

PHOTOFACT[®] with

CIRCUITRACE[®]

For Supplier Address See PHOTOFACT Index

NOTE

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

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

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

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

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



PRESIDENT MODEL AR-7

Model AR-7

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

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80CE1108

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, L7, L9, L10, L12 9440
L6, L8 5000, 5009, 8276, 8728, 8728A, 9089
L16 8728, 8728A, 9091

SYNTHESIZER ALIGNMENT

TEST EQUIPMENT	TRANSCIVER	ADJUST	REMARKS
Input of frequency counter to TP5 (TR9 Emitter).	Ch. 19		Check for 10.240MHz.
Input of DC meter to TP1 (Junction of R13 and R51).	Ch. 1	L3	Adjust for 1.40 volts. Check for approximately 2.20 volts on channel 40.
Input of DC meter to TP1 (Junction of R13 and R51).	Ch. 1, XMT		Check for approximately 2.22 volts on channel 1 and 3.41 volts on channel 40.
Input of frequency counter to TP6 (IC3 Pin 9).	Ch. 1		Check for 16.270MHz. Check all channels. (See Truth Chart for correct frequencies.)
Input of frequency counter to TP6 (IC3 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, CB/PA CB.

SSB

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

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Output of signal generator to antenna input. 27.185MHz, 1000Hz @ 30% modulation.	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	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	L9, L10, L12, L16	Adjust for maximum RF output.
Input of RF wattmeter to antenna input.	Ch. 19	L16	Adjust for 4.0 watts RF output maximum.

TRANSMITTER ADJUSTMENTS

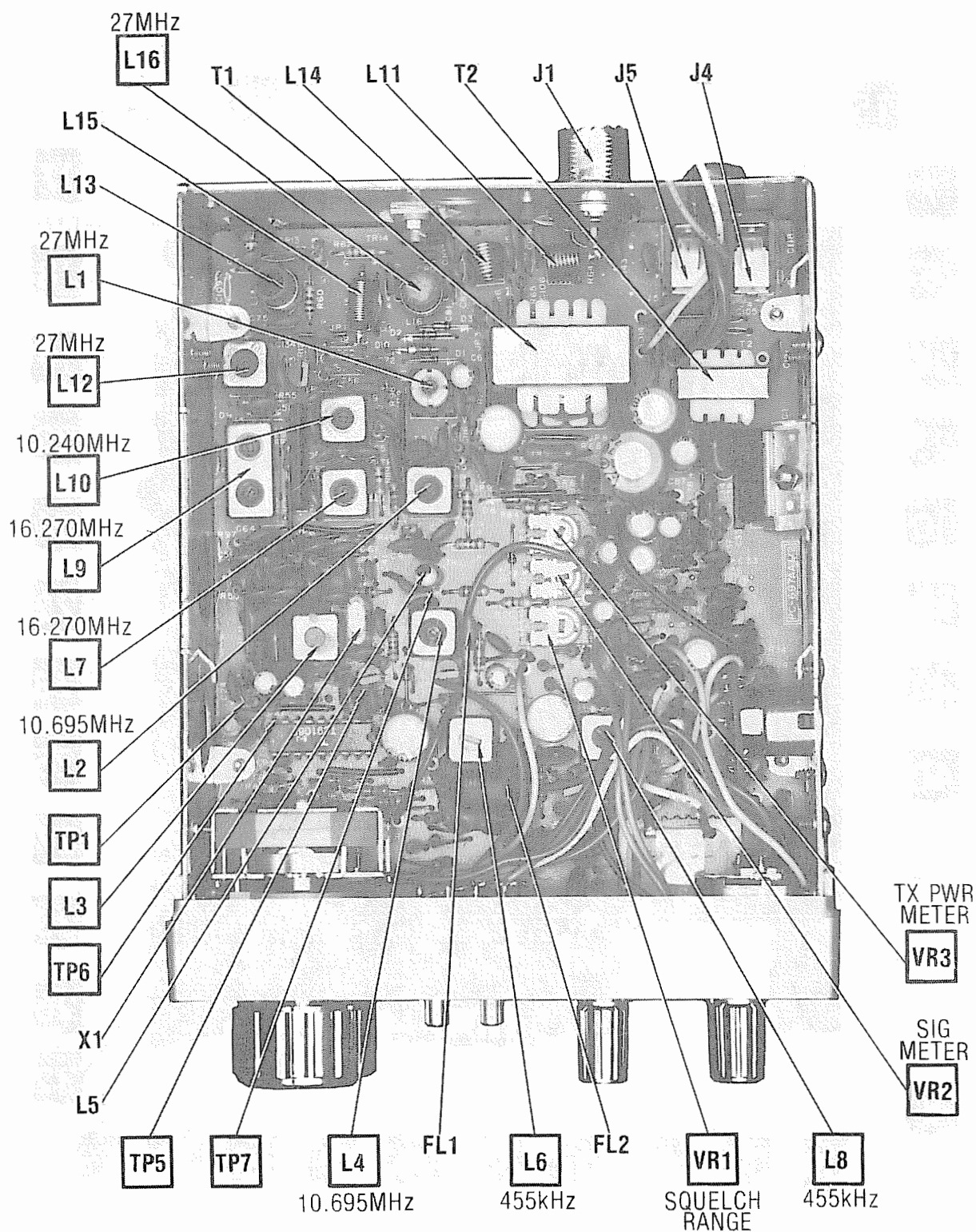
Connect an RF wattmeter and 50-ohm, 25-watt dummy load to antenna connector.
NOTE: Be sure to check transmit frequency and power on all active channels after adjustment of transmitter.
See page 4 for channel frequencies.

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

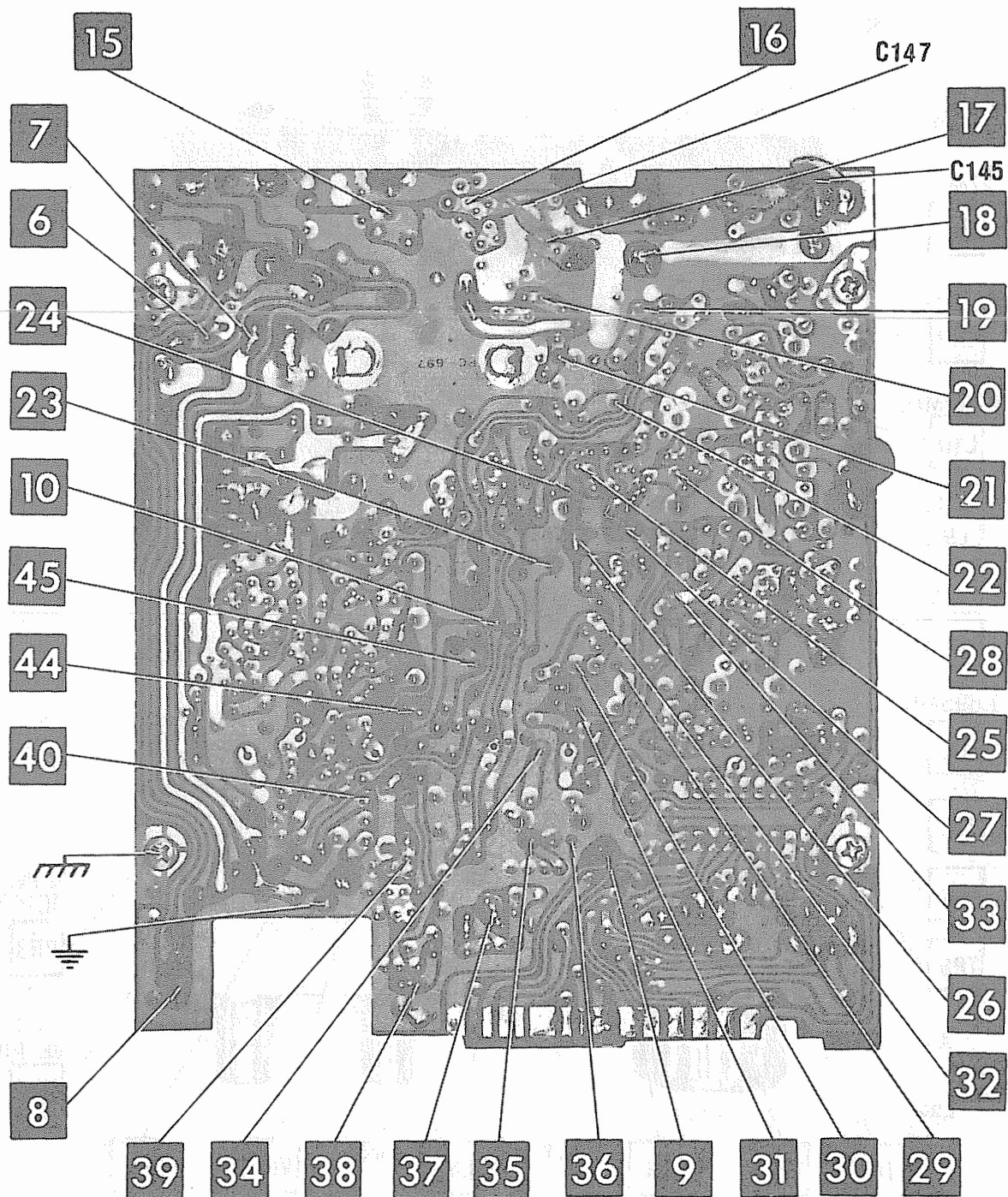
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TRUTH CHART

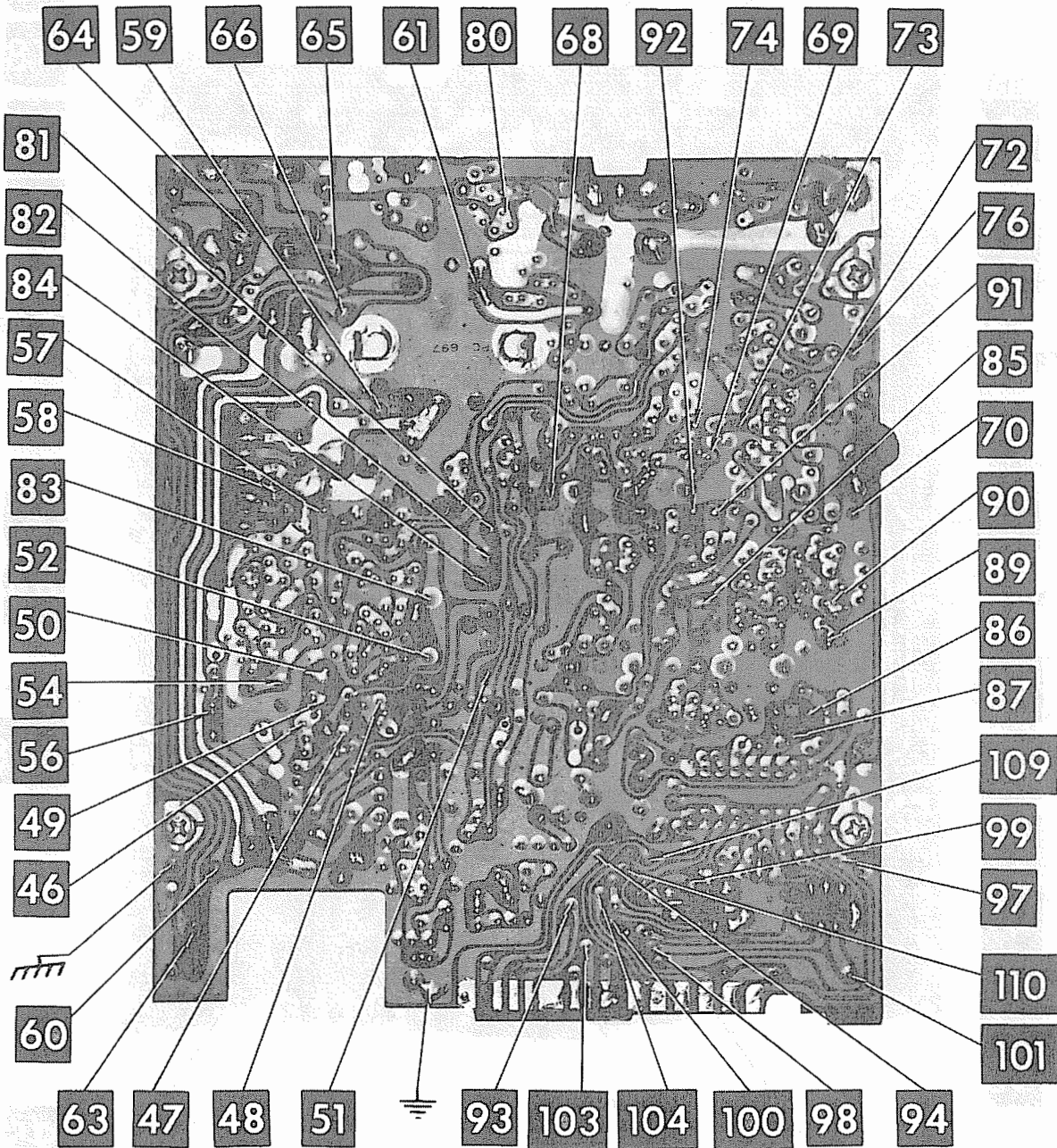
C H A N N E L	1 = 7.46Volts 0 = 0 Volts								REC VCO OUTPUT IN MHz AT TP6	XMT VCO OUTPUT IN MHz AT TP6
	CHANNEL INPUT CODES									
	IC3 PINS									
	17	16	15	14	13	12	11	10		
1	1	1	1	1	1	1	1	1	16.270	16.725
2	1	1	1	0	0	0	0	1	16.280	16.735
3	1	1	1	0	1	0	0	1	16.290	16.745
4	1	1	1	1	1	0	1	0	16.310	16.765
5	1	1	1	0	1	0	0	0	16.320	16.775
6	1	1	1	0	0	0	1	0	16.330	16.785
7	1	1	1	1	1	1	0	1	16.340	16.795
8	1	1	1	0	0	0	0	0	16.360	16.815
9	1	1	1	1	1	0	0	0	16.370	16.825
10	1	1	0	0	0	1	0	0	16.380	16.835
11	1	1	0	1	1	1	1	1	16.390	16.845
12	1	1	0	0	0	0	0	1	16.410	16.865
13	1	1	0	0	1	0	0	1	16.420	16.875
14	1	1	0	1	1	0	1	0	16.430	16.885
15	1	1	0	0	1	0	0	0	16.440	16.895
16	1	1	0	0	0	0	1	0	16.460	16.915
17	1	1	0	1	1	1	0	1	16.470	16.925
18	1	1	0	0	0	0	0	0	16.480	16.935
19	1	1	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



CHASSIS-BOTTOM



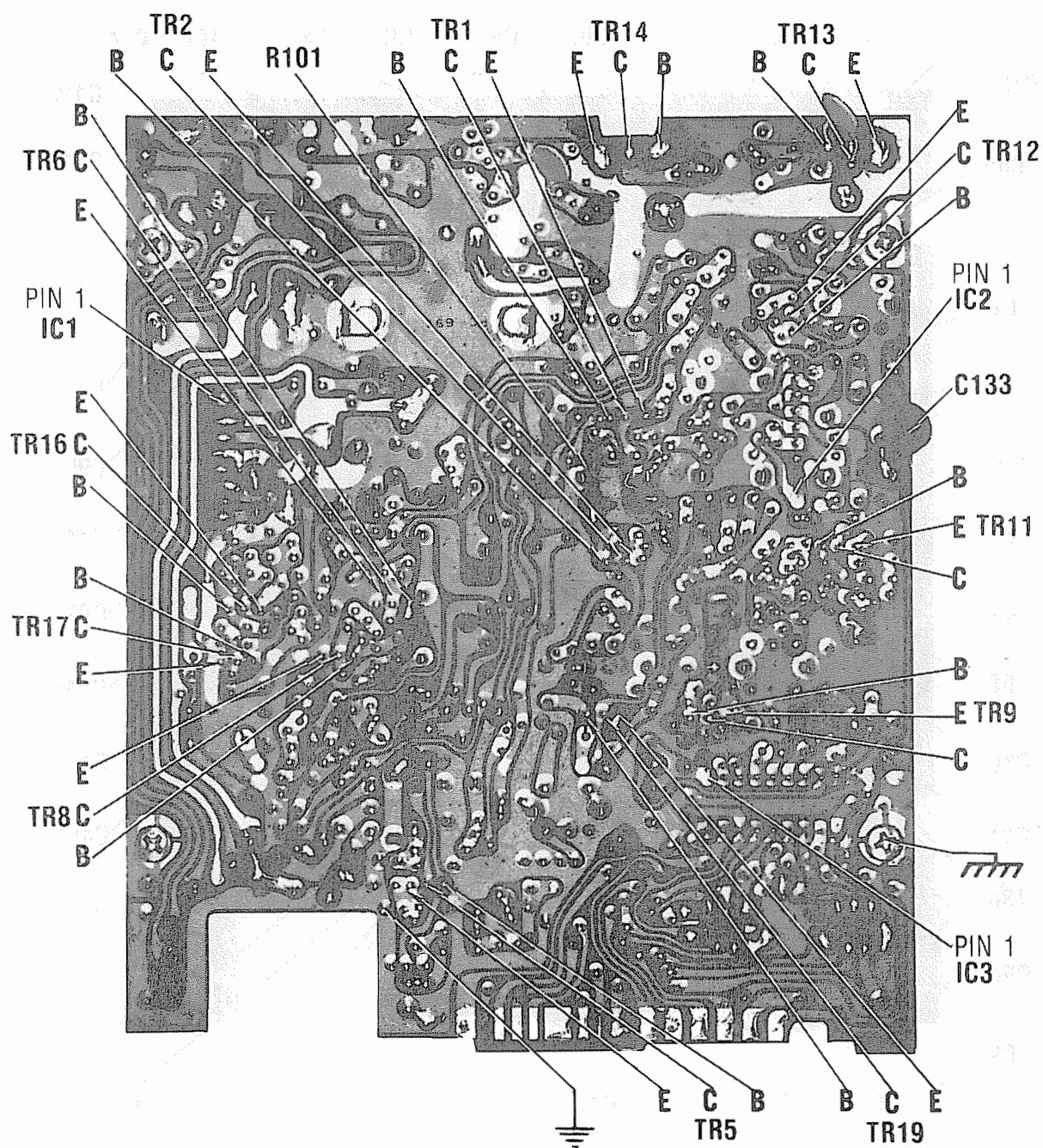
MAIN BOARD



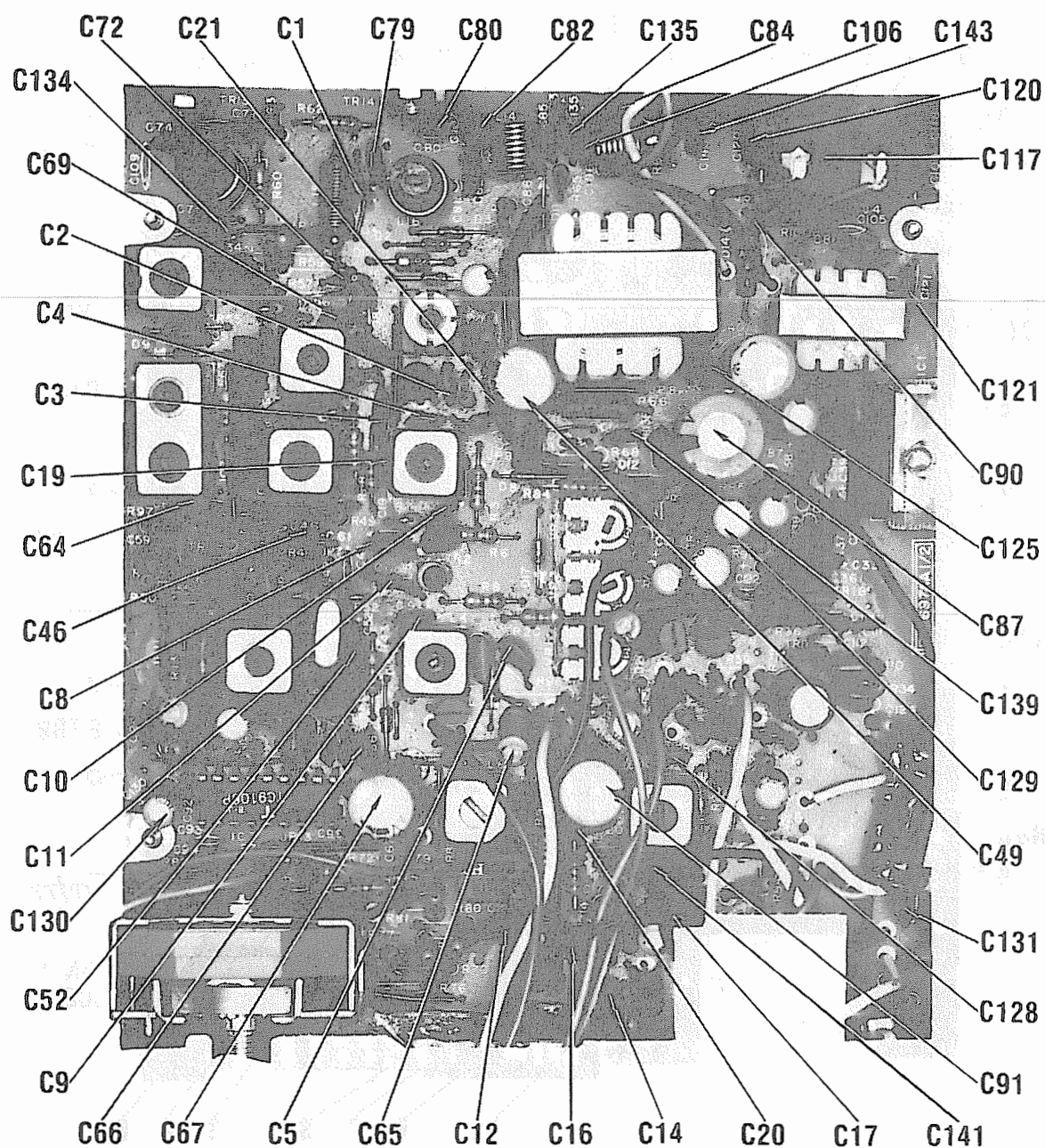
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MAIN BOARD

