



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 AR-14

PRESIDENT MODEL AR-14

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

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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,L3,L9,L10,L11.....9440
 L4,L6,L7,L8.....5000,5009,8276,8728,8728A
 L12,L15.....8282,9304,8728,8728A

SYNTHESIZER ALIGNMENT

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Input of frequency counter to TP4 (IC3 Pin 2).	Ch. 19		Check for 10.240MHz.
Input of DC meter to TP1 (IC3 Pin 7).	Ch. 19	L9	Adjust for 3.00 volts. Check for approximately 4.00 volts on channel 40.
Input of DC meter to TP1 (IC3 Pin 7).	Ch. 1, XMT		Check for 1.85 volts. Check for approximately 4.48 volts on channel 40.
Input of oscilloscope to TP3 (L3 Secondary).	Ch. 19	L3	Adjust for maximum RF. (180mV typical). (See Figure 1.)
Input of frequency counter to TP5 (IC2 Pin 3).	Ch. 1		Check for 16.270MHz. Check all channels. See Synthesizer Chart for correct frequencies.
Input of frequency counter to TP6 (IC2 Pin 6).	Ch. 1, XMT		Check for 26.965MHz. Check all channels. See Synthesizer 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 Off, Local-DX DX, CB-PA CB.

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Output of signal generator thru .01uF to TP7 (D4 anode). 455kHz, 1000Hz @ 30% modulation.	Ch. 19	L8,L7,L6	Adjust for maximum output.
Output of signal generator to antenna input. 27.185MHz, 1000Hz @ 30% modulation.	Ch. 19	L4,L2,L1	Adjust for maximum output. Readjust L6, L7 and L8 for maximum.

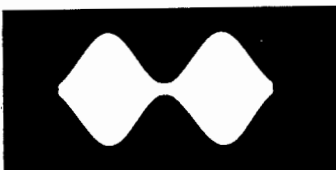


Figure 1

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 Off, Local-DX DX, CB-PA CB.

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Output of signal generator to antenna input. 27.185MHz, 1000Hz @ 30% modulation. Output 700uV.	Ch. 19 Squelch Maximum	VR3	SQUELCH RANGE Adjust so that squelch just breaks.
Output of signal generator to antenna input. 27.185MHz, 1000Hz @ 30% modulation. Output 100uV.	Ch. 19	VR4	SIG METER Adjust for 9 on SIG 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	L10, L11, L12	Adjust for maximum RF output.
Input of RF wattmeter to antenna input.	Ch. 19	L15	Adjust for 4.0 watts RF output maximum.

TRANSMITTER ADJUSTMENTS

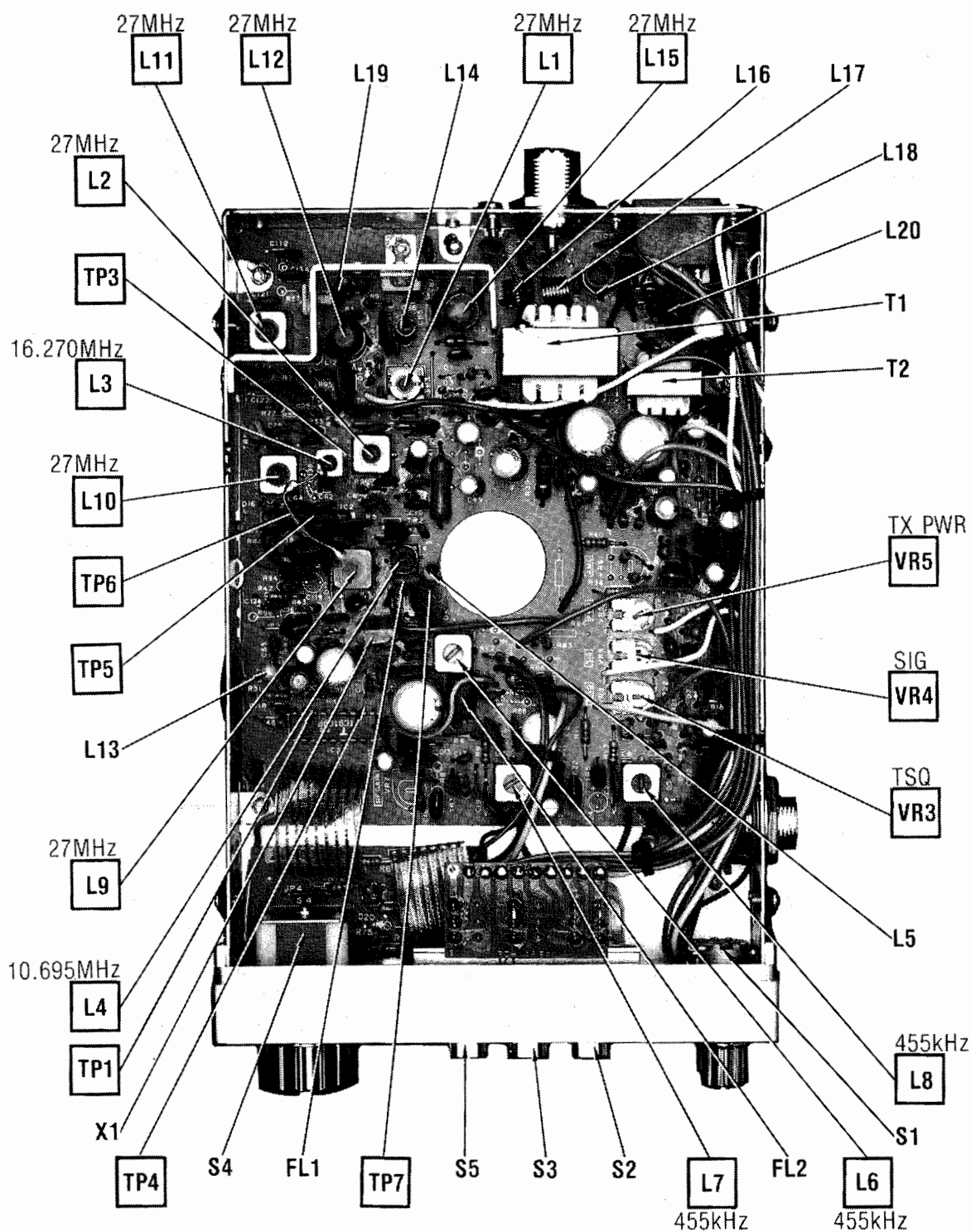
Connect an RF wattmeter and 50-ohm, 25-watt dummy load to antenna connector.
NOTE: Be sure to check transmit frequency and power on all active channels after adjustment of transmitter.
See page 4 for channel frequencies.

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Input of RF wattmeter to antenna input.	Ch. 19	VR5	TX PWR METER Adjust so that TX PWR meter agrees with RF wattmeter.

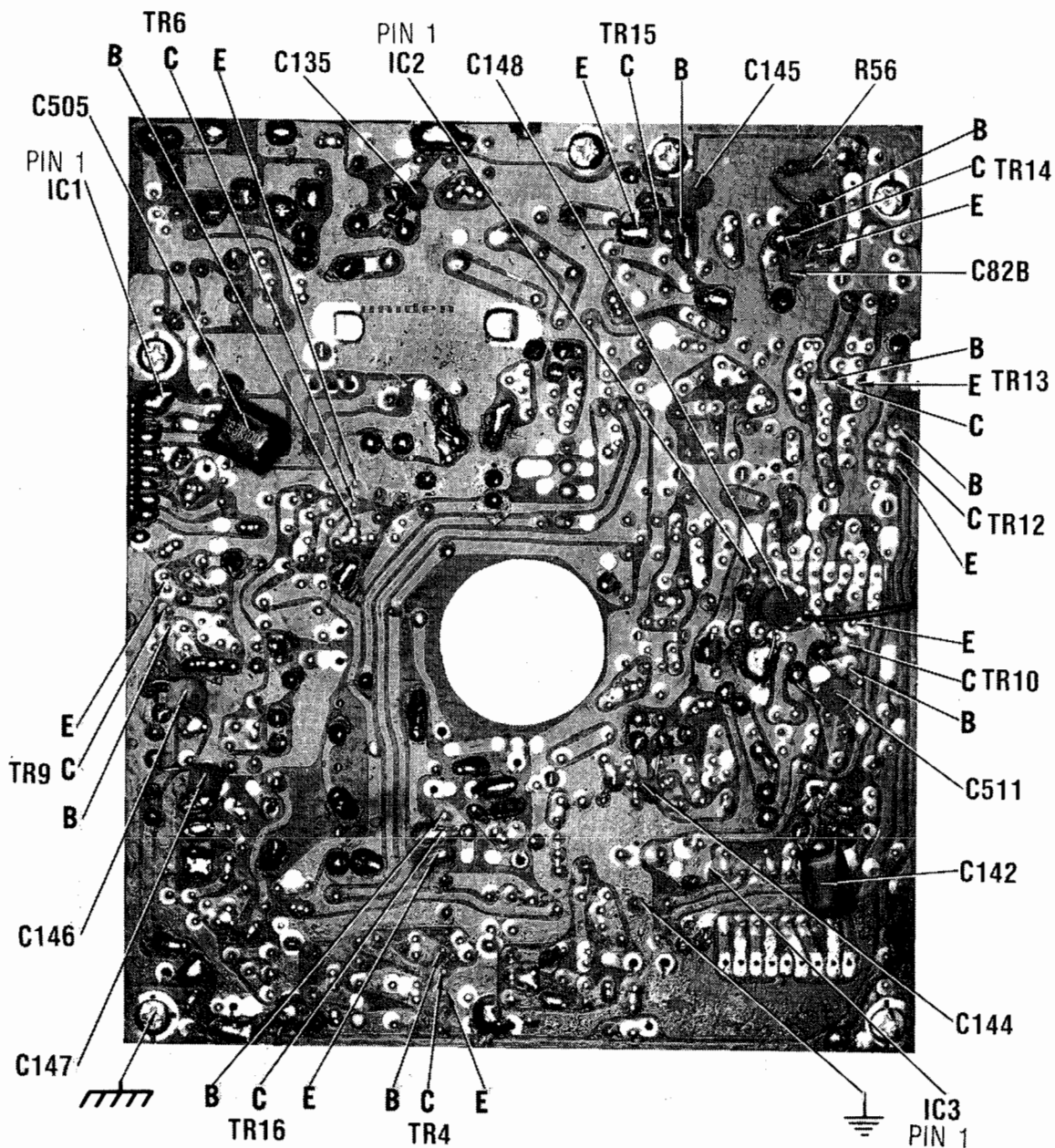
PRESIDENT MODEL AR-14

TRUTH CHART

C H A N N E L	1 = 7.50 Volts 0 = 0 Volts CHANNEL INPUT CODES IC3								REC VCO OUTPUT IN MHz AT TP5	XMT SYNTH OUTPUT IN MHz AT TP6	
	PINS										
	17	16	15	14	13	12	11	10			
1	1	1	1	1	1	1	1	1	16.270	26.965	
2	1	1	1	0	0	0	0	1	16.280	26.975	
3	1	1	1	0	1	0	0	1	16.290	26.985	
4	1	1	1	1	1	0	1	0	16.310	27.005	
5	1	1	1	0	1	0	0	0	16.320	27.015	
6	1	1	1	0	0	0	1	0	16.330	27.025	
7	1	1	1	1	1	1	0	1	16.340	27.035	
8	1	1	1	0	0	0	0	0	16.360	27.055	
9	1	1	1	1	1	0	0	0	16.370	27.065	
10	1	1	0	0	0	1	0	0	16.380	27.075	
11	1	1	0	1	1	1	1	1	16.390	27.085	
12	1	1	0	0	0	0	0	1	16.410	27.105	
13	1	1	0	0	1	0	0	1	16.420	27.115	
14	1	1	0	1	1	0	1	0	16.430	27.125	
15	1	1	0	0	1	0	0	0	16.440	27.135	
16	1	1	0	0	0	0	1	0	16.460	27.155	
17	1	1	0	1	1	1	0	1	16.470	27.165	
18	1	1	0	0	0	0	0	0	16.480	27.175	
19	1	1	0	1	1	0	0	0	16.490	27.185	
20	1	0	1	0	0	1	0	0	16.510	27.205	
21	1	0	1	1	1	1	1	1	16.520	27.215	
22	1	0	1	0	0	0	0	1	16.530	27.225	
23	1	0	1	0	1	0	0	1	16.560	27.255	
24	1	0	1	1	1	0	1	0	16.540	27.235	
25	1	0	1	0	1	0	0	0	16.550	27.245	
26	1	0	1	0	0	0	1	0	16.570	27.265	
27	1	0	1	1	1	1	0	1	16.580	27.275	
28	1	0	1	0	0	0	0	0	16.590	27.285	
29	1	0	1	1	1	0	0	0	16.600	27.295	
30	1	0	0	0	0	1	0	0	16.610	27.305	
31	1	0	0	1	1	1	1	1	16.620	27.315	
32	1	0	0	0	0	0	0	1	16.630	27.325	
33	1	0	0	0	1	0	0	1	16.640	27.335	
34	1	0	0	1	1	0	1	0	16.650	27.345	
35	1	0	0	0	1	0	0	0	16.660	27.355	
36	1	0	0	0	0	0	1	0	16.670	27.365	
37	1	0	0	1	1	1	0	1	16.680	27.375	
38	1	0	0	0	0	0	0	0	16.690	27.385	
39	1	0	0	1	1	0	0	0	16.700	27.395	
40	0	1	0	0	0	1	0	0	16.710	27.405	

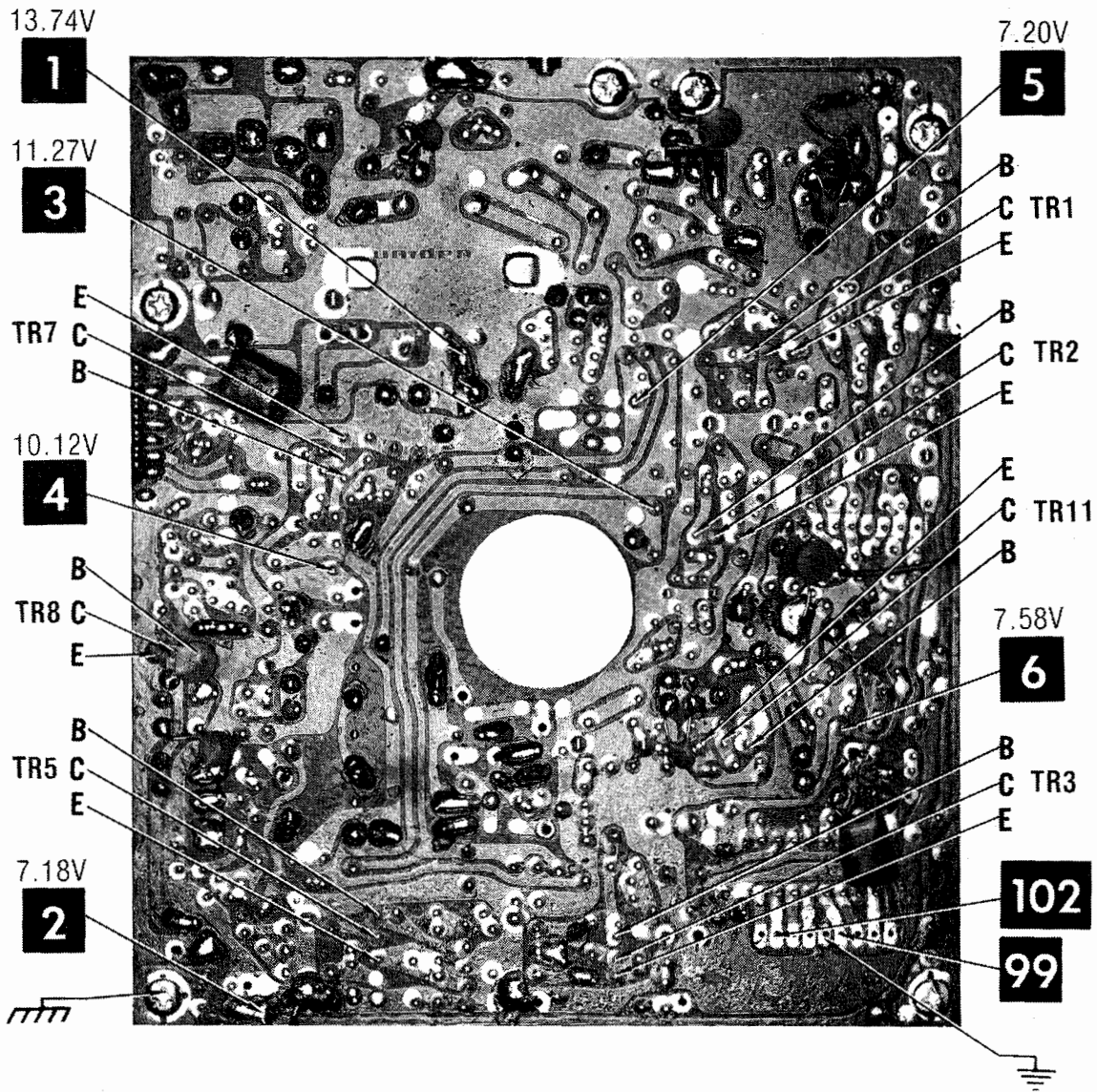


CHASSIS-BOTTOM



MAIN BOARD

PRESIDENT MODEL AR-14



MAIN BOARD

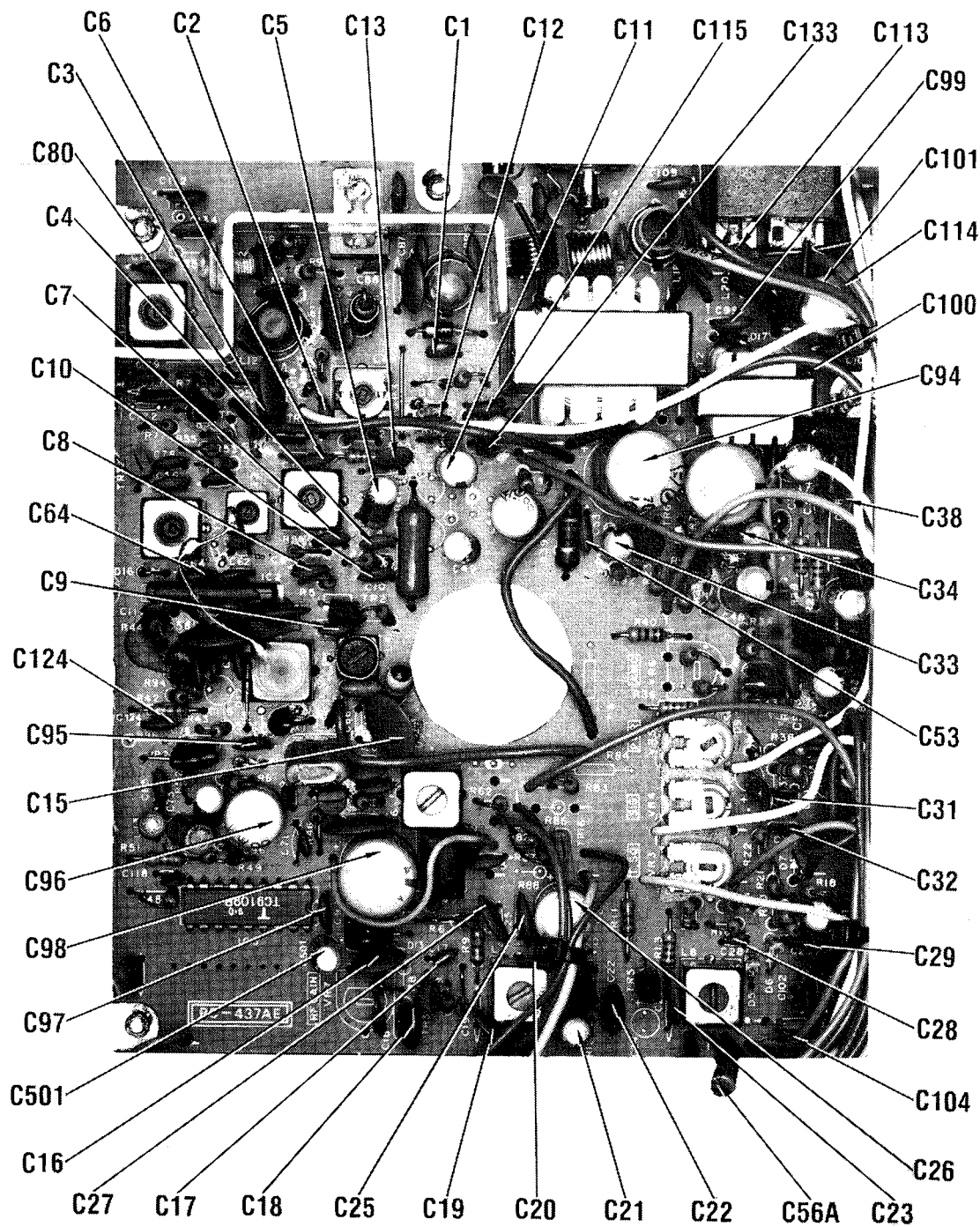


MAIN BOARD

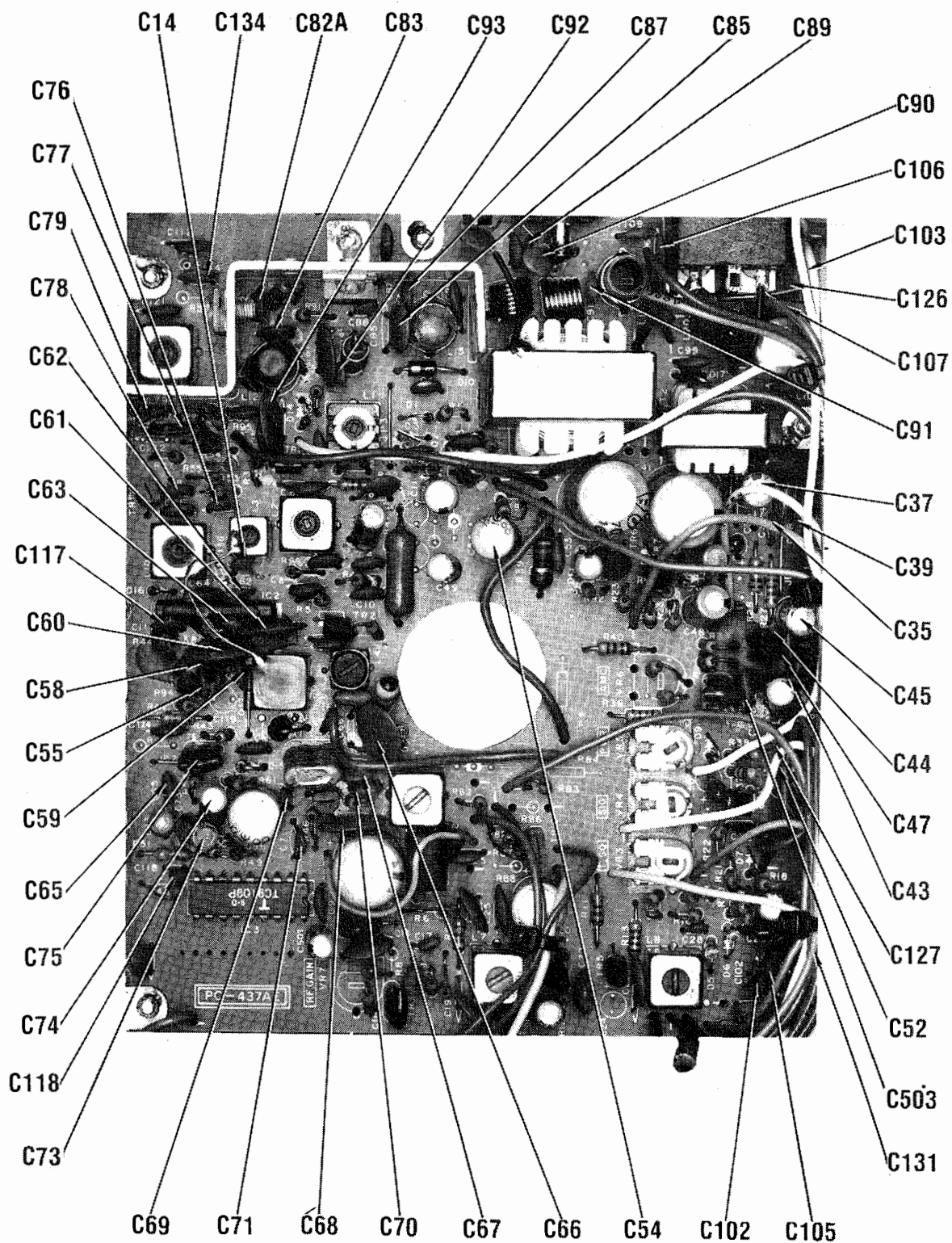


PRESIDENT MODEL AR-14

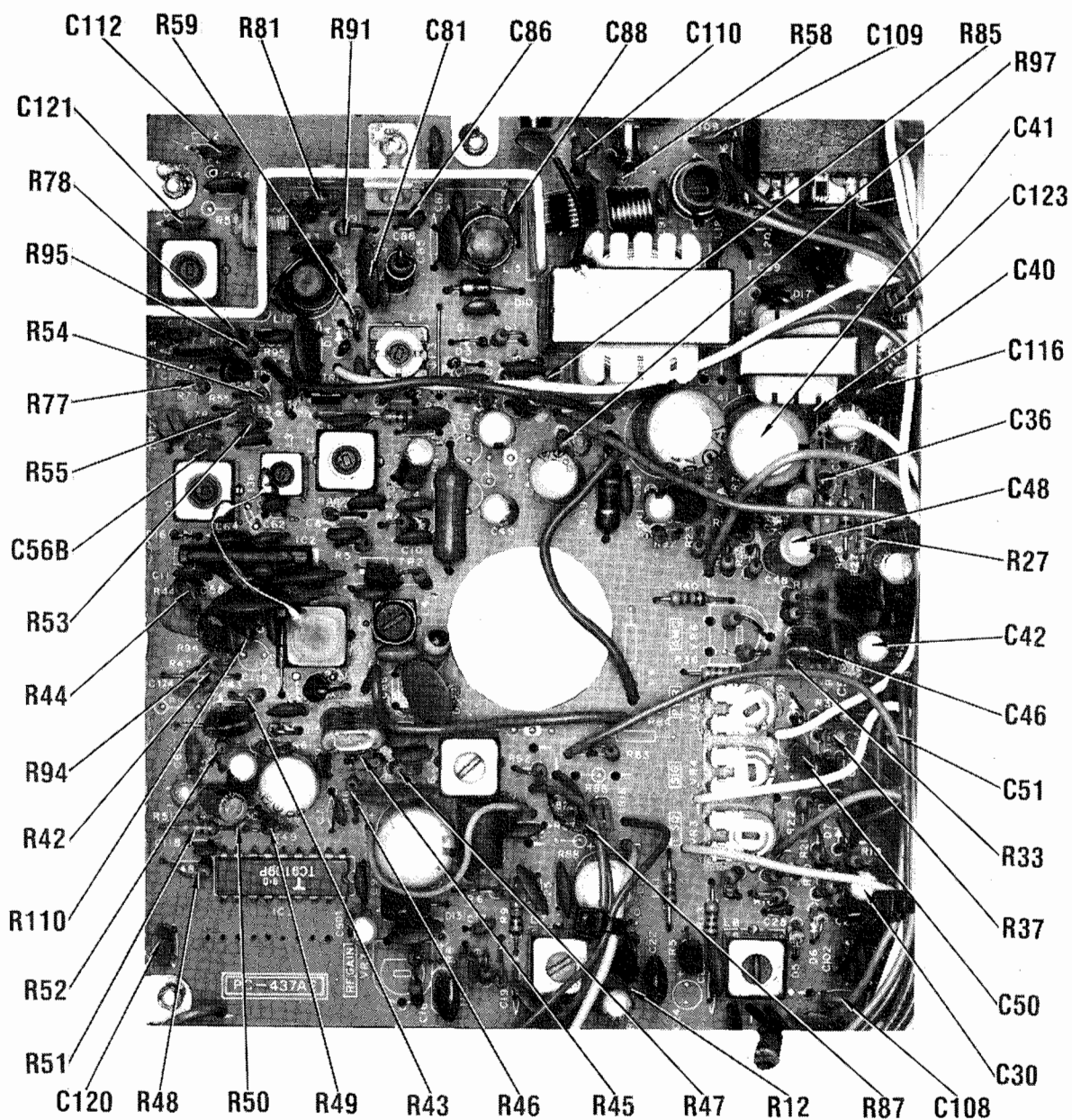
MAIN BOARD



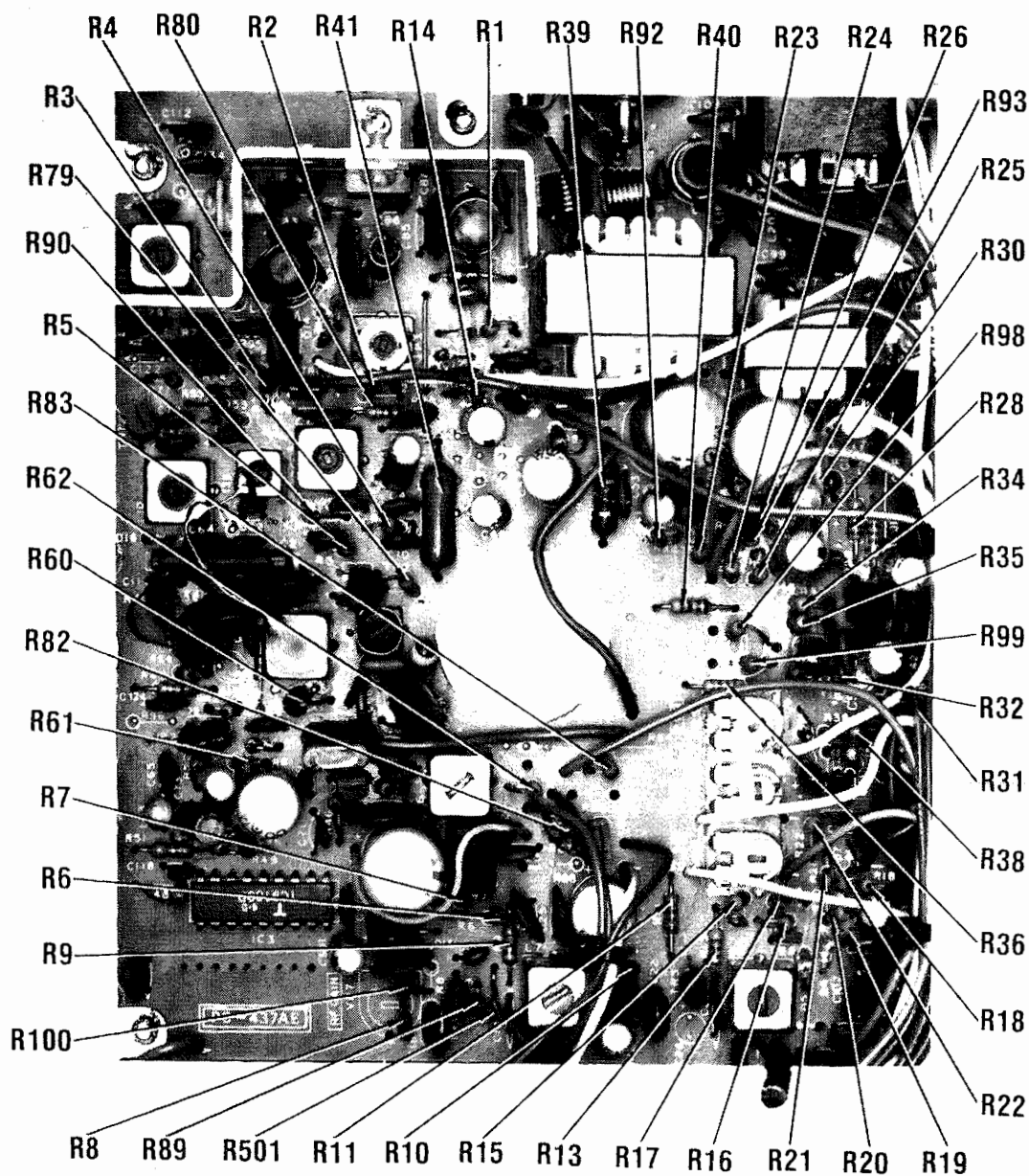
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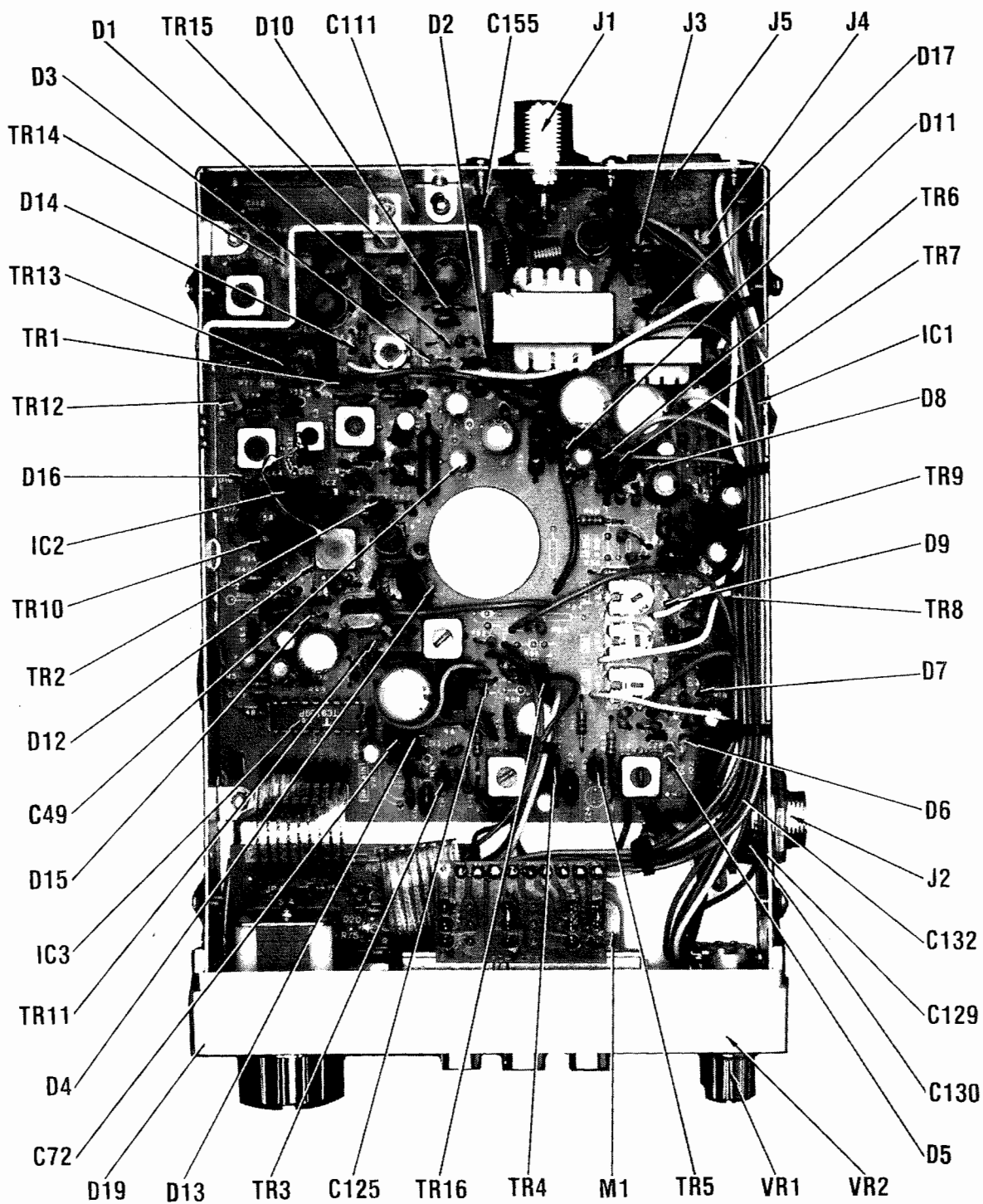
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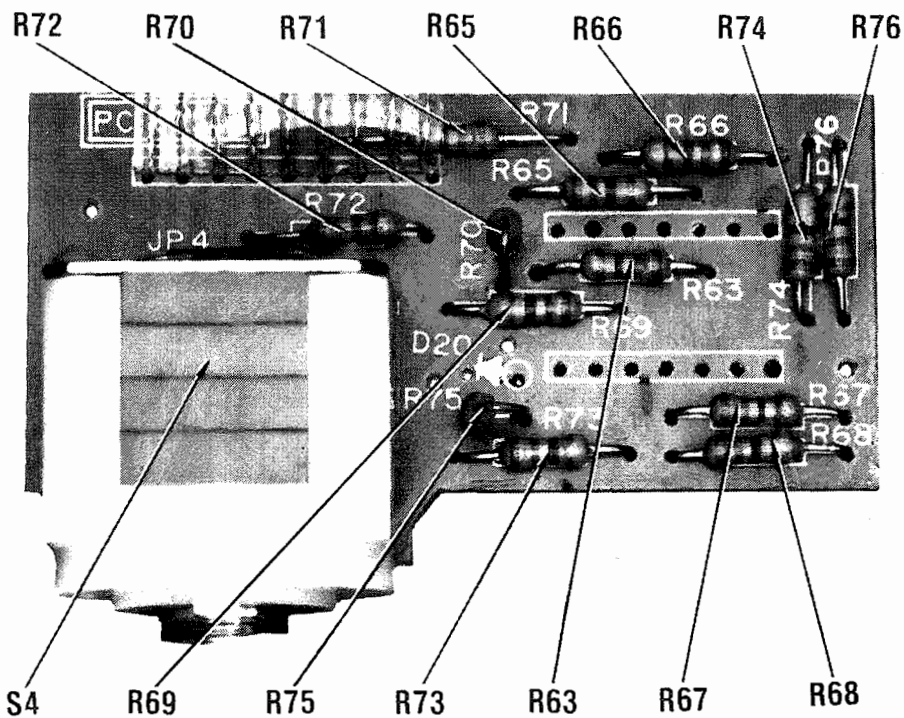
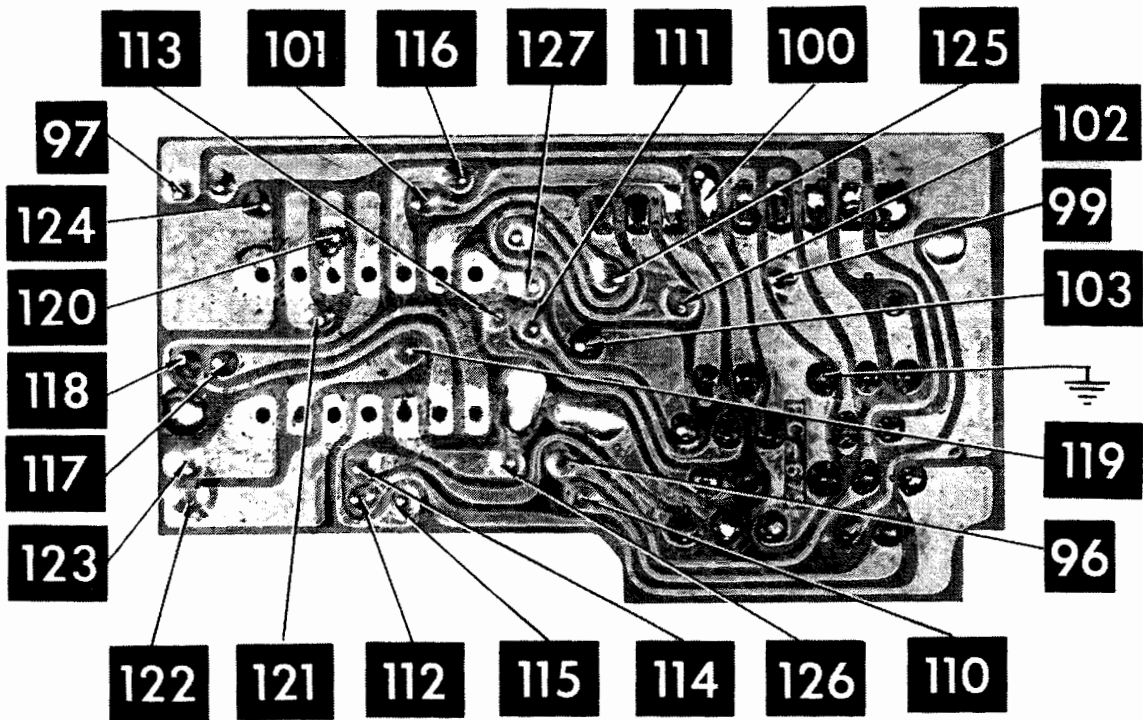
MAIN BOARD



