

SAMS PHOTOFACT[®] CB RADIO SERIES



CB-182
182
APRIL 1978



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SAMS PHOTOFAC[®]

CB RADIO SERIES



by the *Howard W. Sams* ENGINEERING STAFF



HOWARD W. SAMS & CO., INC.
INDIANAPOLIS, INDIANA

**FIRST EDITION
FIRST PRINTING—APRIL 1978**

**C B RADIO SERIES
VOLUME 182**

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Library of Congress Catalog Card Number: 61-18464



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.)

C B RADIO SERIES

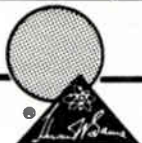
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CHANNEL FREQUENCIES

FREQUENCY	CHANNEL	FREQUENCY	CHANNEL
26.965 MHz	1	27.215 MHz	21
26.975 MHz	2	27.225 MHz	22
26.985 MHz	3	27.235 MHz	24
27.005 MHz	4	27.245 MHz	25
27.015 MHz	5	27.255 MHz	23
27.025 MHz	6	27.265 MHz	26
27.035 MHz	7	27.275 MHz	27
27.055 MHz	8	27.285 MHz	28
27.065 MHz	9	27.295 MHz	29
27.075 MHz	10	27.305 MHz	30
27.085 MHz	11	27.315 MHz	31
27.105 MHz	12	27.325 MHz	32
27.115 MHz	13	27.335 MHz	33
27.125 MHz	14	27.345 MHz	34
27.135 MHz	15	27.355 MHz	35
27.155 MHz	16	27.365 MHz	36
27.165 MHz	17	27.375 MHz	37
27.175 MHz	18	27.385 MHz	38
27.185 MHz	19	27.395 MHz	39
27.205 MHz	20	27.405 MHz	40



PHOTOFACT[®] with

CIRCUITRACE[®]

For Supplier Address See PHOTOFACT Index

NOTE

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

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

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

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

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



MODEL 3-5821B

MANUFACTURER'S SPECIFICATIONS

GENERAL

CHANNELS: 40 channels - PLL digital logic channel synthesizer circuitry

POWER REQUIREMENT: Consumption - 18 watts; Current drain - 1.3 amps (100% mod.) at 13.8 Volt DC

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

SEMICONDUCTORS: integrated circuits, transistors and diodes.

OPERATING TEMPERATURE RANGE: -30 to +50 C.

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

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

CONTROLS/FEATURES: Volume with ON-OFF switch, Squelch, Microphone Gain, Tone and R.F. Gain controls, Channel selector switch, PA/CB switch, Noise blanker + ANL switch, Priority channel switch (monitor one pre-selected channel), Receive Priority Ch., Receive light, Priority Ch. Memory ring indicator, LED type channel readout, TX (transmit) light, antenna warning light (AWI), S-RF meter (receive-transmit).

CONNECTORS: External speaker jack 3.5mm (8 ohms impedance), SO-239 type antenna receptacle to match PL-259 coax plug (50 ohms impedance), PA Speaker Jack 3.5mm (8 ohms impedance), 12 Volt DC power jack, separate power cable, that allows easy disconnect, MIC Jack.

DIMENSIONS: 6½" W, 2¼" H, 9¾" D

RECEIVER

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

FREQUENCY COVERAGE: 26.965 to 27.405 MHz.

ADJACENT CHANNEL SELECTIVITY: Better than 60db.

AUDIO OUTPUT POWER: @ 10% DIST. better than 2.2 watts.

SPURIOUS REJECTION: Better than 60db.

IF FREQUENCIES: 455 KHz, 9.785 MHz

SQUELCH RANGE (SENSITIVITY) 0.5 to 500 uv nominal.

IMAGE REJECTION RATIO: Better than 60db.

PUBLIC ADDRESS (PA): Min. 3 watts @ 10% Distortion.

TRANSMITTER

FREQUENCY RESPONSE: 400 Hz to 2.5 kHz.

FREQUENCY COVERAGE: 26.965 to 27.405 MHz.

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

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

FREQUENCY TOLERANCE: Better than .005% MAX.

Courtesy of the Manufacturer

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

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GENERAL ELECTRIC MODEL 3-5821B

ALIGNMENT INSTRUCTIONS

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

Suggested Alignment Tools: GC Electronics:
 L101 thru L106, L501, L502, L901, L903, F901.....9440
 T301 thru T305, T801 thru T807.....5009, 8728-A, 8728
 L905.....9304, 9300, 9302
 CT801.....8276, 5000

SYNTHESIZER ALIGNMENT

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Input of frequency counter to 10M(A).	Ch. 19		Check for 10.240MHz.
Input of oscilloscope to 10M(A).	Ch. 19	T801	Adjust for maximum RF.
Input of frequency counter thru 5pF to TP10 (Q808, Emitter).	Ch. 19	CT801	Adjust for 11.750MHz.
Input of DC meter to TP11 (IC801, Pin 7).	Ch. 1	T802	Adjust for 1.3 volts.
Input of oscilloscope to 37M(B).	Ch. 19	T803	Adjust for maximum RF.
Input of frequency counter to 37M(B).	Ch. 1		Check for 36.750MHz. Check all channels. (See Truth Chart for correct frequencies). Check for 9.785MHz.
Input of frequency counter to TP12 (Q805, Emitter).	Ch. 19, XMT		
Input of oscilloscope to 27M(C)	Ch. 19, XMT	T804, T805, T806, T807	Adjust for maximum RF.
Input of frequency counter to 27M(C).	Ch. 1, XMT		Check for 26.965MHz. Check all channels. (Should indicate channel frequency).
Input of frequency counter and oscilloscope to TP14 (Q104, Emitter).	Ch. 1, Ch. 9, Priority Auto Off	L106	Adjust for maximum RF. Check for X4 frequency.

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.

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Output of signal generator thru .01uF to TP13. 455kHz, 1000Hz @ 30% modulation.	Ch. 19, RF Gain Maximum Squelch Main MINIMUM NB & ANL Off Ch. 9 Off Priority Off	T304, T303	Adjust for maximum output.
Output of signal generator thru .01uF to antenna jack. 27.185MHz, 1000Hz @ 30% modulation.	Ch. 19, RF Gain Maximum Squelch Main MINIMUM NB & ANL Off Ch. 9 Off Priority Off	T302, T301, L103, L102, L101	Adjust for maximum output. If necessary readjust T303 and T304.
Output of signal generator thru .01uF to antenna jack. 27.185MHz, 1000Hz @ 30% modulation.	Ch. 19, Crystal inserted in Priority Channels socket. Squelch Pri MINIMUM Priority Auto Ch. 9 Off Channel Selector Ch.1	T305, L105, L104	Adjust for maximum output.
Output of pulse generator to antenna jack. Pulse width: 1u sec Frequency: 100Hz Input of oscilloscope across voice coil.	Ch. 19, RF Gain Maximum Squelch Main MINIMUM NB & ANL On Ch. 9 Off Priority Off	L502, L501	Turn core of L502 to top of coil form. Turn L501 counterclockwise until noise disappears. Turn L501 180 degrees counterclockwise.

RECEIVER ADJUSTMENTS

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

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
No signal input. Input of DC meter to TP1.	Ch. 19, RF Gain Maximum Squelch Main MINIMUM NB & ANL Off Ch. 9 Off Priority Off	VR3	AGC Adjust for 1.37 Volts. -.02V + .03V.
Output of signal generator thru .01uF to antenna jack. 27.185MHz,1000Hz @ 30% modulation. Output 50,000uV.	Ch. 19, RF Gain MINIMUM Squelch Main MINIMUM NB & ANL Off Ch. 9 Off Priority Off	VR1	RFG Adjust VR1 for maximum output.
Output of signal generator thru .01uF to antenna jack. 27.185MHz,1000Hz @ 30% modulation. Output 600uV.	Ch. 19, RF Gain Maximum Squelch Maximum NB & ANL Off Ch. 9 Off Priority Off	VR5	MAIN SQUELCH RANGE Adjust VR5 so that squelch just breaks.
Output of signal generator thru .01uF to antenna jack. Priority channel frequency. 1000Hz @ 30% modulation. Output 600uV.	Ch. 19, Priority Auto Ch. 9 Off Squelch Pri Maximum	VR7	PRIORITY SQUELCH RANGE Adjust VR7 so that squelch just breaks.
Output of signal generator thru .01uF to antenna jack. 27.185MHz,1000Hz @ 30% modulation. Output 100uV.	Ch. 19, RF Gain Maximum Squelch Main MINIMUM NB & ANL Off Ch. 9 Off Priority Off	VR6	RX SIGNAL METER Adjust VR6 for 9 on RX signal scale of meter.

TRANSMITTER ALIGNMENT

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

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Input of spectrum analyzer or harmonic meter to antenna jack.	Ch. 19	L901,L903, L905	Adjust for maximum.
	Ch. 19	L905	Decrease output .5 watt.
	Ch. 19	L903	Adjust clockwise for 3.75 watts.
	Ch. 19	L901	Adjust for maximum.
	Ch. 19	L903	Adjust for 3.75 watts.
	Ch. 19	F901	Adjust for MINIMUM at 54MHz.

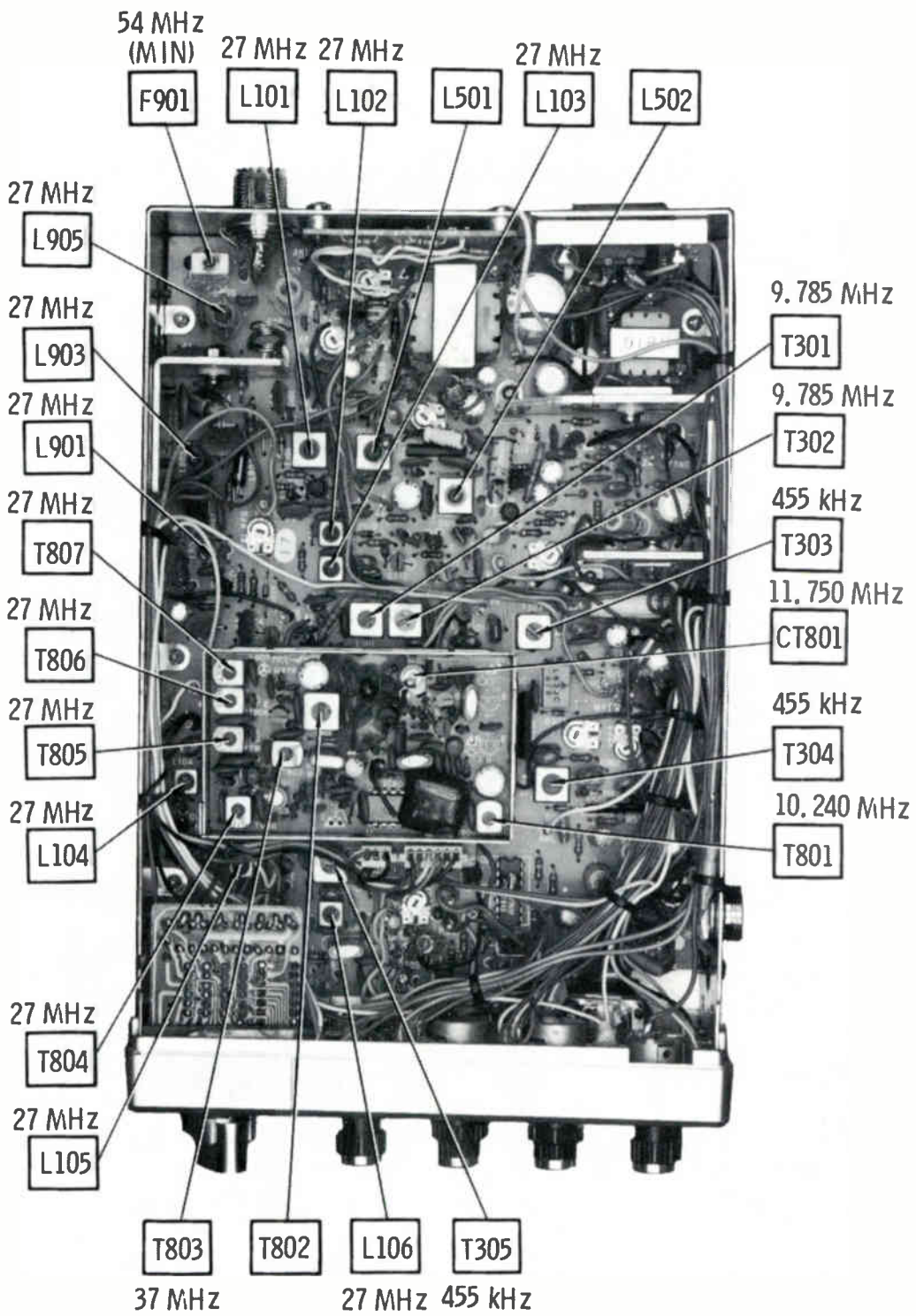
TRANSMITTER ADJUSTMENTS

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.

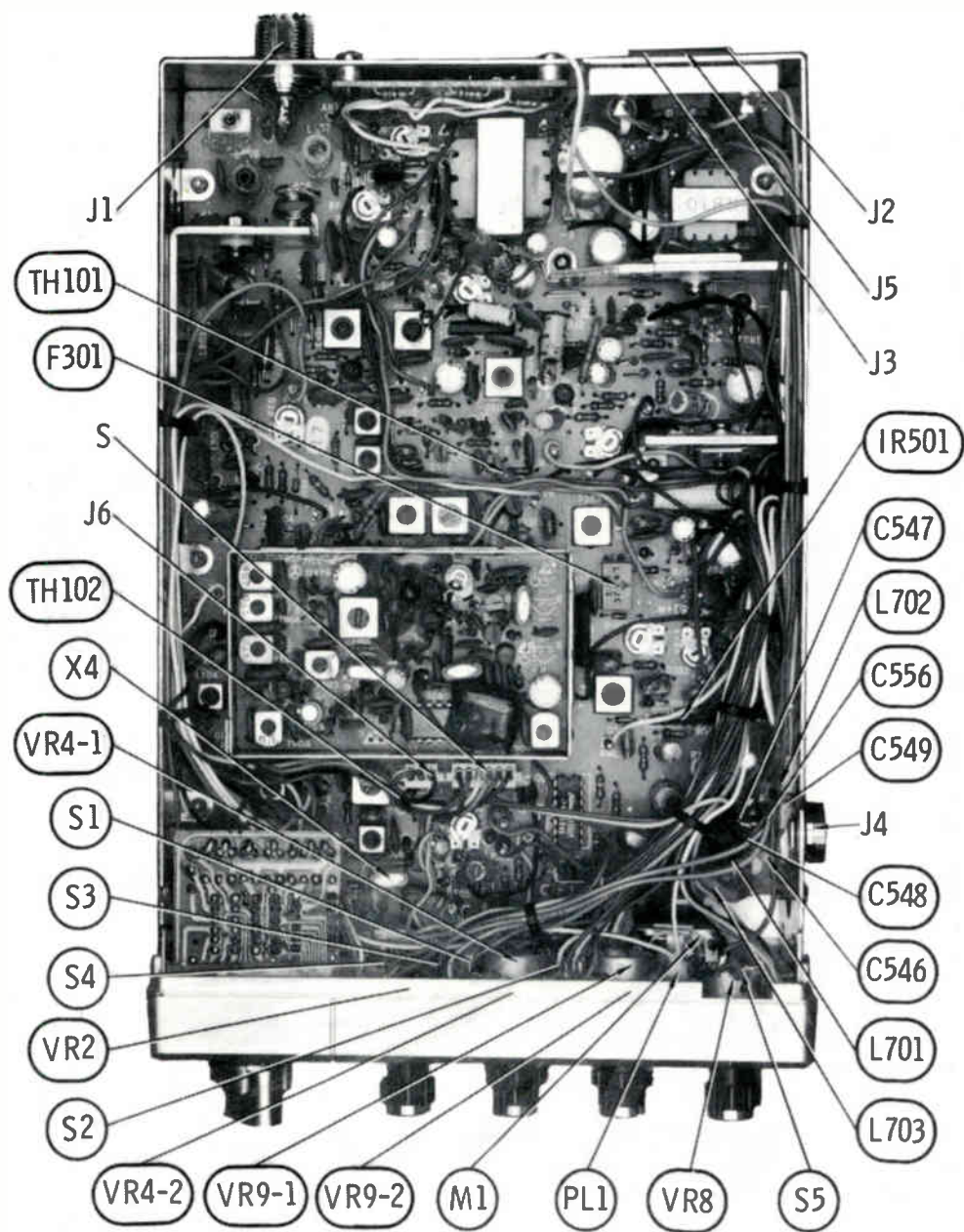
TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Modulation meter or oscilloscope to antenna jack. Inject a 1000Hz, 50mV signal at MIC input.	Ch. 19	VR10	AMC Adjust for 90% modulation.
Connect an RF wattmeter and 50 Ohm dummy load to antenna connector.	Ch. 19	VR11	TX POWER METER Adjust VR11 for a 2/3 reading on TX power scale of meter.
Connect a 250 Ohm 5 watt non-inductive resistor to antenna jack.	Ch. 19	VR12	AWI Adjust VR12 so that AWI indicator lights.

TRUTH CHART

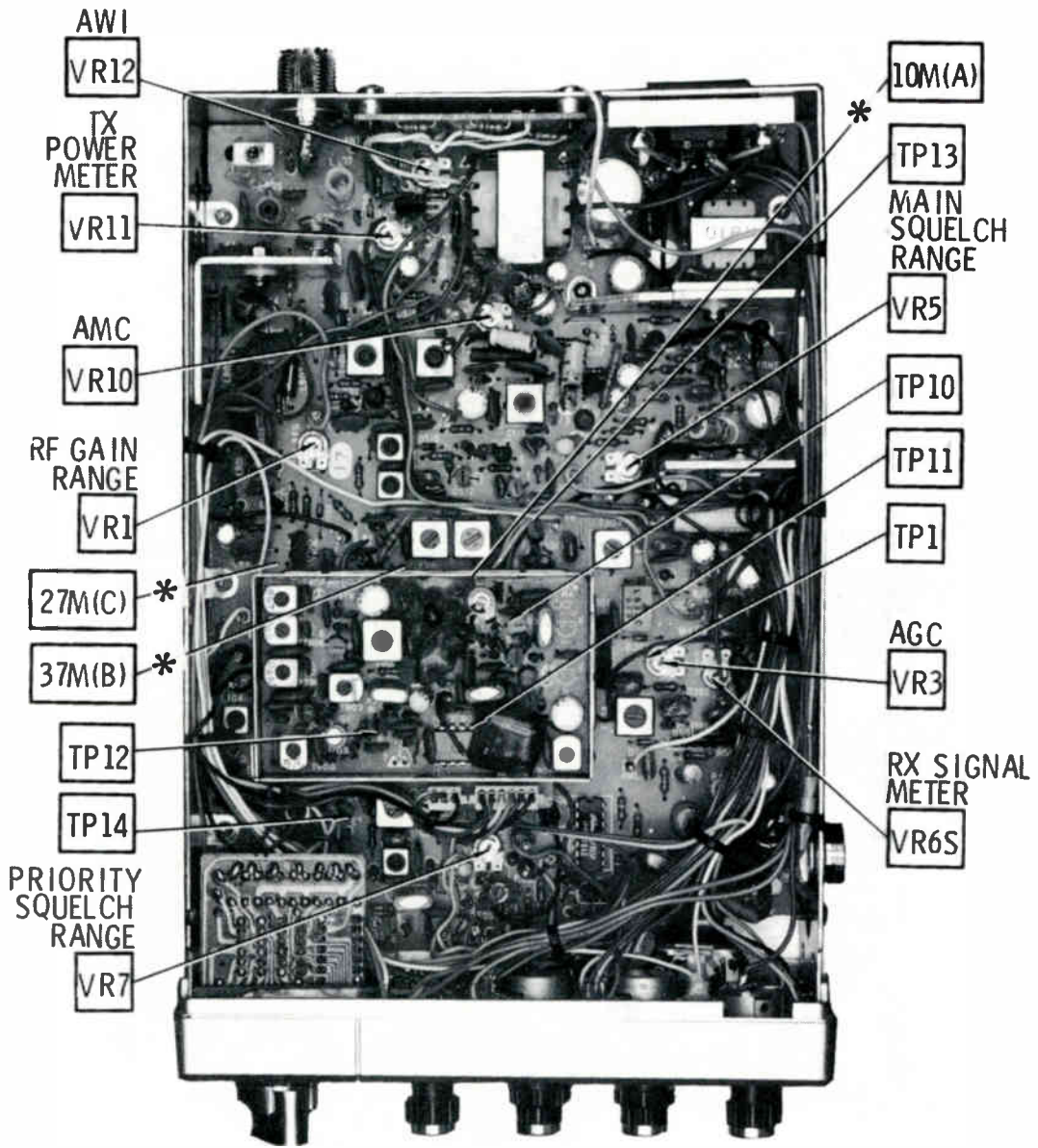
CHANNEL	1 = 6.44 Volts 0 = .50 Volts							REC VCO OUTPUT IN MHz AT 37M(B)	XMT VCO OUTPUT IN MHz AT 27M(C)
	IC801 PROGRAM DIVIDER								
	PINS								
	14	15	16	17	18	19			
1	1	0	1	1	0	0		36.750	26.965
2	1	0	1	0	1	1		36.760	26.975
3	1	0	1	0	1	0		36.770	26.985
4	1	0	1	0	0	0		36.790	27.005
5	1	0	0	1	1	1		36.800	27.015
6	1	0	0	1	1	0		36.810	27.025
7	1	0	0	1	0	1		36.820	27.035
8	1	0	0	0	1	1		36.840	27.055
9	1	0	0	0	1	0		36.850	27.065
10	1	0	0	0	0	1		36.860	27.075
11	1	0	0	0	0	0		36.870	27.085
12	0	1	1	1	1	0		36.890	27.105
13	0	1	1	1	0	1		36.900	27.115
14	0	1	1	1	0	0		36.910	27.125
15	0	1	1	0	1	1		36.920	27.135
16	0	1	1	0	0	1		36.940	27.155
17	0	1	1	0	0	0		36.950	27.165
18	0	1	0	1	1	1		36.960	27.175
19	0	1	0	1	1	0		36.970	27.185
20	0	1	0	1	0	0		36.990	27.205
21	0	1	0	0	1	1		37.000	27.215
22	0	1	0	0	1	0		37.010	27.225
23	0	0	1	1	1	1		37.040	27.255
24	0	1	0	0	0	1		37.020	27.235
25	0	1	0	0	0	0		37.030	27.245
26	0	0	1	1	1	0		37.050	27.265
27	0	0	1	1	0	1		37.060	27.275
28	0	0	1	1	0	0		37.070	27.285
29	0	0	1	0	1	1		37.080	27.295
30	0	0	1	0	1	0		37.090	27.305
31	0	0	1	0	0	1		37.100	27.315
32	0	0	1	0	0	0		37.110	27.325
33	0	0	0	1	1	1		37.120	27.335
34	0	0	0	1	1	0		37.130	27.345
35	0	0	0	1	0	1		37.140	27.355
36	0	0	0	1	0	0		37.150	27.365
37	0	0	0	0	1	1		37.160	27.375
38	0	0	0	0	1	0		37.170	27.385
39	0	0	0	0	0	1		37.180	27.395
40	0	0	0	0	0	0		37.190	27.405



CHASSIS - BOTTOM

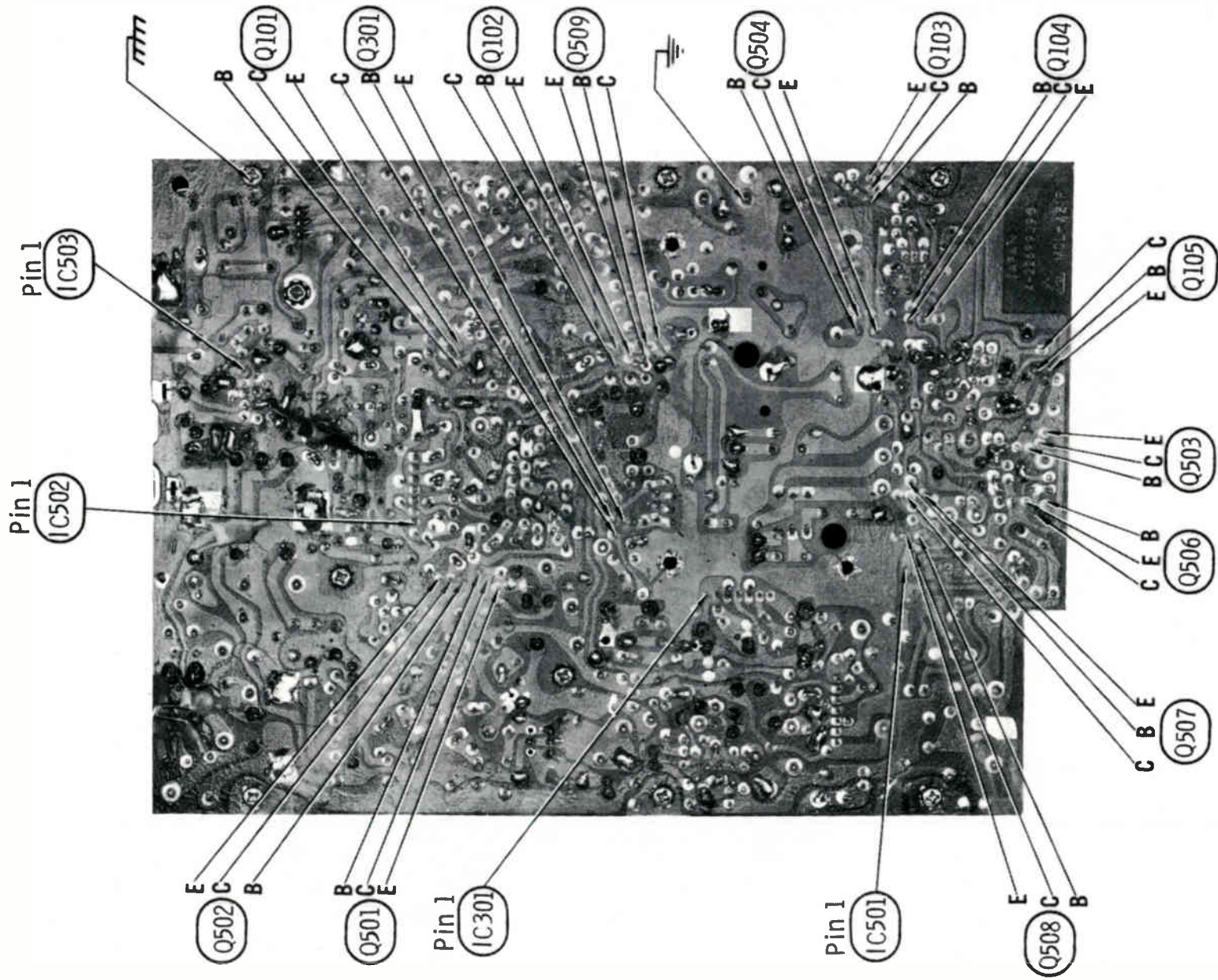


CHASSIS - BOTTOM

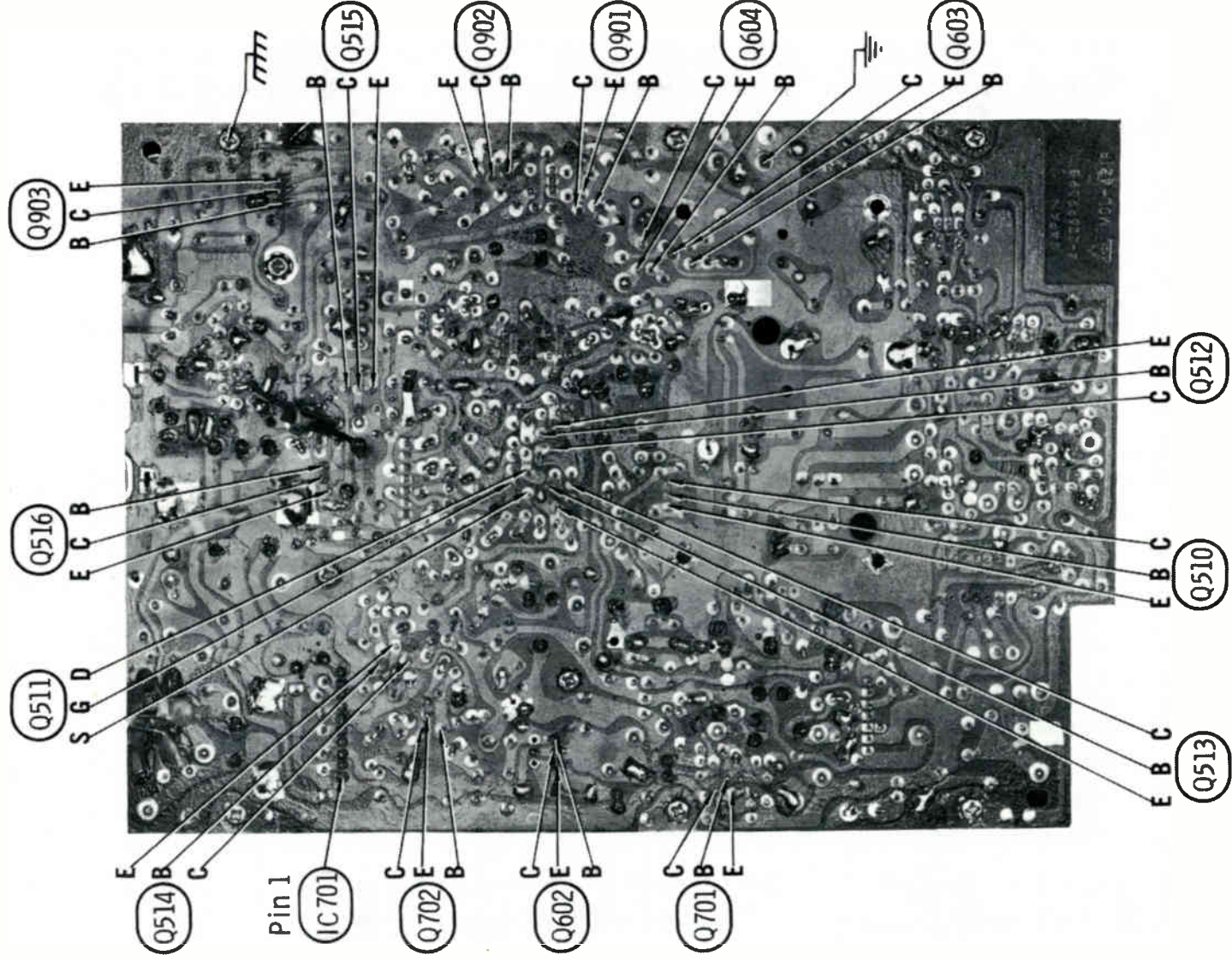


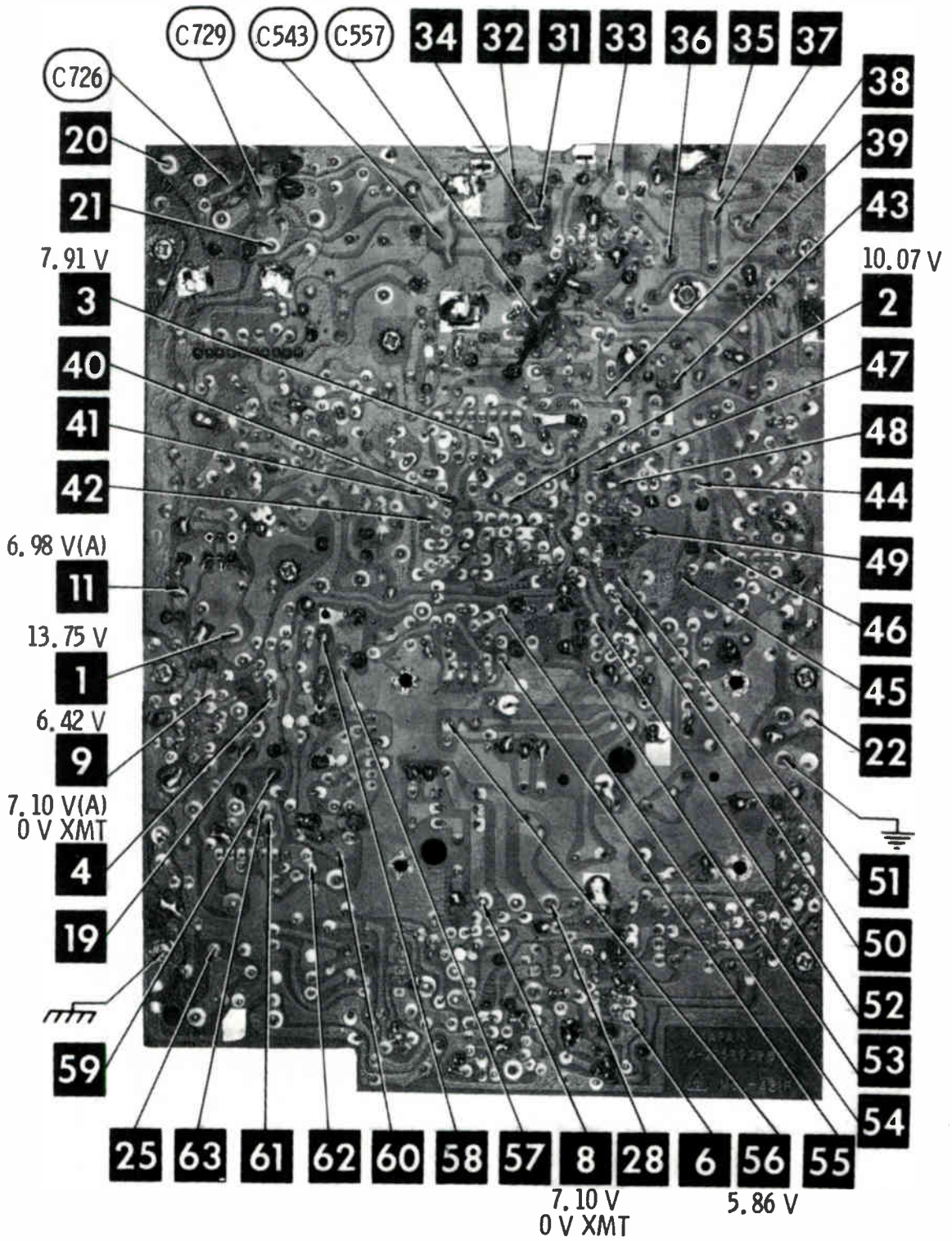
* LOCATED ON BOTTOM OF BOARD

CHASSIS - BOTTOM

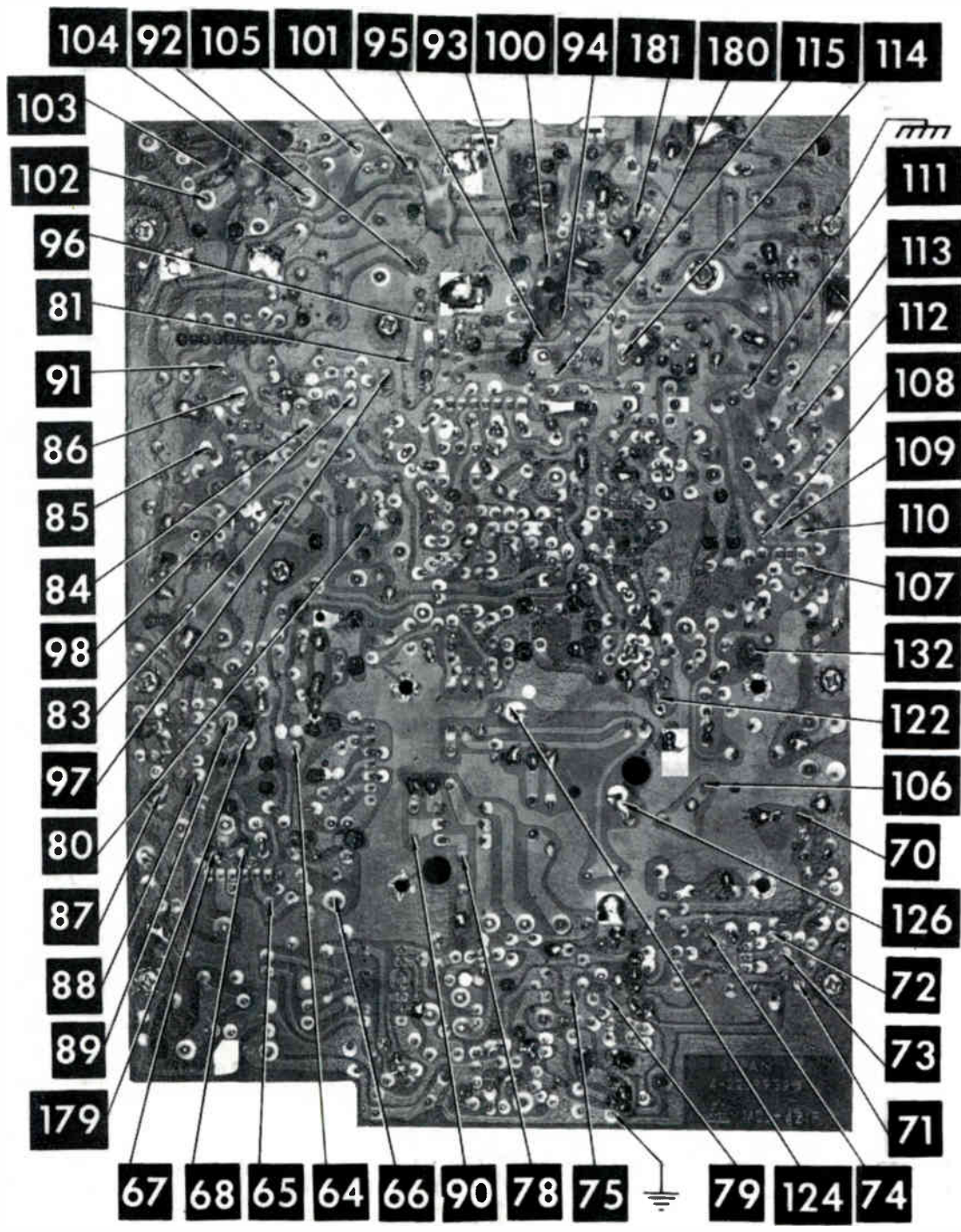


MAIN BOARD



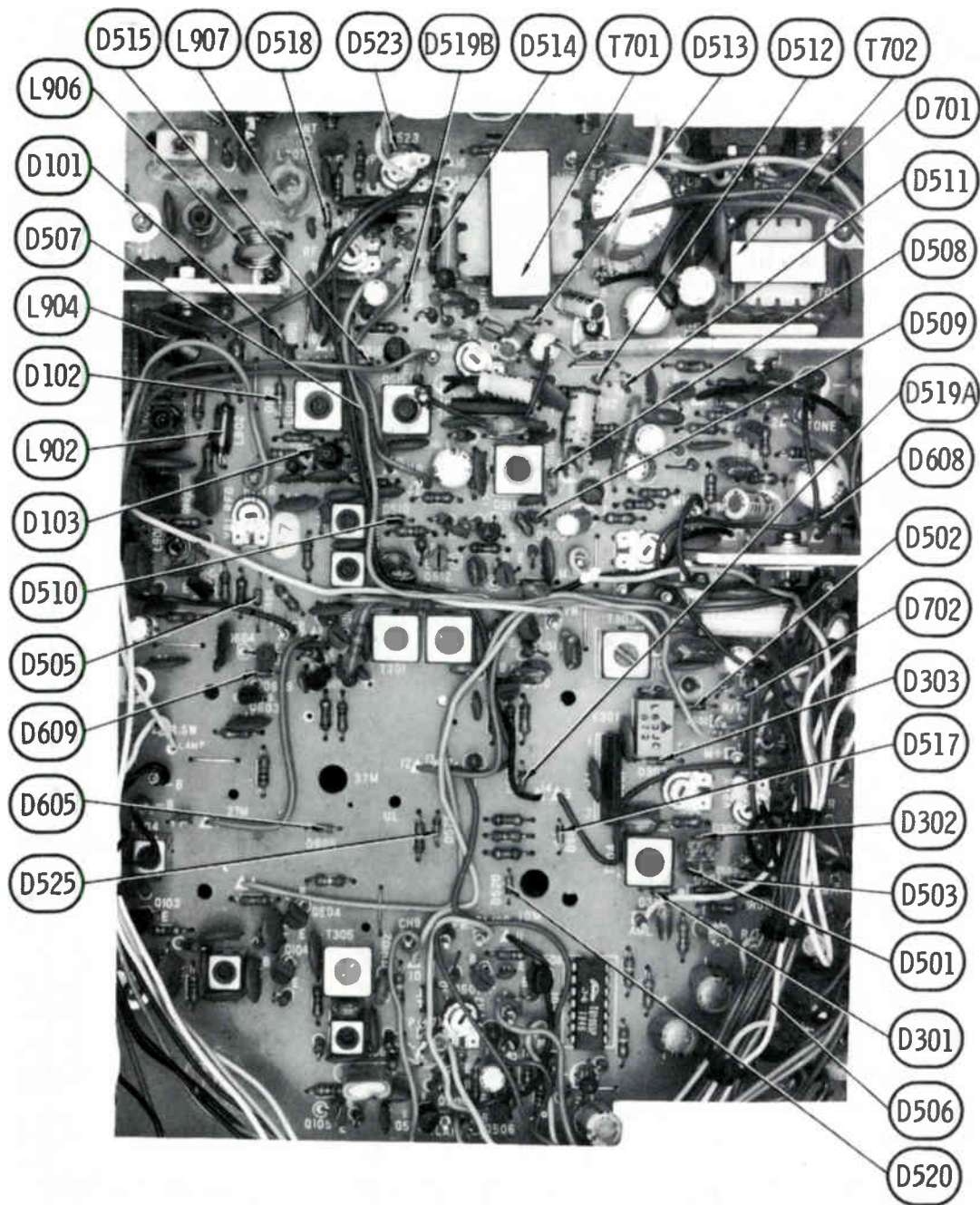


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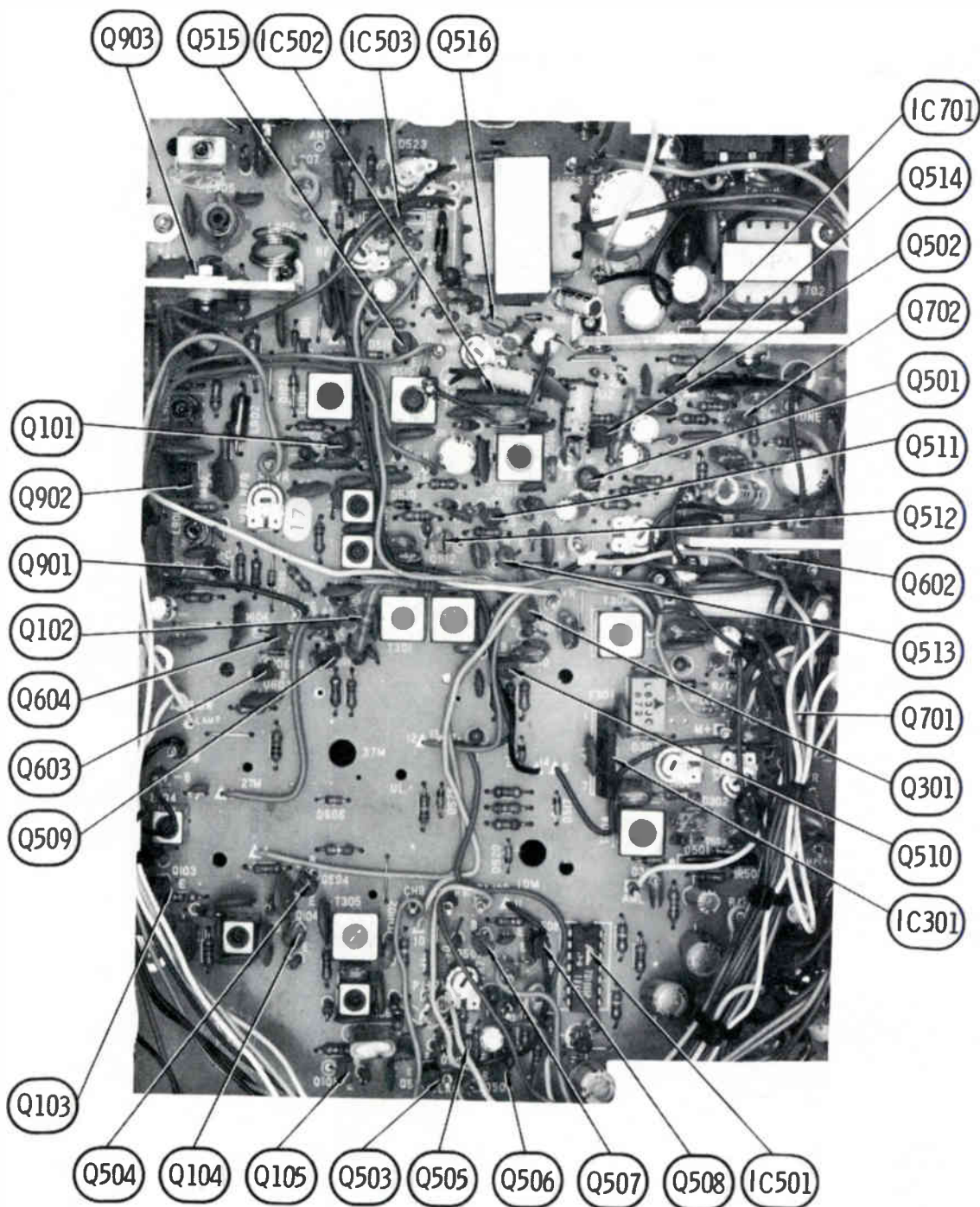


GENERAL ELECTRIC MODEL 3-5821B

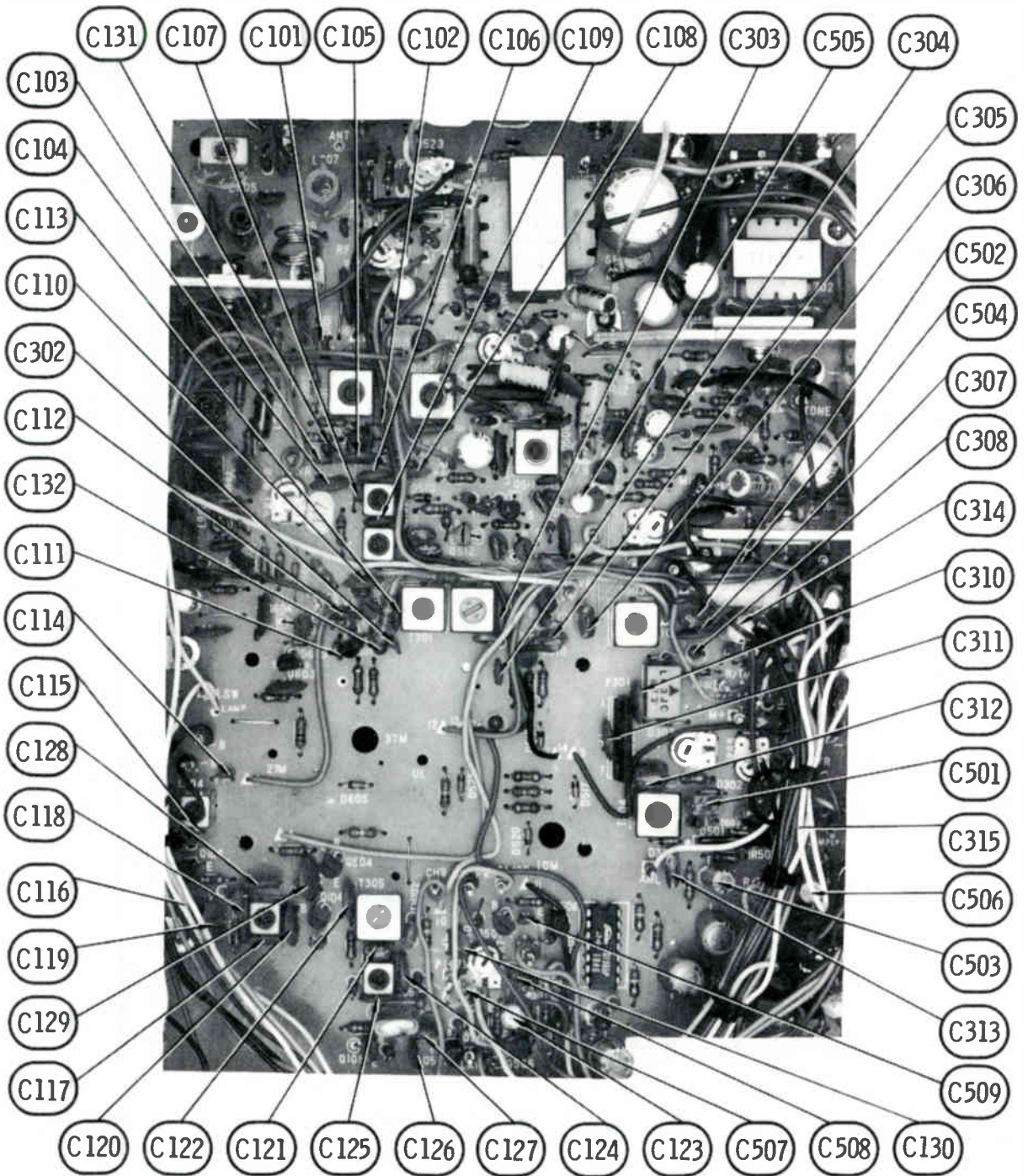
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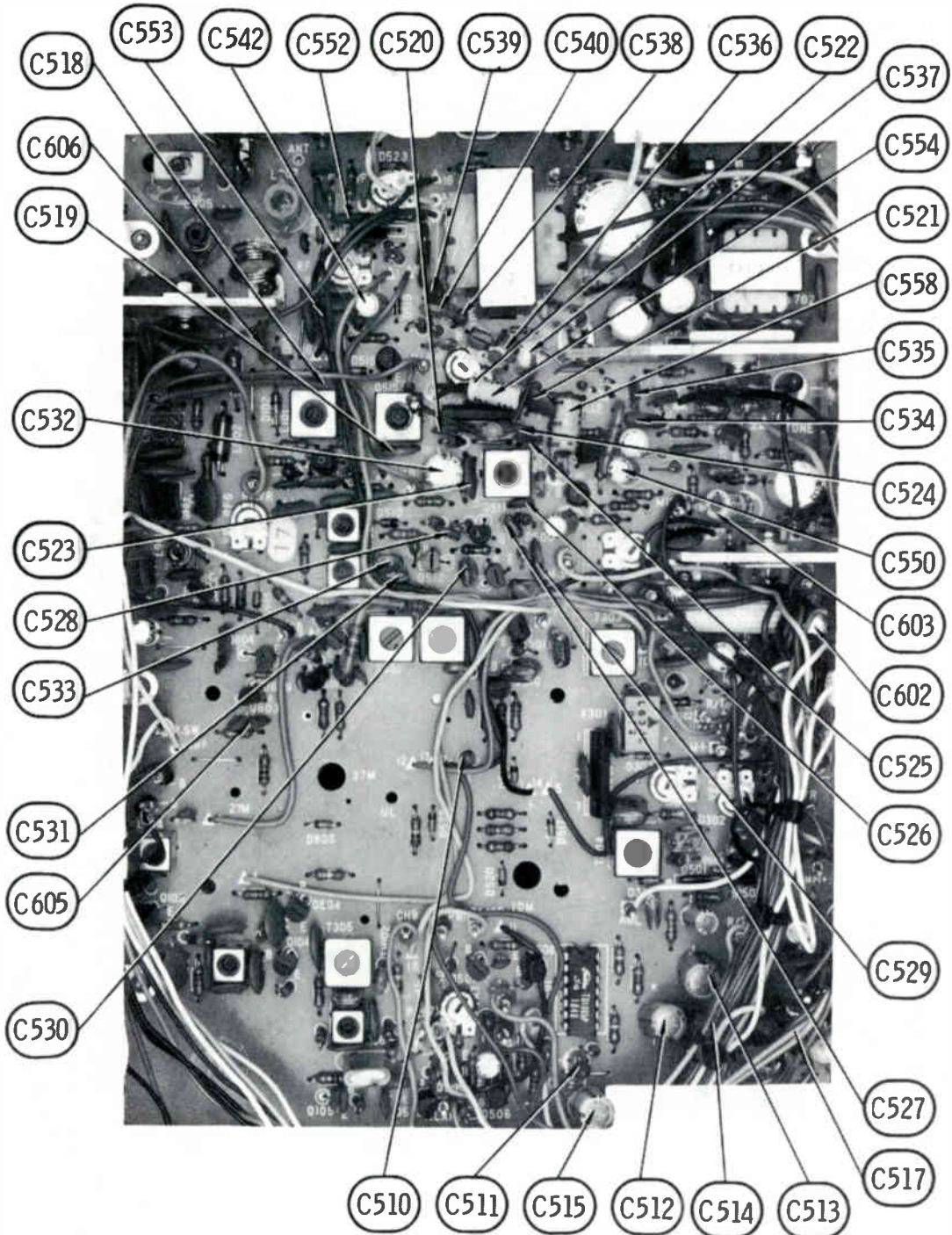
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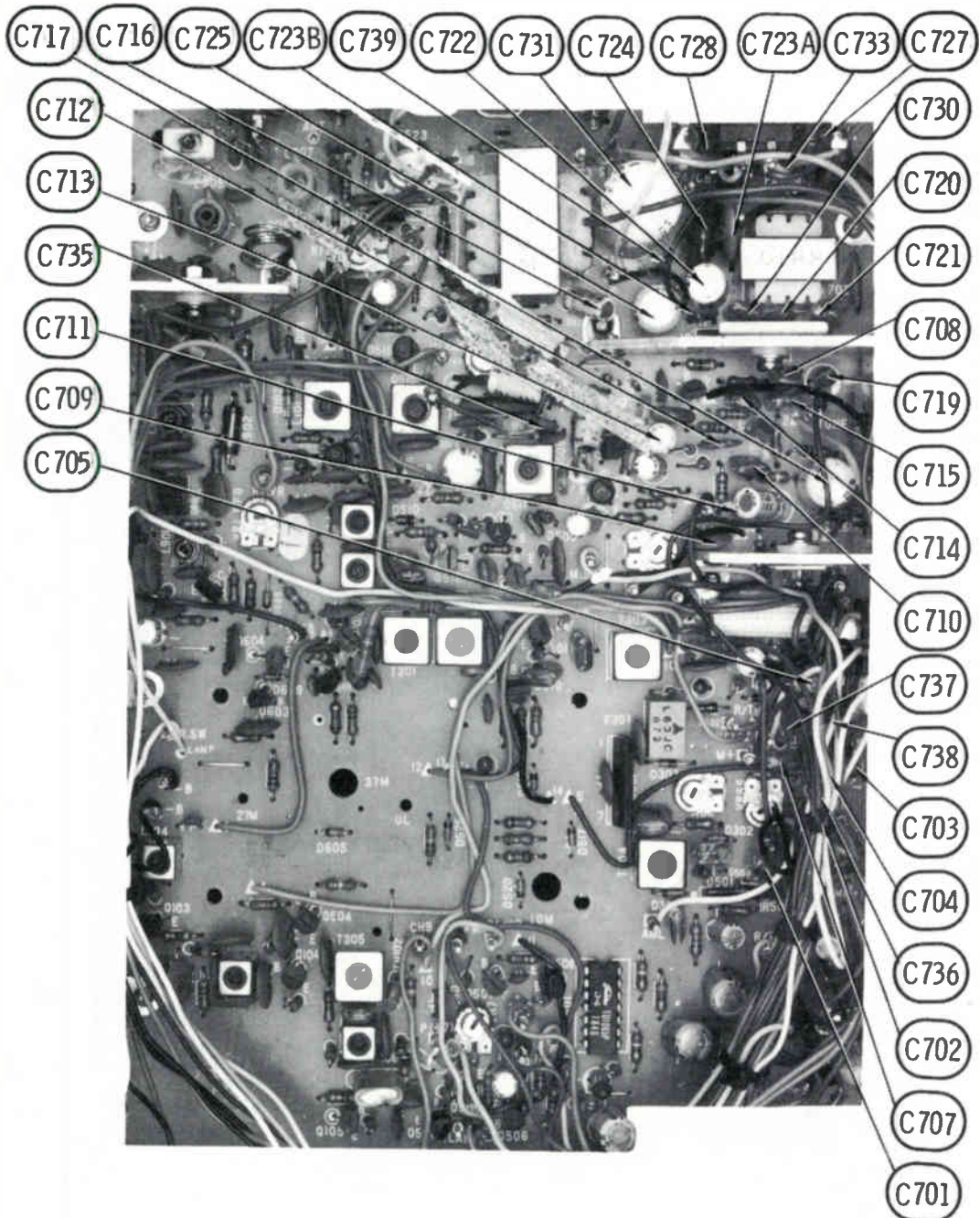
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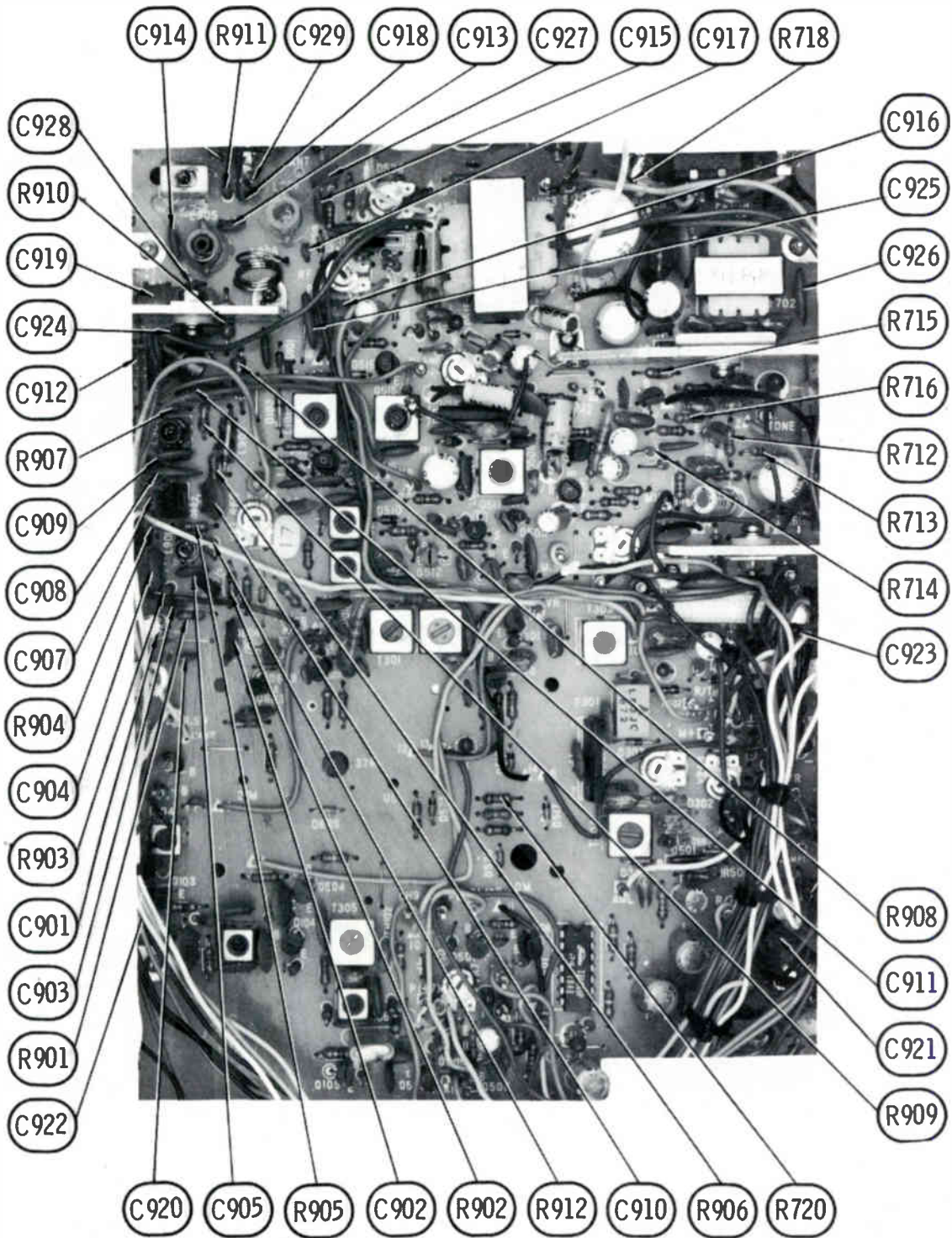
MAIN BOARD