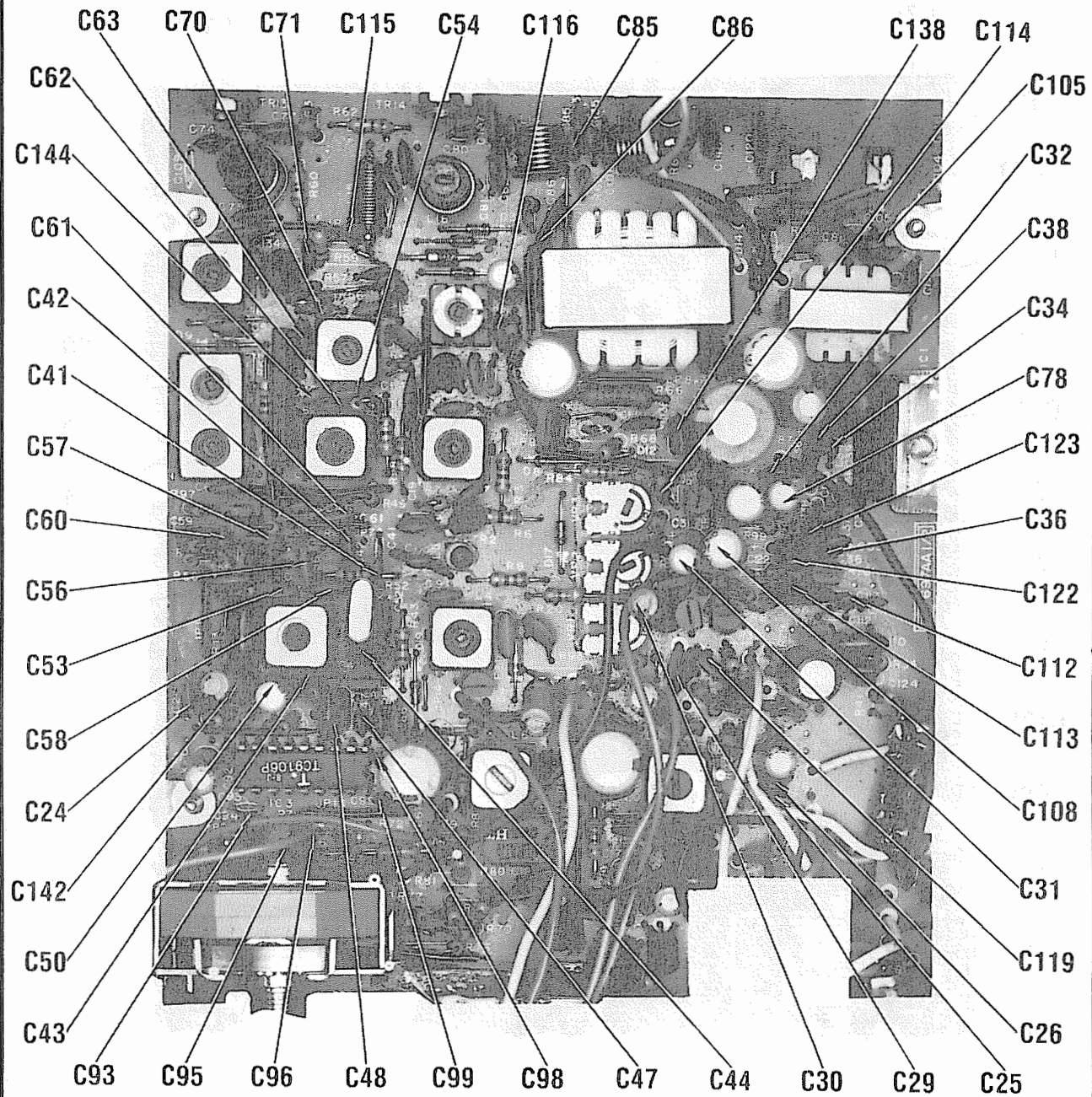




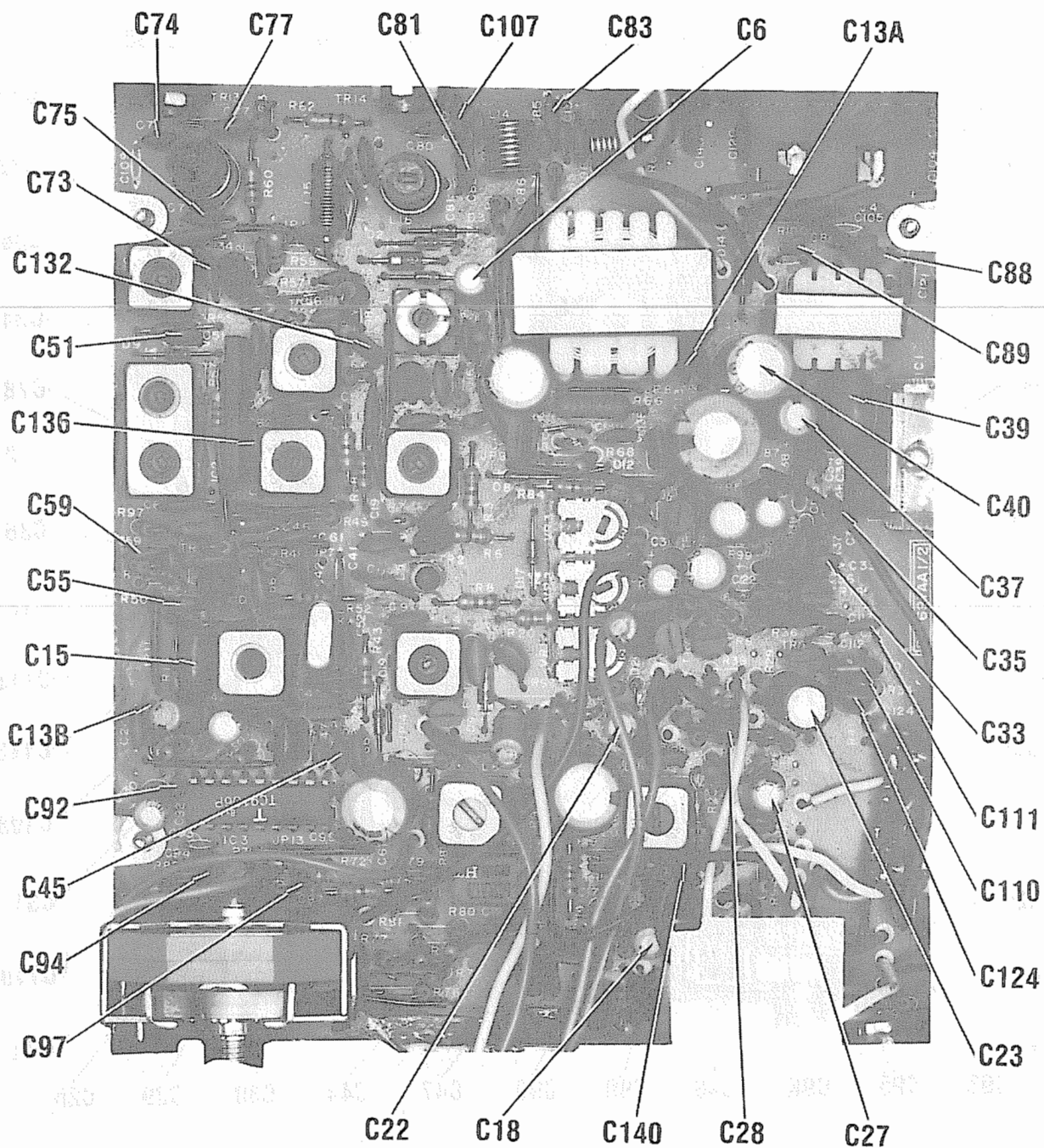
MAIN BOARD



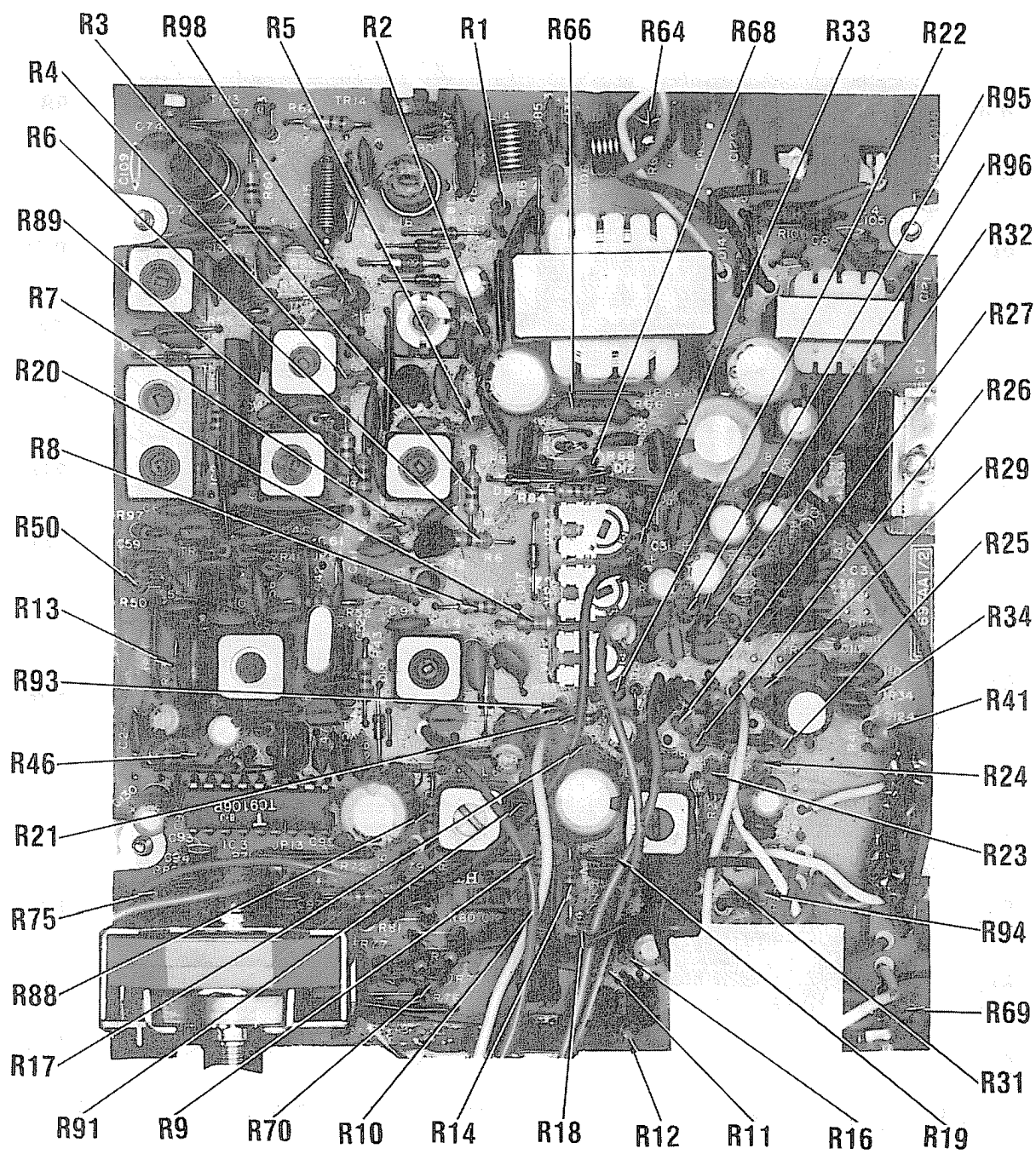
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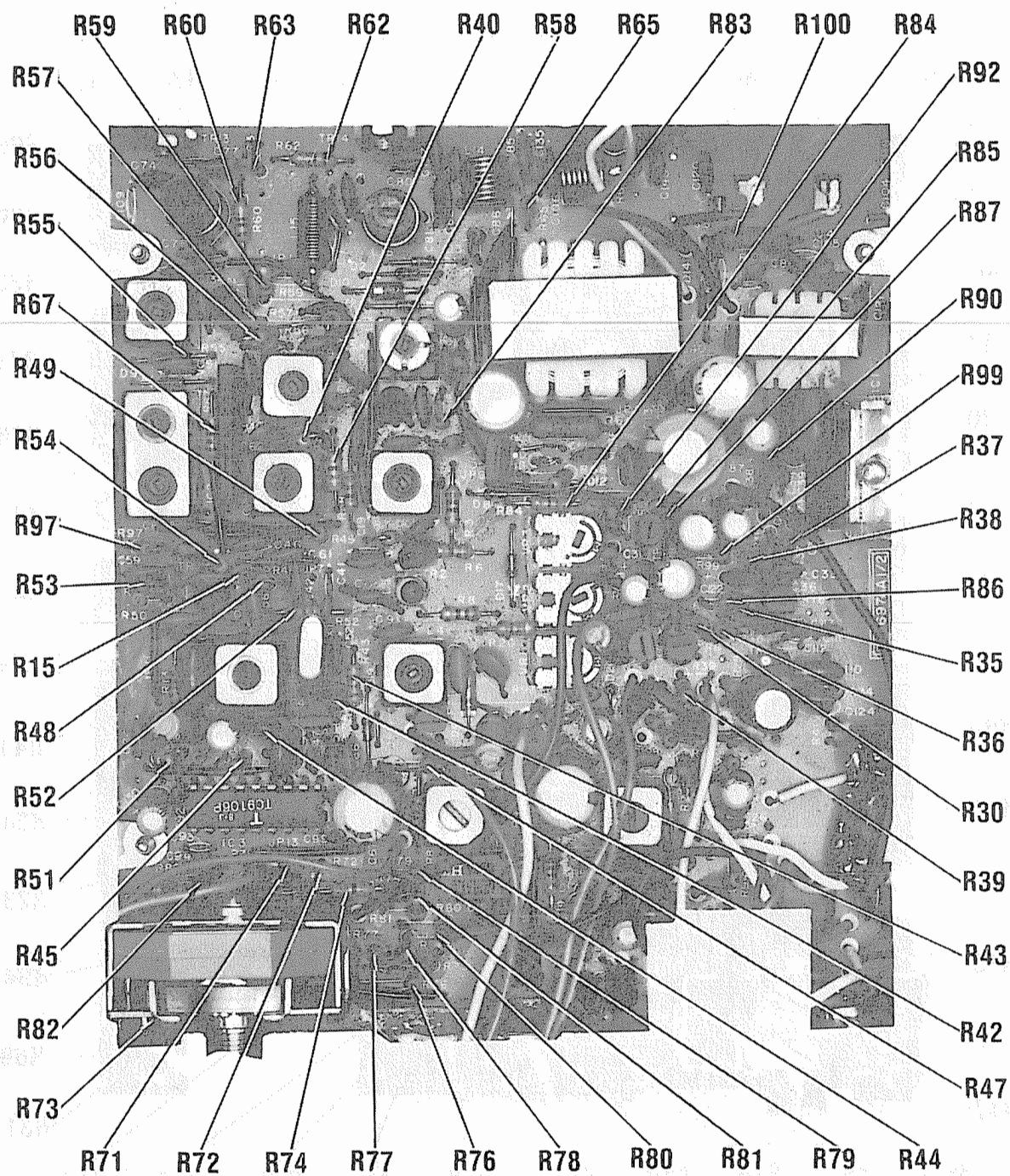
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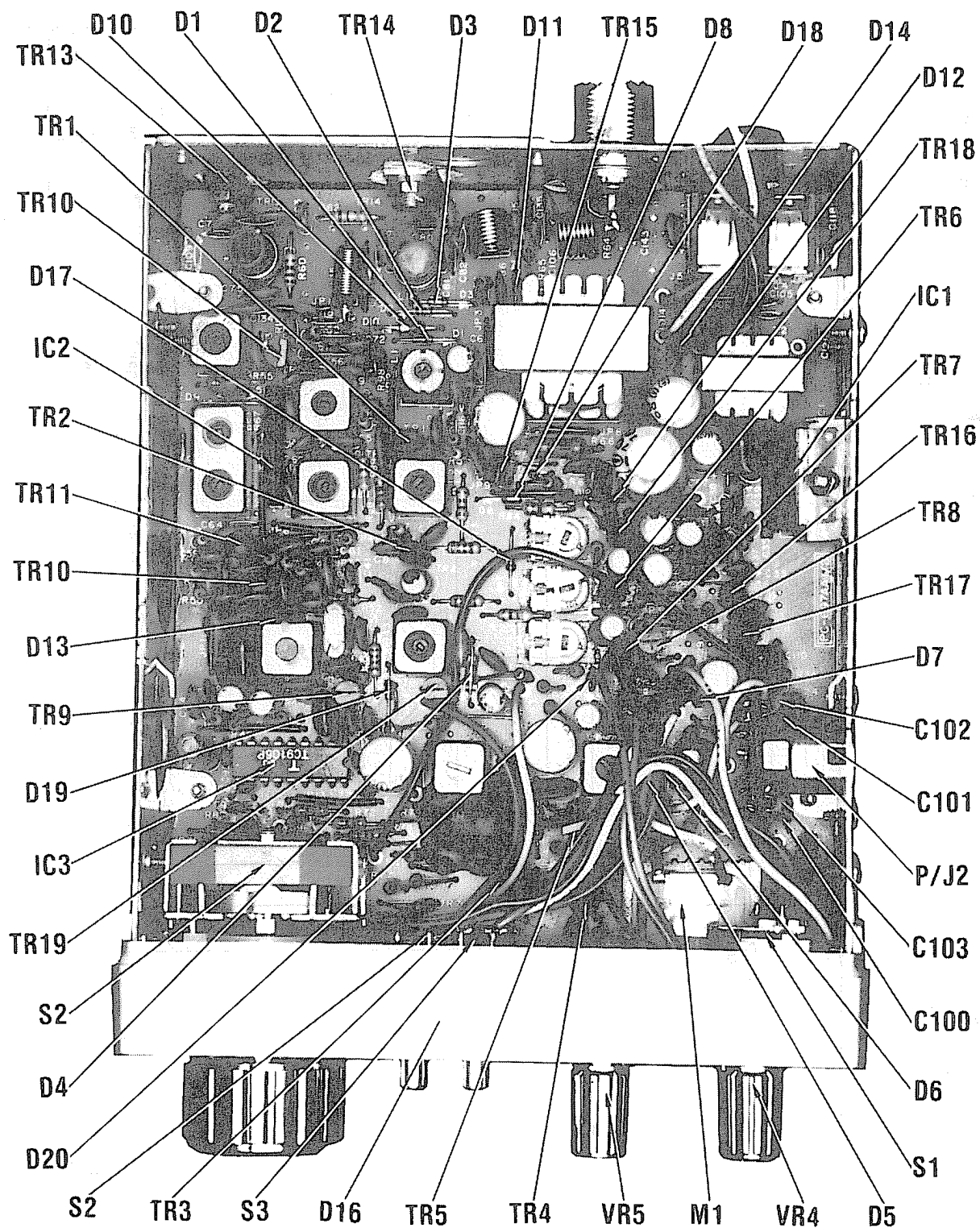
MAIN BOARD



