

PHOTOFACT[®] with

CIRCUITRACE[®]

For Supplier Address See PHOTOFACT Index

NOTE

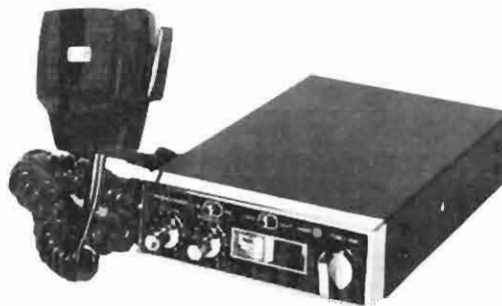
Repair or adjustment of transmitter circuits must be under supervision of a person with first-or second-class radiotelephone license.

(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 TRC-421 (21-1530)

MANUFACTURER'S SPECIFICATIONS

RECEIVER SPECIFICATIONS

Description	Nominal	Limit
Intermediate frequency		
1st IF	10.695 MHz	
2nd IF	455 kHz	
Sensitivity for 500 mW output	0.25 μ V	0.5 μ V
Sensitivity at 10 dB S + N/N	0.5 μ V	1.0 μ V
Adjacent Channel Rejection	80 dB	60 dB
Image Rejection (1st IF/2nd IF)	90/95 dB	60/50 dB
Bandwidth (-6 dB)	7.6 kHz	5 - 9 kHz
Signal-to-Noise ratio		
at 1 mV input	45 dB	35 dB
Distortion at 1 mV input,		
50% mod. (500 mW out)	2%	< 6%
AGC Figure of merit at 50 mV input	95 dB	> 85 dB
Power output at 500 μ V Input		
Undistorted (10% THD)	5.0 W	> 3.5W
Maximum	6.0 W	> 4.5W
Electrical fidelity compared to 1000 Hz		
450 Hz	-6 dB	-6 $\pm$ 3 dB
2500 Hz	-6 dB	-6 $\pm$ 3 dB
Cross Modulation	60 dB	> 50 dB
Squelch	Adjustable from 0.5 μ V to 1 mV	
Current consumption (no signal)	250 mA	350 mA

TRANSMITTER SPECIFICATIONS

Description	Nominal	Limit
RF power output	4.0 watts (max.)	3.6-4.4 watts
Emission	8A3 (6A3 for Australian models)	
Modulation Capabilities	+90%, -100%	
AMC Range at 1 kHz	40 dB	30 dB
Frequency accuracy	0.002%	0.005%
Spurious radiation & Harmonic		
signal radiation ratio from fundamental	-65 dB	-60 dB
Mic Sensitivity (50% Mod. 1 kHz)	1.5 mV	<2 mV
Current consumption (secondly)		
unmodulated	950 mA	1400 mA
1 kHz, 80% mod.	1450 mA	1800 mA
Envelope distortion	10% max. 1000 Hz, 50% mod.	
Hum and Noise level	40 dB min. below max. mod.	
Stability against variation of		
antenna impedance	Satisfactory when dummy antenna is varied from 40 ohms to 200 ohms.	

Courtesy of the Manufacturer

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

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REALISTIC MODEL TRC-421 (21-1530)

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:

T1 thru T4, T9, T10, T12 thru T17	GC ELECTRONICS: 9440
T5 thru T8	5000, 5009, 8276, 8728, 9089
L9, L12, T12	9300, 9302, 9304
T18	8728, 9304, 9089
CT	5000, 8276, 9089

SYNTHESIZER ALIGNMENT

TEST EQUIPMENT	TRANSCIVER	ADJUST	REMARKS
Input of oscilloscope to TP1 (T10 Secondary).	Ch. 19	T10	Adjust for maximum RF (300mV p-p typical). See Figure 1.
Input of frequency counter to TP1 (T10 Secondary).	Ch. 19	CT	Adjust for 10.240MHz $\pm$ 50Hz.
Input of frequency counter to TP2 (IC1 Pin 10).	Ch. 19		Check for 5.120MHz.
Input of oscilloscope to TP3 (IC4 Pin 4).	Ch. 19	T10	Adjust for maximum RF (300mV p-p typical). See Figure 2.
Input of DC meter to TP4 (Junction of R64 & R66).	Ch. 1	T12	Adjust for 3.80 volts check for approx. 4.00 volts on channel 40.
Input of frequency counter to TP5 (IC1 Pin 22).	Ch. 1		Check for .910MHz. Check all channels. See Truth Chart for correct frequencies.
Input of frequency counter to TP5 (IC1 Pin 22).	Ch. 1 XMT		Check for 1.365MHz. Check all channels. See Truth Chart for correct frequencies.
Input of oscilloscope to TP6 (Junction of C83 & C84).	Ch. 19	T13,T14	Adjust for maximum RF (150mV p-p typical). See Figure 3.
Input of frequency counter to TP6 (Junction of C83 & C84).	Ch. 1		Check for 16.270MHz. Check all channels. See Truth Chart for correct frequencies.
Input of frequency counter to TP7 (IC5 Pin 3).	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. Preset controls as follows unless otherwise noted: Squelch MINIMUM, ANL Off.

TEST EQUIPMENT	TRANSCIVER	ADJUST	REMARKS
Output of signal generator to TP8 (Q4 Base). 455kHz, 1000Hz @ 30% modulation.	Ch. 19	T8,T7,T6	Adjust for maximum audio output.
Output of signal generator to antenna input. 27.185MHz,1000Hz @ 30% modulation.	Ch. 19	T5,T4,T3, T2,T1	Adjust for maximum audio output. Readjust T6, T7 and T8 for maximum.

RECEIVER ADJUSTMENTS

Connect an AC VTVM or AF wattmeter across speaker voice coil.
Adjust volume control to obtain a suitable indication.
Preset controls as follows, unless otherwise noted: Squelch MINIMUM, ANL Out.

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Output of signal generator to antenna input. 27.185MHz, 1000Hz @ 30% modulation. Output 1uV.	Ch. 19 Volume Maximum	VR1	IF AGC Adjust for 2.00 volts RMS (.5 watt) audio output.
Output of signal generator to antenna input. 27.185MHz, 1000Hz @ 30% modulation. Output 1000uV.	Ch. 19 Squelch Maximum	VR2	SQUELCH RANGE Adjust so that squelch just breaks.
Output of signal generator to antenna input. 27.185MHz, 1000Hz @ 30% modulation. Output 100uV.	Ch. 19	VR5	RX SIGNAL METER Adjust for 9 on RX SIGNAL Scale of meter.

TRANSMITTER ALIGNMENT

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

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Input of RF wattmeter to antenna input.	Ch. 19	T16, T15, T17, T18, L9	Adjust for maximum RF output.
Input of RF wattmeter to antenna input.	Ch. 19	L12	Adjust for 4.0 watts RF output maximum.
Input of spectrum analyzer or harmonic meter to antenna input.	Ch. 19	T19	Adjust for MINIMUM RF output at 54MHz (2nd harmonic). (-60db attenuation typical)

TRANSMITTER ADJUSTMENTS

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

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Input of RF wattmeter to antenna input.	Ch. 19	VR6	TX POWER METER At 4.0 watts RF output adjust so that needle rests at leading edge of red area on TX POWER scale of meter.

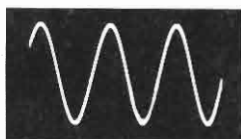


FIGURE 1

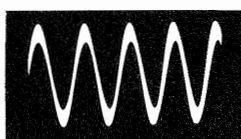


FIGURE 2

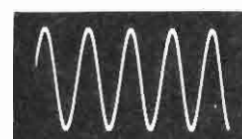
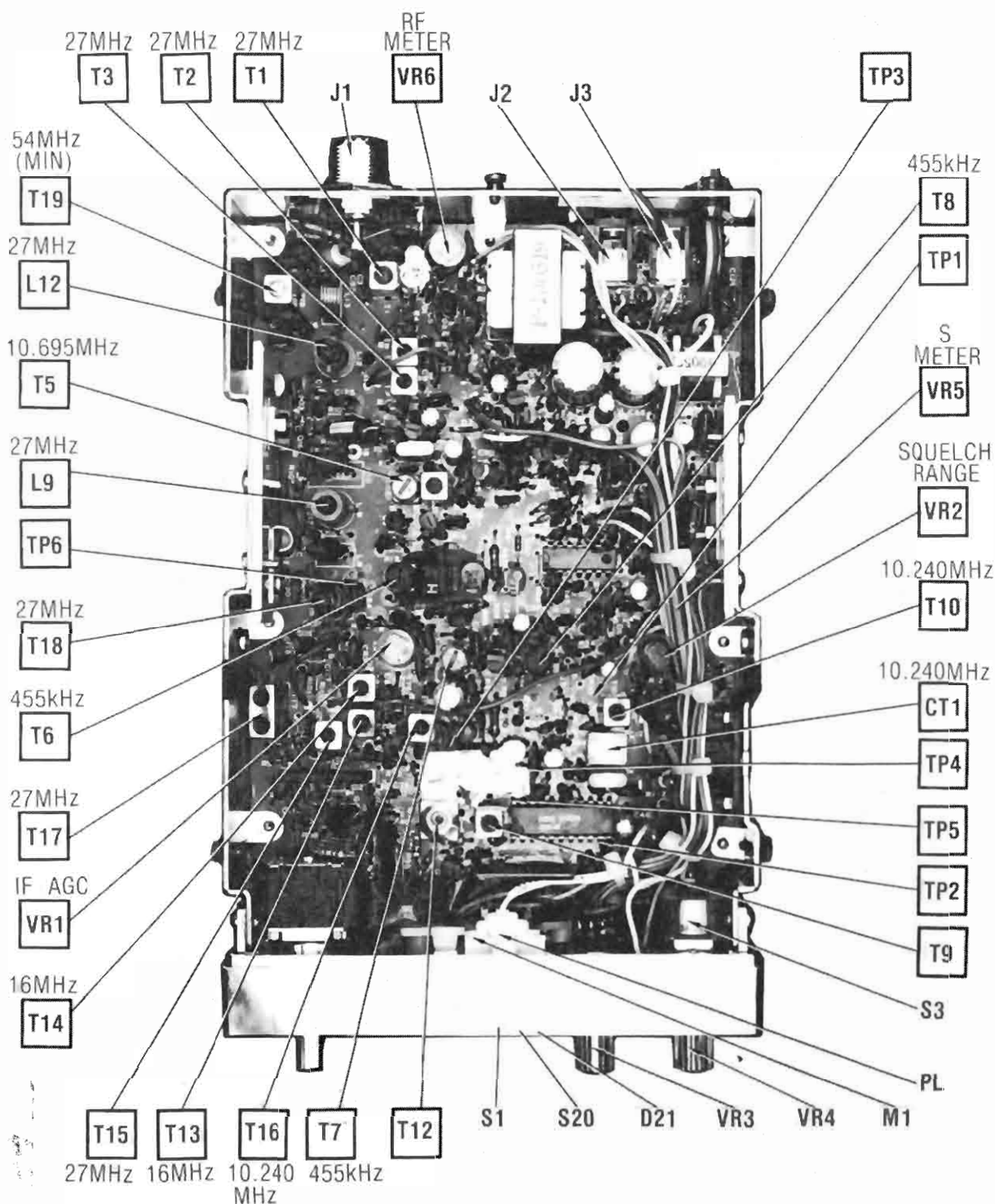


