

PHOTOFACT[®] with

CIRCUITRACE[®]

For Supplier Address See PHOTOFACT Index

NOTE

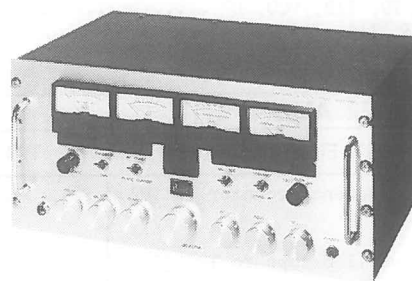
Repair or adjustment of transmitter circuits must be under supervision of a person with first-or second-class radiotelephone license.

(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 MARK X

DAK MODEL MARK X

General

Frequency Control.....	PLL (Phase Lock Loop) Synthesizer
Channel	40 channels all installed
Mode of Operation	AM, LSB & USB
Power Source Voltage	117 VAC
Speaker (built-in).....	4" dynamic type
Microphone	Low impedance or transistorised optional DM 100 power mike available

Receiver

System	SSB: Single Conversion superheterodyne AM: Dual conversion superheterodyne
Sensitivity.....	SSB: 0.25uV for 10dB S/N ratio AM: 1 uV for 10 dB S/N ratio
Selectivity.....	SSB: 2.4 KHz at 6 dB down AM: 6 kHz at 6 dB down
Clarifier	± 600 Hz
Audio Output	3 watts to 8 ohms
Squelch Range	SSB: 0.7uV to 1000 uV AM: 1uV to 1000 uV
IF	SSB: 10.695MHz AM: 1st: 10.695 MHz 2nd: 0.455 MHz

Transmitter SSB

Generation	Double balanced modulator with crystal lattice filter
RF OUTPUT power.....	12 watts (PEP FCC max.)
Carrier Suppression.....	40 dB below mean power output
Unwanted Sideband Suppression.....	at least 60dB below modulated carrier level at + 20 kHz from carrier
Harmonic Suppression	at least 60dB below modulated carrier level

Transmitter AM

Modulation.....	High level pushpull modulator
RF Output Power.....	4 watts (FCC max.)
Harmonic Suppression	at least 60dB

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:
T1 thru T9, T12, VCO, L7 9440
T10, T13, T14, T15 5000, 5009, 8276, 8728, 9089
L201, L902 8282, 8606, 9302, 9440
CT1 thru CT5, C902, C903 5000, 8276, 9089

SYNTHESIZER ALIGNMENT

TEST EQUIPMENT	TRANSCIVER	ADJUST	REMARKS
Input of frequency counter to TP2 (IC1 Pin 3).	Ch. 19, AM	CT3	Adjust for 10.240MHz $\pm$ 50Hz.
Input of oscilloscope to TP3 (IC2 Pin 4).	Ch. 19, AM	T3	Adjust for maximum RF (130mV p-p typical). (See Figure 2.)
Input of frequency counter to TP3 (IC2 Pin 4).	Ch. 19, AM/USB Clarifier Midrange	CT1	Adjust for 20.105MHz $\pm$ 40Hz.
Input of frequency counter to TP3 (IC2 Pin 4).	Ch. 19, LSB Clarifier Midrange	CT2	Adjust for 20.1035MHz $\pm$ 40Hz.
Input of DC meter to TP1 (VCO block Pin 1).	Ch. 1, AM	VCO	Adjust for 3.00 volts $\pm$.1 volt. Check for approximate .70 to 1.40 volts on channel 40.
Input of frequency counter to TP6 (IC1 Pin 2).	Ch. 1, AM		Check for 2.550MHz. Check all channels. (See Truth Chart for correct frequencies.)
Input of oscilloscope to TP7 (T2 Secondary).	Ch. 40, AM	T1	Adjust for maximum RF (50mV p-p typical). (See Figure 3.)
Input of oscilloscope to TP7 (T2 Secondary).	Ch. 1, AM	T2	Adjust for maximum RF (50mV p-p typical). (See Figure 3.)
Input of frequency counter to TP7 (T2 Secondary).	Ch. 1, AM/USB Clarifier Midrange		Check for 37.660MHz. If necessary readjust CT1 for correct frequency. Check all channels. (See Truth Chart for correct frequencies.)
Input of frequency counter to TP7 (T2 Secondary).	Ch. 1, LSB Clarifier Midrange		Check for 37.657MHz. If necessary readjust CT2 for correct frequency. Check all channels. (See Truth Chart for correct frequencies.)
Input of frequency counter to TP5 (Junction of C70 and C71).	Ch. 19, USB	CT5	Adjust for 10.695MHz $\pm$ 50Hz.
Input of frequency counter to TP5 (Junction of C70 and C71).	Ch. 19, LSB	CT4	Adjust for 10.692MHz $\pm$ 50Hz.

RECEIVER ALIGNMENT

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

TEST EQUIPMENT	TRANSCIVER	ADJUST	REMARKS
Output of signal generator thru .01uF to TP8 (T13 tap). 455kHz, 1000Hz @ 30% modulation.	Ch. 19, AM Clarifier Midrange	T14, T15	Adjust for maximum output.

RECEIVER ALIGNMENT (Continued)

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Output of signal generator thru .01uF to antenna input. 27.185MHz, 1000Hz @ 30% modulation.	Ch. 19, AM Clarifier Midrange	T13,T10,T9, T8,T7	Adjust for maximum output. Readjust T14 and T15 for maximum.
Output of signal generator thru .01uF to antenna input. 27.185MHz, 1000Hz @ 30% modulation.	Ch. 19, USB Clarifier Midrange	T12,T11	Adjust for maximum output.

RECEIVER ADJUSTMENTS

Connect an AC VTVM or AF wattmeter across speaker voice coil.
Adjust volume control to obtain a suitable indication.
Preset controls as follows, unless otherwise noted: RF Gain Maximum, Clarifier Midrange, AGC Off, Squelch MINIMUM, NB Off, ANL Off.

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Input of DC meter to TP10 (Junction of R81 and R85). No signal input.	Ch. 19, USB	RV8	AGC Adjust for 2.00 volts.
Output of signal generator thru .01uF to antenna input. 27.185MHz, 1000Hz @ 30% modulation. Output 1000uV.	Ch. 19, AM Squelch Maximum	RV9	AM SQUELCH RANGE Adjust so squelch just breaks.
Output of signal generator thru .01uF to antenna input. 27.186MHz, no modulation. Output 1000uV.	Ch. 19, USB Squelch Maximum	RV10	SSB SQUELCH RANGE Adjust so squelch just breaks.
Output of signal generator thru .01uF to antenna input. 27.185MHz, 1000Hz @ 30% modulation. Output 1000uV.	Ch. 19, AM	RV6	AM SIGNAL METER Adjust for 9 on signal meter.
Output of signal generator thru .01uF to antenna input. 27.186MHz, no modulation. Output 100uV.	Ch. 19, USB	RV7	SSB SIGNAL METER Adjust for 9 on signal meter.

DAK MODEL MARK X

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. Inject a 2400Hz, 2.5mV audio signal at Mic input.	Ch. 40, USB XMT Mic Gain Maximum	T4	Adjust for maximum RF output.
Input of RF wattmeter to antenna input. Inject a 2400Hz, 2.5mV audio signal at Mic input.	Ch. 1, USB XMT Mic Gain Maximum	T5	Adjust for maximum RF output.
Input of RF wattmeter to antenna input. Inject a 2400Hz, 2.5mV audio signal at Mic input.	Ch. 19, USB XMT Mic Gain Maximum RV2, SSB RF ALC, fully counterclockwise	T6,L7,L201, C902,C903, L902	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 oscilloscope or RF wattmeter to antenna input. No modulation.	Ch. 19, USB or LSB XMT Mic Gain MINIMUM	RV4,RV5	CARRIER BALANCE Adjust for MINIMUM RF output.
Input of oscilloscope to TP11 (Q7 Emitter). Inject a 2400Hz, 25mV audio signal at Mic input.	Ch. 19, USB XMT Mic Gain Maximum	RV11	SSB MIC GAIN Adjust for approximately 125 to 140mV p-p.
Input of DC meter to TP12 (VT202 Pin 8).	Ch. 19, USB XMT	RV202	SSB BIAS Adjust for .07 volts.
Input of DC meter to TP12 (VT202 Pin 8).	Ch. 19, USB XMT Mic Gain MINIMUM	RV802	SSB PLATE CURRENT METER Check for .07 volts on VT202 Pin 8. Adjust for 15mA on plate current meter.
Input of RF wattmeter to antenna input. Inject a two-tone, 25mV audio signal at Mic input.	Ch. 19, USB XMT Mic Gain Maximum	RV2	SSB RF ALC Adjust for 10.0 watts P.E.P. Check each channel for 9 to 11 watts P.E.P.
Input of oscilloscope or modulation meter to antenna input. Inject a 1000Hz, 25mV audio signal at Mic input.	Ch. 19, AM XMT Mic Gain Maximum	RV12,RV204	AMC Adjust for 90% modulation maximum. (See Figure 1.)
Input of oscilloscope or modulation meter to antenna input. Inject a 1000Hz audio signal at Mic input.	Ch. 19, AM XMT Mic Gain Maximum	RV801	% MODULATION METER Set generator output level to produce 100% modulation. Adjust RV801 for 100 on % Modulation Meter.
Input of RF wattmeter to antenna input.	Ch. 19, AM XMT Mic Gain MINIMUM	RV201	AM BIAS Adjust for 4.0 watts RF output maximum.
Input of RF wattmeter to antenna input.	Ch. 19, AM XMT	RV602	AM RF POWER METER At 4.0 watts RF output, adjust so RF Power Meter agrees with RF wattmeter.
Input of RF wattmeter to antenna input. Inject a 1000Hz, 25mV audio signal at Mic input.	Ch. 19, USB XMT	RV603	SSB RF POWER METER Adjust so RF Power Meter agrees with RF wattmeter.
Connect a 150-ohm, non-inductive load to antenna input.	Ch. 19, AM XMT SWR/CAL CAL	RV601	SWR METER Adjust calibrate for CAL on SWR Meter. Switch to SWR position and adjust RV601 for 3 on SWR Meter.

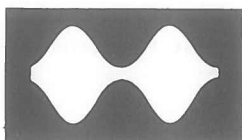


FIGURE 1

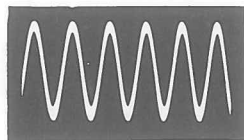


FIGURE 2

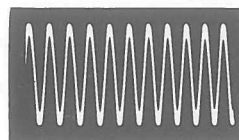
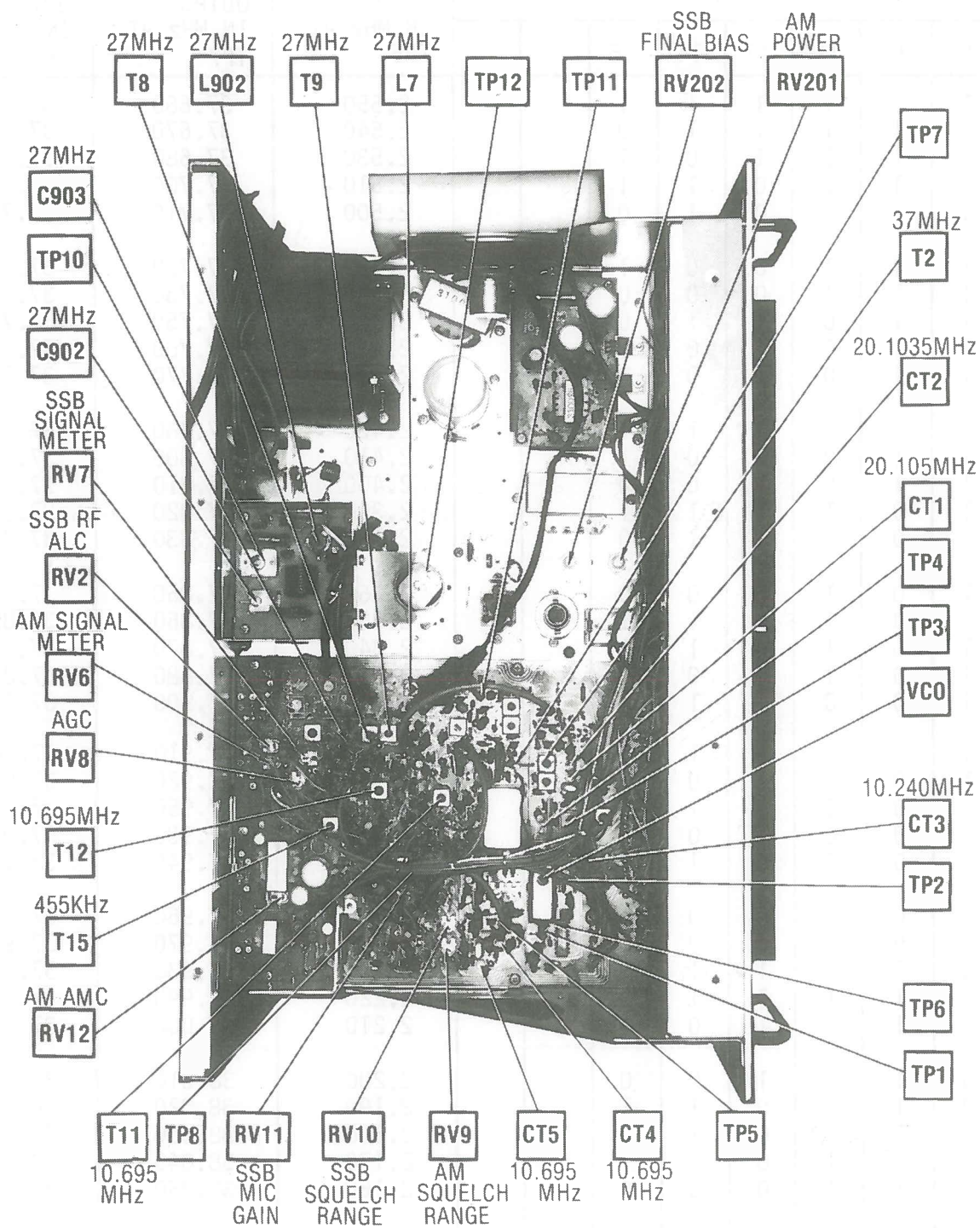


FIGURE 3

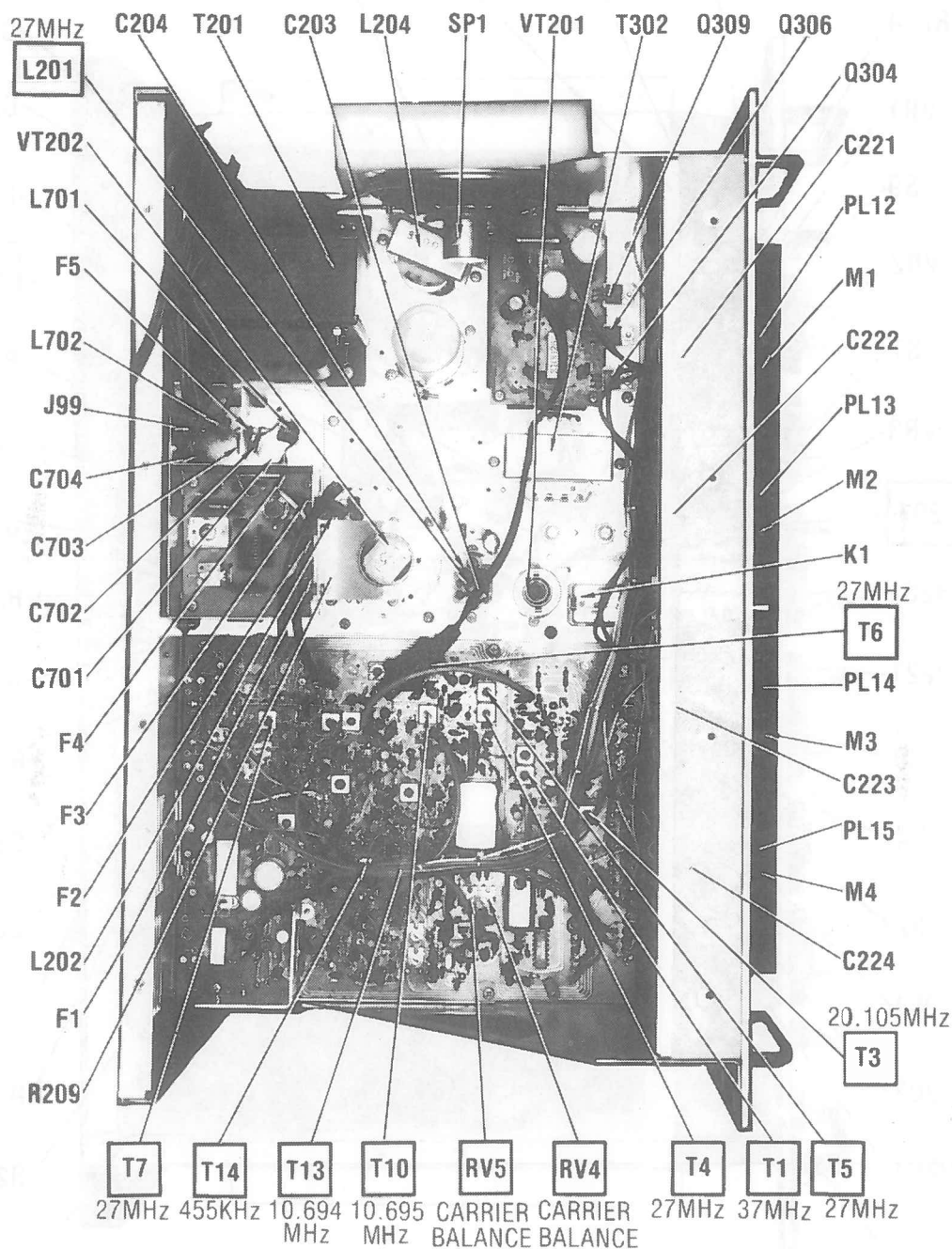
TRUTH CHART

CHANNEL	1 = 5.40 Volts 0 = 0 Volts								DIVIDER INPUT IN MHz AT TP6	AM/USB SYNTH OUTPUT IN MHz AT TP7	LSB SYNTH OUTPUT IN MHz AT TP7
	CHANNEL INPUT CODES										
	IC1 PINS										
	10	11	12	13	14	15					
1	1	1	1	1	1	1			2.550	37.660	37.657
2	1	1	1	1	1	0			2.540	37.670	37.667
3	1	1	1	1	0	1			2.530	37.680	37.677
4	1	1	1	0	1	1			2.510	37.700	37.697
5	1	1	1	0	1	0			2.500	37.710	37.707
6	1	1	1	0	0	1			2.490	37.720	37.717
7	1	1	1	0	0	0			2.480	37.730	37.727
8	1	1	0	1	1	0			2.460	37.750	37.747
9	1	1	0	1	0	1			2.450	37.760	37.757
10	1	1	0	1	0	0			2.440	37.770	37.767
11	1	1	0	0	1	1			2.430	37.780	37.777
12	1	1	0	0	0	1			2.410	37.800	37.797
13	1	1	0	0	0	0			2.400	37.810	37.807
14	1	0	1	1	1	1			2.390	37.820	37.817
15	1	0	1	1	1	0			2.380	37.830	37.827
16	1	0	1	1	0	0			2.360	37.850	37.847
17	1	0	1	0	1	1			2.350	37.860	37.857
18	1	0	1	0	1	0			2.340	37.870	37.867
19	1	0	1	0	0	1			2.330	37.880	37.877
20	1	0	0	1	1	1			2.310	37.900	37.897
21	1	0	0	1	1	0			2.300	37.910	37.907
22	1	0	0	1	0	1			2.290	37.920	37.917
23	1	0	0	0	1	0			2.260	37.950	37.947
24	1	0	0	1	0	0			2.280	37.930	37.927
25	1	0	0	0	1	1			2.270	37.940	37.937
26	1	0	0	0	0	1			2.250	37.960	37.957
27	1	0	0	0	0	0			2.240	37.970	37.967
28	0	1	1	1	1	1			2.230	37.980	37.977
29	0	1	1	1	1	0			2.220	37.990	37.987
30	0	1	1	1	0	1			2.210	38.000	37.997
31	0	1	1	1	0	0			2.200	38.010	38.007
32	0	1	1	0	1	1			2.190	38.020	38.017
33	0	1	1	0	1	0			2.180	38.030	38.027
34	0	1	1	0	0	1			2.170	38.040	38.037
35	0	1	1	0	0	0			2.160	38.050	38.047
36	0	1	0	1	1	1			2.150	38.060	38.057
37	0	1	0	1	1	0			2.140	38.070	38.067
38	0	1	0	1	0	1			2.130	38.080	38.077
39	0	1	0	1	0	0			2.120	38.090	38.087
40	0	1	0	0	1	1			2.110	38.100	38.097