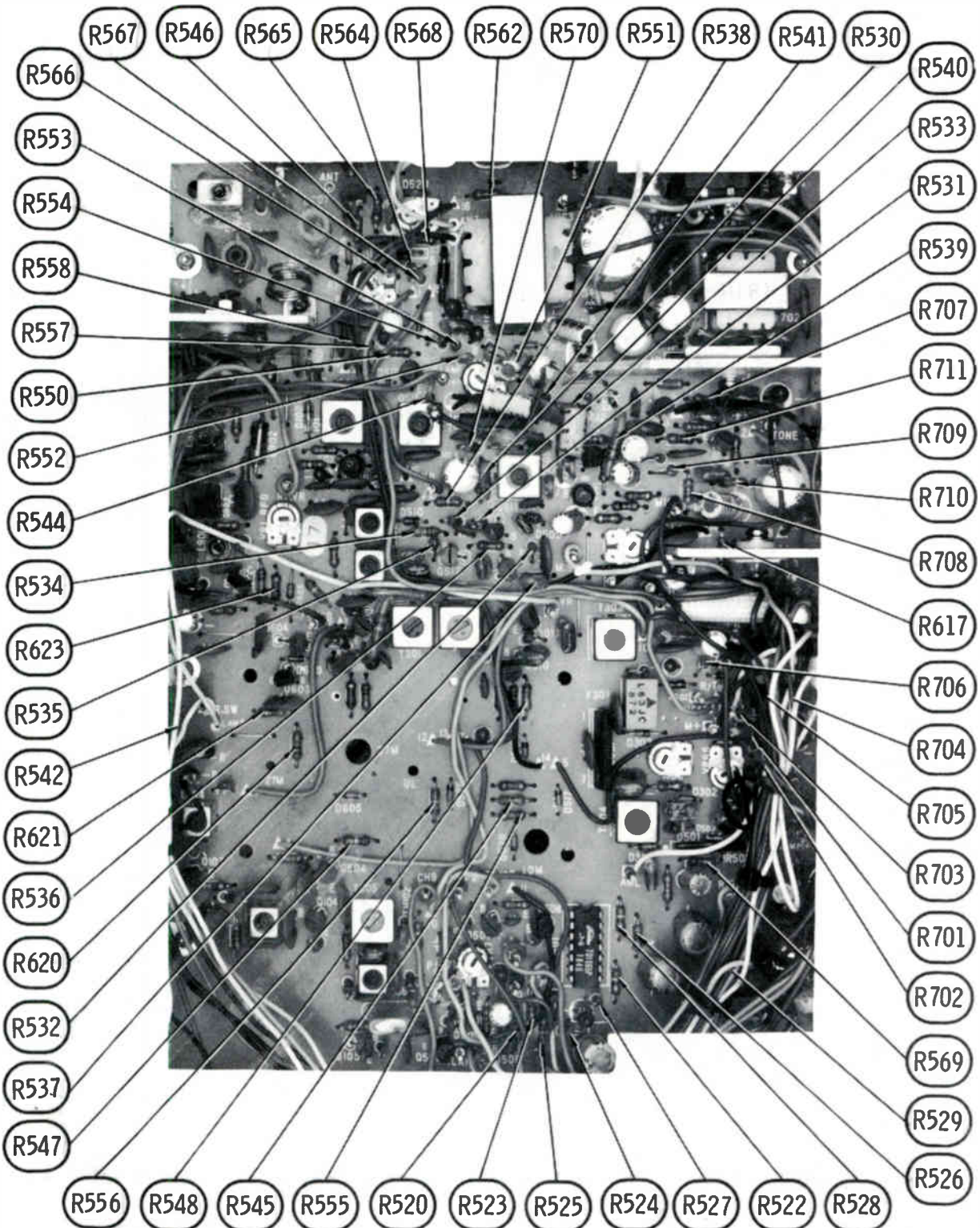
MAIN BOARD



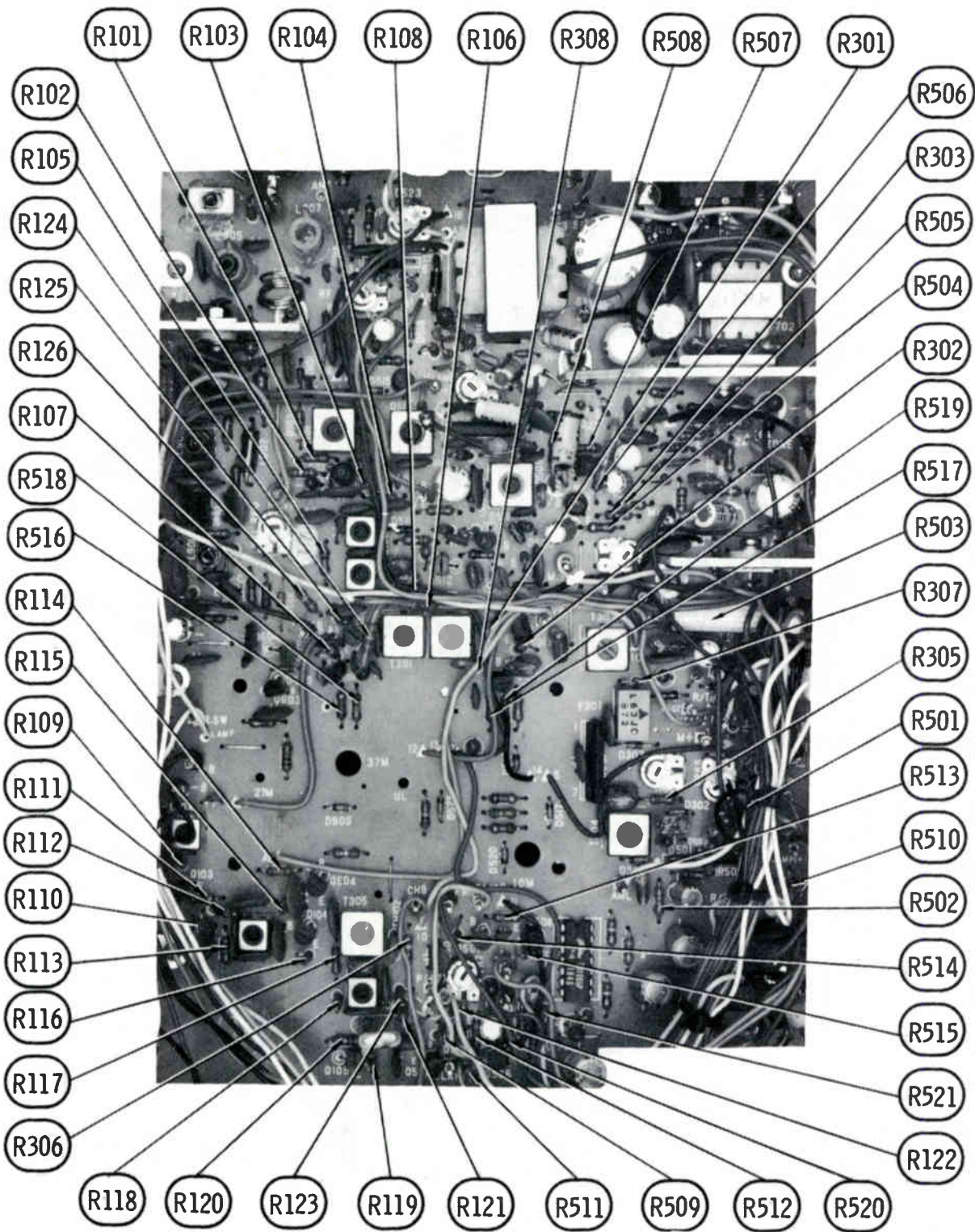
MAIN BOARD



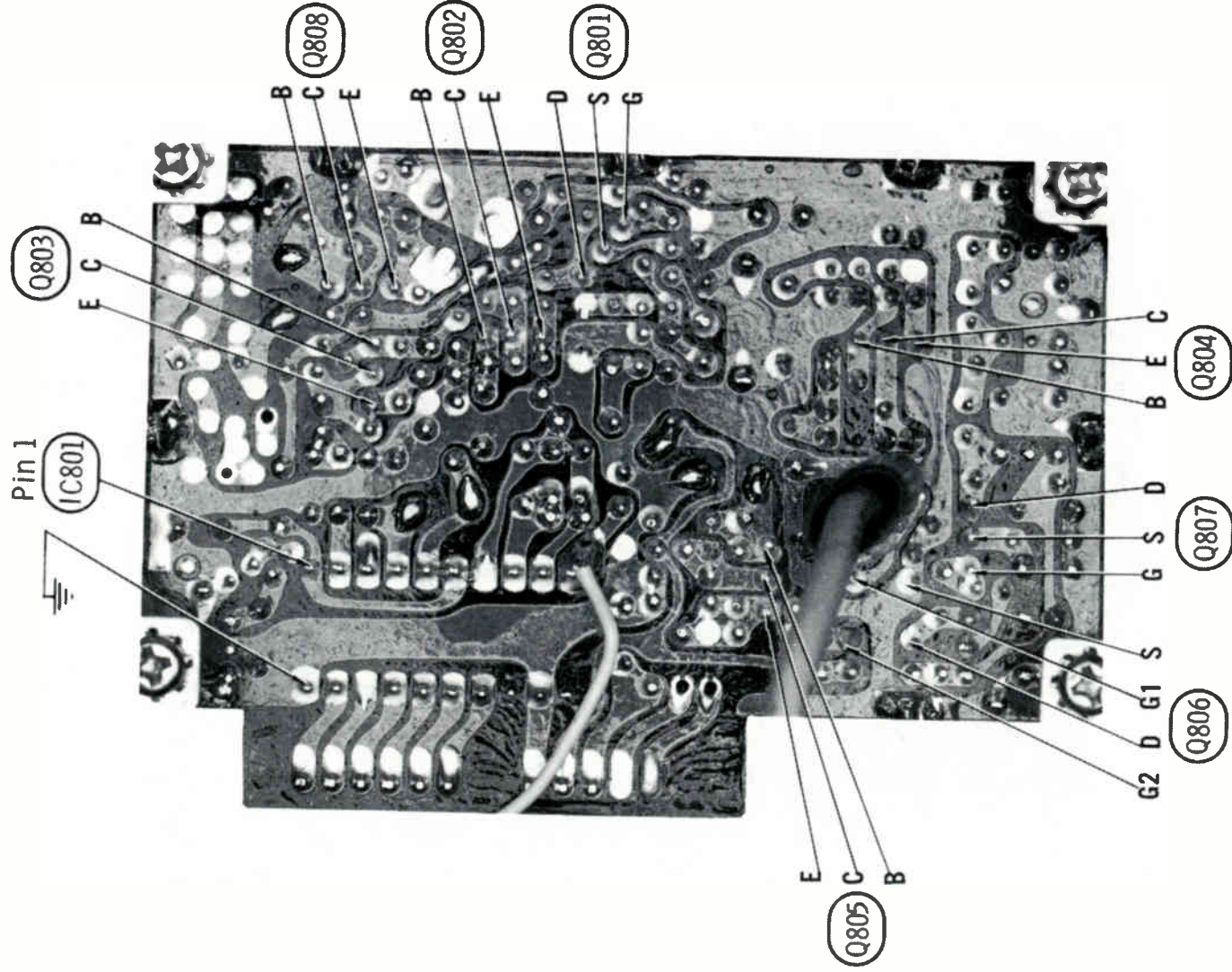
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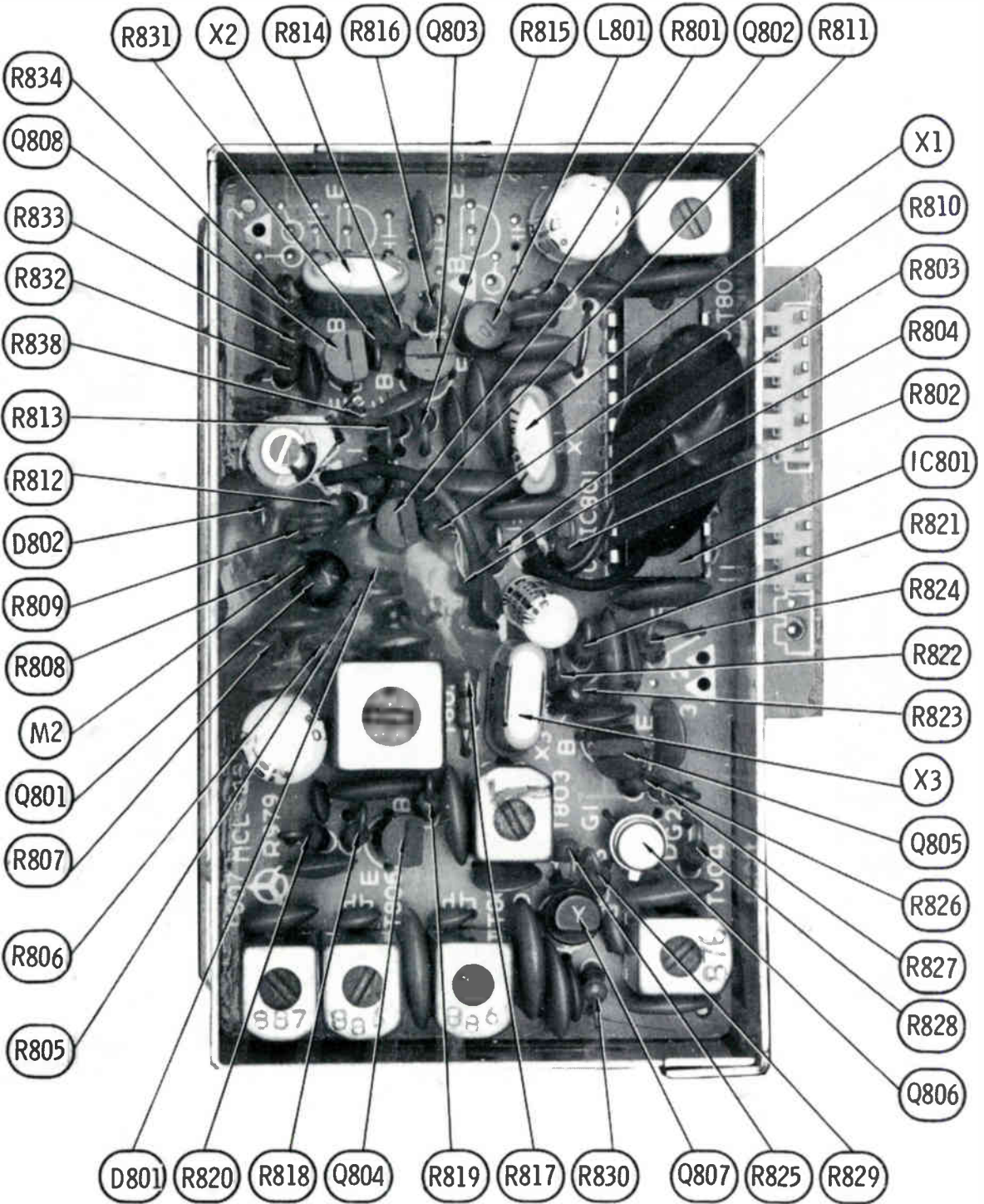


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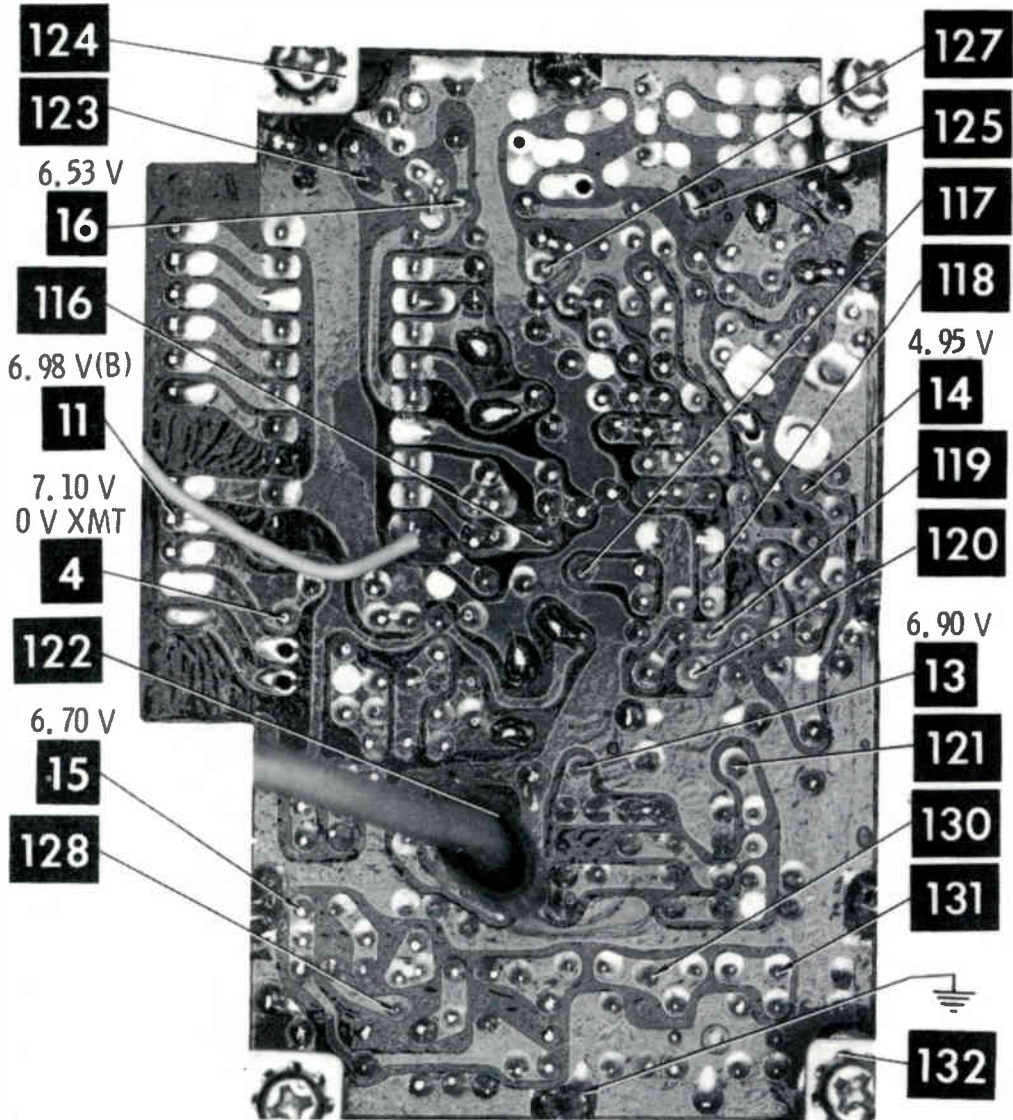


MAIN BOARD

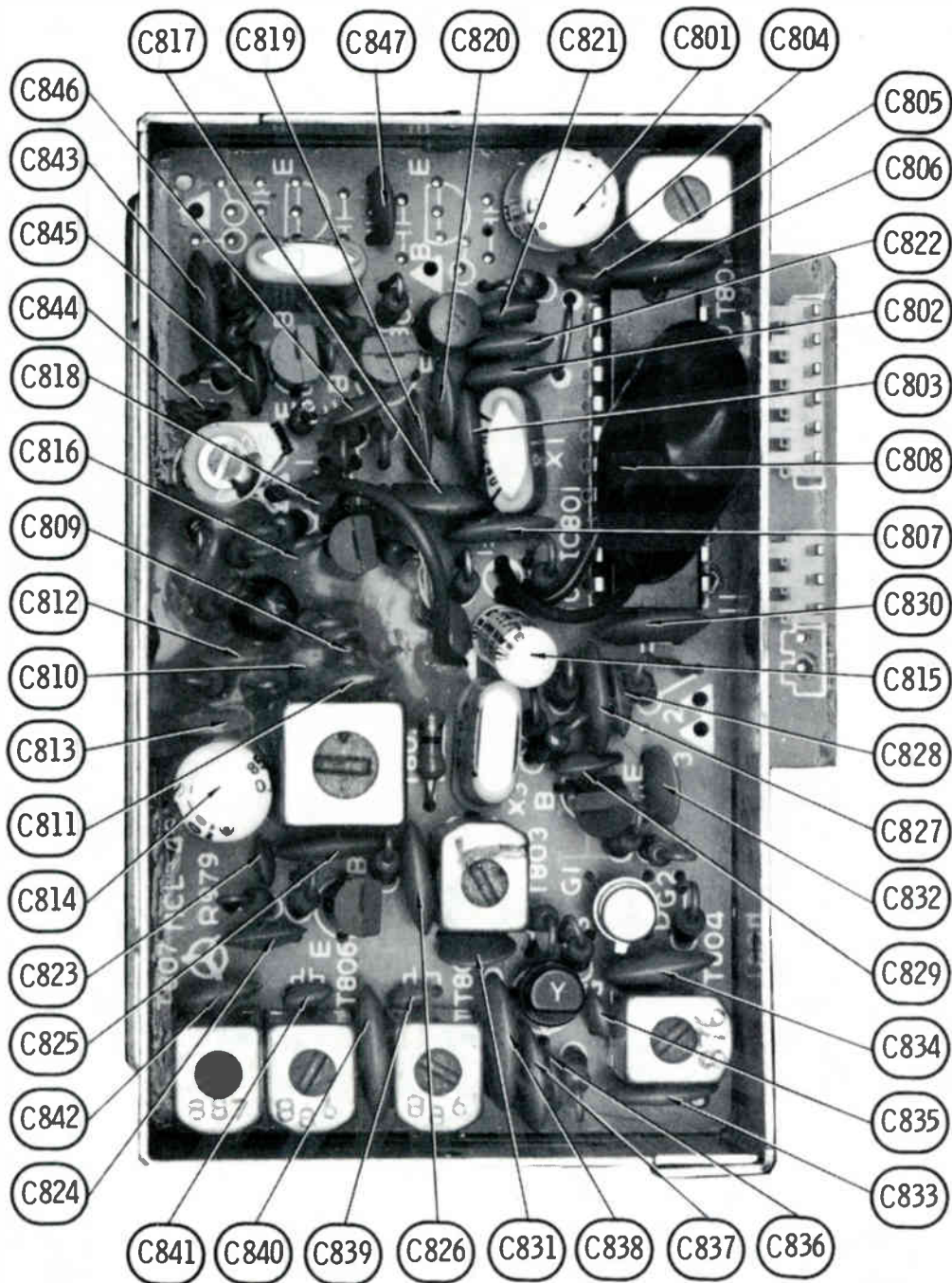




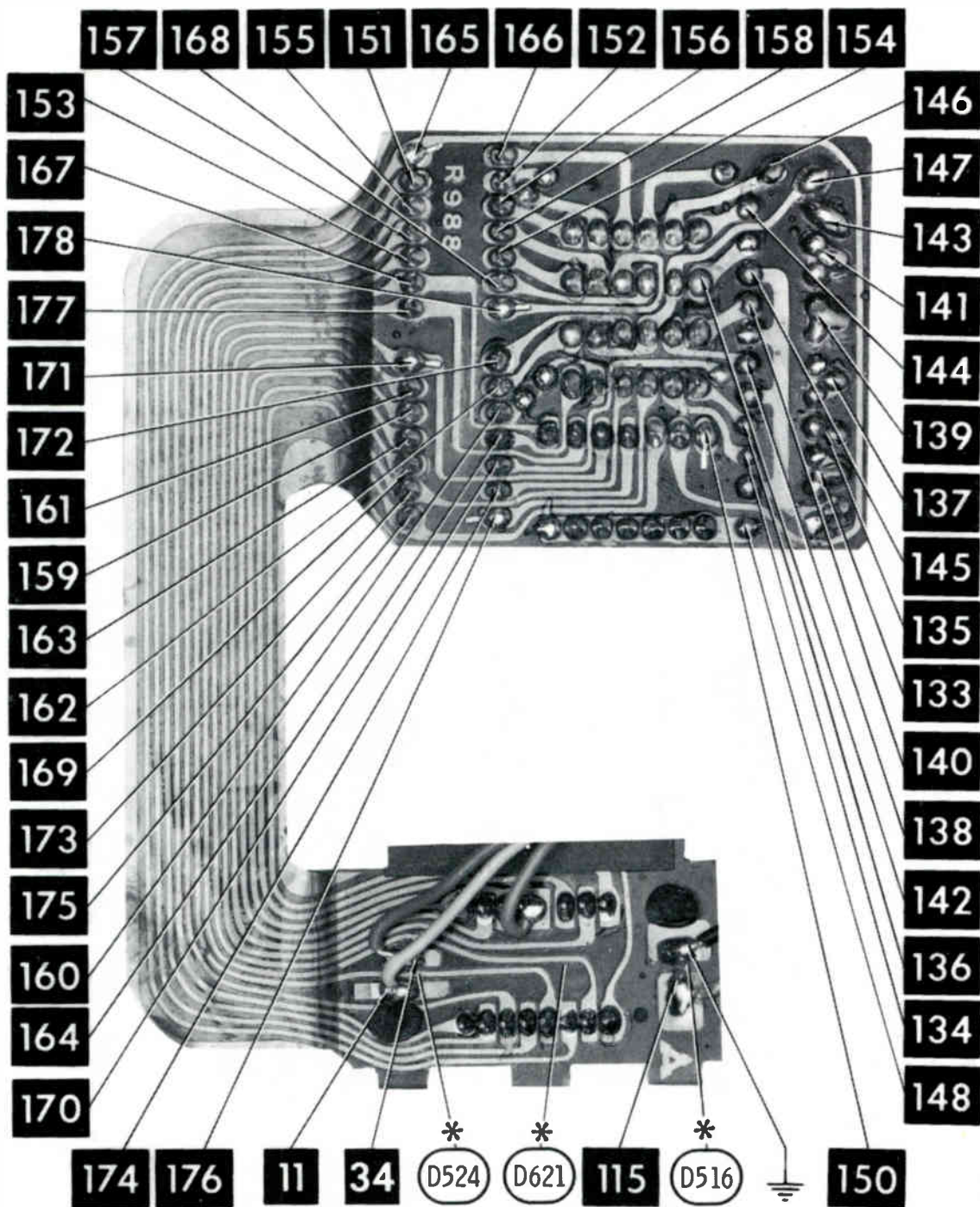
PLL BOARD



PLL BOARD

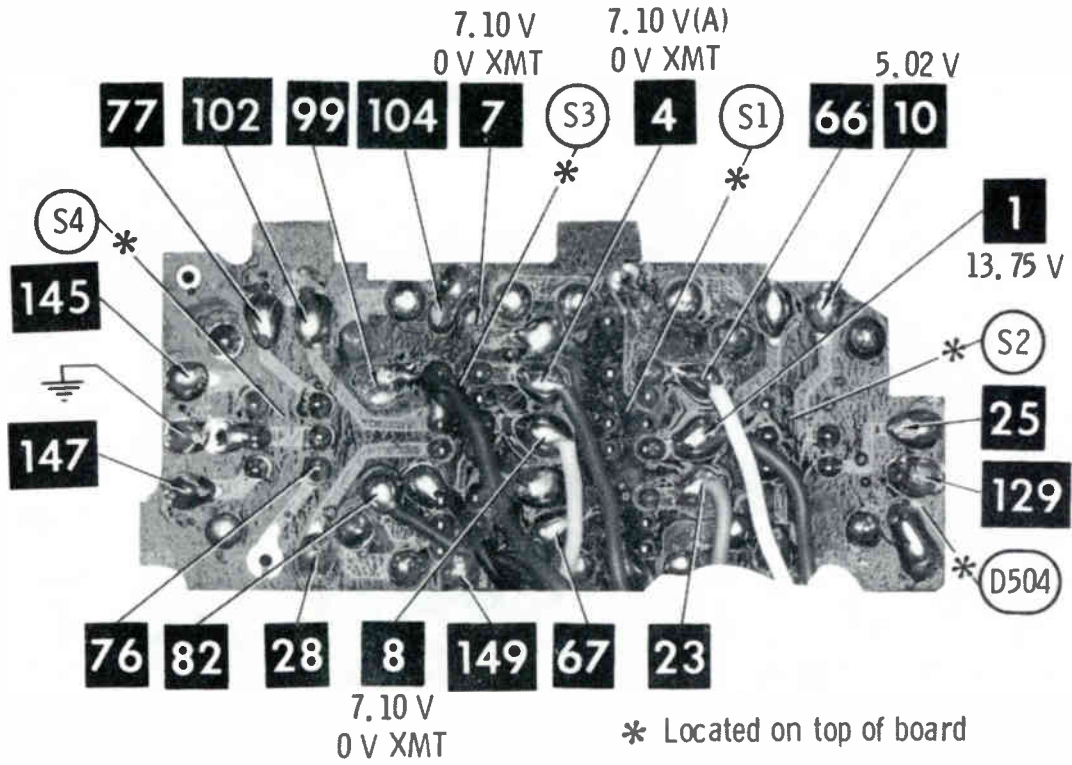


PLL BOARD

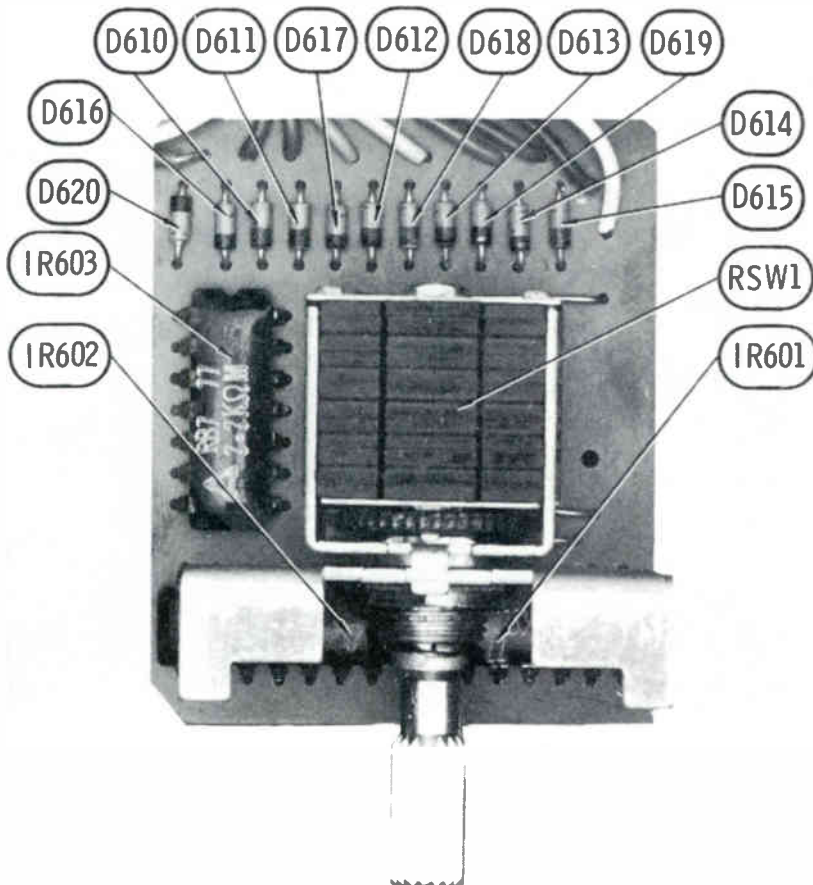


* LOCATED ON TOP OF BOARD

CH. SELECTOR & LED BOARDS

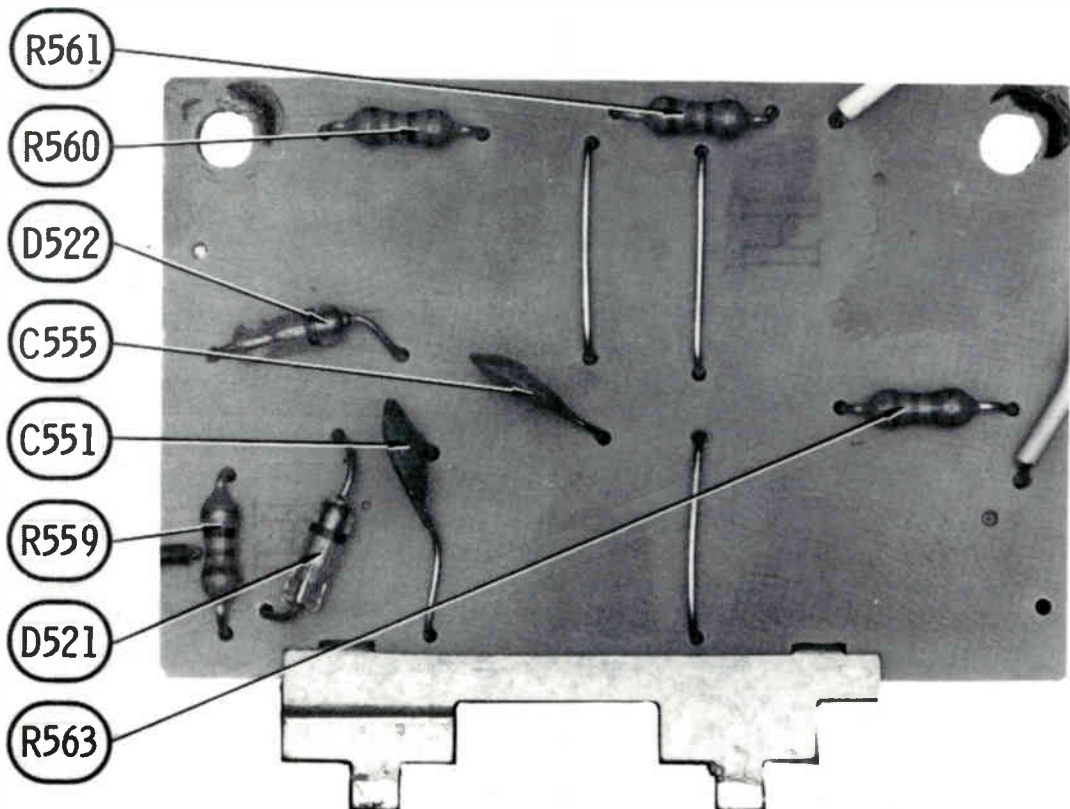
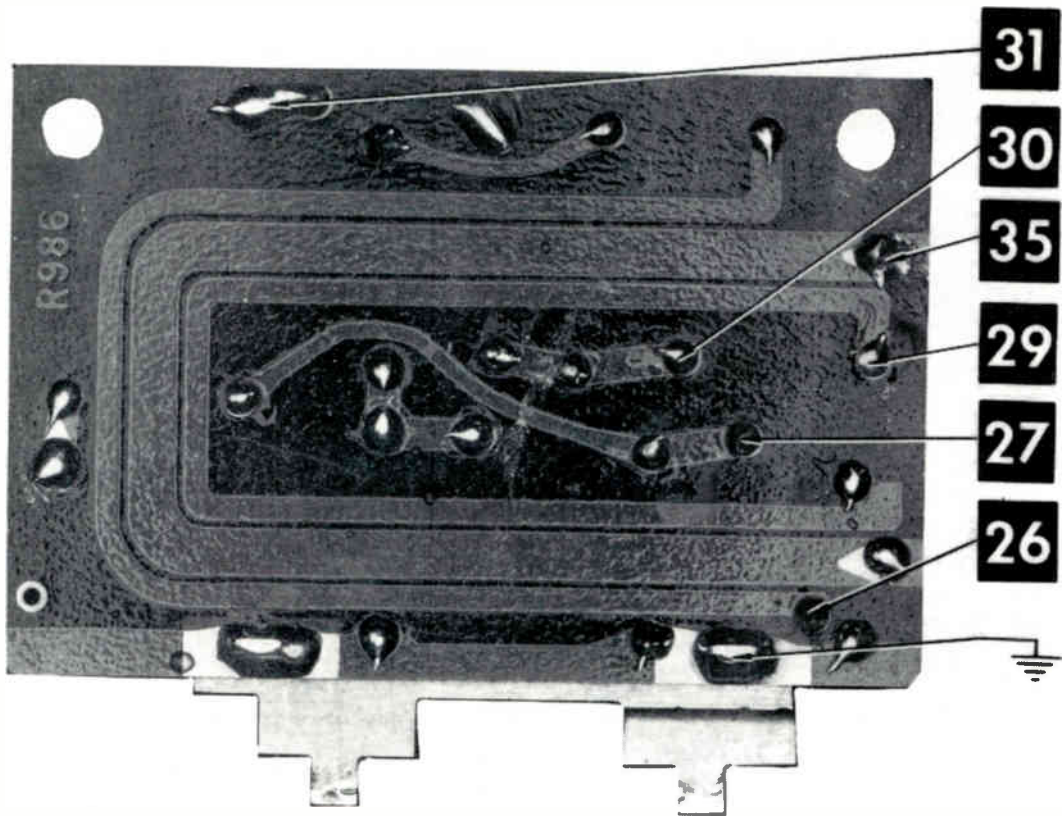


SWITCH & AUTO. INDICATOR BOARD



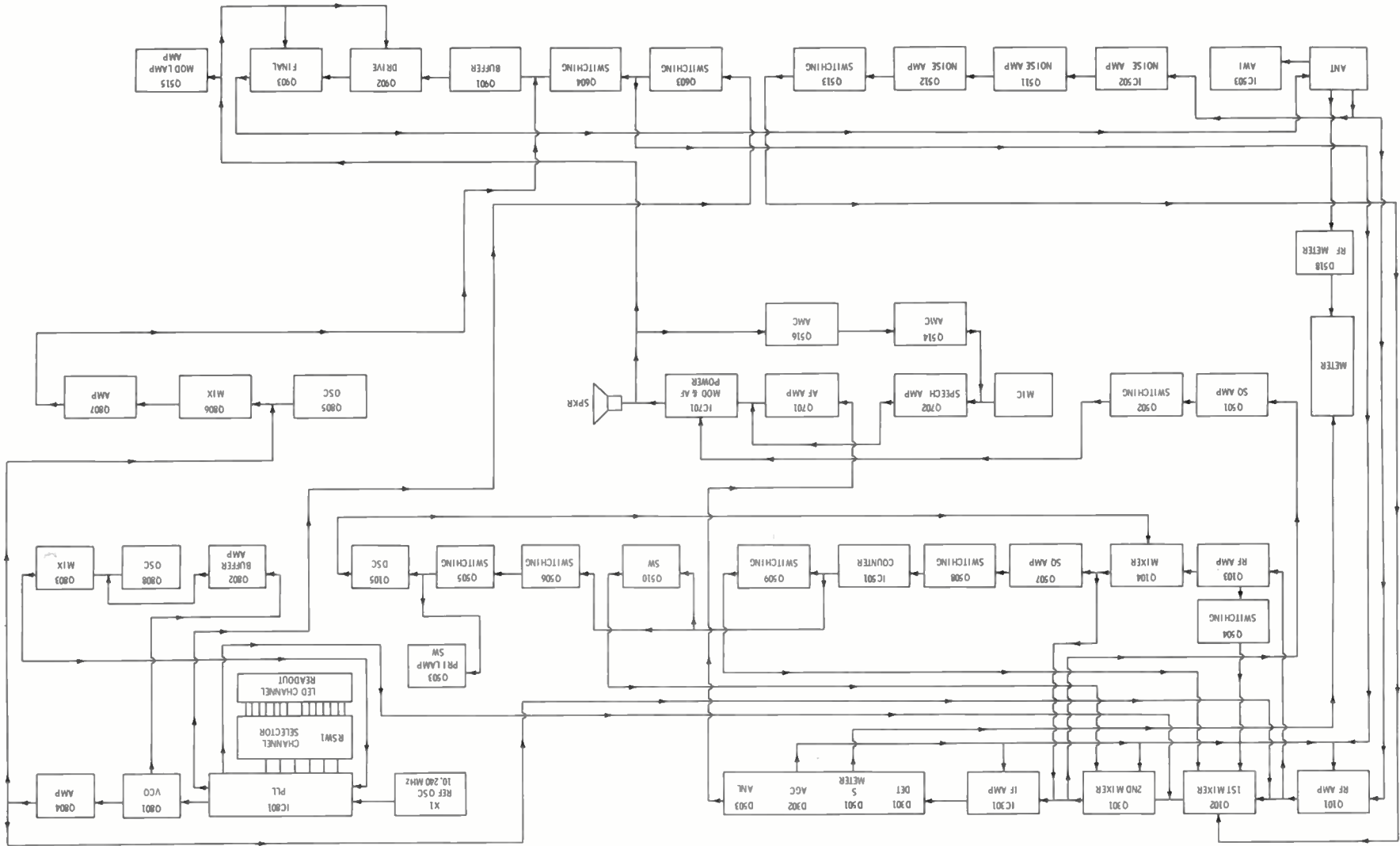
CH. SELECTOR BOARD

GENERAL ELECTRIC MODEL 3-5821B

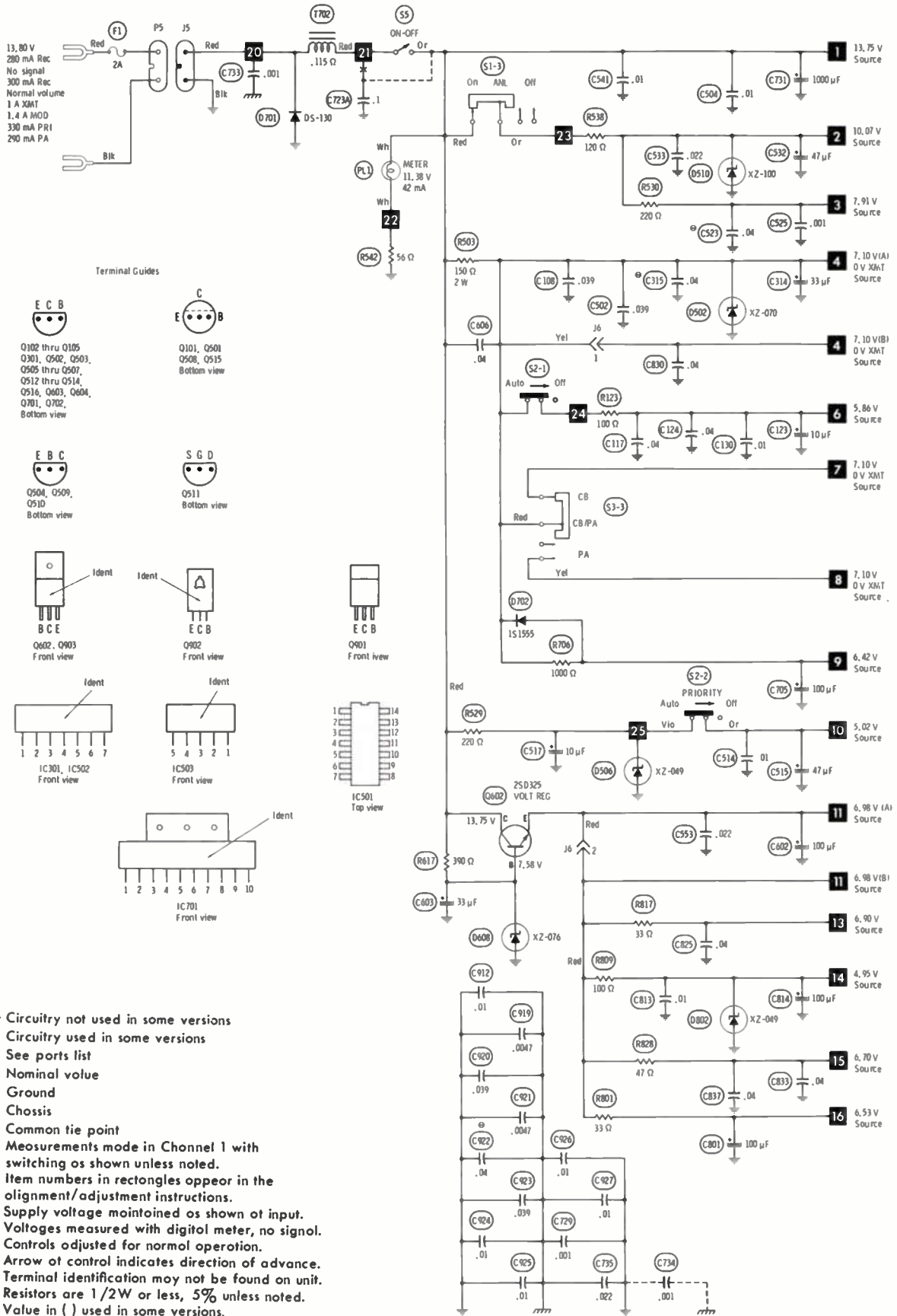


AWI BOARD

GENERAL ELECTRIC MODEL 3-5821B



BLOCK DIAGRAM

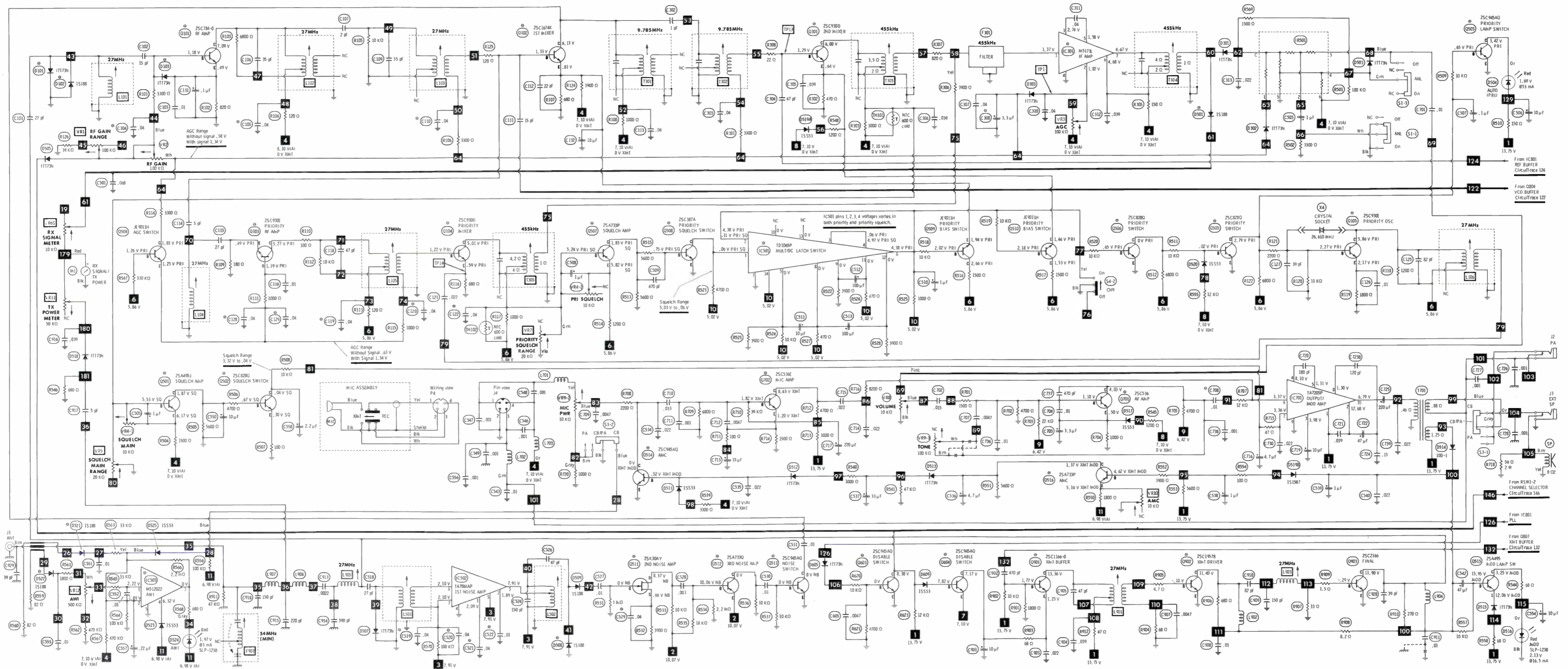


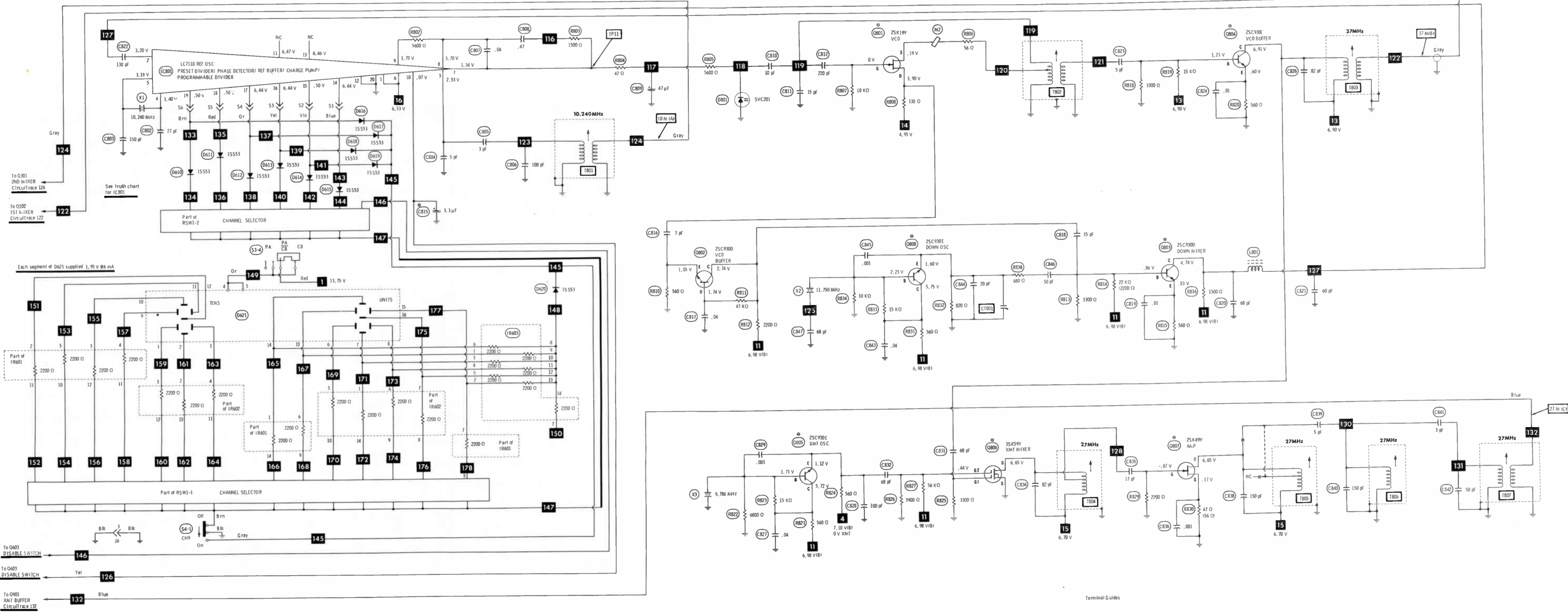
- ✖ Circuitry not used in some versions
- - - Circuitry used in some versions
- ⊙ See ports list
- ⊛ Nominal value
- ⊕ Ground
- ⊞ Chassis
- ▽ Common tie point

Measurements made in Channel 1 with switching as shown unless noted. Item numbers in rectangles appear in the alignment/adjustment instructions. Supply voltage maintained as shown at input. Voltages measured with digital meter, no signal. Controls adjusted for normal operation. Arrow of control indicates direction of advance. Terminal identification may not be found on unit. Resistors are 1/2W or less, 5% unless noted. Value in () used in some versions.

A PHOTOFAC STANDARD NOTATION SCHEMATIC
WITH **CIRCUITRACE**

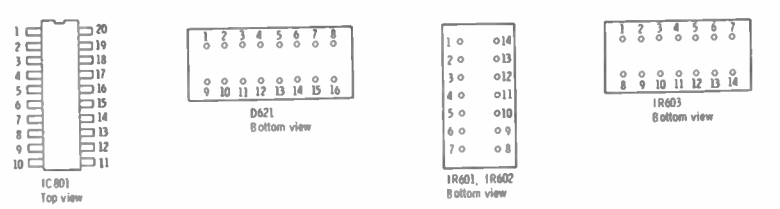
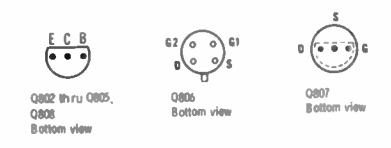
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* Circuitry not used in some versions
 --- Circuitry used in some versions
 See ports list
 * Nominal value
 ⊕ Ground
 Chassis
 Common tie point
 A PHOTOFAC STANDARD NOTATION SCHEMATIC WITH CIRCUITRACE®
 © Howard W. Sams & Co., Inc. 1978

Measurements made in Channel 1 with switching as shown unless noted. Item numbers in rectangles appear in the alignment/adjustment instructions. Supply voltage maintained as shown or input. Voltages measured with digital meter, no signal. Controls adjusted for normal operation. Arrow or control indicates direction of advance. Terminal identification may not be found on unit. Resistors are 1/2W or less, 5% unless noted. Value in () used in some versions.