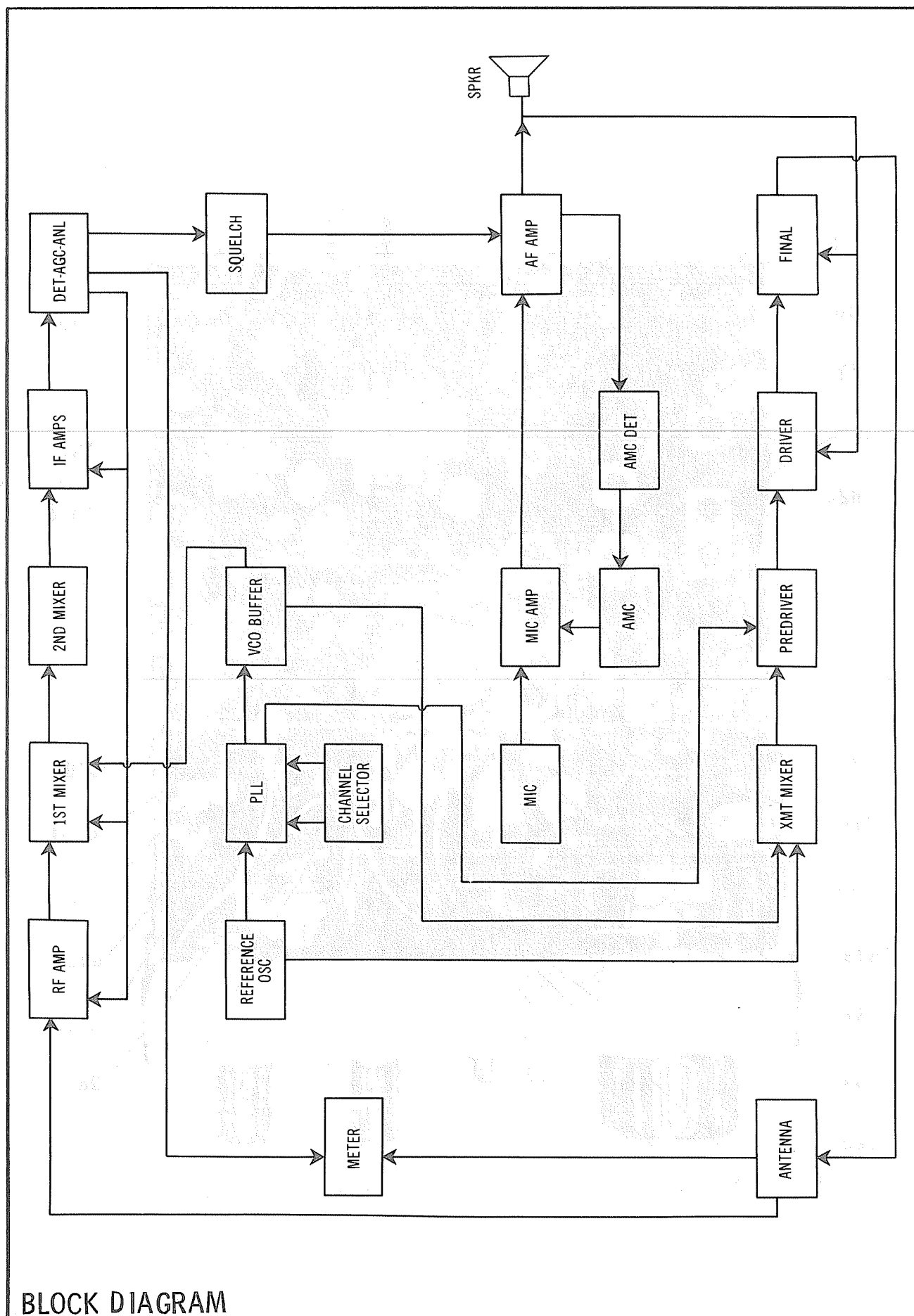
MAIN BOARD



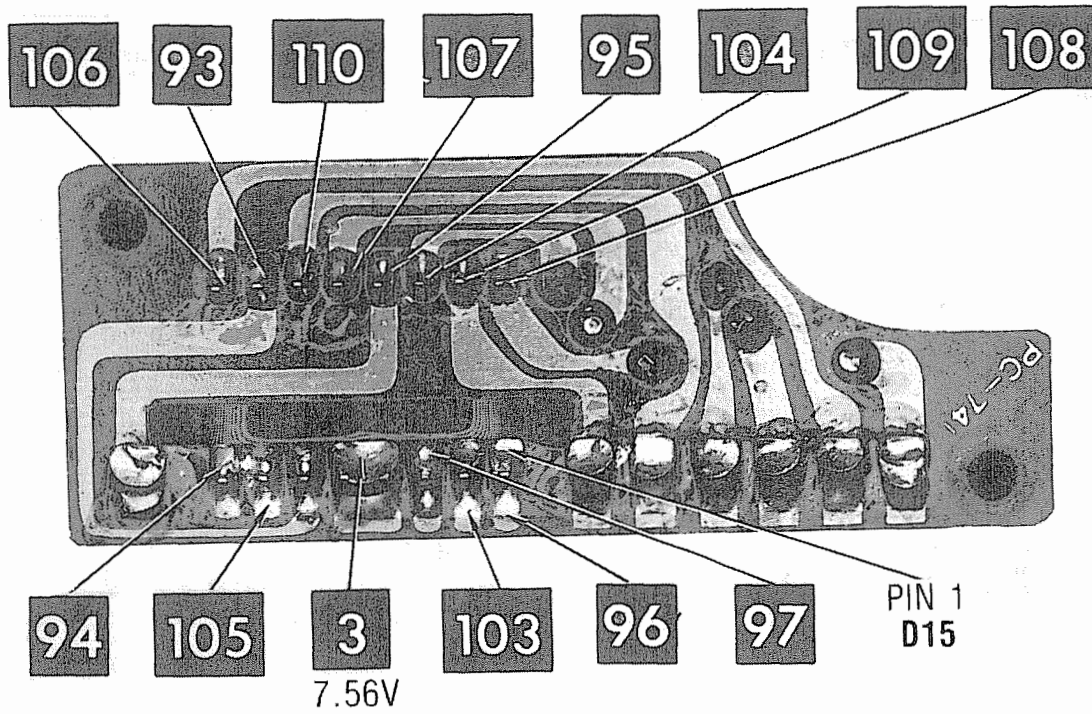
MAIN BOARD



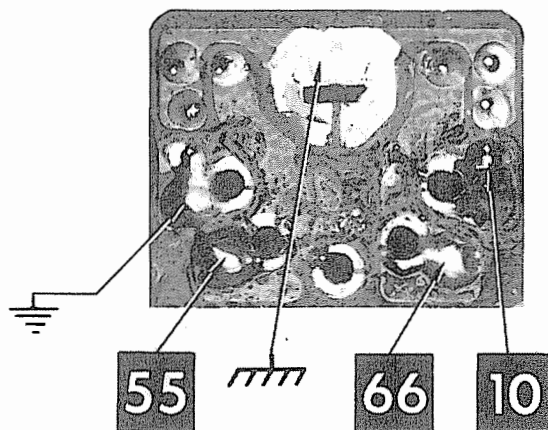
CHASSIS-BOTTOM



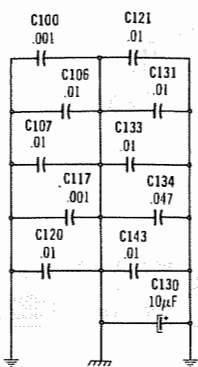
BLOCK DIAGRAM

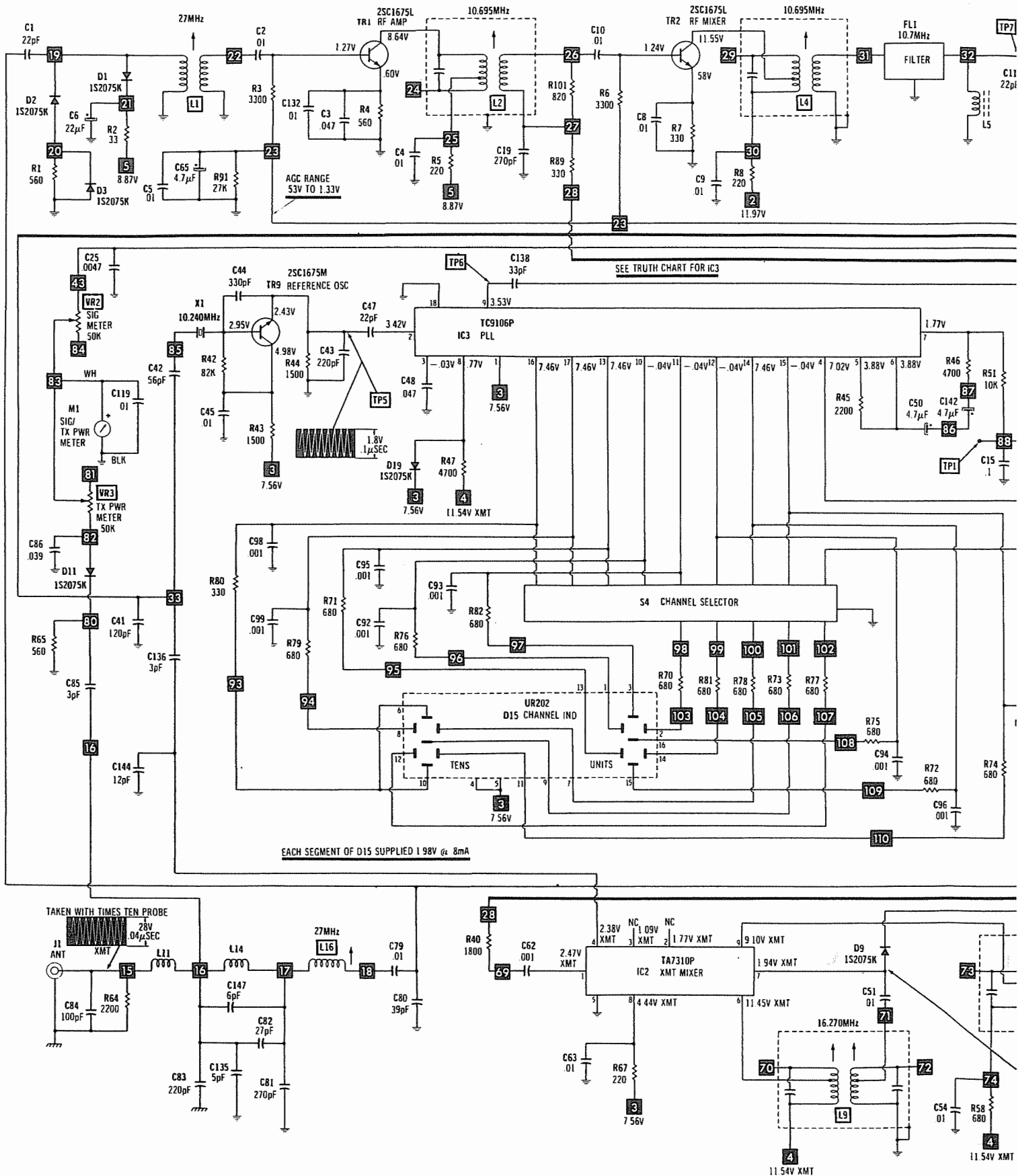


CHANNEL READOUT BOARD



MIC CONNECTOR BOARD

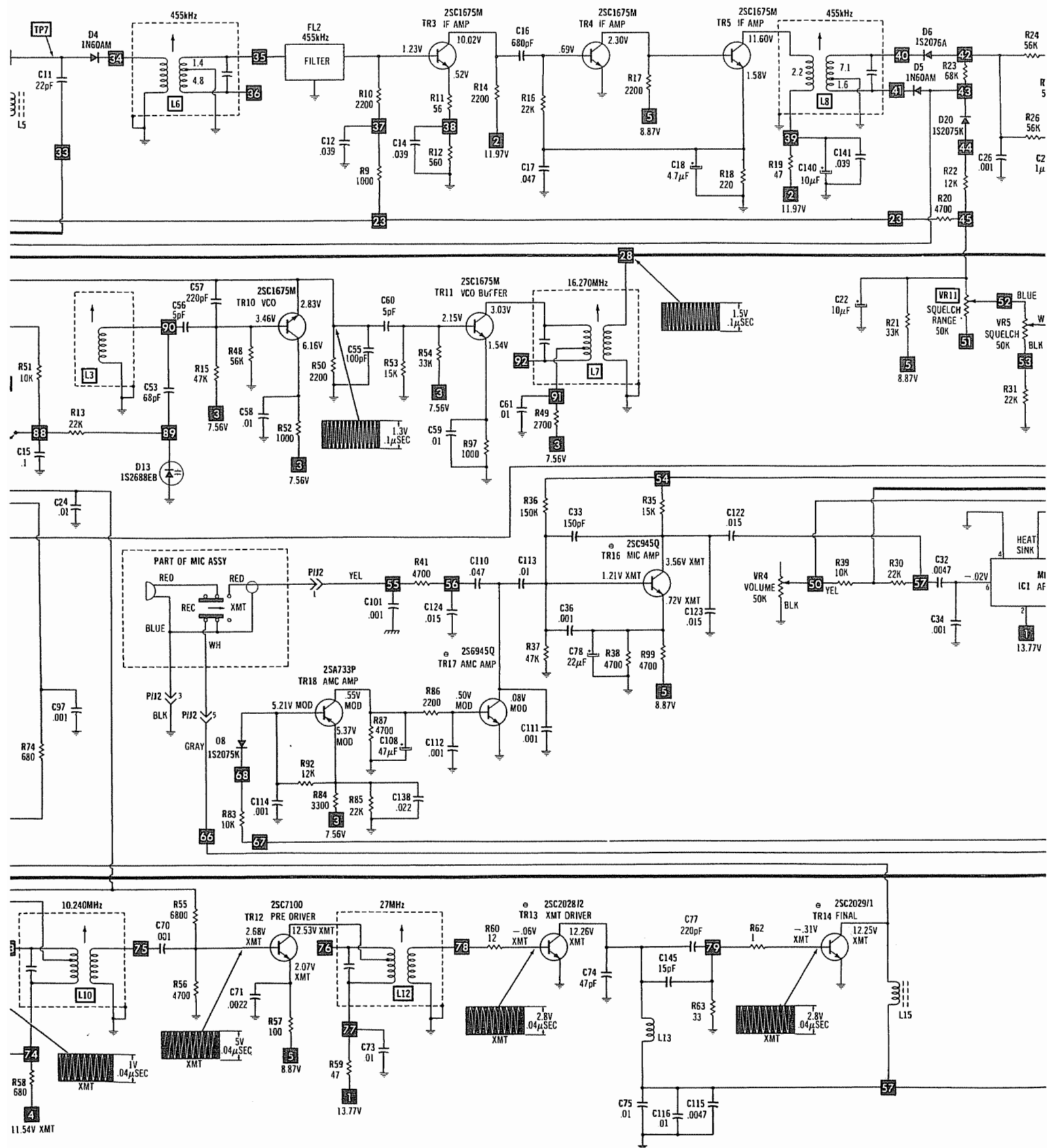




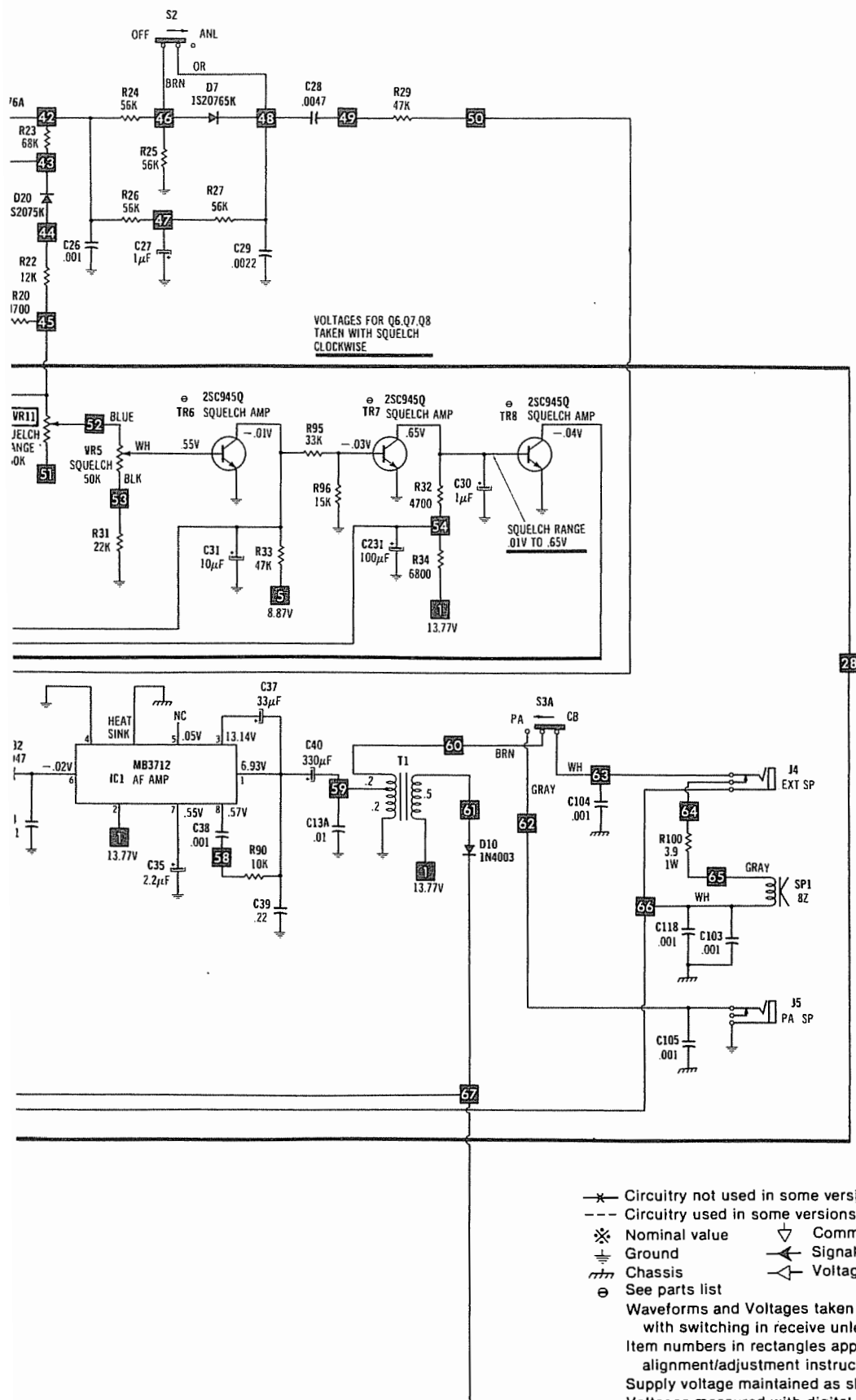
A PHOTOFAC STANDARD NOTATION SCHEMATIC

WITH **CIRCUITRACE**

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MAIN SCHEMATIC



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

PRESIDENT MODEL AR-7

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.	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	1S2076A	2000-366	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
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	1S2075K	2000-303	GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062/177	103-131
D12	R08.2EB2	2000-367		ZMB.2B		SK3782/5016A	ECG5016A	TM5016	WEP1417/5016	103-29019
D13	1S2688B	2000-344			REN 612	SK3325/612	ECG612	TM612		103-176
D14	1N4003	2000-320	GE-504A	1N4003	REN 116	SK3312	ECG116	TM116	WEP156	212-76-02
D17	1S2075K	2000-303	GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062/177	103-131
D18	1S2075K	2000-303	GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062/177	103-131
D19	1S2075K	2000-303	GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062/177	103-131
D20	1S2075K	2000-303	GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062/177	103-131
IC1	M83712	2000-037								
IC2	TA7310P	2000-017			REN 1192	SK3445/1192	ECG1192	TM1192	WEP2120/1192	221-29061
IC3	TC9106P	2000-035				SK3830				
TR1	2SC1675L	2000-213	GE-213	PTC132*	REN 229*	SK3122	ECG229*	TM229*	WEP773	121-29021*
TR2	2SC1675L	2000-213	GE-213	PTC132*	REN 229*	SK3122	ECG229*	TM229*	WEP773	121-29021*
TR3	2SC1675M	2000-275	GE-213	PTC132*	REN 229*	SK3122	ECG229*	TM229*	WEP773	121-29021*
TR4	2SC1675M	2000-275	GE-213	PTC132*	REN 229*	SK3122	ECG229*	TM229*	WEP773	121-29021*
TR5	2SC1675M	2000-275	GE-213	PTC132*	REN 229*	SK3122	ECG229*	TM229*	WEP773	121-29021*
TR6	2SC945Q	2000-258	GE-212	PTC121*	REN 199	SK3124/289	ECG199	TM199/**	WEP1945	121-972*
TR7	2SC945Q	2000-258	GE-212	PTC121*	REN 199	SK3124/289	ECG199	TM199/**	WEP1945	121-972*
TR8	2SC945Q	2000-258	GE-212	PTC121*	REN 199	SK3124/289	ECG199	TM199/**	WEP1945	121-972*
TR9	2SC945Q	2000-258	GE-212	PTC121*	REN 199	SK3124/289	ECG199	TM199/**	WEP1945	121-972*
TR10	2SC1675M	2000-275	GE-213	PTC132*	REN 229*	SK3122	ECG229*	TM229*	WEP773	121-29021*
TR11	2SC1675M	2000-275	GE-213	PTC132*	REN 229*	SK3122	ECG229*	TM229*	WEP773	121-29021*
TR12	2SC710D	2000-268	GE-211*	PTC132*	REN 123AP*	SK3356	ECG107*	TM107/**	WEP710	121-29000A*
TR13	2SC2028/2	2000-270	GE-270	PTC180	REN 295	SK3253/295	ECG295	TM295	WEP755/195A*	121-29066
TR14	2SC2029/1	2000-271	GE-333	PTC186	REN 235	SK3197/235	ECG235	TM235	WEP785/235	121-29039
TR15	2SD471L	2000-276	GE-47	PTC144*	REN 293	SK3849/293	ECG293	TM293	WEP912/293	121-29066
TR16	2SC945Q	2000-258	GE-212	PTC121*	REN 199	SK3124/289	ECG199	TM199/**	WEP1945	121-972*
TR17	2SC945Q	2000-258	GE-212	PTC121*	REN 199	SK3124/289	ECG199	TM199/**	WEP1945	121-972*
TR18	2SC945Q	2000-258	GE-212	PTC121*	REN 199	SK3124/289	ECG199	TM199/**	WEP1945	121-972*
TR19	2SA733P	2000-218	GE-48	PTC127	REN 294	SK3114/290	ECG290	TM290/**	WEP911/290	121-29067
TR19	2SA733P	2000-218	GE-48	PTC127	REN 294	SK3114/290	ECG290	TM290/**	WEP911/290	121-29067

* 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
C6	22 10V		PC25-25	VTT22B16	QV1-55	EV-1224
C18	4.7 25V		PC5-50	VTT4R7B50	QV1-31	EV-1619.1
C22	10 16V		PC10-25	VTT10B25	QV1-41	EV-1222
C23	100 10V		PC100-10	VTT100010	QV1-93	EV-1131
C27	1 50V		PC1-50	VTT1A50	QV1-11	EV-1615
C30	1 50V		PC1-50	VTT1A50	QV1-11	EV-1615
C31	10 16V		PC10-25	VTT10B25	QV1-41	EV-1222
C35	2.2 35V			TDC225M035FL	Q0T1-37	5035-2R29
C37	33 16V		PC30-25	VTT33025	QV1-63	EV-1325
C40	330 10V		WBR300-35*	VTT330H16	QV1-133	EV-1245
C49	220 10V		PC250-10	VTT220F10	QV1-115	EV-1140
C50	4.7 25V		PC5-50	VTT4R7B50	QV1-31	EV-1619.1
C65	4.7 25V		PC5-50	VTT4R7B50	QV1-31	EV-1619.1
C67	470 10V		PC500-16	VTT470K16	QV1-151	EV-1251
C78	22 10V		PC25-25	VTT22B16	QV1-55	EV-1224
C87	470 16V		PC500-16	VTT470K16	QV1-151	EV-1251
C91	220 16V		PC250-25	VTT220H16	QV1-117	EV-1240
C108	47 10V		PC50-16	VTT47D16	QV1-73	EV-1226
C129	47 10V		PC50-16	VTT47D16	QV1-73	EV-1226
C130	10 16V		PC10-25	VTT10B25	QV1-41	EV-1222
C140	10 16V		PC10-25	VTT10B25	QV1-41	EV-1222
C142	4.7 25V		PC5-50	VTT4R7B50	QV1-31	EV-1619.1

* Axial replacement for radial device.

PRESIDENT MODEL AR-7

CAPACITORS

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA			
			CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
					Q-LINE	GENERAL LINE
C1	22 N220 50V			*		10TCR-022
C2	.01 50V			MAG5011		
C3	.047 25V			MAG2515	QC1-205	HY-735
C4	.01 50V			MAG5011		
C5	.01 50V			MAG5011		
C8	.01 50V			MAG5011		
C9	.01 50V			MAG5011		
C10	.01 50V			MAG5011		
C11	22 50V 10%		NP022	CN0422		10TCC-022
C12	.039 25V			GP140		5GA-540
C13A	.01 50V 10%			MAG5011		
C13B	33 50V 10%		NP033	CN0433	OCC2-22	10TCC-033
C14	.039 100V 10%			M192P3939R8		192P3939R8
C15	.1 100V 10%		OPMS2P1	EWFA1010	QF1-215	1PB-P10
C16	680 50V 10%		GP680	GP368		10TS-T68
C17	.047 100V 10%		DPMS2S47	EWFA1A47	QF1-171	1PB-S47
C19	270 50V 10%					10TCC-T27
C20	.047 25V			MAG2515	QC1-205	HY-735
C21	.047 25V			MAG2515	QC1-205	HY-735
C24	.01 50V			MAG5011		
C25	.0047 50V		GP4700	GP247		5GA-D47
C26	.001 50V		GP1000	GP210	QC2-81	5GA-D10
C27	.0047 50V		GP4700	GP247		5GA-D47
C28	.0047 50V		GP4700	GP247		5GA-D47
C29	.0022 100V 10%			M192P2229R8		192P2229R8
C32	.0047 50V		GP4700	GP247		5GA-D47
C33	150 50V 10%			CN0315		10TCC-T15
C34	.001 50V		GP1000	GP210	QC2-81	5GA-D10
C36	.001 50V		GP1000	GP210	QC2-81	5GA-D10
C38	.001 50V		OPMS601	M192P10292	QFT2-1	1FT-D10
C39	.22 50V			MAG25022	QC1-251	HY-770
C41	120 50V 10%			CN0312		10TCC-TT2
C42	56 N220 50V			*		10TCR-n56
C43	200 50V 10%		GP200	GP320	QC2-28	10TS-T20
C44	330 50V 10%		GP330	GP333	QC2-33	10TS-T33
C45	.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
C46	.01 50V			MAG5011		
C47	22 50V 10%		NP022	CH0422		10TCC-022
C48	.047 100V 10%		OPMS2547	EWFA1A147	0F1-171	1PP-547
C52	.01 50V			MAG5011		
C53	68 11750 50V 10%		H60	CH7468		10TCU-068
C54	.01 50V			MAG5011		
C55	100 11750 50V 10%		H100	CN7310		10TCU-T10
C56	33 11220 50V 10%			*		10TCP-033
C57	220 11750 50V 10%		H220	CH7322		10TCU-T22
C58	.01 50V			MAG5011		
C59	.01 50V			MAG5011		
C60	5 50V		NP04P7	CH0547		10TCC-V47
C61	.01 50V			MAG5011		
C62	.001 50V		GP1000	GP210	0C2-81	5GA-010
C63	.01 50V			MAG5011		
C64	.01 50V			MAG5011		
C66	.01 50V			MAG5011		
C69	.01 50V			MAG5011		
C70	.001 50V		GP1000	GP210	0C2-81	5GA-010
C71	.0022 50V			GP222	0C2-97	5GA-022
C72	.01 50V			MAG5011		
C73	.01 50V			MAG5011		
C74	47 50V 10%		NP047	CN0447	0CC2-26	10TCC-047
C75	.01 50V			MAG5011		
C77	220 50V 10%			CN0439		10TCC-T22
C79	.01 50V					
C80	39 50V 10%					10TCC-039
C81	270 50V 10%					10TCC-T27
C82	27 50V			CH0427		10TCC-027
C83	220 50V 10%		NP0100	CH0310		10TCC-T22
C84	100 50V 10%		NP03P3	CH0533		10TCC-T10
C85	3 50V			GP140		10TCC-V33
C86	.039 25V			GP210	0C2-81	5GA-S40
C87	.001 50V		GP1000	GP210	0C2-81	5GA-010
C88	.001 50V		GP1000	GP210	0C2-81	5GA-010
C89	.001 50V		GP1000	GP210	0C2-81	5GA-010
C90	.001 50V		GP1000	GP210	0C2-81	5GA-010
C92	.001 50V		GP1000	GP210	0C2-81	5GA-010
C93	.001 50V		GP1000	GP210	0C2-81	5GA-010
C94	.001 50V		GP1000	GP210	0C2-81	5GA-010
C95	.001 50V		GP1000	GP210	0C2-81	5GA-010
C96	.001 50V		GP1000	GP210	0C2-81	5GA-010
C97	.001 50V		GP1000	GP210	0C2-81	5GA-010
C98	.001 50V		GP1000	GP210	0C2-81	5GA-010
C99	.001 50V		GP1000	GP210	0C2-81	5GA-010
C100	.001 50V		GP1000	GP210	0C2-81	5GA-010
C101	.001 50V		GP1000	GP210	0C2-81	5GA-010
C102	.001 50V		GP1000	GP210	0C2-81	5GA-010
C103	.001 50V		GP1000	GP210	0C2-81	5GA-010
C104	.001 50V		GP1000	GP210	0C2-81	5GA-010
C105	.001 50V		GP1000	GP210	0C2-81	5GA-010
C106	.01 50V			MAG5011		
C107	.01 50V			MAG5011		
C110	.047 100V 10%		OPMS2547	EWFA1A147	0F1-171	1PB-547
C111	.001 50V		GP1000	GP210	0C2-81	5GA-010
C112	.001 50V		GP1000	GP210	0C2-81	5GA-010
C113	.01 100V 10%		WMF151	EWFA1A110	0F1-91	1PB-510
C114	.001 100V 10%		OPMS601	EWFA1A210	0F1-91	1PB-010
C115	.0047 50V		GP4700	GP247		5GA-047
C116	.01 50V			MAG5011		
C117	.001 50V		GP1000	GP210	0C2-81	5GA-010
C118	.001 50V		GP1000	GP210	0C2-81	5GA-010
C119	.01 50V			MAG5011		
C120	.01 50V			MAG5011		
C121	.01 50V			MAG5011		
C122	.015 50V 10%		WMF1515	M192P1539R8	0FT2-105	1FT-S15
C123	.015 50V 10%		WMF1515	M192P1539R8	0FT2-105	1FT-S15
C124	.015 50V 10%		WMF1515	M192P1539R8	0FT2-105	1FT-S15
C125	.01 50V			MAG5011		
C127	.01 50V			MAG5011		
C128	.01 50V			MAG5011		
C131	.01 50V			MAG5011		
C132	.01 50V			MAG5011		
C133	.01 50V			MAG5011		
C134	.047 25V			MAG2515	0C1-205	HY-735
C135	5 50V		NP04P7	CH0547		10TCC-V47
C136	3 50V		NP03P3	CH0533		10TCC-V33
C136	.022 50V		OPMS2522	M192P239R8	0FT2-127	1FT-S22
C139	.01 50V			MAG5011		
C141	.039 25V			GP140		5GA-S40
C143	.01 50V			MAG5011		
C144	12 50V 10%			CN0412		10TCC-012
C145	15 50V		NP015	CN0415		10TCC-015
C147	6 50V 10%		NP06P6	CH0568		10TCC-V68

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

PARTS LIST AND DESCRIPTION (CONTINUED)

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

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	1900-202	RVA0911H503	U260R503B
VR2	SIG Meter	50K	1900-202	RVA0911H503	U260R503B
VR3	RX PWR Meter	50K	1900-202	RVA0911H503	U260R503B
VR4	Volume/Power Switch	50K	1900-104		
VR5	Squelch	50K	1900-108		

COILS (RF-IF)

ITEM No.	FUNCTION	REPLACEMENT DATA			REMARKS
		PART No.	OTHER IDENTIFICATION	MILLER PART No.	
L1	Rec Antenna (27MHz)	2200-504	LA-279		
L2	Rec RF (27MHz)	2200-545	LA-308		
L3	VCO	2200-083	LA-165		
L4	Rec Mixer (10.695MHz)	2200-004	LA-181		
L5	RF Choke (10uH)	2200-205	LZ-016		
L6	IF (455kHz)	2200-508	LA-281		
L7	VCO Buffer (16.270MHz)	2200-047	LA-201		
L8	IF (455kHz)	2200-091	LA-207		
L9	XMT Mixer (16.270MHz)	2200-045	LA-198		
L10	XMT Mixer (10.240MHz)	2200-084	LA-088		
L11	XMT Antenna	2200-087	LE-093		
L12	XMT Pre-driver (27MHz)	2200-085	LA-208		
L13	RF Choke	2200-020	LC-130		
L14	RF Choke	2200-087	LE-093		
L15	RF Choke	2200-017	LD-033		
L16	Final (27MHz)	2200-034	LD-073		

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.	
T2	1.2A	.14	.85mH	2300-001			

TRANSFORMER (Audio Output)

ITEM No.	IMPEDANCE		REPLACEMENT DATA			NOTES
	PRI.	SEC. 1	MFR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T1	6.25	16	2600-013	TR507		
		SEC. 2				
		30				

SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		MFR. PART No.	QUAM PART No.	
SP1	3" PM 16 Ohm	3100-009		

FUSE DEVICES

ITEM No.	DESCRIPTION	REPLACEMENT DATA					
		PART No.		BUSS PART No.		LITTELFUSE PART No.	
		DEVICE	HOLDER	DEVICE	HOLDER	DEVICE	HOLDER
F1	2A Quick Acting			AGC2	HRK	318002	150145
							FG22

PRESIDENT MODEL AR-7

PARTS LIST AND DESCRIPTION (CONTINUED)

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

MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
D15	LED	2000-306	Channel Display (1.98V @ 8mA)
D16	LED		XMT Ind. (2.04V @ 9.5mA, Blue)
FL1	Filter	2200-301	10.7MHz
FL2	Filter	2200-307	455kHz
J1	Jack	1100-002	Antenna
J2	Jack	1100-027	Mic
J4	Jack	1100-021	External Speaker
J5	Jack	1100-021	PA Speaker
Mic	Microphone	3200-011	
M1	Meter	2900-001	
S1	Switch		On/Off (on Volume Control)
S2	Switch	3000-021	ANL/Off
S3	Switch	3000-021	PA/CB
S4	Switch	3000-123	Channel Select
X1	Crystal	2100-013	10.240MHz
	Printed Circuit Board	3500-059	LED
	Power Cord	2700-009	DC

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

ITEM	PART No.	ITEM	PART No.
Cover, Top	3300-132	Knob, Channel Select	1300-001
Cover, Bottom	3300-133	Knob, On-Off-Volume, Squelch	1300-042
Panel, Front	3300-524	Hanger, Microphone	3300-401



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-201

NDI MODEL PC-201

MANUFACTURER'S SPECIFICATIONS

GENERAL:

CHANNELS	40 channels
FREQUENCY RANGE	26.965 to 27.405 MHz
FREQUENCY CONTROL	Digitally synthesized
FREQUENCY TOLERANCE	0.003%
OPERATING TEMPERATURE RANGE	-30°C to +50°C
HUMIDITY	95%
MICROPHONE	Dynamic w/p-t-t switch, coil cord/plug
SUPPLY VOLTAGE	13.8 VDC, $\pm$ 2.1V. Positive or negative ground
CURRENT DRAIN	Transmit:

AM: 95% modulation, 2 amps
SSB: 12W output, 2.5 amps

Receive:
Squelched, 0.35 amps.
4W audio output, 1.2 amps (approx.)

SIZE Inches: 7.4W, 2.3H, 10.0D.

WEIGHT MM: 189W, 60H, 255D
Pounds: 4.5 Kgs: 2.0

TRANSMITTER:

POWER INPUT	AM: 6W @13.8VDC SSB: 25W @13.8VDC
POWER OUTPUT	AM: 4W @13.8VDC SSB: 12W p.e.p @13.8VDC

MODULATION CAPABILITY	100%
INTERMODULATION DISTORTION	SSB: 3rd order, -25 dB
CARRIER SUPPRESSION	SSB: -40 dB
UNWANTED SIDEBAND	-50 dB
FREQUENCY RESPONSE	AM & SSB: 350-2500 Hz
OUTPUT IMPEDANCE	50 ohms, unbalanced
SSB FILTER	7.8 MHz, crystal lattice 6 dB @4.0 kHz, 50 dB @5.5 kHz

RECEIVER:

SENSITIVITY	SSB: 0.25 μ V for 10 db S + N/N AM: 0.7 μ V for 10 db S + N/N
SELECTIVITY	SSB: 6 dB @2.4 kHz. 50 dB @5.5kHz
IMAGE REJECTION	50 db
I-F FREQUENCY	7.8 MHz
AGC	Less than 10 db increase in audio, 10 μ V to 50,000 μ V
(AUTOMATIC GAIN CONTROL)	
SQUELCH	Adjustable. Threshold less than 1 μ V
NOISE LIMITERS	ANL, series gate type and noise blanker type
CLARIFIER RANGE	$\pm$ 1000 Hz, minimum
AUDIO POWER OUTPUT	4W @10% THD (4 ohm load)
HUM AND NOISE	-40 dB

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:

L01, L04, L05, L301, L302, T301 thru T307,
 L301, L302, L401, L402, T401, T402, T403 9440
 C605, C607 5000, 8276, 9089
 L702, L709 5000, 5009, 8276, 8728, 8728A, 9089
 L704, L706 9300, 9302, 9304

SYNTHESIZER ALIGNMENT

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Input of frequency counter thru 10pF to TP9 (Q04 Emitter).	Ch. 19, AM Clarifier Midrange	L05	Adjust for 10.000MHz.
Input of frequency counter thru 10pF to TP9 (Q04 Emitter).	Ch. 19, AM XMT	R106	FINE TUNE RANGE Adjust for 10.000MHz.
Input of frequency counter thru 10pF to TP9 (Q04 Emitter).	Ch. 19, LSB Clarifier Midrange	L04	Adjust for 9.9987MHz.
Input of DC meter to TP2 (Junction of R03 and R04).	Ch. 1	L01	Adjust for 3.63 volts. Check for approximately 2.87 volts on channel 40.
Input of frequency counter to TP3 (IC02 Pin 9).	Ch. 1		Check for .835MHz. Check all channels. (See Truth Chart for correct frequencies.)
Input of frequency counter thru 10pF to TP4 (Q02 Collector).	Ch. 1		Check for 19.165MHz. Check all channels. (See Truth Chart for correct frequencies.)
Input of frequency counter thru 10pF to TP5 (Q604 Emitter).	Ch. 19, LSB	C607	Adjust for 7.8025MHz.
Input of frequency counter thru 10pF to TP5 (Q604 Emitter).	Ch. 19, USB	L601	Adjust for 7.7975MHz.
Input of frequency counter thru 10pF to TP5 (Q604 Emitter).	Ch. 19, AM XMT	C605	Adjust for 7.8000MHz.

RECEIVER ALIGNMENT

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

SSB

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Output of signal generator to TP6 (CR304 Cathode). 7.80MHz, 1000Hz @ 30% modulation.	Ch. 19, AM	T307, T306, T305	Adjust for maximum audio output.
Output of signal generator to antenna input. 27.185MHz, 1000Hz @ 30% modulation.	Ch. 19, AM	T304, T303, T302, T301, L301, L302	Adjust for maximum audio output. Readjust T305, T306, T307 for maximum.
Input of oscilloscope to TP7 (CR403 Anode). Inject a 100pps, 1uSec. pulse width signal at antenna input.	Ch. 19, AM NB On	T402, T401, L402, L401	Adjust for maximum pulse amplitude. (1.75V peak typical.) (See Figure 1.)
Input of oscilloscope to TP8 (CR406 Cathode). Inject a 100pps, 1uSec. pulse width signal at antenna input.	Ch. 19, AM NB On	T403	Adjust for maximum pulse amplitude. (30mV peak typical.)

RECEIVER ADJUSTMENTS

Connect an AC VTVM or AF wattmeter across speaker voice coil.
Adjust volume control to obtain a suitable indication.
RF Gain Maximum, Clarifier Midrange, ANL Off, NB Off.

TEST EQUIPMENT	TRANSCIVER	ADJUST	REMARKS
Input of DC meter to TP1 (Q502 Source).	Ch. 19, AM	R517	AGC Adjust for 1.56 volts.
Output of signal generator to antenna input. 27.185MHz, 1000Hz @ 30% modulation.	Ch. 19, AM	R518	SQUELCH RANGE Adjust so squelch just breaks.
Output of signal generator to antenna input. 27.185MHz, 1000Hz @ 30% modulation. Output 100uV.	Ch. 19, AM	R507	S METER Adjust for 9 on S scale of meter.
Input of DC meter to TP10 (Q102 Base).		R103	AUTO DIMMER Cover RP1 (DIM) to dim display and adjust for 4.00 volts.
Output of signal generator to antenna input. 27.065MHz, 1000Hz @ 30% modulation. Output 60uV.	Ch. 19, Scan On Scan Sens Fully Clockwise	R912	SCAN SENS RANGE Adjust so scan locks onto channel 9. Set generator output to 40uV and check that scan does not lock on channel 9.

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, AM XMT	T701,T702, L702,L704, L706,L709	Adjust for maximum RF output.

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, AM XMT	R207	AM POWER Adjust for 4.0 watts RF output maximum.
Input of oscilloscope or modulation meter to antenna input. Inject a 1000Hz, 10mV signal at Mic input.	Ch. 19, AM XMT Mic Gain Maximum	R217	AM AMC Adjust for 100% modulation maximum. (See Figure 2.)
Input of DC meter to TP11 (IC601 Pin 7).	Ch. 19, USB	R616	BALANCE BIAS Adjust for 2.68 volts.
Input of RF wattmeter to antenna input.	Ch. 19, USB XMT Mic Gain MINIMUM	R611	CARRIER BALANCE. Adjust for MINIMUM RF output.
Input of RF wattmeter to antenna input. Inject a 1000Hz, 20mV signal at Mic input.	Ch. 19, USB XMT Mic Gain Maximum	R721	SSB ALC Adjust for 12 watts RF output maximum.

TRANSMITTER ADJUSTMENTS (Continued)

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Input of RF wattmeter to antenna input.	Ch. 19, AM XMT	R726	RF METER Adjust so RF meter agrees with RF wattmeter.
	Ch. 19, AM XMT	R723	SWR ZERO Adjust for zero on SWR meter.
Input of DC meter to TP12 (ICS1 Pin 9).	Ch. 19, AM	R53	SWR CAL Adjust for .25 volts.
Connect a 150-ohm, 25-watt dummy load to antenna connector.	Ch. 19, AM XMT	R61	SWR METER Adjust for a reading of 3 on the SWR scale.
Connect a 150-ohm, 25-watt dummy load to antenna connector.	Ch. 19, AM XMT	R62	AWI Adjust so AWI light comes on.

