	14	15				
1	1	0	0	1	0	1	0		3.300	37.660	26.965
2	1	0	0	1	0	0	1		3.290	37.670	26.975
3	1	0	0	1	0	0	0		3.280	37.680	26.985
4	1	0	0	0	1	1	0		3.260	37.700	27.005
5	1	0	0	0	1	0	1		3.250	37.710	27.015
6	1	0	0	0	1	0	0		3.240	37.720	27.025
7	1	0	0	0	0	1	1		3.230	37.730	27.035
8	1	0	0	0	0	0	1		3.210	37.750	27.055
9	1	0	0	0	0	0	0		3.200	37.760	27.065
10	1	1	1	1	1	1	1		3.190	37.770	27.075
11	1	1	1	1	1	1	0		3.180	37.780	27.085
12	1	1	1	1	1	0	0		3.160	37.800	27.105
13	1	1	1	1	0	1	1		3.150	37.810	27.115
14	1	1	1	1	0	1	0		3.140	37.820	27.125
15	1	1	1	1	0	0	1		3.130	37.830	27.135
16	1	1	1	0	1	1	1		3.110	37.850	27.155
17	1	1	1	0	1	1	0		3.100	37.860	27.165
18	1	1	1	0	1	0	1		3.090	37.870	27.175
19	1	1	1	0	1	0	0		3.080	37.880	27.185
20	1	1	1	0	0	1	0		3.060	37.900	27.205
21	1	1	1	0	0	0	1		3.050	37.910	27.215
22	1	1	1	0	0	0	0		3.040	37.920	27.225
23	1	1	0	1	1	0	1		3.010	37.950	27.255
24	1	1	0	1	1	1	1		3.030	37.930	27.235
25	1	1	0	1	1	1	0		3.020	37.940	27.245
26	1	1	0	1	1	0	0		3.000	37.960	27.265
27	1	1	0	1	0	1	1		2.990	37.970	27.275
28	1	1	0	1	0	1	0		2.980	37.980	27.285
29	1	1	0	1	0	0	1		2.970	37.990	27.295
30	1	1	0	1	0	0	0		2.960	38.000	27.305
31	1	1	0	0	1	1	1		2.950	38.010	27.315
32	1	1	0	0	1	1	0		2.940	38.020	27.325
33	1	1	0	0	1	0	1		2.930	38.030	27.335
34	1	1	0	0	1	0	0		2.920	38.040	27.345
35	1	1	0	0	0	1	1		2.910	38.050	27.355
36	1	1	0	0	0	1	0		2.900	38.060	27.365
37	1	1	0	0	0	0	1		2.890	38.070	27.375
38	1	1	0	0	0	0	0		2.880	38.080	27.385
39	1	0	1	1	1	1	1		2.870	38.090	27.395
40	1	0	1	1	1	1	0		2.860	38.100	27.405



MAIN BOARD

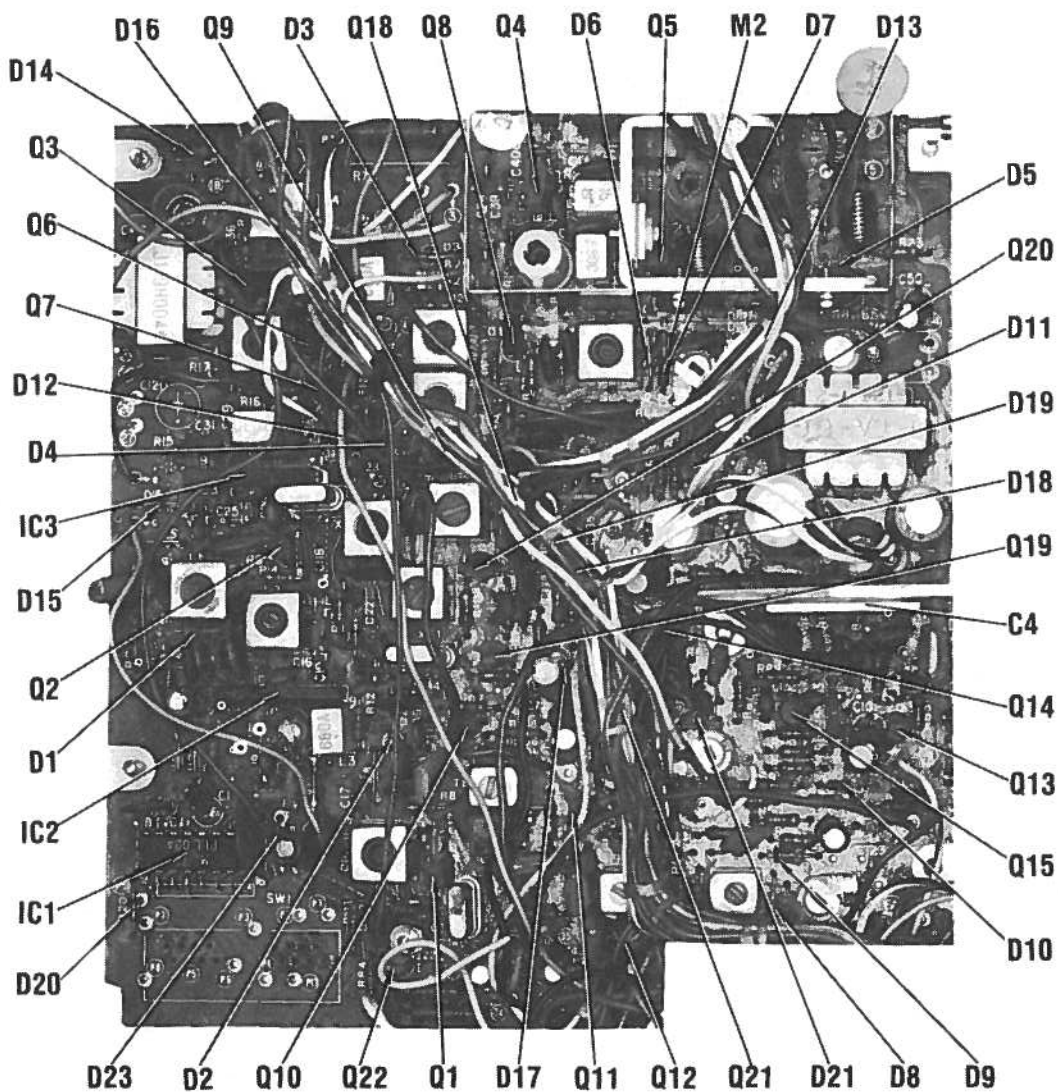


MAIN BOARD

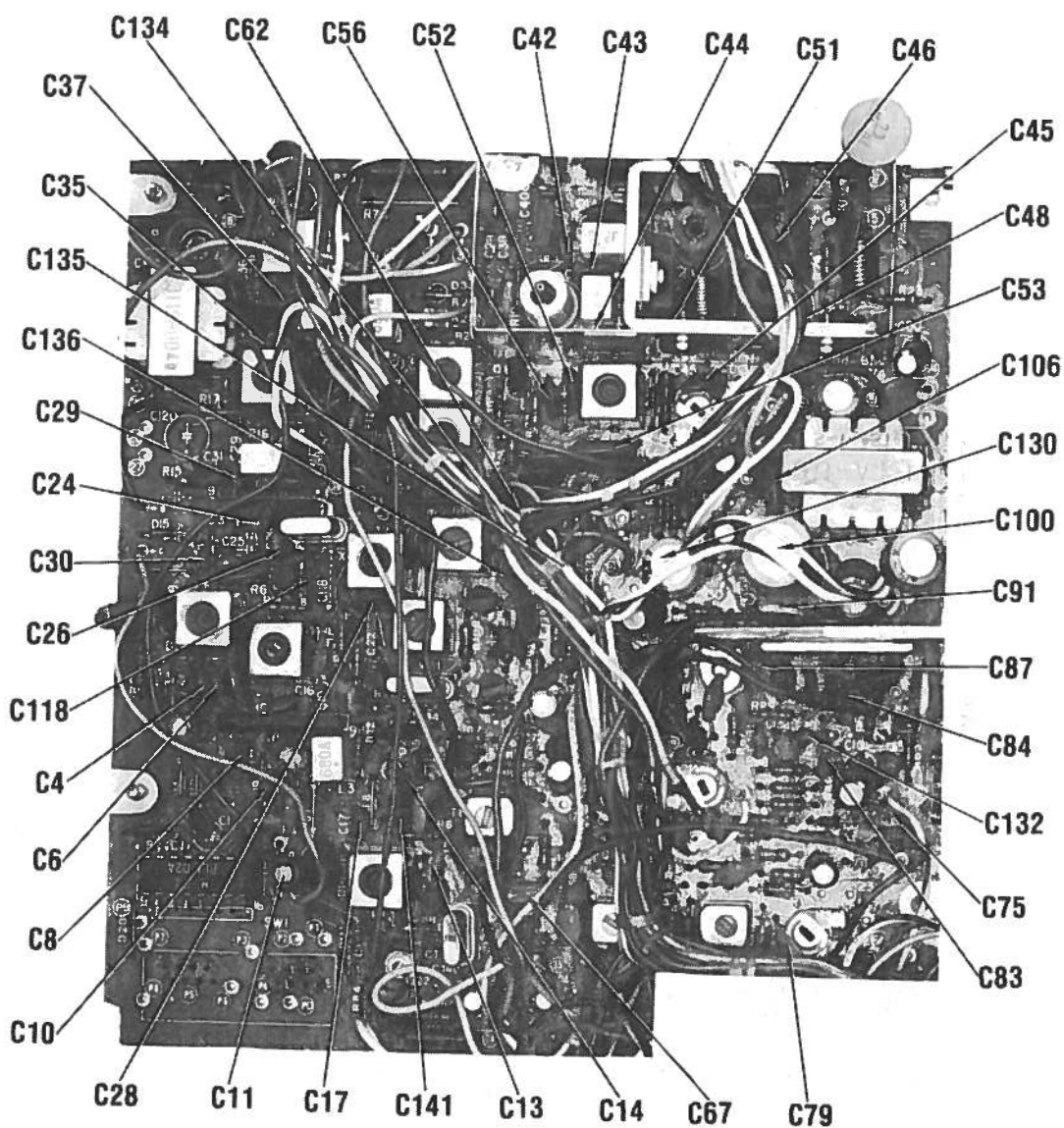


GENERAL ELECTRIC MODEL 3-5814B

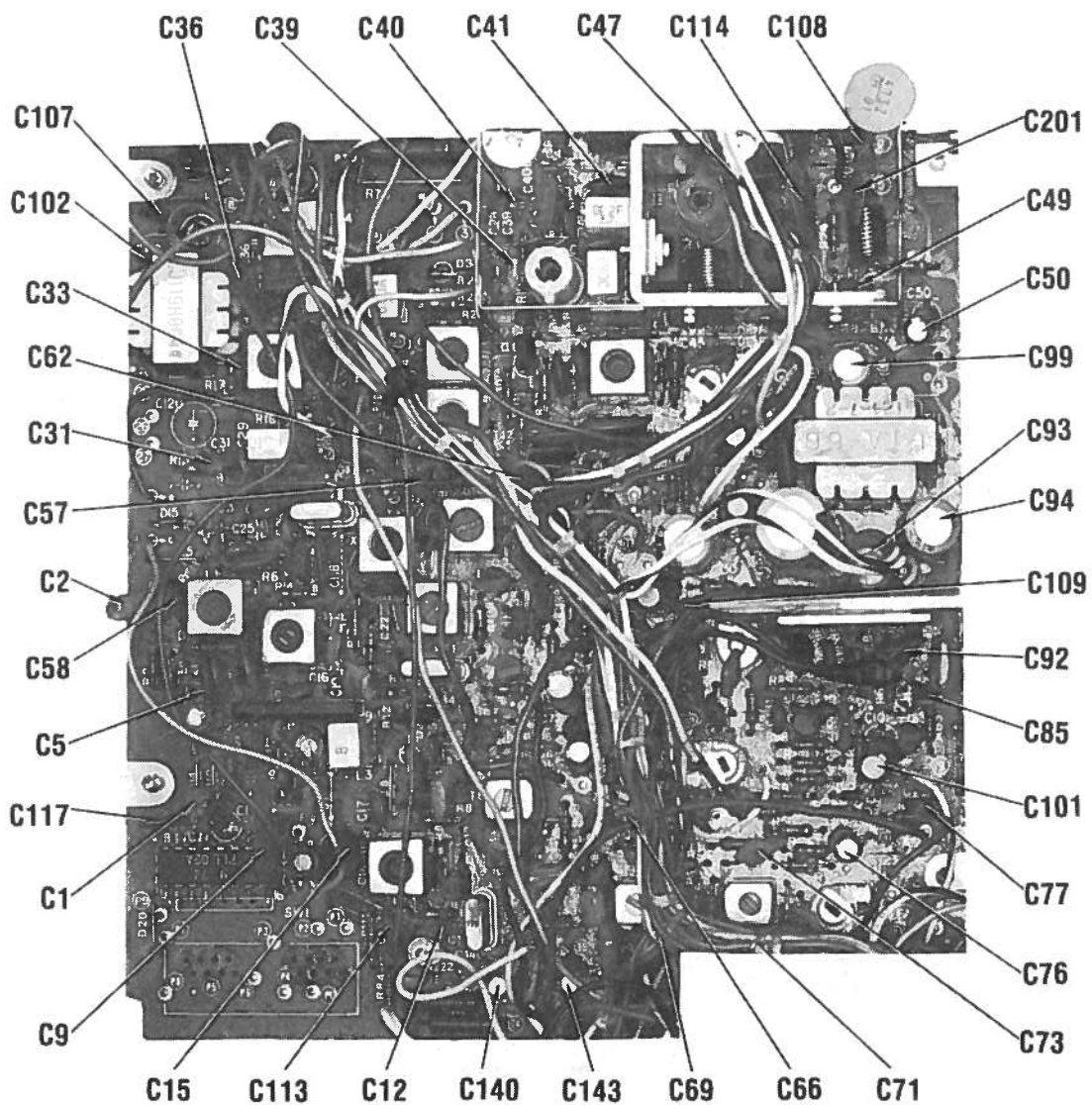
MAIN BOARD



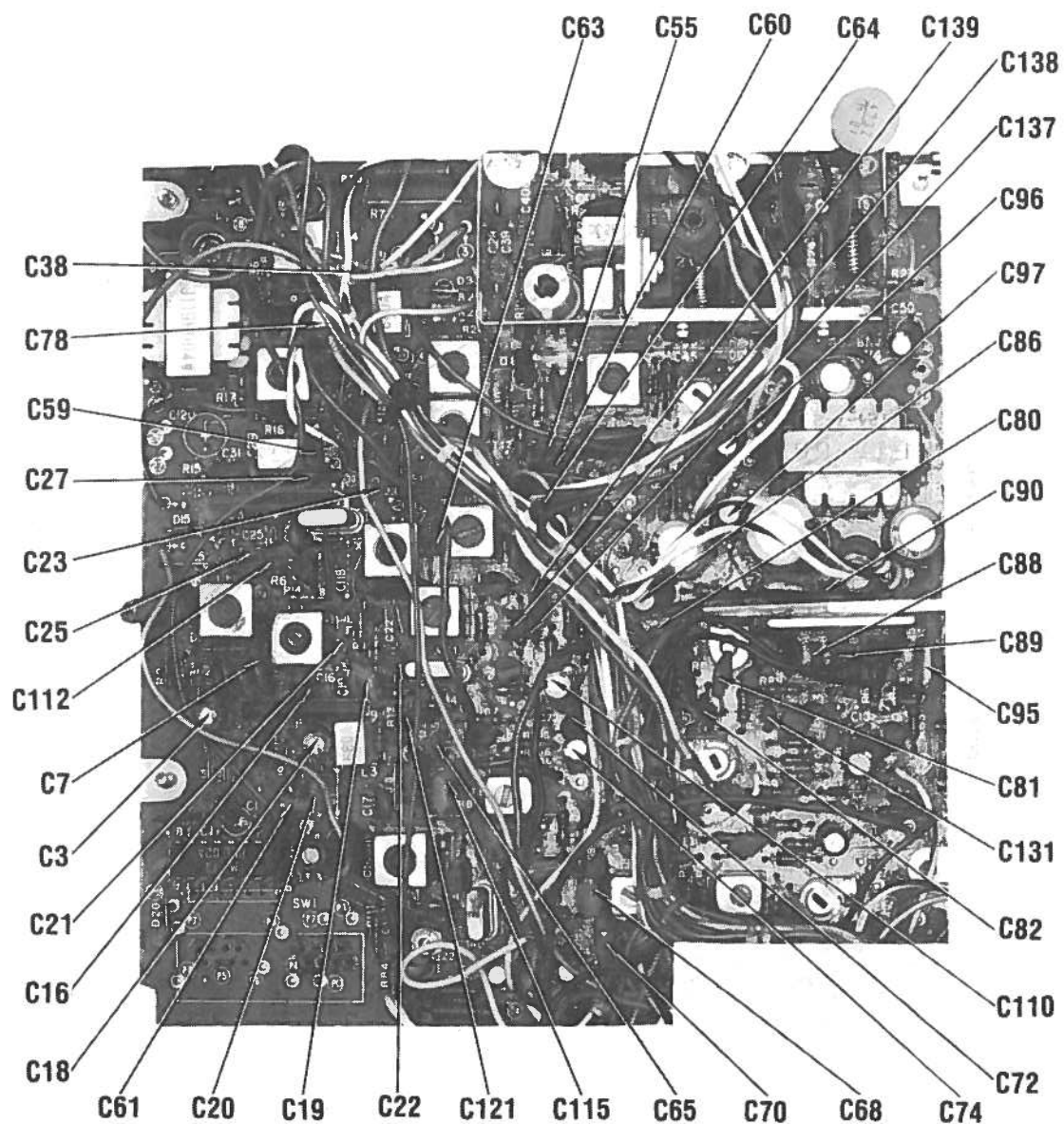
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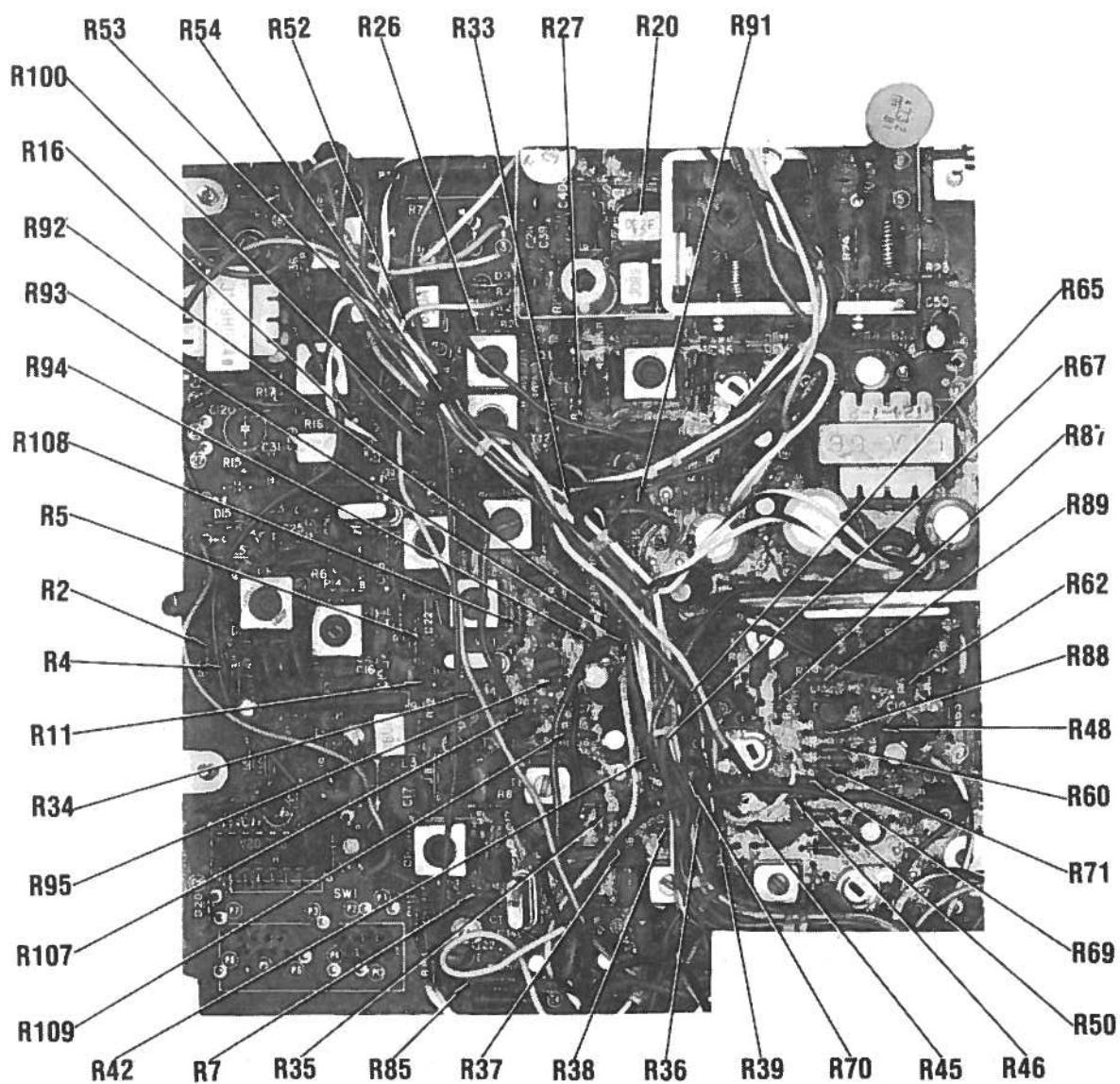
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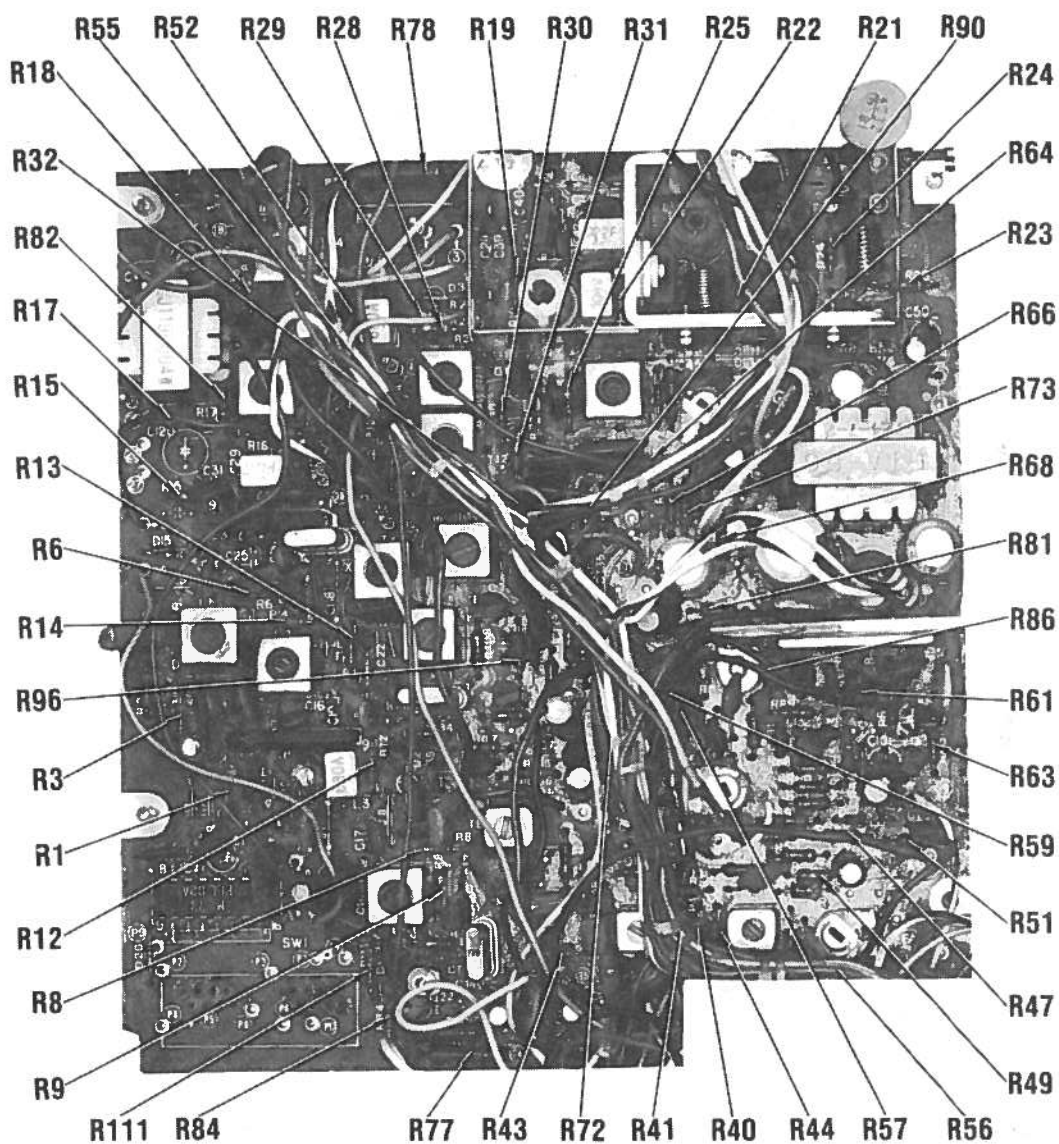
MAIN BOARD



MAIN BOARD

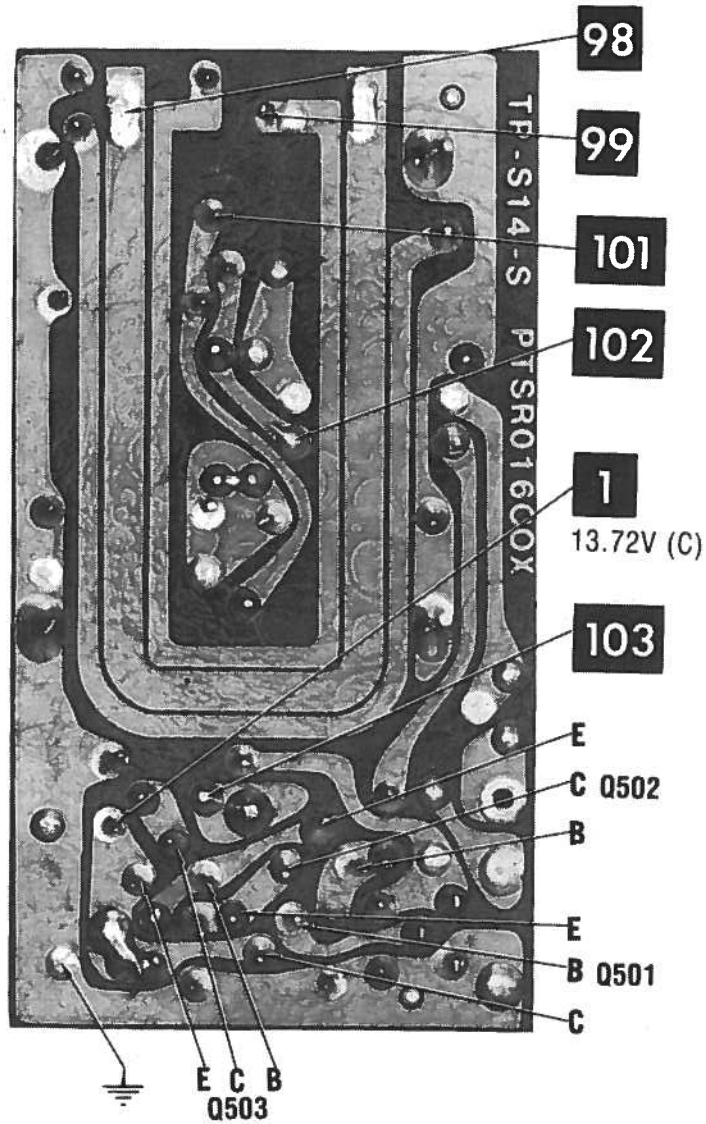


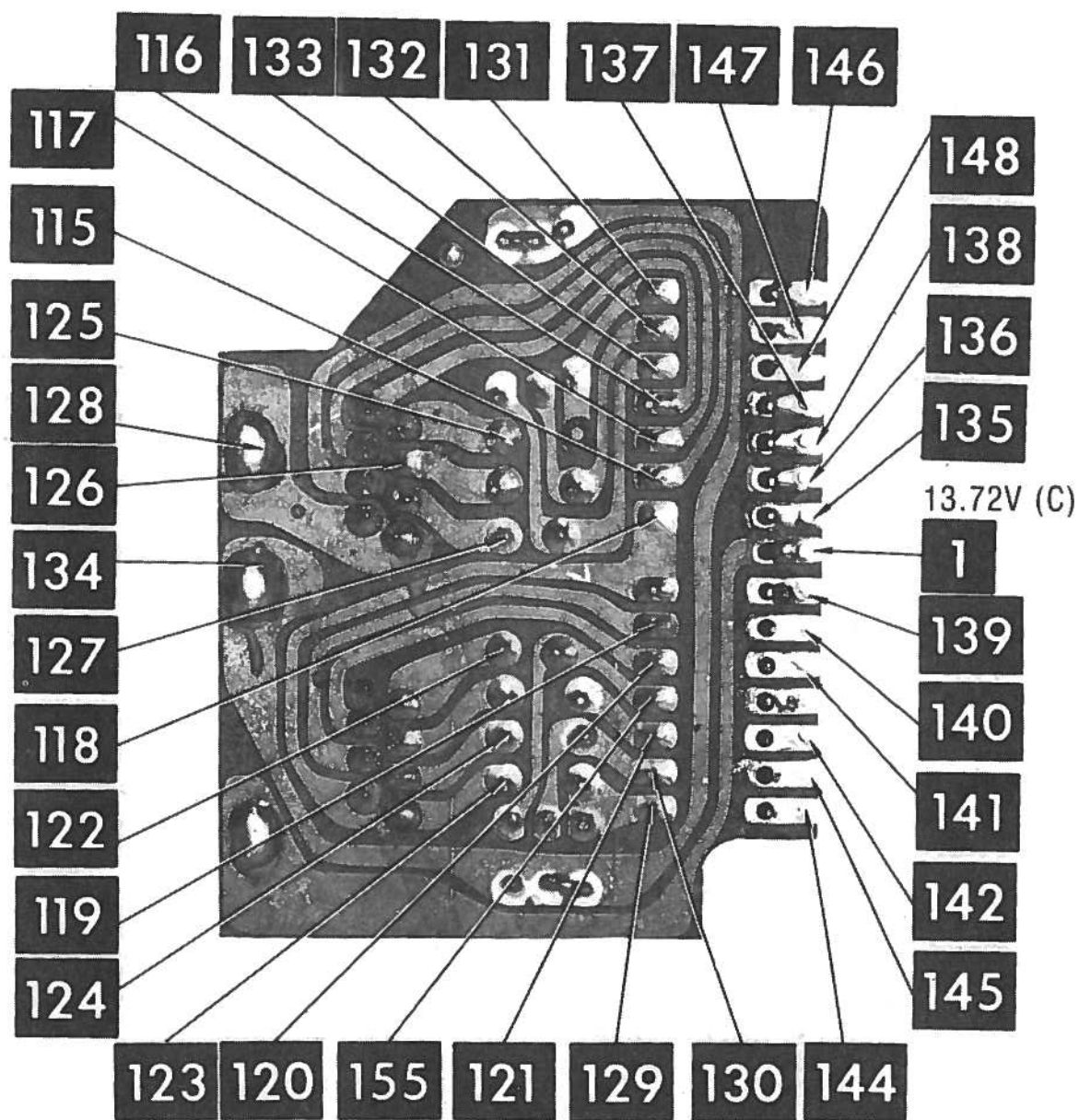
MAIN BOARD



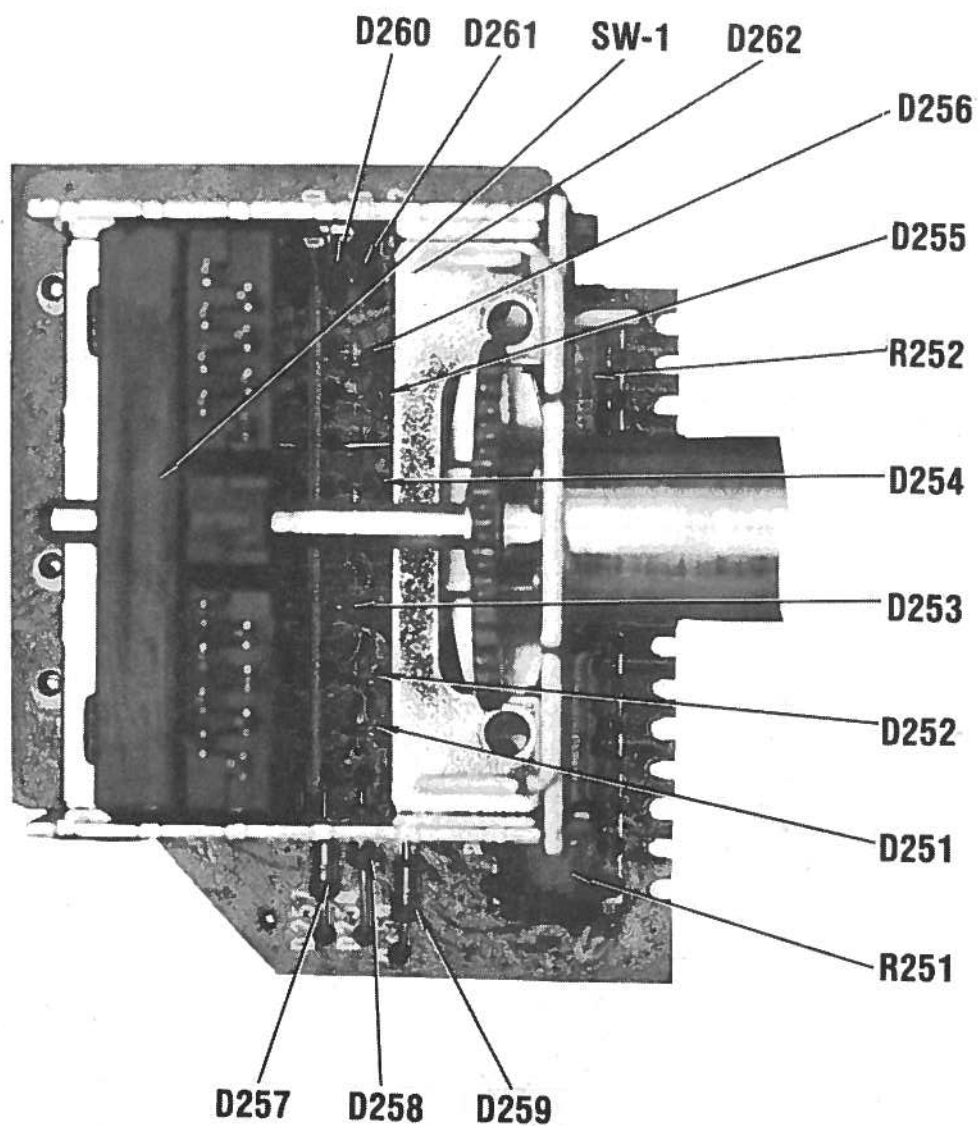
MAIN BOARD



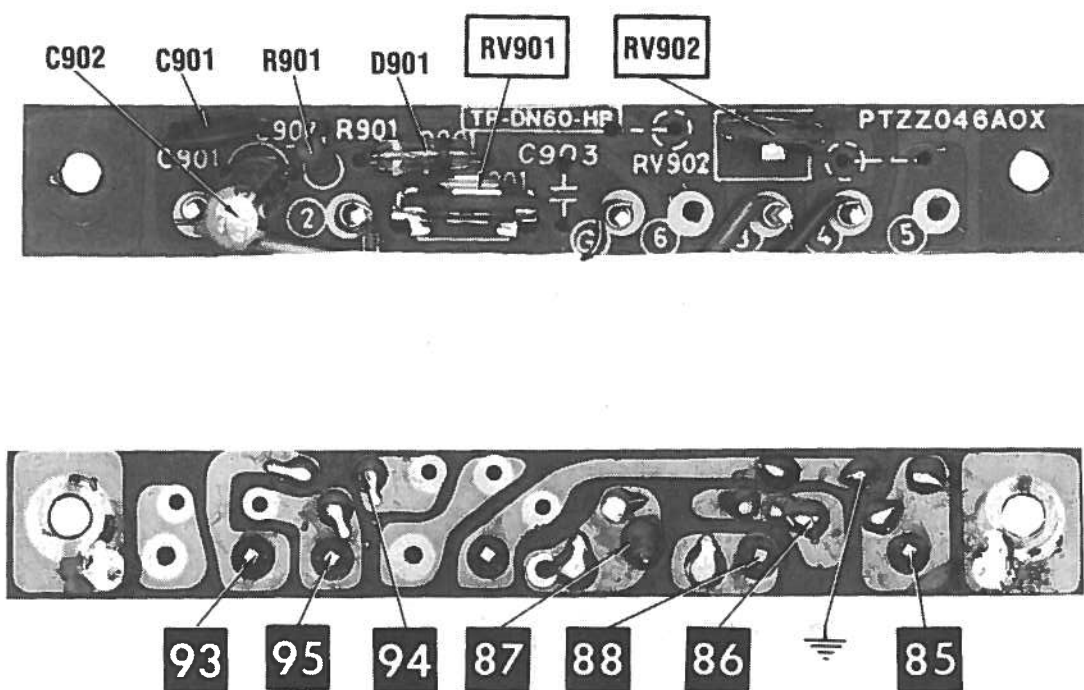




CHANNEL SELECTOR BOARD

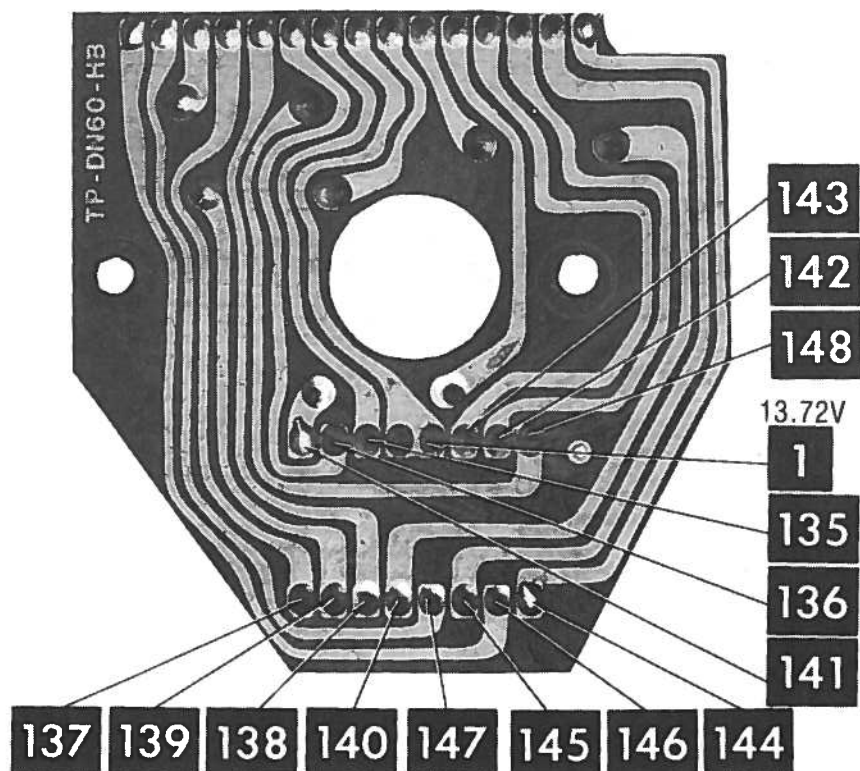


CHANNEL SELECTOR BOARD

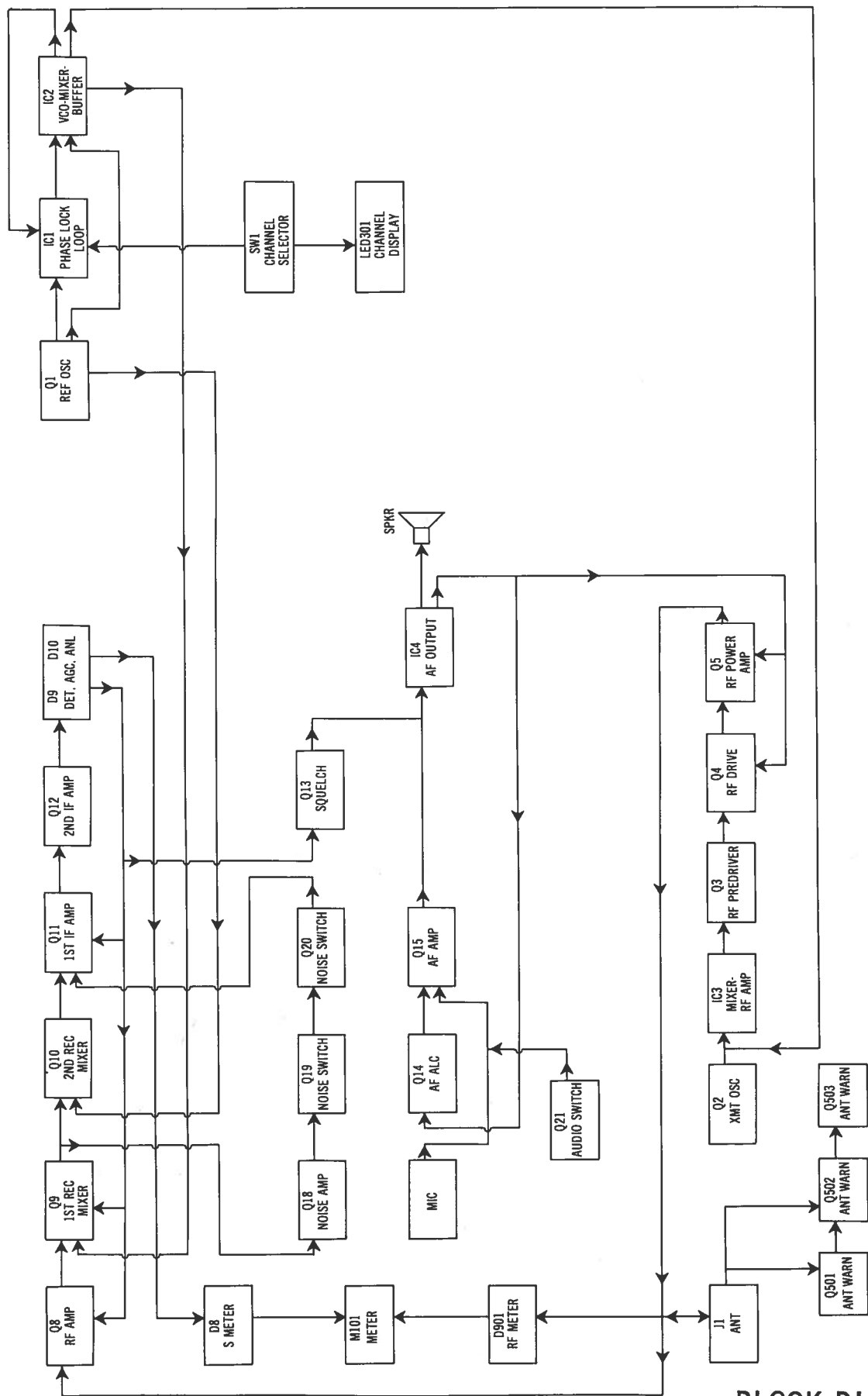


MAIN BOARD

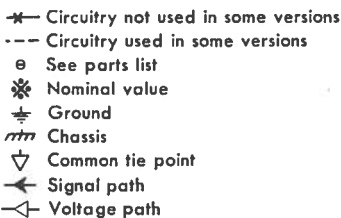
A Howard W. Sams **CIRCUITRACE[®]** Photo