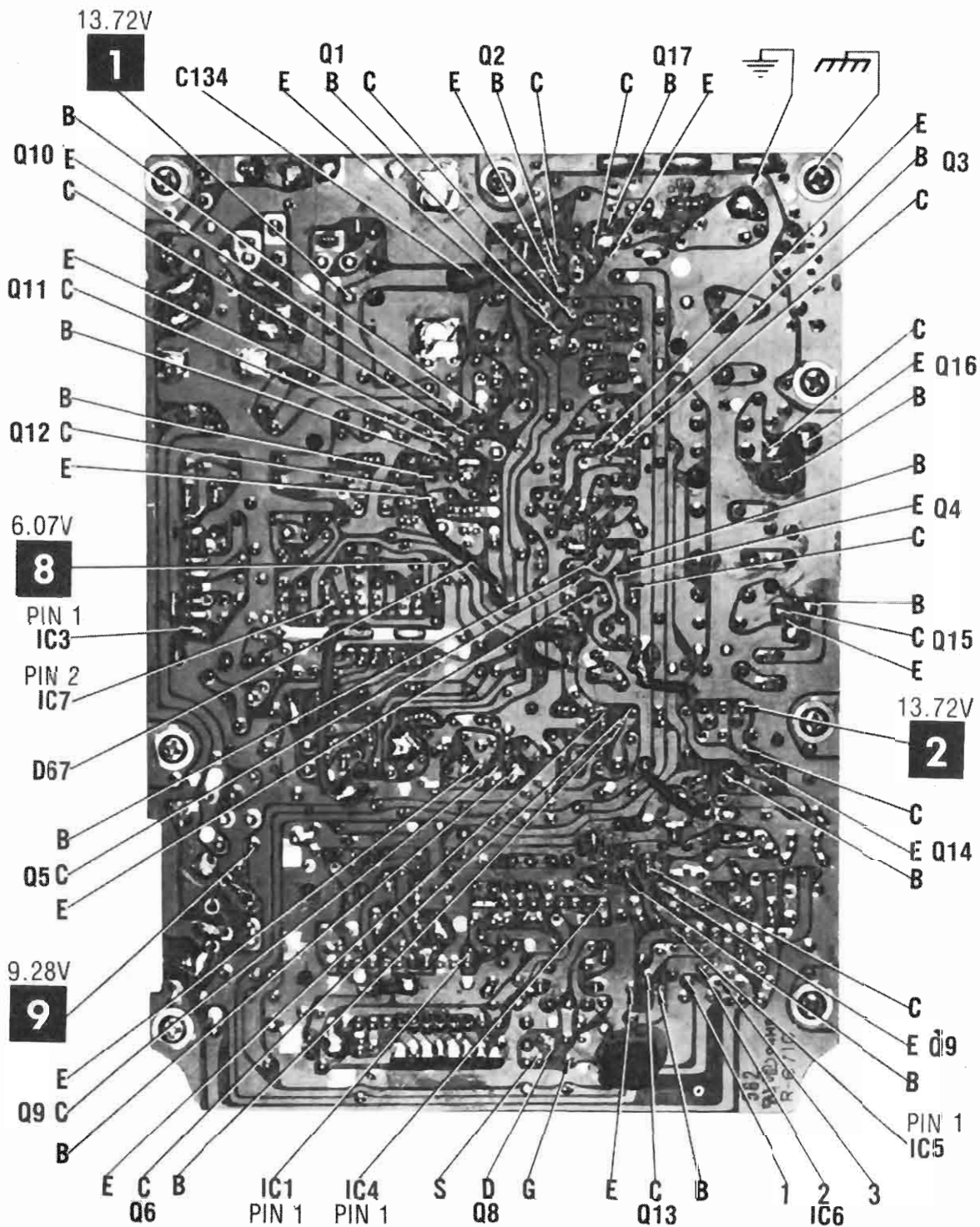
FIGURE 3

TRUTH CHART

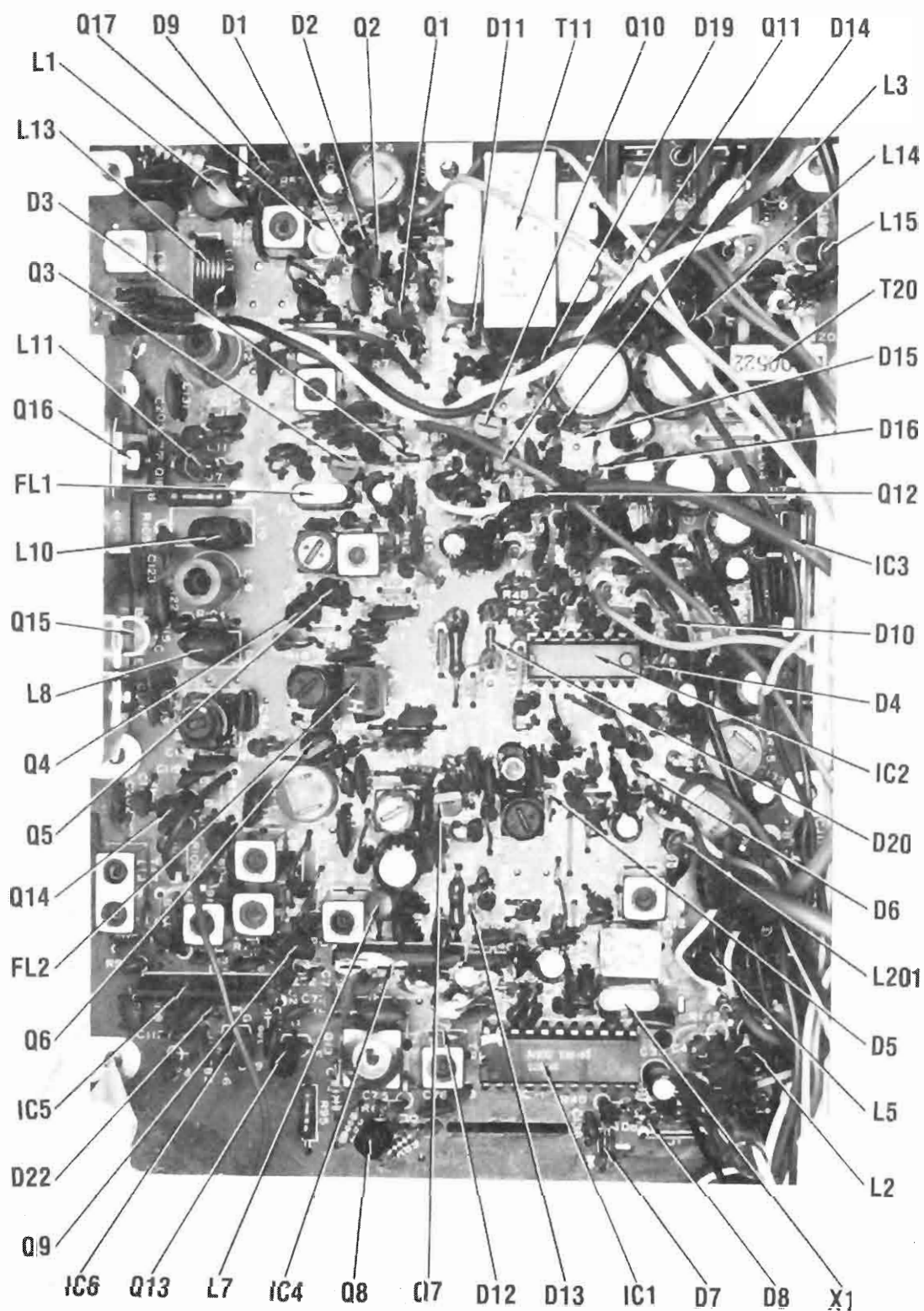
CHANNEL	1 = 4.60 Volts 0 = 0 Volts						REC DIVIDER INPUT IN MHz AT TP5	XMT DIVIDER INPUT IN MHz AT TP5	REC VCO OUTPUT IN MHz AT TP6	XMT VCO OUTPUT IN MHz AT TP7
	CHANNEL INPUT CODES									
	IC1 PINS									
	6	5	4	3	2	1				
1	0	0	0	0	0	1	.910	1.365	16.270	16.725
2	0	0	0	0	1	0	.920	1.375	16.280	16.735
3	0	0	0	0	1	1	.930	1.385	16.290	16.745
4	0	0	0	1	0	0	.950	1.405	16.310	16.765
5	0	0	0	1	0	1	.960	1.415	16.320	16.775
6	0	0	0	1	1	0	.970	1.425	16.330	16.785
7	0	0	0	1	1	1	.980	1.435	16.340	16.795
8	0	0	1	0	0	0	1.000	1.455	16.360	16.815
9	0	0	1	0	0	1	1.010	1.465	16.370	16.825
10	0	1	0	0	0	0	1.020	1.475	16.380	16.835
11	0	1	0	0	0	1	1.030	1.485	16.390	16.845
12	0	1	0	0	1	0	1.050	1.505	16.410	16.865
13	0	1	0	0	1	1	1.060	1.515	16.420	16.875
14	0	1	0	1	0	0	1.070	1.525	16.430	16.885
15	0	1	0	1	0	1	1.080	1.535	16.440	16.895
16	0	1	0	1	1	0	1.100	1.555	16.460	16.915
17	0	1	0	1	1	1	1.110	1.565	16.470	16.925
18	0	1	1	0	0	0	1.120	1.575	16.480	16.935
19	0	1	1	0	0	1	1.130	1.585	16.490	16.945
20	1	0	0	0	0	0	1.150	1.605	16.510	16.965
21	1	0	0	0	0	1	1.160	1.615	16.520	16.975
22	1	0	0	0	1	0	1.170	1.625	16.530	16.985
23	1	0	0	0	1	1	1.200	1.655	16.560	17.015
24	1	0	0	1	0	0	1.180	1.635	16.540	16.995
25	1	0	0	1	0	1	1.190	1.645	16.550	17.005
26	1	0	0	1	1	0	1.210	1.665	16.570	17.025
27	1	0	0	1	1	1	1.220	1.675	16.580	17.035
28	1	0	1	0	0	0	1.230	1.685	16.590	17.045
29	1	0	1	0	0	1	1.240	1.695	16.600	17.055
30	1	1	0	0	0	0	1.250	1.705	16.610	17.065
31	1	1	0	0	0	1	1.260	1.715	16.620	17.075
32	1	1	0	0	1	0	1.270	1.725	16.630	17.085
33	1	1	0	0	1	1	1.280	1.735	16.640	17.095
34	1	1	0	1	0	0	1.290	1.745	16.650	17.105
35	1	1	0	1	0	1	1.300	1.755	16.660	17.115
36	1	1	0	1	1	0	1.310	1.765	16.670	17.125
37	1	1	0	1	1	1	1.320	1.775	16.680	17.135
38	1	1	1	0	0	0	1.330	1.785	16.690	17.145
39	1	1	1	0	0	1	1.340	1.795	16.700	17.155
40	0	0	0	0	0	0	1.350	1.805	16.710	17.165