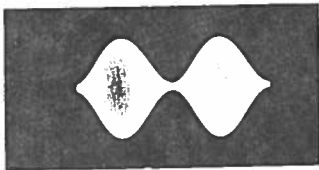


Figure 1

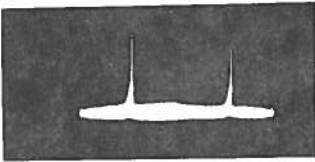
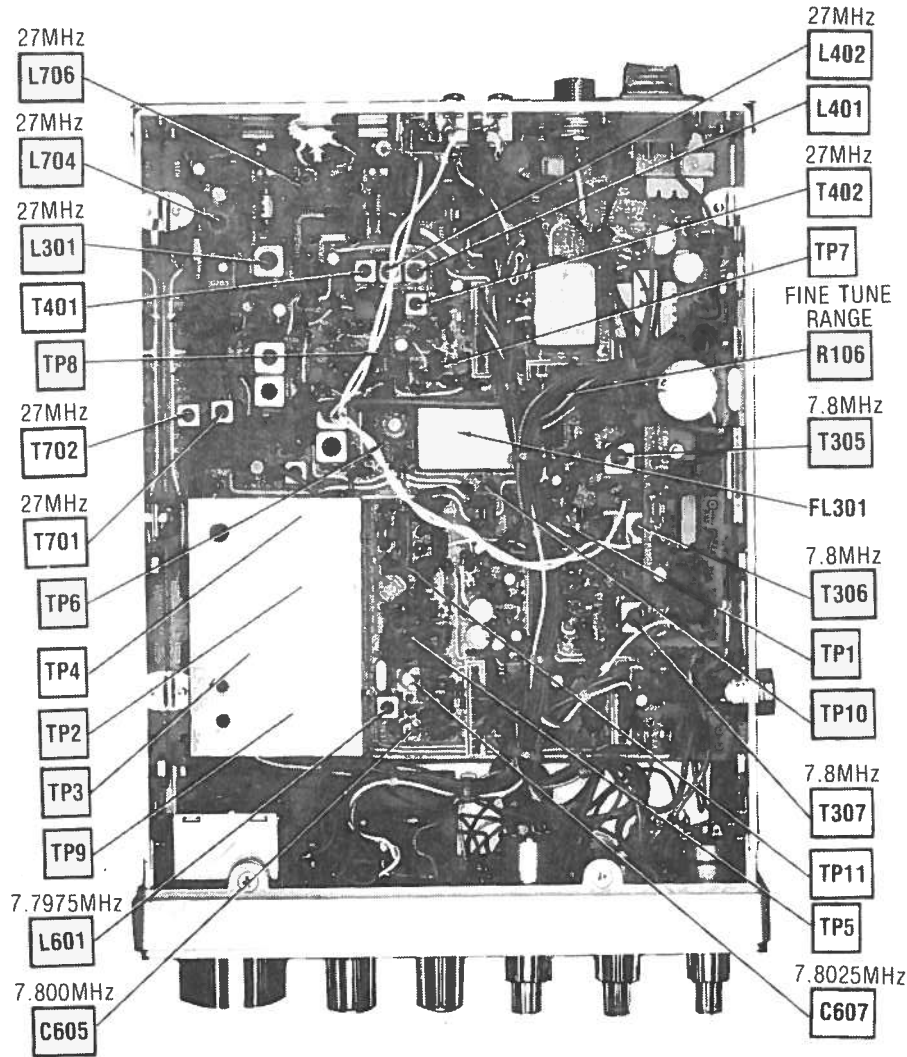
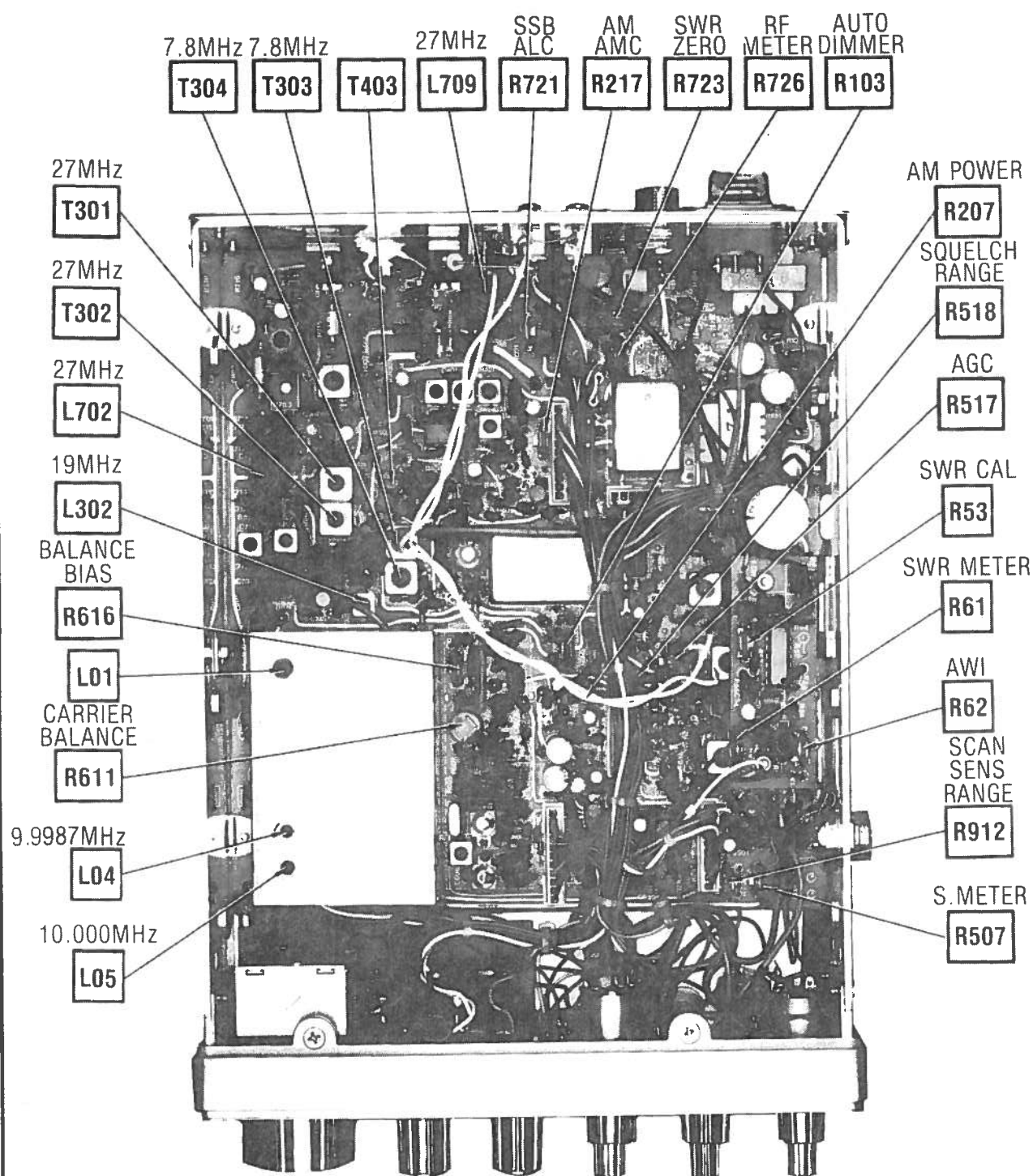


Figure 2

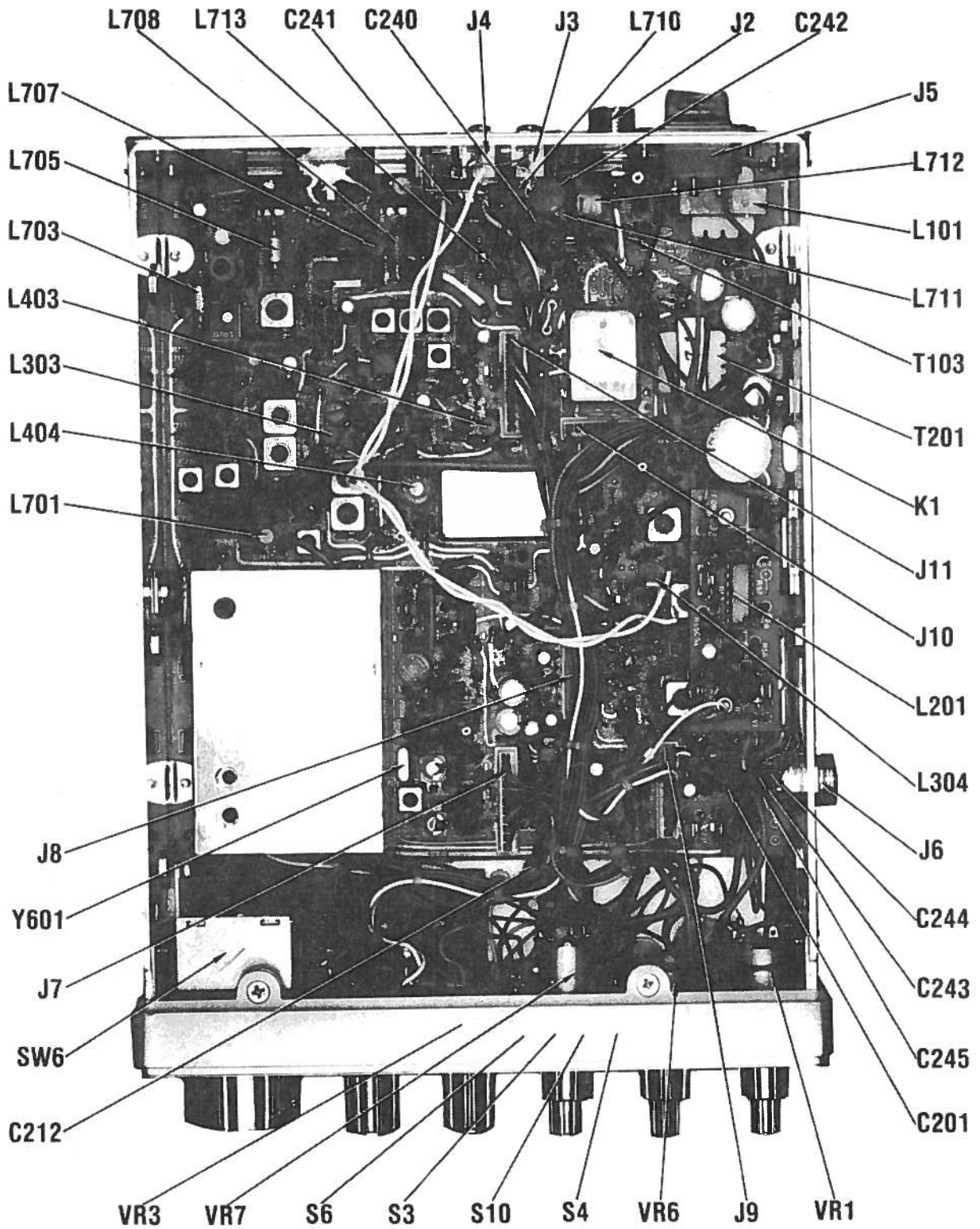




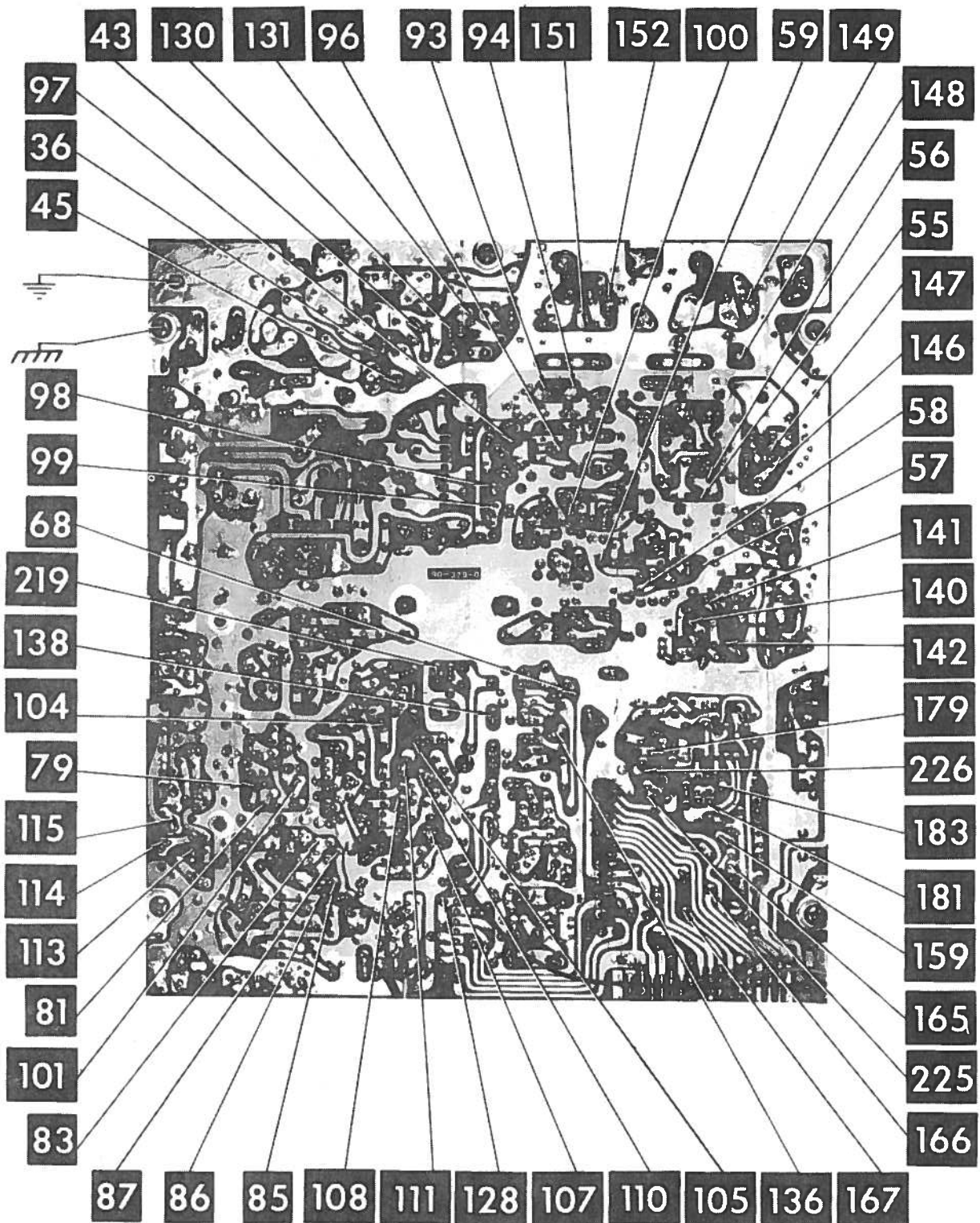
CHASSIS-BOTTOM

TRUTH CHART

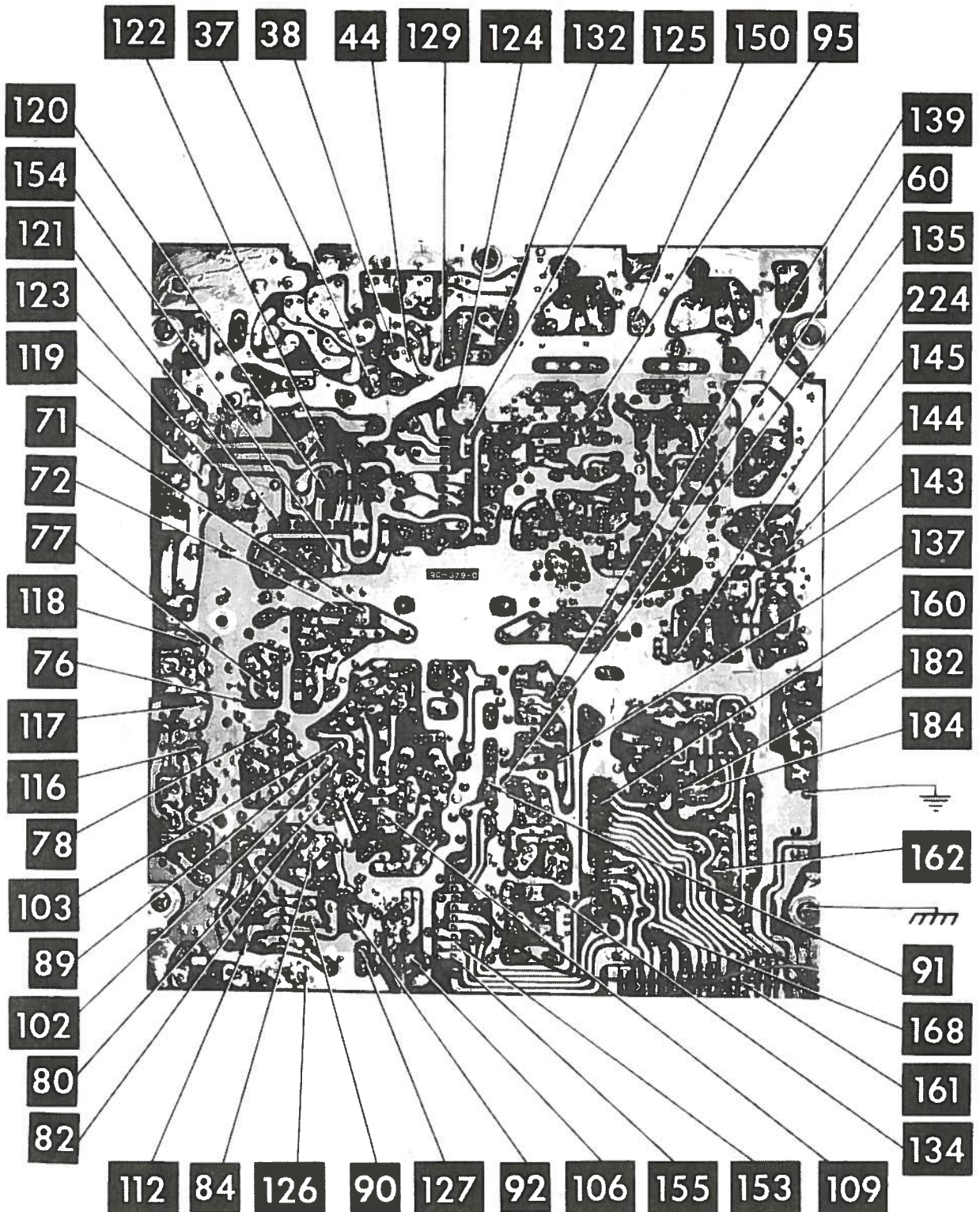
C H A N N E L	1 - 4.57 Volts 0 = .01 Volts								VCO OUTPUT IN MHz AT IC02 PIN 9	VCO OUTPUT IN MHz AT Q02 COLLECT
	CHANNEL INPUT CODES									
	IC03 PINS									
	8	9	10	11	12	13	14			
1	1	0	1	0	0	1	1		.835	19.165
2	1	0	1	0	0	1	0		.825	19.175
3	1	0	1	0	0	0	1		.815	19.185
4	1	0	0	1	1	1	1		.795	19.205
5	1	0	0	1	1	1	0		.785	19.215
6	1	0	0	1	1	0	1		.775	19.225
7	1	0	0	1	1	0	0		.765	19.235
8	1	0	0	1	0	1	0		.745	19.255
9	1	0	0	1	0	0	1		.735	19.265
10	1	0	0	1	0	0	0		.725	19.275
11	1	0	0	0	1	1	1		.715	19.285
12	1	0	0	0	1	0	1		.695	19.305
13	1	0	0	0	1	0	0		.685	19.315
14	1	0	0	0	0	1	1		.675	19.325
15	1	0	0	0	0	1	0		.665	19.335
16	1	0	0	0	0	0	0		.645	19.355
17	0	1	1	1	1	1	1		.635	19.365
18	0	1	1	1	1	1	0		.625	19.375
19	0	1	1	1	1	0	1		.615	19.385
20	0	1	1	1	0	1	1		.595	19.405
21	0	1	1	1	0	1	0		.585	19.415
22	0	1	1	1	0	0	1		.575	19.425
23	0	1	1	0	1	1	0		.545	19.455
24	0	1	1	1	0	0	0		.565	19.435
25	0	1	1	0	1	1	1		.555	19.445
26	0	1	1	0	1	0	1		.535	19.465
27	0	1	1	0	1	0	0		.525	19.475
28	0	1	1	0	0	1	1		.515	19.485
29	0	1	1	0	0	1	0		.505	19.495
30	0	1	1	0	0	0	1		.495	19.505
31	0	1	1	0	0	0	0		.485	19.515
32	0	1	0	1	1	1	1		.475	19.525
33	0	1	0	1	1	1	0		.465	19.535
34	0	1	0	1	1	0	1		.455	19.545
35	0	1	0	1	1	0	0		.445	19.555
36	0	1	0	1	0	1	1		.435	19.565
37	0	1	0	1	0	1	0		.425	19.575
38	0	1	0	1	0	0	1		.415	19.585
39	0	1	0	1	0	0	0		.405	19.595
40	0	1	0	0	1	1	1		.395	19.605