LED DISPLAY BOARD



BLOCK DIAGRAM

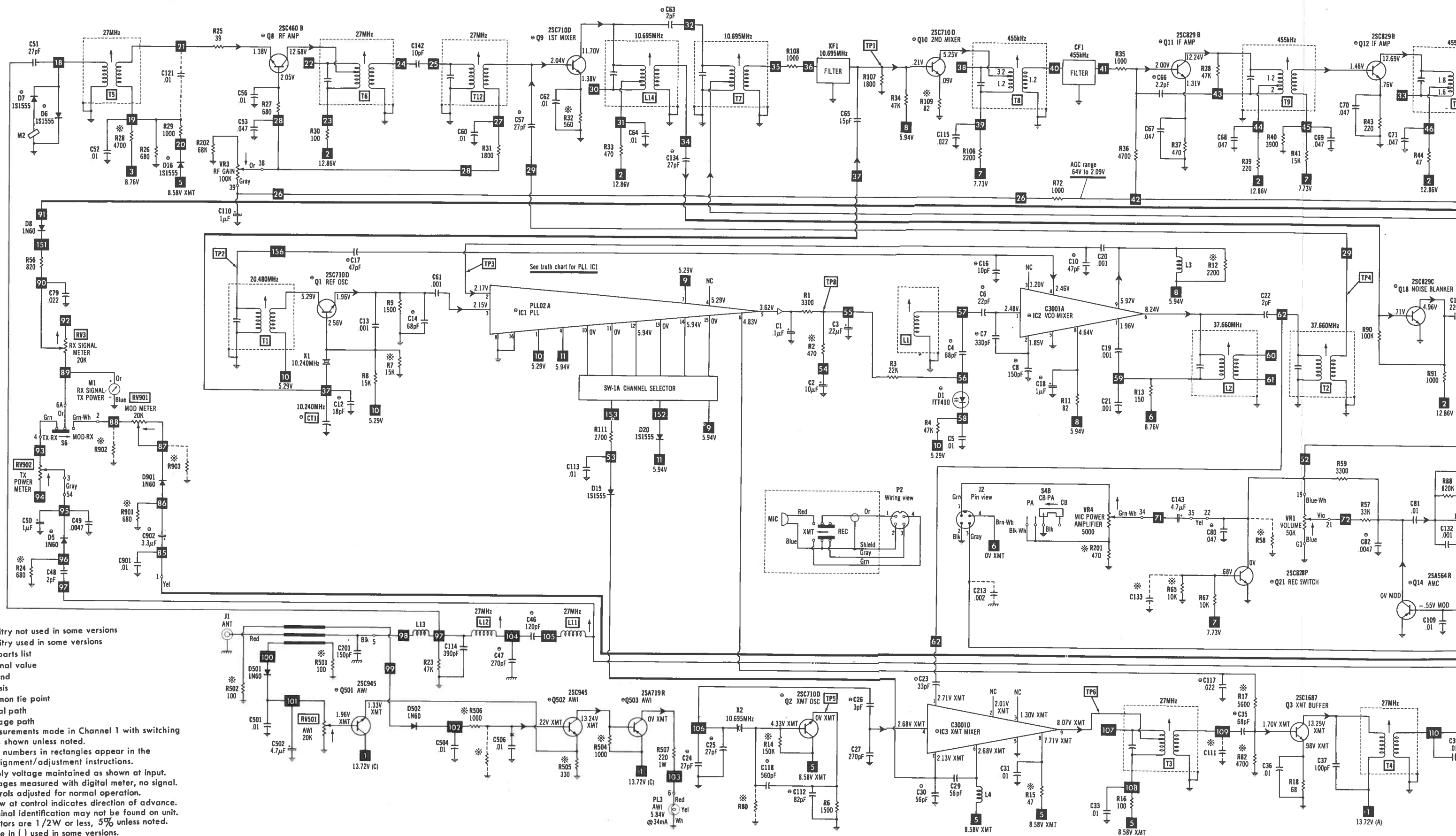


A PHOTOFACCT STANDARD NOTATION SCHEMATIC

WITH **CIRCUITRACE[®]**

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POWER SUPPLY SCHEMATIC

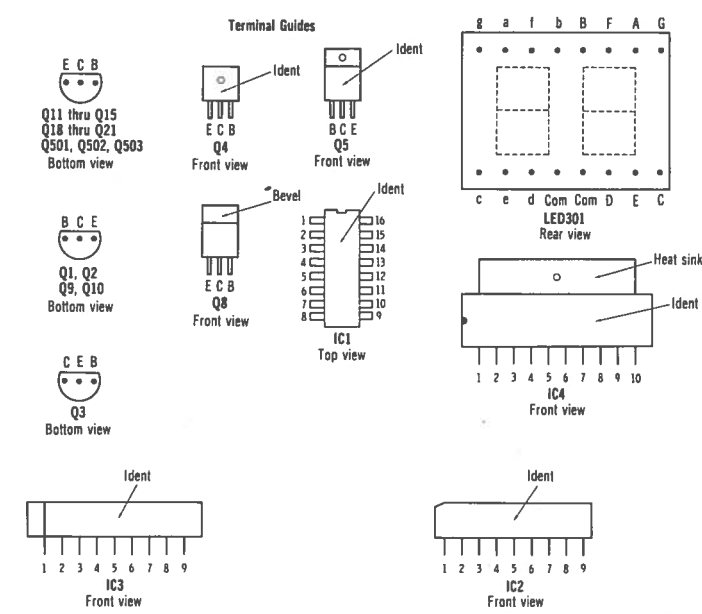
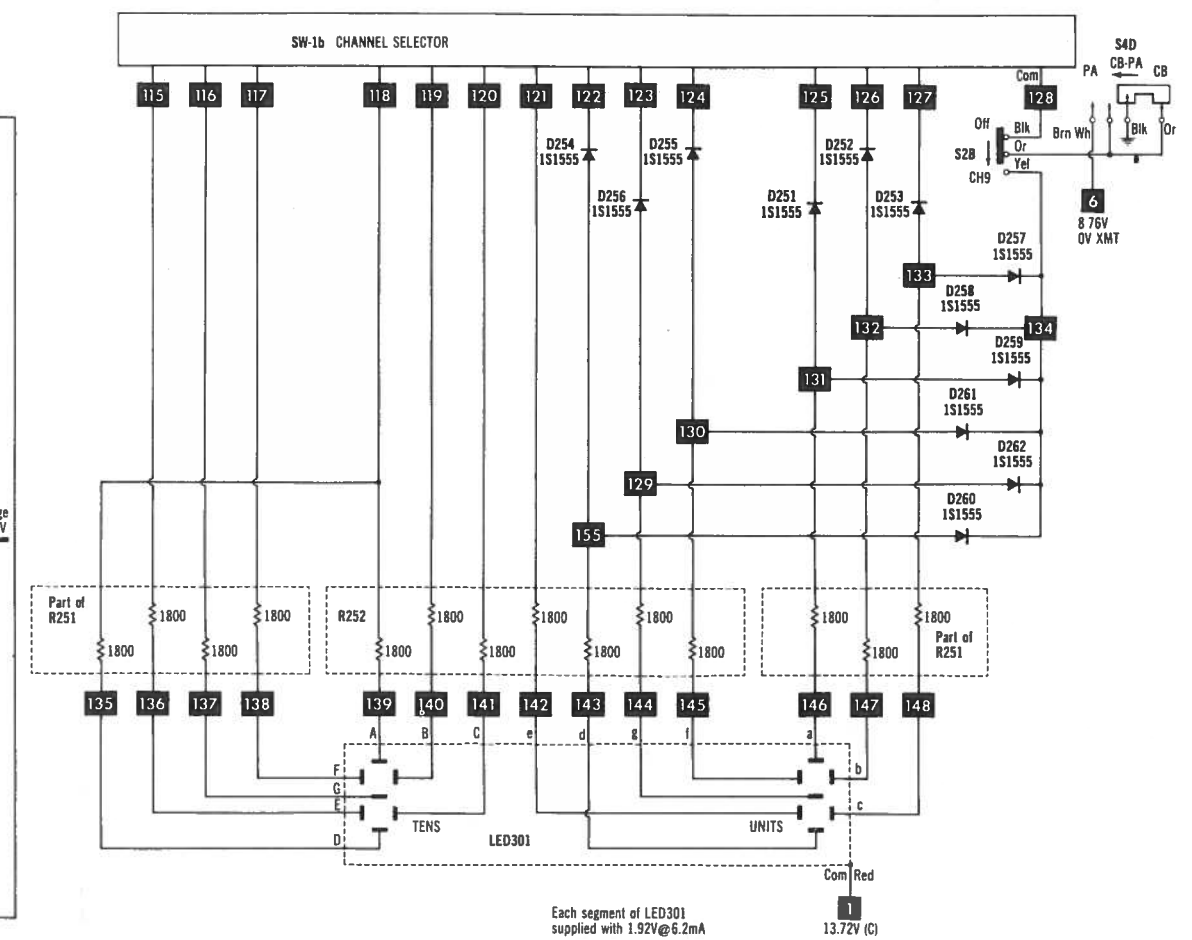
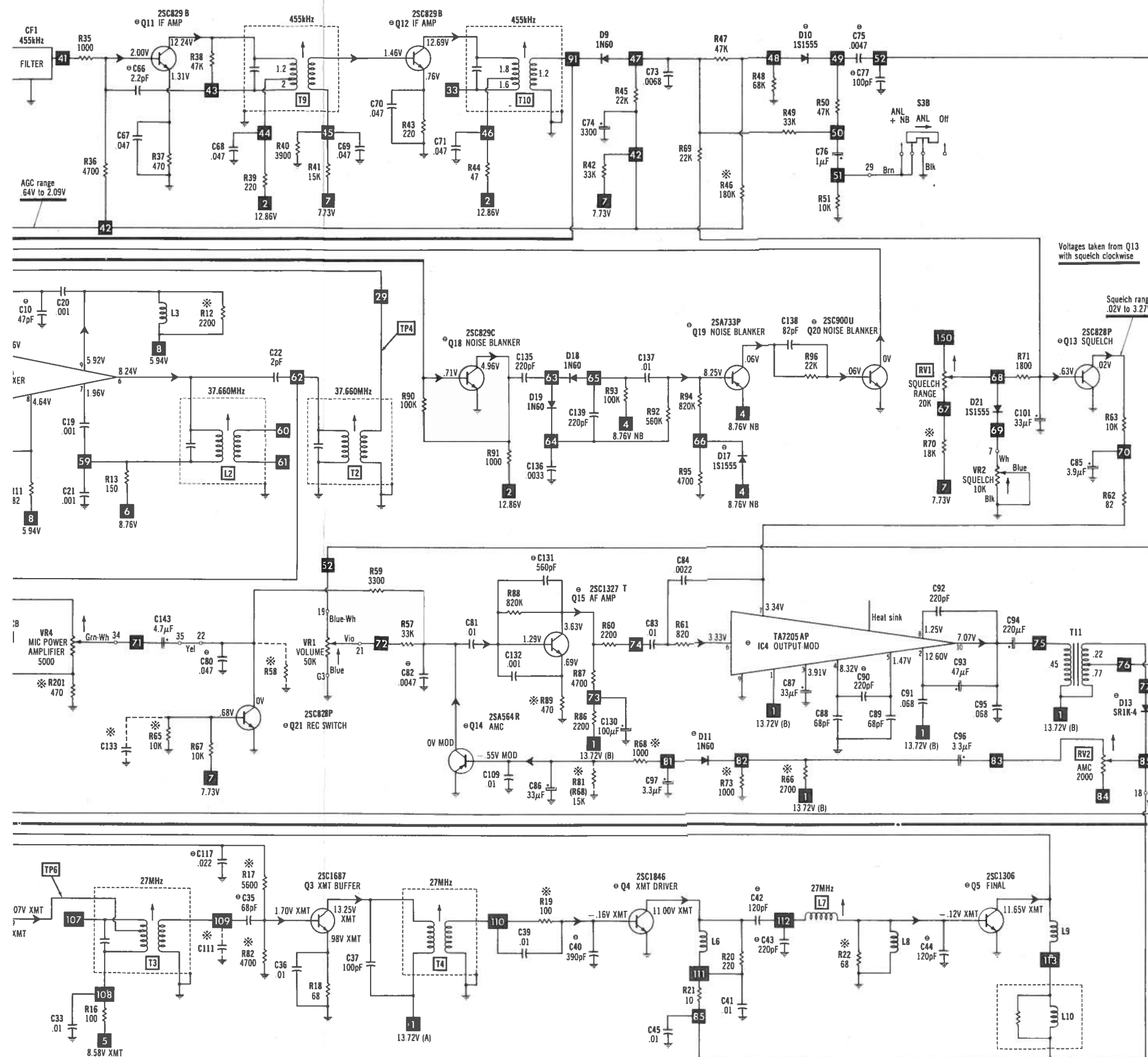


* Circuitry not used in some versions
 --- Circuitry used in some versions
 e See parts list
 * Nominal value
 G Ground
 Chassis
 Common tie point
 Signal path
 Voltage path
 Measurements made in Channel 1 with switching as shown unless noted.
 Item numbers in rectangles appear in the alignment/adjustment instructions.
 Supply voltage maintained as shown at input.
 Voltages measured with digital meter, no signal.
 Controls adjusted for normal operation.
 Arrow at control indicates direction of advance.
 Terminal identification may not be found on unit.
 Resistors are 1/2W or less, 5% unless noted.
 Value in () used in some versions.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

WITH **CircuitTrace**

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

ITEM No.	TYPE No.	MFG. PART No.	REPLACEMENT DATA									ZENITH PART No.
			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.	
D1	ITT410 8B122 MV201	EA16X106			HEPR2502 HEPR2502 HEPR2502	REN 612 REN 612 REN 612			ECG612 ECG612 ECG612			103-176 103-176 103-176
D2	MZ205 RD5.68	EA16X406	GEZD-5.0 GEZD-5.0			REN 135 REN 135			ECG135A ECG135A	TM135 TM135	WEP1103 WEP1103	103-2900 103-2900
D3	RD9.1E UZ9.1B	EA16X408	GEZD-9.1 GEZD-9.1	ZB9.1B ZB9.1B		REN 139 REN 139	SK3060 SK3060	RT-240 RT-240	ECG139A ECG139A	TM139/** TM139/**	WEP1109 WEP1109	103-272 103-272
D4	1S1555 SN4448	RT5217	GE-300 GE-514	PTC214 PTC214	HEPR0602 HEPR0602	REN 177 REN 177	SK3100 SK3100	RT-218 RT-218	ECG177 ECG177	TM177 TM177	WEP1062 WEP1062	103-131 103-131
D5	1N60 1K60	EA16X403	1N60 1N60	PTC206 PTC206	HEPR9135 HEPR9135	REN 109 REN 109	SK3088 SK3088	RT-263 RT-263	ECG109 ECG109	TM109/** TM109/**	WEP134 WEP134	103-2900 103-2900
D6	1N1555 SN4448	RT5217	GE-300 GE-514	PTC214 PTC214	HEPR0602 HEPR0602	REN 177 REN 177	SK3100 SK3100	RT-218 RT-218	ECG177 ECG177	TM177 TM177	WEP1062 WEP1062	103-131 103-131
D7	1S1555 SN4448	RT5217	GE-300 GE-514	PTC214 PTC214	HEPR0602 HEPR0602	REN 177 REN 177	SK3100 SK3100	RT-218 RT-218	ECG177 ECG177	TM177 TM177	WEP1062 WEP1062	103-131 103-131
D8	1N60	EA16X48	1N60	PTC206	HEPR9135	REN 109	SK3088	RT-263	ECG109	TM109/**	WEP134	103-2900
D9	1N60	EA16X48	1N60	PTC206	HEPR9135	REN 109	SK3088	RT-263	ECG109	TM109/**	WEP134	103-2900
D10	1S1555 SN4448	RT5217	GE-300 GE-514	PTC214 PTC214	HEPR0602 HEPR0602	REN 177 REN 177	SK3100 SK3100	RT-218 RT-218	ECG177 ECG177	TM177 TM177	WEP1062 WEP1062	103-131 103-131
D11	1N60 1K60	EA16X403	1N60 1N60	PTC206 PTC206	HEPR9135 HEPR9135	REN 109 REN 109	SK3088 SK3088	RT-263 RT-263	ECG109 ECG109	TM109/** TM109/**	WEP134 WEP134	103-2900 103-2900
D12	1S1555 SN4448	RT5217	GE-300 GE-514	PTC214 PTC214	HEPR0602 HEPR0602	REN 177 REN 177	SK3100 SK3100	RT-218 RT-218	ECG177 ECG177	TM177 TM177	WEP1062 WEP1062	103-131 103-131
D13	SRIK-4 10V200P	EA16X409	GE-504A GE-504A	PTC201 PTC201	HEPR0052 HEPR0052	REN 116 REN 116	SK3311 SK3311	RT-213 RT-213	ECG116 ECG116	TM116 TM116	WEP156 WEP156	212-76-6 212-76-6
D14	1S1885	EA16X404	GE-504A	PTC201	HEPR0052	REN 116	SK3311	RT-213	ECG116	TM116	WEP156	212-76-6
D15	1S1555	RT5217	GE-300	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
D16	1S1555 SN4448	RT5217	GE-300 GE-514	PTC214 PTC214	HEPR0602 HEPR0602	REN 177 REN 177	SK3100 SK3100	RT-218 RT-218	ECG177 ECG177	TM177 TM177	WEP1062 WEP1062	103-131 103-131
D17	1S1555 SN4448	RT5217	GE-300 GE-514	PTC214 PTC214	HEPR0602 HEPR0602	REN 177 REN 177	SK3100 SK3100	RT-218 RT-218	ECG177 ECG177	TM177 TM177	WEP1062 WEP1062	103-131 103-131
D18	1N60	EA16X48	1N60	PTC206	HEPR9135	REN 109	SK3088	RT-263	ECG109	TM109/**	WEP134	103-2900
D19	1N60	EA16X48	1N60	PTC206	HEPR9135	REN 109	SK3088	RT-263	ECG109	TM109/**	WEP134	103-2900
D20	1S1555	RT5217	GE-300	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
D21	1S1555	RT5217	GE-300	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG177	TM177		

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.
Q9	2SC460	RT6204 EA15X364	GE-61*	PTC136*	HEPS0014*	REN 107	SK3122	RT-134	ECG107	TM107/**	WEP460	121-522
	2SC710		GE-211*	PTC132	HEPS0016*	REN 123A*	SK3444	RT-308*	ECG123A*	TM123A*/**	WEP710	121-Z9000A
	2SC1047		GE-60*	PTC132*	HEPS0016*	REN 229*	SK3018*	RT-107	ECG229*	TM229*	WEP63*	121-Z9021
	2SC460A		GE-61*	PTC136*	HEPS0014*	REN 107	SK3122	RT-134	ECG107	TM107/**	WEP460	121-522
Q10	2SC7100	EA15X364	GE-211*	PTC132	HEPS0016*	REN 123A*	SK3444	RT-308*	ECG123A*	TM123A*/**	WEP710	121-Z9000A
	2SC710		GE-211*	PTC132	HEPS0016*	REN 123A*	SK3444	RT-308*	ECG123A*	TM123A*/**	WEP710	121-Z9000A
	2SC1359		GE-212	PTC121*	HEPS0014*	REN 199	SK3122	RT-308	ECG229*	TM229*	WEP66	121-Z9021
	2SC7100		GE-211*	PTC132	HEPS0016*	REN 123A*	SK3444	RT-308*	ECG123A*	TM123A*/**	WEP710	121-Z9000A
Q11	2SC710	R76733	GE-211*	PTC132	HEPS0016*	REN 123A*	SK3444	RT-308*	ECG123A*	TM123A*/**	WEP710	121-Z9000A
	2SC829		GE-20*	PTC139*	HEPS0015*	REN 123A	SK3444	RT-308	ECG229*	TM229*/**	WEP829	121-Z9021*
	2SC829B		GE-20*	PTC139*	HEPS0015*	REN 123A	SK3444	RT-308	ECG229*	TM229*/**	WEP829	121-Z9021*
	2SC829C		GE-20*	PTC139*	HEPS0015*	REN 123A	SK3444	RT-308	ECG229*	TM229*/**	WEP829	121-Z9021*
Q12	2SC829	R76733	GE-20*	PTC139*	HEPS0015*	REN 123A	SK3444	RT-308	ECG229*	TM229*/**	WEP829	121-Z9021*
	2SC829		GE-211*	PTC132	HEPS0016*	REN 123A*	SK3444	RT-308*	ECG123A*	TM123A*/**	WEP710	121-Z9000A
	2SC829B		GE-20*	PTC139*	HEPS0015*	REN 123A	SK3444	RT-308	ECG229*	TM229*/**	WEP829	121-Z9021*
	2SC829C		GE-20*	PTC139*	HEPS0015*	REN 123A	SK3444	RT-308	ECG229*	TM229*/**	WEP829	121-Z9021*
Q13	2SC710	RV2353	GE-20*	PTC139*	HEPS0015*	REN 123A	SK3444	RT-308	ECG229*	TM229*/**	WEP829	121-Z9021*
	2SC828P		GE-211*	PTC132	HEPS0016*	REN 123A*	SK3444	RT-308*	ECG123A*	TM123A*/**	WEP710	121-Z9000A
	2SC828		GE-61*	PTC139*	HEPS0015*	REN 199	SK3444	RT-302	ECG199	TM199/**	WEP828	121-972
	2SC945		GE-61*	PTC139*	HEPS0015*	REN 199	SK3444	RT-302	ECG199	TM199/**	WEP828	121-972
Q14	2SC372	RV2353	GE-212	PTC121*	HEPS0015*	REN 199	SK3124	RT-107A	ECG199	TM199/**	WEP1945	121-972
	2SA564R		GE-61*	PTC121*	HEPS0015*	REN 123A*	SK3444	RT-308	ECG123A*	TM123A*/**	WEP372	121-Z9000A
	2SA564		GE-65	PTC103*	HEPS0019*	REN 234	SK3114	RT-303	ECG234	TM234	WEP564	121-879
	2SA733		GE-65	PTC103*	HEPS0019*	REN 234	SK3114	RT-303	ECG234	TM234	WEP564	121-879
Q15	2SC1327	EA15X386	GE-48	PTC127	HEPS0019*	REN 294	SK3138	RT-303	ECG294	TM294/**	WEP916	121-952
	2SC1327		GE-85*	PTC139*	HEPS0024*	REN 199	SK3245	RT-107A	ECG199	TM199	WEP66	121-972
	2SC900		GE-62	PTC139*	HEPS0015*	REN 199	SK3124	RT-302	ECG199	TM199/**	WEP66	121-972
	2SC945		GE-212	PTC121*	HEPS0015*	REN 199	SK3124	RT-107A	ECG199	TM199/**	WEP1945	121-972
Q18	2SC829C	RT6733	GE-20*	PTC139*	HEPS0015*	REN 123A	SK3444	RT-308	ECG229*	TM229*/**	WEP829	121-Z9021*
	2SC829		GE-20*	PTC139*	HEPS0015*	REN 123A	SK3444	RT-308	ECG229*	TM229*/**	WEP829	121-Z9021*
	2SA733P		GE-48	PTC127	HEPS0019*	REN 294	SK3138	RT-303	ECG294	TM294/**	WEP916	121-952
	2SA733		GE-48	PTC127	HEPS0019*	REN 294	SK3138	RT-303	ECG294	TM294/**	WEP916	121-952
Q20	2SC900A	EA4025	GE-62	PTC139*	HEPS0015*	REN 199	SK3124	RT-302	ECG199	TM199	WEP66	121-972
	2SC1327		GE-85*	PTC139*	HEPS0024*	REN 199	SK3245	RT-107A	ECG199	TM199	WEP66	121-972
	2SC828P		GE-61*	PTC139*	HEPS0015*	REN 199	SK3444	RT-302	ECG199	TM199/**	WEP828	121-972
	2SC828		GE-61*	PTC139*	HEPS0015*	REN 199	SK3444	RT-302	ECG199	TM199/**	WEP828	121-972
Q21	2SC945	RT7557	GE-212	PTC121*	HEPS0015*	REN 199	SK3124	RT-107A	ECG199	TM199/**	WEP1945	121-972
	2SC945U		GE-212	PTC121*	HEPS0015*	REN 199	SK3124	RT-107A	ECG199	TM199/**	WEP1945	121-972
	2SC945		GE-212	PTC121*	HEPS0015*	REN 199	SK3124	RT-107A	ECG199	TM199/**	WEP1945	121-972
	2SC945		GE-212	PTC121*	HEPS0015*	REN 199	SK3124	RT-107A	ECG199	TM199/**	WEP1945	121-972
Q501	2SC828	RT7557	GE-61*	PTC139*	HEPS0015*	REN 199	SK3444	RT-302	ECG199	TM199/**	WEP828	121-972
	2SC945		GE-212	PTC121*	HEPS0015*	REN 199	SK3124	RT-107A	ECG199	TM199/**	WEP1945	121-972
	2SC828		GE-61*	PTC139*	HEPS0015*	REN 199	SK3444	RT-302	ECG199	TM199/**	WEP828	121-972
	2SC945		GE-212	PTC121*	HEPS0015*	REN 199	SK3124	RT-107A	ECG199	TM199/**	WEP1945	121-972
D502	2SC945	RT7557	GE-212	PTC121*	HEPS0015*	REN 199	SK3124	RT-107A	ECG199	TM199/**	WEP1945	121-972
	2SC828		GE-61*	PTC139*	HEPS0015*	REN 199	SK3444	RT-302	ECG199	TM199/**	WEP828	121-972
	2SA719R		GE-269	PTC103*	HEPS0019*	REN 290	SK3114	RT-305	ECG290	TM290/**	WEP911	121-1019
	2SA733		GE-48	PTC127	HEPS0019*	REN 294	SK3138	RT-303	ECG290	TM290/**	WEP916	121-952
Q503	2SA719	RV2355	GE-269	PTC103*	HEPS0019*	REN 290	SK3114	RT-305	ECG290	TM290/**	WEP911	121-1019
	2SA719		GE-269	PTC103*	HEPS0019*	REN 290	SK3114	RT-305	ECG290	TM290/**	WEP911	121-1019
	2SA719		GE-269	PTC103*	HEPS0019*	REN 290	SK3114	RT-305	ECG290	TM290/**	WEP911	121-1019
	2SA719		GE-269	PTC103*	HEPS0019*	REN 290	SK3114	RT-305	ECG290	TM290/**	WEP911	121-1019

(11) $\pm 5\%$ TOL

* Lead configuration may vary from original.
/** Also available as exact type replacement.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING	REPLACEMENT DATA				
		MFR. PART No.	CORNELL- DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
					Q-LINE	GENERAL LINE
C1	.1 50V	EA31X241	PC10-25	TDCL04M050EL	Q0T1-2	SD50-R109
C2	10 16V	EA31X246		VTT10B25	QV1-41	EV-1222
C3	.22 50V	EA31X240		TDCC224M050EL	QD1-10	SD50-R229
C11	47 10V	EA31X214		VTT47D16	QV1-73	EV-1226
C18	1 50V	EA21X204	PC1-50	VTT1A50	QV1-11	EV-1615
C50	1 50V	EA21X204	PC1-50	VTT1A50	QV1-11	EV-1615
C72	10 16V	EA31X246	PC10-25	VTT10B25	QV1-41	EV-1222
C74	3.3 50V	EA21X204	PC5-50	VTT3R3A50	QV1-25	EV-1618
C76	1 50V		PC1-50	VTT1A50	QV1-11	EV-1615
C78	47 16V		PC50-16	VTT47D16	QV1-73	EV-1226
C85	3.9 25V		PC30-25	TIM395025P0X	QD1-46	SD35-3R99
C86	33 10V	VTT33B10		QV1-61	EV-1125	
C87	33 10V	VTT33B10		QV1-61	EV-1125	
C93	47 16V	PC50-16		VTT47D16	QV1-73	EV-1226
C94	220 16V	RT5047	PC250-25	VTT220H16	QV1-117	EV-1240
C96	3.3 25V	EA31X260	PC5-50	VTT3R3A50	QV1-23	EV-1318
C97	3.3 25V	EA31X260	PC5-50	VTT3R3A50	QV1-23	EV-1318
C99	47 25V	RT4632	PC50-25	VTT47E25	QV1-75	EV-1326
C100	1000 16V	EA21X204	PC1000-16	VTT100OL16	QV1-183	EV-1260
C101	33 10V		PC30-25	VTT33B10	QV1-61	EV-1125
C110	1 50V		PC1-50	VTT1A50	QV1-11	EV-1615
C130	100 16V		EA31X269	PC100-16	VTT100F16	QV1-95
C140	3.3 50V	EA31X239	PC5-50	VTT3R3A50	QV1-25	EV-1618
C143	4.7 25V	EA31X211	PC5-50	VTT4R7B50	QV1-27	EV-1319
C502	4.7 25V	EA31X211	PC5-50	VTT4R7B50	QV1-27	EV-1319
C902	3.3 50V	EA31X239	PC5-50	VTT3R3A50	QV1-25	EV-1618

PARTS LIST AND DESCRIPTION (CONTINUED)

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

CAPACITORS

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA							
			CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.				
						Q-LINE	GENERAL LINE			
C4	68 N150 10%	EA18X173	UK50-103	GP330	*	QC2-31	10TCP-Q68			
C5	.01	EA18X155			DD-331		GP333	MAG5011	10TCP-Q22	
C6	22 N150							UK50-503	GP315	MAG5015
C7	330 10%	EA18X202	GP47	GP447	QC2-31		10TS-T15			
C8	150 10%					EA18X173	DPMS6D1	EWFA1210	QFT2-1	56AQ47
C9	.047									UK50-103
C10	47	EA18X246	DPMS6D1	GP410	QC2-1					
C12	18 N150					EA18X181	DPMS6D1	EWFA1210	QC2-1	
C13	1000 50V									EA18X200
C14	68 N150 10%	DD-271	GP270	GP433	QC2-1					
C15	.01					UK50-103	MAG5011	QC2-1	QC2-1	
C16	10									EA18X186
C17	47 N150 10%	UK50-103	GP270	GP456	QC2-1					
C19	1000 50V 10%					EA18X187	GP68	MAG5011	QC2-1	
C20	1000 50V 10%									WMF1S1
C21	1000 50V 10%	GP390	MAG5011	QC2-1	QC2-1					
C22	2					UK50-103	MAG5011	QC2-1	QC2-1	
C23	33									EA18X187
C24	27 N150	UK50-103	GP270	MAG5011	QC2-1					
C25	15 N150					EA18X187	GP68	MAG5011	QC2-1	
C26	3									UK50-103
C27	270	EA18X187	GP68	MAG5011	QC2-1					
C28	.01					UK50-103	GP270	MAG5011	QC2-1	
C29	56									EA18X187
C30	56	UK50-103	GP270	MAG5011	QC2-1					
C31	.01					EA18X187	GP68	MAG5011	QC2-1	
C33	.01									UK50-103
C35	68	EA18X187	GP68	MAG5011	QC2-1					
C36	.01					UK50-103	GP270	MAG5011	QC2-1	
C37	100 N150 10%									EA18X187
C38	.047	UK50-103	GP270	MAG5011	QC2-1					
C39	.01 50V 10%					EA18X187	GP68	MAG5011	QC2-1	
C40	390									UK50-103
C41	.01	EA18X187	GP68	MAG5011	QC2-1					
C42	120 10%					UK50-103	GP270	MAG5011	QC2-1	
C43	220 10%									EA18X187
C44	120 10%	UK50-103	GP270	MAG5011	QC2-1					
C45	.01					EA18X187	GP68	MAG5011	QC2-1	
C46	120 10%									UK50-103
C47	270 10%	EA18X187	GP68	MAG5011	QC2-1					
C48	2					UK50-103	GP270	MAG5011	QC2-1	
C49	4700									EA18X187
C51	27	UK50-103	GP270	MAG5011	QC2-1					
C52	.01					EA18X187	GP68	MAG5011	QC2-1	
C53	.047									UK50-103
C55	.047	EA18X187	GP68	MAG5011	QC2-1					
C56	.01					UK50-103	GP270	MAG5011	QC2-1	
C57	27									EA18X187
C58	.01	UK50-103	GP270	MAG5011	QC2-1					
C59	.01					EA18X187	GP68	MAG5011	QC2-1	
C60	.01									UK50-103
C62	.01	EA18X187	GP68	MAG5011	QC2-1					
C63	2					UK50-103	GP270	MAG5011	QC2-1	
C64	.01									EA18X187
C65	15 N150	UK50-103	GP270	MAG5011	QC2-1					
C66	2.2 10%					EA18X187	GP68	MAG5011	QC2-1	
C67	.047 50V 10%									UK50-103
C68	.047 50V 10%	EA18X187	GP68	MAG5011	QC2-1					
C69	.047 50V 10%					UK50-103	GP270	MAG5011	QC2-1	
C70	.047 50V 10%									EA18X187
C71	.047 50V 10%	UK50-103	GP270	MAG5011	QC2-1					
C73	6800 50V 10%					EA18X187	GP68	MAG5011	QC2-1	
C75	4700 50V 10%									UK50-103
C77	100 10%	EA18X187	GP68	MAG5011	QC2-1					
C79	.022 50V 10%					UK50-103	GP270	MAG5011	QC2-1	
C80	.047 50V 10%									EA18X187
C81	.01 50V 10%	UK50-103	GP270	MAG5011	QC2-1					
C82	4700					EA18X187	GP68	MAG5011	QC2-1	
C83	.01 50V 10%									UK50-103
C84	2200	EA18X187	GP68	MAG5011	QC2-1					
C88	68					UK50-103	GP270	MAG5011	QC2-1	
C89	68									EA18X187
C90	220 10%	UK50-103	GP270	MAG5011	QC2-1					
C91	.068 50V 10%					EA18X187	GP68	MAG5011	QC2-1	
C92	220 10%									UK50-103
C95	.068 50V 10%	EA18X187	GP68	MAG5011	QC2-1					
C102	.01					UK50-103	GP270	MAG5011	QC2-1	
C106	.047									EA18X187
C107	.047	UK50-103	GP270	MAG5011	QC2-1					
C108	.047					EA18X187	GP68	MAG5011	QC2-1	
C109	.01									UK50-103
C112	82 N150 10%	EA18X234	GP390	MAG5011	QC2-1					
C113	.01					UK50-103	GP270	MAG5011	QC2-1	
C114	390 10%									EA18X234
C115	.022 50V 10%	UK50-103	GP270	MAG5011	QC2-1					
C117	.022					EA18X234	GP68	MAG5011	QC2-1	
C118	560 10%									UK50-103
C131	560	EA18X234	GP68	MAG5011	QC2-1					
C132	1000					UK50-103	GP270	MAG5011	QC2-1	
C134	27									EA18X234
C135	220 10%	UK50-103	GP270	MAG5011	QC2-1					
						EA18X234	GP68	MAG5011	QC2-1	

GENERAL ELECTRIC MODEL 3-5814B

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

CAPACITORS (cont)

ITEM No.	RATING	MFGR. PART No.	REPLACEMENT DATA					
			CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE	PART No.	
						Q-LINE	GENERAL LINE	
C136	3300 50V 10%		UK50-103 DD-820 DD-221 UK50-103 DD-151 UK50-103 UK50-103 UK50-503 UK50-103 UK50-103	WMF1D33	M192P3329R8 MAG5011 GP482 GP322 MAG5011 GP315 MAG5011 MAG5011 MAG5015 MAG5011 MAG5011	QFT2-43	1FT-D33 10TS-Q82 10TS-T22 10TS-T15	
C137	.01							
C138	82							
C139	220 10%							
C141	.01							
C201	150 10%							
C202	.01							
C203	.01							
C204	.047							
C205	.01							
C206	.01							
C207	4700							
C208	1000							
C209	4700							
C210	4700							
C211	2000							
C212	2000							
C213	2000							
C501	10		EA18X228	UK50-103	CD15CD100J03	MAG5011	QW1-6	MWA-100
C503	.01							
C504	10							
C506	.01	EA18X228	UK50-103	CD15CD100J03	MAG5011	QW1-6	MWA-100	
C901	.01	EA30X52	UK50-103		MAG5011			
CT1								

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

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

ITEM No.	FUNCTION	RESIST-ANCE	REPLACEMENT DATA			
			MFGR. PART No.	CENTRALAB PART No.	MALLORY PART No.	TRW PART No.
RV1	Squelch Range	20K	EA49X332	T-20K	MTC24L1	U260R253B
RV2	ALC	2000	EA49X331			U260R252B
RV3	RX Signal	20K	EA49332			U260R253B
RV501	AWI	20K	EA49X490			X260R253B
RV901	MOD	20K	EA49X396			X201R253R
RV902	TX Power	20K	EA49X490			X260R253B
	TX Power	20K	EA49X396(6)			X201R253R
VR1	Volume/On-Off Switch	50K	EA49X488			X201R253B
VR2	Squelch	10K	EA49X489(18)			
VR3	RF Gain	100K				
VR4	Mic Power	5000	EA49X487			

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

(18) Includes VR2 and VR3.

RESISTORS (Power and Special)

ITEM No.	RATING	REPLACEMENT DATA		ITEM No.	RATING	REPLACEMENT DATA	
		WORKMAN PART No.	MFGR. PART No.			WORKMAN PART No.	MFGR. PART No.
ARY251	Resistor Network(1)		EA62X167	ARY252	Resistor Network(1)		EA62X167

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

COILS (RF-IF)

ITEM No.	FUNCTION	REPLACEMENT DATA			REMARKS
		PART No.	OTHER IDENTIFICATION	MILLER PART No.	
L1	VCO (TX/RX)	EA36X257	1000003S7288		
L2	VCO/PLL (37MHz)	EA36X258	10MB803M6NC3		
L3	Peaking (68uH)	EA36X239			
L4	Peaking (1uH)	EA36X240			
L6	Peaking (2.2uH)	EA36X237			
L7	RF Choke (27MHz)	EA36X238			
L8	Peaking (68uH)	EA36X239			
L9	RF (.55uH)	EA36X245			
L10	RF (1.0uH)	EA36X240			
L11	RF (27MHz)	EA36X241			
L12	RF (27MHz)	EA36X242			
L13	Antenna Loading (.4uH)	EA36X336			
L14	Mixer (10.7MHz)	EA36X266	10MA017S6003		
L15	Peaking (68uH)	EA36X239			
L16	Choke (1.15uH)	EA36X263			
L17	Choke (1.15uH)	EA36X263			
T1	Oscillator (10.25MHz)	EA36X281	1000002S60ET		
T2	VCO (38MHz)	EA36X264			
T3	Mixer (27MHz)	EA36X260			
T4	RF Driver (27MHz)	EA36X248	100P005M60AT		
T5	RF (27MHz)	EA36X249	ETRO33369E3		
T6	RF (27MHz)	EA36X265	ETRO33471F3		
T7	IF (10.7MHz)	EA36X266			
T8	IF (455kHz)	EA61X188	ET10122688T		
T9	IF (455kHz)	EA61X189	ET101236DA3		
T10	IF (455kHz)	EA61X190	ET101296NH3		
T12	RF (27MHz)	EA36X265			

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.	
CH1	1.5A	.241	3.72mH	EA36X256 LJ119H004W(1)			(1) Number on unit.

TRANSFORMER (Audio Output)

ITEM No.	IMPEDANCE		REPLACEMENT DATA			NOTES
	PRI.	SEC.	MFGR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T11	2.88	1 2 8 13.52	EA64X30 ETA66(1)	TR723	MCB16	(1) Number on unit.

SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		MFGR. PART No.	QUAM PART No.	
SP	3 1/4" PM 8 Ohms	EA95X127	3A05Z8R	

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
AC4	2A Quick Acting	5.1725		AGC(2)	HDJ-A	312002	150145	F62-2

PARTS LIST AND DESCRIPTION (CONTINUED)

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

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
M1c	EA68X1238	18-032	18-034	18-010	18-092	1	2	4	3	NC	2

MISCELLANEOUS

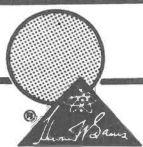
ITEM No.	PART NAME	PART No.	NOTES
AC1	Power Supply	5-1210	12V DC
AC2	Adaptor	501230	Automotive, 12V DC
AC3	Cord	5-1722	DC Power
CF1	Filter	EA36X332	455kHz
J1	Jack	EA41X220	Antenna
J2	Jack	EA41X175	Microphone
J3	Jack	EA41X135	External Speaker (3 Pin)
J4	Jack	EA41X135	PA Speaker (2 Pin)
J5	Jack	EA41X183	DC Power (2 Pin)
M1	Meter	EA62X165	
M1	PWB	EA93X368	LED Assembly W/Comp.
M2	PC	EA65X9	Connector (Flex)
M3	PWB	EA93X369	AWI without Comp.
M4	LED	EA16X308	SL1222C
M5	PWB	EA93X370	Mod without Components
PL2	Lamp	EA41X179	Meter
PL3	Lamp	EA41X145	Mod Indicator
PL4	Lamp	EA41X179	AWI Indicator
SW1	Switch	EA55X141	Channel Selector
S2	Switch	EA39X226	Ch. 9
S3	Switch	EA39X227	ANL/NB
S4	Switch	EA55X133	CB/PA
S5	Switch	EA39X226	Meter Mod/RX & TX/RX
X1	Crystal	EA75X6	10.24MHz
X2	Crystal	EA75X7	10.695MHz
XF1	Filter	EA36X333	10.695MHz

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

ITEM	PART No.	ITEM	PART No.
Cabinet, Bottom	EA98X665	Knob, Mic Gain	EA43X917
Cabinet, Top	EA98X664	Knob, RF Gain	EA43X730
Escutcheon, Front Assembly	EA89X273	Knob, Squelch	EA43X729
Knob, Channel Selector	EA43X918	Knob, Volume	EA43X727

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')



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 VIKING 430 (242-0430)

MANUFACTURER'S SPECIFICATIONS

RECEIVER

Sensitivity	10 dB (S + N)/N at 0.5 μ V input
Selectivity	6 kHz bandwidth at -6 dB 30 kHz bandwidth at -60 dB
Spurious Rejection	50 dB except image of 12 dB
Audio Output Power	4 watts
Tight Squelch	500 μ V minimum and 5000 μ V maximum
Squelch Sensitivity	1 dB or less signal change for 40 dB of quieting at 1 μ V
Intermediate Frequency	455 kHz
AGC Characteristics	Flat within $\pm$ 6 dB from 500,000 to 5 μ V with 22 $\pm$ 6 dB rolloff from 500 to 0.5 μ V (ANL/NB disabled)
Noise Limiting	Audio noise blanker plus audio noise limiter
Receiver Radiation	100 μ V maximum
Speaker Impedance	3.2 ohms
Audio Frequency Response	+1 dB, -20 dB from 300 to 3000 Hz
Chassis Radiation	5 μ V/meter at 3 meters

TRANSMITTER

Emission	6A3
RF Power Output	4 watts maximum and 3.5 watts minimum at 13.8 VDC
RF Spurious and Harmonic Attenuation	60 dB minimum
Audio Frequency Response	+1 dB, -14 dB from 300 to 3000 Hz
Modulation	80% minimum

MINIMUM PERFORMANCE SPECIFICATIONS

(The specifications listed in this section are absolute service minimums.)

RECEIVER

Sensitivity	7 dB (S + N)/N at 0.5 μ V input
Spurious Rejection	35 dB
Audio Output Power	0.1 watt at 0.5 μ V input and 3 watts with less than 10% distortion at 500 μ V input
Tight Squelch	500 μ V minimum and 5000 μ V maximum
AGC Characteristics	15 $\pm$ 4 dB rolloff from 500 to 0.5 μ V (ANL/NB disabled)

TRANSMITTER

RF Power Output	4 watts maximum and 3.5 watts minimum at 13.8 VDC
Modulation	70% minimum, positive and negative

JOHNSON MODEL VIKING 430

Courtesy of the Manufacturer

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

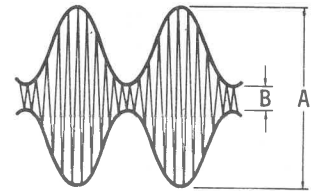
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8CE811

ALIGNMENT INSTRUCTIONS

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

Suggested Alignment Tools: GC ELECTRONICS:
 T1, T2, T81, T83, L131, L132.....9440
 T3, T4.....5000, 5009, 8276, 8728A
 T84, T85, L84.....8282, 8606, 9302, 9440
 L85, L86, L87.....9300, 9302, 9304



$$\text{Modulation Ratio} = \frac{A - B}{A + B} \times 100 (\%)$$

FIGURE 1

SYNTHESIZER ALIGNMENT

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Input of frequency counter to TP2 (Junction of R132 and C131).	Ch. 19		Check for 5.120MHz.
Input of DC meter to TP1.	Ch. 40	L131	Adjust for 6.00 volts $\pm$.1 volt.
Input of frequency counter to TP3 (U131 Pin 1).	Ch. 1		Check for 1.010MHz. Check all channels. (See Truth Chart for correct frequencies.)
Input of frequency counter to TP4 (U132 Pin 1).	Ch. 1		Check for 31.630MHz. Check all channels. (See Truth Chart for correct frequencies.)
Input of frequency counter to TP4 (U132 Pin 1).	Ch. 1, XMT		Check for 32.085MHz. 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: Squelch MINIMUM, ANL/NB Switch Off, LOC/EXT Switch EXT.

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Output of signal generator thru .01uF to TP5 (U1 Pin 15). 455kHz, 1000Hz @ 30% modulation.	Ch. 19	T4, T3	Adjust for maximum output.
Output of signal generator thru .01uF to antenna input. 27.185MHz, 1000Hz @ 30% modulation.	Ch. 19	T2, T1	Adjust for maximum output. If necessary readjust T3 and T4 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:
Squelch MINIMUM, ANL/NB Switch Off, LOC/EXT Switch EXT.

TEST EQUIPMENT	TRANSCIVER	ADJUST	REMARKS
Output of signal generator thru .01uF to antenna jack. 27.185MHz, 1000Hz @ 30% modulation. Output 1000uV.	Ch. 19	R13	AGC Set volume R59 for 0db. Decrease generator output to 1uV. Adjust so that audio drops 15db <u>+4db</u> .
Output of signal generator thru .01uF to antenna input. 27.185MHz, 1000Hz @ 30% modulation. Output 1uV.	Ch. 19	R39	S METER/ANL Set volume R59 for 0db. Switch ANL on. Adjust so that audio drops 6 to 12db.

TRANSMITTER ALIGNMENT

Connect an RF wattmeter and 50-ohm, 25-watt dummy load to antenna connector.
NOTE: Be sure to check transmit frequency and power on all active channels after alignment of transmitter.
See page 4 for channel frequencies.

TEST EQUIPMENT	TRANSCIVER	ADJUST	REMARKS
Input of RF wattmeter and 50-ohm, 25 watt dummy load to antenna input.	Ch. 19	T132, T81, T83	Adjust for maximum RF output.
Input of RF wattmeter and 50-ohm, 25 watt dummy load to antenna input.	Ch. 19	L84	Adjust for 4.0 watts RF output maximum.
		L85, L86 L87	Factory adjust flush with bottom of coil form.

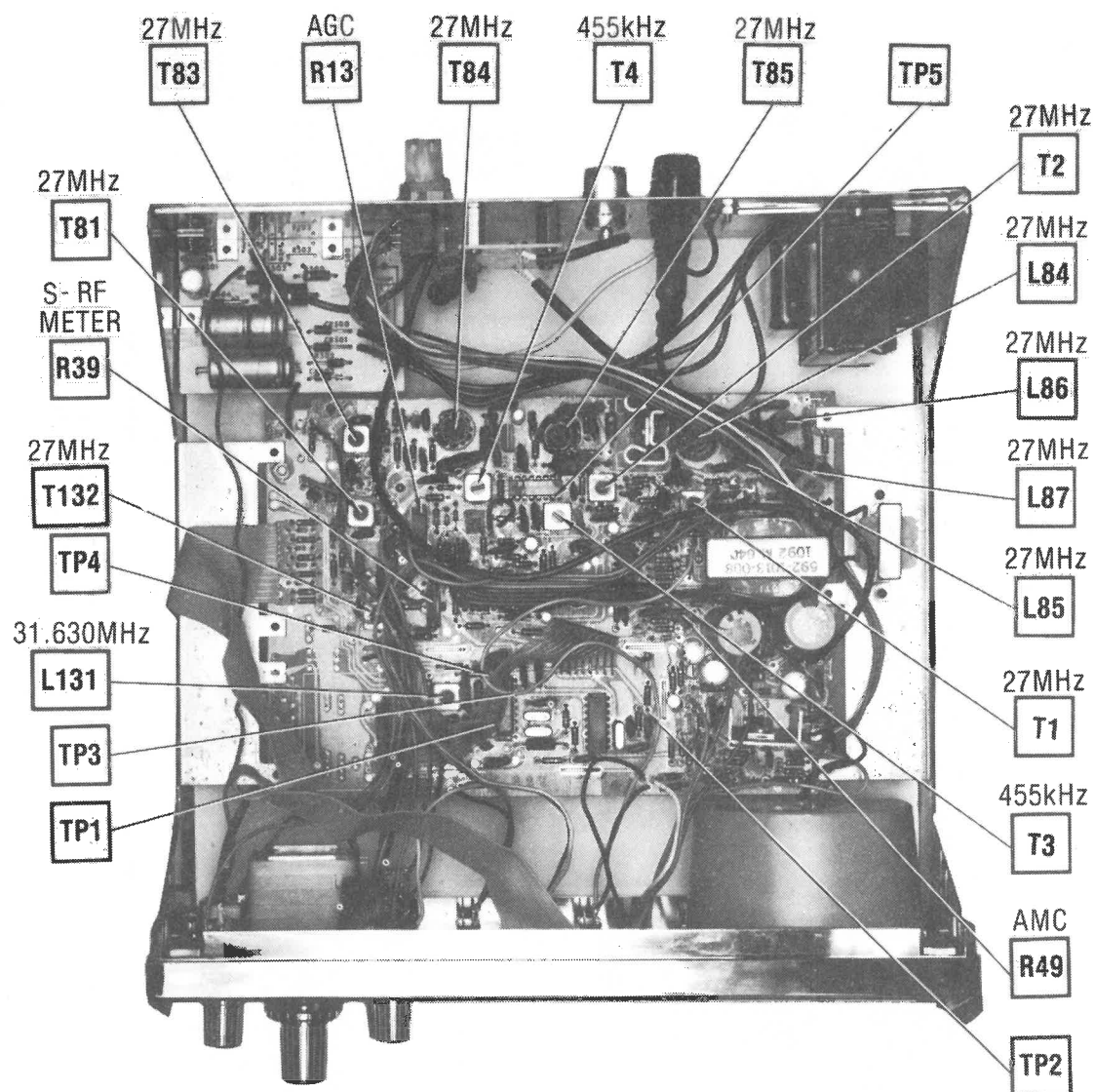
TRANSMITTER ADJUSTMENTS

Connect an RF wattmeter and 50-ohm, 25-watt dummy load to antenna connector.
NOTE: Be sure to check transmit frequency and power on all active channels after adjustment of transmitter.
See page 4 for channel frequencies.

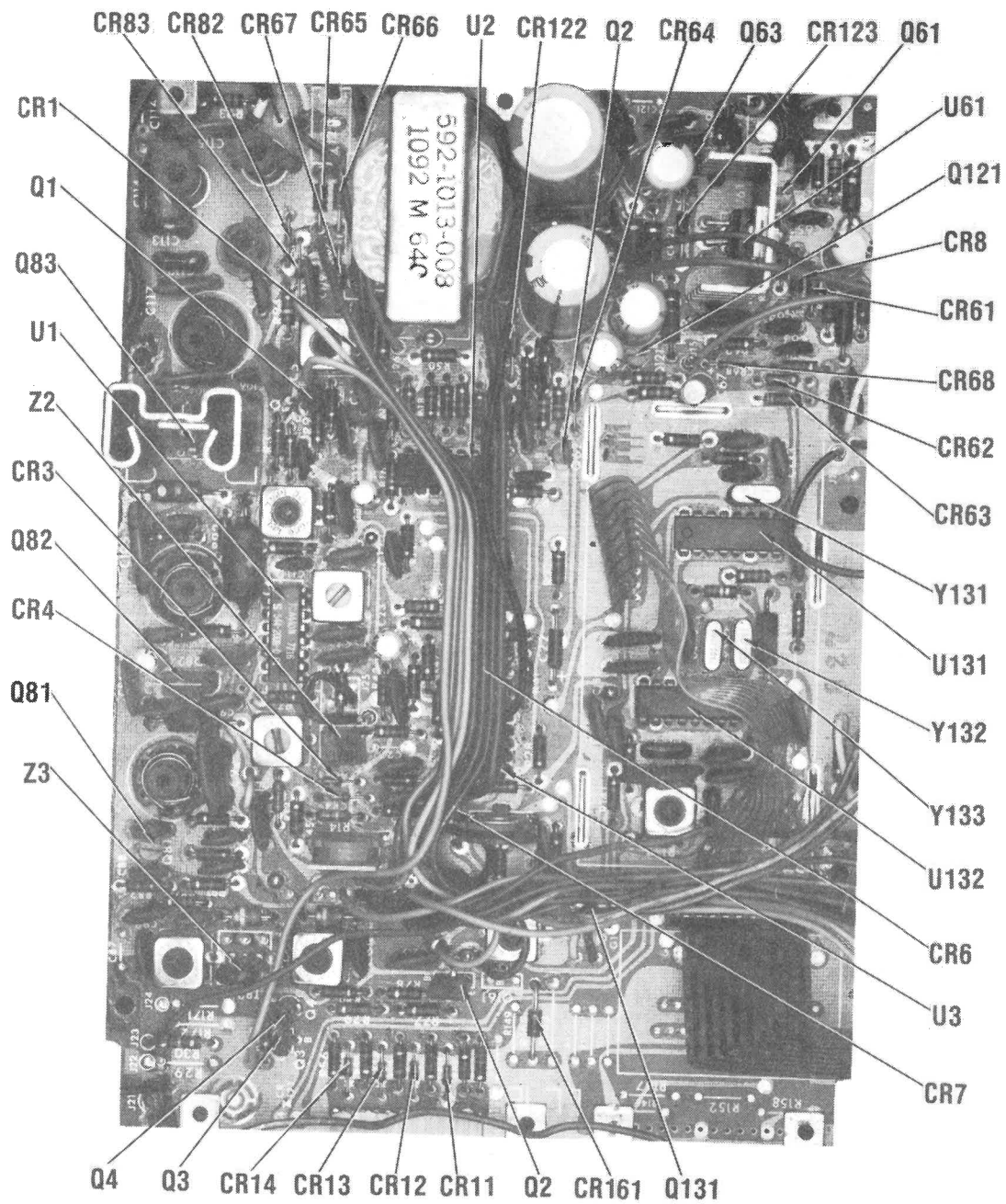
TEST EQUIPMENT	TRANSCIVER	ADJUST	REMARKS
Input of oscilloscope or modulation meter to antenna input. Inject a 1000Hz, 20mV signal at Mic input.	Ch. 19	R49 T84 T85	AMC Adjust R49 for 50% modulation. Increase signal input to 200mV. Check for 100% modulation maximum and adjust T84 and T85 for cleanest envelope. (See Figure 1.)