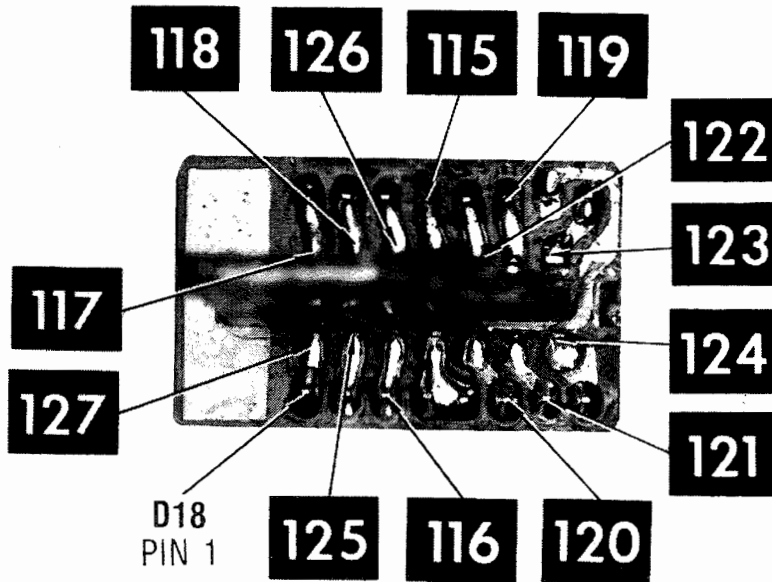
MAIN BOARD



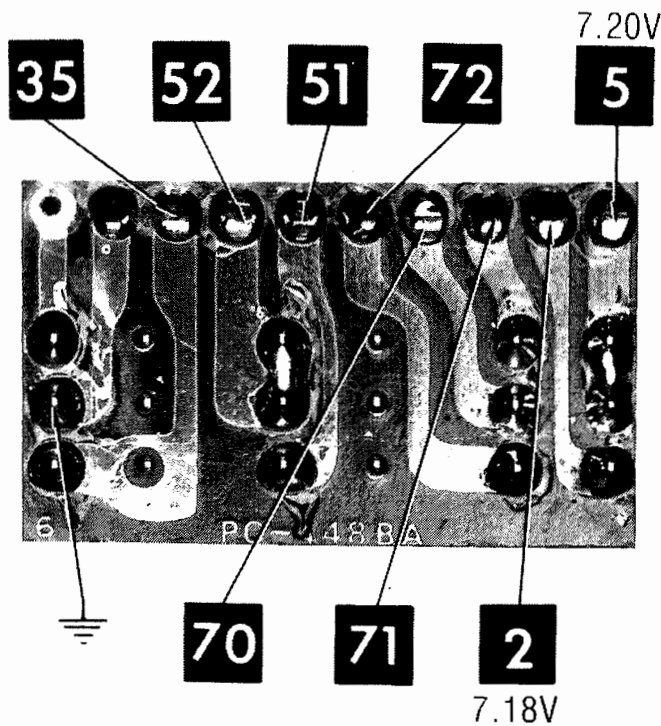
CHASSIS-BOTTOM



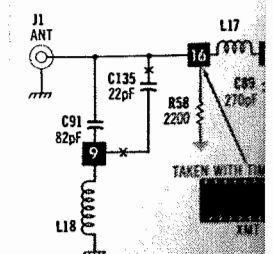
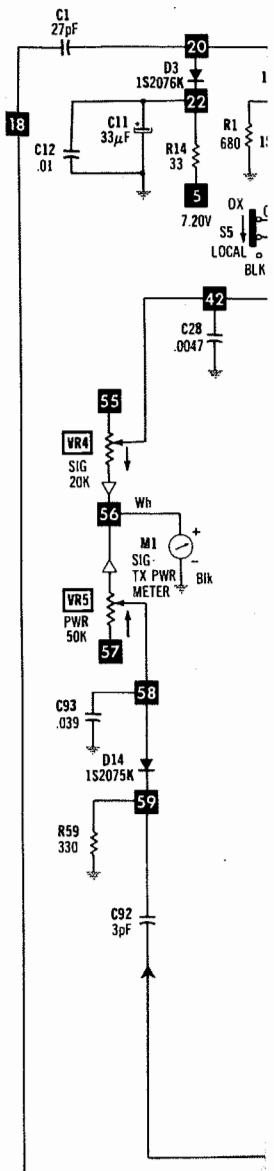
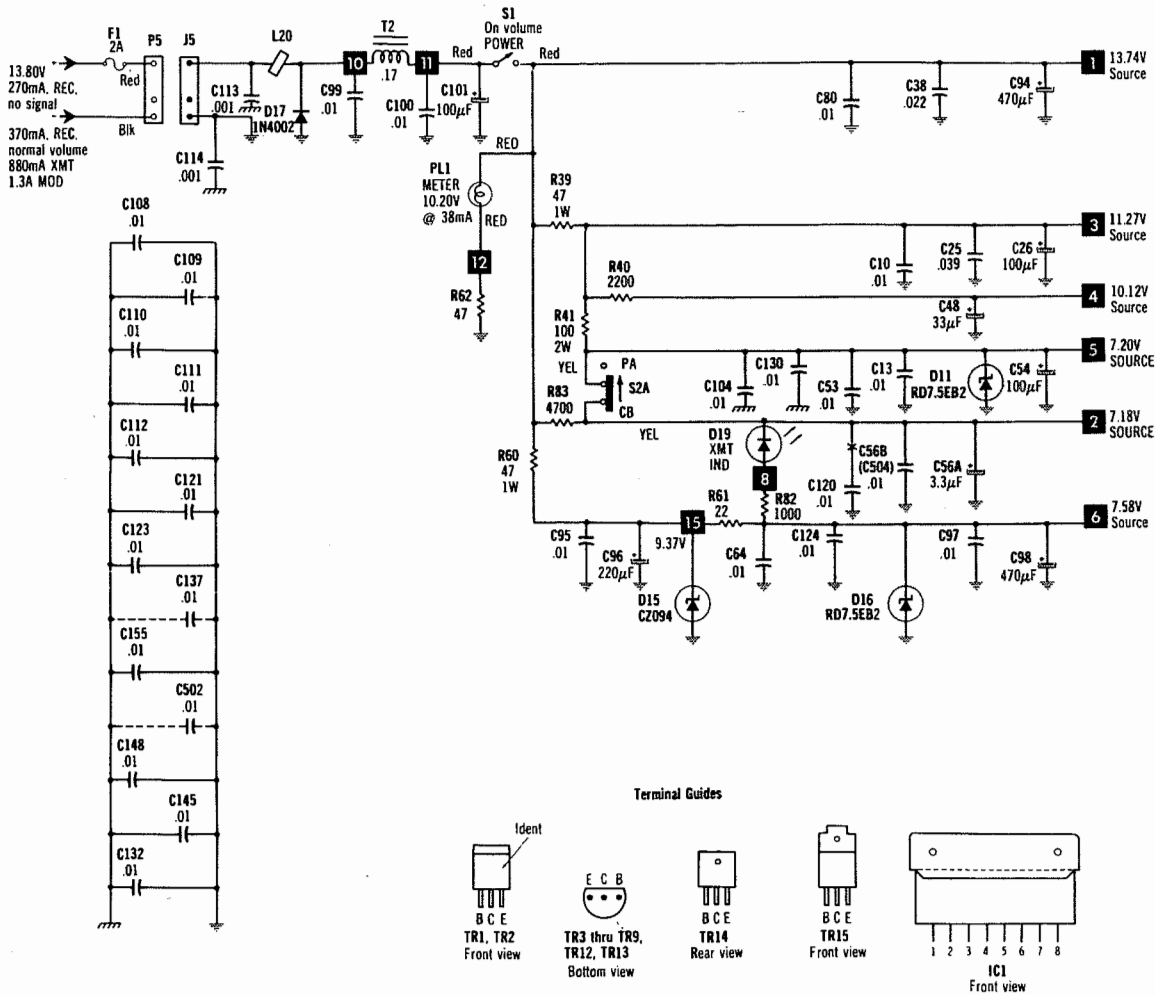
CHANNEL SELECTOR BOARD



CHANNEL INDICATOR BOARD



MODE SWITCH BOARD



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

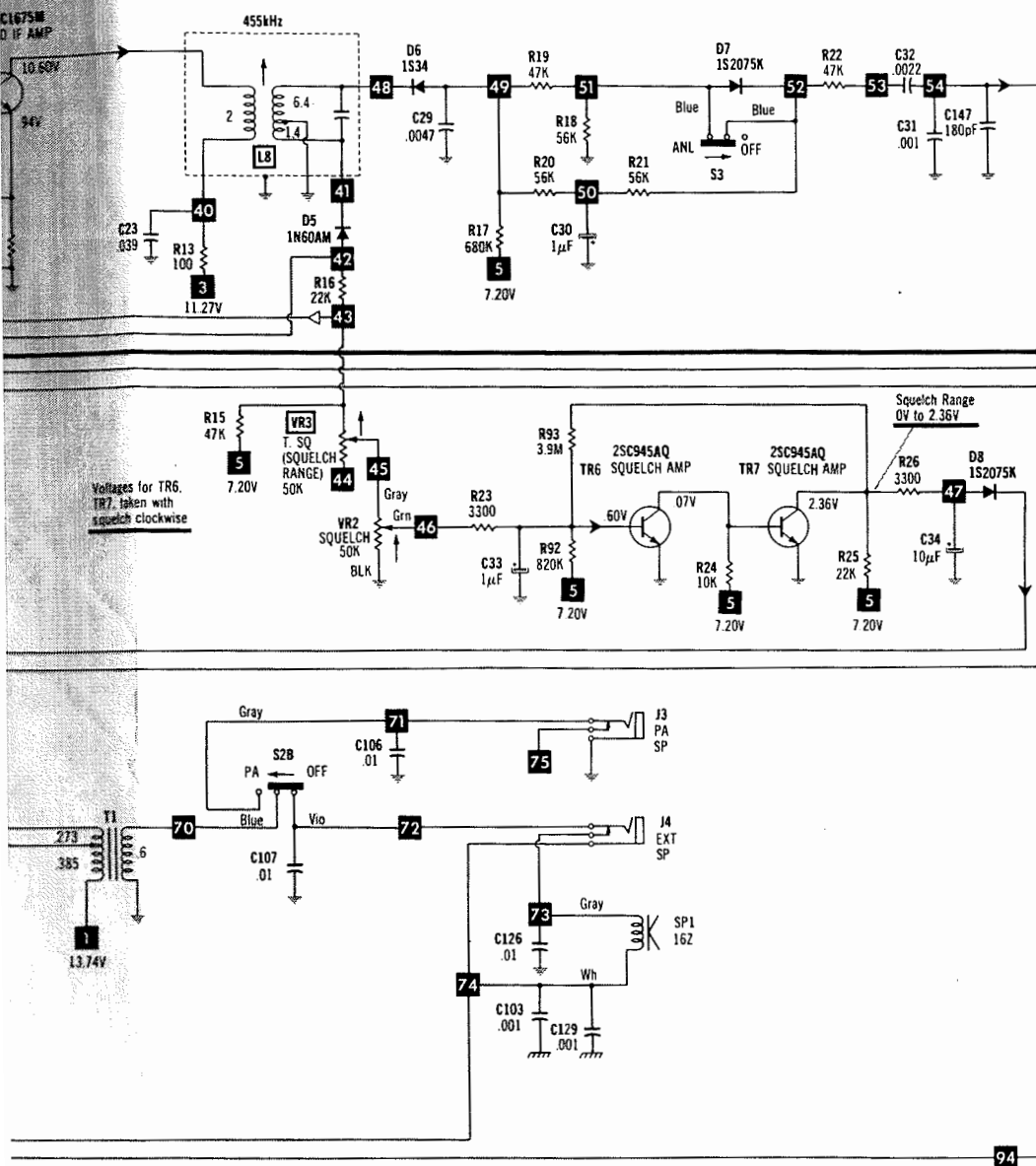
A PHOTOFACT STANDARD NOTATION SCHEMATIC

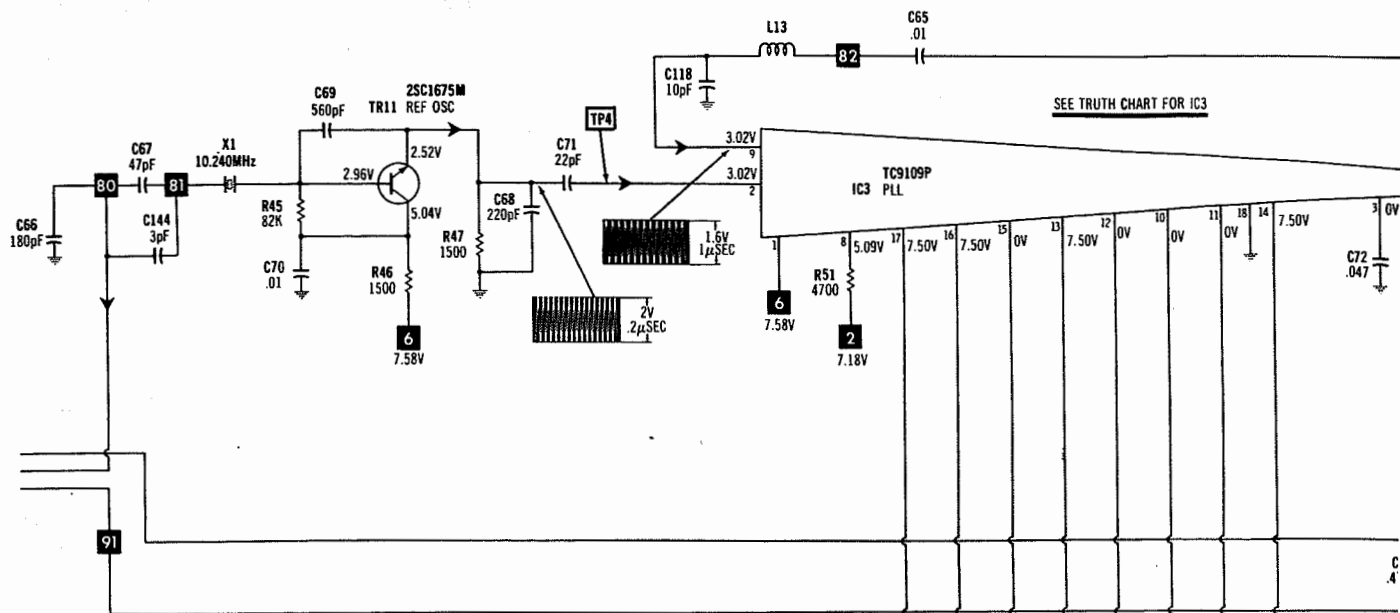
WITH **CIRCUITRACE™**

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MAIN SCHEMATIC







Terminal Guides

Ident

Ident

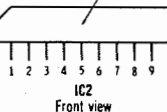
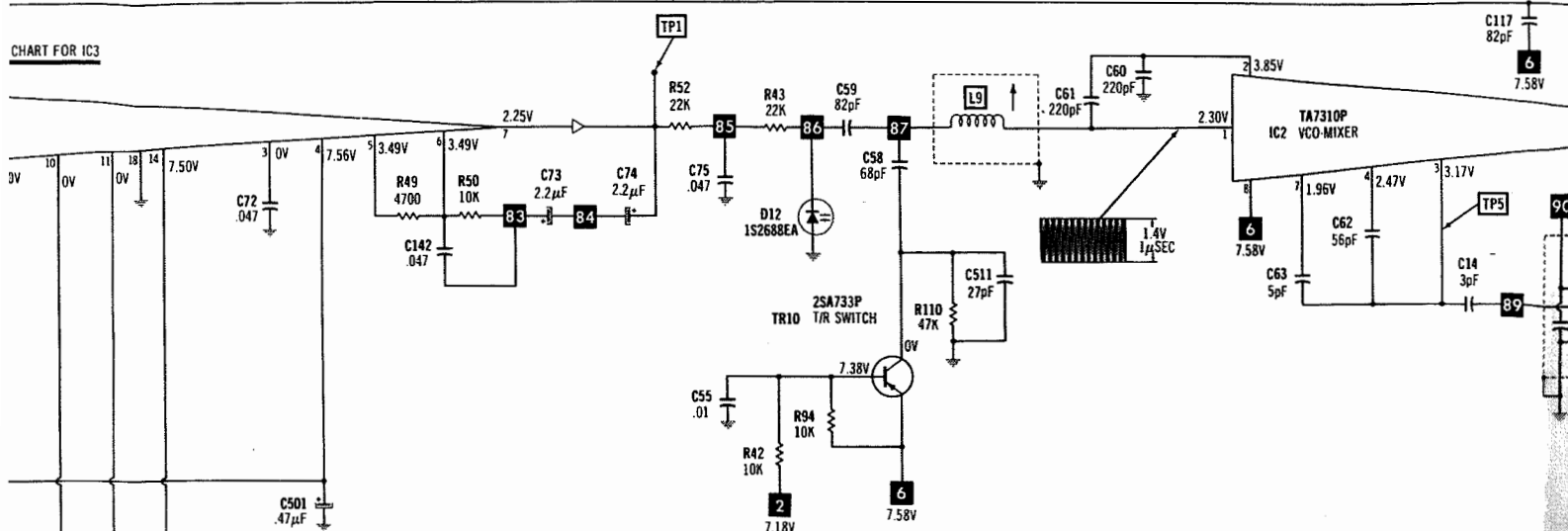
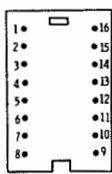


CHART FOR IC3



Terminal Guides



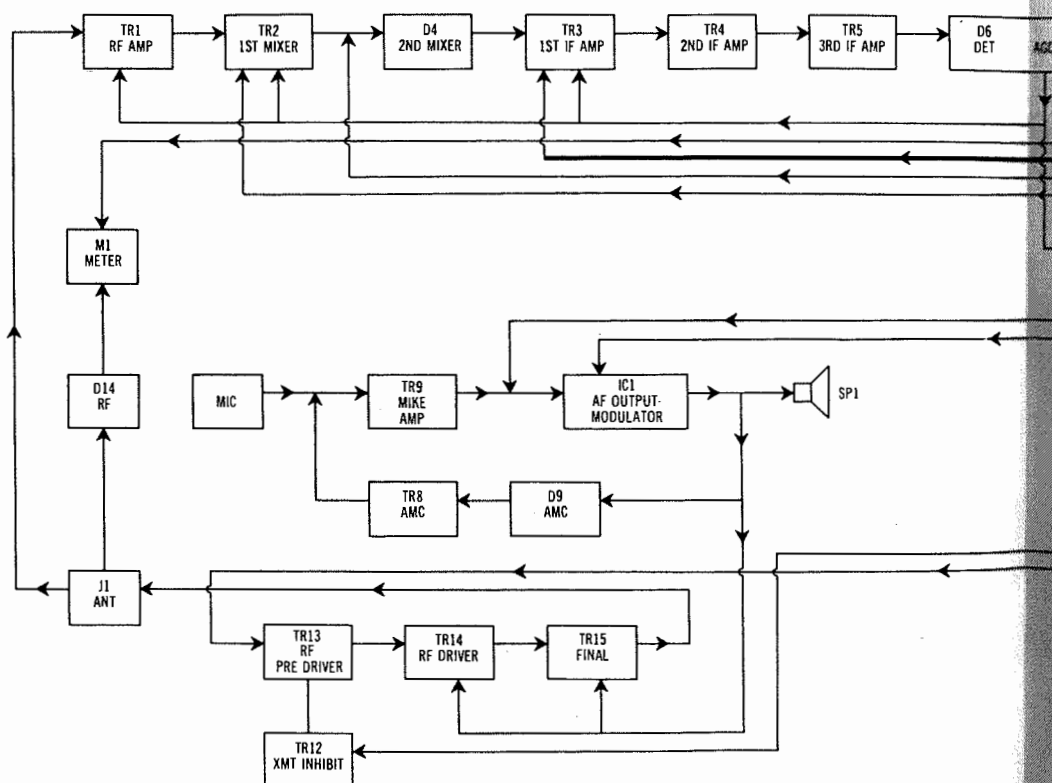
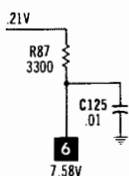
D18 REAR VIEW



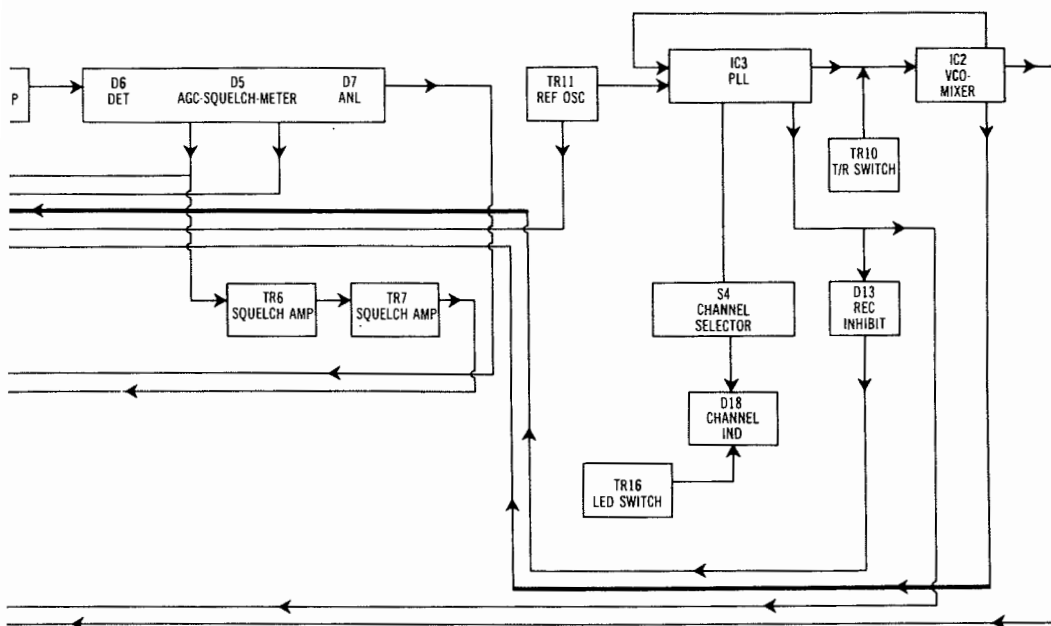
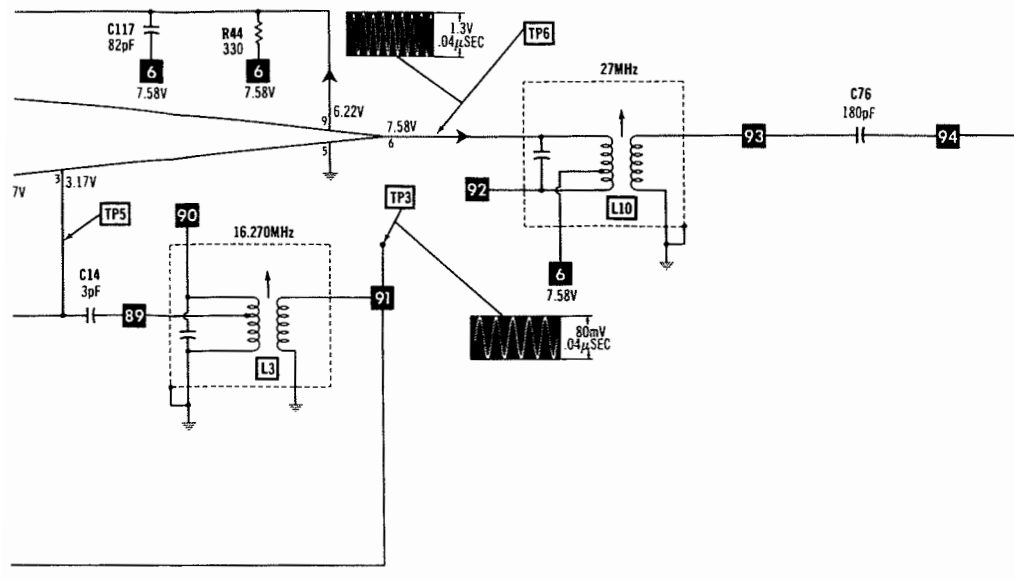
ECB TR16 FRONT VIEW

EACH SEGMENT OF D18 SUPPLIED 1.90V @ 7mA

2SC1957Q
16 SWITCH



BLOCK DIAGRAM



PARTS LIST AND DESCRIPTION

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

SEMICONDUCTORS (Select replacement transistor for best results)

ITEM No.	TYPE No.	MFR. PART No.	REPLACEMENT DATA							
			GENERAL ELECTRIC PART No.	MALLORY PART No.	RAYTHEON PART No.	RCA PART No.	SYLVANIA PART No.	THORDARSON PART No.	WORKMAN PART No.	ZENITH PART No.
D1	1S2075K	2000-303	GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062/177	103-131
D2	1S2075K	2000-303	GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062/177	103-131
D3	1S2075K	2000-303	GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062/177	103-131
D4	1N60AM	2000-301	1N60	PTC206	REN 109	SK3088	ECG109	TM109/**	WEP134/109	103-29001
D5	1N60AM	2000-301	1N60	PTC206	REN 109	SK3088	ECG109	TM109/**	WEP134/109	103-29001
D6	1S34	2000-346	1N34AS	PTC207	REN 109	SK3087	ECG109	TM109/**	WEP134/109	103-29001
D7	1S2075K	2000-303	GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062/177	103-131
D8	1S2075K	2000-303	GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062/177	103-131
D9	1S2075K	2000-303	GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062/177	103-131
D10	1N4003	2000-320	GE-504A	1N4003	REN 116	SK3312	ECG116	TM116	WEP156	212-76-02
D11	R07.5EB2	2000-311		ZM7.5B		SK3781/5015A	ECG5015A	TM5015	WEP1416/5015	103-29002
D12	1S2688EA	2000-344			REN 612	SK3325/612	ECG612	TM612	WEP156	103-176
D13	1S2075K	2000-303	GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062/177	103-131
D14	1S2075K	2000-303	GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062/177	103-131
D15	CZ094	2000-305		ZM9.1B		SK3784/5018A	ECG5018A	TM5018	WEP1419/5018	103-279-18
D16	R07.5EB2	2000-311		ZM7.5B		SK3781/5015A	ECG5015A	TM5015	WEP1416/5015	103-29002
D17	1N4003	2000-320	GE-504A	1N4003	REN 116	SK3312	ECG116	TM116	WEP156	212-76-02
IC1	MB3712	2000-037								
IC2	TA7310P	2000-017			REN 1192	SK3445/1192	ECG1192	TM1192	WEP2120/1192	221-29061
IC3	TC9109P	2000-038								
TR1	2SC1342B	2000-205	GE-61*	PTC132	REN 229*	SK3124/289	ECG229*	TM229*	WEP784	121-29021*
TR2	2SC1342B	2000-205	GE-61*	PTC132	REN 229*	SK3124/289	ECG229*	TM229*	WEP784	121-29021*
TR3	2SC1675M	2000-275	GE-213	PTC132*	REN 229*	SK3124/289	ECG229*	TM229*	WEP773	121-29021*
TR4	2SC1675M	2000-275	GE-213	PTC132*	REN 229*	SK3124/289	ECG229*	TM229*	WEP773	121-29021*
TR5	2SC1675M	2000-275	GE-213	PTC132*	REN 229*	SK3124/289	ECG229*	TM229*	WEP773	121-29021*
TR6	2SC945Q		GE-212	PTC121*	REN 199	SK3124/289	ECG199	TM199/**	WEP1945	121-972*
TR7	2SC945AQ	2000-258	GE-212	PTC121*	REN 199	SK3124/289	ECG199	TM199/**	WEP1945	121-972*
TR8	2SC945AQ	2000-258	GE-212	PTC121*	REN 199	SK3124/289	ECG199	TM199/**	WEP1945	121-972*
TR9	2SC945Q		GE-212	PTC121*	REN 199	SK3124/289	ECG199	TM199/**	WEP1945	121-972*
TR10	2SC945AQ	2000-258	GE-212	PTC121*	REN 199	SK3124/289	ECG199	TM199/**	WEP1945	121-972*
TR11	2SC945Q	2000-258	GE-212	PTC121*	REN 199	SK3124/289	ECG199	TM199/**	WEP1945	121-972*
TR12	2SC945AQ	2000-258	GE-212	PTC121*	REN 199	SK3124/289	ECG199	TM199/**	WEP1945	121-972*
TR13	2SC2076C	2000-206	GE-210	PTC121*	REN 295	SK3122	ECG295	TM295	WEP784	121-880
TR14	2SC2028B/20	2000-270	GE-270	PTC180	REN 295	SK3253/295	ECG295	TM295	WEP755/195A*	121-29066
TR15	2SC2029/1		GE-333	PTC186	REN 235	SK3197/235	ECG235	TM235	WEP785/235	121-29039
TR16	2SC2029B/10	2000-271	GE-333	PTC186	REN 235	SK3197/235	ECG235	TM235	WEP785/235	121-29039
	2SC1957Q		GE-270	PTC180	REN 295	SK3253/295	ECG295	TM295	WEP913/295	121-880
	2SC2028B/20	2000-270	GE-270	PTC180	REN 295	SK3253/295	ECG295	TM295	WEP755/195A*	121-29066

* 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.	
C5	10 16V	1800-306	PC10-25	VTT10B25	QV1-41	EV-1222
C11	33 16V	1800-307	PC30-25	VTT33D25	QV1-63	EV-1325
C21	4.7 25V	1800-304	PC5-50	VTT4R7B50	QV1-31	EV-1619.1
C26	100 16V	1800-312	PC100-16	VTT100E16	QV1-95	EV-1231
C30	1 50V	1800-302	PC1-50	VTT1A50	QV1-11	EV-1615
C33	1 50V	1800-302	PC1-50	VTT1A50	QV1-11	EV-1615
C34	10 16V	1800-306	PC10-25	VTT10B25	QV1-41	EV-1222
C36	2.2 25V	1800-302		TDC225M035FL	QDT1-37	SD35-2R29
C37	33 16V	1800-307	PC30-25	VTT33D25	QV1-63	EV-1325
C41	470 16V	1800-309	PC500-16	VTT470K16	QV1-151	EV-1251
C42	.47 50V	1800-301	PC1-50	VTT47A63	QV1-3	EV-1610
C45	33 10V	1800-323	PC30-25	VTT33B10		EV-1225
C48	33 16V	1800-307	PC30-25	VTT33D25	QV1-63	EV-1325
C49	1 50V	1800-302	PC1-50	VTT1A50	QV1-11	EV-1615
C50	4.7 16V	1800-616				
C51	33 10V	1800-323	PC30-25	VTT33B10		EV-1225
C54	100 10V	1800-310	PC100-10	VTT100D10	QV1-93	EV-1131
C56A	3.3 16V	1800-334	RLM4-50	VTT3R3A50	QV1-25	EV-1618.1
C73	2.2 25V	1800-303	PC2-100	VTT2R2A50	QV1-21	EV-1617.1
C74	2.2 25V	1800-303	PC2-100	VTT2R2A50	QV1-21	EV-1617.1
C94	470 16V	1800-309	PC500-16	VTT470K16	QV1-151	EV-1251
C96	220 10V	1800-325	PC250-10	VTT220H16	QE1-491*	TVA-1161*
C98	470 10V	1800-327	PC500-16	VTT470K16	QV1-151	EV-1251
C101	100 25V	1800-313	PC100-25	VTT100G25	QV1-97	EV-1331
C133	10 16V	1800-306	PC10-25	VTT10B25	QV1-41	EV-1222
C501	.47 50V	1800-301	PC1-50	VTT47A63	QV1-3	EV-1610

* Lead configuration may vary from original.

PARTS LIST AND DESCRIPTION (CONTINUED)

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

PARTS LI

(When ordering,

CAPACITORS

ITEM No.	RATING	MFGR. PART No.	REPLACEMENT DATA			
			CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
					Q-LINE	GENERAL LINE
C1	27 N220 50V 10%			*		10TCR-Q27
C2	.01 50V			MAG5011		
C3	.01 50V			MAG5011		
C4	.01 50V			MAG5011		
C5	.01 50V			MAG5011		
C6	.01 50V			MAG5011		
C7	.01 50V			MAG5011		
C8	.01 50V			MAG5011		
C9	.01 50V			MAG5011		
C10	.01 50V			MAG5011		
C11	.01 50V			MAG5011		
C12	.01 50V			MAG5011		
C13	.01 50V			MAG5011		
C14	3 50V	NP03P3		CN0533		10TCC-V33
C15	47 NPO 50V 10%	NP047		CN0447	QCC2-26	10TCC-Q47
C16	.039 25V			GP140		5GA-S40
C17	1 50V			CN0510		10TCC-V10
C18	.039 25V	DPMS6539		M192P3939R8	QFT2-159	1FT-S39
C19	.039 25V			GP140		5GA-S40
C20	.01 50V			MAG5011		
C21	.039 25V	DPMS6539		M192P3939R8	QFT2-159	1FT-S39
C22	.039 25V			GP140		5GA-S40
C23	.039 25V			GP140		5GA-S40
C24	.039 25V			GP140		5GA-S40
C25	.039 25V			GP140		5GA-S40
C26	.039 25V			GP140		5GA-S40
C27	.039 25V			GP140		5GA-S40
C28	.0047 50V	GP4700		GP247	QFT2-63	1FT-D47
C29	.0047 25V	WMF1047		M192P4729R8	QFT2-1	1FT-D10
C30	.001 25V	DPMS601		M192P10292	QFT2-27	1FT-D22
C31	.0022 25V	DPMS6222		M192P2229R8	QFT2-81	5GA-D10
C32	.001 50V	GP1000		GP210	QFT2-127	1FT-S22
C33	.022 25V	DPMS2522		M192P2239R8	QFT2-215	1FT-P10
C34	.1 25V	WMF1556		M192P1049R8	QFT2-1	1FT-D10
C35	.001 25V	DPMS601		M192P10292		
C36	.01 50V			MAG5011		
C37	.01 50V			MAG5011		
C38	.01 50V			MAG5011		
C39	.033 25V	DPMS6533		M192P3339R8	QFT2-149	1FT-S33
C40	.0047 25V	WMF1047		M192P4729R8	QFT2-63	1FT-D47
C41	.01 50V			MAG5011		
C42	.01 50V			MAG5011		
C43	.01 50V			MAG5011		
C44	.01 50V			MAG5011		
C45	.01 50V			MAG5011		
C46	.01 50V			MAG5011		
C47	.01 50V			MAG5011		
C48	.01 50V			MAG5011		
C49	.01 50V			MAG5011		
C50	.01 50V			MAG5011		
C51	.01 50V			MAG5011		
C52	.01 50V			MAG5011		
C53	.01 50V			MAG5011		
C54	.01 50V			MAG5011		
C55	.01 50V			MAG5011		
C56	.01 50V			MAG5011		
C57	.01 50V			MAG5011		
C58	.01 50V			MAG5011		
C59	.01 50V			MAG5011		
C60	.01 50V			MAG5011		
C61	.01 50V			MAG5011		
C62	.01 50V			MAG5011		
C63	.01 50V			MAG5011		
C64	.01 50V			MAG5011		
C65	.01 50V			MAG5011		
C66	.01 50V			MAG5011		
C67	.01 50V			MAG5011		
C68	.01 50V			MAG5011		
C69	.01 50V			MAG5011		
C70	.01 50V			MAG5011		
C71	.01 50V			MAG5011		
C72	.01 50V			MAG5011		
C73	.01 50V			MAG5011		
C74	.01 50V			MAG5011		
C75	.01 50V			MAG5011		
C76	.01 50V			MAG5011		
C77	.01 50V			MAG5011		
C78	.01 50V			MAG5011		
C79	.01 50V			MAG5011		
C80	.01 50V			MAG5011		
C81	.01 50V			MAG5011		
C82	.01 50V			MAG5011		
C83	.01 50V			MAG5011		
C84	.01 50V			MAG5011		
C85	.01 50V			MAG5011		
C86	.01 50V			MAG5011		
C87	.01 50V			MAG5011		
C88	.01 50V			MAG5011		
C89	.01 50V			MAG5011		
C90	.01 50V			MAG5011		
C91	.01 50V			MAG5011		
C92	.01 50V			MAG5011		
C93	.01 50V			MAG5011		
C94	.01 50V			MAG5011		
C95	.01 50V			MAG5011		
C96	.01 50V			MAG5011		
C97	.01 50V			MAG5011		
C98	.01 50V			MAG5011		
C99	.01 50V			MAG5011		
C100	.01 50V			MAG5011		
C101	.01 50V			MAG5011		
C102	.01 50V			MAG5011		
C103	.01 50V			MAG5011		
C104	.01 50V			MAG5011		
C105	.01 50V			MAG5011		
C106	.01 50V			MAG5011		
C107	.01 50V			MAG5011		
C108	.01 50V			MAG5011		
C109	.01 50V			MAG5011		
C110	.01 50V			MAG5011		
C111	.01 50V			MAG5011		
C112	.01 50V			MAG5011		
C113	.01 50V			MAG5011		
C114	.01 50V			MAG5011		
C115	.01 50V			MAG5011		
C116	.01 50V			MAG5011		
C117	.01 50V			MAG5011		
C118	.01 50V			MAG5011		

CAPACIT

ITEM No.	
C120	.01
C121	.01
C122	.01
C123	.01
C124	.01
C125	.01
C126	.01
C127	.01
C128	.01
C129	.01
C130	.01
C131	.01
C132	.01
C133	.01
C134	.01
C135	.01
C136	.01
C137	.01
C138	.01
C139	.01
C140	.01
C141	.01
C142	.01
C143	.01
C144	.01
C145	.01
C146	.01
C147	.01
C148	.01
C149	.01
C150	.01
C151	.01
C152	.01
C153	.01
C154	.01
C155	.01
C156	.01
C157	.01
C158	.01
C159	.01
C160	.01
C161	.01
C162	.01
C163	.01
C164	.01
C165	.01
C166	.01
C167	.01
C168	.01
C169	.01
C170	.01
C171	.01
C172	.01
C173	.01
C174	.01
C175	.01
C176	.01
C177	.01
C178	.01
C179	.01
C180	.01
C181	.01
C182	.01
C183	.01
C184	.01
C185	.01
C186	.01
C187	.01
C188	.01
C189	.01
C190	.01
C191	.01
C192	.01
C193	.01
C194	.01
C195	.01
C196	.01
C197	.01
C198	.01
C199	.01
C200	.01

* Not normal

CONTR

ITEM No.	
VR1	Vol
VR2	Squ
VR3	T S
VR4	Stg
VR5	Pos

COILS (

ITEM No.	
L1	Rec
L2	Rec
L3	Mixe
L4	Rec
L5	RF C
L6	IF C
L7	IF C
L8	IF C
L9	VCO
L10	VCO
L11	RF P
L12	RF D
L13	RF C
L14	RF C
L15	Fin
L16	Pi F
L17	XMT
L18	TVI

PARTS LIST AND DESCRIPTION (CONTINUED)

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

CAPACITORS (cont)

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA			
			CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
					Q-LINE	GENERAL LINE
C120	.01 50V			MAG5011		
C121	.01 50V			MAG5011		
C123	.01 50V			MAG5011		
C124	.01 50V			MAG5011		
C125	.01 50V			MAG5011		
C126	.01 50V			MAG5011		
C127	.01 50V			MAG5011		
C129	.001 50V		GP1000	GP210	QC2-81	5GA-D10
C130	.01 50V			MAG5011		
C131	.01 50V			MAG5011		
C132	.01 50V			MAG5011		
C134	330 50V 10%		GP330	GP333	QCT2-33	10TS-T33
C135	22		NPO22	CN0422		10TCC-Q22
C142	.047 25V		DPMS2547	MT92P4739R8	QFT2-171	1FT-S47
C144	3 N220 50V			*		10TCR-V30
C145	.01 50V			MAG5011		
C146	.01 50V			MAG5011		
C147	180 50V 10%			GP318	QCT2-27	10TS-T18
C148	.01 50V			MAG5011		
C155	.01 50V			MAG5011		
C503	330 50V 10%		GP330	GP333	QCT2-33	10TS-T33
C505	.068 25V		WMF1S68	EFW1A168	QF1-195	1PB-S68
C511	27 N220 50V 5%			*		10TCR-Q27

* 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	RESISTANCE	REPLACEMENT DATA		
			MFR. PART No.	MALLORY PART No.	TRW PART No.
VR1	Volume/Power Switch	50K	1900-136		
VR2	Squelch	50K	1900-129		
VR3	T Sq (Squelch Range)	100K	1900-211	RVA0911H104	U260R1048
VR4	Sig	20K	1900-204	RVA0911H253	U260R2538
VR5	Power	50K	1900-202	RVA0911H503	U260R5038

COILS (RF-IF)

ITEM No.	FUNCTION	REPLACEMENT DATA			REMARKS
		PART No.	OTHER IDENTIFICATION	MILLER PART No.	
L1	Rec Antenna (27MHz)	2200-504	LA-279	CBS740-T	
L2	Rec RF (27MHz)	2200-084	LA-088	CBS717-TC	
L3	Mixer (16.270MHz)	2200-547	LB-127		
L4	Rec Mixer (10.695MHz)	2200-507	LB-119		
L5	RF Choke (10uH)	2200-205			
L6	IF (455kHz)	2200-508	LA-281		
L7	IF (455kHz)	2200-048	LA-204		
L8	IF (455kHz)	2200-091	LA-207		
L9	VCO	2200-546	LA-307		
L10	VCO Mixer (27MHz)	2200-510	LA-283		
L11	RF Predriver (27MHz)	2200-085	LA-208		
L12	RF Driver (27MHz)	2200-020	LC-072		
L13	RF Choke (4.7uH)	2200-208			
L14	RF Choke	2200-017	LO-033		
L15	Final (27MHz)	2200-034	LC-073		
L16	Pi Filter	2200-088	LE-092		
L17	XMT Antenna	2200-087	LE-093		
L18	TVI Trap	2200-020	LC-130		

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.	
T2	1.3A	.17	.85mH	2300-001			

TRANSFORMER (Audio Output)

ITEM No.	IMPEDANCE		REPLACEMENT DATA			NOTES
	PRI.	SEC.	MFGR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T1	6.25	16	2600-013			
		SEC 2				
		30				

SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		MFGR. PART No.	QUAM PART No.	
SP1	3" PM, 16 Ohms	3100-009		

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	2A Quick-Acting	2800-001		AGC2	HRK	312002	150145	F62-2

PRESIDENT MODEL AR-14

PARTS LIST AND DESCRIPTION (CONTINUED)

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

MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
D18	LED	2000-303	Channel Display (1.90V @ 7mA)
D19	LED	2000-347	XMT Ind
FL1	Filter	2200-301	10.695MHz
FL2	Filter	2200-302	455kHz
J1	Jack	1100-002	Antenna
J2	Jack	1100-007	Mic
J3	Jack	1100-021	PA Speaker
J4	Jack	1100-021	External Speaker
J5	Jack	1100-003	Power
L19	Ferrite Bead	2200-052	
L20	Ferrite Bead	2200-101	
Mic	Microphone	3200-005	
M1	Meter	2900-001	Sig-TX Power
PL1	Lamp		Meter
P2	Plug		Mic
P5	Plug		Power
S1	Switch		On/Off (On Volume)
S2	Switch	3000-005	PA/CB
S3	Switch	3000-005	ANL/Off
S4	Switch	3000-124	Channel Select
S5	Switch	3000-005	Local/DX
X1	Crystal	2100-013	10.240MHz
	Printed Circuit Board	3500-060	Channel Switch
	Printed Circuit Board	3500-061	Pushbutton Switch
	Printed Circuit Board	3500-047	LED
	Printed Circuit Board	3500-048	Mic Jack
	Cord	2700-001	DC Power

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

ITEM	PART No.	ITEM	PART No.
Cover, Top	3300-107	Knob, Squelch/On-Off-Volume	1300-007
Cover, Bottom	3300-108	Pushbutton, PA-CB/ANL-Off/Local-DX	1300-003
Panel, Front	3300-525	Hanger, Microphone	3300-401
Knob, Channel Select	1300-006		

WIRING DATA

Cable (Speaker)(Unshielded).....	Use BELDEN No. 8782 (AWG24)(4 colors)
Shielding Strap.....	Use BELDEN No. 8660 (3/16" width)
Hook-up Wire (General Use).....	Use BELDEN No. 8524 (AWG22)(13 colors)
Hook-up Wire (Shielded).....	Use BELDEN No. 8401 (Braided Shield)(1 conductor)(AWG25)
	Use BELDEN No. 8421 (Spiral Shield)(1 conductor)(AWG25)
	Use BELDEN No. 8737 (Spiral Shield)(2 conductor)(AWG22)
Microphone Cable (Coiled)	Use BELDEN No. 8497 (3 conductor-1 shielded)(6 ft.)(AWG22)
Microphone Cable (Coiled)	Use BELDEN No. 9466 (3 conductor-1 shielded)(6 ft.)(AWG28)
Microphone Cable (Coiled)	Use BELDEN No. 946B (3 conductor-1 shielded)(6 ft.)(AWG31)

PRESIDENT MODEL AR-14



PHOTOFACT[®] with CIRCUITRACE[®]

For Supplier Address See PHOTOFACT Index

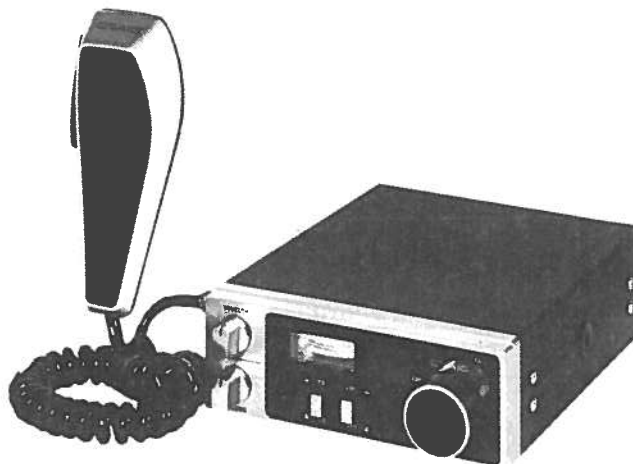
NOTE

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 L103

MANUFACTURER'S SPECIFICATIONS

RECEIVER

SENSITIVITY	0.4 μ V for 10 dB (S+N)/N
BANDWIDTH	7 KHz @ -6.0 dB
AGC	Charge in audio output less than 10 dB from 10 μ V to 1.0 V
SQUELCH	Adjustable; Threshold, less than 0.5 μ V. Tight, more than 250 μ V
POWER OUTPUT	4.0 W at 10 % THD
IMAGE REJECTION	Better than 90 dB
IF REJECTION	Better than 60 dB
ADJACENT CHANNEL REJECTION	Better than 60 dB
IF FREQUENCY	10.695 MHz

TRANSMITTER

RF POWER OUTPUT	4.0 W
SPURIOUS ATTENUATION	60 dB minimum
OUTPUT IMPEDANCE	50 ohm

GENERAL

CHANNELS	40 AM
FREQUENCY RANGE	26.965 to 27.405 MHz
FREQUENCY TOLERANCE	0.005 % from -30 C to 50 C
FREQUENCY STABILITY	+0.001%
MICROPHONE	Dynamic
POWER SOURCE	13.8 Vdc, pos. or neg. ground
CURRENT DRAIN; RECEIVE:	0.7 A at max. audio output 0.3 A at standby
TRANSMIT	1.5 A

P.A. SYSTEM

POWER OUTPUT	4.0 W
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CRAIG MODEL L103

Courtesy of the Manufacturer

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

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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 thru L4, L9, L10, L12 9440
L6, L7, L8 5000, 5009, 8276, 8728, 8728A, 9089
L13, L16 9440, 8728, 8728A

SYNTHESIZER ALIGNMENT

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Input of frequency counter to TP2 (TR9 Emitter).	Ch. 19		Check for 10.240MHz.
Input of DC voltmeter to TP1 (Junction of R51 and R52).	Ch. 1	L9	Adjust for 1.36 volts. Check for approximately 2.37 volts on channel 40.
Input of DC voltmeter to TP1 (Junction of R51 and R52).	Ch. 1, XMT		Check for 1.33 volts. Check for 3.11 volts on channel 40.