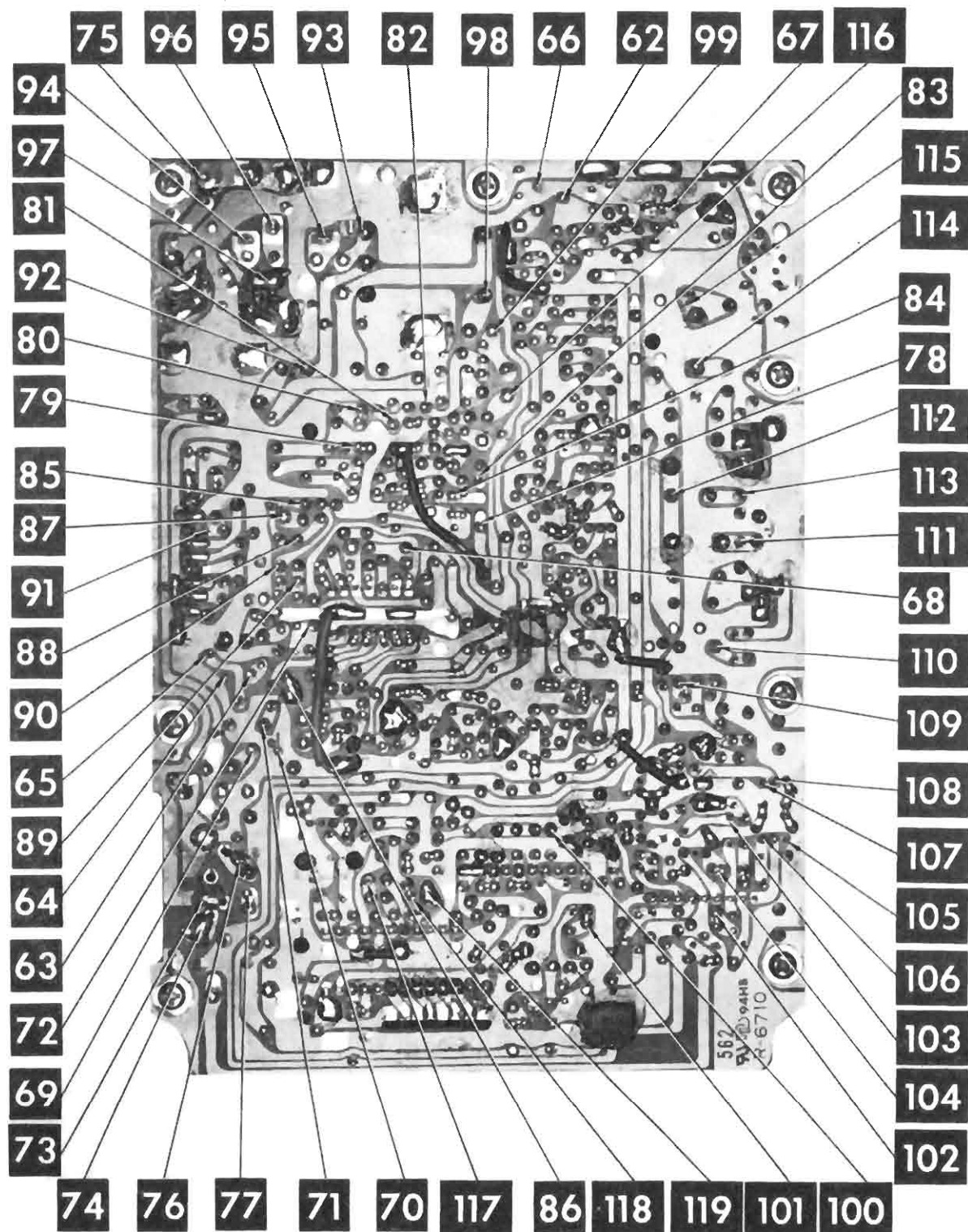
CHASSIS-BOTTOM



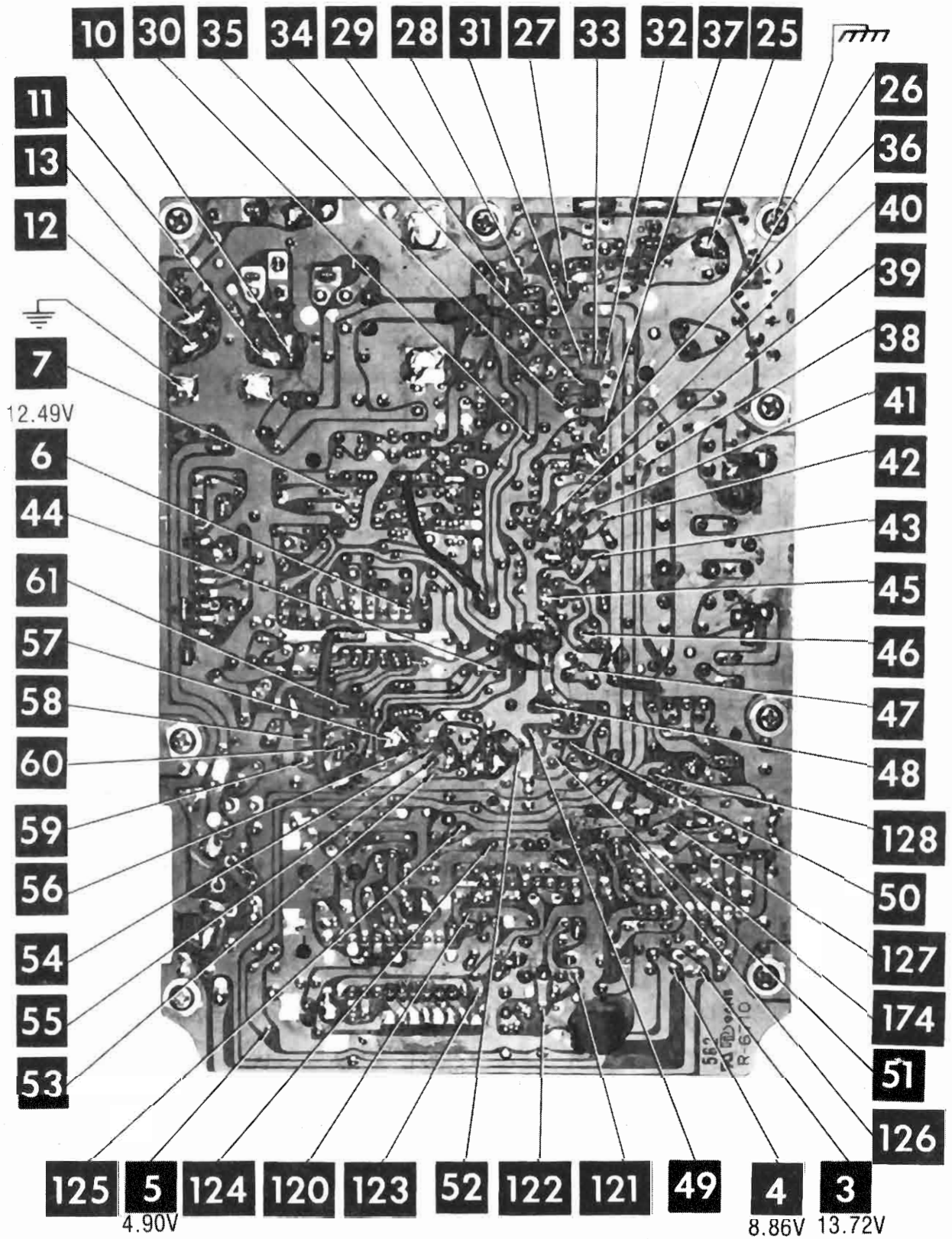
MAIN BOARD



MAIN BOARD

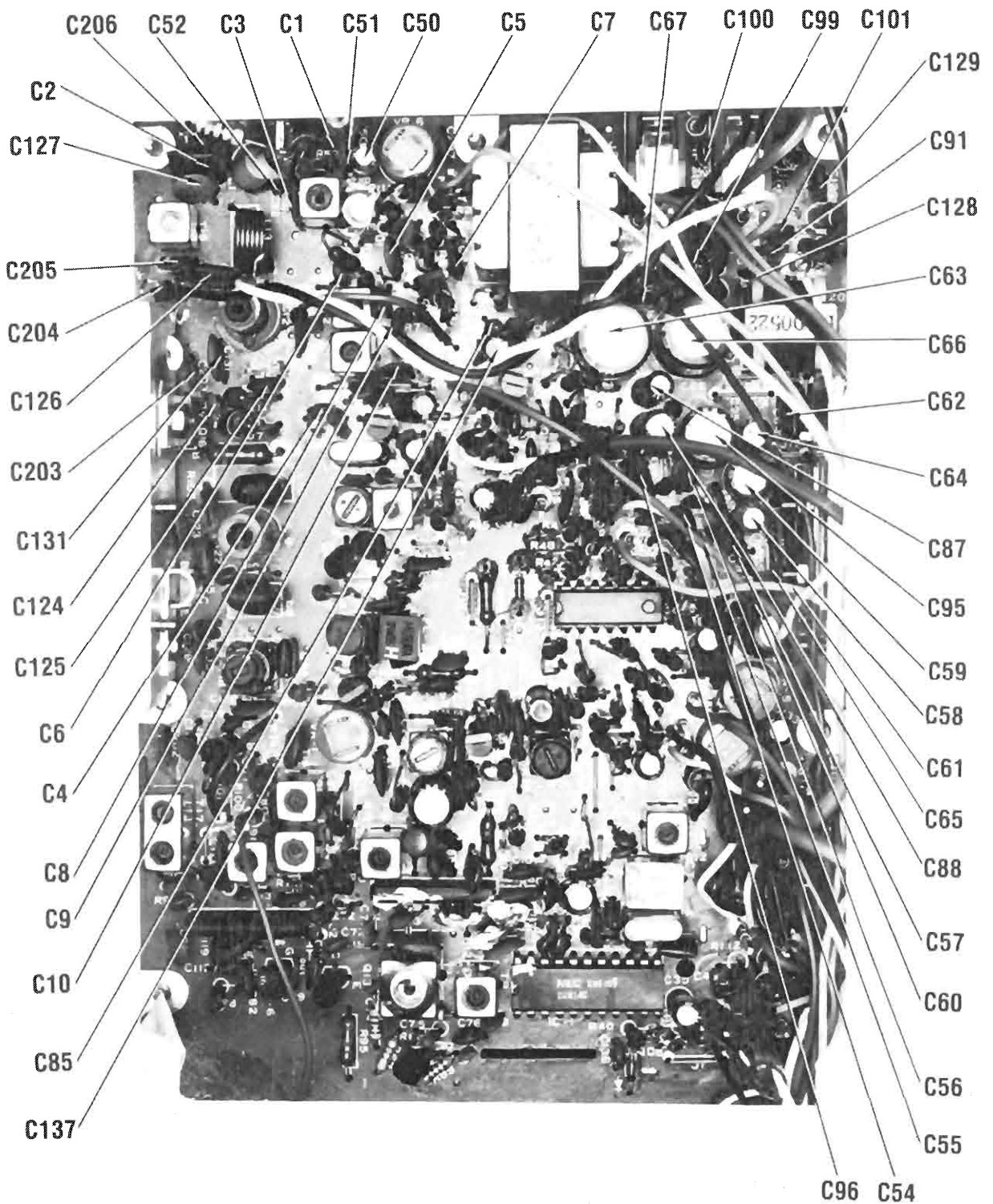


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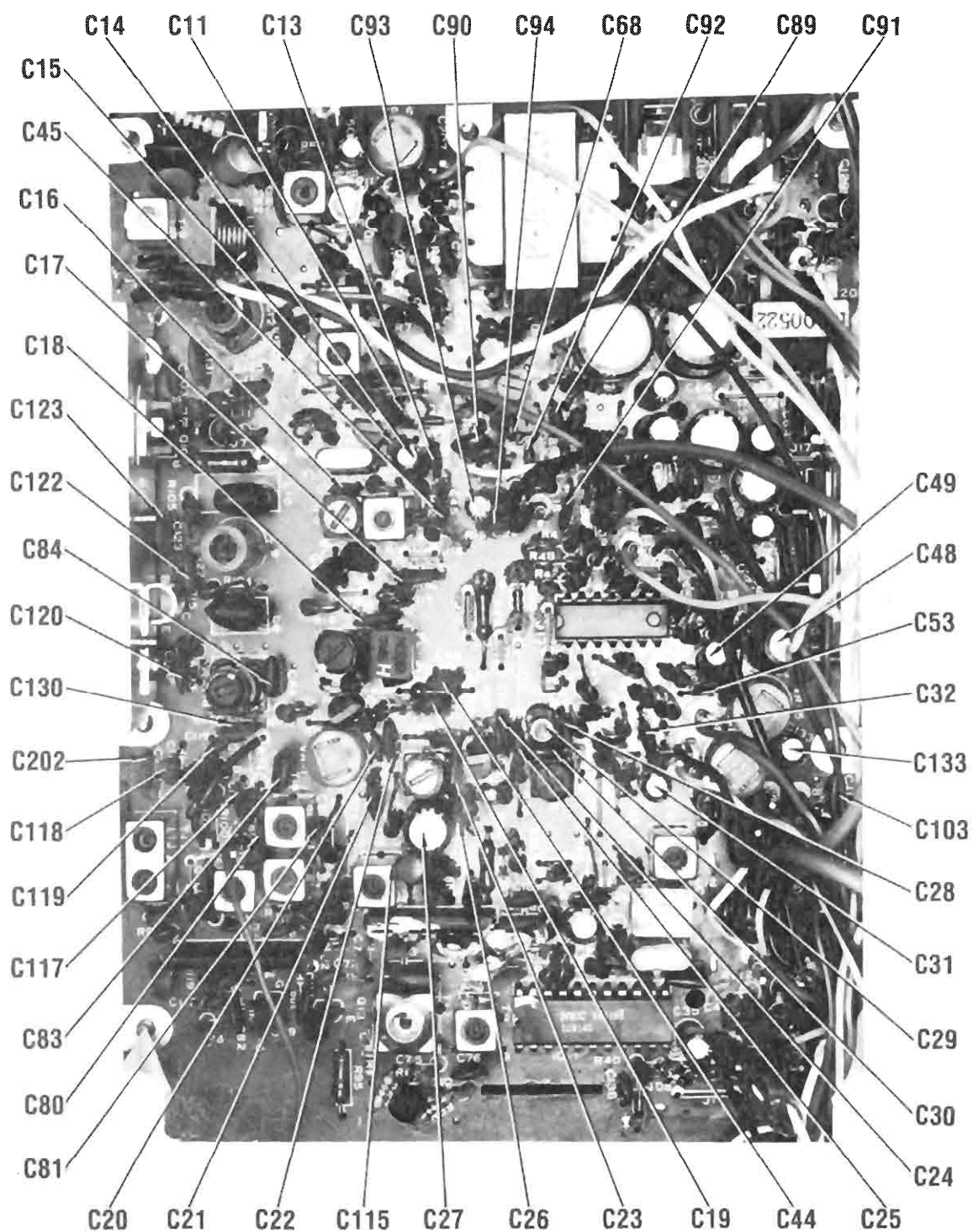