TRUTH CHART

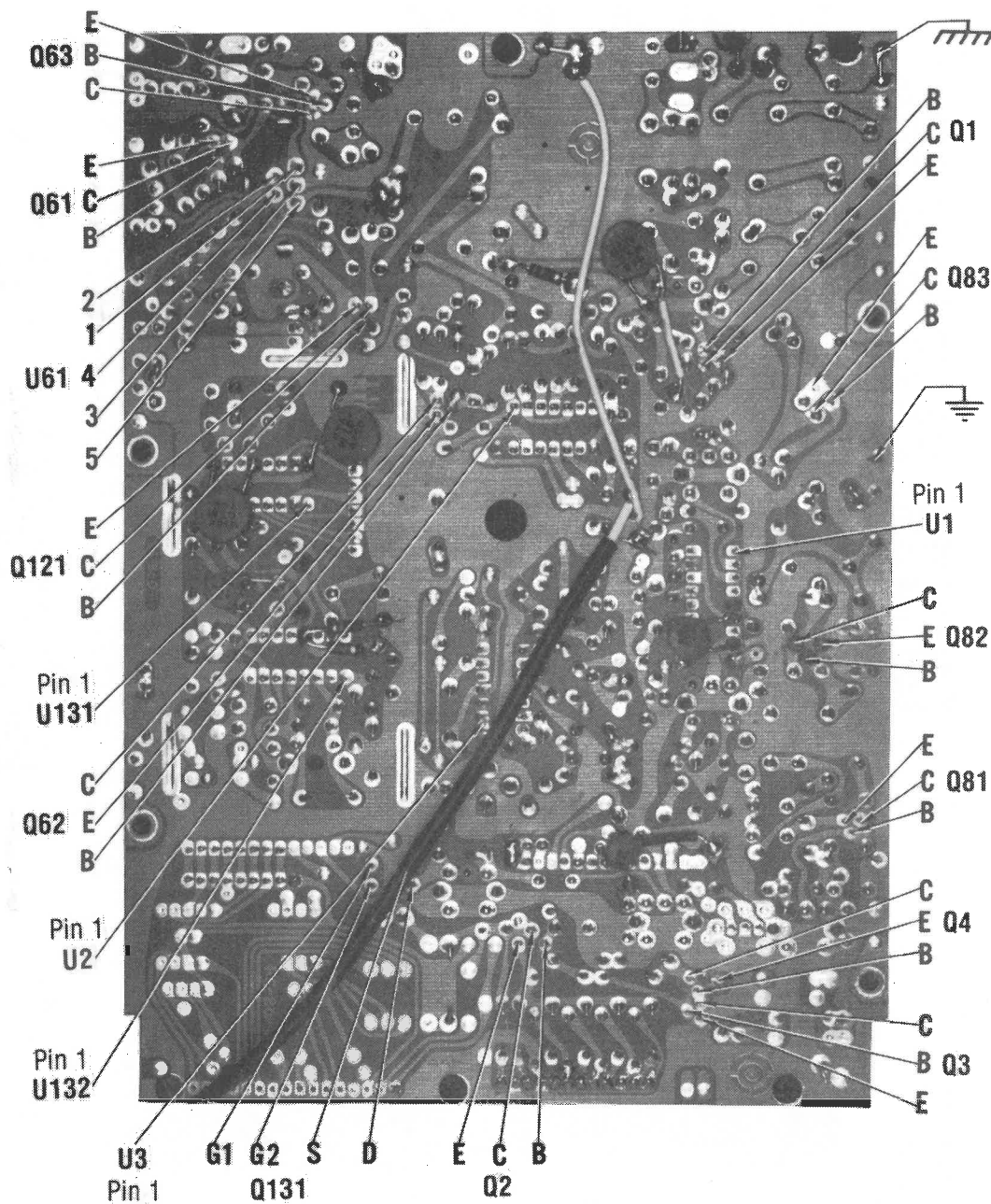
C H A N N E L	1 = 10.38 Volts 0 - .63 Volts								DIVIDER INPUT IN MHz AT TP3	REC VCO OUTPUT IN MHz AT TP4	XMT VCO OUTPUT IN MHz AT TP4
	U131 PROGRAM DIVIDER										
	PINS										
	13	14	15	2	3	4	5				
1	0	1	0	0	0	0	1		1.010	31.630	32.085
2	0	1	0	0	0	1	0		1.020	31.640	32.095
3	0	1	0	0	0	1	1		1.030	31.650	32.105
4	0	1	0	0	1	0	1		1.050	31.670	32.125
5	0	1	0	0	1	1	0		1.060	31.680	32.135
6	0	1	0	0	1	1	1		1.070	31.690	32.145
7	0	1	0	1	0	0	0		1.080	31.700	32.155
8	0	1	1	0	0	0	0		1.100	31.720	32.175
9	0	1	1	0	0	0	1		1.110	31.730	32.185
10	0	1	1	0	0	1	0		1.120	31.740	32.195
11	0	1	1	0	0	1	1		1.130	31.750	32.205
12	0	1	1	0	1	0	1		1.150	31.770	32.225
13	0	1	1	0	1	1	0		1.160	31.780	32.235
14	0	1	1	0	1	1	1		1.170	31.790	32.245
15	0	1	1	1	0	0	0		1.180	31.800	32.255
16	1	0	0	0	0	0	0		1.200	31.820	32.275
17	1	0	0	0	0	0	1		1.210	31.830	32.285
18	1	0	0	0	0	1	0		1.220	31.840	32.295
19	1	0	0	0	0	1	1		1.230	31.850	32.305
20	1	0	0	0	1	0	1		1.250	31.870	32.325
21	1	0	0	0	1	1	0		1.260	31.880	32.335
22	1	0	0	0	1	1	1		1.270	31.890	32.345
23	1	0	1	0	0	0	0		1.300	31.920	32.375
24	1	0	0	1	0	0	0		1.280	31.900	32.355
25	1	0	0	1	0	0	1		1.290	31.910	32.365
26	1	0	1	0	0	0	1		1.310	31.930	32.385
27	1	0	1	0	0	1	0		1.320	31.940	32.395
28	1	0	1	0	0	1	1		1.330	31.950	32.405
29	1	0	1	0	1	0	0		1.340	31.960	32.415
30	1	0	1	0	1	0	1		1.350	31.970	32.425
31	1	0	1	0	1	1	0		1.360	31.980	32.435
32	1	0	1	0	1	1	1		1.370	31.990	32.445
33	1	0	1	1	0	0	0		1.380	32.000	32.455
34	1	0	1	1	0	0	1		1.390	32.010	32.465
35	1	1	0	0	0	0	0		1.400	32.020	32.475
36	1	1	0	0	0	0	1		1.410	32.030	32.485
37	1	1	0	0	0	1	0		1.420	32.040	32.495
38	1	1	0	0	0	1	1		1.430	32.050	32.505
39	1	1	0	0	1	0	0		1.440	32.060	32.515
40	1	1	0	0	1	0	1		1.450	32.070	32.525



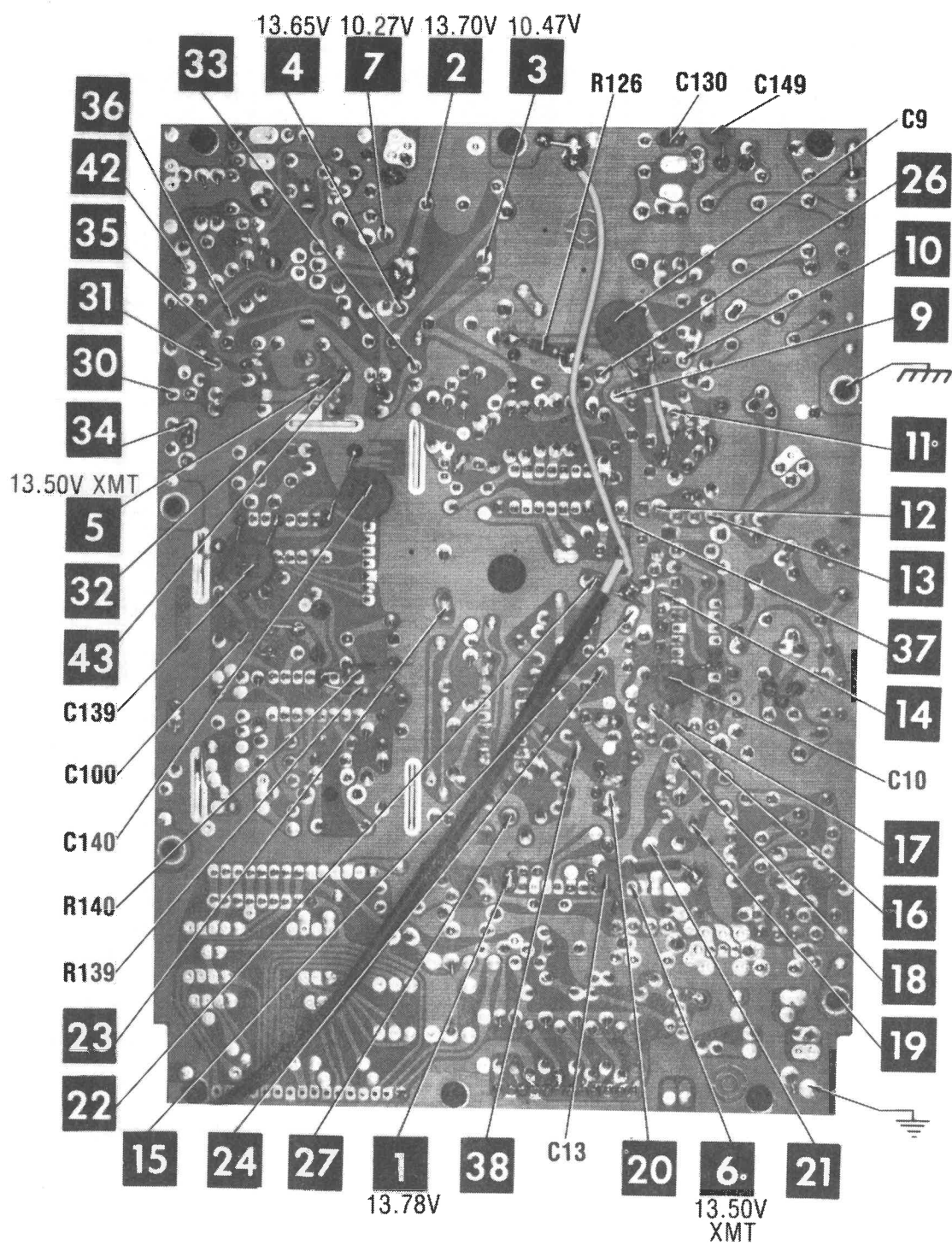
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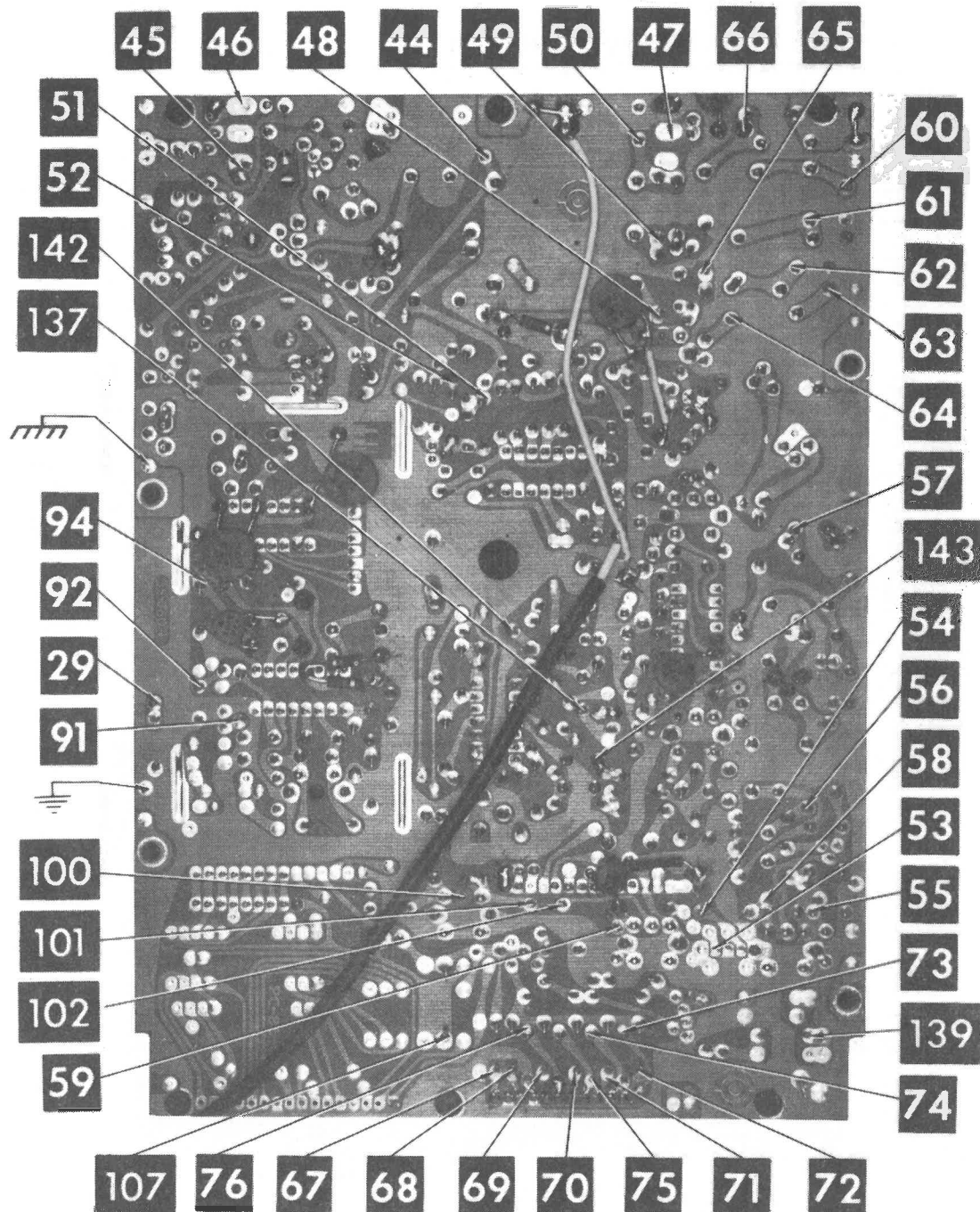
MAIN BOARD



MAIN BOARD

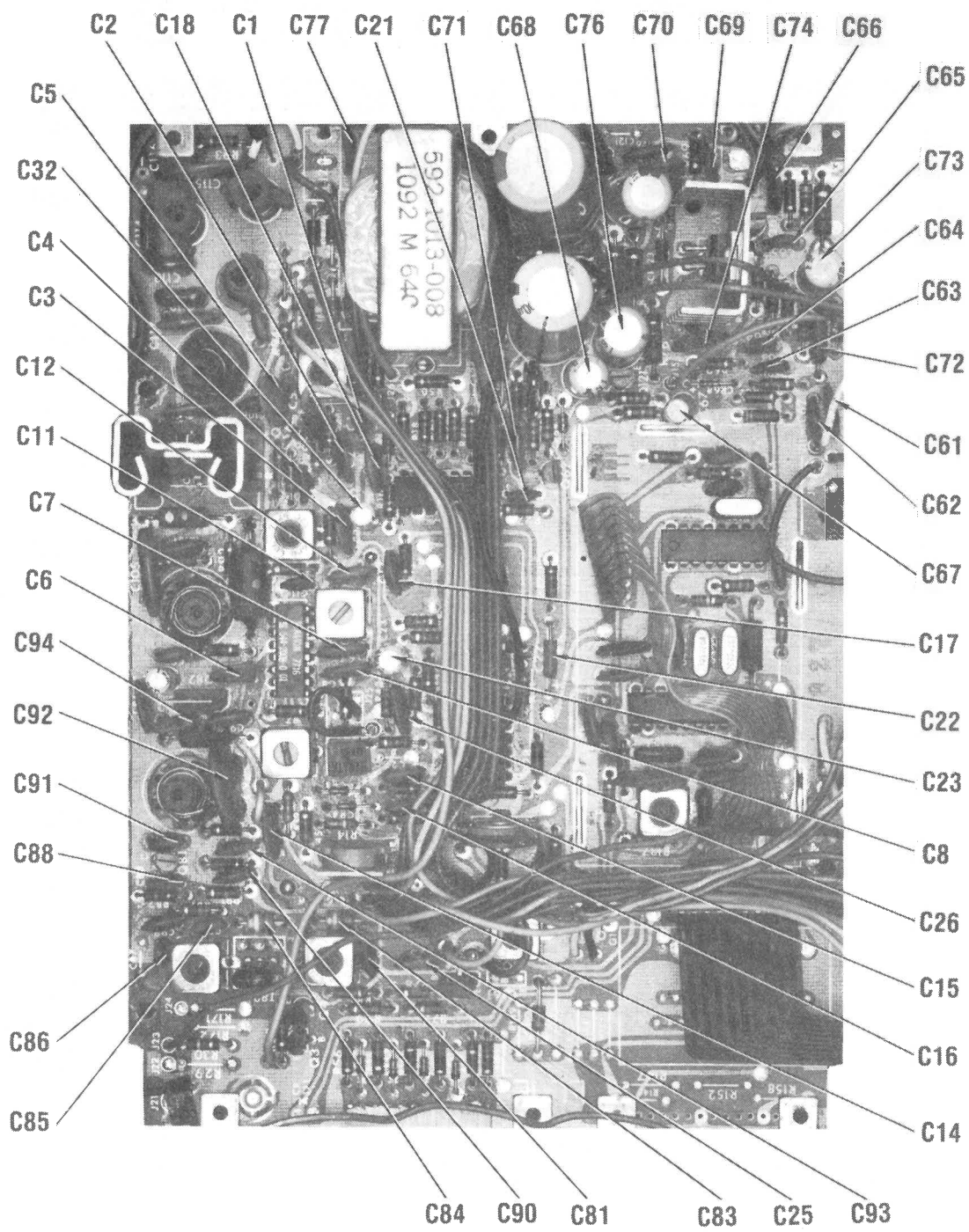


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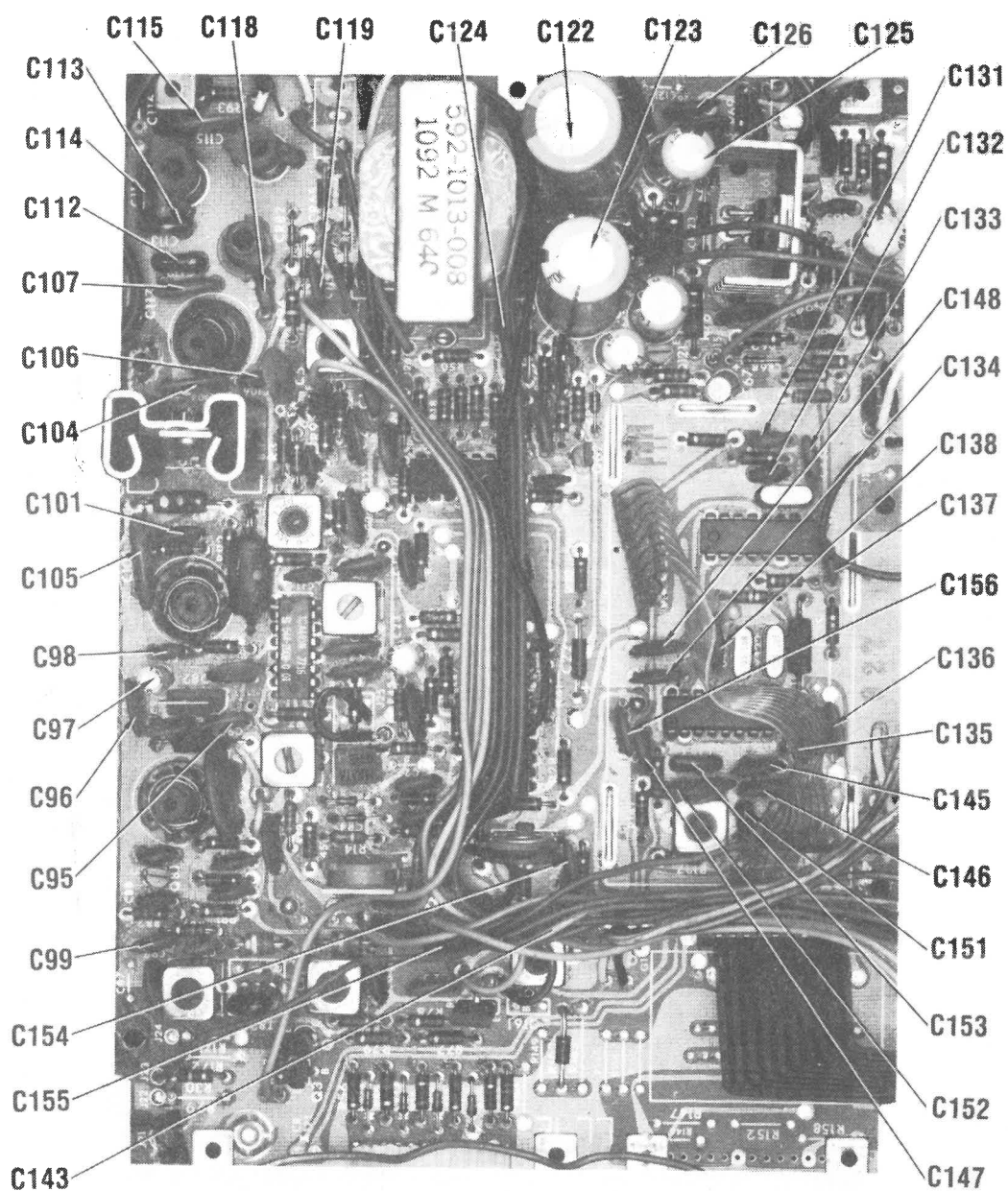


JOHNSON MODEL VIKING 430

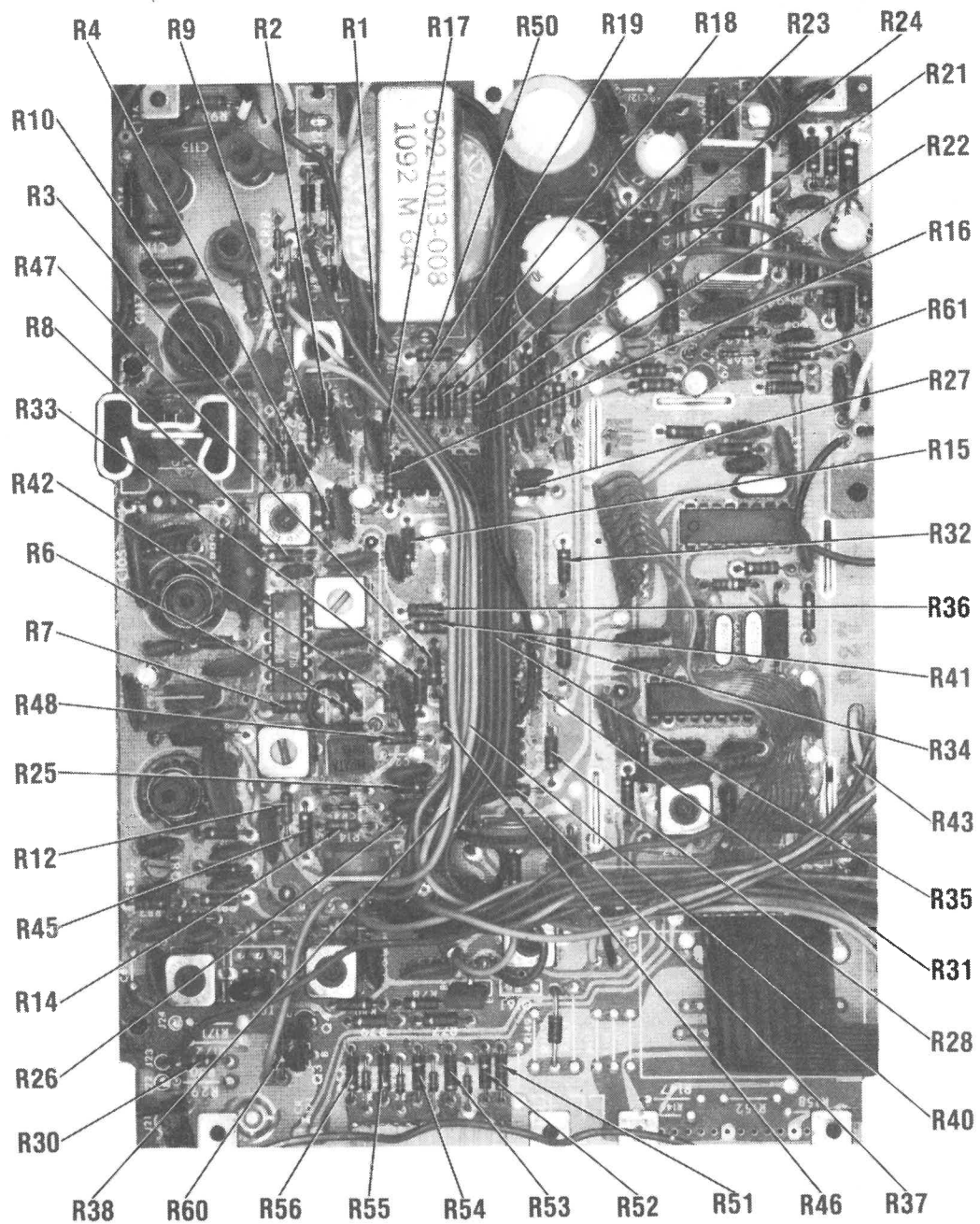
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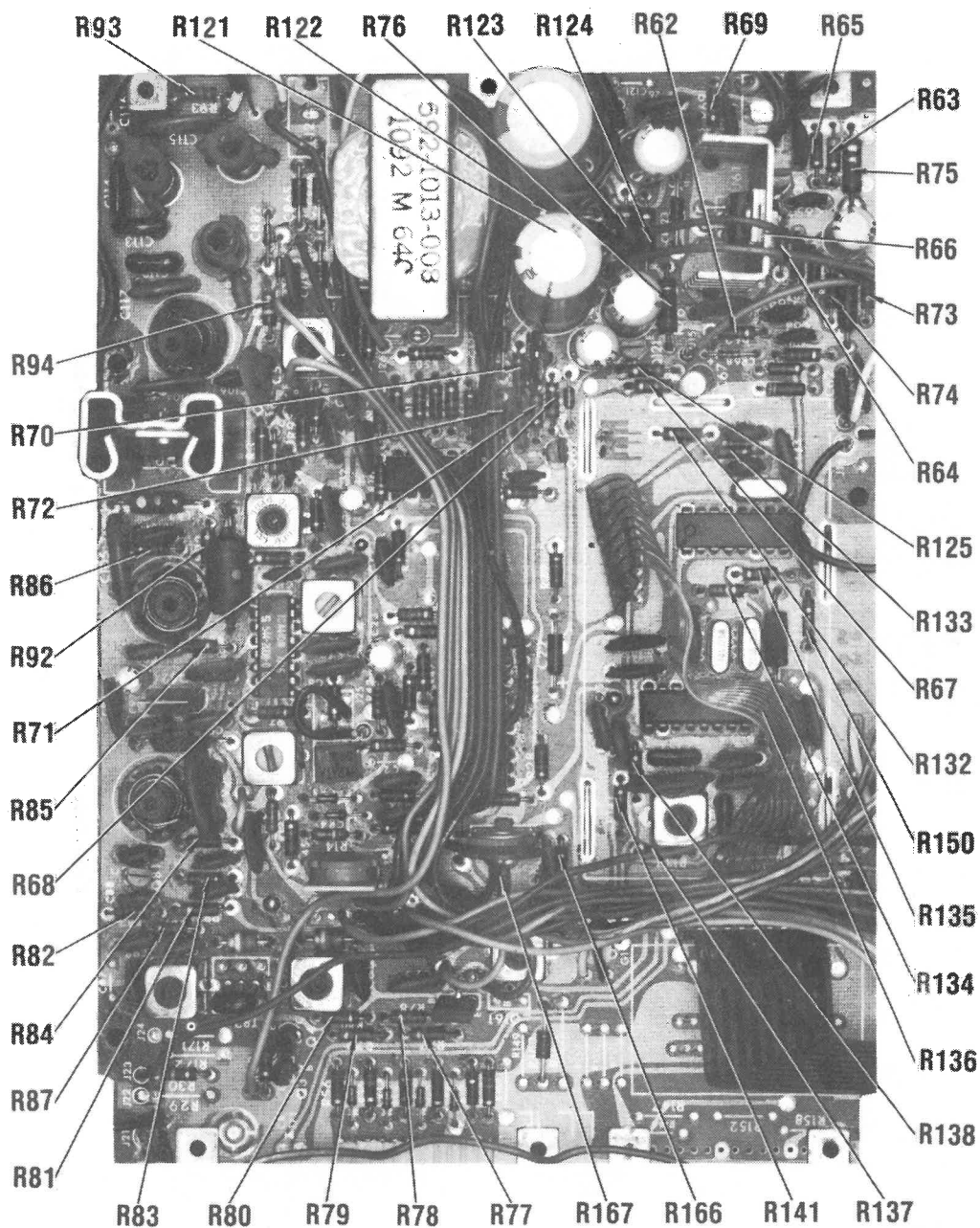
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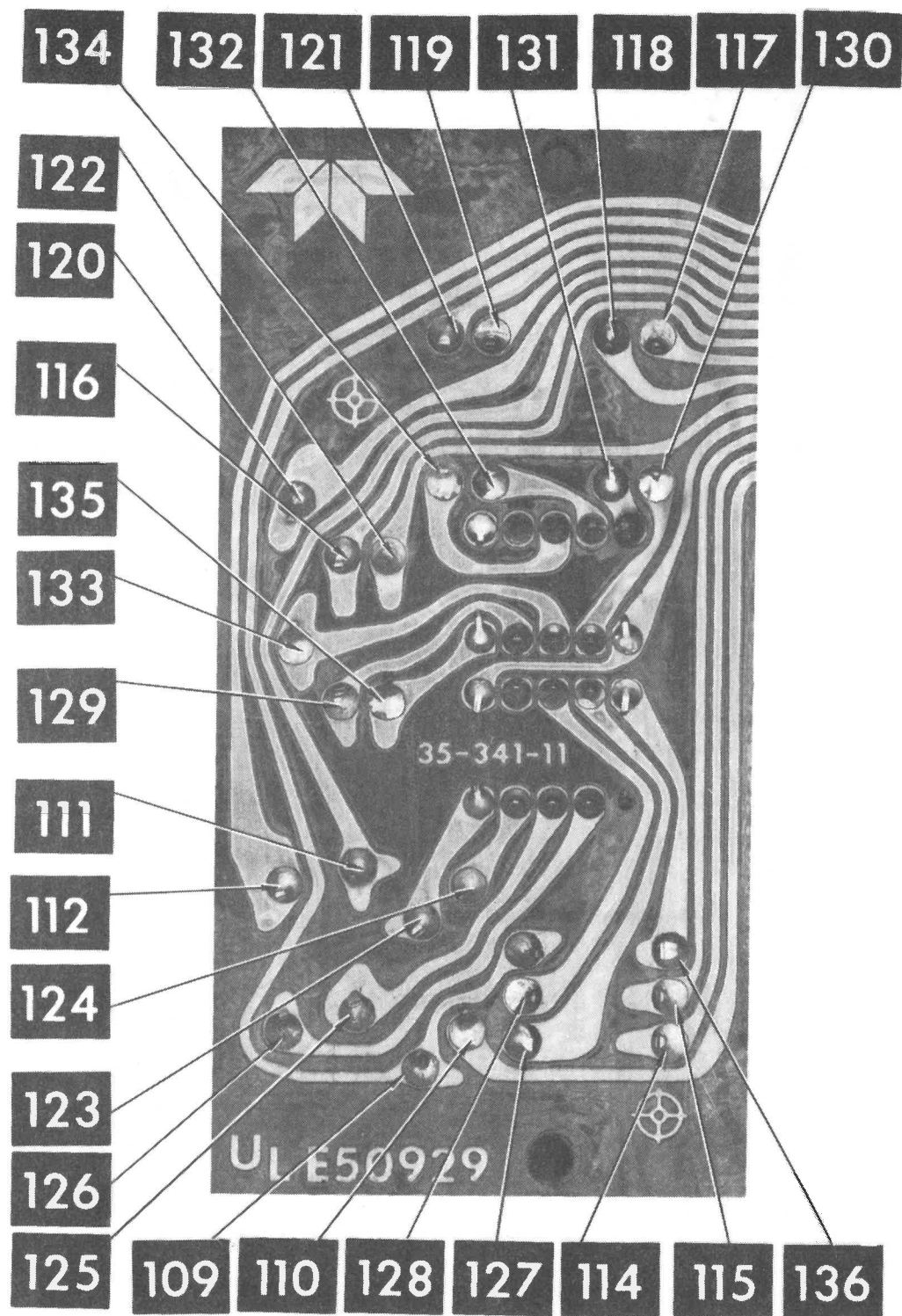
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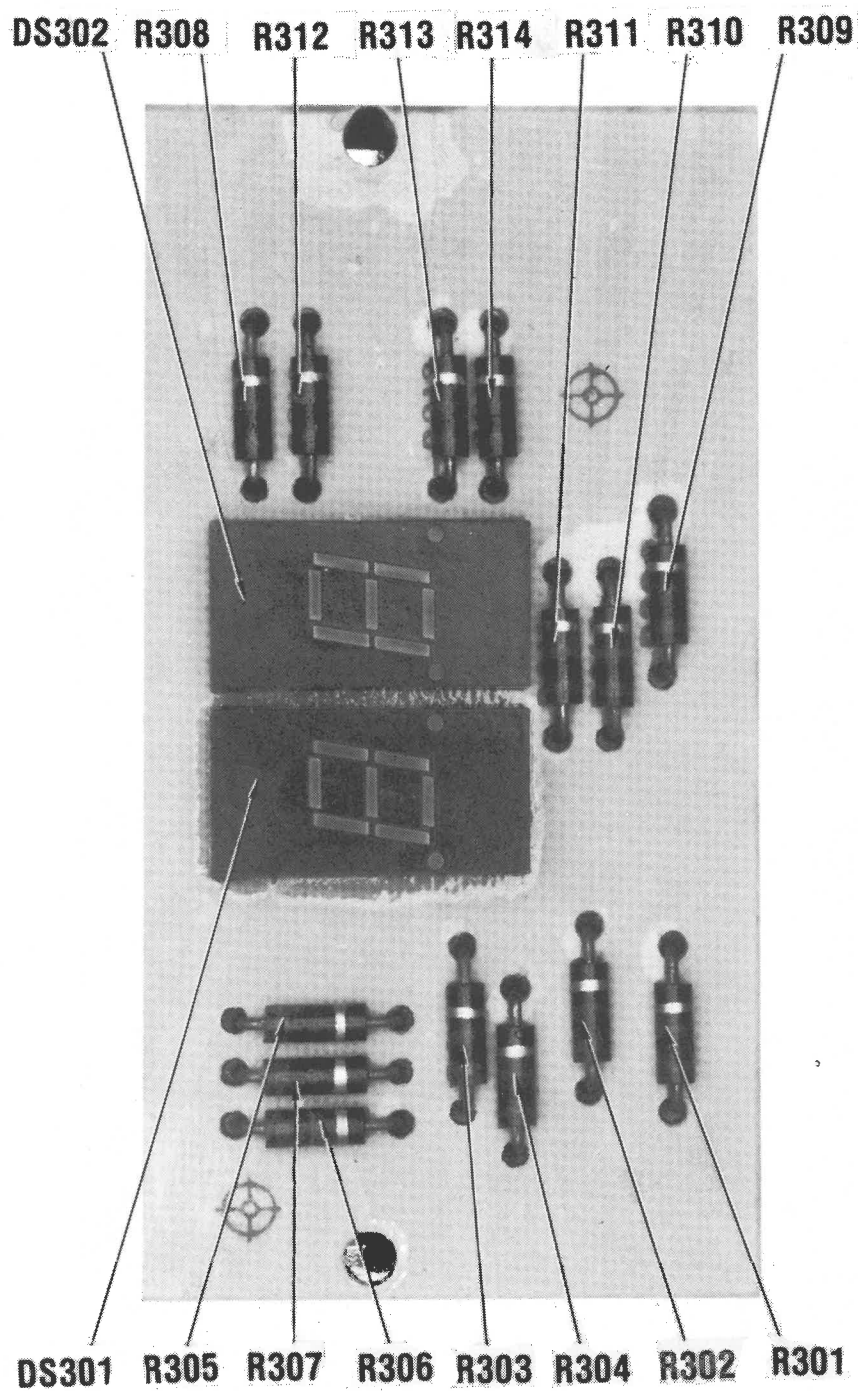
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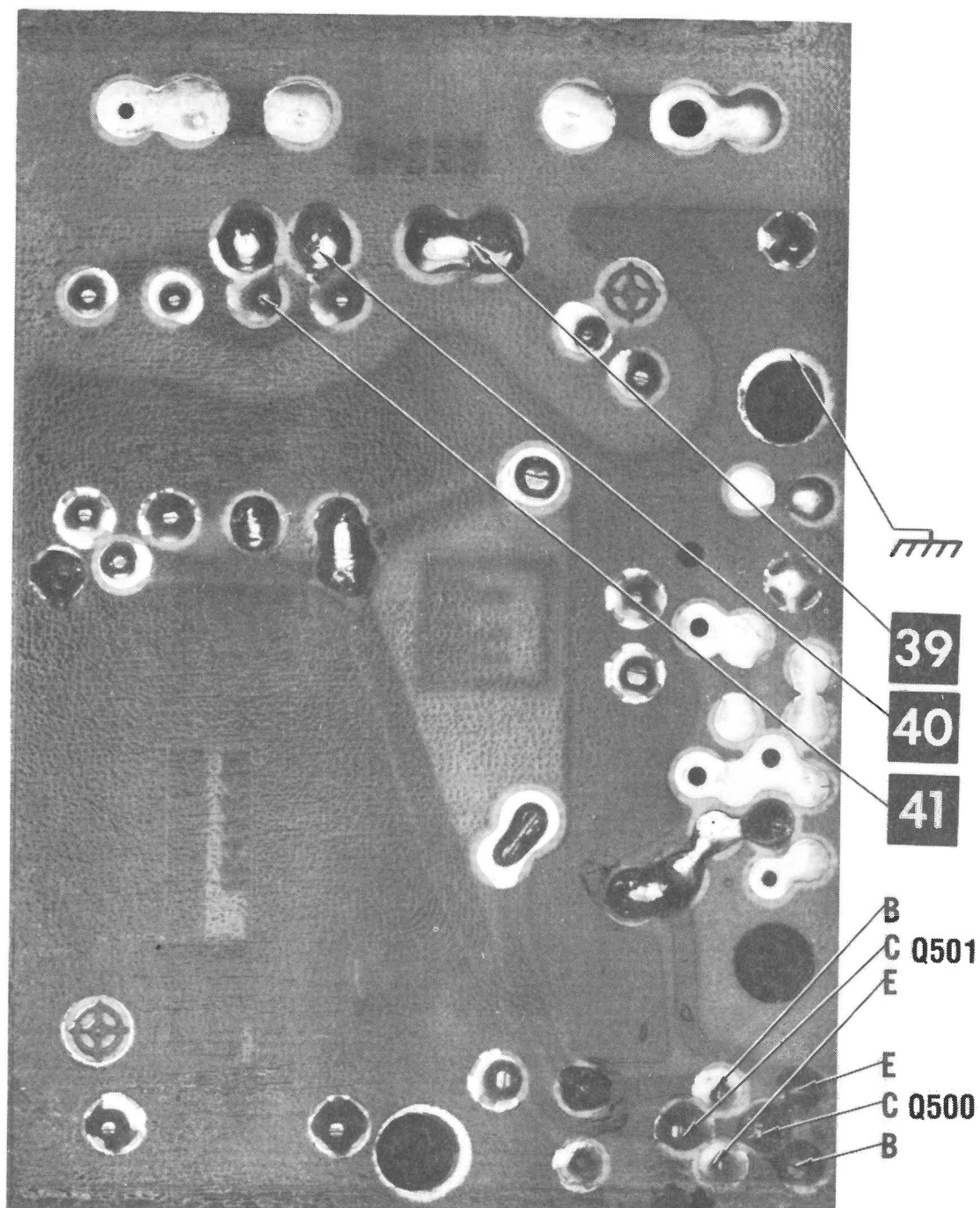
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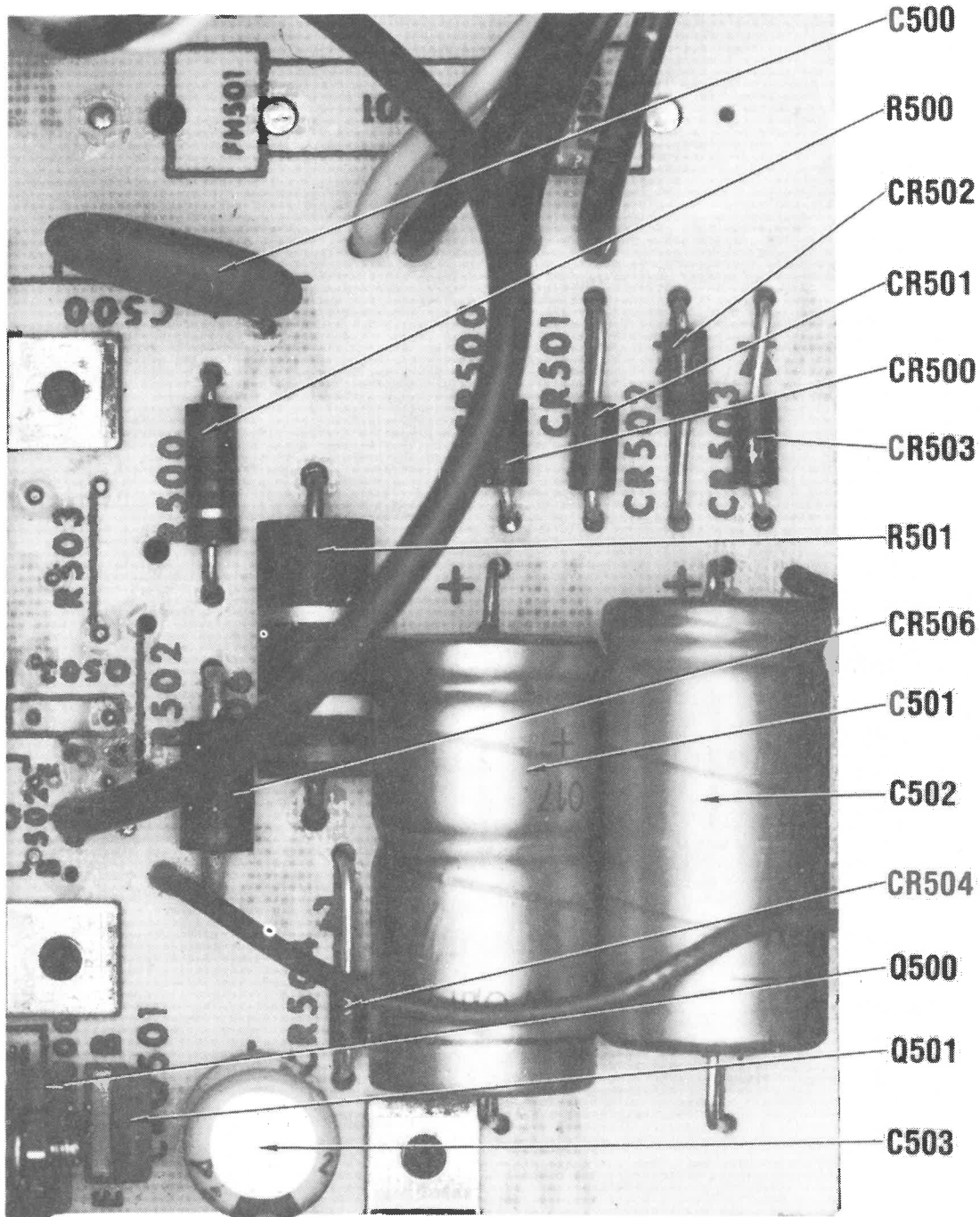
LED READOUT BOARD