DAK MODEL MARK X

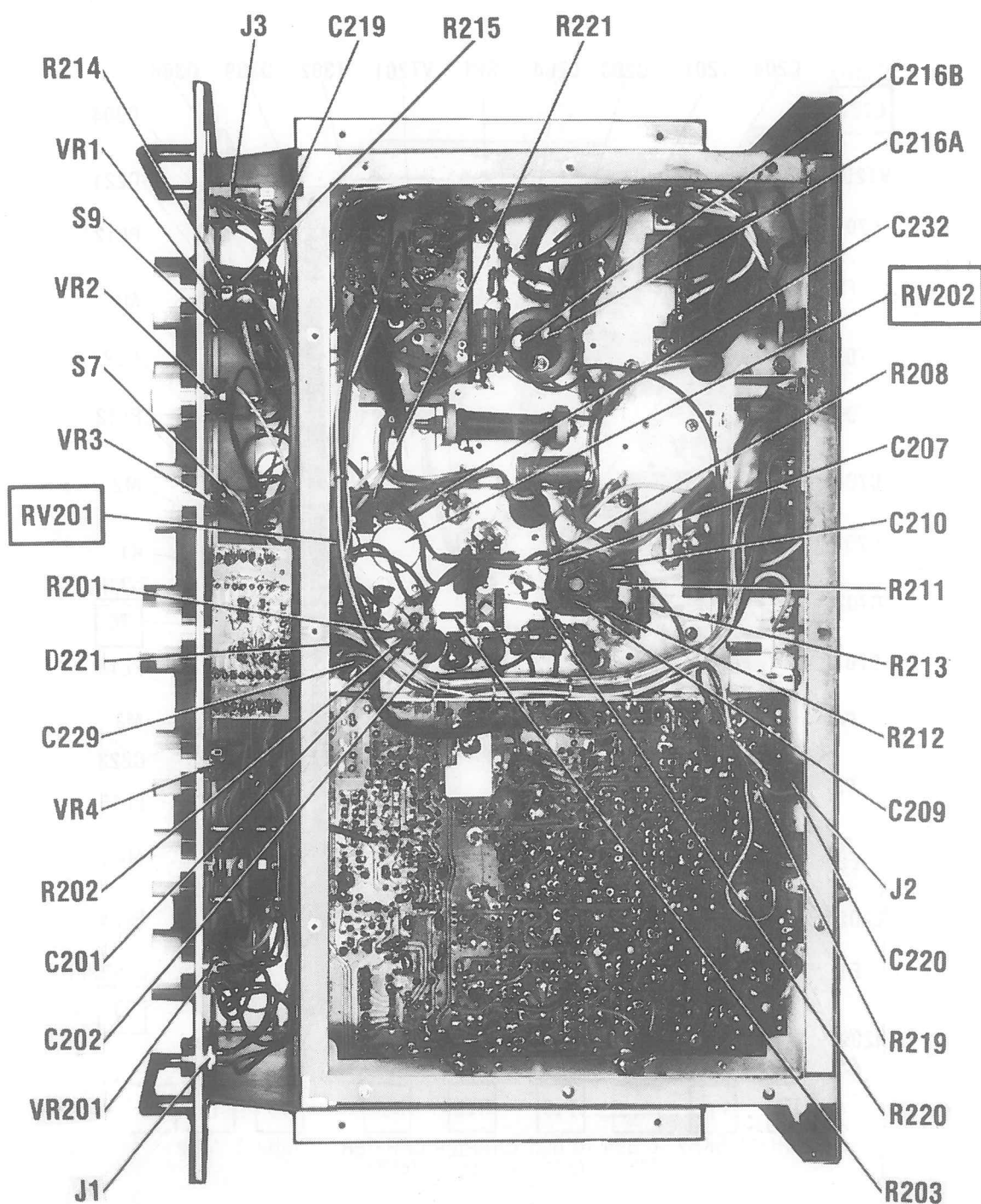


CHASSIS-TOP

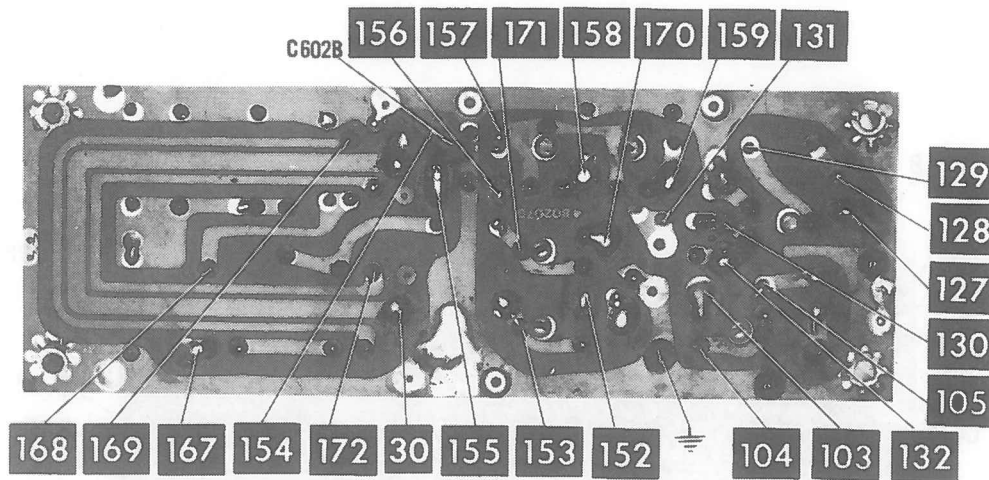


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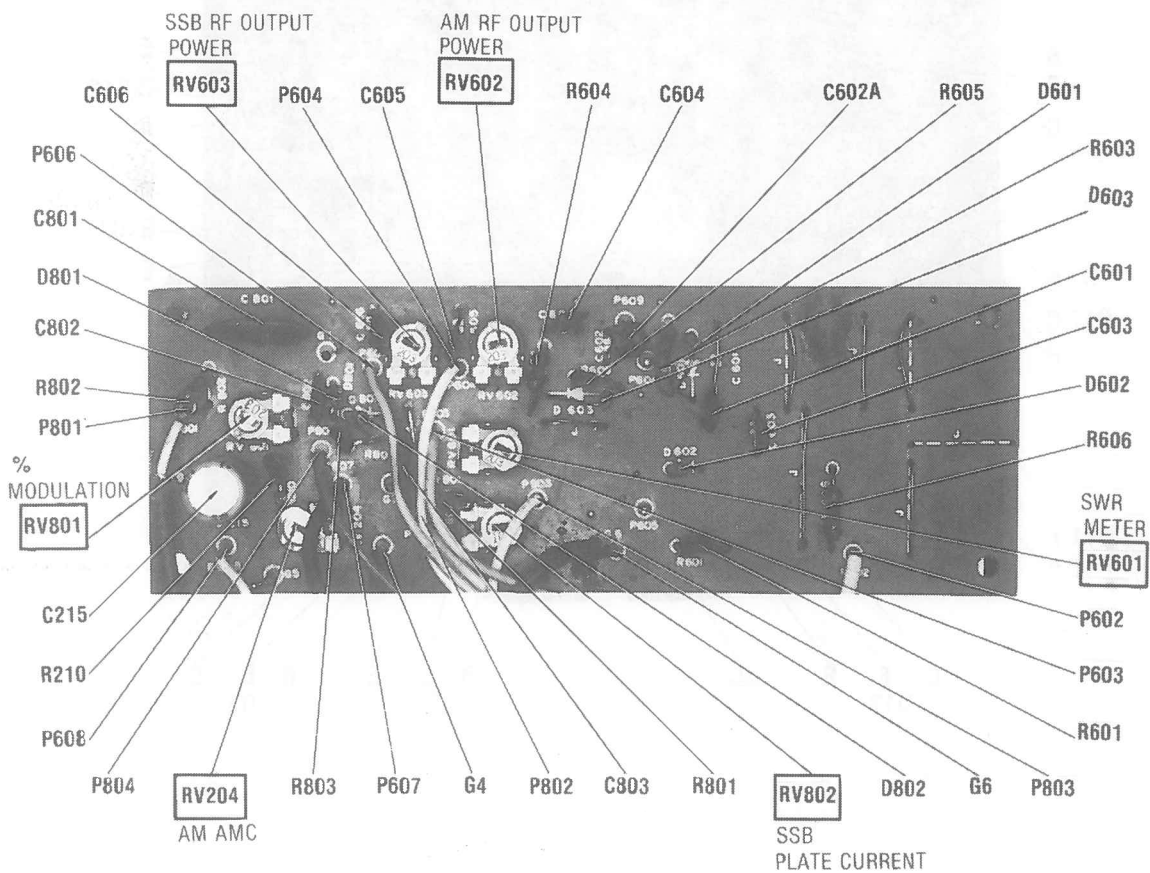
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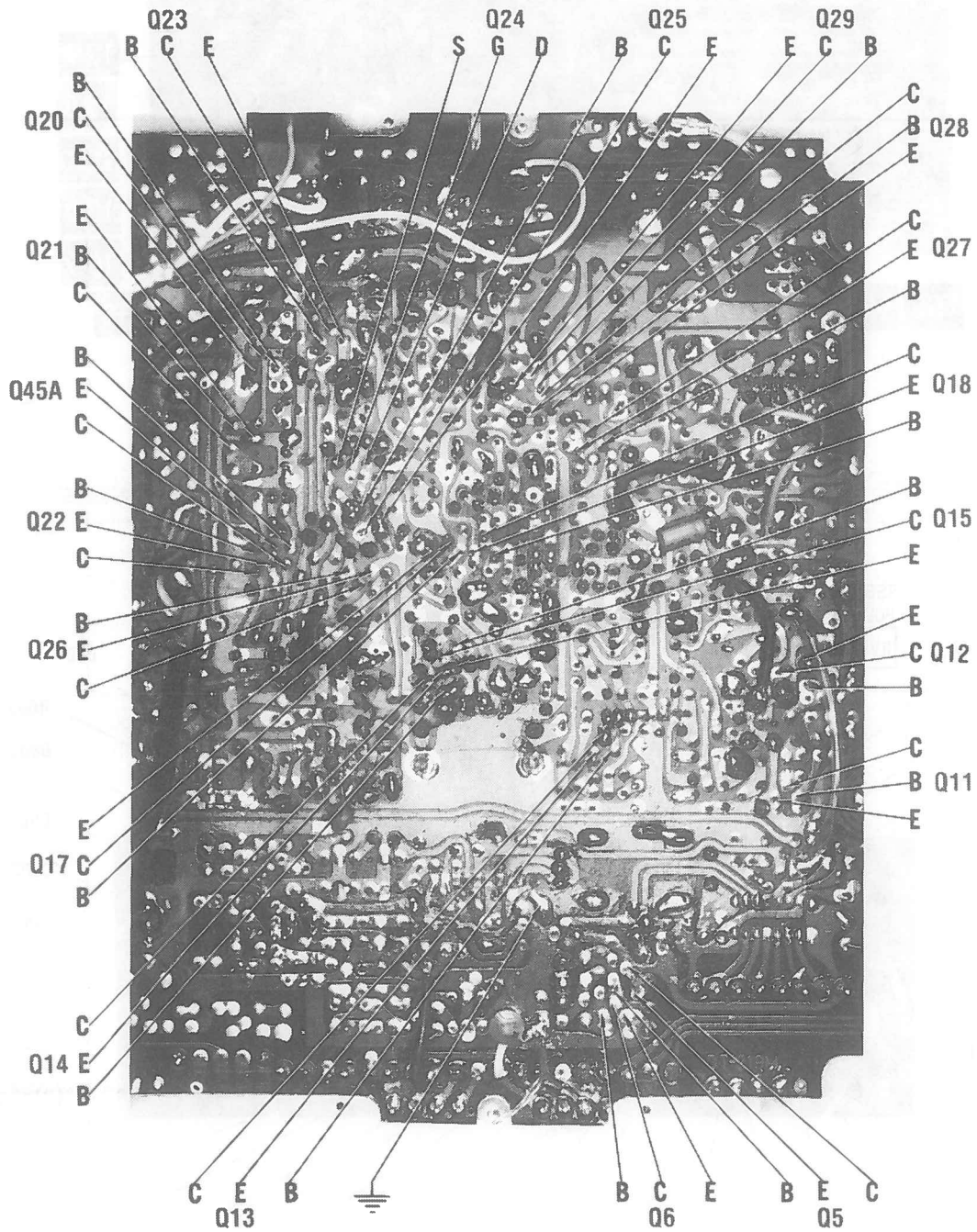
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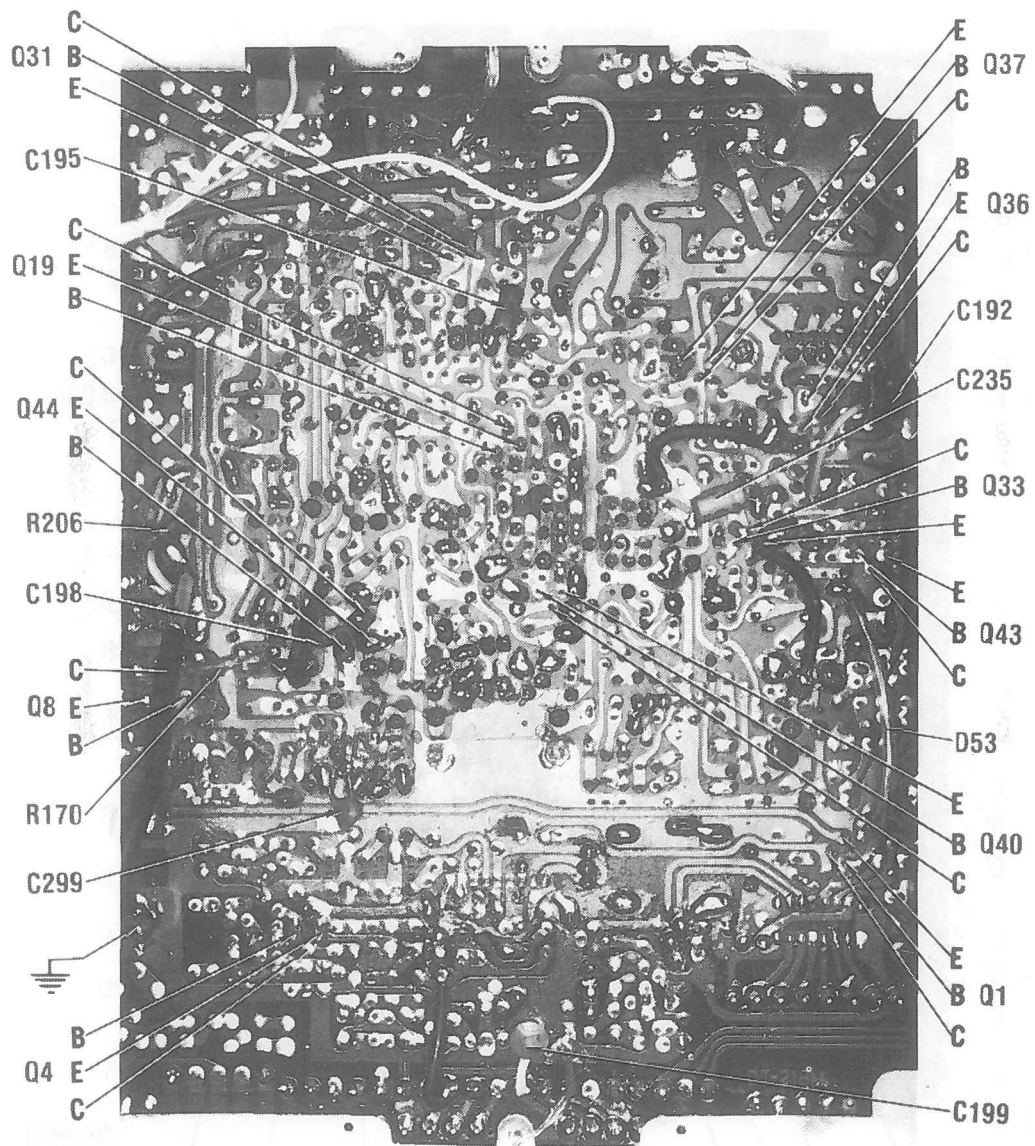
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TRANSMIT/POWER BOARD