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.
Squelch MINIMUM, ANL Off, CB-PA in CB.

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Output of signal generator thru .01uF capacitor to TP3 (D4 anode). 455kHz, 1000Hz @ 30% modulation.	Ch. 19	L8, L7, L6	Adjust for maximum audio output.
Output of signal generator to antenna input. 27.185MHz, 1000Hz @ 30% modulation	Ch. 19	L4, L3, L2, L1	Adjust for maximum audio output. Readjust L6, L7 and L8 for maximum.

RECEIVER ADJUSTMENTS

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

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Output of signal generator to antenna input. 27.185MHz, 1000Hz @ 30% modulation Output 300uV.	Ch. 19 Squelch Maximum	VR1	SQUELCH RANGE Adjust so squelch just breaks.
Output of signal generator to antenna input. 27.185MHz, 1000Hz @ 30% modulation Output 100uV.	Ch. 19	VR2	S METER Adjust for 9 on SIG scale of meter.

TRANSMITTER ALIGNMENT

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

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

See page 4 for channel frequencies.

SSB

TEST EQUIPMENT	TRANSCIVER	ADJUST	REMARKS
Input of RF wattmeter to antenna input.	Ch. 19, XMT	L10, L12, L13 L16	Adjust for maximum RF
Input of RF wattmeter to antenna input.	Ch. 19, XMT	L16	Adjust for 4.0 watts RF output maximum.

TRANSMITTER ADJUSTMENTS

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

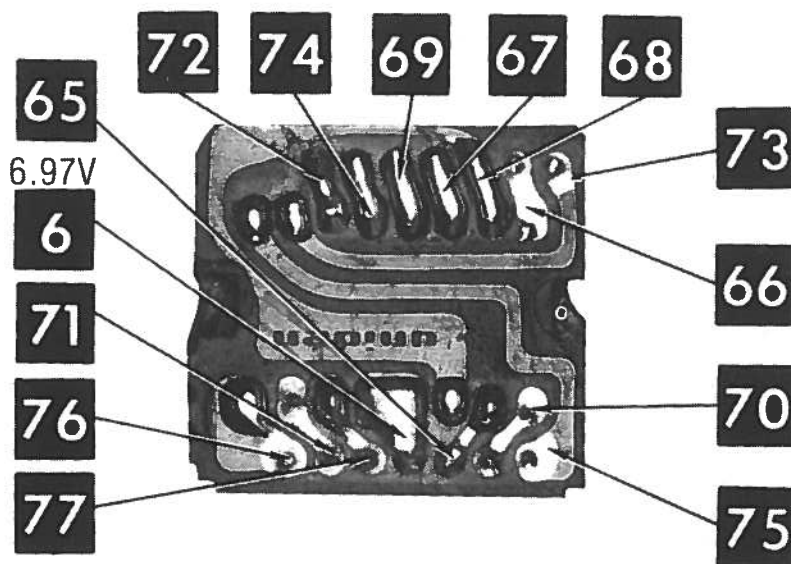
NOTE: Be sure to check transmit frequency and power on all active channels after adjustment of transmitter.

See page 4 for channel frequencies.

TEST EQUIPMENT	TRANSCIVER	ADJUST	REMARKS
Input of RF wattmeter to antenna input.	Ch. 19, XMT	VR3	RF POWER METER Adjust so TX PWR meter agrees with RF wattmeter.

CRAIG MODEL L103

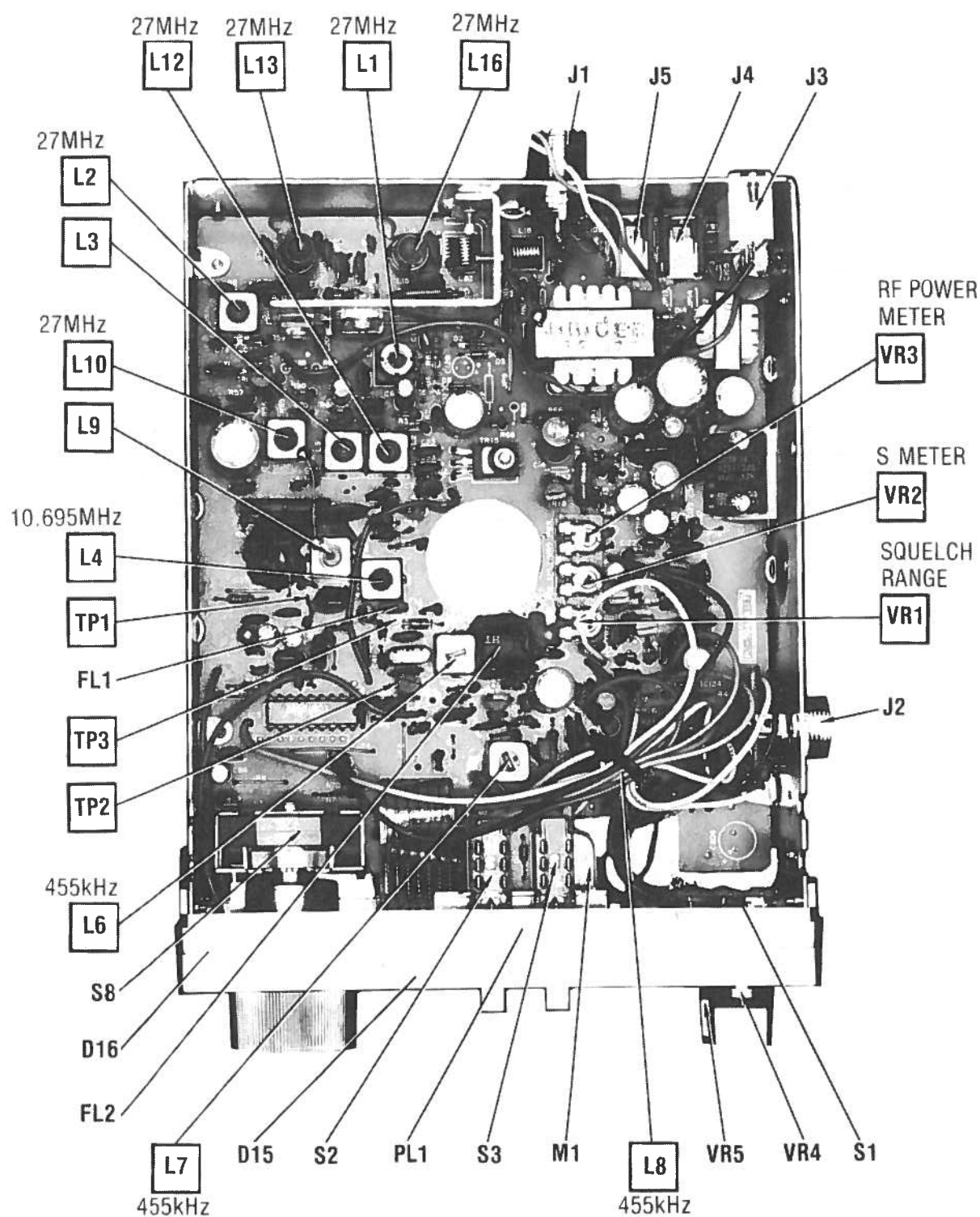
A Howard W. Sams **CIRCUITRACE** Photo



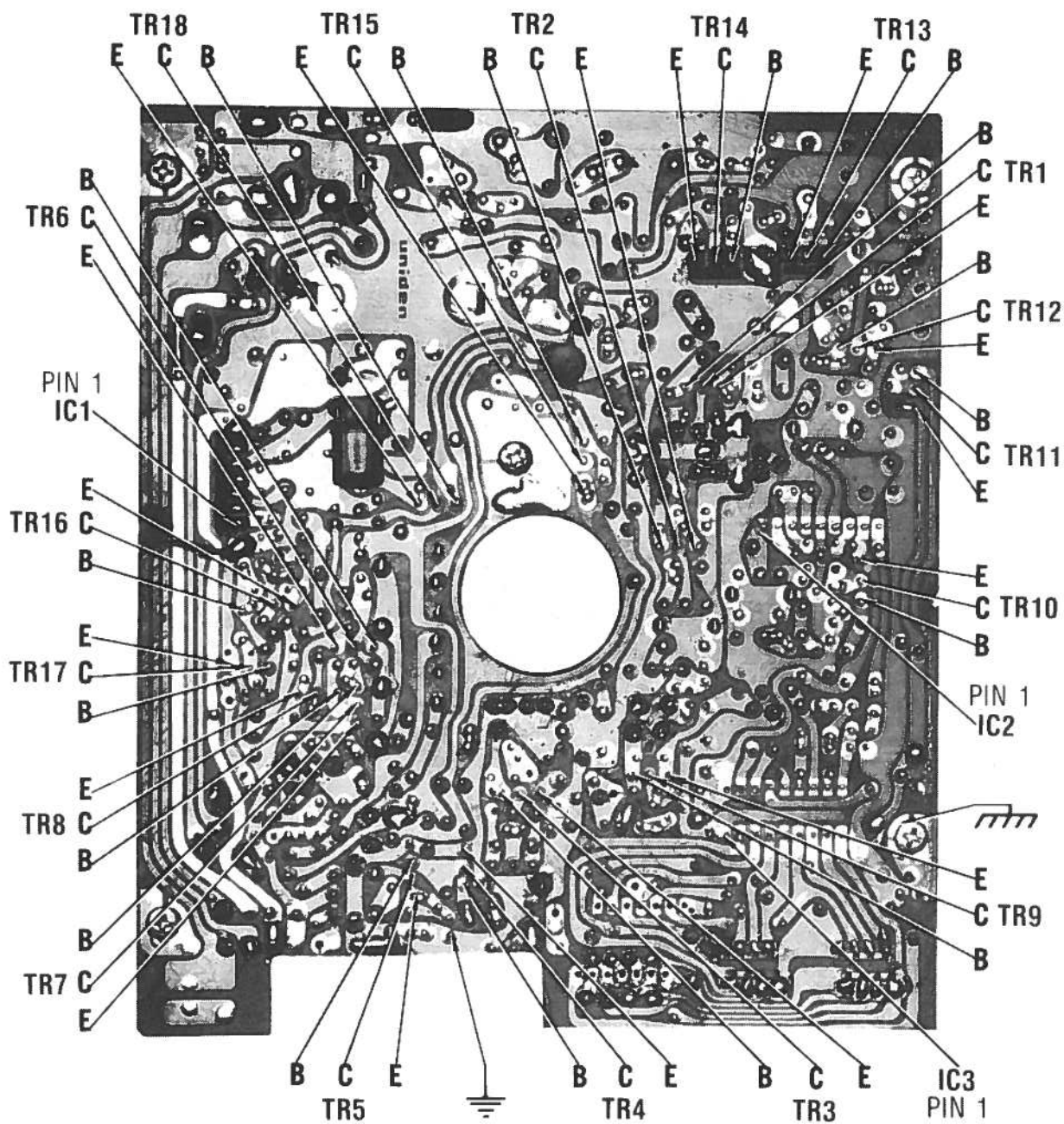
READOUT DISPLAY BOARD

TRUTH CHART

CHANNEL	1 = 6.91 Volts 0 = 0 Volts								REC VCO OUTPUT IN MHz AT IC2 Pin 1	XMT VCO OUTPUT IN MHz AT IC2 Pin 1	VCO OUTPUT IN MHz AT
	PROGRAM DIVIDER										
	IC3 PINS										
	17	16	15	14	13	12	11	10			
1	1	1	1	1	1	1	1	1	16.270	13.4825	
2	1	1	1	0	0	0	0	1	16.280	13.4875	
3	1	1	1	0	1	0	0	1	16.290	13.4925	
4	1	1	1	1	1	0	1	0	16.310	13.5025	
5	1	1	1	0	1	0	0	0	16.320	13.5075	
6	1	1	1	0	0	0	1	0	16.330	13.5125	
7	1	1	1	1	1	1	0	1	16.340	13.5175	
8	1	1	1	0	0	0	0	0	16.360	13.5275	
9	1	1	1	1	1	0	0	0	16.370	13.5325	
10	1	1	0	0	0	1	0	0	16.380	13.5375	
11	1	1	0	1	1	1	1	1	16.390	13.5425	
12	1	1	0	0	0	0	0	1	16.410	13.5525	
13	1	1	0	0	1	0	0	1	16.420	13.5575	
14	1	1	0	1	1	0	1	0	16.430	13.5625	
15	1	1	0	0	1	0	0	0	16.440	13.5675	
16	1	1	0	0	0	0	1	0	16.460	13.5775	
17	1	1	0	1	1	1	0	1	16.470	13.5825	
18	1	1	0	0	0	0	0	0	16.480	13.5875	
19	1	1	0	1	1	0	0	0	16.490	13.5925	
20	1	0	1	0	0	1	0	0	16.510	13.6025	
21	1	0	1	1	1	1	1	1	16.520	13.6075	
22	1	0	1	0	0	0	0	1	16.530	13.6125	
23	1	0	1	0	1	0	0	1	16.560	13.6275	
24	1	0	1	1	1	0	1	0	16.540	13.6175	
25	1	0	1	0	1	0	0	0	16.550	13.6225	
26	1	0	1	0	0	0	1	0	16.570	13.6325	
27	1	0	1	1	1	1	0	1	16.580	13.6375	
28	1	0	1	0	0	0	0	0	16.590	13.6425	
29	1	0	1	1	1	0	0	0	16.600	13.6475	
30	1	0	0	0	0	1	0	0	16.610	13.6525	
31	1	0	0	1	1	1	1	1	16.620	13.6575	
32	1	0	0	0	0	0	0	1	16.630	13.6625	
33	1	0	0	0	1	0	0	1	16.640	13.6675	
34	1	0	0	1	1	0	1	0	16.650	13.6725	
35	1	0	0	0	1	0	0	0	16.660	13.6775	
36	1	0	0	0	0	0	1	0	16.670	13.6825	
37	1	0	0	1	1	1	0	1	16.680	13.6875	
38	1	0	0	0	0	0	0	0	16.690	13.6925	
39	1	0	0	1	1	0	0	0	16.700	13.6975	
40	0	1	0	0	0	1	0	0	16.710	13.7025	

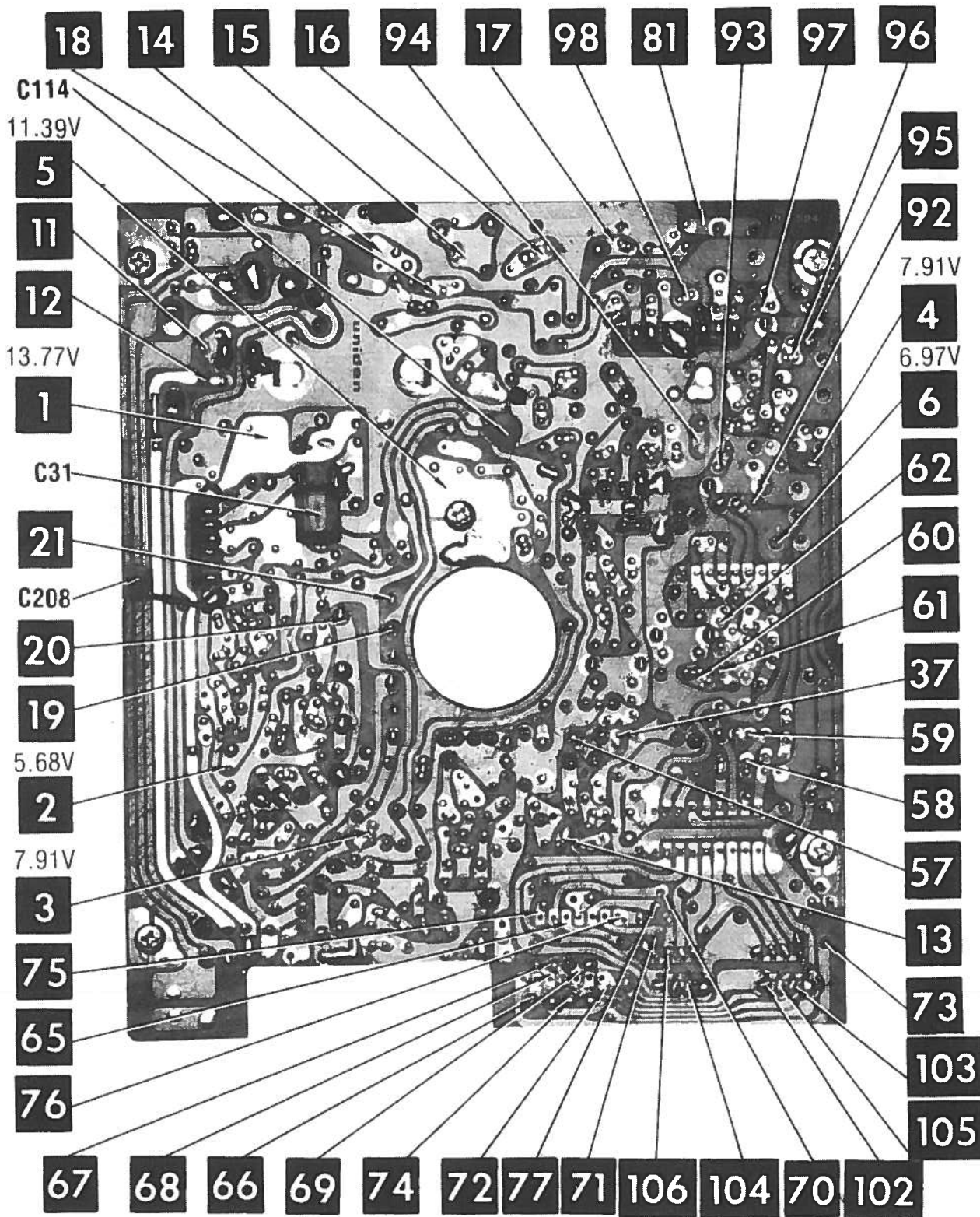


CHASSIS-OVERALL

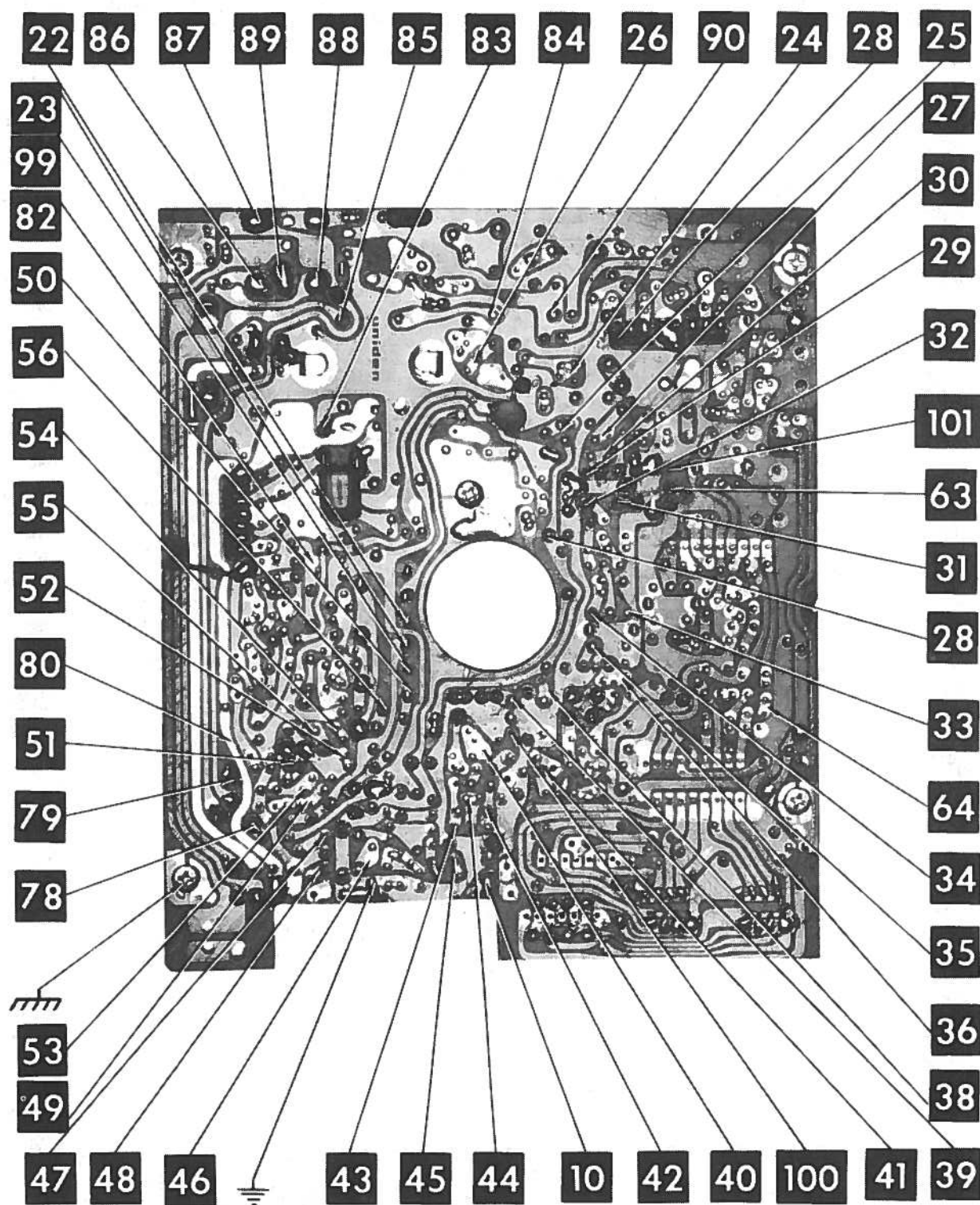


MAIN BOARD

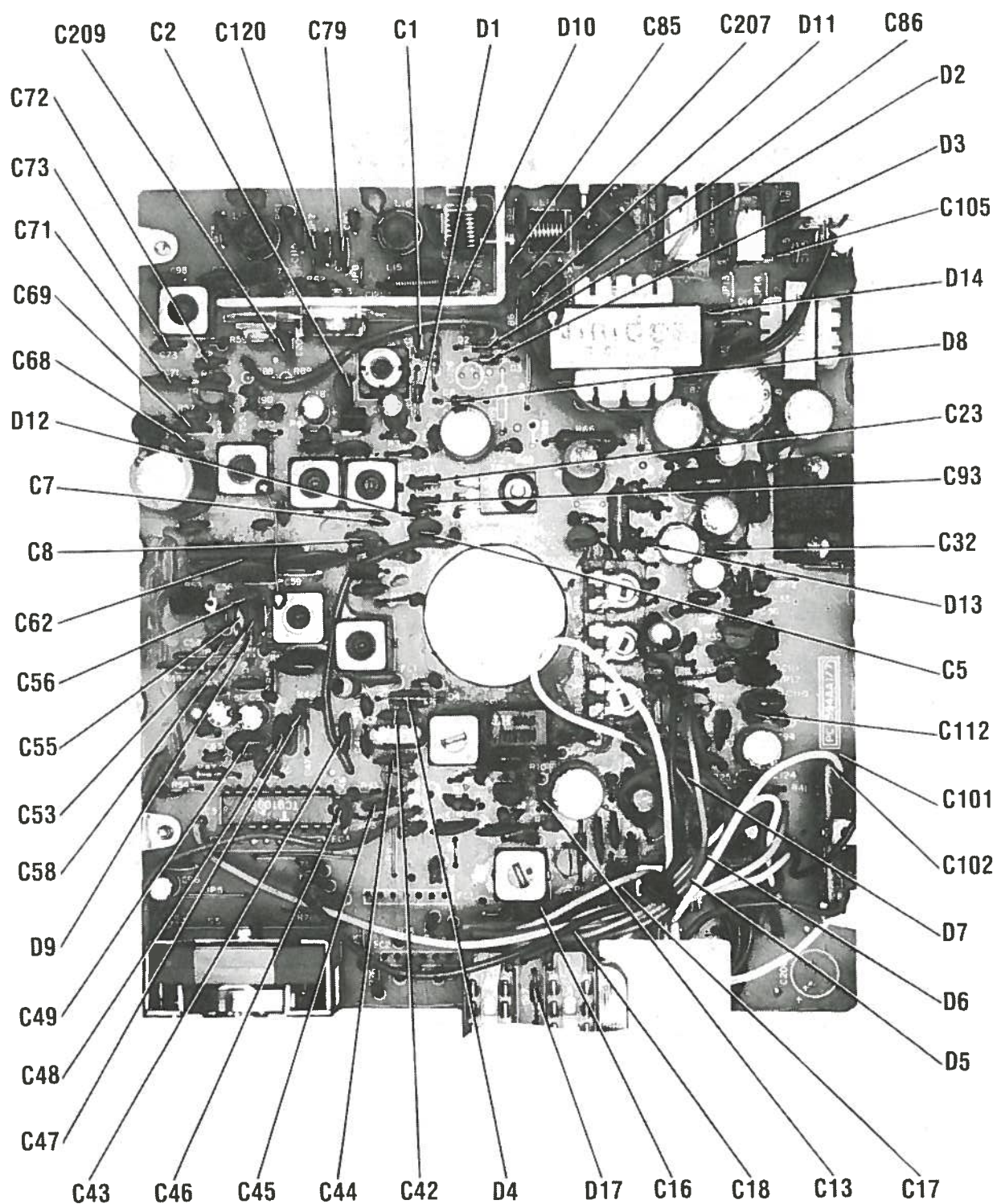
CRAIG MODEL L103



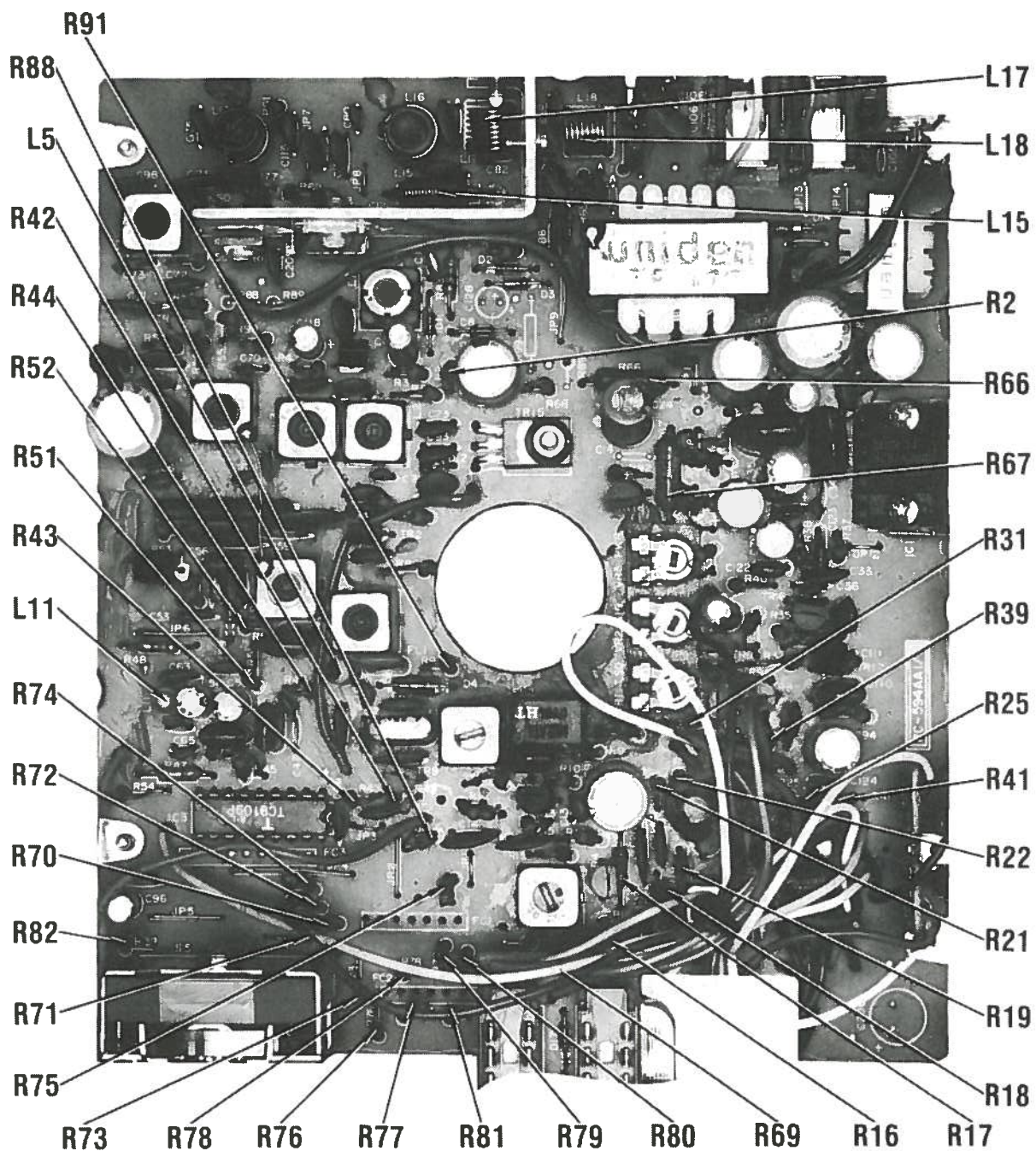
MAIN BOARD



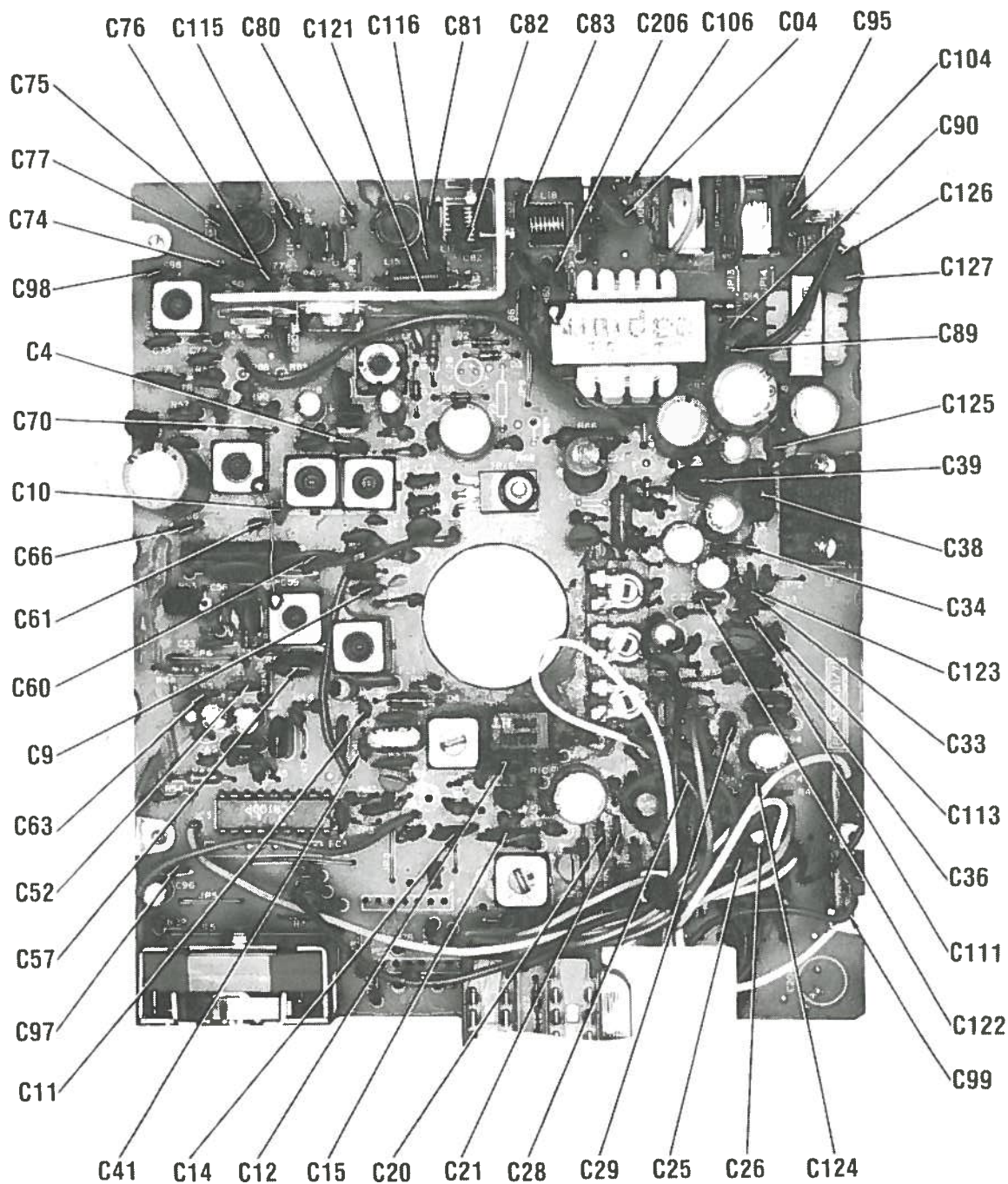
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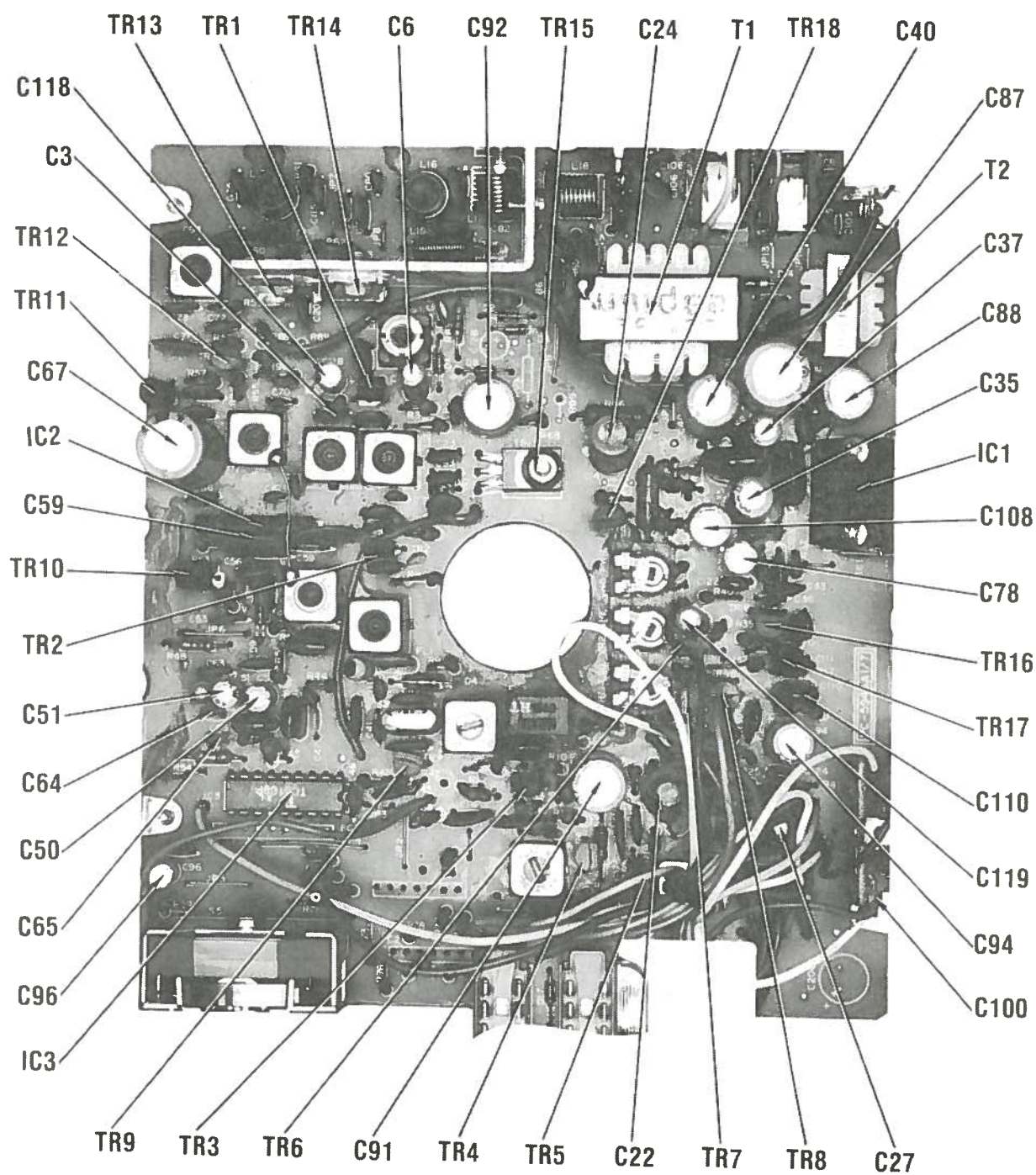
MAIN BOARD



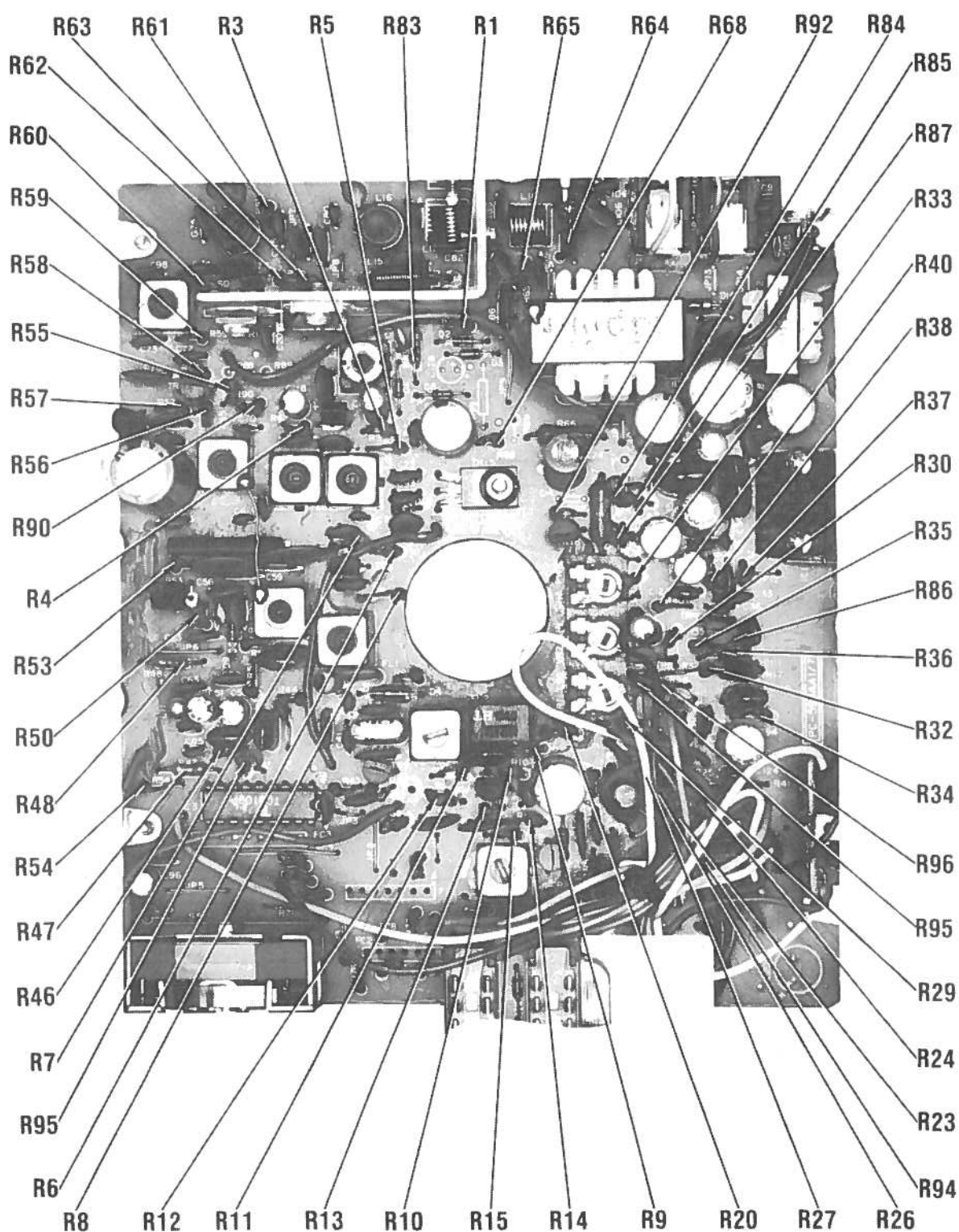
MAIN BOARD



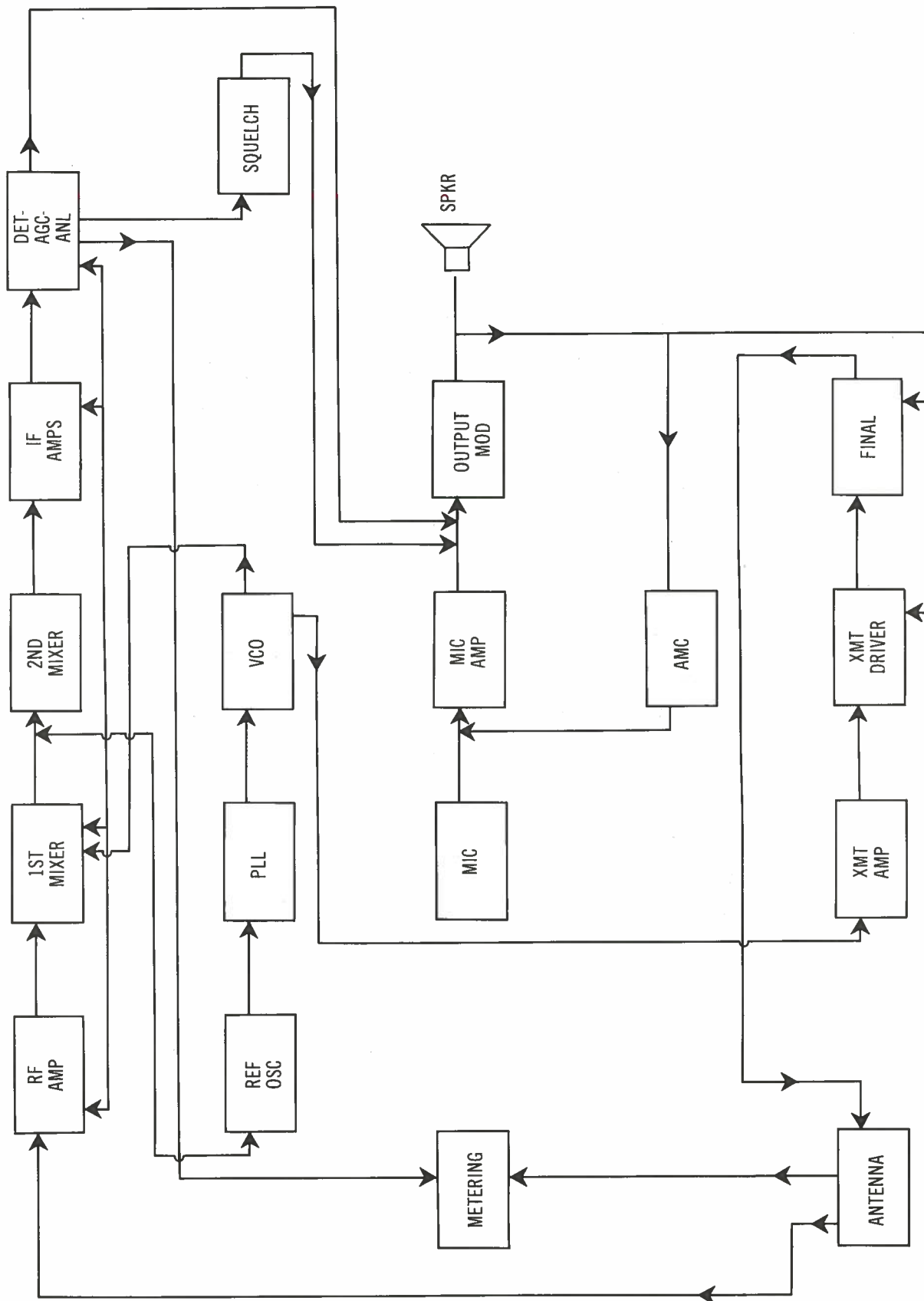
MAIN BOARD



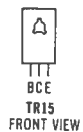
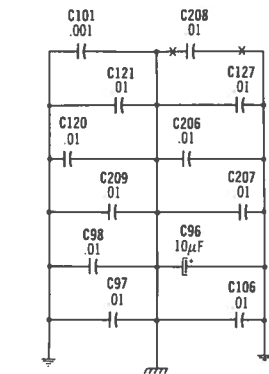
MAIN BOARD