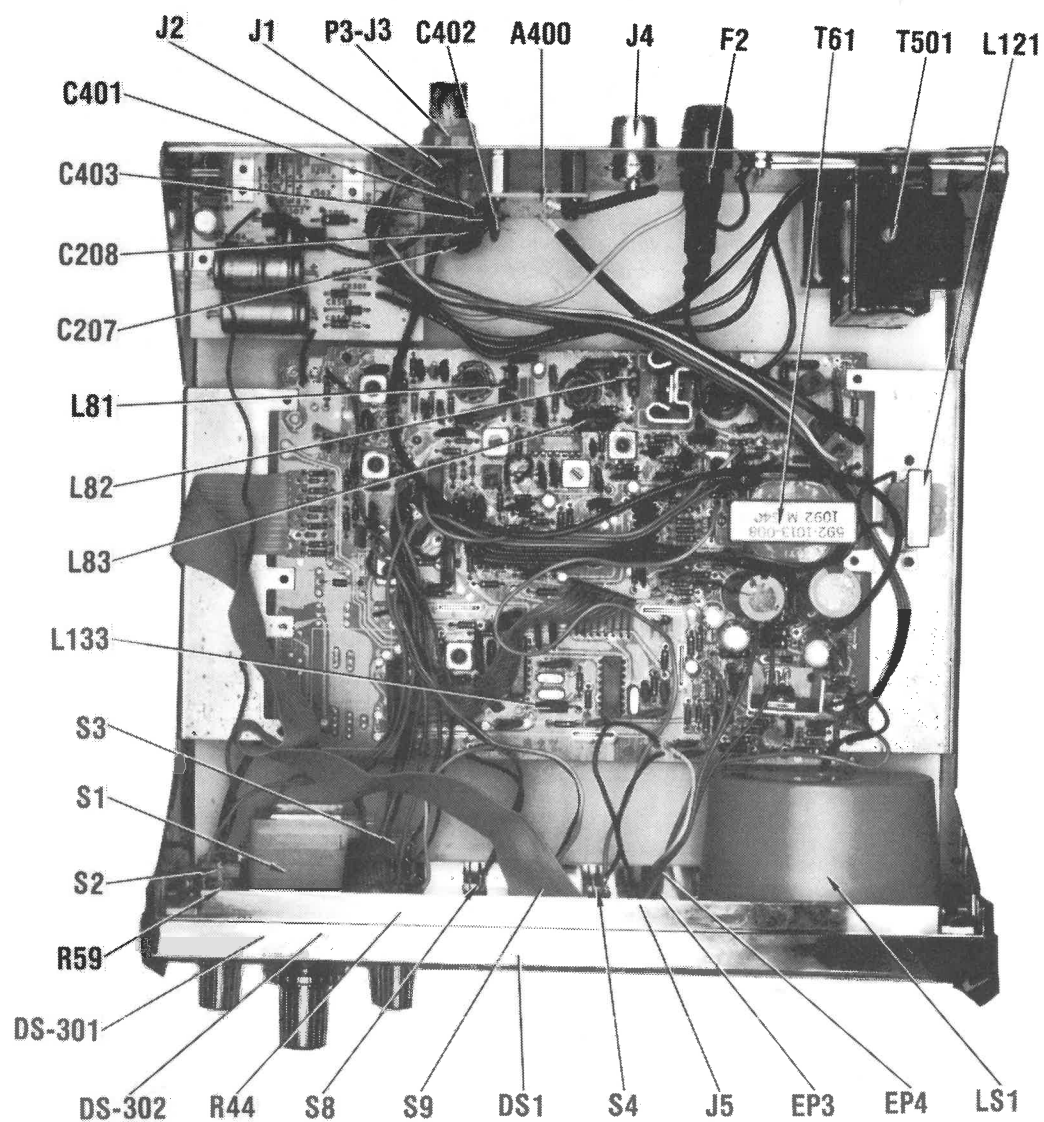
LED READOUT BOARD



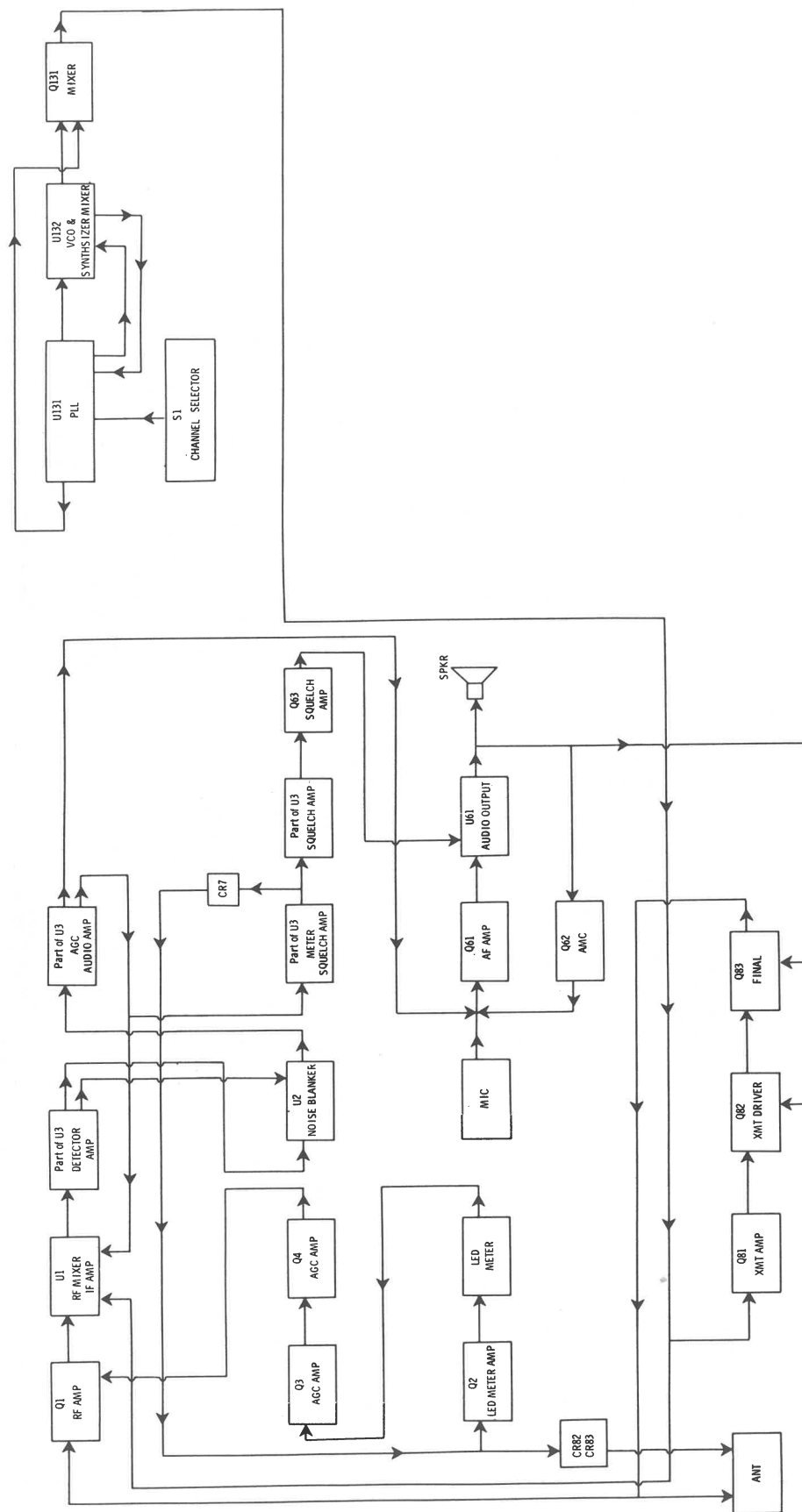
POWER SUPPLY BOARD



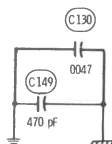
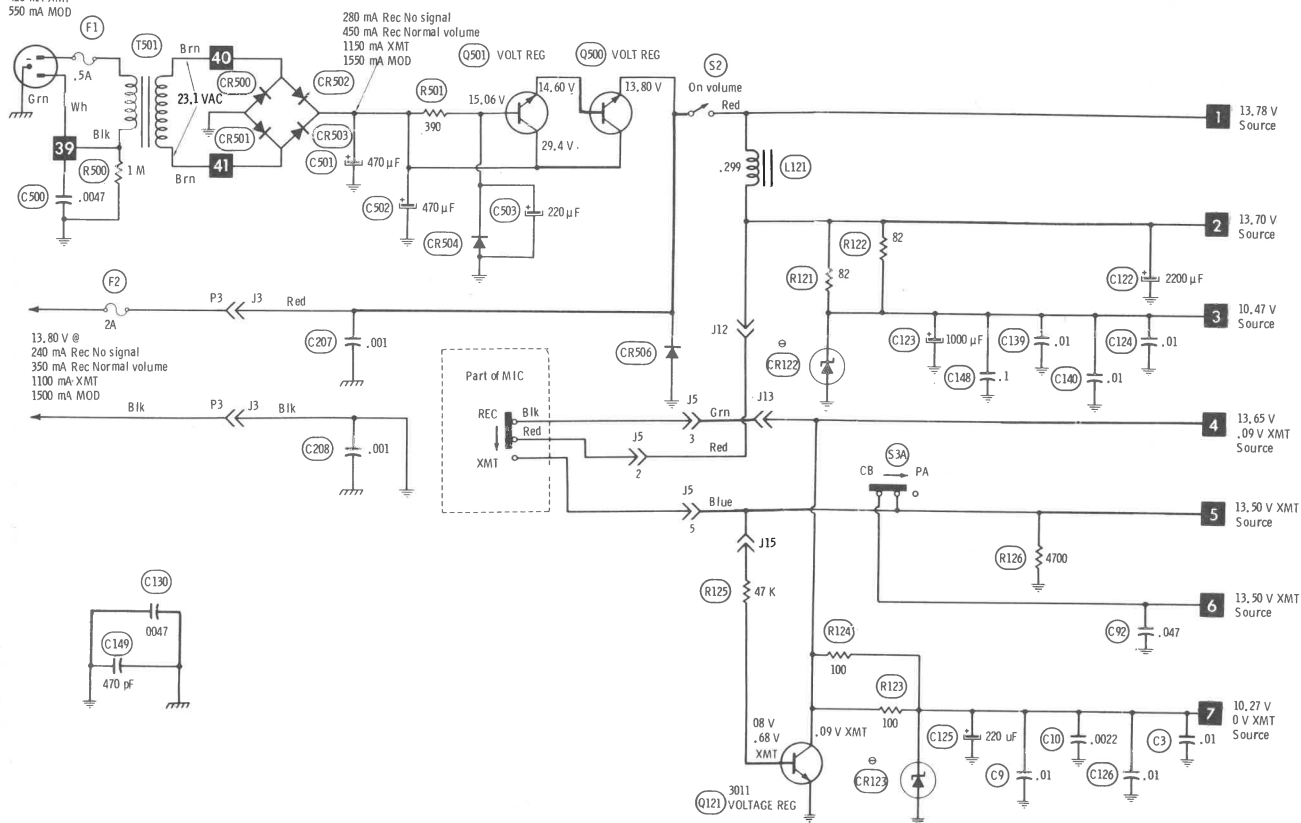
POWER SUPPLY BOARD



CHASSIS TOP



120 VAC @
200 mA Rec, no signal
220 mA Rec normal volume
420 mA XMT
550 mA MOD



- Circuitry not used in some versions
- - - Circuitry used in some versions
- ⊙ See parts list
- ✱ Nominal value
- ⊥ Ground
- Chassis
- Common tie point
- Signal path
- Voltage path

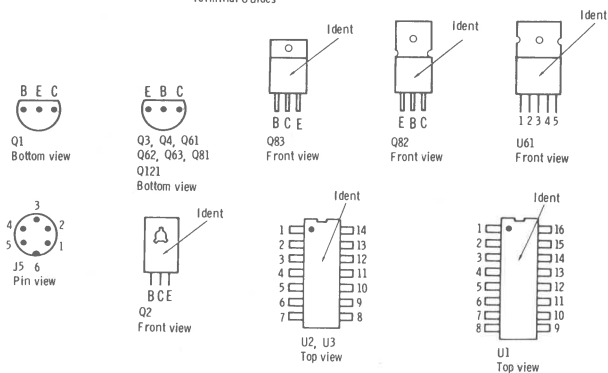
Measurements made in Channel 1 with switching as shown unless noted.

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.

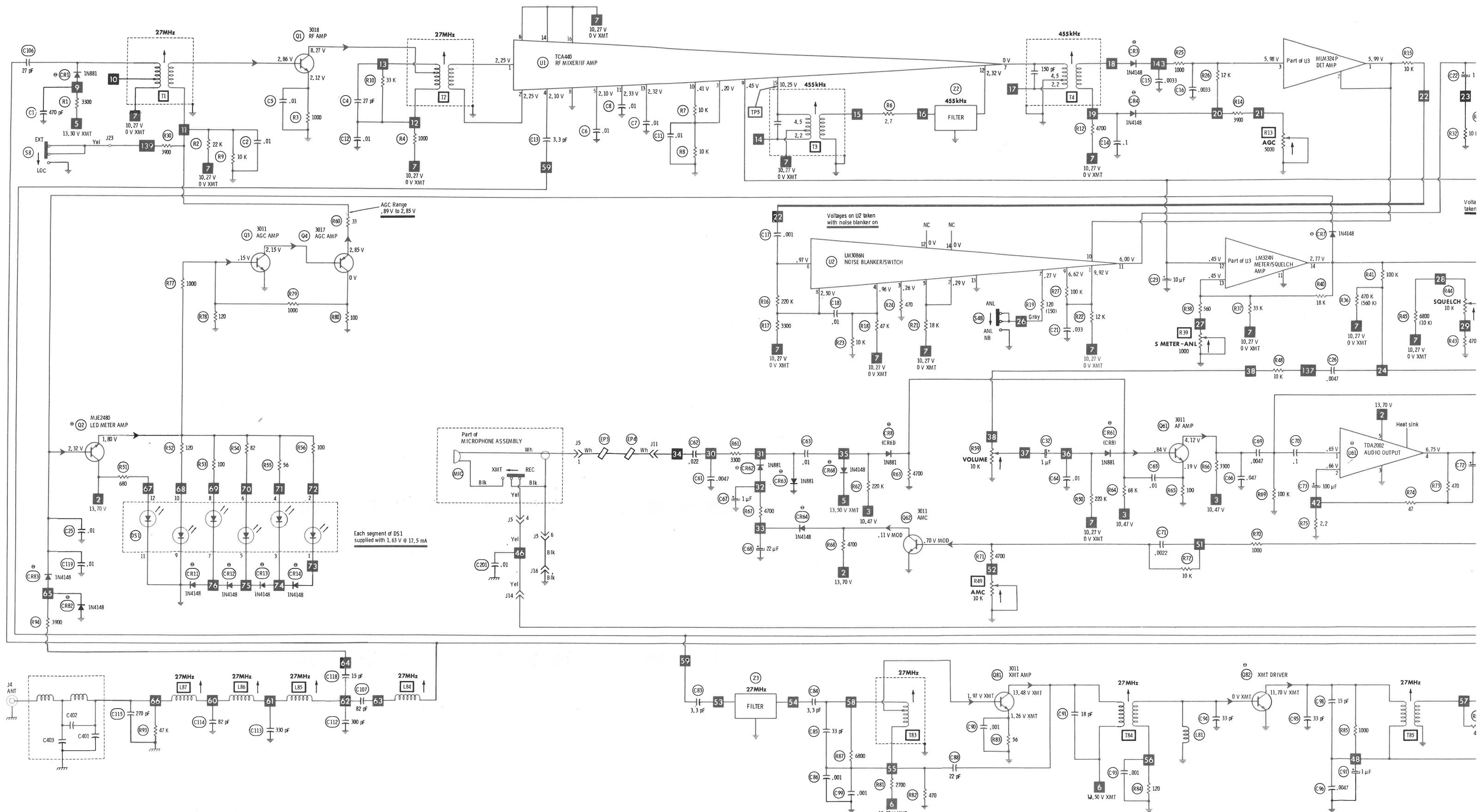
Arrow at control indicates direction of advance. Terminal identification may not be found on unit. Resistors are 1/2W or less, 5% unless noted. Value in () used in some versions.

Terminal Guides

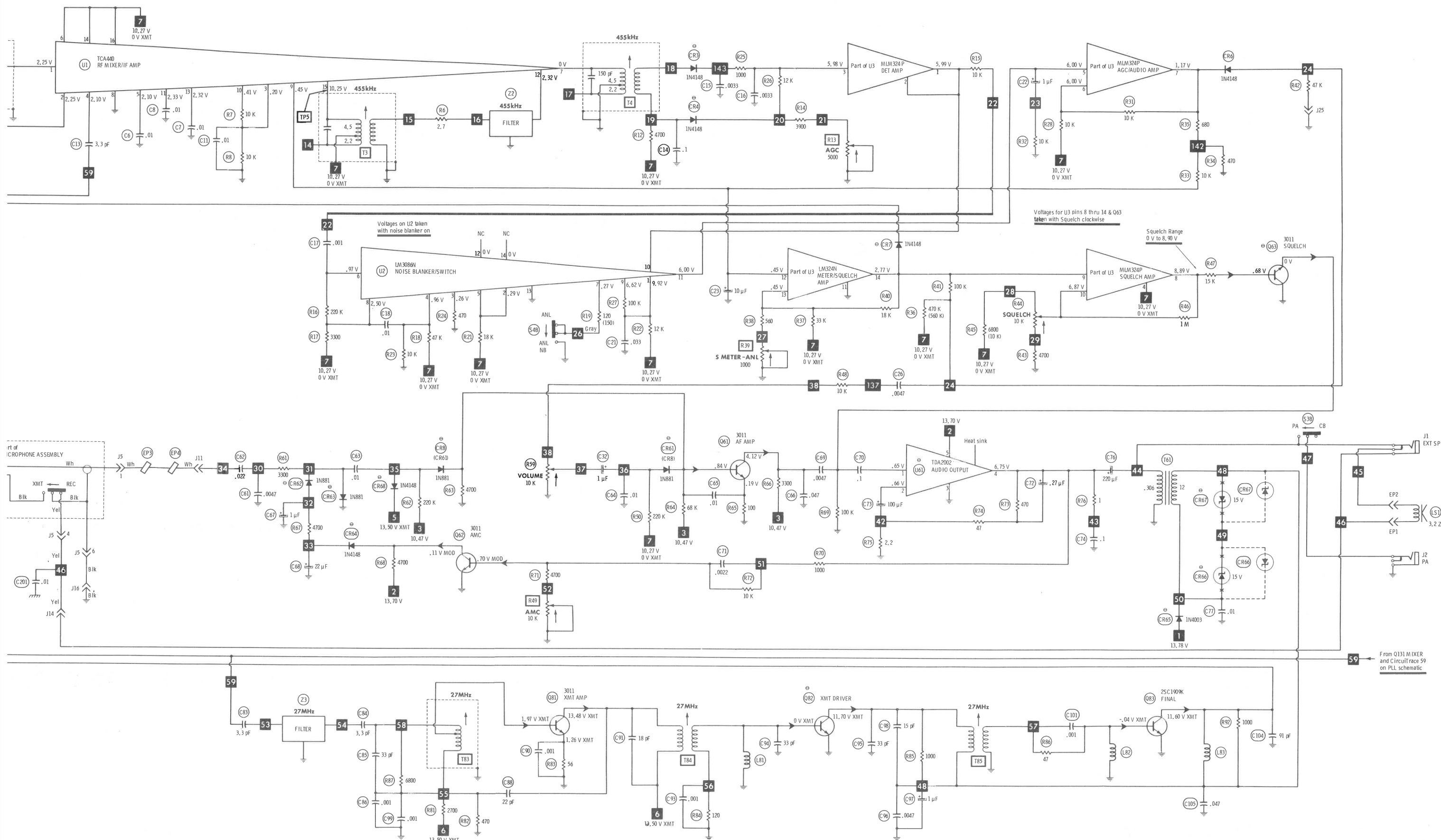


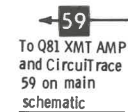
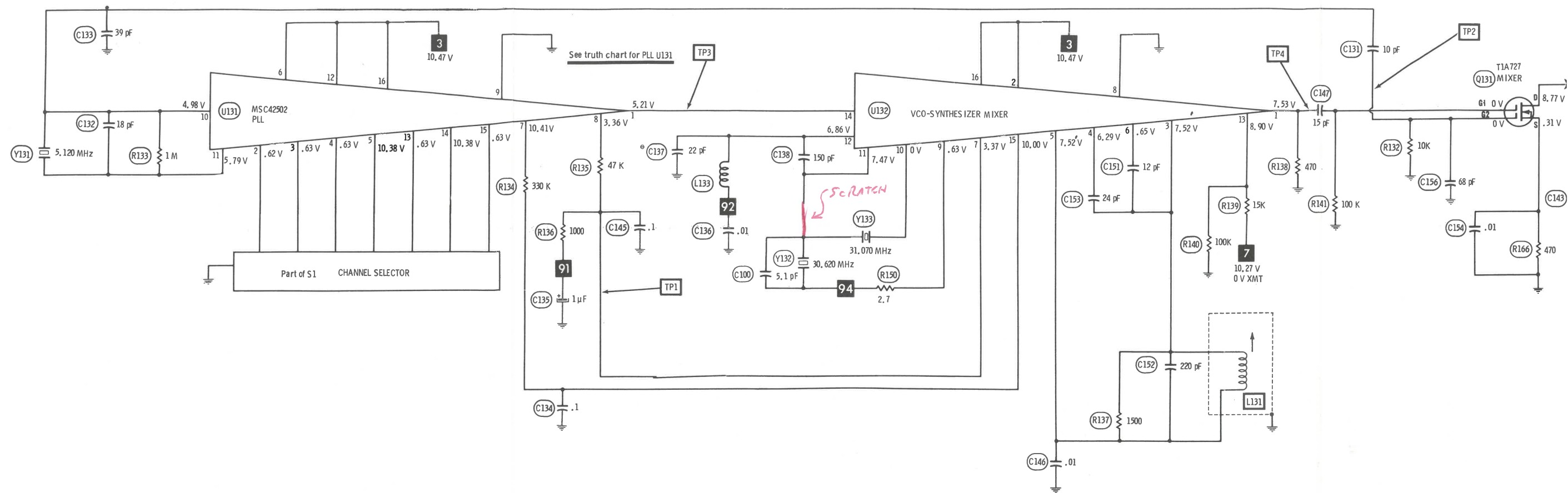
A PHOTOFAC STANDARD NOTATION SCHEMATIC
WITH **CIRCUITRACE**
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POWER SUPPLY SCHEMATIC



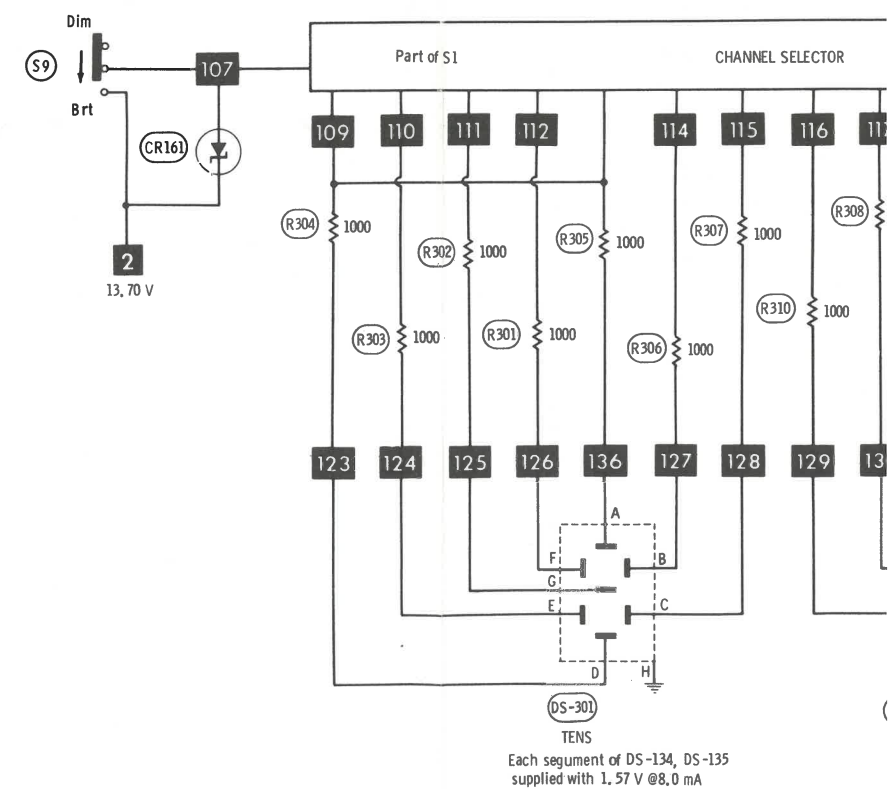
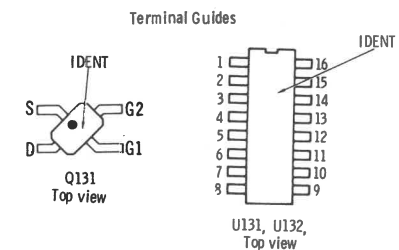
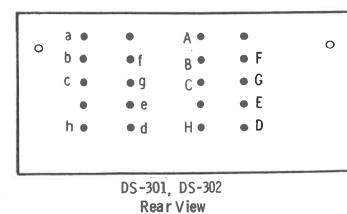
MAIN CB SCHEMATIC



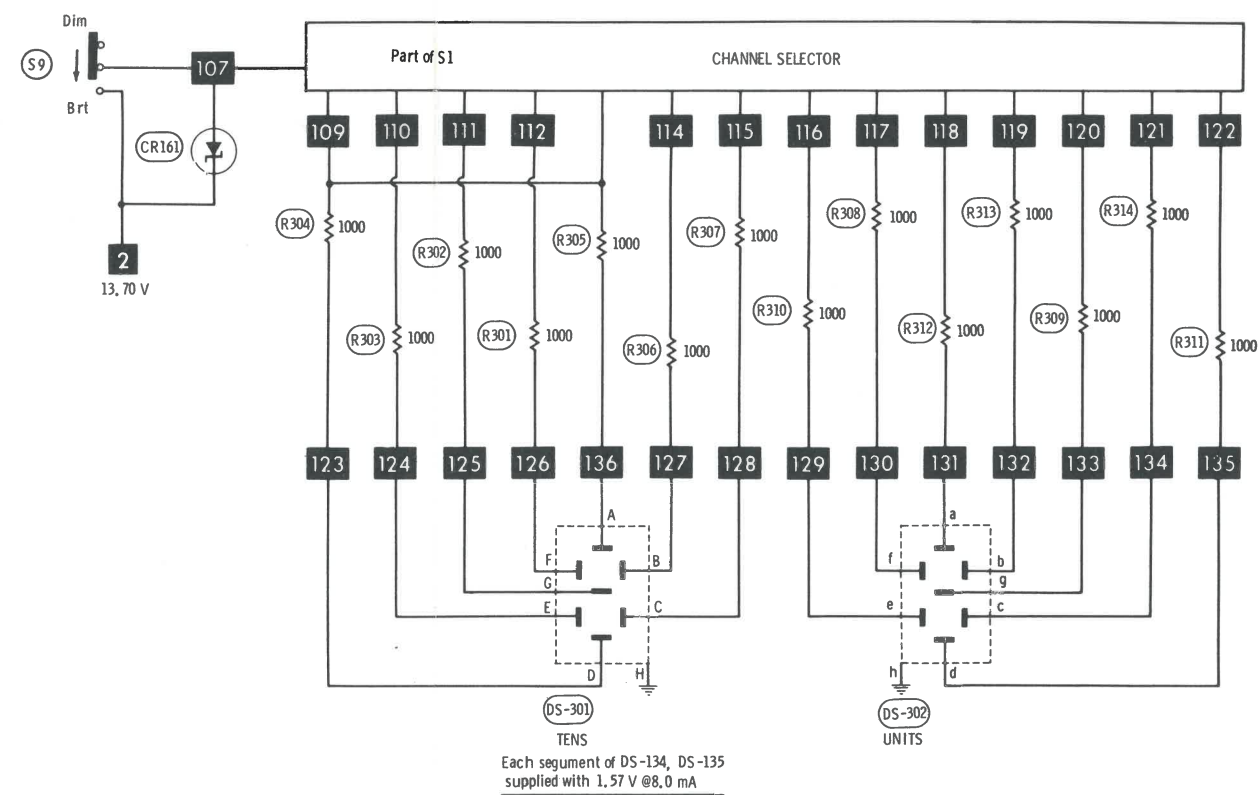
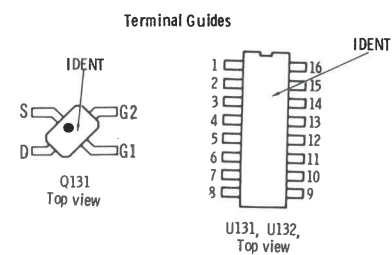
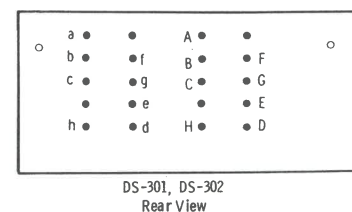
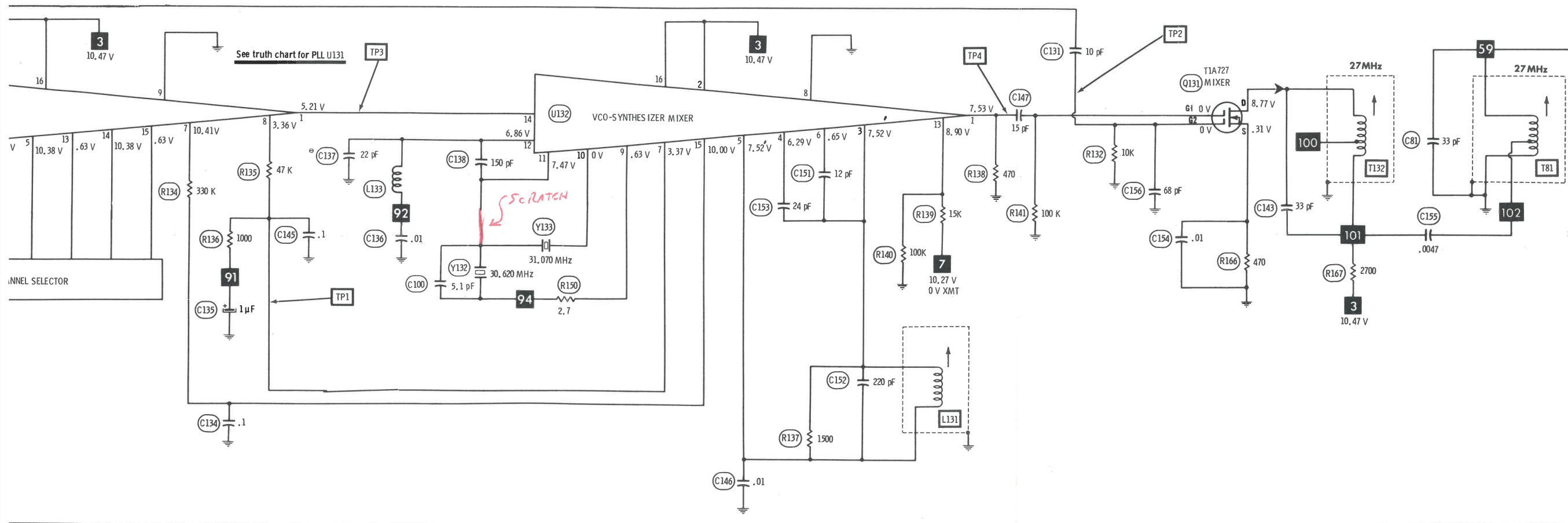


-  Circuitry not used in some versions
-  Circuitry used in some versions
-  See parts list
-  Nominal value
-  Ground
-  Chassis
-  Common tie point
-  Signal path
-  Voltage path

Measurements made in Channel 1 with switching as shown 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.
Arrow at control indicates direction of advance.
Terminal identification may not be found on unit.
Resistors are 1/2W or less, 5% unless noted.
Value in () used in some versions.



PLL SCHEMATIC



PLL 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)

			REPLACEMENT DATA											
ITEM No.	TYPE No.	MFR. PART No.	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.		
CR1	1N645	523-1500-881	GE-504A	PTC201	HEPRO052	REN 116	SK3311	RT-213	ECG116	TM116	WEP156	212-76-02		
	1N881	523-1500-881	GE-504A	PTC201	HEPRO052	REN 116	SK3311	RT-213	ECG116	TM116	WEP156	212-76-02		
CR3	1N4148	523-1500-883	GE-514	PTC214	HEPRO602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287		
CR4	1N4148	523-1500-883	GE-514	PTC214	HEPRO602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287		
CR6	1N4148	523-1500-883	GE-514	PTC214	HEPRO602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287		
CR7	1N4148	523-1500-883	GE-514	PTC214	HEPRO602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287		
CR8	1N645	523-1500-881	GE-504A	PTC201	HEPRO052	REN 116	SK3311	RT-213	ECG116	TM116	WEP156	212-76-02		
	1N881	523-1500-881	GE-504A	PTC201	HEPRO052	REN 116	SK3311	RT-213	ECG116	TM116	WEP156	212-76-02		
CR11	1N4148	523-1500-883	GE-514	PTC214	HEPRO602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287		
CR12	1N4148	523-1500-883	GE-514	PTC214	HEPRO602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287		
CR13	1N4148	523-1500-883	GE-514	PTC214	HEPRO602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287		
CR14	1N4148	523-1500-883	GE-514	PTC214	HEPRO602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287		
CR61	1N645	523-1500-881	GE-504A	PTC201	HEPRO052	REN 116	SK3311	RT-213	ECG116	TM116	WEP156	212-76-02		
	1N881	523-1500-881	GE-504A	PTC201	HEPRO052	REN 116	SK3311	RT-213	ECG116	TM116	WEP156	212-76-02		
CR62	1N645	523-1500-881	GE-504A	PTC201	HEPRO052	REN 116	SK3311	RT-213	ECG116	TM116	WEP156	212-76-02		
	1N881	523-1500-881	GE-504A	PTC201	HEPRO052	REN 116	SK3311	RT-213	ECG116	TM116	WEP156	212-76-02		
CR63	1N645	523-1500-881	GE-504A	PTC201	HEPRO052	REN 116	SK3311	RT-213	ECG116	TM116	WEP156	212-76-02		
	1N881	523-1500-881	GE-504A	PTC201	HEPRO052	REN 116	SK3311	RT-213	ECG116	TM116	WEP156	212-76-02		
CR64	1N4148	523-1500-883	GE-514	PTC214	HEPRO602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287		
CR65	1N4003	523-0501-002	GE-504A	1N4003	HEPRO052	REN 116	SK3312	RT-210	ECG116	TM116	WEP156	212-76-02		
CR66		523-2503-150	GEZD-15	ZB15B	REN 145	SK3063	RT-245	ECG145A	TM145/**	WEP1114	103-29013			
CR67		523-2503-150	GEZD-15	ZB15B	REN 145	SK3063	RT-245	ECG145A	TM145/**	WEP1114	103-29013			
CR68	1N4148	523-1500-883	GE-514	PTC214	HEPRO602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287		
CR82	1N4148	523-1500-883	GE-514	PTC214	HEPRO602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287		
CR83	1N4148	523-1500-883	GE-514	PTC214	HEPRO602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287		
CR122		523-2509-100	GEZD-10	ZB10A	HEPZ0413	REN 140	SK3061	RT-241	ECG140	TM140/**	WEP1110	103-29010		
CR123		523-2509-100	GEZD-10	ZB10A	HEPZ0413	REN 140	SK3061	RT-241	ECG140	TM140/**	WEP1110	103-29010		
CR161		523-2503-689	GEZD-6.8	ZB6.8A	HEPZ0409	REN 5071	SK3334	RT-238	ECG5071	TM5071/**	WEP1106			
CR500	1N4818	523-0013-201	GE-514	PTC214	HEPRO602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287		
	1N4148	523-0013-201	GE-514	PTC214	HEPRO602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287		
CR501	1N4818	523-0013-201	GE-514	PTC214	HEPRO602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287		
	1N4148	523-0013-201	GE-514	PTC214	HEPRO602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287		
CR502	1N4818	523-0013-201	GE-514	PTC214	HEPRO602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287		
	1N4148	523-0013-201	GE-514	PTC214	HEPRO602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287		
CR503	1N4818	523-0013-201	GE-514	PTC214	HEPRO602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287		
	1N4148	523-0013-201	GE-514	PTC214	HEPRO602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287		
CR504		523-2003-150	GEZD-15	ZB15B	REN 145	SK3063	RT-245	ECG145A	TM145/**	WEP1114	103-29013			
CR506		523-0017-001	GE-512	PTC204	HEPRO098	REN 156	SK3051	RT-201	ECG156	TM156	WEP4008	212-29000		
Q1	3018	576-003-018	GE-86	PTC123	HEPS0016	REN 108	SK3452	RT-107A	ECG108	TM108	WEP56	121-522		
Q2	MJE2480	576-0002-029	GE-57		HEPS5004	REN 152	SK3188	RT-197	ECG241	TM241	WEP241	121-29002		
Q3	3011	576-0003-011	GE-220	PTC123	HEPS0015	REN 123A	SK3018	RT-102	ECG123A	TM123A	WEP736	121-29000A		
Q4	3017	576-0003-017	GE-82	PTC141	HEPS0019	REN 159	SK3466	RT-303	ECG159	TM159	WEP62	121-290003		
Q61	3011	576-0003-011	GE-220	PTC123	HEPS0015	REN 123A	SK3018	RT-102	ECG123A	TM123A	WEP736	121-29000A		
Q62	3011	576-0003-011	GE-220	PTC123	HEPS0015	REN 123A	SK3018	RT-102	ECG123A	TM123A	WEP736	121-29000A		
Q63	3011	576-0003-011	GE-220	PTC123	HEPS0015	REN 123A	SK3018	RT-102	ECG123A	TM123A	WEP736	121-29000A		
Q81	3011	576-0003-011	GE-220	PTC123	HEPS0015	REN 123A	SK3018	RT-102	ECG123A	TM123A	WEP736	121-29000A		
Q82	NCBV14		GE-219	PTC158	HEPS3004	REN 329	SK3048	RT-182	ECG329	TM329	WEP755			
		576-0004-104	GE-219	PTC158	HEPS3004	REN 329	SK3048	RT-182	ECG329	TM329	WEP755			
Q83	2SC1909K	576-0004-105	GE-215	PTC186		REN 235	SK3197	RT-146	ECG235	TM235	WEP785	121-29039		
Q121	3011	576-0003-011	GE-220	PTC123	HEPS0015	REN 123A	SK3018	RT-102	ECG123A	TM123A	WEP736	121-29000A		
Q131	TA727	576-0006-227	GE-FET-4*	PTC182*		REN 222*	SK3065*	RT-181*	ECG222*	TM222*	WEP905*	121-826*		
Q500		576-0002-001	GE-57		HEPS5000	REN 152	SK3054	RT-197	ECG241	TM241	WEP880	121-29002		
Q501	MJE2480	576-0002-029	GE-57		HEPS5004	REN152	SK3188	RT-197	ECG241	TM241	WEP241	121-29002		
U1	TCA440N	544-2008-001												
U2	LM3086N	544-2002-008	GEIC-172				SK3543	TVMC-66	ECG912					
U3	LM324N	544-2020-002												
U61	TDA2002	544-2006-011												
U131		544-3001-201												
U132	7722	544-2007-001												

JOHNSON MODEL VIKING 430

(11) ±5 TOL

* Lead configuration may vary from original.
/** Also available as exact type replacement.

PARTS LIST AND DESCRIPTION (CONTINUED)

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

ELECTROLYTIC CAPACITORS

ITEM No.	RATING	REPLACEMENT DATA				
		MFGR. PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
					Q-LINE	GENERAL LINE
C22	1 35V	510-2075-109		TDC105M035EL	QTD1-25	SD35-19
C23	10 25V	510-4125-100	PC10-25	VTT10B25	QV1-43	EV-1322
C32	1 50V	510-4150-109	PC1-50	VTT1A50	QV1-11	EV-1615
C67	1 50V	510-4150-109	PC1-50	VTT1A50	QV1-11	EV-1615
C68	22 25V	510-4125-220	PC25-25	VTT22D25	QV1-57	EV-1324
C72	.27 15V	510-2013-278			QDT1-12	SD35-R279
C73	100 10V	510-4110-101	PC100-10	VTT100E10	QV1-93	EV-1130
C76	220 16V	510-4116-221	PC250-25	VTT220H16	QV1-117	EV-1240
C97	1 50V	510-4150-109	PC1-50	VTT1A50	QV1-11	EV-1615
C122	2200 16V	510-4116-222	WBR2000-16	TC1520C	QE1-643	TVA-1175.3
C123	1000 16V	510-4116-102	PC1000-16	VTT1000L16	QV1-183	EV-1260
C125	220 16V	510-4116-221	PC250-25	VTT220H16	QV1-117	EV-1240
C135	1 35V	510-2245-109		TDC105M035EL	QTD1-25	SD35-19
C501	470 40V	510-4009-001	WBR500-50*	VTT470N50	QV1-159	EV-1550
C502	470 40V	510-4009-001	WBR500-50*	VTT470N50	QV1-159	EV-1550
C503	220 16V	510-4116-221	PC250-25	VTT220H16	QV1-117	EV-1240

CAPACITORS

ITEM No.	RATING	MFGR. PART No.	REPLACEMENT DATA				
			CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
						Q-LINE	GENERAL LINE
C1	470 1KV	510-3216-270	DD-471	GP470	GP347		10TS-T47
C2	.01 50V		UK50-103		MAG5011		
C3	.01 50V		UK50-103		MAG5011		
C4	27 N150 5%				*		10TCP-Q27
C5	.01 50V		UK50-103		MAG5011		
C6	.01 50V		UK50-103		MAG5011		
C7	.01 50V		UK50-103		MAG5011		
C8	.01 50V		UK50-103		MAG5011		
C9	.01 50V		UK50-103		MAG5011		
C10	.0022 50V				GP222		10TS-D22
C11	.01 16V	510-3216-330	UK16-103		MAG1611		HY-420
C12	.01 50V		UK50-103		MAG5011		
C13	3.3 NPO 50V 5%		DTZ-3R3	NP03P3	CN0533		10TCC-V33
C14	.1 16V		UK16-104		MAG1601		HY-650
C15	.0033 50V		DD-332	GP3300	GP233	QC2-107	5GA-D33
C16	.0033 50V		DD-332	GP3300	GP233	QC2-107	5GA-D33
C17	.001 1KV		DD-102		GP210		10TS-D10
C18	.01 50V		UK50-103		MAG5011		
C21	.033 16V		UK16-333		MAG16133		HY-630
C25	.01 50V		UK50-103		MAG5011		
C26	.0047 50V	510-3216-150	DD-472	GP4700	GP247		5GA-D47
C61	.0047 50V		DD-472	GP4700	GP247		5GA-D47
C62	.022 16V		UK16-223				HY-625
C63	.01 16V		UK16-103		MAG1611		HY-420
C64	.01 16V		UK16-103		MAG1611		HY-420
C65	.01 16V		UK16-103		MAG1611		HY-420
C66	.047 16V		UK16-503		MAG1615		HY-635
C69	.0047 50V		DD-472	GP4700	GP247		5GA-D47
C70	.1 10V		UK12-104		MAG1201		HY-360
C71	.0022 50V				GP222		10TS-D22
C74	.1 16V	510-3216-910	UK16-104		MAG1601		HY-650
C77	.01 50V		UK50-103		MAG5011		
C81	33 N150 5%				*		10TCP-Q33
C83	3.3 500V 5%		DTZ-3R3	NP03P3	CN0533		10TCC-V33
C84	3.3 500V 5%		DTZ-3R3	NP03P3	CN0533		10TCC-V33
C85	33 N750 5%		DTN-33	N33	CN7433		10TCU-Q33
C86	.001 1KV		DD-102		GP210		10TS-D10
C88	22 NPO 5%		DTZ-22	NP022	CN0422		10TCC-Q22
C90	.001 1KV		DD-102		GP210		10TS-D10
C91	18 N750 5%		DTN-20	N20	CN7420		10TCU-Q20
C92	.047 50V	510-3216-270	UK50-503		MAG5015		
C93	.001 1KV		DD-102		GP210		10TS-D10
C94	33 NPO 50V 5%		DTZ-33	NP033	CN0433		10TCC-Q33
C95	33 NPO 50V 5%		DTZ-33	NP033	CN0433		10TCC-Q33
C96	.0047 50V		DD-472	GP4700	GP247		5GA-D47
C98	15 N150 200V 5%				*		10TCP-Q15
C99	.001 1KV		DD-102		GP210		10TS-D10
C100	5.1 NPO 200V ±.5						
C101	.001 1KV		DD-102		GP210		10TS-D10
C104	91 N150 50V 5%				*		10TCP-T10
C105	.047 50V	510-3126-820	UK50-503		MAG5015		
C106	27 N150 5%				*		10TCP-Q27
C107	82 N150 200V 5%				*		10TCP-Q82
C112	300 100V 5%			CD15FD301J03	SX330	QW1-38	MWA-301
C113	330 100V 5%			CD15FD331J03	SX333	QW1-39	MWA-331
C114	82 100V 5%			CD15ED820J03	SX482	QW1-25	MWA-820
C115	270 N750 200V 5%				CN7327		10TCU-T27
C118	15 N750 200V 5%		DTN-15	N15	CN7415		10TCU-Q15
C119	.01 50V		UK50-103		MAG5011		
C124	.01 50V		UK50-103		MAG5011		
C126	.01 50V		UK50-103		MAG5011		
C130	.0047 50V		DD-472	GP4700	GP247		5GA-D47

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 Q-LINE	PART No. GENERAL LINE
C131	10 N750 200V 5%	510-3220-680	DTN-10	N10	CN7410	QW1-7 QW1-12	10TCU-010
C132	18 N750 200V 5%		DTN-20	N20	CN7420		10TCU-020
C133	39 N750 200V 5%				CN7439		10TCU-039
C134	.1 16V		UK16-104		MAG1601		HY-650
C136	.01 50V		UK50-103		MAG5011		
C137	27 N750 200V 5%				CN7427		10TCU-027
C138	150 N750 200V 5%		DTN-150	N150	CN7315		10TCU-T15
C139	.01 50V		UK50-103		MAG5011		
C140	.01 50V		UK50-103		MAG5011		
C143	33 NPO 50V 5%		DTZ-33	NP033	CN0433		10TCC-033
C145	.1 10V		UK12-104		MAG1201		HY-360
C146	.01 50V		UK50-103		MAG5011		
C147	15 N750 200V 5%		DTN-15	N15	CN7415		10TCU-Q15
C148	.1 16V		UK16-104		MAG1601		HY-650
C149	470 1KV		DD-471	GP470	GP347		10TS-T47
C151	12 5%			CD12CD120J03			MMA-120
C152	220 N750 50V 5%		DTN-220	N220	CN7322		10TCU-T22
C153	24 100V 5%			CD15ED240J03	SX424		MMA-240
C154	.01 50V		UK50-103		MAG5011		
C155	.0047 50V		DD-472	GP4700	GP247		5GA-D47
C156	68 N150 200V 5%				*		10TCP-Q68
C207	.001 1KV		DD-102		GP210		10TS-D10
C208	.001 1KV		DD-102		GP210		10TS-D10
C401	27 NPO 50V 5%		DTZ-47	NP047	CN0447		10TCC-Q27
C402	47 NPO 50V 5%		DTZ-82	NP082	CN0482		10TCC-Q47
C403	82 NPO 50V 5%		DD-472	GP4700	GP247		10TCC-Q82
C500	.0047						5GA-D47

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

JOHNSON MODEL VIKING 430

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.
R13	AGC	5000	562-0004-502	T-5000	MTC53L1	X201R502B
R39	S Meter-ANL	1000	562-0004-102	T-1000	MTC13L1	X201R102B
R44	Squelch/Switch	10K	562-0002-041			
			562-0002-41(5)			
R49	AMC	10K	562-0019-103			X260R103B
R59	Volume/On-Off Switch	10K	562-0002-021			
			562-0002-021(5)			

(5) Number on unit.

COILS (RF-IF)

ITEM No.	FUNCTION	REPLACEMENT DATA			REMARKS
		PART No.	OTHER IDENTIFICATION	MILLER PART No.	
L81	RF Choke (6.8uH)	542-3504-689			
L82	RF Choke (6.8uH)	542-3504-689			
L83	RF Choke (13uH)	542-3003-001		4624	
L84	Final Loading (27MHz)	542-1005-010		7515-E	
L85	Pi Filter (27MHz)	542-1015-002			
L86	Pi Filter (27MHz)	542-1015-025			
L87	Antenna Tuning (27MHz)	542-1015-025			
L131	VCO	542-1013-003	10130037708		
L133	RF Choke				
T1	Rec RF (27MHz)	592-5015-002	5015002	CBS739-T	
T2	RF Amp (27MHz)	592-5015-002	5015002	CBS739-T	
T3	IF (455kHz)	592-5015-024	5015024HK		
T4	IF (455kHz)	592-5015-024	50150247622		
T81	Mixer (27MHz)	592-5015-005		CBS107-T	
T83	XMT Amp (27MHz)	592-5015-005		CBS107-T	
T84	XMT Driver (27MHz)	592-5014-001		CB909	
T85	Final (27MHz)	592-5014-002		CB910	
T132	Mixer (27MHz)	592-5015-005		CBS107-T	

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.	
L121	1.5A	.299	.434mH	542-5007-021			

TRANSFORMER (Driver)

ITEM No.	TURNS RATIO			REPLACEMENT DATA			NOTES
	PRI.	SEC. 1	SEC. 2	MFGR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T61	.4	1		592-1013-008		MCB31	

SPEAKER

ITEM No.	TYPE		REPLACEMENT DATA		NOTES
			MFGR. PART No.	QUAM PART No.	
LS1	3-1/2" PM	3.2 Ohms	589-1013-001	3A05	

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
F1	.5A	Quick Acting	534-0003-017	534-1002-001	AGC1/2	HPK	312.500	342028L	FG1/2-2
F2	2A	Quick Acting	534-0003-024	534-1004-031	AGC2	HDJ	312002	150145	FG2-2

PARTS LIST AND DESCRIPTION (CONTINUED)

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

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	023-2708-214	18-032	18-034	18-010	18-099	1	6	5	3	4	2

MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
DS1	LED	549-4002-051	Meter Readout (1.63V @ 17.5mA)
DS301	LED	549-4002-001	Channel Readout (1.57V @ 8.0mA)
DS302	LED	549-4002-001	Channel Readout (1.57V @ 8.0mA)
EP3	Ferrite Bead	517-2002-002	
EP4	Ferrite Bead	517-2002-002	
J1	Jack		Ext. Speaker
J2	Jack		PA
J4	Jack		Antenna
S1	Switch	583-2009-225	Channel Selector
S3	Switch	(1)	CB/PA
S4	Switch	583-3003-012	ANL/NB
S8	Switch	583-3003-012	Ext/Loc
S9	Switch	583-3003-013	Dim/Brk
Y131	Crystal	519-0008-002	5.120MHz
Y132	Crystal	519-0005-207	30.620MHz
Y133	Crystal	519-0005-208	31.070MHz
Z2	Filter	532-2004-002	455kHz
Z3	Filter	532-2001-021	27MHz
	Cord	023-3690-001	DC Power
	PC Board	035-0360-001	Main
	PC Board	035-0343-001	Harmonic Filter
	PC Board	035-0341-031	Power Supply

(1) Part of Squelch switch.

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

ITEM	PART No.	ITEM	PART No.
Cover, Cabinet	017-1969-011	Knobs, Volume/Squelch	032-0583-051
Knob, Channel	032-0583-041	Panel Front	032-0475-001

JOHNSON MODEL VIKING 430



PHOTOFACT[®] with

CIRCUITRACE[®]

For Supplier Address See PHOTOFACT Index

NOTE

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

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

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

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

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



PRESIDENT MODEL 1010002, MADISON

MODEL 1010002, MADISON

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

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ALIGNMENT INSTRUCTIONS

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:

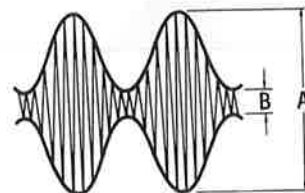
L1, L2 L4 thru L10, L12, L14, L19 thru L23,

L30, L31, L45 thru L48 9440

L3, L13, L15 5000, 5009 8276, 8728, 8728A

L36, L38 5009, 8728, 8728A

CT1, CT2 5000, 8276



$$\text{Modulation Ratio} = \frac{A - B}{A + B} \times 100 (\%)$$

FIGURE 1

SYNTHESIZER ALIGNMENT

TEST EQUIPMENT	TRANSCEIVER	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.
Input of DC meter to TP9.	Ch. 40, AM	L19	Adjust for 5.00 volts. Check for approximately 3.40 volts on Channel 1.
Input of oscilloscope to TP1.	Ch. 19, AM	L20	Adjust for maximum RF.
Input of frequency counter to TP1.	Ch. 1, AM	L23	Adjust for 34.7650MHz +20Hz. Check all channels. (See Truth Chart for correct frequencies.)
Input of frequency counter to TP1.	Ch. 1, USB	CT1	Adjust for 34.7665MHz +20Hz. Check all channels. (See Truth Chart for correct frequencies.)
Input of frequency counter to TP1.	Ch. 1, LSB	L22	Adjust for 34.7635MHz +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 +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, Clarifier Midrange, Squelch MINIMUM, NB/ANL Off, Ch. 9 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, pu pulse width signal at antenna input. Switch Noise Blanker to On and adjust for maximum pulse amplitude.