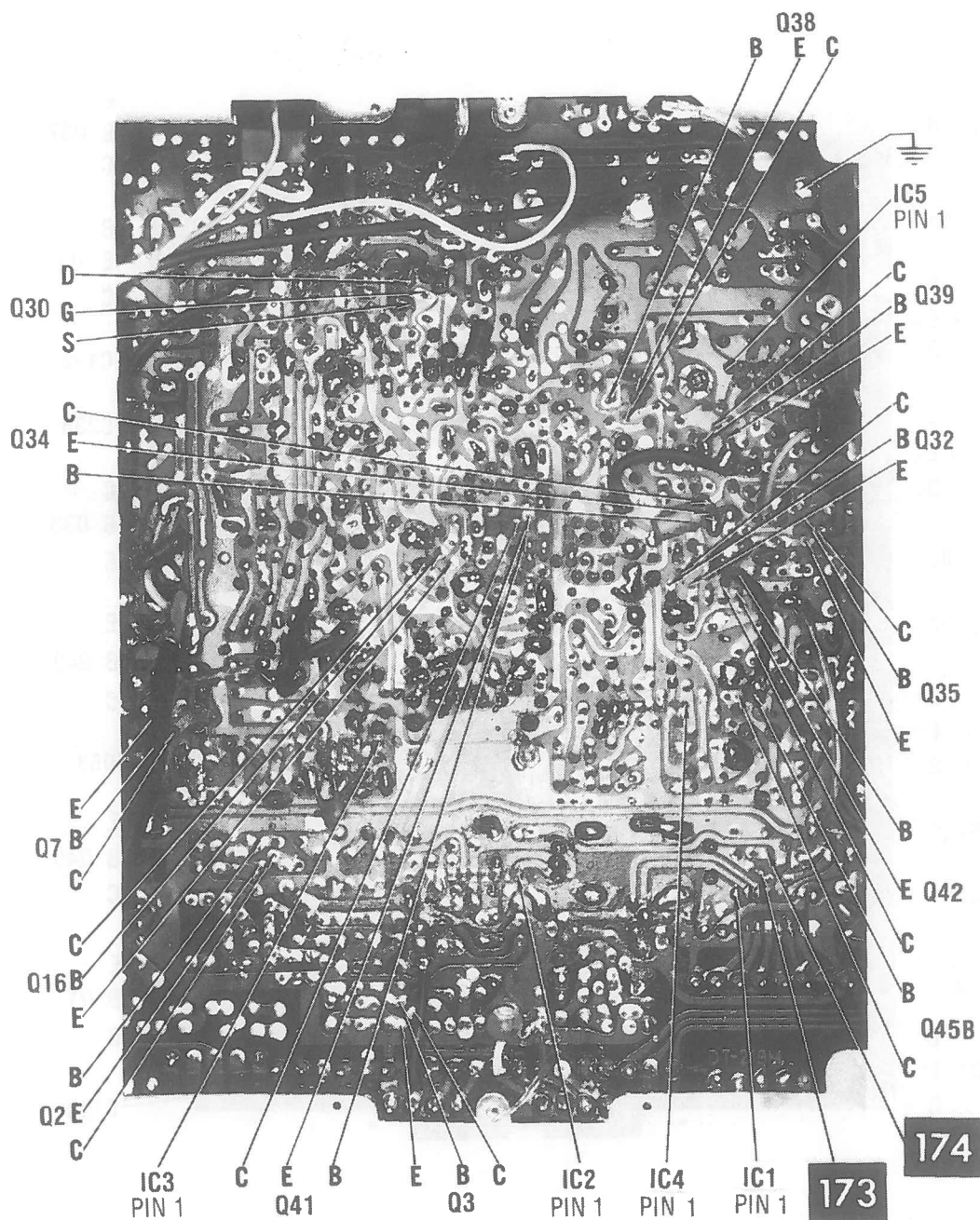


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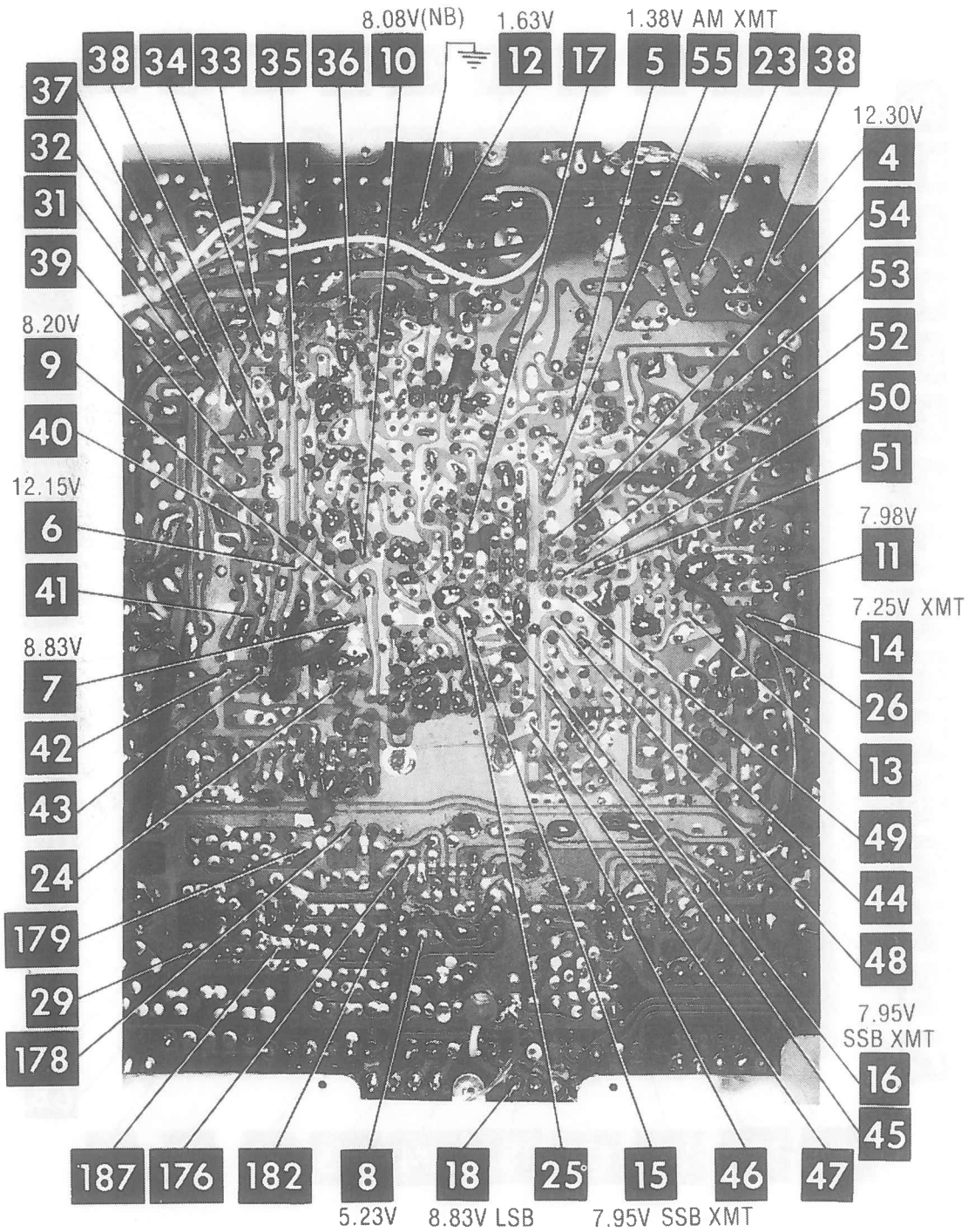


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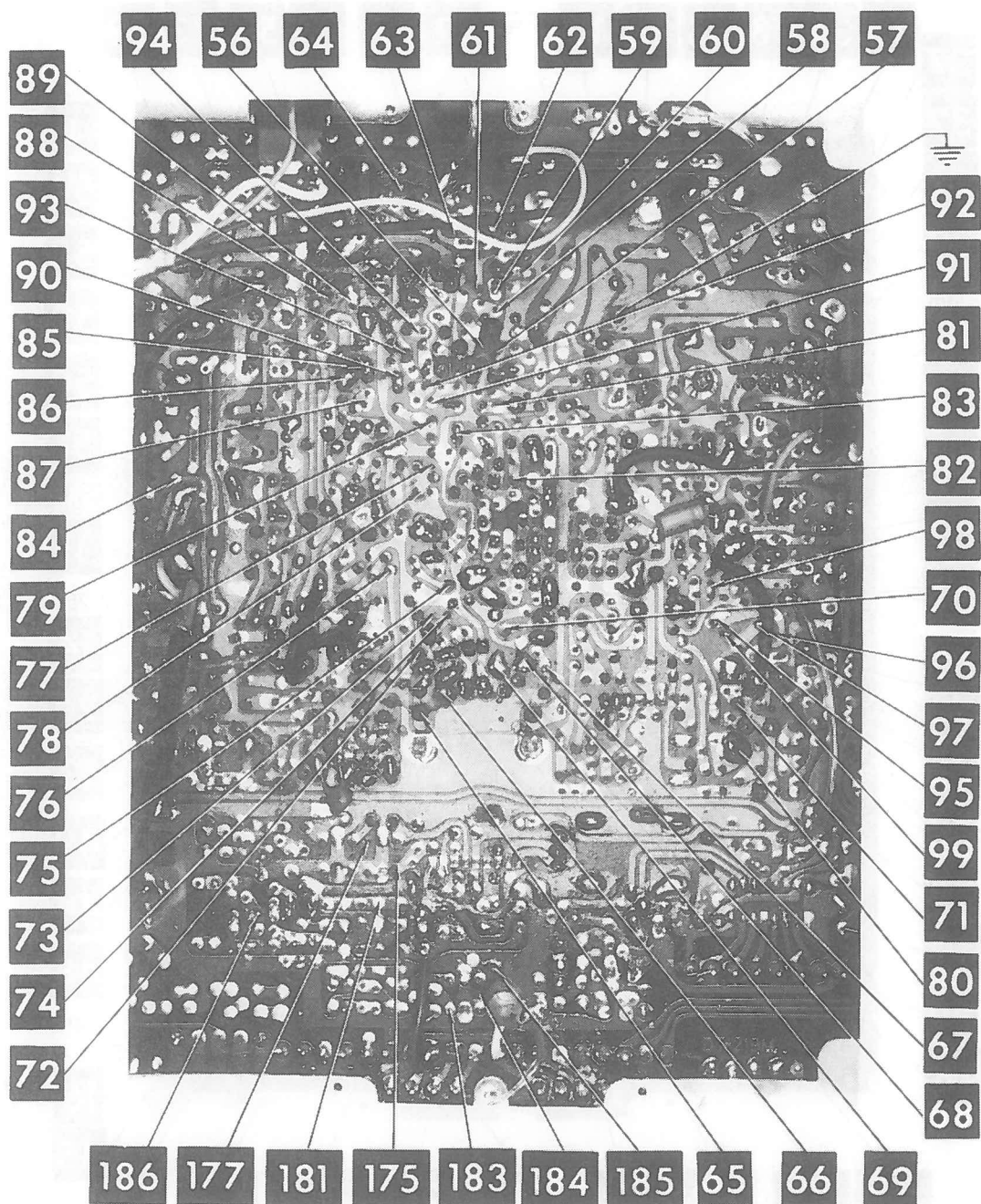


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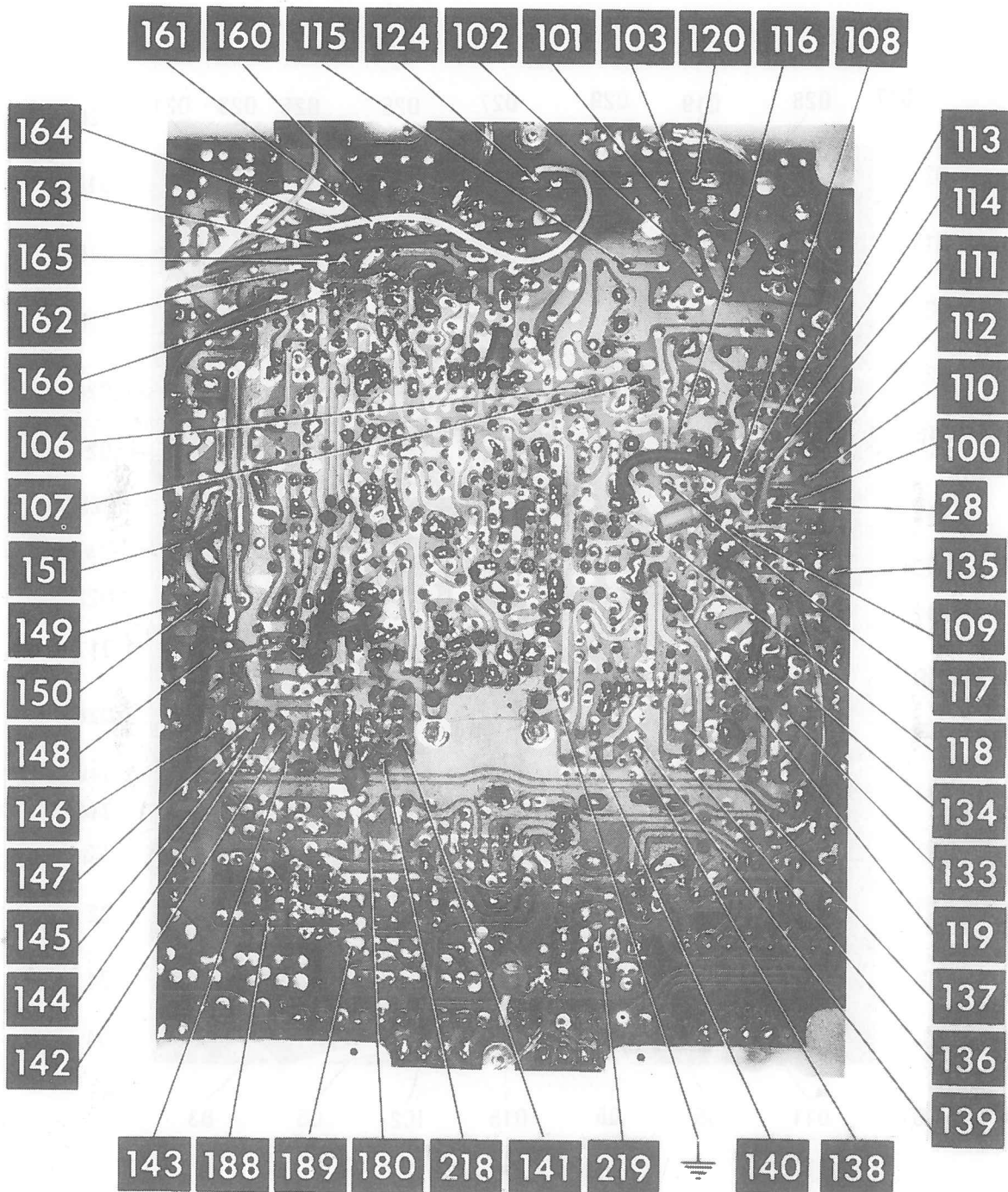
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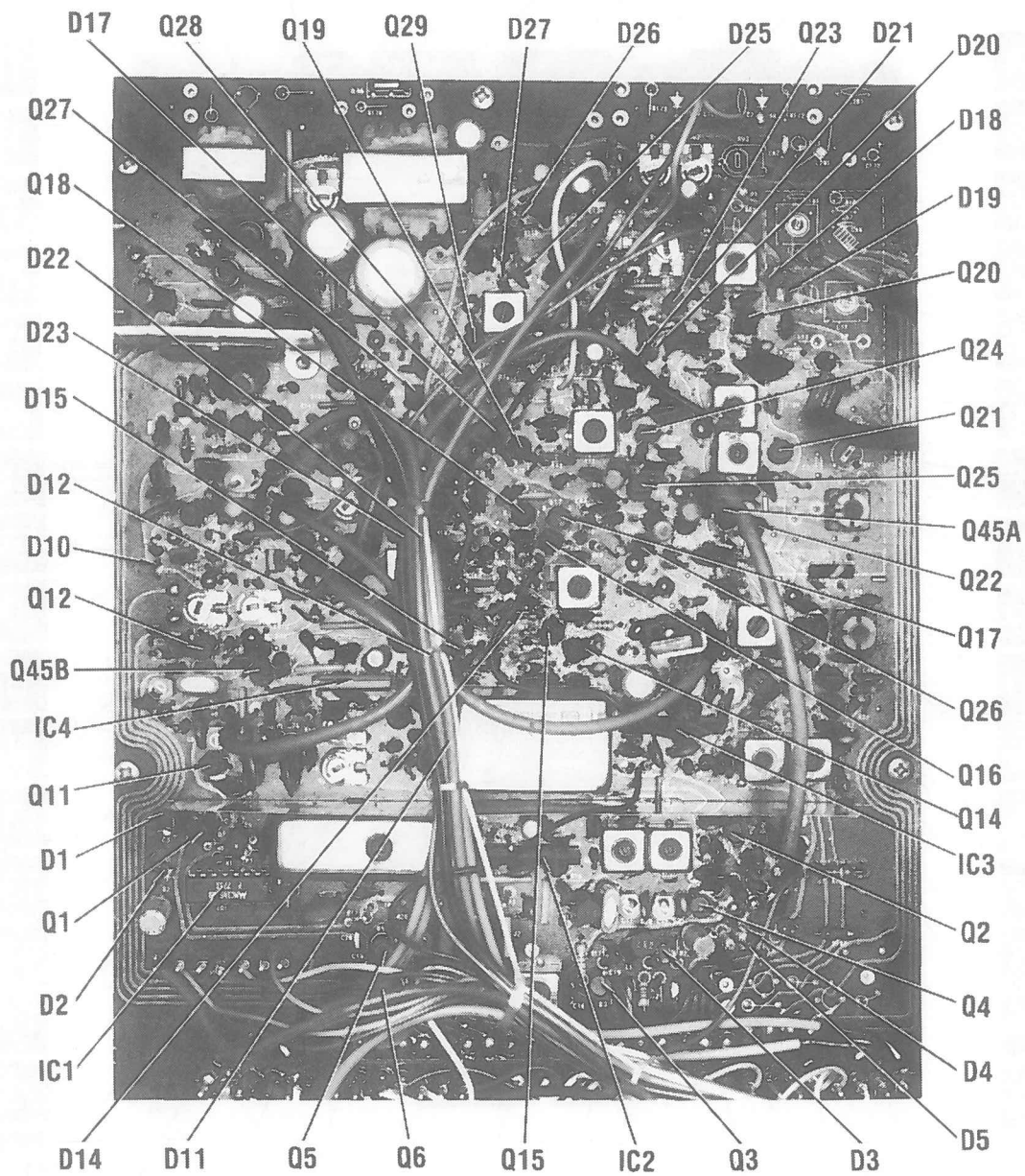