MAIN BOARD



BLOCK DIAGRAM



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PARTS LIST AND DESCRIPTION

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

WIRING DATA

Cable (Speaker)(Unshielded).....	Use BELDEN No. 8782 (AWG24)(4 colors)
Shielding Strap.....	Use BELDEN No. 8660 (3/16" width)
Hook-up Wire (General Use).....	Use BELDEN No. 8524 (AWG22)(13 colors)
Hook-up Wire (Shielded).....	Use BELDEN No. 8401 (Braided Shield)(1 conductor)(AWG25)
	Use BELDEN No. 8421 (Spiral Shield)(1 conductor)(AWG25)
	Use BELDEN No. 8737 (Spiral Shield)(2 conductor)(AWG22)
Microphone Cable (Coiled)	Use BELDEN No. 8497 (3 conductor-1 shielded)(6 ft.)(AWG22)
Microphone Cable (Coiled)	Use BELDEN No. 9466 (3 conductor-1 shielded)(6 ft.)(AWG28)
Microphone Cable (Coiled)	Use BELDEN No. 9468 (3 conductor-1 shielded)(6 ft.)(AWG31)

SEMICONDUCTORS (Select replacement transistor for best results)

ITEM No.	TYPE No.	MFR. PART No.	REPLACEMENT DATA						
			GENERAL ELECTRIC PART No.	MALLORY PART No.	RCA PART No.	SYLVANIA PART No.	THORDARSON PART No.	WORKMAN PART No.	ZENITH PART No.
D1	1S2075K		GE-514	PTC214	SK3100/519	ECG519	TM519	WEP925/519	103-131
D2	1S2075K		GE-514	PTC214	SK3100/519	ECG519	TM519	WEP925/519	103-131
D3	1S2075K		GE-514	PTC214	SK3100/519	ECG519	TM519	WEP925/519	103-131
D4	1N60AM		1N60	PTC206	SK3088	ECG109	TM109	WEP134/109	103-29001
	1N60		1N60	PTC206	SK3088	ECG109	TM109	WEP134/109	103-29001
D5	1N60AM		1N60	PTC206	SK3088	ECG109	TM109	WEP134/109	103-29001
	1N60		1N60	PTC206	SK3088	ECG109	TM109	WEP134/109	103-29001
D6	1S2076A		GE-514	PTC214	SK3100/519	ECG519	TM519	WEP925/519	103-131
D7	1S2075K		GE-514	PTC214	SK3100/519	ECG519	TM519	WEP925/519	103-131
D8	1S2075K		GE-514	PTC214	SK3100/519	ECG519	TM519	WEP925/519	103-131
D9	1S2688EA				SK3126	ECG614		WEP200/613	103-281
	1S2688				SK3126	ECG614		WEP200/613	103-281
D10	1N4003		GE-504A	1N4003	SK3312	ECG116	TM116	WEP156	212-76-02
D11	1S2075K		GE-514	PTC214	SK3100/519	ECG519	TM519	WEP925/519	103-131
D12	RDB.2EB1		GEZD-8.2	ZMB.2B	SK3782/5016A	ECG5016A	TM5016A	WEP1417/5016	103-29019
D13	RDB.2EB1		GEZD-8.2	ZMB.2B	SK3782/5016A	ECG5016A	TM5016A	WEP1417/5016	103-29019
D14	1N4003		GE-504A	1N4003	SK3312	ECG116	TM116	WEP156	212-76-02
D17	1S2075K		GE-514	PTC214	SK3100/519	ECG519	TM519	WEP925/519	103-131
IC1	UPC1182H				SK3923				
IC2	TA7310P		GEIC-326		SK3445/1192	ECG1192	TM1192	WEP2120/1192	221-Z9061
IC3	TC9109P								
TR1	2SC1342B		GE-61*	PTC132	SK3124/289	ECG229*	TM229*	WEP784	121-Z9021*
	2SC1342		GE-61*	PTC132	SK3124/289	ECG229*	TM229*	WEP784	121-Z9021*
TR2	2SC1342B		GE-61*	PTC132	SK3124/289	ECG229*	TM229*	WEP784	121-Z9021*
	2SC1342		GE-61*	PTC132	SK3124/289	ECG229*	TM229*	WEP784	121-Z9021*
TR3	2SC710C		GE-211*	PTC132*	SK3356	ECG107*	TM107*	WEP710	121-Z9000A*
	2SC1675L		GE-213	PTC132*	SK3124/289	ECG123AP*	TM123AP*	WEP773	121-Z9021*
	2SC1675		GE-213	PTC132*	SK3124/289	ECG123AP*	TM123AP*	WEP773	121-Z9021*
TR4	2SC710C		GE-211*	PTC132*	SK3356	ECG107*	TM107*	WEP710	121-Z9000A*
	2SC1675L		GE-213	PTC132*	SK3124/289	ECG123AP*	TM123AP*	WEP773	121-Z9021*
	2SC1675		GE-213	PTC132*	SK3124/289	ECG123AP*	TM123AP*	WEP773	121-Z9021*
TR5	2SC710C		GE-211*	PTC132*	SK3356	ECG107*	TM107*	WEP710	121-Z9000A*
	2SC1675L		GE-213	PTC132*	SK3124/289	ECG123AP*	TM123AP*	WEP773	121-Z9021*
	2SC1675		GE-213	PTC132*	SK3124/289	ECG123AP*	TM123AP*	WEP773	121-Z9021*
TR6	2SC711E		GE-62*	PTC121	SK3899	ECG199+	TM199+	WEP372+	121-972*
	2SC711		GE-62*	PTC121	SK3899	ECG199+	TM199+	WEP372+	121-972*
TR7	2SC711E		GE-62*	PTC121	SK3899	ECG199+	TM199+	WEP372+	121-972*
	2SC711		GE-62*	PTC121	SK3899	ECG199+	TM199+	WEP372+	121-972*
TR8	2SC711E		GE-62*	PTC121	SK3899	ECG199+	TM199+	WEP372+	121-972*
	2SC711		GE-62*	PTC121	SK3899	ECG199+	TM199+	WEP372+	121-972*
TR9	2SC710C		GE-211*	PTC132*	SK3356	ECG107*	TM107*	WEP710	121-Z9000A*
	2SC1675L		GE-213	PTC132*	SK3124/289	ECG123AP*	TM123AP*	WEP773	121-Z9021*
	2SC1675		GE-213	PTC132*	SK3124/289	ECG123AP*	TM123AP*	WEP773	121-Z9021*
TR10	2SA628F		GE-82*	PTC103*	SK3114/290	ECG159*	TM159*	WEP62/159	121-Z9003*
	2SA733P		GE-48	PTC127	SK3114/290	ECG290	TM290	WEP62/159*	121-Z9067
	2SA733		GE-48	PTC127	SK3114/290	ECG290	TM290	WEP62/159*	121-Z9067
TR11	2SC711E		GE-62*	PTC121	SK3899	ECG199+	TM199+	WEP372+	121-972*
	2SC711		GE-62*	PTC121	SK3899	ECG199+	TM199+	WEP372+	121-972*
TR12	2SC710C		GE-211*	PTC132*	SK3356	ECG107*	TM107*	WEP710	121-Z9000A*
	2SC710		GE-211*	PTC132*	SK3356	ECG107*	TM107*	WEP710	121-Z9000A*
TR13	2SC2028/2		GE-270	PTC180	SK3253/295	ECG295	TM295	WEP755/195A*	121-Z9066
	2SC2028B/20		GE-270	PTC180	SK3253/295	ECG295	TM295	WEP755/195A*	121-Z9066
	2SC2028		GE-270	PTC180	SK3253/295	ECG295	TM295	WEP755/195A*	121-Z9066
TR14	2SC2029/1		GE-333	PTC186	SK3197/235	ECG235	TM235	WEP785/235	121-Z9039
	2SC2029B/10		GE-333	PTC186	SK3197/235	ECG235	TM235	WEP785/235	121-Z9039
	2SC2029		GE-333	PTC186	SK3197/235	ECG235	TM235	WEP785/235	121-Z9039
TR15	2SC2028/2		GE-270	PTC180	SK3253/295	ECG295	TM295	WEP755/195A*	121-Z9066
	2SC2028B/20		GE-270	PTC180	SK3253/295	ECG295	TM295	WEP755/195A*	121-Z9066
	2SC2028		GE-270	PTC180	SK3253/295	ECG295	TM295	WEP755/195A*	121-Z9066
TR16	2SC711E		GE-62*	PTC121	SK3899	ECG199+	TM199+	WEP372+	121-972*
	2SC711		GE-62*	PTC121	SK3899	ECG199+	TM199+	WEP372+	121-972*
TR17	2SC711E		GE-62*	PTC121	SK3899	ECG199+	TM199+	WEP372+	121-972*
	2SC711		GE-62*	PTC121	SK3899	ECG199+	TM199+	WEP372+	121-972*
TR18	2SA628F		GE-82*	PTC103*	SK3114/290	ECG159*	TM159*	WEP62/159	121-Z9003*
	2SA733P		GE-48	PTC127	SK3114/290	ECG234	TM234	WEP62/159*	121-Z9067
	2SA733		GE-48	PTC127	SK3114/290	ECG234	TM234	WEP62/159*	121-Z9067

* Lead configuration may vary from original.

PARTS LIST AND DESCRIPTION (CONTINUED)

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

ELECTROLYTIC CAPACITORS

ITEM No.	RATING	REPLACEMENT DATA			
		MFR. PART No.	MALLORY PART No.	SPRAGUE PART No.	
				Q-LINE	GENERAL LINE
C6	22 10V		VTT22B16	QV1-55	EV-1224
C18	4.7 25V		VTT4R7B50	QV1-31	EV-1619.1
C22	10 16V		VTT10B25	QV1-41	EV-1222
C24	100 10V		VTT100D10	QV1-93	EV-1131
C27	1 50V		VTT1A50	QV1-11	EV-1615
C35	100 10V		VTT100D10	QV1-93	EV-1131
C37	33 16V		VTT33D25	QV1-63	EV-1325
C40	330 10V		VTT330H16	QV1-133	EV-1245
C50	4.7 25V		VTT4R7B50	QV1-31	EV-1619.1
C51	4.7 25V		VTT4R7B50	QV1-31	EV-1619.1
C67	470 10V		VTT470K16	QV1-151	EV-1251
C78	22 16V		VTT22B16	QV1-55	EV-1224
C87	470 16V		VTT470K16	QV1-151	EV-1251
C88	100 25V		VTT100G25	QV1-97	EV-1331
C91	220 16V		VTT220H16	QV1-117	EV-1240
C92	220 10V		VTT220F10	QV1-115	EV-1140
C94	100 10V		VTT100D10	QV1-93	EV-1131
C96	10 16V		VTT10B25	QV1-41	EV-1222
C108	100 10V		VTT100D10	QV1-93	EV-1131
C118	10 16V		VTT10B25	QV1-41	EV-1222
C119	10 16V		VTT10B25	QV1-41	EV-1222

CAPACITORS

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA		
			MALLORY PART No.	SPRAGUE PART No.	
				Q-LINE	GENERAL LINE
C04	100 50V		CN0310		10TCC-T10
C1	27 N220 50V		*		10TCR-Q27
C2	180 50V				10TCC-T18
C3	.01 50V		MAG5011		
C4	.01 50V		MAG5011		
C5	.01 50V		MAG5011		
C7	.001 50V		GP210	QCT2-41	10TS-D10
C8	.01 50V		MAG5011		
C9	.01 50V		MAG5011		
C10	10 50V		CN0410	QCC2-15	10TCC-Q10
C11	22 50V		CN0422		10TCC-Q22
C12	.039 50V 10%		M192P3939R8	QFT2-159	1FT-S39
C13	1pF 50V $\pm$.25		CN0510		
C14	.039 50V		M192P3939R8		192P3939R8
C15	.039 50V		M192P3939R8		192P3939R8
C16	.01 50V		MAG5011		
C17	.047 50V 10%		M192P4739R8	QFT2-171	1FT-S47
C20	.039 50V		M192P3939R8		192P3939R8
C21	.01 50V		MAG5011		
C23	.01 50V		MAG5011		
C25	.0047 50V		GP247		5GA-D47
C26	.01 50V		MAG5011		
C28	.0022 50V		GP222	QCT2-46	10TS-D22
C29	.0022 50V		GP222	QCT2-46	10TS-D22
C31	.1 50V		MAG5001		
C32	.0047 50V		GP247		5GA-D47
C33	150 50V		CN0315		10TCC-T15
C34	.001 50V		GP210	QCT2-41	10TS-D10
C36	.001 50V		GP210	QCT2-41	10TS-D10
C38	.1 50V		MAG5001		
C39	.1 50V		MAG5001		
C41	120 50V		CN0312		10TCC-T12
C42	56 50V		CN0456		10TCC-Q56
C43	220 50V				10TCC-T22
C44	330 50V		GP333	QCT2-33	10TS-T33
C45	.01 50V		MAG5011		
C46	.01 50V		MAG5011		
C47	22 50V		CN0422		10TCC-Q22
C48	.047 50V		EW1A147	QF1-171	1PB-S47
C49	.047 50V 10%		M192P4739R8	QFT2-171	1FT-S47
C52	.01 50V		MAG5011		
C53	.01 50V		MAG5011		
C55	27 N220 50V		*		10TCR-Q27
C56	68 50V		CN0468		10TCC-Q68
C57	.047 50V 10%		M192P4739R8	QFT2-171	1FT-S47
C58	82 50V		CN0482		10TCC-Q82
C59	220 50V				10TCC-T22
C60	220 50V				10TCC-T22
C61	10 50V		CN0410	QCC2-15	10TCC-Q10
C62	5pF 50V		CN0568		10TCC-V68
C63	82 50V		CN0482		10TCC-Q82
C64	.001 50V		GP210	QCT2-41	10TS-D10
C65	10 50V		CN0410	QCC2-15	10TCC-Q10
C66	.01 50V		MAG5011		
C68	.01 50V		MAG5011		
C69	.01 50V		MAG5011		
C70	.001 50V		GP210	QCT2-41	10TS-D10
C71	.01 50V		MAG5011		
C72	.01 50V		MAG5011		
C73	.01 50V		MAG5011		
C74	330 50V		GP333	QCT2-33	10TS-T33

PARTS LIST AND DESCRIPTION (CONTINUED)

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

CAPACITORS (cont)

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA		
			MALLORY PART No.	SPRAGUE PART No.	
				Q-LINE	GENERAL LINE
C75	.01 50V		MAG5011	QCC2-22	10TCC-Q33
C76	33 50V		CN0433		10TS-T82
C77	820 50V		GP382		
C79	.01 50V		MAG5011		10TCC-Q39
C80	39 50V		CN0439		10TCC-T27
C81	270 50V				10TCC-Q22
C82	22 50V		CN0422		10TCC-T22
C83	220 50V				10TCC-V33
C85	3pF 50V		CN0533		192P3939R8
C86	.039 50V		M192P3939R8	QCT2-41	10TS-D10
C89	.001 50V		GP210		10TS-D10
C90	.001 50V		GP210	QCT2-41	
C93	.01 50V		MAG5011		
C95	.001 50V		GP210		
C97	.01 50V		MAG5011		
C98	.01 50V		MAG5011		
C99	.001 50V		GP210	QCT2-41	10TS-D10
C100	.001 50V		GP210	QCT2-41	10TS-D10
C101	.001 50V		GP210	QCT2-41	10TS-D10
C102	.001 50V		GP210	QCT2-41	10TS-D10
C104	.001 50V		GP210	QCT2-41	10TS-D10
C105	.001 50V		GP210	QCT2-41	10TS-D10
C106	.01 50V		MAG5011		
C110	.047 50V		EWFI1A147	QF1-171	1PB-S47
C111	.001 50V		GP210	QCT2-41	10TS-D10
C112	.001 50V		GP210	QCT2-41	10TS-D10
C113	.01 50V		MAG5011		
C114	.01 50V		MAG5011		
C115	.01 50V		MAG5011		
C116	.01 50V		MAG5011		
C120	.01 50V		MAG5011		
C121	.01 50V		MAG5011		
C122	.01 50V		MAG5011		
C123	.015 50V		M192P1539R8		192P1539R8
C124	.01 50V		MAG5011		
C125	.01 50V		MAG5011		
C126	.001 50V		GP210	QCT2-41	10TS-D10
C127	.01 50V		MAG5011		
C206	.01 50V		MAG5011		
C207	.01 50V		MAG5011		
C208	.01 50V		MAG5011		
C209	.01 50V		MAG5011		

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

CRAIG MODEL L103

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

ITEM No.	FUNCTION	RESISTANCE	REPLACEMENT DATA		
			MFR. PART No.	MALLORY PART No.	TRW PART No.
VR1	Squelch Range	50K	L600593	RVA0911H503	U260R503B
VR2	S Meter	50K	L600593	RVA0911H503	U260R503B
VR3	RF Power Meter	50K	L600593	RVA0911H503	U260R503B
VR4	Volume/Switch	50K	L103570		
VR5	Squelch	50K	L103571		

COILS (RF-IF)

ITEM No.	FUNCTION	REPLACEMENT DATA			REMARKS
		PART No.	OTHER IDENTIFICATION	MILLER PART No.	
L1	Rec Antenna (27MHz)	L103672			
L2	RF Amp (27MHz)	L103673			
L3	VCO	L103674			
L4	IF (10.695MHz)	L103675			
L5	RF Choke (10mH)	L103676			
L6	IF (455kHz)	L103677			
L7	IF (455kHz)	L103678			
L8	IF (455kHz)	L103679			
L9	VCO Osc	L103680			
L10	XMT Amp (27MHz)	L103681			
L11	RF Choke (4.7uH)	L103682			
L12	XMT Amp (27MHz)	L103683			
L13	XMT Driver (27MHz)	L103684			
L15	RF Choke	L103685			
L16	Final (27MHz)	L103686			
L17	P1	L103687			
L18	Antenna	L103687			

PARTS LIST AND DESCRIPTION (CONTINUED)

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

FUSE DEVICES

ITEM No.	DESCRIPTION	REPLACEMENT DATA				
		PART No.		BUSS PART No.		WORKMAN PART No.
		DEVICE	HOLDER	DEVICE	HOLDER	DEVICE
F1	2A Quick-Acting	XFU002	4101033	AGC2	HRK	FG2-2

TRANSFORMER (Audio Output)

ITEM No.	IMPEDANCE		REPLACEMENT DATA			NOTES
	PRI.	SEC. 1	MFGR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T1	6.25	16	L103641			(1) Number on unit.
		SEC 2	TF177 (1)			
		30				

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.	
T2	1.2A	.14	.85mH	L103642 TF083 (1)			(1) Number on unit.

SPEAKER

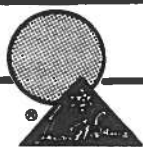
ITEM No.	TYPE		REPLACEMENT DATA		NOTES
			MFGR. PART No.	QUAM PART No.	
SP1	4" PM	16 Ohm	L103702	4A1Z16	

MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
D15	LED	UR202	Channel Indicator
D16	LED	TLR124	TX Indicator
FL1	Filter	L103670	FL048, 10.695MHz
FL2	Filter	L103671	FL066, 455kHz
J1	Jack	L103607	Antenna
J2	Jack	L103608	Socket Mic Connector
J3	Jack	4101027	DC Power
J4	Jack	L103609	PA Speaker
J5	Jack	L133609	External Speaker
M1	Meter	L103604	Signal TX/Power
MK1	Mic	L103507	Microphone (Complete)
P1	Plug	4101033	DC Power Plug w/ Cord
PL1	Lamp	L103550	Pilot Lamp, SIG/TX Meter
S1	Switch	L103570	Power/Off
S2	Switch	L103533	ANL/On/Off
S3	Switch	L103533	CB/PA Select
S8	Switch	L103531	Channel Select
X1	Crystal	L103722	(10.24MHz)
PC2/7	P.C. Board w/Comp	L103517	LED Channel Indicator
PC3/7	P.C. Board w/Comp	L103518	Vol; Power On/Off
PC4/7	P.C. Board w/Comp	L103519	Squelch Cont.
PC7/7	P.C. Board w/Comp	L103520	LED TX Indicator
PC594	P.C. Board w/Comp		Main
PC639	P.C. Board w/Comp	L103521	Mic Jack
PC640	P.C. Board w/Comp	L103522	ANL PA/CB Switch

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

ITEM	PART No.	ITEM	PART No.
Cabinet Bottom	L103051	Knob, Squelch, Volume; On/Off	L103027
Cabinet Top	L103050	Push Button, PA/CB; ANL	L103028
Knob, Channel Select	L103026		



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 100M(77-100)

MIDLAND MODEL 100M

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

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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:
L101 thru L104, L203, L204, L301 thru L304 9440
L105, L106, L107 5000, 5009, 8276, 8728, 9089
L305, L306 8728, 9304, 9089

SYNTHESIZER ALIGNMENT

TEST EQUIPMENT	TRANSCIVER	ADJUST	REMARKS
Input of oscilloscope to TP11 (L204 Secondary).	Ch. 19	L204	Adjust for maximum RF (1.5 volts p-p typical). (See Figure 1.)
Input of frequency counter to TP11 (L204 Secondary).	Ch. 19		Check for 10.340MHz $\pm$ 100Hz.
Input of frequency counter to TP14 (IC202 Pin 13).	Ch. 19		Adjust for 5.120MHz.
Input of DC meter to TP1 (IC202 Pin 19).	Ch. 40, XMT	L203	Adjust for 6.80 volts. Check for approximately 1.00 volt on Channel 1 receive.
Input of frequency counter to TP2 (Junction of C203 and C204).	Ch. 1		Check for .910MHz. Check all channels. (See Truth Chart for correct frequencies.)
Input of frequency counter to TP2 (Junction of C203 and C204).	Ch. 1, XMT		Check for 1.365MHz. Check all channels. (See Truth Chart for correct frequencies.)
Input of frequency counter to TP12 (IC203 Pin 3).	Ch. 1		Check for 16.270MHz. Check all channels. (See Truth Chart for correct frequencies.)
Input of frequency counter to TP13 (IC203 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.
Squelch MINIMUM, CB-PA in CB.

TEST EQUIPMENT	TRANSCIVER	ADJUST	REMARKS
Output of signal generator to TP15 (Q105 Emitter). 455kHz, 1000Hz @ 30% modulation.	Ch. 19	L107, L106,	Adjust for maximum audio output.
Output of signal generator to antenna input. 27.185MHz, 1000Hz @ 30% modulation.	Ch. 19	L104, L103, L102, L101	Adjust for maximum audio output. Readjust L105, L106, L107 for maximum.

RECEIVER ADJUSTMENTS

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

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Output of signal generator to antenna input. 27.185MHz, 1000Hz @ 30% modulation Output 500uV.	Ch. 19 Squelch Maximum	RV101	SQUELCH RANGE Adjust so squelch just breaks.
Output of signal generator to antenna input. 27.185MHz, 1000Hz @ 30% modulation	Ch. 19	RV103	SIGNAL METER Adjust for 9 on S scale of meter.

TRANSMITTER ALIGNMENT

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

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Input of RF wattmeter to antenna input.	Ch. 19, XMT	L301, L302, L303, L304, L305	Adjust for maximum RF output.
Input of RF wattmeter to antenna input.	Ch. 19, XMT	L306	Adjust for 4.0 watts RF output maximum.

MIDLAND MODEL 100M

TRANSMITTER ADJUSTMENTS

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

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Input of oscilloscope or modulation meter to antenna input. Inject a 1000Hz, 20mV audio signal to mic input.	Ch. 19, XMT	RV201	AMC Adjust for 85% modulation maximum. (See Figure 2.)
Input of RF wattmeter to antenna input.	Ch. 19, XMT	RV202	POWER METER At 4.0 watts RF output adjust for 4 on power scale of meter.

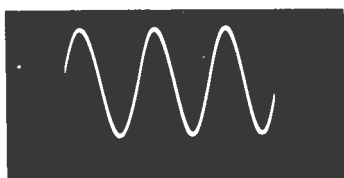


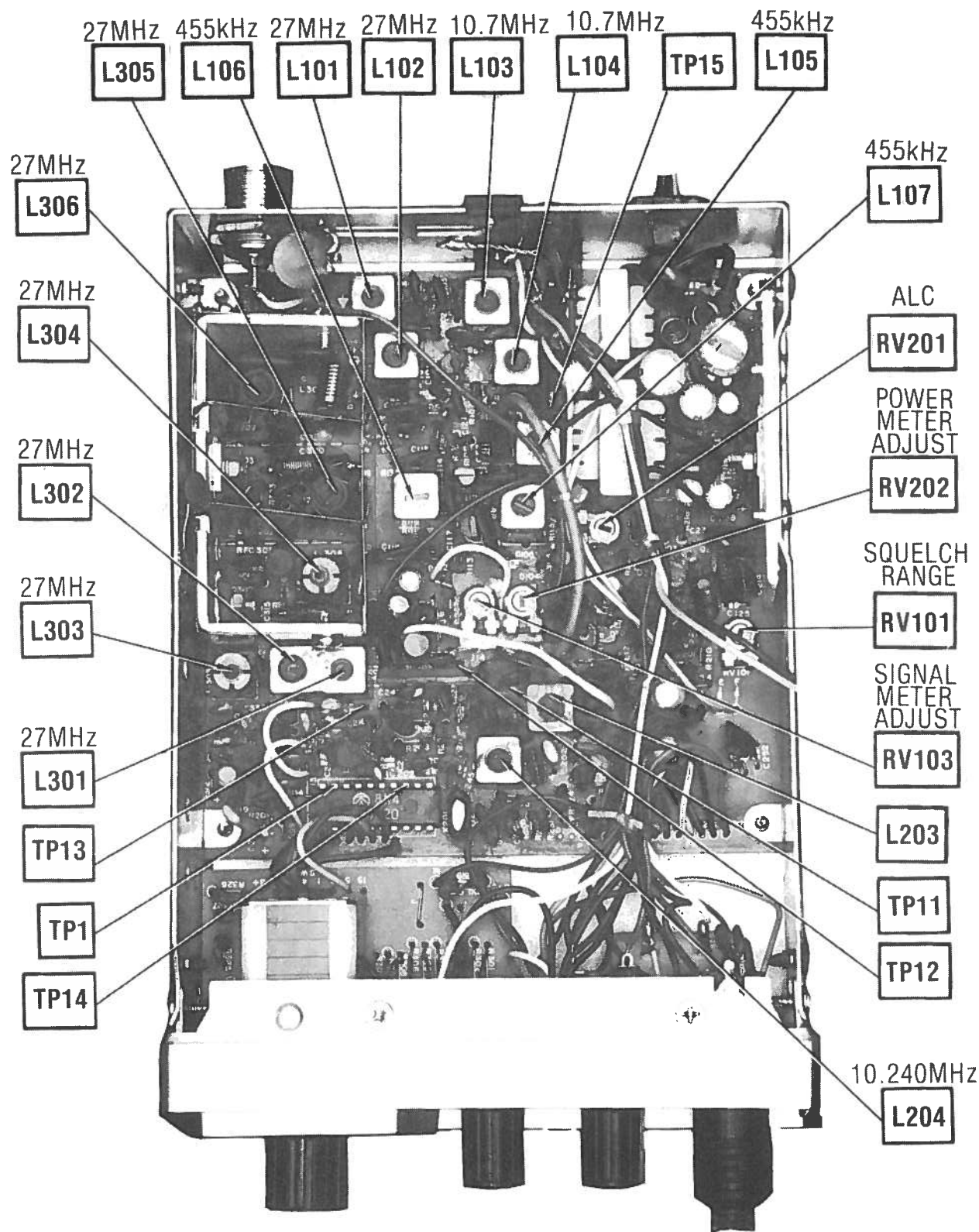
Figure 1



Figure 2

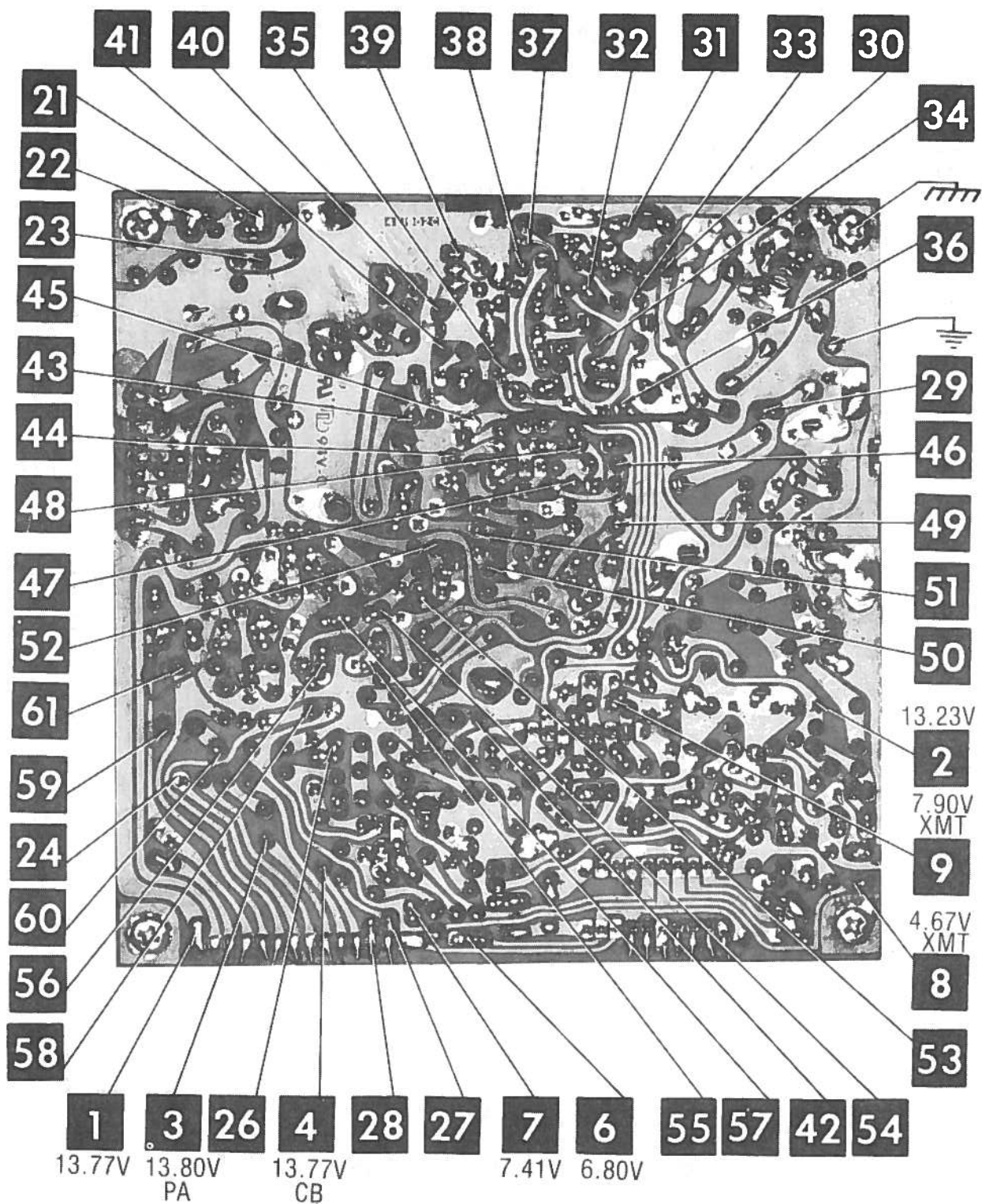
TRUTH CHART

C H A N N E L	1 = 6.80 Volts 0 = 0 Volts						REC VCO OUTPUT IN MHz AT TP12	XMT SYNTH OUTPUT IN MHz AT TP13	REC DIVIDER INPUT IN MHz AT TP2	XMT DIVIDER INPUT IN MHz AT TP2
	CHANNEL INPUT CODES									
	IC202 PINS									
	6	5	4	3	2	1				
1	0	0	0	0	0	1	16.270	26.965	.910	1.365
2	0	0	0	0	1	0	16.280	26.975	.920	1.375
3	0	0	0	0	1	1	16.290	26.985	.930	1.385
4	0	0	0	1	0	0	16.310	27.005	.950	1.405
5	0	0	0	1	0	1	16.320	27.015	.960	1.415
6	0	0	0	1	1	0	16.330	27.025	.970	1.425
7	0	0	0	1	1	1	16.340	27.035	.980	1.435
8	0	0	1	0	0	0	16.360	27.055	1.000	1.455
9	0	0	1	0	0	1	16.370	27.065	1.010	1.465
10	0	1	0	0	0	0	16.380	27.075	1.020	1.475
11	0	1	0	0	0	1	16.390	27.085	1.030	1.485
12	0	1	0	0	1	0	16.410	27.105	1.050	1.505
13	0	1	0	0	1	1	16.420	27.115	1.060	1.515
14	0	1	0	1	0	0	16.430	27.125	1.070	1.525
15	0	1	0	1	0	1	16.440	27.135	1.080	1.535
16	0	1	0	1	1	0	16.460	27.155	1.100	1.555
17	0	1	0	1	1	1	16.470	27.165	1.110	1.565
18	0	1	1	0	0	0	16.480	27.175	1.120	1.575
19	0	1	1	0	0	1	16.490	27.185	1.130	1.585
20	1	0	0	0	0	0	16.510	27.205	1.150	1.605
21	1	0	0	0	0	1	16.520	27.215	1.160	1.615
22	1	0	0	0	1	0	16.530	27.225	1.170	1.625
23	1	0	0	0	1	1	16.560	27.255	1.200	1.655
24	1	0	0	1	0	0	16.540	27.235	1.180	1.635
25	1	0	0	1	0	1	16.550	27.245	1.190	1.645
26	1	0	0	1	1	0	16.570	27.265	1.210	1.665
27	1	0	0	1	1	1	16.580	27.275	1.220	1.675
28	1	0	1	0	0	0	16.590	27.285	1.230	1.685
29	1	0	1	0	0	1	16.600	27.295	1.240	1.695
30	1	1	0	0	0	0	16.610	27.305	1.250	1.705
31	1	1	0	0	0	1	16.620	27.315	1.260	1.715
32	1	1	0	0	1	0	16.630	27.325	1.270	1.725
33	1	1	0	0	1	1	16.640	27.335	1.280	1.735
34	1	1	0	1	0	0	16.650	27.345	1.290	1.745
35	1	1	0	1	0	1	16.660	27.355	1.300	1.755
36	1	1	0	1	1	0	16.670	27.365	1.310	1.765
37	1	1	0	1	1	1	16.680	27.375	1.320	1.775
38	1	1	1	0	0	0	16.690	27.385	1.330	1.785
39	1	1	1	0	0	1	16.700	27.395	1.340	1.795
40	0	0	0	0	0	0	16.710	27.405	1.350	1.805

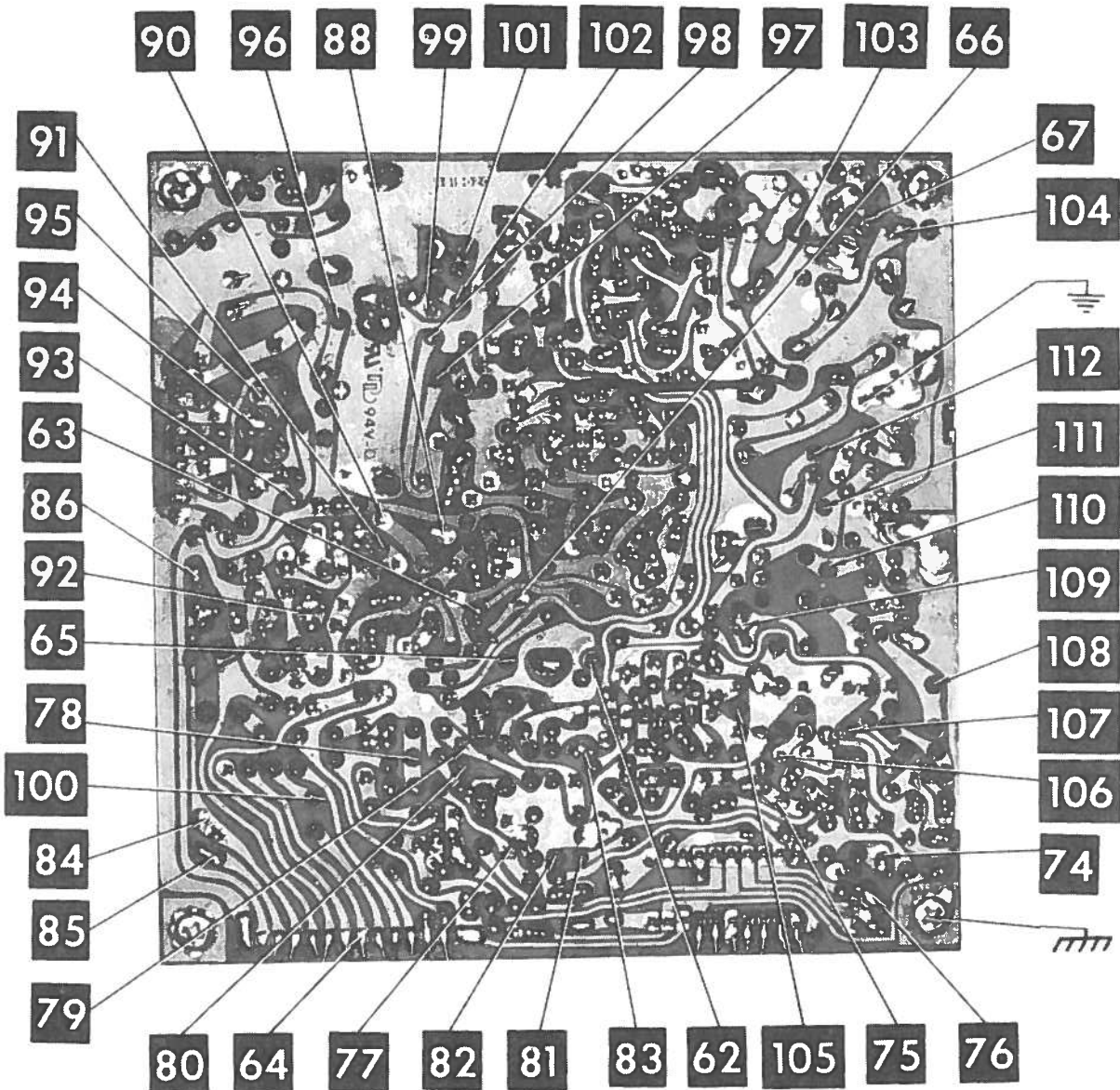


MIDLAND MODEL 100M

CHASSIS-BOTTOM

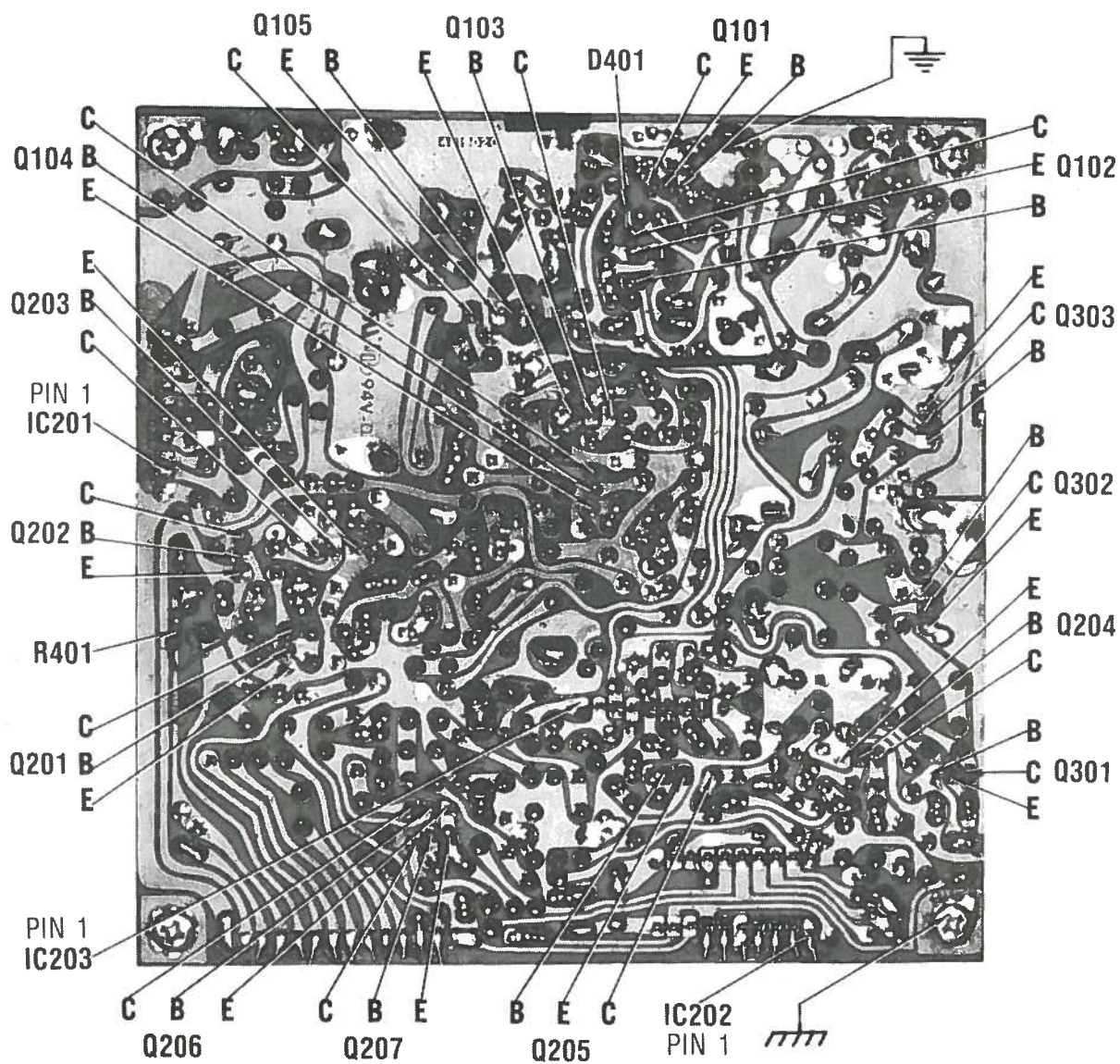


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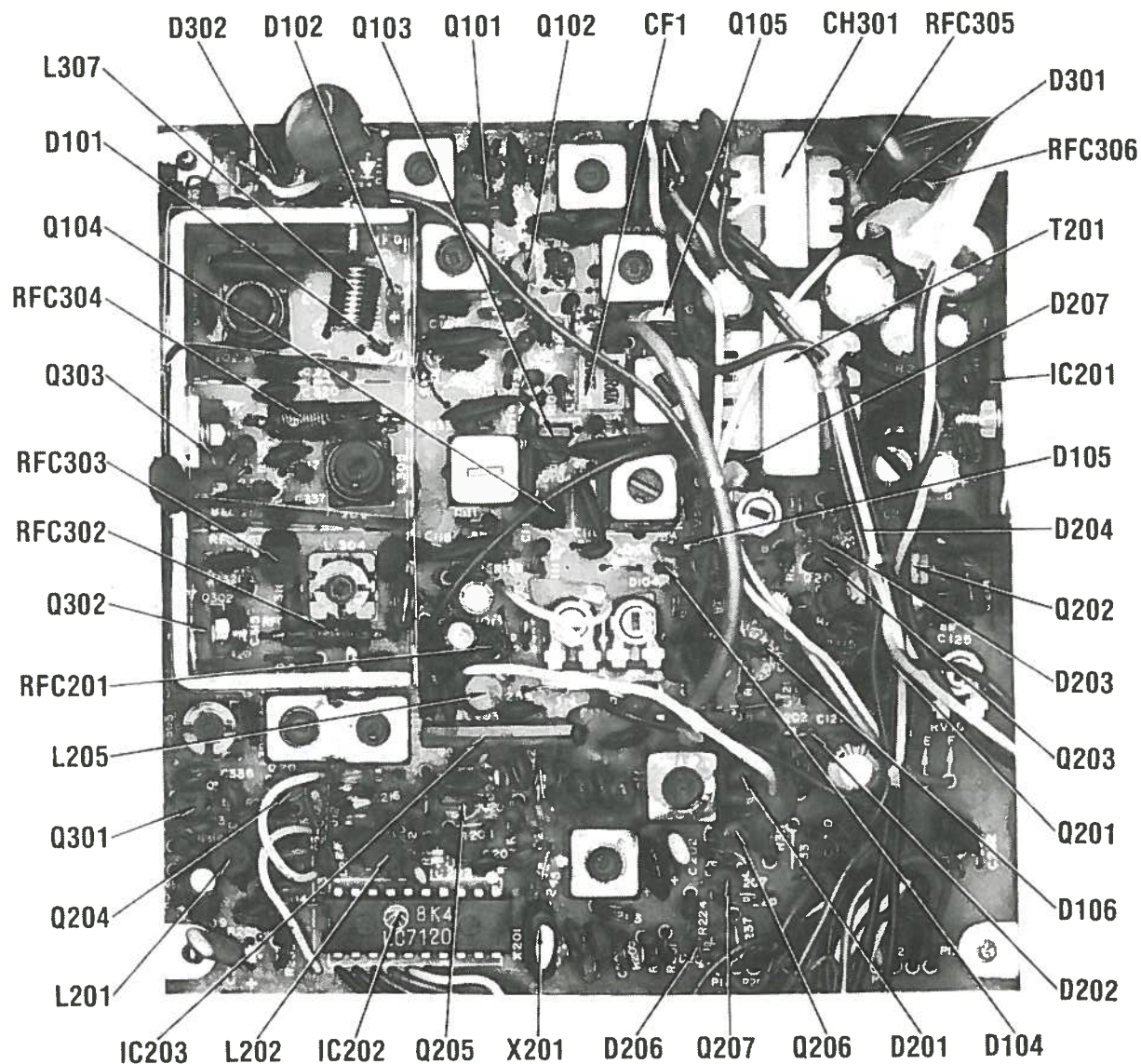