REALISTIC MODEL TRC-421 (21-1530)

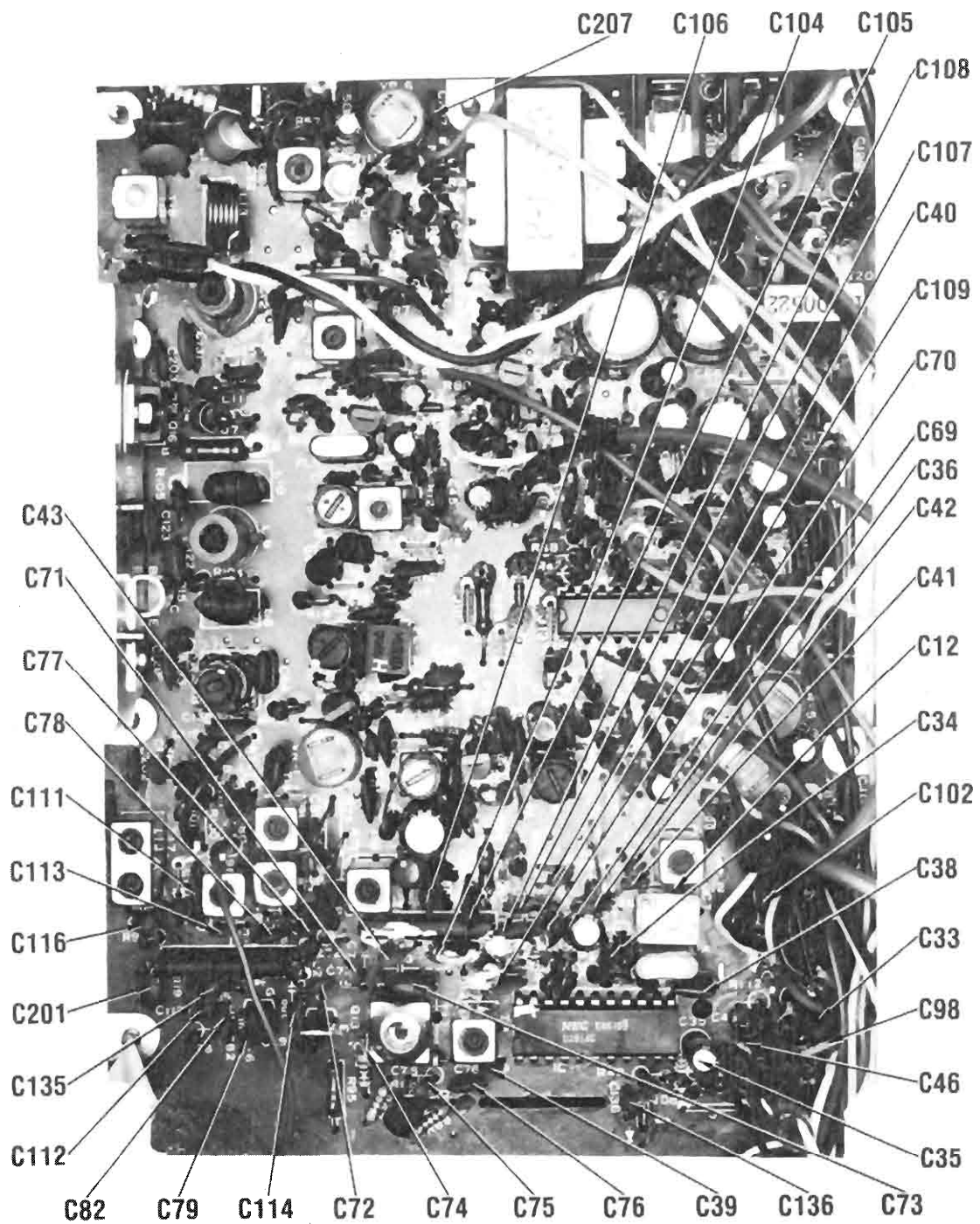
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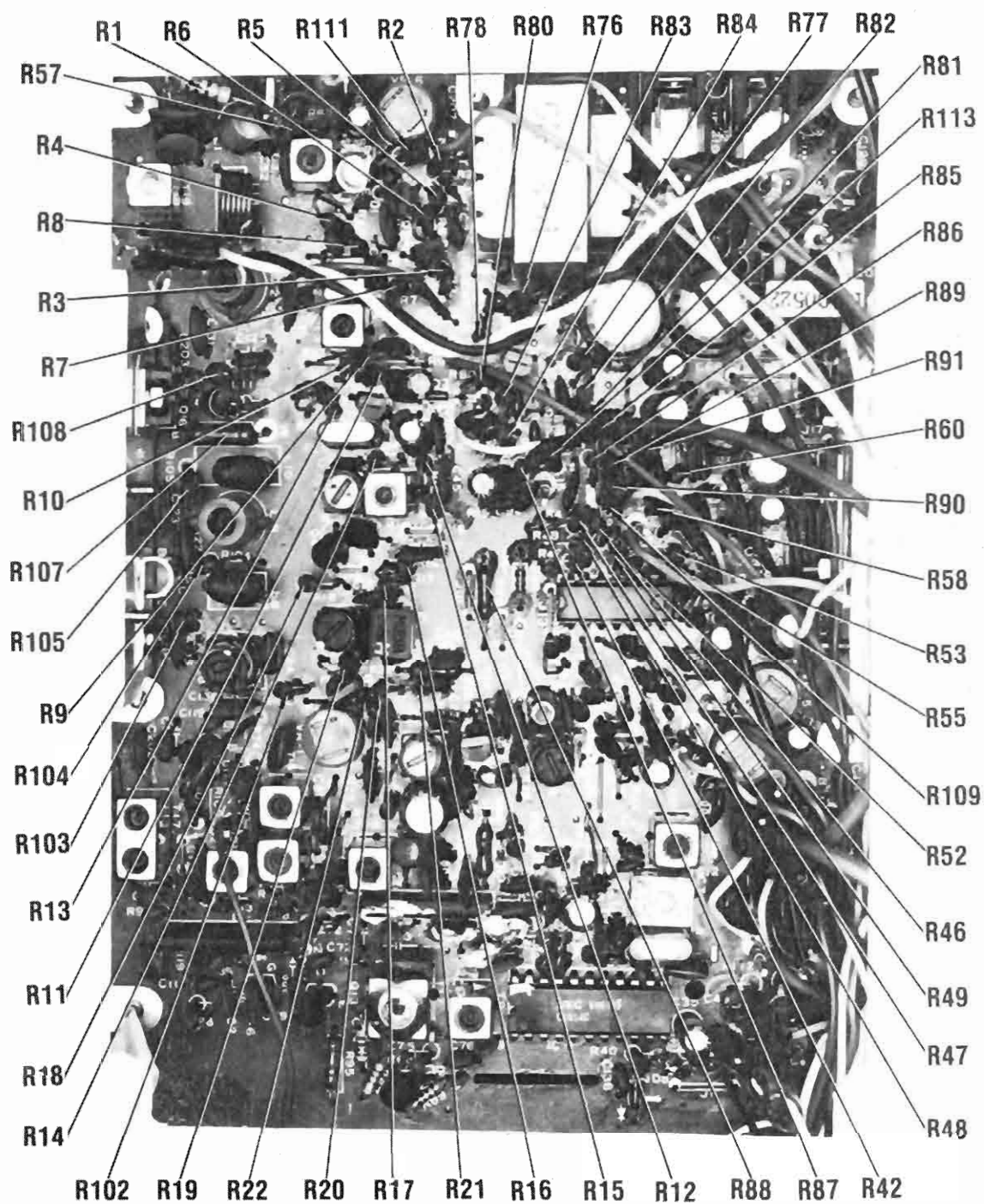
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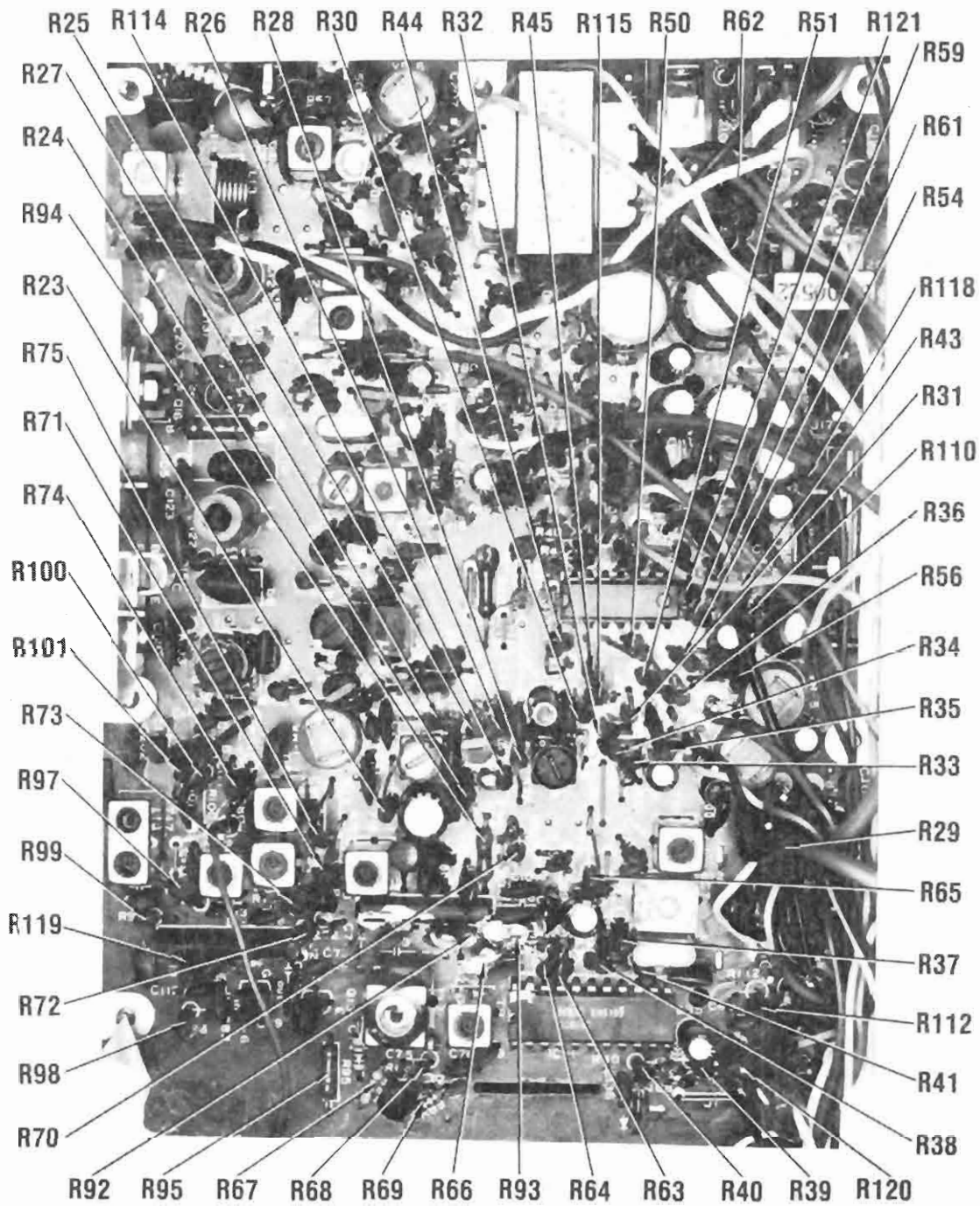
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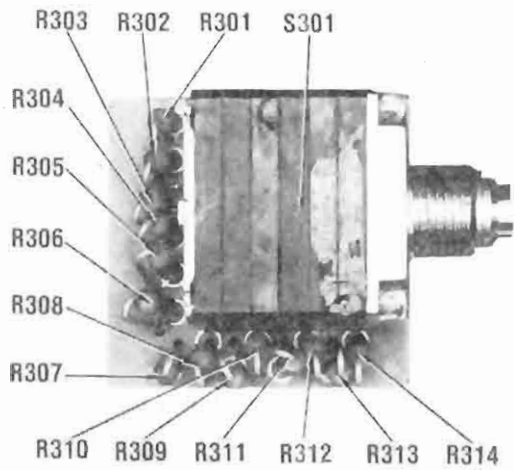