PRESIDENT MODEL 1010002, MADISON

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, Clarifier Midrange, Squelch MINIMUM, NB/ANL Off, Ch. 9 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 that 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 jack. 27.186MHz, no modulation. Output 100uV.	Ch. 19, USB	VR2	SSB SIGNAL METER Adjust for 9 on Signal scale of meter.

TRANSMITTER ALIGNMENT

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

NOTE: Be sure to check transmit frequency and power on all active channels after alignment of transmitter.
See page 4 for channel frequencies.

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.

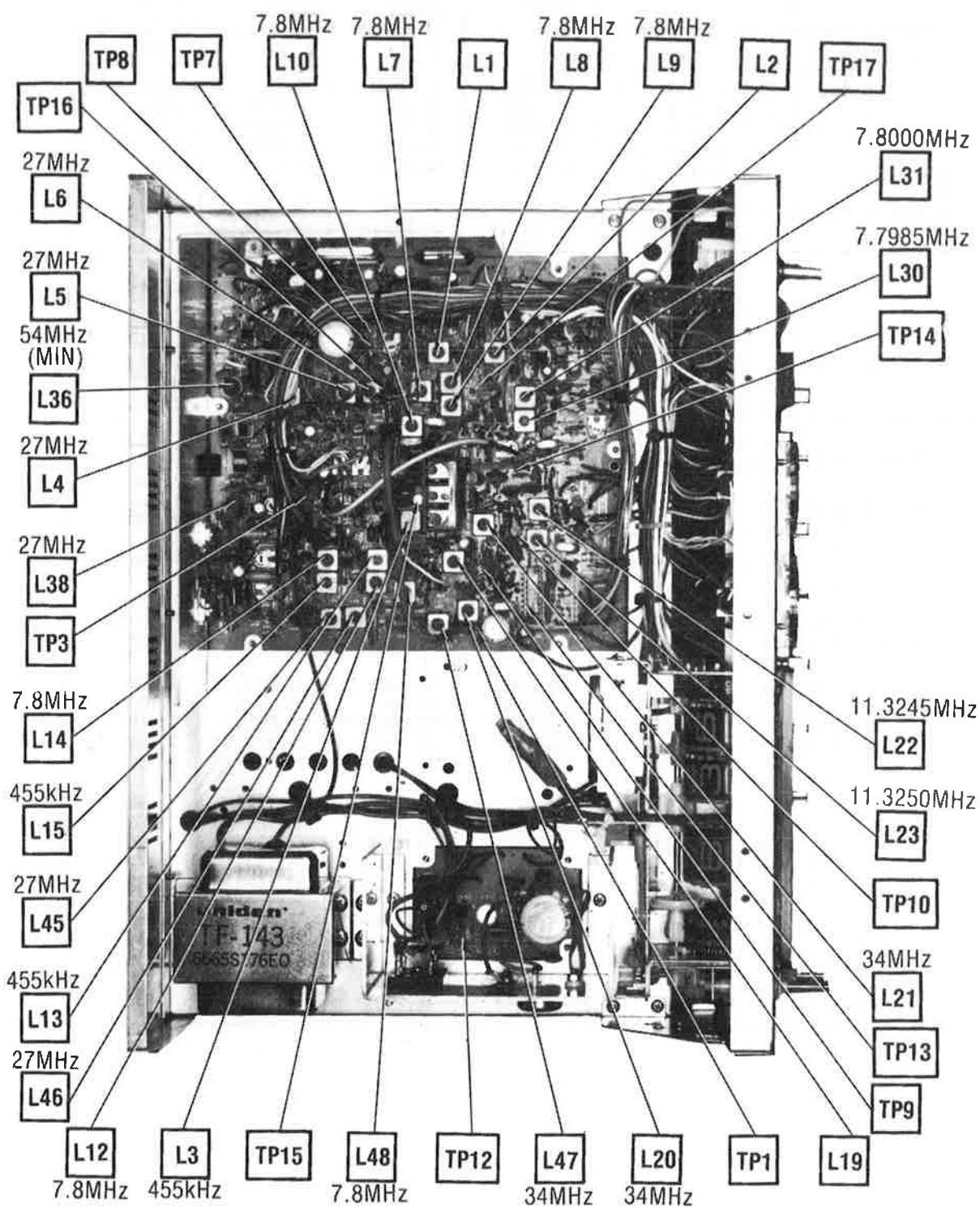
NOTE: Be sure to check transmit frequency and power on all active channels after adjustment of transmitter.
See page 4 for channel frequencies.

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Input of RF wattmeter to antenna input. No modulation.	Ch. 19, USB Mike Gain 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 Mike Gain 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 Mike Gain 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 Mike Gain Maximum	VR11	SSB ALC Adjust for 11.0 watts PEP RF output maximum.
Input of RF wattmeter to antenna input.	Ch. 19, AM Mike Gain 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 that RF PWR Meter agrees with RF wattmeter.
Input of oscilloscope or modulation meter to antenna input. Inject a 1000Hz signal at Mic input with enough output to produce 100% modulation. See Figure 1.	Ch. 19, AM Mike Gain Maximum SWR-RF/MOD MOD	VR7	MOD METER Adjust for 100% on MOD scale of meter.
Connect a 150 ohm non-inductive resistor to antenna input.	Ch. 19, AM	VR12	AWI Adjust so that AWI indicator just comes on.

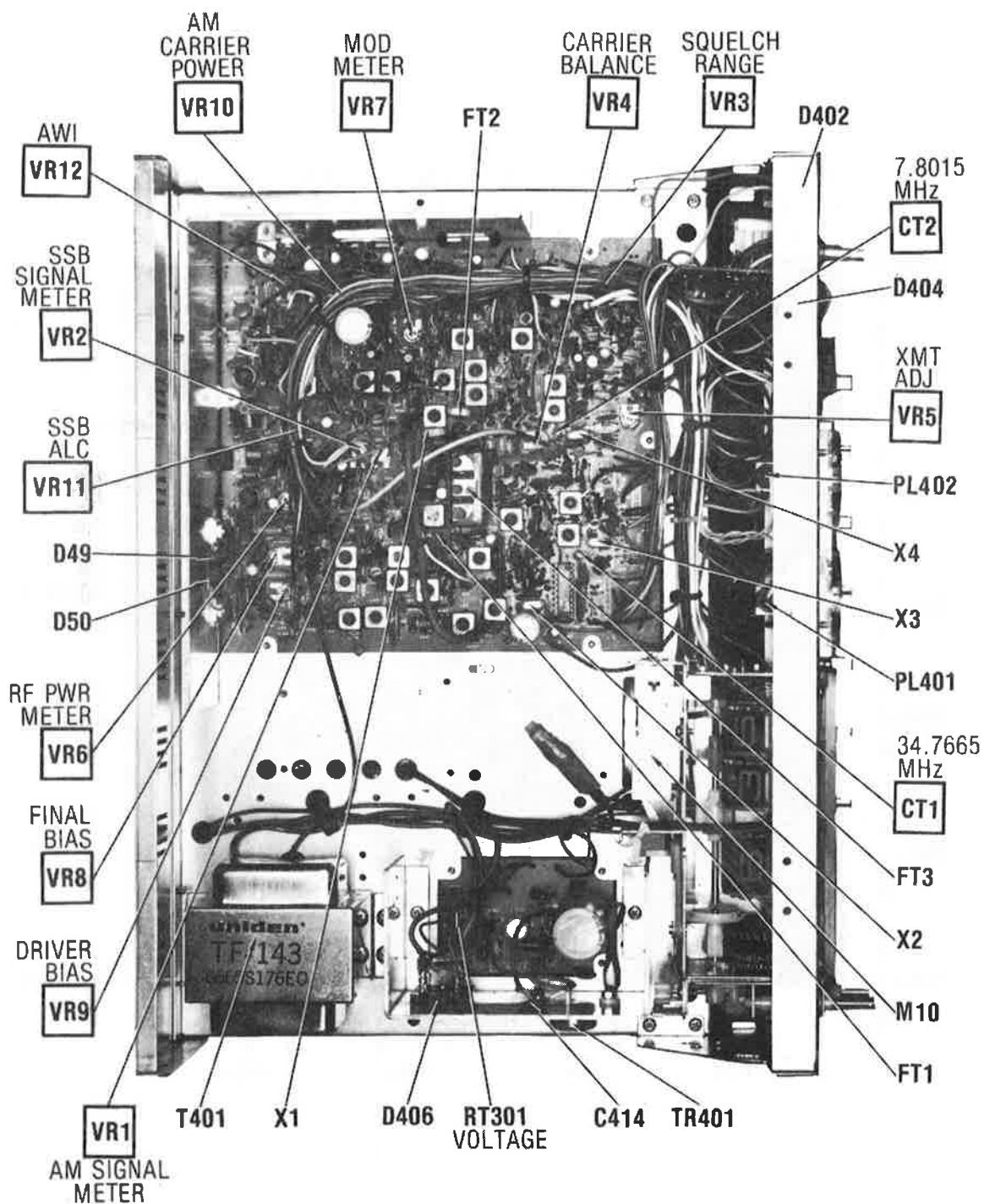
TRUTH CHART

C H A N N E L	1 = 8.00 Volts 0 = 0 to .50 Volts PROGRAM DIVIDER IC1								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
	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	

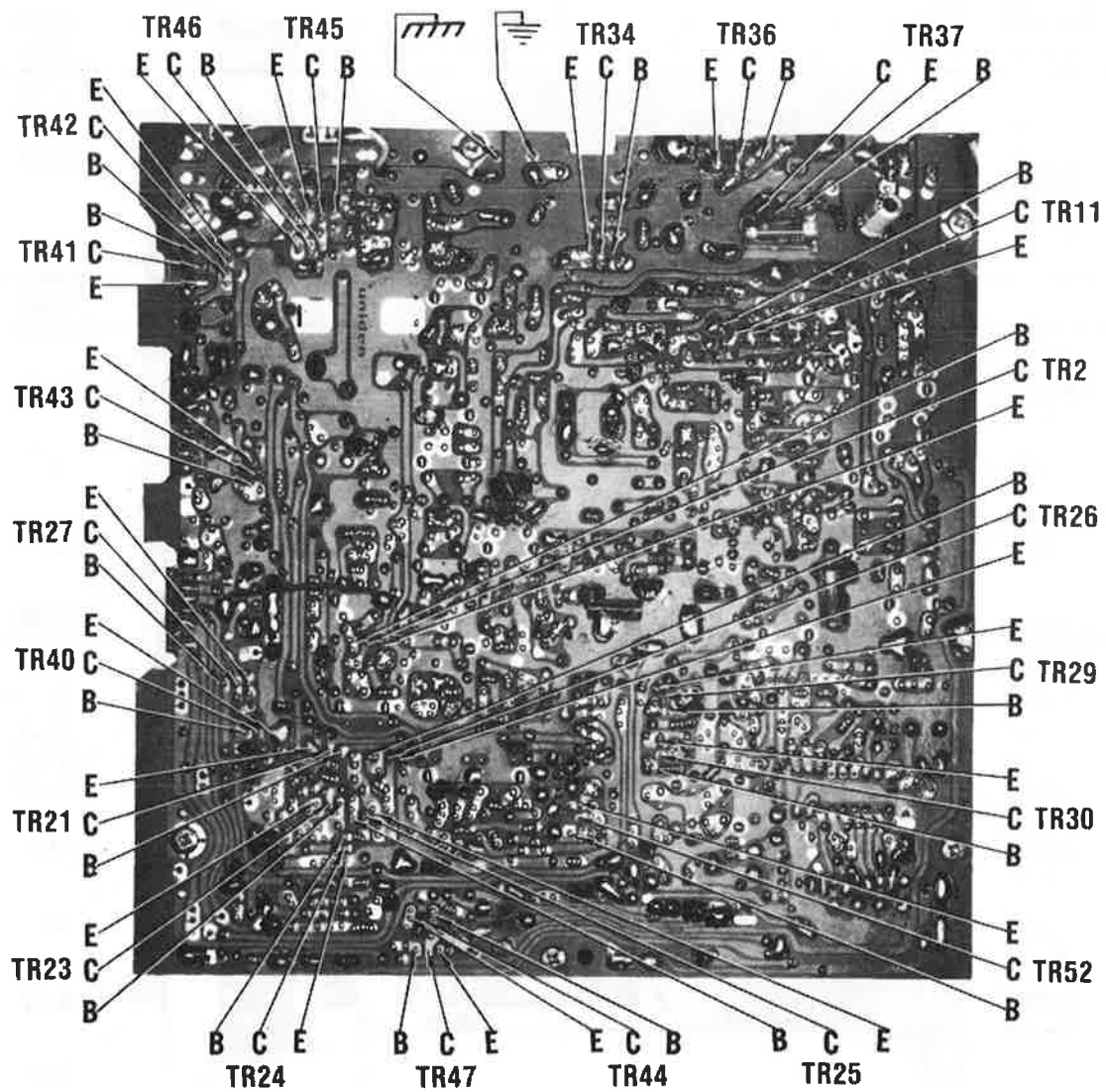
PRESIDENT MODEL 1010002, MADISON



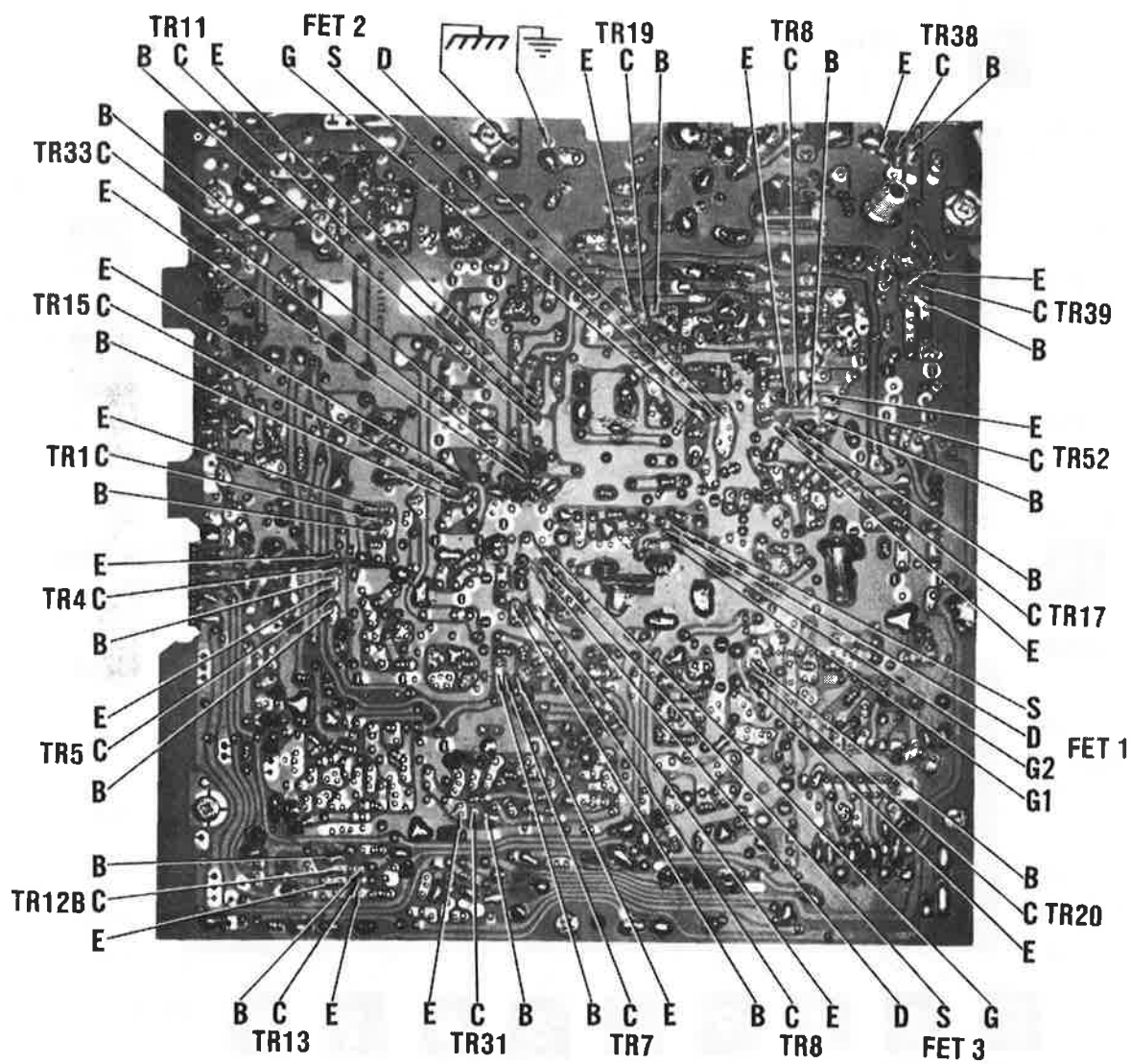
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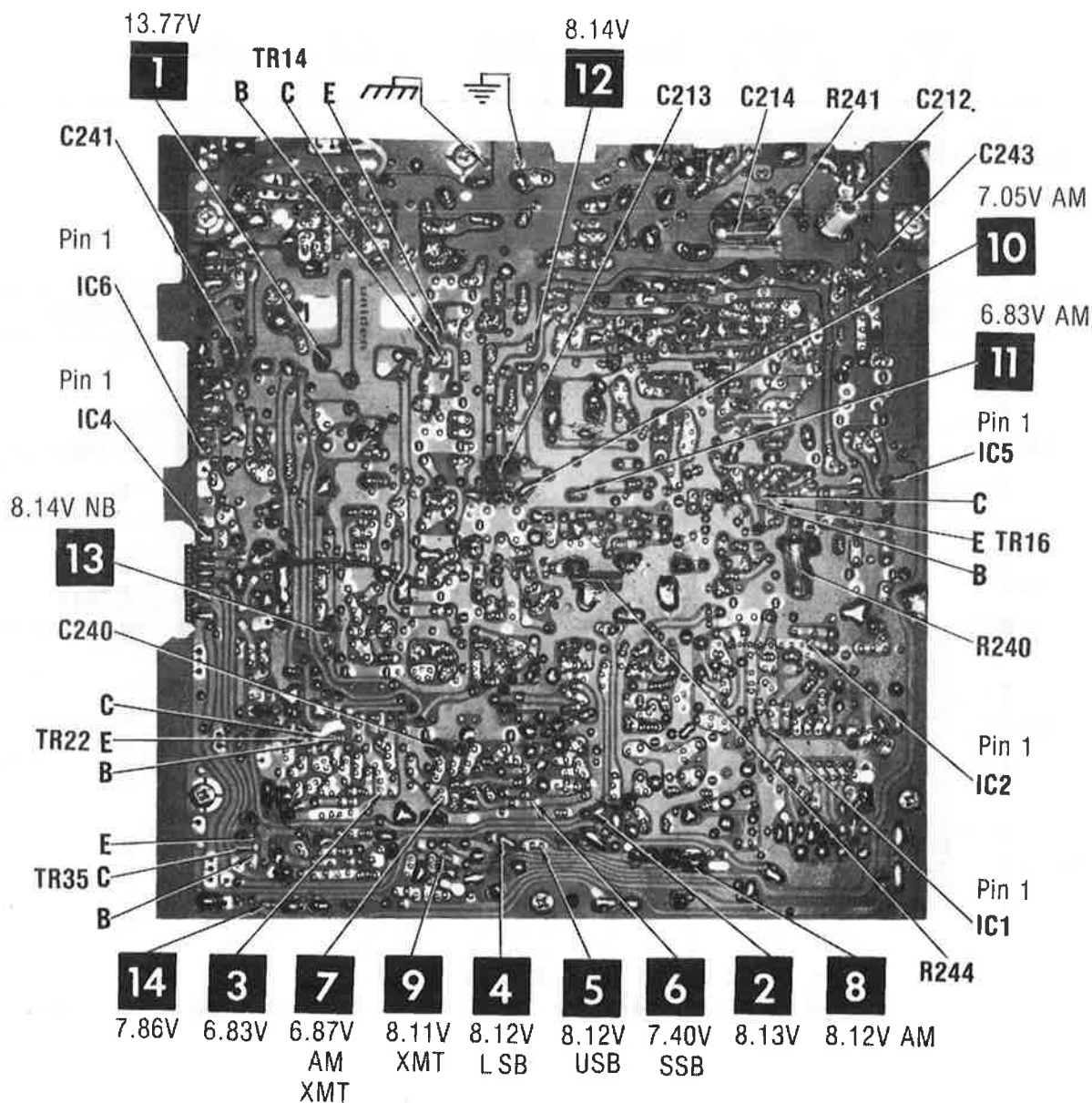
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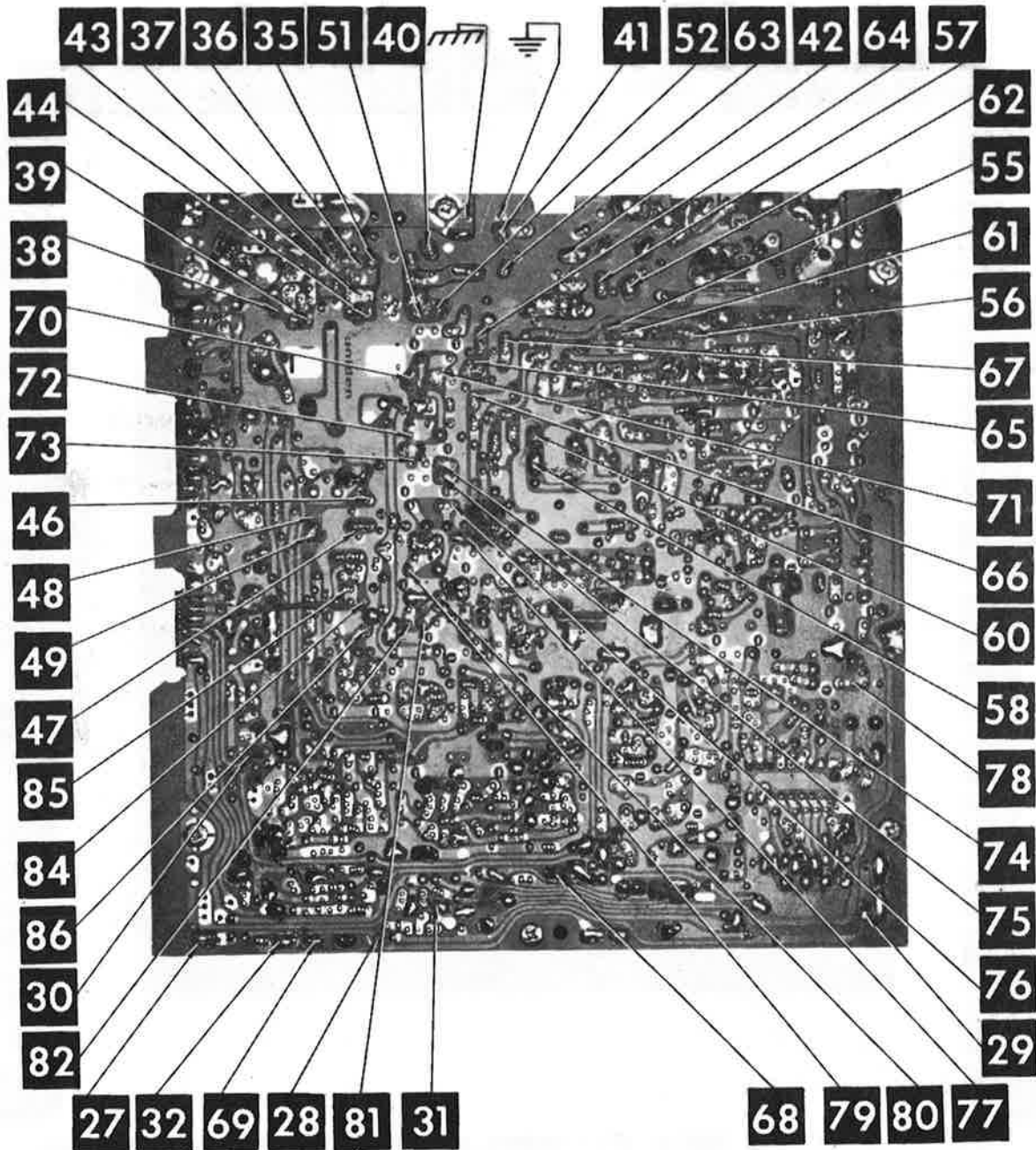
MAIN BOARD



MAIN BOARD

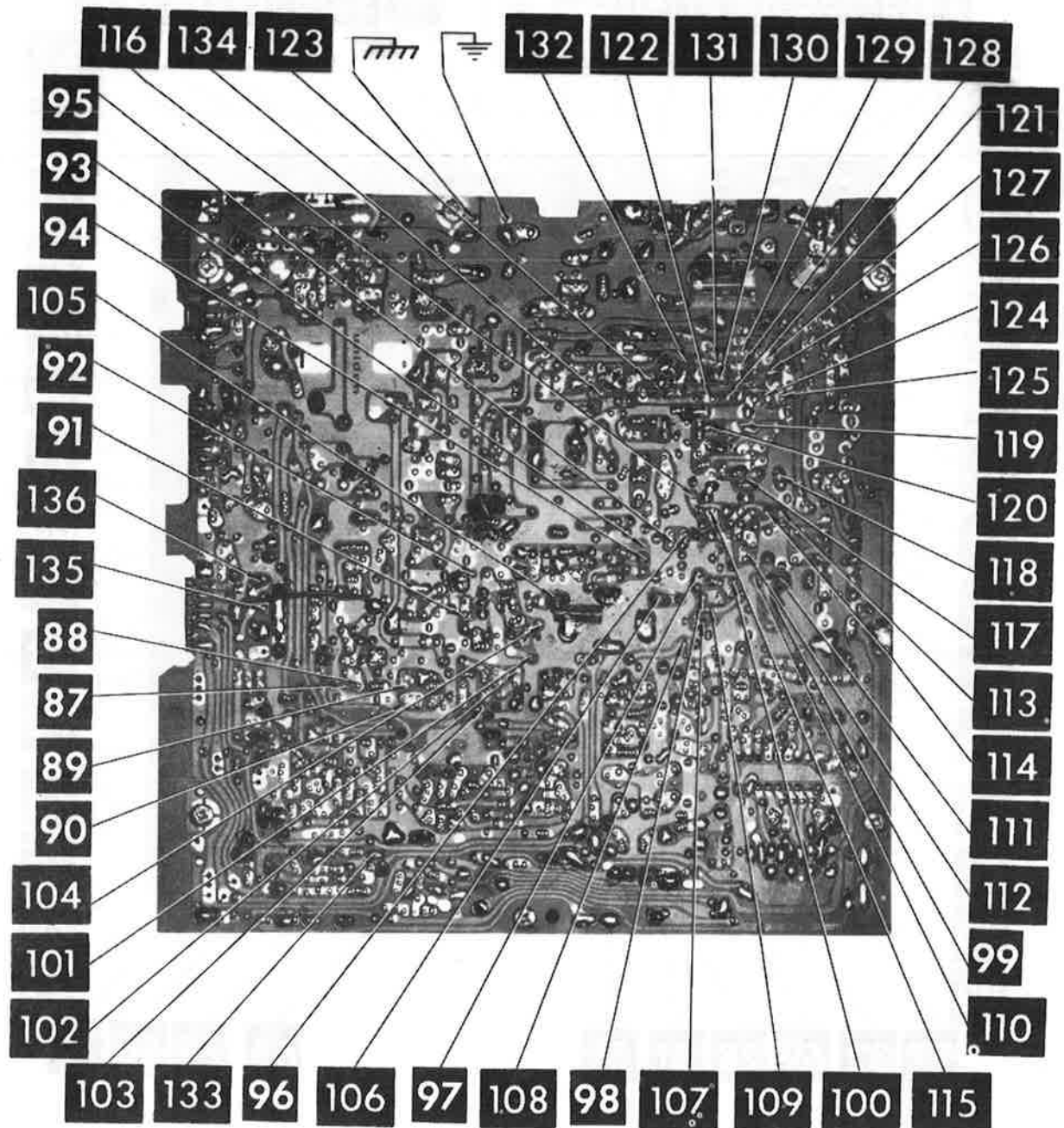


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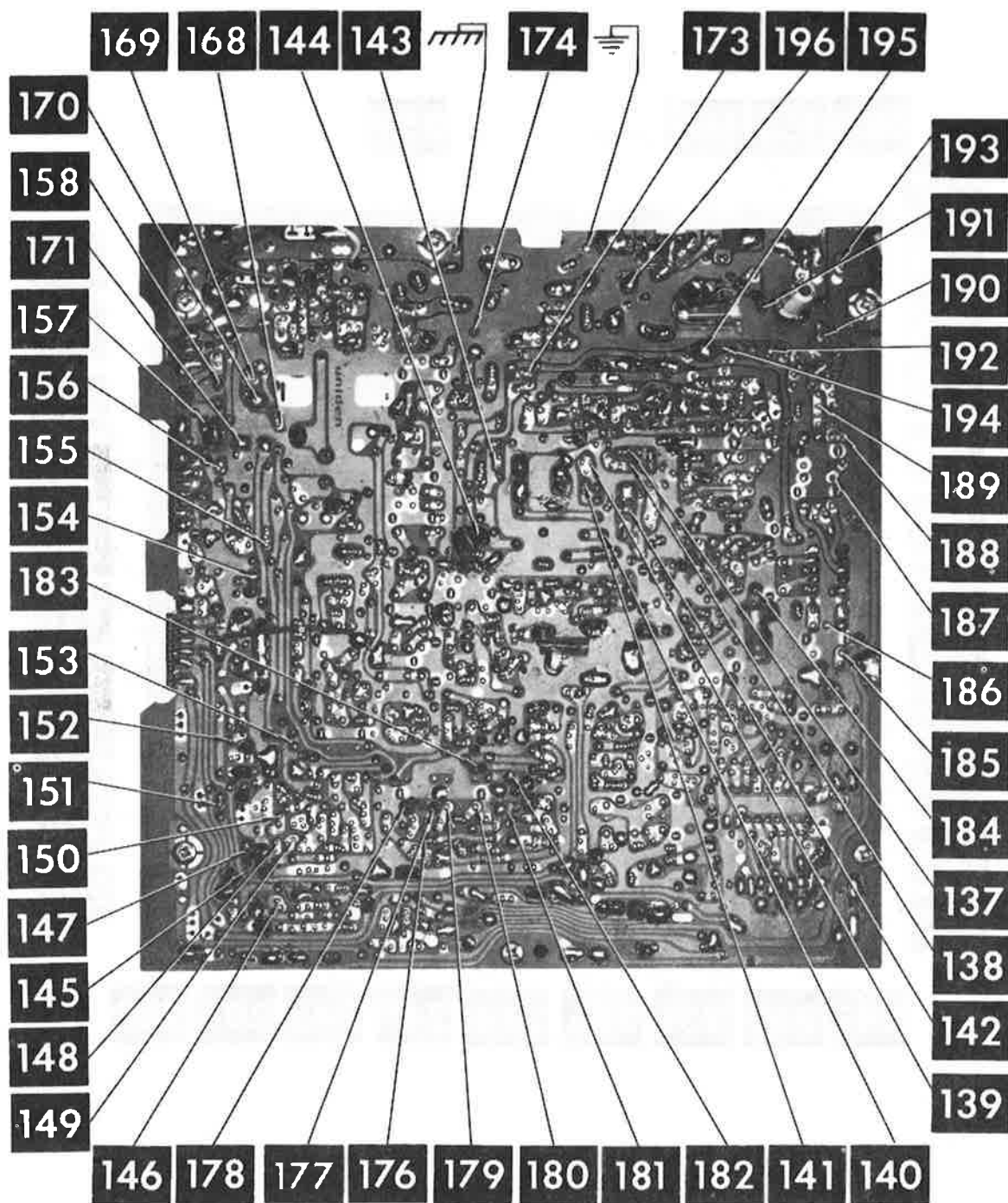


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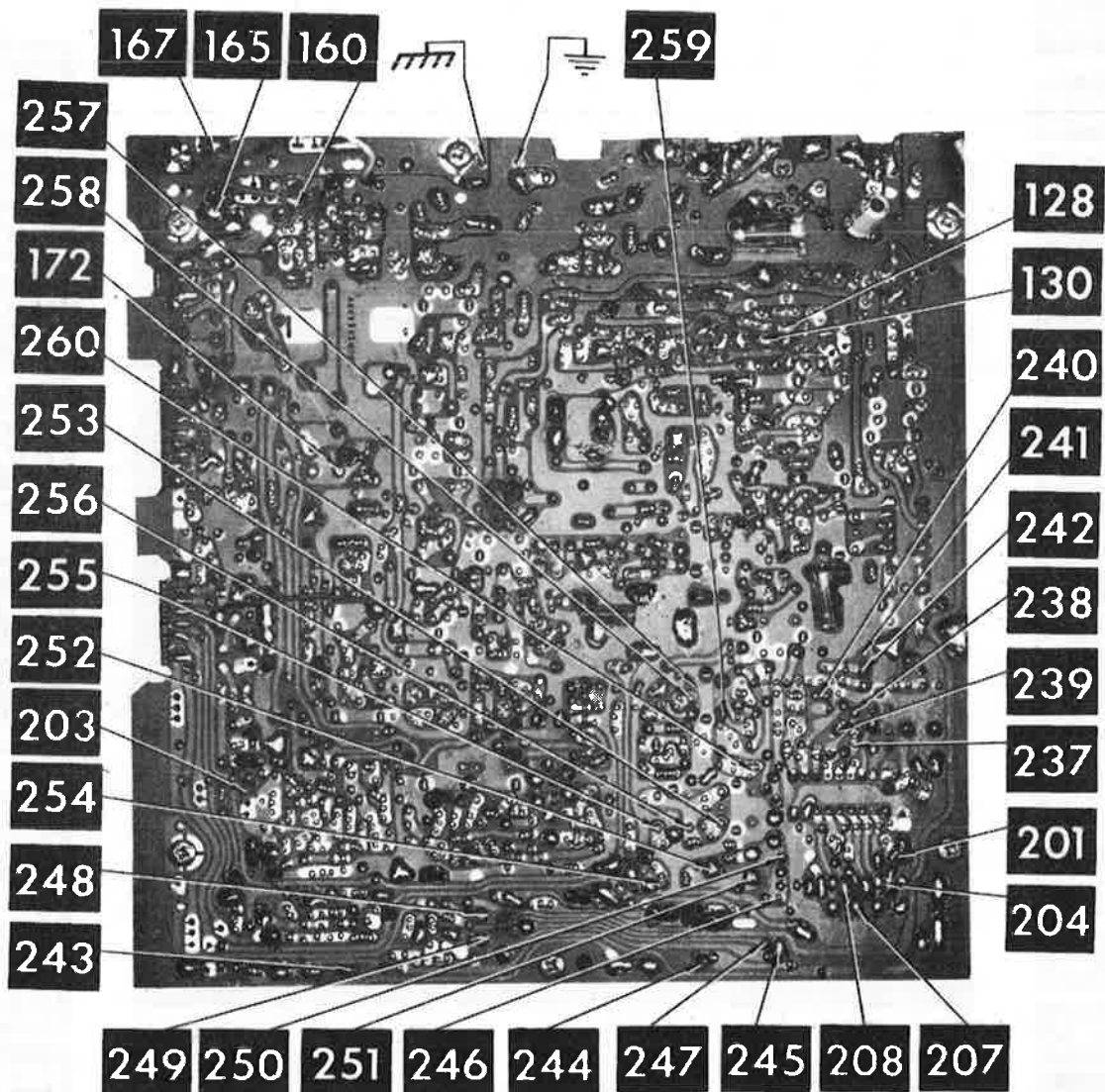


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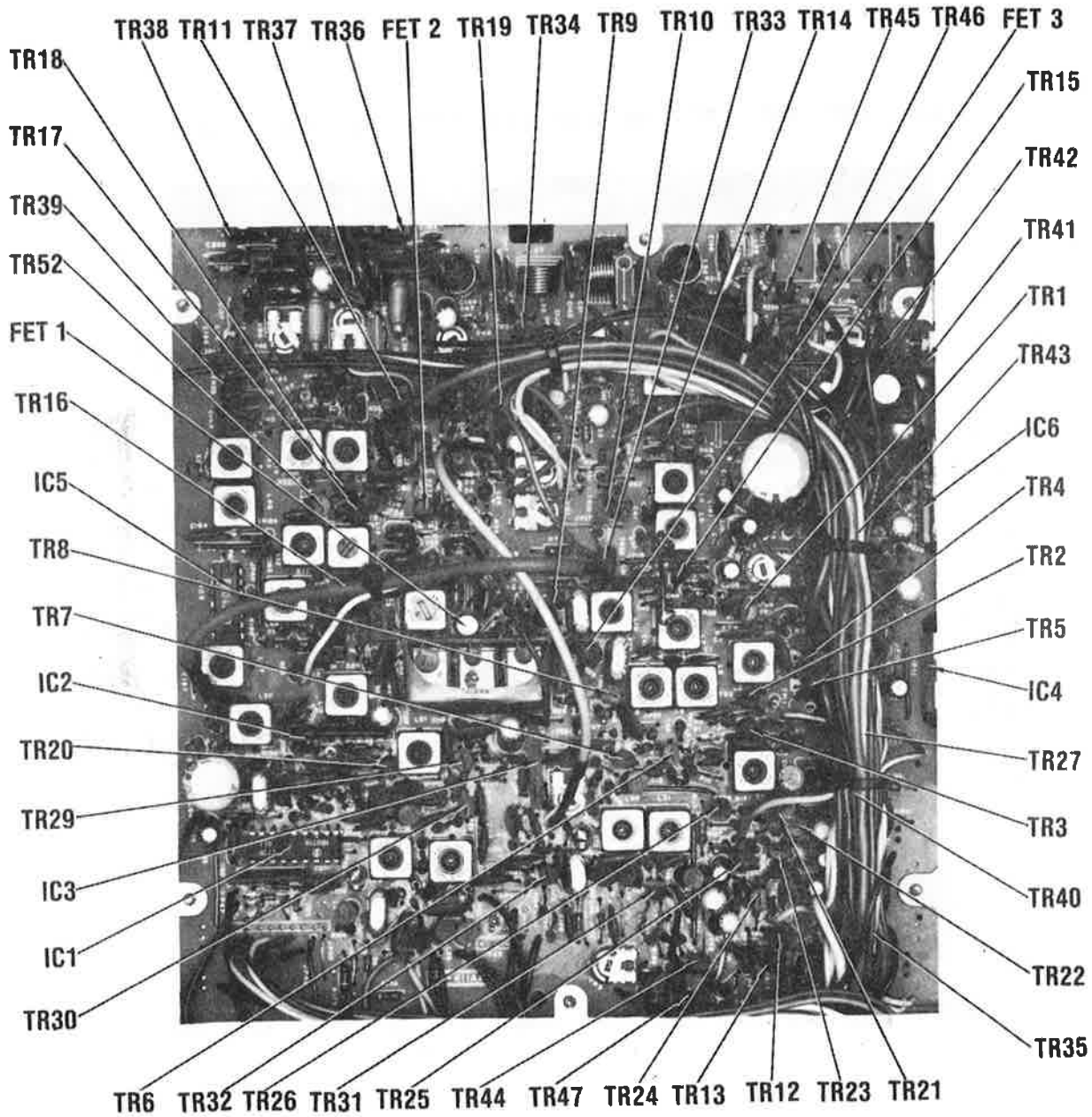


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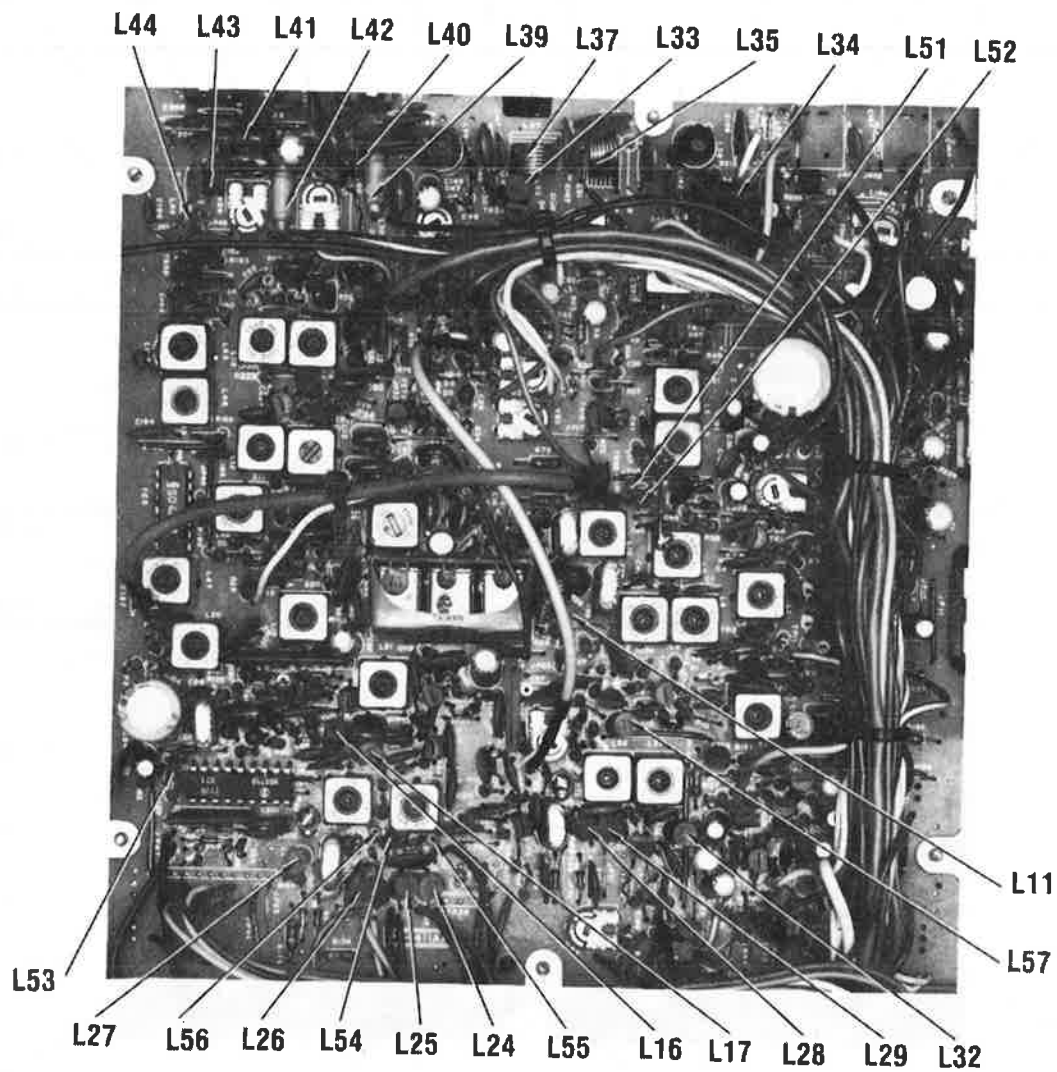
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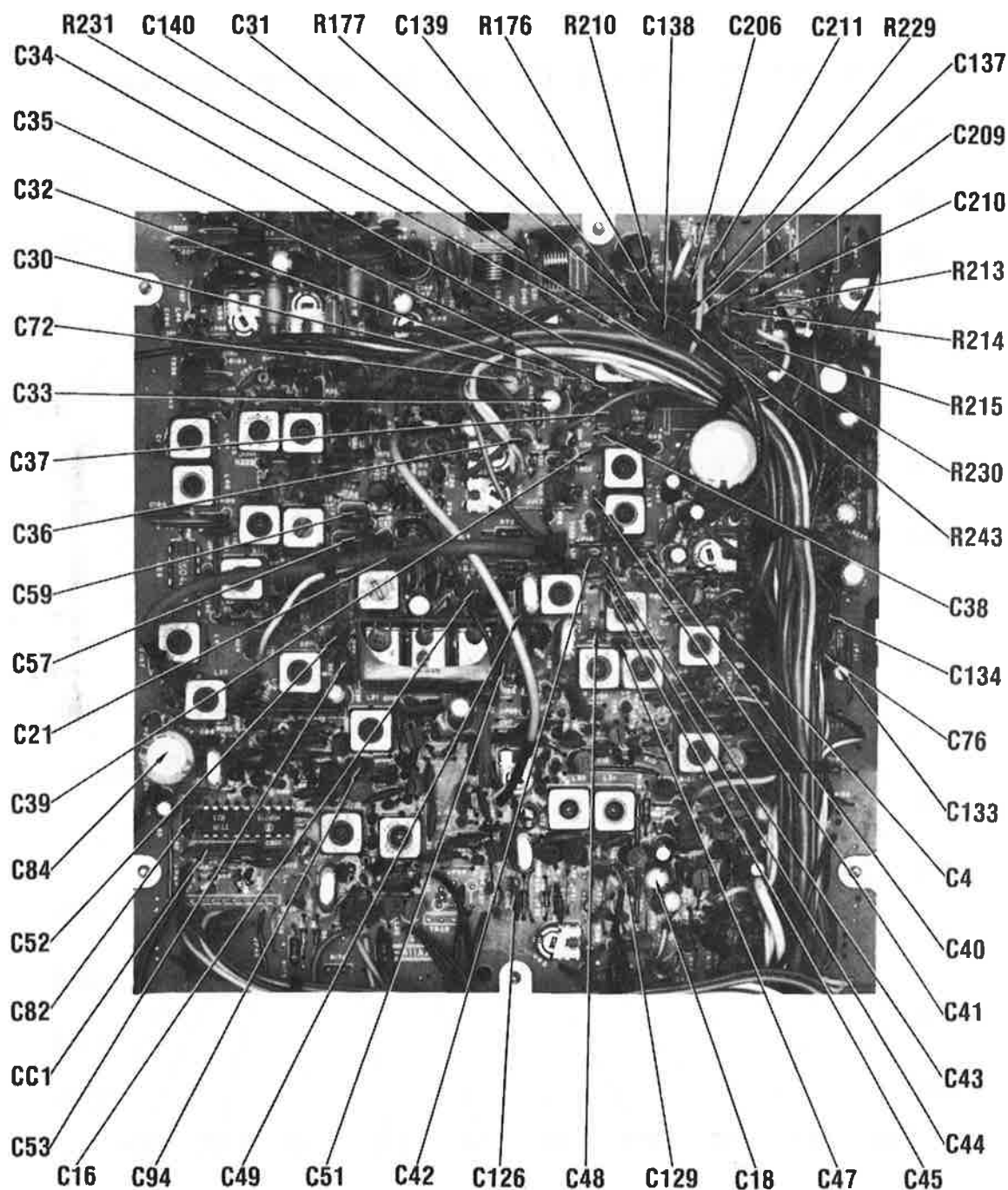
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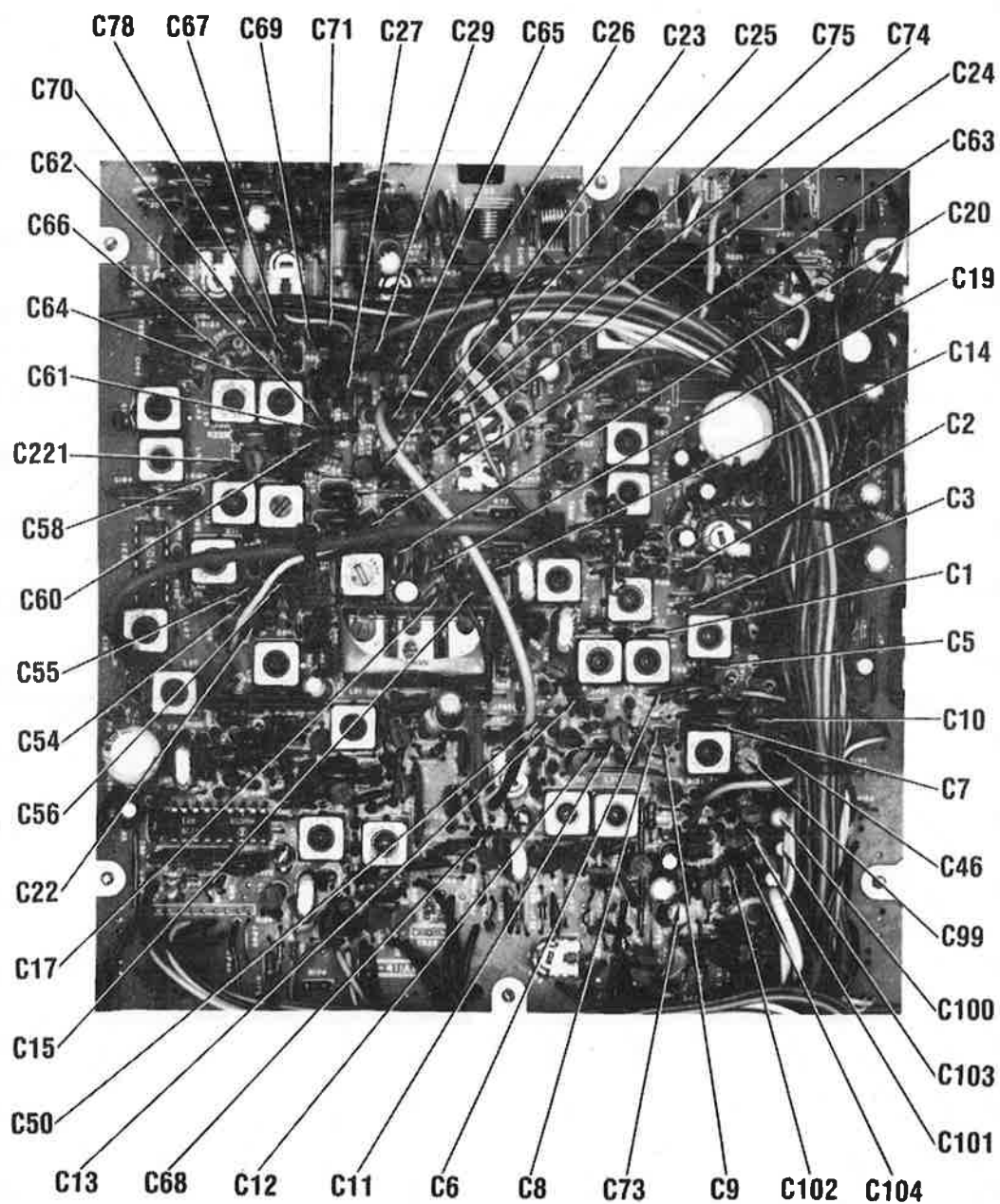
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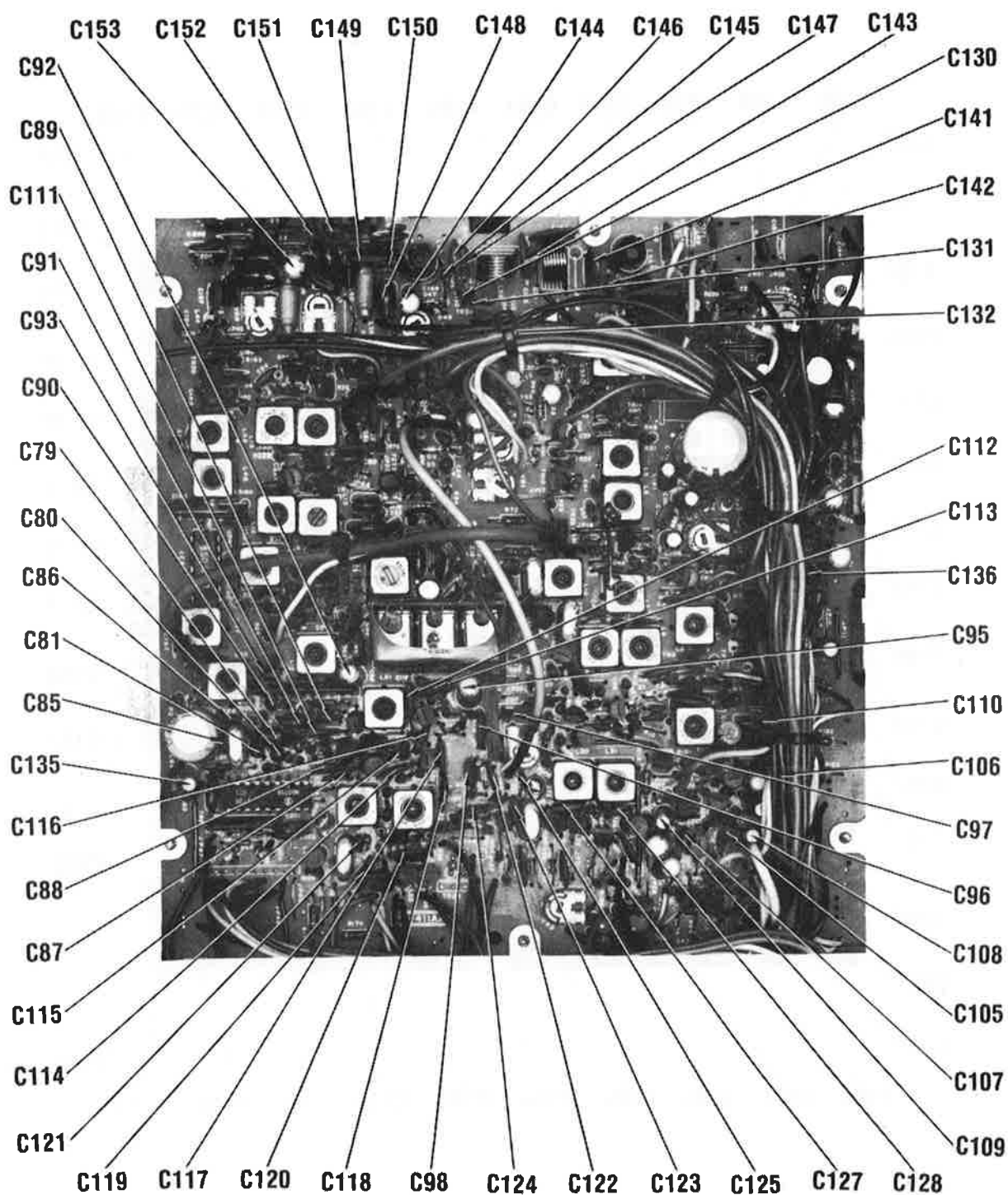
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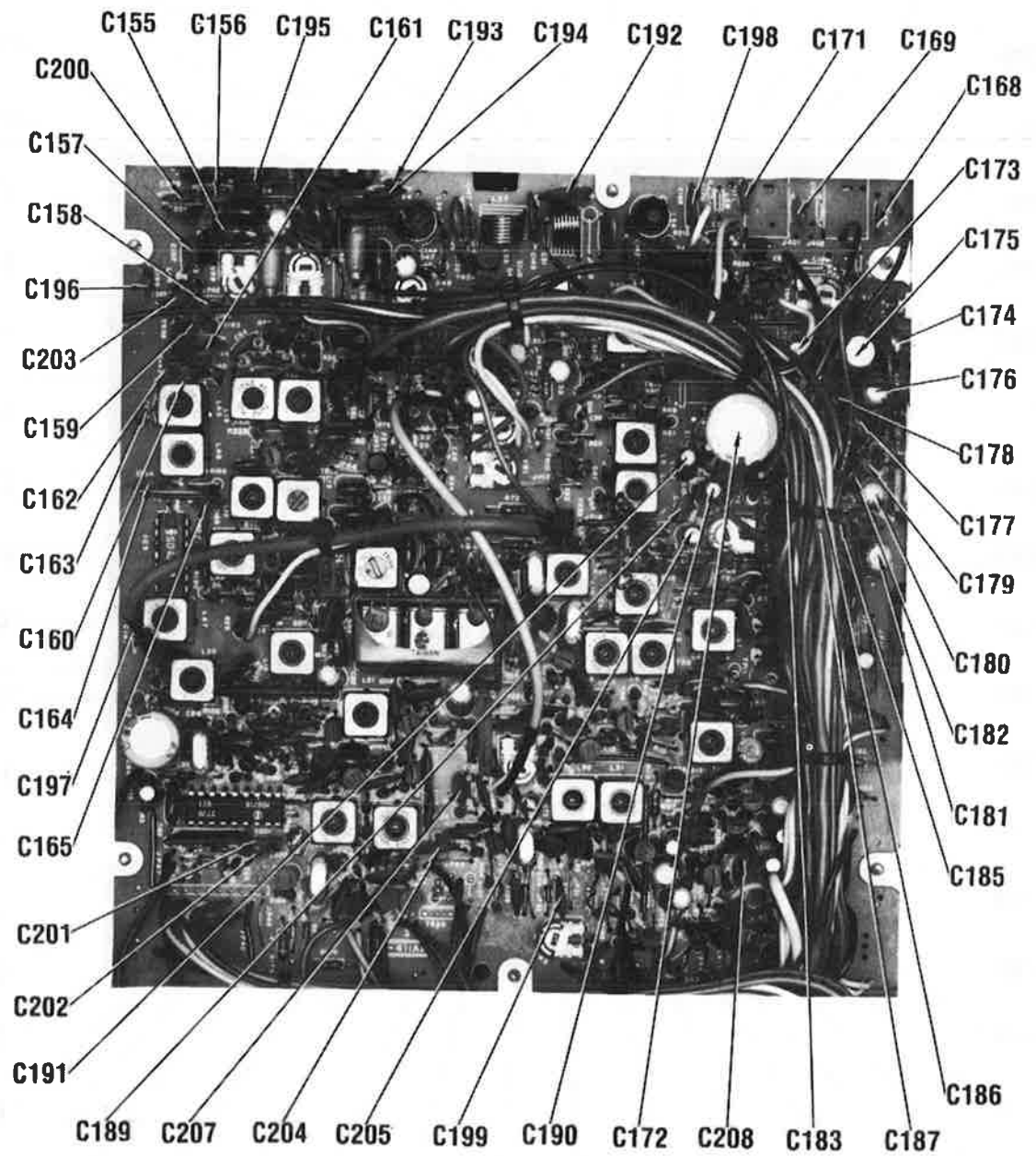
MA IN BOARD