PARTS LIST AND DESCRIPTION

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

SEMICONDUCTORS (Select replacement transistor for best results)

ITEM No.	TYPE No.	MFR. PART No.	REPLACEMENT DATA									
			GENERAL ELECTRIC PART No.	MALLORY PART No.	MOTOROLA PART No.	RAYTHEON PART No.	RCA PART No.	SPRAGUE PART No.	SYLVANIA PART No.	THORDARSON PART No.	WORKMAN PART No.	ZENITH PART No.
D101	ITT73N	EA16X135	GE-514	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG519	1N4148	WEP925	ZEN-430
D102	1S188-FM1-A	EA16X140	1N34AS	PTC207	HEPR9134A	RE 47	SK3087	RT-200	ECG109	1N34A	WEP134	
D103	1S188		1N34AS	PTC207	HEPR9134A	RE 47	SK3087	RT-200	ECG109	1N34A	WEP134	ZEN-430
D301	ITT73N	EA16X135	GE-514	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG519	1N4148	WEP925	
D302	ITT73N	EA16X135	GE-514	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG519	1N4148	WEP925	ZEN-430
D303	ITT73N	EA16X135	GE-514	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG519	1N4148	WEP925	
D501	1S188-FM1-A	EA16X140	1N34AS	PTC207	HEPR9134A	RE 47	SK3087	RT-200	ECG109	1N34A	WEP134	ZEN-430
D502	1S188		1N34AS	PTC207	HEPR9134A	RE 47	SK3087	RT-200	ECG109	1N34A	WEP134	
D503	XZ-070	EA16X123	GEZD-6.8	ZB6.8A	HEPZ0409	RE 110	SK3334	RT-238	ECG5071	1N4736A	WEP1106	ZEN-430
D505	ITT73N	EA16X135	GE-514	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG519	1N4148	WEP925	
D506	ITT73N	EA16X126	GEZD-4.7		HEPZ0405	RE 104	SK3333	RT-218	ECG5069	1N4148	WEP1102	ZEN-430
D507	ITT73N	EA16X135	GE-514	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG519	1N4148	WEP925	
D508	1S188		1N34AS	PTC207	HEPR9134A	RE 47	SK3087	RT-200	ECG109	1N34A	WEP134	ZEN-430
D509	1S188-FM1-A	EA16X140	1N34AS	PTC207	HEPR9134A	RE 47	SK3087	RT-200	ECG109	1N34A	WEP134	
D510	1S188		1N34AS	PTC207	HEPR9134A	RE 47	SK3087	RT-200	ECG109	1N34A	WEP134	ZEN-430
D511	XZ-100	EA16X157	GEZD-10	ZB10A	HEPZ0413	RE 115	SK3061	RT-241	ECG140	1N4740A	WEP1110	
D512	1S553	EA16X171	GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG177		WEP1062	212-61
D513	ITT73N	EA16X135	GE-514	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG519	1N4148	WEP925	
D514	ITT73N	EA16X135	GE-514	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG519	1N4148	WEP925	212-61
D515	100-1	EA57X14	GE-504A	PTC201	HEPRO052	RE 49	SK3030	RT-213	ECG116	1N4004	WEP156	
D516	ITT73N	EA16X135	GE-514	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG519	1N4148	WEP925	212-61
D517	1S553	EA16X171	GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG177		WEP1062	
D518	ITT73N	EA16X135	GE-514	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG519	1N4148	WEP925	212-61
D519A	1S553	EA16X171	GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG177		WEP1062	
D519B	1S1587	EA16X172	GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG177		WEP1062	ZEN-430
D520	1S553	EA16X171	GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG177		WEP1062	
D521	1S188		1N34AS	PTC207	HEPR9134A	RE 47	SK3087	RT-200	ECG109	1N34A	WEP134	ZEN-430
D522	1S188-FM1-A	EA16X140	1N34AS	PTC207	HEPR9134A	RE 47	SK3087	RT-200	ECG109	1N34A	WEP134	
D523	1S553	EA16X171	GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG177		WEP1062	ZEN-505
D525	1S553	EA16X171	GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG177		WEP1062	
D605	ITT73N	EA16X135	GE-514	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG519	1N4148	WEP925	ZEN-505
D608	XZ-076	EA16X125	GEZD-7.5	ZB7.5B	HEPZ0405	RE 111	SK3100	RT-239	ECG138A	1N4737A	WEP1107	
D609	1S553	EA16X171	GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG177		WEP1062	ZEN-505
D610	1S553	EA16X171	GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG177		WEP1062	
D611	1S553	EA16X171	GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG177		WEP1062	ZEN-505
D612	1S553	EA16X171	GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG177		WEP1062	
D613	1S553	EA16X171	GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG177		WEP1062	ZEN-505
D614	1S553	EA16X171	GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG177		WEP1062	
D615	1S553	EA16X171	GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG177		WEP1062	ZEN-505
D616	1S553	EA16X171	GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG177		WEP1062	
D617	1S553	EA16X171	GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG177		WEP1062	ZEN-505
D618	1S553	EA16X171	GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG177		WEP1062	
D619	1S553	EA16X171	GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG177		WEP1062	ZEN-505
D620	1S553	EA16X171	GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG177		WEP1062	
D701	DS-130	RV1424	GE-504A	PTC201	HEPRO052	RE 49	SK3030	RT-213	ECG116	1N4004	WEP156	212-61
D702	1S1555	RT5217	GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG177		WEP1062	
D801	SVC-201		GE-90		HEPR2503			RT-262	ECG614		WEP200	ZEN-453
D802	XZ-049		GEZD-4.7		HEPZ0405	RE 104	SK3333		ECG5069		WEP1102	
IC301	M51171L											ZEN-104
IC501	CX-0758	EA33X8383							ECG9946		WEP9946	
IC501	T01065P								ECG9946		WEP9946	ZEN-104
IC502	T01065	EA33X8399							ECG1100	TA7061AP	WEP941	
IC502	TA7061AP	EA33X8500	GE1C-92		TA7061AP	RE 344-M	SK3223	TVCM-78				ZEN-104
IC503	M51202											
IC503	M51202L	EA33X8506										ZEN-104
IC701	TA7205P	EA33X8389	GE1C-179	PTC780	TA7205P	RE 357-IC	SK3231	TVCM-81	ECG1155	TA7205P	WEP949	
IC801	LC7110											ZEN-104
Q101	2SC784-0	EA3713	GE-60*	PTC132*	2SC784	RE 28*	SK3018*	RT-187	ECG229*	2SC784	WEP784	
Q102	2SC784		GE-60*	PTC132*	2SC784	RE 28*	SK3018*	RT-187	ECG229*	2SC784	WEP784	ZEN-104
Q102	25C1674K	EA15X376	GE-61	PTC132*	HEPS0010*	RE 9*	SK3018*	RT-308	ECG229*		WEP956*	
Q103	25C1674		GE-61	PTC132*	HEPS0010*	RE 9*	SK3018*	RT-308	ECG229*		WEP956*	ZEN-127
Q103	25C930E	RT6787	GE-60*	PTC132*	25C930	RE 9	SK3018*	RT-308	ECG229*	25C930	WEP956*	
Q103	25C930		GE-60*	PTC132*	25C930	RE 9	SK3018*	RT-308	ECG229*	25C930	WEP956*	ZEN-127
Q103	25C930D	RT8333	GE-60*	PTC132*	25C930	RE 9	SK3018*	RT-308	ECG229*	25C930	WEP956*	
Q103	25C930		GE-60*	PTC132*	25C930	RE 9	SK3018*	RT-308	ECG229*	25C930	WEP956*	ZEN-127
Q103	25C930E	RT6787	GE-60*	PTC132*	25C930	RE 9	SK3018*	RT-308	ECG229*	25C930	WEP956*	
Q105	25C930D	RT8333	GE-60*	PTC132*	25C930	RE 9	SK3018*	RT-308	ECG229*	25C930	WEP956*	ZEN-127
Q105	25C930		GE-60*	PTC132*	25C930	RE 9	SK3018*	RT-308	ECG229*	25C930	WEP956*	
Q301	25C930D	RT8333	GE-60*	PTC132*	25C930	RE 9	SK3018*	RT-308	ECG229*	25C930	WEP956*	ZEN-127
Q301	25C930		GE-60*	PTC132*	25C930	RE 9	SK3018*	RT-308	ECG229*	25C930	WEP956*	
Q501	25A495J	EA3714	GE-221*	PTC103*	25A495	RE 26*	SK3114	RT-303	ECG159*	25A495	WEP495	ZEN-106
Q501	25A495		GE-221*	PTC103*	25A495	RE 26*	SK3114	RT-303	ECG159*	25A495	WEP495	
Q502	25C828Q	EA15X325	GE-61*	PTC121*	25C828	RE 192	SK3122	RT-302	ECG199	25C828	WEP828	ZEN-119
Q502	25C828		GE-61*	PTC121*	25C828	RE 192	SK3122	RT-302	ECG199	25C828	WEP828	
Q503	25C945AQ	EA15X404	GE-212	PTC121*	25C945	RE 192	SK3124	RT-107A	ECG199	25C945	WEP1945	ZEN-119
Q503	25C945Q		GE-212	PTC121*	25C945	RE 192	SK3124	RT-107A	ECG199	25C945	WEP1945	
Q504	JE9011H	EA15X412	GE-210	PTC179	HEPS0034	RE 79A	SK3047	RT-102A	ECG195A	25C945	WEP755	ZEN-120
Q504	25C828Q	EA15X325	GE-61*	PTC121*	25C828	RE 192	SK3122	RT-302	ECG199	25C828	WEP828	
Q505	25C828		GE-61*	PTC121*	25C828	RE 192	SK3122	RT-302	ECG199	25C828	WEP828	ZEN-119
Q506	25C828Q	EA15X325	GE-61*	PTC121*	25C828	RE 192	SK3122	RT-302	ECG199	25C828	WEP828	
Q506	25C828		GE-61*	PTC121*	25C828	RE 192	SK3122	RT-302	ECG199	25C828	WEP828	ZEN-119
Q507	25A733P	EA15X385	GE-48	PTC144*	HEPS3012*	RE 18*	SK3025*	RT-115*	ECG129*		WEP60*	
Q507	25A733		GE-48	PTC144*	HEPS3012*	RE 18*	SK3025*	RT-115*	ECG129*		WEP60*	ZEN-104
Q508	25C387A	EA15X415	GE-214	PTC132*	HEPS0020*	RE 10*	SK3039*	RT-134	ECG108*	25C717*	WEP56*	
Q508	25C387		GE-214	PTC132*	HEPS0020*	RE 10*	SK3039*	RT-134	ECG108*	25C717*	WEP56*	ZEN-104
Q509	JE9011H	EA15X412	GE-210	PTC179	HEPS0034	RE 79A	SK3047	RT-102A	ECG195A		WEP755	
Q510	JE9011H	EA15X412	GE-210	PTC179	HEPS0034							

PARTS LIST AND DESCRIPTION (CONTINUED)

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

CAPACITORS

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA				
			CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
						Q-LINE	GENERAL LINE
C101	27 N220 50V 5%	EA18X181			*		10TCR-Q27
C102	15 N220 50V 5%	EA18X200			*		10TCR-Q15
C103	.01 50V		UK50-103		MAG5011		
C104	.04 25V				GP140		5GA-S40
C105	.04 25V				GP140		5GA-S40
C106	35 N220 50V 5%	RT7405			*		10TCR-Q39
C107	2 50V		DTZ-2R2	NP02P2	CN0522		10TCC-V22
C108	.039 25V						
C109	35 N220 50V 5%	RT7405			*		10TCR-Q39
C110	.04 25V				GP140		5GA-S40
C111	15 N220 50V 5%	EA18X200			*		10TCR-Q15
C112	.022 25V		UK25-223				HY-725
C113	.04 25V				GP140		5GA-S40
C114	5 50V		DTZ-4R7	NP04P7	CN0547		10TCC-V47
C115	27 N220 50V 5%	EA18X181			*		10TCR-Q27
C116	.01 50V		UK50-103		MAG5011		
C117	.04 25V				GP140		5GA-S40
C118	47 N220 50V 5%	EA18X246			*		10TCR-Q47
C119	.04 25V				GP140		5GA-S40
C120	.04 25V				GP140		5GA-S40
C121	.022 50V				H192P2239R8	QFT2-127	1FT-S22
C122	.04 25V				GP140		5GA-S40
C124	.04 25V				GP140		5GA-S40
C125	82 N220 50V 5%	EA18-234			*		10TCR-Q82
C126	.01 50V		UK50-103		MAG5011		
C127	39 N220 5% 50V	EA18X141			*		10TCR-Q39
C128	.04 25V				GP140		5GA-S40
C129	.04 25V				GP140		5GA-S40
C130	.01 50V		UK50-103		MAG5011		
C302	1 50V				CN0510		10TCC-V10
C303	.04 25V				GP140		5GA-S40
C304	47 N220 50V 5%	EA18X246			*		10TCR-Q47
C305	.039 50V				H192P3939R8	QFT2-159	1FT-S39
C306	.039 50V				H192P3939R8	QFT2-159	1FT-S39
C307	.04 25V				GP140		5GA-S40
C310	.04 25V				GP140		5GA-S40
C311	.04 25V				GP140		5GA-S40
C312	.039 50V				H192P3939R8	QFT2-159	1FT-S39
C313	.022 50V				H192P2239R8	QFT2-127	1FT-S22
C315	.04 25V				GP140		5GA-S40
C501	.068 50V			WMF1S68	EFW1A168	QF1-195	1PB-S68
C502	.039 50V				H192P3939R8	QFT2-159	1FT-S39
C504	.01 50V		UK50-103		MAG5011		
C509	470 50V 5%		DD-471	GP470	GP347		10TS-T47
C514	.01 50V		UK50-103		MAG5011		
C518	27 N220 50V 5%	EA18X181			*		10TCR-Q27
C519	.04 25V				GP140		5GA-S40
C520	.04 25V				GP140		5GA-S40
C521	.04 25V				GP140		5GA-S40
C522	.01 25V		UK25-103		MAG2511		HY-520
C523	.04 25V				GP140		5GA-S40
C524	150 N220 50V 5%	EA18X217			*		10TCR-T15
C525	.001 50V		DD-102		GP210		10TS-D10
C526	47 N220 50V 5%	EA18X246			*		10TCR-Q47
C527	.01 50V			WMF1S1	EFW1A110	QFT2-91	1FT-S10
C528	.001 50V		DD-102		GP210		10TS-D10
C529	.04 25V				GP140		5GA-S40
C530	.01 50V			WMF1S1	EFW1A110	QFT2-91	1FT-S10
C531	.01 50V			WMF1S1	EFW1A110	QFT2-91	1FT-S10
C533	.022 50V				H192P2239R8	QFT2-127	1FT-S22
C534	.022 50V				H192P2239R8	QFT2-127	1FT-S22
C535	.022 25V		UK25-223				HY-725
C540	.022 50V				H192P2239R8	QFT2-127	1FT-S22
C543	.01 50V		UK50-103		MAG5011		
C546	.001 50V		DD-102		GP210		10TS-D10
C547	.001 50V		DD-102		GP210		10TS-D10
C548	.001 50V		DD-102		GP210		10TS-D10
C549	.001 50V		DD-102		GP210		10TS-D10
C551	.01 50V		UK50-103		MAG5011		
C552	.01 50V		UK50-103		MAG5011		
C553	.022 25V		UK25-223				HY-725
C555	.01 50V		UK50-103		MAG5011		
C556	.001 50V		DD-102		GP210		10TS-D10
C605	.0047 50V		DD-472	GP4700	GP247		5GA-D47
C606	.04 25V				GP140		5GA-S40
C701	.01 50V			WMF1S1	EFW1A110	QFT2-91	1FT-S10
C702	.015 50V				H192P1539R8	QFT2-105	1FT-S15
C704	.01 50V			WMF1S1	EFW1A110	QFT2-91	1FT-S10
C707	.0047 50V				H192P4729R8	QFT2-63	1FT-D47
C708	.01 50V			WMF1S1	EFW1A110	QFT2-91	1FT-S10
C709	.0047 50V		DD-472	GP4700	GP247		5GA-D47
C710	.033 50V				H192P3339R8	QFT2-149	1FT-S33
C711	.001 50V		DD-102		GP210		10TS-D10
C712	.0047 50V		DD-472	GP4700	GP247		5GA-D47
C714	.022 50V				H192P2239R8	QFT2-127	1FT-S22
C715	.022 50V				H192P2239R8	QFT2-127	1FT-S22
C720	180 50V 5%		DTZ-180				10TCC-T18
C721	.039 50V				H192P3939R8	QFT2-159	1FT-S39
C723A	.1		CK-104		MAG5001		
C723B	120 50V 5%		DTZ-120		CN0312		10TCC-T12
C724	.15			WMF05P15	EMF05015		431P1549R5
C726	.001 50V		DD-102		GP210		10TS-D10
C727	.001 50V		DD-102		GP210		10TS-D10
C728	.001 50V		DD-102		GP210		10TS-D10
C729	.001 50V		DD-102		GP210		10TS-D10
C730	.022 50V				H192P2239R8	QFT2-127	1FT-S22
C733	.001 50V		DD-102		GP210		10TS-D10
C735	.022 25V		UK25-223				HY-725

GENERAL ELECTRIC MODEL 3-5821B

PARTS LIST AND DESCRIPTION (CONTINUED)

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

CAPACITORS (cont)

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA				
			CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
						Q-LINE	GENERAL LINE
C736	.01 50V			WMF1S1	EMF1A110	QFT2-91	1FT-S10
C737	470 50V 5%		DD-471	GP470	GP347		10TS-T47
C738	.001		DD-102		GP210		10TS-D10
C739	.022 25V		UK25-223				HY-725
C802	27 NPO 50V 5%				CN0427		10TCC-Q27
C803	150 50V 10%		DTZ-150		CN0315		10TCC-T15
C804	5 50V		DTZ-4R7	NP04P7	CN0547		10TCC-V47
C805	3 50V		DTZ-3R3	NP03P3	CN0533		10TCC-V33
C806	100 N220 50V 5%		DTZ-100	NP0100	CN0310		10TCC-T10
C807	.04 25V				GP140		5GA-S40
C808	.47 50V			WMF05P47	EMF05047	QFT2-287	1FT-P47
C810	10 50V 10%		DTZ-10	NP010	CN0410		10TCC-Q10
C811	15 N220 50V 5%		DTZ-15	NP015	CN0415		10TCC-Q15
C812	220 50V 10%		DTZ-220				10TCC-T22
C813	.01 50V		UK50-103		MAG5011		
C816	7 50V		DTZ-6R8	NP06P8	CN0568		10TCC-V68
C817	.04 25V				GP140		5GA-S40
C818	15 50V 10%		DTZ-15	NP015	CN0415		10TCC-Q15
C819	.01 50V		UK50-103		MAG5011		
C820	68 50V 10%		DTZ-68	NP068	CN0468		10TCC-Q68
C821	60 50V 10%				CN0456		10TCC-Q56
C822	130 50V 10%		DTZ-120		CN0312		10TCC-T12
C823	5 50V		DTZ-4R7	NP04P7	CN0547		10TCC-V47
C824	.01 50V		UK50-103		MAG5011		
C825	.04 25V				GP140		5GA-S40
C826	82 N220 5%	EA18X234			*		10TCR-Q82
C827	.04 25V				GP140		5GA-S40
C828	100 50V 10%		DTZ-100	NP0100	CN0310		10TCC-T10
C829	.001 50V 10%		DD-102		GP210		10TS-D10
C830	.04 25V				GP140		5GA-S40
C831	68 50V 10%		DTZ-68	NP068	CN0468		10TCC-Q68
C832	68 50V 10%		DTZ-68	NP068	CN0468		10TCC-Q68
C833	.04 25V				GP140		5GA-S40
C834	82 N220 50V 5%	EA18X234			*		10TCR-Q82
C835	17 50V 10%				CN0418		10TCC-Q18
C836	.001 50V 10%		DD-102		GP210		10TS-D10
C837	.04 25V				GP140		5GA-S40
C838	150 N220 50V 5%	EA18X217			*		10TCR-T15
C839	5 50V		DTZ-4R7	NP04P7	CN0547		10TCC-V47
C840	150 N220 50V 5%	EA18X217			*		10TCR-T15
C841	3 50V		DTZ-3R3	NP03P3	CN0533		10TCC-V33
C842	50 N220 50V 5%				*		10TCR-Q50
C843	.04 25V				GP140		5GA-S40
C844	20 HPO 50V 5%		DTZ-20	NP020	CN0420		10TCC-Q20
C845	.001 50V 10%		DD-102		GP210		10TS-D10
C846	50 50V 10%		DTZ-50	NP050	CN0450		10TCC-Q50
C847	68 50V 10%		DTZ-68	NP068	CN0468		10TCC-Q68
C902	470 50V 5%		DD-471	GP470	GP347		10TS-T47
C903	.022 25V		UK25-223				HY-725
C904	.039 25V				GP140		5GA-S40
C905	47 50V N220 5%	EA18X246			*		10TCR-Q47
C907	.0047 50V		DD-472	GP4700	GP247		5GA-D47
C908	.01 50V		UK50-103		MAG5011		
C909	150 N220 50V 5%	EA18X217			*		10TCR-T15
C910	82 N220 50V 5%	EA18X234			*		10TCR-Q82
C911	.01 50V		UK50-103		MAG5011		
C912	.01 50V		UK50-103		MAG5011		
C913	.0022 50V				GP222		10TS-D22
C914	390 50V 5%		DD-391	GP390	GP339		10TS-T39
C915	220 50V 5%		DTZ-220				10TCC-T22
C916	.039 25V				GP140		5GA-S40
C917	5 50V		DTZ-4R7	NP04P7	CN0547		10TCC-V47
C918	150 N220 50V 5%	EA18X217			*		10TCR-T15
C919	.0047 50V		DD-472	GP4700	GP247		5GA-D47
C920	.039 25V				GP140		5GA-S40
C921	.0047 50V		DD-472	GP4700	GP247		5GA-D47
C922	.04 25V				GP140		5GA-S40
C923	.039 25V				GP140		5GA-S40
C924	.01 50V		UK50-103		MAG5011		
C925	.01 50V		UK50-103		MAG5011		
C926	.01 50V		UK50-103		MAG5011		
C927	.01 50V		UK50-103		MAG5011		
C928	39 N220 50V 5%	EA18X141			*		10TCR-Q39
C929	39 N220 50V 5%	EA18X141			*		10TCR-Q39
CT801	Trimmer	4-224R157					

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

ITEM No.	FUNCTION	RESIST-ANCE	REPLACEMENT DATA				
			MFR. PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	MALLORY PART No.	TRW PART No.
VR1	RF Gain Range	100K	EA49X386				U260R104B
VR2	RF Gain	100K	EA49X335				
VR3	AGC	100K	EA49X386				U260R104B
VR4-1	Squelch, Main	10K	EA49X387 (18)				
VR4-2	Squelch, Priority	10K					
VR5	Squelch Range, Main	20K	EA49X388				U260R253B
VR6	RX Signal Meter	10K	EA49X389				U260R103B
VR7	Squelch Range, Priority	20K	EA49X388				U260R253B
VR8	Volume/Switch	10K	EA49X418				
VR9-1	Tone	100K	EA49X419 (19)				
VR9-2	Mic Power	10K					
VR10	AMC	10K	EA49X389				U260R103B
VR11	TX Power Meter	50K	EA49X391				U260R503B
VR12	AWI	500K	EA49X384				U260R504B

PARTS LIST AND DESCRIPTION (CONTINUED)

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

RESISTORS (Power and Special)

ITEM No.	RATING	REPLACEMENT DATA		ITEM No.	RATING	REPLACEMENT DATA	
		WORKMAN PART No.	MFGR. PART No.			WORKMAN PART No.	MFGR. PART No.
IR501	Resistor Network		EA42X1	IR603	Resistor Network		EA42X3 (2)
IR601	Resistor Network		EA42X3 (2)	TH101	60 Cold NTC		EA16X121
IR602	Resistor Network		EA42X3 (2)	TH102	60 Cold NTC		EA16X121

- (1) Consist of five resistors.
 (2) Consist of seven 2.2K Ohms resistors.

COILS (RF-IF)

ITEM No.	FUNCTION	REPLACEMENT DATA			REMARKS
		PART No.	OTHER IDENTIFICATION	MILLER PART No.	
F901	TVI Trap (54MHz)	EA36X201			
L101	Antenna (27MHz)	EA36X201			
L102	RF (27MHz)	EA36X324			
L103	RF (27MHz)	EA36X324			
L104	Antenna (27MHz)	EA36X325			
L105	RF (27MHz)	EA36X326			
L106	Oscillator (27MHz)	EA35X115			
L501	Noise Blanker	EA36X327			
L502	Noise Blanker	EA36X202			
L701	RF Choke	EA36X319			
L702	RF Choke	EA36X319			
L703	RF Choke	EA36X217	4-253R-706	9250-223	
L801	Low Pass Filter (100uH)	EA36X217			
L901	TX Buffer	EA36X206		74F186AP	
L902	RF Choke	EA36X207			
L903	Driver	EA36X310			
L904	RF Choke	EA36X210			
L905	Antenna Loading	EA36X211			
L906	Pi Filter	EA36X311			
L907	Antenna TX	EA36X328			
T301	IF (9.785MHz)	EA61X202			
T302	IF (9.785MHz)	EA61X203			
T303	IF (455kHz)	EA56X55		8535	
T304	IF (455kHz)	EA56X51			
T305	IF (455kHz)	EA56X62			
T801	Oscillator (10.24MHz)	EA36X212	4-259R-872		
T802	VCO (37MHz)	EA35X120	4-259R-827	CB5729	
T803	Buffer (37MHz)	EA36X216	4-259R-875		
T804	Mixer (27MHz)	EA36X217	4-259R-876	9250-223	
T805	Bandpass (27MHz)	EA36X217	4-259R-876	9250-223	
T806	Bandpass (27MHz)	EA36X345	4-259R-886		
T807	Bandpass (27MHz)	EA36X346	4-259R-887		

GENERAL ELECTRIC MODEL 3-5821B

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.	
T702	1400mA	.115	.94mH	EA36X314 RB10 (1)	TR574		(1) Number on unit.

TRANSFORMER (Audio Output)

ITEM No.	IMPEDANCE		REPLACEMENT DATA			NOTES
	PRI.	SEC.	MFGR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T701	8	1 1B 2 50	EA64X34 4R811 (1)			(1) Number on unit.

SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		MFGR. PART No.	QUAM PART No.	
SP	3 1/2" PM 8 Ohms		26A07Z16	

PARTS LIST AND DESCRIPTION (CONTINUED)

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

FUSE DEVICES

ITEM No.	DESCRIPTION	REPLACEMENT DATA						
		PART No.		BUSS PART No.		LITTELFUSE PART No.		WORKMAN PART No.
		DEVICE	HOLDER	DEVICE	HOLDER	DEVICE	HOLDER	DEVICE
F1	2A Quick Acting	EA68X64		AGC-2	HDJ	312002	150145	FG2-2

MICROPHONE

ITEM No.	REPLACEMENT DATA				CONNECTION DATA							
	MFR. PART No.	GC PART No.	GC NOISE CANCEL	GC POWER	GC CONNECTOR	GC Red	GC Shield	GC Yellow	GC Blue	GC White	GC Black	
MIC	EA68X123 (1) EA68X63 (2)	18-032	18-034	18-010	18-092	1	2	4	3	NC	2	

- (1) Screw Type.
(2) DIN Type

MISCELLANEOUS

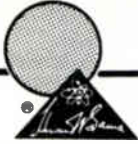
ITEM No.	PART NAME	PART No.	NOTES
F301	Filter	EA36X365	455kHz
F901	Filter	EA36X306	54MHz
J1	Jack	EA38X33	Antenna
J2	Jack	EA41X131	PA Speaker
J3	Jack	EA41X131	External Speaker
J4	Jack	EA41X157	
J5	Jack	EA41X183	DC Power
PL1	Lamp Holder	EA2X908	
	Lamp	EA41X174	(14V @ 50 mA)
	LED	EA16X306	Display Digital Readout
M1	Meter	EA62X161	TX/RX Signal
	Plug	EA38X31	6 Pin
	Plug	EA38X32	3 Pin
S1	Switch	EA39X252	ANL/Noise Blanker
S2	Switch	EA39X207	Priority Channel
S3	Switch	EA39X252	CB/PA
S4	Switch	EA39X207	Instant (Ch. 9)
SW-1	Switch	EA55X145	Channel Selector
X1	Crystal	EA75X6	10.240MHz
X2	Crystal	EA75X13	11.750MHz
X3	Crystal	EA75X14	9.785MHz
X4	Crystal		26.610MHz
	Crystal Socket	EA34X49	

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

ITEM	PART No.	ITEM	PART No.
Cabinet, Front	EA90X220	Cabinet, Top	EA98X580
Cabinet, Bottom	EA98X581		

WIRING DATA

General-use Hook-up Wire (available in 5 colors)	BELDEN No. 8523	Coiled Microphone Cable	
Shielded Hook-up Wire (spiral wrapped)	BELDEN No. 8421	3-conductor (1 shielded)	23AWG BELDEN No. 9471 (5')
(braided)	BELDEN No. 8401		BELDEN No. 8497 (6')
Speaker Cable (available in 4 colors)	BELDEN No. 8782		BELDEN No. 9472 (7-1/2')
Bonding Strap	BELDEN No. 8672		28AWG BELDEN No. 9466 (6')
AC Power Cord	(6') BELDEN No. 17106		31AWG BELDEN No. 9468 (10')
	(9') BELDEN No. 17109	4-conductor (unshielded)	23AWG BELDEN No. 8415 (6')
		5-conductor (1 shielded)	28AWG BELDEN No. 9467 (6')
			BELDEN No. 9465 (7-1/2')



PHOTOFACT[®] with

CIRCUITRACE[®]

For Supplier Address See PHOTOFACT Index

NOTE

Repair or adjustment of transmitter circuits must be under supervision of a person with first-or second-class radiotelephone license. (Refer to FCC Rules and Regulations Part 95, Subpart C & D.)

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

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

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



MODEL 4145 (242-4145)

JOHNSON MODELS MESSENGER 4140/45

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.

Suggested Alignment Tools:

GC ELECTRONICS:

T1, T2, T5, T6, T10, T101 9440

Z1A, Z1B, T3, T4 5009, 8728, 8728A

T7, T8, L3 8282, 8606, 9302, 9440

L4, L5, L7 9300, 9302, 9304

L6 9440

SYNTHESIZER ALIGNMENT

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Input of frequency counter to TP2 (Q102 Gate 2).	Ch. 19		Check for 5.120MHz.
Input of frequency counter to TP3 (Q105 Base).	Ch. 19		Check for 30.820MHz.
Input of DC meter to TP1.	Ch. 1	T101	Adjust for 3.00 volts.
Input of oscilloscope to TP4 (junction of CR102 and CR103).	Ch. 19	T10	Adjust for maximum RF output.
Input of frequency counter to TP4 (junction of CR102 and CR103).	Ch. 1		Check for 26.510MHz. Check all channels. (See Truth Chart for correct frequencies.)
Input of frequency counter to TP3 (Q105 Base).	Ch. 19, Xmt		Check for 31.275MHz.
Input of frequency counter to TP4 (junction of CR102 and CR103).	Ch. 1, Xmt		Check for 26.965MHz. Check all channels. (See Truth Chart for correct frequencies.)

RECEIVER ALIGNMENT

Connect an AC VTVM or AF wattmeter across speaker voice coil.
Adjust volume control to obtain a suitable indication.
Set generator output low enough to prevent AGC limiting.

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Output of signal generator thru .01uF to TP5 (Q2 Base). 455kHz, 1000Hz @ 30% modulation.	Ch. 19 Squelch MIN ANL Off	T4,T3, Z1A,Z1B	Adjust for maximum output.
Output of signal generator thru .01uF to antenna jack. 27.185MHz, 1000Hz @ 30% modulation.	Ch. 19 Squelch MIN ANL Off	T2,T1	Adjust for maximum output. If necessary, readjust Z1A, Z1B, T3 and T4.

RECEIVER ADJUSTMENTS

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

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Output of signal generator thru .01uF to antenna jack. 27.185MHz, 1000Hz @ 30% modulation. Output 100uV.	Ch. 19 Squelch MIN ANL Off	R202	S METER Adjust for 9 on S scale of meter.

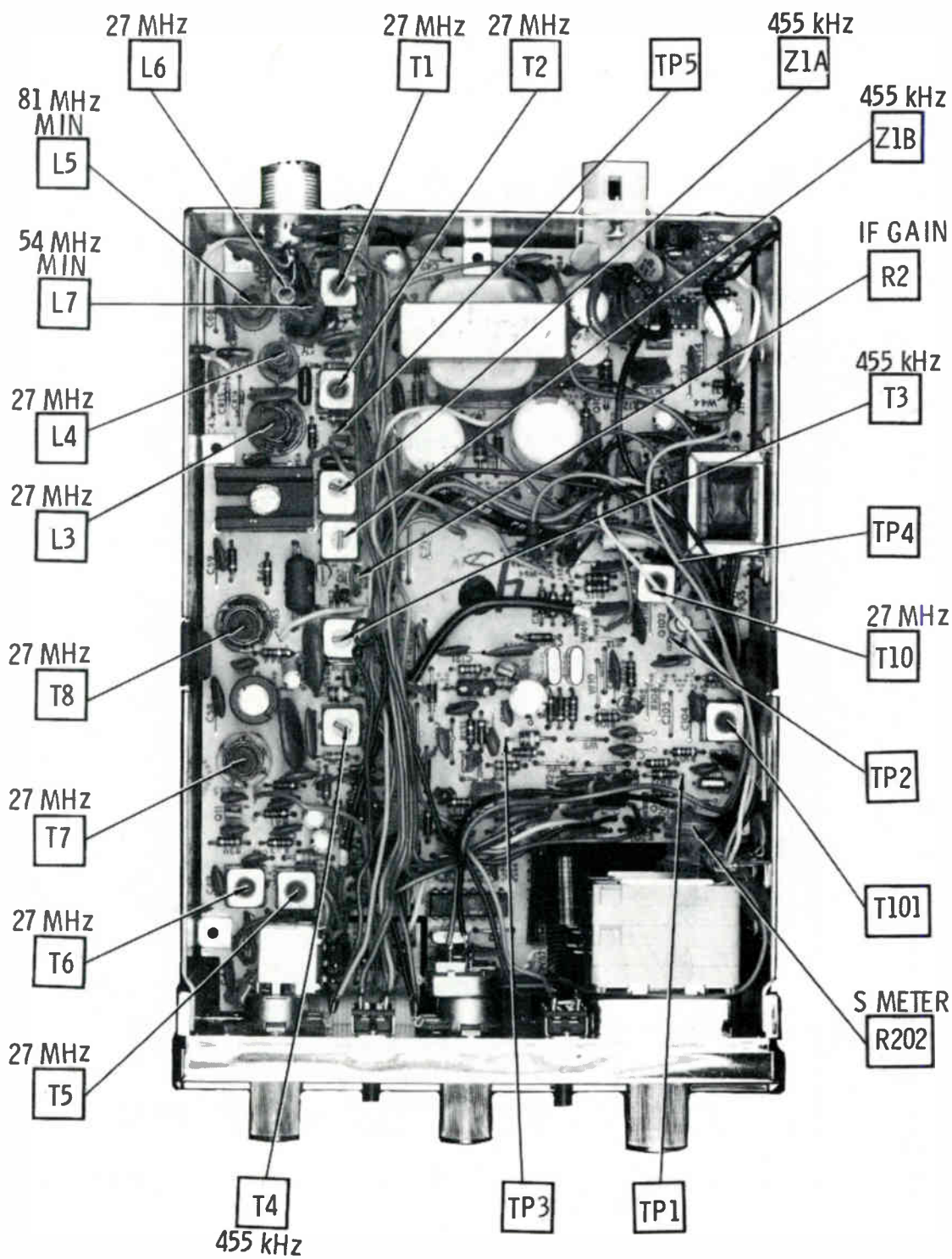
TRANSMITTER ALIGNMENT

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

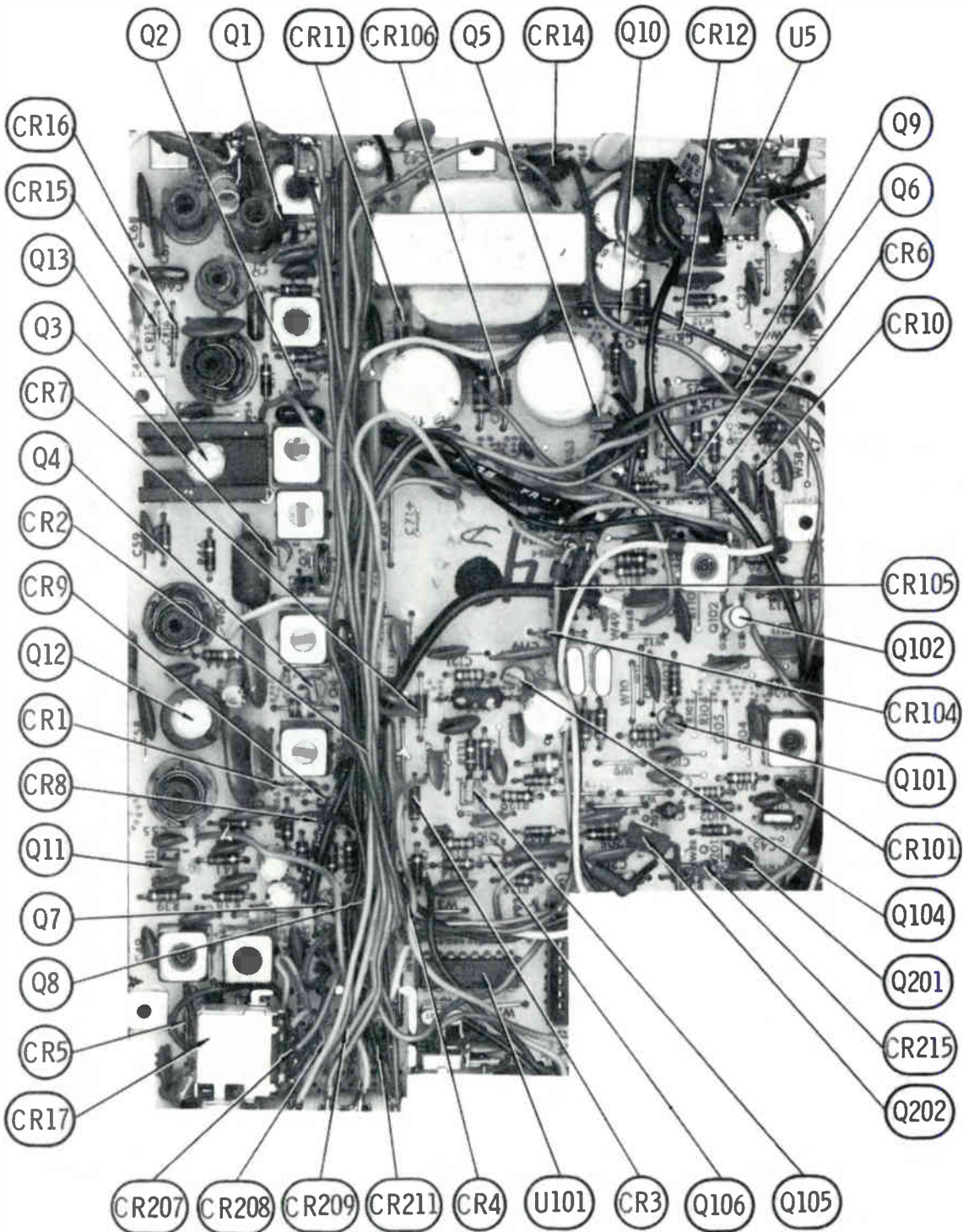
TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
	Ch. 19	T5,T6,T7, T8,L3,L4,L6	Adjust for maximum RF output.
	Ch. 19	L4,L6	Adjust for 3.8 watts RF output maximum.
Input of spectrum analyzer or harmonic meter to antenna jack.	Ch. 19	L7	Adjust for MINIMUM at 54MHz (second harmonic).
Input of spectrum analyzer or harmonic meter to antenna jack.	Ch. 19	L5	Adjust for MINIMUM at 81MHz (third harmonic).

TRUTH CHART

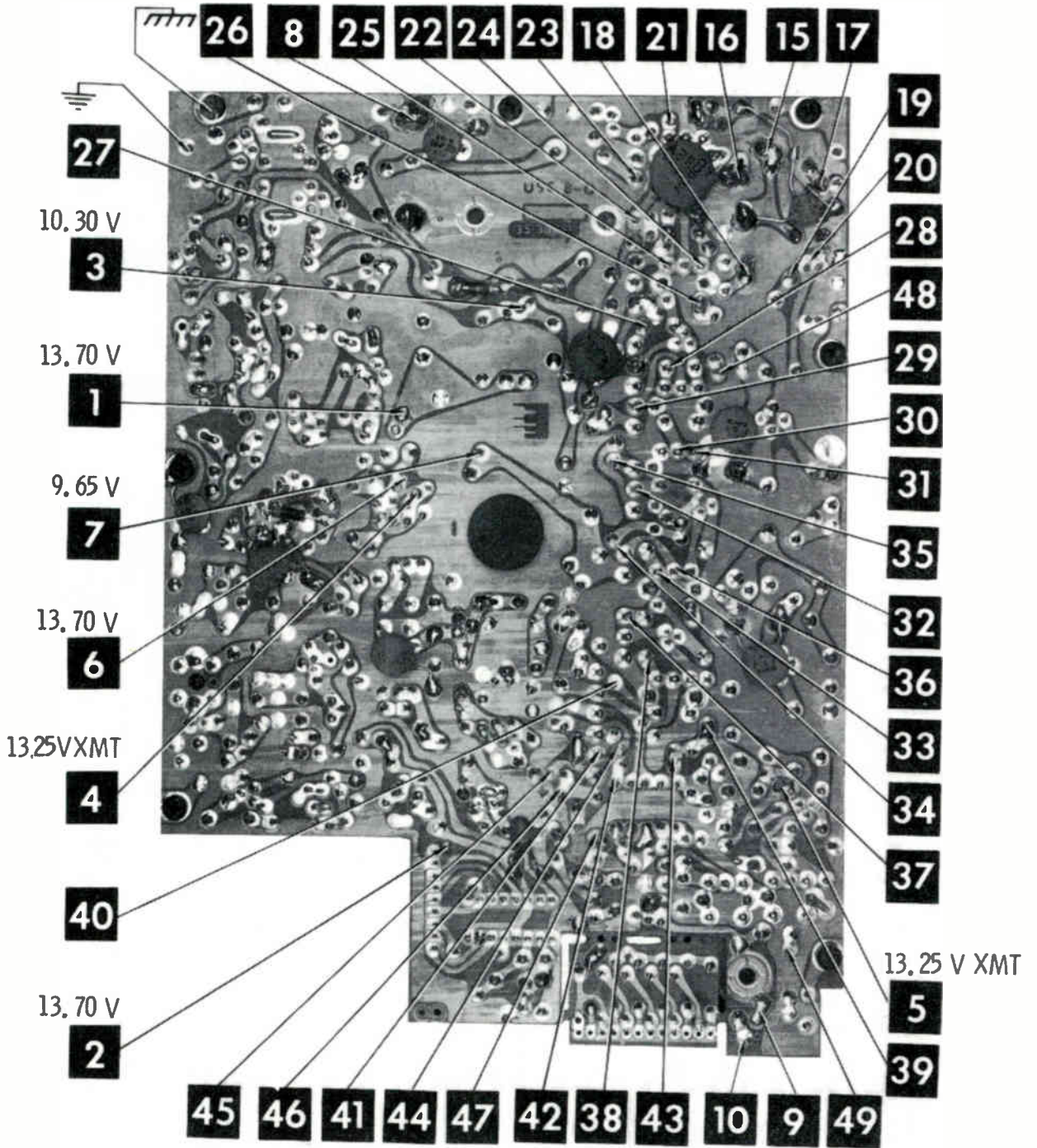
CHANNEL	1 = 10.30 Volts 0 = 0 Volts								REC VCO OUTPUT IN MHz AT TP4	XMT VCO OUTPUT IN MHz AT TP4	VCO OUTPUT IN MHz AT
	U101 PROGRAM DIVIDER										
	PINS										
	13	14	15	2	3	4	5				
1	0	0	0	0	0	0	1		26.510	26.965	
2	0	0	0	0	0	1	0		26.520	26.975	
3	0	0	0	0	0	1	1		26.530	26.985	
4	0	0	0	0	1	0	1		26.550	27.005	
5	0	0	0	0	1	1	0		26.560	27.015	
6	0	0	0	0	1	1	1		26.570	27.025	
7	0	0	0	1	0	0	0		26.580	27.035	
8	0	0	1	0	0	0	0		26.590	27.055	
9	0	0	1	0	0	0	1		26.610	27.065	
10	0	0	1	0	0	1	0		26.620	27.075	
11	0	0	1	0	0	1	1		26.630	27.085	
12	0	0	1	0	1	0	1		26.650	27.105	
13	0	0	1	0	1	1	0		26.660	27.115	
14	0	0	1	0	1	1	1		26.670	27.125	
15	0	0	1	1	0	0	0		26.680	27.135	
16	0	1	0	0	0	0	0		26.700	27.155	
17	0	1	0	0	0	0	1		26.710	27.165	
18	0	1	0	0	0	1	0		26.720	27.175	
19	0	1	0	0	0	1	1		26.730	27.185	
20	0	1	0	0	1	0	1		26.750	27.205	
21	0	1	0	0	1	1	0		26.760	27.215	
22	0	1	0	0	1	1	1		26.770	27.225	
23	0	1	1	0	0	0	0		26.800	27.255	
24	0	1	0	1	0	0	0		26.780	27.235	
25	0	1	0	1	0	0	1		26.790	27.245	
26	0	1	1	0	0	0	1		26.810	27.265	
27	0	1	1	0	0	1	0		26.820	27.275	
28	0	1	1	0	0	1	1		26.830	27.285	
29	0	1	1	0	1	0	0		26.840	27.295	
30	0	1	1	0	1	0	1		26.850	27.305	
31	0	1	1	0	1	1	0		26.860	27.315	
32	0	1	1	0	1	1	1		26.870	27.325	
33	0	1	1	1	0	0	0		26.880	27.335	
34	0	1	1	1	0	0	1		26.890	27.345	
35	1	0	0	0	0	0	0		26.900	27.355	
36	1	0	0	0	0	0	1		26.910	27.365	
37	1	0	0	0	0	1	0		26.920	27.375	
38	1	0	0	0	0	1	1		26.930	27.385	
39	1	0	0	0	1	0	0		26.940	27.395	
40	1	0	0	0	1	0	1		26.950	27.405	