MIDLAND MODEL 100M

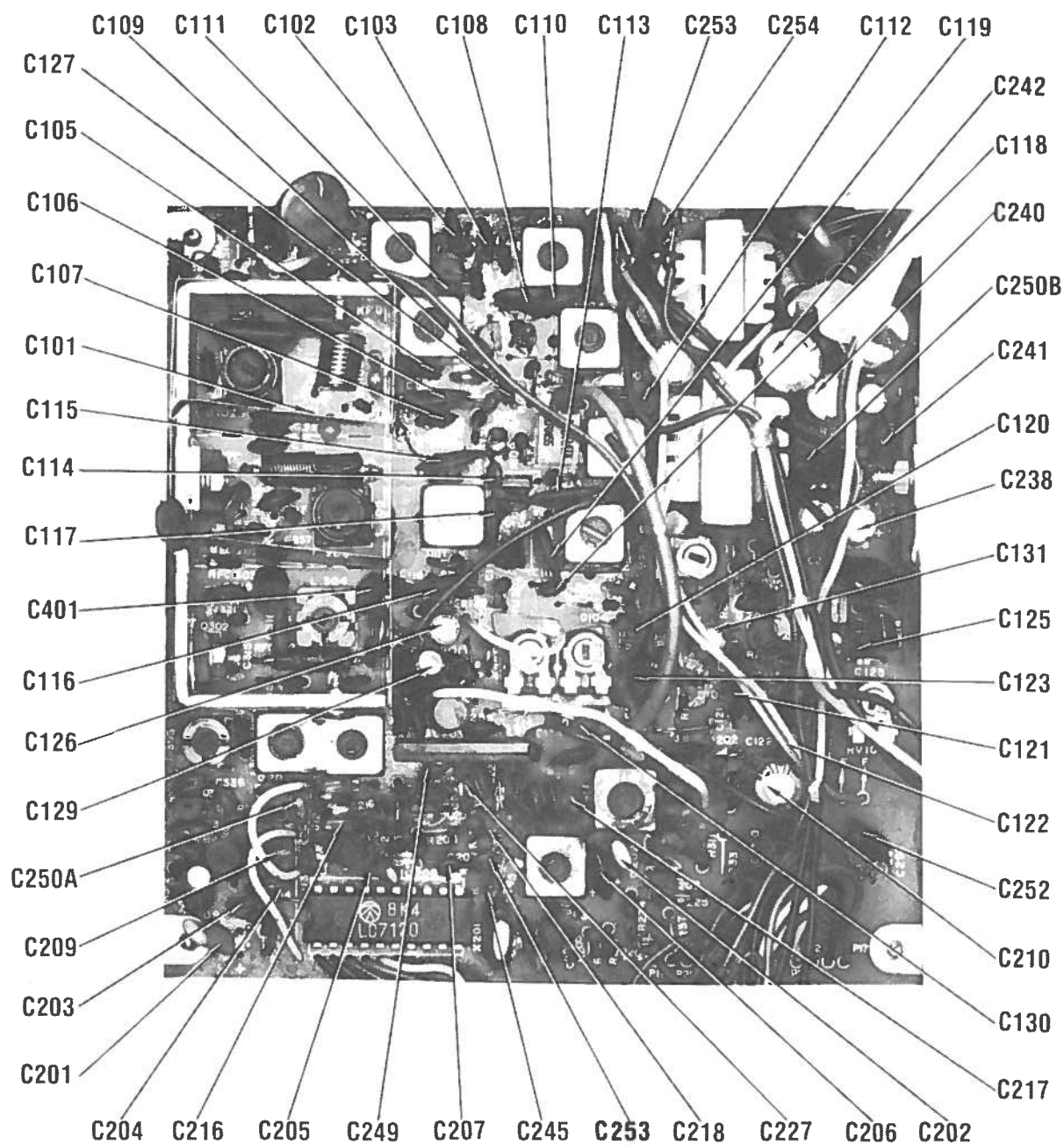
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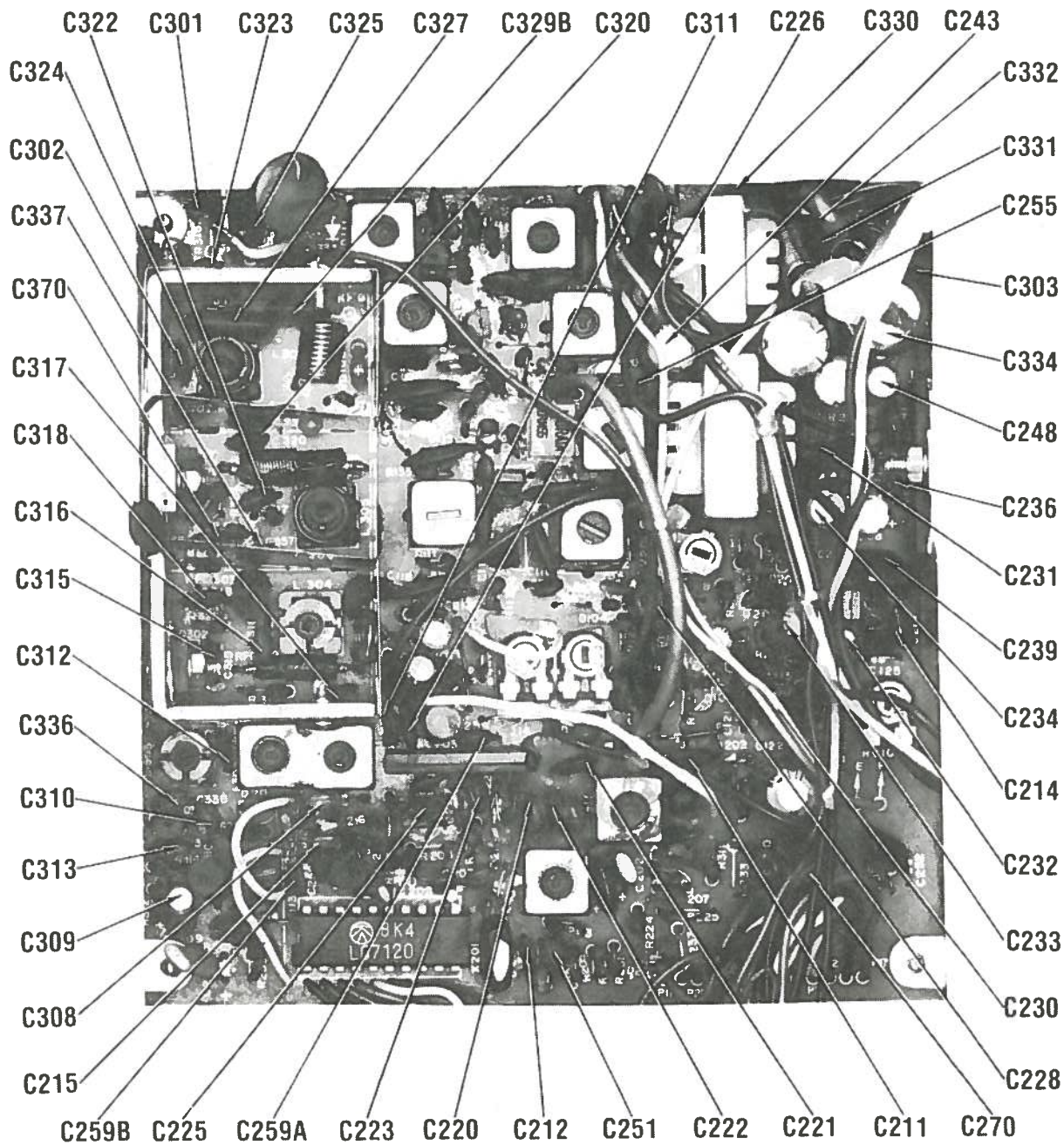
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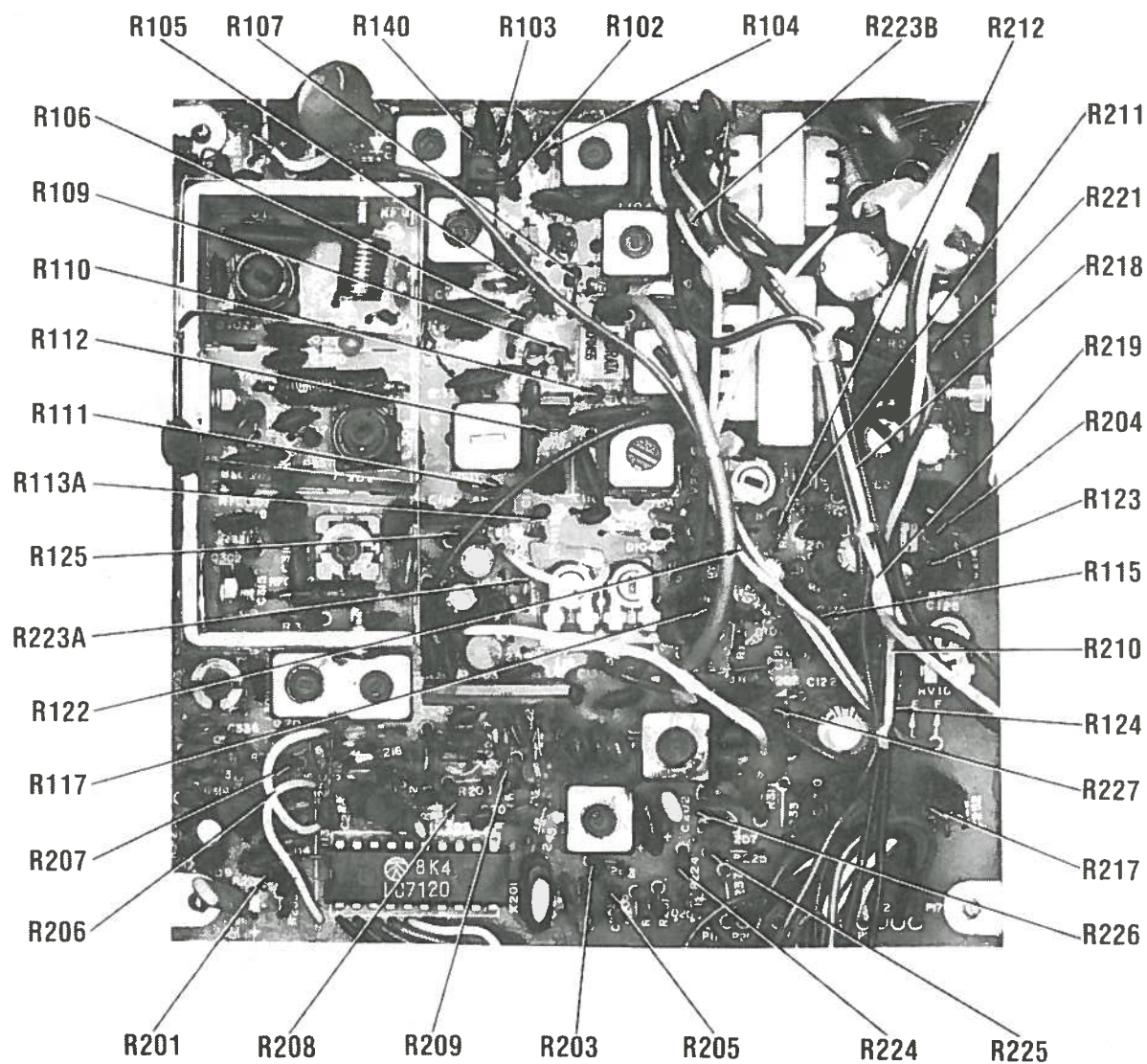
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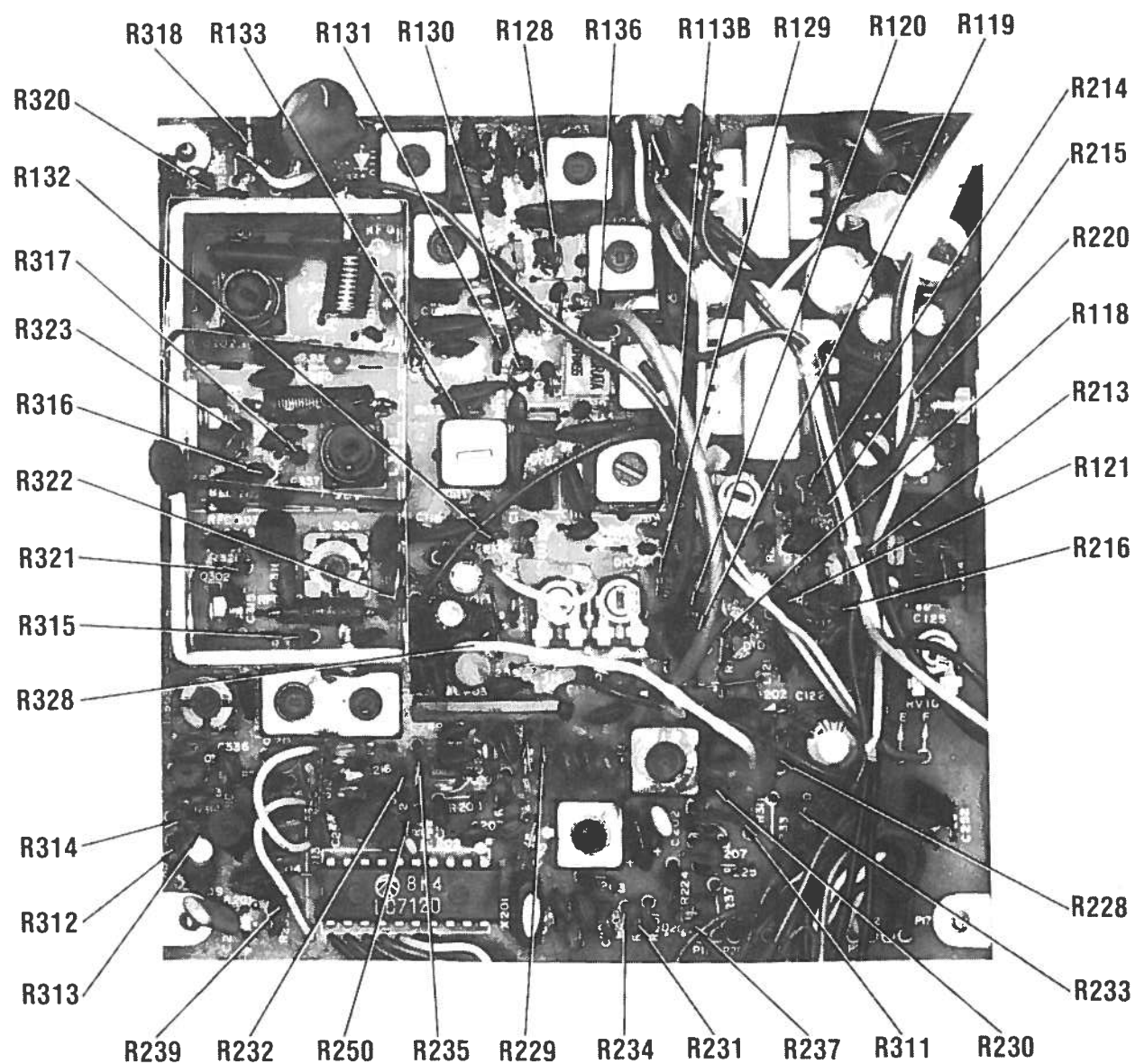
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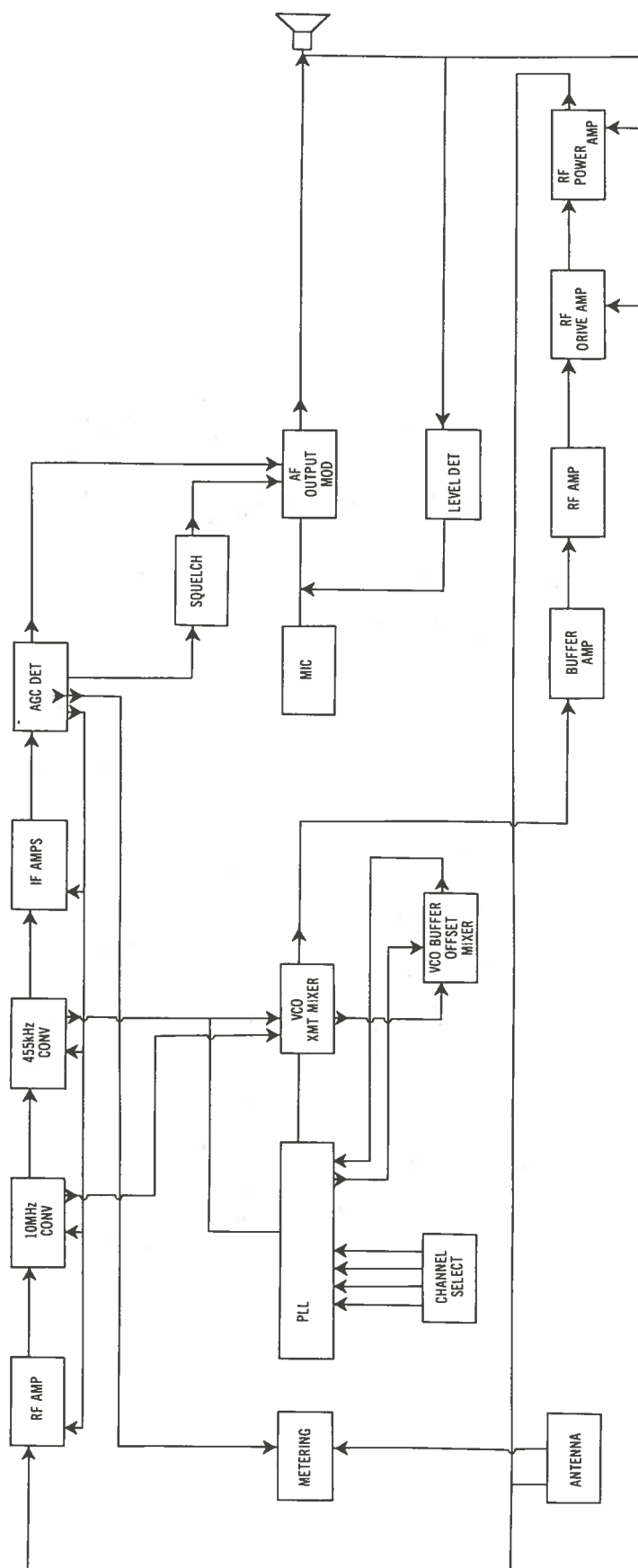
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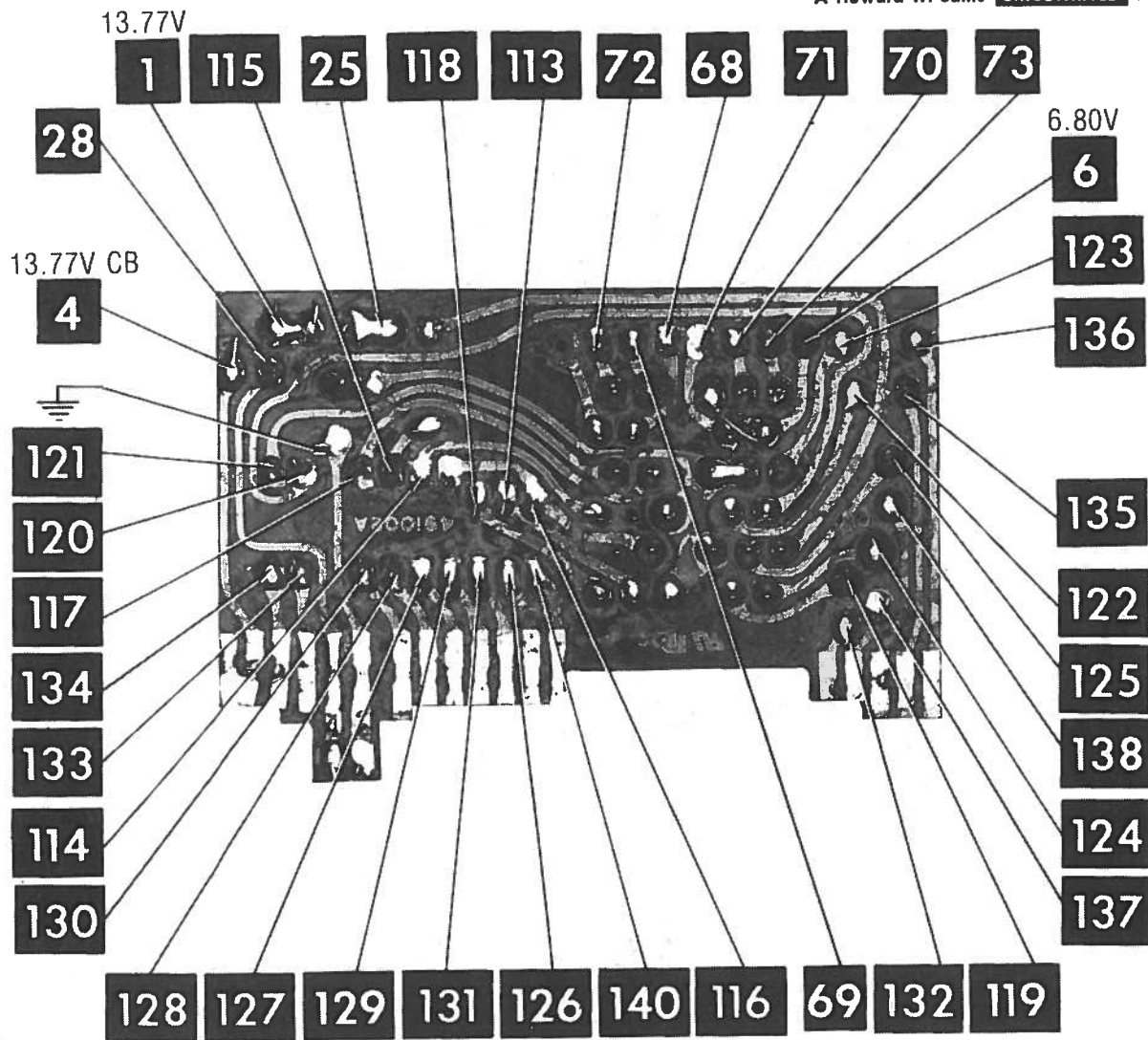
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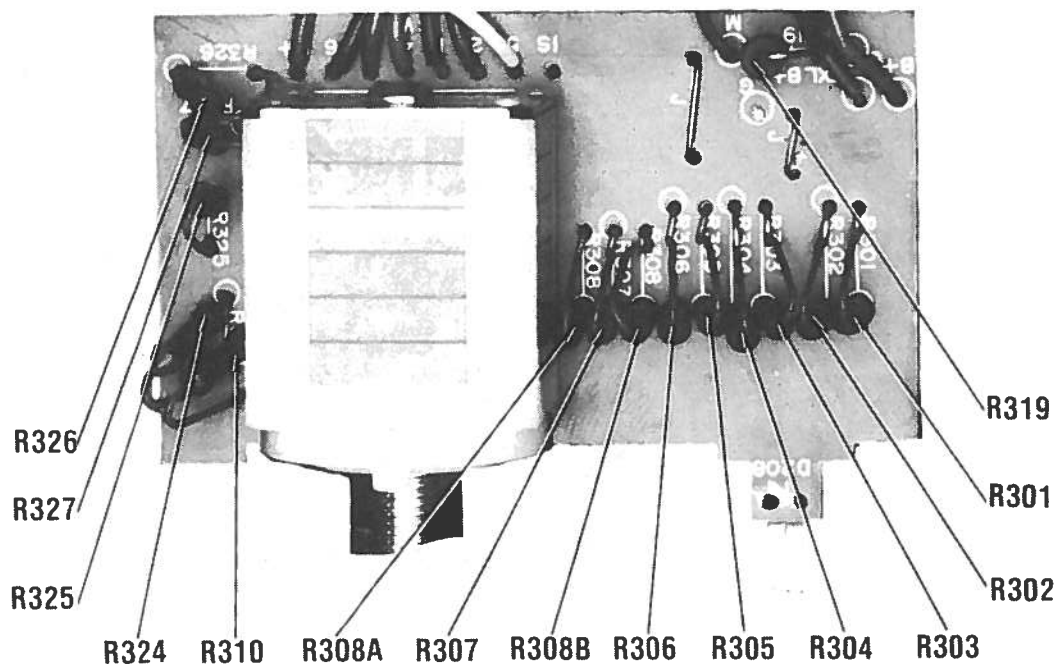
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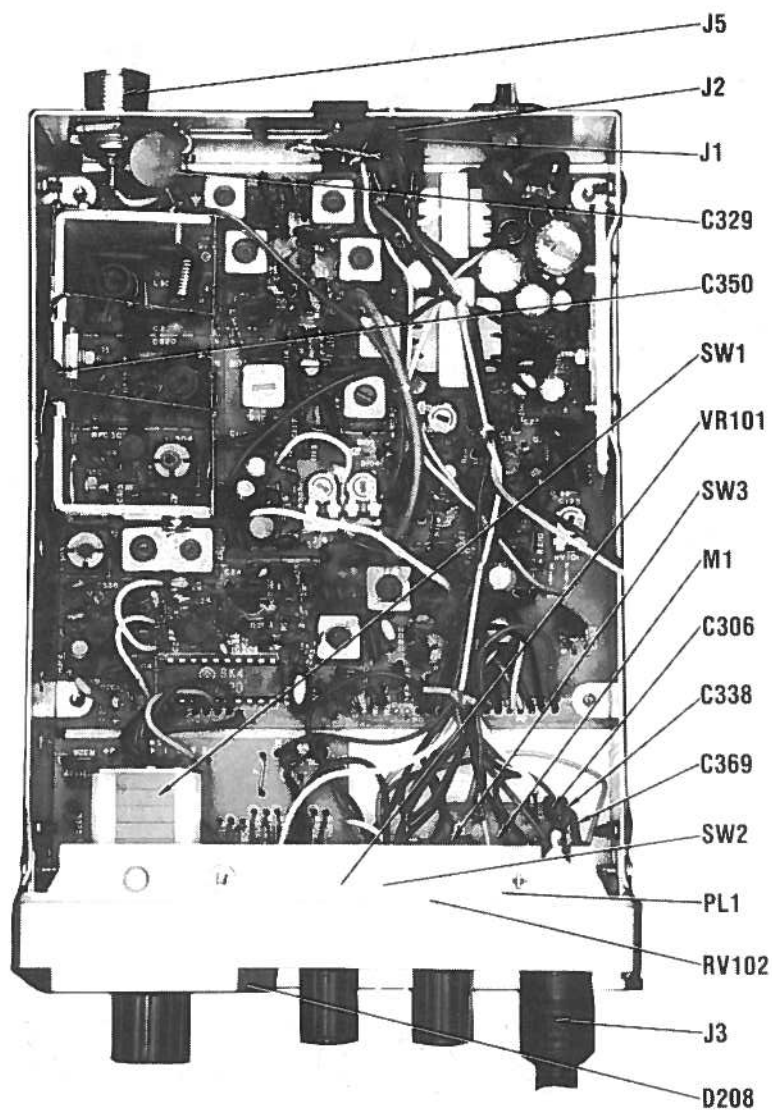
BLOCK DIAGRAM



MIDLAND MODEL 100M

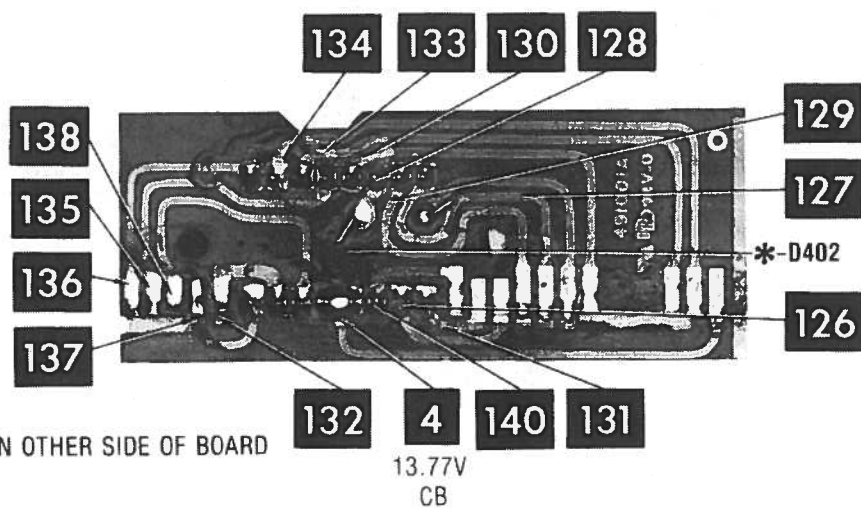


CHANNEL SWITCH BOARD



CHASSIS-BOTTOM

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



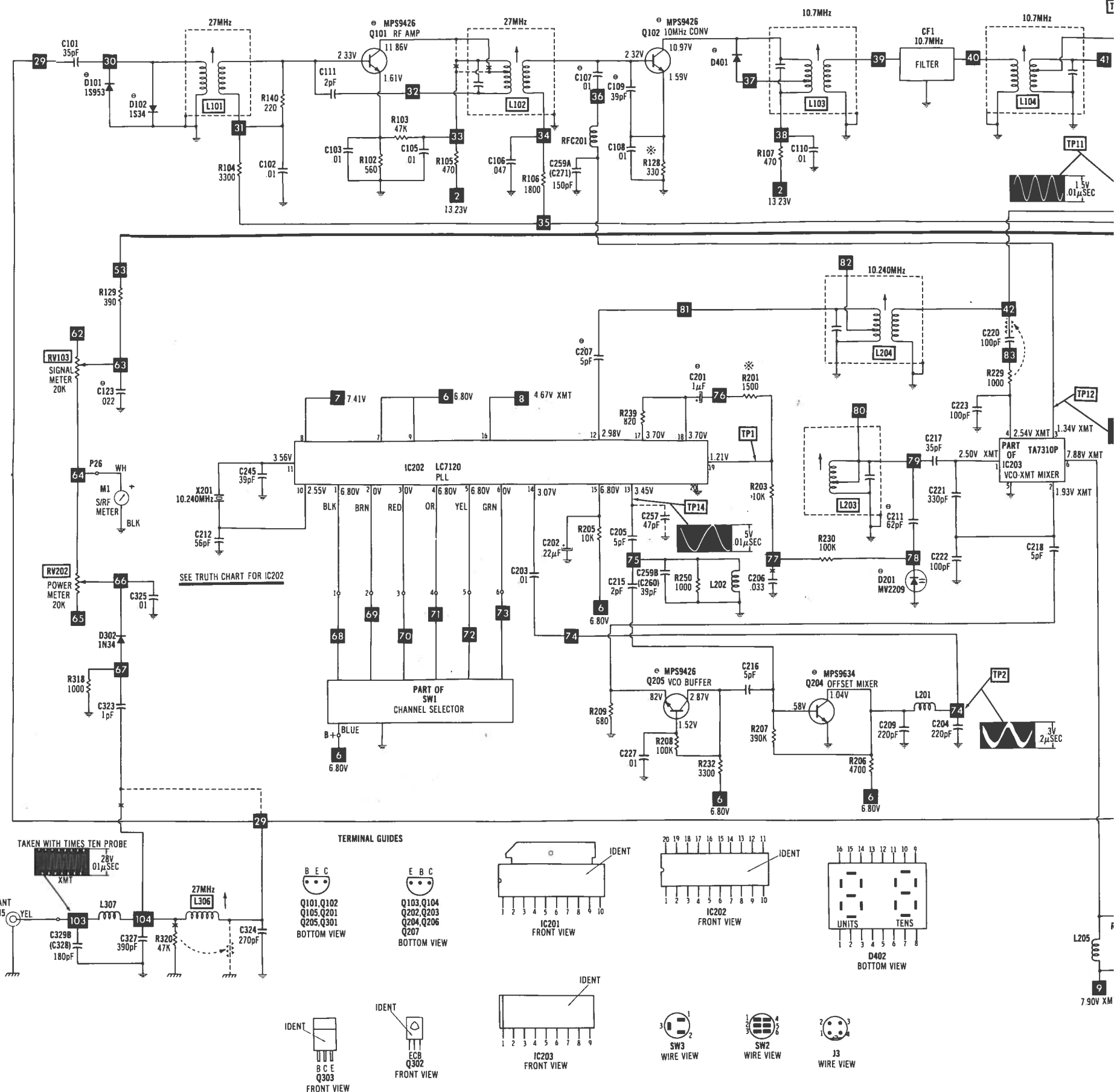
* LOCATED ON OTHER SIDE OF BOARD

CHANNEL READOUT BOARD

A PHOTOFACT STANDARD NOTATION SCHEMATIC
WITH **CIRCUITRACE™**

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POWER SUPPLY SCHEMATIC



PARTS LIST AND DESCRIPTION

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

SEMICONDUCTORS (Select replacement transistor for best results)

ITEM No.	TYPE No.	MFR. PART No.	REPLACEMENT DATA							
			GENERAL ELECTRIC PART No.	MALLORY PART No.	RAYTHEON PART No.	RCA PART No.	SYLVANIA PART No.	THORDARSON PART No.	WORKMAN PART No.	ZENITH PART No.
D101	1S953 1S1555 MA150	05-180953	GE-300 GE-300 GE-300	PTC214 PTC214 PTC214	REN 177 REN 177 REN 177	SK3175/177 SK3175/177 SK3175/177	ECG177 ECG177 ECG177	TM177 TM177 TM177	WEP1062/177 WEP1062/177 WEP1062/177	103-131 103-131 103-131
D102	1S34 1N60	05-180034	1N60 1N60	PTC206 PTC206	REN 109 REN 109	SK3088 SK3088	ECG109 ECG109	TM109/** TM109/**	WEP134/109 WEP134/109	103-29001 103-29001
D104	1S953 1S1555 MA150	05-180953	GE-300 GE-300 GE-300	PTC214 PTC214 PTC214	REN 177 REN 177 REN 177	SK3175/177 SK3175/177 SK3175/177	ECG177 ECG177 ECG177	TM177 TM177 TM177	WEP1062/177 WEP1062/177 WEP1062/177	103-131 103-131 103-131
D105	1S34 1N60	05-180034	1N34AS 1N60	PTC207 PTC206	REN 109 REN 109	SK3087 SK3088	ECG109 ECG109	TM109/** TM109/**	WEP134/109 WEP134/109	103-29001 103-29001
D106	1S1555 1S953 MA150	05-180953	GE-300 GE-300 GE-300	PTC214 PTC214 PTC214	REN 177 REN 177 REN 177	SK3175/177 SK3175/177 SK3175/177	ECG177 ECG177 ECG177	TM177 TM177 TM177	WEP1062/177 WEP1062/177 WEP1062/177	103-131 103-131 103-131
D201	MV2209 1S1658	05-472209	GE-90 GE-90		REN 614 REN 614		ECG614 ECG614	TM614 TM614	WEP200/614 WEP200/614	103-219 103-219
D202	MA1091	05-331091		ZM9.1B		SK3784/5018A	ECG5018A	TM5018	WEP1419/5018	103-279-18
D203	MA150 1S953 1S1555	05-180953	GE-300 GE-300 GE-300	PTC214 PTC214 PTC214	REN 177 REN 177 REN 177	SK3175/177 SK3175/177 SK3175/177	ECG177 ECG177 ECG177	TM177 TM177 TM177	WEP1062/177 WEP1062/177 WEP1062/177	103-131 103-131 103-131
D204	1S953	05-180953	GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062/177	103-131
D206	1S953 1S1555 MA150	05-180953	GE-300 GE-300 GE-300	PTC214 PTC214 PTC214	REN 177 REN 177 REN 177	SK3175/177 SK3175/177 SK3175/177	ECG177 ECG177 ECG177	TM177 TM177 TM177	WEP1062/177 WEP1062/177 WEP1062/177	103-131 103-131 103-131
D207	1N4002 MR9602	05-001100	GE-504A GE-504A	1N4002 PTC201	REN 116 REN 116	SK3312 SK3311	ECG116 ECG116	TM116 TM116	WEP156 WEP156	212-76-02 212-76-02
D301	1N4002 MR9602	05-001100	GE-504A GE-504A	1N4002 PTC201	REN 116 REN 116	SK3312 SK3311	ECG116 ECG116	TM116 TM116	WEP156 WEP156	212-76-02 212-76-02
D302	1N60 1S34	05-180034	1N60 1N34AS	PTC206 PTC207	REN 109 REN 109	SK3088 SK3087	ECG109 ECG109	TM109/** TM109/**	WEP134/109 WEP134/109	103-29001 103-29001
IC201	KIA7205P TA7205AP TA7205P	02-257205	GEIC-179 GEIC-179 GEIC-179	PTC780 PTC780 PTC780	REN 1155 REN 1155 REN 1155	SK3231/1155 SK3231/1155 SK3231/1155	ECG1155 ECG1155 ECG1155	TM1155 TM1155 TM1155	WEP949/1155 WEP949/1155 WEP949/1155	221-29051 221-29051 221-29051
IC202	LC7120	02-507120								
IC203	AN103-0 AN103 TA7310P	02-257310			REN 1192 REN 1192 REN 1192	SK3445/1192 SK3445/1192 SK3445/1192	ECG1192 ECG1192 ECG1192	TM1192 TM1192 TM1192	WEP2120/1192 WEP2120/1192 WEP2120/1192	221-29061 221-29061 221-29061
Q101	MPS9426 MPS9426B MPS9426C	01-349426	GE-61 GE-61 GE-61	PTC121* PTC121* PTC121*	REN 229 REN 229 REN 229	SK3246/229 SK3246/229 SK3246/229	ECG229 ECG229 ECG229	TM229 TM229 TM229	WEP956/229 WEP956/229 WEP956/229	121-29021 121-29021 121-29021
Q102	MPS9426 MPS9426B MPS9426C	01-349426	GE-61 GE-61 GE-61	PTC121* PTC121* PTC121*	REN 229 REN 229 REN 229	SK3246/229 SK3246/229 SK3246/229	ECG229 ECG229 ECG229	TM229 TM229 TM229	WEP956/229 WEP956/229 WEP956/229	121-29021 121-29021 121-29021
Q103	MPS9623 MPS9623H MPS9623I	01-349623	GE-20 GE-20 GE-20	PTC121 PTC121 PTC121	REN 123A REN 123A REN 123A	SK3444/123A SK3444/123A SK3444/123A	ECG123AP ECG123AP ECG123AP	TM123AP TM123AP TM123AP	WEP736/123A WEP736/123A WEP736/123A	121-29000A 121-29000A 121-29000A
Q104	MPS9623 MPS9623H MPS9623I	01-349623	GE-20 GE-20 GE-20	PTC121 PTC121 PTC121	REN 123A REN 123A REN 123A	SK3444/123A SK3444/123A SK3444/123A	ECG123AP ECG123AP ECG123AP	TM123AP TM123AP TM123AP	WEP736/123A WEP736/123A WEP736/123A	121-29000A 121-29000A 121-29000A
Q105	MPS9426 MPS9426B MPS9426C	01-349426	GE-61 GE-61 GE-61	PTC121* PTC121* PTC121*	REN 229 REN 229 REN 229	SK3246/229 SK3246/229 SK3246/229	ECG229 ECG229 ECG229	TM229 TM229 TM229	WEP956/229 WEP956/229 WEP956/229	121-29021 121-29021 121-29021
Q201	MPS9634 MPS9634C MPS9634D	01-349634	GE-62* PTC136 GE-62*	PTC136 PTC136 PTC136	REN 199* REN 199* REN 199*	SK3854/123AP SK3854/123AP SK3854/123AP	ECG199* ECG199* ECG199*	TM199* TM199* TM199*	WEP66/199* WEP66/199* WEP66/199*	121-972 121-972 121-972
Q202	MPS9634 MPS9634C MPS9634D	01-349634	GE-62* PTC136 GE-62*	PTC136 PTC136 PTC136	REN 199* REN 199* REN 199*	SK3854/123AP SK3854/123AP SK3854/123AP	ECG199* ECG199* ECG199*	TM199* TM199* TM199*	WEP66/199* WEP66/199* WEP66/199*	121-972 121-972 121-972
Q203	MPS9634 MPS9634C MPS9634D	01-349634	GE-62* PTC136 GE-62*	PTC136 PTC136 PTC136	REN 199* REN 199* REN 199*	SK3854/123AP SK3854/123AP SK3854/123AP	ECG199* ECG199* ECG199*	TM199* TM199* TM199*	WEP66/199* WEP66/199* WEP66/199*	121-972 121-972 121-972
Q204	MPS9634 MPS9634C MPS9634D	01-349634	GE-62* PTC136 GE-62*	PTC136 PTC136 PTC136	REN 199* REN 199* REN 199*	SK3854/123AP SK3854/123AP SK3854/123AP	ECG199* ECG199* ECG199*	TM199* TM199* TM199*	WEP66/199* WEP66/199* WEP66/199*	121-972 121-972 121-972
Q205	MPS9426 MPS9426B MPS9426C	01-349426	GE-61 PTC121* GE-61	PTC121* PTC121* PTC121*	REN 229 REN 229 REN 229	SK3246/229 SK3246/229 SK3246/229	ECG229 ECG229 ECG229	TM229 TM229 TM229	WEP956/229 WEP956/229 WEP956/229	121-29021 121-29021 121-29021
Q206	MPS9418 MPS9418T	01-349418	GE-222 PTC121	PTC121 PTC121	REN 297* REN 297*	SK3854/123AP SK3854/123AP	ECG297* ECG297*	TM297* TM297*	WEP914/297* WEP914/297*	921-340* 921-340*
Q207	MPS9681 MPS9681T	01-349681	GE-82 PTC103	PTC103 PTC103	REN 159 REN 159	SK3466/159 SK3466/159	ECG159 ECG159	TM159 TM159	WEP62/159 WEP62/159	121-29003 121-29003
Q301	MPS9426 MPS9426B MPS9426C	01-349426	GE-61 PTC121* GE-61	PTC121* PTC121* PTC121*	REN 229 REN 229 REN 229	SK3246/229 SK3246/229 SK3246/229	ECG229 ECG229 ECG229	TM229 TM229 TM229	WEP956/229 WEP956/229 WEP956/229	121-29021 121-29021 121-29021
Q302	2SC1957 2SC2314	01-031957	GE-270 PTC180	PTC180 PTC180	REN 295 REN 295	SK3253/295 SK3252/302	ECG295 ECG295	TM295 TM295	WEP913/295 WEP913/295	121-880 121-880
Q303	2SC2078 2SC1306	01-031306	GE-215 PTC186	PTC186 PTC186	REN 235 REN 235	SK3197/235 SK3239/236	ECG235 ECG235	TM235 TM235/**	WEP785/235 WEP785/235	121-29039 121-29039