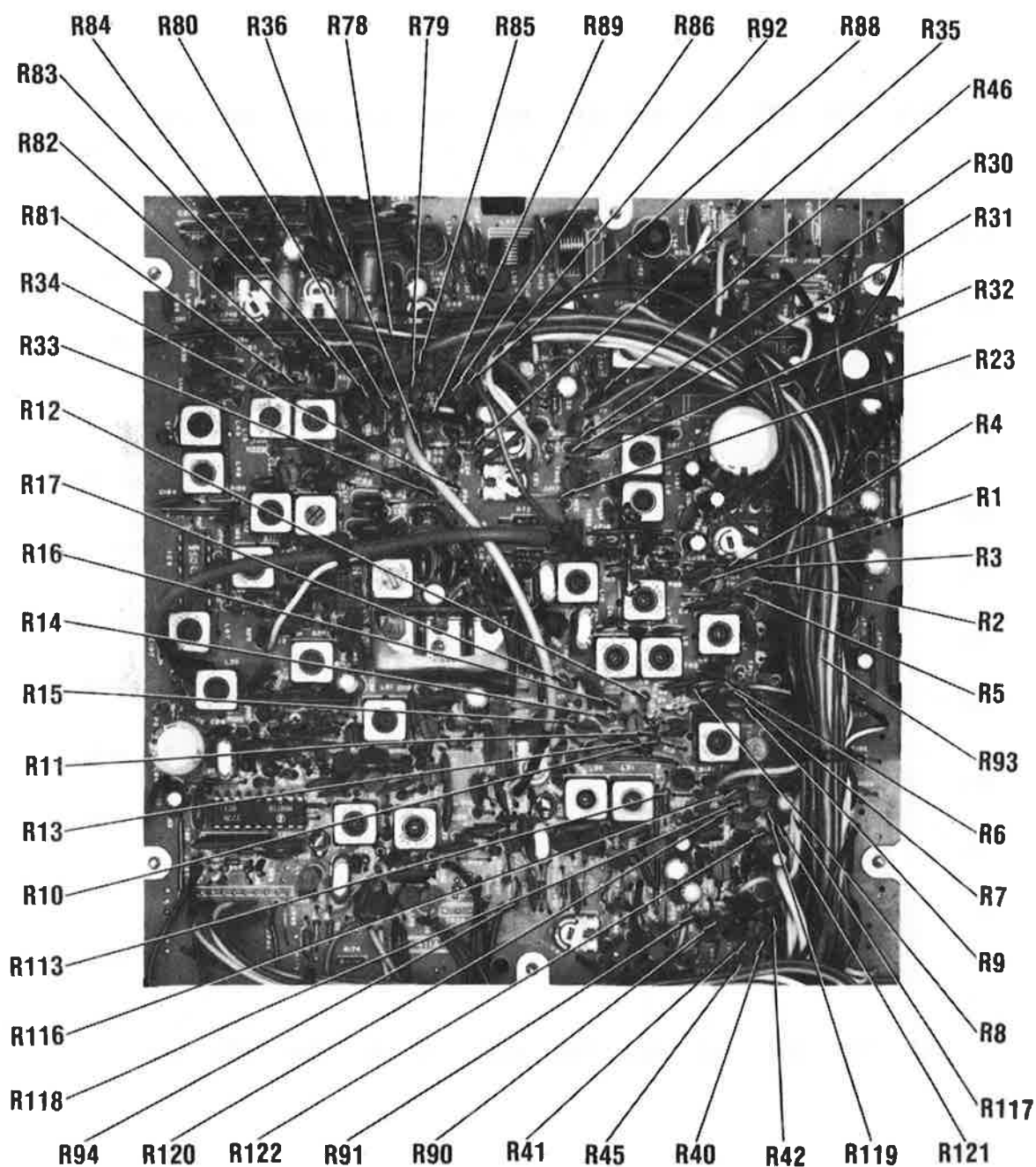
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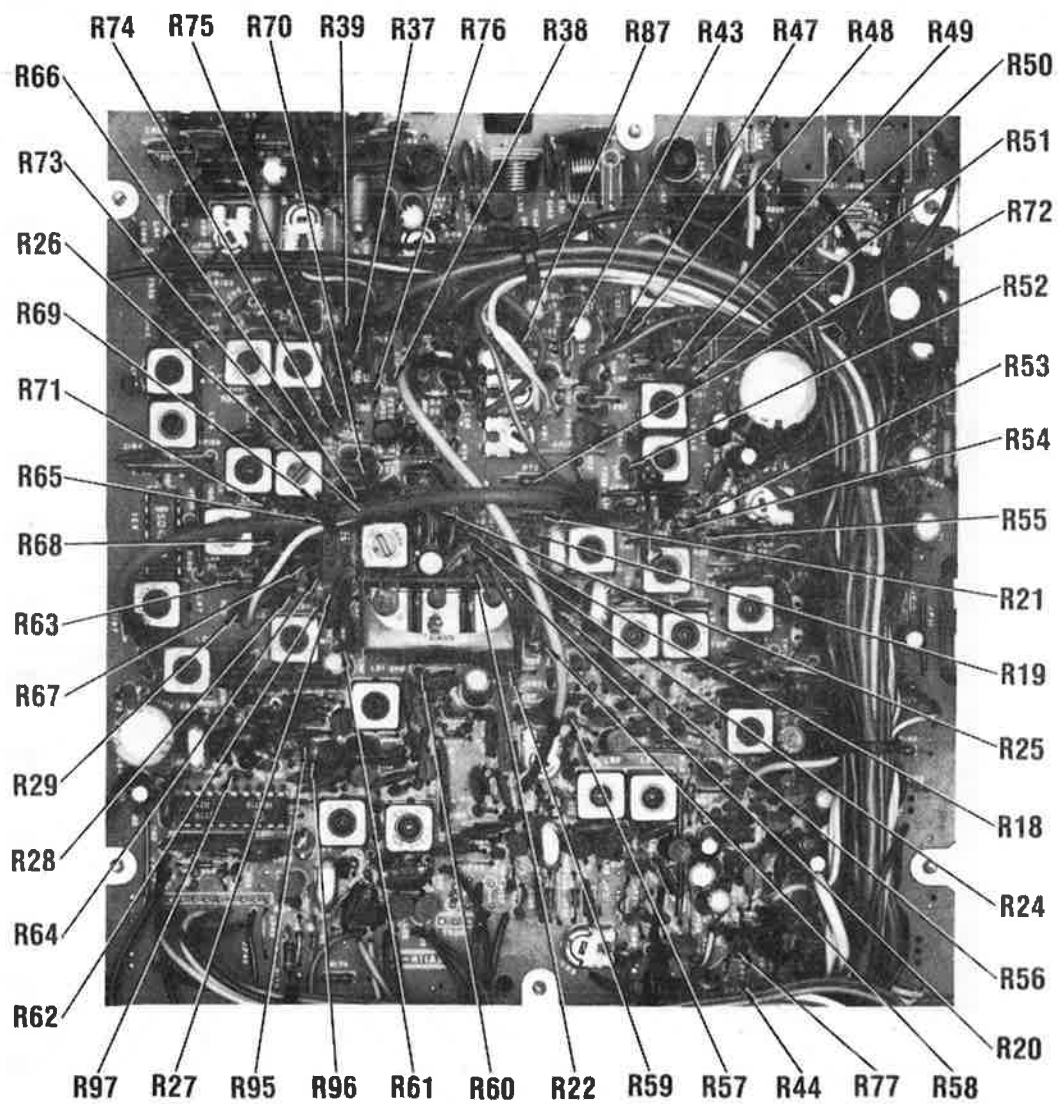
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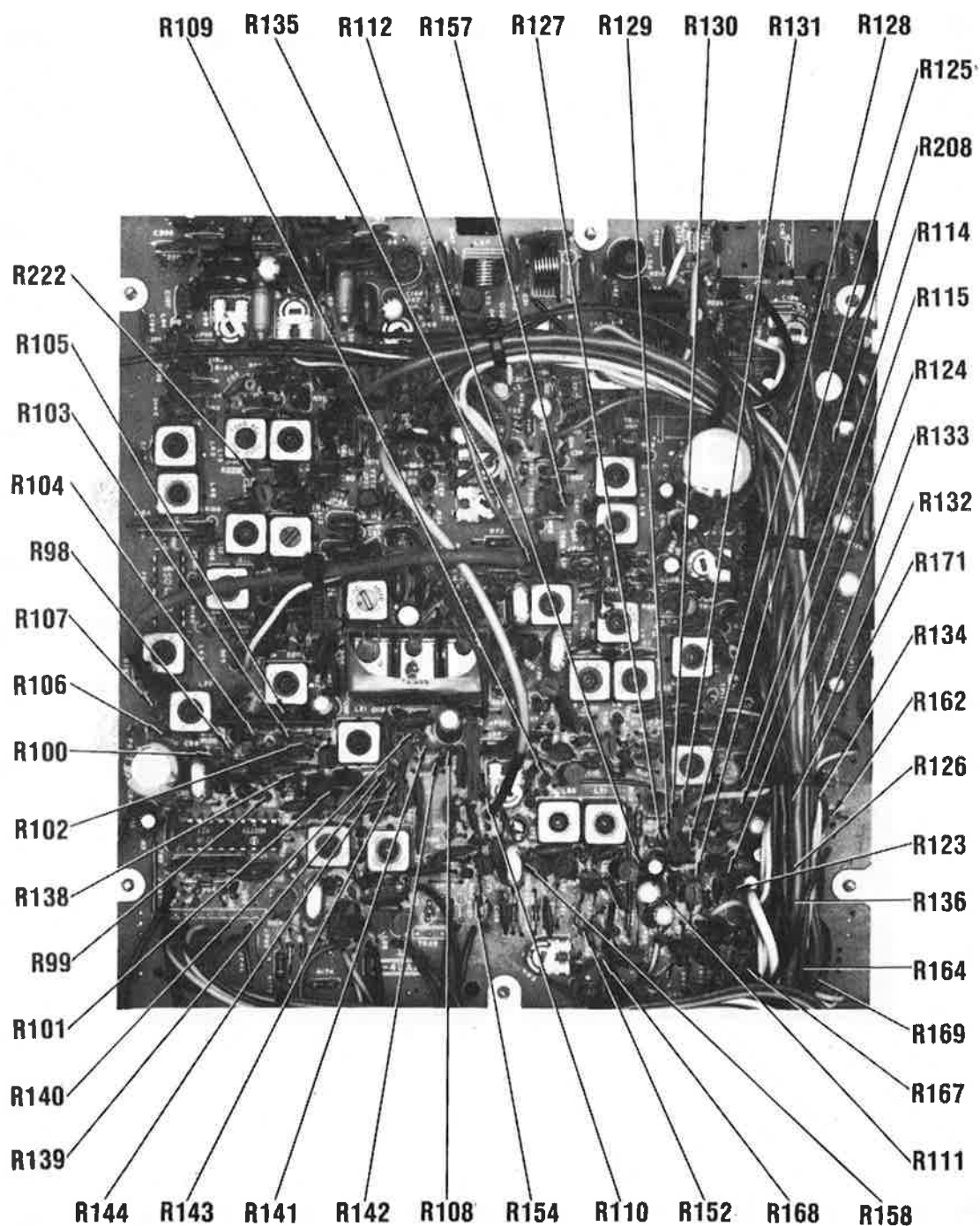
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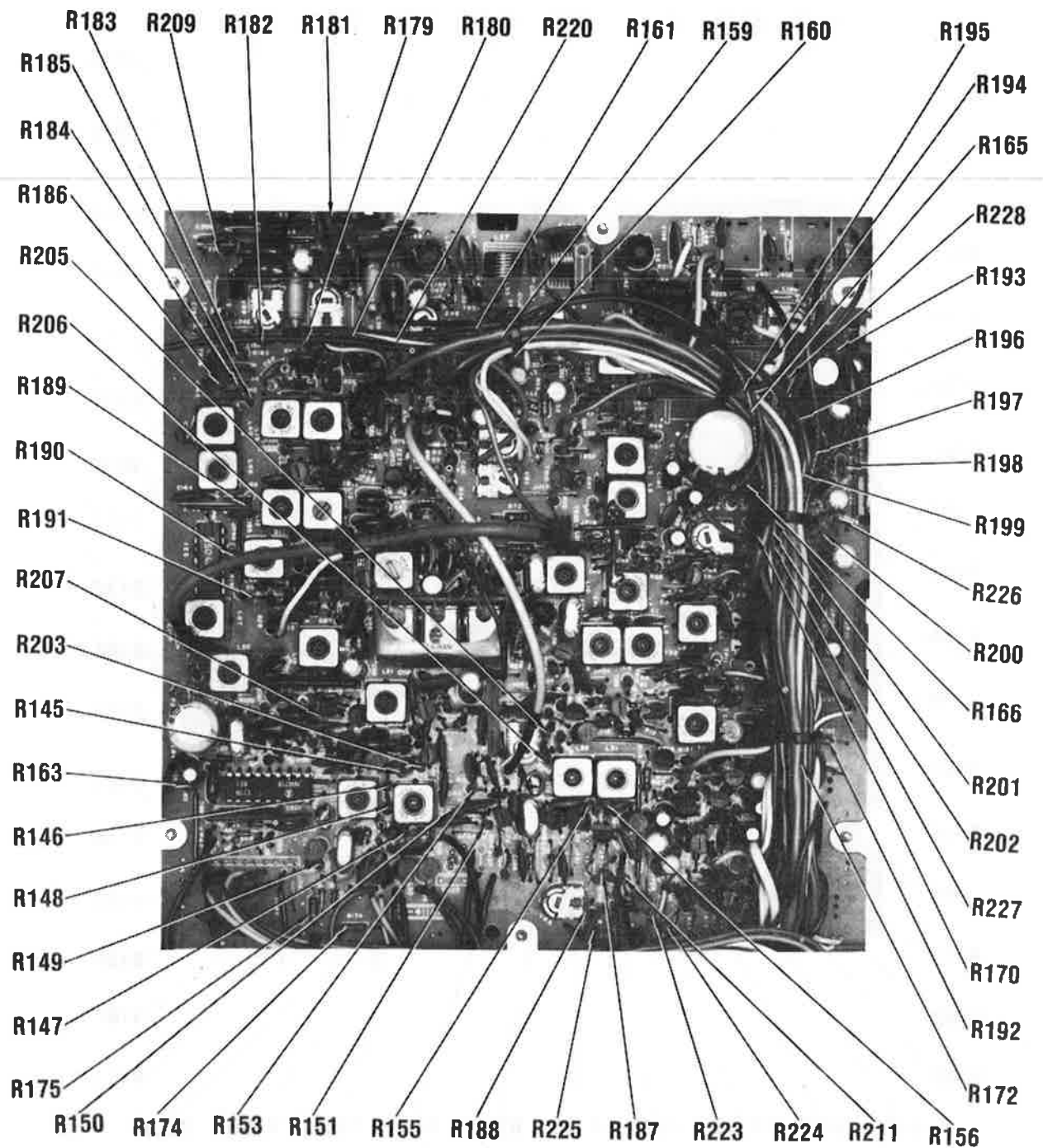
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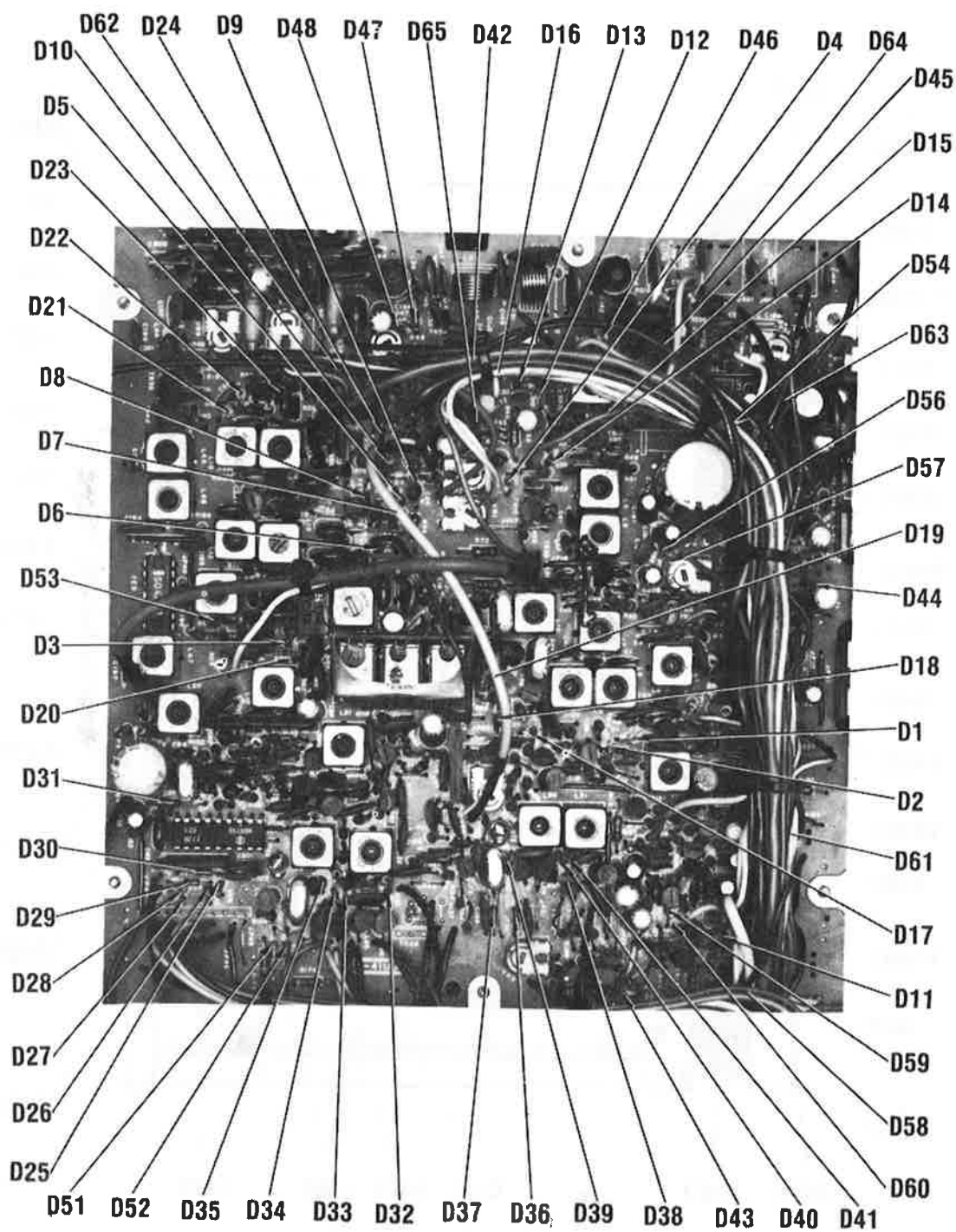
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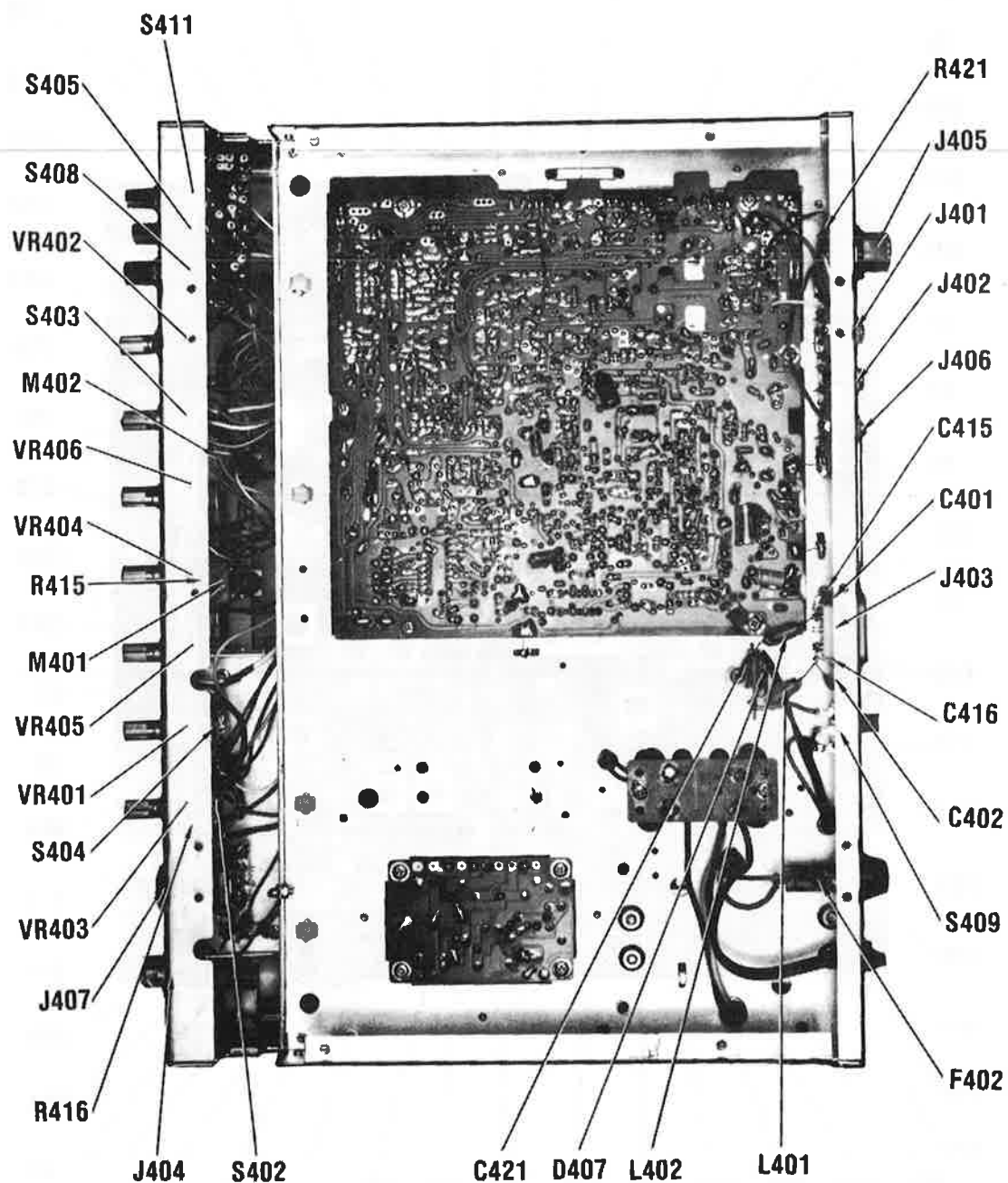
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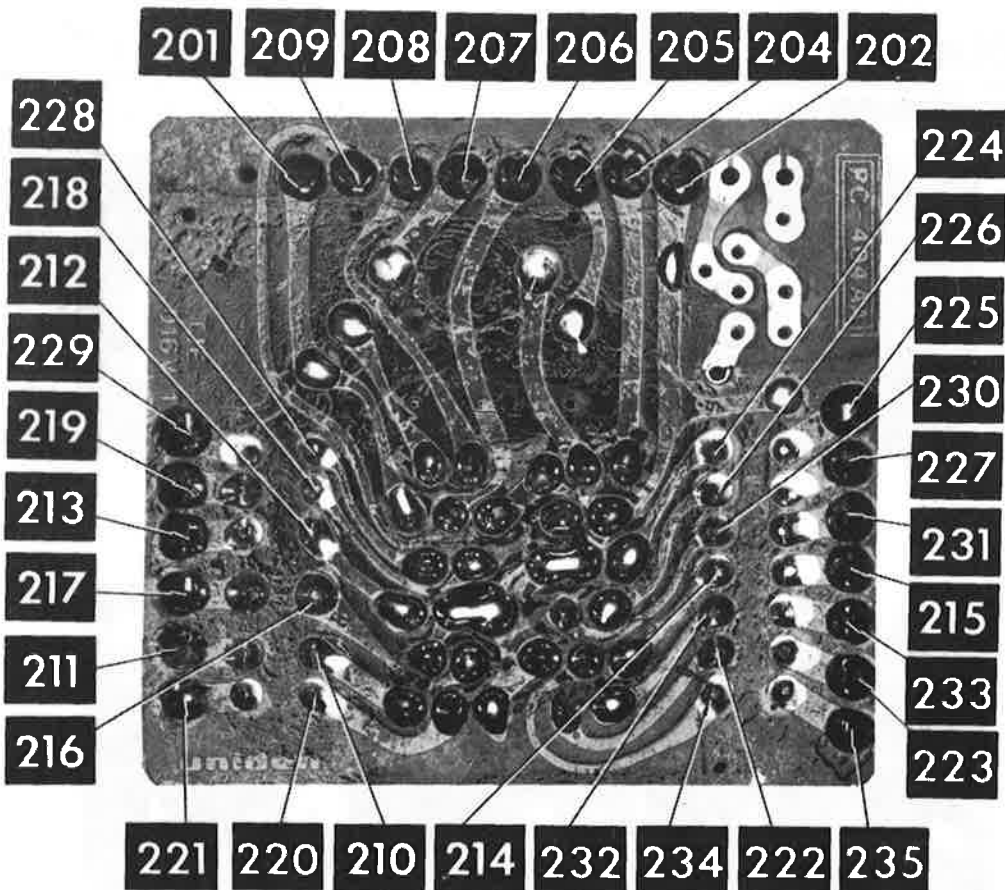
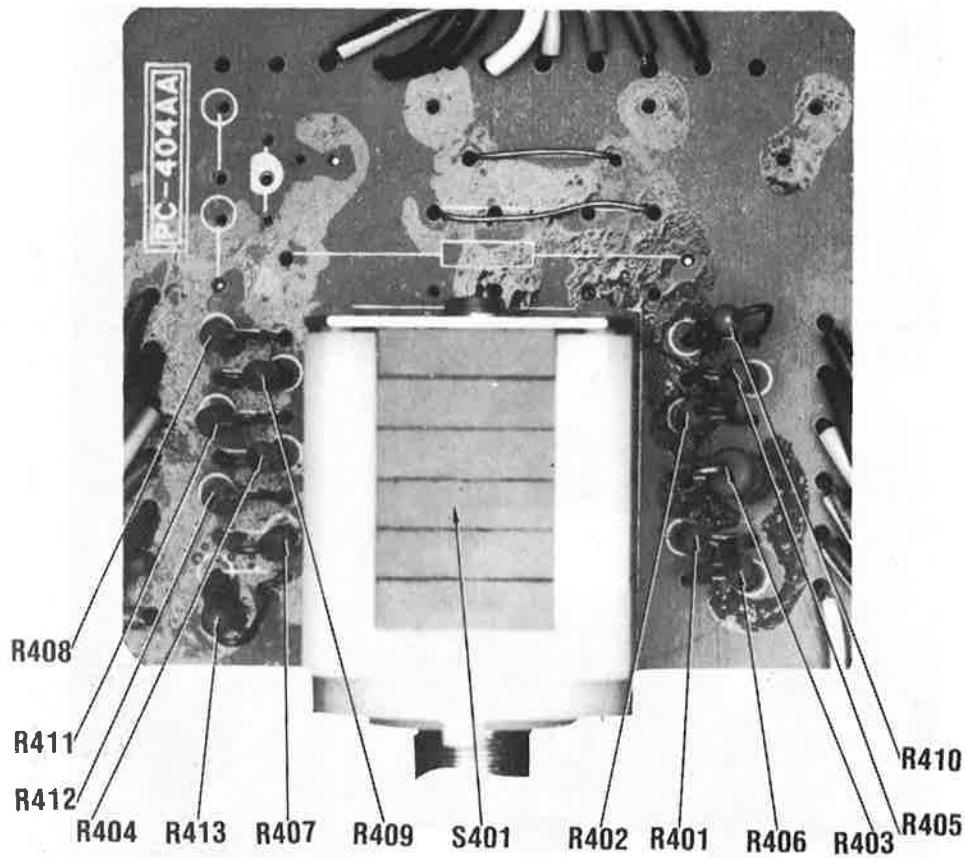
MAIN BOARD



MAIN BOARD

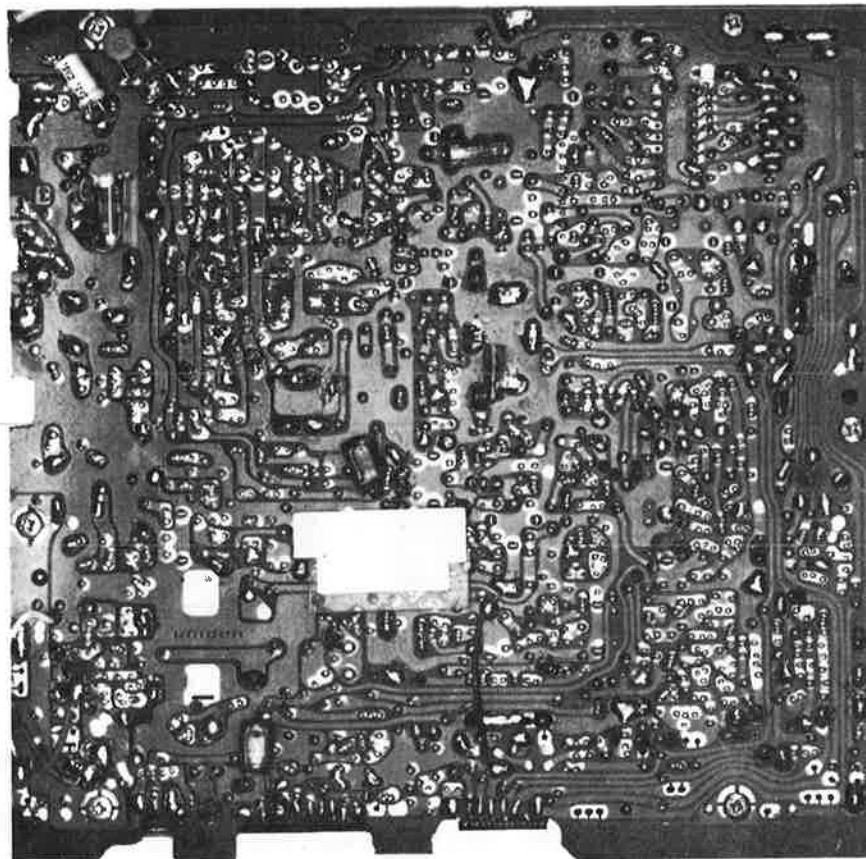


CHASSIS-BOTTOM



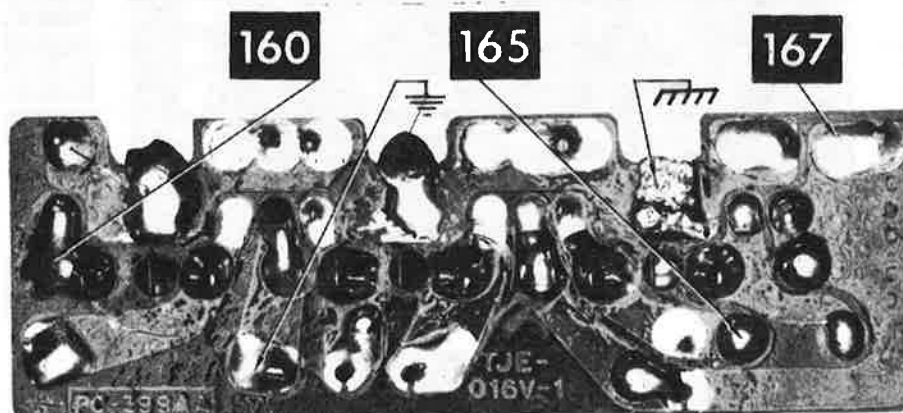
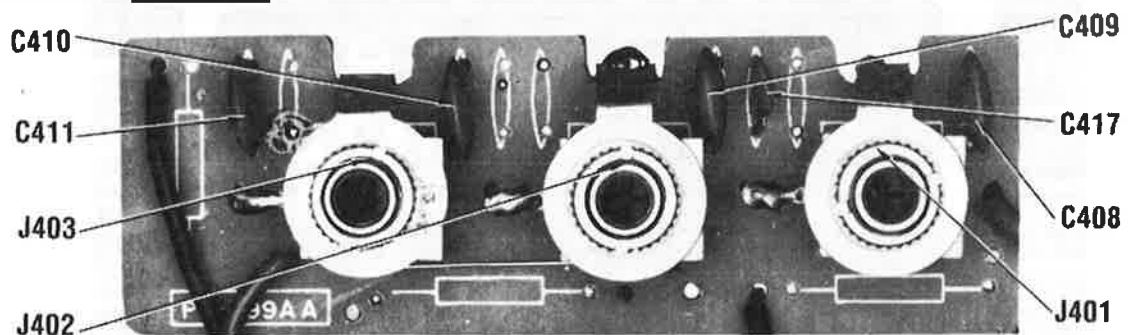
CHANNEL SWITCH BOARD

PRESIDENT MODEL 1010002, MADISON

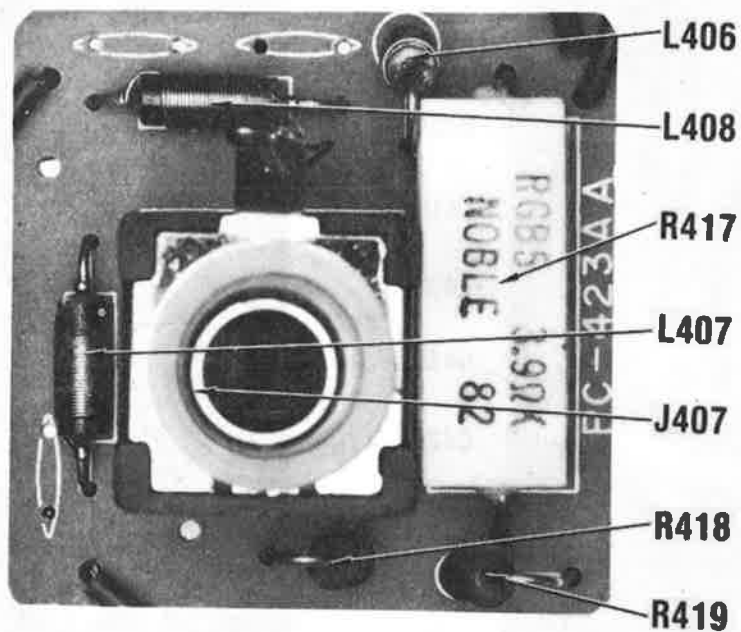


SHIELD LOCATION

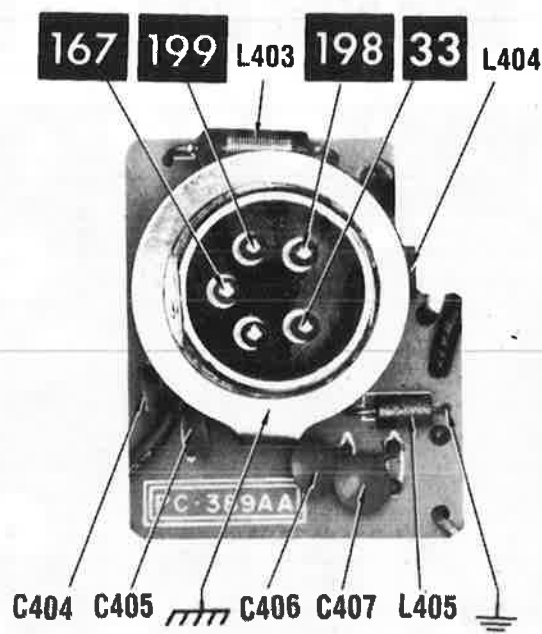
A Howard W. Sams **CIRCUITRACE**® Photo



EXTERNAL SPEAKER BOARD

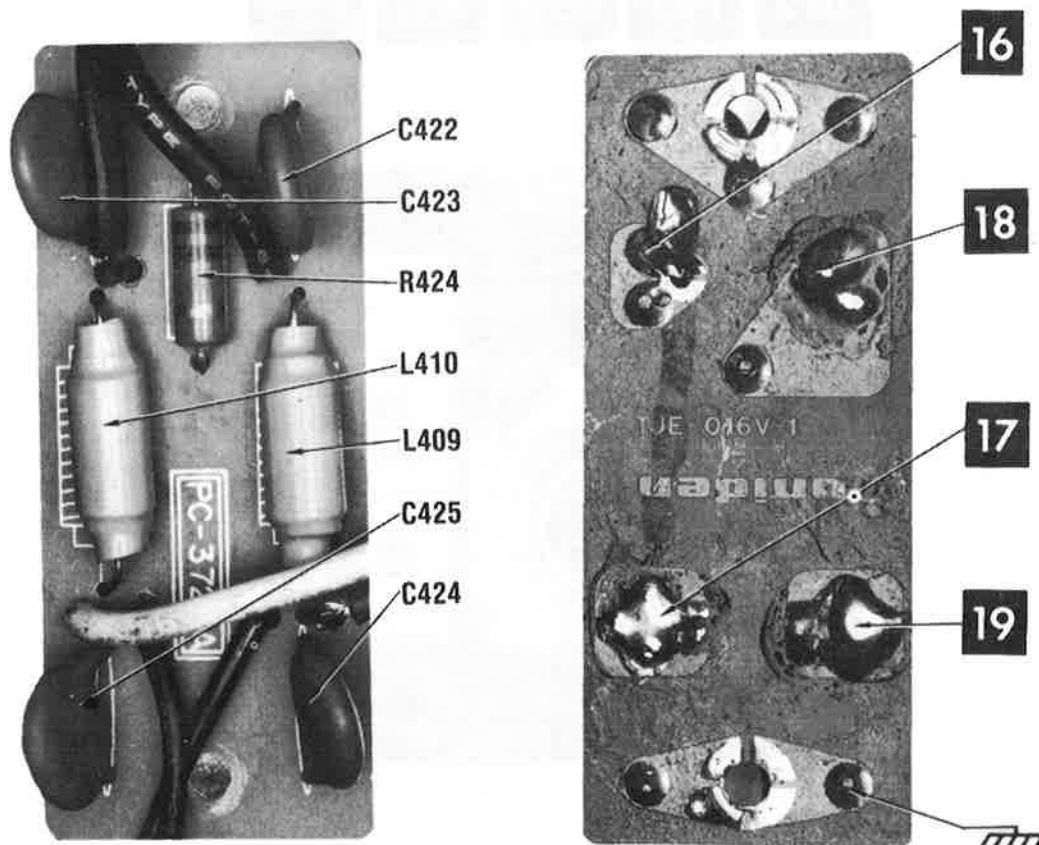


97

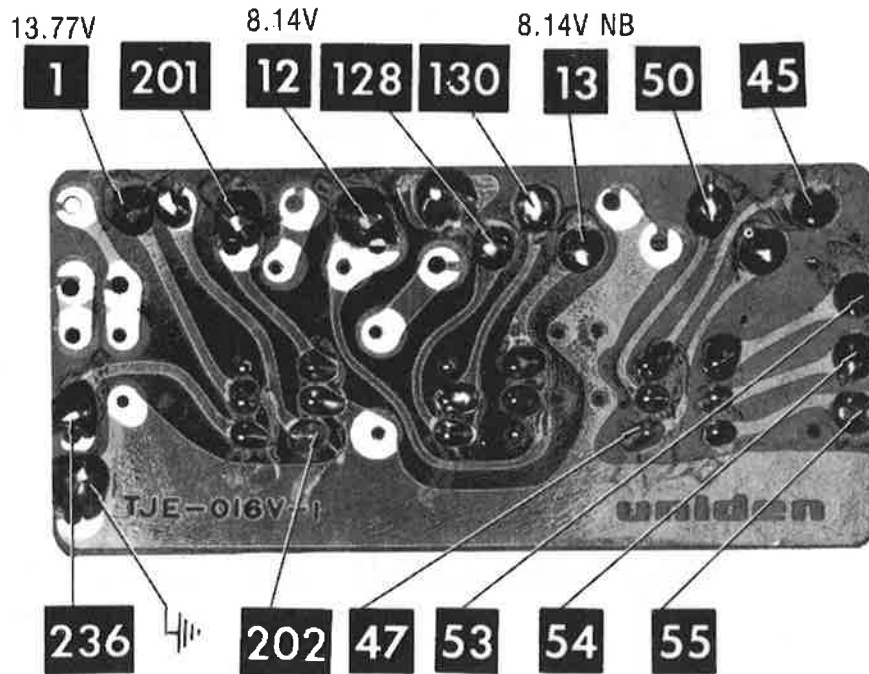


MIC CONNECTOR BOARD

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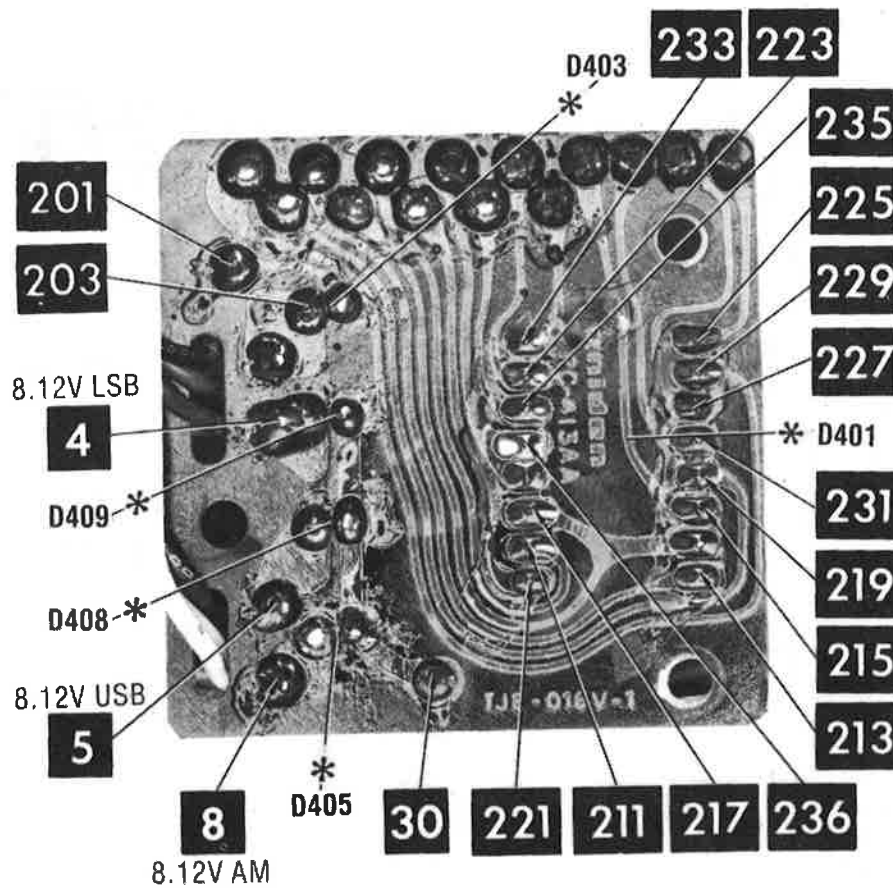