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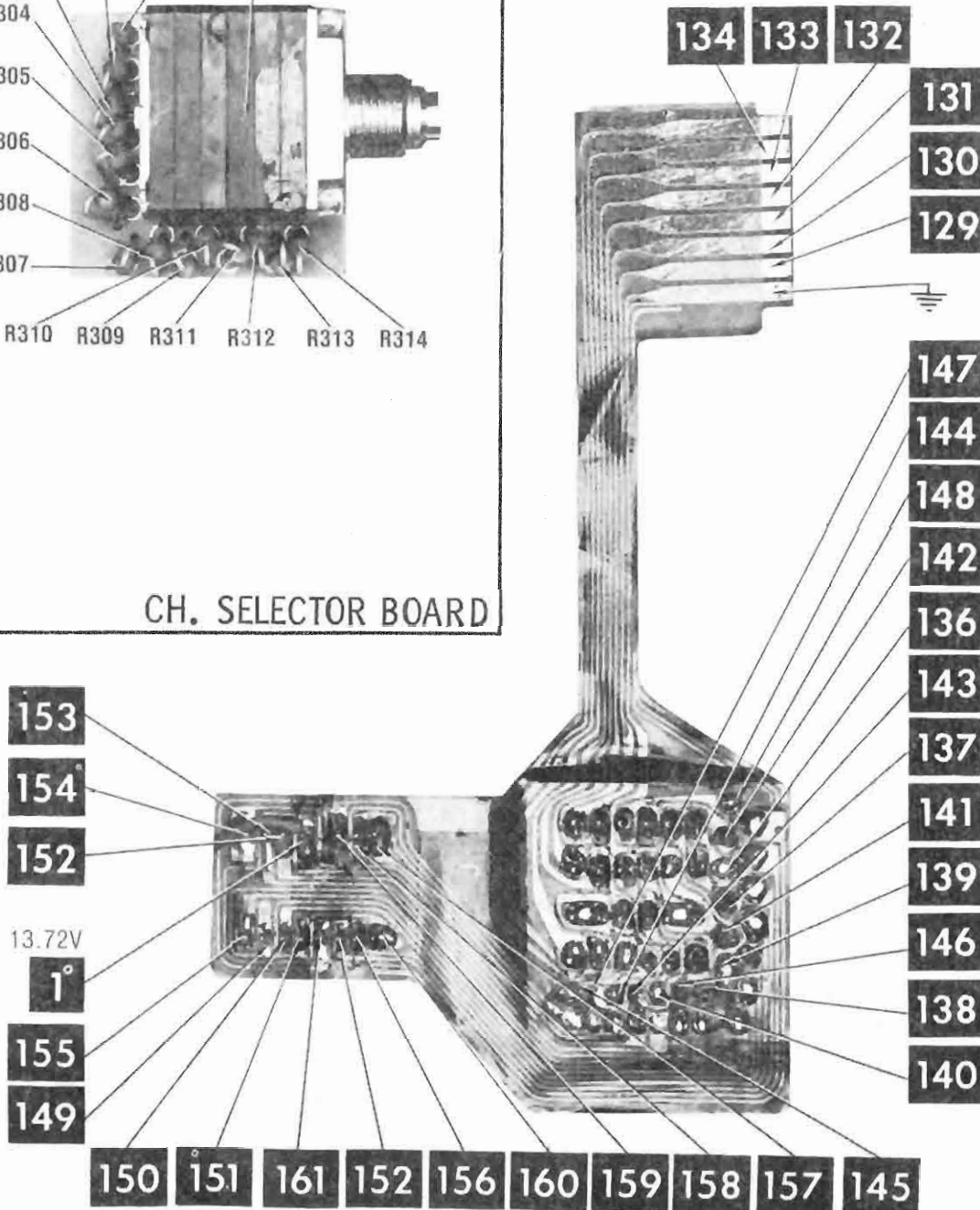
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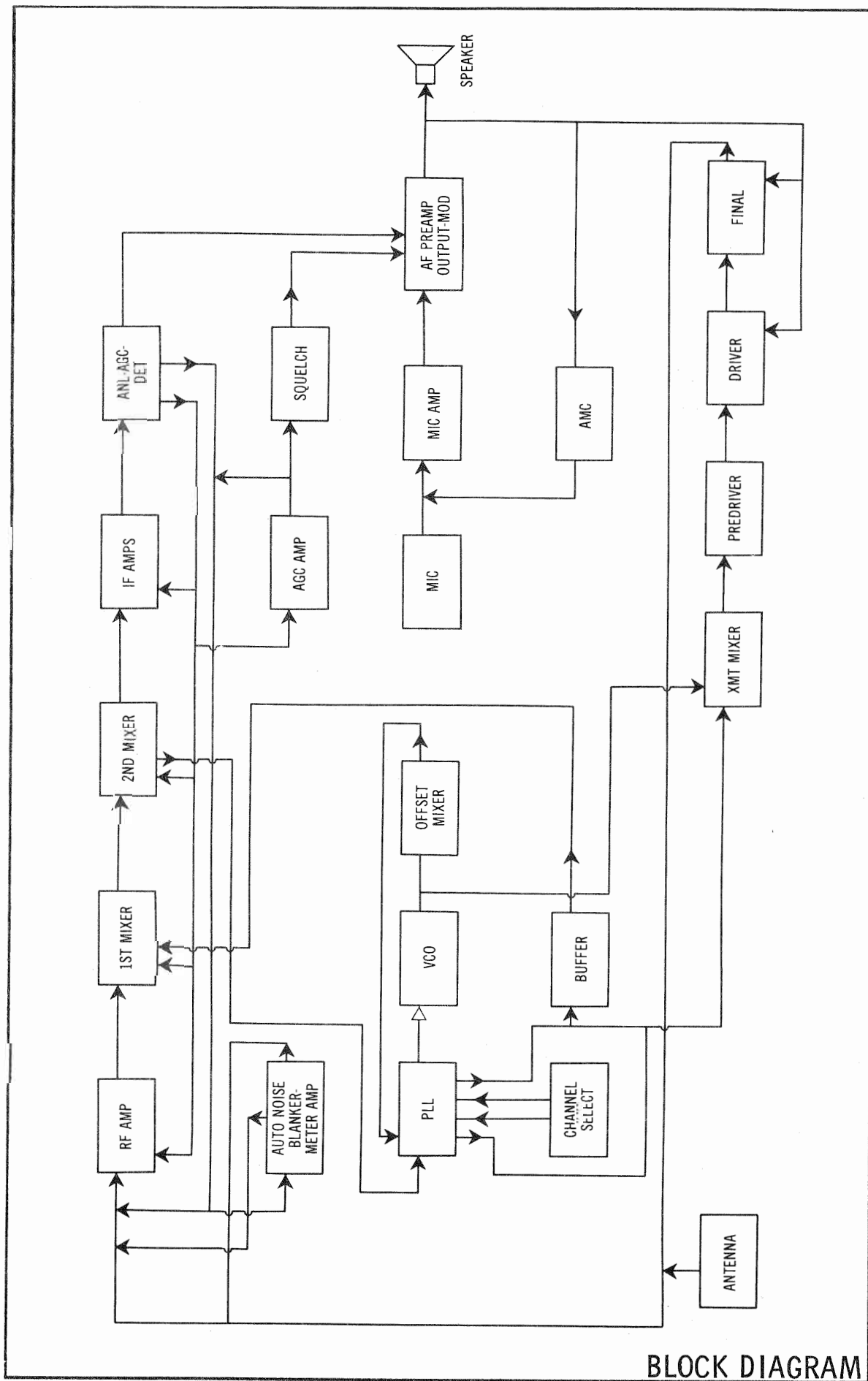
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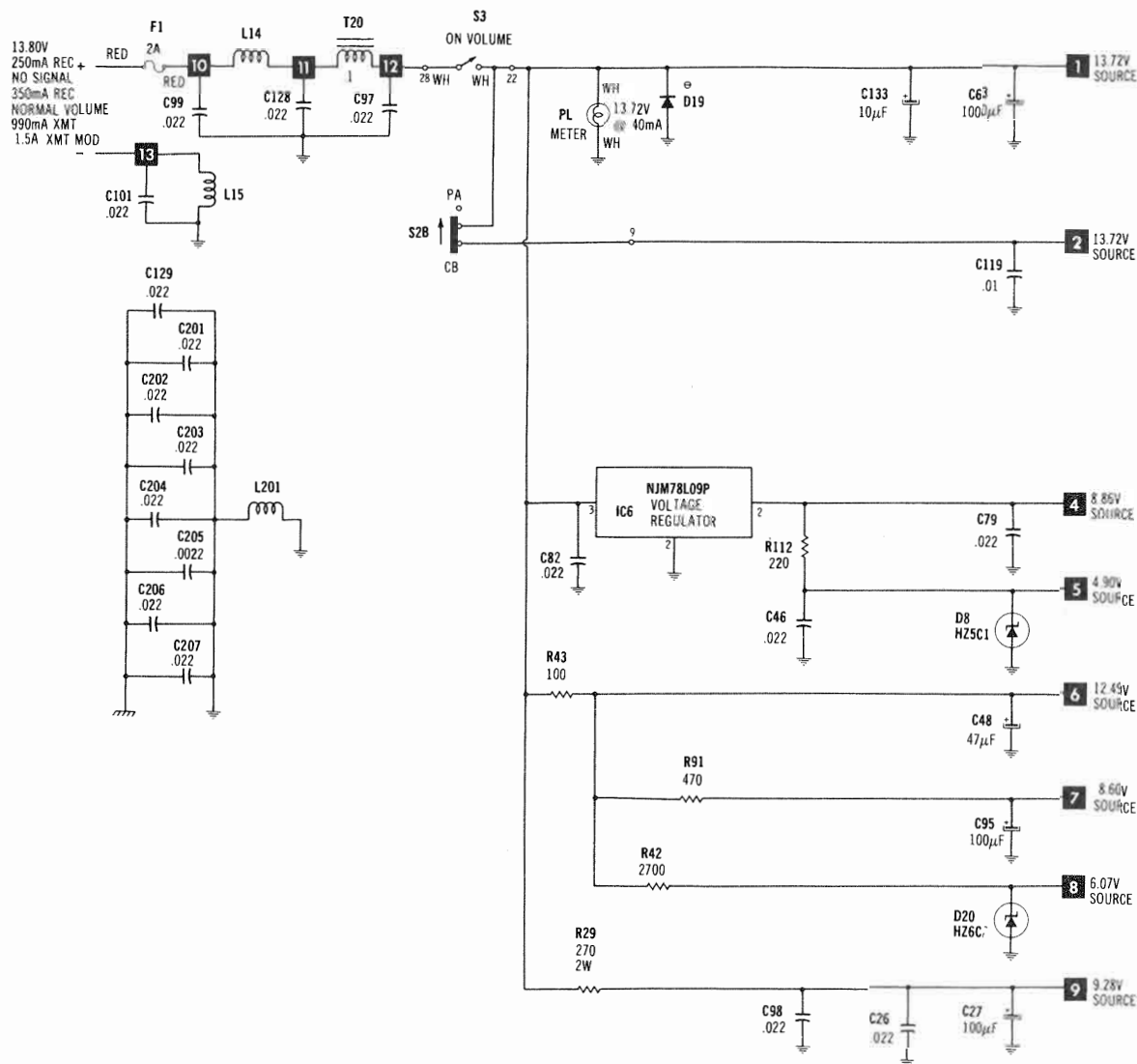
CH. SELECTOR BOARD