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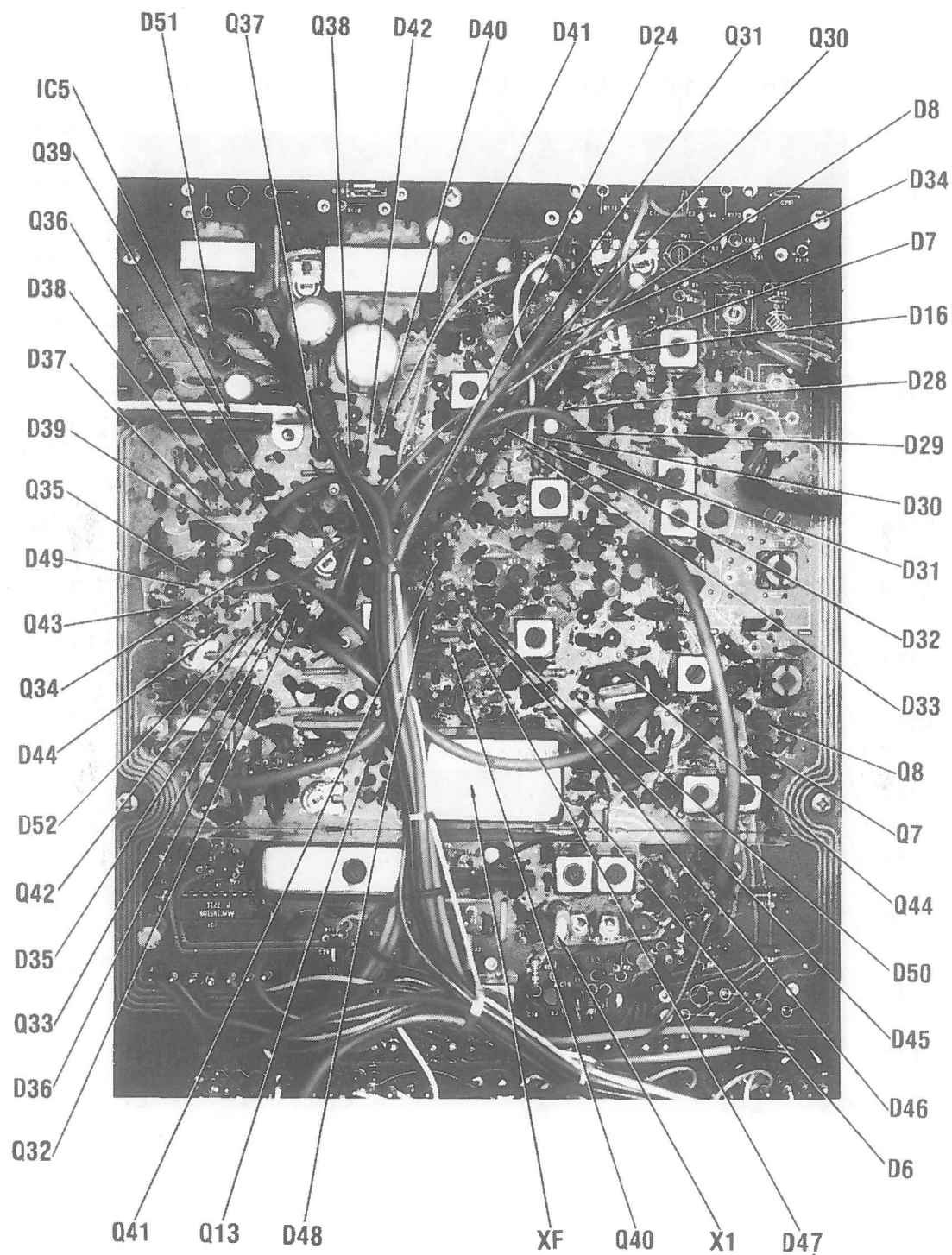
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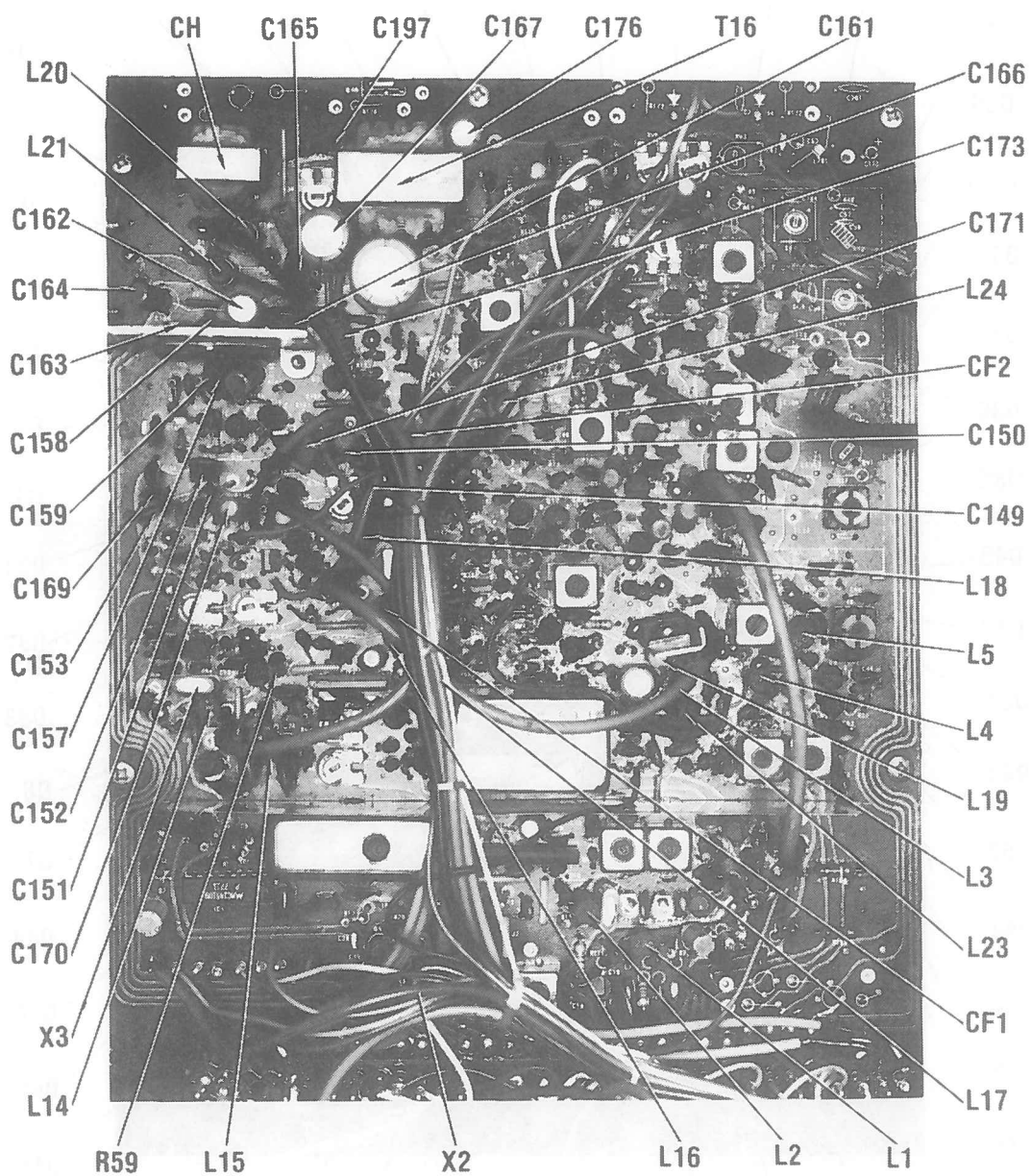
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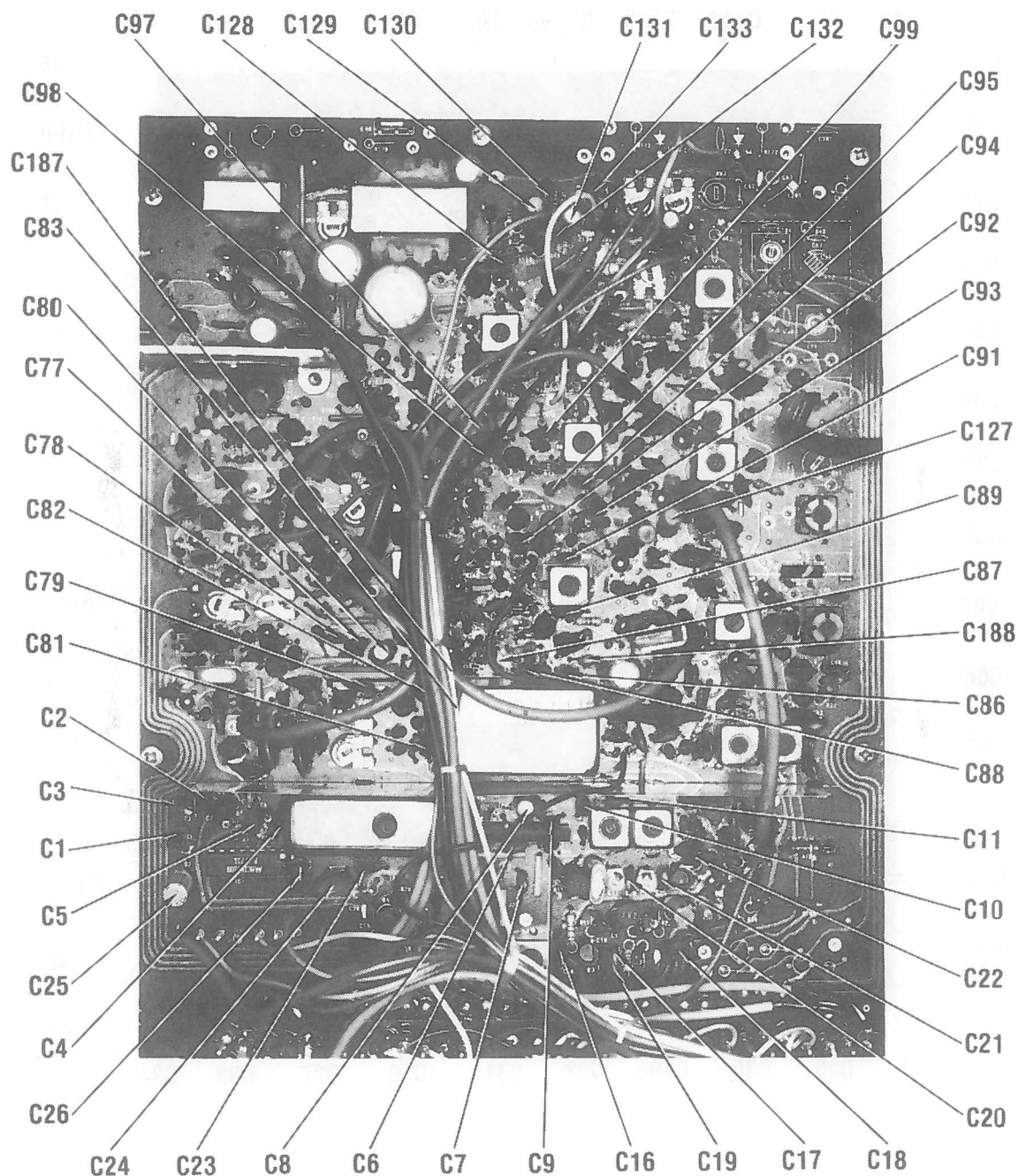
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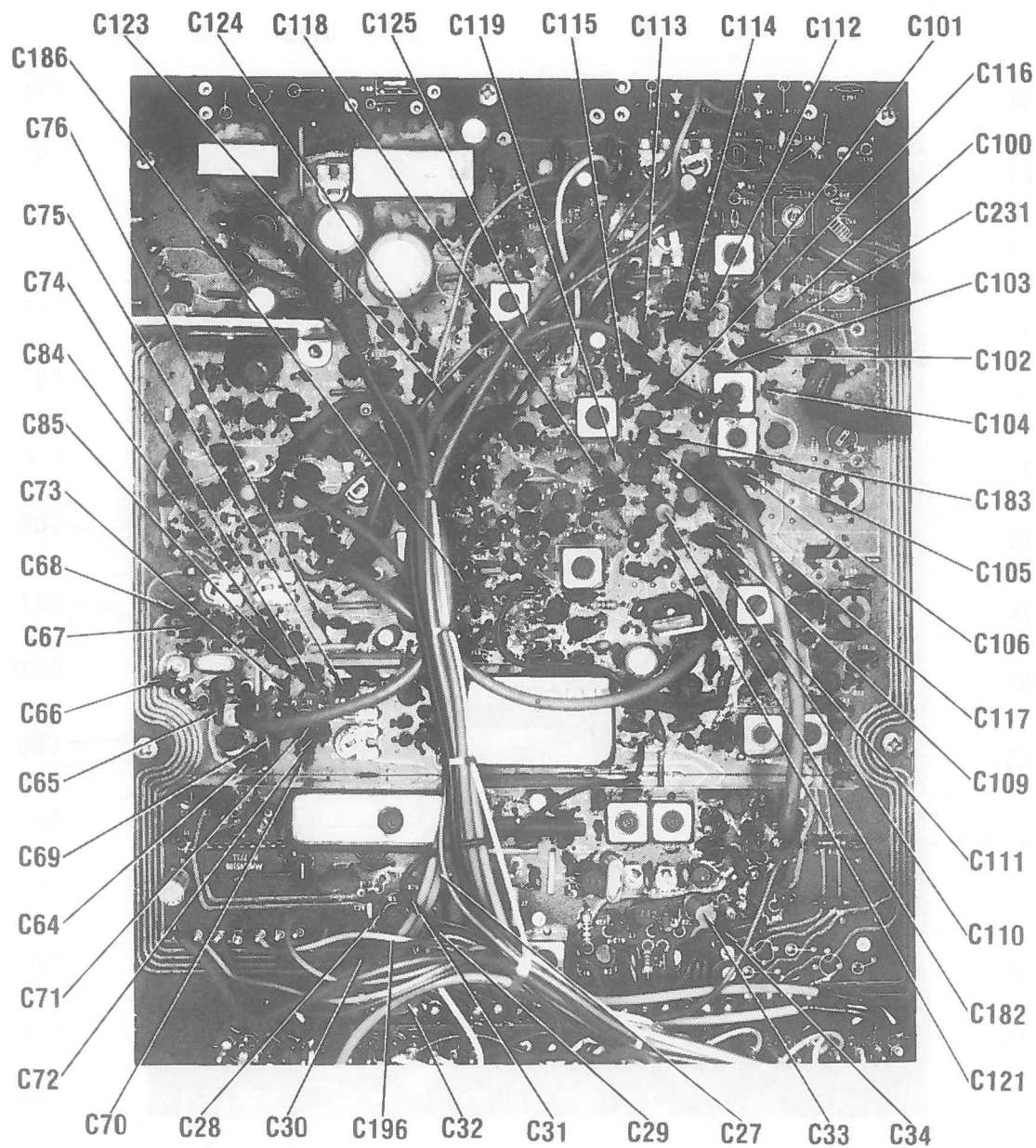
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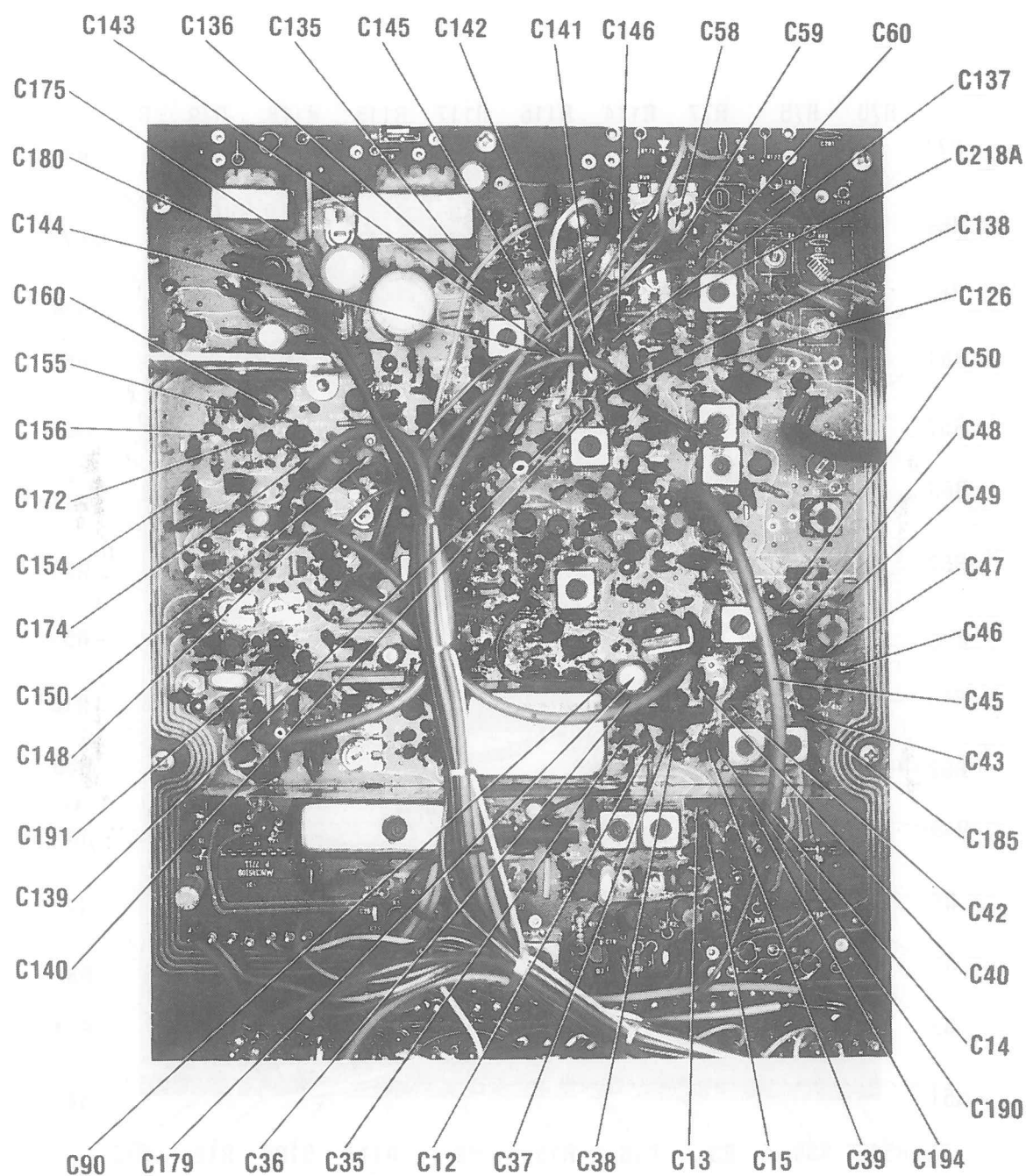
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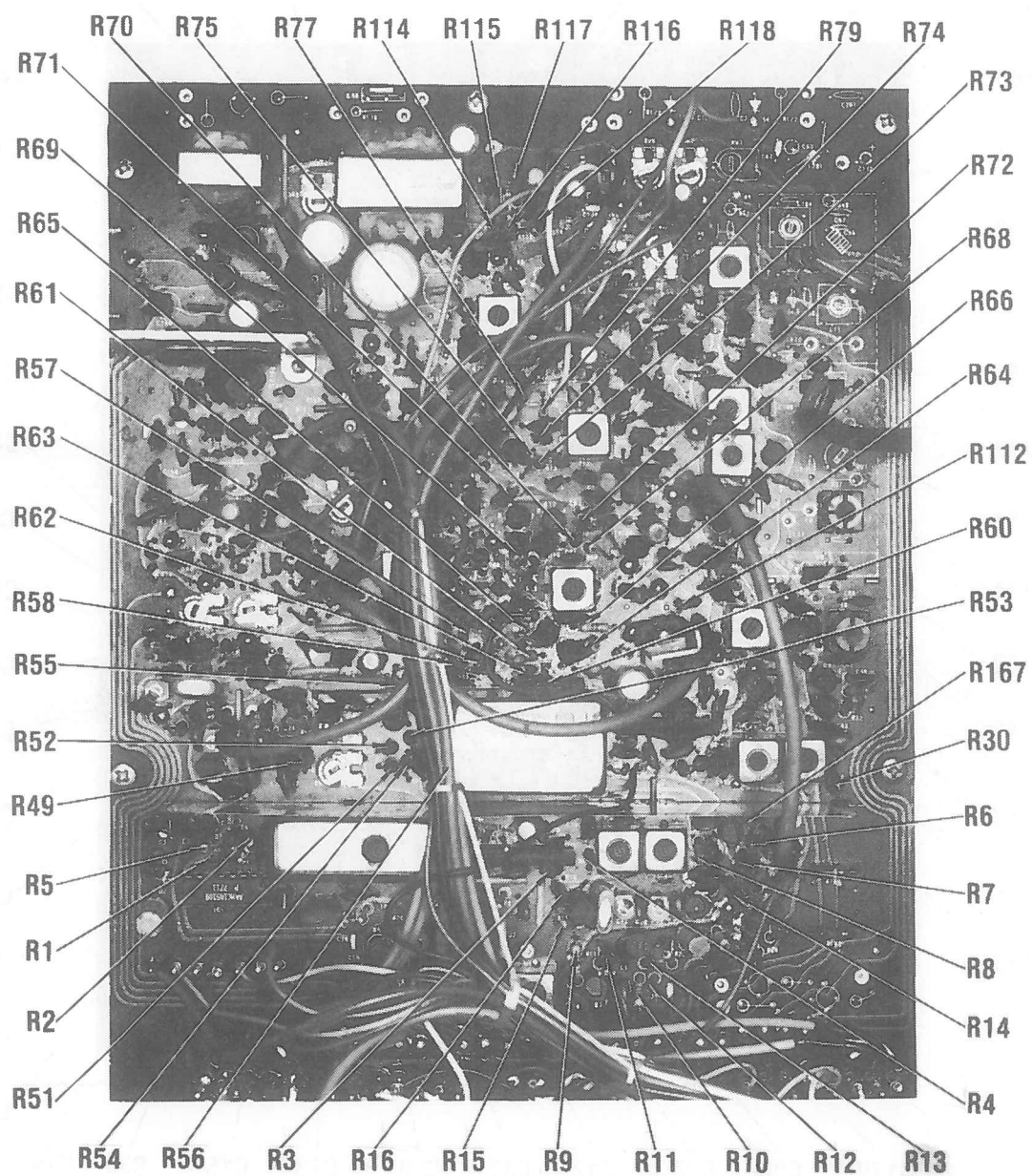
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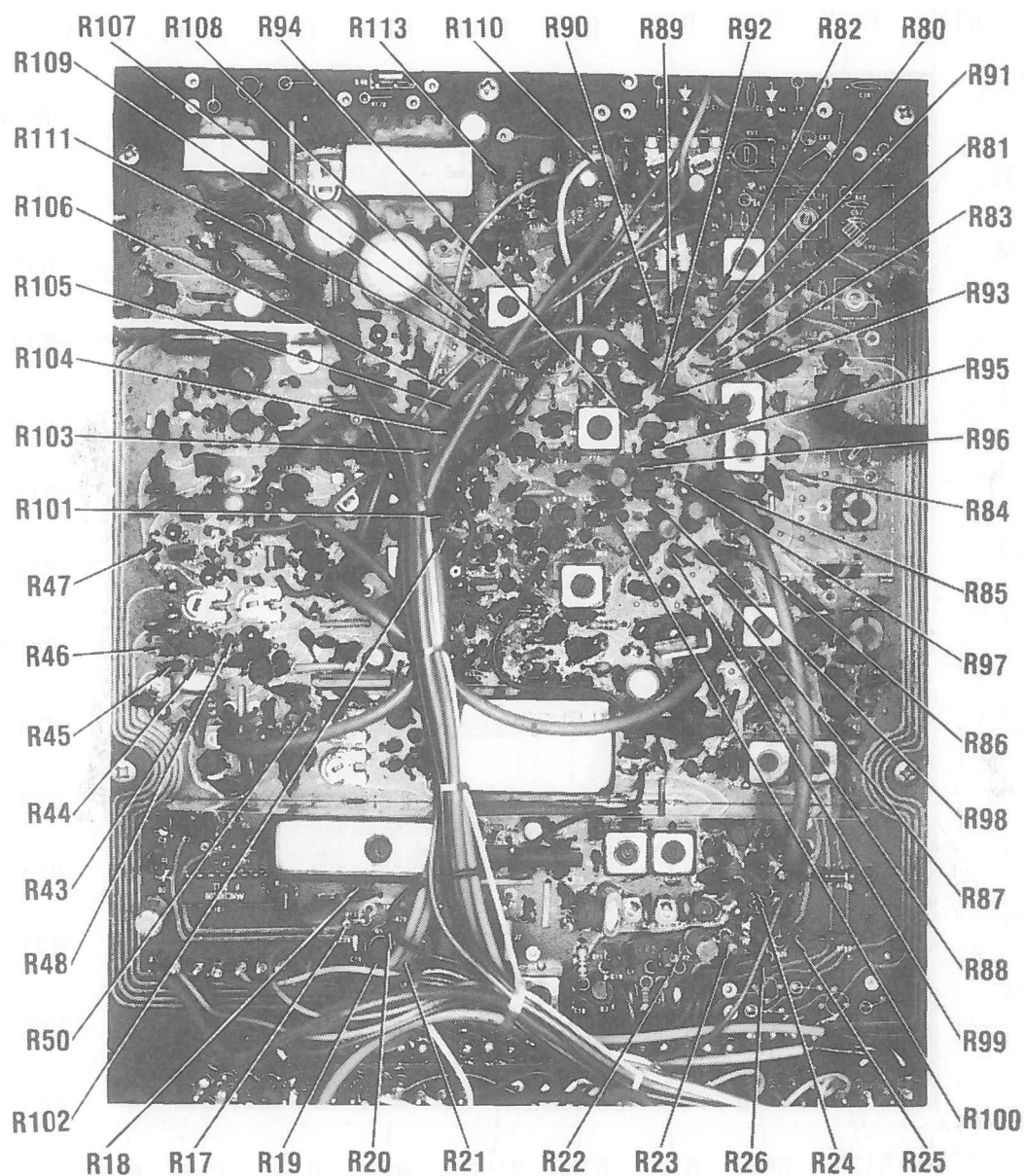
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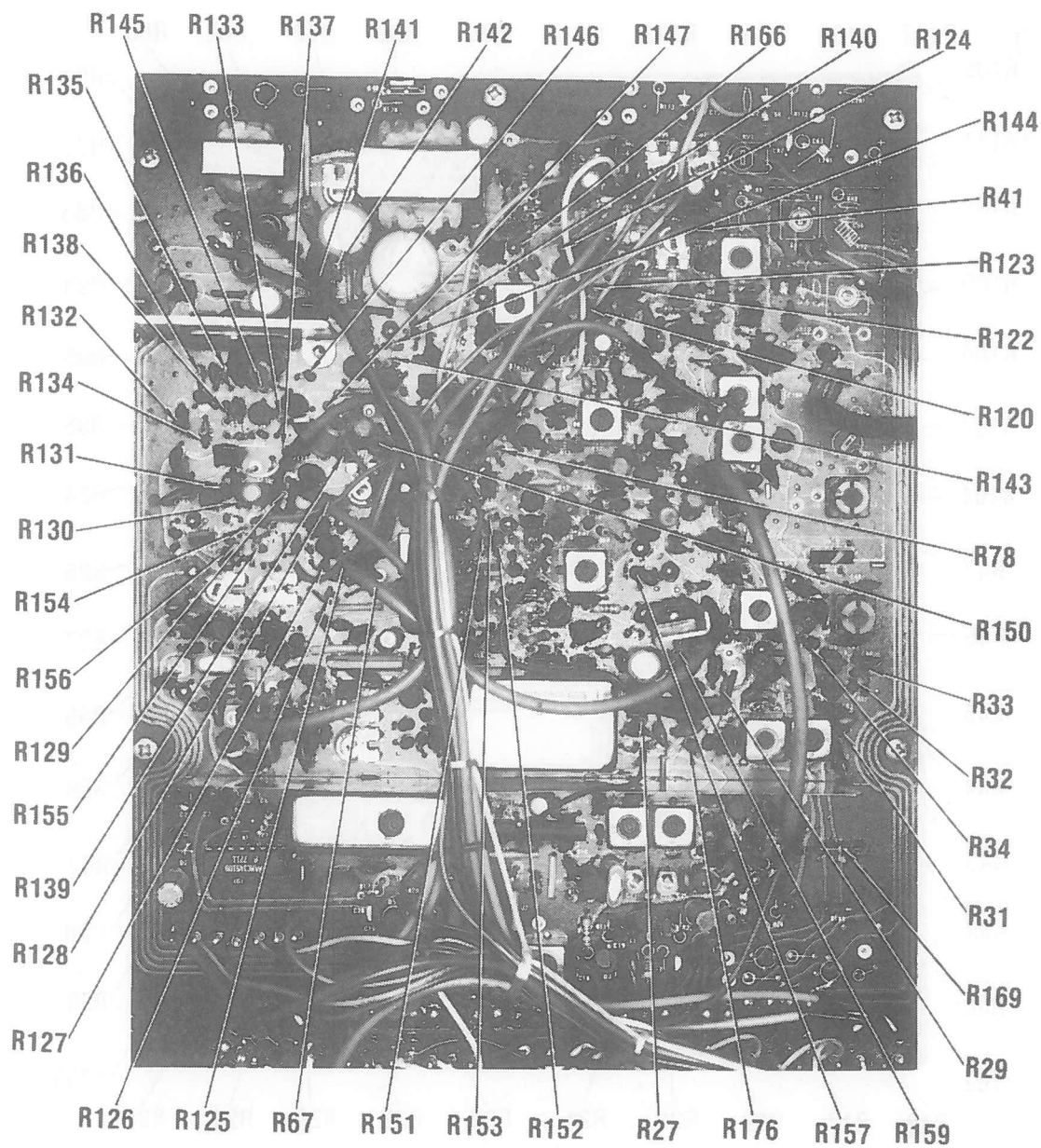
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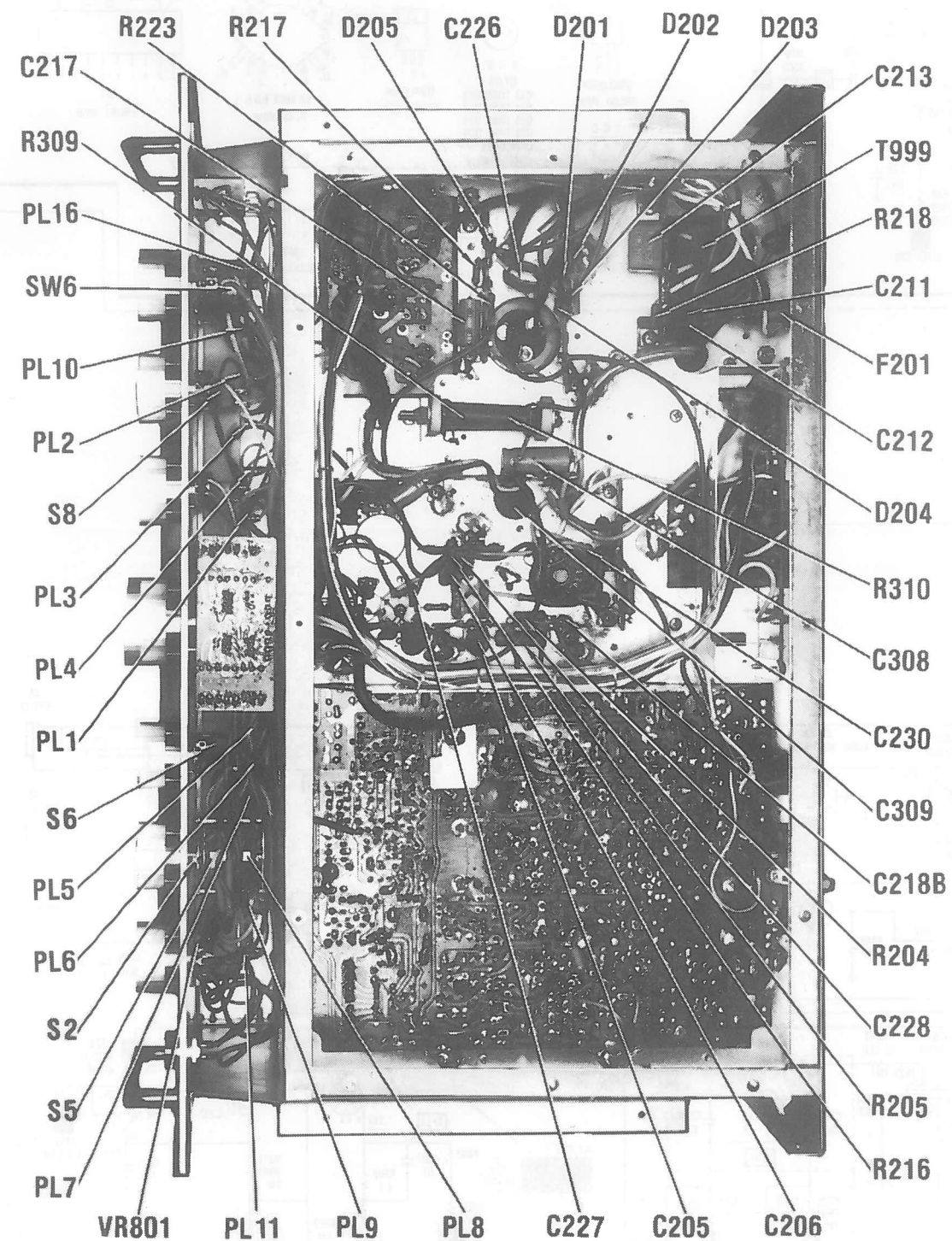
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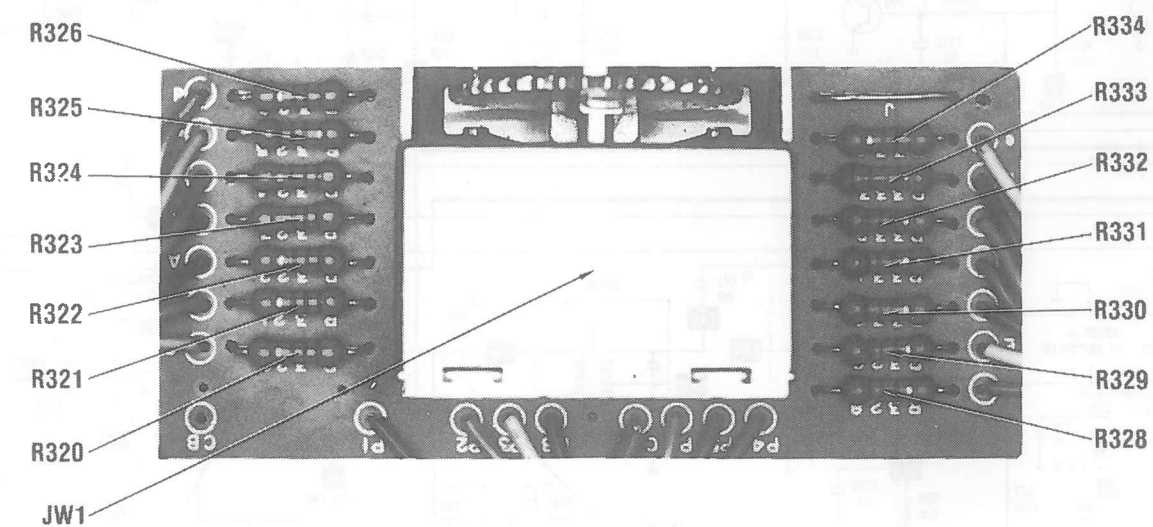
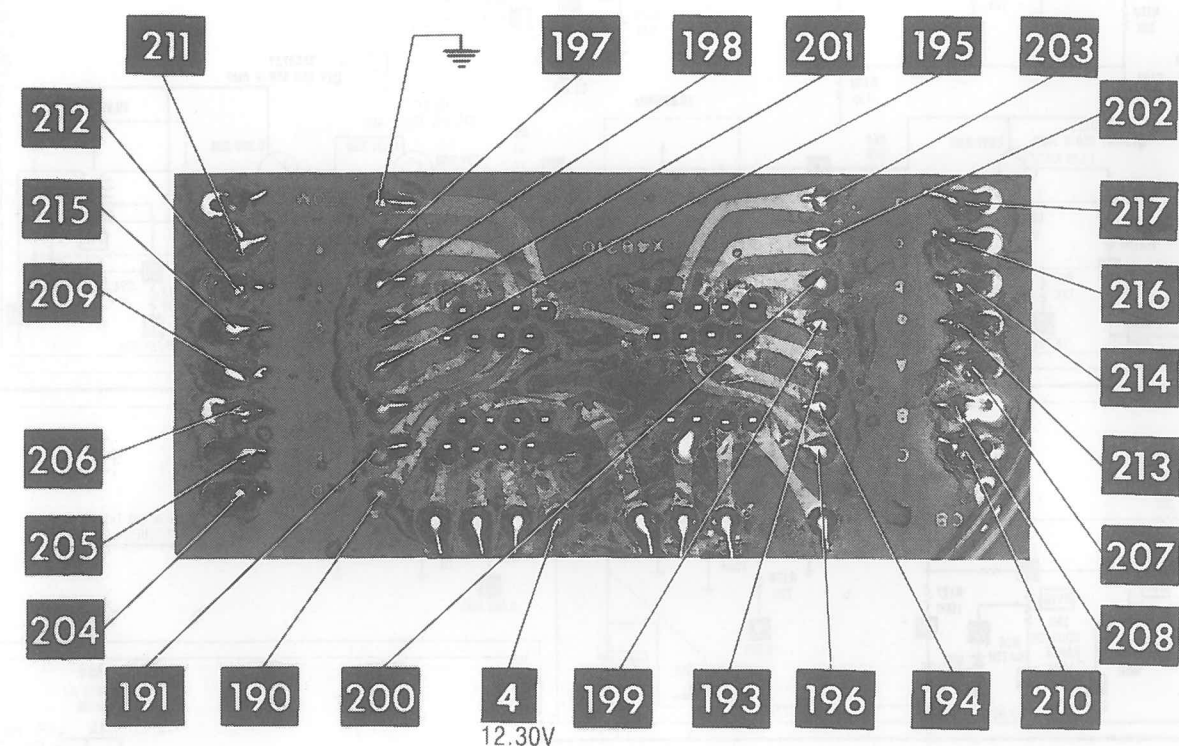
MAIN BOARD