AC INPUT BOARD



PUSH SWITCH BOARD

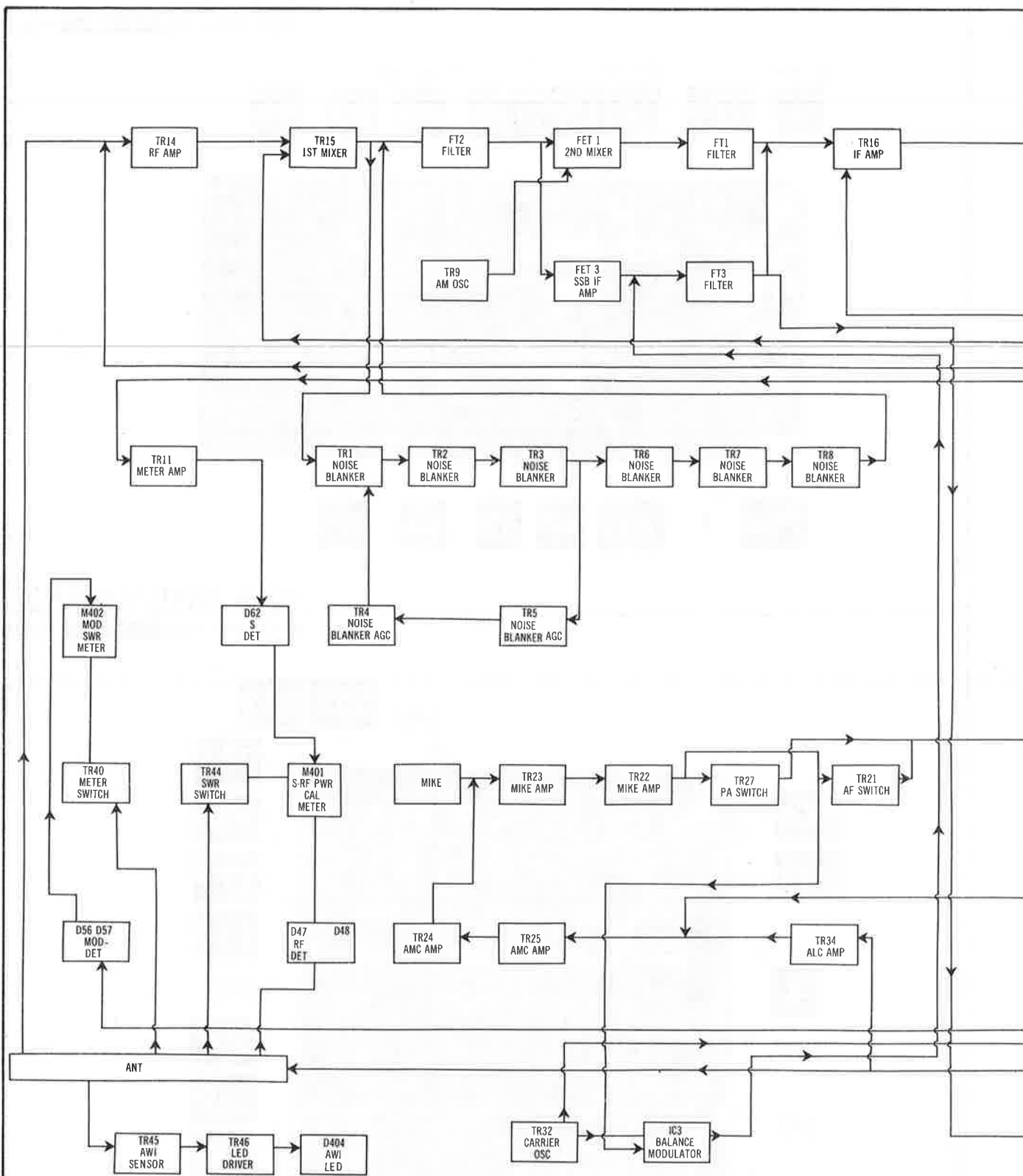
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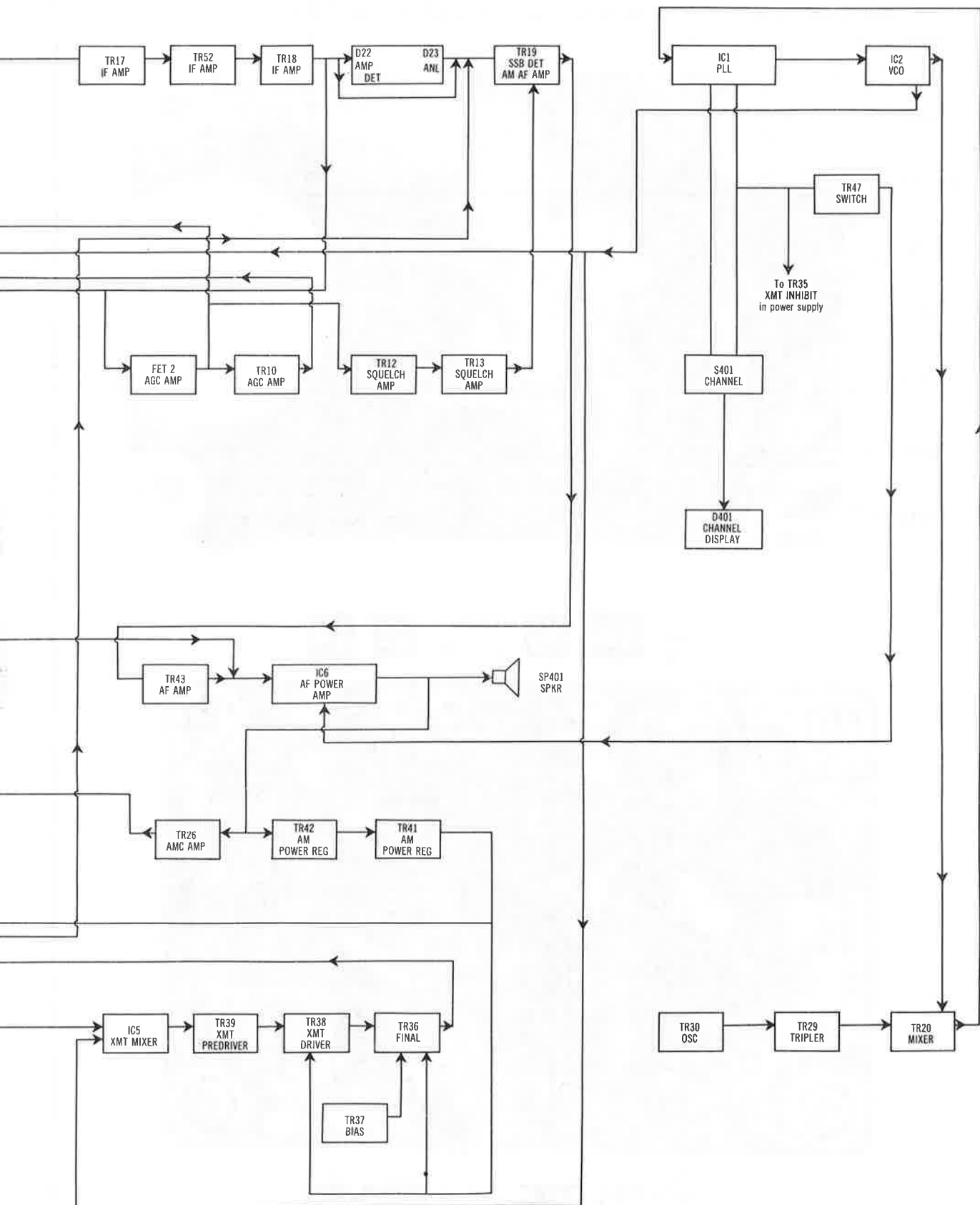
* Located on top of board

CHANNEL LED BOARD

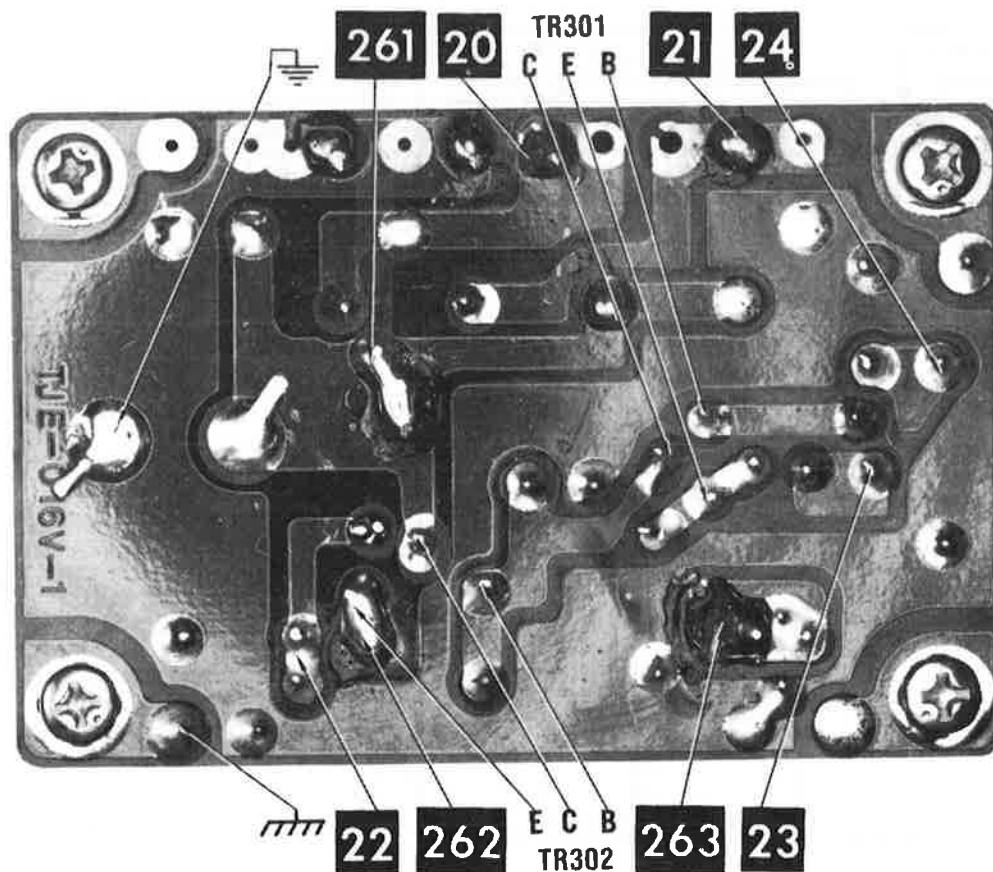
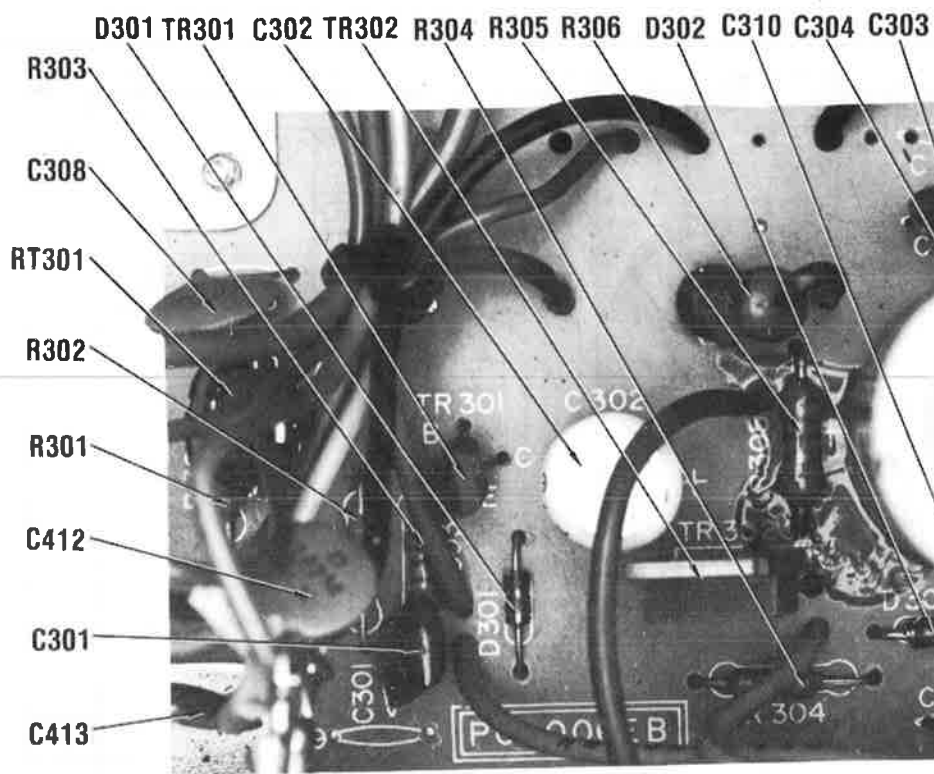
PRESIDENT MODEL 1010002, MADISON



BLOCK DIAGRAM



BLOCK DIAGRAM



POWER SUPPLY BOARD

PARTS LIST AND DESCRIPTION

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

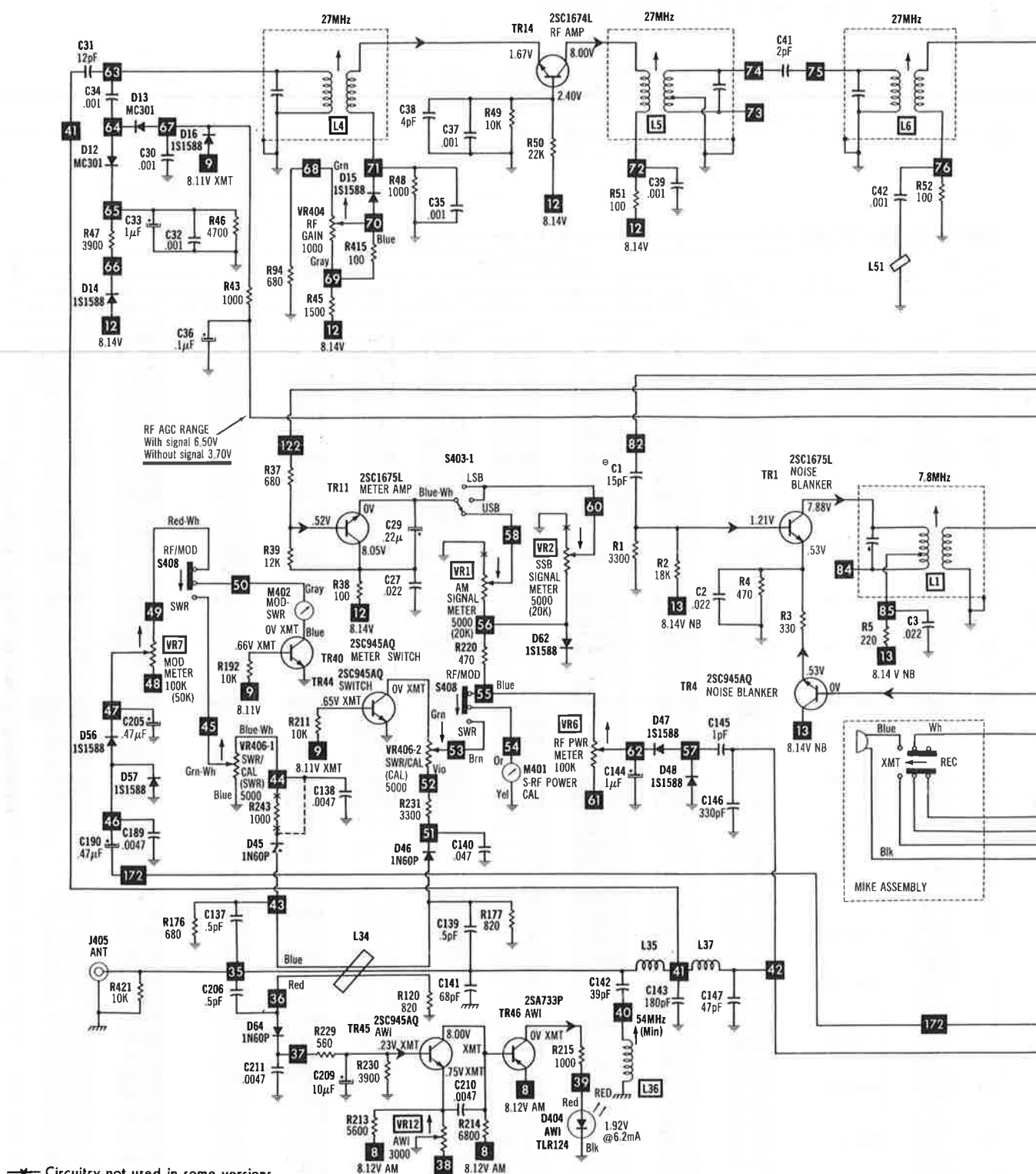
WIRING DATA

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	2000-318	1N60	PTC206	HEPR9135	REN 109	SK3088	RT-263	ECG109	TM109/**	WEP134	103-29001
	1N60		1N60	PTC206	HEPR9135	REN 109	SK3088	RT-263	ECG109	TM109/**	WEP134	103-29001
D2	1N60P	2000-318	1N60	PTC206	HEPR9135	REN 109	SK3088	RT-263	ECG109	TM109/**	WEP134	103-29001
	1N60		1N60	PTC206	HEPR9135	REN 109	SK3088	RT-263	ECG109	TM109/**	WEP134	103-29001
D3	1S1588	2000-332	GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2473		GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2472		GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S953		GE-300	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
D4	1S1588	2000-332	GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2473		GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2472		GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S953		GE-300	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
D5	1S1588	2000-332	GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2473		GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2472		GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S953		GE-300	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
D6	1S1588	2000-332	GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2473		GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2472		GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S953		GE-300	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
D8	1S1588	2000-332	GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2473		GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2472		GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S953		GE-300	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
D9	1S1588	2000-332	GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2473		GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2472		GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S953		GE-300	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
D10	1N60P	2000-318	1N60	PTC206	HEPR9135	REN 109	SK3088	RT-263	ECG109	TM109/**	WEP134	103-29001
	1N60		1N60	PTC206	HEPR9135	REN 109	SK3088	RT-263	ECG109	TM109/**	WEP134	103-29001
D11	1S1588	2000-332	GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2473		GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2472		GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S953		GE-300	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
D12	MC301	2000-341	GE-300	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
	1S2186		GE-300	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
	BA243		GE-300	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
	BA244		GE-300	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
D13	MC301	2000-341	GE-300	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
	1S2186		GE-300	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
	BA243		GE-300	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
	BA244		GE-300	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
D14	1S1588	2000-332	GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2473		GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2472		GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S953		GE-300	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
D15	1S1588	2000-332	GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2473		GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2472		GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S953		GE-300	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
D16	1S1588	2000-332	GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2473		GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2472		GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S953		GE-300	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
D17	1S1588	2000-332	GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2473		GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2472		GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S953		GE-300	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
D18	1S1588	2000-332	GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2473		GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2472		GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S953		GE-300	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
D19	1S1588	2000-332	GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2473		GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2472		GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S953		GE-300	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
D20	1S1588	2000-332	GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2473		GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2472		GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S953		GE-300	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
D21	1N60P	2000-318	1N60	PTC206	HEPR9135	REN 109	SK3088	RT-263	ECG109	TM109/**	WEP134	103-29001
	1N60		1N60	PTC206	HEPR9135	REN 109	SK3088	RT-263	ECG109	TM109/**	WEP134	103-29001
D22	1N60P	2000-318	1N60	PTC206	HEPR9135	REN 109	SK3088	RT-263	ECG109	TM109/**	WEP134	103-29001
	1N60		1N60	PTC206	HEPR9135	REN 109	SK3088	RT-263	ECG109	TM109/**	WEP134	103-29001
D23	1S1588	2000-332	GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2473		GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2472		GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S953		GE-300	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
D24	1S1588	2000-332	GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2473		GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2472		GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S953		GE-300	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131

PRESIDENT MODEL 1010002, MADISON



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

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Measurements made in Channel 1 with switching as shown 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.

Arrow at control indicates direction of advance.

Terminal identification may not be found on unit.

Resistors are 1/2W or less, 5% unless noted.

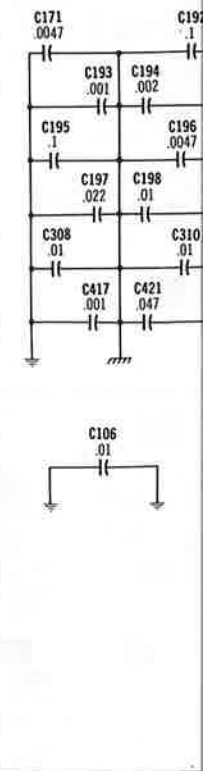
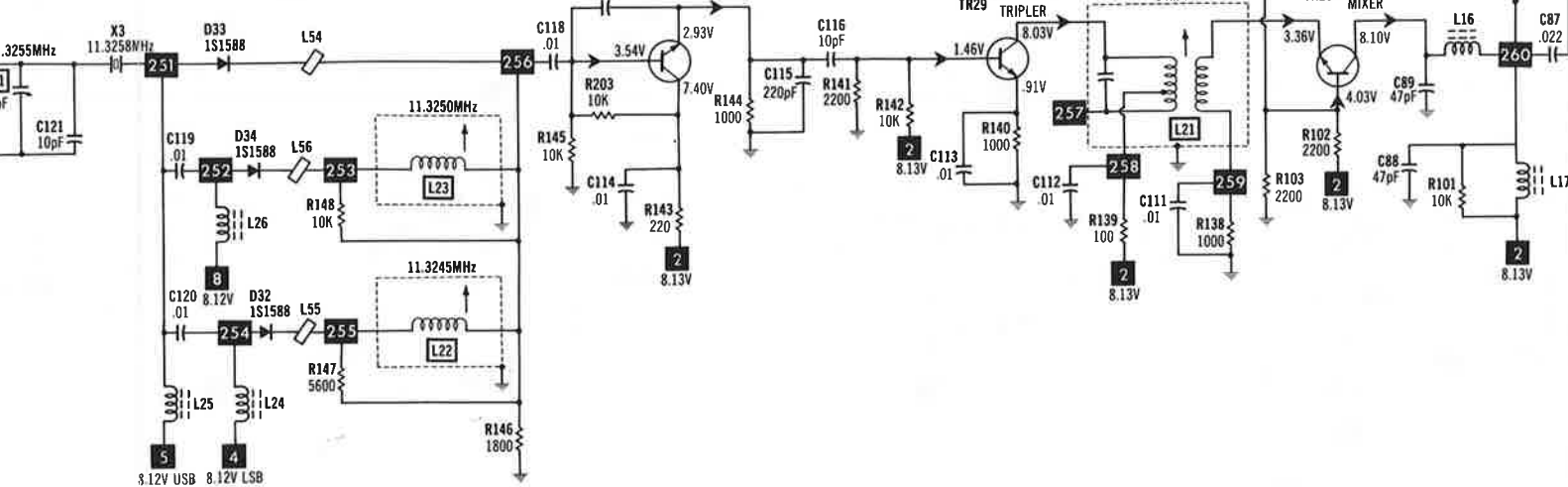
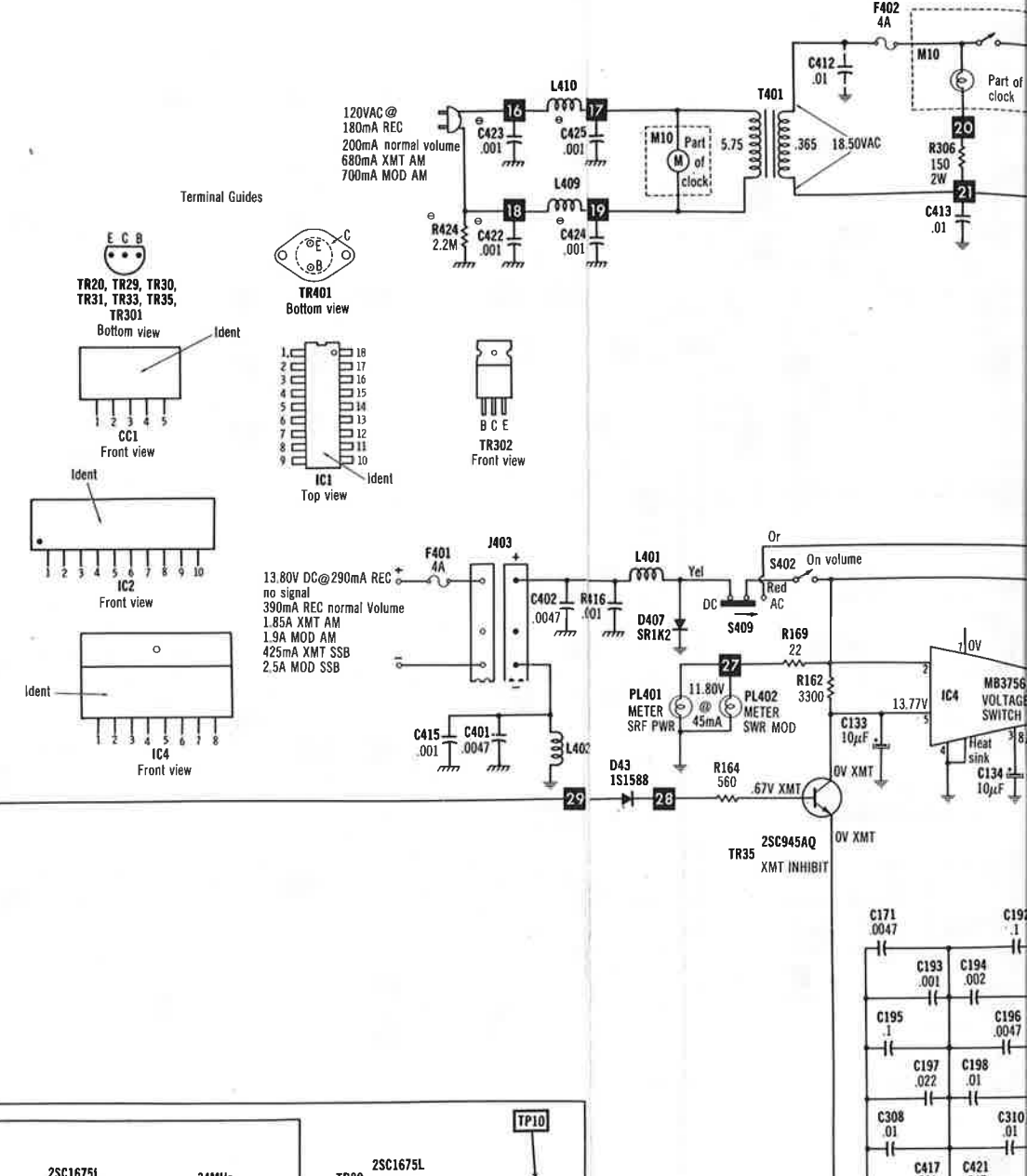
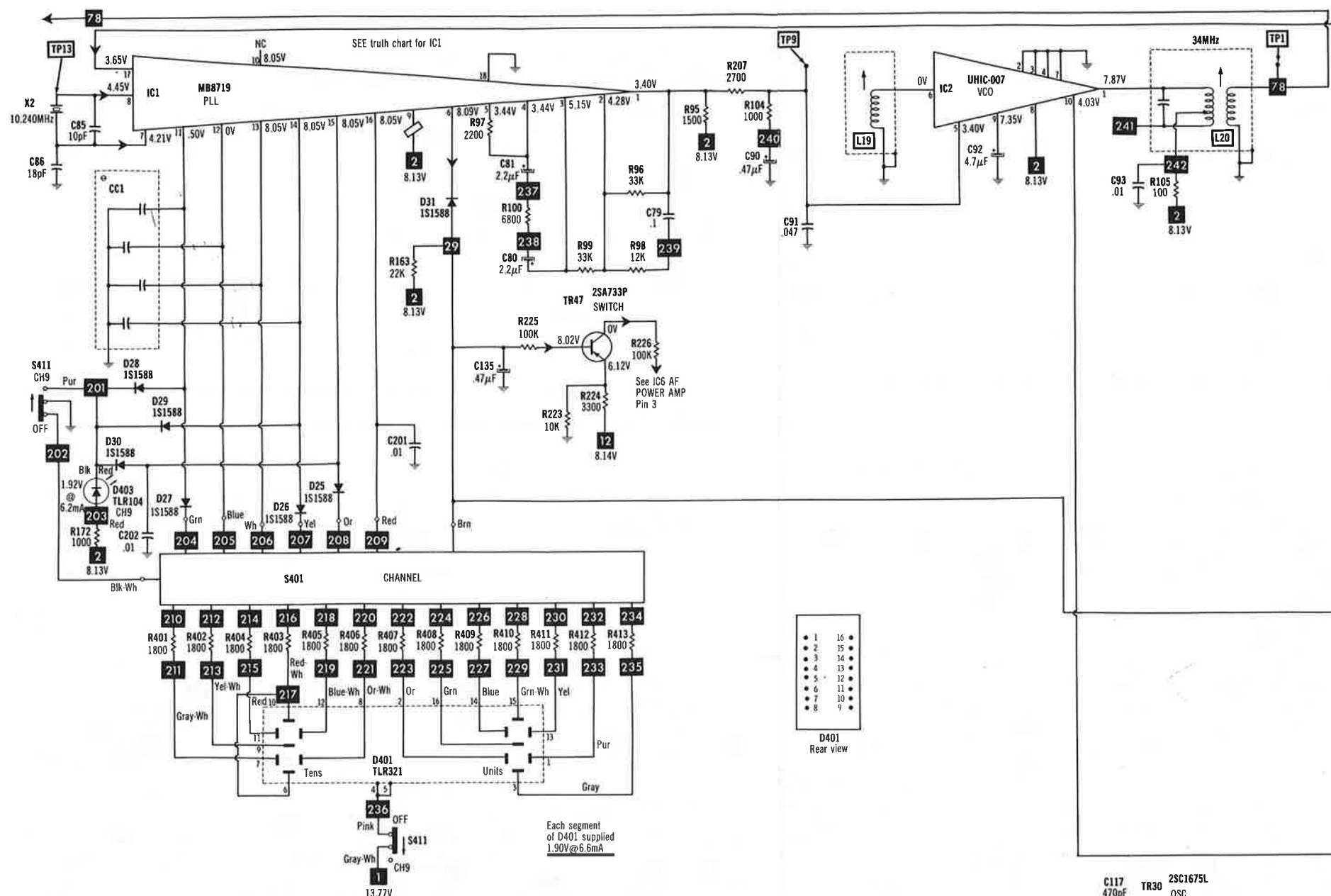
Value in () used in some versions.

MAIN CB SCHEMATIC

* Circuitry not used in some versions
 --- Circuitry used in some versions
 e See parts list
 * Nominal value
 G Ground
 Chassis
 Common tie point
 Signal path
 Voltage path
 Measurements made in Channel 1 with switching as shown 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.
 Arrow at control indicates direction of advance.
 Terminal identification may not be found on unit.
 Resistors are 1/2W or less, 5% unless noted.
 Value in () used in some versions.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
 WITH **CIRCUITRACE®**
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PLL SCHEMATIC



POWER SUP

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

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.
D25	1S1588	2000-332	GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2473		GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2472		GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S953		GE-300	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
	1S1588		GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
D26	1S2473	2000-332	GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2472		GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S953		GE-300	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
	1S1588		GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2473		GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
D27	1S2472	2000-332	GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S953		GE-300	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
	1S1588		GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2473		GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2472		GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
D28	1S953	2000-332	GE-300	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
	1S1588		GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2473		GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2472		GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S953		GE-300	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
D29	1S1588	2000-332	GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2473		GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2472		GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S953		GE-300	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
	1S1588		GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
D30	1S2473	2000-332	GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2472		GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S953		GE-300	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
	1S1588		GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2473		GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
D31	1S2472	2000-332	GE-514	PTC214	HEPR0602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S953		GE-300	PTC214	HEPR0602	REN						

PRESIDENT MODEL 1010002, MADISON

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.
D53	1S1588	2000-332	GE-514	PTC214	HEPRO602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2473		GE-514	PTC214	HEPRO602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2472		GE-514	PTC214	HEPRO602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S953		GE-300	PTC214	HEPRO602	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
D54	1N60P	2000-318	1N60	PTC206	HEPR9135	REN 109	SK3088	RT-263	ECG109	TM109/**	WEP134	103-29001
	1N60		1N60	PTC206	HEPR9135	REN 109	SK3088	RT-263	ECG109	TM109/**	WEP134	103-29001
D56	1S1588	2000-332	GE-514	PTC214	HEPRO602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2473		GE-514	PTC214	HEPRO602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2472		GE-514	PTC214	HEPRO602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S953		GE-300	PTC214	HEPRO602	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
D57	1S1588	2000-332	GE-514	PTC214	HEPRO602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2473		GE-514	PTC214	HEPRO602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2472		GE-514	PTC214	HEPRO602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S953		GE-300	PTC214	HEPRO602	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
D58	1S1588	2000-332	GE-514	PTC214	HEPRO602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2473		GE-514	PTC214	HEPRO602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2472		GE-514	PTC214	HEPRO602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S953		GE-300	PTC214	HEPRO602	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
D59	1S1588	2000-332	GE-514	PTC214	HEPRO602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2473		GE-514	PTC214	HEPRO602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2472		GE-514	PTC214	HEPRO602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S953		GE-300	PTC214	HEPRO602	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
D60	1S1588	2000-332	GE-514	PTC214	HEPRO602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2473		GE-514	PTC214	HEPRO602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2472		GE-514	PTC214	HEPRO602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S953		GE-300	PTC214	HEPRO602	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
D61	1S1588	2000-332	GE-514	PTC214	HEPRO602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2473		GE-514	PTC214	HEPRO602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2472		GE-514	PTC214	HEPRO602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S953		GE-300	PTC214	HEPRO602	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
D62	1N60P	2000-318	1N60	PTC206	HEPR9135	REN 109	SK3088	RT-263	ECG109	TM109/**	WEP134	103-29001
	1N60		1N60	PTC206	HEPR9135	REN 109	SK3088	RT-263	ECG109	TM109/**	WEP134	103-29001
D63	1S1588	2000-332	GE-514	PTC214	HEPRO602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2473		GE-514	PTC214	HEPRO602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2472		GE-514	PTC214	HEPRO602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S953		GE-300	PTC214	HEPRO602	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
D64	1N60P	2000-318	1N60	PTC206	HEPR9135	REN 109	SK3088	RT-263	ECG109	TM109/**	WEP134	103-29001
	1N60		1N60	PTC206	HEPR9135	REN 109	SK3088	RT-263	ECG109	TM109/**	WEP134	103-29001
D65	1S1588	2000-332	GE-514	PTC214	HEPRO602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2473		GE-514	PTC214	HEPRO602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S2472		GE-514	PTC214	HEPRO602	REN 177	SK3100	RT-218	ECG519	TM519	WEP925	103-287
	1S953		GE-300	PTC214	HEPRO602	REN 177	SK3100	RT-218	ECG177	TM177	WEP1062	103-131
D301	WZ-061	2000-330	GEZD-6,2	ZB6,28	HEPRO602	REN 137	SK3058	RT-237	ECG137A	TM137/**	WEP1154	103-29008
D302	BZ-162		GEZD-16	ZB168	HEPRO602	REN 5075	SK3751	RT-246	ECG5075A	TM5075/**	WEP1160	103-29013
D406	S5VB-10		GEBR-206						ECG5313		WEP1044	
	S10VB-10		GEBR-206						ECG5313		WEP1044	
D407	SRIK-2	2000-102	GE-504A	PTC201	HEPRO052	REN 116	SK3311	RT-213	ECG116	TM116	WEP156	212-76-02
	10D-1		GE-504A	PTC201	HEPRO052	REN 116	SK3311	RT-213	ECG116	TM116	WEP156	212-76-02
	3SK45B		GE-FET-4	PTC182	HEPF2007	REN 222	SK3065	RT-181	ECG222	TM222	WEP905	121-826
	3SK45		GE-FET-4	PTC182	HEPF2007	REN 222	SK3065	RT-181	ECG222	TM222	WEP905	121-826
FET1	3SK40	2000-105	GE-FET-4	PTC182	HEPF2007	REN 222	SK3065	RT-181	ECG222	TM222	WEP905	121-826
	3SK41		GE-FET-4	PTC182	HEPF2007	REN 222	SK3065	RT-181	ECG222	TM222	WEP905	121-826
	3N201		GE-FET-4	PTC182	HEPF2007	REN 222	SK3065	RT-181	ECG222	TM222	WEP905	121-826
	2SK198L		GE-FET-2	PTC161	HEPF0021	REN 132	SK3448	RT-175	ECG312	TM312	WEP956*	121-756
FET2	2SK19	2000-105	GE-FET-2	PTC161	HEPF0021	REN 132	SK3448	RT-175	ECG312	TM312	WEP956*	121-756
	JF1033		GE-FET-2	PTC161	HEPF0021	REN 132	SK3448	RT-175	ECG312	TM312	WEP956*	121-756
	2N3233B		GE-FET-2	PTC161	HEPF0021	REN 132	SK3448	RT-175	ECG312	TM312	WEP956*	121-756
	2SK33		GE-FET-2	PTC161	HEPF0021	REN 132	SK3448	RT-175	ECG312	TM312	WEP956*	121-756
FET3	2SK55	2000-108	GE-FET-2	PTC161	HEPF0021	REN 132	SK3448	RT-175	ECG312	TM312	WEP956*	121-756
	2SK196R		GE-FET-2	PTC161	HEPF0021	REN 132	SK3448	RT-175	ECG312	TM312	WEP956*	121-756
	JF1033		GE-FET-2	PTC161	HEPF0021	REN 132	SK3448	RT-175	ECG312	TM312	WEP956*	121-756
	2N3233B		GE-FET-2	PTC161	HEPF0021	REN 132	SK3448	RT-175	ECG312	TM312	WEP956*	121-756
IC1	2SK33	2000-108	GE-FET-2	PTC161	HEPF0021	REN 132	SK3448	RT-175	ECG312	TM312	WEP956*	121-756
	2SK55		GE-FET-2	PTC161	HEPF0021	REN 132	SK3448	RT-175	ECG312	TM312	WEP956*	121-756
	MBB719		GE-FET-2	PTC161	HEPF0021	REN 132	SK3448	RT-175	ECG312	TM312	WEP956*	121-756
	UHC007		GE-FET-2	PTC161	HEPF0021	REN 132	SK3448	RT-175	ECG312	TM312	WEP956*	121-756
IC2	UHC007	2000-029										
IC3	AN612	2000-031										
IC4	MB3756	2000-033										
IC5	5042P	2000-034										
IC6	TA7222P	2000-032										
TR1	2SC1675L	2000-213	GE-213	PTC132*	HEPS0025*	REN 123A*	SK3122	RT-308	ECG229*	TM229*	WEP956*	121-29021
	GE-213		PTC132*	HEPS0025*	REN 123A*	SK3122	RT-308	ECG229*	TM229*	WEP956*	121-29021	
	GE-61*		PTC136*	HEPS0014*	REN 107	SK3122	RT-134	ECG107	TM107/**	WEP460	121-522	
	GE-61*		PTC132*	HEPS0015*	REN 123A*	SK3444	RT-308	ECG123A*	TM123A/**	WEP736*	121-29000A*	
TR2	2SC839	2000-213	GE-61	PTC132*	HEPS0010*	REN 107	SK3246	RT-308	ECG229*	TM229*	WEP956*	121-29021
	GE-17*		PTC136*	HEPS0025*	REN 107	SK3018*	RT-107A	ECG316*	TM316*	WEP535	121-972*	
	GE-213		PTC132*	HEPS0025*	REN 123A*	SK3122	RT-308	ECG229*	TM229*	WEP956*	121-29021	
	GE-213		PTC132*	HEPS0025*	REN 123A*	SK3122	RT-308	ECG229*	TM229*	WEP956*	121-29021	
TR3	2SC460	2000-213	GE-61*	PTC136*	HEPS0014*	REN 107	SK3122	RT-134	ECG107	TM107/**	WEP460	121-522
	GE-61*		PTC132*	HEPS0015*	REN 123A*	SK3444	RT-308	ECG123A*	TM123A/**	WEP736*	121-29000A*	
	GE-61		PTC132*	HEPS0010*	REN 107	SK3246	RT-308	ECG229*	TM229*	WEP956*	121-29021	
	GE-17*		PTC136*	HEPS0025*	REN 107	SK3018*	RT-107A	ECG316*	TM316*	WEP535	121-972*	
TR4	2SC1730	2000-214	GE-17*	PTC136*	HEPS0025*	REN 107	SK3018*	RT-107A	ECG316*	TM316*	WEP535	121-972*
	2SC1730L		GE-17*	PTC136*	HEPS0025*	REN 107	SK3018*	RT-107A	ECG316*	TM316*	WEP535	121-972*
	2SC1675		GE-213	PTC132*	HEPS0025*	REN 123A*	SK3122	RT-308	ECG229*	TM229*	WEP956*	121-29021
	2SC1674		GE-61	PTC132*	HEPS0010*	REN 107	SK3246	RT-308	ECG229*	TM229*	WEP956*	121-29021
TR5	2SC460	2000-214	GE-61*	PTC136*	HEPS0014*	REN 107	SK3122	RT-134	ECG107	TM107/**	WEP460	121-522
	2SC839		GE-61*	PTC132*	HEPS0015*	REN 123A*	SK3444	RT-308	ECG123A*	TM123A/**	WEP736*	121-29000A*
	2SC1674		GE-61	PTC132*	HEPS0010*	REN 107	SK3246	RT-308	ECG229*	TM229*	WEP956*	121-29021
	2SC839		GE-17*	PTC136*	HEPS0025*	REN 107	SK3018*	RT-107A	ECG316*	TM316*	WEP535	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.	MOTOROLA PART No.	RAYTHEON PART No.	RCA PART No.	SPRAGUE PART No.	SYLVANIA PART No.	THORDARSON PART No.	WORKMAN PART No.	ZENITH PART No.
TR4	2SC945A	2000-235	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
	2SC372		GE-210*	PTC121*	HEPS0009*	REN 123A*	SK3122	RT-187	ECG289	TM289/**	WEP458	121-773
	2SC900		GE-62	PTC139*	HEPS0015*	REN 199	SK3444	RT-308	ECG123A*	TM123A/**	WEP372	121-Z9000A*
	2SC828		GE-61*	PTC139*	HEPS0015*	REN 199	SK3444	RT-302	ECG199	TM199/**	WEP66	121-972
	2SC1740		GE-62	PTC121*	HEPS0015*	REN 123A*	SK3122	RT-109*	ECG123A*	TM123A*	WEP736*	121-Z9000A*
	2SC945A		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 123A*	SK3122	RT-187	ECG289	TM289/**	WEP458	121-773
	2SC372		GE-61*	PTC121*	HEPS0015*	REN 123A*	SK3444	RT-308	ECG123A*	TM123A/**	WEP372	121-Z9000A*
TR5	2SC900	2000-235	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*
	2SC945A		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
	2SC372		GE-210*	PTC121*	HEPS0009*	REN 123A*	SK3122	RT-187	ECG289	TM289/**	WEP458	121-773
	2SC900		GE-61*	PTC121*	HEPS0015*	REN 123A*	SK3444	RT-308	ECG123A*	TM123A/**	WEP372	121-Z9000A*
	2SC828		GE-62	PTC139*	HEPS0015*	REN 199	SK3124	RT-302	ECG199	TM199/**	WEP66	121-972
	2SC1740		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*
TR6	2SC945A	2000-235	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 123A*	SK3122	RT-187	ECG289	TM289/**	WEP458	121-773
	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*
	2SC1675L		GE-213	PTC132*	HEPS0025*	REN 123A*	SK3122	RT-308	ECG229*	TM229*	WEP956*	121-Z9021
	2SC1675		GE-213	PTC132*	HEPS0025*	REN 123A*	SK3122	RT-308	ECG229*	TM229*	WEP956*	121-Z9021
	2SC460		GE-61*	PTC136*	HEPS0014*	REN 107	SK3122	RT-134	ECG107	TM107/**	WEP460	121-522
TR7	2SC839	2000-218	GE-61*	PTC132*	HEPS0015*	REN 123A*	SK3444	RT-308	ECG123A*	TM123A/**	WEP736*	121-Z9000A*
	2SC1674		GE-61	PTC132*	HEPS0010*	REN 107	SK3246	RT-308	ECG229*	TM229*	WEP956*	121-Z9021
	2SC1730		GE-17*	PTC136*	HEPS0025*	REN 107	SK3018*	RT-107A	ECG316*	TM316*	WEP535	121-972*
	2SC945A		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 123A*	SK3122	RT-187	ECG289	TM289/**	WEP458	121-773
	2SC372		GE-62	PTC139*	HEPS0015*	REN 199	SK3444	RT-302	ECG199	TM199/**	WEP828	121-972
	2SC900		GE-61*	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*
TR8	2SC1675L	2000-213	GE-213	PTC132*	HEPS0025*	REN 123A*	SK3122	RT-308	ECG229*	TM229*	WEP956*	121-Z9021
	2SC1675		GE-213	PTC132*	HEPS0025*	REN 123A*	SK3122	RT-308	ECG229*	TM229*	WEP956*	121-Z9021
	2SC460		GE-61*	PTC136*	HEPS0014*	REN 107	SK3122	RT-134	ECG107	TM107/**	WEP460	121-522
	2SC839		GE-61*	PTC132*	HEPS0015*	REN 123A*	SK3444	RT-308	ECG123A*	TM123A/**	WEP736*	121-Z9000A*
	2SC1674		GE-61	PTC132*	HEPS0010*	REN 107	SK3246	RT-308	ECG229*	TM229*	WEP956*	121-Z9021
	2SC1730		GE-17*	PTC136*	HEPS0025*	REN 107	SK3018*	RT-107A	ECG316*	TM316*	WEP535	121-972*
	2SC945A		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 123A*	SK3122	RT-187	ECG289	TM289/**	WEP458	121-773
	2SC372		GE-62	PTC139*	HEPS0015*	REN 199	SK3444	RT-302	ECG199	TM199/**	WEP828	121-972
TR9	2SC900	2000-235	GE-61*	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*
	2SC945A		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
	2SC372		GE-210*	PTC121*	HEPS0009*	REN 123A*	SK3122	RT-187	ECG289	TM289/**	WEP458	121-773
	2SC900		GE-62	PTC139*	HEPS0015*	REN 199	SK3444	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*
	2SC1675L		GE-213	PTC132*	HEPS0025*	REN 123A*	SK3122	RT-308	ECG229*	TM229*	WEP956*	121-Z9021
TR10	2SC1675	2000-213	GE-213	PTC132*	HEPS0025*	REN 123A*	SK3122	RT-308	ECG229*	TM229*	WEP956*	121-Z9021
	2SC460		GE-61*	PTC136*	HEPS0014*	REN 107	SK3122	RT-134	ECG107	TM107/**	WEP460	121-522
	2SC839		GE-61*	PTC132*	HEPS0015*	REN 123A*	SK3444	RT-308	ECG123A*	TM123A/**	WEP736*	121-Z9000A*
	2SC1674		GE-61	PTC132*	HEPS0010*	REN 107	SK3246	RT-308	ECG229*	TM229*	WEP956*	121-Z9021
	2SC1730		GE-17*	PTC136*	HEPS0025*	REN 107	SK3018*	RT-107A	ECG316*	TM316*	WEP535	121-972*
	2SC945A		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 123A*	SK3122	RT-187	ECG289	TM289/**	WEP458	121-773
	2SC372		GE-62	PTC139*	HEPS0015*	REN 199	SK3444	RT-302	ECG199	TM199/**	WEP828	121-972
	2SC900		GE-61*	PTC139*	HEPS0015*	REN 199	SK3124	RT-302	ECG199	TM199/**	WEP66	121-972
TR11	2SC828	2000-218	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*
	2SC945A		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 123A*	SK3122	RT-187	ECG289	TM289/**	WEP458	121-773
	2SC372		GE-62	PTC139*	HEPS0015*	REN 199	SK3444	RT-302	ECG199	TM199/**	WEP828	121-972
	2SC900		GE-61*	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*
	2SC1675L		GE-213	PTC132*	HEPS0025*	REN 123A*	SK3122	RT-308	ECG229*	TM229*	WEP956*	121-Z9021
TR12	2SC1675	2000-213	GE-213	PTC132*	HEPS0025*	REN 123A*	SK3122	RT-308	ECG229*	TM229*	WEP956*	121-Z9021
	2SC460		GE-61*	PTC136*	HEPS0014*	REN 107	SK3122	RT-134	ECG107	TM107/**	WEP460	121-522
	2SC839		GE-61*	PTC132*	HEPS0015*	REN 123A*	SK3444	RT-308	ECG123A*	TM123A/**	WEP736*	121-Z9000A*
	2SC1674		GE-61	PTC132*	HEPS0010*	REN 107	SK3246	RT-308	ECG229*	TM229*	WEP956*	121-Z9021
	2SC1730		GE-17*	PTC136*	HEPS0025*	REN 107	SK3018*	RT-107A	ECG316*	TM316*	WEP535	121-972*
	2SC945A		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 123A*	SK3122	RT-187	ECG289	TM289/**	WEP458	121-773
	2SC372		GE-62	PTC139*	HEPS0015*	REN 199	SK3444	RT-302	ECG199	TM199/**	WEP828	121-972
	2SC900		GE-61*	PTC139*	HEPS0015*	REN 199	SK3124	RT-302	ECG199	TM199/**	WEP66	121-972
TR13	2SC828	2000-218	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*
	2SC945A		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 123A*	SK3122	RT-187	ECG289	TM289/**	WEP458	1