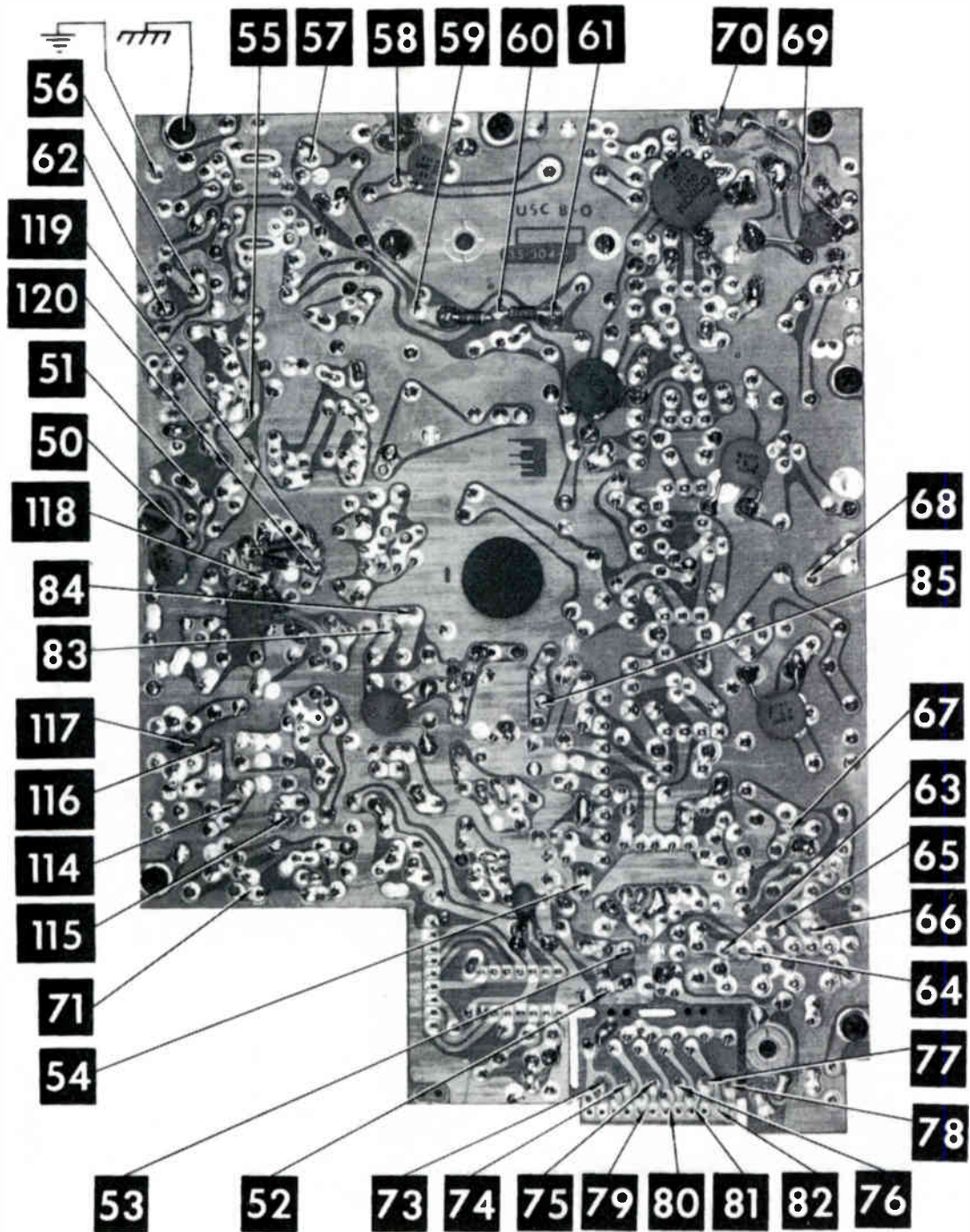
CHASSIS - BOTTOM



MAIN BOARD

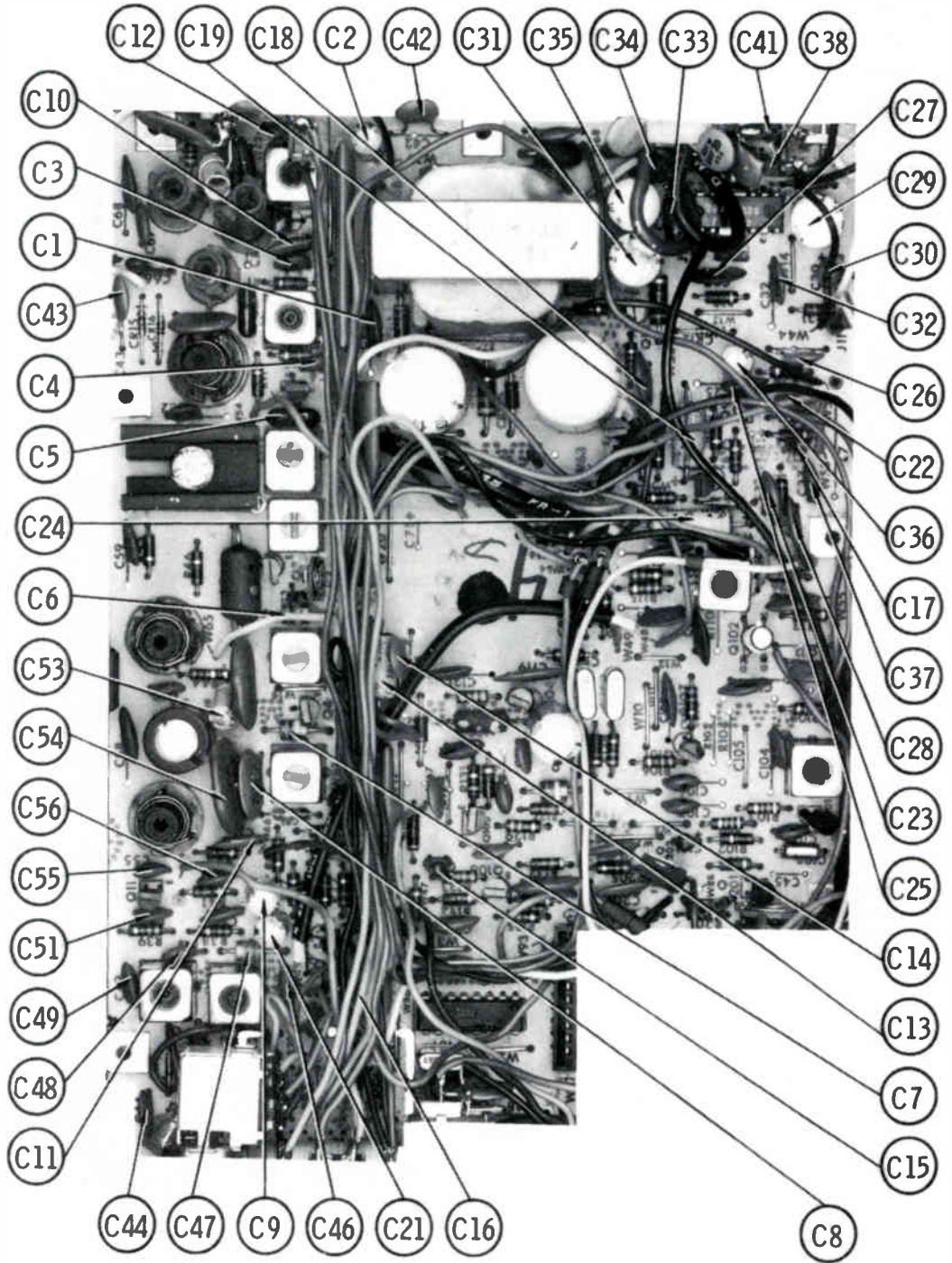


MAIN BOARD

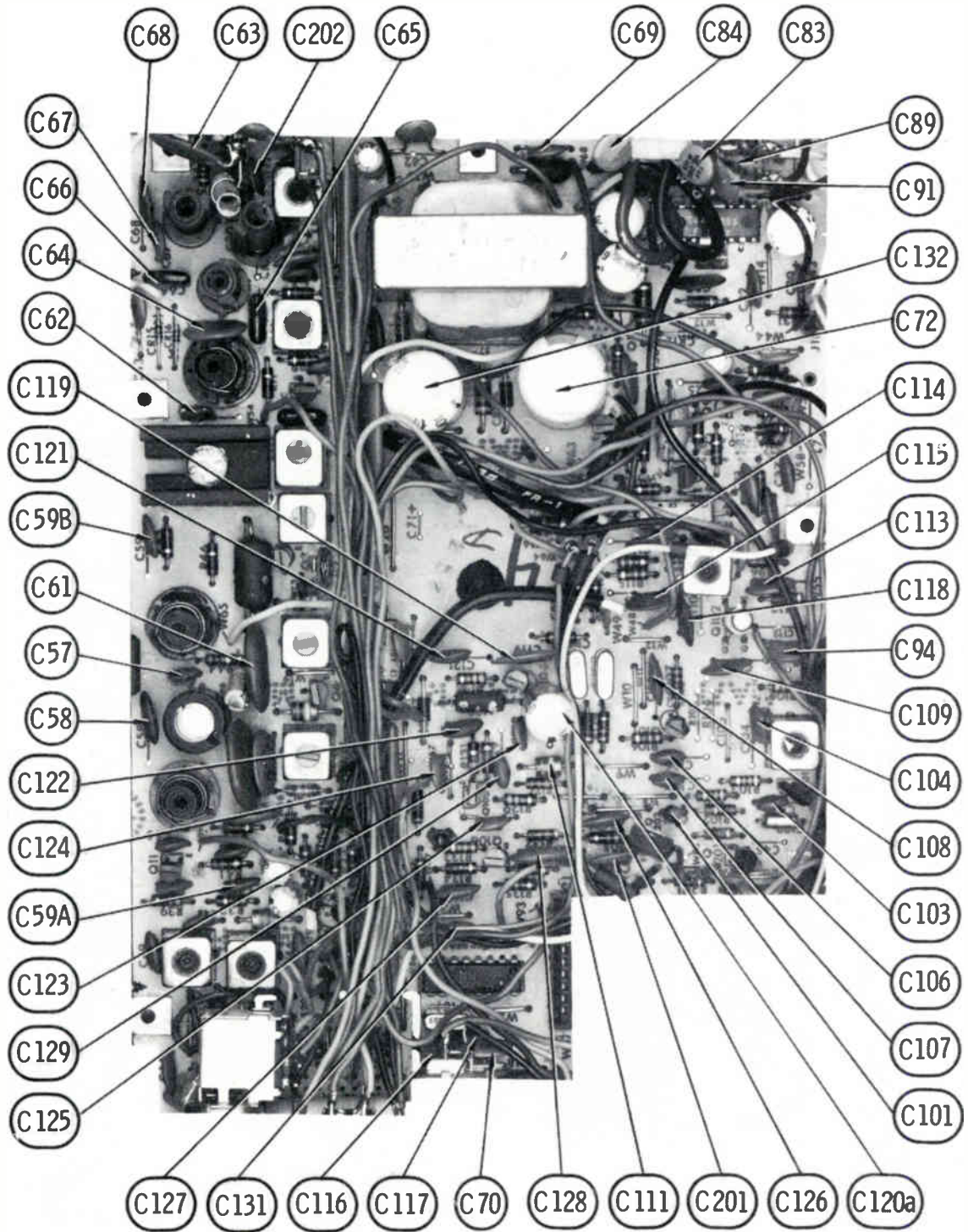


JOHNSON MODELS MESSENGER 4140/45

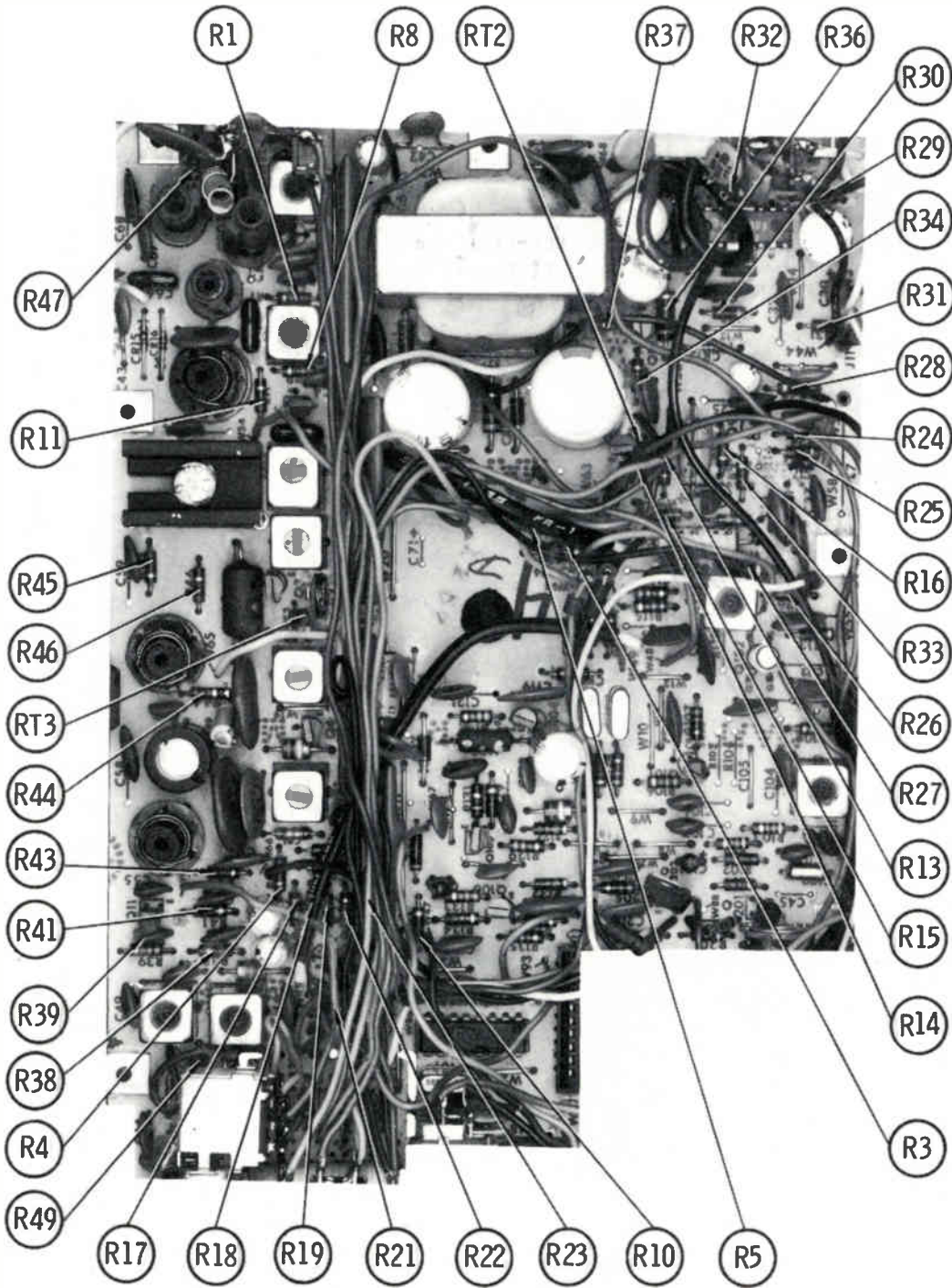
MAIN BOARD



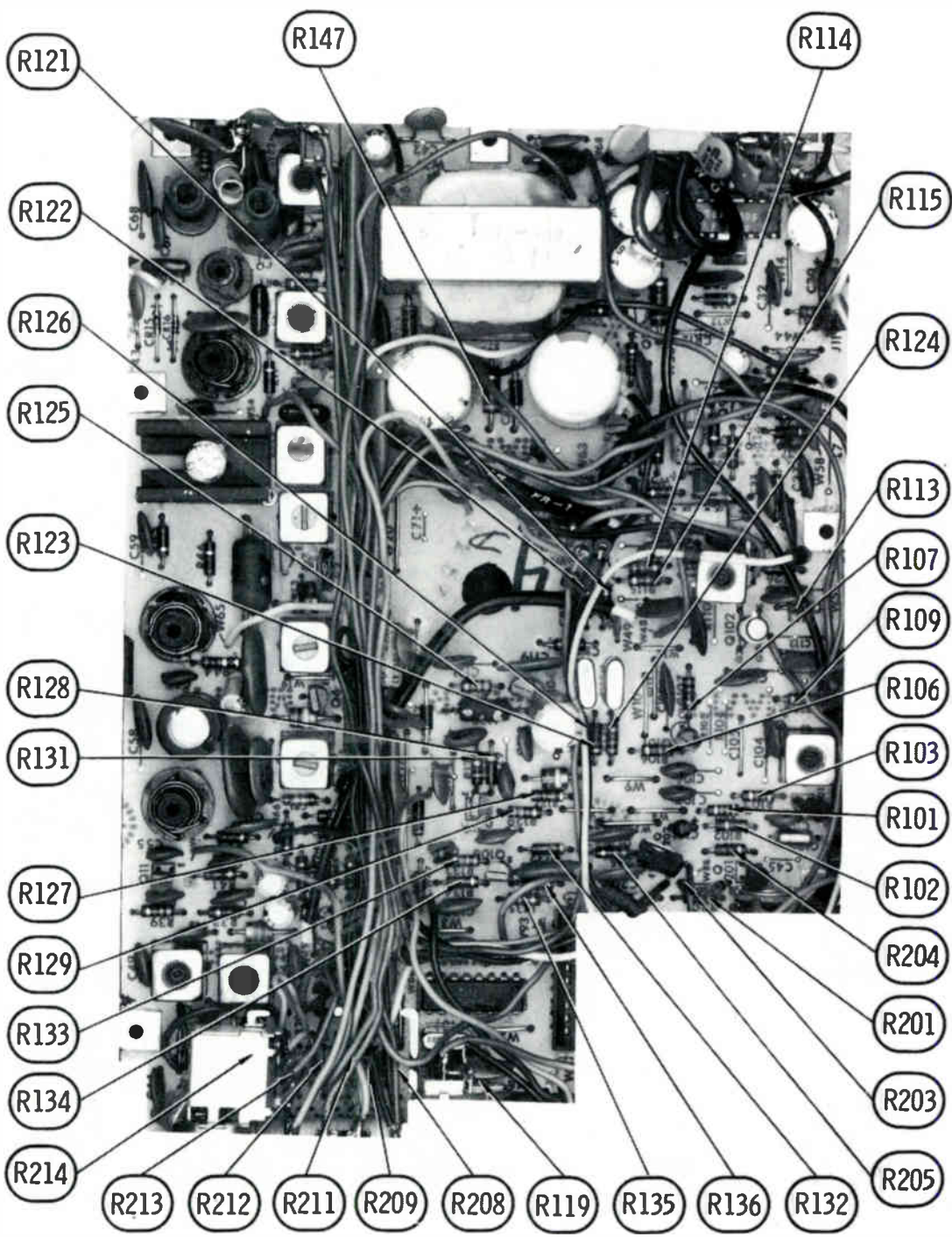
MAIN BOARD



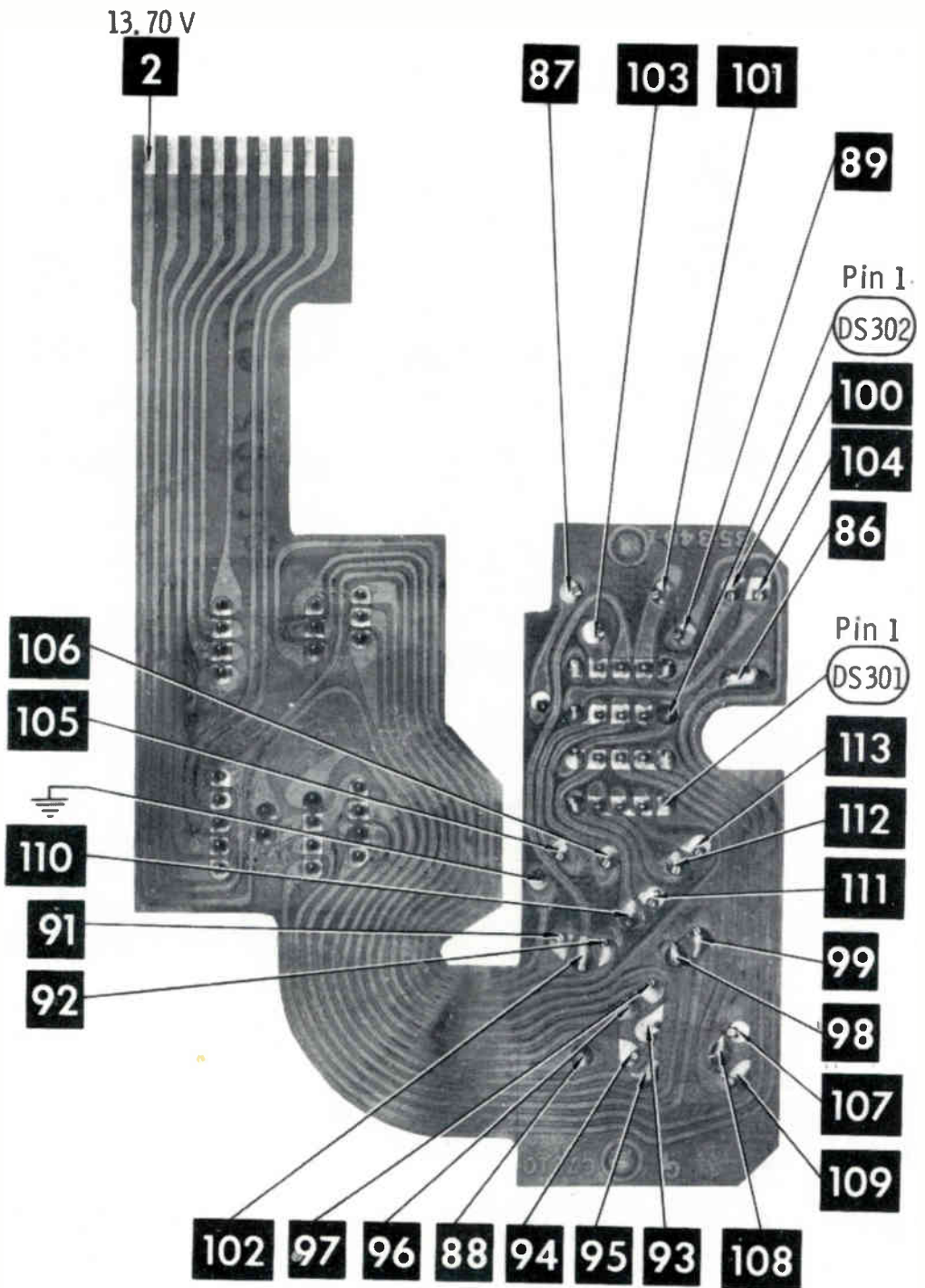
MAIN BOARD



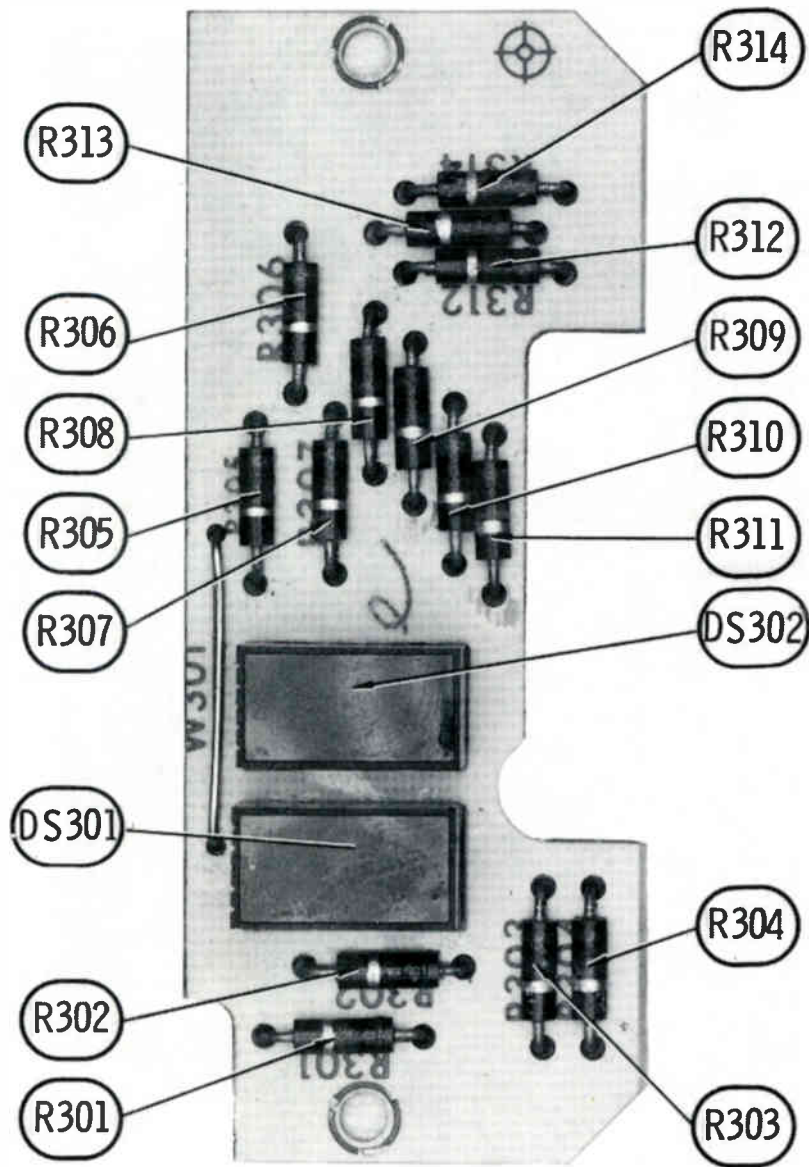
MAIN BOARD



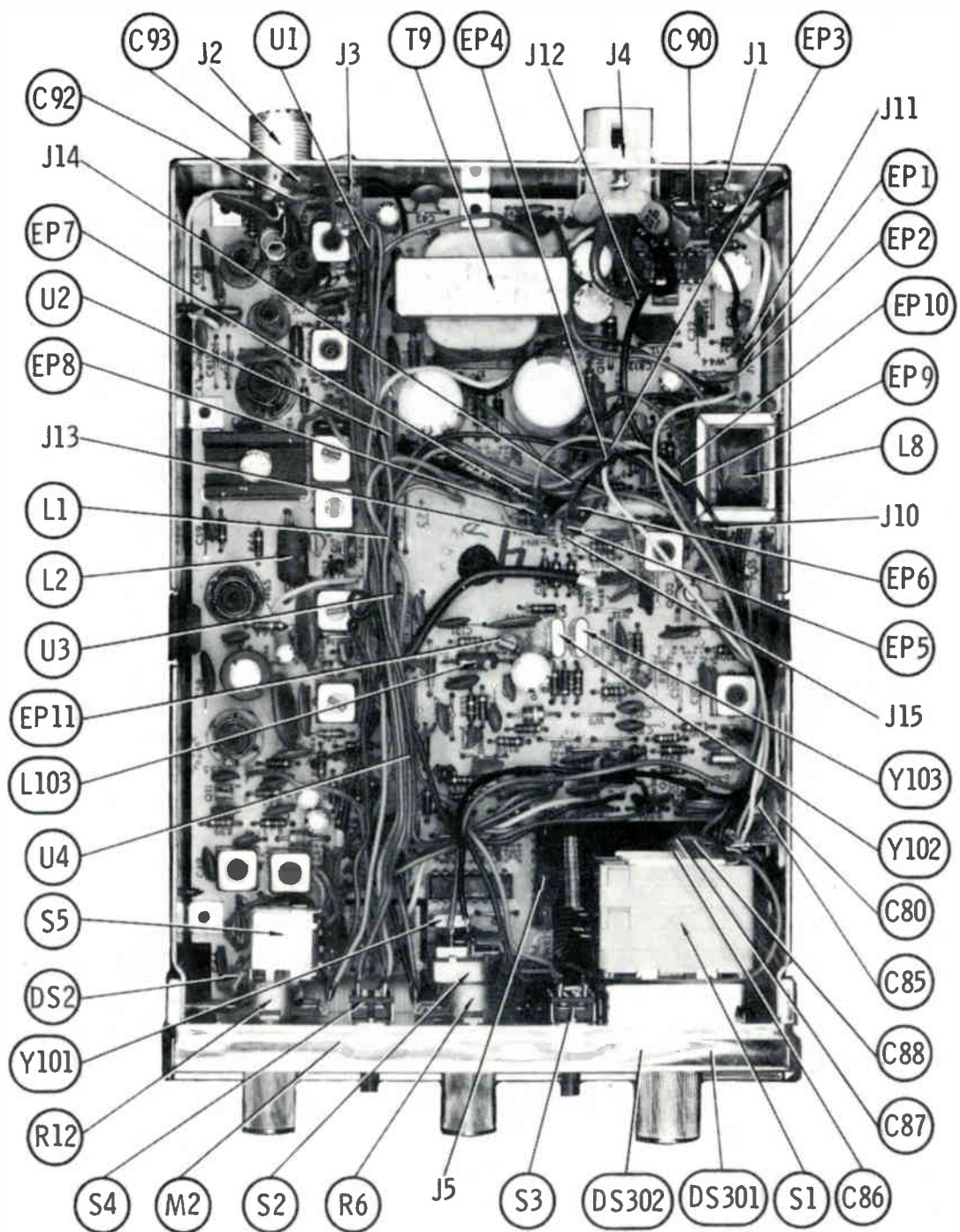
MAIN BOARD



CH. SELECTOR & READOUT BOARD

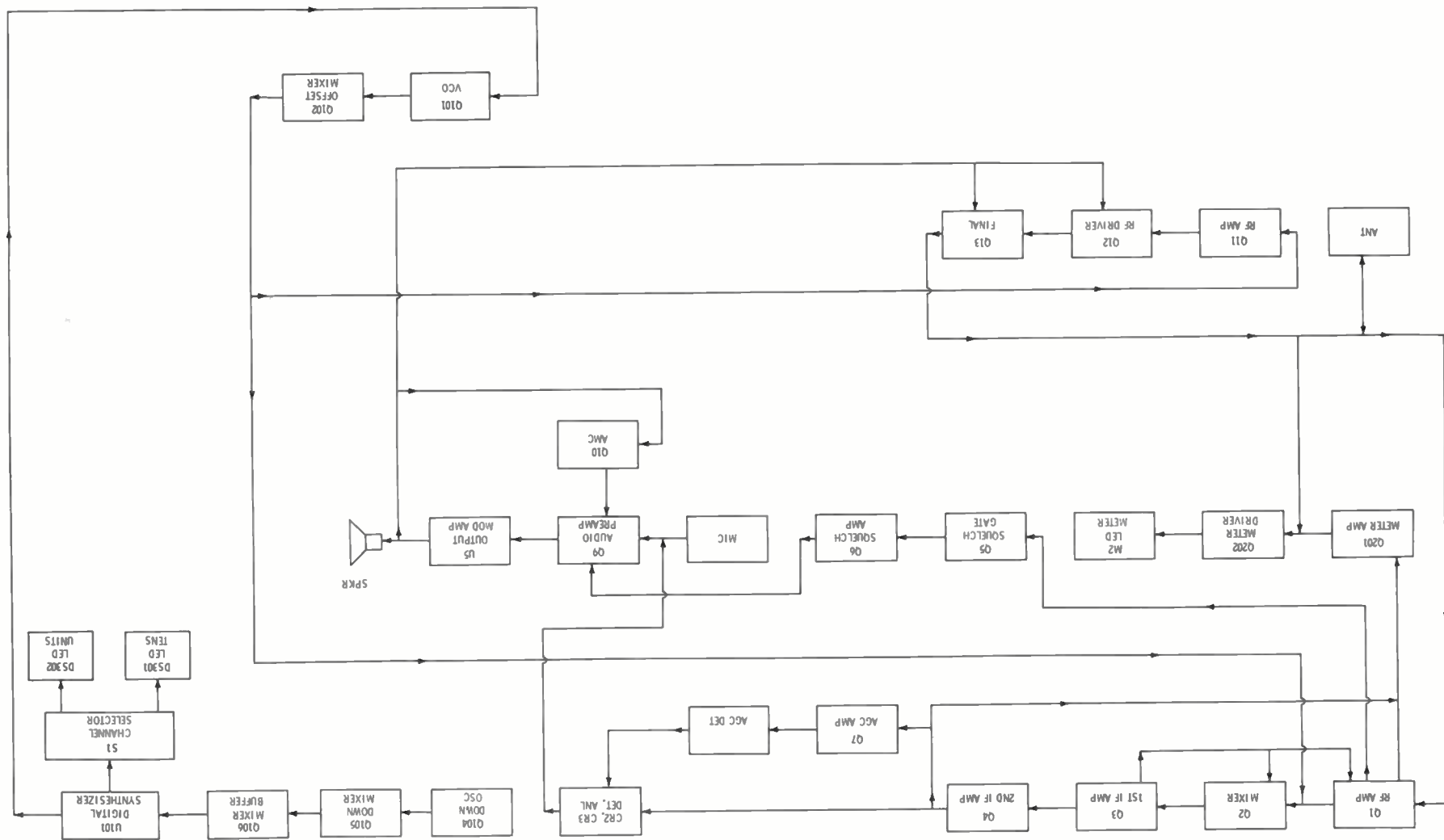


READOUT BOARD

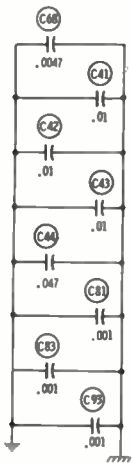
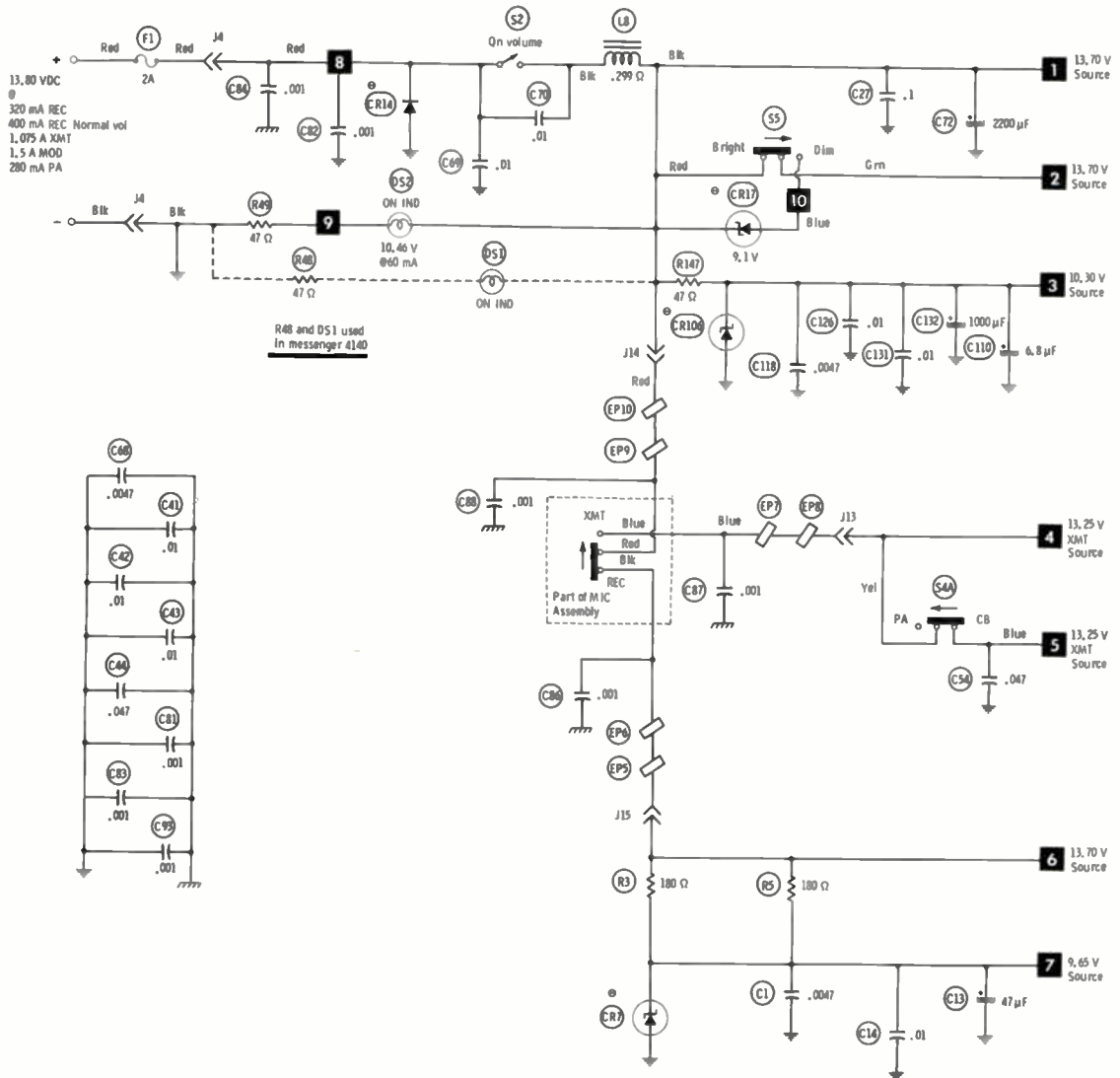


CHASSIS - BOTTOM

JOHNSON MODELS MESSENGER 4140/45

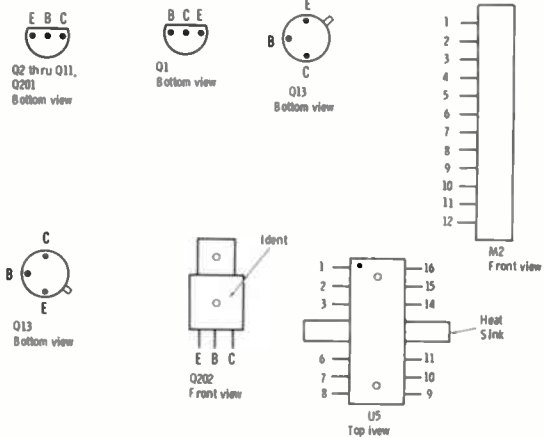


BLOCK DIAGRAM



R88 and D51 used in messenger 4140

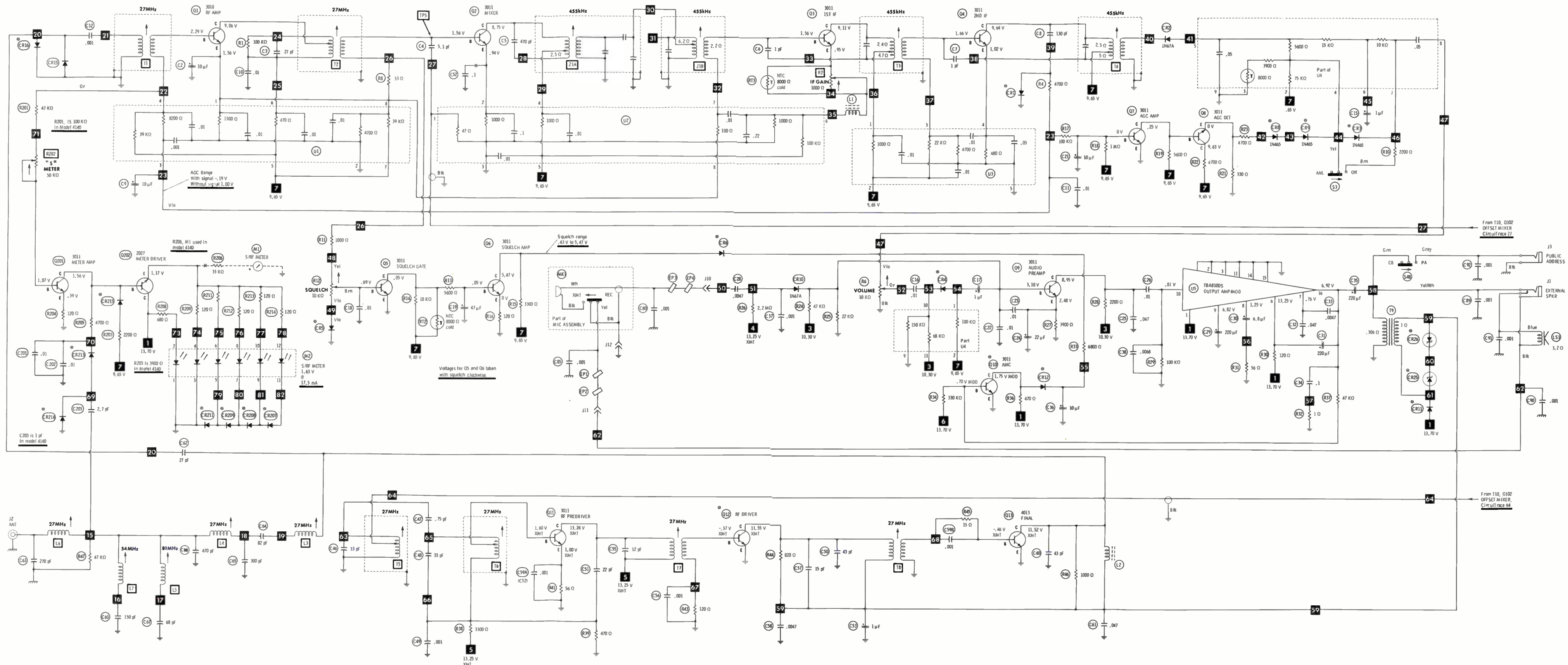
Terminal Guides



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

A PHOTOFAC STANDARD NOTATION SCHEMATIC
 WITH **CIRCUITRACE**

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PARTS LIST AND DESCRIPTION

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

SEMICONDUCTORS (Select replacement transistor for best results)

ITEM No.	TYPE No.	MFR. PART No.	REPLACEMENT DATA									
			GENERAL ELECTRIC PART No.	MALLORY PART No.	MOTOROLA PART No.	RAYTHEON PART No.	RCA PART No.	SPRAGUE PART No.	SYLVANIA PART No.	THORDARSON PART No.	WORKMAN PART No.	ZENITH PART No.
CR1			1N34AS	PTC207	HEPR9134A	RE 47	SK3087	RT-200	EGG109	1N34A	WEP138	ZEN-430
CR2	1N67A	523-1500-067	1N34AS	PTC207	HEPR9134A	RE 47	SK3087	RT-200	EGG109	1N34A	WEP138	ZEN-430
CR3	1N645(12)	523-1500-881	GE-504A	PTC201	HEPRO052	RE 49	SK3030	RT-213	EGG116	1N4004	WEP156	212-61
CR4	1N881		GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP156	212-61
CR5			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR6			1N34AS	PTC207	HEPR9134A	RE 47	SK3087	RT-200	EGG109	1N34A	WEP134	ZEN-430
CR7			GEZD-9,1	ZB9,1B		RE 114	SK3030	RT-240	EGG139A	1N4739A	WEP1109	103-372
CR8	1N645(12)	523-1500-881	GE-504A	PTC201	HEPRO052	RE 49	SK3030	RT-213	EGG116	1N4004	WEP156	212-61
CR9	1N645(12)	523-1500-881	GE-504A	PTC201	HEPRO052	RE 49	SK3030	RT-213	EGG116	1N4004	WEP156	212-61
CR10	1N881		GE-504A	PTC201	HEPRO052	RE 49	SK3030	RT-213	EGG116	1N4004	WEP156	212-61
CR11	1N67A	523-1500-067	1N34AS	PTC207	HEPR9134A	RE 47	SK3087	RT-200	EGG109	1N34A	WEP138	ZEN-430
CR12			GE-504A	PTC201	HEPRO052	RE 49	SK3030	RT-213	EGG116	1N4004	WEP138	ZEN-430
CR13			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR14			GE-300	PTC201	HEPRO052	RE 49	SK3030	RT-213	EGG116	1N4004	WEP156	212-61
CR15			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR16			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR17			GEZD-9,1	ZB9,1B		RE 114	SK3030	RT-240	EGG139A	1N4739A	WEP1109	103-372
CR18			GEZD-13	ZB13B		RE 119	SK3093	RT-244	EGG143A	1N4743A	WEP1158	ZEN-506
CR19			GE-90	ZB13B		RE 119	SK3093	RT-244	EGG143A	1N4743A	WEP1158	ZEN-506
CR20			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR21			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR22			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR23			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR24			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR25			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR26			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR27			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR28			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR29			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR30			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR31			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR32			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR33			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR34			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR35			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR36			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR37			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR38			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR39			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR40			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR41			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR42			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR43			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR44			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR45			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR46			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR47			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR48			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR49			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR50			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR51			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR52			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR53			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR54			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR55			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR56			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR57			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR58			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR59			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR60			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR61			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR62			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR63			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR64			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR65			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR66			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR67			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR68			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR69			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR70			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR71			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR72			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR73			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR74			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR75			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR76			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR77			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR78			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR79			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR80			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR81			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR82			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR83			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR84			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR85			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR86			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR87			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR88			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR89			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR90			GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	EGG177	1N4004	WEP1062	
CR91			GE-300									

PARTS LIST AND DESCRIPTION (CONTINUED)

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

CAPACITORS

ITEM No.	RATING	MFGR. PART No.	REPLACEMENT DATA					
			CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.		
						Q-LINE	GENERAL LINE	
C1	.0047	510-3216-270	DD-472	GP4700	GP247		5GA-D47	
C3	27 N150 5%				*		10TCP-Q27	
C4	5.1 NPO ±.5		DTZ-4R7	NPO4P7	CND547		10TCC-V47	
C5	470 5%			CD15FD471J03	SX347	QW1-42	MMA-471	
C6	1 5%			CD15CD010D03		QW1-1	MMA-010	
C7	1 5%			CD15CD010D03		QW1-1	MMA-010	
C8	130 NPO 5%			CD15FD131J03		QW1-30	MMA-131	
C10	.01 50V			UK50-103				
C11	.01 50V			UK50-103				
C12	.01 50V			UK50-103				
C14	.01 50V			UK50-103				
C16	.01 50V			UK50-103				
C18	.01 50V			UK50-103				
C22	.01 50V			UK50-103				
C23	.01 50V			UK50-103				
C25	.047 16V			UK16-503			HY-635	
C26	.01 50V			UK50-103				
C27	.1 16V			UK16-104			HY-650	
C28	.0047			DD-472	GP4700	GP247	5GA-D47	
C32	.047 16V			UK16-503		MAG1615	HY-635	
C33	.0047			DD-472	GP4700	GP247	5GA-D47	
C34	.1 16V			UK16-104		MAG1601	HY-650	
C37	.001			DD-102		GP210	10TS-D10	
C38	.0068 50V			DD-682	GP6800	GP268	5GA-D68	
C40	43 5%				CD15ED430J03	SX443	MMA-430	
C41	.01 50V			UK50-103		MAG5011		
C42	.01 50V			UK50-103		MAG5011		
C43	.01 50V			UK50-103		MAG5011		
C44	.047 16V			UK16-503		MAG1615	HY-635	
C46	33 N150 5%		510-3216-330			*	10TCP-Q33	
C47	.75 5%							
C48	33 N750			DTN-33	N33	CN7433		10TCU-Q33
C49	.001			DD-102		GP210		10TS-U10
C50	43 5%					CD15ED430J03		MMA-430
C51	22 NPO 5%			DTZ-22	NPO22	CND422	QW1-18	10TCC-Q22
C52	.1 16V			UK16-104		MAG1601		HY-650
C54	.047 50V			UK16-503		MAG1615		HY-635
C55	12 N750 5%					CN7412		10TCU-Q12
C56	.001					GP210		10TS-D10
C57	15 N150 5%		510-3016-150	DD-102			10TCP-Q15	
C58	.0047			DD-472	GP4700	GP247		5GA-D47
C59A	.001			DD-102		GP210		10TS-D10
C59B	.001			DD-102		GP210		10TS-D10
C60	150 N150 5%		510-3016-151			*	10TCP-T15*	
C61	.047 50V	UK16-503			MAG1615		HY-635	
C62	27 5%				CND427		10TCC-Q27	
C63	270 N750 5%				CN7327		10TCU-T27	
C64	82 N150 5%	510-3216-820			*	10TCP-Q82		
C65	300 5%						MMA-301	
C66	470 5%				CD15FD301J03	QW1-38	MMA-471	
C67	68 5%		DTZ-68	NPO68	CND468	QW1-42	10TCC-Q68	
C68	.0047		DD-472	GP4700	GP247		5GA-D47	
C69	.01 50V		UK50-103		MAG5011			
C70	.01 50V		UK50-103		MAG5011			
C80	.001		DD-102		GP210		10TS-D10	
C81	.001		DD-102		GP210		10TS-D10	
C82	.001		DD-102		GP210		10TS-D10	
C83	.001	DD-102		GP210		10TS-D10		
C84	.001	DD-102		GP210		10TS-D10		
C85	.001	DD-102		GP210		10TS-D10		
C86	.001	DD-102		GP210		10TS-D10		
C87	.001	DD-102		GP210		10TS-D10		
C88	.001	DD-102		GP210		10TS-D10		
C89	.001	DD-102		GP210		10TS-D10		
C90	.001	DD-102		GP210		10TS-D10		
C91	.001	DD-102		GP210		10TS-D10		
C92	.001	DD-102		GP210		10TS-D10		
C93	.001	DD-102		GP210		10TS-D10		
C94	39 NPO 5%	510-3216-330			CND439	10TCC-Q39		
C95	33 N150 5%				*	10TCP-Q33		
C103	18 N750 5%		DTN-20	N20	CN7420		10TCU-Q20	
C104	56 N750 5%		DTN-68	N68	CN7468		10TCU-Q68	
C106	27 N750 5%				CN7427		10TCU-Q27	
C107	18 N750 5%		DTN-20	N20	CN7420		10TCU-Q20	
C108	.0047		DD-472	GP4700	GP247		5GA-D47	
C109	.0047		DD-472	GP4700	GP247		5GA-D47	
C111	1.5 5%		DTZ-1R5	NPO1P5	CND515		10TCC-V15	
C113	.01 50V		UK50-103		MAG5011			
C114	.0047	DD-472	GP4700	GP247		5GA-D47		
C115	.0047	DD-472	GP4700	GP247		5GA-D47		
C116	39 NPO 5%			CND439		10TCC-Q39		
C117	18 N750 5%	DTN-20	N20	CN7420		10TCU-Q20		

JOHNSON MODELS MESSENGER 4140/45

PARTS LIST AND DESCRIPTION (CONTINUED)

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

CAPACITORS (cont)

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA				
			CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
						Q-LINE	GENERAL LINE
C118	.0047		DD-472	GP4700	GP247		5GA-D47
C119	100 N150 5%	510-3216-101			*		10TCP-T10
C120	.01 50V		UK50-103		MAG5011		
C121	33 N150 5%	510-3216-330			*		10TCP-Q33
C122	33 N150 5%	510-3216-330					10TCP-Q33
C123	5.1 NPO ±.5%						
C124	.01 50V		UK50-103		MAG5011		
C125	.01 50V		UK50-103		MAG5011		
C126	.01 50V		UK50-103		MAG5011		
C127	.01 50V		UK50-103		MAG5011		
C128	100 N150 5%	510-3216-101			*		10TCP-T10
C129	470		DD-471	GP470	GP347		10TS-T47
C131	.01 50V		UK50-103		MAG5011		
C201	.01 50V		UK50-103		MAG5011		
C202	.01 50V		UK50-103		MAG5011		
C203	2.7 NPO ±.5						

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

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

ITEM No.	FUNCTION	RESISTANCE	REPLACEMENT DATA				
			MFR. PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	MALLORY PART No.	TRW PART No.
R2	IF Gain	1000	562-0019-102				X260R102B
R6	Volume/Power Switch	10K	562-0002-021				
R12	Squelch/Dimmer Switch	10K	562-0002-041 (5)				
R202	S Meter	50K	562-0002-41 562-0004-503	T-50K	C-503	HTC54L1	X201R503B

(5) Number on unit.

COILS (RF-IF)

ITEM No.	FUNCTION	REPLACEMENT DATA			REMARKS
		PART No.	OTHER IDENTIFICATION	MILLER PART No.	
L1	RF Choke (6.8uH)	542-3504-689			(1) Includes Z1A and Z1B.
L2	RF Choke (13uH)	542-3003-001		4624	
L3	Loading, Final (27MHz)	542-1005-010		7515-E	
L4	Pi Filter (27MHz)	542-1015-002			
L5	TVI Trap (81MHz)	542-1015-002			
L6	Tuning, Antenna (27MHz)	542-1007-005			
L7	TVI Trap (54MHz)	542-1015-002			
L103	Osc Tank (6.8uH)	542-3504-689			
T1	Rec RF Amp (27MHz)	592-5015-001	50150017626	CBS731	
T2	Rec Mixer (27MHz)	592-5015-002	5015002	CBS739-T	
T3	Rec 1st IF (455kHz)	592-5015-024	50150247622		
T4	Rec 2nd IF (455kHz)	592-5015-024	50150247622		
T5	Xmit Bandpass (27MHz)	592-5015-005	5925015005	CBS107-T	
T6	Xmit Bandpass (27MHz)	592-5015-005	5925015005	CBS107-T	
T7	Xmit Driver (27MHz)	592-5014-001			
T8	Xmit Final (27MHz)	592-5014-002			
T10	Mixer Tank (27MHz)	592-5015-005	5925015005		
T101	Osc Tank (22MHz)	592-5015-005	5925015005		
Z1A	Rec IF Filter (455kHz)	532-1004-001(1)	MFH71T		
Z1B	Rec IF Bandpass (455kHz)		YXE10857ATA		

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.	
L8	1.5A	.299	4.94mH	542-5000-021			

TRANSFORMER (Driver)

ITEM No.	TURNS RATIO			REPLACEMENT DATA			NOTES
	PRI.	SEC. 1	SEC. 2	MFGR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T9	.4	1		592-1013-008			

SPEAKER

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

FUSE DEVICES

ITEM No.	DESCRIPTION	REPLACEMENT DATA							
		PART No.		BUSS PART No.		LITTELFUSE PART No.		WORKMAN PART No.	
		DEVICE	HOLDER	DEVICE	HOLDER	DEVICE	HOLDER	DEVICE	
F1	2A Quick Acting	534-0003-024	534-1004-031	AGC-2	HDJ	312002	150145	FG2-2	

PARTS LIST AND DESCRIPTION (CONTINUED)

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

MICROPHONE

ITEM No.	REPLACEMENT DATA				CONNECTION DATA						
	MFGR. PART No.	GC PART No.	GC NOISE CANCEL	GC POWER	GC Lead Color →	Red	Shield	Yellow	Blue	White	Black
MIC	023-2708-014	18-032	18-034	18-010	Orig Color →	White	Shield	Blue	Black	Yellow	Red

MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
DS2	Lamp		Power Indicator (10.46V @ 60mA)
DS301	LED	549-4002-011	Tens (1.63V @ 23mA)
DS302	LED	549-4002-011	Units (1.63V @ 23mA)
M2	Meter	549-4002-051	S/R/F Meter
S1	Switch	583-2009-221	Channel Selector
S2	Switch		Power (Part of Volume Control)
S3	Switch	583-3003-011	ANL
S4	Switch	583-3003-011	PA/CB
S5	Switch		Bright/Dim (Part of Squelch Control)
Y101	Crystal	519-0008-002	5.120MHz
Y102	Crystal	519-0005-202	30.820MHz
Y103	Crystal	519-0005-203	31.275MHz

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

ITEM	PART No.	ITEM	PART No.
Bottom Cover Assembly	023-3854-001	Cover Top	017-1904-003
Front Panel (M145)	032-0521-011		

WIRING DATA

General-use Hook-up Wire (available in 5 colors)	BELDEN No. 8523	Coiled Microphone Cable	
Shielded Hook-up Wire (spiral wrapped)	BELDEN No. 8421	3-conductor (1 shielded) 23AWG	BELDEN No. 9471 (5')
(braided)	BELDEN No. 8401		BELDEN No. 8497 (6')
Speaker Cable (available in 4 colors)	BELDEN No. 8782		BELDEN No. 9472 (7-1/2')
Bonding Strap	BELDEN No. 8672	28AWG	BELDEN No. 9466 (6')
AC Power Cord	(6') BELDEN No. 17106	31AWG	BELDEN No. 9468 (10')
	(9') BELDEN No. 17109	4-conductor (unshielded) 23AWG	BELDEN No. 8415 (6')
		5-conductor (1 shielded) 28AWG	BELDEN No. 9467 (6')
			BELDEN No. 9465 (7-1/2')



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 1-621

MANUFACTURER'S SPECIFICATIONS

GENERAL

- | | |
|-------------------------|--|
| 1. Semiconductor | : 27 Transistors, 1 FET, 19 Diodes, 3 ICs, 2 LEDs |
| 2. Frequency Range | : 26.965 MHz – 27.405 MHz |
| 3. Mode of Operation | : AM |
| 4. Controls | : Fine Tune Control
: Tone Control
: Squelch Control
: Volume Control |
| 5. Switches | : Channel Selector Switch
: ANL ON-OFF Push Switch
: PA-CB Push Switch
: AC-DC Slide Switch
: Power ON-OFF Push Switch |
| 6. Connectors and Jacks | |
| Front | : Microphone Connector |
| Rear | : Antenna Connector
: EXT. Speaker Jack
: PA Speaker Jack
: Fuse 1A
: DC Cord
: AC Cord |
| 7. Indicators | : TX Light
: RX Light
: SIGNAL/TRANSMIT POWER METER |
| 8. Speaker | : 2-5/8 inches, 8 ohms |
| 9. Microphone | : Dynamic Microphone, 500 ohms |
| 10. Power Supply | : 13.8 VDC Positive or Negative ground 117 VAC |
| 11. Dimensions | : 12-3/8(W) x 4-1/8(H) x 8-9/16(D) |
| 12. Weight | : 10 Lbs. 9 Ozs |

RECEIVER

- | | |
|--|----------------------------------|
| 1. Sensitivity | : 0.5 μ V for 10 dB S + N/N |
| 2. Selectivity | : 5 KHz minimum at 6 dB down |
| 3. Adj. Channel Rejection | : More than 50 dB |
| 4. Audio Power output at 8 ohms | : More than 3W at 10% distortion |
| 5. Audio fidelity (1KHz = 0 dB, 6 dB down) | : 400 Hz – 2000 Hz |
| 6. AGC figure of merit | : More than 80 dB |
| 7. Squelch Sensitivity (Threshold) | : Less than 0.5 μ V |
| 8. Spurious Rejection | : More than 45 dB |
| 9. Current drain no audio | : 400 mA DC |

TRANSMITTER

- | | |
|--------------------------|--------------------|
| 1. RF Power Output | : 4W |
| 2. Modulation Capability | : 100% |
| 3. Spurious Suppression | : More than 60 dB. |
| 4. Frequency Tolerance | : \pm 0.005% |
| 5. Current Drain | : 1200 mA DC |

Courtesy of the Manufacturer

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

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ROYCE MODEL 1-621

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 at TP5. 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:
 T3, T4..... 5009, 8728-A, 8728
 T1, T2..... 9440
 L4, T6, T7..... 8282, 9440, 8606, 9302

SYNTHESIZER ALIGNMENT

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Input of frequency counter to TP1 (PLL unit, Pin 2).	Ch. 19, Tune Midrange		Check for 10.240MHz.
Input of frequency counter to TP2 (PLL unit, Pin 19).	Ch. 1, Tune Midrange		Check for 37.660MHz. Check all channels. (Channel frequency +10.695MHz = frequency on counter.)
Input of frequency counter to TP3 (PLL unit, Pin 23).	Ch. 1, Xmt		Check for 26.965MHz. Check all channels. (Counter should indicate channel frequency.)

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.

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Output of signal generator thru .01uF to TP4. (Q4, Base) 455kHz,1000Hz @ 30% modulation.	Ch. 19, Squelch MINIMUM Tune Midrange NL Off	T4,T3	Adjust for maximum output.
Output of signal generator thru .01uF to antenna jack-J3. 27.185MHz,1000Hz @ 30% modulation.	Ch. 19 Squelch MINIMUM Tune Midrange NL Off	T2,T1	Adjust for maximum output. It may be necessary to readjust T3, T4.

TRANSMITTER ALIGNMENT

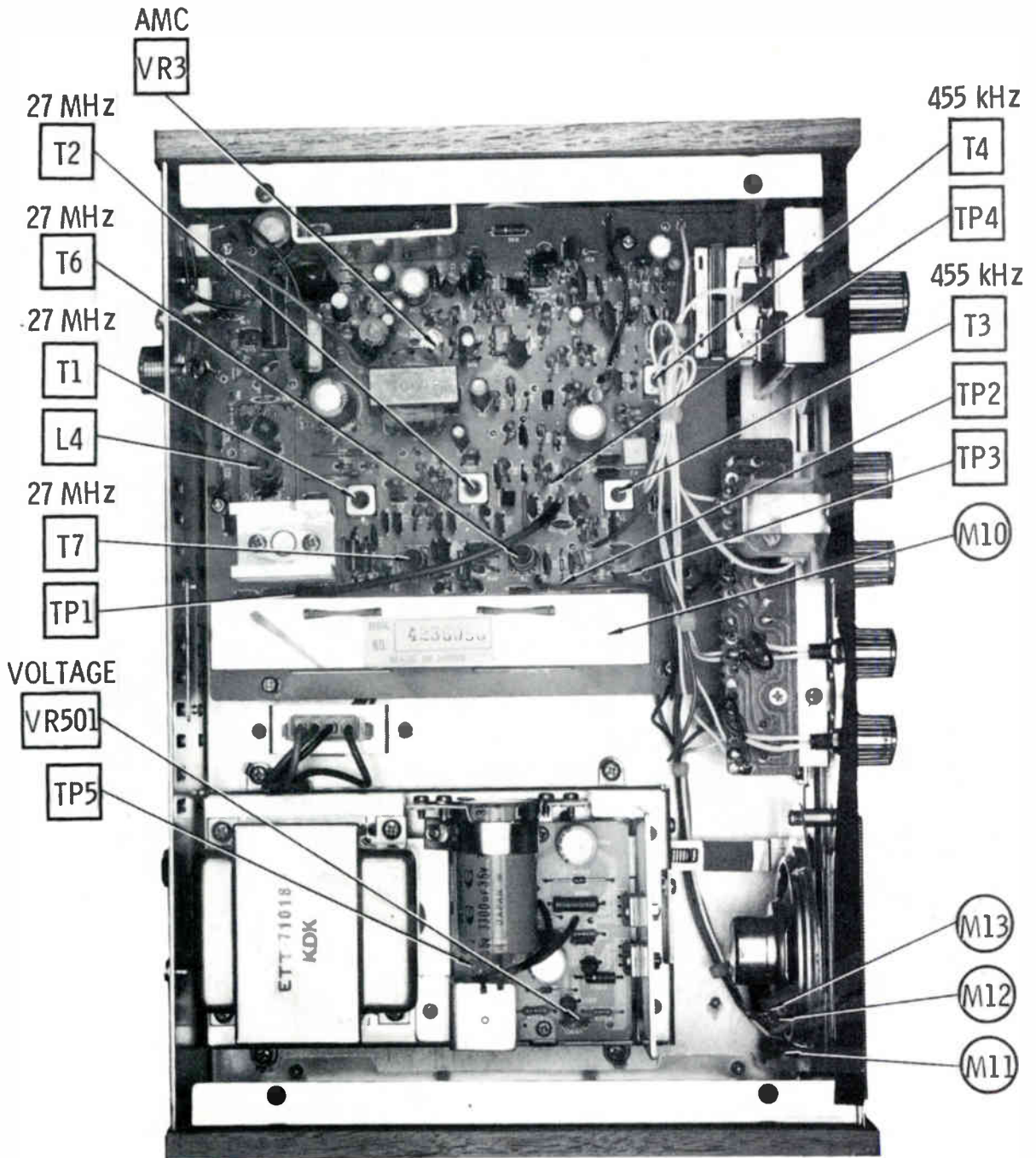
Connect an RF wattmeter and 50-ohm, 25-watt dummy load to antenna connector. NOTE: Be sure to check transmit frequency and power on all active channels after alignment of transmitter. See page 4 for channel frequencies.

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
	Ch. 19	T6,T7,T4	Adjust for maximum
	Ch. 19	L4	Adjust for 4 watts maximum.

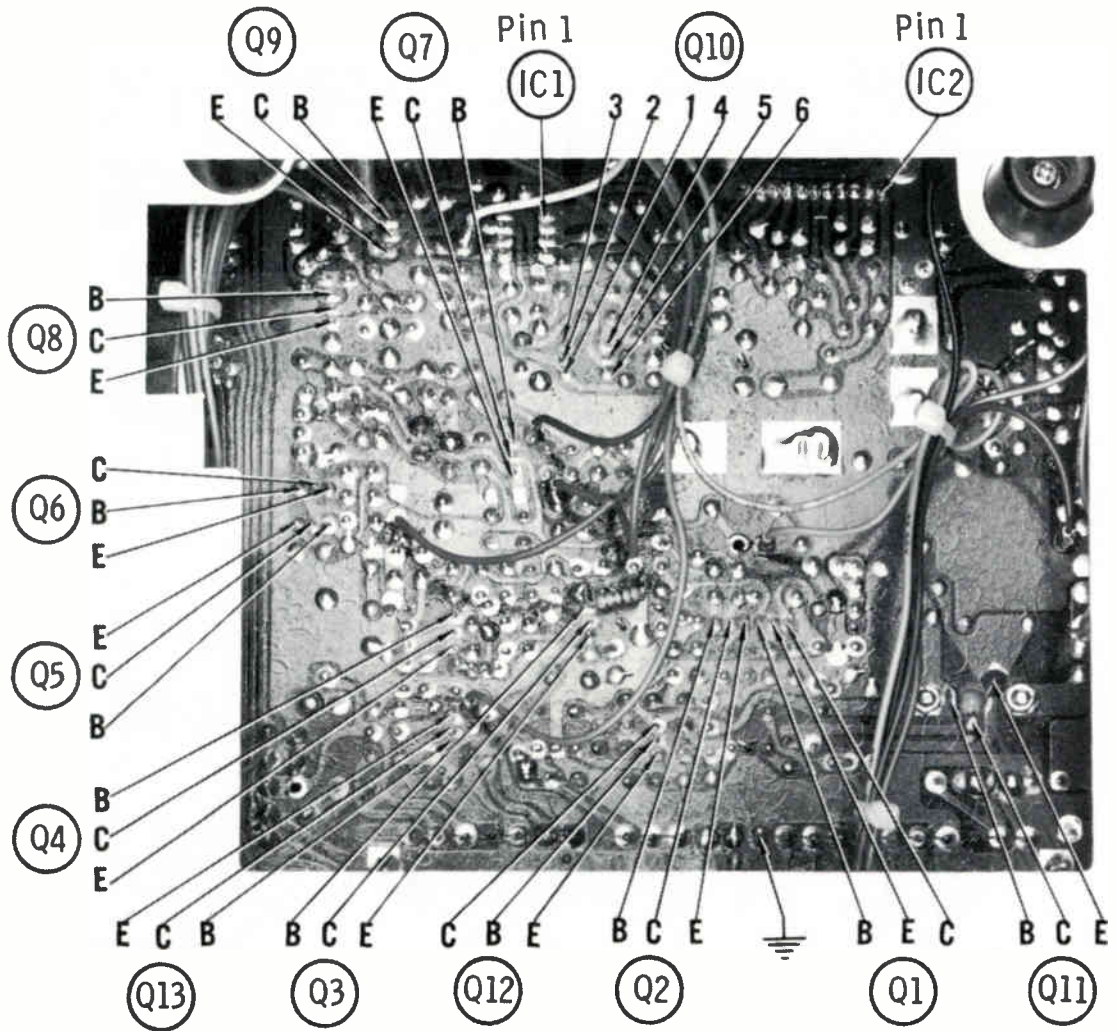
TRANSMITTER ADJUSTMENTS

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.

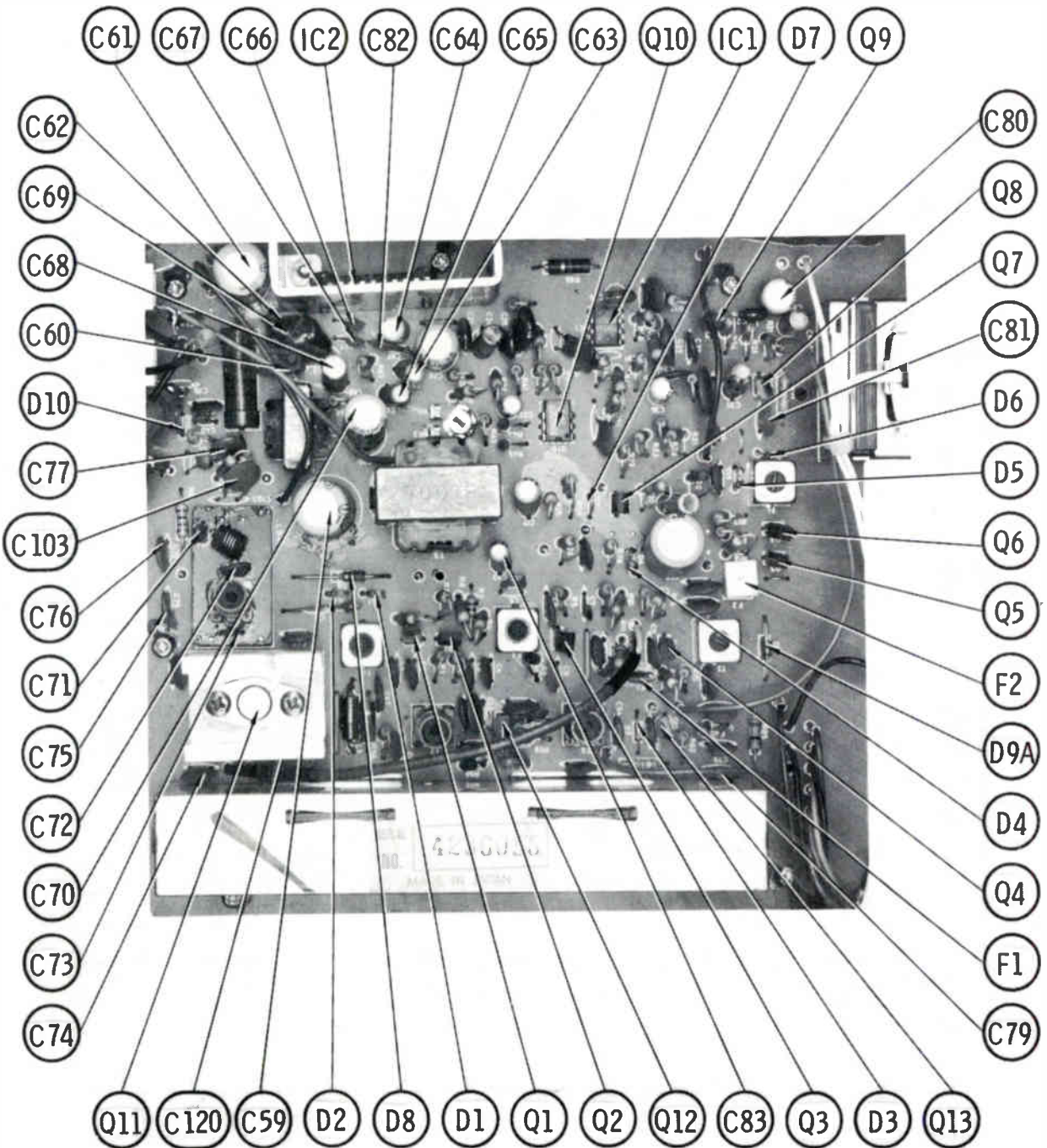
TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Input of DC meter to TP5 (Fuse).	Ch. 19	VR501	VOLT REG Adjust VR501 for 13.80 volts.
Modulation meter to antenna jack. Inject a 1000Hz,20mV signal at MIC input.	Ch. 19	VR3	AMC Adjust VR3 for 90% modulation.