* 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				
		MFR. PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
					Q-LINE	GENERAL LINE
C126	3.3 50V	00-132460	NLW4-50	VTT3R3A50	QV1-25	EV-1618.1
C129	33 16V	00-132510	PC30-25	VTT33D25	QV1-63	EV-1325
C131	2.2 16V	00-132265	PC2-100	VTT2R2A50	QV1-21	EV-1617.1
C201	1 16V	03-007004		TDC105M035EL		SD35-19
C202	.22 16V	03-007016		TDC224M050EL	QDT1-10	SD50-R229
C210	47 16V	00-132565	PC50-16	VTT47D16	QV1-73	EV-1226
C228	1 50V	00-132055	PC1-50	VTT1A50	QV1-11	EV-1615
C230	10 16V	00-132115	PC10-25	VTT10B25	QV1-41	EV-1222
C232	4.7 16V	00-132595	PC5-50	VTT4R7B50	QV1-31	EV-1619.1
C233	47 6.3V	00-132620	PC50-16	VTT47D16	QV1-73	EV-1226
C234	47 10V	00-132625	PC50-16	VTT47D16	QV1-73	EV-1226
C238	33 10V	00-132505	PC30-25	VTT33B10	QV1-25	EV-1225
C240	47 16V	00-132565	PC50-16	VTT47D16	QV1-73	EV-1226
C242	220 16V	00-132380	PC250-25	VTT220H16	QV1-117	EV-1240
C243	47 16V	00-132565	PC50-16	VTT47D16	QV1-73	EV-1226
C248	.47 16V		PC1-50	VTT47A63	QV1-3	EV-1610
C270	47 16V	00-132565	PC50-16	VTT47D16	QV1-73	EV-1226
C309	2.2 16V	00-132265	PC2-100	VTT2R2A50	QV1-21	EV-1617.1
C334	1000 16V	00-132210	PC1000-16	VTT1000M16	QV1-183	EV-1261

CAPACITORS

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA			
			CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
					Q-LINE	GENERAL LINE
C101	35 50V			CN0439		10TCC-Q39
C102	.01 50V			MAG5011		
C103	.01 50V			MAG5011		
C105	.01 50V			MAG5011		
C106	.047 50V		DPMS2S47	EWFA1A147	QF1-171	1PB-S47
C107	.01 50V			MAG5011		
C108	.01 50V			MAG5011		
C109	39 50V			CN0439		10TCC-Q39
C110	.01 50V			MAG5011		
C111	2 50V		NP02P2	CN0522		10TCC-V22
C112	470 50V		CD15FD471J03	SN347	QW1-42	MWB-471
C113	.047 50V		DPMS2S47	EWFA1A147	OF1-171	1PB-S47
C114	3 50V		NP03P3	CN0533		10TCC-V33
C115	.047 50V		DPMS2S47	EWFA1A147	QF1-171	1PB-S47
C116	.047 50V		DPMS2S47	EWFA1A147	QF1-171	1PB-S47
C117	.047 50V		DPMS2S47	EWFA1A147	QF1-171	1PB-S47
C118	2 50V		NP02P2	CN0522		10TCC-V22
C119	.047 50V		DPMS2S47	EWFA1A147	OF1-171	1PB-S47
C120	.0047 50V			M192P4729R8		192P4729R8
C121	.022 50V			M192P2239R8		192P2239R8
C122	100 50V		NP0100	CN0310		10TCC-T10
C123	.022 50V			M192P2239R8		192P2239R8
C125	.0022 50V			M192P2229R8		192P2229R8
C127	.01 50V			MAG5011		
C130	18 50V			CN0418		10TCC-N18
C203	.01 50V			MAG5011		
C204	220 50V					
C205	5 50V		NP04P7	CN0547		10TCC-T22
C206	.033 50V			M192P3339R8		10TCC-V47
C207	5 50V		NP04P7	CN0547		192P3339R8
C209	220 50V					10TCC-V47
C211	60 NPO 50V 5%		NP06B	CN0468		10TCC-T22
C212	56 50V			CN0456		10TCC-Q68
C214	.022 50V			M192P2239R8		10TCC-Q56
C215	2 50V		NP02P2	CN0522		192P2239R8
C216	5 50V		NP04P7	CN0547		10TCC-V22
C217	35 50V			CN0439		10TCC-V47
C218	5 50V		NP04P7	CN0547		10TCC-Q39
C220	100 50V		NP0100	CN0310		10TCC-V47
C221	330 50V		GP330	GP333	QCT2-33	10TCC-T10
C222	100 50V		NP0100	CN0310		10TS-T33
C223	100 50V		NP0100	CN0310		10TCC-T10
C225	330 50V		GP330	GP333	QCT2-33	10TCC-T10
C226	.01 50V			MAG5011		10TS-T33
C227	.01 50V			MAG5011		
C231	.047 50V		DPMS2S47	EWFA1A147	QF1-171	1PB-S47
C236	120 50V			CN0312		10TCC-T12
C239	.068 50V		WMF1S68	EWFA1A168	QF1-195	1PB-S68
C241	100 50V		NP0100	CN0310		10TCC-T10
C245	39 50V			CN0439		10TCC-Q39
C249	100 50V		NP0100	CN0310		10TCC-T10
C250A	.01 50V			MAG5011		
C250B	.0022 50V			M192P2229R8		192P2229R8
C251	.01 50V			MAG5011		
C252	.0068 50V		WMF1D68	EWFA1A268	QF1-73	1PB-D68
C253	82 50V 10%		NP082	CN0482		10TCC-Q82
C254	82 50V 10%		NP082	CN0482		10TCC-Q82
C255	.01 50V			MAG5011		
C257	47 50V		NP047	CN0447	QCC2-26	10TCC-Q47
C259A	150 50V			CN0315		10TCC-T15
C259B	39 50V			CN0439		10TCC-Q39
C301	.01 50V			MAG5011		
C302	.01 50V			MAG5011		
C303	.01 50V			MAG5011		
C304	.047 50V		DPMS2S47	EWFA1A147	OF1-171	1PB-S47
C305	.047 50V		DPMS2S47	EWFA1A147	OF1-171	1PB-S47
C306	.001 50V			GP210	QCT2-41	10TS-D10
C308	2 50V		NP02P2	CN0522		10TCC-V22
C310	.01 50V			MAG5011		
C311	.01 50V			MAG5011		
C312	.01 50V			MAG5011		

PARTS LIST AND DESCRIPTION (CONTINUED)

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

CAPACITORS

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA			
			CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
					Q-LINE	GENERAL LINE
C313	.01 50V			MAG5011		
C315	330 50V		GP330	GP333	QCT2-33	10TS-T33
C316	82 50V		NP082	CN0482		10TCC-Q82
C317	.01 50V			MAG5011		
C318	220 50V 10%					10TCC-T22
C320	.01 50V			MAG5011		
C322	100 50V		NP0100	CN0310		10TCC-T10
C323	1 50V			CN0510		10TCC-V10
C324	270 50V		CD15FD271J03	SX327	QW1-37	MWB-271
C325	.01 50V			MAG5011		
C327	390 50V		CD15FD391J03	SX339	QW1-41	MWB-391
C329A	.047 50V		DPMS2S47	ENF1A147	QF1-171	1PB-S47
C329B	180 50V		CD15FD181J03	SX318	QW1-33	MWA-181
C330	.01 50V			MAG5011		
C331	.01 50V			MAG5011		
C332	.01 50V			MAG5011		
C336	100 50V		NP0100	CN0310		10TCC-T10
C337	330 50V		GP330	GP333	QCT2-33	10TS-T33
C338	.01 50V			MAG5011		
C339	1 50V			CN0510		10TCC-V10
C340	47 50V		NP047	CN0447	QCC2-26	10TCC-Q47
C341	5 50V		NP04P7	CN0547		10TCC-V47
C350	.01 50V			MAG5011		
C369	.01 50V			MAG5011		
C370	.01 50V			MAG5011		

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

ITEM No.	FUNCTION	RESISTANCE	REPLACEMENT DATA		
			MFR. PART No.	MALLORY PART No.	TRW PART No.
RV101	Squelch Range	10K	13-164132	RVA0911H103	U260R103B
RV102	Volume/Power Switch	50K	77-160011		
RV103	Signal Meter Adj.	20K	13-164142	RVA0911H253	U260R253B
RV201	ALC	10K	13-164132	RVA0911H103	U260R103B
RV202	Power Meter Adj.	20K	13-164142	RVA0911H253	U260R253B
VR101	Squelch	10K	13-166031		

COILS (RF-IF)

ITEM No.	FUNCTION	REPLACEMENT DATA			REMARKS
		PART No.	OTHER IDENTIFICATION	MILLER PART No.	
L101	Rec Antenna (27MHz)	77-090014	340005B		
L102	RF Amp (27MHz)	77-090015	340006A		
L103	Converter (10.7MHz)	77-090016	340007A		
L104	Converter (10.7MHz)	77-090016	340007A		
L105	IF (455kHz)	77-090017	340008		
L106	IF (455kHz)	77-090018	340009		
L107	IF (455kHz)	77-090018	340010		
L201	RF Choke (25uH)	77-178024	250K	70F226A1	
L202	RF Choke (2.2uH)	77-178026	2R2K		
L203	VCO	77-176055	340035		
L204	Ref Osc (10.24MHz)	77-090016			
L205	RF Choke (.45uH)	77-178034	045K		
L301	Buffer (27MHz)	77-176065			
L302	Buffer (27MHz)	77-090021			
L303	RF Amp (27MHz)	77-090022			
L304	RF Driver (27MHz)	77-090023			
L305	Final (27MHz)	77-176051			
L306	Antenna Matching (27MHz)	77-176052			
L307	Pi Filter	77-176053			
RFC201	RF Choke (1.5uH)	77-178033		70F686A1	
RFC302	RF Choke (1uH)	77-178030			
RFC303	RF Choke (6.8uH)	77-178025			
RFC304	RF Choke (.5uH)	77-178032			
RFC305	RF Choke (.8uH)	77-178027			
RFC306	RF Choke (.8uH)	77-178027			

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000~)	MFR. PART No.	THORDARSON PART No.	TRIAD PART No.	
CH301	1.3A	.07	.52mH	77-178023			(1) Number on unit.
				310008(1)			

TRANSFORMER (Audio Output)

ITEM No.	IMPEDANCE		REPLACEMENT DATA			NOTES
	PRI.	SEC. 1	MFR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T201	2.5	8	77-096007			(1) Number on unit.
		SEC. 2				
		13	310019(1)			

MIDLAND MODEL 100M

PARTS LIST AND DESCRIPTION (CONTINUED)

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

SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		MFR. PART No.	QUAM PART No.	
SP	3" PM 8 Ohms	77-060005		

FUSE DEVICES

ITEM No.	DESCRIPTION	REPLACEMENT DATA					
		PART No.		BUSS PART No.		LITTELFUSE PART No.	
		DEVICE	HOLDER	DEVICE	HOLDER	DEVICE	WORKMAN PART No.
F1	2A @ 125V Quick-Acting			AGC-2	HRK	312002	150145 FG2-2

MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
CF1	Ceramic Filter	13-179021	10.7MHz
CF2	Ceramic Filter	13-179036	455kHz
D208	LED	77-202009	LN23, Red Transmit Indicator (1.56V @ 7mA)
D402	LED	77-202008	TH201P, Each segment is supplied with 1.93V @ 11.7mA.
J1	Jack	77-153001	External Speaker
J2	Jack	77-153001	PA Speaker
J3	Jack	76-153001	Microphone
J5	Connector	77-159035	Antenna
M1	Meter	77-200012	Signal/Power
PL1	Lamp		Meter 5.14V @ 57mA
SW1	Switch	77-180011	Channel Select
SW2	Switch	77-183017	CB/PA
SW3	Switch	77-160011	Power On/Off (Part of Volume Control RV102)
X201	Crystal	77-128005	10.24MHz
	Cord	77-034012	DC Power Assembly. Includes Fuse and Fuse Holder.
	Microphone	77-038017	Assembly
	P.C. Board	77-070018	LED Display and TX Indicator
	P.C. Board	77-070019	Channel Select.

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

ITEM	PART No.	ITEM	PART No.
Chassis, Main Body		Knob, Channel Select	77-115026
Panel, Front Escutcheon	77-020033	Cover, Upper	77-010034
Chassis, Front Body	77-158064	Cover, Bottom	77-013012
Knob, Volume and Squelch	77-110019	Lens, LFD Display	77-020024

WIRING DATA

Cable (Speaker)(Unshielded).....	Use BELDEN No. 8782 (AWG24)(4 colors)
Shielding Strap.....	Use BELDEN No. 8660 (3/16" width)
Hook-up Wire (General Use).....	Use BELDEN No. 8524 (AWG22)(13 colors)
Hook-up Wire (Shielded).....	Use BELDEN No. 8401 (Braided Shield)(1 conductor)(AWG25)
	Use BELDEN No. 8421 (Spiral Shield)(1 conductor)(AWG25)
	Use BELDEN No. 8737 (Spiral Shield)(2 conductor)(AWG22)
Microphone Cable (Coiled).....	Use BELDEN No. 8491 (4 conductor-2 shielded)(6 ft.)(AWG23)



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 PC-101

NDI MODEL PC-101

GENERAL:

MANUFACTURER'S SPECIFICATIONS

CHANNELS	40 channels
FREQUENCY RANGE	26.965 to 27.405 MHz
FREQUENCY CONTROL	Digitally Synthesized
FREQUENCY TOLERANCE	0.005%
OPERATING TEMPERATURE RANGE	-30°C to +50°C
HUMIDITY	95%
MICROPHONE	Dynamic w/push-to-talk switch and coiled cord.
SUPPLY VOLTAGE	13.8VDC, pos. or neg. gnd $\pm 2.1V$
CURRENT DRAIN	Transmit: AM, 95% mod., Carrier: 2 amps. Receive: Squelched: 0.5A 2W audio output: 1A
SIZE	Inches: 6.7W x 2.2H x 8.8D MM: 170W x 55H x 225D
WEIGHT	Pounds: 3.5 Kgs: 1.6

TRANSMITTER:

POWER INPUT	6 watts
POWER OUTPUT	4 watts
MODULATION CAPABILITY	100%
FREQUENCY RESPONSE	350 - 2500 Hz
OUTPUT IMPEDANCE	50 ohms, unbalanced.

RECEIVER:

SENSITIVITY	0.7 μV for 10 db S+N/N
SELECTIVITY	65 db @ ± 10 KHz
IMAGE REJECTION	50 db
IF FREQUENCY	10.695 MHz (1st), 455 KHz (2nd)
AGC (AUTOMATIC GAIN CONTROL)	Less than 10 db increase in audio 10 μV to 50,000 μV
SQUELCH	Adjustable. Threshold less than 0.7 μV
NOISE LIMITER	Parallel gate type
CLARIFIER RANGE	± 1000 Hz minimum
AUDIO OUTPUT POWER	3W @ 10% THD into 8 ohm load.
HUM & NOISE	40 db (REF 1000 μV 30% 2W)

Courtesy of the Manufacturer

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

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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:
 T101 thru T104, T401, T402, T403, L401, L403.....9440
 T105.....5009, 8728, 8728A
 T106.....5000, 5009, 8276, 8728, 8728A, 9089
 T501, T502, T503.....8728, 8728A, 9091
 C407.....5000, 8276, 9089

SYNTHESIZER ALIGNMENT

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Input of frequency counter to TP1 (Junction of R422 and C423).	Ch. 19, XMT	C407	Adjust for 10.240MHz.
Input of frequency counter to TP1 (Junction of R422 and C423).	Ch. 19 Delta Tune Fully Counterclockwise	L401	Adjust for 10.2395MHz.
Input of frequency counter to TP1 (Junction of R422 and C423).	Ch. 19 Delta Tune Fully Clockwise	VR403	Adjust for 10.2405MHz.
Input of frequency counter to TP1 (Junction of R422 and C423).	Ch. 19 Delta Tune Midrange	VR401	Adjust for 10.240MHz.
Input of DC meter to TP2 (Junction of R414 and R415).	Ch. 1	L403	Adjust for 2.30 volts. Check channel 40 for approximately 3.28 volts.
Input of DC meter to TP2 (Junction of R414 and R415).	Ch. 1, XMT		Check for 3.45 volts. Check channel 40 for approximately 4.8 volts.
Input of frequency counter to TP10 (IC401 Pin 9).	Ch. 1		Check for 16.270MHz. Check all channels. (See Truth Chart for correct frequencies.)
Input of frequency counter to TP10 (IC401 Pin 9).	Ch. 1, XMT		Check for 16.725MHz. 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. Squelch MINIMUM, RF Gain Maximum, Delta Tune Midrange, ANL Sens MINIMUM,
 Ch. 9 Scan Off, CB/PA CB.

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Output of signal generator thru .01uF to TP11 (IC101, Pin 2). 455kHz, 1000Hz @ 30% modulation.	Ch. 19	T105, T106	Adjust for maximum audio output.
Output of signal generator to antenna input. 27.185MHz, 1000Hz @ 30% modulation.	Ch. 19	T104, T103, T101	Adjust for maximum audio output. Readjust T105 and T106 for maximum.
Input of oscilloscope to TP4 (CR204 Cathode). Inject a 100pps, 1uSec. pulse width signal at antenna input.	Ch. 19 NB On	T102	Adjust for maximum pulse amplitude. (750mV peak typical). (See Figure 1.)

RECEIVER ADJUSTMENTS

Connect an AC VTVM or AF wattmeter across speaker voice coil.
Adjust volume control to obtain a suitable indication.
Squelch MINIMUM, RF Gain Maximum, Delta Tune Midrange, ANL Sens MINIMUM, Ch. 9 Scan Off,
CB/PA CB.

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Output of signal generator to antenna input. 27.185MHz, 1000Hz @ 30% modulation. Output 1000uV.	Ch. 19 Squelch Maximum	VR201	SQUELCH RANGE Adjust so squelch just breaks.
Output of signal generator to antenna input. 27.185MHz, 1000Hz @ 30% modulation. Output 100uV.	Ch. 19	VR102	S METER Adjust for 9 on S scale of meter.
		VR601	DIM Cover photo-electric sensor (CDS601) with tape and adjust for desired brightness on dim.

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, XMT	T401, T402, T403, T501, T502, T503	Adjust for maximum RF output.
Input of RF wattmeter to antenna input.	Ch. 19, XMT	T502	Adjust for 4.0 watts RF output maximum.

TRANSMITTER ADJUSTMENTS

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

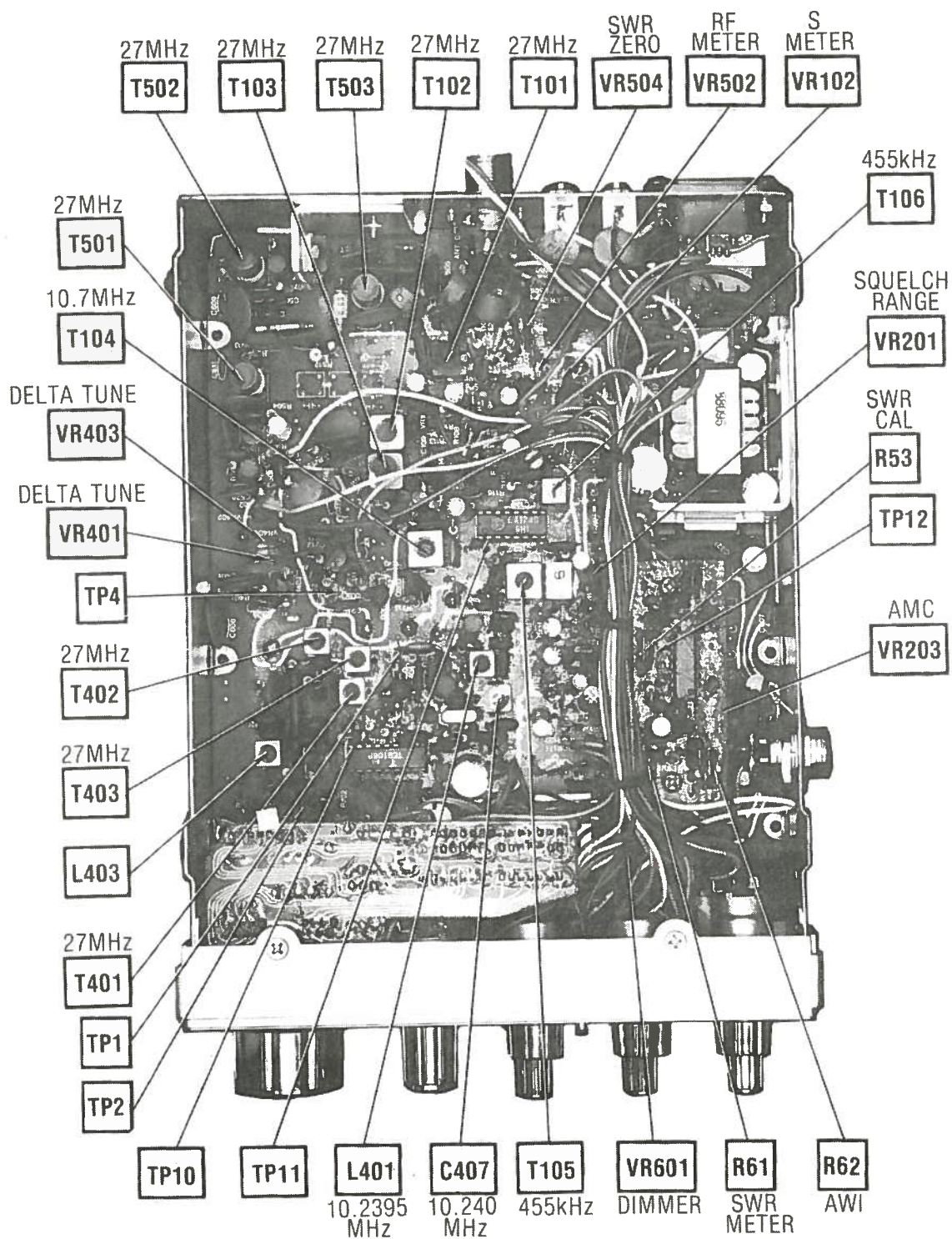
TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Input of oscilloscope or modulation meter to antenna input. Inject a 1000Hz, 40mV audio signal at Mic input.	Ch. 19, XMT Mic Gain Maximum	VR203	AMC Adjust for 100% modulation maximum. (See Figure 2.)
Input of RF wattmeter to antenna input.	Ch. 19, XMT	VR502	RF METER Adjust so RF meter agrees with RF wattmeter.
	Ch. 19, XMT	VR504	SWR ZERO Adjust for zero on SWR meter.
Input of DC meter to TP12 (IC51 Pin 9).	Ch. 19, XMT	R53	SWR CAL Adjust for 1.15 volts.
Connect a 150 ohm, 5 watt dummy load to antenna connector.	Ch. 19, XMT	R61	SWR METER Adjust for a reading of 3 on the SWR scale.
Connect a 150 ohm, 5 watt dummy load to antenna connector.	Ch. 19, XMT	R62	AWI Adjust so AWI light just comes on.



Figure 1



Figure 2

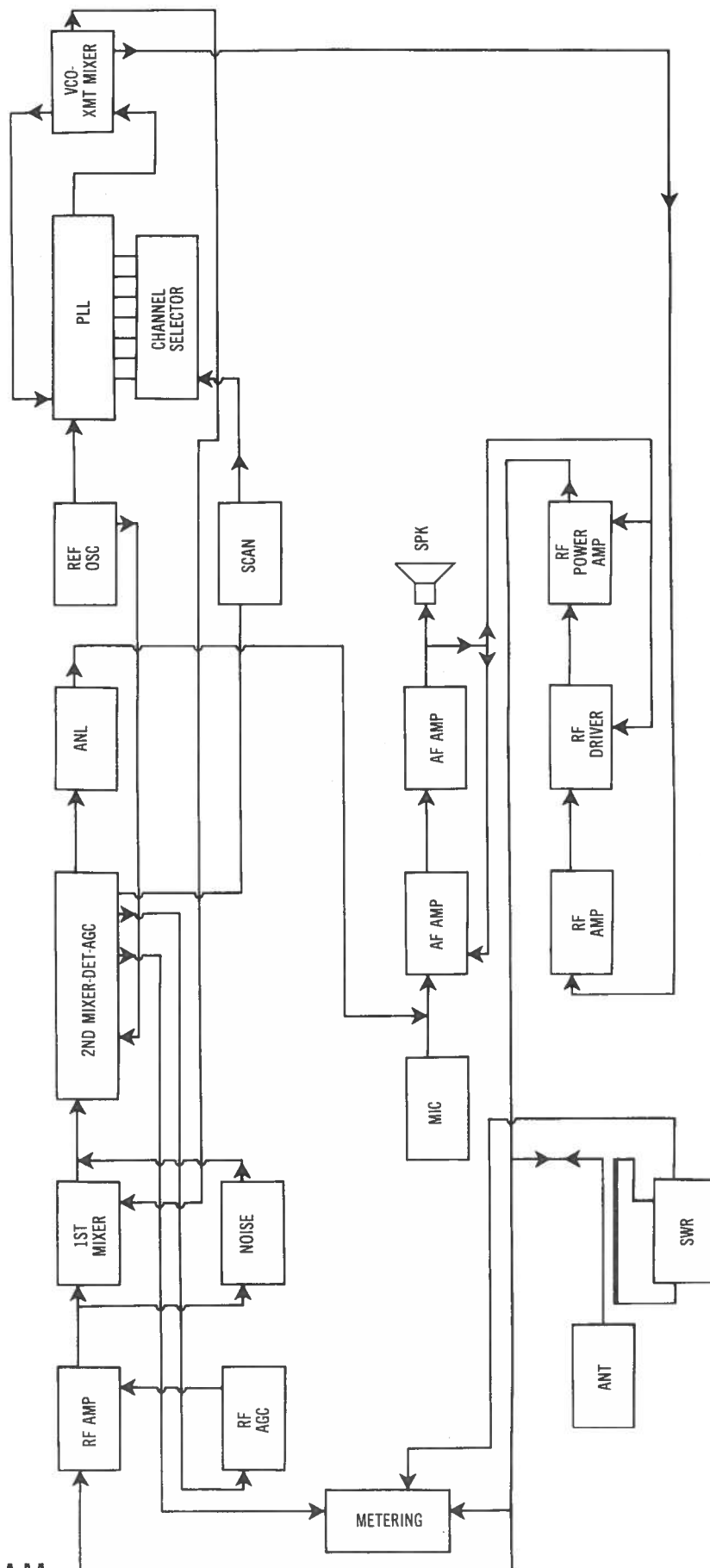


CHASSIS-BOTTOM

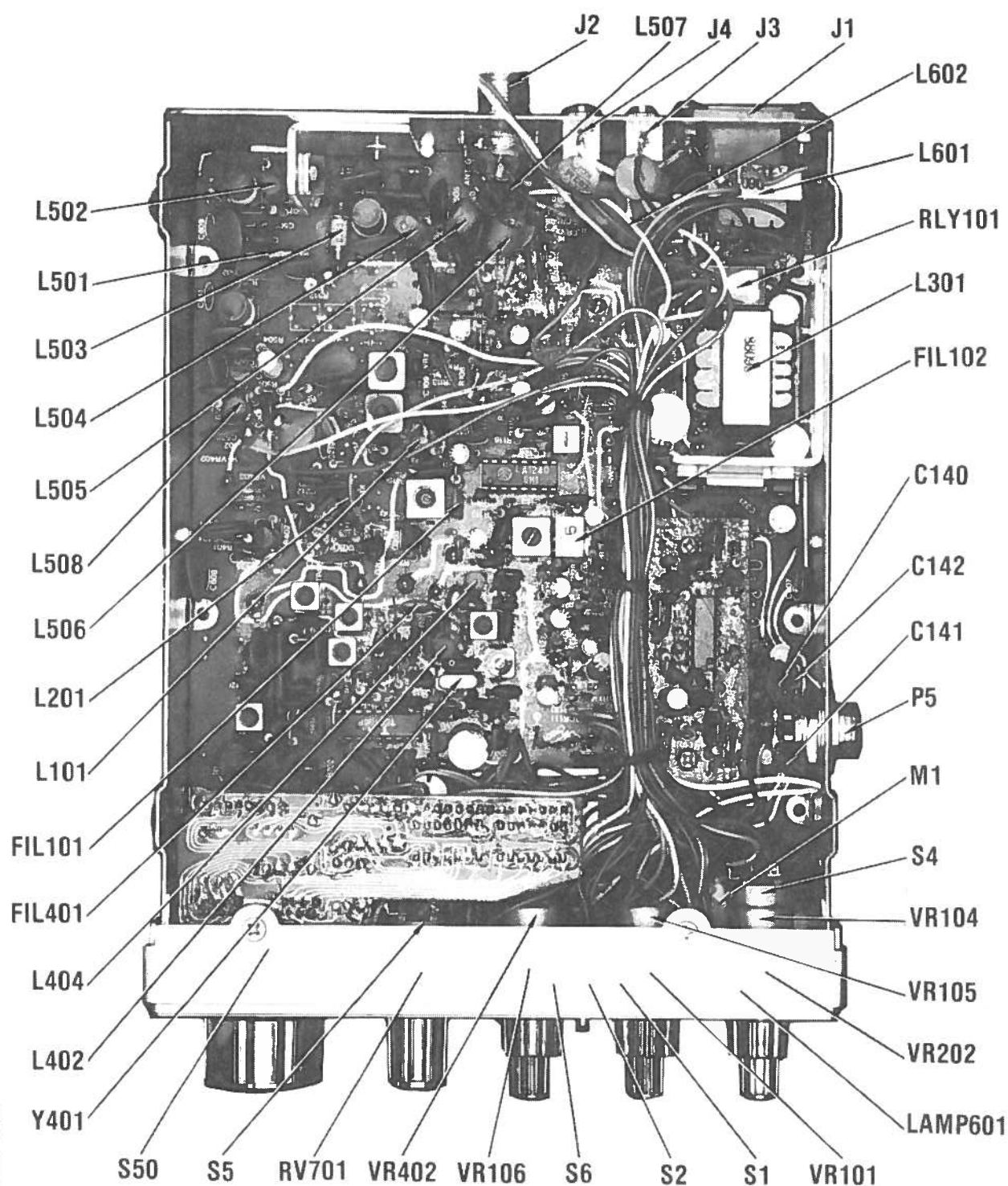
TRUTH CHART

C H A N N E L	1= 7.79 Volts 0 = .72 Volts								REC VCO OUTPUT IN MHz AT TP10	XMT VCO OUTPUT IN MHz AT TP10	
	CHANGE INPUT CODES										
	IC401 PINS										
	17	16	15	14	13	12	11	10			
1	1	0	1	1	1	1	1	1	16.270	16.725	
2	1	0	1	0	0	0	0	1	16.280	16.735	
3	1	0	1	0	1	0	0	1	16.290	16.745	
4	1	0	1	1	1	0	1	0	16.310	16.765	
5	1	0	1	0	1	0	0	0	16.320	16.775	
6	1	0	1	0	0	0	1	0	16.330	16.785	
7	1	0	1	1	1	1	0	1	16.340	16.795	
8	1	0	1	0	0	0	0	0	16.360	16.815	
9	1	0	1	1	1	0	0	0	16.370	16.825	
10	1	0	0	0	0	1	0	0	16.380	16.835	
11	1	0	0	1	1	1	1	1	16.390	16.845	
12	1	0	0	0	0	0	0	1	16.410	16.865	
13	1	0	0	0	1	0	0	1	16.420	16.875	
14	1	0	0	1	1	0	1	0	16.430	16.885	
15	1	0	0	0	1	0	0	0	16.440	16.895	
16	1	0	0	0	0	0	1	0	16.460	16.915	
17	1	0	0	1	1	1	0	1	16.470	16.925	
18	1	0	0	0	0	0	0	0	16.480	16.935	
19	1	0	0	1	1	0	0	0	16.490	16.945	
20	1	0	1	0	0	1	0	0	16.510	16.965	
21	1	0	1	1	1	1	1	1	16.520	16.975	
22	1	0	1	0	0	0	0	1	16.530	16.985	
23	1	0	1	0	1	0	0	1	16.560	17.015	
24	1	0	1	1	1	0	1	0	16.540	16.995	
25	1	0	1	0	1	0	0	0	16.550	17.005	
26	1	0	1	0	0	0	1	0	16.570	17.025	
27	1	0	1	1	1	1	0	1	16.580	17.035	
28	1	0	1	0	0	0	0	0	16.590	17.045	
29	1	0	1	1	1	0	0	0	16.600	17.055	
30	1	0	0	0	0	1	0	0	16.610	17.065	
31	1	0	0	1	1	1	1	1	16.620	17.075	
32	1	0	0	0	0	0	0	1	16.630	17.085	
33	1	0	0	0	1	0	0	1	16.640	17.095	
34	1	0	0	1	1	0	1	0	16.650	17.105	
35	1	0	0	0	1	0	0	0	16.660	17.115	
36	1	0	0	0	0	0	1	0	16.670	17.125	
37	1	0	0	1	1	1	0	1	16.680	17.135	
38	1	0	0	0	0	0	0	0	16.690	17.145	
39	1	0	0	1	1	0	0	0	16.700	17.155	
40	0	1	0	0	0	1	0	0	16.710	17.165	