MAIN BOARD

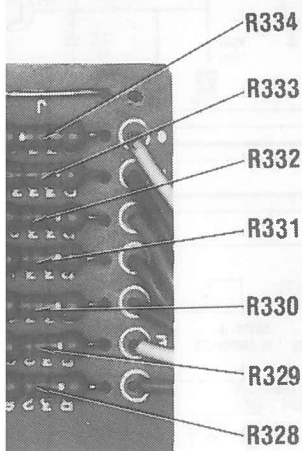
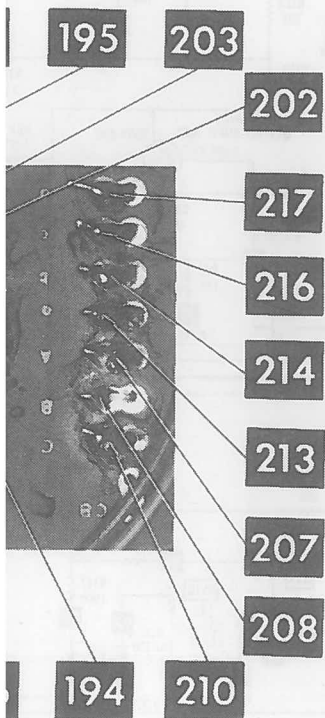


CHASSIS-BOTTOM

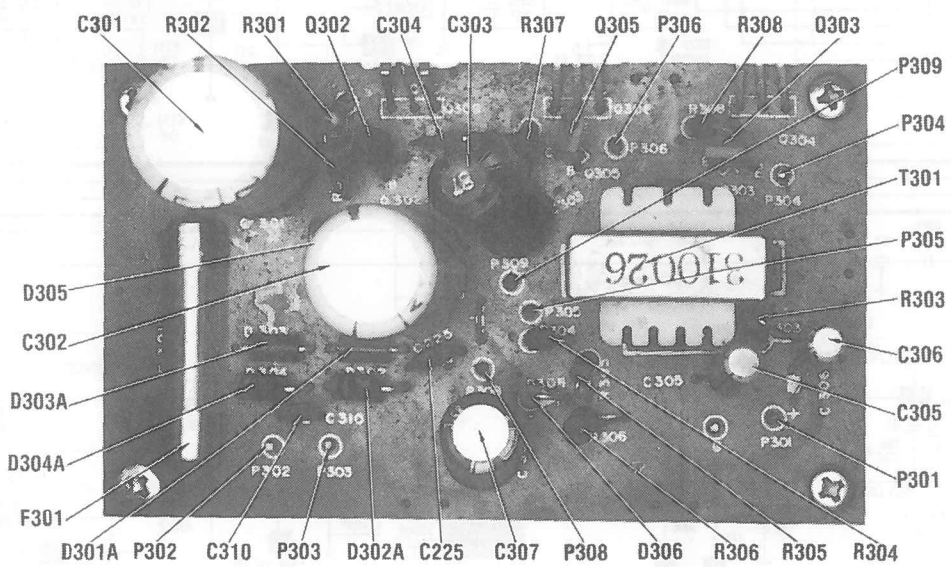
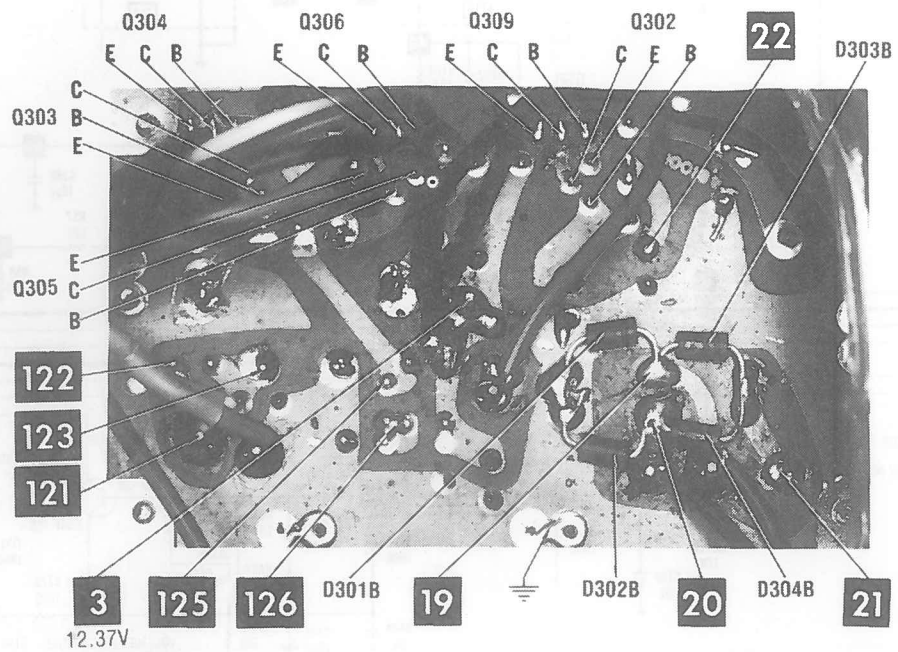