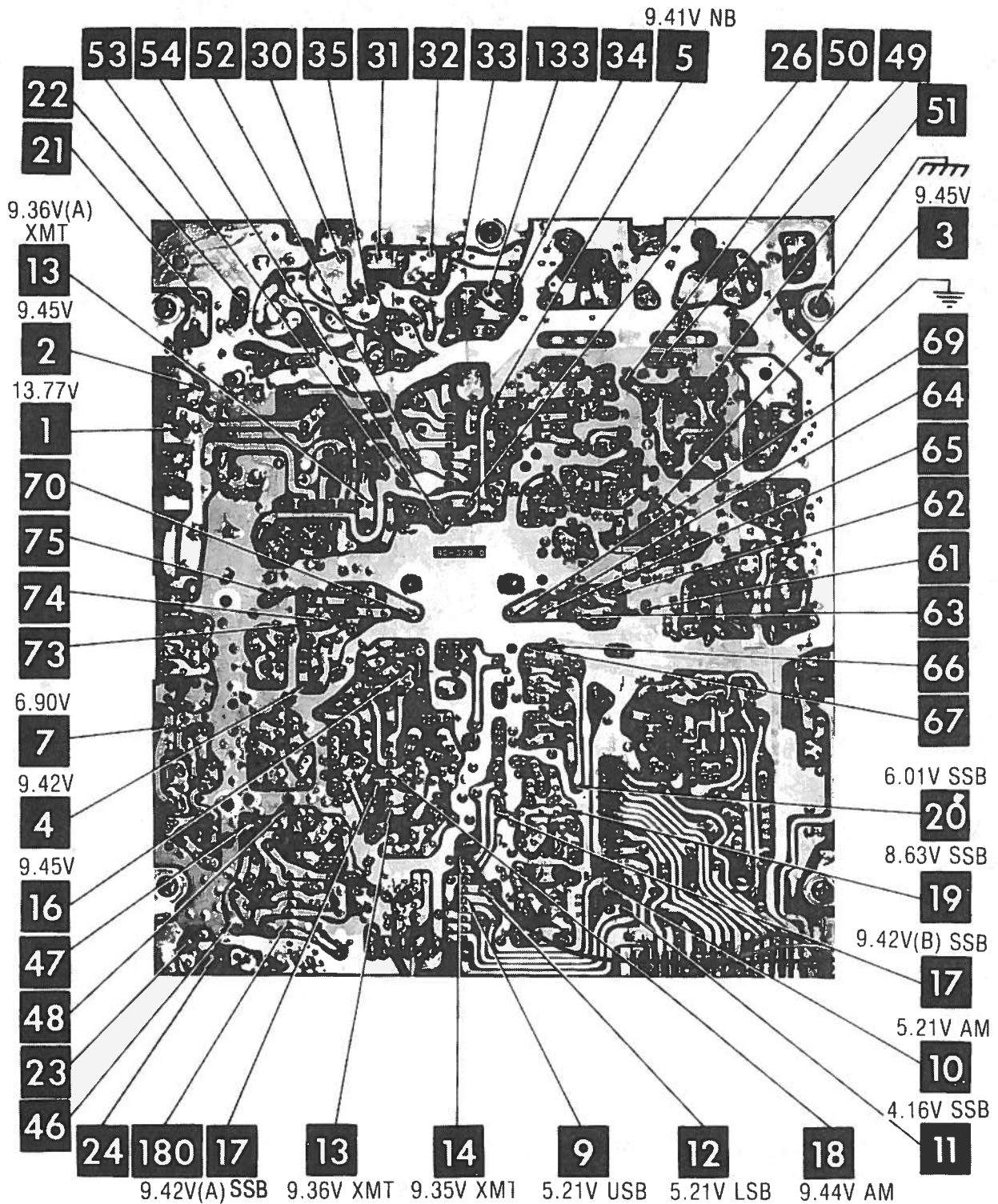
CHASSIS-BOTTOM



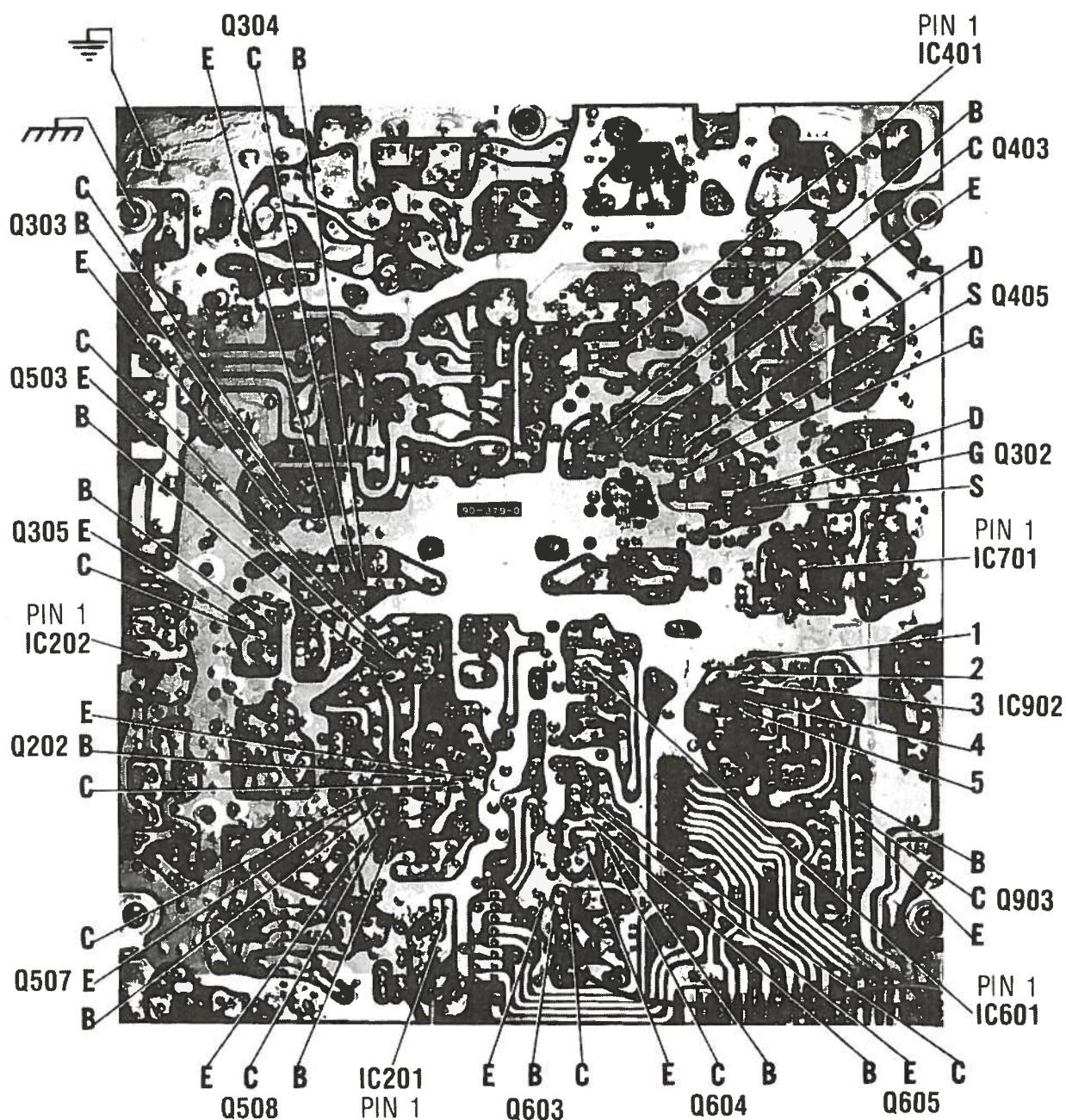
MAIN BOARD



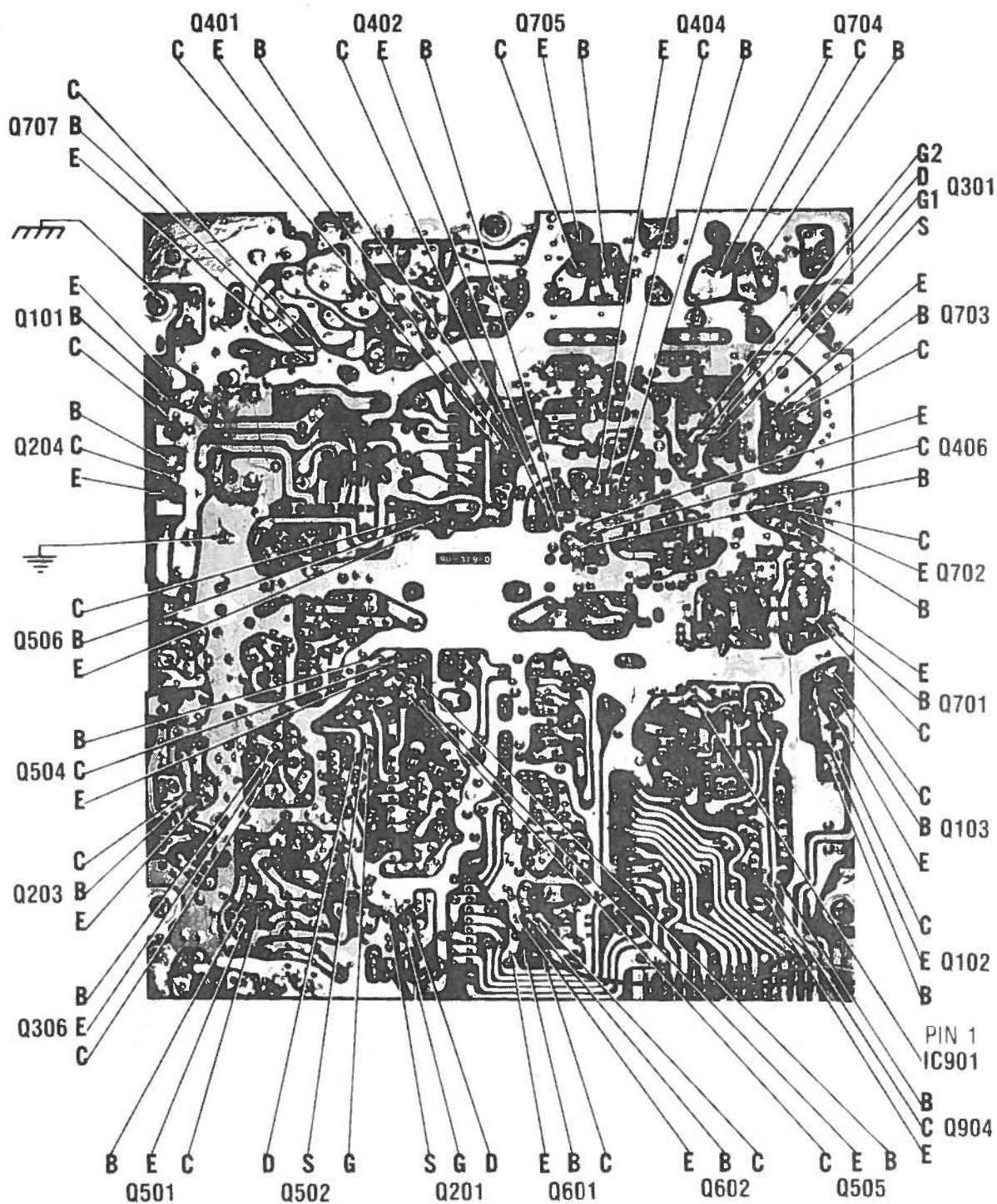
MAIN BOARD



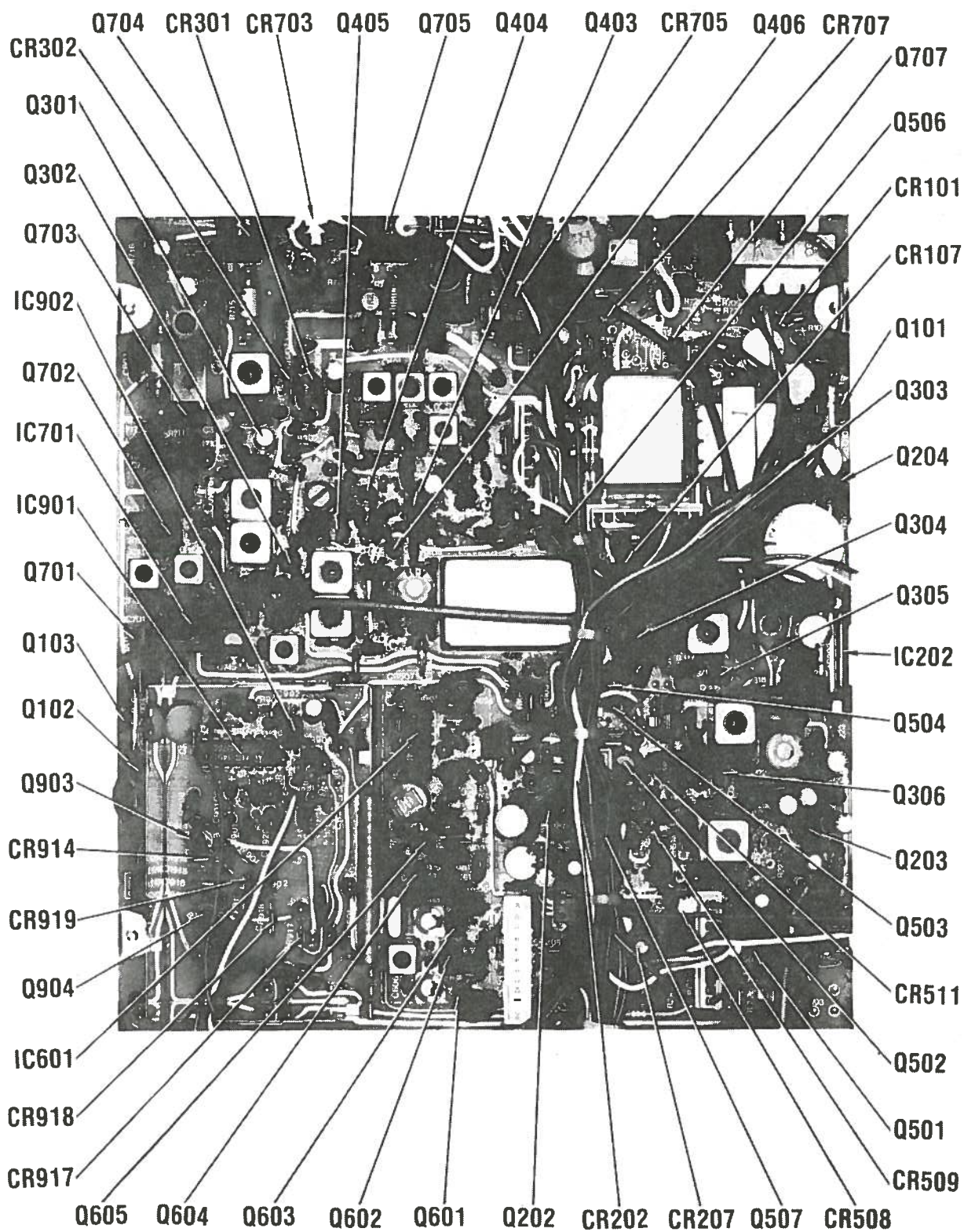
MAIN BOARD



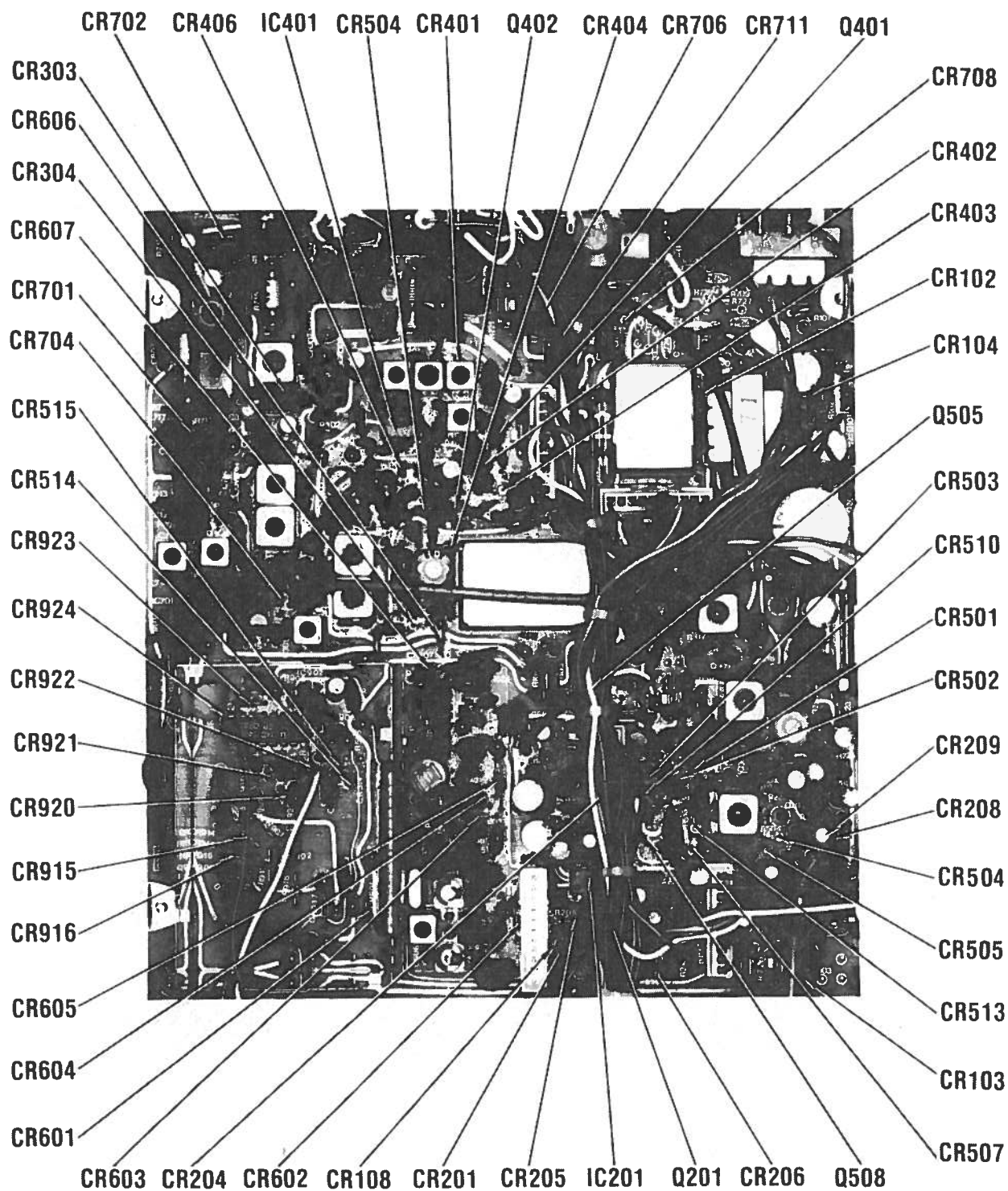
MAIN BOARD



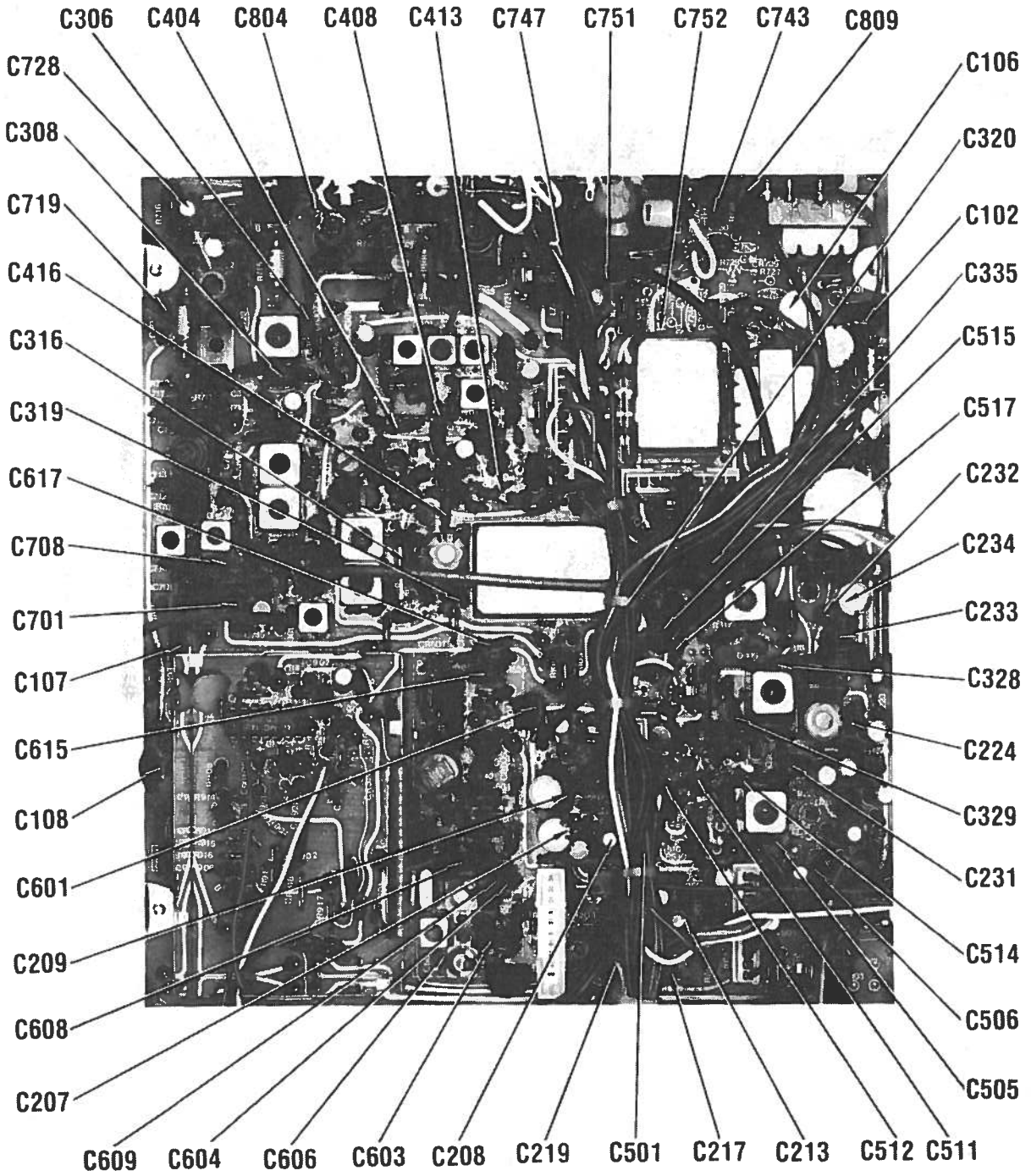
MAIN BOARD



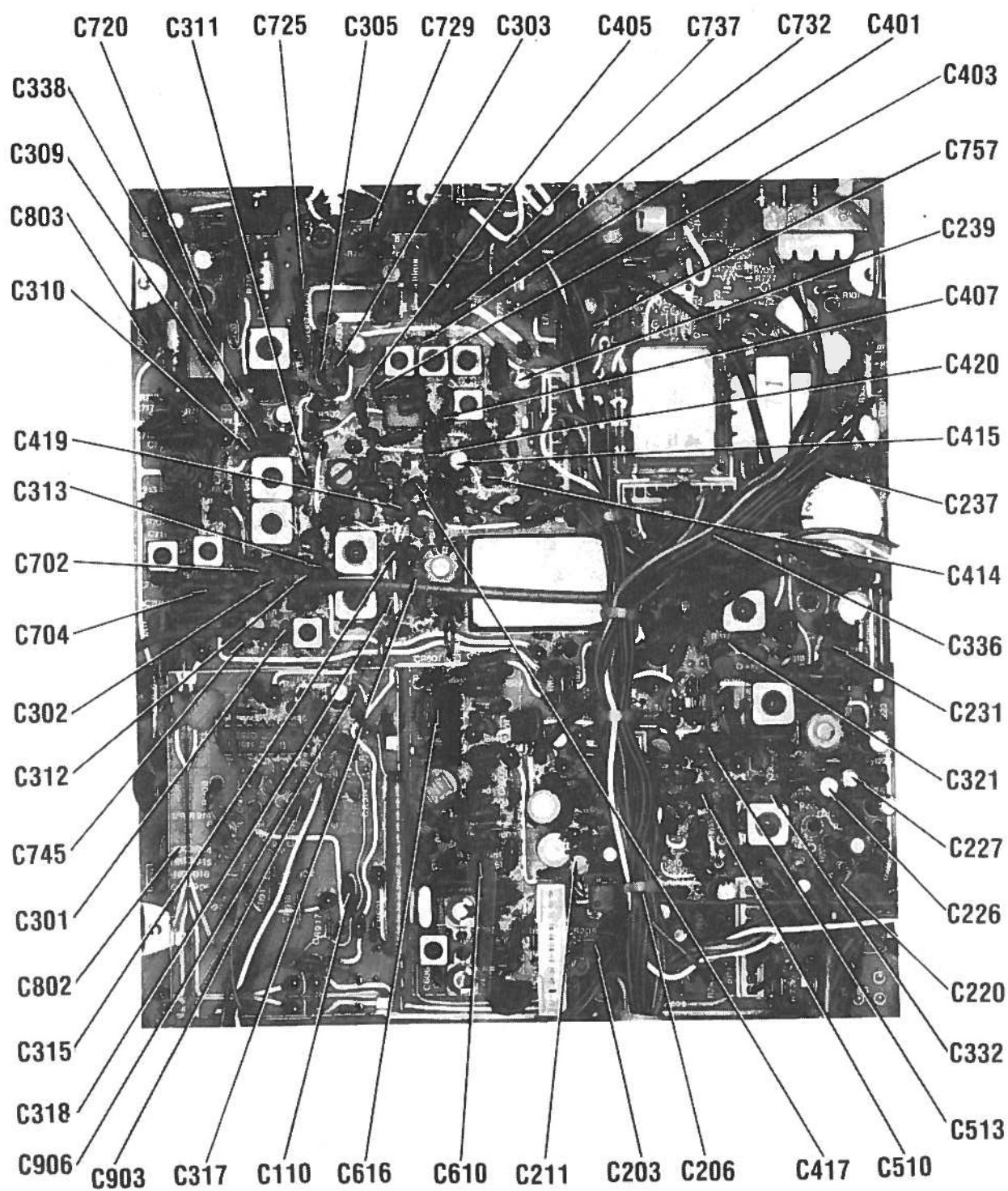
MAIN BOARD



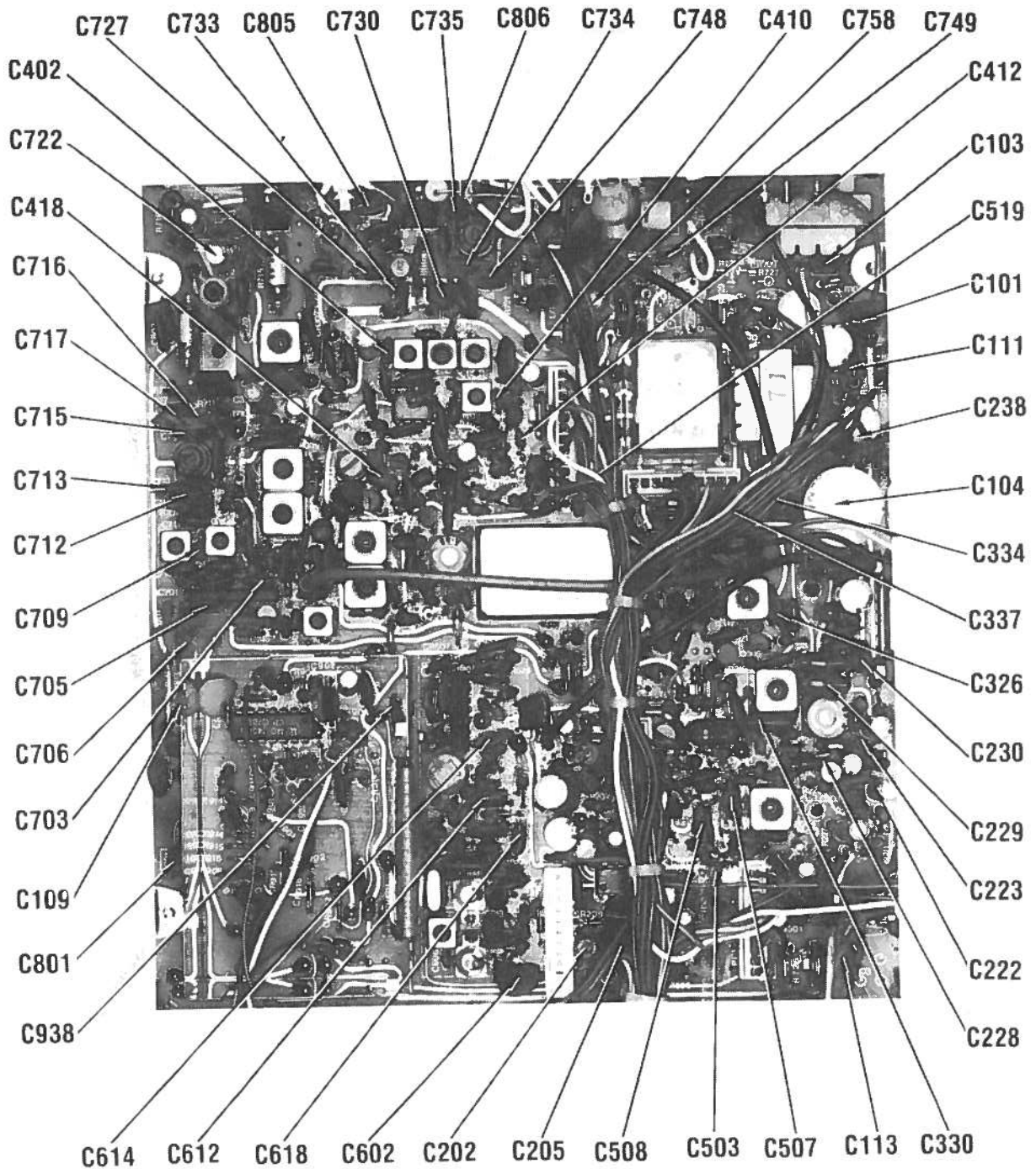