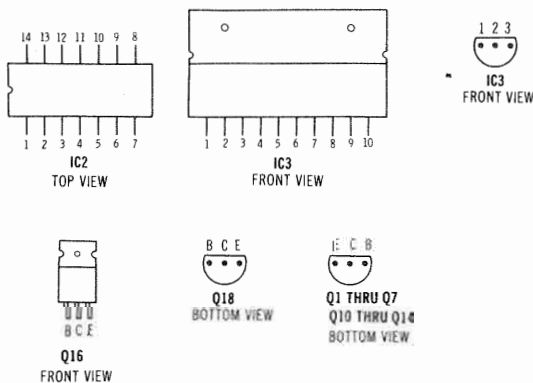
CH. SEL. & READOUT BOARD



BLOCK DIAGRAM



TERMINAL GUIDE



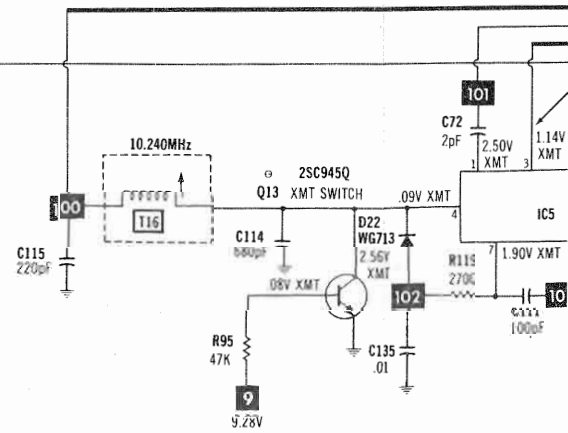
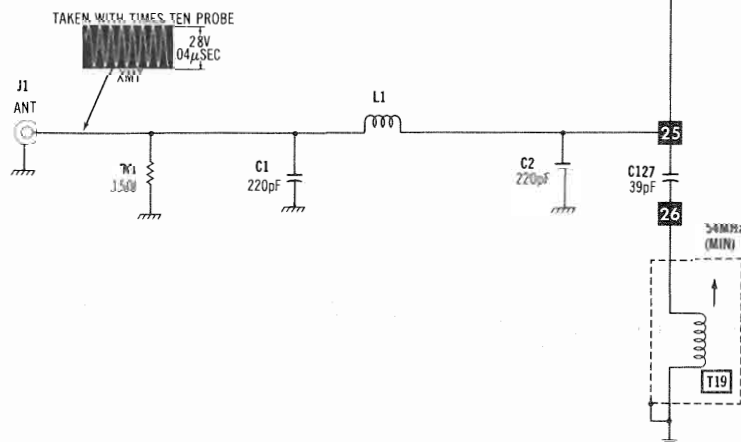
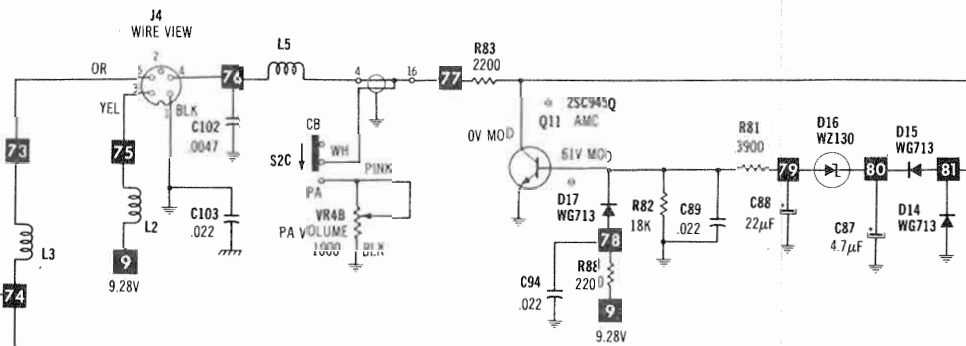
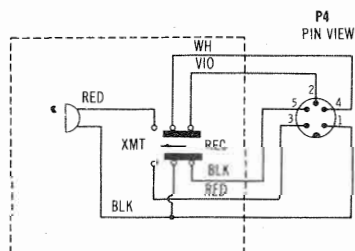
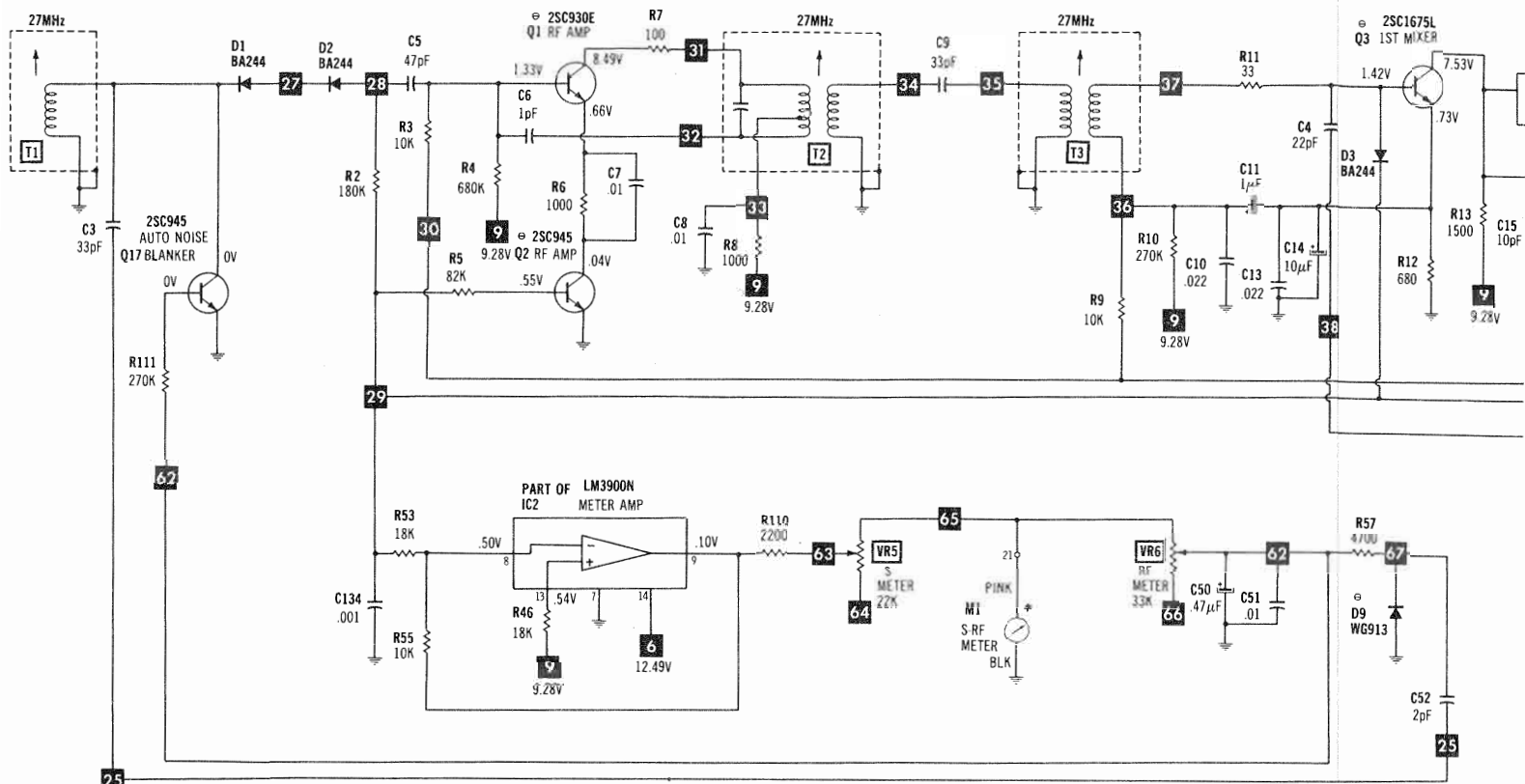
- ✖ Circuitry not used in some versions.
 - Circuitry used in some versions.
 - ✱ Nominal value
 - ▽ Common tie point
 - ⊥ Ground
 - ⏏ Chassis
 - ⊖ See parts list
- Waveforms and Voltages taken in Channel 19 with switching in receive unless noted. Item numbers in rectangles appear in the alignment/adjustment 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).

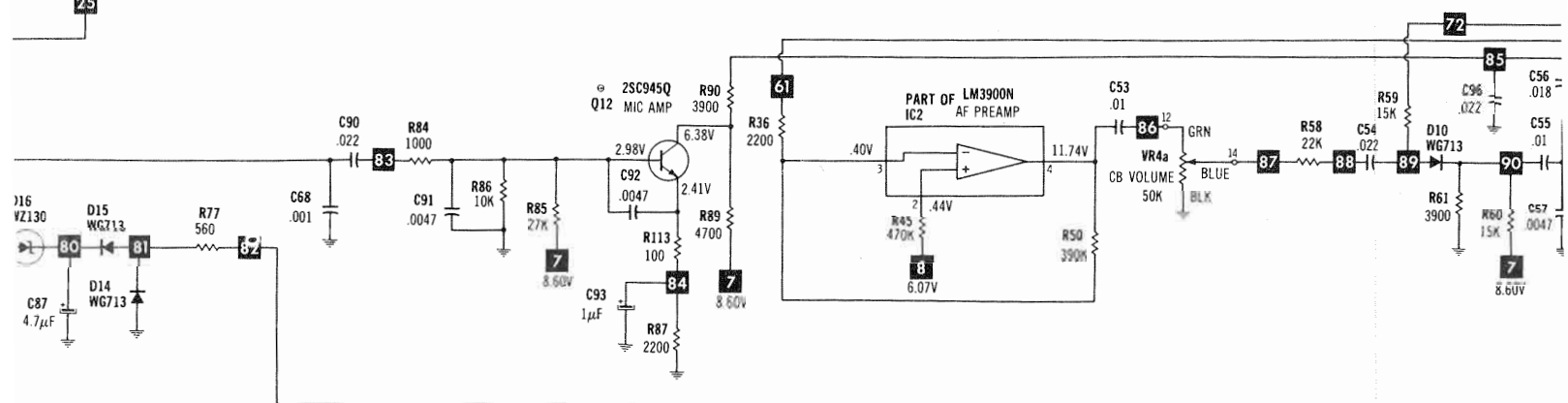
A PHOTOFACIT STANDARD NOTATION SCHEMATIC

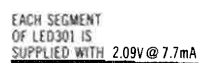
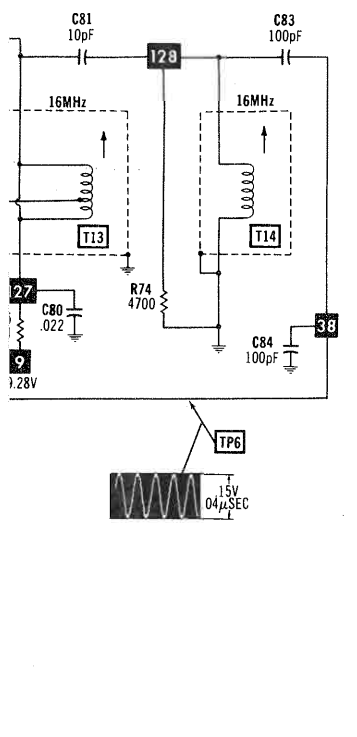
WITH **SCUITRACE**

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MAIN SCHEMATIC







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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. 9467 (5 conductor-1 shielded)(6 ft.)(AWG28)

SEMICONDUCTORS (Select replacement transistor for best results)