CHANNEL SELECTOR BOARD

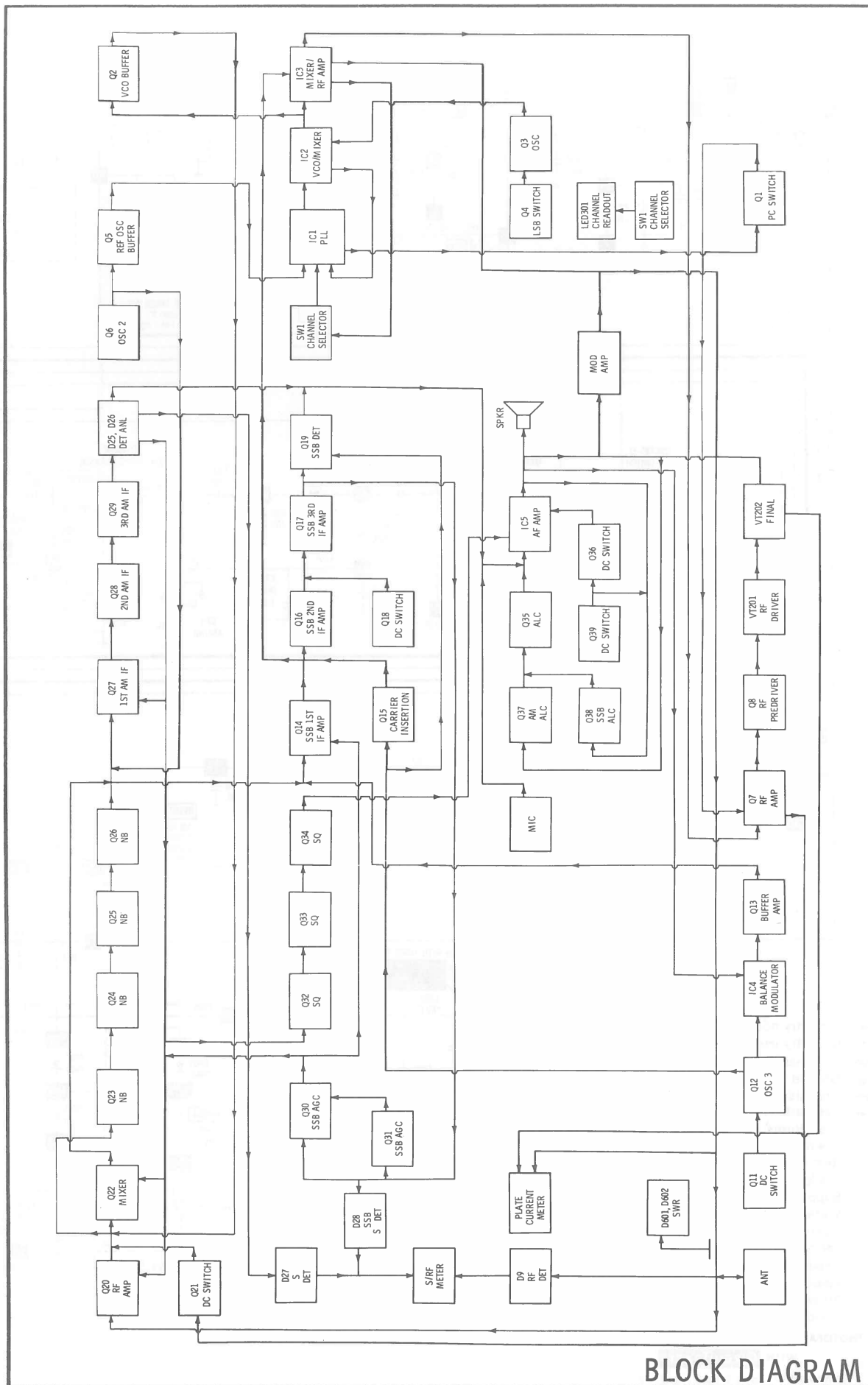
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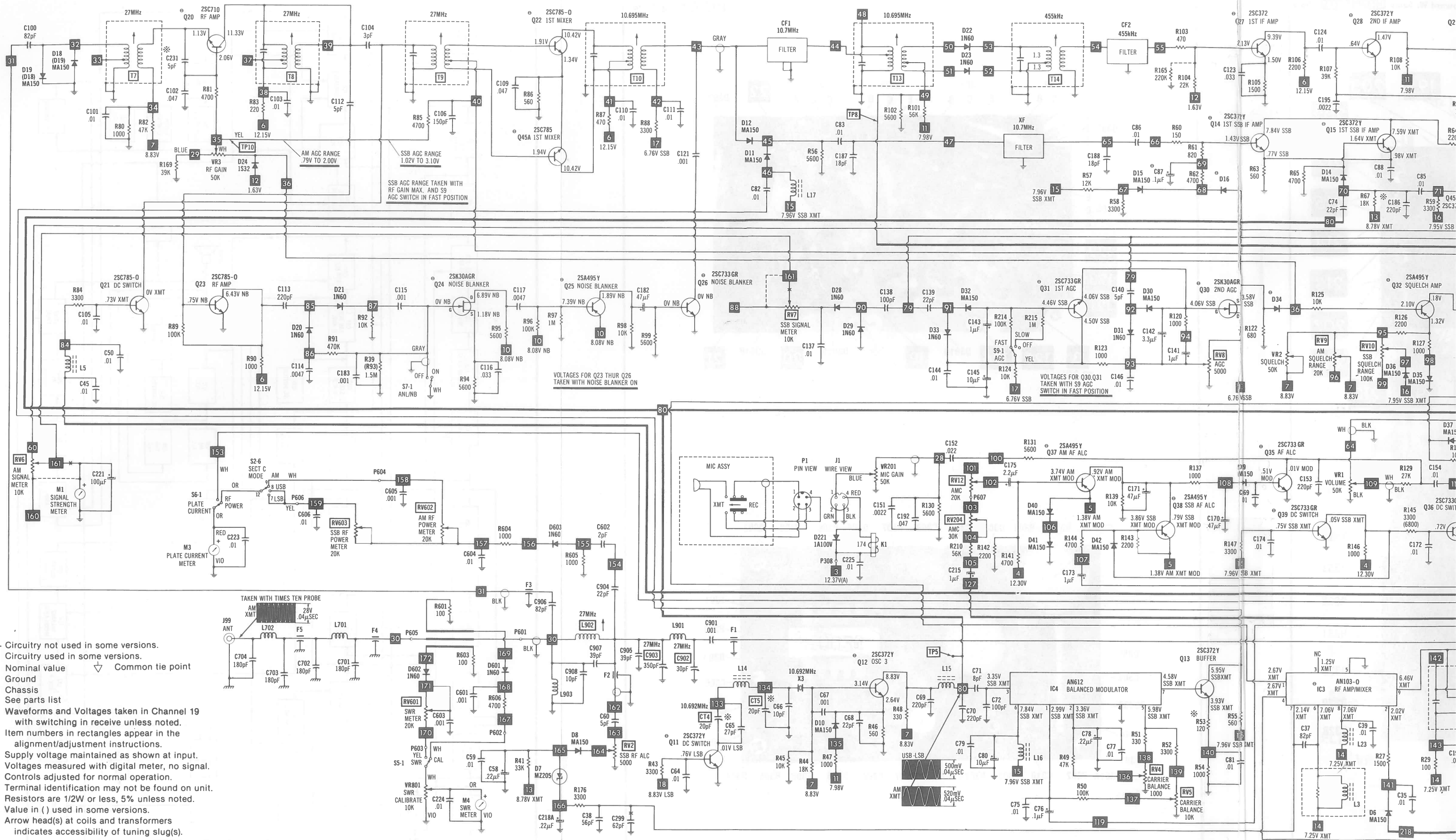


CHANNEL SELECTOR BOARD



POWER SUPPLY BOARD

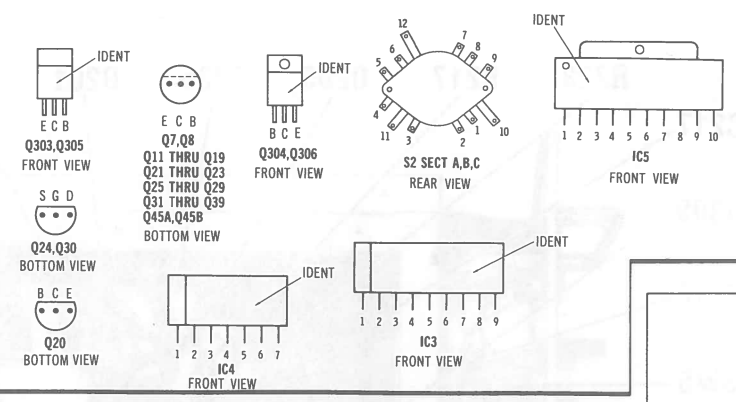


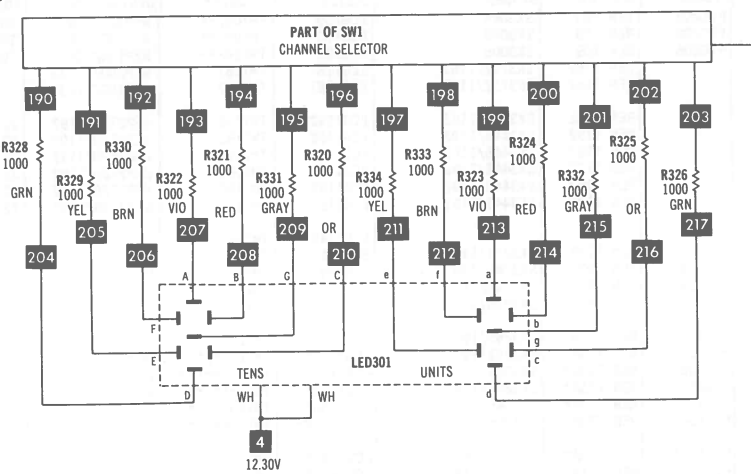
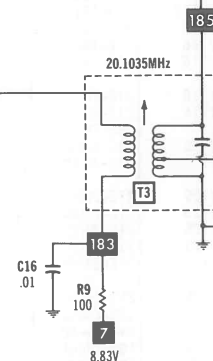
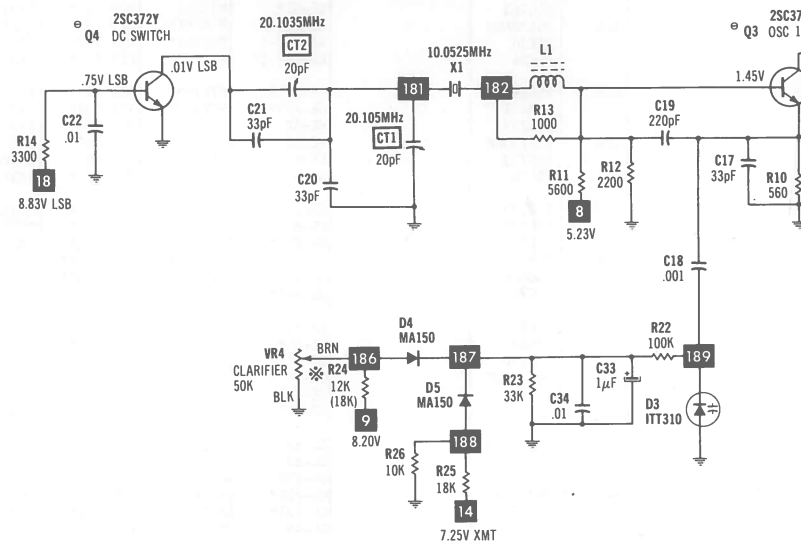
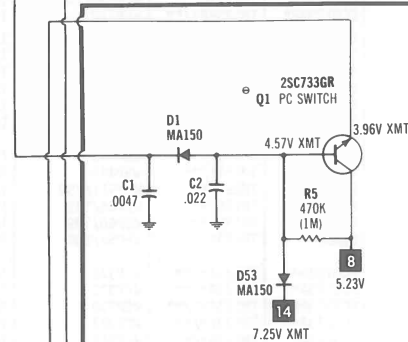
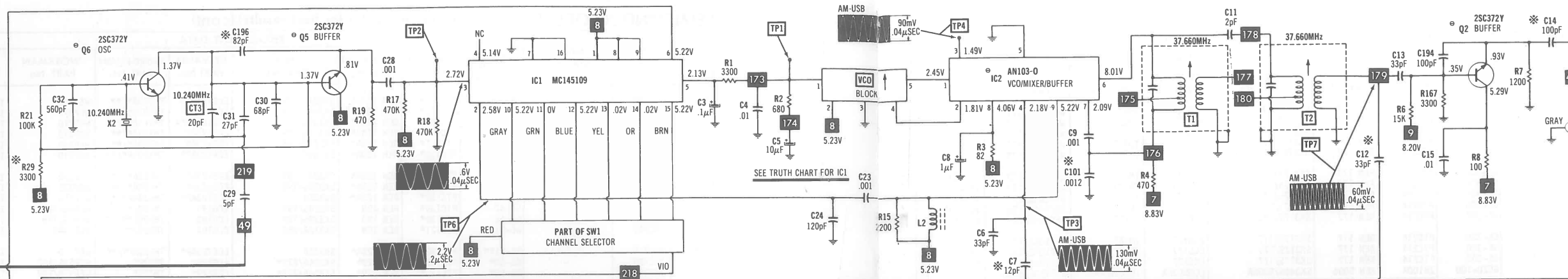


--- Circuitry not used in some versions.
 --- Circuitry used in some versions.
 * Nominal value ▽ Common tie point
 ⊥ Ground
 CH Chassis
 e See parts list
 Waveforms and Voltages taken in Channel 19 with switching in receive unless noted. Item numbers in rectangles appear in the alignment/adjustment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

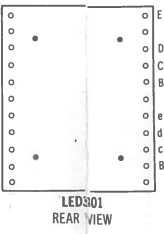
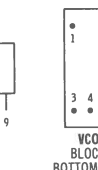
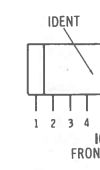
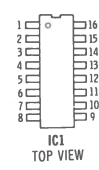
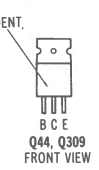
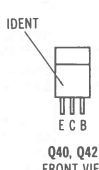
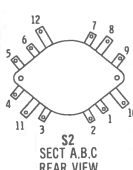
A PHOTOFACT STANDARD NOTATION SCHEMATIC
 WITH CIRCUITRACE
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MAIN SCHEMATIC

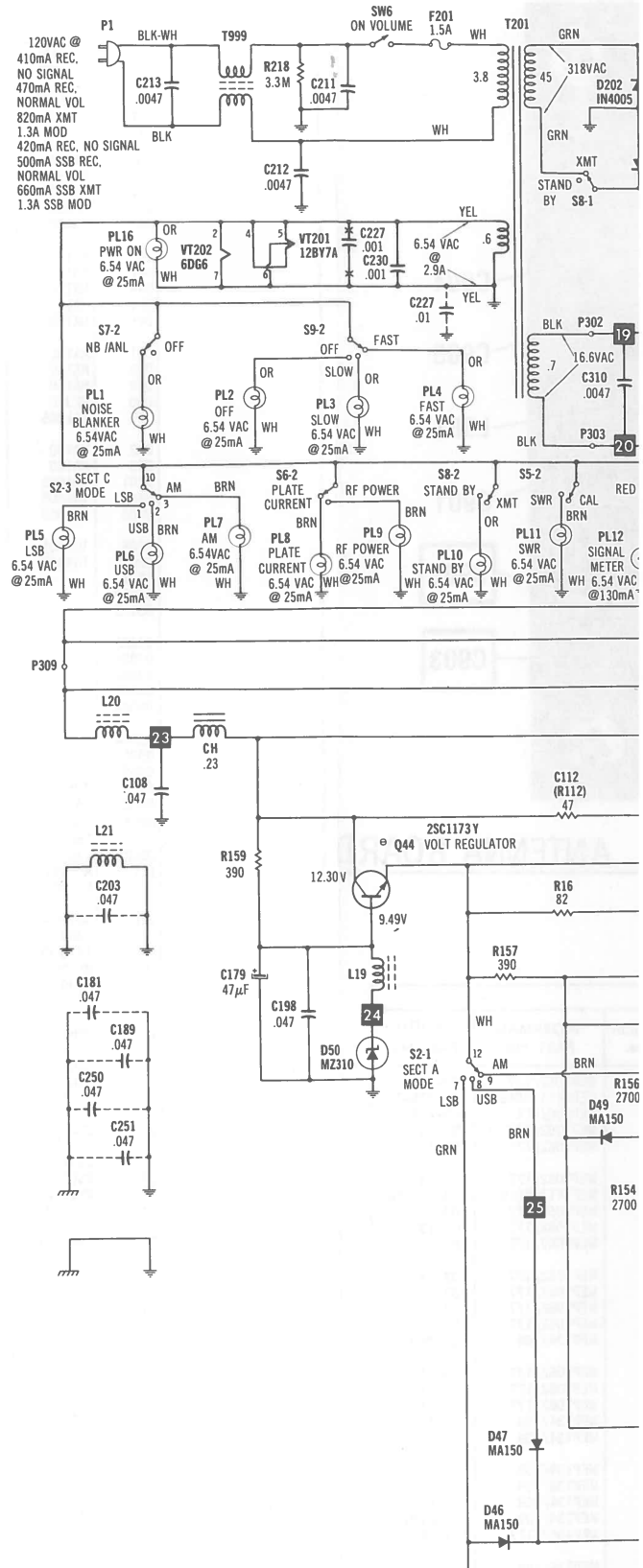


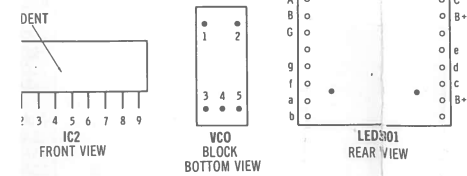


TERMINAL GUIDES



- 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).





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.	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.
D36	MA150		GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062/177
D37	MA150		GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062/177
D38	MA150		GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062/177
D39	MA150		GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062/177
D40	MA150		GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062/177
D41	MA150		GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062/177
D42	MA150		GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062/177
D44	MA150		GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062/177
D45	MA150		GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062/177
D46	MA150		GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062/177
D47	MA150		GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062/177
D48	MA150		GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062/177
D49	MA150		GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062/177
D50	MZ310		GEZD-100	ZB100A	REN 5096	SK3446/5096A	ECG5096A	TM5096	WEP1134/5096
D51	1S1885		GE-504A	PTC201	REN 116	SK3311	ECG116	TM116	WEP156
D52	MA150		GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062/177
D53	MA150		GE-300	PTC214	REN 177	SK3175/177	ECG177	TM177	WEP1062/177
D201	1N4005		GE-504A	PTC202	REN 116	SK3313/116	ECG116	TM116	WEP158/116
D202	1N4005		GE-504A	PTC202	REN 116	SK3313/116	ECG116	TM116	WEP158/116
D203	1N4005		GE-504A	PTC202	REN 116	SK3313/116	ECG116	TM116	WEP158/116
D204	1N4005		GE-504A	PTC202	REN 116	SK3313/116	ECG116	TM116	WEP158/116
D205	1N4005		GE-504A	PTC202	REN 116	SK3313/116	ECG116	TM116	WEP158/116
D221			GE-504A	PTC201	REN 116	SK3311	ECG116	TM116	WEP158/116
D301A			GE-510	PTC205	REN 125	SK3081/125	ECG125	TM125	WEP170/125
D301B			GE-510	PTC205	REN 125	SK3081/125	ECG125	TM125	WEP170/125
D302A			GE-510	PTC205	REN 125	SK3081/125	ECG125	TM125	WEP170/125
D302B			GE-510	PTC205	REN 125	SK3081/125	ECG125	TM125	WEP170/125
D303A			GE-510	PTC205	REN 125	SK3081/125	ECG125	TM125	WEP170/125
D303B			GE-510	PTC205	REN 125	SK3081/125	ECG125	TM125	WEP170/125
D304A			GE-510	PTC205	REN 125	SK3081/125	ECG125	TM125	WEP170/125
D304B			GE-510	PTC205	REN 125	SK3081/125	ECG125	TM125	WEP170/125
D305			GEZD-14		REN 144	SK3094/144A	ECG144A	TM144A	WEP1159/144A
D306	1N4002		GE-504A	1N4002	REN 116	SK3312	ECG116	TM116	WEP156
D601	1N60		1N60	PTC206	REN 109	SK3088	ECG109	TM109/**	WEP134/109
D602	1N60		1N60	PTC206	REN 109	SK3088	ECG109	TM109/**	WEP134/109
D603	1N60		1N60	PTC206	REN 109	SK3088	ECG109	TM109/**	WEP134/109
D801	1N60		1N60	PTC206	REN 109	SK3088	ECG109	TM109/**	WEP134/109
D802	1N60		1N60	PTC206	REN 109	SK3088	ECG109	TM109/**	WEP134/109
IC1	MCT45109		GE1C-317		REN 1167	SK3732/1167	ECG1167	TM1167	WEP2007/1233
	PL102		GE1C-317		REN 1167	SK3732/1167	ECG1167	TM1167	WEP2007/1233
IC2	AN103-0				REN 1192	SK3445/1192	ECG1192	TM1192	WEP2120/1192
	C3001				REN 1192	SK3445/1192	ECG1192	TM1192	WEP2120/1192
	TA7310P				REN 1192	SK3445/1192	ECG1192	TM1192	WEP2120/1192
IC3	AN103-0				REN 1192	SK3445/1192	ECG1192	TM1192	WEP2120/1192
	C3001				REN 1192	SK3445/1192	ECG1192	TM1192	WEP2120/1192
	TA7310P				REN 1192	SK3445/1192	ECG1192	TM1192	WEP2120/1192
IC4	AN612				REN 1155	SK3231/1155	ECG1155	TM1155	WEP949/1155
IC5	TA7205P		GE1C-179	PTC139*	REN 199	SK3245/199	ECG199	TM199/**	WEP66/199
Q1	25C733GR		GE-62	PTC139*	REN 199	SK3245/199	ECG199	TM199/**	WEP66/199
	25C733		GE-62	PTC139*	REN 199	SK3245/199	ECG199	TM199/**	WEP66/199
	25C900		GE-62	PTC139*	REN 199	SK3250/315	ECG199	TM199/**	WEP66/199
Q2	25C372Y		GE-61*	PTC121*	REN 123A*	SK3245/199	ECG123A*	TM123A/**	WEP372
	25C372		GE-61*	PTC121*	REN 123A*	SK3245/199	ECG123A*	TM123A/**	WEP372
	25C710		GE-211*	PTC132*	REN 123A*	SK3356	ECG123AP*	TM123AP/**	WEP710
Q3	25C372Y		GE-61*	PTC121*	REN 123A*	SK3245/199	ECG123A*	TM123A/**	WEP372
	25C372		GE-61*	PTC121*	REN 123A*	SK3245/199	ECG123A*	TM123A/**	WEP372
	25C710		GE-211*	PTC132*	REN 123A*	SK3356	ECG123AP*	TM123AP/**	WEP710
Q4	25C372Y		GE-61*	PTC121*	REN 123A*	SK3245/199	ECG123A*	TM123A/**	WEP372
	25C372		GE-61*	PTC121*	REN 123A*	SK3245/199	ECG123A*	TM123A/**	WEP372
	25C710		GE-211*	PTC132*	REN 123A*	SK3356	ECG123AP*	TM123AP/**	WEP710
Q5	25C372Y		GE-61*	PTC121*	REN 123A*	SK3245/199	ECG123A*	TM123A/**	WEP372
	25C372		GE-61*	PTC121*	REN 123A*	SK3245/199	ECG123A*	TM123A/**	WEP372
	25C710		GE-211*	PTC132*	REN 123A*	SK3356	ECG123AP*	TM123AP/**	WEP710
Q6	25C372Y		GE-61*	PTC121*	REN 123A*	SK3245/199	ECG123A*	TM123A/**	WEP372
	25C372		GE-61*	PTC121*	REN 123A*	SK3245/199	ECG123A*	TM123A/**	WEP372
	25C710		GE-211*	PTC132*	REN 123A*	SK3356	ECG123AP*	TM123AP/**	WEP710
Q7	25C372Y		GE-61*	PTC121*	REN 123A*	SK3245/199	ECG123A*	TM123A/**	WEP372
	25C372		GE-61*	PTC121*	REN 123A*	SK3245/199	ECG123A*	TM123A/**	WEP372
	25C710		GE-211*	PTC132*	REN 123A*	SK3356	ECG123AP*	TM123AP/**	WEP710
Q8	25C372Y		GE-61*	PTC121*	REN 123A*	SK3245/199	ECG123A*	TM123A/**	WEP372
	25C372		GE-61*	PTC121*	REN 123A*	SK3245/199	ECG123A*	TM123A/**	WEP372
	25C460		GE-61*	PTC136*	REN 107	SK3122	ECG107	TM107/**	WEP460
Q11	25C372Y		GE-61*	PTC121*	REN 123A*	SK3245/199	ECG123A*	TM123A/**	WEP372
	25C372		GE-61*	PTC121*	REN 123A*	SK3245/199	ECG123A*	TM123A/**	WEP372
	25C710		GE-211*	PTC132*	REN 123A*	SK3356	ECG123AP*	TM123AP/**	WEP710
Q12	25C372Y		GE-61*	PTC121*	REN 123A*	SK3245/199	ECG123A*	TM123A/**	WEP372
	25C372		GE-61*	PTC121*	REN 123A*	SK3245/199	ECG123A*	TM123A/**	WEP372
	25C710		GE-211*	PTC132*	REN 123A*	SK3356	ECG123AP*	TM123AP/**	WEP710
Q13	25C372Y		GE-61*	PTC121*	REN 123A*	SK3245/199	ECG123A*	TM123A/**	WEP372
	25C372		GE-61*	PTC121*	REN 123A*	SK3245/199	ECG123A*	TM123A/**	WEP372
	25C710		GE-211*	PTC132*	REN 123A*	SK3356	ECG123AP*	TM123AP/**	WEP710
Q14	25C372Y		GE-61*	PTC121*	REN 123A*	SK3245/199	ECG123A*	TM123A/**	WEP372
	25C372		GE-61*	PTC121*	REN 123A*	SK3245/199	ECG123A*	TM123A/**	WEP372
	25C710		GE-211*	PTC132*	REN 123A*	SK3356	ECG123AP*	TM123AP/**	WEP710
Q15	25C372Y		GE-61*	PTC121*	REN 123A*	SK3245/199	ECG123A*	TM123A/**	WEP372
	25C372		GE-61*	PTC121*	REN 123A*	SK3245/199	ECG123A*	TM123A/**	WEP372
	25C710		GE-211*	PTC132*	REN 123A*	SK3356	ECG123AP*	TM123AP/**	WEP710