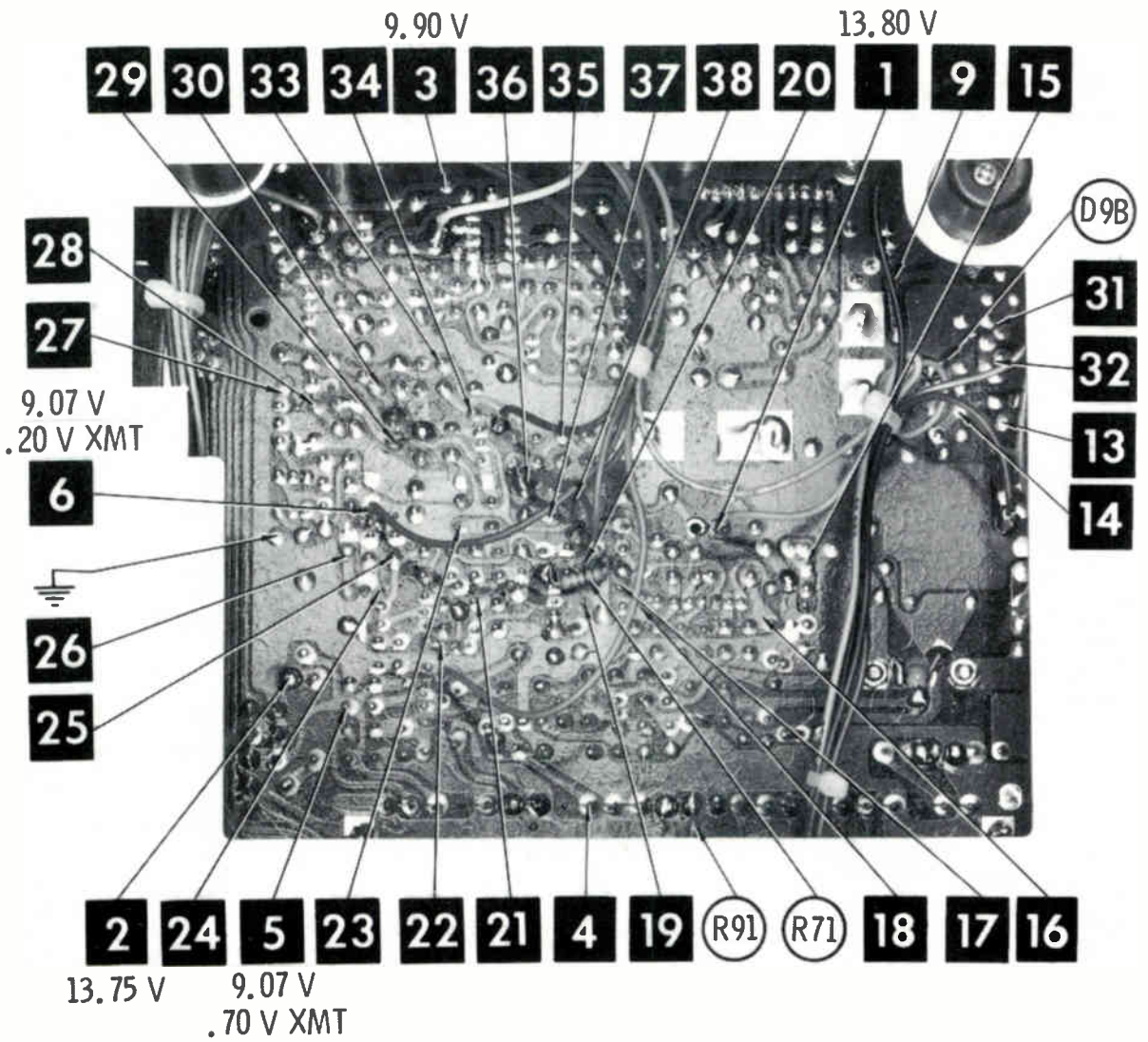
CHASSIS - TOP



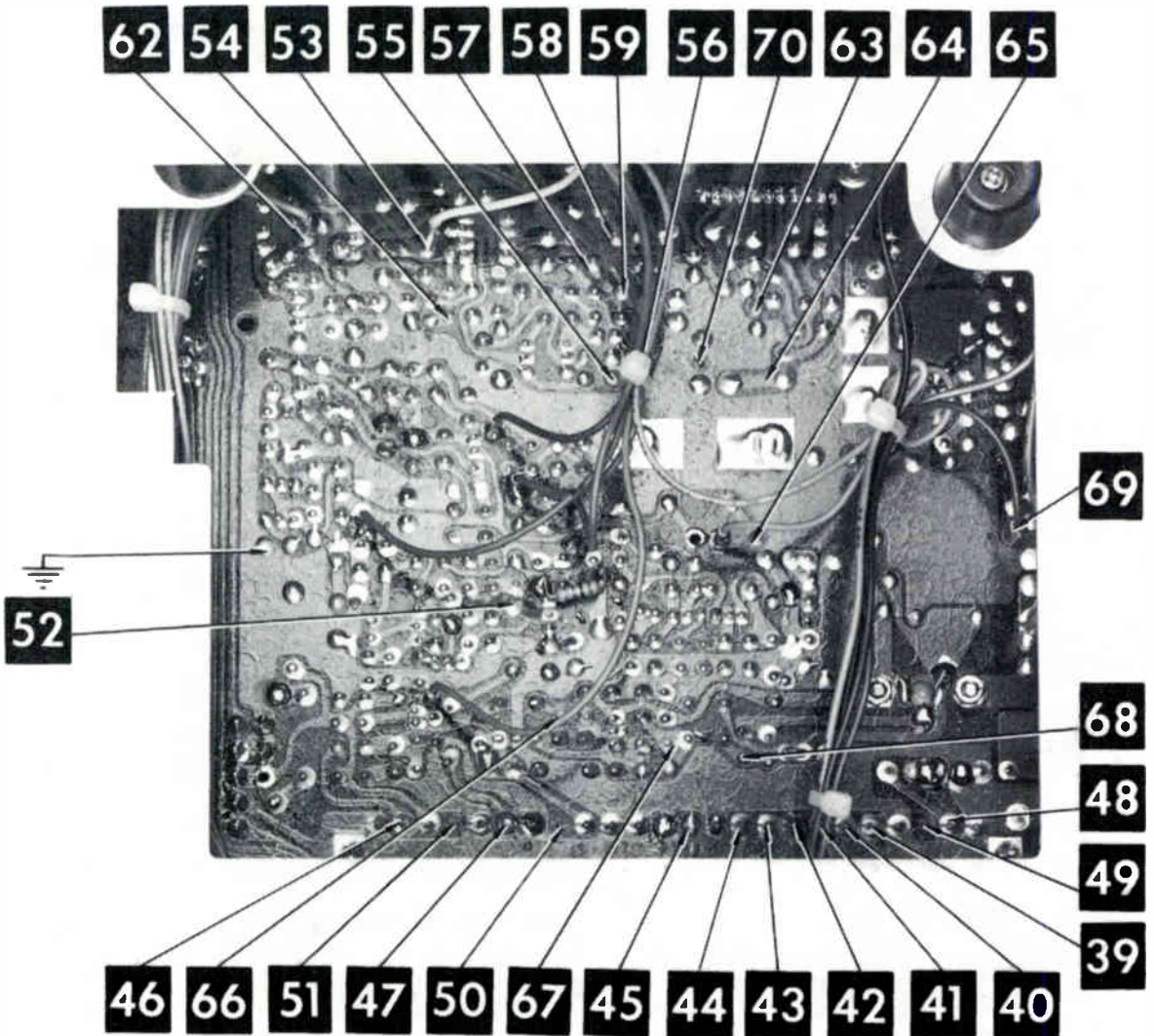
MAIN BOARD



MAIN BOARD

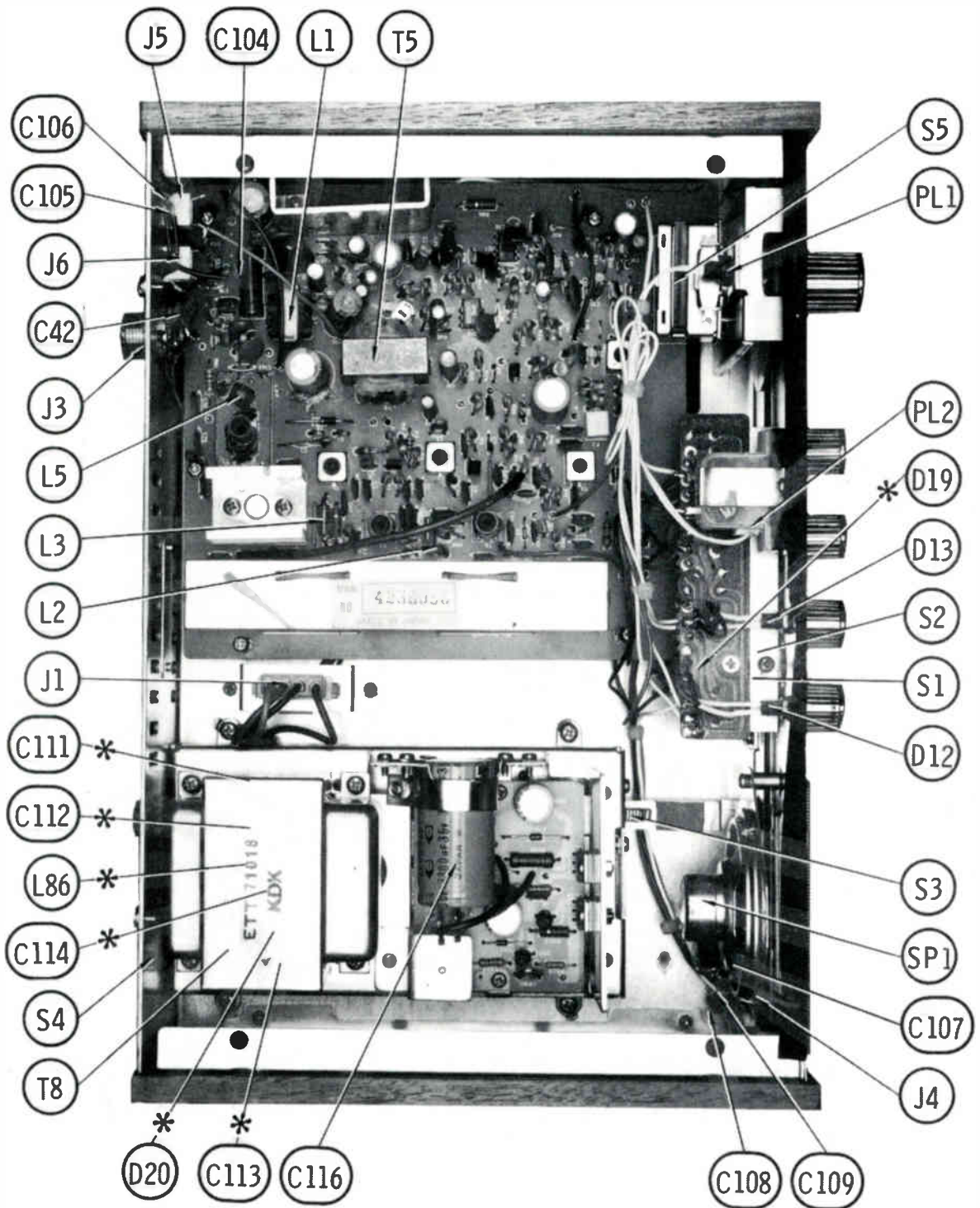


MAIN BOARD



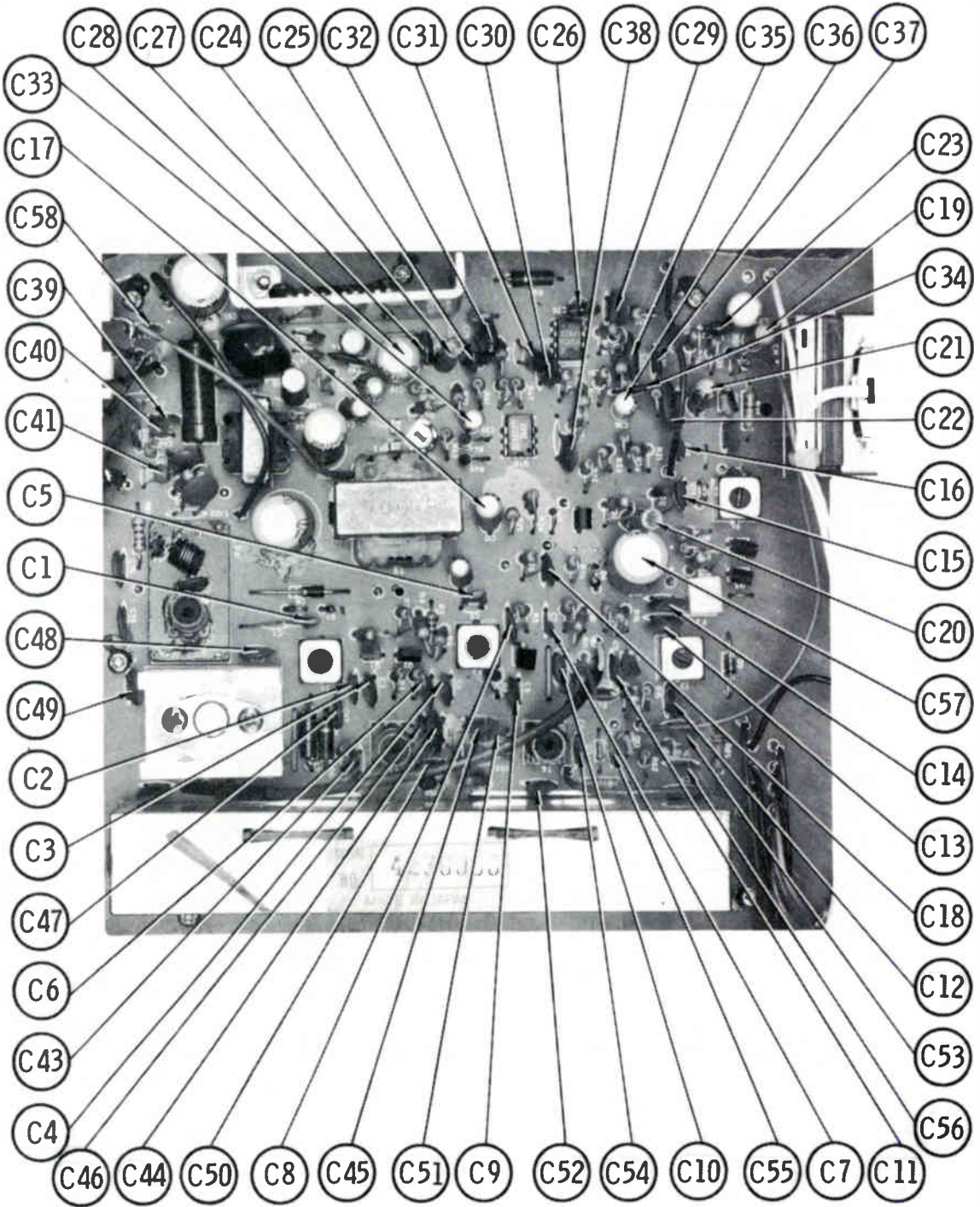
ROYCE MODEL 1-621

MAIN BOARD

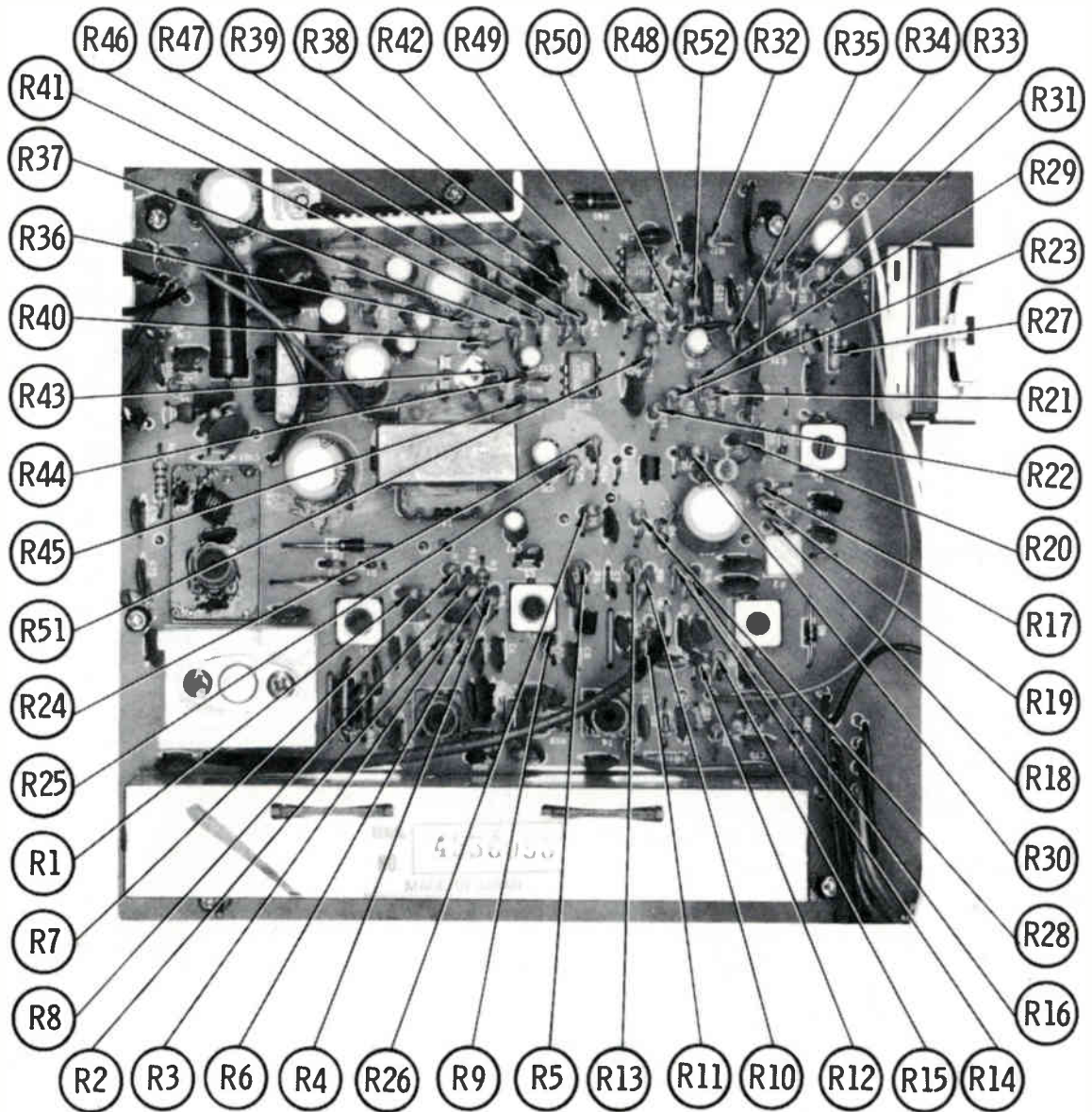


* Located on bottom of board

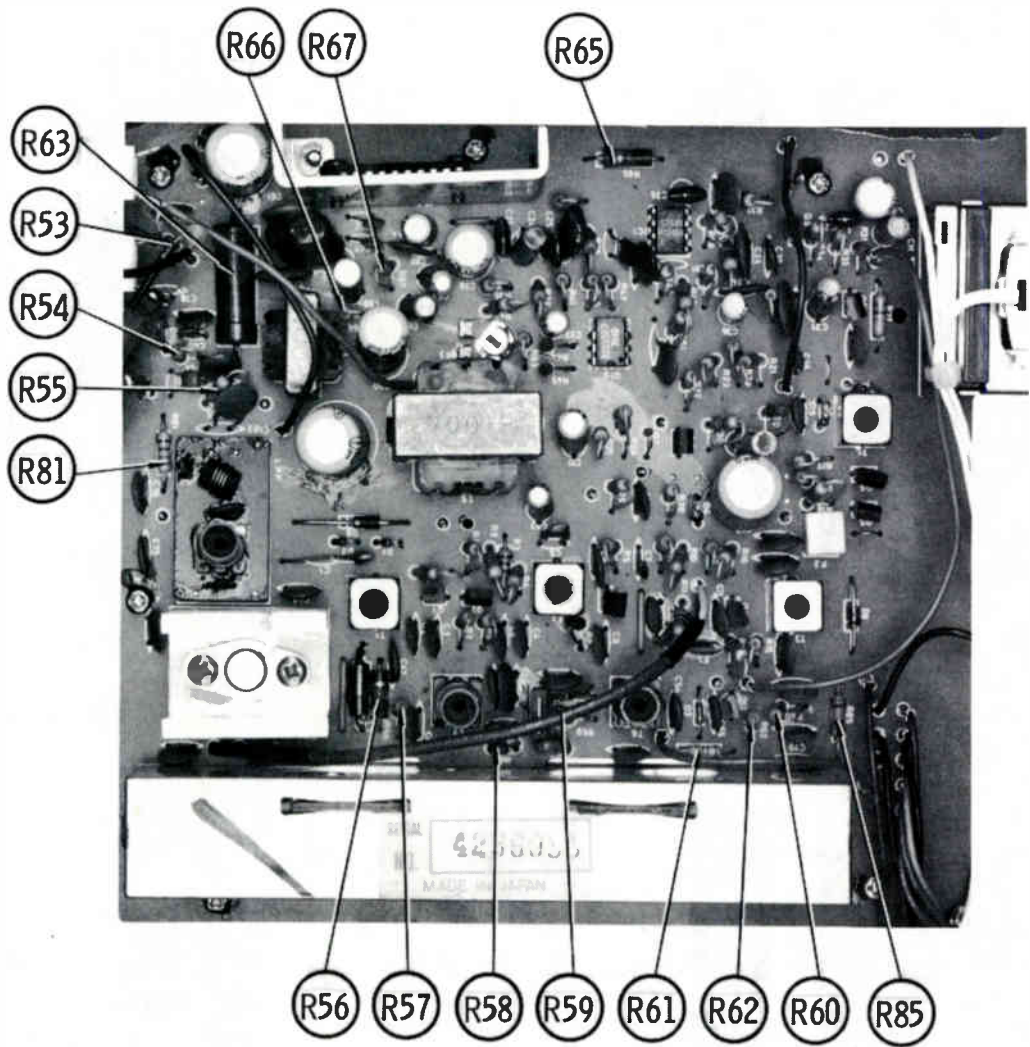
CHASSIS - TOP



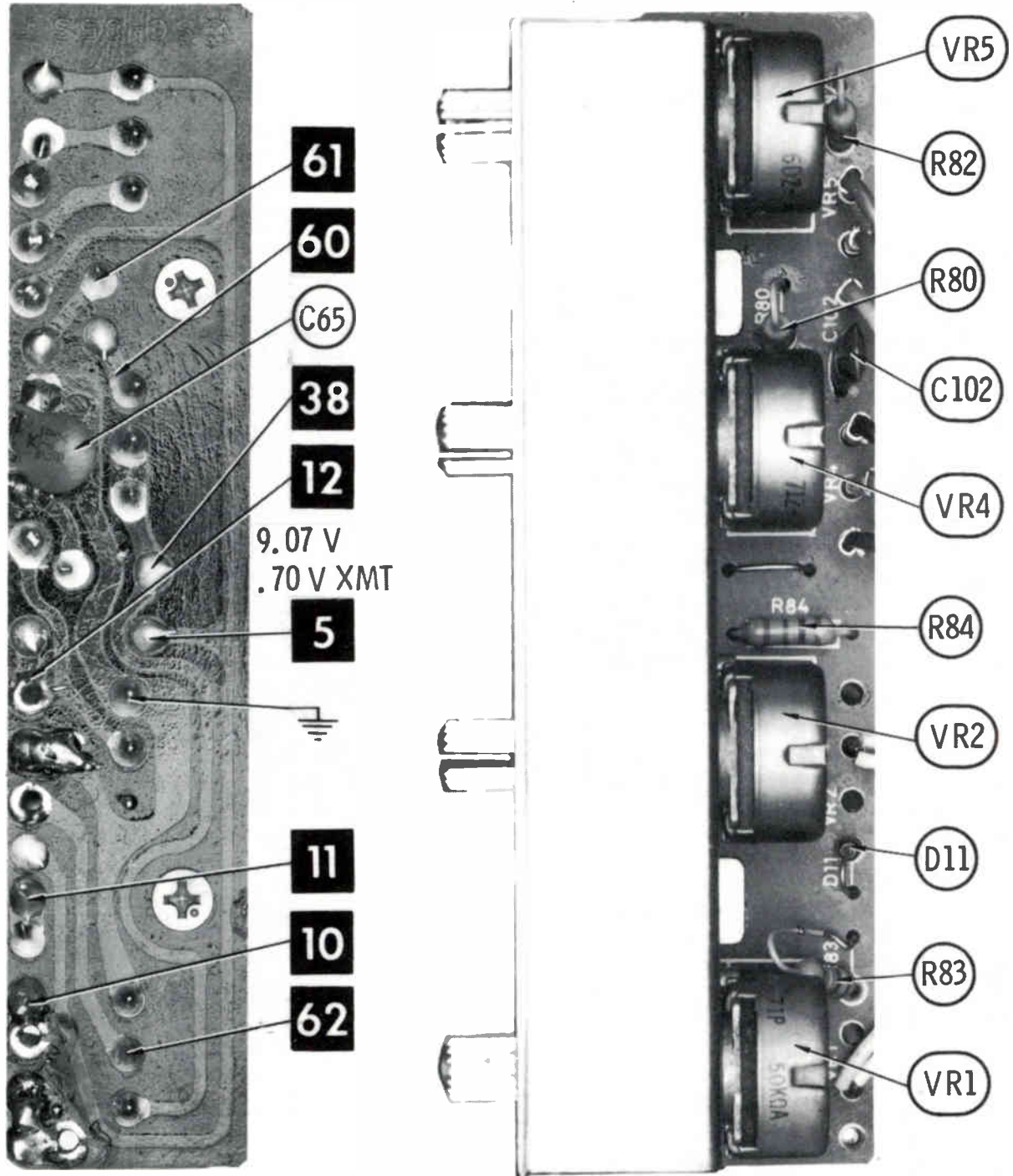
MAIN BOARD



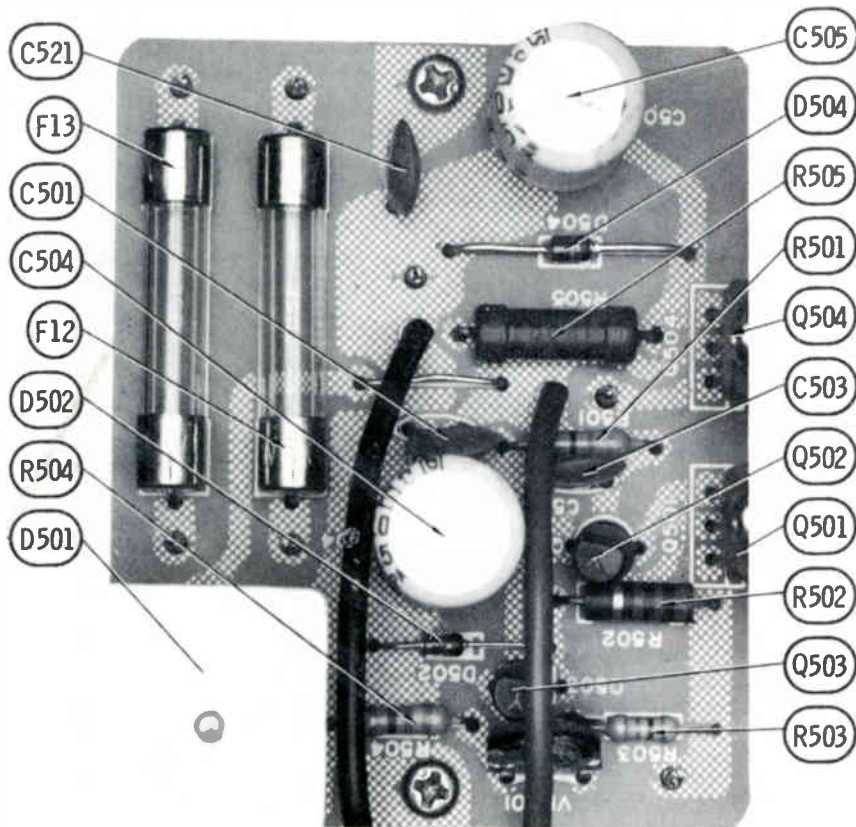
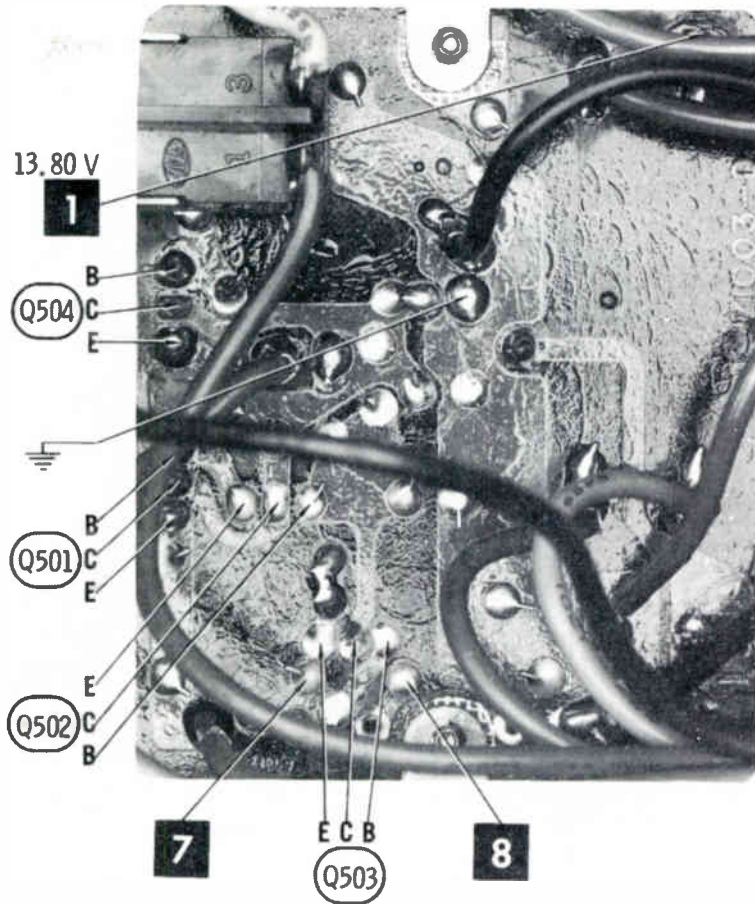
MAIN BOARD



MAIN BOARD



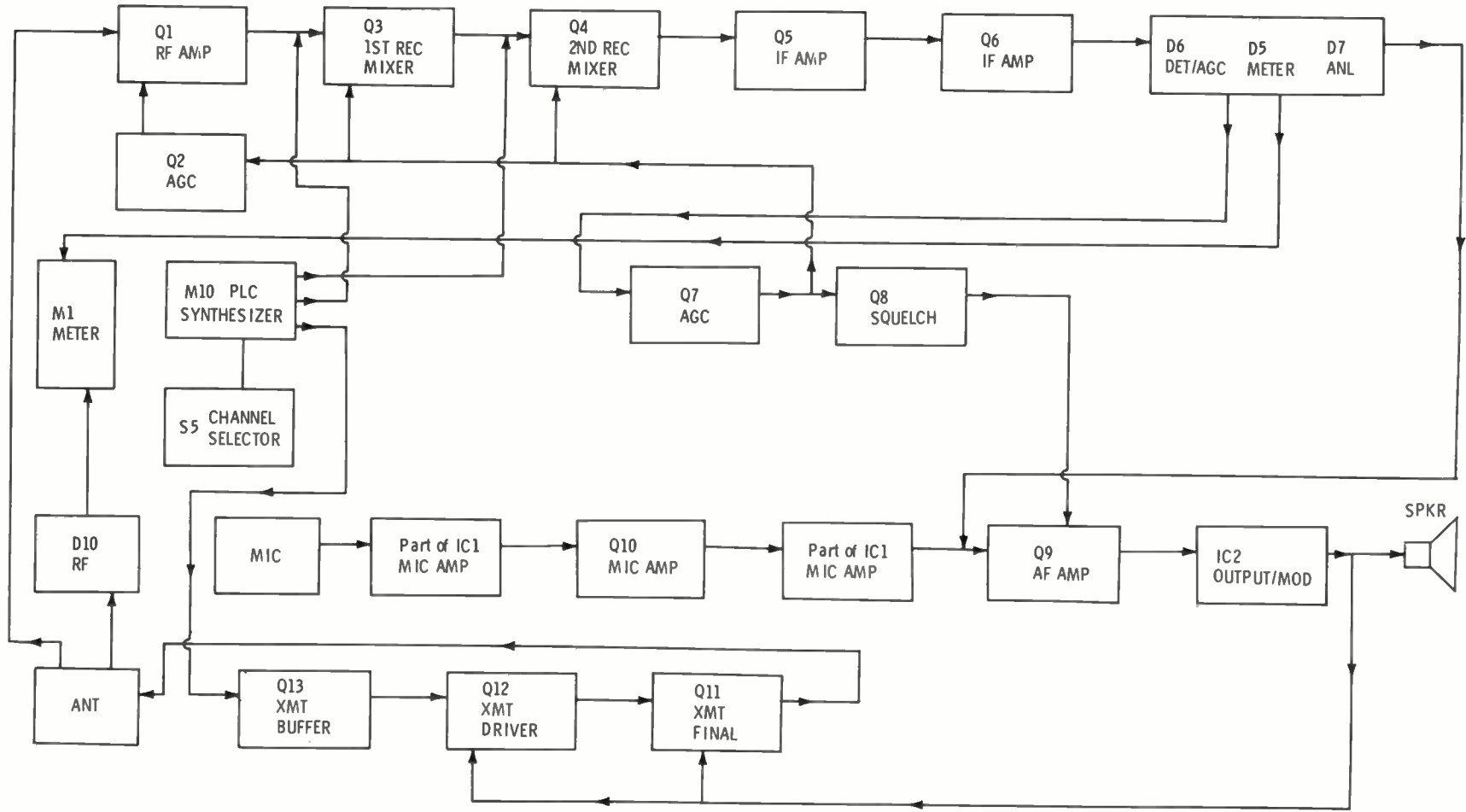
CONTROL BOARD



POWER SUPPLY BOARD

ROYCE MODEL 1-621

BLOCK DIAGRAM



TRUTH CHART

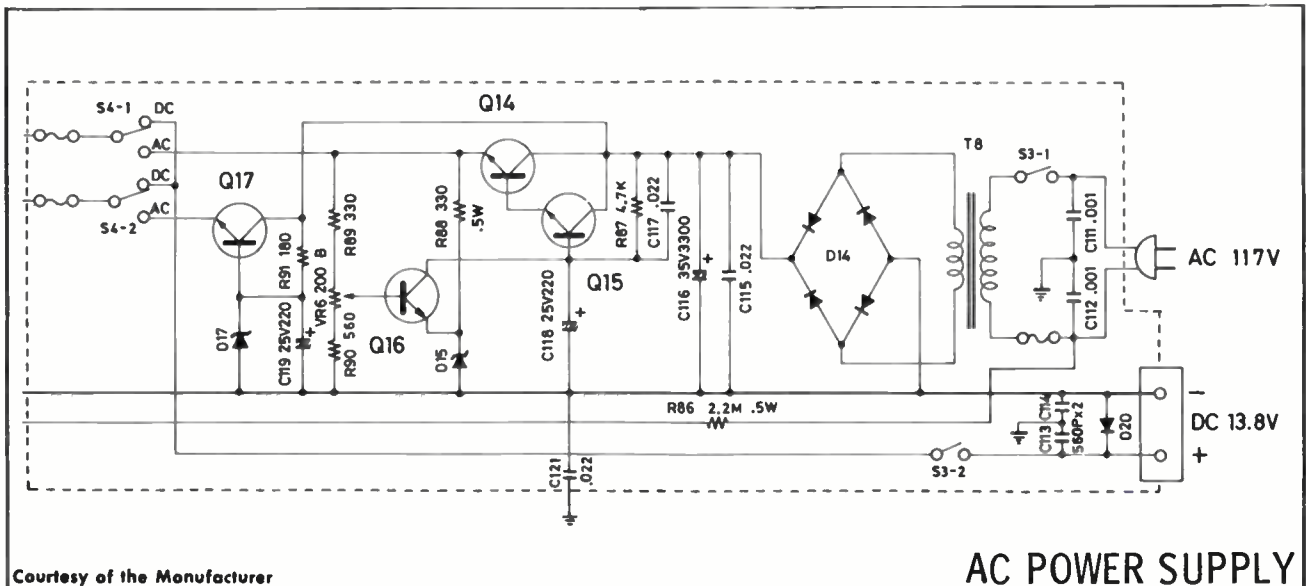
1 = 5.97Volts 0 = 0 Volts

CHANNEL	PLL UNIT						REC VCO OUTPUT IN MHz AT TP2	XMT VCO OUTPUT IN MHz AT TP3
	PINS							
	5	6	7	8	9	10		
1	0	0	0	0	0	0	37.660	26.965
2	0	0	0	0	1	0	37.670	26.975
3	0	0	0	0	0	1	37.680	26.985
4	0	0	0	1	0	0	37.700	27.005
5	0	0	0	1	1	0	37.710	27.015
6	0	0	0	1	0	1	37.720	27.025
7	0	0	0	1	1	1	37.730	27.035
8	0	0	1	0	1	0	37.750	27.055
9	0	0	1	0	0	1	37.760	27.065
10	0	0	1	0	1	1	37.770	27.075
11	0	0	1	1	0	0	37.780	27.085
12	0	0	1	1	0	1	37.800	27.105
13	0	0	1	1	1	1	37.810	27.115
14	1	0	0	0	0	0	37.820	27.125
15	1	0	0	0	1	0	37.830	27.135
16	1	0	0	0	1	1	37.850	27.155
17	1	0	0	1	0	0	37.860	27.165
18	1	0	0	1	1	0	37.870	27.175
19	1	0	0	1	0	1	37.880	27.185
20	1	0	1	0	0	0	37.900	27.205

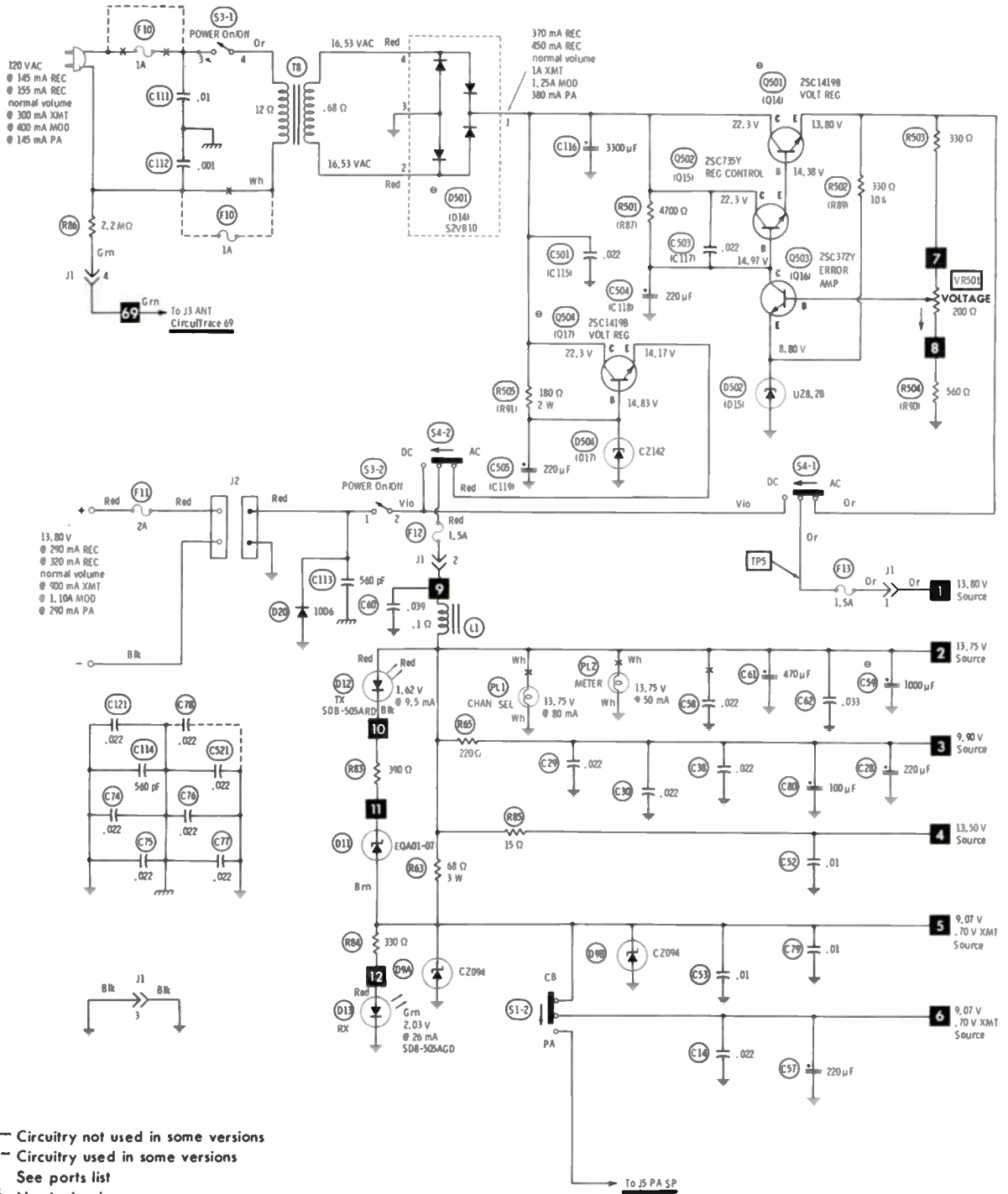
1 = 5.97 Volts 0 = 0 Volts

CHANNEL	PLL UNIT						REC VCO OUTPUT IN MHz AT TP2	XMT VCO OUTPUT IN MHz AT TP3
	PINS							
	5	6	7	8	9	10		
21	1	0	1	0	1	0	37.910	27.215
22	1	0	1	0	0	1	37.920	27.225
23	1	0	1	1	1	0	37.950	27.255
24	1	0	1	0	1	1	37.930	27.235
25	1	0	1	1	0	0	37.940	27.245
26	1	0	1	1	0	1	37.960	27.265
27	1	0	1	1	1	1	37.970	27.275
28	0	1	1	0	0	0	37.980	27.285
29	0	1	0	0	1	0	37.990	27.295
30	0	1	0	0	0	1	38.000	27.305
31	0	1	0	0	1	1	38.010	27.315
32	0	1	0	1	0	0	38.020	27.325
33	0	1	0	1	1	0	38.030	27.335
34	0	1	0	1	0	1	38.040	27.345
35	0	1	0	1	1	1	38.050	27.355
36	0	1	1	0	0	0	38.060	27.365
37	0	1	1	0	1	0	38.070	27.375
38	0	1	1	0	0	1	38.080	27.385
39	0	1	1	0	1	1	38.090	27.395
40	0	1	1	1	0	0	38.100	27.405

ROYCE MODEL 1-621

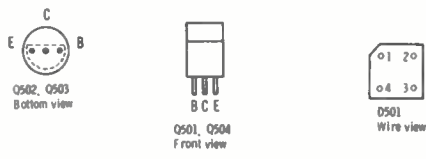


Courtesy of the Manufacturer

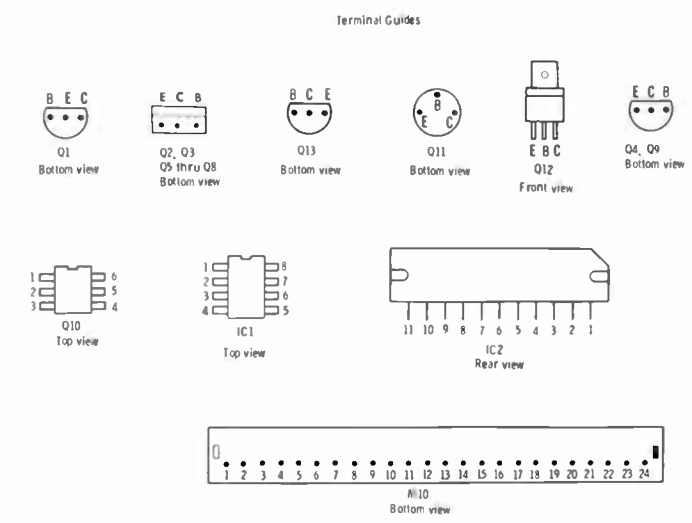
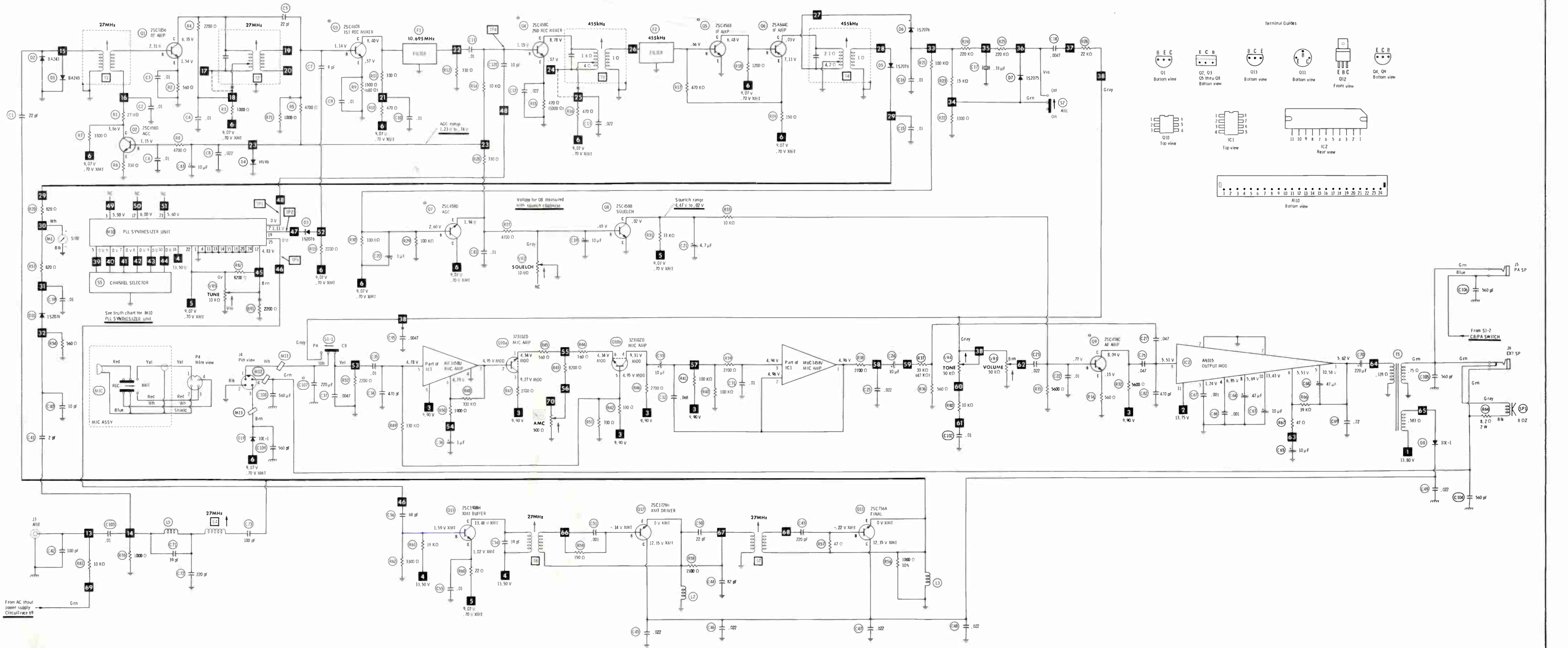


- ✖ Circuitry not used in some versions
 - Circuitry used in some versions
 - ⊙ See ports list
 - ⊛ Nominal value
 - ⊕ Ground
 - ⊞ Chassis
 - ▽ Common tie point
- Measurements in Chunnel 1 with switching as shown unless noted. Item numbers in rectangles appear in the alignment/adjustment instructions.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

Terminal Guides



A PHOTOFAC STANDARD NOTATION SCHEMATIC WITH **CIRCUITRACE**



From AC input power supply
Circuit trace 69

PARTS LIST AND DESCRIPTION

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

WIRING DATA

General-use Hook-up Wire (available in 5 colors)	BELDEN No. 8523	Coiled Microphone Cable	23AWG BELDEN No. 9471 (6')
Shielded Hook-up Wire (epi) (braided)	BELDEN No. 8421	3-conductor (1 shielded)	23AWG BELDEN No. 9471 (6')
	BELDEN No. 8401		BELDEN No. 9497 (6')
Speaker Cable (available in 4 colors)	BELDEN No. 8782		BELDEN No. 9472 (7-1/2')
Bonding Strap	BELDEN No. 8672		28AWG BELDEN No. 9466 (6')
AC Power Cord	BELDEN No. 17106		31AWG BELDEN No. 9468 (10')
	BELDEN No. 17109		4-conductor (unshielded) 23AWG BELDEN No. 8415 (6')
			5-conductor (1 shielded) 23AWG BELDEN No. 9467 (6')
			BELDEN No. 9465 (7-1/2')

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	
C17	.33 50V		PC1-50	VTTM7A63	QV1-3	EV-1610	
C19	10 16V		PC10-25	VTT10B25	QV1-41	EV-1222	
C20	1 50V		PC1-50	VTT1A50	QV1-11	EV-1615	
C21	4.7 25V		PC5-50	VTT4R7B50	QV1-27	EV-1319	
C24	10 16V		PC10-25	VTT10B25	QV1-41	EV-1222	
C28	220 16V		PC250-25	VTT220H16	QV1-117	EV-1240	
C33	1 50V		PC10-25	VTT10B25	QV1-41	EV-1222	
C36	1 50V		PC1-50	VTT1A50	QV1-11	EV-1615	
C57	220 16V		PC250-25	VTT220H16	QV1-117	EV-1240	
C59	100 16V		PC1000-16	VTT1000L16	QV1-183	EV-1260	
C61	470 16V		PC500-16	VTT470K16	QV1-151	EV-1250	
C63	10 16V		PC10-25	VTT10B25	QV1-41	EV-1222	
C64	47 10V		PC50-16	VTT47D16	QV1-73	EV-1226	
C65	10 16V		PC10-25	VTT10B25	QV1-41	EV-1222	
C68	47 10V		PC50-16	VTT47D16	QV1-73	EV-1226	
C70	220 16V		PC250-25	VTT220H16	QV1-117	EV-1240	
C80	100 10V		PC100-10	VTT100E10	QV1-93	EV-1130	
C83	10 16V		PC10-25	VTT10B25	QV1-41	EV-1222	
C116	3300 35V		PC250-25	VTT220K25	QV1-119	EV-1340	
C504	220 25V		PC250-25	VTT220K25	QV1-119	EV-1340	
C505	220 25V		PC250-25	VTT220K25	QV1-119	EV-1340	

PARTS LIST AND DESCRIPTION (CONTINUED)

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

CAPACITORS (cont)

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA				
			CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
						Q-LINE	GENERAL LINE
C108	560		DD-561		GP356		10T5-T56
C109	560		DD-561		GP356		10T5-T56
C111	.01		UK50-103		MAG5011		
C112	.001		DD-102		GP210		10T5-D10
C113	560		DD-561		GP356		10T5-T56
C114	560		DD-561		GP356		10T5-T56
C120	10 NPO		DTZ-10	HP010	GP356		10TCC-Q10
C503	.022		UK25-223		CN0410		HY-725
C521	.022		UK25-223				HY-725

SEMICONDUCTORS (Select replacement transistor for best results)

ITEM No.	TYPE No.	MFR. PART No.	REPLACEMENT DATA										
			GENERAL ELECTRIC PART No.	MALLORY PART No.	MOTOROLA PART No.	RAYTHEON PART No.	RCA PART No.	SPRAGUE PART No.	SYLVANIA PART No.	THORDARSON PART No.	WORKMAN PART No.	ZENITH PART No.	
													PTC214
D1	BA243		GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG177		WEPI062		
D2	BA243		GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG177		WEPI062		
D3	1S2076		GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG177		WEPI062		
D4	1S1555		GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG177		WEPI062		
D5	HV46		GE-300	PTC302	HEPRO605	RE 52	SK3100	RT-218	ECG605		WEPI062		
D6	1S2076		GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG177		WEPI062		
D7	1S1555		GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG177		WEPI062		
D8	1S2075		GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG177		WEPI062		
D9A	10E-1		GE-504A	PTC201	HEPRO052	RE 49	SK3030	RT-213	ECG016	1N4004	WEPI56	212-61	
D9B	W038		GE-504A	PTC201	HEPRO052	RE 49	SK3030	RT-213	ECG016	1N4004	WEPI56	212-61	
D9C	CZ094		GEZD-9.1	ZB9.1B	HEPRO052	RE 114	SK3030	RT-240	ECG139A	1N4739A	WEPI109	103-372	
D9D	E0801-09		GEZD-9.1	ZB9.1B	HEPRO052	RE 114	SK3030	RT-240	ECG139A	1N4739A	WEPI109	103-372	
D9E	CZ094		GEZD-9.1	ZB9.1B	HEPRO052	RE 114	SK3030	RT-240	ECG139A	1N4739A	WEPI109	103-372	
D9F	E0801-09		GEZD-9.1	ZB9.1B	HEPRO052	RE 114	SK3030	RT-240	ECG139A	1N4739A	WEPI109	103-372	
D10	1S2076		GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG177		WEPI062		
D11	1S1555		GE-300	PTC214	HEPRO602	RE 52	SK3100	RT-218	ECG177		WEPI062		
D12	EQA01-07		GEZD-6.8	ZB6.8A	HEP20409	RE 110	SK3334	RT-238	ECG6071	1N4736A	WEPI106		
D19	W2069		GEZD-6.8	ZB6.8A	HEP20409	RE 110	SK3334	RT-238	ECG6071	1N4736A	WEPI106		
D20	10E-1		GE-504A	PTC201	HEPRO052	RE 49	SK3030	RT-213	ECG016	1N4004	WEPI56	212-61	
D21	W038		GE-504A	PTC201	HEPRO052	RE 49	SK3030	RT-213	ECG016	1N4004	WEPI56	212-61	
D501	10D-6		GE-504A	PTC202	HEPRO054	RE 49	SK3017A	RT-215	ECG116	1N4007	WEPI56	ZEN-401	
D502	SZV810		GEZD-8.2	ZB8.2B	HEPRO054	RE 112	SK3017A	RT-215	ECG116	1N4007	WEPI56	ZEN-401	
D503	UZ8.2B		GEZD-8.2	ZB8.2B	HEPRO054	RE 112	SK3017A	RT-215	ECG116	1N4007	WEPI56	ZEN-401	
D504	W2083		GEZD-8.2	ZB8.2B	HEPRO054	RE 112	SK3017A	RT-215	ECG116	1N4007	WEPI56	ZEN-401	
D505	CZ142		GEZD-8.2	ZB8.2B	HEPRO054	RE 112	SK3017A	RT-215	ECG116	1N4007	WEPI56	ZEN-401	
D506	BZ140		GEZD-8.2	ZB8.2B	HEPRO054	RE 112	SK3017A	RT-215	ECG116	1N4007	WEPI56	ZEN-401	
IC1	MC1458V		GE-86	PTC121	HEP50010	RE 10	SK3018	RT-107	ECG1240		WEPI56	ZEN-104	
IC2	AR315		GE-210*	PTC121*	HEP50010	RE 13*	SK3124	RT-187	ECG123A*	25C458	WEPI56	ZEN-114	
Q1	25C1856		GE-210*	PTC121*	HEP50010	RE 13*	SK3124	RT-187	ECG123A*	25C458	WEPI56	ZEN-114	
Q2	25C458D		GE-61*	PTC136*	HEP50015	RE 9	SK3122*	RT-302*	ECG199*	25C711	WEPI56	ZEN-116	
Q3	25C711F		GE-210*	PTC136*	HEP50015	RE 9	SK3122*	RT-302*	ECG199*	25C711	WEPI56	ZEN-116	
Q4	25C460B		GE-210*	PTC136*	HEP50015	RE 9	SK3122*	RT-302*	ECG199*	25C711	WEPI56	ZEN-116	
Q5	25C710C		GE-210*	PTC136*	HEP50015	RE 9	SK3122*	RT-302*	ECG199*	25C711	WEPI56	ZEN-116	
Q6	25C710C		GE-210*	PTC136*	HEP50015	RE 9	SK3122*	RT-302*	ECG199*	25C711	WEPI56	ZEN-116	
Q7	25C458C		GE-210*	PTC121*	HEP50010	RE 13*	SK3124*	RT-187	ECG123A*	25C458	WEPI56	ZEN-114	
Q8	25C711E		GE-210*	PTC121*	HEP50010	RE 13*	SK3124*	RT-187	ECG123A*	25C458	WEPI56	ZEN-114	
Q9	25C458B		GE-210*	PTC121*	HEP50010	RE 13*	SK3124*	RT-187	ECG123A*	25C458	WEPI56	ZEN-114	
Q10	25C711D		GE-210*	PTC121*	HEP50010	RE 13*	SK3124*	RT-187	ECG123A*	25C458	WEPI56	ZEN-114	
Q11	25C711D		GE-210*	PTC121*	HEP50010	RE 13*	SK3124*	RT-187	ECG123A*	25C458	WEPI56	ZEN-114	
Q12	25C711D		GE-210*	PTC121*	HEP50010	RE 13*	SK3124*	RT-187	ECG123A*	25C458	WEPI56	ZEN-114	
Q13	25C711D		GE-210*	PTC121*	HEP50010	RE 13*	SK3124*	RT-187	ECG123A*	25C458	WEPI56	ZEN-114	
Q14	25C711D		GE-210*	PTC121*	HEP50010	RE 13*	SK3124*	RT-187	ECG123A*	25C458	WEPI56	ZEN-114	
Q15	25C711D		GE-210*	PTC121*	HEP50010	RE 13*	SK3124*	RT-187	ECG123A*	25C458	WEPI56	ZEN-114	
Q16	25C711D		GE-210*	PTC121*	HEP50010	RE 13*	SK3124*	RT-187	ECG123A*	25C458	WEPI56	ZEN-114	
Q17	25C711D		GE-210*	PTC121*	HEP50010	RE 13*	SK3124*	RT-187	ECG123A*	25C458	WEPI56	ZEN-114	
Q18	25C711D		GE-210*	PTC121*	HEP50010	RE 13*	SK3124*	RT-187	ECG123A*	25C458	WEPI56	ZEN-114	
Q19	25C711D		GE-210*	PTC121*	HEP50010	RE 13*	SK3124*	RT-187	ECG123A*	25C458	WEPI56	ZEN-114	
Q20	25C711D		GE-210*	PTC121*	HEP50010	RE 13*	SK3124*	RT-187	ECG123A*	25C458	WEPI56	ZEN-114	
Q21	25C711D		GE-210*	PTC121*	HEP50010	RE 13*	SK3124*	RT-187	ECG123A*	25C458	WEPI56	ZEN-114	
Q22	25C711D		GE-210*	PTC121*	HEP50010	RE 13*	SK3124*	RT-187	ECG123A*	25C458	WEPI56	ZEN-114	
Q23	25C711D		GE-210*	PTC121*	HEP50010	RE 13*	SK3124*	RT-187	ECG123A*	25C458	WEPI56	ZEN-114	
Q24	25C711D		GE-210*	PTC121*	HEP50010	RE 13*	SK3124*	RT-187	ECG123A*	25C458	WEPI56	ZEN-114	
Q25	25C711D		GE-210*	PTC121*	HEP50010	RE 13*	SK3124*	RT-187	ECG123A*	25C458	WEPI56	ZEN-114	
Q26	25C711D		GE-210*	PTC121*	HEP50010	RE 13*	SK3124*	RT-187	ECG123A*	25C458	WEPI56	ZEN-114	
Q27	25C711D		GE-210*	PTC121*	HEP50010	RE 13*	SK3124*	RT-187	ECG123A*	25C458	WEPI56	ZEN-114	
Q28	25C711D		GE-210*	PTC121*	HEP50010	RE 13*	SK3124*	RT-187	ECG123A*	25C458	WEPI56	ZEN-114	
Q29	25C711D		GE-210*	PTC121*	HEP50010	RE 13*	SK3124*	RT-187	ECG123A*	25C458	WEPI56	ZEN-114	
Q30	25C711D		GE-210*	PTC121*	HEP50010	RE 13*	SK3124*	RT-187	ECG123A*	25C458	WEPI56	ZEN-114	
Q31	25C711D		GE-210*	PTC121*	HEP50010	RE 13*	SK3124*	RT-187	ECG123A*	25C458	WEPI56	ZEN-114	
Q32	25C711D		GE-210*	PTC121*	HEP50010	RE 13*	SK3124*	RT-187	ECG123A*	25C458	WEPI56	ZEN-114	
Q33	25C711D		GE-210*	PTC121*	HEP50010	RE 13*	SK3124*	RT-187	ECG123A*	25C458	WEPI56	ZEN-114	
Q34	25C711D		GE-210*	PTC121*	HEP50010	RE 13*	SK3124*	RT-187	ECG123A*	25C458	WEPI56	ZEN-114	
Q35	25C711D		GE-210*	PTC121*	HEP50010	RE 13*	SK3124*	RT-187	ECG123A*	25C458	WEPI56	ZEN-114	
Q36	25C711D		GE-210*	PTC121*	HEP50010	RE 13*	SK3124*	RT-187	ECG123A*	25C458	WEPI56	ZEN-114	
Q37	25C711D		GE-210*	PTC121*	HEP50010	RE 13*	SK3124*	RT-187	ECG123A*	25C458	WEPI56	ZEN-114	
Q38	25C711D		GE-210*	PTC121*	HEP50010	RE 13*	SK3124*	RT-187	ECG123A*	25C458	WEPI56	ZEN-114	
Q39	25C711D		GE-210*	PTC121*	HEP50010	RE 13*	SK3124*	RT-187	ECG123A*	25C458</			

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~)	MFR. PART No.	THORDARSON PART No.	TRIAD PART No.	
L1	1100mA	.1	1.1mH	02-127 1002 (1)	TR-509		(1) Number on unit.