MAIN BOARD



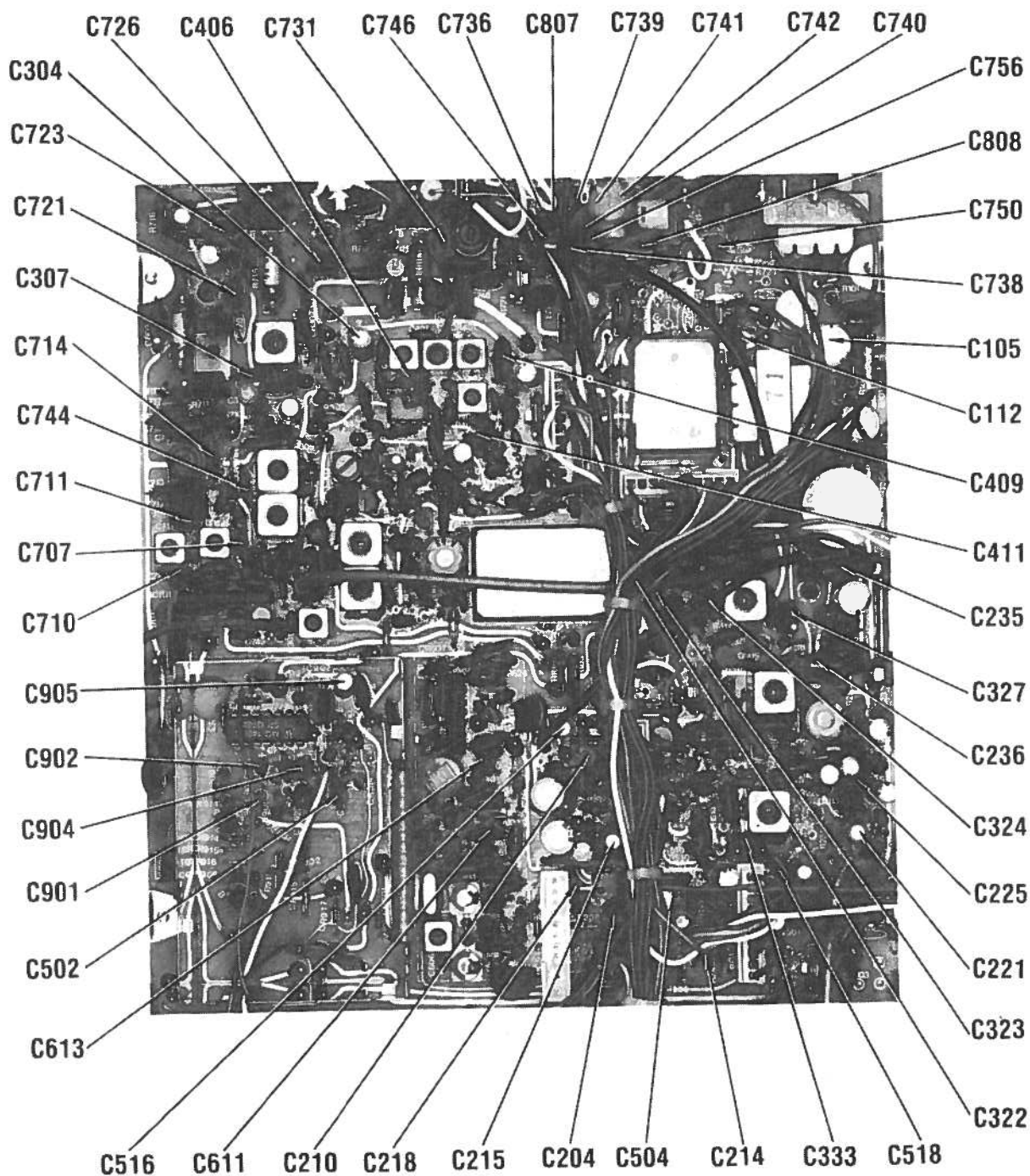
MAIN BOARD



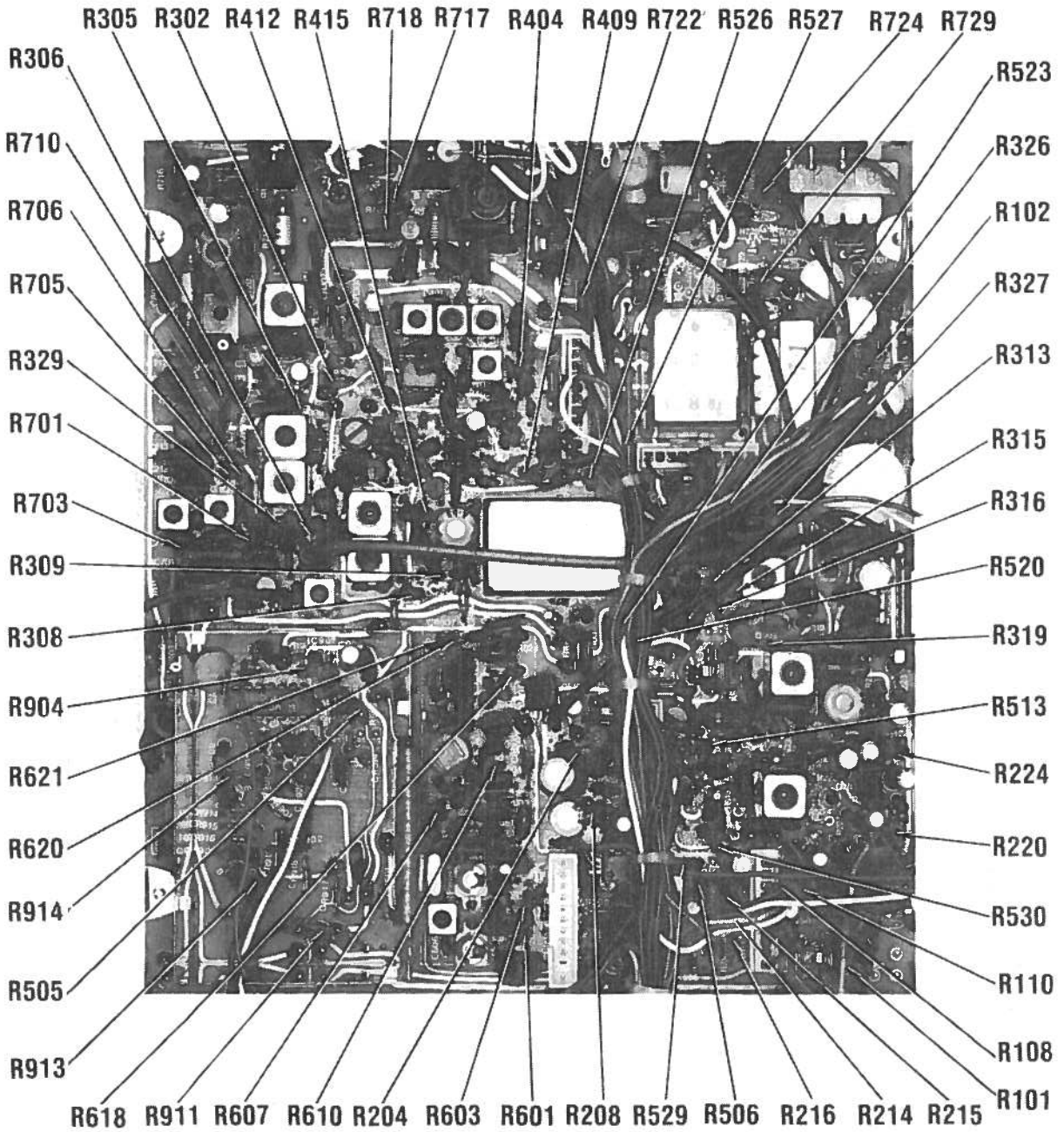
MAIN BOARD



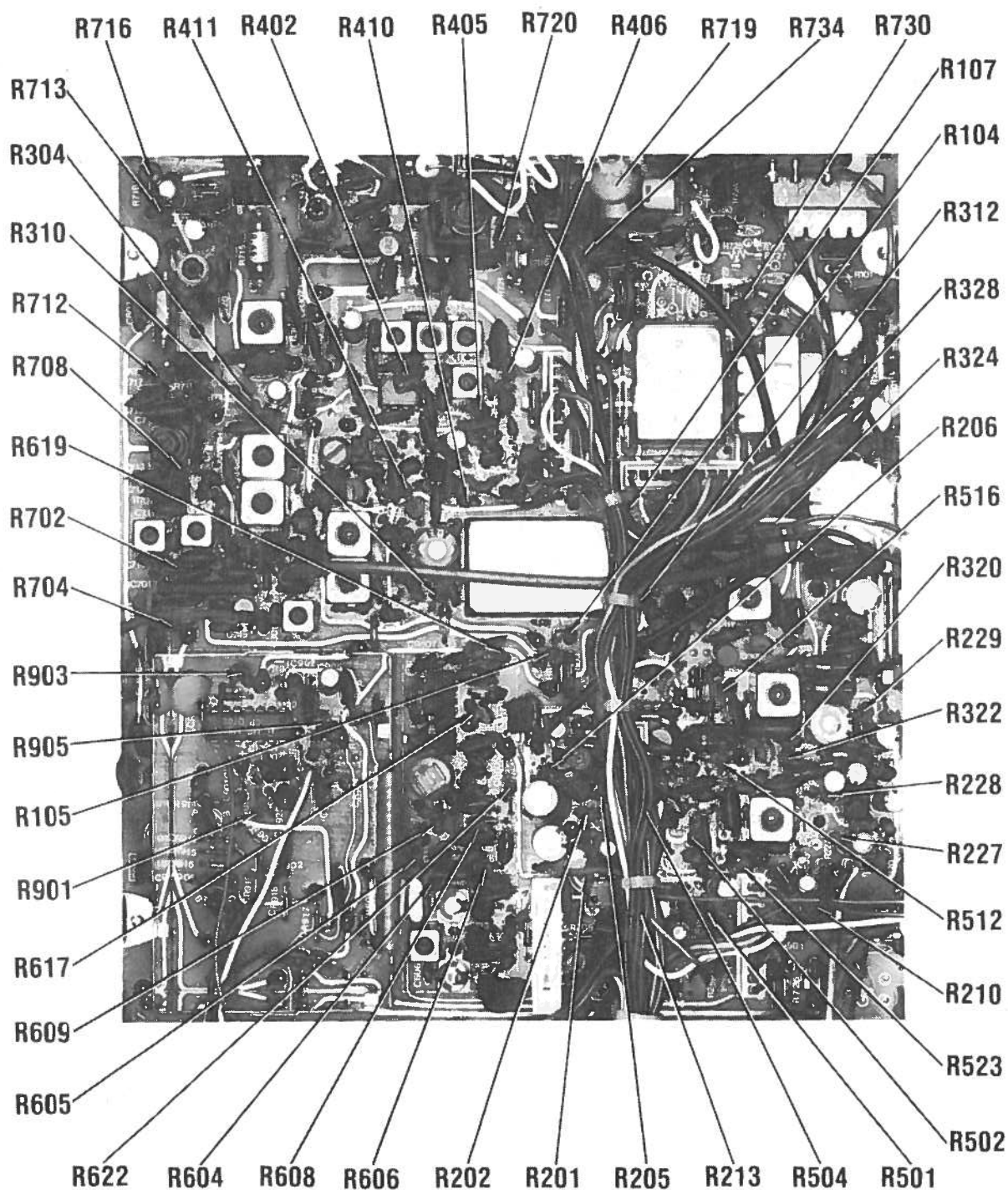
MAIN BOARD



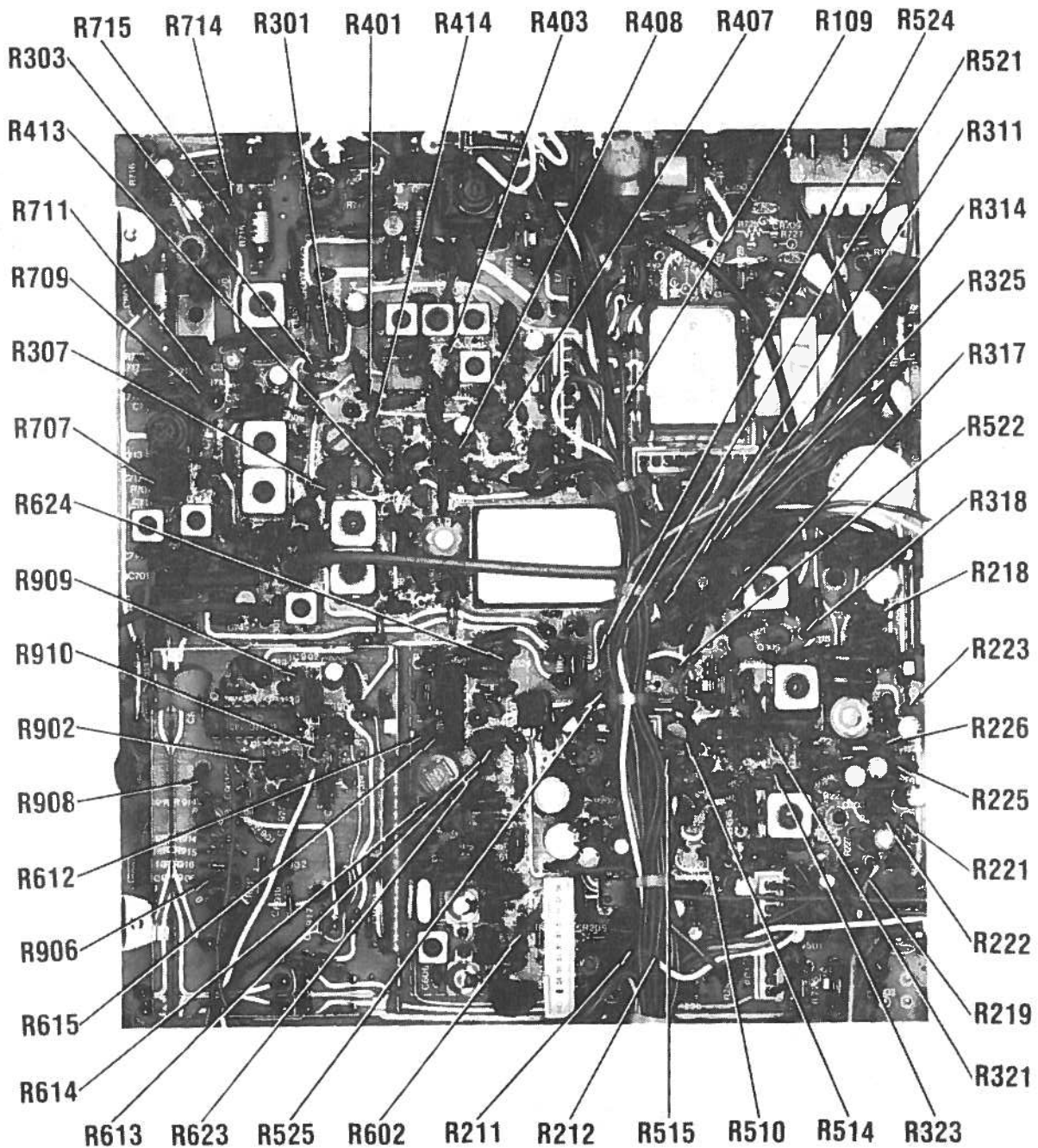
MAIN BOARD



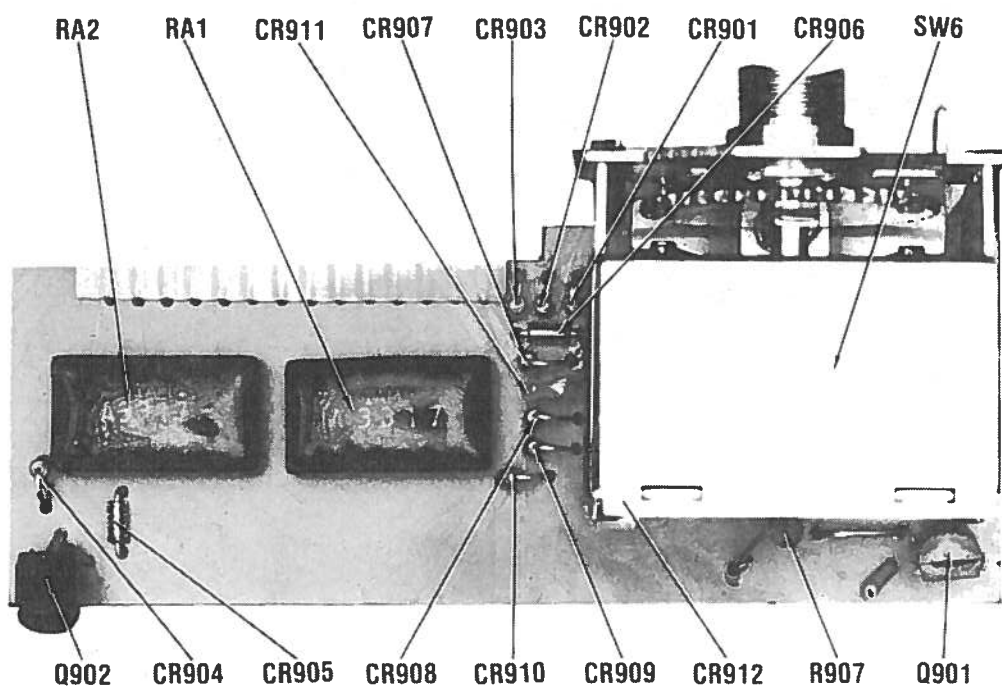
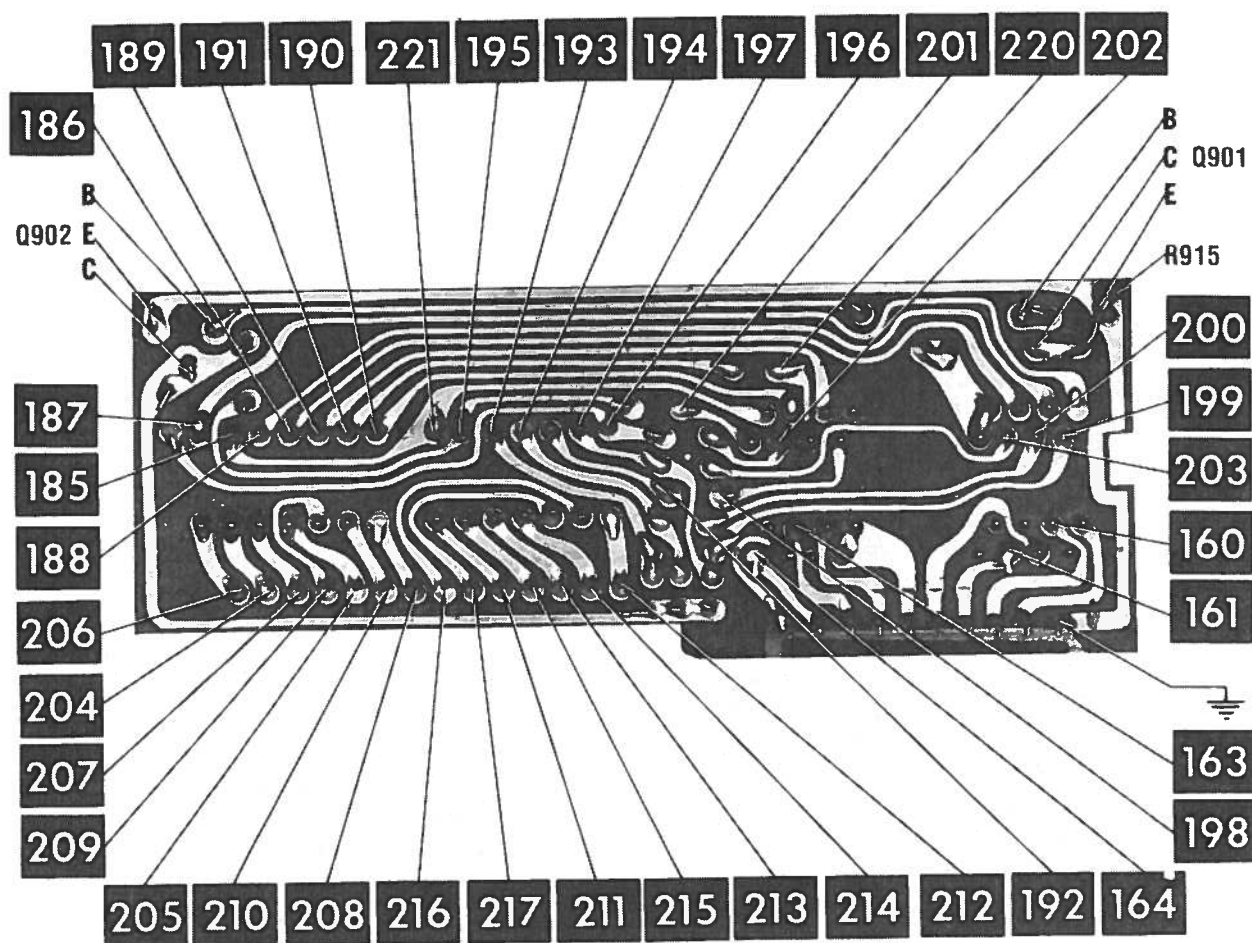
MAIN BOARD



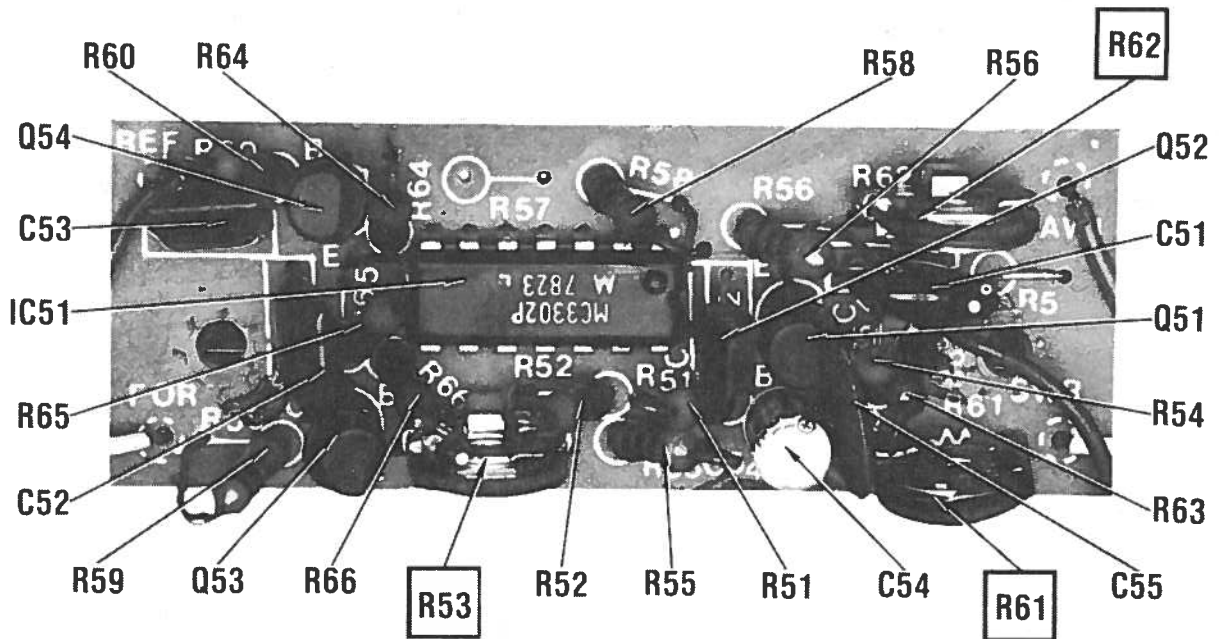
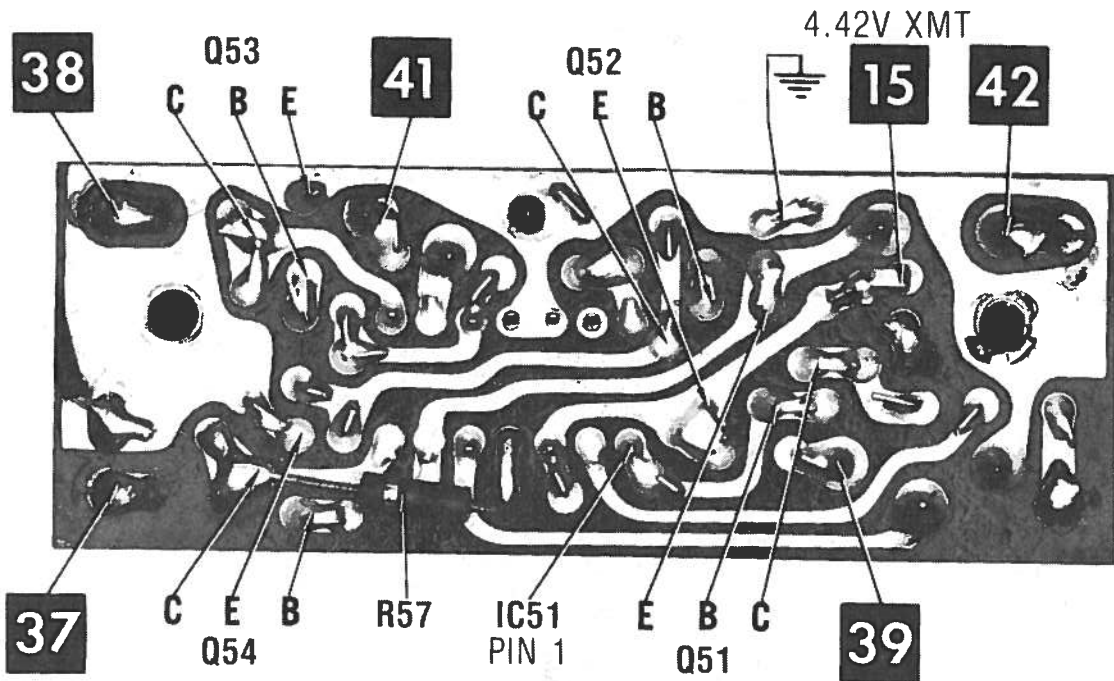
MAIN BOARD