ITEM No.	TYPE No.	MFG. 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	BA244	DX-1096	GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062	103-131
D2	BA244	DX-1096	GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062	103-131
D3	BA244	DX-1096	GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062	103-131
D4	WG713	DX-0543	GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062	103-131
	1S1588	DX-0543	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925	103-287
	1S953	DX-0543	GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062	103-131
D5	1N60	DX-0162	1N60	PTC206	REN 109	SK3088	ECG109	TM109/**	WEP134	103-29001
	1N60P	DX-0162	1N60	PTC206	REN 109	SK3088	ECG109	TM109/**	WEP134	103-29001
	1S188FM	DX-0162	1N34AS	PTC207	REN 109	SK3087	ECG109	TM109/**	WEP134	103-29001
D6	WG713	DX-0543	GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062	103-131
	1S1588	DX-0543	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925	103-287
	1S593	DX-0543	GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062	103-131
D7	WG713	DX-0543	GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062	103-131
	1S1588	DX-0543	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925	103-287
	1S953	DX-0543	GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062	103-131
D8	H25C1	DX-1097	ZN5.1B	PTC214	REN 177	SK3776/5010	ECG5010	TM5010	WEP1411	103-279-10
D9	WG713	DX-0543	GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062	103-131
	1S1588	DX-0543	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925	103-287
	1S953	DX-0543	GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062	103-131
D10	WG713	DX-0543	GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062	103-131
	1S1588	DX-0543	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925	103-287
	1S953	DX-0543	GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062	103-131
D11	10E1	DX-1039	GE-504A	PTC201	REN 116	SK3311	ECG116	TM116	WEP156	212-76-02
	SR1K	DX-1039	GE-504A	PTC201	REN 116	SK3311	ECG116	TM116	WEP156	212-76-02
D12	ITT310S	DX-1080	GE-90	PTC214	REN 614	SK3175/177	ECG177	TM177	WEP200	103-219
D13	WG713	DX-0543	GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062	103-131
	1S1588	DX-0543	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925	103-287
	1S953	DX-0543	GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062	103-131
D14	WG713	DX-0543	GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062	103-131
	1S1588	DX-0543	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925	103-287
	1S953	DX-0543	GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062	103-131
D15	WG713	DX-0543	GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062	103-131
	1S1588	DX-0543	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925	103-287
	1S953	DX-0543	GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062	103-131
D16	WZ130	DX-0537	ZM13A	PTC214	REN 177	SK3788/5022	ECG5022	TM5022	WEP1424	103-131
D17	WG713	DX-0543	GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062	103-287
	1S1588	DX-0543	GE-514	PTC214	REN 177	SK3100/519	ECG519	TM519	WEP925	103-131
	1S953	DX-0543	GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062	103-131
D19	10E1	DX-1039	GE-504A	PTC201	REN 116	SK3311	ECG116	TM116	WEP156	212-76-02
	SR1K	DX-1039	GE-504A	PTC201	REN 116	SK3311	ECG116	TM116	WEP156	212-76-02
D20	H26C2	DX-1098	ZM6.2A	PTC214	REN 177	SK3779/5013	ECG5013	TM5013	WEP1414	103-131
D22	WG713	DX-0543	GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062	103-131
IC1	UPD2814C	MX-3540								
IC2	HD42853	MX-3540								
IC2	LM3900N	MX-3231								
IC3	LM3900	MX-3372								
IC4	UPC1156H2	MX-3256								
IC5	TA7310P	MX-3545								
IC6	TA7310P-Y	MX-3256								
IC6	78L09A									
Q1	NJM78L09A	MX-3544								
	2SC930E		GE-60*	PTC132*	REN 229	SK3356	ECG229*	TM229/**	WEP380	121-Z9021*
	2SC460		GE-61*	PTC136*	REN 107	SK3122	ECG107	TM107/**	WEP460	121-Z9000*
	2SC461		GE-61*	PTC121*	REN 108*	SK3122	ECG108*	TM108*	WEP394	121-Z9000*
Q2	2SC945Q		GE-212	PTC121*	REN 199	SK3124/289	ECG199	TM199/**	WEP1945	121-972
	2SC945		GE-212	PTC121*	REN 199	SK3124/289	ECG199	TM199/**	WEP1945	121-972
	2SC930		GE-60*	PTC132*	REN 229	SK3356	ECG229*	TM229/**	WEP380	121-Z9021*
	2SC461		GE-61*	PTC121*	REN 108*	SK3122	ECG108*	TM108*	WEP394	121-Z9000*
Q3	2SC1675L		GE-213	PTC132*	REN 229*	SK3122	ECG229*	TM229*	WEP773	121-Z9021*
	2SC1675		GE-213	PTC132*	REN 229*	SK3122	ECG229*	TM229*	WEP773	121-Z9021*
	2SC1342		GE-61*	PTC132	REN 229*	SK3124/289	ECG229*	TM229*	WEP784	121-Z9021
Q4	2SC1675L		GE-213	PTC132*	REN 229*	SK3122	ECG229*	TM229*	WEP773	121-Z9021
	2SC1675		GE-213	PTC132*	REN 229*	SK3122	ECG229*	TM229*	WEP773	121-Z9021
	2SC1342		GE-61*	PTC132	REN 229*	SK3124/289	ECG229*	TM229*	WEP784	121-Z9021
Q5	2SC1675L		GE-213	PTC132*	REN 229*	SK3122	ECG229*	TM229*	WEP773	121-Z9021
	2SC1675		GE-213	PTC132*	REN 229*	SK3122	ECG229*	TM229*	WEP773	121-Z9021
	2SC1342		GE-61*	PTC132	REN 229*	SK3124/289	ECG229*	TM229*	WEP784	121-Z9021
Q6	2SC930E		GE-60*	PTC132*	REN 229	SK3356	ECG229*	TM229/**	WEP380	121-Z9021*
	2SC930		GE-60*	PTC132*	REN 229	SK3356	ECG229*	TM229/**	WEP380	121-Z9021*
	2SC460		GE-61*	PTC136*	REN 107	SK3122	ECG107	TM107/**	WEP460	121-Z9000*
Q7	2SC930E		GE-60*	PTC132*	REN 229	SK3356	ECG229*	TM229/**	WEP380	121-Z9021*
	2SC930		GE-60*	PTC132*	REN 229	SK3356	ECG229*	TM229/**	WEP380	121-Z9021*
	2SC460		GE-61*	PTC136*	REN 107	SK3122	ECG107	TM107/**	WEP460	121-Z9000*
Q8	2SK41E		GE-FET-2	PTC161	REN 132*	SK3834/132	ECG132*	TM132*	WEP920	121-756
	2SK41		GE-FET-2	PTC161	REN 132*	SK3834/132	ECG132*	TM132*	WEP920	121-756
	2SK41E2		GE-FET-2	PTC161	REN 132*	SK3834/132	ECG132*	TM132*	WEP920	121-756
Q9	2SC945Q		GE-212	PTC121*	REN 199	SK3124/289	ECG199	TM199/**	WEP1945	121-972
	2SC945		GE-212	PTC121*	REN 199	SK3124/289	ECG199	TM199/**	WEP1945	121-972
	2SC460		GE-61*	PTC136*	REN 107	SK3122	ECG107	TM107/**	WEP460	121-Z9000*
Q10	2SC945Q		GE-212	PTC121*	REN 199	SK3124/289	ECG199	TM199/**	WEP1945	121-972
	2SC945		GE-212	PTC121*	REN 199	SK3124/289	ECG199	TM199/**	WEP1945	121-972
	2SC1175		GE-210	PTC123*	REN 123A*	SK3444/123A	ECG123A*	TM123A*	WEP774	121-Z9000A*
Q11	2SC945Q		GE-212	PTC121*	REN 199	SK3124/289	ECG199	TM199/**	WEP1945	121-972
	2SC945		GE-212	PTC121*	REN 199	SK3124/289	ECG199	TM199/**	WEP1945	121-972
	2SC735		GE-210	PTC123*	REN 199	SK3124/289	ECG199	TM199/**	WEP1945	121-972
	2SC536		GE-212	PTC121*	REN 199	SK3122	ECG199	TM199	WEP735A	121-Z9000A*
	2SC458		GE-210	PTC121*	REN 289	SK3124/289	ECG289	TM289/**	WEP536	121-972
									WEP458	121-Z9000A*

REALISTIC MODEL TRC-421 (21-1530)

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.
Q12	2SC945Q		GE-212	PTC121*	REN 199	SK3124/289	ECG195	TM199/**	WEP1945	121-972
	2SC945		GE-212	PTC121*	REN 199	SK3124/289	ECG195	TM199/**	WEP1945	121-972
	2SC373		GE-212	PTC121*	REN 199	SK3245/199	ECG195	TM199/**	WEP373	121-972
	2SC693		GE-62	PTC136*	REN 199	SK3124/289	ECG195	TM199	WEP66	121-972
Q13	2SC945Q		GE-212	PTC121*	REN 199	SK3124/289	ECG195	TM199/**	WEP1945	121-972
	2SC945		GE-212	PTC121*	REN 199	SK3124/289	ECG195	TM199/**	WEP1945	121-972
	2SC735		GE-210	PTC123*	REN 289	SK3122	ECG285	TM289/**	WEP735A	121-29000A*
	2SC1175E		GE-210	PTC123*	REN 123A*	SK3444/123A	ECG123A*	TM123A*	WEP774	121-29000A*
Q14	2SC1175		GE-210	PTC123*	REN 123A*	SK3444/123A	ECG123A*	TM123A*	WEP774	121-29000A*
	2SC945		GE-212	PTC121*	REN 199	SK3124/289	ECG195	TM199/**	WEP1945	121-972
	2SC735		GE-210	PTC123*	REN 289	SK3122	ECG285	TM289/**	WEP735A	121-29000A*
	2SC2086		GE-47*	PTC143*	REN 293*	SK3842	ECG293*	TM293*	WEP914	121-880
Q15	2SC1957		GE-270	PTC180	REN 295	SK3253/295	ECG295	TM295	WEP913	121-29039
	2SC2166		GE-215	PTC186	REN 235	SK3197/235	ECG235	TM235	WEP736*	121-29039
	2SC1909		GE-215	PTC186	REN 235	SK3197/235	ECG235	TM235	WEP785	121-29039
	2SC945K		GE-212	PTC121*	REN 199	SK3124/289	ECG195	TM199/**	WEP1945	121-972
Q17	2SC945		GE-212	PTC121*	REN 199	SK3124/289	ECG195	TM199/**	WEP1945	121-972
	2SC460		GE-61*	PTC136*	REN 107	SK3124/289	ECG107	TM107/**	WEP460	121-29000*

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

ELECTROLYTIC CAPACITORS

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA			
			CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
					Q-LINE	GENERAL LINE
C11	1 50V		PC1-50	VTT1A50	QV1-11	EV-1615
C14	10 16V		PC10-25	VTT10B25	QV1-41	EV-1222
C27	47 16V		PC50-16	VTT47D16	QV1-73	EV-1226
	100 16V		PC100-16	VTT100F16	QV1-95	EV-1231
C29	10 16V		PC10-25	VTT10B25	QV1-41	EV-1222
C31	.47 50V		PC1-50	VTT47A63	QV1-3	EV-1610
C34	1 25V			TDC105H035EL		S035-19
C35	1 50V		PC1-50	VTT1A50	QV1-11	EV-1615
C48	47 16V		PC50-16	VTT47D16	QV1-73	EV-1226
C49	10 16V		PC10-25	VTT10B25	QV1-41	EV-1222
C50	.47 50V		PC1-50	VTT47A63	QV1-3	EV-1610
C58	10 16V		PC10-25	VTT10B25	QV1-41	EV-1222
C59	100 16V		PC100-10	VTT100E10	QV1-93	EV-1131
C63	1000 16V		PC1000-16	VTT1000L16	QV1-183	EV-1261
C64	47 10V		PC50-16	VTT47D16	QV1-73	EV-1226
C66	470 16V		PC500-16	VTT470K16	QV1-151	EV-1251
C69	33 16V		PC30-25	VTT33D25	QV1-63	EV-1325
C85	1 50V			TDC105H050EL	QDT1-25	S050-19
C87	4.7 33V		PC5-50	VTT47R750	QV1-31	EV-1619.1
C88	22 16V		PC25-25	VTT22B16	QV1-55	EV-1224
C93	1 50V		PC1-50	VTT1A50	QV1-11	EV-1615
C95	100 16V		PC100-16	VTT100F16	QV1-95	EV-1231
C133	10 16V		PC10-25	VTT10B25	QV1-41	EV-1222
C137	1 50V		PC1-50	VTT1A50	QV1-11	EV-1615