TRANSFORMER (Audio Output)

ITEM No.	IMPEDANCE		REPLACEMENT DATA			NOTES
	PRI.	SEC.	MFR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T5	3.92	1 2 8 23.12	02-144 70019 (1)			(1) Number on unit.

TRANSFORMER (Power)

ITEM No.	RATING		REPLACEMENT DATA			NOTES
	PRI.	SEC. 1	MFR. PART No.	THORDARSON PART No.	TRIAD PART No.	
TB	120V AC @ 400mA	16.53V AC @ 1980mA	02-145 ETT-71018 (1)			(1) Number on unit.

SPEAKER

ITEM No.	TYPE		REPLACEMENT DATA		NOTES
			MFR. PART No.	QUAM PART No.	
SP	2 1/2" PM	8 Ohms	06-002	25A05Z8R	

PARTS LIST AND DESCRIPTION (CONTINUED)

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

FUSE DEVICES

ITEM No.	DESCRIPTION	REPLACEMENT DATA						
		PART No.		BUSS PART No.		LITTELFUSE PART No.		WORKMAN PART No.
		DEVICE	HOLDER	DEVICE	HOLDER	DEVICE	HOLDER	DEVICE
F10	1A Quick Acting			AGC1	HKP	312001	342-048L	F61-2
F11	2A Quick Acting			AGC2	HDJ	312002	150145	F62-2
F12	1.5A Quick Acting			GJV1/2		31501.5		
F13	1.5A Quick Acting			GJV1/2		31501.5		

MICROPHONE

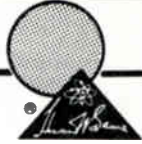
ITEM No.	REPLACEMENT DATA				CONNECTION DATA							
	MFGR. PART No.	GC PART No.	GC NOISE CANCEL	GC POWER	GC CONNECTOR	GC Red	GC Shield	GC Yellow	GC Blue	GC White	GC Black	
MIC		18-032	18-034	18-101	18-092	1	2	3	4	NC	2	

MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
F1	Filter		SFE10.7mA 10.695mH
F2	Filter		CFU-455H 455kHz
J3	Jack	10-002	Antenna
J4	Jack	10-001	MIC
J5	Jack	10-003A	PA Speaker
J6	Jack	10-003A	External Speaker
M1	Meter	05-022	S/RF
PL1	Lamp	07-001	Dial 13.75V @ 80mA
PL2	Lamp	07-001	Meter 13.75V @ 50mA
S1	Switch	09-153	CB/PA
S2	Switch	09-153	ANL
S3	Switch	09-151	Power
S4	Switch	09-154	DC/AC
S5	Switch	09-120	Channel Selector
	Cord	08-006	AC
	Cord	08-004	DC

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

ITEM	PART No.	ITEM	PART No.
Button (On-Off)	19-640	Knob (Channel)	19-626
Button (NL-PA-CB)	19-641	Knob (Control)	19-605
Chassis (Bottom)	19-124A	Plate (Decoration Control)	19-324
Cover (Top Bonnet)	19-123	Plate (Decoration Wood Grain)	19-324A
Disc (Channel)	19-725	Plate (Wood End)	19-125



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 D12

MANUFACTURER'S SPECIFICATIONS

GENERAL

Channels:	40
Frequency Range:	26.965 to 27.405MHz
Frequency Tolerance:	0.005%
Operating Temperature Range:	-30°C to +50°C
Microphone:	Dynamic with push-to-talk switch and coiled cord.
Supply Voltage:	13.8VDC (positive or negative ground)
Current Drain:	Receive: 1.3A @ maximum audio output 0.3A standby. (no signal) Transmit: Full Mod. 1.8A
Meter:	Illuminated. Indicates incoming signal strength and relative power output.
Size:	Height: 53cm (2-3/32") Width: 140cm (5-33/64") Depth: 189cm (7-7/16")
Weight:	1.13kg (2.5 pounds)

TRANSMITTER

Full Carrier:	4.0 Watts
Modulation Capability:	100%
Harmonic Suppression and Spurious Emissions:	Better than FCC requirement
Frequency Response:	300 to 3,000Hz

Courtesy of the Manufacturer

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:
 L3, L5, L6, L11, L12, T1, T6, T8..... 9440
 L13, T2, T3, T4, T5, T13..... 5000, 5009, 8276, 8728, 8728-A.
 L14..... 9440
 C173..... 5000, 9276

SYNTHESIZER ALIGNMENT

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Input of frequency counter to TP11 (IC8, Pin 3).	Ch. 19		Check for 5.120MHz.
Input of oscilloscope to TP2.	Ch. 19	T13	Adjust for maximum AF output at 5.120MHz.
Input of frequency counter to TP12 (Q38, Emitter).	Ch. 19	L14	Adjust for 10.825MHz.
Input of DC meter to TP13 (IC7, Pin 1).	Ch. 19	L12	Adjust for 3.90 volts.
Input of oscilloscope to TP14 (IC7, Pin 8).	Ch. 19	L13	Adjust for symmetrical sinewave.
Input of frequency counter to TP15 (Q34, Emitter).	Ch. 1		Check for 22.300MHz. If necessary readjust L14 for 22.300MHz. Check all channels. (See Truth Chart for correct frequencies.)
Input of frequency counter to TP16 (Q37, Emitter).	Ch. 19, Xmt	C173	Adjust for 13.157MHz.
Input of DC meter to TP13 (IC7, Pin 1).	Ch. 19, Xmt	L11	Adjust for 3.15 Volts.
Input of frequency counter to TP15 (Q34, Emitter).	Ch. 1, Xmt		Check for 26.965MHz. If necessary readjust L11 for 26.965MHz. Check all channels. (See Truth Chart for correct frequencies.)
Input of frequency counter to TP10.	Ch. 1		Check for .650MHz. 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.

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Output of signal generator thru .01uF to TP2. 455kHz, 1000Hz @ 30% modulation.	Ch. 19, LOC/DX DX Squelch MINIMUM ANL Off	T5, T4	Adjust for maximum output.
Output of signal generator thru .01uF to antenna jack. 27.185MHz, 1000Hz @ 30% modulation.	Ch. 19 LOC/DX DX Squelch MINIMUM ANL Off	T3, T2, T1 T8	Adjust for maximum output. If necessary readjust T4 and T5.

RECEIVER ADJUSTMENTS

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

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Output of signal generator thru .01uF to antenna jack. 27.185MHz, 1000Hz @ 30% modulation. Output 1000uV.	Ch. 19 LOC/DX DX Squelch Maximum ANL Off	R37	SQUELCH RANGE Adjust so that squelch just breaks.
Output of signal generator thru .01uF to antenna jack. 27.185MHz, 1000Hz @ 30% modulation. Output 200uV.	Ch. 19 LOC/DX DX Squelch MINIMUM ANL Off	R17	S METER Adjust for 9 on S scale of meter.

TRANSMITTER ALIGNMENT

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

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
	Ch. 19	T6, L5, L6, L3	Adjust for maximum RF output.
	Ch. 19	L3	Readjust for 4.0 watts output maximum.

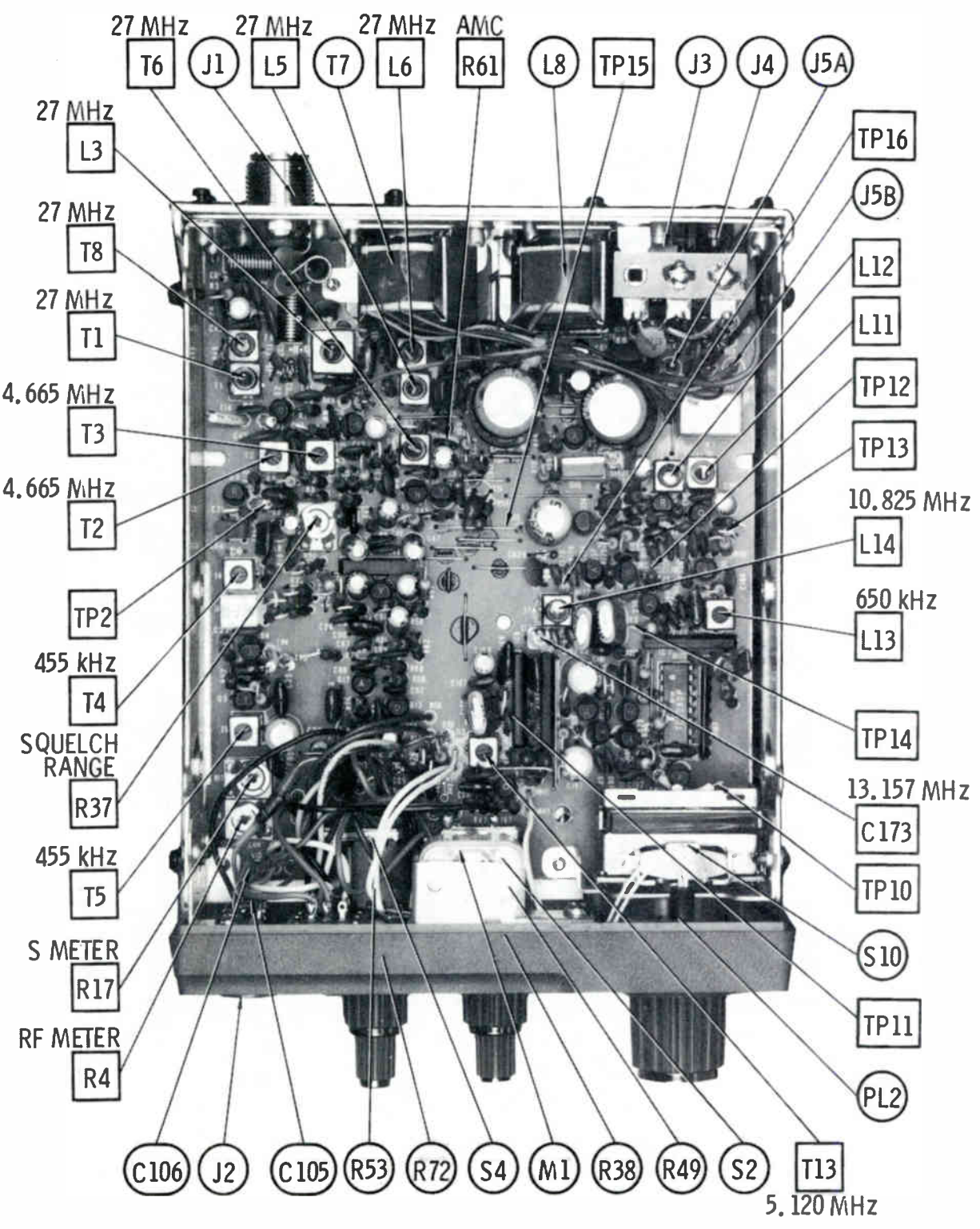
TRANSMITTER ADJUSTMENTS

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.

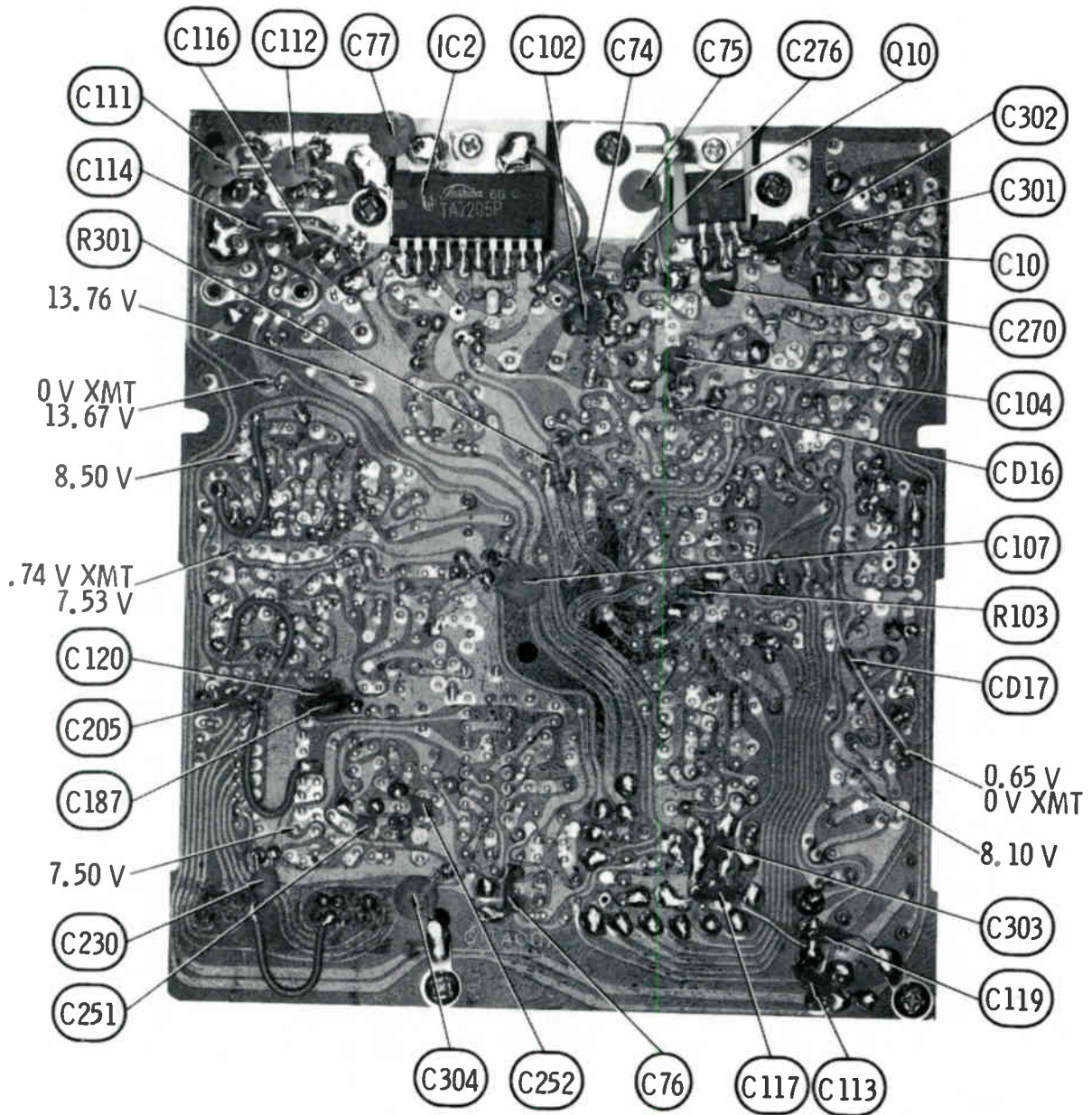
TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Oscilloscope or modulation meter to antenna jack. Inject a 1000Hz 20mV signal at MIC input.	Ch. 19	R61	AMC Adjust for 100% modulation maximum.
	Ch. 19	R4	RF PANEL METER Adjust R4 so that RF panel meter agrees with RF wattmeter.

TRUTH CHART

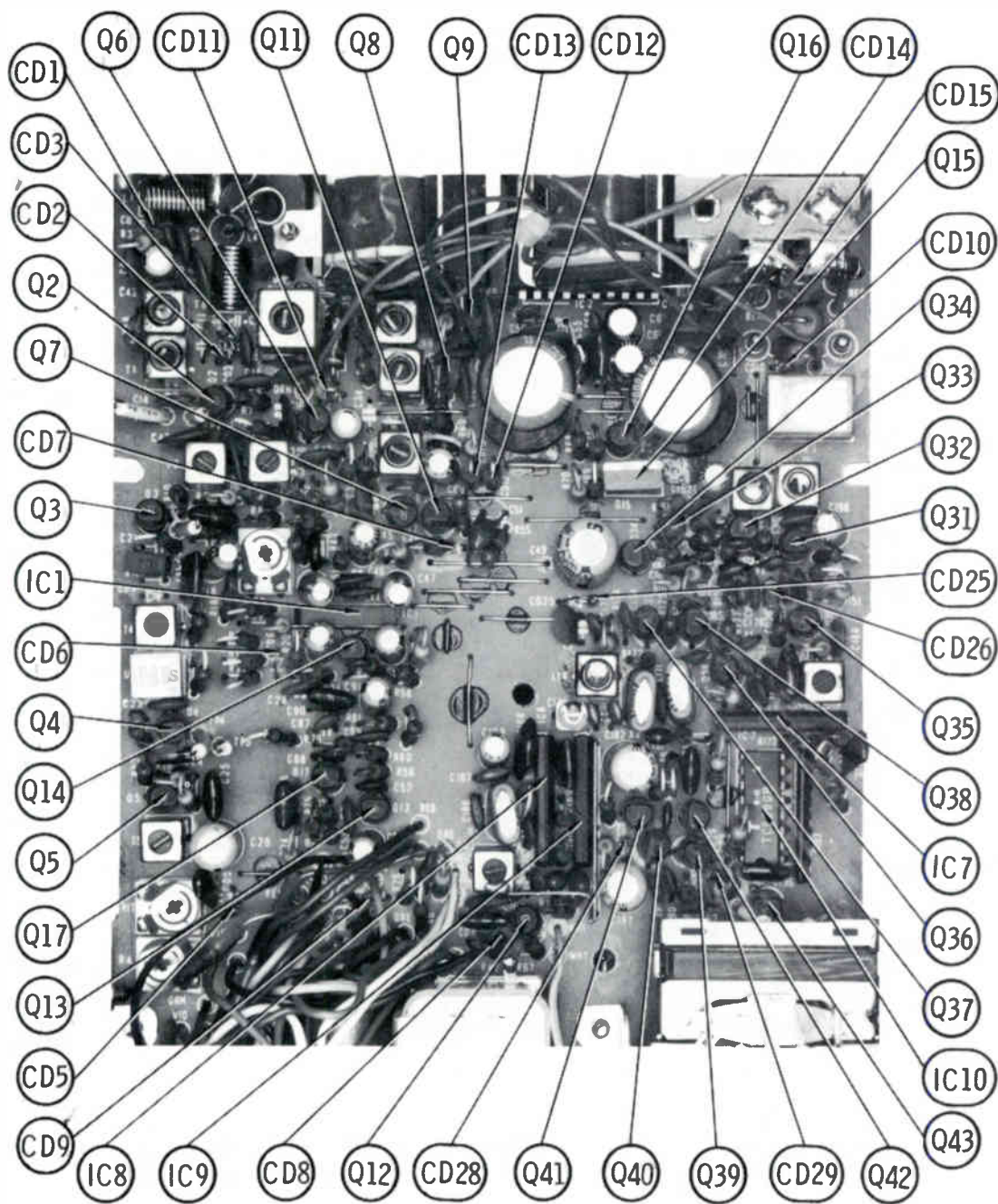
CHANNEL	1 = 7.80 Volts 0 = 0 Volts								REC VCO OUTPUT IN MHz AT AT TP15	XMT VCO OUTPUT IN MHz AT AT TP15	VCM OUTPUT IN MHz AT AT TP10
	IC10 PROGRAM DIVIDER										
	PINS										
	8	7	6	5	4	3	2				
1	1	0	0	0	0	0	1		22.300	26.965	.650
2	1	0	0	0	0	1	0		22.310	26.975	.660
3	1	0	0	0	0	1	1		22.320	26.985	.670
4	1	0	0	0	1	0	1		22.340	27.005	.690
5	1	0	0	0	1	1	0		22.350	27.015	.700
6	1	0	0	0	1	1	1		22.360	27.025	.710
7	1	0	0	1	0	0	0		22.370	27.035	.720
8	1	0	0	1	0	1	0		22.390	27.055	.740
9	1	0	0	1	0	1	1		22.400	27.065	.750
10	1	0	0	1	1	0	0		22.410	27.075	.760
11	1	0	0	1	1	0	1		22.420	27.085	.770
12	1	0	0	1	1	1	1		22.440	27.105	.790
13	1	0	1	0	0	0	0		22.450	27.115	.800
14	1	0	1	0	0	0	1		22.460	27.125	.810
15	1	0	1	0	0	1	0		22.470	27.135	.820
16	1	0	1	0	1	0	0		22.490	27.155	.840
17	1	0	1	0	1	0	1		22.500	27.165	.850
18	1	0	1	0	1	1	0		22.510	27.175	.860
19	1	0	1	0	1	1	1		22.520	27.185	.870
20	1	0	1	1	0	0	1		22.540	27.205	.890
21	1	0	1	1	0	1	0		22.550	27.215	.900
22	1	0	1	1	0	1	1		22.560	27.225	.910
23	1	0	1	1	1	1	0		22.590	27.255	.940
24	1	0	1	1	1	0	0		22.570	27.235	.920
25	1	0	1	1	1	0	1		22.580	27.245	.930
26	1	0	1	1	1	1	1		22.600	27.265	.950
27	1	1	0	0	0	0	0		27.610	27.275	.960
28	1	1	0	0	0	0	1		22.620	27.285	.970
29	1	1	0	0	0	1	0		22.630	27.295	.980
30	1	1	0	0	0	1	1		22.640	27.305	.990
31	1	1	0	0	1	0	0		22.650	27.315	1.000
32	1	1	0	0	1	0	1		22.660	27.325	1.010
33	1	1	0	0	1	1	0		22.670	27.335	1.020
34	1	1	0	0	1	1	1		22.680	27.345	1.030
35	1	1	0	1	0	0	0		22.690	27.355	1.040
36	1	1	0	1	0	0	1		22.700	27.365	1.050
37	1	1	0	1	0	1	0		22.710	27.375	1.060
38	1	1	0	1	0	1	1		22.720	27.385	1.070
39	1	1	0	1	1	0	0		22.730	27.395	1.080
40	1	1	0	1	1	0	1		22.740	27.405	1.090



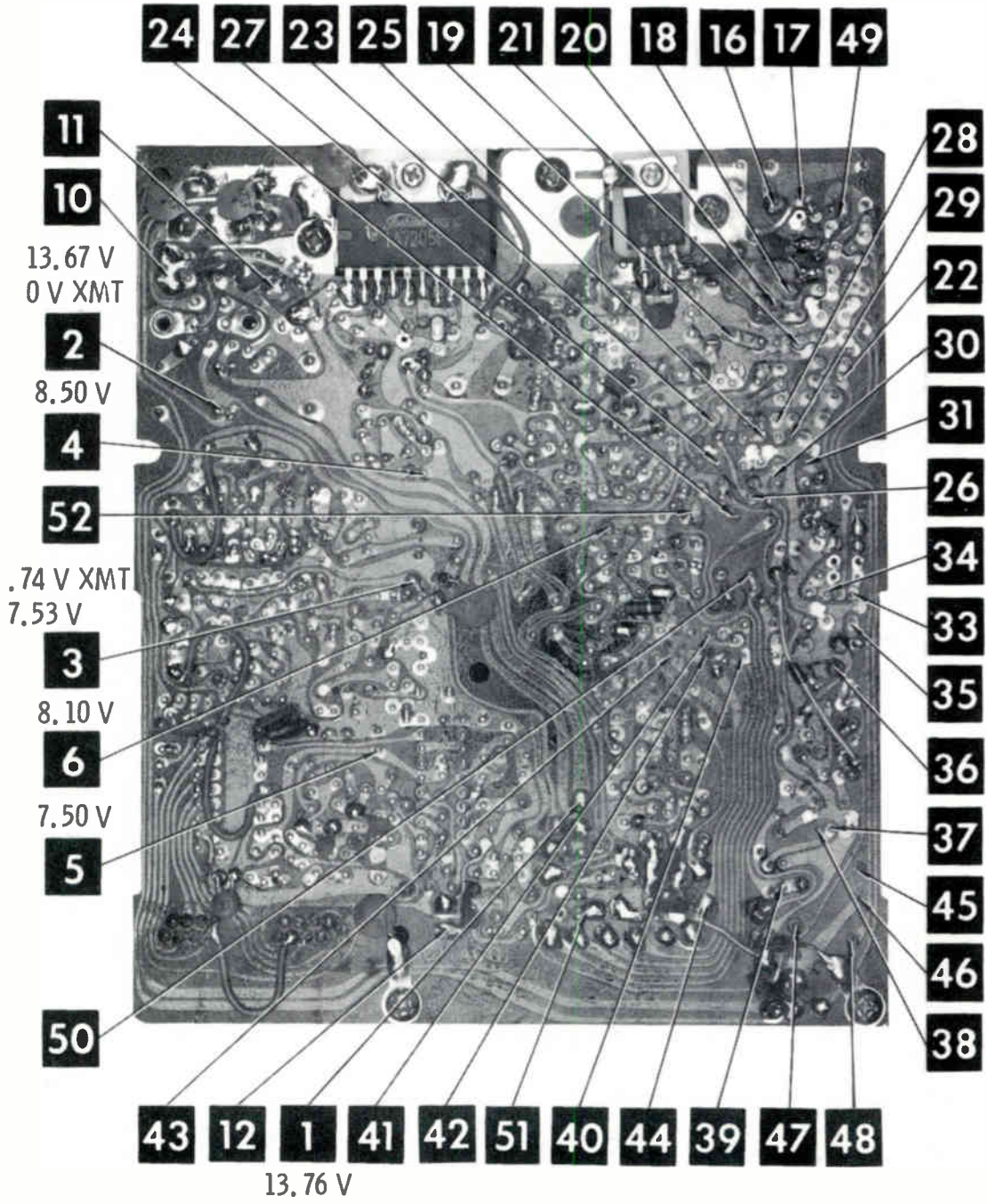
CHASSIS - BOTTOM



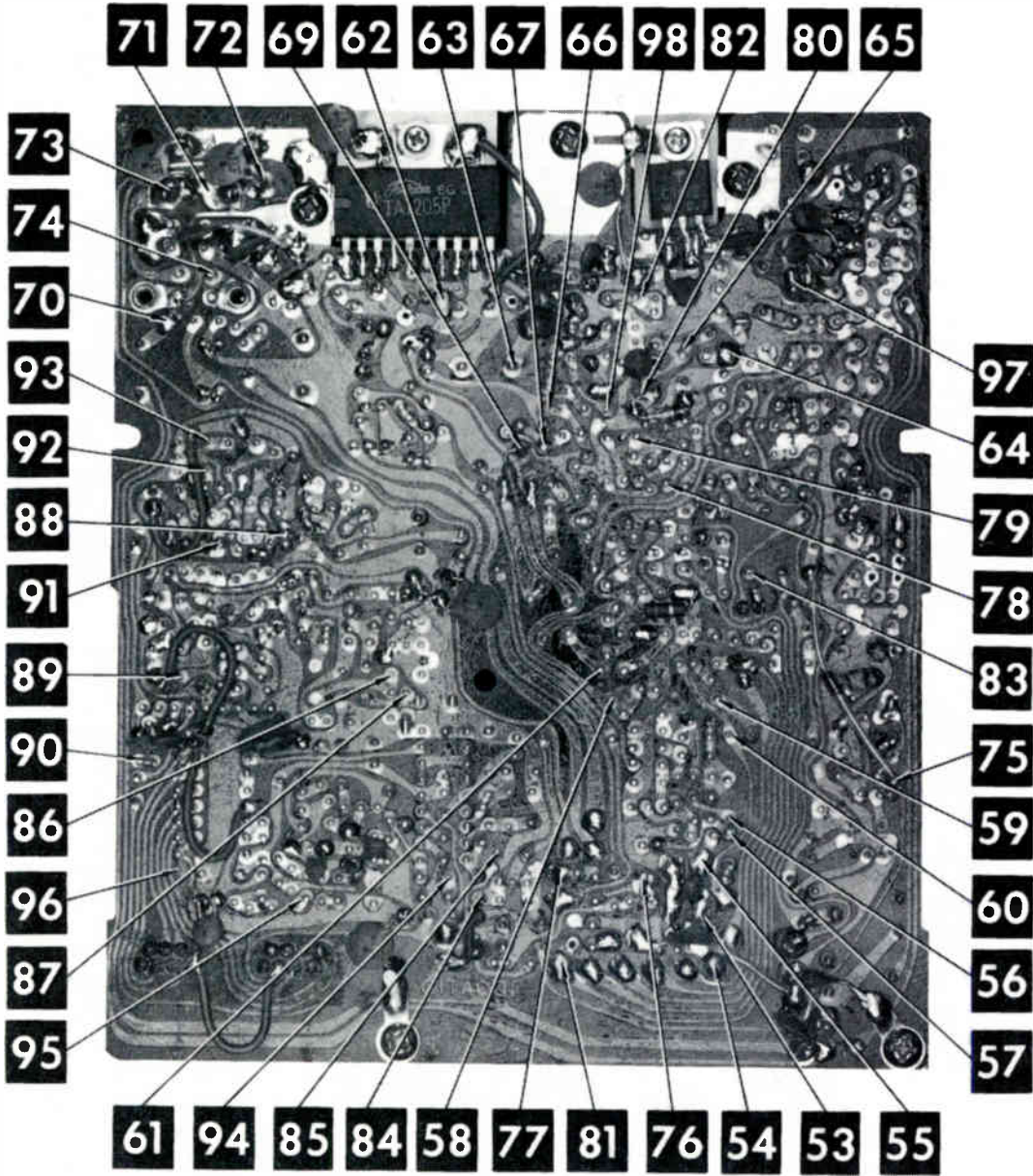
MAIN BOARD



MAIN BOARD

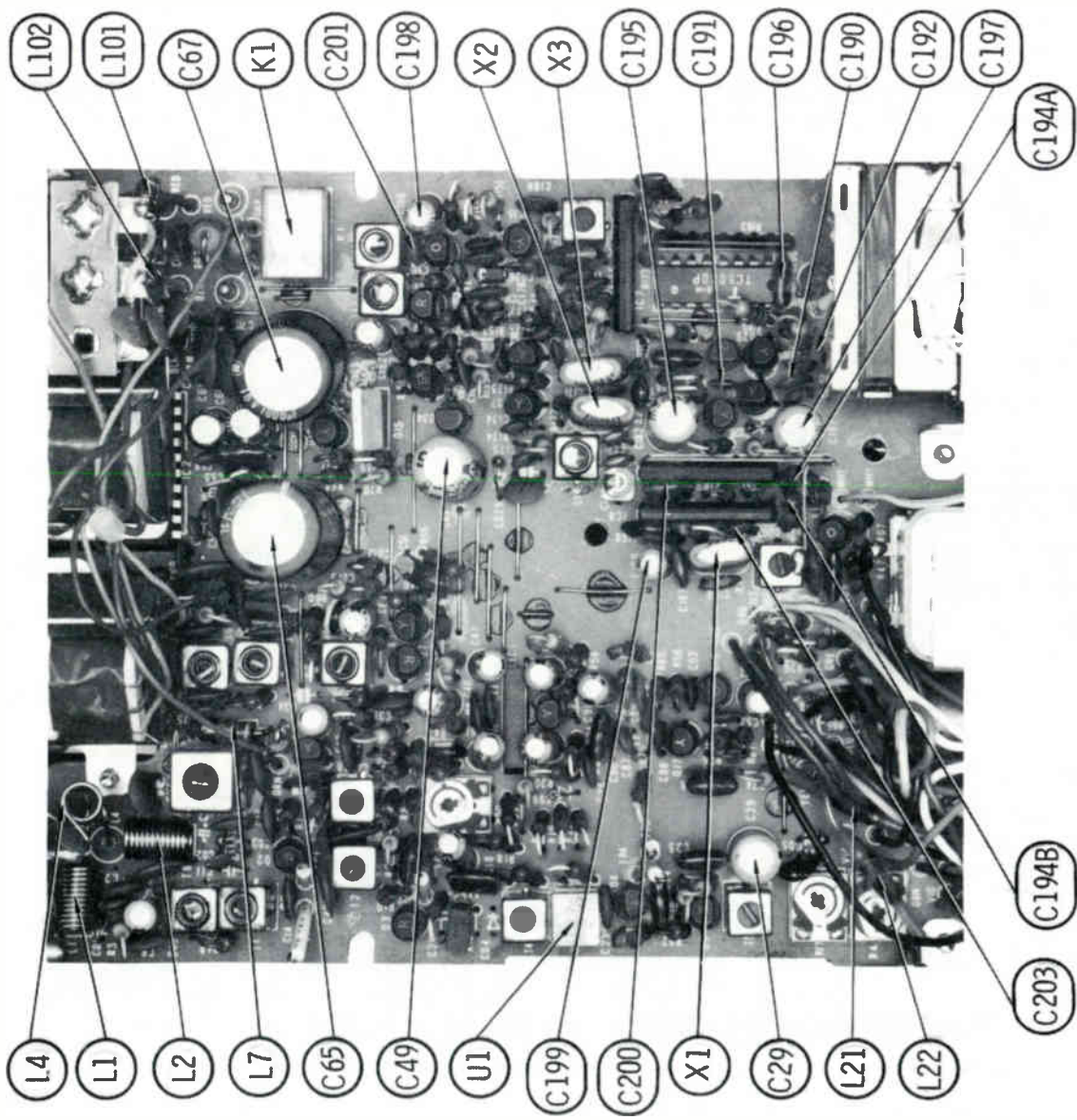


MAIN BOARD

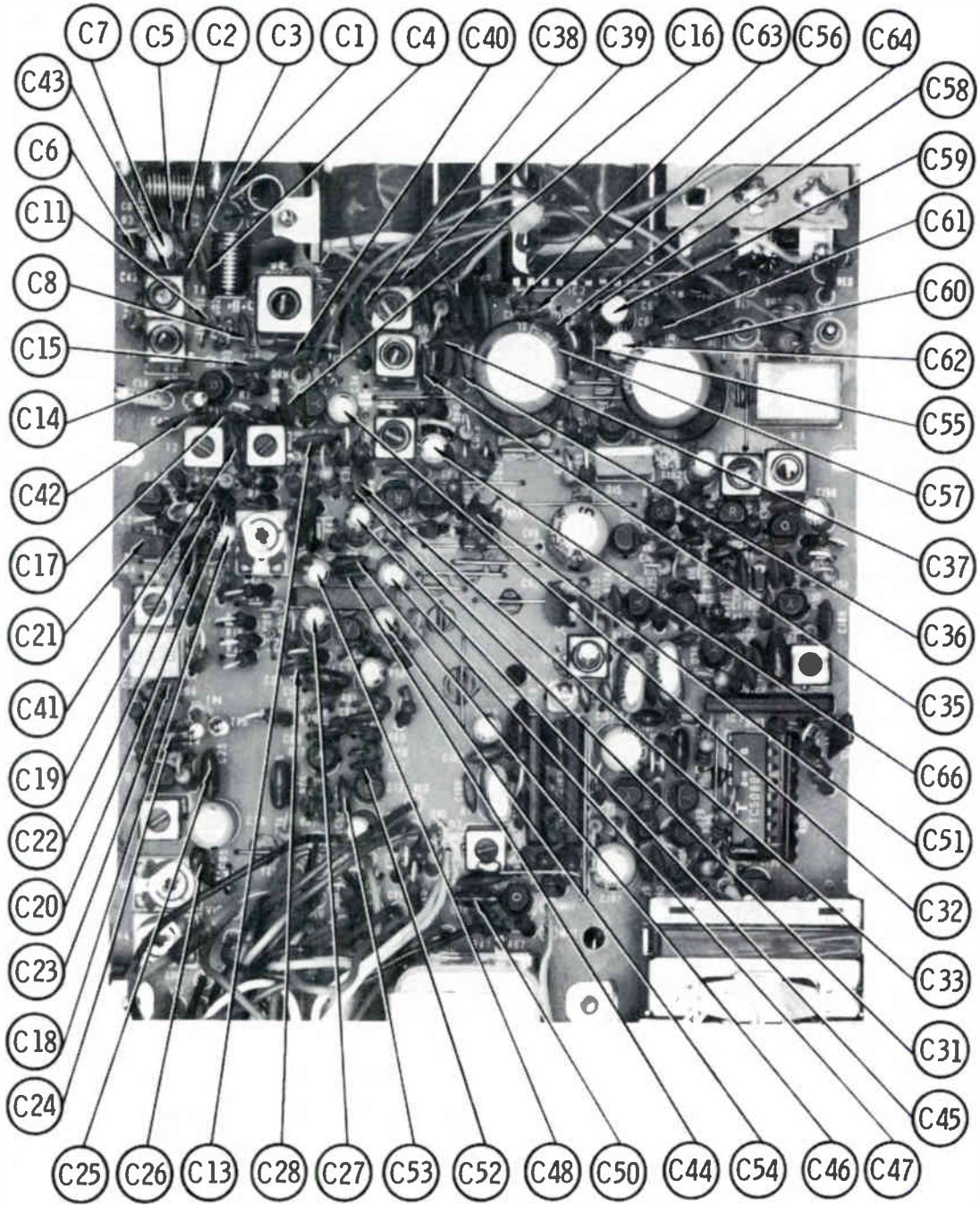


TRAM MODEL D12

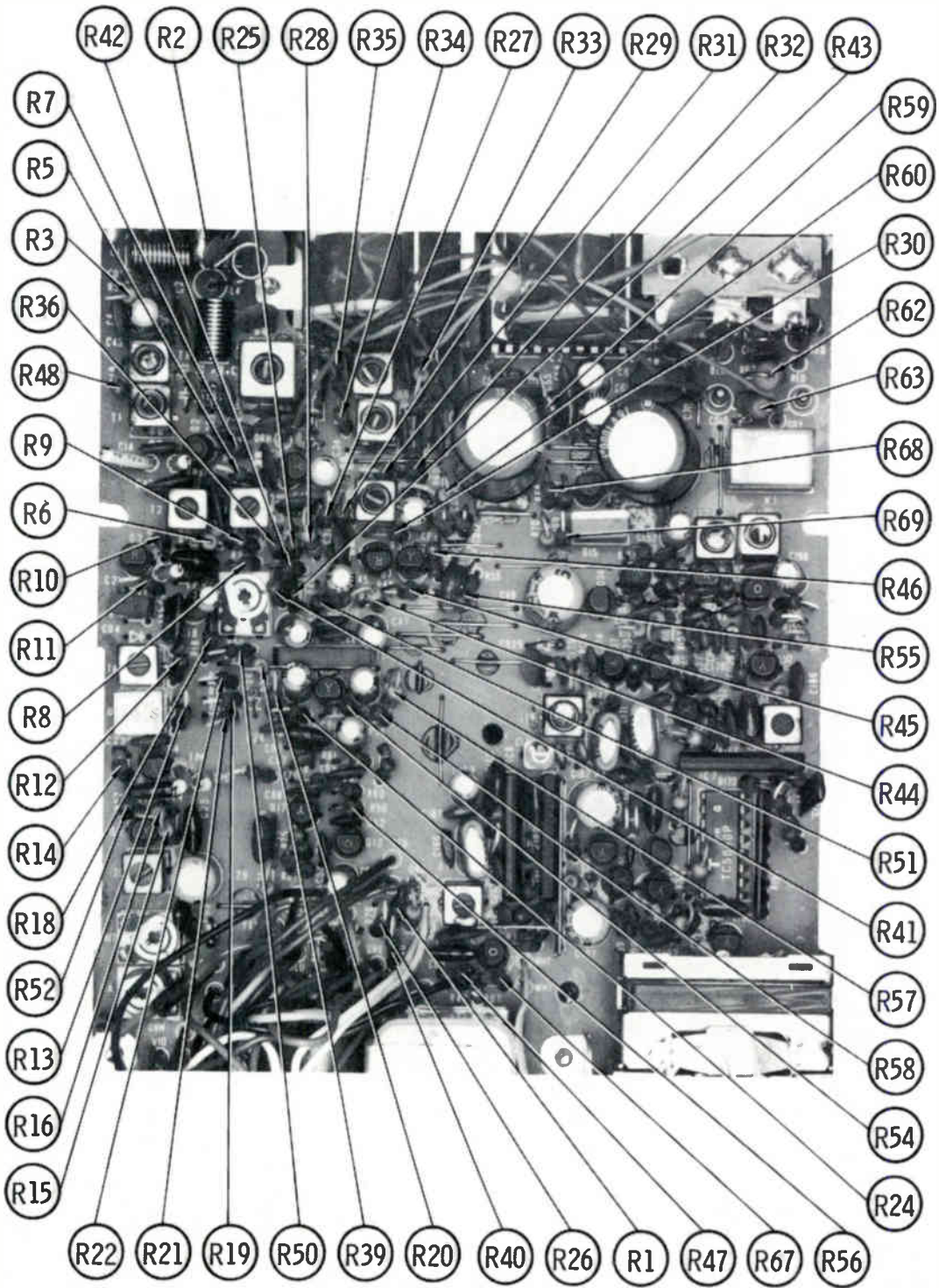
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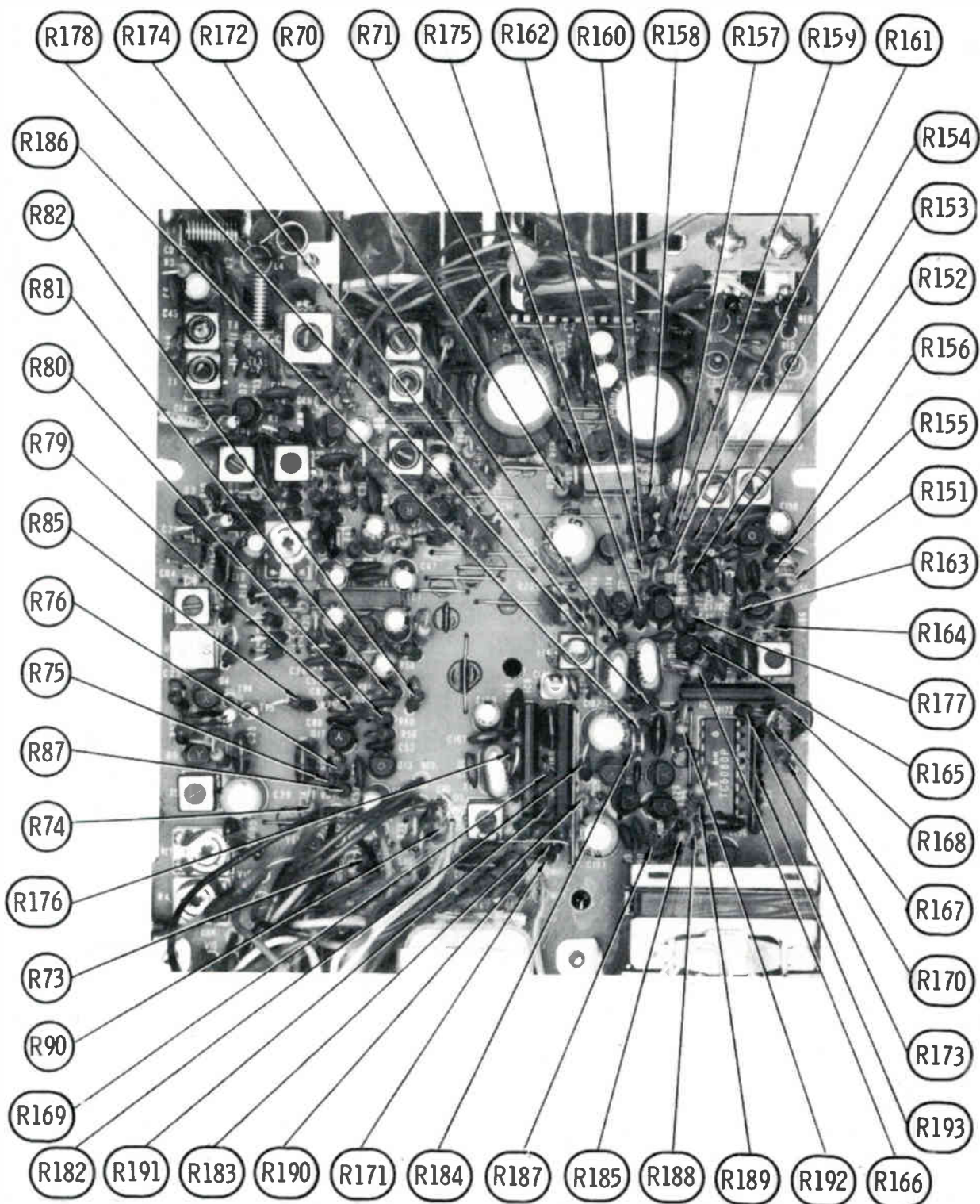
MAIN BOARD



MAIN BOARD

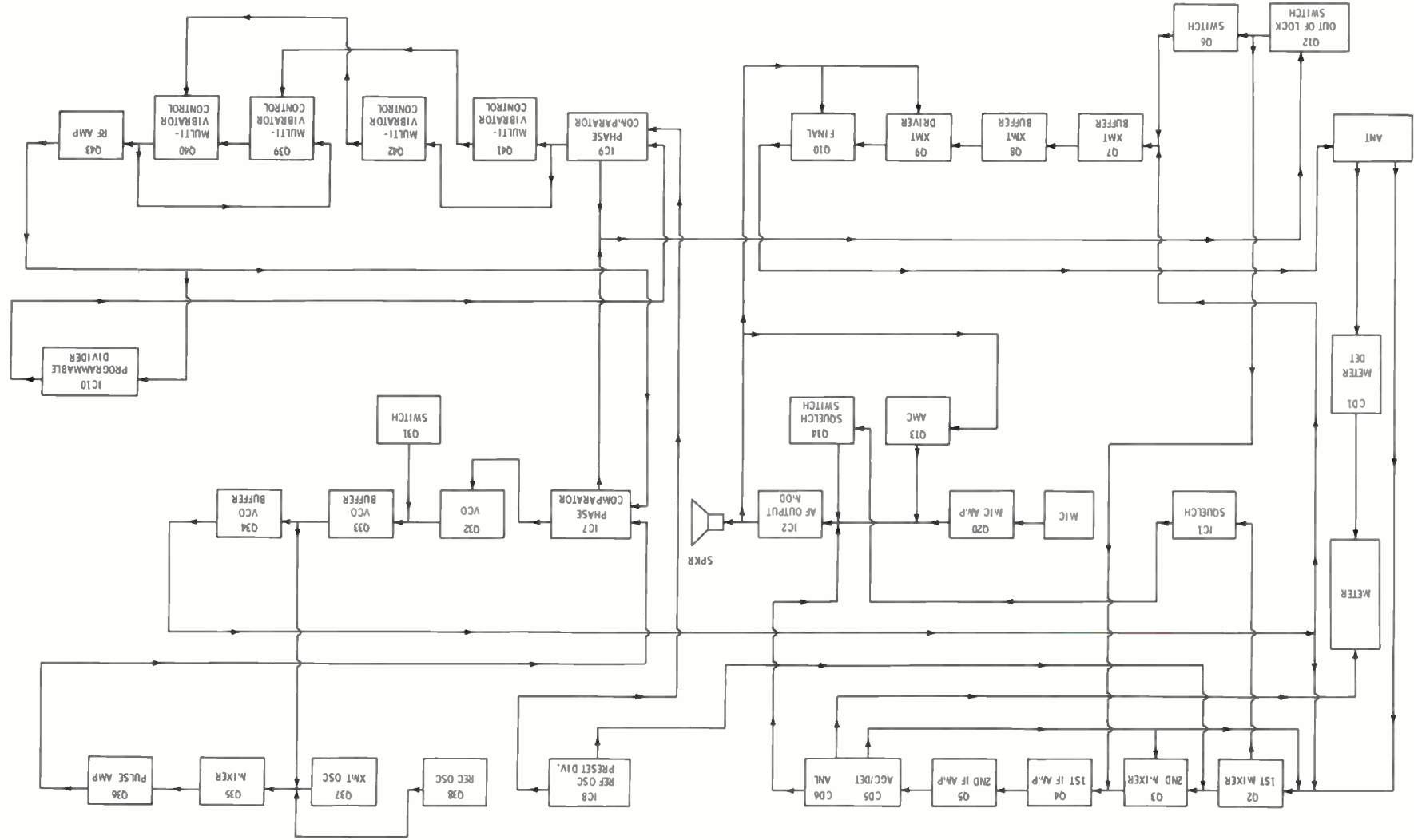


MAIN BOARD

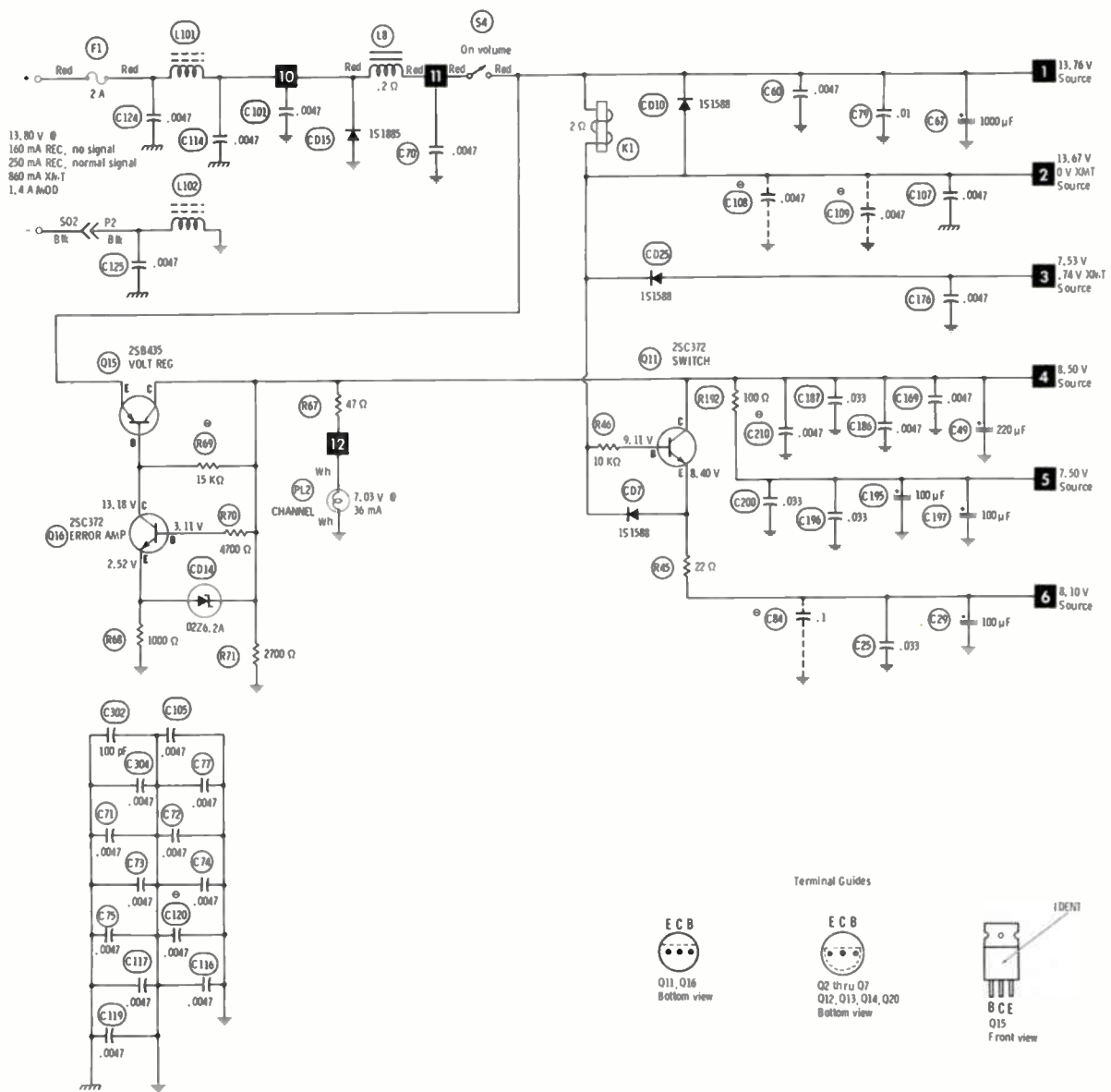


MAIN BOARD

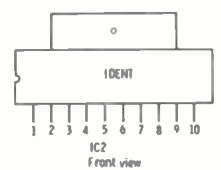
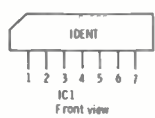
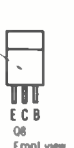
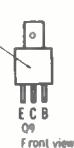
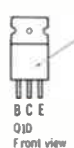
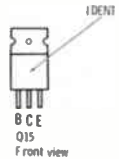
TRAM MODEL D12