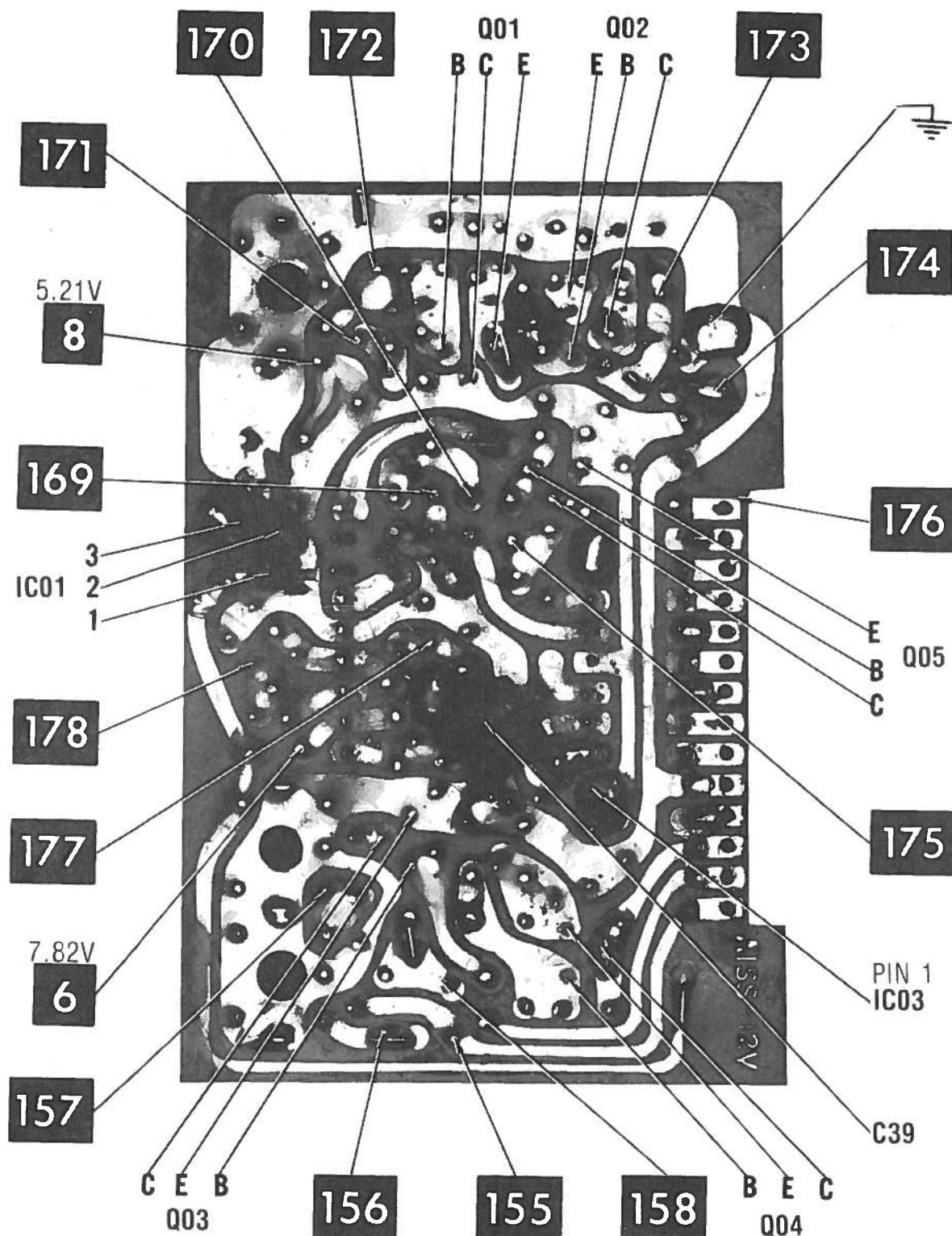
MAIN BOARD

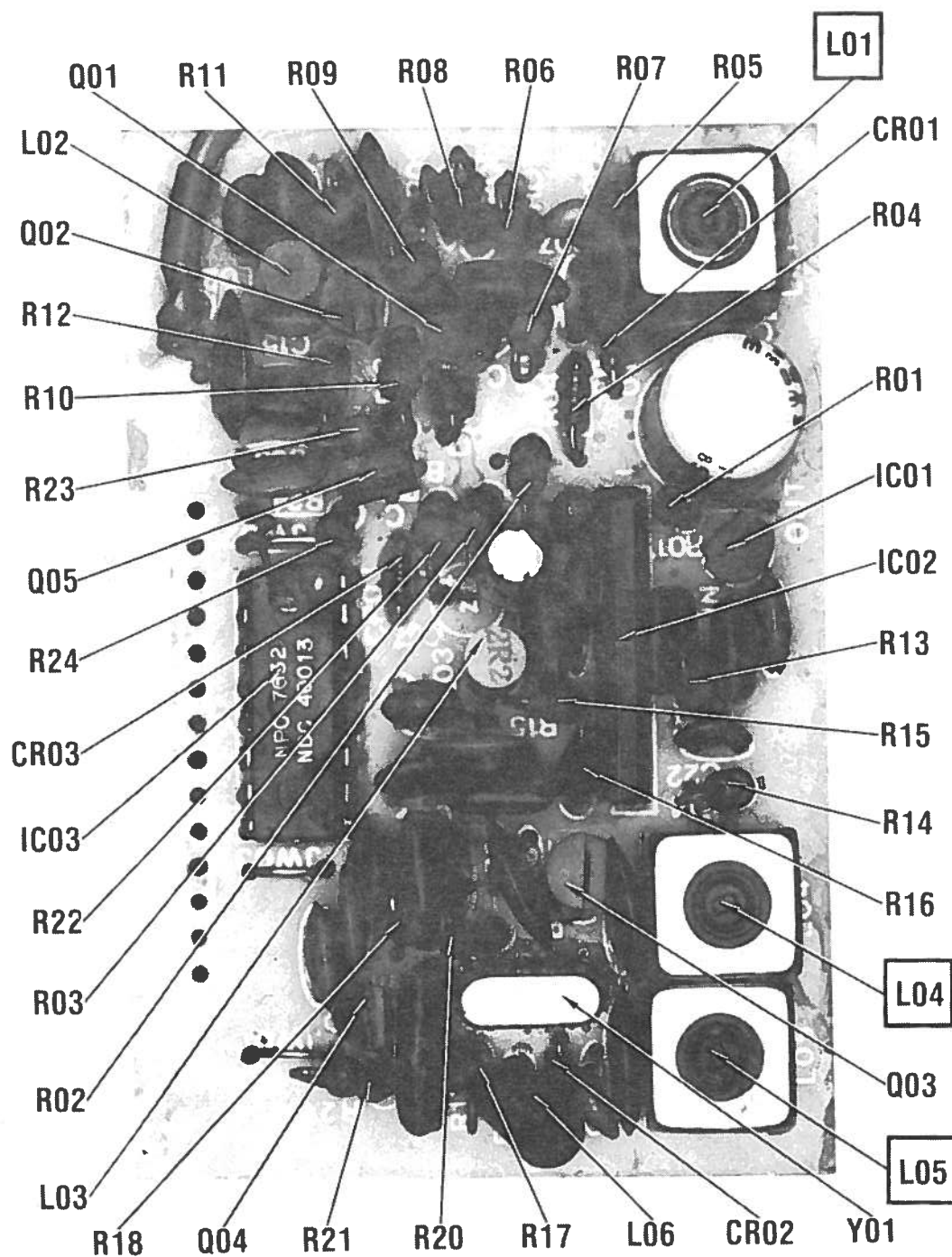


CHANNEL SELECT INDICATOR BOARD

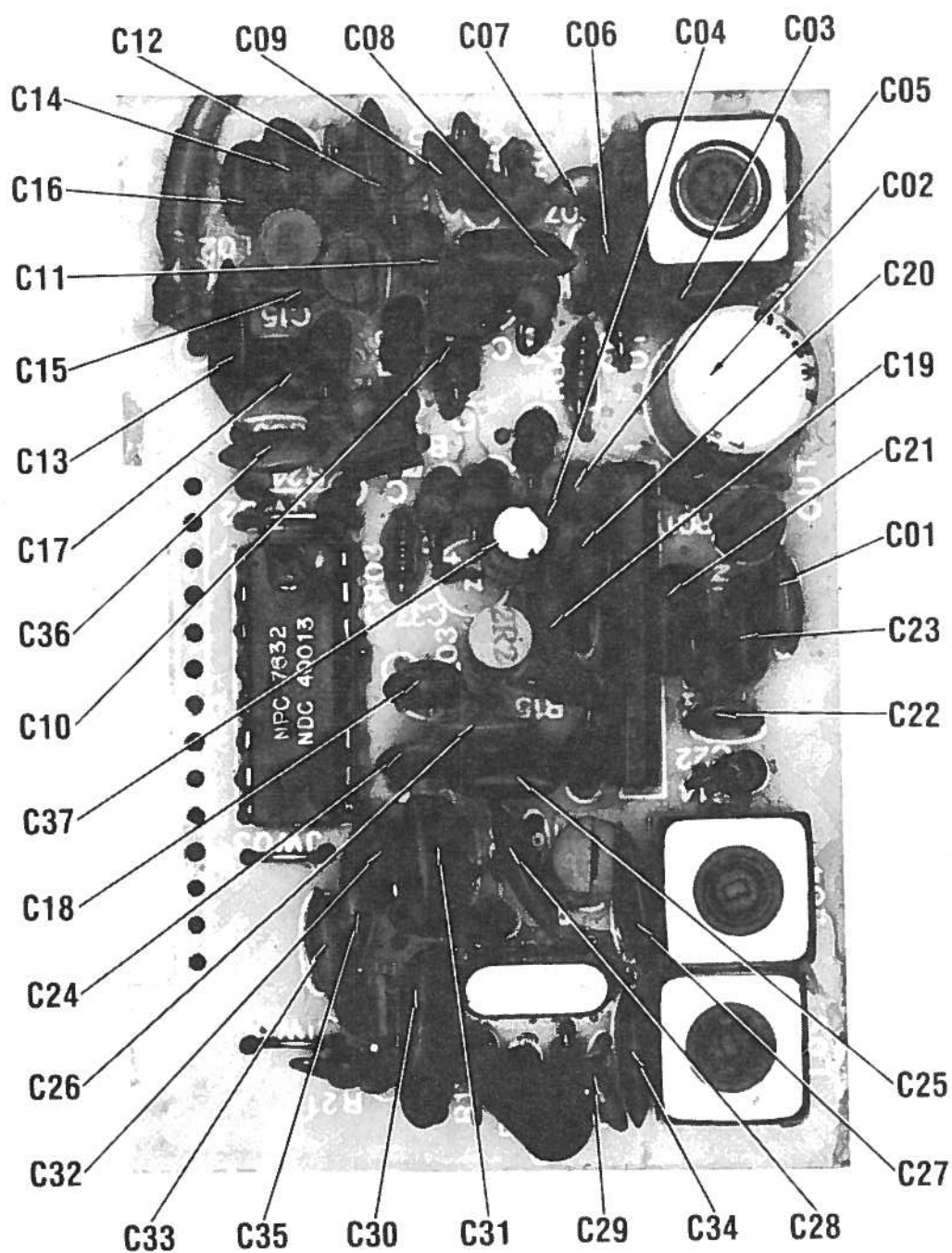


AUTO SWR BOARD

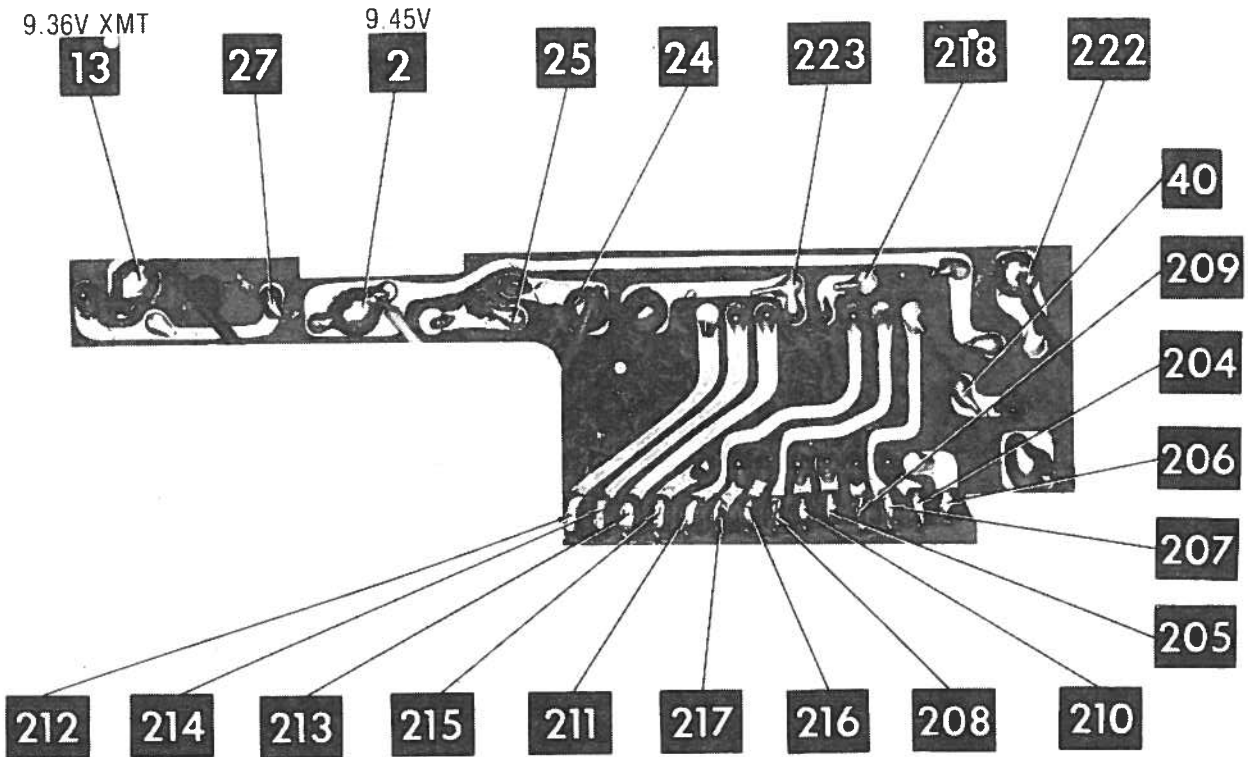




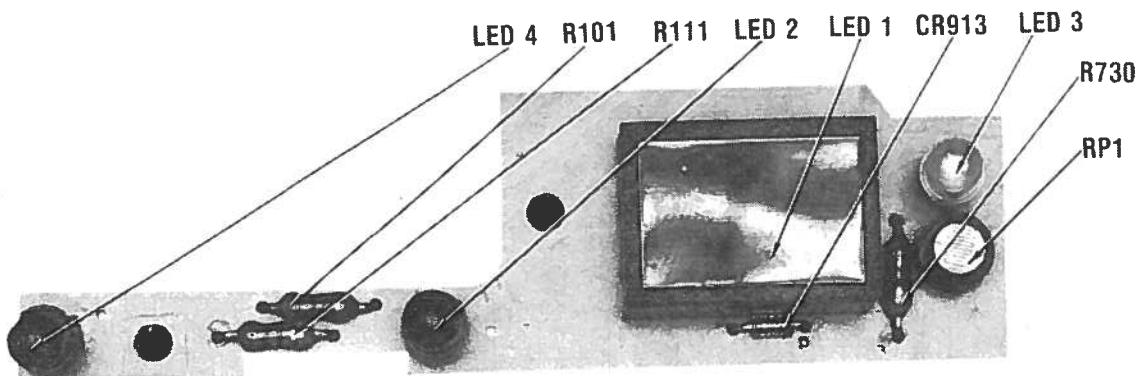
PLL BOARD



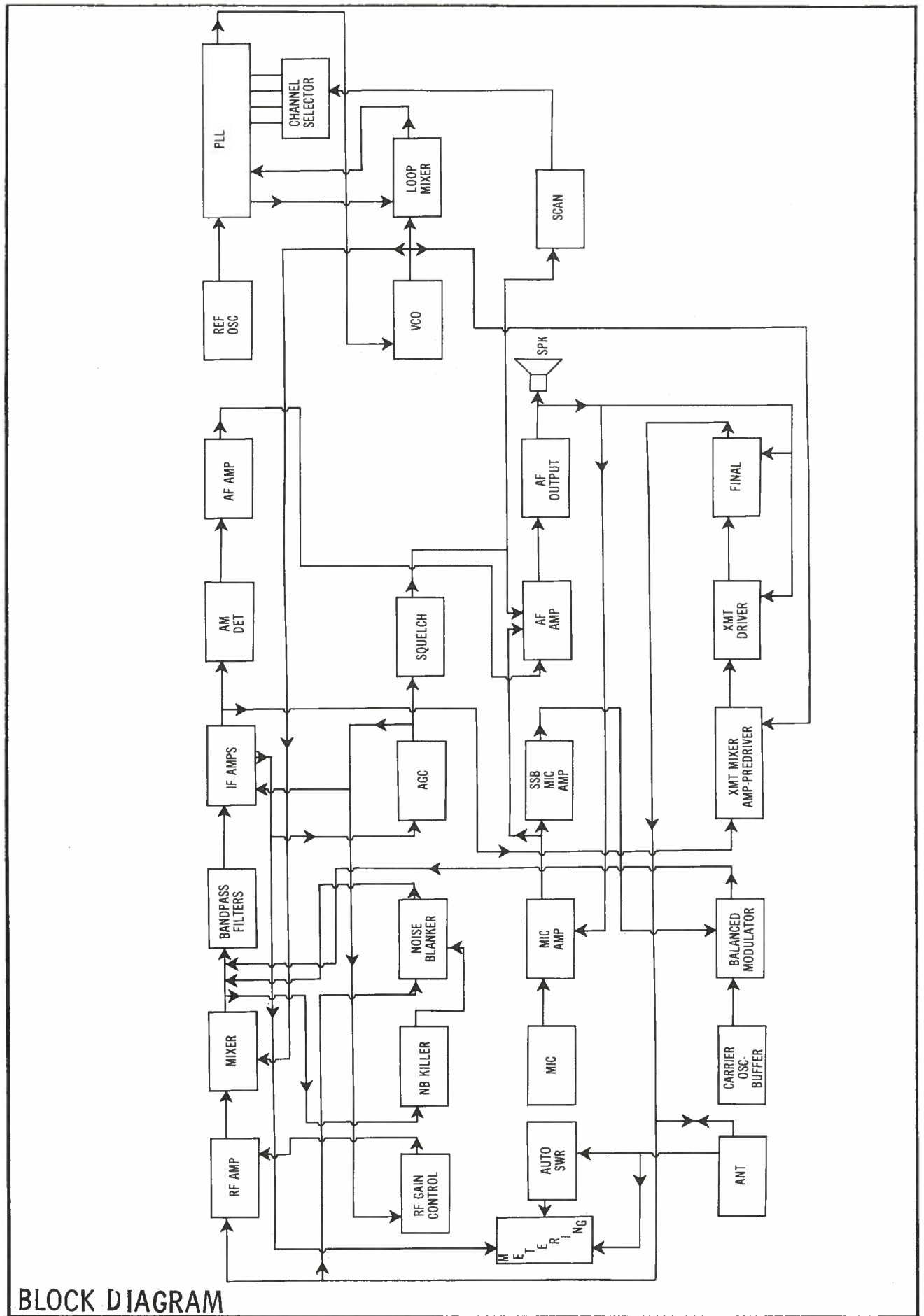
PLL BOARD



NDI MODEL PC-201



LED BOARD



BLOCK DIAGRAM

PARTS LIST AND DESCRIPTION

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

WIRING DATA

Cable (Speaker)(Unshielded).....	Use BELDEN No. 8782 (AWG24)(4 colors)
Shielding Strap.....	Use BELDEN No. 8660 (3/16" width)
Hook-up Wire (General Use).....	Use BELDEN No. 8524 (AWG22)(13 colors)
Hook-up Wire (Shielded).....	Use BELDEN No. 8401 (Braided Shield)(1 conductor)(AWG25)
	Use BELDEN No. 8421 (Spiral Shield)(1 conductor)(AWG25)
	Use BELDEN No. 8737 (Spiral Shield)(2 conductor)(AWG22)
Coax (Transmission Line).....	Use BELDEN No. 8216 (RG-174/U, 50 ohms)
Microphone Cable (Coiled).....	Use BELDEN No. 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.	RAYTHEON PART No.	RCA PART No.	SYLVANIA PART No.	THORDARSON PART No.	WORKMAN PART No.	ZENITH PART No.
CR01	MV201	35-013-0		PTC311	REN 613	SK3126	ECG611	TM611	WEP200/613	103-146
CR02	1S2688	34-029-0			REN 177	SK3100/519	ECG613	TM613	WEP925/519	103-281
CR03	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR101	U05B	35-014-0	GE-512	PTC204	REN 156	SK3051/156	ECG156	TM156	WEP4008/156	212-29000
CR102	1001	35-025-0	GE-504A	PTC201	REN 116	SK3311	ECG116	TM116	WEP156	212-76-02
CR103	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR104	BZ100	35-004-0	GEZD-10	ZB108	REN 140	SK3061/140A	ECG140A	TM140A/**	WEP1110/140A	103-29010
CR107	1N4448	34-036-0	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
CR201	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR202	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR204	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR205	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR206	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR207	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR208	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR209	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR301	M1301	35-011-0	GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062/177	103-131
CR302	M1301	35-011-0	GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062/177	103-131
CR303	1N60	34-028-0	1N60	PTC206	REN 109	SK3088	ECG109	TM109/**	WEP134/109	103-29001
CR304	1N60	34-028-0	1N60	PTC206	REN 109	SK3088	ECG109	TM109/**	WEP134/109	103-29001
CR401	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR402	1N60	34-028-0	1N60	PTC206	REN 109	SK3088	ECG109	TM109/**	WEP134/109	103-29001
CR403	1N60	34-028-0	1N60	PTC206	REN 109	SK3088	ECG109	TM109/**	WEP134/109	103-29001
CR404	1N34	34-001-0	1N34AS	PTC207	REN 109	SK3087	ECG109	TM109/**	WEP134/109	103-29001
CR405	1N34	34-001-0	1N34AS	PTC207	REN 109	SK3087	ECG109	TM109/**	WEP134/109	103-29001
CR406	1N34	34-001-0	1N34AS	PTC207	REN 109	SK3087	ECG109	TM109/**	WEP134/109	103-29001
CR501	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR502	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR503	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR504	1N60	34-028-0	1N60	PTC206	REN 109	SK3088	ECG109	TM109/**	WEP134/109	103-29001
CR505	1N60	34-028-0	1N60	PTC206	REN 109	SK3088	ECG109	TM109/**	WEP134/109	103-29001
CR507	1N60	34-028-0	1N60	PTC206	REN 109	SK3088	ECG109	TM109/**	WEP134/109	103-29001
CR508	1N34A	34-001-0	1N34AS	PTC207	REN 109	SK3087	ECG109	TM109/**	WEP134/109	103-29001
CR509	1N60	34-028-0	1N60	PTC206	REN 109	SK3088	ECG109	TM109/**	WEP134/109	103-29001
CR510	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR511	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR513	1N60	34-028-0	1N60	PTC206	REN 109	SK3088	ECG109	TM109/**	WEP134/109	103-29001
CR514	1N34A	34-001-0	1N34AS	PTC207	REN 109	SK3087	ECG109	TM109/**	WEP134/109	103-29001
CR515	1N34A	34-001-0	1N34AS	PTC207	REN 109	SK3087	ECG109	TM109/**	WEP134/109	103-29001
CR601	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
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	1N60	34-028-0	1N60	PTC206	REN 109	SK3088	ECG109	TM109/**	WEP134/109	103-29001
CR607	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR701	1S990A	34-033-0	GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062/177	103-131
CR702	1S990A	34-033-0	GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062/177	103-131
CR703	1S990A	34-033-0	GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062/177	103-131
CR704	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR705	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR706	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR707	1N60	34-028-0	1N60	PTC206	REN 109	SK3088	ECG109	TM109/**	WEP134/109	103-29001
CR708	1N60	34-028-0	1N60	PTC206	REN 109	SK3088	ECG109	TM109/**	WEP134/109	103-29001
CR711	1N60	34-028-0	1N60	PTC206	REN 109	SK3088	ECG109	TM109/**	WEP134/109	103-29001
CR901	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR902	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR903	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR904	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR905	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR906	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR907	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR908	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR909	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR910	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR911	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR912	1N4448	34-036-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR913	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR914	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131

PARTS LIST AND DESCRIPTION (CONTINUED)

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

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

ITEM No.	TYPE No.	MFR. PART No.	REPLACEMENT DATA							
			GENERAL ELECTRIC PART No.	MALLORY PART No.	RAYTHEON PART No.	RCA PART No.	SYLVANIA PART No.	THORDARSON PART No.	WORKMAN PART No.	ZENITH PART No.
CR915	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR916	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR917	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR918	1N4448	34-036-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR919	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR920	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR921	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR922	1N4448	34-036-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR923	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
CR924	1N4448	34-032-0	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925/519	103-131
IC01	F7BL62HV 78L62HV	39-033-2					ECG988	TM988		
IC02	TA7310P	39-061-0			REN 1192	SK3445/1192	ECG1192	TM1192	WEP2120/1192	221-Z9061
IC03	NDC40013	40-013-0								
IC51	MC3302P MC3302	39-077-0								
IC201	MC3340PA	39-047-1					ECG829			
IC202	HA1366NR	39-060-1					ECG1261	TM1261	WEP2024/746	221-Z9071
IC401	MC1350P	40-031-0	GE1C-217			SK3234/746	ECG746	TM746		221-Z9028
IC601	UPC1037H	39-062-0								
IC701	TA7310P	39-061-0			REN 1192	SK3445/1192	ECG1192	TM1192	WEP2120/1192	221-Z9061
IC901	MC14011B	40-035-0	GE-4011			SK4011	ECG4011B	TM4011B		221-Z9133
IC902	M51202 M51202L 51206L	39-076-0								
Q01	2SC710C	31-025-0	GE-211*	PTC132*	REN 123AP*	SK3356	ECG107*	TM107*/**	WEP710	121-Z9000A*
Q02	2SC710C	31-025-0	GE-211*	PTC132*	REN 123AP*	SK3356	ECG107*	TM107*/**	WEP710	121-Z9000A*
Q03	2SC711F	31-027-0	GE-61*	PTC121	REN 199*	SK3245/199	ECG199*	TM199*/**	WEP372*	121-972*
Q04	2SC710C	31-025-0	GE-211*	PTC132*	REN 123AP*	SK3356	ECG107*	TM107*/**	WEP710	121-Z9000A*
Q05	2SA844C	30-007-0	GE-244*	PTC103*	REN 129*	SK3114/290	ECG294	TM294	WEP564	121-Z9005
Q51	2SC372Y	31-002-0	GE-61*	PTC121*	REN 123A*	SK3245/199	ECG123AP*	TM123AP*/**	WEP372	121-Z9000A*
Q52	2SA844C	30-007-0	GE-244*	PTC103*	REN 129*	SK3114/290	ECG294	TM294	WEP564	121-Z9005
Q53	2SC372Y	31-002-0	GE-61*	PTC121*	REN 123A*	SK3245/199	ECG123AP*	TM123AP*/**	WEP372	121-Z9000A*
Q54	2SC372Y	31-002-0	GE-61*	PTC121*	REN 123A*	SK3245/199	ECG123AP*	TM123AP*/**	WEP372	121-Z9000A*
Q101	2SC1014D	31-058-0	GE-273	PTC193	REN 300	SK3464/300	ECG300	TM300	WEP1014	121-Z9092
Q102	2SC372Y	31-002-0	GE-61*	PTC121*	REN 123A*	SK3245/199	ECG123AP*	TM123AP*/**	WEP372	121-Z9000A*
Q103	2SC1014D	31-058-0	GE-273	PTC193	REN 300	SK3464/300	ECG300	TM300	WEP1014	121-Z9092
Q201	2SK30Y	33-005-0	GE-FET-1	PTC151*	REN 132*	SK3112	ECG132*	TM132*	WEP801/133*	121-756*
Q202	2SC372Y	31-002-0	GE-61*	PTC121*	REN 123A*	SK3245/199	ECG123AP*	TM123AP*/**	WEP372	121-Z9000A*
Q203	2SC372Y	31-002-0	GE-61*	PTC121*	REN 123A*	SK3245/199	ECG123AP*	TM123AP*/**	WEP372	121-Z9000A*
Q204	2SC1061D	31-061-0	GE-66	PTC167	REN 152	SK3054/196	ECG152	TM152/**	WEP745/152	121-987-03
	2SC1061		GE-66	PTC167	REN 152	SK3054/196	ECG152	TM152/**	WEP745/152	121-987-03
Q301	3SK59GR	33-032-0	GE-FET-4	PTC182*	REN 222	SK3050/221	ECG222	TM222	WEP905/222	121-826
	3SK41L		GE-FET-4	PTC182*	REN 222	SK3065/222	ECG222	TM222	WEP905/222	121-826
Q302	2SK196GR	33-001-0	GE-FET-2	PTC161	REN 132*	SK3834/132	ECG312*	TM312*	WEP920/312*	921-1067*
Q303	2SC710C	31-025-0	GE-211*	PTC132*	REN 123AP*	SK3356	ECG107*	TM107*/**	WEP710	121-Z9000A*
Q304	2SC710C	31-025-0	GE-211*	PTC132*	REN 123AP*	SK3356	ECG107*	TM107*/**	WEP710	121-Z9000A*
Q305	2SC710C	31-025-0	GE-211*	PTC132*	REN 123AP*	SK3356	ECG107*	TM107*/**	WEP710	121-Z9000A*
Q306	2SC710C	31-025-0	GE-211*	PTC132*	REN 123AP*	SK3356	ECG107*	TM107*/**	WEP710	121-Z9000A*
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	2SC710C	31-025-0	GE-211*	PTC132*	REN 123AP*	SK3356	ECG107*	TM107*/**	WEP710	121-Z9000A*
Q405	2SK41F	33-022-0	GE-FET-4	PTC182*	REN 222	SK3065/222	ECG222	TM222	WEP905/222	121-826
Q406	2SC710C	31-025-0	GE-211*	PTC132*	REN 123AP*	SK3356	ECG107*	TM107*/**	WEP710	121-Z9000A*
Q501	2SC372Y	31-002-0	GE-61*	PTC121*	REN 123A*	SK3245/199	ECG123AP*	TM123AP*/**	WEP372	121-Z9000A*
Q502	2SK34E	33-007-0	GE-FET-2*	PTC161*	REN 132*	SK3448	ECG312*	TM312*	WEP920/312*	921-1067*
Q503	2SC710C	31-025-0	GE-211*	PTC132*	REN 123AP*	SK3356	ECG107*	TM107*/**	WEP710	121-Z9000A*
Q504	2SC710C	31-025-0	GE-211*	PTC132*	REN 123AP*	SK3356	ECG107*	TM107*/**	WEP710	121-Z9000A*
Q505	2SC710C	31-025-0	GE-211*	PTC132*	REN 123AP*	SK3356	ECG107*	TM107*/**	WEP710	121-Z9000A*
Q506	2SC710C	31-025-0	GE-211*	PTC132*	REN 123AP*	SK3356	ECG107*	TM107*/**	WEP710	121-Z9000A*
Q507	2SC710C	31-025-0	GE-211*	PTC132*	REN 123AP*	SK3356	ECG107*	TM107*/**	WEP710	121-Z9000A*
	2SC710		GE-211*	PTC132*	REN 123AP*	SK3356	ECG107*	TM107*/**	WEP710	121-Z9000A*
Q508	2SA844C	30-007-0	GE-244*	PTC103*	REN 129*	SK3114/290	ECG294	TM294	WEP564	121-Z9005
Q601	JA1350	32-016-0	GE-62*	PTC136*	REN 199*	SK3444/123A	ECG199*	TM199*	WEP66/199*	121-972*
Q602	JA1350	32-016-0	GE-62*	PTC136*	REN 199*	SK3444/123A	ECG199*	TM199*	WEP66/199*	121-972*
Q603	JA1350	32-016-0	GE-62*	PTC136*	REN 199*	SK3444/123A	ECG199*	TM199*	WEP66/199*	121-972*
Q604	2SC710C	31-025-0	GE-211*	PTC132*	REN 123AP*	SK3356	ECG107*	TM107*/**	WEP710	121-Z9000A*
Q605	2SC710C	31-025-0	GE-211*	PTC132*	REN 123AP*	SK3356	ECG107*	TM107*/**	WEP710	121-Z9000A*
Q701	2SC711F	31-027-0	GE-62*	PTC121	REN 199*	SK3245/199	ECG199*	TM199*/**	WEP372*	121-972*
Q702	JSP7001B	32-005-0	GE-20*	PTC136*	REN 123A*	SK3246/229	ECG123AP*	TM123AP*	WEP736/123A*	121-Z9000A*
Q703	2SC1449L		GE-270	PTC180	REN 295	SK3253/295	ECG295	TM295	WEP701	121-880
	2SC1449		GE-270	PTC180	REN 295	SK3253/295	ECG295	TM295	WEP701	121-880
Q704	2SC1306	31-073-0	GE-215	PTC186	REN 235	SK3239/235	ECG235	TM235/**	WEP785/235	121-Z9039
	2SC2092	31-069-0	GE-337	PTC186	REN 235	SK3197/235	ECG235	TM235	WEP785/235	121-Z9039
Q705	2SC1969AH		GE-216	PTC186	REN 236	SK3239/236	ECG236	TM236	WEP840/236	121-Z9040
	2SC1969BH	31-091-3	GE-216	PTC186	REN 236	SK3239/236	ECG236	TM236	WEP840/236	121-Z9040
	2SC1969H		GE-216	PTC186	REN 236	SK3239/236	ECG236	TM236	WEP840/236	121-Z9040
Q707	2SA844C	30-007-0	GE-244*	PTC103*	REN 129*	SK3114/290	ECG294	TM294	WEP564	121-Z9005
Q901	2SD355		GE-271	PTC143*	REN 297	SK3849/293	ECG297	TM297	WEP914/297	921-340
	2SD355C	30-030-0	GE-271	PTC143*	REN 297	SK3849/293	ECG297	TM297	WEP914/297	921-340
Q902	2SD355		GE-271	PTC143*	REN 297	SK3849/293	ECG297	TM297	WEP914/297	921-340
	2SD355C	30-030-0	GE-271	PTC143*	REN 297	SK3849/293	ECG297	TM297	WEP914/297	921-340
Q903	2SA844C	30-007-0	GE-244*	PTC103*	REN 129*	SK3114/290	ECG294	TM294	WEP564	121-Z9005
Q904	2SC710C	31-025-0	GE-211*	PTC132*	REN 123AP*	SK3356	ECG107*	TM107*/**	WEP710	121-Z9000A*
	2SC710		GE-211*	PTC132*	REN 123AP*	SK3356	ECG107*	TM107*/**	WEP710	121-Z9000A*

* 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
C2	220 16V	614-010-0	PC250-25	VTT220H16	QW1-117	EV-1240
C4	1 35V	14-055-0		TDC105M035EL	QDT1-25	SD35-19
C5	33 35V	14-053-0		TDC336M035GL		SD35-339
C37	.1 25V	614-039-0		TDC104M050EL	QDT1-2	SD50-R109
C54	10 50V	614-006-0	PC10-50	VTT10B63	QV1-45	EV-1622
C104	2200 25V	614-013-0	WBR2000-25*	TC2520A*	QE1-645	TVA-1213.5*
C105	220 50V	614-010-0	WBR250-50*	VTT220M50	QV1-123	EV-1540
C106	220 50V	614-010-0	WBR250-50*	VTT220M50	QV1-123	EV-1540
C202	1 50V	614-022-0	PC1-50	VTT1A50	QV1-11	EV-1615
C207	47 50V	614-008-0	PC50-50	VTT47J63	QV1-79	EV-1626
C208	3.3 50V	614-028-0	NLM4-50	VTT3R3A50	QV1-25	EV-1618.1
C209	100 16V	614-009-0	PC100-16	VTT100E16	QV1-95	EV-1231
C210	1 50V	614-022-0	PC1-50	VTT1A50	QV1-11	EV-1615
C211	.22 50V	614-005-0	PC30-50	VTT22G63	QV1-59	EV-1524
C212	.33 50V	614-034-0		TDC334M050EL	QDT1-14	SD50-R339
C213	1 50V	614-022-0	PC1-50	VTT1A50	QV1-11	EV-1615
C216	1 50V	614-022-0	PC1-50	VTT1A50	QV1-11	EV-1615
C219	10 25V	14-081-0		TDC106M025FL	QDT1-64	SD25-109
C221	1 50V	614-022-0	PC1-50	VTT1A50	QV1-11	EV-1615
C222	1 50V	614-022-0	PC1-50	VTT1A50	QV1-11	EV-1615
C223	10 50V	614-006-0	PC10-50	VTT10B63	QV1-45	EV-1622
C226	10 50V	614-006-0	PC10-50	VTT10B63	QV1-45	EV-1622
C227	1 50V	614-022-0	PC1-50	VTT1A50	QV1-11	EV-1615
C232	22 35V	14-070-0		TDC226M035GL	QDT1-83	SD35-229
C234	47 50V	614-008-0	PC50-50	VTT47J63	QV1-79	EV-1626
C238	220 50V	614-010-0	WBR250-50*	VTT220M50	QV1-123	EV-1540
C239	4.7 50V	614-015-0	PC5-50	VTT4R7B50	QV1-31	EV-1619.1
C304	1 50V	614-022-0	PC1-50	VTT1A50	QV1-11	EV-1615
C338	1 50V	614-022-0	PC1-50	VTT1A50	QV1-11	EV-1615
C415	4.7 50V	614-015-0	PC5-50	VTT4R7B50	QV1-31	EV-1619.1
C503	.22 50V	614-005-0	PC30-50	VTT22G63	QV1-59	EV-1524
C504	4.7 50V	614-015-0	PC5-50	VTT4R7B50	QV1-31	EV-1619.1
C506	1 50V	614-022-0	PC1-50	VTT1A50	QV1-11	EV-1615
C512	1 50V	614-022-0	PC1-50	VTT1A50	QV1-11	EV-1615
C515	1 50V	614-022-0	PC1-50	VTT1A50	QV1-11	EV-1615
C516	1 50V	614-022-0	PC1-50	VTT1A50	QV1-11	EV-1615
C722	10 16V	614-006-0	PC10-25	VTT10B25	QV1-41	EV-1222
C728	10 16V	614-006-0	PC10-25	VTT10B25	QV1-41	EV-1222
C758	1 50V	614-022-0	PC1-50	VTT1A50	QV1-11	EV-1615
C901	2.2 35V	14-052-0		TDC225M035FL	QDT1-37	SD35-2R29
C902	2.2 35V	14-052-0		TDC225M035FL	QDT1-37	SD35-2R29
C903	22 16V	14-070-0		TDC226M035GL	QDT1-83	SD35-229
C904	22 16V	14-070-0		TDC226M035GL	QDT1-83	SD35-229
C905	10 16V	614-006-0	PC10-25	VTT10B25	QV1-41	EV-1222

* Axial replacement for radial device.