CAPACITORS

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA			
			CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
					Q-LINE	GENERAL LINE
C1	220 50V 10%		CD15F0221J03	SX322	QW1-35	MWA-221
C2	220 50V 10%		CD15F0221J03	SX322	QW1-35	MWA-221
C3	33 NPO 50V 10%		NP033	CN0433		10TCC-Q33
C4	22 NPO 50V 10%		NP022	CN0422		10TCC-Q22
C5	47 50V 10%		NP047	CN0447		10TCC-Q47
C6	1 50V +.25			CN0510		
C7	.01 25V			MAG2511		HY-520
C8	.01 25V			MAG2511		HY-520
C9	33 NPO 50V 10%		NP033	CN0433		10TCC-Q33
C10	.022 25V					HY-725
C12	12 NPO 50V 10%			CN0412		10TCC-Q12
C13	.022 25V					HY-725
C15	10 50V 10%		NP010	CN0410		10TCC-Q10
C16	15 NPO 50V 10%		NP015	CN0415		10TCC-Q15
C17	.047 25V			MAG2515		HY-735
C18	.047 25V			MAG2515		HY-735
	.01 25V			MAG2511		HY-520
C19	330 50V 5%		GP330	GIP333		10TS-T33
C20	4 50V +.25			CN0547		
C21	.047 25V			MAG2515		HY-735
C22	.047 25V			MAG2515		HY-735
C23	.022 50V 10%		DPMS2522	M192P2239R8	QFT2-127	1FT-S22
C24	.047 25V			MAG2515		HY-735
C25	.047 25V			MAG2515		HY-735
C26	.022 25V			MAG2515		HY-725
C28	.022 25V					HY-725
C30	.01 50V 10%		WMF1S1	M192P1039R8	QFT2-91	1FT-S10
C32	.0047 50V 10%		WMF1D47	M192P4729R8	QFT2-63	1FT-D47
C33	.022 50V			M192P2239R8		192P2239R8
C36	.022 50V			M192P2239R8		192P2239R8
C38	12 50V 10%		CD15E0820J03	SX482	QW1-25	MWA-820
C39	12 50V 10%			CN0412		10TCC-Q12
C40	1 NPO 50V +.25			CN0510		
C41	2 50V +.25			CN0522		
C42	220 50V 10%					10TCC-T22
C43	12 50V 10%			CN0412		10TCC-Q12
C44	75 50V 10%		NP075	CN0475		10TCC-Q75
C45	470 50V 10%		GP470	GP347		10TS-T47
C46	.022 50V			M192P2239R8		192P2239R8
C51	.01 25V			MA132511		HY-520
C52	2 50V +.25			CN0522		

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
C53	.01 50V 10%		WMF1S1	M192P1039R8	QFT2-91	1FT-S10
C54	.022 50V 10%		DPMS2S22	M192P2239R8	QFT2-127	1FT-S22
C55	.01 50V 10%		WMF1S1	M192P1039R8	QFT2-91	1FT-S10
C56	.018 50V 10%			M192P1839R8		1S2P1839R8
C57	.0047 50V 10%		WMF1D47	M192P4729R8	QFT2-63	1FT-D47
C60	.0047 50V 10%		WMF1D47	M192P4729R8	QFT2-63	1FT-D47
C61	100 50V 10%					
C62	.068 50V 10%		WMF1S68	EWF1A168	QF1-195	1PB-S68
C65	220 50V 10%					
C67	.068 50V 10%		WMF1S68	EWF1A168	QF1-195	1PB-S68
C68	.001 50V 10%		DPMS6D1	M192P10292	QFT2-1	1FT-D10
C70	.022 50V 10%		DPMS2S22	M192P2239R8	QFT2-127	1FT-S22
C71	5 50V +.5			CN0522		10TCC-V50
C72	2 50V +.25			*		
C73	100 N220 50V 5%					
C74	47 50V 5%		NP047	CN0447		10TCC-T10
C75	39 50V 5%			CN0439		10TCC-Q47
C76	.022 25V			*		10TCC-Q39
C77	8 50V +.5					HY-725
C78	.022 25V					10TCC-V82
C79	.022 25V					HY-725
C80	.022 25V					HY-725
C81	10 50V +.5			*		10TCC-Q10
C82	.022 25V					HY-725
C83	100 50V 10%		CD15FD101J03	SX310	QW1-27	MMA-101
C84	100 50V 10%		CD15FD101J03	SX310	QW1-27	MMA-101
C89	.022 25V					HY-725
C90	.022 50V 10%		DPMS2S22	M192P2239R8	QFT2-127	1FT-S22
C91	.0047 50V 10%		WMF1D47	M192P4729R8	QFT2-63	1FT-D47
C92	.0047 50V 10%		WMF1D47	M192P4729R8	QFT2-63	1FT-D47
C94	.022 25V					HY-725
C96	.022 50V 10%		DPMS2S22	M192P2239R8	QFT2-127	1FT-S22
C97	.022 25V					HY-725
C98	.022 25V					HY-725
C99	.022 25V					HY-725
C100	.0047 50V 10%		WMF1D47	M192P4729R8	QFT2-63	1FT-D47
C101	.022 25V					HY-725
C102	.0047 50V 10%		WMF1D47	M192P4729R8	QFT2-63	1FT-D47
C103	.022 25V					HY-725
C104	82 50V 10%		NP082	CN0482		10TCC-Q82
C105	.001 50V 10%		DPMS6D1	M192P10292	QFT2-1	1FT-D10
C106	330 50V 10%		GP330	GP333		10TS-T33
C107	.022 25V					HY-725
C108	220 50V 10%	(1)				10TCC-T22
C109	82 50V 10%		NP082	CN0482		10TCC-Q82
C111	100 50V 10%		NP0100	CN0310		10TCC-T22
C112	.01 25V			MAG2511		10TCC-T10
C113	.01 25V			MAG2511		HY-520
C114	680 50V 10%		GP680	GP368		HY-520
C115	220 50V 10%					10TS-T68
C116	.01 25V			MAG2511		10TCC-T22
C117	100 50V 10%		NP0100	CN0310		HY-520
C118	.01 25V			MAG2511		10TCC-T10
C119	.01 25V			MAG2511		HY-520
C120	220 50V 10%					HY-520
C122	27 50V 10%			CN0427		10TCC-T22
C123	56 50V 10%			CN0456		10TCC-Q27
C124	33 50V 10%		NFQ33	CN0433		10TCC-Q56
C125	.022 50V			M192P2239R8		10TCC-Q33
C126	220 50V 10%		CD15FD221J03	SX322	QW1-35	192P2239R8
C127	39 50V 10%			CN0439		MMA-221
C128	.022 25V					10TCC-Q39
C129	.022 25V					HY-725
C130	47 50V 10%		NP047	CN0447		HY-725
C131	.0047 50V		GP4700	GP247		10TCC-Q47
C134	.001 50V 10%		DPMS6D1	M192P10292	QFT2-1	5GA-D47
C135	.01 25V			MAG2511		1FT-D10
C136	.01 25V			MAG2511		HY-520
C201	.022 25V					HY-520
C202	.022 25V					HY-725
C203	.022 25V					HY-725
C204	.022 25V					HY-725
C205	.022 25V					HY-725
C206	.022 25V					HY-725
C207	.022 25V					HY-725
CT1		C-0751				

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

(1) Used with IC1 Part Number UPD2814C.

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	IF AGC	1000	P-6493		U260R102B
VR2	Squelch Range	10K	P-6494		U260R103B
VR3	Squelch	10K	P-3087		
VR4a	CB Volume	50K	P-1870(19)		
VR4b	PA Volume/Power Switch	10000			
VR5	Signal Meter	22K	P-6495		U260R253B
VR6	RF Meter	33K	P-1873		U260R503B

(19) Includes VR4a, VR5b and Power Switch.

REALISTIC MODEL TRC-421 (21-1530)

PARTS LIST AND DESCRIPTION (CONTINUED)

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

COILS (RF-IF)

ITEM No.	FUNCTION	REPLACEMENT DATA			REMARKS
		PART No.	OTHER IDENTIFICATION	MILLER PART No.	
L1	P1 Filter	CA-3548	P-380043		
L2	RF Choke	CB-2318	P-380098		
L3	RF Choke	CB-2318	P-380098		
L5	RF Choke	CB-2318	P-380098		
L7	RF Choke	CB-2318	P-380098		
L8	RF Choke	CB-2394	P-360026		
L9	XMT Driver (27MHz)	CA-3915	P-380154		
L10	RF Choke	CB-2395	P-380157		
L11	RF Choke	CB-2284	P-380155		
L12	Final (27MHz)	CA-3914	P-380048		
L13	Loading Final	CA-3547	P0380033		
L14	RF Choke	CB-2393	P-380044		
L15	RF Choke	CB-2393	P-380156		
L201	RF Choke	CB-2318	P-380156		
T1	Rec Antenna (27MHz)	CA-0295	P-380098		
T2	Rec RF (27MHz)	CA-3916	P-110090		
T3	Red RF (27MHz)	CA-3917	P-380140		
T4	Mixer (10.695MHz)	CA-7869	P-380141		
T5	Mixer (10.695MHz)	CA-7870	P-140037		
T6	IF (455kHz)	CA-7871	P-140038		
T7	IF (455kHz)		P-130055		
T8	IF (455kHz)		P-130063		
T9	Offset Mixer (15.360MHz)	CA-7514	P-130027		
T10	PLL (10.240MHz)	CA-3918	P-380144		
T12	Buffer (16MHz)	CA-3919	P-380145		
T14	Buffer (16MHz)	CA-3921	P-3800147		
T15	XMT Mixer (27MHz)	CA-3922	P-380148		
T16	PLL (10.240MHz)	CA-3923	P-380149		
T17	XMT Mixer (27MHz)	CA-3925	P-380182		
T18	XMT PreDriver (27MHz)	CA-3545	P-380151		
T19	TVI Trap (54MHz)	CA-3908	P-380046/P-380158		
			P-380132		

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.	
T20	1.5A	.1	200uH	TA-0671 P-100522(1)			(1) Number on unit.

TRANSFORMER (Audio Output)

ITEM No.	IMPEDANCE		REPLACEMENT DATA			NOTES
	PRI.	SEC.	MFGR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T11	12.5	1 8 2 1.4	TD-0172 P-100519(1)			(1) Number on unit.

SPEAKER

ITEM No.	TYPE		REPLACEMENT DATA		NOTES
			MFGR. PART No.	QUAM PART No.	
SP	3" PM	8 Ohms	S-4676	30A05ZBR	

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	HF-1111	F-1133	AGC-2	HRK	312002	150145
							F62-2

MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
D21	Diode	L-0902	Light Emitting, GL-31AR 1.59V @ 12mA
FL1	Filter	C-0915	Crystal Filter (10F7AA) (10.695MHz)
FL2	Filter	C-0754	Ceramic Filter (CFU455H2) (455kHz)
J1	Jack	J-6574	Antenna
J2	Jack	J-0957	External Speaker
J3	Jack	J-0957	PA Speaker
J4	Jack	J-6575	(5 Pin) Mic
LED301	LED	L-0903	Channel Indicator (SG2-N52-02) (2.08V @ 7.2mA) per segment.
Mic	Microphone		(21-1172)
M1	Meter	M-0320	S-RF Meter 500uA @ 650 ohm
PC	Lamp	L-0904	Meter 13.72V @ 40mA
S1	Switch	S-2452	ANL (SLE-1242-12K)
S2	Switch	S-2452	CB-PA (SLE-1242-12K)
S3	Switch	P-1870	Power (Part of VR-4 A/B)
S301	Switch	S-1307	Channel Selector
X1	Crystal	Mx-2295	10.240MHz (HC-18/U)
	P.C. Board	P-200562	Main
	P.C. Board	X-7720	Flexible
	P.C. Board	P-200564	LED

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

ITEM	PART No.	ITEM	PART No.
Case Bottom	Z-4038	Front Plate	HB-7591
Case Top	Z-4037	Knob for Channel Selector	K-2893
Chassis	P-400200	Knob for Volume & Squelch	K-2894
Front Panel	Z-4039		