BLOCK DIAGRAM

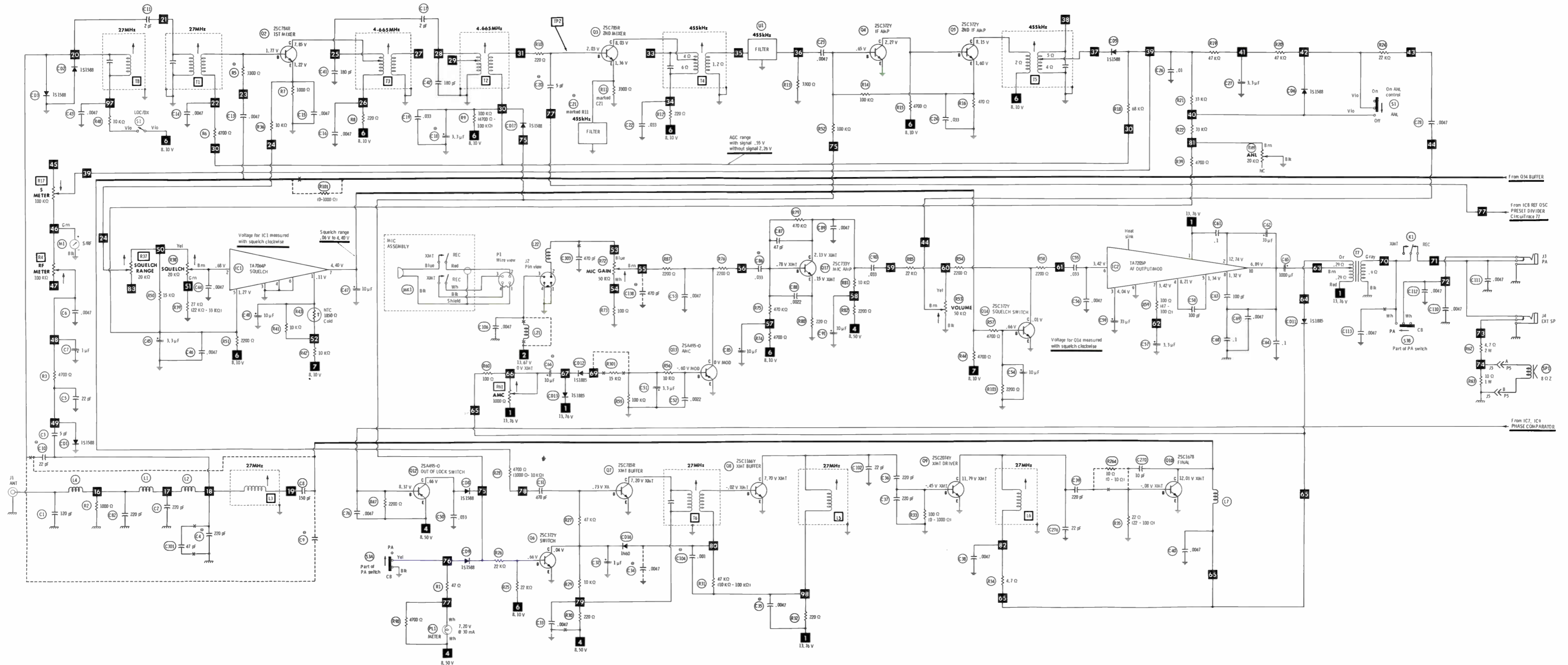


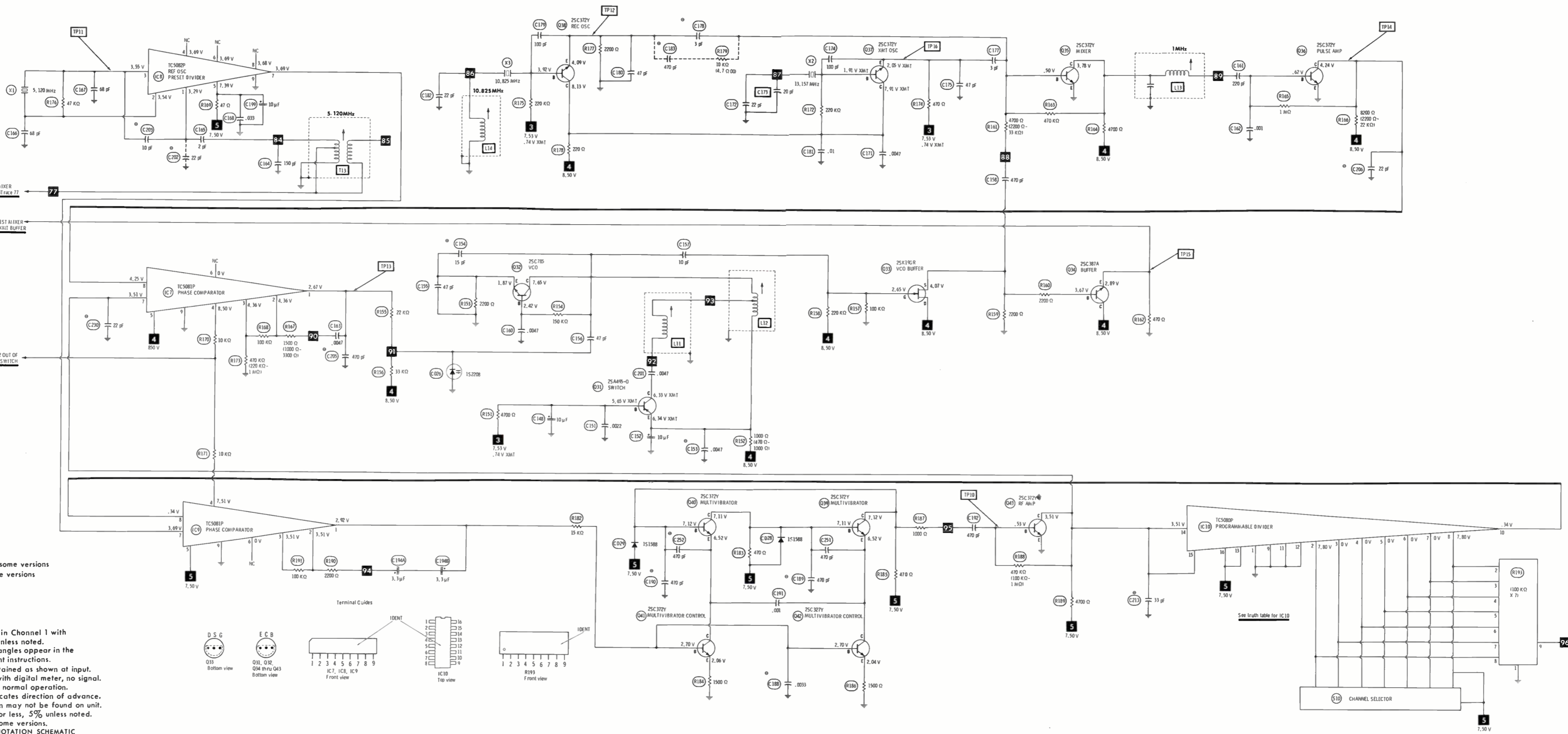
Terminal Guides



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

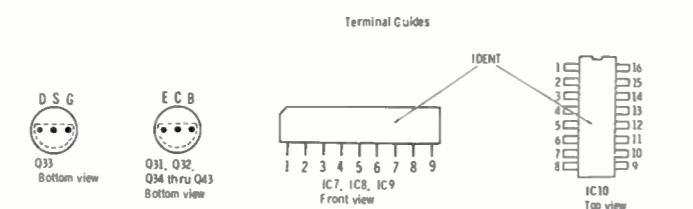
A PHOTOFAC STANDARD NOTATION SCHEMATIC WITH **CIRCUITRACE**





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

A PHOTOFACIT STANDARD NOTATION SCHEMATIC
 WITH **CIRCUITRACE**



PARTS LIST AND DESCRIPTION

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

WIRING DATA

General-use Hook-up Wire (available in 5 colors)	BELDEN No. 8523	Coiled Microphone Cable	
Shielded Hook-up Wire (spiral wrapped)	BELDEN No. 8421	3-conductor (1 shielded) 23AWG	BELDEN No. 9471 (5')
(braided)	BELDEN No. 8401		BELDEN No. 8497 (6')
Speaker Cable (available in 4 colors)	BELDEN No. 8782		BELDEN No. 9472 (7-1/2')
Bonding Strap	BELDEN No. 8672		28AWG BELDEN No. 9466 (6')
AC Power Cord	(6') BELDEN No. 17106		31AWG BELDEN No. 9468 (10')
	(9') BELDEN No. 17109	4-conductor (unshielded) 23AWG	BELDEN No. 8415 (6')
		5-conductor (1 shielded) 28AWG	BELDEN No. 9467 (6')
			BELDEN No. 9465 (7-1/2')

SEMICONDUCTORS (Select replacement transistor for best results)

ITEM No.	TYPE No.	MFR. PART No.	REPLACEMENT DATA									
			GENERAL ELECTRIC PART No.	MALLORY PART No.	MOTOROLA PART No.	RAYTHEON PART No.	RCA PART No.	SPRAGUE PART No.	SYLVANIA PART No.	THORDARSON PART No.	WORKMAN PART No.	ZENITH PART No.
CD1	1S1588		GE-514	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519	1N4148	WEP925	
	1S1588V	A7249601	GE-514	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519	1N4148	WEP925	
CD2	1S1588		GE-514	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519	1N4148	WEP925	
	1S1588V	A7249601	GE-514	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519	1N4148	WEP925	
CD3	1S1588		GE-514	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519	1N4148	WEP925	
	1S1588V	A7249601	GE-514	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519	1N4148	WEP925	
CD5	1S1588		GE-514	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519	1N4148	WEP925	
	1S1588V	A7249601	GE-514	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519	1N4148	WEP925	
CD6	1S1588		GE-514	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519	1N4148	WEP925	
	1S1588V	A7249601	GE-514	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519	1N4148	WEP925	
CD7	1S1588		GE-514	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519	1N4148	WEP925	
	1S1588V	A7249601	GE-514	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519	1N4148	WEP925	
CD8	1S1588		GE-514	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519	1N4148	WEP925	
	1S1588V	A7249601	GE-514	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519	1N4148	WEP925	
CD9	1S1588		GE-514	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519	1N4148	WEP925	
	1S1588V	A7249601	GE-514	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519	1N4148	WEP925	
CD10	1S1588		GE-514	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519	1N4148	WEP925	
	1S1588V	A7249601	GE-514	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519	1N4148	WEP925	
CD11	1S1885	A7568500	GE-504A	PTC202	HEPR0054	RE 49	SK3017A	RT-215	ECG116	1N4007	WEP158	212-76
CD12	1S1885	A7568500	GE-504A	PTC202	HEPR0054	RE 49	SK3017A	RT-215	ECG116	1N4007	WEP158	212-76
CD13	1S1885	A7568500	GE-504A	PTC202	HEPR0054	RE 49	SK3017A	RT-215	ECG116	1N4007	WEP158	212-76
CD14	02Z6 . 2A	A7286100										
CD15	1S1885	A7568500	GE-504A	PTC202	HEPR0054	RE 49	SK3017A	RT-215	ECG116	1N4007	WEP158	212-76
	1S1588V	A7249601	GE-514	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519	1N4148	WEP925	
CD16	1N60	A7000900	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109	1N60	WEP134	ZEN-430
CD17	1S1588		GE-514	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519	1N4148	WEP925	
	1S1588V	A7249601	GE-514	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519	1N4148	WEP925	
CD25	1S1588		GE-514	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519	1N4148	WEP925	
	1S1588V	A7249601	GE-514	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519	1N4148	WEP925	
CD26	1S2298	26010062	GE-514	PTC311	HEPR2501	RE 52	SK3100	RT-218	ECG611			ZEN-451
	1S2789				HEPR2502	RE 52			ECG612			ZEN-452
CD28	1S1588		GE-514	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519	1N4148	WEP925	
	1S1588V	A7249601	GE-514	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519	1N4148	WEP925	
CD29	1S1588		GE-514	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519	1N4148	WEP925	
	1S1588V	A7249601	GE-514	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519	1N4148	WEP925	
IC1	TA7064P								ECG1235			
	TA7064P-JA	80305401							ECG1235			
IC2	TA7205P	80319200	GE1C-179	PTC780	TA7205P	RE 355-IC	SK3231	TVM-81	ECG1155	TA7205P	WEP949	
IC7	TC5081P	80480810							ECG1208			
IC8	TC5082P	80480820							ECG1197			
IC9	TC5081P	80480810							ECG1208			
IC10	TC5080P	80480800										
	TC508P											
Q2	25C784R	A6737940	GE-60*	PTC132*	25C784	RE 28*	SK3122*	RT-187	ECG229*	25C784	WEP784	ZEN-104
	25C784		GE-60*	PTC132*	25C784	RE 28*	SK3122*	RT-187	ECG229*	25C784	WEP784	ZEN-104
Q3	25C785R	A6738040	GE-60*	PTC132*	25C785	RE 9	SK3018*	RT-187	ECG107	25C784	WEP535	ZEN-104
	25C285		GE-60*	PTC132*	25C785	RE 9	SK3018*	RT-187	ECG107	25C784	WEP535	ZEN-104
Q4	25C372Y	A6707244	GE-61*	PTC121*	25C372	RE 13*	SK3444	RT-308	ECG123A*	25C372	WEP372	ZEN-114
	25C372		GE-61*	PTC121*	25C372	RE 13*	SK3444	RT-308	ECG123A*	25C372	WEP372	ZEN-114
Q5	25C372Y	A6707244	GE-61*	PTC121*	25C372	RE 13*	SK3444	RT-308	ECG123A*	25C372	WEP372	ZEN-114
	25C372		GE-61*	PTC121*	25C372	RE 13*	SK3444	RT-308	ECG123A*	25C372	WEP372	ZEN-114
Q6	25C372Y	A6707244	GE-61*	PTC121*	25C372	RE 13*	SK3444	RT-308	ECG123A*	25C372	WEP372	ZEN-114
	25C372		GE-61*	PTC121*	25C372	RE 13*	SK3444	RT-308	ECG123A*	25C372	WEP372	ZEN-114
Q7	25C785R	A6738040	GE-60*	PTC132*	25C785	RE 9	SK3018*	RT-187	ECG107	25C784	WEP535	ZEN-104
	25C785		GE-60*	PTC132*	25C785	RE 9	SK3018*	RT-187	ECG107	25C784	WEP535	ZEN-104
Q8	25C1166X	A6770960	GE-81*	PTC143	25C1166	RE 210	SK3122	RT-141	ECG297	25C1166	WEP914	
	25C1166		GE-81*	PTC143	25C1166	RE 210	SK3122	RT-141	ECG297	25C1166	WEP914	
Q9	25C2074Y	A6319640	GE-336			RE 209			ECG306		WEP771	
	25C2074		GE-336			RE 209			ECG306		WEP771	
Q10	25C1678	A6319611	GE-322	PTC186	25C1306	RE 203	SK3197	RT-146	ECG235	25C1306	WEP785	
	(14)											
Q11	25C372Y	A6707244	GE-61*	PTC121*	25C372	RE 13*	SK3444	RT-308	ECG123A*	25C372	WEP372	ZEN-114
	25C372		GE-61*	PTC121*	25C372	RE 13*	SK3444	RT-308	ECG123A*	25C372	WEP372	ZEN-114
Q12	25A495-0	A6502360	GE-221*	PTC103*	25A495	RE 26*	SK3466	RT-303	ECG159*	25A495	WEP495	ZEN-106
	25A495		GE-221*	PTC103*	25A495	RE 26*	SK3466	RT-303	ECG159*	25A495	WEP495	ZEN-106
Q13	25A495-0	A6502360	GE-221*	PTC103*	25A495	RE 26*	SK3466	RT-303	ECG159*	25A495	WEP495	ZEN-106
	25A495		GE-221*	PTC103*	25A495	RE 26*	SK3466	RT-303	ECG159*	25A495	WEP495	ZEN-106
Q14	25C372Y	A6707244	GE-61*	PTC121*	25C372	RE 13*	SK3444	RT-308	ECG123A*	25C372	WEP372	ZEN-114
	25C372		GE-61*	PTC121*	25C372	RE 13*	SK3444	RT-308	ECG123A*	25C372	WEP372	ZEN-114
Q15	25S435-0	A6610140	GE-69	PTC162		RE 22	SK3083	RT-155	ECG153		WEP746	
	(15)											
Q16	25S435		GE-69	PTC162		RE 22	SK3083	RT-155	ECG153		WEP746	
	25C372Y	A6707244	GE-61*	PTC121*	25C372	RE 13*	SK3444	RT-308	ECG123A*	25C372	WEP372	ZEN-114
	25C372		GE-61*	PTC121*	25C372	RE 13*	SK3444	RT-308	ECG123A*	25C372	WEP372	ZEN-114
Q17	25C733V	A6733340	GE-62	PTC139*	25C733	RE 192	SK3122	RT-302	ECG199	25C733	WEP66	ZEN-114
	25C733		GE-62	PTC139*	25C733	RE 192	SK3122	RT-302	ECG199	25C733	WEP66	ZEN-114
Q31	25A495-0	A6502360	GE-221*	PTC103*	25A495	RE 26*	SK3466	RT-303	ECG159*	25A495	WEP495	ZEN-106
	25A495		GE-221*	PTC103*	25A495	RE 26*	SK3466	RT-303	ECG159*	25A495	WEP495	ZEN-106
Q32	25C785R	A6738040	GE-60*	PTC132*	25C785	RE 9	SK3018*	RT-187	ECG107	25C784	WEP535	ZEN-104
	25C785		GE-60*	PTC132*	25C785	RE 9	SK3018*	RT-187	ECG107	25C784	WEP535	ZEN-104
Q33	25K196R	A6046940	GE-FET-2	PTC161	HEPF0021	RE 45	SK3116	RT-175	ECG312		WEP920	ZEN-123
	25K19		GE-FET-2	PTC161	HEPF0021	RE 45	SK3116	RT-175	ECG312		WEP920	ZEN-123

TRAM MODEL D12

PARTS LIST AND DESCRIPTION (CONTINUED)

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

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

ITEM No.	TYPE No.	MFR. PART No.	REPLACEMENT DATA									
			GENERAL ELECTRIC PART No.	MALLORY PART No.	MOTOROLA PART No.	RAYTHEON PART No.	RCA PART No.	SPRAGUE PART No.	SYLVANIA PART No.	THORDARSON PART No.	WORKMAN PART No.	ZENITH PART No.
Q34	2SC387A	A6708760	GE-214	PTC132*	HEP50020*	RE 10*	SK3039*	RT-134	ECG108*	2SC717*	WEP56*	ZEN-104
Q35	2SC372Y	A6707244	GE-61*	PTC121*	2SC372	RE 13*	SK3444	RT-308	ECG123A*	2SC372	WEP372	ZEN-114
	2SC372		GE-61*	PTC121*	2SC372	RE 13*	SK3444	RT-308	ECG123A*	2SC372	WEP372	ZEN-114
Q36	2SC372Y	A6707244	GE-61*	PTC121*	2SC372	RE 13*	SK3444	RT-308	ECG123A*	2SC372	WEP372	ZEN-114
	2SC372		GE-61*	PTC121*	2SC372	RE 13*	SK3444	RT-308	ECG123A*	2SC372	WEP372	ZEN-114
Q37	2SC372Y	A6707244	GE-61*	PTC121*	2SC372	RE 13*	SK3444	RT-308	ECG123A*	2SC372	WEP372	ZEN-114
	2SC372		GE-61*	PTC121*	2SC372	RE 13*	SK3444	RT-308	ECG123A*	2SC372	WEP372	ZEN-114
Q38	2SC372Y	A6707244	GE-61*	PTC121*	2SC372	RE 13*	SK3444	RT-308	ECG123A*	2SC372	WEP372	ZEN-114
	2SC372		GE-61*	PTC121*	2SC372	RE 13*	SK3444	RT-308	ECG123A*	2SC372	WEP372	ZEN-114
Q39	2SC372Y	A6707244	GE-61*	PTC121*	2SC372	RE 13*	SK3444	RT-308	ECG123A*	2SC372	WEP372	ZEN-114
	2SC372		GE-61*	PTC121*	2SC372	RE 13*	SK3444	RT-308	ECG123A*	2SC372	WEP372	ZEN-114
Q40	2SC372Y	A6707244	GE-61*	PTC121*	2SC372	RE 13*	SK3444	RT-308	ECG123A*	2SC372	WEP372	ZEN-114
	2SC372		GE-61*	PTC121*	2SC372	RE 13*	SK3444	RT-308	ECG123A*	2SC372	WEP372	ZEN-114
Q41	2SC372Y	A6707244	GE-61*	PTC121*	2SC372	RE 13*	SK3444	RT-308	ECG123A*	2SC372	WEP372	ZEN-114
	2SC372		GE-61*	PTC121*	2SC372	RE 13*	SK3444	RT-308	ECG123A*	2SC372	WEP372	ZEN-114
Q42	2SC372Y	A6707244	GE-61*	PTC121*	2SC372	RE 13*	SK3444	RT-308	ECG123A*	2SC372	WEP372	ZEN-114
	2SC372		GE-61*	PTC121*	2SC372	RE 13*	SK3444	RT-308	ECG123A*	2SC372	WEP372	ZEN-114
Q43	2SC372Y	A6707244	GE-61*	PTC121*	2SC372	RE 13*	SK3444	RT-308	ECG123A*	2SC372	WEP372	ZEN-114
	2SC372		GE-61*	PTC121*	2SC372	RE 13*	SK3444	RT-308	ECG123A*	2SC372	WEP372	ZEN-114

* Lead configuration may vary from original.

(14) 10 WATT @ 3.0 AMP.

(15) 1.5 WATT @ 3.0 AMP.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA			
			CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
					Q-LINE	GENERAL LINE
C7	1 50V	26043011	PC1-50	VTT1A50	QV1-11	EV-1615
C18	3.3 50V	26043015	PC5-50	VTT3R3A50	QV1-25	EV-1618
C27	3.3 50V	26043015	PC5-50	VTT3R3A50	QV1-25	EV-1618
C29	100 10V	26043036	PC100-10	VTT100E10	QV1-93	EV-1130
C32	1 50V	26043011	PC1-50	VTT1A50	QV1-11	EV-1615
C45	3.3 50V	26043015	PC5-50	VTT3R3A50	QV1-25	EV-1618
C47	10 16V	26043016	PC10-25	VTT10B25	QV1-41	EV-1222
C48	10 16V	26043016	PC10-25	VTT10B25	QV1-41	EV-1222
C49	220 10V	26043049	PC250-10	VTT220F10	QV1-115	EV-1140
C51	3.3 3V	26040001		TDC335M010FL	QDT1-89	SD10-339
C54	10 16V	26043016	PC10-25	VTT10B25	QV1-41	EV-1222
C57	3.3 16V	26040003		TDC335M015FL	QDT1-41	SD15-3R39
C59	33 16V	26043018	PC30-25	VTT33025	QV1-63	EV-1325
C62	33 16V	26043018	PC30-25	VTT33025	QV1-63	EV-1325
C65	1000 25V	26043051	WBR1000-25	VTT1000M25	QV1-185	EV-1360
C66	10 50V		PC10-50	VTT10D63	QV1-45	EV-1622
	1 50V	26043011	PC1-50	VTT1A50	QV1-11	EV-1615
C67	1000 16V	26043050	PC1000-16	VTT1000L16	QV1-183	EV-1260
C85	10 16V	26043016	PC10-25	VTT10B25	QV1-41	EV-1222
C91	10 16V	26043016	PC10-25	VTT10B25	QV1-41	EV-1222
C152	10 16V	26043016	PC10-25	VTT10B25	QV1-41	EV-1222
C194A	3.3 16V	26040003		TDC335M015FL	QDT1-41	SD15-3R39
C194B	3.3 16V	25040003		TDC335M015FL	QDT1-41	SD15-3R39
C195	100 10V	25043036	PC100-10	VTT100E10	QV1-93	EV-1130
C197	100 10V	25043036	PC100-10	VTT100E10	QV1-93	EV-1130
C198	10 16V	25043016	PC10-25	VTT10B25	QV1-41	EV-1222
C199	10 16V	26043016	PC10-25	VTT10B25	QV1-41	EV-1222

CAPACITORS

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA				
			CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
						Q-LINE	GENERAL LINE
C1	120 50V 10%		OTZ-120		CN0312		10TCC-T12
C2	220 50V 10%		OTZ-220				10TCC-T22
C3	5 50V 10%		DTZ-4R7	NP04P7	CN0547		10TCC-V47
C4	180 H470 50V 10%	(1)			*		10TCT-T18
C5	22 50V 10%		DTZ-22	NP022	CN0422		10TCC-Q22
C6	.0047 50V 10%		DD-472	GP4700	GP247		5GA-D47
C8	150 50V 10%		DTZ-150		CN0315		10TCC-T15
C9	15						
C10	22 H220 50V 10%	(1)			*		10TCC-V22
C11	2 50V 10%		OTZ-2R2	NP02P2	CN0522		10TCC-Q22
C13	.0047 50V 10%		DD-472	GP4700	GP247		5GA-D47
C14	.0047 50V 10%		DD-472	GP4700	GP247		5GA-D47
C15	.0047 50V 10%		DD-472	GP4700	GP247		5GA-D47
C16	.0047 50V 10%		DD-472	GP4700	GP247		5GA-D47
C17	2 50V 10%		DTZ-2R2	NP02P2	CN0522		10TCC-V22
C19	.033 50V				M192P3339R8	QFT2-149	1FT-S33
C20	5 50V 10%		DTZ-4R7	NP04P7	CN0547		10TCC-V47
C21	.033				M192P3339R8		192P3339R8
C22	.033 50V				M192P3339R8	QFT2-149	1FT-S33
C23	.0047 50V 10%		DD-472	GP4700	GP247		5GA-D47
C24	.033 50V				M192P3339R8	QFT2-149	1FT-S33
C25	.033 50V				M192P3339R8	QFT2-149	1FT-S33
C26	.01 50V			WMF1S1	EWFI110	QFT2-91	1FT-S10
C28	.0047 50V 10%		DD-472	GP4700	GP247		5GA-D47

PARTS LIST AND DESCRIPTION (CONTINUED)

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

CAPACITORS (cont)

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA				
			CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
						Q-LINE	GENERAL LINE
C31	470 50V 10%		DD-471	GP470	GP347		10TS-T47
C33	.0047 50V 10%		DD-472	GP4700	GP247		5GA-D47
C34	.0047	(1)					
C35	.0047 50V 10%	(1)	DD-472	GP4700	GP247		5GA-D47
C36	220 50V 10%		DTZ-220				10TCC-T22
C37	220 50V 10%		DTZ-220				10TCC-T22
C38	.0047 50V 10%		DD-472	GP4700	GP247		5GA-D47
C39	220 50V 10%		DTZ-220				10TCC-T22
C40	.0047 50V 10%		DD-472	GP4700	GP247		5GA-D47
C41	180 N470 50V 10%	26036020			*		10TCT-T18
C42	180 N470 50V 10%	26036020			*		10TCT-T18
C43	.0047 50V 10%		DD-472	GP4700	GP247		5GA-D47
C44	.0047 50V 10%		DD-472	GP4700	GP247		5GA-D47
C46	.0047 50V 10%		DD-472	GP4700	GP247		5GA-D47
C50	.033 50V				M192P3339R8	QFT2-149	1FT-S33
C52	.0022 50V 10%				GP222		10TS-D22
C53	.0047 50V 10%		DD-472	GP4700	GP247		5GA-D47
C55	.033 50V				M192P3339R8	QFT2-149	1FT-S33
C56	.0047 50V 10%		DD-472	GP4700	GP247		5GA-D47
C58	100 50V 10%		DTZ-100	NP0100	CN0310		10TCC-T10
C60	.0047 50V 10%		DD-472	GP4700	GP247		5GA-D47
C61	.1 50V 10%		CK-104		MAG5001		
C63	100 50V 10%		DTZ-100	NP0100	CN0310		10TCC-T10
C64	.1 50V 10%		CK-104		MAG5001		
C68	.1 50V 10%		CK-104		MAG5001		
C69	.0047 50V 10%		DD-472	GP4700	GP247		5GA-D47
C70	.0047 50V 10%		DD-472	GP4700	GP247		5GA-D47
C71	.0047 50V 10%		DD-472	GP4700	GP247		5GA-D47
C72	.0047 50V 10%		DD-472	GP4700	GP247		5GA-D47
C73	.0047 50V 10%		DD-472	GP4700	GP247		5GA-D47
C74	.0047 50V 10%		DD-472	GP4700	GP247		5GA-D47
C75	.0047 50V 10%		DD-472	GP4700	GP247		5GA-D47
C76	.0047 50V 10%		DD-472	GP4700	GP247		5GA-D47
C77	.0047 50V 10%		DD-472	GP4700	GP247		5GA-D47
C79	.01 50V 10%		UK50-103		MAG5011		
C82	220 50V 10%		DTZ-220				10TCC-T22
C86	.033 50V				M192P3339R8	QFT2-149	1FT-S33
C87	47 50V 10%		DTZ-47	NP047	CN0447		10TCC-047
C88	.0022 50V 10%				GP222		10TS-D22
C89	.0047 50V 10%		DD-472	GP4700	GP247		5GA-D47
C90	.033 50V				M192P3339R8	QFT2-149	1FT-S33
C101	.0047 50V 10%		DD-472	GP4700	GP247		5GA-D47
C102	22 50V 10%		DTZ-22	NP022	CN0422		10TCC-022
C104	.001 50V 10%	(1)	DD-102		GP210		10TS-D10
C105	.0047 50V 10%		DD-472	GP4700	GP247		5GA-D47
C106	.0047 50V 10%		DD-472	GP4700	GP247		5GA-D47
C107	.0047 50V 10%		DD-472	GP4700	GP247		5GA-D47
C110	.0047						
C111	.0047 50V 10%		DD-472	GP4700	GP247		5GA-D47
C112	.0047 50V 10%		DD-472	GP4700	GP247		5GA-D47
C113	.0047 50V 10%		DD-472	GP4700	GP247		5GA-D47
C114	.0047 50V 10%		DD-472	GP4700	GP247		5GA-D47
C116	.0047 50V 10%		DD-472	GP4700	GP247		5GA-D47
C117	.0047 50V 10%		DD-472	GP4700	GP247		5GA-D47
C119	.0047 50V 10%		DD-472	GP4700	GP247		5GA-D47
C120	.0047 50V 10%		DD-472	GP4700	GP247		5GA-D47
C124	.0047 50V 10%		DD-472	GP4700	GP247		5GA-D47
C125	.0047 50V 10%		DD-472	GP4700	GP247		5GA-D47
C151	.0022 50V 10%				GP222		10TS-D22
C153	.0047 50V 10%		DD-472	GP4700	GP247		5GA-D47
C154	15 N470 50V 10%	26036017(1)			*		10TCT-Q15
C155	47 N750 50V 10%		DTN-47	N47	CN7447		10TCU-Q47
C156	47 N750 50V 10%		DTN-47	N47	CN7447		10TCU-Q47
C157	10 N750 50V 10%		DTN-10	N10	CN7410		10TCU-Q10
C158	470 50V 10%		DD-471	GP470	GP347		10TS-T47
C160	.0047 50V 10%		DD-472	GP4700	GP247		5GA-D47
C161	220 50V 10%		DTZ-220				10TCC-T22
C162	.001 50V 10%		DD-102		GP210		10TS-D10
C163	.0047 50V				M192P4729R8	QFT2-63	1FT-D47
C164	150 N470 50V 10%	26036059			*		10TCT-T15
C165	2 50V 10%		DTZ-2R2	NP02P2	CN0522		10TCC-V22
C166	68 N220 50V 10%	26036036			*		10TCR-Q68
C167	68 N220 50V 10%	26036036			*		10TCR-Q68
C168	.033 50V				M192P3339R8	QFT2-149	1FT-S33
C169	.0047 50V 10%		DD-472	GP4700	GP247		5GA-D47
C171	.0047 50V 10%		DD-472	GP4700	GP247		5GA-D47
C172	22 N220 50V 10%	26036049			*		10TCR-Q22
C173	20pF						
C174	100 50V 10%		DTZ-100	NP0100	CN0310		10TCC-T10
C175	47 50V 10%		DTZ-47	NP047	CN0447		10TCC-Q47
C176	.0047 50V 10%		DD-472	GP4700	GP247		5GA-D47
C177	3 50V 10%		DTZ-3R3	NP03P3	CN0533		10TCC-V33
C178	3 50V 10%	(1)	DTZ-3R3	NP03P3	CN0533		10TCC-V33
C179	100 50V 10%		DTZ-100	NP0100	CN0310		10TCC-T10
C180	47 50V 10%		DTZ-47	NP047	CN0447		10TCC-Q47
C181	.01 50V			MNF1S1	EWF1A110	QFT2-91	1FT-S10
C182	22 N220 50V 10%	26036049			*		10TCR-Q22
C186	.0047 50V 10%		DD-472	GP4700	GP247		5GA-D47
C187	.033 50V				M192P3339R8	QFT2-149	1FT-S33
C188	.033 50V				M192P3329R8	QFT2-43	1FT-D33
C189	470 50V 10%	(1)	DD-471	GP470	GP347		10TS-T47
C190	470 50V 10%	(1)	DD-471	GP470	GP347		10TS-T47
C191	.001 50V			DMP56D1	EWF1A210	QFT2-1	1FT-D10
C192	470 50V 10%		DD-471	GP470	GP347		10TS-T47
C196	.033 50V				M192P3339R8	QFT2-149	1FT-S33
C200	.033 50V				M192P3339R8	QFT2-149	1FT-S33
C201	.0047 50V 10%		DD-472	GP4700	GP247		5GA-D47
C203	10 50V 10%	(1)	DTZ-10	NP010	CN0410		10TCC-Q10

TRAM MODEL D12

PARTS LIST AND DESCRIPTION (CONTINUED)

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

CAPACITORS (cont)

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA				
			CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
						Q-LINE	GENERAL LINE
C205	470 50V 10%		DD-471	GP470	GP347		10TS-T47
C230	22 50V 10%		DTZ-22	HP022	CNO422		10TCC-Q22
C251	470 50V 10%		DD-471	GP470	GP347		10TS-T47
C252	470 50V 10%		DD-471	GP470	GP347		10TS-T47
C270	10 50V 10%		DTZ-10	HP010	CNO410		10TCC-Q10
C276	22 50V 10%		DTZ-22	HP022	CNO422		10TCC-Q22
C301	47 50V 10%		DTZ-47	HP047	CNO447		10TCC-Q47
C302	100 50 10%		DTZ-100	HP0100	CNO310		10TCC-T10
C303	470 50V 10%		DD-471	GP470	GP347		10TS-T47
C304	.0047 50V 10%		DD-472	GP4700	GP247		56A-M47

(1) Value varies, replace with original value.

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

ITEM No.	FUNCTION	RESISTANCE	REPLACEMENT DATA				
			MFR. PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	MALLORY PART No.	TRW PART No.
R4	RF Meter	100K	26061071				U260R104B
R17	S Meter	100K	26061071				U260R104B
R37	Squelch Range	20K	26061082				U260R253B
R38	Squelch	20K	26061097 (18)				
R49	ANL/ANL Switch	20K					
R53	Volume	50K	26061098 (19)				
R72	MIC Gain/Power/Switch	50K					
R61	AMC	1000	26061111				

(18) Includes R38 and R49.

(19) Includes R53 and R72.

COILS (RF-IF)

ITEM No.	FUNCTION	REPLACEMENT DATA			REMARKS
		PART No.	OTHER IDENTIFICATION	MILLER PART No.	
L1	P1 Filter	26025071	L1904-G1		74F106AP
L2	P1 Filter	26025071	L1904-G1		
L3	Antenna Match (27MHz)	26025106	25106		
L4	RF Coil	26025107	L1904-G3		
L5	XMT Buffer (27MHz)	26025082	25082		
L6	XMT Driver (27MHz)	26025082	25082		
L7	RF Choke	26025072	L1998		
L11	Switch	26025082	25082		
L12	VCO	26025085	25085		
L13	Mixer (1MHz)	26025090	25090		
L14	Input Ref Osc(10.825MHz)	26025086	25086		
L21	RF Choke	26020002	L1447		
L22	RF Choke	26020002	L1447		
L101	RF Choke				
L102	RF Choke				
T1	Input Mixer (27MHz)	26025103	25103		
T2	Rec Mixer (4.665MHz)	26025088	25088		
T3	Rec Mixer (4.665MHz)	26025088	25088		
T4	IF (455kHz)	26027008	D10753	8812	
T5	IF (455kHz)	26027008	D10753	8812	
T6	XMT Buffer (27MHz)	26025089	25089		
T8	Rec Antenna (27MHz)	26025102	25102		
T13	Input Ref Osc	26025088	25088		

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.	
L8	1500	.2	.1mH	26020008 6507 (1)			(1) Number on unit.

TRANSFORMER (Audio Output)

ITEM No.	IMPEDANCE		REPLACEMENT DATA			NOTES
	PRI.	SEC.	MFR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T7	2	1 2 2 5.5	26023018 6506 (1)			(1) Number on unit.

PARTS LIST AND DESCRIPTION (CONTINUED)

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

SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		MFR. PART No.	QUAM PART No.	
SP1	2 5/8" X 4 1/8" PM 8 Ohms	26015280		

FUSE DEVICES

ITEM No.	DESCRIPTION	REPLACEMENT DATA						WORKMAN PART No.
		PART No.		BUSS PART No.		LITTELFUSE PART No.		
		DEVICE	HOLDER	DEVICE	HOLDER	DEVICE	HOLDER	
F1	2A Quick Acting	26014024	26017008	AGC-2	HDJ	312002	150145	FG2-2

MICROPHONE

ITEM No.	REPLACEMENT DATA				CONNECTION DATA							
	MFR. PART No.	GC PART No.	GC NOISE CANCEL	GC POWER	GC CONNECTOR	GC Red	GC Shield	GC Yellow	GC Blue	GC White	GC Black	
MK1	26015293	18-032	18-034	18-010	18-092	2	1	3	NC	NC	4	

MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
J1	Jack	26016024	Antenna
J2	Jack	26016044	MIC
J3	Jack	26016047	PA
J4	Jack	26016047	External Speaker
K1	Relay	26014079	
M1	Meter	26019016	DC Ammeter S/RF
P1	Plug	26016045	MIC
PL1	Lamp	26011014	Meter 7.20V 30mA
PL2	Lamp	26011015	Indicator, Channel 7.03V 36mA
S1	Switch	26014069	LDC/DX Slide Switch
S2	Switch		ANL
S3	Switch	26014069	PA/CB
S10	Switch	26014077	Channel Selector
U1	Filter	26019007	455KHz Ceramic
W3		26017008	DC (With Fuse Holder)
X1	Crystal	26015283	15283 (5.120MHz)
X2	Crystal	26015285	15285 (13.157MHz)
X3	Crystal	26015284	15284 (10.825MHz)
Z1	PC Board	26001048	

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

ITEM	PART No.	ITEM	PART No.
Bottom Cover Assembly	26083056	Meter Holder	26074110
Front Panel	26084033	Top Cover Assembly	26083055

TRAM MODEL D12

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Listing all models/chassis covered in
PHOTOFACT CB (Citizens Band) Series volumes

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SBE-3CB (Cascade) ...	31	Pg. 105)	104	"TT" Dispatch	177	MIC4733A-67 (DC4733) .	116	XCB-88	132
SBE-5CB (Cascade II) .	49	CB-500UB	104	"TT" Scout	85	MIC4737A-67 (DC4737) .	159	XSSB-10	93
SBE-6CB	33	CB-700	123	Tele "T"	87	MIC4739A-67 (DC4739) .	98	ZODIAC	
SBE-7CB (Sierra)	39	CB-750A	126	Titan "T" (4005)	141	MIC4812B-17 (DC4812B) 34		M-5023	108
SBE-8CB (Console)	41	CB-800	160	Twin "T"	40	MIC4820A-86		M-5026	113
SBE-9CB (Catalina) ...	41	CB-800A	126			MIC4821A-86 (DX4821) .	20		
SBE-10CB (Coronado II)	48	CB-2260	169			MIC4920A-96 (DC4920) .	28		
SBE-11CB (Trinidad) ..	47	CB-2460	172			MIC4920B-37 (DC4920) .	44		
		CBT-58	45			MID4820A-86			
		SILTRONIX				512 Series B (DX4101) .	7		
		Apache (AM-1)	114			1250A	10		
		Cherokee				1250B	11		
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MIDLAND		TRAM			
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HOWARD W. SAMS & CO., INC.
INDIANAPOLIS, INDIANA

**FIRST EDITION
FIRST PRINTING – FEBRUARY, 1975**

**C B RADIO SERIES
VOLUME 62**

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**ONLY THOSE PERSONS PROPERLY LICENSED ARE
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C B RADIO SERIES

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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 Telsat 925 (99-32856W)

ALIGNMENT INSTRUCTIONS

Suggested Alignment Tools: GC ELECTRONICS:
 L1, L2, L3, L4, L5, L6, L8, L9, L10, L11, L17, L18..9440
 L12, L13, L14, L15, L16, L19, L20, L21, L22.....5000, 8290

RECEIVER

Connect an AC VTVM or AF Wattmeter across speaker voice coil.
 Adjustments are made with 120 volt AC input to power supply.
 Adjust volume control to obtain suitable reading.

SIGNAL GENERATOR	CHANNEL	GEN FREQ	ADJUST	REMARKS
High side thru a .01uF capacitor to cathode of D6, low side to ground.	Any	Set to 455kHz, 1000Hz @ 30% Modulation Output MINIMUM uV for 0.5V reading.	L14, L15, L16	Adjust for maximum.
High side thru a .01uF capacitor to Base of Q8, low side to ground.	Any	Set to 10.625MHz, 1000Hz @ 30% Modulation Output MINIMUM uV for 0.5V reading.	L12, L13	Adjust for maximum.
High side thru a .01uF capacitor to antenna jack low side to ground.	13	Set to 27.115MHz, 1000Hz @ 30% Modulation Output 10uV.	L9, L10, L11, L17	Adjust for maximum.

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

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LAFAYETTE MODEL TELSAT 925

RECEIVER

SIGNAL GENERATOR	CHANNEL	GEN FREQ	ADJUST	REMARKS
High side thru a .01uF capacitor to antenna jack low side to ground.	13	Set to 27.115MHz, 1000Hz @ 30% Modulation Output 1uV.	L9, L10, L11, L12, L13, L14, L15, L16	Adjust for maximum. Repeat until no further improvement is noted.

RECEIVER ADJUSTMENTS

SIGNAL GENERATOR	CHANNEL	GEN FREQ	ADJUST	REMARKS
<p>SQUELCH RANGE High side thru a .01uF capacitor to antenna jack, low side to ground.</p> <p>"S" METER High side thru a .01uF capacitor to antenna jack, low side to ground.</p>	13	Set to 27.115Hz, 1000Hz @ 30% Modulation Output 10,000uV.	VR5	Set Norm/Mon switch to Norm. Set CB squelch control fully clockwise. Adjust so that squelch just breaks.
	13	Set to 27.115Hz, 1000Hz @ 30% Modulation Output 50uV.	VR4	Adjust for "S9" on panel "S" meter.

TRANSMITTER

Connect an RF Wattmeter or 50 ohm 25 watt dummy load to antenna connector. Adjustments are made with 120 volt AC input to power supply.

INDICATOR	ADJUST	REMARKS
<p>OSC., MIXER, BUFFER, DRIVER, FINAL AM RF Wattmeter or dummy load and RF VTVM.</p> <p>FINAL INPUT POWER 0 - 1.5A DC Milliammeter.</p> <p>TVI TRAP TV Set Ch. 2.</p>	<p>L1, L2, L3, L4, L5, L6, L7, L8, VC</p> <p>L8</p> <p>L23</p>	<p>Connect wattmeter to antenna connector. Mode switch to AM. Channel Selector to Ch. 13. Key transmitter. Adjust for maximum.</p> <p>Insert meter between RFC3 and R16 (TP1). Key transmitter. Adjust for no more than 5 watts DC input.</p> <p>Channel Selector to Ch. 13. Key transmitter. Adjust for MINIMUM interference.</p>

TRANSMITTER ADJUSTMENTS

Connect an RF Wattmeter or 50 ohm 25 watt dummy load to antenna connector.
Adjustments are made with 120 volt AC input to power supply.

INDICATOR	ADJUST	REMARKS
RF PANEL METER RF Wattmeter.	VR7	Set mode switch to AM. Key transmitter. Adjust so that panel "RF" meter agrees with RF Wattmeter.
AMC Modulator Meter.	VR6	Connect audio generator to microphone input. Inject a 1000Hz signal. Key transmitter. Adjust for 100% modulation maximum.

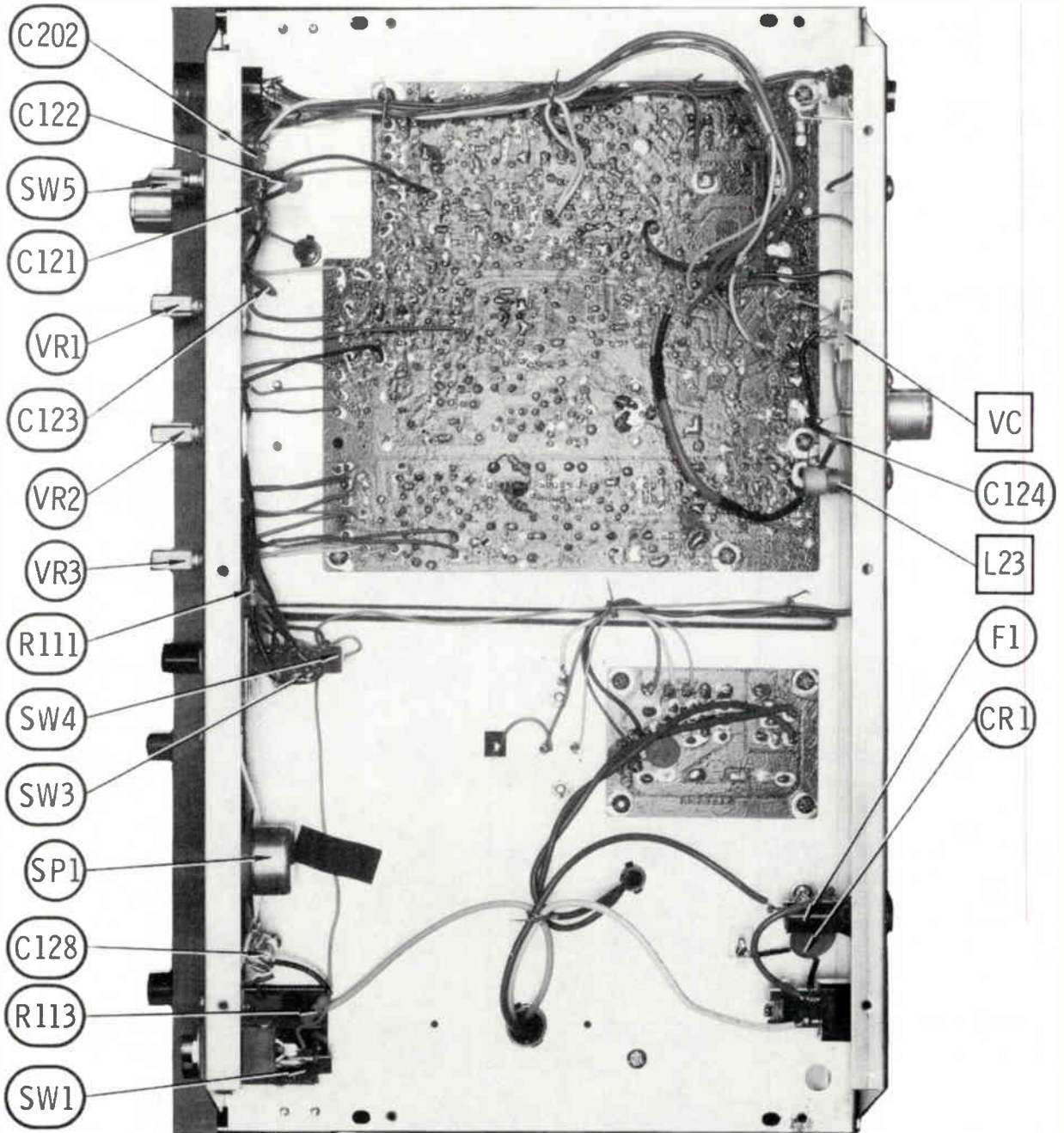
MONITOR

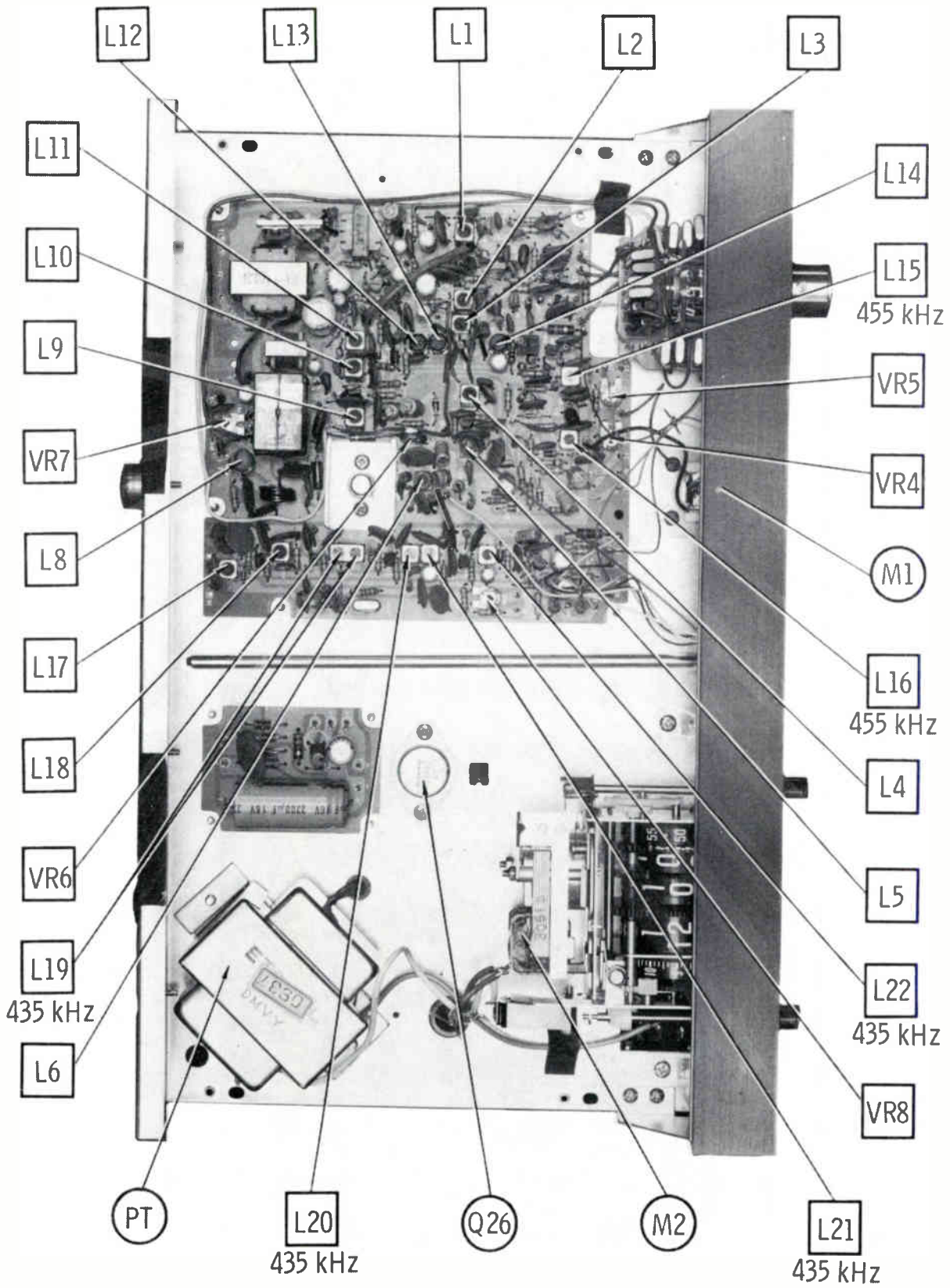
Connect an AC VTVM or AF Wattmeter across speaker voice coil.
Adjustments are made with 120 volt AC input to power supply.
Adjust volume control to obtain suitable reading.

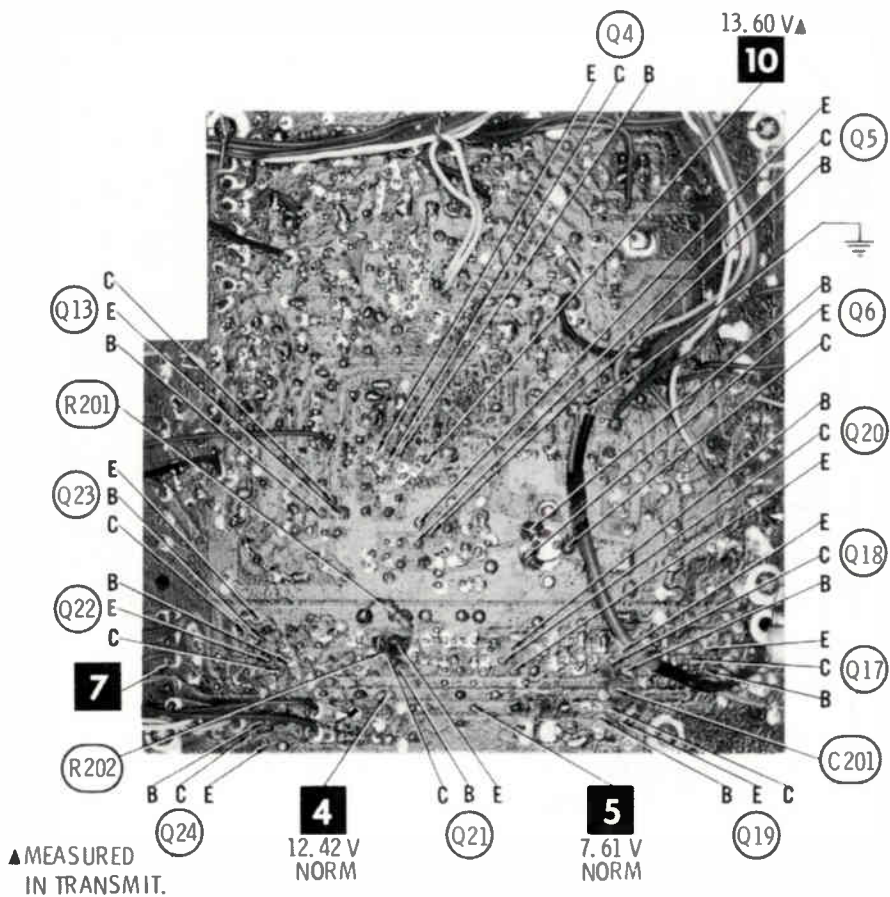
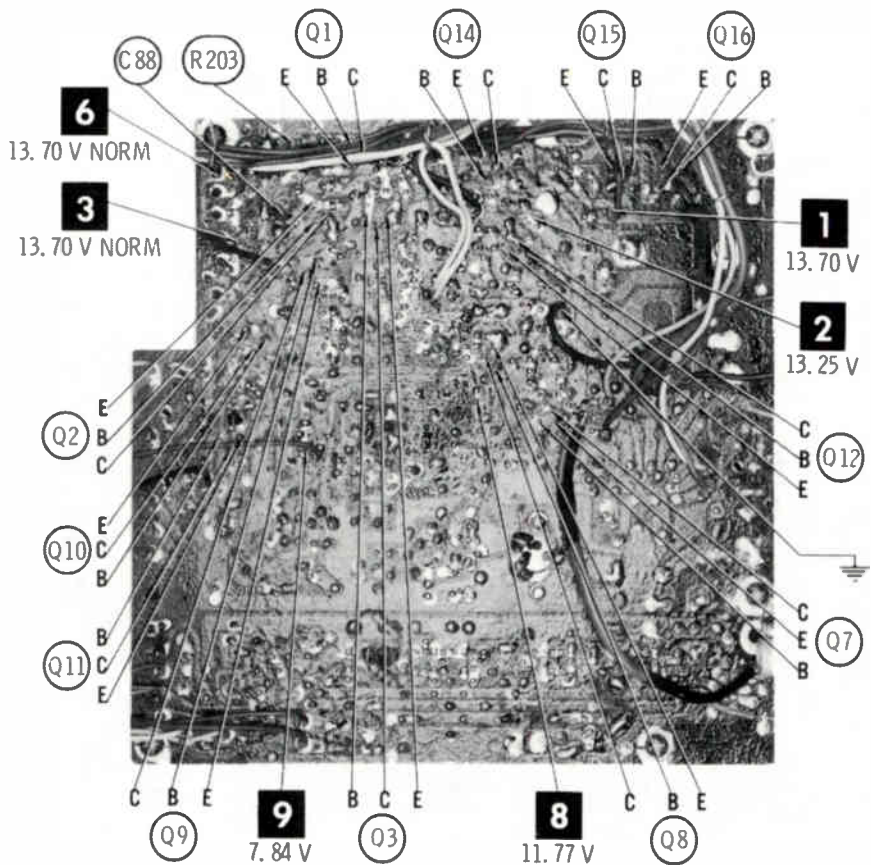
SIGNAL GENERATOR	CHANNEL	GEN FREQ	ADJUST	REMARKS
High side thru a .01uF capacitor to Base of Q18 low side to ground.	Any	Set to 435kHz, 1000Hz @ 30% Modulation Output MINIMUM uV to produce 0.3V on DC VTVM.	L19, L20, L21, L22	Connect a DC VTVM to Cathode of D16. Adjust for maximum.
High side thru a .01uF capacitor to antenna jack, low side to ground.	9	Set to 27.065MHz, 1000Hz @ 30% Modulation Output 10uV.	L17, L18	Connect a DC VTVM to Cathode of D16. Adjust for maximum.
High side thru a .01uF capacitor to antenna jack, low side to ground.	9	Set to 27.065MHz, 1000Hz @ 30% Modulation Output 1uV.	L17, L18, L19, L20, L21, L22	Connect a DC VTVM to Cathode of D16. Adjust for maximum.