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.	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.
Q16	25C372Y 25C372 25C710		GE-61* GE-61* GE-211*	PTC121* PTC121* PTC132*	REN 123A* REN 123A* REN 123A*	SK3245/199 SK3245/199 SK3356	ECG123A* ECG123A* ECG123AP*	TM123A*/** TM123A*/** TM123AP*/**	WEP372 WEP372 WEP710	121-Z9000A* 121-Z9000A* 121-Z9000A*
Q17	25C372Y 25C372 25C710		GE-61* GE-61* GE-211*	PTC121* PTC121* PTC132*	REN 123A* REN 123A* REN 123A*	SK3245/199 SK3245/199 SK3356	ECG123A* ECG123A* ECG123AP*	TM123A*/** TM123A*/** TM123AP*/**	WEP372 WEP372 WEP710	121-Z9000A* 121-Z9000A* 121-Z9000A*
Q18	25C372Y 25C372 25C710		GE-61* GE-61* GE-211*	PTC121* PTC121* PTC132*	REN 123A* REN 123A* REN 123A*	SK3245/199 SK3245/199 SK3356	ECG123A* ECG123A* ECG123AP*	TM123A*/** TM123A*/** TM123AP*/**	WEP372 WEP372 WEP710	121-Z9000A* 121-Z9000A* 121-Z9000A*
Q19	25C733GR 25C732 25C945		GE-62 GE-62 GE-212	PTC139* PTC139* PTC121*	REN 199 REN 199 REN 199	SK3245/199 SK3245/199 SK3124/289	ECG199 ECG199 ECG199	TM199/** TM199/** TM199/**	WEP66/199 WEP66/199 WEP1945	121-972 121-972 121-972
Q20	25C710 25C785 25C785-0		GE-211* PTC132* GE-60*	PTC132* PTC132* PTC132*	REN 123A* REN 229* REN 229*	SK3356 SK3246/229* SK3246/229*	ECG123AP* ECG229* ECG229*	TM123AP*/** TM229* TM229*	WEP710 WEP535/107 WEP535/107	121-Z9000A 121-Z9021 121-Z9021
Q21	25C710 25C785-0 25C710		GE-60* GE-211* GE-60*	PTC132* PTC132* PTC132*	REN 229* REN 123A* REN 229*	SK3356 SK3246/229* SK3356	ECG123AP* ECG229* ECG123AP*	TM123AP*/** TM229* TM123AP*/**	WEP710 WEP535/107 WEP710	121-Z9000A 121-Z9021 121-Z9000A
Q22	25C785-0 25C710		GE-60* GE-211*	PTC132* PTC132*	REN 229* REN 123A*	SK3246/229* SK3356	ECG229* ECG123AP*	TM229* TM123AP*/**	WEP535/107 WEP710	121-Z9021 121-Z9000A
Q23	25C785-0 25C785 25C763		GE-60* GE-60* GE-61*	PTC132* PTC132* PTC115	REN 229* REN 229* REN 229*	SK3246/229* SK3246/229* SK3122	ECG229* ECG229* ECG229*	TM229* TM229* TM229*	WEP535/107 WEP535/107 WEP56/108	121-Z9021 121-Z9021 121-Z9021
Q24	25K30AGR 25K30 25K34		GE-FET-1 GE-FET-1 GE-FET-2*	PTC151* PTC151* PTC161*	REN 132* REN 132* REN 132*	SK3112 SK3112 SK3448	ECG132* ECG132* ECG312*	TM132* TM132* TM312*	WEP801/133* WEP801/133* WEP920/312*	121-756* 121-756* 121-756*
Q25	25A495Y 25A495 25A733		GE-221* GE-221* GE-48	PTC103* PTC103* PTC127	REN 159* REN 159* REN 294	SK3114/290 SK3114/290 SK3114/290	ECG159* ECG159* ECG294	TM159*/** TM159*/** TM294/**	WEP495 WEP495 WEP911/290	121-Z9003 121-Z9003 121-Z9003
Q26	25C733GR 25C733 25C763		GE-62 GE-62 GE-61*	PTC139* PTC139* PTC115	REN 199 REN 199 REN 229*	SK3245/199 SK3245/199 SK3122	ECG199 ECG199 ECG229*	TM199/** TM199/** TM229*	WEP66/199 WEP66/199 WEP56/108	121-972 121-972 121-Z9021
Q27	25C372Y 25C372 25C710		GE-61* GE-61* GE-211*	PTC121* PTC121* PTC132*	REN 123A* REN 123A* REN 123A*	SK3245/199 SK3245/199 SK3356	ECG123A* ECG123A* ECG123AP*	TM123A*/** TM123A*/** TM123AP*/**	WEP372 WEP372 WEP710	121-Z9000A* 121-Z9000A* 121-Z9000A
Q28	25C372Y 25C710 25C710		GE-61* GE-61* GE-211*	PTC121* PTC121* PTC132*	REN 123A* REN 123A* REN 123A*	SK3245/199 SK3245/199 SK3356	ECG123A* ECG123A* ECG123AP*	TM123A*/** TM123A*/** TM123AP*/**	WEP372 WEP372 WEP710	121-Z9000A* 121-Z9000A* 121-Z9000A
Q29	25C372Y 25C372 25C710		GE-61* GE-61* GE-211*	PTC121* PTC121* PTC132*	REN 123A* REN 123A* REN 123A*	SK3245/199 SK3245/199 SK3356	ECG123A* ECG123A* ECG123AP*	TM123A*/** TM123A*/** TM123AP*/**	WEP372 WEP372 WEP710	121-Z9000A* 121-Z9000A* 121-Z9000A
Q30	25K30AGR 25K30 25K34		GE-FET-1 GE-FET-1 GE-FET-2*	PTC151* PTC151* PTC161*	REN 132* REN 132* REN 132*	SK3112 SK3112 SK3448	ECG132* ECG132* ECG312*	TM132* TM132* TM312*	WEP801/133* WEP801/133* WEP920/312*	121-756* 121-756* 121-756*
Q31	25C733GR 25C733 25C945		GE-62 GE-62 GE-212	PTC139* PTC139* PTC121*	REN 199 REN 199 REN 199	SK3245/199 SK3245/199 SK3124/289	ECG199 ECG199 ECG199	TM199/** TM199/** TM199/**	WEP66/199 WEP66/199 WEP1945	121-972 121-972 121-972
Q32	25A495Y 25A495 25A733		GE-221* GE-221* GE-48	PTC103* PTC103* PTC127	REN 159* REN 159* REN 294	SK3114/290 SK3114/290 SK3114/290	ECG159* ECG159* ECG294	TM159*/** TM159*/** TM294/**	WEP495 WEP495 WEP911/290	121-Z9003 121-Z9003 121-Z9003
Q33	25C733GR 25C733 25C945		GE-62 GE-62 GE-212	PTC139* PTC139* PTC121*	REN 199 REN 199 REN 199	SK3245/199 SK3245/199 SK3124/289	ECG199 ECG199 ECG199	TM199/** TM199/** TM199/**	WEP66/199 WEP66/199 WEP1945	121-972 121-972 121-972
Q34	25C733GR 25C733 25C945		GE-62 GE-62 GE-212	PTC139* PTC139* PTC121*	REN 199 REN 199 REN 199	SK3245/199 SK3245/199 SK3124/289	ECG199 ECG199 ECG199	TM199/** TM199/** TM199/**	WEP66/199 WEP66/199 WEP1945	121-972 121-972 121-972
Q35	25C733GR 25C733 25C900		GE-62 GE-62 GE-62	PTC139* PTC139* PTC139*	REN 199 REN 199 REN 199	SK3245/199 SK3245/199 SK3250/315	ECG199 ECG199 ECG199	TM199/** TM199/** TM199/**	WEP66/199 WEP66/199 WEP66/199	121-972 121-972 121-972
Q36	25C733GR 25C733 25C945		GE-62 GE-62 GE-212	PTC139* PTC139* PTC121*	REN 199 REN 199 REN 199	SK3245/199 SK3245/199 SK3124/289	ECG199 ECG199 ECG199	TM199/** TM199/** TM199/**	WEP66/199 WEP66/199 WEP1945	121-972 121-972 121-972
Q37	25A495Y 25A562 25A719		GE-221* GE-269 GE-269	PTC103* PTC103* PTC103*	REN 159* REN 290 REN 290	SK3114/290 SK3114/290 SK3114/290	ECG159* ECG290 ECG290	TM159*/** TM290/** TM290/**	WEP495 WEP911/290 WEP911/290	121-Z9003 121-Z9046 121-1019
Q38	25A495Y 25A562 25A719		GE-221* GE-269 GE-269	PTC103* PTC103* PTC103*	REN 159* REN 290 REN 290	SK3114/290 SK3114/290 SK3114/290	ECG159* ECG290 ECG290	TM159*/** TM290/** TM290/**	WEP495 WEP911/290 WEP911/290	121-Z9003 121-Z9046 121-1019
Q39	25C733GR 25C733 25C945		GE-62 GE-62 GE-212	PTC139* PTC139* PTC121*	REN 199 REN 199 REN 199	SK3245/199 SK3245/199 SK3124/289	ECG199 ECG199 ECG199	TM199/** TM199/** TM199/**	WEP66/199 WEP66/199 WEP1945	121-972 121-972 121-972
Q40	25A509-0 25A509 25A683		GE-269 GE-269 GE-48	PTC103* PTC103* PTC177	REN 290 REN 290 REN 294	SK3114/290 SK3114/290 SK3841/294	ECG290 ECG290 ECG294	TM290 TM290 TM294	WEP911/290 WEP911/290 WEP916/294	121-1019 121-1019 121-952
Q41	25C509-0 25C509 25A509-0		GE-81* GE-81* GE-269	PTC123* PTC123* PTC103*	REN 289 REN 289 REN 290	SK3124/289 SK3124/289 SK3114/290	ECG289 ECG289 ECG290	TM289 TM289 TM290	WEP910/289 WEP910/289 WEP911/290	121-Z9000A* 121-Z9000A* 121-1019
Q42	25A509 25A683		GE-269 GE-48	PTC103* PTC177	REN 290 REN 294	SK3114/290 SK3841/294	ECG290 ECG294	TM290 TM294	WEP911/290 WEP916/294	121-1019 121-952
Q43	25C509-0 25C509 25C1173Y		GE-81* GE-81* GE-215	PTC123* PTC123* PTC110	REN 289 REN 289 REN 236	SK3124/289 SK3124/289 SK3197/235	ECG289 ECG289 ECG236	TM289 TM289 TM236/**	WEP910/289 WEP910/289 WEP745/152	121-Z9000A* 121-Z9000A* 121-Z9040
Q44	25C1173 25C1847		GE-215 GE-270	PTC110 PTC180	REN 236 REN 295	SK3197/235 SK3253/295	ECG236 ECG295	TM236/** TM295	WEP745/152 WEP913/295	121-Z9040 121-880
Q45A Q45B	25C785-0 25C372Y (11)		GE-60* GE-61*	PTC132* PTC121*	REN 229* REN 123A*	SK3246/229* SK3245/199	ECG229* ECG123A*	TM229* TM123A*/**	WEP535/107 WEP372	121-Z9021 121-Z9000A*
Q302	25C509-0 25C509 25C2236		GE-81* GE-81* GE-270	PTC123* PTC123* PTC177	REN 289 REN 289 REN 295	SK3124/289 SK3124/289 SK3250/315	ECG289 ECG289 ECG295	TM289 TM289 TM295	WEP910/289 WEP910/289 WEP913/295	121-Z9000A* 121-Z9000A* 121-880*

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.
Q303	2SA509Y		GE-269	PTC103*	REN 290	SK3114/290	ECG290	TM290	WEP911/290	121-1019
Q304	2SA509		GE-269	PTC103*	REN 290	SK3114/290	ECG290	TM290	WEP911/290	121-1019
	2SD234		GE-66		REN 152	SK3054/196	ECG152	TM152	WEP745/152	121-987-02
Q305	2SC789		GE-66	PTC154	REN 152	SK3054/196	ECG152	TM152	WEP745	121-987-02
	2SA509Y		GE-269	PTC103*	REN 290	SK3114/290	ECG290	TM290	WEP911/290	121-1019
Q306	2SA509		GE-269	PTC103*	REN 290	SK3114/290	ECG290	TM290	WEP911/290	121-1019
	2SD234		GE-66		REN 152	SK3054/196	ECG152	TM152	WEP745/152	121-987-02
Q309	2SC789		GE-66	PTC154	REN 152	SK3054/196	ECG152	TM152	WEP745/152	121-987-02
	2SC525		GE-256	PTC195	REN 225	SK3045	ECG225	TM225	WEP762/225	121-880*

* Lead configuration may vary from original.
 /** Also available as exact type replacement.
 (11) Modified to function as diode.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING	REPLACEMENT DATA				
		MFRG. PART No.	CORNELL- DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
					Q-LINE	GENERAL LINE
C3	.1 35V			TDC104M050EL	QDT1-2	SD50-R109
C5	10 16V			TDC106M025FL	QDT1-64	SD25-109
C8	1 50V		PC1-50	VTT1A50	QV1-11	EV-1615
C25	47 10V		PC50-16	VTT47D16	QV1-73	EV-1226
C33	1 50V		PC1-50	VTT1A50	QV1-11	EV-1615
C58	.22 50V			TDC224M050EL	QDT1-10	SD50-R229
C76	.1 35V			TDC104M050EL	QDT1-2	SD50-R109
C78	.22 35V			TDC224M050EL	QDT1-10	SD50-R229
C80	10 16V		PC10-25	VTT10B25	QV1-41	EV-1222
C87	.1 35V			TDC104M050EL	QDT1-2	SD50-R109
C97	33 10V		PC30-25	VTT33B10		EV-1225
C119	10 16V		PC10-25	VTT10B25	QV1-41	EV-1222
C127	10 16V		PC10-25	VTT10B25	QV1-41	EV-1222
C129	3.3 50V		PC5-50	VTT3R3A50	QV1-25	EV-1618.1
C131	4.7 25V		PC5-50	VTT4R7B50	QV1-31	EV-1619.1
C135	1 50V		PC1-50	VTT1A50	QV1-11	EV-1615
C141	1 25V			TDC105M035EL		SD35-19
C142	3.3 50V		PC5-50	VTT3R3A50	QV1-25	EV-1618.1
C143	1 25V			TDC105M035EL		SD35-19
C145	10 16V		PC10-25	VTT10B25	QV1-41	EV-1222
C148	10 16V		PC10-25	VTT10B25	QV1-41	EV-1222
C150	4.7 25V		PC5-50	VTT4R7B50	QV1-31	EV-1619.1
C156	3.3 10V			TDC335M015FL	QDT1-41	SD15-3R39
C160	33 10V		PC30-25	VTT33B10		EV-1225
C162	47 16V		PC50-16	VTT47D16	QV1-73	EV-1226
C164	1 50V		PC1-50	VTT1A50	QV1-11	EV-1615
C166	2200 16V		WBR2000-16*	TC1520C*	QV1-643*	TVA-1175.3*
C167	330 16V		WBR300-35*	VTT330H16	QV1-133	EV-1245
C170	.47 50V		PC1-50	VTT4R7A63	QV1-3	EV-1610
C171	47 10V		PC50-16	VTT47D16	QV1-73	EV-1226
C173	1 50V		PC1-50	VTT1A50	QV1-11	EV-1615
C175	2.2 50V		PC2-100	VTT2R2A50	QV1-21	EV-1617.1
C176	47 16V		PC50-16	VTT47D16	QV1-73	EV-1226
C179	47 16V		PC50-16	VTT47D16	QV1-73	EV-1226
C182	.47 50V		PC1-50	VTT4R7A63	QV1-3	EV-1610
C215	1 450V		WBR1-450	TC6942		TVA-1700
C216A	47 500V		BB0489A			TVLU-2930
C216B	47 500V		BB0489A			TVLU-2930
C217	1 450V		WBR1-450	TC6942		TVA-1700
C218A	.22 35V			TDC224M050EL	QDT1-10	SD50-R229
C221	100 16V		PC100-16	VTT100F16	QV1-95	EV-1231
C232	1 450V		WBR1-450	TC6942		TVA-1700
C235	33 16V		PC30-25	VTT33D25	QV1-63	EV-1325
C301	2200 25V		WBR2000-25*	TC2520A*	QV1-645*	TVA-1213.5*
C302	1000 25V		WBR1000-25*	VTT100M25	QV1-185	EV-1360
C303	470 16V		PC500-16	VTT470K16	QV1-151	EV-1251
C305	1 50V		PC1-50	VTT1A50	QV1-11	EV-1615
C306	4.7 25V		PC5-50	VTT4R7B50	QV1-31	EV-1619.1
C307	470 16V		PC500-16	VTT470K16	QV1-151	EV-1251
C308	4.7 450V		WBR5-450	TC70B		TVA-1703