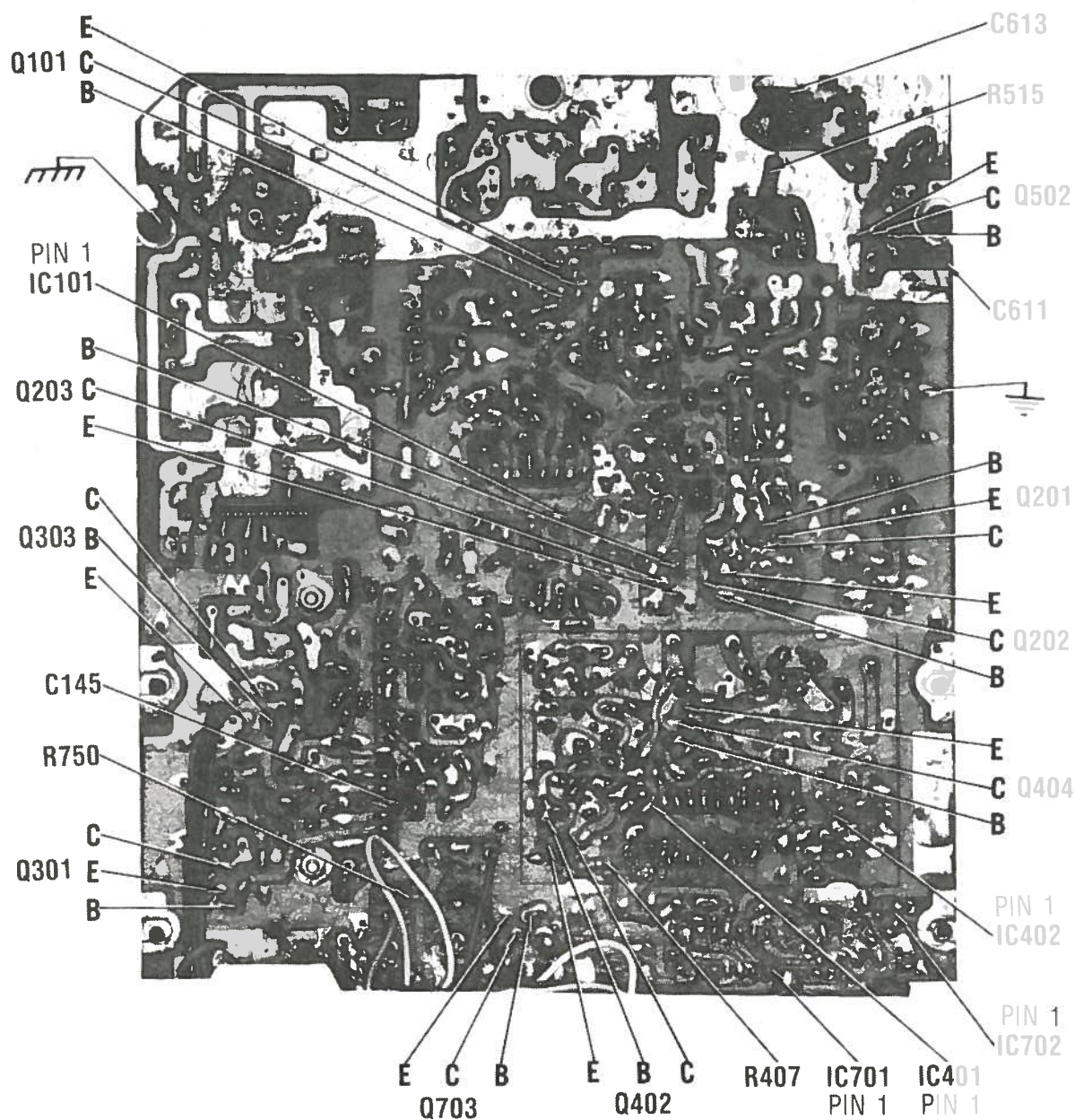
NDI MODEL PC-101



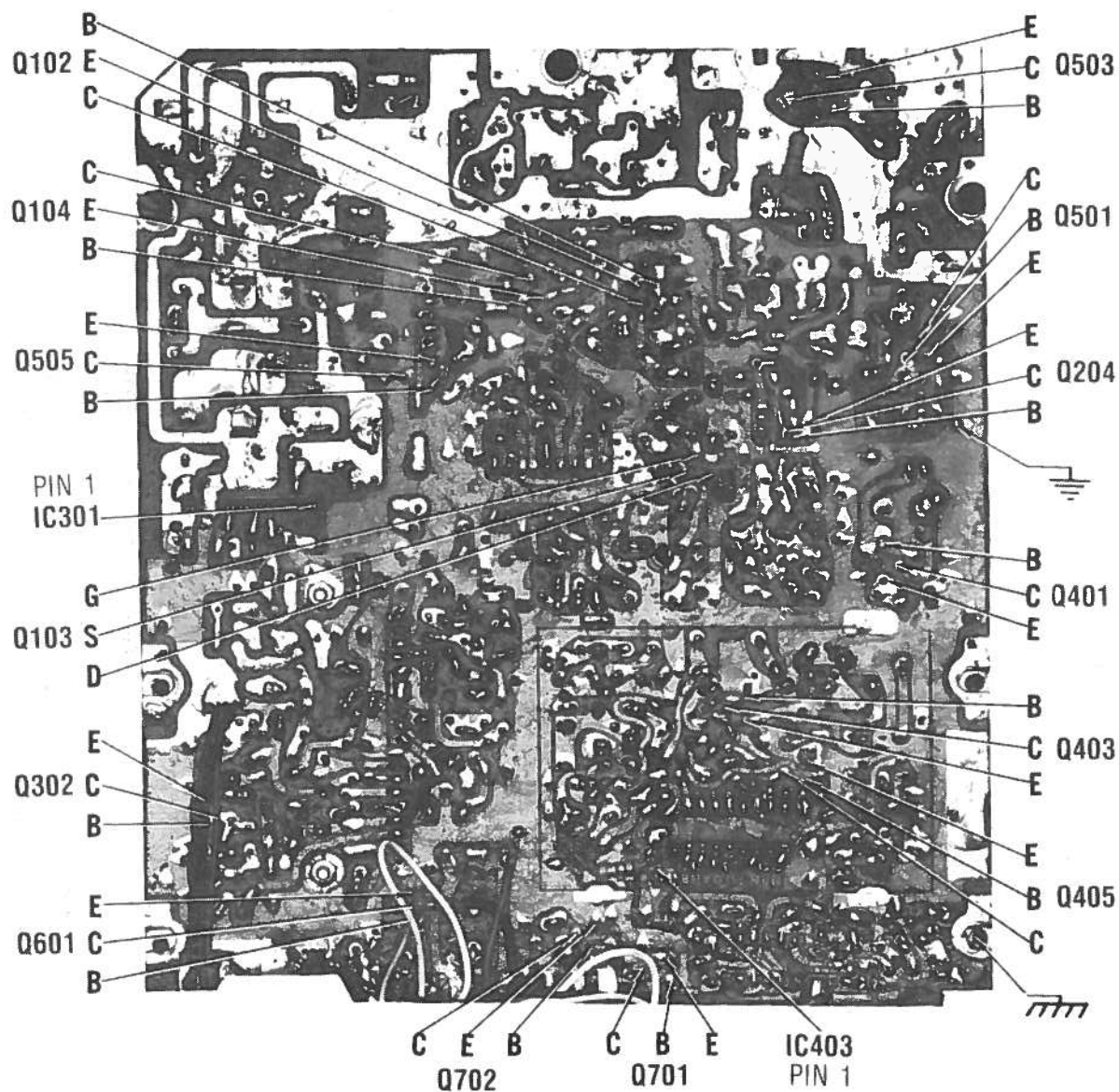
BLOCK DIAGRAM



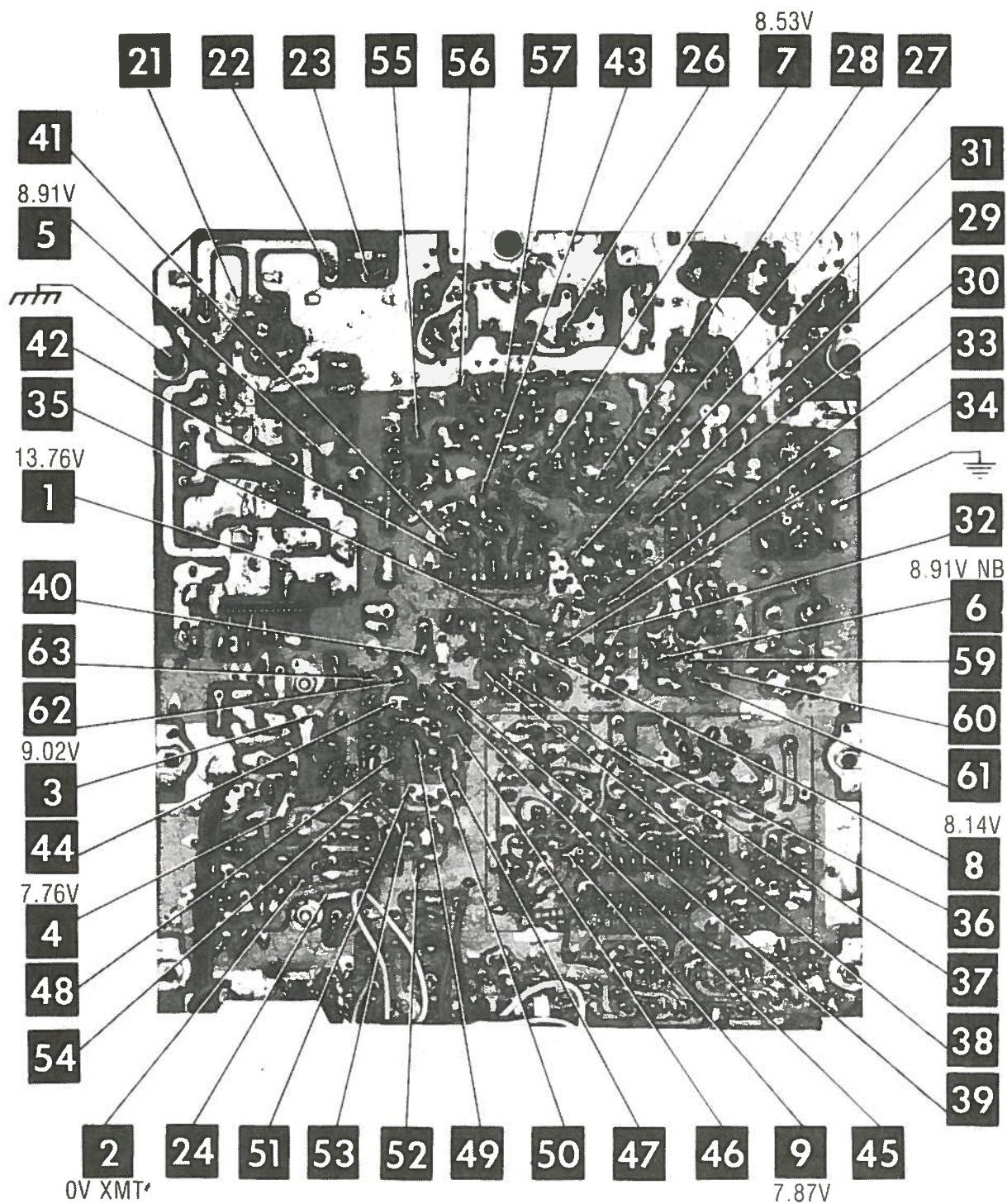
CHASSIS-BOTTOM



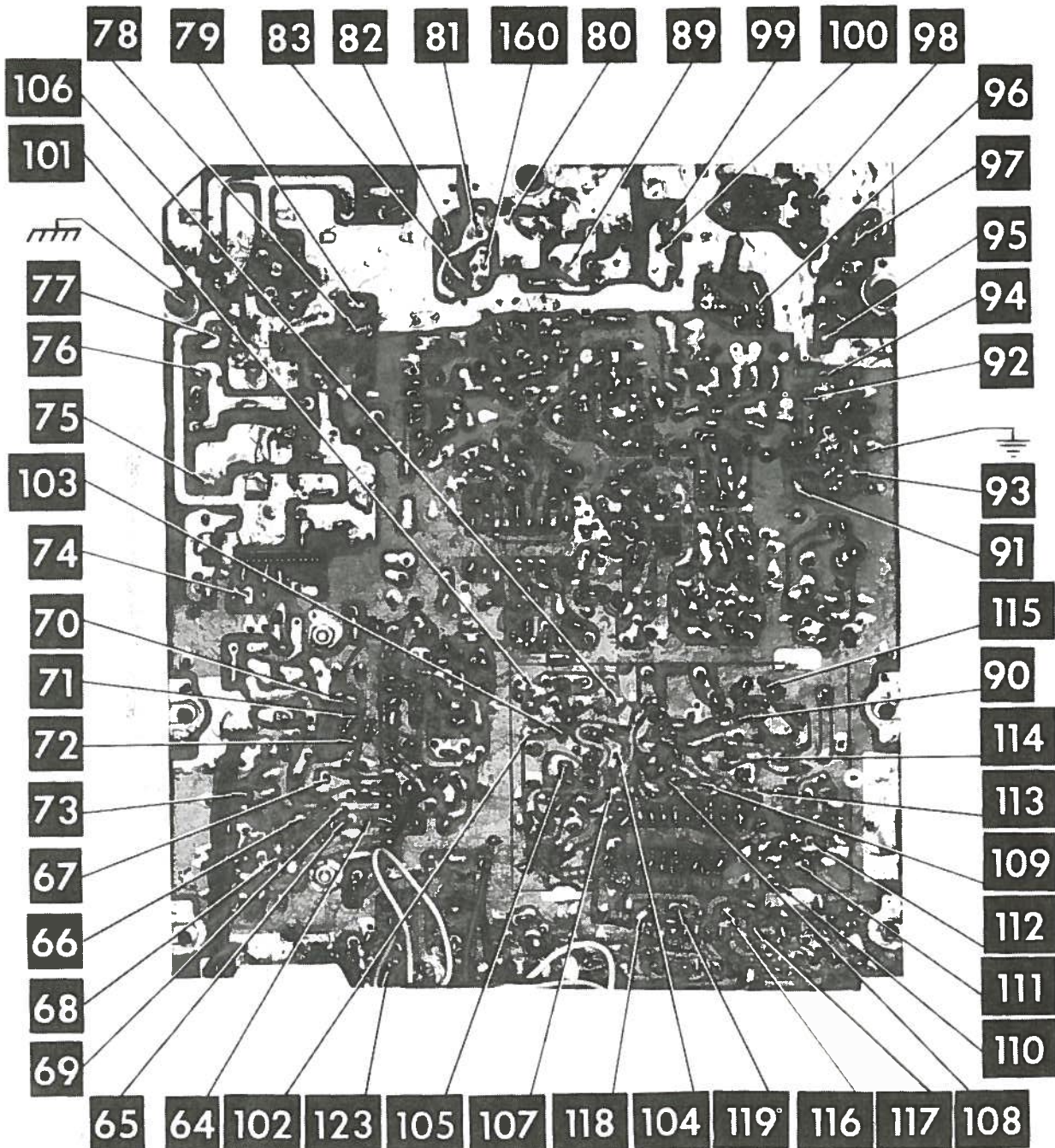
MAIN BOARD



MAIN BOARD

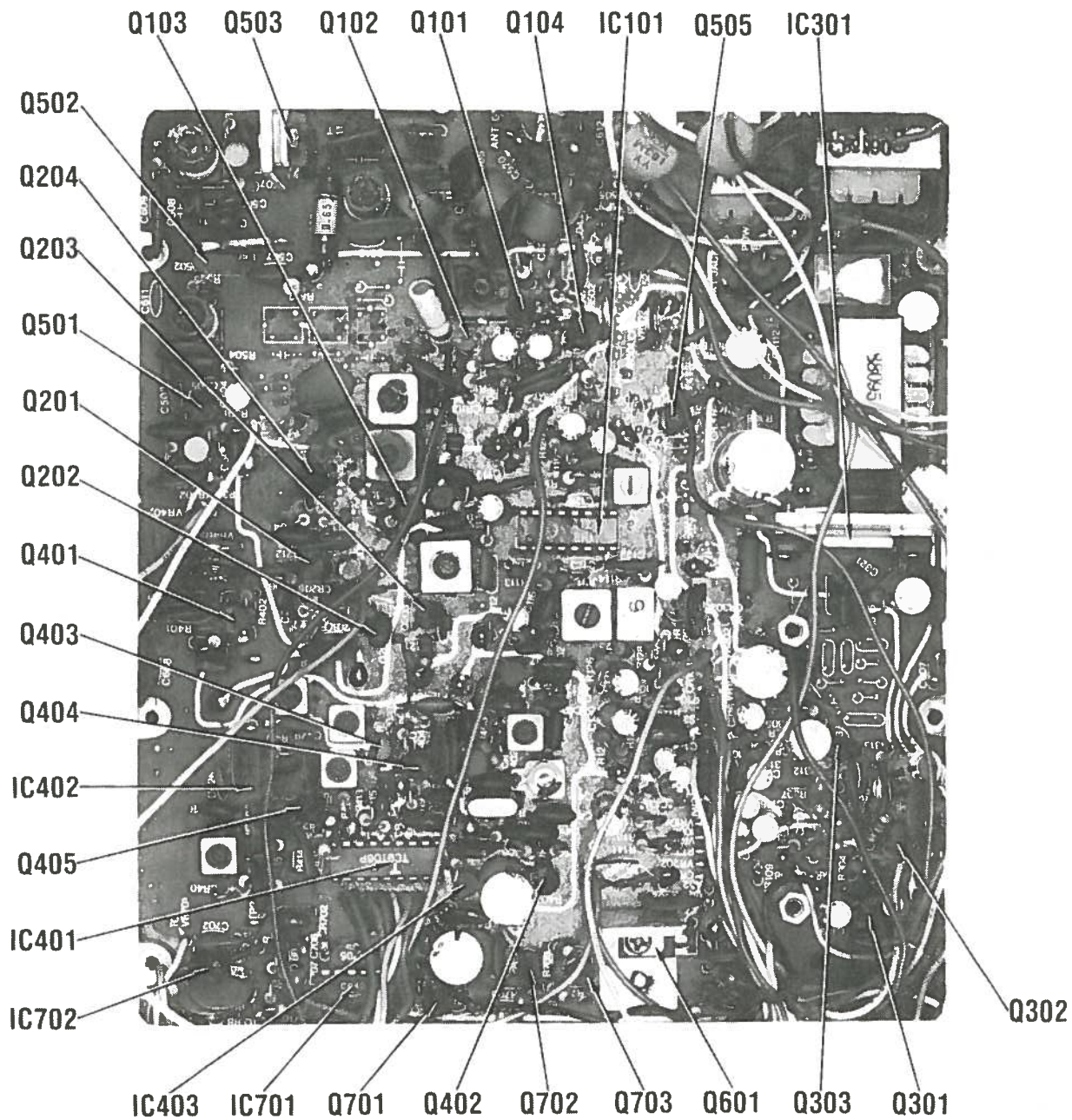


MAIN BOARD

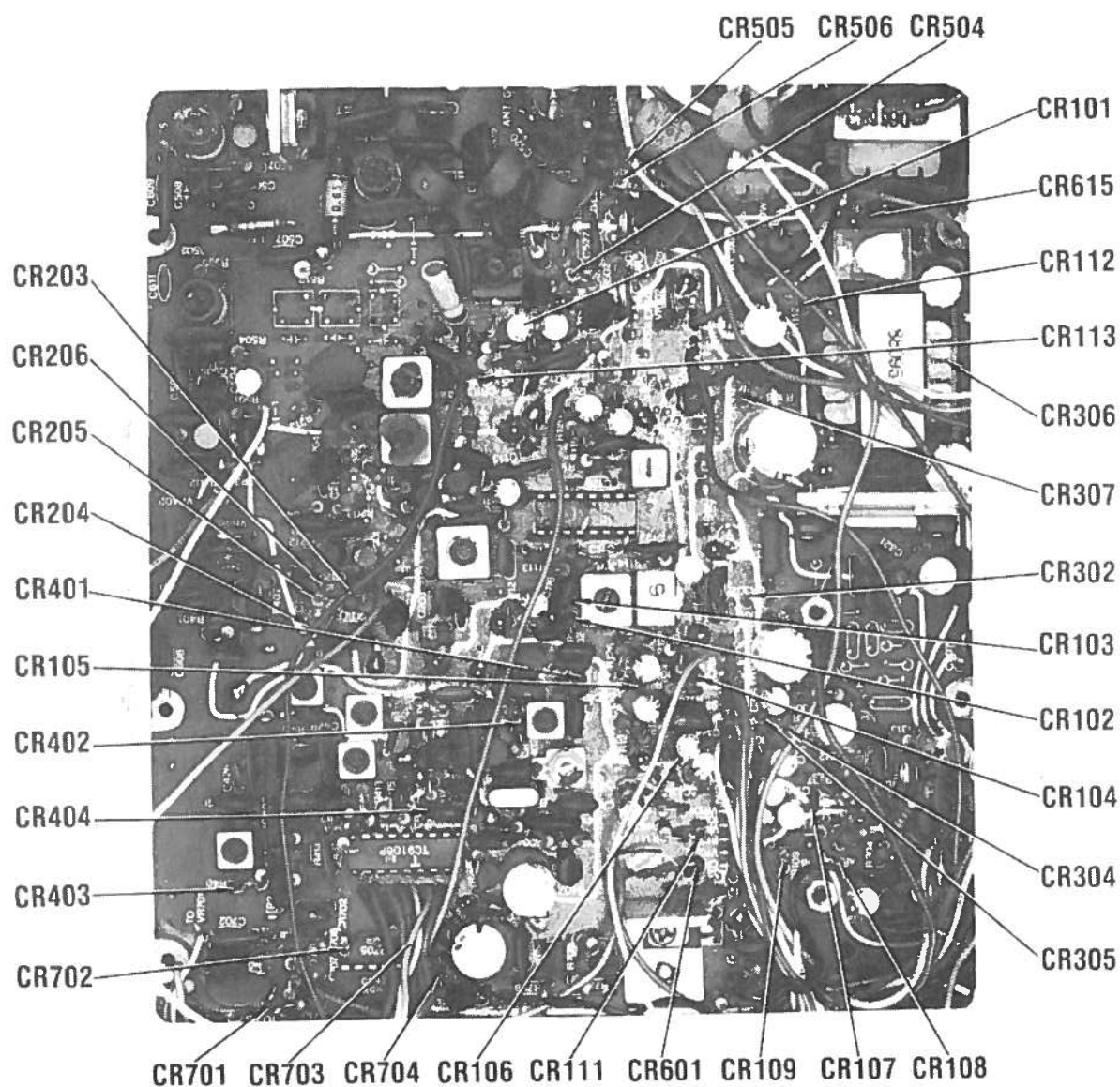


NDI MODEL PC-101

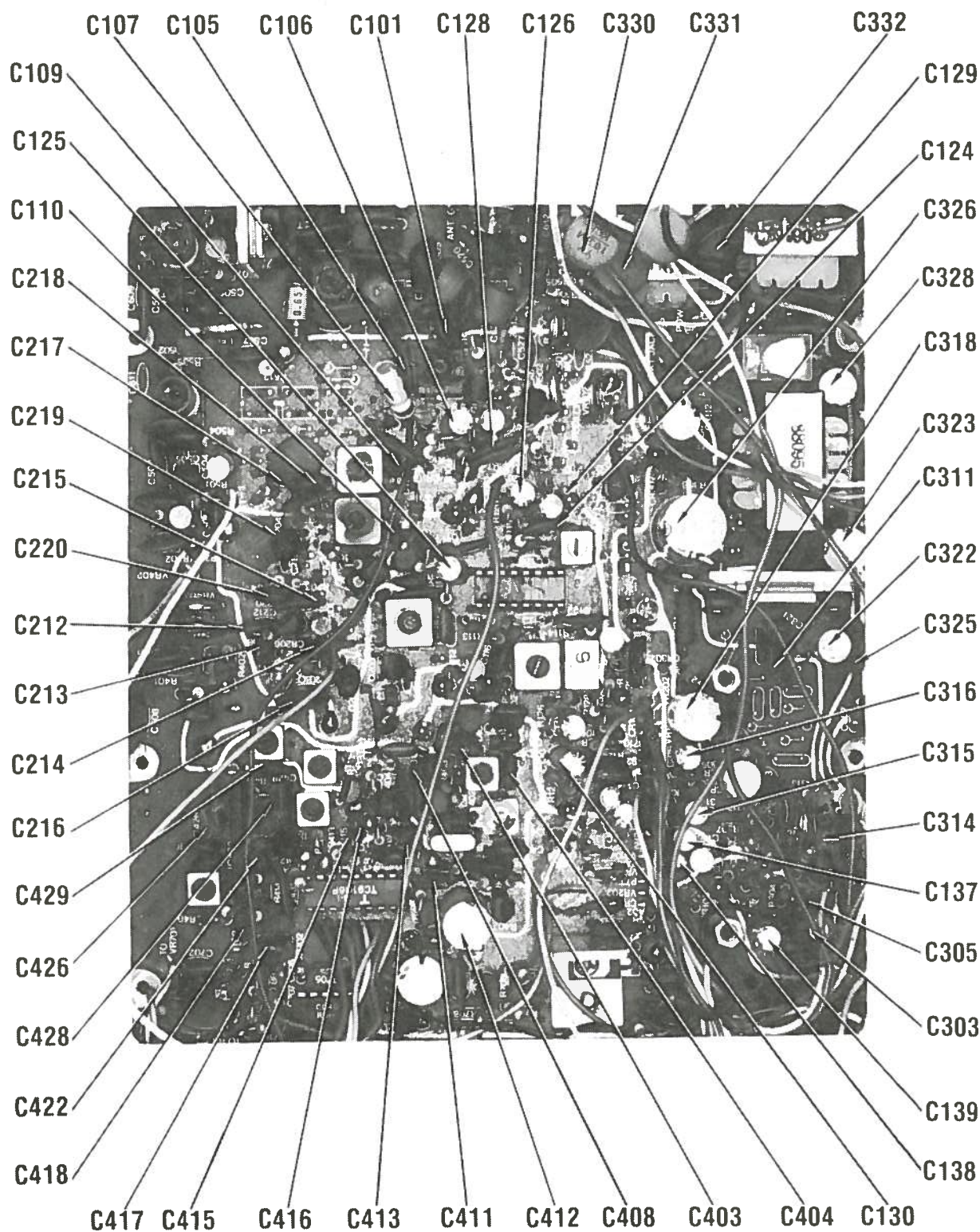
MAIN BOARD



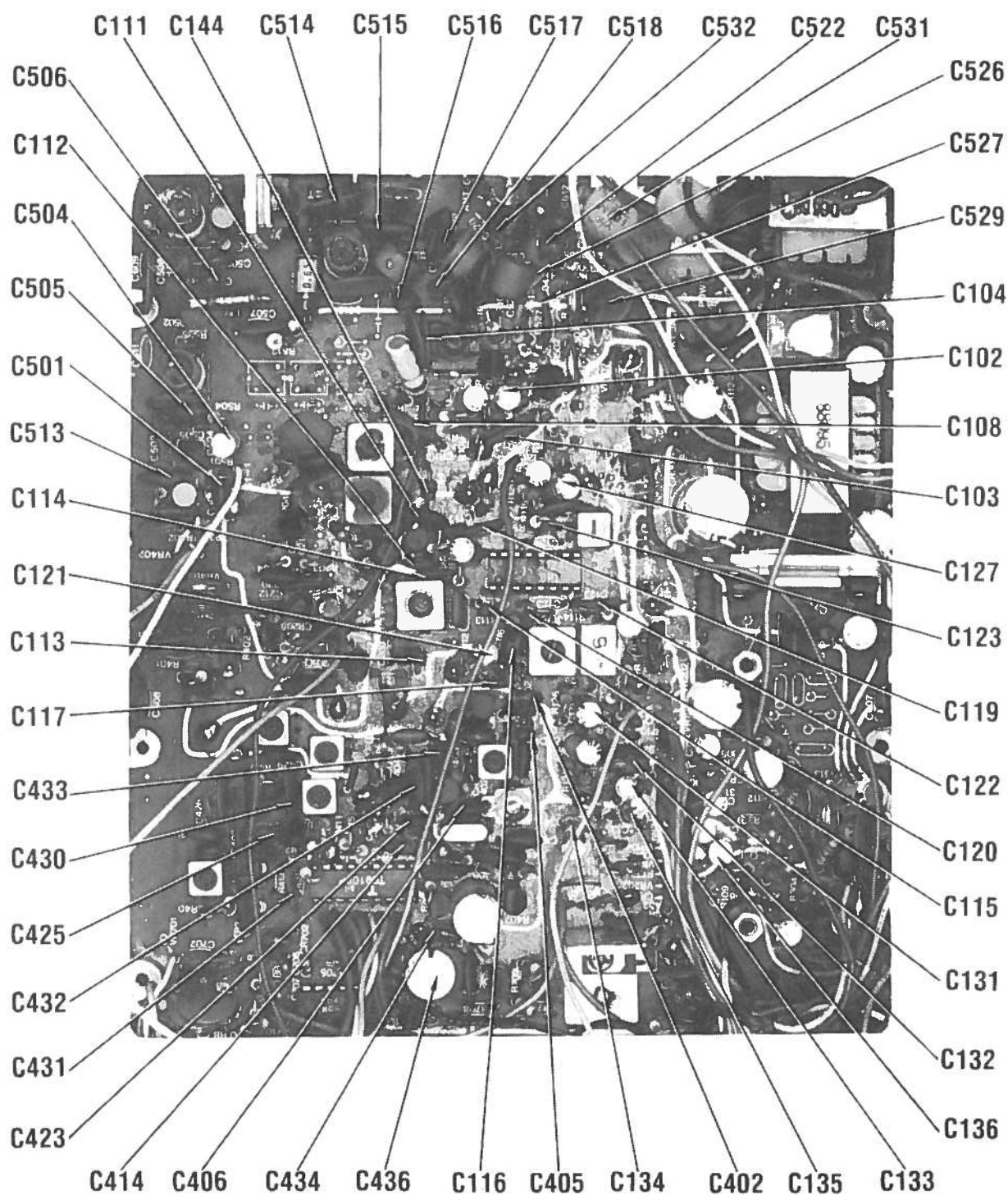
MAIN BOARD



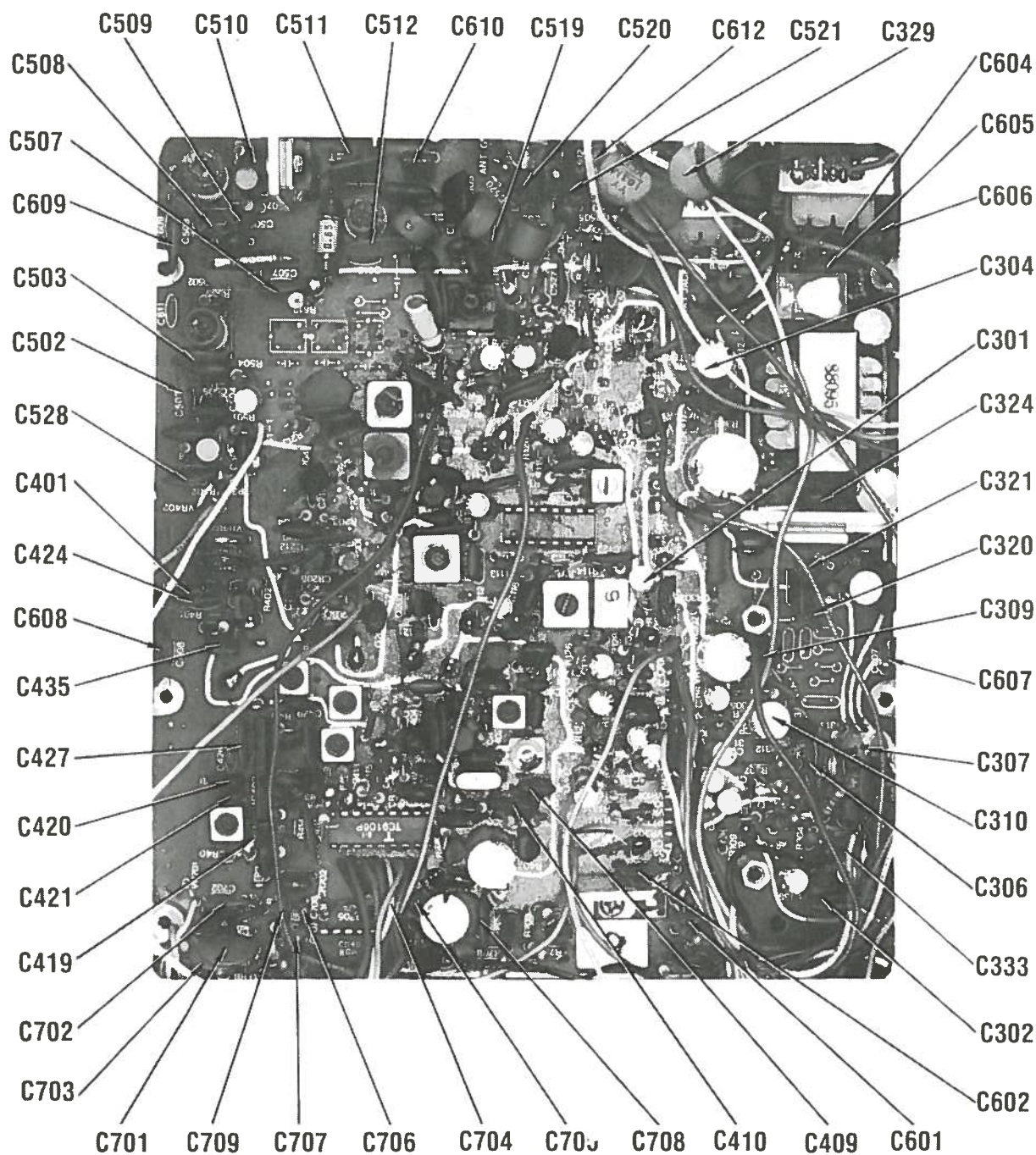
MAIN BOARD



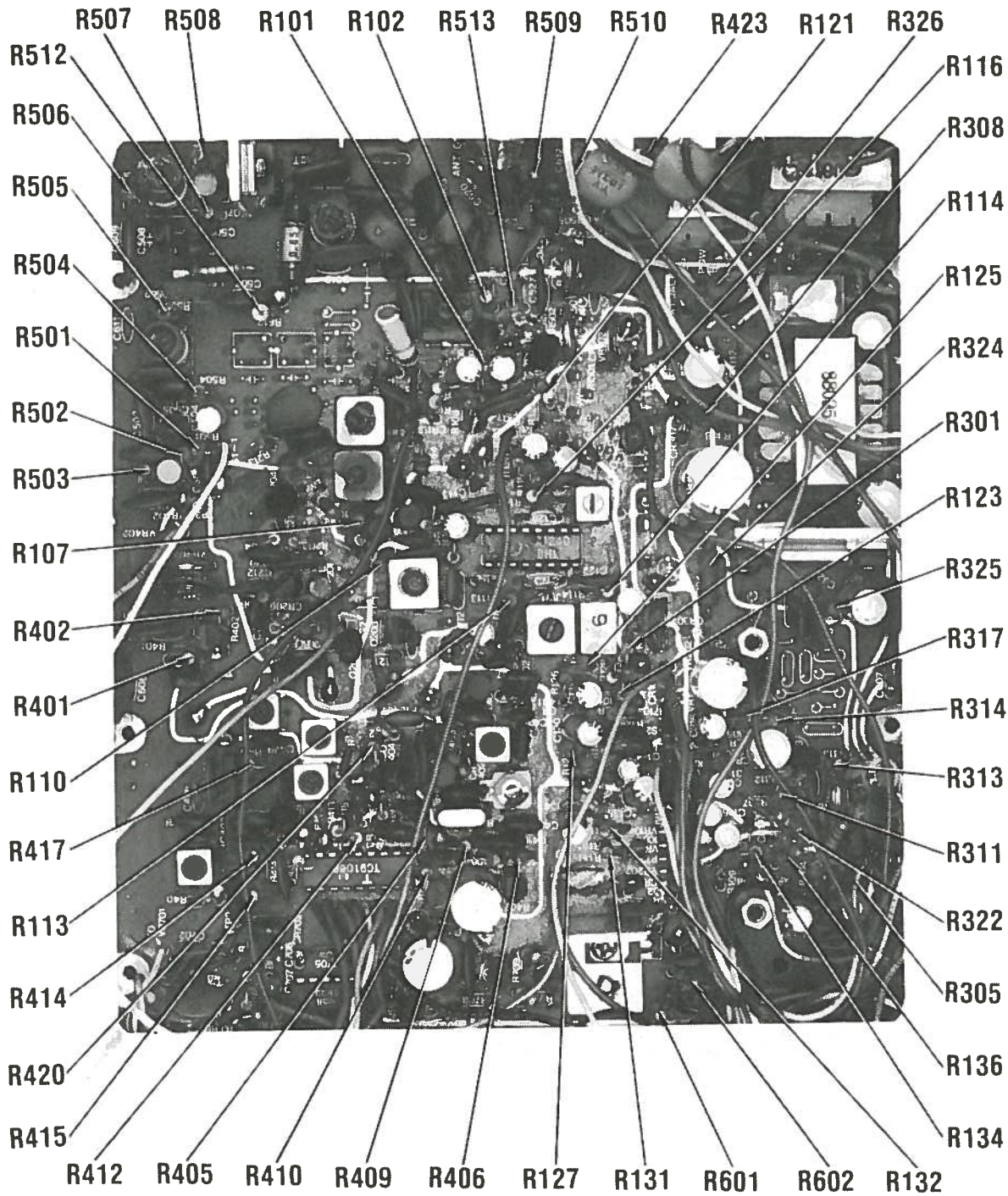
MAIN BOARD



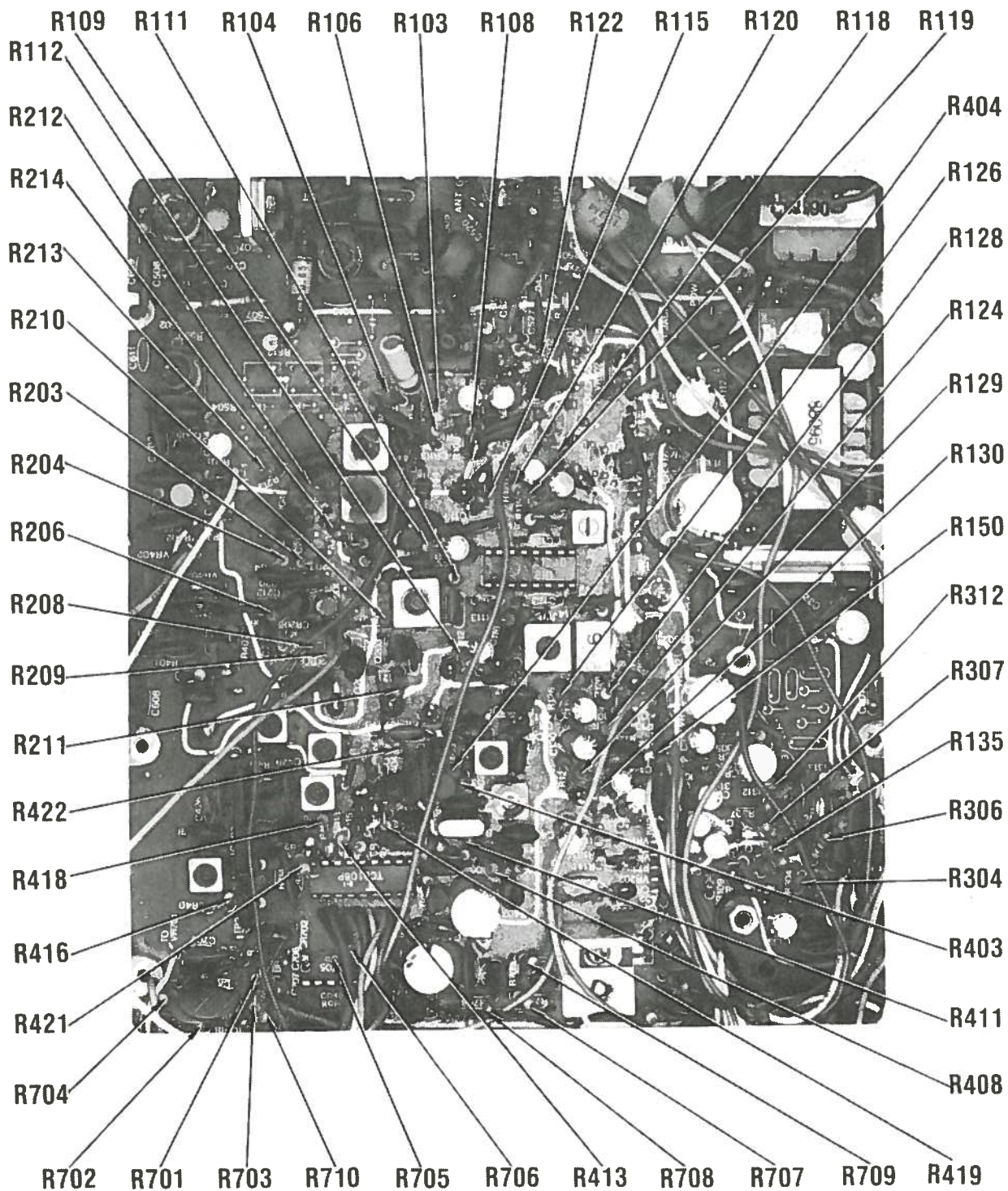
MAIN BOARD



MAIN BOARD

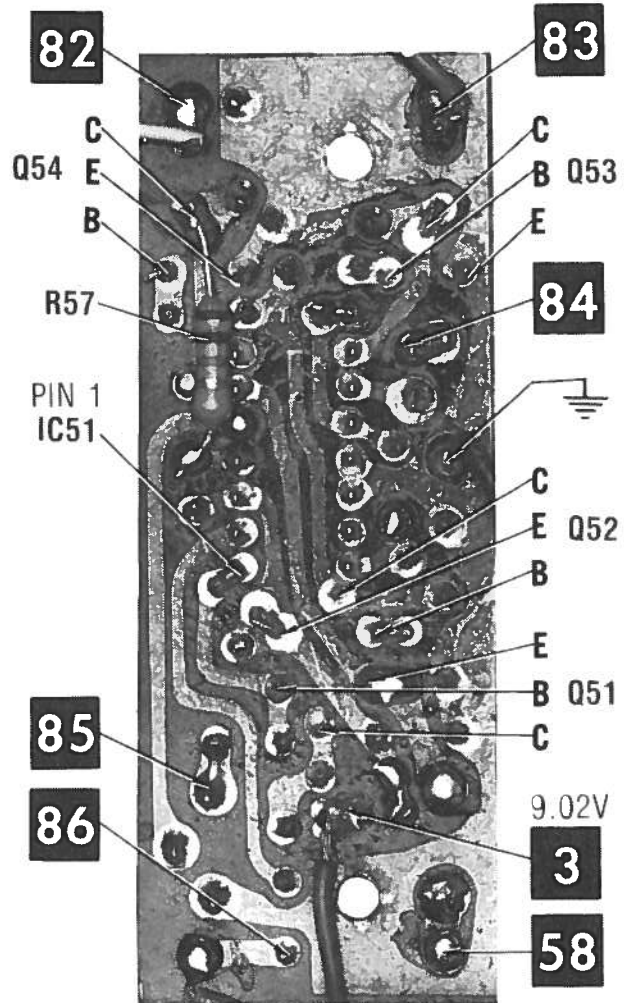
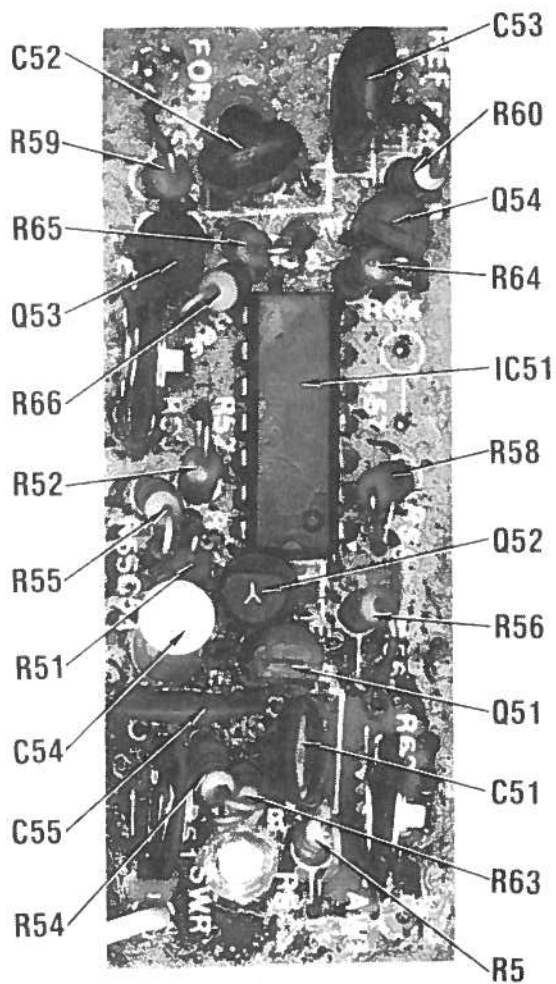


MAIN BOARD

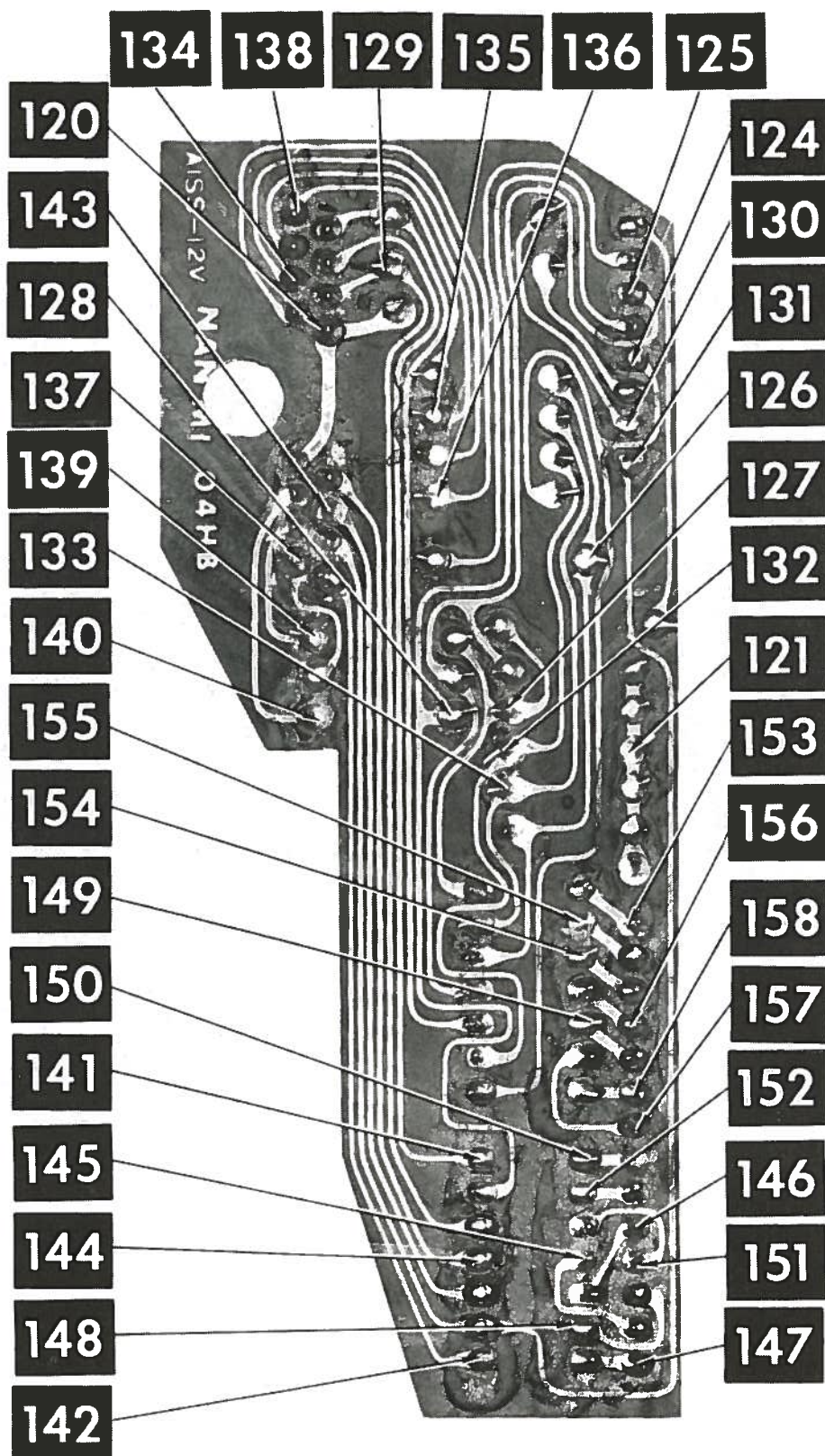


MAIN BOARD

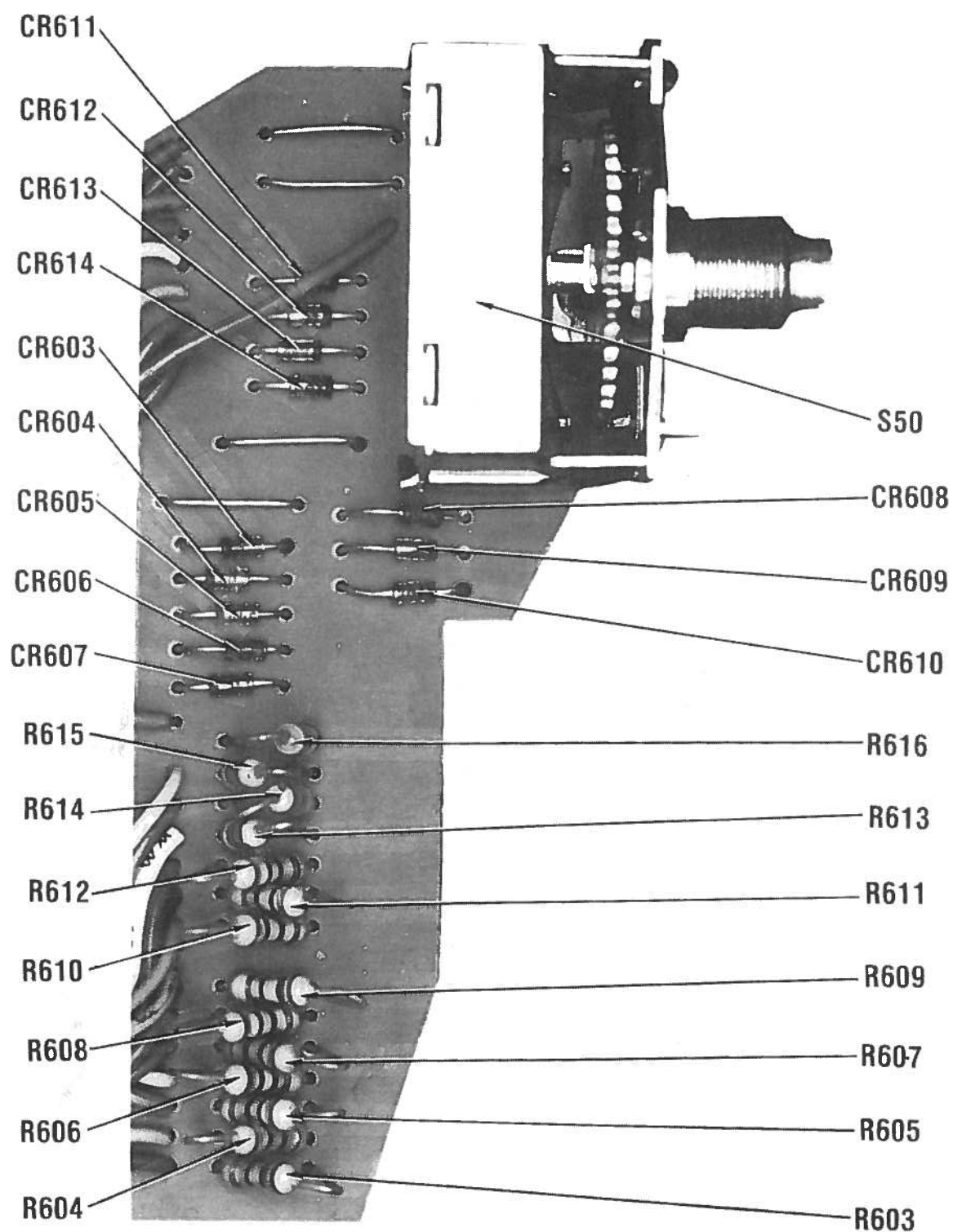
NDI MODEL PC-101



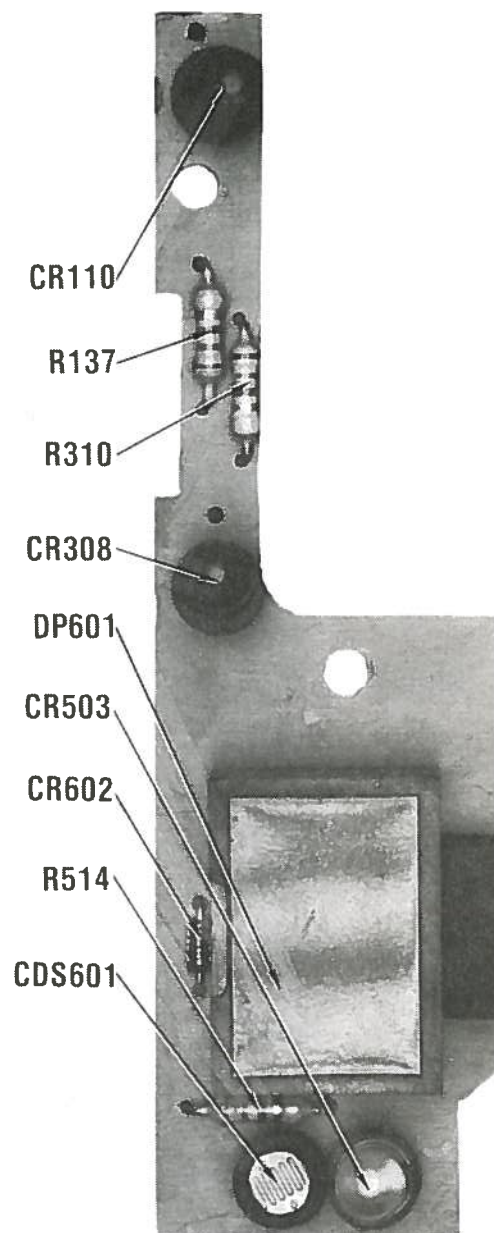
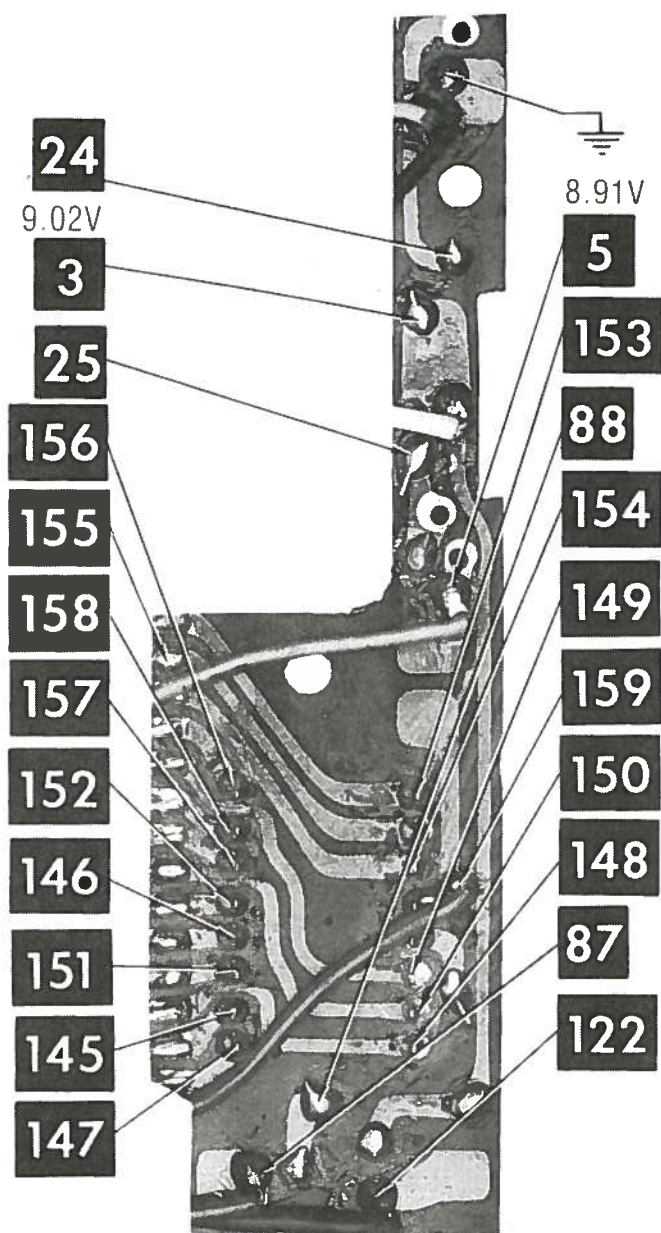
SWR BOARD