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.
TR19	25C839	2000-235	GE-61*	PTC132*	HEPS0015*	REN 123A*	SK3444	RT-308	ECG123A*	TM123A**	WEP736*	121-29000A*
	25C945AQ		GE-212	PTC121*	HEPS0015*	REN 199	SK3124	RT-107A	ECG199	TM199**	WEP1945	121-972
	25C945A		GE-212	PTC121*	HEPS0015*	REN 199	SK3124	RT-107A	ECG199	TM199**	WEP1945	121-972
	25C458		GE-210*	PTC121*	HEPS0009*	REN 123A*	SK3122	RT-187	ECG289	TM289**	WEP458	121-773
	25C372		GE-61*	PTC121*	HEPS0015*	REN 123A*	SK3444	RT-308	ECG123A*	TM123A**	WEP372	121-29000A*
	25C900		GE-62	PTC139*	HEPS0015*	REN 199	SK3124	RT-302	ECG199	TM199**	WEP66	121-972
	25C828		GE-61*	PTC139*	HEPS0015*	REN 199	SK3444	RT-302	ECG199	TM199**	WEP828	121-972
	25C1740		GE-62	PTC121*	HEPS0015*	REN 123A*	SK3122	RT-109*	ECG123A*	TM123A*	WEP736*	121-29000A*
	25C1675L		GE-213	PTC132*	HEPS0025*	REN 123A*	SK3122	RT-308	ECG229*	TM229*	WEP956*	121-29021
	25C1675		GE-213	PTC132*	HEPS0025*	REN 123A*	SK3122	RT-308	ECG229*	TM229*	WEP956*	121-29021
TR20	25C460	2000-213	GE-61*	PTC136*	HEPS0014*	REN 107	SK3122	RT-134	ECG107	TM107**	WEP460	121-522
	25C839		GE-61*	PTC132*	HEPS0015*	REN 123A*	SK3444	RT-308	ECG123A*	TM123A**	WEP736*	121-29000A*
	25C1674		GE-61	PTC136*	HEPS0010*	REN 107	SK3246	RT-308	ECG229*	TM229*	WEP956*	121-29021
	25C1730		GE-17*	PTC136*	HEPS0025*	REN 107	SK3018*	RT-107A	ECG316*	TM316*	WEP535	121-972*
	25C945AQ		GE-212	PTC121*	HEPS0015*	REN 199	SK3124	RT-107A	ECG199	TM199**	WEP1945	121-972
	25C945A		GE-212	PTC121*	HEPS0015*	REN 199	SK3124	RT-107A	ECG199	TM199**	WEP1945	121-972
	25C458		GE-210*	PTC121*	HEPS0009*	REN 123A*	SK3122	RT-187	ECG289	TM289**	WEP458	121-773
	25C372		GE-61*	PTC121*	HEPS0015*	REN 123A*	SK3444	RT-308	ECG123A*	TM123A**	WEP372	121-29000A*
	25C900		GE-62	PTC139*	HEPS0015*	REN 199	SK3124	RT-302	ECG199	TM199**	WEP66	121-972
	25C828		GE-61*	PTC139*	HEPS0015*	REN 199	SK3444	RT-302	ECG199	TM199**	WEP828	121-972
TR21	25C1740	2000-235	GE-62	PTC121*	HEPS0015*	REN 123A*	SK3122	RT-109*	ECG123A*	TM123A*	WEP736*	121-29000A*
	25C945AQ		GE-212	PTC121*	HEPS0015*	REN 199	SK3124	RT-107A	ECG199	TM199**	WEP1945	121-972
	25C945A		GE-212	PTC121*	HEPS0015*	REN 199	SK3124	RT-107A	ECG199	TM199**	WEP1945	121-972
	25C458		GE-210*	PTC121*	HEPS0009*	REN 123A*	SK3122	RT-187	ECG289	TM289**	WEP458	121-773
	25C372		GE-61*	PTC121*	HEPS0015*	REN 123A*	SK3444	RT-308	ECG123A*	TM123A**	WEP372	121-29000A*
	25C900		GE-62	PTC139*	HEPS0015*	REN 199	SK3124	RT-302	ECG199	TM199**	WEP66	121-972
	25C828		GE-61*	PTC139*	HEPS0015*	REN 199	SK3444	RT-302	ECG199	TM199**	WEP828	121-972
	25C1740		GE-62	PTC121*	HEPS0015*	REN 123A*	SK3122	RT-109*	ECG123A*	TM123A*	WEP736*	121-29000A*
	25C945AQ		GE-212	PTC121*	HEPS0015*	REN 199	SK3124	RT-107A	ECG199	TM199**	WEP1945	121-972
	25C945A		GE-212	PTC121*	HEPS0015*	REN 199	SK3124	RT-107A	ECG199	TM199**	WEP1945	121-972
TR22	25C458	2000-235	GE-210*	PTC121*	HEPS0009*	REN 123A*	SK3122	RT-187	ECG289	TM289**	WEP458	121-773
	25C372		GE-61*	PTC121*	HEPS0015*	REN 123A*	SK3444	RT-308	ECG123A*	TM123A**	WEP372	121-29000A*
	25C900		GE-62	PTC139*	HEPS0015*	REN 199	SK3124	RT-302	ECG199	TM199**	WEP66	121-972
	25C828		GE-61*	PTC139*	HEPS0015*	REN 199	SK3444	RT-302	ECG199	TM199**	WEP828	121-972
	25C1740		GE-62	PTC121*	HEPS0015*	REN 123A*	SK3122	RT-109*	ECG123A*	TM123A*	WEP736*	121-29000A*
	25C945AQ		GE-212	PTC121*	HEPS0015*	REN 199	SK3124	RT-107A	ECG199	TM199**	WEP1945	121-972
	25C945A		GE-212	PTC121*	HEPS0015*	REN 199	SK3124	RT-107A	ECG199	TM199**	WEP1945	121-972
	25C458		GE-210*	PTC121*	HEPS0009*	REN 123A*	SK3122	RT-187	ECG289	TM289**	WEP458	121-773
	25C372		GE-61*	PTC121*	HEPS0015*	REN 123A*	SK3444	RT-308	ECG123A*	TM123A**	WEP372	121-29000A*
	25C900		GE-62	PTC139*	HEPS0015*	REN 199	SK3124	RT-302	ECG199	TM199**	WEP66	121-972
TR23	25C828	2000-235	GE-61*	PTC139*	HEPS0015*	REN 199	SK3444	RT-302	ECG199	TM199**	WEP828	121-972
	25C1740		GE-62	PTC121*	HEPS0015*	REN 123A*	SK3122	RT-109*	ECG123A*	TM123A*	WEP736*	121-29000A*
	25C945AQ		GE-212	PTC121*	HEPS0015*	REN 199	SK3124	RT-107A	ECG199	TM199**	WEP1945	121-972
	25C945A		GE-212	PTC121*	HEPS0015*	REN 199	SK3124	RT-107A	ECG199	TM199**	WEP1945	121-972
	25C458		GE-210*	PTC121*	HEPS0009*	REN 123A*	SK3122	RT-187	ECG289	TM289**	WEP458	121-773
	25C372		GE-61*	PTC121*	HEPS0015*	REN 123A*	SK3444	RT-308	ECG123A*	TM123A**	WEP372	121-29000A*
	25C900		GE-62	PTC139*	HEPS0015*	REN 199	SK3124	RT-302	ECG199	TM199**	WEP66	121-972
	25C828		GE-61*	PTC139*	HEPS0015*	REN 199	SK3444	RT-302	ECG199	TM199**	WEP828	121-972
	25C1740		GE-62	PTC121*	HEPS0015*	REN 123A*	SK3122	RT-109*	ECG123A*	TM123A*	WEP736*	121-29000A*
	25A733P		GE-48	PTC127	HEPS0019*	REN 294	SK3138	RT-303	ECG294	TM294**	WEP916	121-952
TR24	25A733	2000-218	GE-48	PTC127	HEPS0019*	REN 294	SK3138	RT-303	ECG294	TM294**	WEP916	121-952
	25A495		GE-221*	PTC103*	HEPS0013*	REN 159*	SK3114	RT-303	ECG159*	TM159**	WEP495	121-29003
	25A564		GE-65	PTC103*	HEPS0019*	REN 234	SK3114	RT-303	ECG234	TM234	WEP564	121-879
	25C945AQ		GE-212	PTC121*	HEPS0015*	REN 199	SK3124	RT-107A	ECG199	TM199**	WEP1945	121-972
	25C945A		GE-212	PTC121*	HEPS0015*	REN 199	SK3124	RT-107A	ECG199	TM199**	WEP1945	121-972
	25C458		GE-210*	PTC121*	HEPS0009*	REN 123A*	SK3122	RT-187	ECG289	TM289**	WEP458	121-773
	25C372		GE-61*	PTC121*	HEPS0015*	REN 123A*	SK3444	RT-308	ECG123A*	TM123A**	WEP372	121-29000A*
	25C900		GE-62	PTC139*	HEPS0015*	REN 199	SK3124	RT-302	ECG199	TM199**	WEP66	121-972
	25C828		GE-61*	PTC139*	HEPS0015*	REN 199	SK3444	RT-302	ECG199	TM199**	WEP828	121-972
	25C1740		GE-62	PTC121*	HEPS0015*	REN 123A*	SK3122	RT-109*	ECG123A*	TM123A*	WEP736*	121-29000A*
TR25	25A733P	2000-218	GE-48	PTC127	HEPS0019*	REN 294	SK3138	RT-303	ECG294	TM294**	WEP916	121-952
	25A733		GE-48	PTC127	HEPS0019*	REN 294	SK3138	RT-303	ECG294	TM294**	WEP916	121-952
	25A495		GE-221*	PTC103*	HEPS0013*	REN 159*	SK3114	RT-303	ECG159*	TM159**	WEP495	121-29003
	25A564		GE-65	PTC103*	HEPS0019*	REN 234	SK3114	RT-303	ECG234	TM234	WEP564	121-879
	25C1675L		GE-213	PTC132*	HEPS0025*	REN 123A*	SK3122	RT-308	ECG229*	TM229*	WEP956*	121-29021
	25C1675		GE-213	PTC132*	HEPS0025*	REN 123A*	SK3122	RT-308	ECG229*	TM229*	WEP956*	121-29021
	25C460		GE-61*	PTC136*	HEPS0014*	REN 107	SK3122	RT-134	ECG107	TM107**	WEP460	121-522
	25C839		GE-61*	PTC132*	HEPS0015*	REN 123A*	SK3444	RT-308	ECG123A*	TM123A**	WEP736*	121-29000A*
	25C1674		GE-61	PTC132*	HEPS0010*	REN 107	SK3246	RT-308	ECG229*	TM229*	WEP956*	121-29021
	25C1730		GE-17*	PTC136*	HEPS0025*	REN 107	SK3018*	RT-107A	ECG316*	TM316*	WEP535	121-972*
TR26	25C1675L	2000-213	GE-213	PTC132*	HEPS0025*	REN 123A*	SK3122	RT-308	ECG229*	TM229*	WEP956*	121-29021
	25C1675		GE-213	PTC132*	HEPS0025*	REN 123A*	SK3122	RT-308	ECG229*	TM229*	WEP956*	121-29021
	25C460		GE-61*	PTC136*	HEPS0014*	REN 107	SK3122	RT-134	ECG107	TM107**	WEP460	121-522
	25C839		GE-61*	PTC132*	HEPS0015*	REN 123A*	SK3444	RT-308	ECG123A*	TM123A**	WEP736*	121-29000A*
	25C1674		GE-61	PTC132*	HEPS0010*	REN 107	SK3246	RT-308	ECG229*	TM229*	WEP956*	121-29021
	25C1730		GE-17*	PTC136*	HEPS0025*	REN 107	SK3018*	RT-107A	ECG316*	TM316*	WEP535	121-972*
	25C1675L		GE-213	PTC132*	HEPS0025*	REN 123A*	SK3122	RT-308	ECG229*	TM229*	WEP956*	121-29021
	25C1675		GE-213	PTC132*	HEPS0025*	REN 123A*	SK3122	RT-308	ECG229*	TM229*	WEP956*	121-29021
	25C460		GE-61*	PTC136*	HEPS0014*	REN 107	SK3122	RT-134	ECG107	TM107**	WEP460	121-522
	25C839		GE-61*	PTC132*	HEPS0015*	REN 123A*	SK3444	RT-308	ECG123A*	TM123A**	WEP736*	121-29000A*
TR27	25C1674	2000-213	GE-61	PTC132*	HEPS0010*	REN 107	SK3246	RT-308	ECG229*	TM229*	WEP956*	121-29021
	25C1730		GE-17*	PTC136*	HEPS0025*	REN 107	SK3018*	RT-107A	ECG316*	TM316*	WEP535	121-972*
	25C1675L		GE-213	PTC132*	HEPS0025*	REN 123A*	SK3122	RT-308	ECG229*	TM229*	WEP956*	121-29021
	25C1675		GE-213	PTC132*	HEPS0025*	REN 123A*	SK3122	RT-308	ECG229*	TM229*	WEP956*	121-29021
	25C460		GE-61*	PTC136*	HEPS0014*	REN 107	SK3122	RT-134	ECG107	TM107**	WEP460	121-522
	25C839		GE-61*	PTC132*	HEPS0015*	REN 123A*	SK3444	RT-308	ECG123A*	TM123A**	WEP736*	121-29000A*
	25C1674		GE-61	PTC132*	HEPS0010*	REN 107	SK3246	RT-308	ECG229*	TM229*	WEP956*	121-29021
	25C1730		GE-17*	PTC136*	HEPS0025*	REN 107	SK3018*	RT-107A	ECG316*	TM316*	WEP535	121-972*
	25C1675L		GE-213	PTC132*	HEPS0025*	REN 123A*	SK3122	RT-308	ECG229*	TM229*	WEP956*	121-29021
	25C1675		GE-213	PTC132*	HEPS0025*	REN 123A*	SK3122	RT-308	ECG229*	TM229*	WEP956*	121-29021
TR28	25C460	2000-235	GE-61*	PTC136*	HEPS0014*	REN 107	SK3122	RT-134	ECG107	TM107**	WEP460	121-522
	25C839		GE-61	PTC132*	HEPS0015*	REN 123A*	SK3444	RT-308	ECG123A*	TM123A**	WEP736*	121-29000A*
	25C1674		GE-61	PTC132*	HEPS0010*	REN 107	SK3246	RT-308	ECG229*	TM229*	WEP956*	121-29021
	25C1730		GE-17*	PTC13								

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.
TR35	2SC945AQ	2000-235	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 123A*	SK3122	RT-187	ECG289	TM289/**	WEP458	121-773
	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*
TR36	2SC1969	2000-242	GE-216	PTC186	REN 236	SK3197	RT-158	ECG236	TM236	WEP840	121-29040	
	2SC1969B		GE-216	PTC186	REN 236	SK3197	RT-158	ECG236	TM236	WEP840	121-29040	
	2SC496		GE-57	PTC163	HEPS5000	REN 295	SK3253	RT-162	ECG295	TM295/**	WEP880	121-880
TR37	2SC496-0	2000-241	GE-336	PTC904	HEPS5000	REN 295	SK3253	RT-162	ECG295	TM295/**	WEP880	121-880
	2SD471		GE-268	PTC144*	HEPS3001*	REN 289	SK3124	RT-114*	ECG289	TM289	WEP913	121-880
	2SC1306		GE-215	PTC186	REN 235	SK3197	RT-146	ECG235	TM235/**	WEP785	121-29039	
TR38	2SC2020	2000-211	GE-329	PTC186	REN 235	SK3197	RT-146	ECG235	TM235	WEP785	121-29039	
	2SC2184		GE-329	PTC186	REN 235	SK3197	RT-146	ECG235	TM235	WEP785	121-29039	
	2SC2166		GE-215	PTC186	REN 235	SK3197	RT-146	ECG235	TM235	WEP785	121-29039	
TR39	2SC1973	2000-215	GE-335	PTC186	REN 235	SK3197	RT-146	ECG235	TM235	WEP785	121-29039	
TR40	2SC945AQ	2000-235	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 123A*	SK3122	RT-187	ECG289	TM289/**	WEP458	121-773
	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*
TR41	2SC1419C	2000-216	GE-66	PTC167	HEPS5027	REN 152	SK3054	RT-197	ECG152	TM152	WEP745	121-987-02
	2SC1419		GE-66	PTC167	HEPS5027	REN 152	SK3054	RT-197	ECG152	TM152	WEP745	121-987-02
	2SD325		GE-28	PTC110	HEPS5027	REN 186	SK3197	RT-197	ECG186	TM186/**	WEP751	121-29008
	2SC1096		GE-28	PTC110	HEPS3041	REN 186	SK3197	RT-166	ECG186A	TM186A/**	WEP1096	121-29008
	2SD235		GE-66	PTC154	HEPS3061	REN 152	SK3054	RT-197	ECG152	TM152/**	WEP745	121-987-02
	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
TR42	2SC458	2000-235	GE-210*	PTC121*	HEPS0009*	REN 123A*	SK3122	RT-187	ECG289	TM289/**	WEP458	121-773
	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*
	2SC458B		GE-210*	PTC121*	HEPS0009*	REN 123A*	SK3122	RT-187	ECG289	TM289/**	WEP458	121-773
	2SC945		GE-212	PTC121*	HEPS0015*	REN 199	SK3124	RT-107A	ECG199	TM199/**	WEP1945	121-972
TR43	2SC945A	2000-203	GE-210*	PTC121*	HEPS0009*	REN 123A*	SK3122	RT-187	ECG289	TM289/**	WEP458	121-773
	2SC458		GE-212	PTC121*	HEPS0015*	REN 199	SK3124	RT-107A	ECG199	TM199/**	WEP1945	121-972
	2SC945		GE-212	PTC121*	HEPS0015*	REN 199	SK3124	RT-107A	ECG199	TM199/**	WEP1945	121-972
	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*
	2SC458B		GE-210*	PTC121*	HEPS0009*	REN 123A*	SK3122	RT-187	ECG289	TM289/**	WEP458	121-773
TR44	2SC945	2000-235	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 123A*	SK3122	RT-187	ECG289	TM289/**	WEP458	121-773
	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*
TR45	2SC945AQ	2000-235	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 123A*	SK3122	RT-187	ECG289	TM289/**	WEP458	121-773
	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*
TR46	2SC945AQ	2000-218	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 123A*	SK3122	RT-187	ECG289	TM289/**	WEP458	121-773
	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*
TR47	2SA733P	2000-218	GE-48	PTC127	HEPS0019*	REN 294	SK3138	RT-303	ECG294	TM294/**	WEP916	121-952
	2SA733		GE-48	PTC127	HEPS0019*	REN 294	SK3138	RT-303	ECG294	TM294/**	WEP916	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
	2SA733P		GE-48	PTC127	HEPS0019*	REN 294	SK3138	RT-303	ECG294	TM294/**	WEP916	121-952
	2SA733		GE-48	PTC127	HEPS0019*	REN 294	SK3138	RT-303	ECG294	TM294/**	WEP916	121-952
	2SA495		GE-221*	PTC103*	HEPS0013*	REN 159*	SK3114	RT-303	ECG159*	TM159/**	WEP495	121-29003
TR301	2SA564	2000-235	GE-65	PTC103*	HEPS0019*	REN 234	SK3114	RT-303	ECG234	TM234	WEP564	121-879
	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 123A*	SK3122	RT-187	ECG289	TM289/**	WEP458	121-773
TR302	2SC372	2000-216	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*
	2SC1419C		GE-66	PTC167	HEPS5027	REN 152	SK3054	RT-197	ECG152	TM152	WEP745	121-987-02
	2SC1419		GE-66	PTC167	HEPS5027	REN 152	SK3054	RT-197	ECG152	TM152	WEP745	121-987-02
	2SD325		GE-28	PTC110	HEPS5027	REN 186	SK3197	RT-197	ECG186	TM186/**	WEP751	121-29008
TR401	2SC1096	2000-252	GE-28	PTC110	HEPS3041	REN 186	SK3197	RT-166	ECG186A	TM186A/**	WEP1096	121-29008
	2SD235		GE-66	PTC154	HEPS3061	REN 152	SK3054	RT-197	ECG152	TM152/**	WEP745	121-987-02
	2SD188		GE-75	PTC118	HEPS7004	REN 130	SK3027	RT-131	ECG130	TM130	WEP704	121-29011
	2SD188M		GE-75	PTC118	HEPS7004	REN 130	SK3027	RT-131	ECG130	TM130	WEP704	121-29011
	2SC1618		GE-14	PTC140	HEPS7004	REN 130	SK3027	RT-131	ECG130	TM130	WEP704	121-29011
	2SC1777		GE-14	PTC129A	HEPS7004	REN 130	SK3027	RT-131	ECG130	TM130	WEP704	121-29011

PRESIDENT MODEL 1010002, MADISON

* Lead configuration may vary from original.
/** Also available as exact type replacement.

(11)+5% Tol.
(12) No information available.

PARTS LIST AND DESCRIPTION (CONTINUED)

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

ELECTROLYTIC CAPACITORS

ITEM No.	RATING	REPLACEMENT DATA				
		MFR. PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
					Q-LINE	GENERAL LINE
C10	.22 35V			TDC224M050EL	QDT1-10	SD50-R229
C18	.47 10V	1800-324	PC50-16	VTT47D16	QV1-73	EV-1226
C23	.47 35V			TDC474M050EL	QDT1-19	SD50-R479
C24	4.7 10V			TDC475M010EL	QDT1-48	SD10-4R79
C25	.47 50V	1800-611		TDC474M050EL	QDT1-19	SD50-R479
C28	.47					
C29	4.7 25V		PC5-50	VTT4R7B50	QV1-27	EV-1319
C33	1 50V	1800-302	PC1-50	VTT1A50	QV1-11	EV-1615
C36	.1 35V			TDC104M050EL	QDT1-2	SD50-R109
C62	1 25V	1800-606		TDC105M035EL		SD35-19
C67	1 25V	1800-606		TDC105M035EL		SD35-19
C72	22 10V	1800-331	PC25-25	VTT22B16	QV1-55	EV-1224
C73	22 10V	1800-331	PC25-25	VTT22B16	QV1-55	EV-1224
C74	47 10V	1800-324	PC50-16	VTT47D16	QV1-73	EV-1226
C80	2.2 25V	1800-603		TDC225M035FL		SD35-2R29
C81	2.2 25V	1800-603		TDC225M035FL		SD35-2R29
C84	1000 10V	1800-332	PC1000-16	VTT1000L10	QV1-179	EV-1160
C90	.47 35V			TDC474M050EL	QDT1-19	SD50-R479
C92	4.7 25V	1800-304	PC5-50	VTT4R7B50	QV1-27	EV-1319
C95	47 10V		PC50-16	VTT47D16	QV1-73	EV-1226
C99	2.2 50V		PC2-100	VTT2R2A50	QV1-19	EV-1517
C100	22 10V	1800-331	PC25-25	VTT22B16	QV1-55	EV-1224
C101	.1 35V			TDC104M050EL	QDT1-2	SD50-R109
C103	10 16V	1800-306	PC10-25	VTT10B25	QV1-41	EV-1222
C104	.47 35V			TDC474M050EL	QDT1-19	SD50-R479
C108	.47 50V	1800-301	PC1-50	VTT4R7A63	QV1-3	EV-1610
C109	10 16V	1800-306	PC10-25	VTT10B25	QV1-41	EV-1222
C133	10 16V	1800-306	PC10-25	VTT10B25	QV1-41	EV-1222
C134	10 16V	1800-306	PC10-25	VTT10B25	QV1-41	EV-1222
C135	.47 50V	1800-301	PC1-50	VTT4R7A63	QV1-3	EV-1610
C144	1 50V	1800-302	PC1-50	VTT1A50	QV1-11	EV-1615
C153	47 10V	1800-324	PC50-16	VTT47D16	QV1-73	EV-1226
C172	1000 25V	1800-333	WBRT000-25*	VTT1000M25	QV1-185	EV-1360
C173	10 16V	800-306	PC10-25	VTT10B25	QV1-41	EV-1222
C174	1 50V		PC1-50	VTT1A50	QV1-11	EV-1615
C175	470 10V		PC500-16	VTT470K16	QV1-149	EV-1150
C176	47 10V	1800-324	PC50-16	VTT47D16	QV1-73	EV-1226
C179	22 6V	1800-610		TDC226M015FL	QDT1-82	SD15-229
C180	4.7 25V	1800-304	PC5-50	VTT4R7B50	QV1-27	EV-1319
C181	10 25V	1800-330	PC10-25	VTT10B25	QV1-43	EV-1322
C186	220 16V		PC250-25	VTT220H16	QV1-117	EV-1240
C190	.47 50V	1800-301	PC1-50	VTT4R7A63	QV1-3	EV-1610
C191	1 50V	1800-302	PC1-50	VTT1A50	QV1-11	EV-1615
C205	.47 50V	1800-301	PC1-50	VTT4R7A63	QV1-3	EV-1610
C209	10 16V		PC10-25	VTT10B25	QV1-41	EV-1222
C212	47 10V		PC50-16	VTT47D16	QV1-73	EV-1226
C302	220 16V	1800-314	PC250-25	VTT220H16	QV1-117	EV-1240
C304	3300 35V	1800-336				

CAPACITORS

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA				
			CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
						Q-LINE	GENERAL LINE
C1	15 NPO 5%		DTZ-15	NP015	CN0415		10TCC-Q15
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		GP210		10TS-D10
C6	.022 50V		DC-253	MGP025	TA125		TG-S25
C7	.022 50V		DC-253	MGP025	TA125		TG-S25
C8	.001 50V		DD-102		GP210		10TS-D10
C9	82 N750 5%				CN7482		10TCU-Q82
C11	.001 50V		DD-102		GP210		10TS-D10
C12	100 N750 10%		DTN-100	N100	CN7310		10TCU-T10
C13	.022 50V		DC-253	MGP025	TA125		TG-S25
C14	.001 50V		DD-102		GP210		10TS-D10
C15	100 N750 10%		DTN-100	N100	CN7310		10TCU-T10
C16	.022 50V		DC-253	MGP025	TA125		TG-S25
C17	100 N750 10%		DTN-100	N100	CN7310		10TCU-T10
C19	.047 50V			DPMS2S47	EWFA1A47	QFT2-171	1FT-S47
C20	.047 50V			DPMS2S47	EWFA1A47	QFT2-171	1FT-S47
C21	.022 50V			DPMS2S22	M192P2239R8	QFT2-127	1FT-S22
C22	.022 50V		DC-253	MGP025	TA125		TG-S25
C26	39 NPO 5%				CN0439		10TCC-Q39
C27	.022 50V		DC-253	MGP025	TA125		TG-S25
C30	.001 50V		DD-102		GP210		10TS-D10
C31	12 NPO				CN0412		10TCC-Q12
C32	.001 50V		DD-102		GP210		10TS-D10
C34	.001 50V		DD-102		GP210		10TS-D10
C35	.001 50V		DD-102		GP210		10TS-D10
C37	.001 50V		DD-102		GP210		10TS-D10
C38	4 NPO		DTZ-4R7	NP04P7	CN0547		10TCC-V47
C39	.001 50V		DD-102		GP210		10TS-D10
C40	.001		DD-102		GP210		10TS-D10
C41	2 NPO		DTZ-2R2	NP02P2	CN0522	10TCC-V22	10TS-D10
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 N750 10%		DTN-100	N100	CN7310		10TCU-T10
C46	.022			DPMS2S22	M192P2239R8	QFT2-127	1FT-S22
C47	2 NPO		DTZ-2R2	NP02P2	CN0522		10TCC-V22
C48	5 NPO						10TCC-V50
C49	.022 50V			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

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
C53	.022 50V		DC-253	MGPO25	TA125		TG-S25
C54	.022 50V		DC-253	MGPO25	TA125		TG-S25
C55	.022 50V			DPMS2S22	M192P2239R8	QFT2-127	1FT-S22
C56	.047 50V			DPMS2S47	EWFA1A147	QFT2-171	1FT-S47
C57	.047 50V			DPMS2S47	EWFA1A147	QFT2-171	1FT-S47
C58	.022 50V			DPMS2S22	M192P2239R8	QFT2-127	1FT-S22
C59	.047 50V			DPMS2S47	EWFA1A147	QFT2-171	1FT-S47
C60	.047 50V			DPMS2S47	EWFA1A147	QFT2-171	1FT-S47
C61	.022		UK25-223				HY-725
C63	.022 50V			DPMS2S22	M192P2239R8	QFT2-127	1FT-S22
C64	220 N750 10%		DTN-220	N220	CN7322		10TCU-T22
C65	.001 50V		DD-102		GP210		10TS-D10
C66	220 N750 10%		DTN-220	N220	CN7322		10TCU-T22
C68	15 NPO 5%		DTZ-15	NP015	CN0415		10TCC-Q15
C69	.0022 50V			DPMS6D22	M192P2229R8	QFT2-27	1FT-D22
C70	.001 50V			DPMS6D1	EWFA1A210	QFT2-1	1FT-D10
C71	.001 50V			DPMS6D1	EWFA1A210	QFT2-1	1FT-D10
C75	.047 50V			DPMS2S47	EWFA1A147	QFT2-171	1FT-S47
C76	.01			WMF1S1	EWFA1A110	QFT2-91	1FT-S10
C78	.01 50V			WMF1S1	EWFA1A110	QFT2-91	1FT-S10
C79	.1 50V			WMF05P1	EWFO5010	QFT2-215	1FT-P10
C82	.047 50V			DPMS2S47	EWFA1A147	QFT2-171	1FT-S47
C85	10 NPO		DTZ-10	NP010	CN0410		10TCC-Q10
C86	18 NPO				CN0418		10TCC-Q18
C87	.022 50V		DC-253	MGPO25	TA125		TG-S25
C88	47 NPO 5%		DTZ-47	NP047	CN0447		10TCC-Q47
C89	47 NPO 5%		DTZ-47	NP047	CN0447		10TCC-Q47
C91	.047 50V			DPMS2S47	EWFA1A147	QFT2-171	1FT-S47
C93	.01 50V		UK50-103		MAG5011		
C94	.047			DPMS2S47	EWFA1A147	QFT2-171	1FT-S47
C96	.01 50V		UK50-103		MAG5011		
C97	.01 50V		UK50-103		MAG5011		
C98	10 NPO		DTZ-10	NP010	CN0410		10TCC-Q10
C102	.0047 50V			WMF1D47	M192P4729R8	QFT2-63	1FT-D47
C105	.01 50V			WMF1S1	EWFA1A110	QFT2-91	1FT-S10
C106	.01		UK50-103		MAG5011		
C107	.01 50V			WMF1S1	EWFA1A110	QFT2-91	1FT-S10
C110	.01 50V			WMF1S1	EWFA1A110	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 50V		DD-221		GP322		10TS-T22
C116	10 NPO		DTZ-10	NP010	CN0410		10TCC-Q10
C117	470 50V		DD-471	GP470	GP347		10TS-T47
C118	.01 50V		UK50-103		MAG5011		
C119	.01 50V		UK50-103		MAG5011		
C120	.01 50V		UK50-103		MAG5011		
C121	10 NPO		DTZ-10	NP010	CN0410		10TCC-Q10
C122	100 N220 5%	1800-009			*		10TCR-T10
C123	220 N750 10%		DTN-220	N220	CN7322		10TCU-T22
C124	.022 50V		DC-253	MGPO25	TA125		TG-S25
C125	5 NPO	1800-095					10TCC-V50
C126	.01 50V		UK50-103		MAG5011		
C127	82 NPO 5%		DTZ-82	NP082	CN0482		10TCC-Q82
C128	27 NPO 5%				CN0427		10TCC-Q27
C129	.01 50V		UK50-103		MAG5011		
C130	1 NPO				CN0510		10TCC-V10
C131	10 NPO		DTZ-10	NP010	CN0410		10TCC-Q10
C132	.0047 50V		DD-472	GP4700	GP247		5GA-D47
C136	.047 50V			DPMS2S47	EWFA1A147	QFT2-171	1FT-S47
C137	.5 NPO	1800-002					
C138	.0047 50V		DD-472	GP4700	GP247		5GA-D47
C139	.5 NPO	1800-002					
C140	.0047 50V		DD-472	GP4700	GP247		5GA-D47
C141	82 NPO 5%		DTZ-82	NP082	CN0482		10TCC-Q82
C142	39 NPO 5%				CN0439		10TCC-Q39
C143	180 N220 10%	1800-116			*		10TCR-T18
C145	1 NPO				CN0510		10TCC-V10
C146	390 N750 10%		DTN-390				10TCU-T39
C147	47 NPO 5%		DTZ-47	NP047	CN0447		10TCC-Q47
C148	.1 50V			WMF05P1	EWFO5010	QFT2-215	1FT-P10
C149	220 N220 10%				*		10TCR-T22
C150	330 N750 10%		DTN-330	N330	CN7333		10TCU-T33
C151	.0047 50V		DD-472	GP4700	GP247		5GA-D47
C152	470 N750 10%		DTN-470				10TCU-T47
C154	.047 50V						
C155	.1 50V 10%			WMF05P1	EWFO5010	QFT2-215	1FT-P10
C156	220 N750 10%		DTN-220	N220	CN7322		10TCU-T22
C157	.0047 50V		DD-472	GP4700	GP247		5GA-D47
C158	.0047 50V		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 10%		DTN-330	N330	CN7333		10TCU-T33
C162	47 NPO 10%		DTZ-47	NP047	CN0447		10TCC-Q47
C163	2 NPO		DTZ-2R2	NP02P2	CN0522		10TCC-V22
C164	.01 50V		UK50-103		MAG5011		
C165	.0047 50V		DD-472	GP4700	GP247		5GA-D47
C166	.0047						
C168	.0047		DD-472	GP4700	GP247		5GA-D47
C169	.0047		DD-472	GP4700	GP247		5GA-D47
C171	.0047		DD-472	GP4700	GP247		5GA-D47
C177	.1 50V			WMF05P1	EWFO5010	QFT2-215	1FT-P10
C178	.001 50V			DPMS6D1	EWFA1A210	QFT2-1	1FT-D10
C182	.022 50V			DPMS2S22	M192P2239R8	QFT2-127	1FT-S22
C183	.1 50V			WMF05P1	EWFO5010	QFT2-215	1FT-P10
C185	.001 50V			DPMS6D1	EWFA1A210	QFT2-1	1FT-D10
C187	.1 50V			WMF05P1	EWFO5010	QFT2-215	1FT-P10
C189	.0047 50V		DD-472	GP4700	GP247		5GA-D47
C192	.1 50V		CK-104		MAG5001		
C193	.001		DD-102		GP210		10TS-D10
C194	.022 50V		DC-253	MGPO25	TA125		TG-S25

PRESIDENT MODEL 1010002, MADISON

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
C195	.1 50V	1800-002	CK-104		MAG5001		
C196	.0047 50V		DD-472	GP4700	GP247		5GA-D47
C197	.022		DC-253	MGPO25	TA125		TG-S25
C198	.01 50V		UK50-103		MAG5011		
C199	.01 50V		UK50-103		MAG5011		
C200	.0047 50V		DD-472	GP4700	GP247		5GA-D47
C201	.01 50V		UK50-103		MAG5011		
C202	.01 50V		UK50-103		MAG5011		
C203	47 NPO 10%		DTZ-47	NP047	CN0447		10TCC-Q47
C204	.022 50V		DC-253	MGPO25	TA125		TG-S25
C206	.5 NPO						
C207	47 NPO 5%		DTZ-47	NP047	CN0447		10TCC-Q47
C208	.001		DD-102		GP210		10TS-D10
C210	.0047		DD-472	GP4700	GP247		5GA-D47
C211	.0047		DD-472	GP4700	GP247		5GA-D47
C213	.047			DPMS2547	EWFA147	QFT2-171	1FT-S47
C214	.01			WMF151	EWFA110	QFT2-91	1FT-S10
C221	.001		DD-102		GP210		10TS-D10
C240	10 NPO		DTZ-10	NP010	CN0410		10TCC-Q10
C241	.047			DPMS2547	EWFA147	QFT2-171	1FT-S47
C243	33 NPO 5%		DTZ-33	NP033	CN0433		10TCC-Q33
C301	.039			DPMS6S39	M192P3939R8	QFT2-159	1FT-S39
C303	.039			DPMS6S39	M192P3939R8	QFT2-159	1FT-S39
C308	.01 50V		UK50-103		MAG5011		
C310	.01 50V		UK50-103		MAG5011		
C401	.0047		DD-472	GP4700	GP247		5GA-D47
C402	.0047		DD-472	GP4700	GP247		5GA-D47
C404	.001 50V		DD-102		GP210		10TS-D10
C405	.001 50V		DD-102		GP210		10TS-D10
C406	.001 50V		DD-102		GP210		10TS-D10
C407	.001 50V		DD-102		GP210		10TS-D10
C408	.0047 50V		DD-472	GP4700	GP247		5GA-D47
C409	.0047 50V		DD-472	GP4700	GP247		5GA-D47
C410	.0047 50V		DD-472	GP4700	GP247		5GA-D47
C411	.0047 50V		DD-472	GP4700	GP247		5GA-D47
C412	.01 50V		UK50-103		MAG5011		
C413	.01 50V		UK50-103		MAG5011		
C414	.1 50V		CK-104		MAG5001		
C415	.001 50V		DD-102		GP210		10TS-D10
C416	.001 50V		DD-102		GP210		10TS-D10
C417	.001 50V		DD-102		GP210		10TS-D10
C421	.047 50V		UK25-503		MAG2515		HY-735
C422	.001 125V		DD-102		GP210		10TS-D10
C423	.001 125V		DD-102		GP210		10TS-D10
C424	.001 125V		DD-102		GP210		10TS-D10
C425	.001 125V		DD-102		GP210		10TS-D10
C426	.0033						
C427	.0047		DD-472	GP4700	GP247		5GA-D47
CC1	20	1800-103					
CT1	20	1800-203					
CT2	20	1800-203					

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

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.
RT301	Voltage	300	1900-221	T-300	MTC52L1	X201R501B
VR1	AM Signal Meter	5000	1900-201			U260R502B
	AM Signal Meter	20K	1900-204(6)			U260R253B
VR2	SSB Signal Meter	5000	1900-201			U260R502B
	SSB Signal Meter	20K	1900-204(6)			U260R253B
VR3	Squelch Range	1000	1900-220			U260R102B
VR4	Carrier Balance	10K	1900-203			U260R103B
VR5	XMT Adjust	3000	1900-215			U260R502B
VR6	RF PWR Meter	100K	1900-211			U260R104B
VR7	MOD Meter	100K	1900-211			U260R104B
	MOD Meter	50K	1900-202(6)			U260R503B
VR8	Final Bias	5000	1900-201			U260R502B
VR9	Driver Bias	500	1900-205			U260R501B
VR10	AM Carrier Power	5000	1900-201			U260R502B
VR11	SSB ALC	10K	1900-203			U260R103B
VR12	AWI	3000	1900-215			U260R502B
VR401	Squelch/CB-PA Switch/CB-PA Switch	100K	1900-139			
VR402	Clarifier	20K	1900-126			
VR403	Volume/On-Off Switch	10K	1900-137			
VR404	RF Gain	1000	1900-124			
VR405	MIKE Gain	1000	1900-138			
VR406-1	SWR/CAL	5000	1900-116			
VR406-2	SWR/CAL	5000	(18)			

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

(18) Includes VR406-1 and VR406-2.

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	
		WORKMAN PART No.	MFGR. PART No.			WORKMAN PART No.	MFGR. PART No.
R417	3.9 Ohms 5W		1900-378				

COILS (RF-IF)

ITEM No.	FUNCTION	REPLACEMENT DATA			REMARKS
		PART No.	OTHER IDENTIFICATION	MILLER PART No.	
L1	Noise Blanker Input (7.8MHz)	2200-022	LA-038	CBS512-7TC	
L2	Noise Blanker Input (7.8MHz)	2200-029	LA-179		
L3	IF (455kHz)	2200-002	LA-163		
L4	Antenna (27MHz)	2200-071	LA-261		
L5	RF Amp (27MHz)	2200-070	LA-260		
L6	RF Amp (27MHz)	2200-069	LA-259		
L7	Mixer (7.8MHz)	2200-068	LA-258		
L8	Mixer (7.8MHz)	2200-067	LA-257		
L9	Mixer (7.8MHz)	2200-098	LA-268		
L10	Mixer (7.8MHz)	2200-099	LA-269		
L11	Choke (100uH)	2200-202	LZ-012		
L12	IF Amp (7.8MHz)	2200-501	LA-270		
L13	IF (455kHz)	2200-502	LA-272		
L14	IF Amp (7.8MHz)	2200-503	LA-271		
L15	IF Amp (455kHz)	2200-094	LA-264		
L16	Choke (100uH)	2200-202	LZ-012		
L17	Choke (470uH)	2200-040	LZ-012		
L19	VCO	2200-072	LA-216		
L20	VCO Buffer (37MHz)	2200-055	LA-195		
L21	Tripler (34MHz)	2200-074	LA-256		
L22	Frequency Adjust	2200-093	LA-273	CB305	
L23	Frequency Adjust	2200-097	LA-267		
L24	Choke (470uH)	2200-040	LZ-012		
L25	Choke (470uH)	2200-040	LZ-012		
L26	Choke (470uH)	2200-040	LZ-012		
L27	Choke (470uH)	2200-040	LZ-012		
L28	Choke (470uH)	2200-040	LZ-012		
L29	Choke (470uH)	2200-040	LZ-012		
L30	Frequency Adjust (7.7985MHz)	2200-096	LA-266		
L31	Frequency Adjust (7.8MHz)	2200-095	LA-265		
L32	Choke (470uH)	2200-040	LZ-012	CB305	
L33	Choke (100uH)	2200-202	LZ-012		
L35	Choke	2200-038	LE-051		
L36	TVI Trap (54MHz)	2200-034	LC-019		
L37	Loading Final	2200-038	LE-051		
L38	Final (27MHz)	2200-034	LC-019		
L39	Choke	2200-080	LD-098		
L42	Choke	2200-080	LD-098		
L44	Choke	2200-061	LD-096		
L45	XMT (27MHz)	2200-079	LA-254		
L46	XMT Mixer (27MHz)	2200-078	LA-220	CB305	
L47	Mixer VCO (37MHz)	2200-028	LA-160		
L48	Balanced Modulator (7.8MHz)	2200-077	LA-219		
L57	Choke		LD-013		
L401	Choke	2200-035	LD-013		
L402	Choke	2200-035	LD-013		
L403	Choke	2200-059	LD-089		
L406	Choke	2200-059	LD-089		
L407	Choke	2200-059	LD-089		
L408	Choke	2200-059	LD-089		
L409	Choke				
L410	Choke				

PRESIDENT MODEL 1010002, MADISON

TRANSFORMER (Power)

ITEM No.	RATING		REPLACEMENT DATA			NOTES
	PRI.	SEC. 1	MFGR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T401	120V AC @ 700mA AC	18.50V AC @ 2.55A AC	2600-010 TF-143(1)			(1) Number on unit.

PARTS LIST AND DESCRIPTION (CONTINUED)

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

SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		MFGR. PART No.	QUAM PART No.	
SP401	4" PM 8 Ohms	3100-001	4A1Z8	

FUSE DEVICES

ITEM No.	DESCRIPTION	REPLACEMENT DATA						
		PART No.		BUSS PART No.		LITTELFUSE PART No.		WORKMAN PART No.
		DEVICE	HOLDER	DEVICE	HOLDER	DEVICE	HOLDER	DEVICE
F401	4A Quick Acting			(4) AGC	HRK	312004	150145	
F402	4A Quick Acting		1100-816	(4) AGC	HTA	312004	442-006A	

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	3200-004	18-032	18-034	18-010		1	2	5	3	NC	4

MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
D401	LED	2000-306	Numerical Readout (TLR-321)
D402a	LED	2000-343	Receive TLR6101 (2.16 @ 15.3mA)
D402b	LED	2000-343	Transmit TLR6101 (1.89V @ 6.2mA)
D403	LED	2000-349	CH 9 TLR104 (1.92V @ 6.2mA)
D404	LED	2000-330	AWI TLR124
FT1	Filter	2200-302	Ceramic (455kHz) FL-050
FT2	Filter	2200-310	Crystal (7.8MHz) FL-046
FT3	Filter	2200-311	Crystal (7.8MHz) FL-067
J401	Jack	1100-001	Miniature Phone (JK-010)
J402	Jack	1100-001	Miniature Phone (JK-010)
J403	Jack	1100-003	DC Power Connector (JK-052)
J404	Jack	1100-023	Microphone Connector (5 Pin)
J405	Jack	1100-002	Antenna Connector (JK-068)
J406	Jack	1200-004	EXT. Speaker Plug Assembly
J407	Jack	1100-009	Headphone (JK-005)
L34	Ferrite Bead	2200-109	Core for SWR (LD-104)
L40	Ferrite Bead	2200-052	(LD-087)
L41	Ferrite Bead	2200-108	(LD-101)
L43	Ferrite Bead	2200-052	(LD-087)
L51	Ferrite Bead	2200-103	(LD-077)
L52	Ferrite Bead	2200-103	(LD-077)
L53	Ferrite Bead	2200-103	(LD-077)
L54	Ferrite Bead		(LD-077)
L55	Ferrite Bead		(LD-077)
L56	Ferrite Bead		(LD-077)
L404	Ferrite Bead	2200-103	(LD-077)
L405	Ferrite Bead	2200-103	(LD-077)
M10	Motor		Part of Clock
M401	Meter	2900-005	S/RF MT-125
M402	Meter	2900-007	Modulation/SWR (MT-140)
PL401	Lamp	2500-003	Power (11.80V @ 45mA) S/RF
PL402	Lamp	2500-003	SWR/Modulation (11.80V @ 45mA)
S401	Switch	3000-120	Channel Selector
S402	Switch		Power On/Off (Part of Volume Control)
S403	Switch		Mode Selector (AM/LSB/USB)
S404	Switch	3000-111	PA/CB (Part of Squelch Control)
S405	Switch	3000-008	NB/ANL
S408	Switch	3000-008	RF/Modulation, SWR
S409	Switch	3000-112	AC/DC
S411	Switch	3000-008	CH 9
X1	Crystal	2100-014	7.345MHz (QX-093)
X2	Crystal	2100-001	10.240MHz (QX-077)
X3	Crystal	2100-015	11.3250MHz (QX-086)
X4	Crystal	2100-016	7.8MHz (QX-092)
	Cord	2700-001	DC Power
	Cord	2700-002	AC Power
	PCB	3500-051	Channel LED
	PCB	3500-050	Channel Switch
	PCB	3500-042	DC Power Supply
	PCB	3500-052	EXT. Speaker
	PCB	3500-029	Microphone
	PCB	3500-044	Phone Jack
	PCB	3500-028	Push-Switch
	Clock	3600-001	

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

ITEM	PART No.	ITEM	PART No.
Knob, Bar Style	1300-005	Knob, Outside Clock	1300-013
Knob, Channel Selector	1300-004	Front Panel, Plain	3300-518
Knob, Clock Time Set	1300-015	Knob, Push-Switch	1300-003
Knob, Control (Round)	1300-002	Spring Insert, Channel Selector Knob	1100-305
Knob, Inside Clock	1300-014	Spring Insert, Inside Clock Knob	1100-307
Control Plate, Metal	1700-510	Top Cover	3300-125