* 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	.0047 10%		WMF1D47	M192P4729R8	QFT2-63	1FT-D47
C2	.022 50V 10%		DPMS2S22	M192P2239R8	QFT2-127	1FT-S22
C4	.01 10%		WMF1S1	EW1A110	QFT2-91	1FT-S10
C6	33 N220 10%			*		10TCR-Q33
C7	12 N220	(1)		*		10TCR-Q12
C9	.001 10%		DPMS6D1	EW1A210	QFT2-1	1FT-D10
C10	.0012 10%		DPMS6D15	EW1F6215	QFT2-13	1FT-D15
C11	2 N150			*		10TCP-V22
C12	33 N220 10%	(1)		*		10TCR-Q33
C13	33 N220 10%			*		10TCR-Q33
C14	100 10%		GP100	GP310		10TS-T10
C15	.01 10%		WMF1S1	EW1A110	QFT2-91	1FT-S10
C16	.01 10%		WMF1S1	EW1A110	QFT2-91	1FT-S10
C17	33 N220 10%			*		10TCR-Q33
C18	.001 10%		DPMS6D1	EW1A210	QFT2-1	1FT-D10
C19	220 N220 10%			*		10TCR-T22
C20	33 N220 10%			*		10TCR-Q33

DAK MODEL MARK X

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
C21	22 N220		WMF1S1	*		10TCR-Q22
C22	.01 10%		DPMS6D1	EWFA1A110	QFT2-91	1FT-S10
C23	.001 10%			EWFA1A210	QFT2-1	1FT-D10
C24	120 10%					
C26	.047 10%		DPMS2S47	EWFA1A147	QFT2-171	1FT-S47
C27	.01 10%		WMF1S1	EWFA1A110	QFT2-91	1FT-S10
C28	.001 10%		DPMS6D1	EWFA1A210	QFT2-1	1FT-D10
C29	5 N220			*		10TCR-V50
C30	68 NPO 10%			*		10TCC-Q68
C31	27 N220 10%			*		10TCR-Q27
C32	560 10%			GP356		10TS-T56
C34	.01 10%		WMF1S1	EWFA1A110	QFT2-91	1FT-S10
C35	.01 10%		WMF1S1	EWFA1A110	QFT2-91	1FT-S10
C36	150 N220 5%	(1)		*		10TCR-T15
C37	82 10%			GP482		10TS-Q82
C38	56 N220 10%			*		10TCR-Q56
C39	.01 10%		WMF1S1	EWFA1A110	QFT2-91	1FT-S10
C40	.01 10%		WMF1S1	EWFA1A110	QFT2-91	1FT-S10
C42	3 N220	(1)		*		10TCR-V30
C43	47 NPO 10%	(1)	NPO47	CNO447		10TCC-Q47
C45	.01 10%		WMF1S1	EWFA1A110	QFT2-91	1FT-S10
C46	.01 10%		WMF1S1	EWFA1A110	QFT2-91	1FT-S10
C47	68 NPO 10%		NPO68	CNO468		10TCC-Q68
C48	.01 10%		WMF1S1	EWFA1A110	QFT2-91	1FT-S10
C49	47		GP47	GP447A		5GA-Q47
C50	.01 10%		WMF1S1	EWFA1A110	QFT2-91	1FT-S10
C51	62		GP68	GP468		10TS-Q68
C59	.01 10%		WMF1S1	EWFA1A110	QFT2-91	1FT-S10
C60	5 N220			*		10TCR-V50
C64	.01 10%		WMF1S1	EWFA1A110	QFT2-91	1FT-S10
C65	27 N220 10%	(1)		*		10TCR-Q27
C66	10 NPO	(1)	NPO10	CNO410		10TCC-Q10
C67	.001 10%		DPMS6D1	EWFA1A210	QFT2-1	1FT-D10
C68	22 N220			*		10TCR-Q22
C69	220 N220 10%			*		10TCR-T22
C70	220 N220 10%			*		10TCR-T22
C71	8 N150			*		10TCP-V82
C72	100 10%		GP100	GP310		10TS-T10
C73	33 N220 10%			*		10TCR-Q33
C74	22 N220			*		10TCR-Q22
C75	.01 10%		WMF1S1	EWFA1A110	QFT2-91	1FT-S10
C77	.01 10%		WMF1S1	EWFA1A110	QFT2-91	1FT-S10
C79	.01 10%		WMF1S1	EWFA1A110	QFT2-91	1FT-S10
C81	.01 10%		WMF1S1	EWFA1A110	QFT2-91	1FT-S10
C82	.01 10%		WMF1S1	EWFA1A110	QFT2-91	1FT-S10
C83	.01 10%		WMF1S1	EWFA1A110	QFT2-91	1FT-S10
C84	.01 10%		WMF1S1	EWFA1A110	QFT2-91	1FT-S10
C85	.01 10%		WMF1S1	EWFA1A110	QFT2-91	1FT-S10
C86	.01 10%		WMF1S1	EWFA1A110	QFT2-91	1FT-S10
C88	.01 10%		WMF1S1	EWFA1A110	QFT2-91	1FT-S10
C89	.01 10%		WMF1S1	EWFA1A110	QFT2-91	1FT-S10
C90	.01 10%		WMF1S1	EWFA1A110	QFT2-91	1FT-S10
C91	.01 10%		WMF1S1	EWFA1A110	QFT2-91	1FT-S10
C92	.01 10%		WMF1S1	EWFA1A110	QFT2-91	1FT-S10
C93	.01 10%		WMF1S1	EWFA1A110	QFT2-91	1FT-S10
C94	.01 10%		WMF1S1	EWFA1A110	QFT2-91	1FT-S10
C95	6			GP568A		5GA-V68
C98	.001 10%		DPMS6D1	EWFA1A210	QFT2-1	1FT-D10
C99	.01 10%		WMF1S1	EWFA1A110	QFT2-91	1FT-S10
C100	82 10%			GP482		10TS-Q82
C101	.01 10%		WMF1S1	EWFA1A110	QFT2-91	1FT-S10
C102	.047 10%		DPMS2S47	EWFA1A147	QFT2-171	1FT-S47
C103	.01 10%		WMF1S1	EWFA1A110	QFT2-91	1FT-S10
C104	3 N220			*		10TCR-V30
C105	.01 10%		WMF1S1	EWFA1A110	QFT2-91	1FT-S10
C106	150 N220 5%			*		10TCR-T15
C109	.047 10%		DPMS2S47	EWFA1A147	QFT2-171	1FT-S47
C110	.01 10%		WMF1S1	EWFA1A110	QFT2-91	1FT-S10
C111	.01 10%		WMF1S1	EWFA1A110	QFT2-91	1FT-S10
C112	5 N220			*		10TCR-V50
C113	220 N220 10%			*		10TCR-T22
C114	.0047 10%		WMF1D47	M192P4729R8	QFT2-63	1FT-D47
C115	.001 10%		DPMS6D1	EWFA1A210	QFT2-1	1FT-D10
C116	.033 10%		DPMS6S33	M192P3339R8	QFT2-149	1FT-S33
C117	.0047 10%		WMF1D47	M192P4729R8	QFT2-63	1FT-D47
C118	.01 10%		WMF1S1	EWFA1A110	QFT2-91	1FT-S10
C121	.001 10%		DPMS6D1	EWFA1A210	QFT2-1	1FT-D10
C123	.033 10%		DPMS6S33	M192P3339R8	QFT2-149	1FT-S33
C124	.01 10%		WMF1S1	EWFA1A110	QFT2-91	1FT-S10
C125	.033 10%		DPMS6S33	M192P3339R8	QFT2-149	1FT-S33
C126	.01 10%		WMF1S1	EWFA1A110	QFT2-91	1FT-S10
C128	.0047 10%		WMF1D47	M192P4729R8	QFT2-63	1FT-D47
C130	.033 10%		DPMS6S33	M192P3339R8	QFT2-149	1FT-S33
C132	.0047 10%		WMF1D47	M192P4729R8	QFT2-63	1FT-D47
C133	.0047 10%		WMF1D47	M192P4729R8	QFT2-63	1FT-D47
C136	.01 10%		WMF1S1	EWFA1A110	QFT2-91	1FT-S10
C137	.01 10%		WMF1S1	EWFA1A110	QFT2-91	1FT-S10
C138	100 10%		GP100	GP310		10TS-T10
C139	22 N220			*		10TCR-Q22
C140	5 N220			*		10TCR-V50
C144	.01 10%		WMF1S1	EWFA1A110	QFT2-91	1FT-S10
C146	.01 10%		WMF1S1	EWFA1A110	QFT2-91	1FT-S10
C149	.01 10%		WMF1S1	EWFA1A110	QFT2-91	1FT-S10
C151	.0022 10%		DPMS6D22	M192P2229R8	QFT2-27	1FT-D22
C152	.022 10%		DPMS2S22	M192P2239R8	QFT2-127	1FT-S22
C153	220 N220 10%			*		10TCR-T22
C154	.01 10%		WMF1S1	EWFA1A110	QFT2-91	1FT-S10
C155	.0022 10%		DPMS6D22	M192P2229R8	QFT2-27	1FT-D22
C157	68 NPO 10%		NPO68	CNO468		10TCC-Q68
C158	150 N220 5%			*		10TCR-T15

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
C159	68 NPO 10%		NP068	CH0468		10TCC-Q68
C161	.068 10%		WMF1568	EWFA168	QF1-195	1PB-S68
C163	100 10%		GP100	GP310		10TS-T10
C165	.047			MAG2515		HY-735
C169	.01 10%		WMF151	EWFA110	QFT2-91	1FT-S10
C172	.01 10%		WMF151	EWFA110	QFT2-91	1FT-S10
C174	.01 10%		WMF151	EWFA110	QFT2-91	1FT-S10
C180	.047			MAG2515		HY-735
C181	.047			MAG2515		HY-735
C183	.001 10%			EWFA210	QFT2-1	1FT-D10
C185	39 N220 10%	(1)	DPMS6D1	*		10TCR-Q39
C186	220 N220 10%	(1)		*		10TCR-T22
C187	18 N220			*		10TCR-Q18
C188	18 N220			*		10TCR-Q18
C190	.01 10%		WMF151	EWFA110	QFT2-91	1FT-S10
C191	.01 10%		WMF151	EWFA110	QFT2-91	1FT-S10
C192	.047 10%		DPMS2S47	EWFA147	QFT2-171	1FT-S47
C194	100 10%		GP100	GP310		10TS-T10
C195	.0222 10%		DPMS6D22	M192P2229R8	QFT2-27	1FT-D22
C196	82 10%	(1)		GP482		10TS-Q82
C197	.0022			GP222		10TS-D22
C198	.047			MAG2515		HY-735
C199	.01			MAG5011		
C201	.01			MAG5011		
C202	.01 10%			MAG5011		
C203	33		CD15ED330J03	SX433	QW1-15	MWA-330
C204	33		CD15ED330J03	SX433	QW1-15	MWA-330
C205	.001 10%			GP210		10TS-D10
C206	.001 10%			GP210		10TS-D10
C207	.01			MAG5011		
C209	.001 10%		DPMS6D1	EWFA210	QFT2-1	1FT-D10
C210	.001			GP210		10TS-D10
C211	.0047 125VAC					
C212	.0047 125VAC					
C213	.0047 125VAC					
C2188	.001			GP210		10TS-D10
C219	.001			GP210		10TS-D10
C220	.01			MAG5011		
C222	.1			MAG5001		
C223	.01			MAG5011		
C224	.01			MAG5011		
C225	.01			MAG5011		
C226	.22 600V		DPMS6P22	EWFA022		6PS-P22
C227	.001			GP210		10TS-D10
C228	.01			MAG5011		
C229	.01			MAG5011		
C230	.001			GP210		10TS-D10
C231	5 N220	(1)		*		10TCR-V50
C299	62 5%					
C304	.047			MAG2515		HY-735
C309	.0047 1000V		GP4700	GP247		5GA-D47
C310	.0047		GP4700	GP247		5GA-D47
C601	.001			GP210		10TS-D10
C602	.2		CD15CD050D03		QW1-2	MWA-050
C603	.001			GP210		10TS-D10
C604	.01			MAG5011		
C605	.001			GP210		10TS-D10
C606	.01			MAG5011		
C701	180 10%		CD15FD181J03	SX318	QW1-33	MWA-181
C702	180 10%		CD15FD181J03	SX318	QW1-33	MWA-181
C703	180 10%		CD15FD181J03	SX318	QW1-33	MWA-181
C704	180 10%		CD15FD181J03	SX318	QW1-33	MWA-181
C801	.01			MAG5011		
C802	.01			MAG5011		
C803	.047			MAG2515		HY-735
C901	.001 10%		DPMS6D1	EWFA210	QFT2-1	1FT-D10
C902	30					
C903	350					
C904	22		CD15ED220J03	SX422	QW1-11	MWA-220
C905	39 10%		CD15ED390J03	SX439	QW1-17	MWA-390
C906	82 10%		CD15ED820J03	SX482	QW1-25	MWA-820
C907	39 10%		CD15ED390J03	SX439	QW1-17	MWA-390
C908	10		CD15CD100J03		QW1-6	MWA-100
CT1	20					
CT2	20					
CT3	20					
CT4	20					
CT5	20					
F1						
F2						
F3						
F4						
F5						

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
 (1) Indicates value may vary unit to unit.

DAK MODEL MARK X

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.
RV2	SSB RF ALC	5000		RVA0911H502	U260R502B
RV4	Carrier Balance	1000		RVA0911H102	U260R102B
RV5	Carrier Balance	10K		RVA0911H103	U260R103B
RV6	AM Signal Meter	10K		RVA0911H103	U260R103B
RV7	SSB Signal Meter	10K		RVA0911H103	U260R103B
RV8	AGC	5000		RVA0911H502	U260R502B
RV9	AM Squelch Range	20K		RVA0911H253	U260R253B
RV10	SSB Squelch Range	100K		RVA0911H104	U260R104B
RV11	SSB Mic Gain	500		RVA0911H501	U260R501B
RV12	AMC	20K		RVA0911H253	U260R253B
RV201	AM Bias	100K		RU15L,SL36,SL1500	BU1(1),CF13,SS2,DC1
RV202	SSB Final Bias	100K		RU15L,SL36,SL1500	BU1(1),CF13,SS2,DC1
RV204	AMC	30K		RVA0911H503	U260R503B
RV601	SWR Meter	20K		RVA0911H253	U260R253B
RV602	AM RF Power Meter	20K		RVA0911H253	U260R253B
RV603	SSB RF Power Meter	20K		RVA0911H253	U260R253B
RV801	% Modulation Meter	20K		RVA0911H253	U260R253B
RV802	SSB Plate Current	10K		RVA0911H103	U260R103B
VR1	Volume-Power Switch	50K		RU54A,SL36,SL1500,US41	BU1(1),CF63,SS1,GC
VR2	Squelch	50K		RU54L,SL36,SL1500	BU1(1),CF12,SS1,DC1
VR3	RF Gain	50K			
VR4	Clarifier	50K		RU54A,SL36,SL1500	BU1(1),CF63,SS1,DC1
VR201	Mic Gain	50K		RU54A,SL36,SL1500	BU1(1),CF63,SS1,DC1
VR801	SWR Calibrate	10K		RU14L,SL36,SL1500	BU1(1),CF9,SS1,DC1

(1) Enlarge mounting hole.

COILS (RF-IF)

ITEM No.	FUNCTION	REPLACEMENT DATA			REMARKS
		PART No.	OTHER IDENTIFICATION	MILLER PART No.	
L1	RF Choke		2R2	70F226AI	
L2	RF Choke		0B9		
L3	RF Choke		0B9		
L4	RF Choke		2R2	70F226AI	
L5	RF Choke		2R2	70F226AI	
L7	RF Predriver (27MHz)				
L14	RF Choke		4R7		
L15	Pi Filter		2R2	70F226AI	
L16	RF Choke				
L17	RF Choke		0B9		
L18	RF Choke		102		
L19	RF Choke		0B9		
L20	RF Choke				
L21	RF Choke				
L23	RF Choke				
L24	RF Choke		0B9		
L201	RF Driver (27MHz)				
L202	RF Choke				
L701	Pi Filter				
L702	Pi Filter				
L901	RF Choke				
L902	Loading Final (27MHz)				
L903	RF Choke				
T1	Mixer (37.660MHz)				
T2	Mixer (37.660MHz)				
T3	Oscillator (20.1035MHz)		PT3S		
T4	RF Amp (27MHz)		PT4S		
T5	RF Amp (27MHz)		PT5S		
T6	RF Predriver (27MHz)				
T7	Rec Antenna (27MHz)		RX1S		
T8	RF Amp (27MHz)				
T9	RF Amp (27MHz)				
T10	Mixer (10.695MHz)		RX4S		
T11	SSB IF Amp (10.695MHz)		RX5S		
T12	SSB IF Amp (10.695MHz)		RX6S		
T13	Mixer (10.695MHz)		RX7S		
T14	AM IF (455kHz)		RX8S		
T15	AM IF Amp (455kHz)				
T999	RF Choke				

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.	
CH L204	300mA 150mA	.23 39.8	3.3mH 780mH	310028(1)			(1) Number on unit.

TRANSFORMER

ITEM No.	IMPEDANCE		REPLACEMENT DATA			NOTES
	PRI.	SEC.	MFGR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T302	1CT	15	310029A(1)			(1) Number on unit.

PARTS LIST AND DESCRIPTION (CONTINUED)

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

TRANSFORMER (Power)

ITEM No.	RATING		REPLACEMENT DATA			NOTES
	PRI.	SEC. 1	MFGR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T201	120V AC @ 1.3A AC	16.60V AC @ 3.3A AC				
	SEC. 2 6.54V AC @ 2.9A AC	SEC. 3 318V AC @ 280mA AC				

TRANSFORMER

ITEM No.	TURNS RATIO			REPLACEMENT DATA			NOTES
	PRI.	SEC. 1	SEC. 2	MFGR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T301	1	5CT		310026(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.	
T16	32	8				

SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		MFGR. PART No.	QUAM PART No.	
SPK	4" PH, 8 Ohms		4A1Z8	

FUSE DEVICES

ITEM No.	DESCRIPTION	REPLACEMENT DATA						
		PART No.		BUSS PART No.		LITTELFUSE PART No.		WORKMAN PART No.
		DEVICE	HOLDER	DEVICE	HOLDER	DEVICE	HOLDER	DEVICE
F201	1.5A Quick Acting			AGC1 1/2	HKP	31201.5	342014AL	FG1 1/2-2
F301	5A Quick Acting			GJV5		318005		

DAK MODEL MARK X

PARTS LIST AND DESCRIPTION (CONTINUED)

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

MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
CF1	Filter		(10.7MHz)
CF2	Filter		(455kHz)
K1	Relay		174 Ohms
LED301	LED		Channel Display (Tens & Units) (Each segment supplied with 1.72V @ 10mA)
M1	Meter		Signal Strength
M2	Meter		% Modulation
M3	Meter		Plate Current
M4	Meter		SWR
PL1	Lamp		Noise Blanker (6.54V AC @ 25mA)
PL2	Lamp		Off (6.54V AC @ 25mA)
PL3	Lamp		Slow (6.54V AC @ 25mA)
PL4	Lamp		Fast (6.54V AC @ 25mA)
PL5	Lamp		LSB (6.54V AC @ 25mA)
PL6	Lamp		USB (6.54V AC @ 25mA)
PL7	Lamp		AM (6.54V AC @ 25mA)
PL8	Lamp		Plate Current (6.54V AC @ 25mA)
PL9	Lamp		RF Power (6.54V AC @ 25mA)
PL10	Lamp		Standby (6.54V AC @ 25mA)
PL11	Lamp		SWR (6.54V AC @ 25mA)
PL12	Lamp		Signal Strength Meter (6.54V AC @ 130mA)
PL13	Lamp		% Modulation Meter (6.54V AC @ 130mA)
PL14	Lamp		RF Output Power Meter (6.54V AC @ 130mA)
PL15	Lamp		SWR Meter (6.54V AC @ 130mA)
PL16	Lamp		Power/On (6.54V AC @ 25mA)
S2	Switch		LSB/USB/AM
S5	Switch		SWR/CAL
S6	Switch		Plate Current/RF Power
S7	Switch		NB/ANL/Off
S8	Switch		Standby/Xmt
S9	Switch		Off/Slow/Fast (AGC)
SW1	Switch		Channel Selector
SW6	Switch		On/Volume
VT201	Tube		RF Driver, 12BY7A (Pentagrid)
VT202	Tube		Final, 6DG6 (Pentagrid)
X1	Crystal		(10.0525MHz)
X2	Crystal		(10.240MHz)
X3	Crystal		(10.642MHz)
XF	Filter		(10.7MHz)

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. 8259 (RG-58A/U, 50 ohms)
Microphone Cable (Coiled)	Use BELDEN No. 9466 (3 conductor-1 shielded)(6 ft.)(AWG28)
AC Power Cord	Use BELDEN No. 17106 (6 ft.)(2 conductors)
AC Power Cord	Use BELDEN No. 17109 (9 ft.)(2 conductors)