CHANNEL SELECT BOARD



CHANNEL SELECT BOARD



LED BOARD

PARTS LIST AND DESCRIPTION

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

WIRING DATA

Cable (Speaker)(Unshielded).....	Use BELDEN No. 8782 (AWG24)(4 colors)
Shielding Strap.....	Use BELDEN No. 8660 (3/16" width)
Hook-up Wire (General Use).....	Use BELDEN No. 8524 (AWG22)(13 colors)
Hook-up Wire (Shielded).....	Use BELDEN No. 8401 (Braided Shield)(1 conductor)(AWG25)
	Use BELDEN No. 8421 (Spiral Shield)(1 conductor)(AWG25)
	Use BELDEN No. 8737 (Spiral Shield)(2 conductor)(AWG22)
Microphone Cable (Coiled)	Use BELDEN No. 8497 (3 conductor-1 shielded)(6 ft.)(AWG22)
Microphone Cable (Coiled)	Use BELDEN No. 9466 (3 conductor-1 shielded)(6 ft.)(AWG28)
Microphone Cable (Coiled)	Use BELDEN No. 9468 (3 conductor-1 shielded)(6 ft.)(AWG31)

SEMICONDUCTORS (Select replacement transistor for best results)

ITEM No.	TYPE No.	MFRG. PART No.	REPLACEMENT DATA							
			GENERAL ELECTRIC PART No.	MALLORY PART No.	RAYTHEON PART No.	RCA PART No.	SYLVANIA PART No.	THORDARSON PART No.	WORKMAN PART No.	ZENITH PART No.
CR101	1S1007 1S1007S	34-016-0	1N34AS	PTC207	REN 109	SK3087	ECG1 09	TM1 09/**	WEP134/109	103-Z9001
			1N34AS	PTC207	REN 109	SK3087	ECG1 09	TM1 09/**	WEP134/109	103-Z9001
CR102	1N4448		GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR103	1N4448		GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR104	1N34A	34-001-0	1N34AS	PTC207	REN 109	SK3087	ECG1 09	TM1 09/**	WEP134/109	103-Z9001
CR105	1N34A	34-001-0	1N34AS	PTC207	REN 109	SK3087	ECG1 09	TM1 09/**	WEP134/109	103-Z9001
CR106	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR107	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR108	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR109	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR111	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR112	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR113	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR203	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR204	1N60	34-003-0	1N60	PTC206	REN 109	SK3088	ECG1 09	TM1 09/**	WEP134/109	103-Z9001
	1N60P		1N60	PTC206	REN 109	SK3088	ECG1 09	TM1 09/**	WEP134/109	103-Z9001
CR205	1N60	34-003-0	1N60	PTC206	REN 109	SK3088	ECG1 09	TM1 09/**	WEP134/109	103-Z9001
	1N60P		1N60	PTC206	REN 109	SK3088	ECG1 09	TM1 09/**	WEP134/109	103-Z9001
CR206	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR302	BZ090	34-030-0	GEZD-9.1	ZB9.1B	REN 139	SK3060/139A	ECG1 39A	TM1 39A/**	WEP1109/139A	103-272
	1N4739A	34-030-0	GEZD-9.1	ZB9.1B	REN 139	SK3060/139A	ECG1 39A	TM1 39A/**	WEP1109/139A	103-272
CR304	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR305	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR306	1N4002	34-007-0	GE-504A	1N4002	REN 116	SK3312	ECG1 16	TM1 16	WEP156	212-76-02
CR307	BZ090	34-030-0	GEZD-9.1	ZB9.1B	REN 139	SK3060/139A	ECG1 39A	TM1 39A/**	WEP1109/139A	103-272
	1N4739A	34-030-0	GEZD-9.1	ZB9.1B	REN 139	SK3060/139A	ECG1 39A	TM1 39A/**	WEP1109/139A	103-272
CR401	1S3688	34-029-0	GE-504A	1N4002	REN 613	SK3126	ECG613	TM613	WEP200/613	103-281
CR402	1N4002	34-007-0		1N4002	REN 116	SK3312	ECG1 16	TM1 16	WEP156	212-76-02
CR403	1S2688	34-029-0		1N4002	REN 613	SK3126	ECG613	TM613	WEP200/613	103-281
CR404	1N4448	34-032-0		GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519
CR504	1N60	34-003-0	1N60	PTC206	REN 109	SK3088	ECG1 09	TM1 09/**	WEP134/109	103-Z9001
	1N60P		1N60	PTC206	REN 109	SK3088	ECG1 09	TM1 09/**	WEP134/109	103-Z9001
CR505	1N60	34-003-0	1N60	PTC206	REN 109	SK3088	ECG1 09	TM1 09/**	WEP134/109	103-Z9001
	1N60P		1N60	PTC206	REN 109	SK3088	ECG1 09	TM1 09/**	WEP134/109	103-Z9001
CR506	1N60	34-003-0	1N60	PTC206	REN 109	SK3088	ECG1 09	TM1 09/**	WEP134/109	103-Z9001
	1N60P		1N60	PTC206	REN 109	SK3088	ECG1 09	TM1 09/**	WEP134/109	103-Z9001
CR601	10D4	34-026-0	GE-504A	PTC201	REN 116	SK3312	ECG1 16	TM1 16	WEP157	212-76-02
CR602	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR603	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR604	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR605	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR606	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR607	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR608	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR609	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR610	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR611	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR612	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR613	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR614	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR615	10D4	35-026-0	GE-504A	PTC201	REN 116	SK3312	ECG1 16	TM1 16	WEP157	212-76-02
CR701	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131

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

ITEM No.	TYPE No.	MFRG. PART No.	REPLACEMENT DATA							
			GENERAL ELECTRIC PART No.	MALLORY PART No.	RAYTHEON PART No.	RCA PART No.	SYLVANIA PART No.	THORDARSON PART No.	WORKMAN PART No.	ZENITH PART No.
CR702	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR703	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR704	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
IC51	MC3302P	39-077-0				SK3569/834	ECG834	TM834		221-121
	MC3302					SK3569/834	ECG834	TM834		221-121
IC101	LA1240	39-059-0				SK3736/1214	ECG1214	TM1214		905-155
IC301	HA1366W	39-060-0				SK3744/1260	ECG1260	TM1260		
IC401	TC9106P	40-063-0				SK3830				
IC402	TA7310P	39-061-0				SK3445/1192	ECG1192	TM1192	WEP2120/1192	221-Z9061
	TA7310					SK3445/1192	ECG1192	TM1192	WEP2120/1192	221-Z9061
IC403	78L09	39-054-1								
	78L09CLP									
IC701	CD4011BE	40-035-0	GE-4011			SK4011	ECG4011B	TM4011B		221-Z9133
	MC14011BCP		GE-4011			SK4011	ECG4011B	TM4011B		221-Z9133
	4011B		GE-4011			SK4011	ECG4011B	TM4011B		221-Z9133
IC702	M51202	39-076-0								
	M51202L									
Q51	2SC1815Y	31-002-0	GE-62	PTC136	REN 199	SK3245/199	ECG199	TM199	WEP66/199	121-972
	2SC372Y		GE-61*	PTC121*	REN 123A*	SK3245/199	ECG123AP*	TM123AP**	WEP372	121-Z9000A*
Q52	2SA495Y	30-007-0	GE-221*	PTC103*	REN 159*	SK3114/290	ECG290	TM290**	WEP495	121-Z9003*
	2SA844C		GE-244*	PTC103*	REN 129*	SK3114/290	ECG234	TM234	WEP564	121-Z9005
Q53	2SC1815Y	31-002-0	GE-62	PTC136	REN 199	SK3245/199	ECG199	TM199	WEP66/199	121-972
	2SC372Y		GE-61*	PTC121*	REN 123A*	SK3245/199	ECG123AP*	TM123AP**	WEP372	121-Z9000A*
Q54	2SC1815Y	31-002-0	GE-62	PTC136	REN 199	SK3245/199	ECG199	TM199	WEP66/199	121-972
	2SC372Y		GE-61*	PTC121*	REN 123A*	SK3245/199	ECG123AP*	TM123AP**	WEP372	121-Z9000A*
Q101	2SC710C	31-025-0	GE-211*	PTC132*	REN 123AP*	SK3356	ECG107*	TM107**	WEP710	121-Z9000A*
Q102	2SC941-0	31-116-0	GE-210	PTC132*	REN 123A*	SK3124/289	ECG123AP*	TM123AP**	WEP66/199	121-Z9000A*
	2SC941-TM-0		GE-210	PTC132*	REN 123A*	SK3124/289	ECG123AP*	TM123AP**	WEP66/199	121-Z9000A*
Q103	2SK19Y	33-002-0	GE-FET-2	PTC161	REN 132*	SK3834/132	ECG312*	TM312*	WEP920/312*	921-1067*
Q104	2SC710C	31-025-0	GE-211*	PTC132*	REN 123AP*	SK3356	ECG107*	TM107**	WEP710	121-Z9000A*
Q201	2SC710C	31-025-0	GE-211*	PTC132*	REN 123AP*	SK3356	ECG107*	TM107**	WEP710	121-Z9000A*
Q202	2SA495Y	30-007-0	GE-221*	PTC103*	REN 159*	SK3114/290	ECG290	TM290**	WEP495	121-Z9003*
	2SA844C		GE-244*	PTC103*	REN 129*	SK3114/290	ECG234	TM234	WEP564	121-Z9005
Q203	2SC710C	31-025-0	GE-211*	PTC132*	REN 123AP*	SK3356	ECG107*	TM107**	WEP710	121-Z9000A*
Q204	2SC710C	31-025-0	GE-211*	PTC132*	REN 123AP*	SK3356	ECG107*	TM107**	WEP710	121-Z9000A*
Q301	2SC710C	31-025-0	GE-211*	PTC132*	REN 123AP*	SK3356	ECG107*	TM107**	WEP710	121-Z9000A*
Q302	2SC710C	31-025-0	GE-211*	PTC132*	REN 123AP*	SK3356	ECG107*	TM107**	WEP710	121-Z9000A*
Q303	2SC711L	31-027-1	GE-62*	PTC121	REN 199*	SK3899	ECG199*	TM199**	WEP372*	121-972*
	2SC711E		GE-62*	PTC121	REN 199*	SK3899	ECG199*	TM199**	WEP372*	121-972*
Q401	2SC710C	31-025-0	GE-211*	PTC132*	REN 123AP*	SK3356	ECG107*	TM107**	WEP710	121-Z9000A*
Q402	2SC710C	31-025-0	GE-211*	PTC132*	REN 123AP*	SK3356	ECG107*	TM107**	WEP710	121-Z9000A*
Q403	2SC710C	31-025-0	GE-211*	PTC132*	REN 123AP*	SK3356	ECG107*	TM107**	WEP710	121-Z9000A*
Q404	2SA495Y	30-007-0	GE-221*	PTC103*	REN 159*	SK3114/290	ECG290	TM290**	WEP495	12

ELECTROLYTIC CAPACITORS (cont)

ITEM No.	RATING	REPLACEMENT DATA				
		MFR. PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
					Q-LINE	GENERAL LINE
C125	1 16V	614-036-0	PC1-50	VTT1A50	QV1-11	EV-1615
C126	4.7 16V	614-051-0	PC5-50	VTT4R7B50	QV1-31	EV-1619.1
C127	4.7 16V	614-015-0	PC5-50	VTT4R7B50	QV1-31	EV-1619.1
C129	15 16V	14-105-0		TDC154M050EL	QDT1-6	SD50-R159
C130	10 16V	614-006-0	PC10-25	VTT10B25	QV1-41	EV-1222
C131	1 50V	614-022-0	PC1-50	VTT1A50	QV1-11	EV-1615
C133	.47 50V	614-035-0	PC1-50	VTT4R7A63	QV1-3	EV-1610
C134	10 16V	614-006-0	PC10-25	VTT10B25	QV1-41	EV-1222
C135	1 50V	614-022-0	PC1-50	VTT1A50	QV1-11	EV-1615
C136	1 50V	614-022-0	PC1-50	VTT1A50	QV1-11	EV-1615
C137	1 50V	614-022-0	PC1-50	VTT1A50	QV1-11	EV-1615
C138	.1 25V	614-032-0		TDC104M050EL	QDT1-2	SD50-R109
C139	10 16V	614-006-0	PC10-25	VTT10B25	QV1-41	EV-1222
C301	1 50V	614-022-0	PC1-50	VTT1A50	QV1-11	EV-1615
C303	10 16V	614-006-0	PC10-25	VTT10B25	QV1-41	EV-1222
C304	100 16V	614-009-0	PC100-16	VTT100E16	QV1-95	EV-1231
C307	47 16V	614-008-0	PC50-16	VTT47D16	QV1-73	EV-1226
C310	47 16V	614-008-0	PC50-16	VTT47D16	QV1-73	EV-1226
C314	10 16V	614-006-0	PC10-25	VTT10B25	QV1-41	EV-1222
C315	4.7 16V	614-015-0	PC5-50	VTT4R7B50	QV1-31	EV-1619.1
C316	1 50V	614-022-0	PC1-50	VTT1A50	QV1-11	EV-1615
C318	220 16V	614-010-0	PC250-25	VTT220H16	QV1-117	EV-1240
C321	10 16V	14-081-0		TDC106M025FL	QDT1-64	SD25-109
C322	47 16V	614-008-0	PC50-16	VTT47D16	QV1-73	EV-1226
C323	220 16V	614-010-0	PC250-25	VTT220H16	QV1-117	EV-1240
C326	1000 16V	614-012-0	PC1000-16	VTT1000M16	QV1-183	EV-1261
C328	47 16V	614-008-0	PC50-16	VTT47D16	QV1-73	EV-1226
C412	220 16V	614-010-0	PC250-25	VTT220H16	QV1-117	EV-1240
C415	4.7 16V	14-077-1		TDC685M006EL	QDT1-54	SD6-6R89
C416	4.7 16V	14-077-1		TDC685M006EL	QDT1-54	SD6-6R89
C436	220 16V	614-010-0	PC250-25	VTT220H16	QV1-117	EV-1240
C504	10 16V	614-006-0	PC10-25	VTT10B25	QV1-41	EV-1222
C612	10 16V	614-006-0	PC10-25	VTT10B25	QV1-41	EV-1222
C704	22 16V	14-070-0		TDC226M035GL	QDT1-83	SD35-229
C705	22 16V	14-070-0		TDC226M035GL	QDT1-83	SD35-229
C706	1 16V	14-055-0		TDC105M035EL	QDT1-25	SD35-19
C707	1 16V	14-055-0		TDC105M035EL	QDT1-25	SD35-19

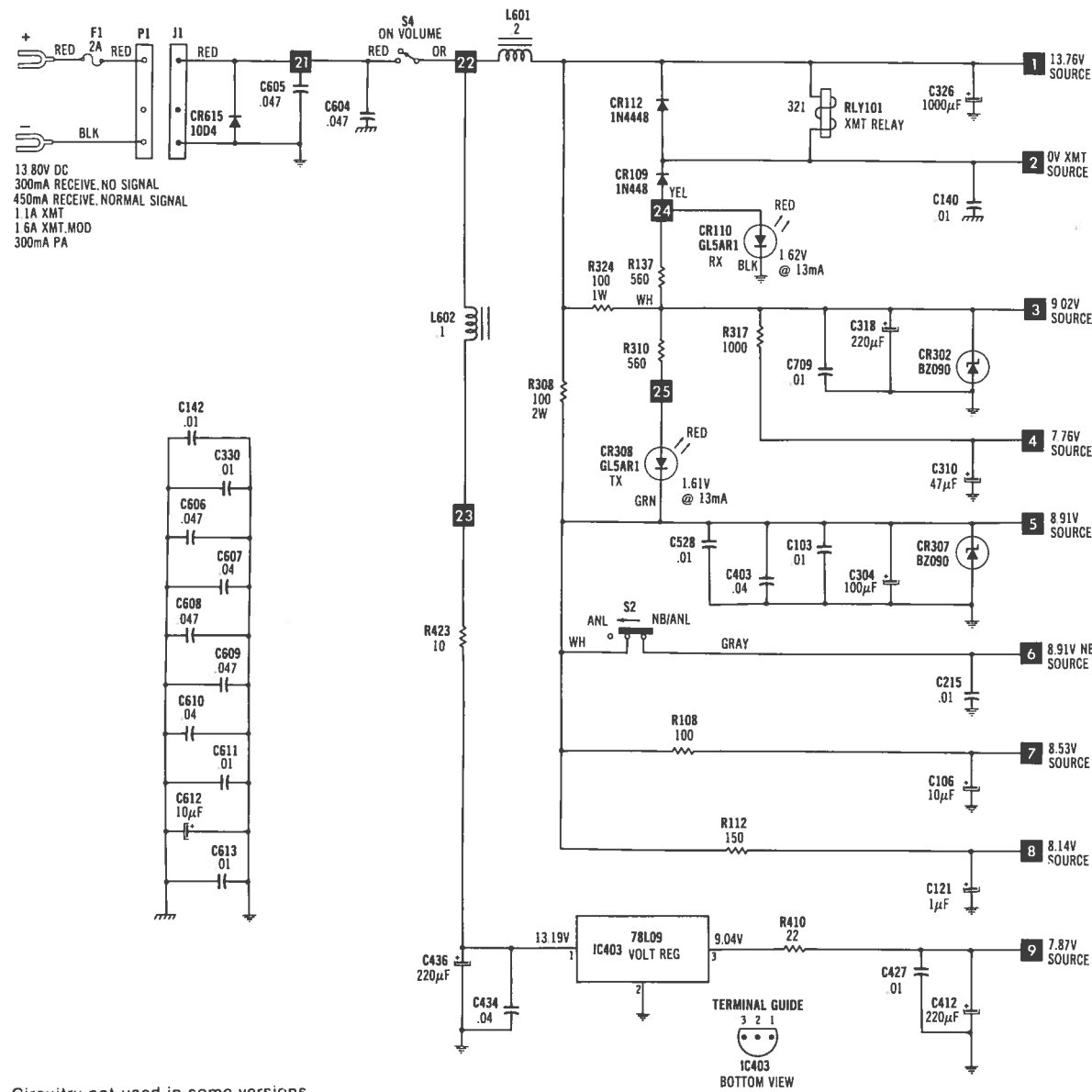
CAPACITORS

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA			
			CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
					Q-LINE	GENERAL LINE
C51	.047 50V	613-011-0	DPMS2S47	M192P4739R8	QFT2-171	1F1-S47
C52	.047 50V	613-011-0	DPMS2S47	M192P4739R8	QFT2-171	1F1-S47
C53	.047 50V	613-011-0	DPMS2S47	M192P4739R8	QFT2-171	1F1-S47
C55	.01 50V			MAG5011		
C101	27 50V		CD15ED270J03	SX427	QW1-13	MWA-270
C103	.01 50V			MAG5011		
C104	.01 50V			MAG5011		
C105	.01 50V			MAG5011		
C108	.01 50V			MAG5011		
C109	10 50V		CD15CD100J03		QW1-6	MWA-100
C110	10 50V		CD15CD100J03		QW1-6	MWA-100
C111	82 50V		CD15ED0820J03	SX482	QW1-25	MWA-820
C112	22 50V		CD15ED220J03	SX422	QW1-11	MWA-220
C113	.001 50V			GP210	QCT2-41	10TS-D10
C114	.01 50V			MAG5011		
C115	.001 50V			GP210	QCT2-41	10TS-D10
C116	100 50V		CD15FD101J03	SX310	QW1-27	MWA-101
C117	10 50V		CD15CD100J03		QW1-6	MWA-100
C119	.01 50V			MAG5011		
C120	.001 50V			GP210	QCT2-41	10TS-D10
C122	.01 50V			MAG5011		
C123	.001 50V			GP210	QCT2-41	10TS-D10
C124	.01 50V			MAG5011		
C128	.01 50V			MAG5011		
C132	.1 50V		WMF05P1	M192P1049R8	QFT2-215	1FT-P10
C140	.01 50V			MAG5011		
C141	.01 50V			MAG5011		
C142	.01 50V			MAG5011		
C144	.47 50V		NP047	CN0447	QCC2-26	10TCC-Q47
C145	.01 50V			MAG5011		
C212	.01 50V			MAG5011		
C213	30 50V		CD15ED300J03	SX430	QW1-14	MWA-300
C214	20 50V		CD15ED200J03	SX420	QW1-10	MWA-200
	18 50V			CN0418		10TCC-Q18

CAPACITORS (cont)

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA			
			CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
					Q-LINE	GENERAL LINE
C215	.01 50V			MAG5011		
C216	.01 50V			MAG5011		
C217	100 50V		CD15FD101J03	SX310	QW1-27	MWA-101
C218	.01 50V			MAG5011		
C219	.001 50V			GP210	QCT2-41	10TS-D10
C220	100 50V		CD15FD101J03	SX310	QW1-27	MWA-101
C302	.01 50V			MAG5011		
C305	.01 50V			MAG5011		
C306	.01 50V			MAG5011		
C309	.047 50V	613-011-0	DPMS2S47	M192P4739R8	QFT2-171	1FT-S47
C311	.033 50V		DPMS6S33	M192P3339R8	QFT2-149	1FT-S33
C320	.01 50V			MAG5011		
C324	.1 50V		WMF05P1	M192P1049R8	QFT2-215	1FT-P10
C325	.01 50V			MAG5011		
C329	.01 50V			MAG5011		
C330	.01 50V			MAG5011		
C331	.01 50V			MAG5011		
C332	.01 50V			MAG5011		
C333	.01 50V			MAG5011		
C401	.01 50V			MAG5011		
C402	.04 50V			GP140		5GA-S40
C403	.04 50V			GP140		5GA-S40
C404	100 50V		CD15FD101J03	SX310	QW1-27	MWA-101
C405	10 50V		CD15CD100J03		QW1-6	MWA-100
C406	68 50V		CD15ED680J03	SX468	QW1-23	MWA-680
C407	Trimmer 40pF	20-063-0				
C408	.01 50V			MAG5011		
C409	100 50V		CD15FD101J03	SX310	QW1-27	MWA-101
C410	220 50V		CD15FD221J03	SX322	QW1-35	MWA-221
C411	.04 50V			GP140		5GA-S40
C413	.001 50V			GP210	QCT2-41	10TS-D10
C414	.04 50V			GP140		5GA-S40
C417	.047 50V	613-011-0	DPMS2S47	M192P4739R8	QFT2-171	1FT-S47
C418	100 50V		CD15FD101J03	SX310	QW1-27	MWA-101
C419	30 50V		NP033	CN0433	QCC2-22	10TCC-Q33
C420	100 50V		CD15FD101J03	SX310	QW1-27	MWA-101
C421	47 50V		CD15ED470J03	SX447	QW1-19	MWA-470
C422	100 50V		CD15FD101J03	SX310	QW1-27	MWA-101
C423	10 50V		CD15CD100J03		QW1-6	MWA-100
C424	.01 50V			MAG5011		
C425	1pF 50V		CD15CD010D03		QW1-1	MWA-010
C426	.001 50V			GP210	QCT2-41	10TS-D10
C427	.01 50V			MAG5011		
C428	33 50V		CD15ED330J03	SX433	QW1-15	MWA-330
C429	3pF 50V		CD15CD050D03		QW1-2	MWA-050
C430	.01 50V			MAG5011		
C431	.01 50V			MAG5011		
C432	.01 50V			MAG5011		
C433	47 50V		CD15ED470J03	SX447	QW1-19	MWA-470
C434	.04 50V			GP140		5GA-S40
C435	.04 50V			GP140		5GA-S40
C501	40 50V		CD15ED430J03	SX443		MWA-430
C502	.01 50V			MAG5011		
C503	.01 50V			MAG5011		
C505	120 50V			CN0312		10TCC-T12
C506	35 50V		CD15ED360J03	SX436		MWA-360
C507	.01 50V			MAG5011		
C508	35 50V		CD15ED360J03	SX436		MWA-360
C509	129 50V			CN0315		10TCC-T15
	120					10TCC-T22
C510	30 50V		CD15ED300J03	SX430	QW1-14	MWA-300
C511	50 50V		CD15ED510J03		QW1-20	MWA-510
C512	.047 50V		DPMS2S47	EWFA1A147	QF1-171	1PB-S47
C513	220 50V		CD15FD221J03	SX322	QW1-35	MWA-221
C514	300 50V		CD15FD301J03	SX330	QW1-38	MWB-301
C515	300 50V		CD15FD301J03	SX330	QW1-38	MWB-301
C516	12 50V		CD12CD120J03		QW1-7	MWA-120
C517	220 50V		CD15FD221J03	SX322	QW1-35	MWA-221
C518	22 50V		CD15ED220J03	SX422	QW1-11	MWA-220
C519	200 50V		CD15FD201J03	SX320	QW1-34	MWA-201
C520	82 50V		NP082	CN0482		10TCC-Q82
	91 50V			CN0310		10TCC-T10
C521	1.5pF 50V		CD15CD050D03		QW1-2	MWA-050
C522	1.5pF 50V		CD15CD050D03		QW1-2	MWA-050
C526	2pF 50V		CD15CD050D03		QW1-2	MWA-050
	5pF 50V		CD15CD050D03		QW1-2	MWA-050
C527	.01 50V			MAG5011		
C528	.01 50V			MAG5011		
C529	.01 50V			MAG5011		
C531	.01 50V			MAG5011		
C532	10 50V		NP010	CN0410	QCC2-15	10TCC-Q10
C601	.047 50V		DPMS2S47	EWFA1A147	QF1-171	1PB-S47
C602	.047 50V			MAG5011		
C604	.047 50V		DPMS2S47	EWFA1A147	QF1-171	1PB-S47
C605	.047 50V		DPMS2S47	EWFA1A147	QF1-171	1PB-S47
C606	.047 50V			GP140		5GA-S40
C607	.04 50V			EWFA1A147	QF1-171	1PB-S47
C608	.047 50V					

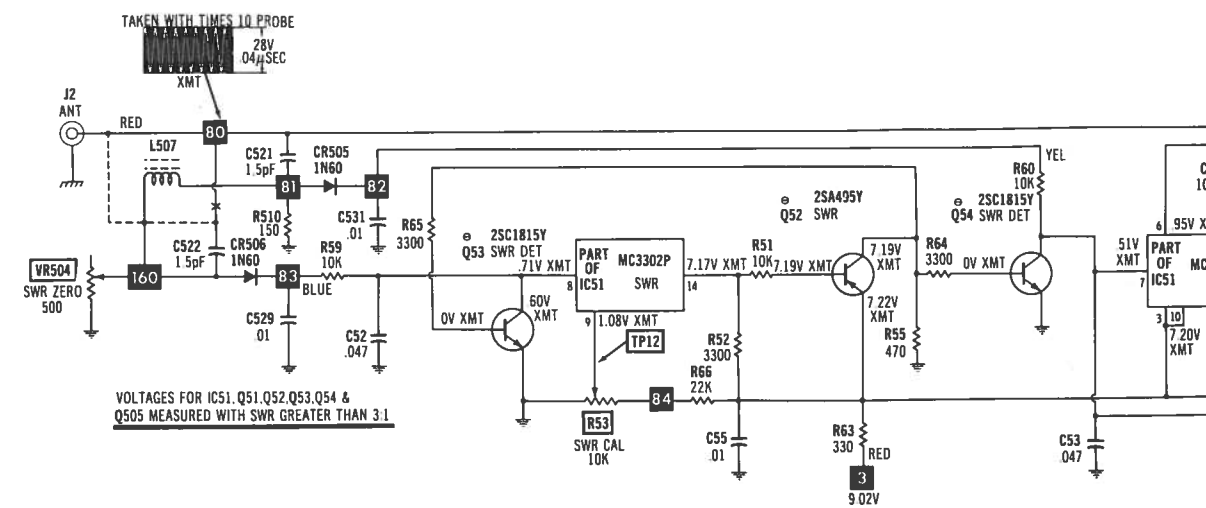
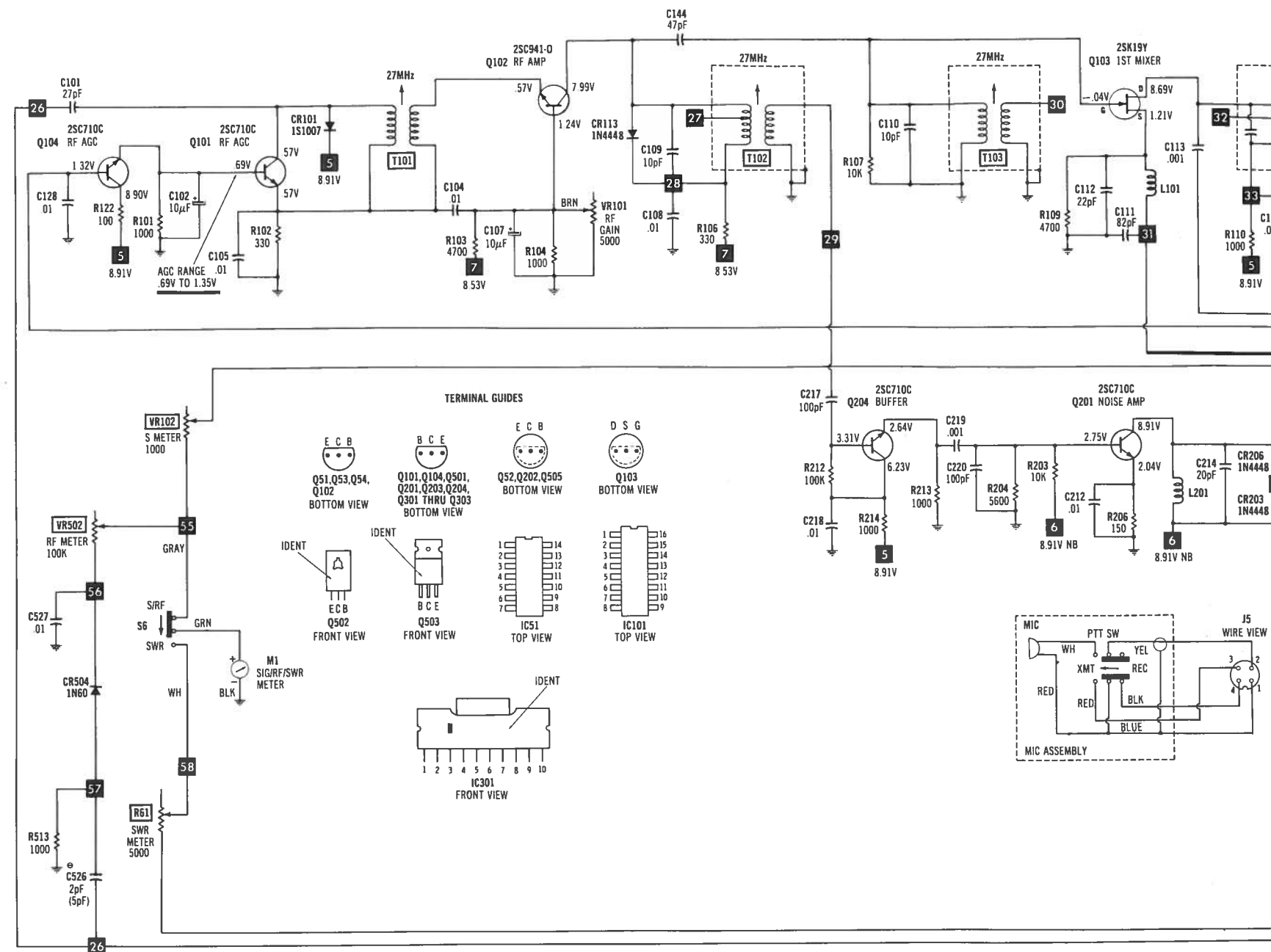
NDI MODEL PC-101



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

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



CAPACITORS (cont)

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA			
			CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
					Q-LINE	GENERAL LINE
C609	.047 50V		DPM52547	EW1A147	QF1-171	1PB-S47 5GA-S40
C610	.04 50V			GP140		
C611	.01 50V			MAG5011		
C613	.01 50V			MAG5011		
C701	.01 50V			MAG5011		
C702	.01 50V			MAG5011		
C703	.01 50V			MAG5011		
C708	.01 50V			MAG5011		
C709	.01 50V			MAG5011		

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

ITEM No.	FUNCTION	RESISTANCE	REPLACEMENT DATA		
			MFR. PART No.	MALLORY PART No.	TRW PART No.
R53	SWR CAL	10K	610-014-0	MTC14L1	X201R103B
R61	SWR Meter	5000	610-003-0	MTC53L1(2)	X201R502B(2)
R62	AWI	10K	610-014-0	MTC14L1	X201R103B
VR101	RF Gain	5000	9-005-0		
VR105	Mic Gain	10K			
VR102	S Meter	1000	610-002-0	MTC13L1(2)	X201R102B(2)
VR104	Volume	10K	9-001-0		
VR202	Squelch/Power Switch	10K			
VR106	ANL Sens	1Meg	9-014-0		
VR402	Delta Tune	10K			
VR201	Squelch Range	10K	610-004-0	MTC14L1(2)	X201R103B(2)
VR203	AMC	20K	610-005-0	MTC24L1(2)	X201R253B(2)
VR401	Delta Tune	5000	610-003-0	MTC53L1(2)	X201R502B(2)
VR403	Delta Tune	5000	610-003-0	MTC53L1(2)	X201R502B(2)
VR502	RF Meter	100K	610-007-0	MTC15L1(2)	X201R104B(2)
VR504	SWR Zero	500	610-001-0	MTC52L1(2)	X201R501B(2)
VR601	Dimmer	10K	610-004-0	MTC14L1(2)	X201R103B(2)
VR701	Scan Sens/Scan Switch	10K	8-039-0		

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

RESISTORS (Power and Special)

ITEM No.	RATING	REPLACEMENT DATA		ITEM No.	RATING	REPLACEMENT DATA	
		MFR. PART No.	WORKMAN PART No.			MFR. PART No.	WORKMAN PART No.
CDS601	LDR	37-007-0					

COILS (RF-IF)

ITEM No.	FUNCTION	REPLACEMENT DATA			REMARKS
		PART No.	OTHER IDENTIFICATION	MILLER PART No.	
L101	RF Choke (4.7uH)	45-024-0	Y584N		
L201	RF Choke (1.2uH)	45-021-0			
L401	Tune Control (10.2395MHz)	42-044-0			
L402	RF Choke (100uH)	45-048-0	Z581NT		
L403	VCO	42-041-1			
L404	RF Choke (100uH)	45-048-0			
L501	RF Choke (2.5uH)	45-018-0			

COILS (RF-IF) (cont)

ITEM No.	FUNCTION	REPLACEMENT DATA			REMARKS
		PART No.	OTHER IDENTIFICATION	MILLER PART No.	
L502	RF Choke (10uH)	45-027-0	Z898NZ		
L503	Peaking (.65uH)	45-004-0			
L504	RF Choke (.22uH)	45-058-0			
L505	RF Choke (.22uH)	45-058-0			
L506	RF Choke (.42uH)	45-053-0			
L507	RF Choke	43-150-0			
L508	RF Choke (100uH)	45-048-0			
T101	RF Amp (27MHz)	41-229-0			
T102	RF Amp (27MHz)	41-190-0			
T103	RF Amp (27MHz)	41-190-0			
T104	1st Mixer	41-001-0	C360DD C337BD C337BD F001AS A459AT A585ZT		
T105	IF Amp (455kHz)	41-343-0			
T106	IF Amp (455kHz)	42-045-0			
T401	RF Amp (27MHz)	42-046-0			
T402	RF Amp (27MHz)	42-046-0	C042DD C352ZD C046ZD		
T403	RF Amp (27MHz)	42-046-0			
T501	RF Amp (27MHz)	41-006-0			
T502	RF Driver (27MHz)	41-238-0			
T503	RF Amp (27MHz)	41-010-0			

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	2A 125V Quick-Acting		60-209-1	AGC2	HRK	312002	150145	FG2-2

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.	
L601	1.6A	.2	2.1mH	46-015-0	TR555		

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.	
L602	65mA	.1	.9mH	46-070-0			

TRANSFORMER (Audio Output)

ITEM No.	IMPEDANCE		REPLACEMENT DATA			NOTES
	PRI.	SEC.	MFGR. PART No.	THORDARSON PART No.	TRIAD PART No.	
L301	2,75	11	46-066-0			

NDI MODEL PC-101

SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		MFR. PART No.	QUAM PART No.	
SP	3" PM 8 Ohms	54-D18-0	30A05Z8R	

MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
CR110	LED	38-025-0	GL-5AR1, RX (1.62V @ 13mA)
CR308	LED	38-025-0	GL-5AR1, TX (1.61V @ 13mA)
CR503	LED	38-026-0	GL-5PY1, AWI (1.83V @ 9mA)
DP601	LED	38-027-0	TLR-321, Tens, Units
FIL101	Filter	25-032-0	10.7MHz
FIL102	Filter	25-114-0	LFH6, 455kHz
FIL401	Filter	25-113-1	10.24MHz
J1	Jack	60-205-0	DC 3P Jack
J2	Jack	60-026-0	S0239, Antenna Jack
J3	Jack	60-043-0	EP Jack SJ296
J4	Jack	60-043-0	EP Jack SJ296, PA
J5	Jack	60-031-0	4P Metal Connector
Lamp 601	Meter	28-026-0	W6V60M, (7.80V @ 62mA)
M1	Meter	27-057-0	A-36, M8716, SIG/RF, SWR
RLY101	Relay	53-008-0	G2E, 12V, Xmit Relay
S1	Switch	49-023-0	SSM02205, CB
S2	Switch	49-023-0	SSM02205, ANL/NB
S4	Switch	9-001-0	Part of VR104
S5	Switch		ONSCW/Off, Sens
S6	Switch	49-023-0	SSM02205, S/RF/SWR
S50	Switch	48-133-0	Channel Selector, CB-1-2-40
Y401	Crystal	22-061-0	10.240MHz