CAPACITORS

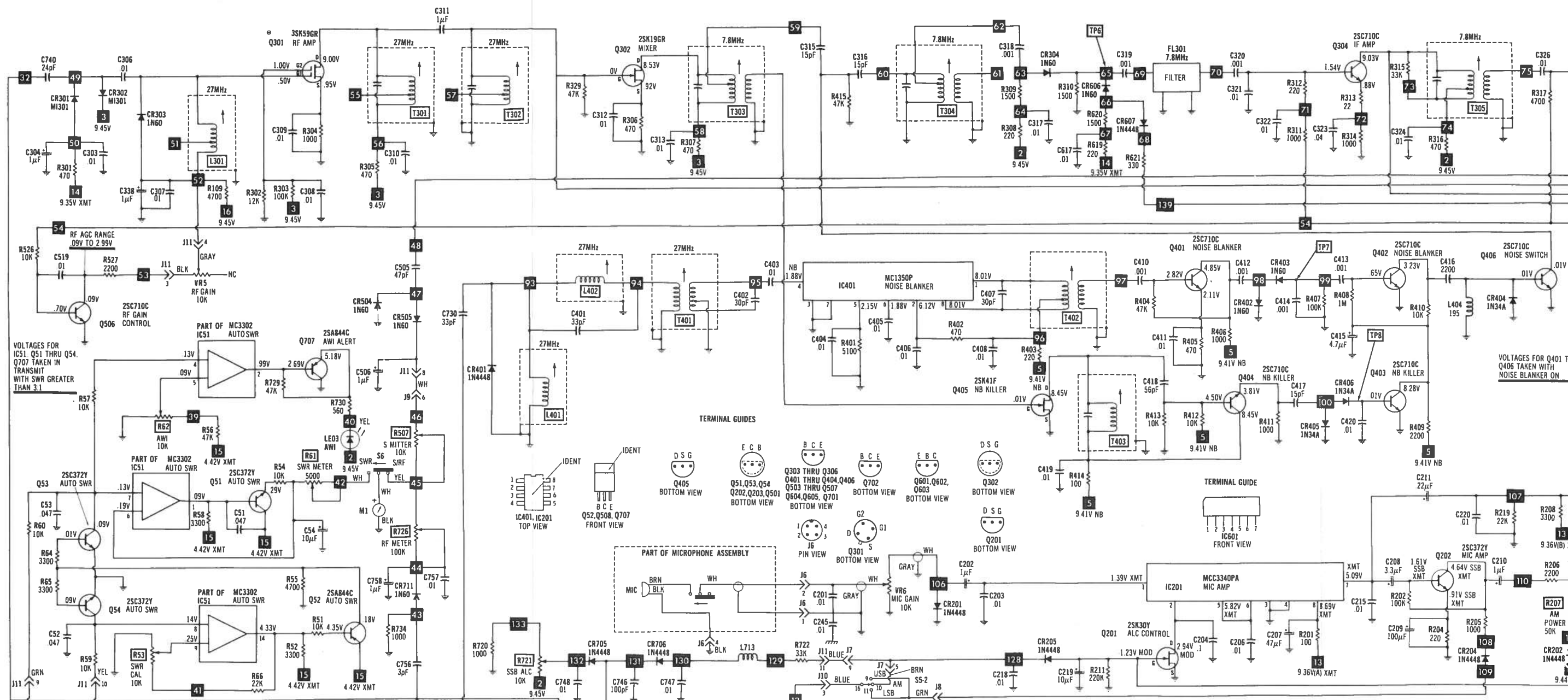
ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA			
			CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
					Q-LINE	GENERAL LINE
C1	.047 50V		DPMS2S47	EWFI1A147	QF1-171	1PB-S47
C3	.01 50V			MAG5011		
C6	82 50V		NP082	CN0482		10TCC-Q82
C7	37 50V			CN0439		10TCC-Q39
C8	100 50V		CD15FD101J03	SX310	QW1-27	MWA-101
C9	47 50V		NP047	CN0447	QCC2-26	10TCC-Q47
C10	1 50V			CN0510		10TCC-V10
C11	5 50V		CD15CD050D03		QW1-2	MWA-050
C12	.01 50V			MAG5011		
C13	.01 50V			MAG5011		
C14	20 50V			CN0420		
C15	4 50V		NP020		QCC2-19	10TCC-Q20
C16	15 50V		CD15CD050D03		QW1-2	MWA-050
C17	15 50V		CD15CD150J03		QW1-8	MWA-150
C18	1 50V		CD15CD150J03		QW1-8	MWA-150
C19	27 50V		CD15CD010D03		QW1-1	MWA-010
C20	5 50V		CD15ED270J03	SX427	QW1-13	MWA-270
C21	100 50V		CD15CD050D03		QW1-2	MWA-050
C22	.001 50V		CD15FD101J03	SX310	QW1-27	MWA-101
C23	100 50V			GP210	QCT2-41	10TS-D10
C24	.001 50V		CD15FD101J03	SX310	QW1-27	MWA-101
C25	56 50V			GP210	QCT2-41	10TS-D10
C26	.047 50V		DPMS2S47	CN0456		10TCC-Q56
C27	.01 50V			EWFI1A147	QF1-171	1PB-S47
C28	.01 50V			MAG5011		
C29	22 50V			MAG5011		
C30	330 50V		CD15ED220J03	SX422	QW1-11	MWA-220
C31	120 50V		CD15FD331J03	SX333	QW1-39	MWB-331
C32	30 50V		CD15FD121J03	SX312	QW1-29	MWA-121
C33	.047 50V		CD15ED030J03	SX430	QW1-14	MWA-300
C34	.01 50V		DPMS2S47	EWFI1A147	QF1-171	1PB-S47
C35	.047 50V			MAG5011		
C36	.047 50V		DPMS2S47	EWFI1A147	QF1-171	1PB-S47
C38	.01 50V		DPMS2S47	EWFI1A147	QF1-171	1PB-S47
C39	100 50V		CD15FD101J03	MAG5011	QW1-27	MWA-101

PARTS LIST AND DESCRIPTION (CONTINUED)

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

CAPACITORS (cont)

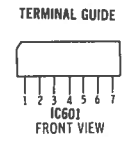
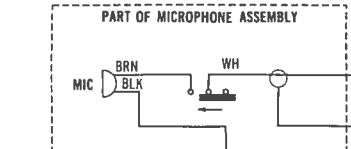
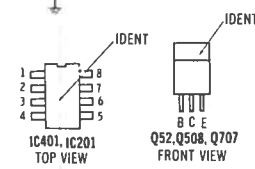
ITEM No.	RATING	MFRG. PART No.	REPLACEMENT DATA			
			CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
					Q-LINE	GENERAL LINE
C51	.047 50V		DPMS2S47	M192P4739R8	QFT2-171	1FT-S47
C52	.047 50V		DPMS2S47	M192P4739R8	QFT2-171	1FT-S47
C53	.047 50V		DPMS2S47	M192P4739R8	QFT2-171	1FT-S47
C55	.01 50V			MAG5011		
C101	.01 50V			MAG5011		
C102	.04 50V			GP140		5GA-S40
C103	.04 50V			GP140		5GA-S40
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		
C201	.01 50V			MAG5011		
C203	.01 50V			MAG5011		
C204	.1 50V			MAG5011		
C205	.01 50V		WMF05P1	EWFO5010		431P1049R5
C206	.01 50V			MAG5011		
C214	.01 50V		WMF1S1	EWFI1A110	QF1-91	1PB-S10
C215	.01 50V			MAG5011		
C217	.01 50V			MAG5011		
C218	.01 50V			MAG5011		
C220	.01 50V			MAG5011		
C224	.01 50V		WMF1S1	M192P1039R8	QFT2-91	1FT-S10
C225	.01 50V			MAG5011		
C228	.04 50V			GP140		5GA-S40
C229	.1 50V		WMF05P1	M192P1049R8	QFT2-215	1FT-P10
C230	.01 50V		WMF1S1	M192P1039R8	QFT2-91	1FT-S10
C231	.01 50V			MAG5011		
C233	.01 50V			MAG5011		
C235	.2 50V		DPMS2P2	PVC602		2PS-P20
C236	.01 50V		WMF1S1	M192P1039R8	QFT2-91	1FT-S10
C237	.01 50V			MAG5011		
C240	.01 50V			MAG5011		
C241	.01 50V			MAG5011		
C242	.01 50V			MAG5011		
C243	.01 50V			MAG5011		
C244	.01 50V			MAG5011		
C245	.01 50V			MAG5011		
C301	15 50V		CD15CD150J03		QW1-8	MMA-150
C302	33 50V		CD15ED330J03	SX433	QW1-15	MMA-330
C303	.01 50V			MAG5011		
C305	.01 50V			MAG5011		
C306	.01 50V			MAG5011		
C307	.01 50V			MAG5011		
C308	.01 50V			MAG5011		
C309	.01 50V			MAG5011		
C310	.01 50V			MAG5011		
C311	1 50V			CNO510		10TCC-V10
C312	.01 50V			MAG5011		
C313	.01 50V			MAG5011		
C315	15 50V		CD15CD150J03		QW1-8	MMA-150
C316	15 50V		CD15CD150J03		QW1-8	MMA-150
C317	.01 50V			MAG5011		
C318	.001 50V			GP210	QCT2-41	10TS-D10
C319	.001 50V			GP210	QCT2-41	10TS-D10
C320	.001 50V			GP210	QCT2-41	10TS-D10
C321	.01 50V			MAG5011		
C322	.01 50V			MAG5011		
C323	.04 50V			GP140		5GA-S40
C324	.01 50V			MAG5011		
C326	.01 50V			MAG5011		
C327	.04 50V			GP140		5GA-S40
C328	.01 50V			MAG5011		
C329	.01 50V			MAG5011		
C330	300 50V		CD15FD301J03	SX330	QW1-38	MMA-301
C331	.04 50V			GP140		5GA-S40
C332	.01 50V			MAG5011		
C333	100 50V		CD15FD101J03	SX310	QW1-27	MMA-101
C334	.01 50V			MAG5011		
C335	20 50V		CD15ED200J03	SX420	QW1-10	MMA-200
C336	.01 50V			MAG5011		
C337	.001 50V			GP210	QCT2-41	10TS-D10
C401	33 50V		CD15ED330J03	SX433	QW1-15	MMA-330
C402	30 50V		CD15ED300J03	SX430	QW1-14	MMA-300
C403	.01 50V			MAG5011		
C404	.01 50V			MAG5011		
C405	.01 50V			MAG5011		
C406	.01 50V			MAG5011		
C407	30 50V		CD15ED300J03	SX430	QW1-14	MMA-300
C408	.01 50V			MAG5011		
C409	.01 50V			MAG5011		
C410	.001 50V			GP210	QCT2-41	10TS-D10
C411	.01 50V			MAG5011		
C412	.001 50V			GP210	QCT2-41	10TS-D10
C413	.001 50V			GP210	QCT2-41	10TS-D10
C414	.001 50V			GP210	QCT2-41	10TS-D10
C416	.01 50V			MAG5011		
C417	15 50V		CD15CD150J03		QW1-8	MMA-150
C418	56 50V		CD15ED560J03	SX456	QW1-21	MMA-560
C419	.01 50V			MAG5011		
C420	.01 50V			MAG5011		
C501	.01 50V			MAG5011		
C502	.01 50V			MAG5011		
C505	47 50V		CD15ED470J03	SX447	QW1-19	MMA-470
C507	160 50V		CD15FD161J03	SX316	QW1-32	MMA-161
C508	.01 50V			MAG5011		



VOLTAGES FOR IC51 Q51 THRU Q54, Q707 TAKEN IN TRANSMIT WITH SWR GREATER THAN 3.1

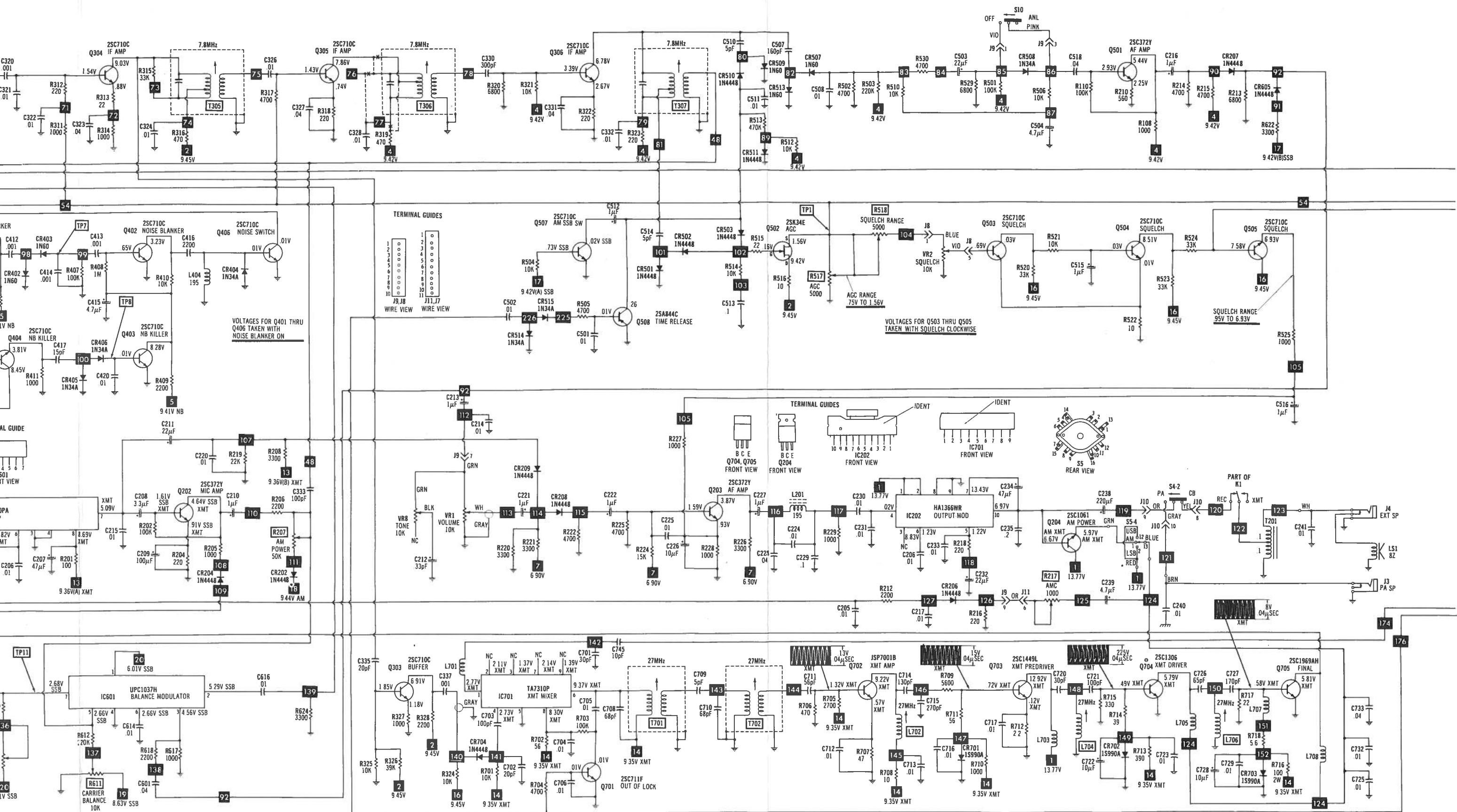
VOLTAGES FOR Q401 TO Q406 TAKEN WITH NOISE BLANKER ON

TERMINAL GUIDES



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

A PHOTOFAC STANDARD NOTATION SCHEMATIC
 WITH **CIRCUITRACE**
 © Howard W. Sams & Co., Inc. 1980

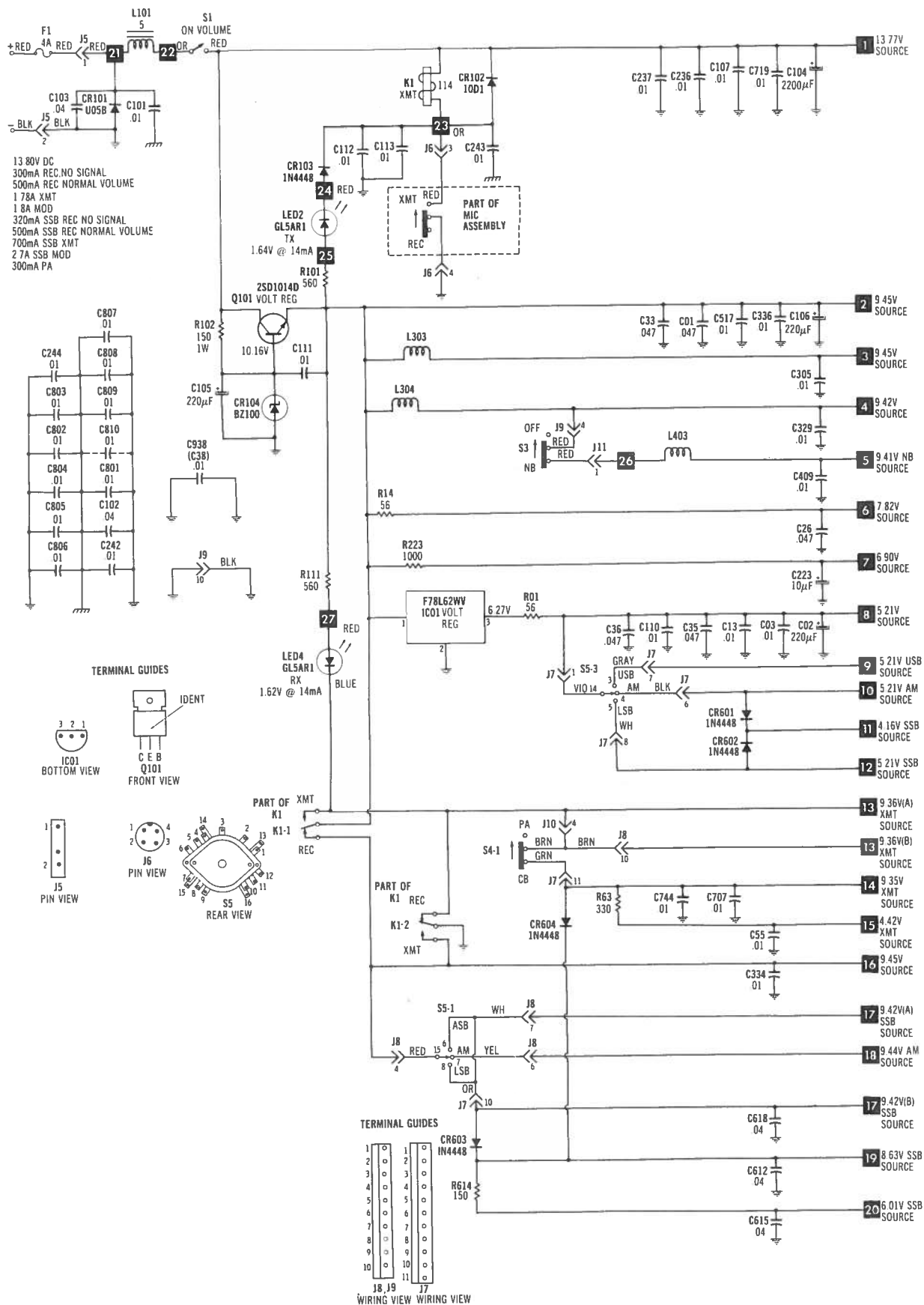


MAIN SCHEMATIC

NDI MODEL PC-201



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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
C510	5 50V	620-014-0	CD15CD050003	MAG5011	QW1-2	MMA-050
C511	.01 50V		WMF05P1 CD15CD050003	M192P1049R8	QFT2-215	1FT-P10
C513	.1 50V				QW1-2	MMA-050
C514	5 50V			MAG5011		5GA-S40
C517	.01 50V			GP140		5GA-S40
C518	.04 50V			MAG5011		
C519	.01 50V			GP140		
C601	.04 50V			MAG5011		
C602	.01 50V			MAG5011		
C603	.01 50V			MAG5011		
C604	.01 50V			MAG5011		
C605	20		NP020	CN0420	QCC2-19	10TCC-Q20
C606	20 50V					
C607	10	620-013-0	NP010	GP356		10TS-T56
C608	510 50V			CN0315		10TCC-T15
C609	150 50V			CN0410	QCC2-15	10TCC-Q10
C610	10 50V			MAG5011		5GA-S40
C611	.01 50V			GP140	QCT2-41	10TS-D10
C612	.04 50V			GP210		5GA-S40
C613	.001 50V			MAG5011		5GA-S40
C614	.01 50V			GP140		
C615	.04 50V			MAG5011		
C616	.01 50V			MAG5011		
C617	.01 50V			MAG5011		
C618	.04 50V			GP140		5GA-S40
C701	30 50V		CD15ED300J03	SX430	QW1-14	MMA-300
C702	20 50V		CD15ED200J03	SX420	QW1-10	MMA-200
C703	100 50V		CD15FD101J03	SX310	QW1-27	MMA-101
C704	.01 50V		CD15ED680J03 CD15CD050003 CD15ED680J03 CD15ED560J03	MAG5011		
C705	.01 50V			MAG5011		
C706	.01 50V			MAG5011		
C707	.01 50V			MAG5011		
C708	68 50V			SX468	QW1-23	MMA-680
C709	5 50V				QW1-2	MMA-050
C710	68 50V			SX468	QW1-23	MMA-680
C711	56 50V			SX456	QW1-21	MMA-560
C712	.01 50V			MAG5011		
C713	.01 50V			MAG5011		
C714	130 50V		CD15FD131J03	SX313	QW1-30	MMA-131
C715	270 50V		CD15FD271J03	SX327	QW1-37	MMA-271
C716	.01 50V		CD15ED300J03 CD15FD101J03	MAG5011		
C717	.01 50V			MAG5011		
C719	.01 50V			MAG5011		
C720	30 50V			SX430	QW1-14	MMA-300
C721	100 50V			SX310	QW1-27	MMA-101
C723	.01 50V			MAG5011		
C725	.01 50V			MAG5011		
C726	65 50V		CD15ED680J03	SX468	QW1-23	MMA-680
C727	170 50V		CD15FD181J03	SX318	QW1-33	MMA-181
C729	.01 50V		CD15ED330J03 CD15FD101J03	MAG5011		
C730	33 50V			SX433	QW1-15	MMA-330
C731	100 50V			SX310	QW1-27	MMA-101
C732	.01 50V			MAG5011		
C733	.04 50V			GP140		5GA-S40
C734	400 50V		CD15FD431J03	SX343		MMA-431
C735	400 50V		CD15FD431J03	SX343		MMA-431
C736	100 50V		CD15FD101J03	SX310	QW1-27	MMA-101
C737	15 50V		CD15CD150J03		QW1-8	MMA-150
C738	15 50V		CD15CD150J03		QW1-8	MMA-150
C739	220 50V		CD15FD221J03	SX322	QW1-35	MMA-221
C740	24 50V		CD15ED240J03	SX424	QW1-12	MMA-240
C741	35 50V		CD15ED360J03	SX436		MMA-360
C742	200 50V		CD15FD201J03	SX320	QW1-34	MMA-201
C743	100 50V		CD15FD101J03	SX310	QW1-27	MMA-101
C744	.01 50V		CD15CD100J03 NP0100	MAG5011		
C745	10 50V				QW1-6	MMA-100
C746	100 50V			CN0310		10TCC-T10
C747	.01 50V			MAG5011		
C748	.01 50V			MAG5011		
C749	1.5 50V		CD15CD050003 CD15CD050003		QW1-2	MMA-050
C750	1.5 50V				QW1-2	MMA-050
C751	.01 50V			MAG5011		
C752	.01 50V			MAG5011		
C756	3 50V		CD15CD050003		QW1-2	MMA-050
C757	.01 50V		WMF1S1	MAG5011		
C801	.01 50V			M192P1039R8	QFT2-91	1FT-S10
C802	.01 50V			MAG5011		
C803	.01 50V			MAG5011		
C804	.01 50V			MAG5011		
C805	.01 50V			MAG5011		
C806	.01 50V			MAG5011		
C807	.01 50V			MAG5011		
C808	.01 50V			MAG5011		
C809	.01 50V			MAG5011		
C810	.01 50V			MAG5011		
C906	.01 50V			MAG5011		
C938	.01 50V			MAG5011		
CR45	.01 50V			MAG5011		

PARTS LIST AND DESCRIPTION (CONTINUED)

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

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

ITEM No.	FUNCTION	RESISTANCE	REPLACEMENT DATA		
			MFGR. 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)	X260R502B(2)
R62	AWI	10K	610-014-0	MTC14L1	X201R103B
R103	Auto Dimmer	10K	610-004-0	MTC14L1(2)	X201R103B(2)
R106	Fine Tune Range	20K	610-005-0	MTC24L1(2)	X201R253B(2)
R207	AM Power	50K	610-006-0	MTC54L1(2)	X201R503B(2)
R217	AM AMC	1000	610-002-0	MTC13L1(2)	X201R102B(2)
R507	S Meter	10K	610-004-0	MTC14L1(2)	X201R103B(2)
R517	AGC	5000	610-003-0	MTC53L1(2)	X260R502B(2)
R518	Squelch Range	5000	610-003-0	MTC53L1(2)	X260R502B(2)
R611	Carrier Balance	10K	10-023-0	RVA0911H103	U260R103B
R616	Balance Bias	100K	610-007-0	MTC15L1(2)	X201R104B(2)
R721	SSB ALC	10K	610-014-0	MTC14L1	X201R103B
R723	SWR Zero	500	610-001-0	MTC52L1(2)	X201R501B(2)
R726	RF Meter	100K	610-007-0	MTC15L1(2)	X201R104B(2)
R912	Scan Sens Range	20K	610-005-0	MTC24L1(2)	X201R253B(2)
VR1	Volume/Power Switch	10K	09-001-0		
VR2	Squelch	10K			
VR3	Calibrate	10K	08-013-0		
VR5	RF Gain	10K	09-013-0		
VR6	Mic Gain	10K			
VR7	Scan Sens/CH 9 Scan SW	10K	09-012-0		
VR8	Tone	10K			

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

RESISTORS (Power and Special)

ITEM No.	RATING	REPLACEMENT DATA		ITEM No.	RATING	REPLACEMENT DATA	
		MFGR. PART No.	WORKMAN PART No.			MFGR. PART No.	WORKMAN PART No.
AP1	LDR			RA1	Resistor Array	19-005-0(1)	
				RA2	Resistor Array	19-005-0(1)	

(1) Consists of seven 330-ohm resistors.

COILS (RF-IF)

ITEM No.	FUNCTION	REPLACEMENT DATA			REMARKS
		PART No.	OTHER IDENTIFICATION	MILLER PART No.	
L01	VCO	41-240-0	Z368NG		
L02	RF Choke (3.3uH)	45-023-0			
L03	RF Choke (2.2uH)	45-022-0			
L04	Osc. (9.9987MHz)	41-259-0	Y388N		
L05	Osc. (10.000MHz)	41-241-0	Y369N		
L06	RF Choke (150uH)	45-031-0			
L201	RF Choke	46-049-0	K-69		
L301	Antenna (27MHz)	41-236-0	C366ZT		
L302	Amp (19MHz)	42-042-0	Y576QT		
L303	RF Choke (22uH)	45-028-0			
L304	RF Choke (22uH)	45-028-0			
L401	Noise Blanker (27MHz)	42-009-0	Z542RT		
L402	Noise Blanker (27MHz)	42-011-0	C544NT		
L403	RF Choke (22uH)	45-028-0			
L404	RF Choke	46-049-0	K-69		
L601	Osc. (7.7975MHz)	42-042-0	Y576QT		
L701	RF Choke (3.3uH)	45-023-0			
L702	XMT Amp (27MHz)	41-006-0	C042D		
L703	RF Choke (.65uH)	45-004-0	C979NT		
L704	XMT Predriver (27MHz)	43-039-0	C996NM		
L705	RF Choke (.65uH)	45-004-0			
L706	XMT Driver (27MHz)	43-047-0			
L707	RF Choke (1.2uH)	45-021-0			
L708	RF Choke (.22uH)	45-002-0			
L709	Final (27MHz)	41-007-0	C043ND	CB140(34)	
L710	P1 (.22uH)	45-058-0			
L711	P1 (.22uH)	45-058-0			
L712	P1 (.42uH)	45-053-0			
L713	RF Choke (22uH)	45-028-0			
T301	IF (27MHz)	41-110-0	C1931T	CB5136-TC	
T302	IF (27MHz)	41-110-0	C1931T	CB5136-TC	
T303	IF (7.8MHz)	41-101-0	S183AT	CB5516-7TC	
T304	IF (7.8MHz)	41-101-0	S183AT	CB5516-7TC	
T305	IF (7.8MHz)	41-101-0	S183AT	CB5516-7TC	
T306	IF (7.8MHz)	41-101-0	S183AT	CB5516-7TC	
T307	IF (7.8MHz)	41-107-0	S190AT	CB5517-7TC	
T401	Noise Blanker	42-028-0	Z-561DT		
T402	Noise Blanker	42-028-0	Z-561DT		
T403	Noise Blanker	42-001-0	S518AT		
T701	Osc. (7.7975MHz)	42-043-0	C577DT		
T702	XMT Mixer (27MHz)	42-043-0	C577DT		
T703	SWR	43-150-0	Z898NZ		

(34) Cut off unwanted terminals and rotate replacement to use the two terminal required.

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.	
L101	2.7A	.5	1.6mH	46-015-0	TR555		

TRANSFORMER (Audio Output)

ITEM No.	IMPEDANCE		REPLACEMENT DATA			NOTES
	PRI.	SEC.	MFGR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T201	2	8	46-051-0			

SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		MFGR. PART No.	QUAM PART No.	
LS1	2 3/4" PM, 8 Ohms	54-001-0	27A0528	

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	4A Quick-Acting			AGC-4	HRK	312004	150145	

MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
DS1	Lamp		7.77V, Auto Dimmer Cont.
FL301	Filter	25-003-0	Crystal (K07F4A)
J1	Jack	60-031-0	MIC-Connector
J2	Jack	60-132-0	FM-MR-M Antenna Jack
J3	Jack	60-043-0	EP Jack, SJ296
J4	Jack	60-043-0	EP Jack, SJ296
J5	Jack	60-205-0	DC, 3P Jack
K1	Relay	53-006-0	MY4-02-HE
LED1	LED	38-027-0	(TLR321) Channel Display
LED2	LED	38-025-0	(GL-5AR1) Red
LED3	LED	38-026-0	(GL-5PY1) Yellow, AWI
LED4	LED	38-025-0	(GL-5AR1) Red
M1	Meter	27-057-0	A-36
S1	Switch	09-001-0	(Part of VR1)
S2	Switch	49-023-0	SSM02205, Slide Switch
S3	Switch	49-023-0	SSM02205, Slide Switch
S4	Switch	49-023-0	SSM02205, Slide Switch
S5	Switch	48-068-0	BS-283, Mode Switch
S6	Switch	48-126-1	CB-2340, Channel Selector
S7	Switch	09-012-0	(Part of VR7)
S8	Switch	49-023-0	SSM02205, Slide Switch
Y01	Crystal	22-316-0	10.000MHz
Y601	Crystal	22-319-0	7.801MHz