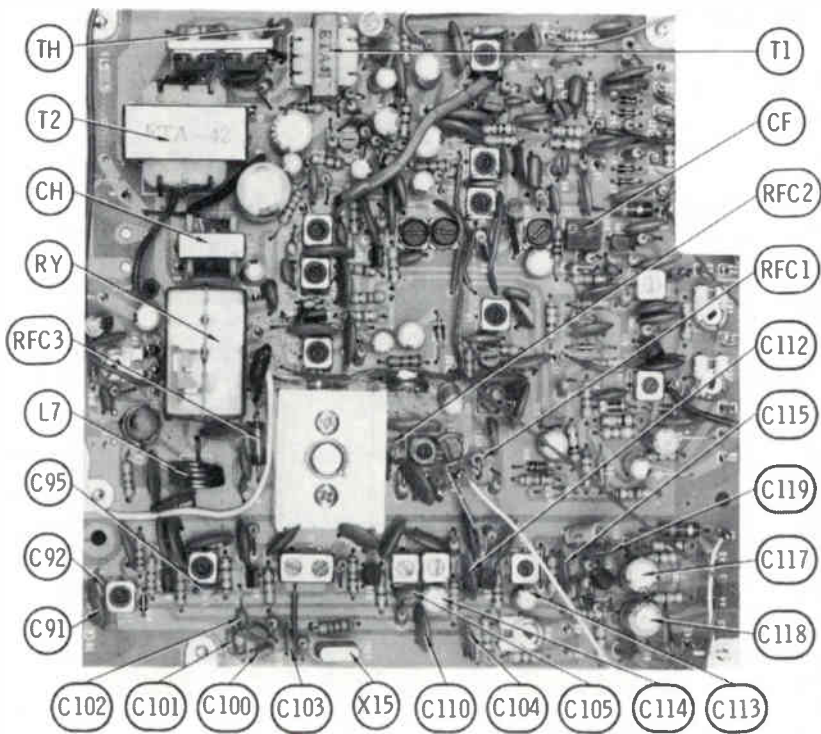
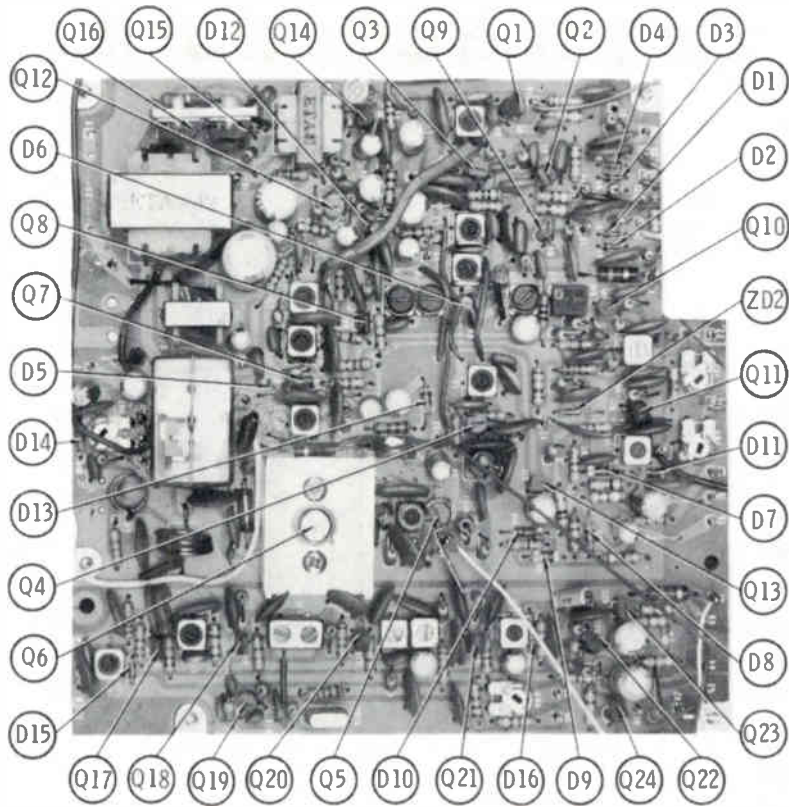
MONITOR ADJUSTMENTS

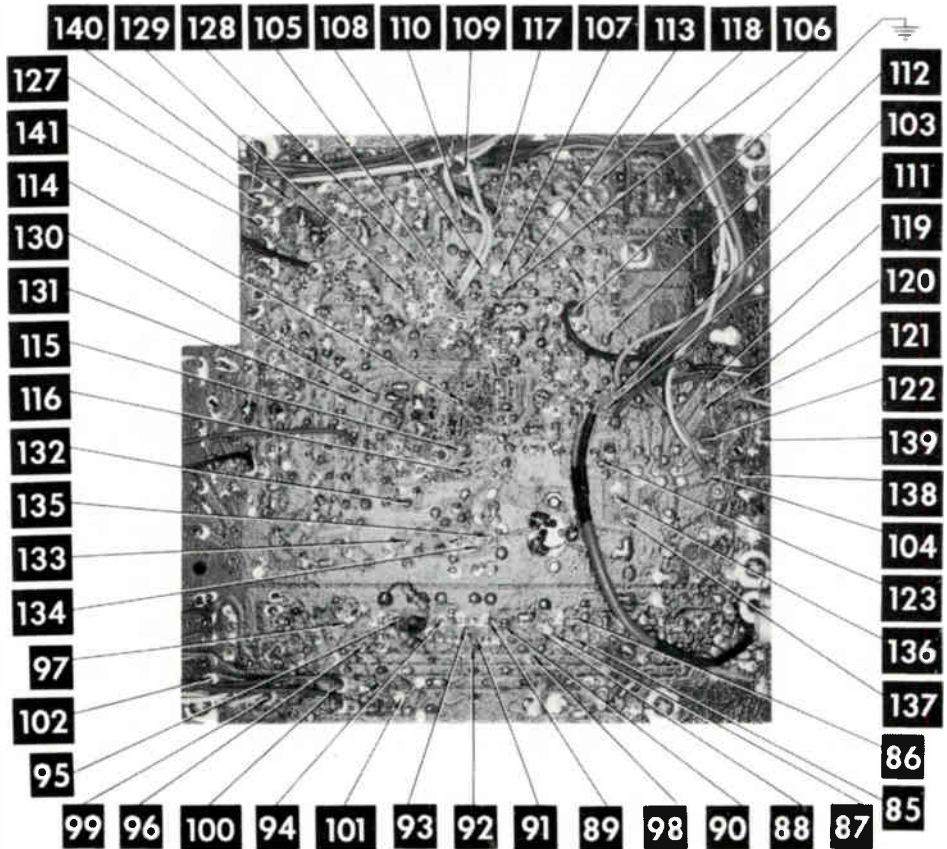
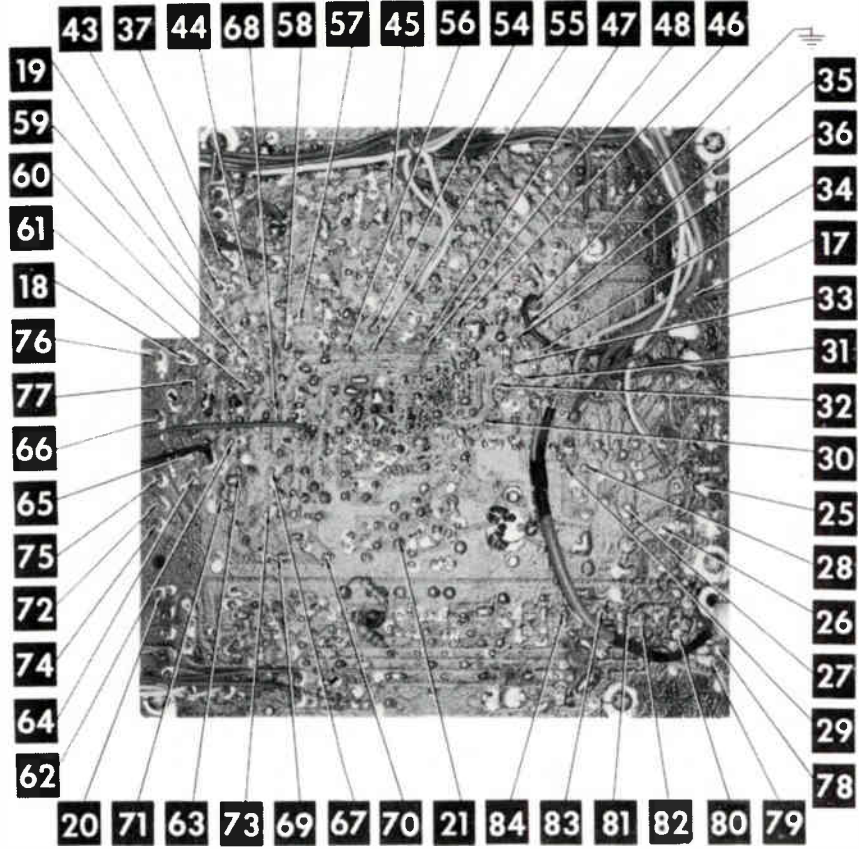
SIGNAL GENERATOR	CHANNEL	GEN FREQ	ADJUST	REMARKS
SQUELCH RANGE High side thru a .01uF capacitor to antenna jack, low side to ground.	9	Set to 27.065Hz, 1000Hz @ 30% Modulation Output 300uV.	VR8	Set Norm/Mon switch to Mon. Set monitor squelch control fully clockwise. Adjust so that monitor lamp starts flashing.

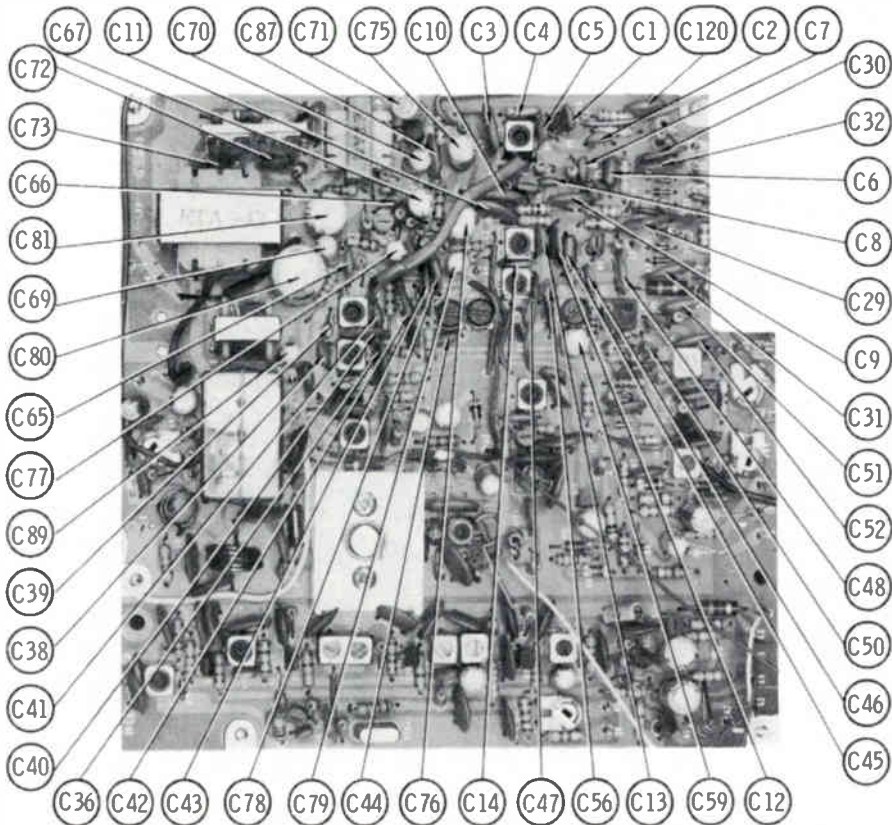
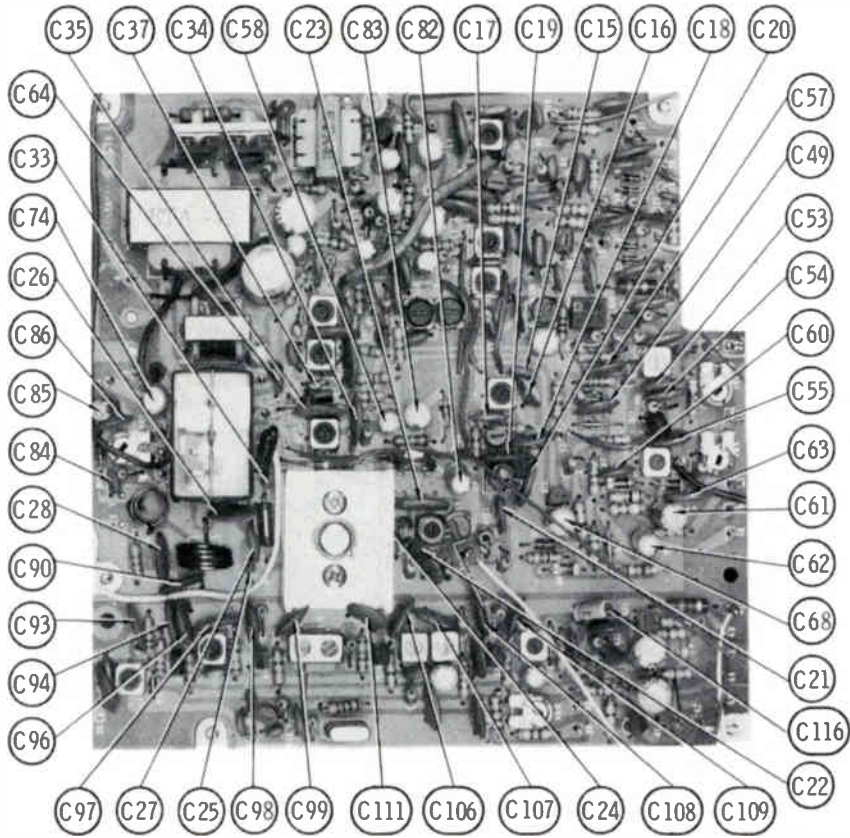


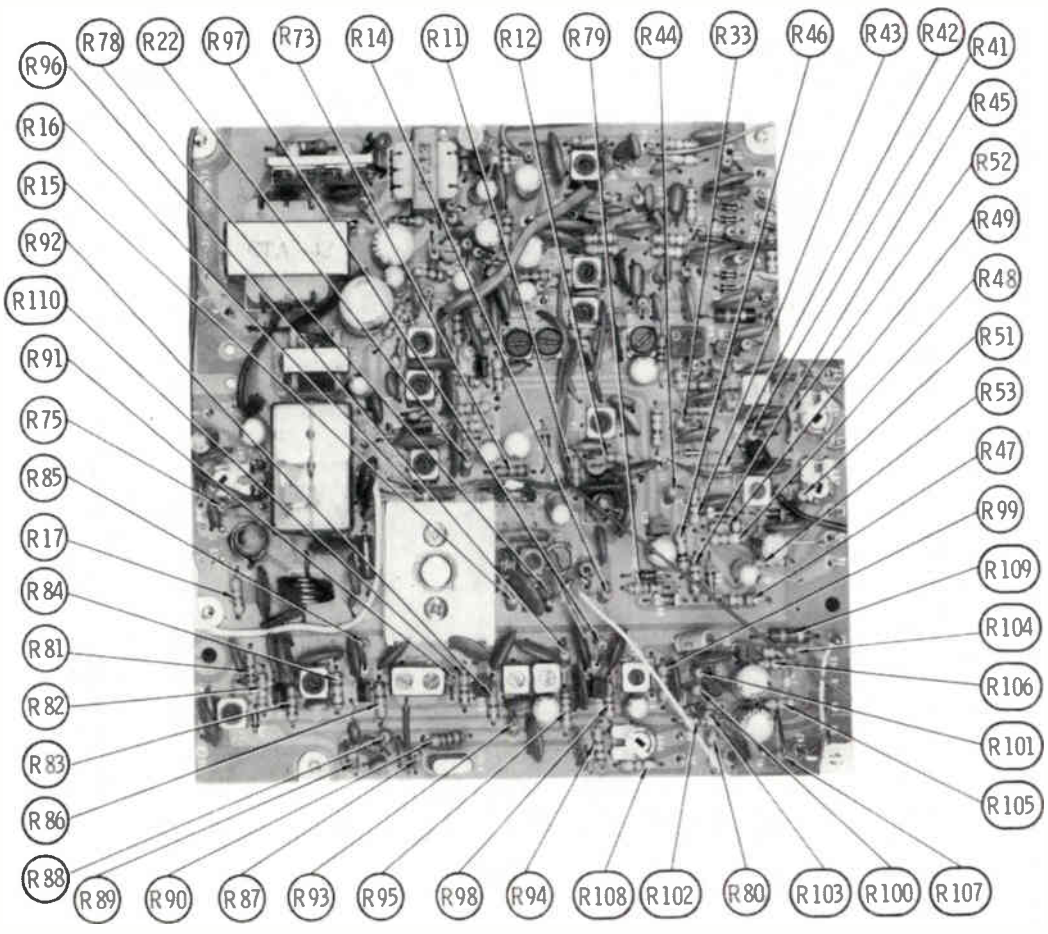
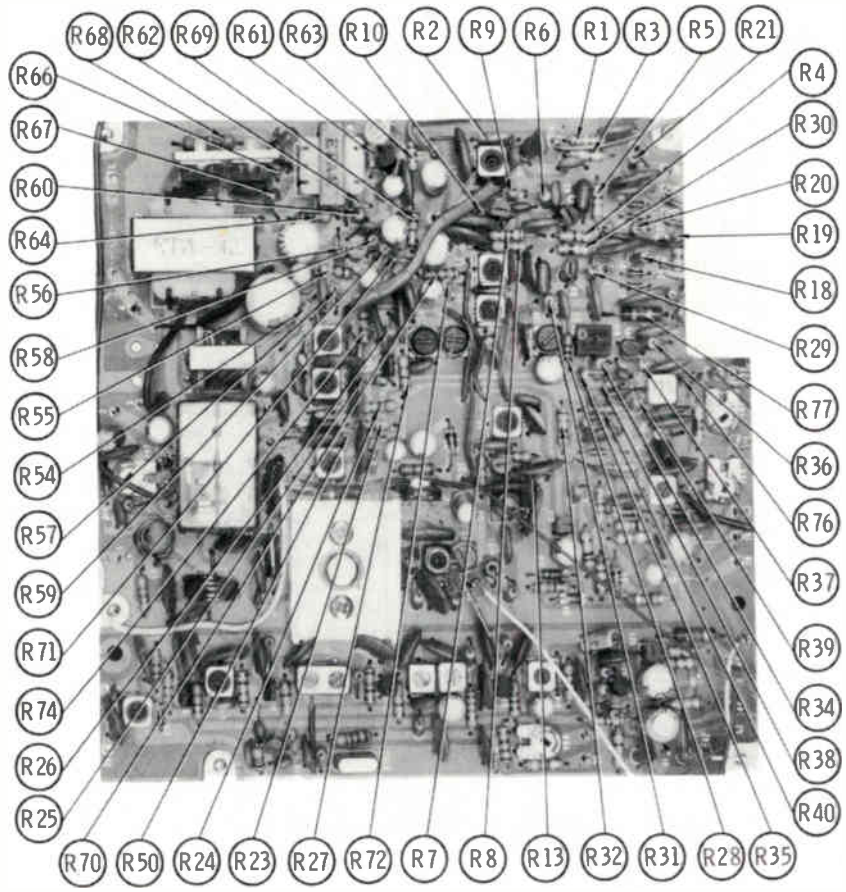


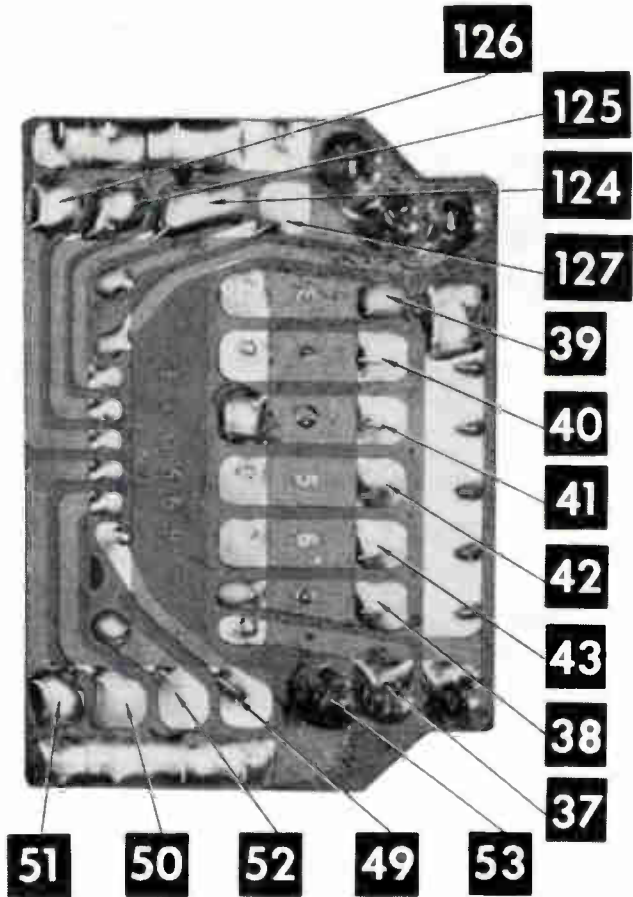




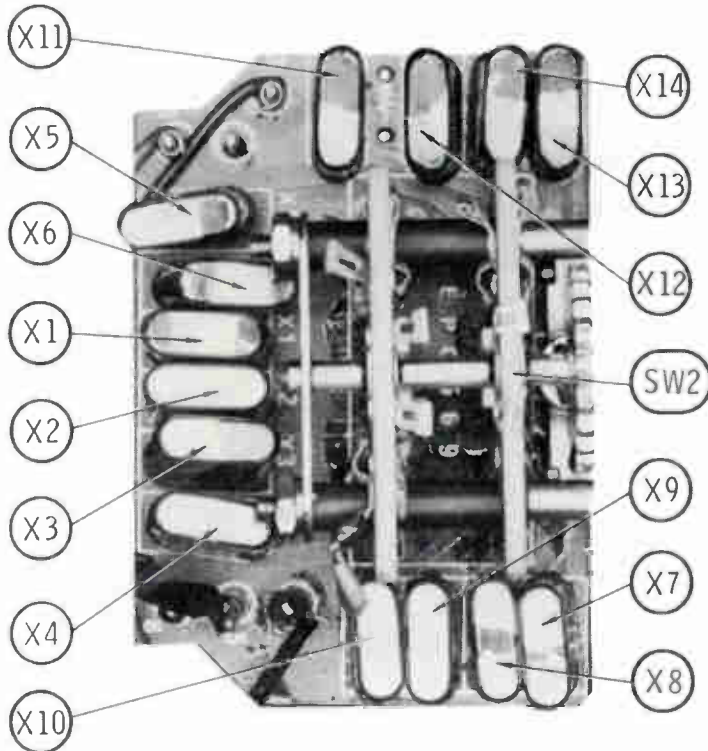




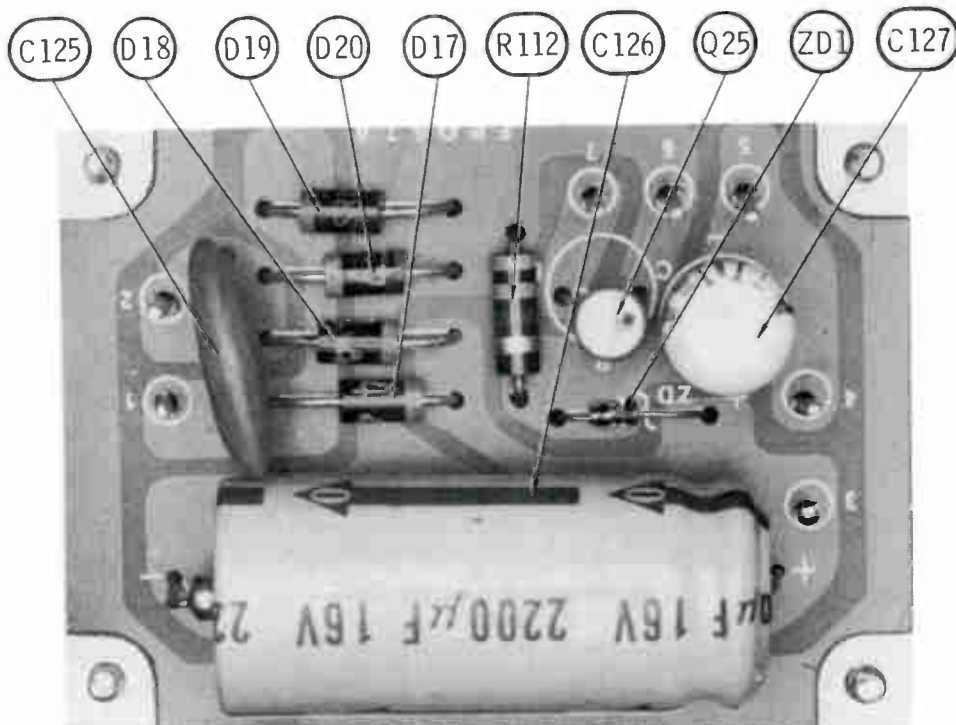
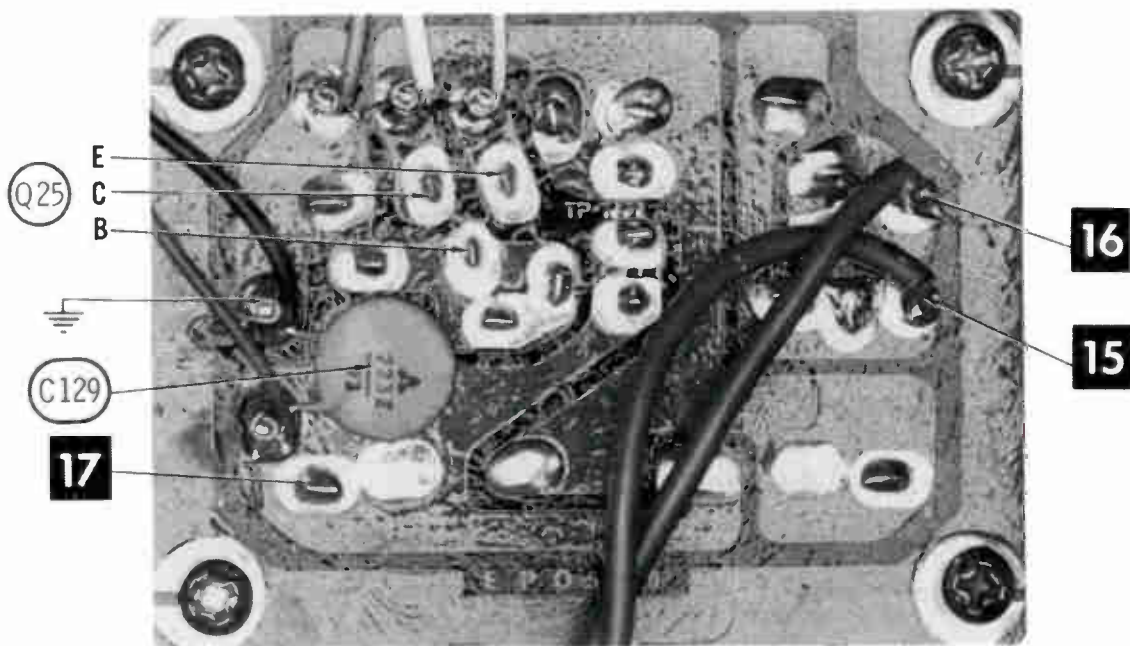




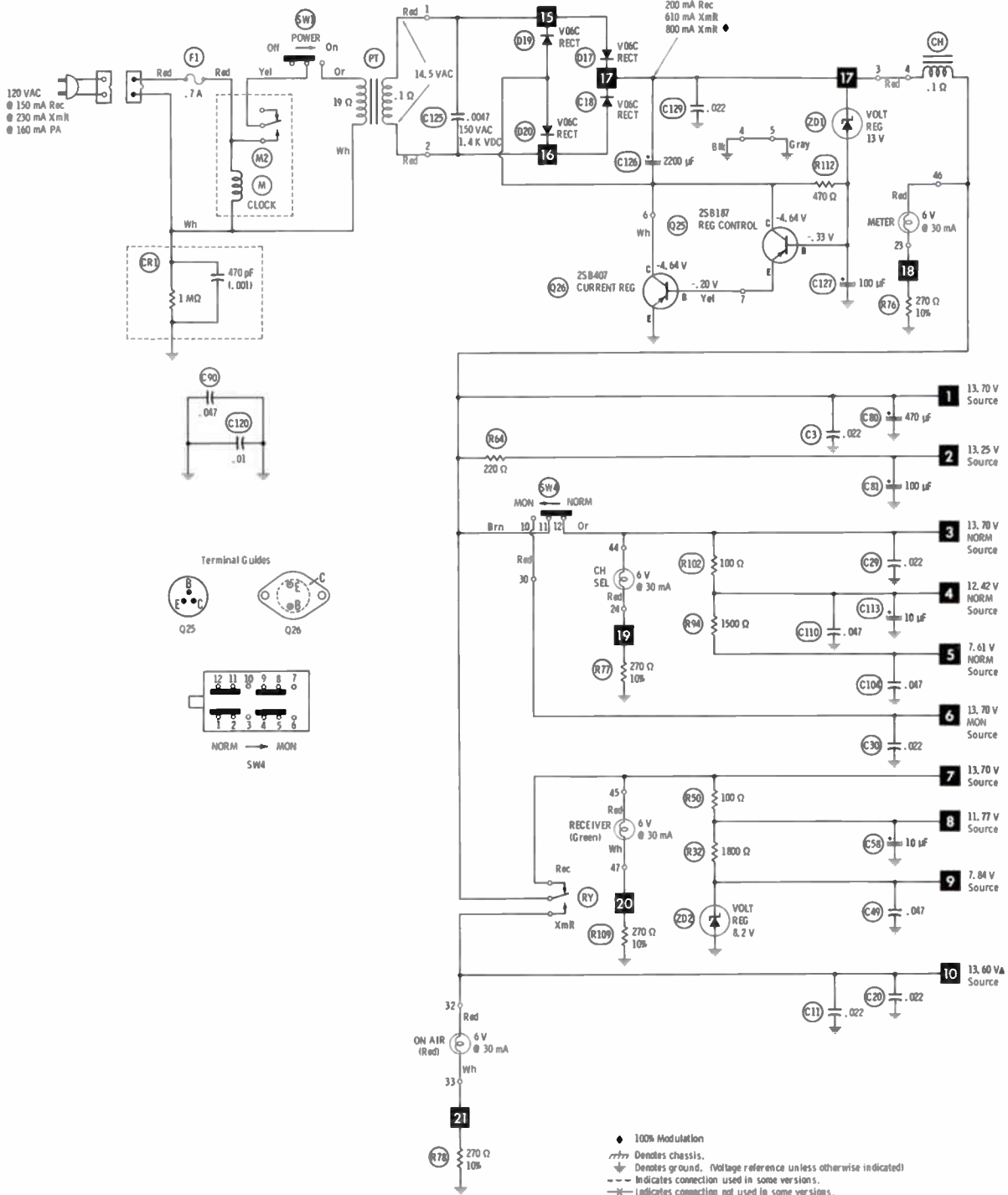
LAFAYETTE MODEL TELSAT 925



CRYSTAL BOARD

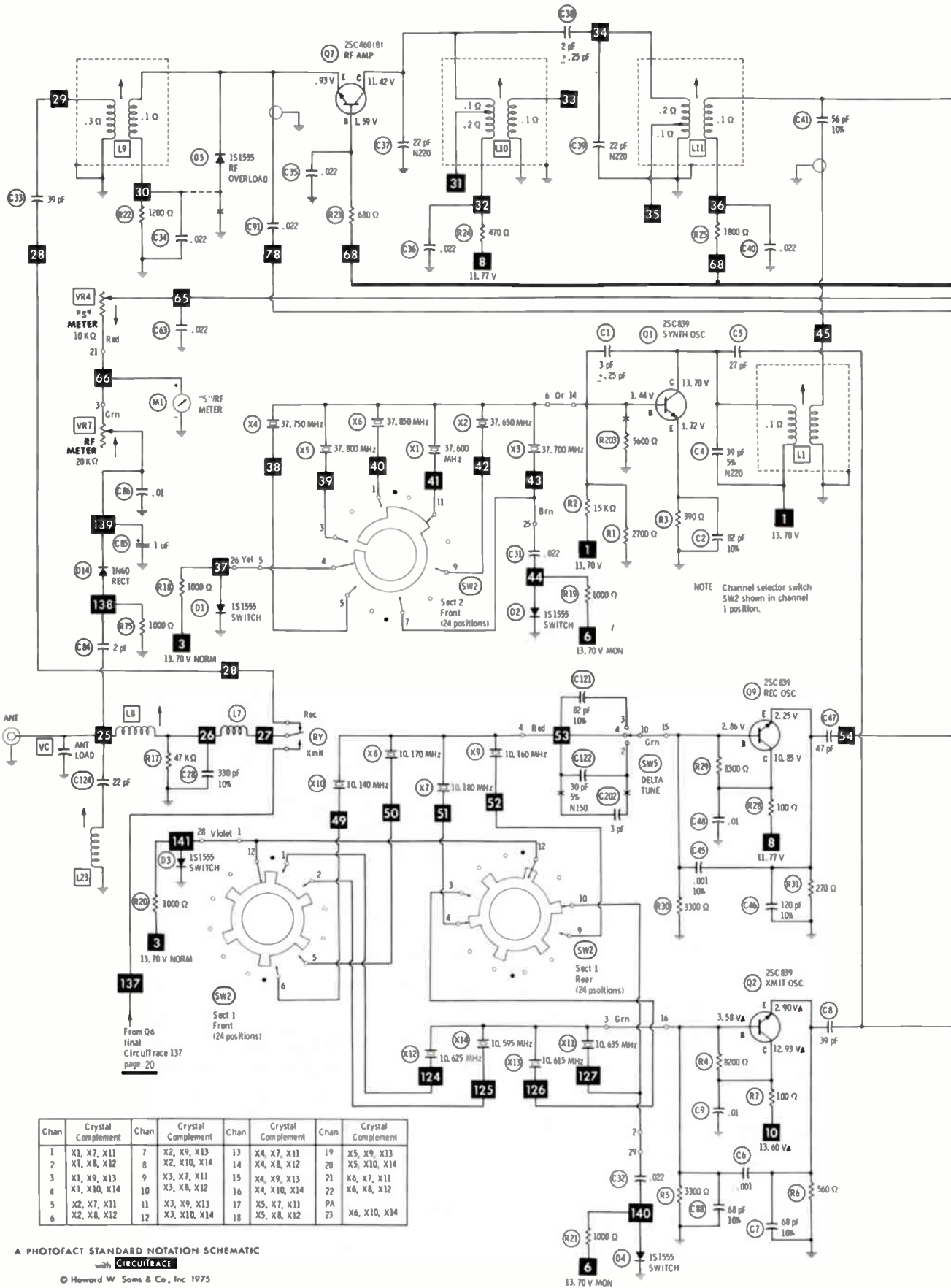


POWER SUPPLY BOARD



- ◆ 100% Modulation
 - ⏏ Denotes chassis.
 - ⏏ Denotes ground. (Voltage reference unless otherwise indicated)
 - - - Indicates connection used in some versions.
 - ⏏ Indicates connection not used in some versions.
 - * Omitted in some versions.
 - ⊗ See parts list.
 - ⊗ Value varies; replace with original value.
 - ▲ Measured in transmit position.
 - Measured with unit squeaked.
 - NC No Connection.
- Measurements taken with switching in position shown unless otherwise indicated.
- Values shown in Γ are used in some applications.
- Resistors are 1/2W or less, 5%, unless otherwise indicated.
- Supply voltage maintained at rated value for measurements.
- Voltage and resistance measured with VTVM or equivalent meter, no signal applied and controls adjusted for normal operation.
- Arrow on control indicates direction of advance.

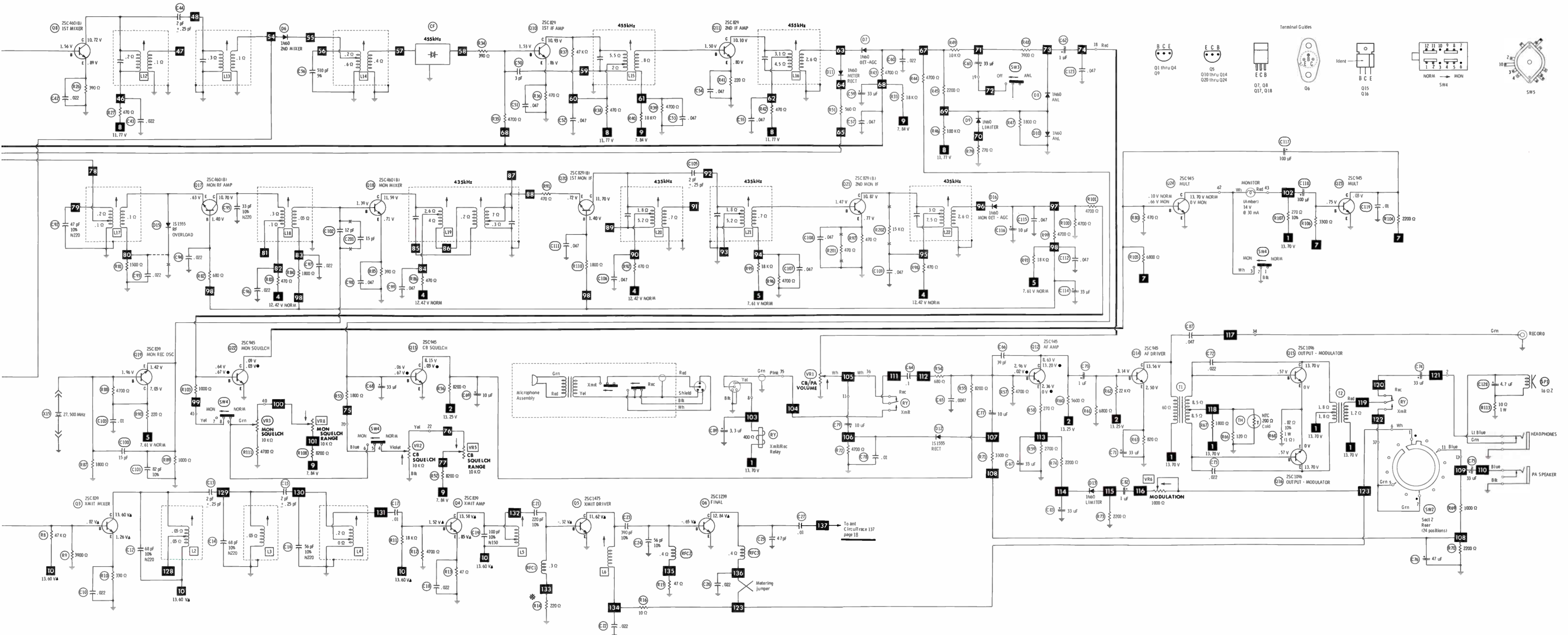
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with **CIRCUITRACE**
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Chan	Crystal Complement	Chan	Crystal Complement	Chan	Crystal Complement	Chan	Crystal Complement
1	X1, X7, X11	7	X2, X9, X13	13	X4, X7, X11	19	X5, X9, X13
2	X1, X8, X12	8	X2, X10, X14	14	X4, X8, X12	20	X5, X10, X14
3	X1, X9, X13	9	X3, X7, X11	15	X4, X9, X13	21	X6, X7, X11
4	X1, X10, X14	10	X3, X8, X12	16	X4, X10, X14	22	X6, X8, X12
5	X2, X7, X11	11	X3, X9, X13	17	X5, X7, X11	PA	
6	X2, X8, X12	12	X3, X10, X14	18	X5, X8, X12	23	X6, X10, X14

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SEE NOTES ON PAGE 17



LAFAYETTE MODEL TELSAT 925

PARTS LIST AND DESCRIPTION

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

WIRING DATA

General-use Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in 12 Colors 8524 (Stranded) Available in 12 Colors
Power Cord, 2-Wire	Use BELDEN No. 17106 (Plastic) or 17126 (Rubber) -6 feet 17109 (Plastic) or 17129 (Rubber) -9 feet
Shielded Antenna Lead	Use BELDEN No. 8214 Lowest-loss (RG-8/U Type) 8237 Low-loss (RG-8/U) 8240 (Solid) Miniature (RG-58/U) 8259 (Stranded) Miniature (RG-58A/U)
Coiled Microphone Cable	Use BELDEN No. 8497 3-Conductor (1 shielded for Press-to-Talk) Neoprene 8491 4-Conductor (2 shielded, 2 unshielded) Neoprene
Ignition Noise Suppression	Use BELDEN No. 7300-Series Spark-Plug Sets
Bonding Strap	Use BELDEN No. 8661 (3/8 inch)

SEMICONDUCTORS (Select replacement transistor for best results)

ITEM No.	TYPE / MFR. No./PART No.	REPLACEMENT DATA						
		GENERAL ELECTRIC PART No.	INTERNATIONAL RECTIFIER PART No.	MALLORY PART No.	MOTOROLA PART No.	RCA PART No.	SPRAGUE PART No.	SYLVANIA PART No.
D1	1S1555/1937-17	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	ECG 177
D2	1S1555/1937-17	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	ECG 177
D3	1S1555/1937-17	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	ECG 177
D4	1S1555/1937-17	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	ECG 177
D5	1S1555/1937-17	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	ECG 177
D6	1N60/1000-17	1N60	1N60	PTC206	HEP135	SK3088		ECG 109
D7	1N60/1000-17	1N60	1N60	PTC206	HEP135	SK3088		ECG 109
D8	1N60/1000-17	1N60	1N60	PTC206	HEP135	SK3088		ECG 109
D9	1N60/1000-17	1N60	1N60	PTC206	HEP135	SK3088		ECG 109
D10	1N60/1000-17	1N60	1N60	PTC206	HEP135	SK3088		ECG 109
D11	1N60/1000-17	1N60	1N60	PTC206	HEP135	SK3088		ECG 109
D12	1S1555/1937-17	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	ECG 177
D13	1N60/1000-17	1N60	1N60	PTC206	HEP135	SK3088		ECG 109
D14	1N60/1000-17	1N60	1N60	PTC206	HEP135	SK3088		ECG 109
D15	1S1555/1937-17	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	ECG 177
D16	1N60/1000-17	1N60	1N60	PTC206	HEP135	SK3088		ECG 109
D17	V06C/1949-17	GE-504A	8D4 or 5A4D	PTC201 or PTC202	HEPR0052	SK3030 or SK3031	RT213 or RT214	ECG 116 or ECG 117
D18	V06C/1949-17	GE-504A	8D4 or 5A4D	PTC201 or PTC202	HEPR0052	SK3030 or SK3031	RT213 or RT214	ECG 116 or ECG 117
D19	V06C/1949-17	GE-504A	8D4 or 5A4D	PTC201 or PTC202	HEPR0052	SK3030 or SK3031	RT213 or RT214	ECG 116 or ECG 117
D20	V06C/1949-17	GE-504A	8D4 or 5A4D	PTC201 or PTC202	HEPR0052	SK3030 or SK3031	RT213 or RT214	ECG 116 or ECG 117
Q1	2SC839/2337-17	GE-17	TR-24	PTC121	HEP728	SK3018	RT107	ECG 107
Q2	2SC839/2337-17	GE-17	TR-24	PTC121	HEP728	SK3018	RT107	ECG 107
Q3	2SC839/2337-17	GE-17	TR-24	PTC121	HEP728	SK3018	RT107	ECG 107
Q4	2SC839/2337-17	GE-17	TR-24	PTC121	HEP728	SK3018	RT107	ECG 107
Q5	2SC1475/2340-17 (3)	GE-45	TR-64	PTC143	HEP243	SK3048		ECG 195
Q6	2SC1239/2167-17 (2)					SK3049		ECG 237
Q7	2SC460(B) / 2SC930(B) / 2214-17 (1)	GE-20	(1R)2SC460(B) TR-51	PTC101 PTC132	HEP720 HEP56	SK3039 SK3018	RT107 RT108	ECG 108 ECG 199
Q8	2SC460(B) / 2SC930(B) / 2214-17 (1)	GE-20	(1R)2SC460(B) TR-51	PTC101 PTC132	HEP720 HEP56	SK3039 SK3018	RT107 RT108	ECG 108 ECG 199
Q9	2SC839/2337-17	GE-17	TR-24	PTC121	HEP728	SK3018	RT107	ECG 107
Q10	2SC829(B)/1925-17	GE-20	(1R)2SC829(B)	PTC132	HEP50	SK3018	RT108	ECG 107
Q11	2SC829(B)/1925-17	GE-20	(1R)2SC829(B)	PTC132	HEP50	SK3018	RT108	ECG 107
Q12	2SC945/2338-17	GE-20	(1R)2SC945	PTC136	HEP728	SK3124	RT102	ECG 123A
Q13	2SC945/2338-17	GE-20	(1R)2SC945	PTC136	HEP728	SK3124	RT102	ECG 123A
Q14	2SC945/2338-17	GE-20	(1R)2SC945	PTC136	HEP728	SK3124	RT102	ECG 123A
Q15	2SC1096/2334-17 (4)	GE-28	TR-55	PTC110	HEP5	SK3054	RT154	ECG 186
Q16	2SC1096/2334-17 (4)	GE-28	TR-55	PTC110	HEP5	SK3054	RT154	ECG 186
Q17	2SC460(B) / 2SC930(B) / 2214-17 (1)	GE-20	(1R)2SC460(B) TR-51	PTC101 PTC132	HEP720 HEP56	SK3039 SK3018	RT107 RT108	ECG 108 ECG 199
Q18	2SC460(B) / 2SC930(B) / 2214-17 (1)	GE-20	(1R)2SC460(B) TR-51	PTC101 PTC132	HEP720 HEP56	SK3039 SK3018	RT107 RT108	ECG 108 ECG 199
Q19	2SC839/2337-17	GE-17	TR-24	PTC121	HEP728	SK3018	RT107	ECG 107
Q20	2SC829(B)/1925-17	GE-20	(1R)2SC829(B)	PTC132	HEP50	SK3018	RT108	ECG 107
Q21	2SC829(B)/1925-17	GE-20	(1R)2SC829(B)	PTC132	HEP50	SK3018	RT108	ECG 107
Q22	2SC945/2338-17	GE-20	(1R)2SC945	PTC136	HEP728	SK3124	RT102	ECG 123A
Q23	2SC945/2338-17	GE-20	(1R)2SC945	PTC136	HEP728	SK3124	RT102	ECG 123A
Q24	2SC945/2338-17	GE-20	(1R)2SC945	PTC136	HEP728	SK3124	RT102	ECG 123A
Q25	2SB187	GE-52	(1R)2SB187	PTC109	HEP632	SK3004	RT121	ECG 102A
Q26	2SB407/2347-17 (5)	GE-25	TR-02	PTC105	HEP232	SK3009	RT124	ECG 121
Z01	RD13E/2006-17	GEZD-12	Z-1212	PTC508	HEP20416	SK3093	RT244	ECG 5022
Z02	13V Zener RFB.2E 8.2V Zener	GE-X11	Z-1208	ZB8.2	HEP20411	SK3059	RT239	ECG 5072

(1) Used in some versions.
(2) Rating 12 Watts @ 4 Amps.
(3) Heat Sink must be used.
(4) Rating 10 Watts @ 2 Amps.
(5) Rating 30 Watts @ 7 Amps.

PARTS LIST AND DESCRIPTION (CONTINUED)

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

ELECTROLYTIC CAPACITORS

ITEM No.	RATING	REPLACEMENT DATA					
		MFR. PART No.	ARCO PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.
C58	10 16V	1043-52	RME-B-E-010	EP15-10	PC10-25	VTT10A25	EV-1222
C59	33 6.3V	1140-52	ME-2-B-035	EP6-25	PC30-25	VTT33A10	EV-1125
C61	33 6.3V	1140-52	ME-2-B-035	EP6-25	PC30-25	VTT33A10	EV-1125
C62	1 50V	1015-52	RME-A-J-001	EP50-1	PC1-50	MTVICB50	EV-1615
C67	33 6.3V	1140-52	ME-2-B-035	EP6-25	PC30-25	VTT33A10	EV-1125
C68	33 6.3V	1140-52	ME-2-B-035	EP6-25	PC30-25	VTT33A10	EV-1125
C69	10 16V	1043-52	RME-B-E-010	EP15-10	PC10-25	VTT10A25	EV-1222
C70	1 50V	1015-52	RME-A-J-001	EP50-1	PC1-50	MTVICB50	EV-1615
C71	33 6.3V	1140-52	ME-2-B-035	EP6-25	PC30-25	VTT33A10	EV-1125
C74	33 16V	1058-52	ME-3-E-035	EP15-25	PC30-25	MTV30CB25	EV-1325
C75	33 16V	1058-52	ME-3-E-035	EP15-25	PC30-25	MTV30CB25	EV-1325
C76	47 16V	1063-52	RME-E-E-050	EP15-50	PC50-16	MTV50CB15	EV-1226
C77	10 16V	1043-52	RME-B-E-010	EP15-10	PC10-25	VTT10A25	EV-1222
C79	10 16V	1043-52	RME-B-E-010	EP15-10	PC10-25	VTT10A25	EV-1222
C80	470 16V	1105-52	RME-L-E-500	EP15-500	PC500-16	MTV500DN15	EV-1250
C81	100 16V	1080-52	RME-E-E-100	EP15-100	PC100-16	MTV100CD15	EV-1230
C82	1 50V	1015-52	RME-A-J-001	EP50-1	PC1-50	MTVICB50	EV-1615
C83	33 10V		ME-3-D-030	EA15-25	WBR35-50	MTA30D15	TVA-1129.92
C85	1 50V	1015-52	RME-A-J-001	EP50-1	PC1-50	MTVICB50	EV-1615
C89	3.3 25V	1026-52	RME-A-H-003	EP30-5	PC5-50	VTT3R3A50	EV-1618
C113	10 16V	1043-52	RME-B-E-010	EP15-10	PC10-25	VTT10A25	EV-1222
C114	33 6.3V	1140-52	ME-2-B-035	EP6-25	PC30-25	VTT33A10	EV-1125
C116	10 16V	1043-52	RME-B-E-010	EP15-10	PC10-25	VTT10A25	EV-1222
C117	100 6.3V	1075-52	RME-E-B-100	EP6-100	PC100-10	MTV100CB6	EV-1030
C118	100 16V	1080-52	RME-E-E-100	EP15-100	PC100-16	MTV100CD15	EV-1230
C126	2200 16V	1120-52	ME-G2000	EA15-2000	WBR2000-16	TC152DC	TVA-1175.3
C127	100 16V	1080-52	RME-E-E-100	EP15-100	PC100-16	MTV100CD15	EV-1230
C128	4.7 25V	1031-52	ME-1-G-005	EA30-5	WBR5-50	MTA5D50	TVA-1203

LAFAYETTE MODEL TELSAT 925

CAPACITORS

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA				
			ARCO/ELMENC0 PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.
C1	3 +.25		CCT0-3R3	DTZ-3R3	NPO3P3	CN0533	10TCC-V33
C2	82 10%		CCT0-820	DTZ-82	NPO82	CN0482	10TCC-Q82
C3	.022		CCD-202	DD-202	GP2000	GP2200	25S-520
C4	39 5% N220		*	*	*	CN0427	10TCC-Q27
C5	.001		CCT0-270	DD-102	GP1000	GP210	25S-510
C6	.001		CCD-102	DD-102	GP1000	GP210	25S-510
C7	68 10%		CCT0-680	DTZ-68	NPO68	CN0468	10TCC-Q68
C8	39		CCT0-390	DTZ-390	NPO39	CN0439	10TCC-Q39
C9	.01		CCD-103	DC-103	GP10000	MAG5011	25S-510
C10	.022		CCD-203	DC-203	GP10000	MAG5012	25S-520
C11	.022		CCD-203	DC-203	GP10000	MAG5012	25S-520
C12	68 10% N220		*	*	*	CN0522	10TCC-Q68
C13	2 +.25		CCT0-2R2	DTZ-2R2	NPO2P2	CN0522	10TCC-V22
C14	68 10% N220		*	*	*	CN0522	10TCC-Q68
C15	2 +.25		CCT0-2R2	DTZ-2R2	NPO2P2	CN0522	10TCC-V22
C16	56 10% N220		*	*	*	CN0522	10TCC-Q56
C17	.01		CCD-103	DC-103	GP10000	MAG5011	25S-510
C18	.022		CCD-203	DC-203	GP10000	MAG5012	25S-520
C19	100 N150 10%		*	*	*	MAG5012	10TCC-Q100
C20	.022		CCD-203	DC-203	GP10000	MAG5012	25S-520
C21	220 10%		CCD-221	DD-221	GP322	GP322	10T5-T22
C22	.022		CCD-203	DC-203	GP390	GP390	10T5-T39
C23	390 10%		CCD-391	DD-391	GP390	GP390	10T5-T39
C24	56 10%		CCT0-560	DTZ-560	NPO47	CN0456	10TCC-Q56
C25	47		CCT0-470	DTZ-47	NPO47	CN0447	10TCC-Q47
C26	.022		CCD-203	DC-203	GP10000	MAG5012	25S-520
C27	.01		CCD-103	DC-103	GP10000	MAG5011	25S-510
C28	33 10%		CCT0-330	DTZ-33	NPO33	CN0433	10TCC-Q33
C29	.022		CCD-203	DC-203	GP10000	MAG5012	25S-520
C30							

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	Synth. Osc. (37MHz)	2728-23	R2753N2J		
L2	Xmit. Mixer (27MHz)	2729-23	R2763N2J		
L3	Xmit. Mixer (27MHz)	2729-23	R2763N2J		
L4	Xmit. Bandpass (27MHz)	2730-23	R2783N2J		
L5	Xmit. Amp (27MHz)	2225-23			
L6	Xmit. Driver (27MHz)	2724-23			
L7	Final (27MHz)	2227-23			
L8	PI Network (27MHz)	2725-23			
L9	Rec. Ant (27MHz)	2721-23	ETR1943N2E		
L10	Rec. RF Amp (27MHz)	2731-23	ETR2613N2J		
L11	Rec. RF Amp (27MHz)	2731-23	ETR2613N2J		
L12	1st Mixer (10MHz)	2732-23			
L13	1st Mixer (10MHz)	2732-23			
L14	2nd Mixer (455kHz)	2197-24			
L15	Input IF (455kHz)	1943-24	ETI-17393F		
L16	Output IF (455kHz)	1944-24	ETI-18392X		
L17	Monitor Ant (27MHz)	2733-23	ETR2603N3E		
L18	Monitor RF (27MHz)	2731-23	ETR2613N2J		
L19	Monitor Mixer (435kHz)	2003-24	ETI-573N25		
L20	Mon Input IF (435kHz)	1943-24	ETI-17393F		
L21	Mon Interstage IF (435kHz)	1943-24	ETI-17393F		
L22	Mon Output IF (435kHz)	1944-24	ETI-18392X		
L23	TVI Trap (54MHz)	2216-23			
RFC1	RF Choke	2342-23			
RFC2	RF Choke	2342-23			
RFC3	RF Choke	2342-23			

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000~)	MFGR. PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
CH	800mA	.1	.21mH	1090-15 (ELA-2)				

TRANSFORMER (Power)

ITEM No.	RATING		REPLACEMENT DATA				NOTES
	PRI.	SEC. 1	MFGR. PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
PT	120V AC @ 230mA AC	14.5V AC @ 800mA DC	1808-15 (ETP53L)				

TRANSFORMER (Driver)

ITEM No.	TURNS RATIO			REPLACEMENT DATA				NOTES
	PRI.	SEC. 1	SEC. 2	MFGR. PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD Part No.	
T1	2	1		1805-15 (ETA-41)				

TRANSFORMER (Audio Output)

ITEM No.	IMPEDANCE		REPLACEMENT DATA				NOTES
	PRI.	SEC.	MFGR. PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
T2	36	16	1806-15 (ETA-42)				

LAFAYETTE MODEL TELSAT 925

PARTS LIST AND DESCRIPTION (CONTINUED)

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

SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		MFR. PART No.	QUAM PART No.	
SP1	2" X 4" PM, 16 Ohms	1298-36 (9D755)		

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	.7A Quick-Acting	3914-20	1417-19	AGC3/4	HKP	312.750	342001AC	

MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
CF	Filter	1361-35	Ceramic (455kHz)
M1	Meter	1203-27	"S"/RF
RY	Relay	1067-37	Xmit/Rec
SW1	Switch	2008-14	Power
SW2	Switch	2035-14	Channel Selector
SW3	Switch	2033-14	Noise Limiter
SW4	Switch	2034-14	Normal/Mon
SW5	Switch	2032-14	Delta Tune
X1	Crystal	1362-35	37.600MHz
X2	Crystal	1363-35	37.650MHz
X3	Crystal	1364-35	37.700MHz
X4	Crystal	1365-35	37.750MHz
X5	Crystal	1366-35	37.800MHz
X6	Crystal	1367-35	37.850MHz
X7	Crystal	1372-35	10.180MHz
X8	Crystal	1373-35	10.170MHz
X9	Crystal	1374-35	10.160MHz
X10	Crystal	1375-35	10.140MHz
X11	Crystal	1368-35	10.635MHz
X12	Crystal	1369-35	10.625MHz
X13	Crystal	1370-35	10.615MHz
X14	Crystal	1371-35	10.595MHz
X15	Crystal	1357-35	27.500MHz
	Board	1711-16	PC Main (Board Only)
	Board	1712-16	PC Power (Board Only)
	Board	1705-16	PC Crystal (Board Only)

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

ITEM	PART No.	ITEM	PART No.
Escutcheon Assembly	1741-80	Disc, Channel	1963-18
Cabinet Assembly	1742-80	Knob, Channel	1964-18
Chassis	1743-80	Knob, Squelch, Volume, Delta Tune	1962-18
Rear Panel	1744-80	Microphone Holder	6897-10
Push Buttons	1961-18		

ACCESSORIES

ITEM	MFR. PART No.	REMARKS
Microphone	1091-34	
AC Power Cord	1287-38	



For Supplier Address See PHOTOFACT Index

NOTE

ONLY THOSE PERSONS PROPERLY LICENSED ARE PERMITTED TO MAKE REPAIRS OR ADJUSTMENTS WHICH MAY RESULT IN ILLEGAL OPERATION. (REFER TO FCC RULES AND REGULATIONS PART 95, SUBPARTS 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 13-724B

ALIGNMENT INSTRUCTIONS

Suggested Alignment Tools:

R-C, IFT-A, IFT-B, IFT-C GC ELECTRONICS: 5000, 8290

A-C, O-C, T-C, X-C, LD-C 9440

MIDLAND MODEL 13-724B

RECEIVER

Connect an AC VTVM or AF Wattmeter across speaker voice coil.

Adjustments are made with 12 volt DC input.

Adjust volume control to obtain suitable reading.

SIGNAL GENERATOR	GEN FREQ	CHANNEL	ADJUST	REMARKS
High side thru a .01uF capacitor to collector of TR2, low side to ground.	Set to 455Hz, 1000Hz @ 30% Modulation Output 10uV.	Any	IFT-A, IFT-B, IFT-C	Adjust for maximum.
High side thru a .01uF capacitor to antenna, low side to ground.	Set to 27.085MHz, 1000Hz @ 30% Modulation Output 1uV.	11	A-C, R-C, O-C	Adjust for maximum.

RECEIVER ADJUSTMENTS

SIGNAL GENERATOR	GEN FREQ	CHANNEL	ADJUST	REMARKS
AGC High side thru a .01uF capacitor antenna jack, low side to ground.	Set to 27.085MHz, 1000Hz @ 30% Modulation Output 5000uV.	11	VR1	Adjust volume control to obtain 00dB. Decrease generator to 50uV. Adjust so that signal does not drop more than 10dB.

TRANSMITTER

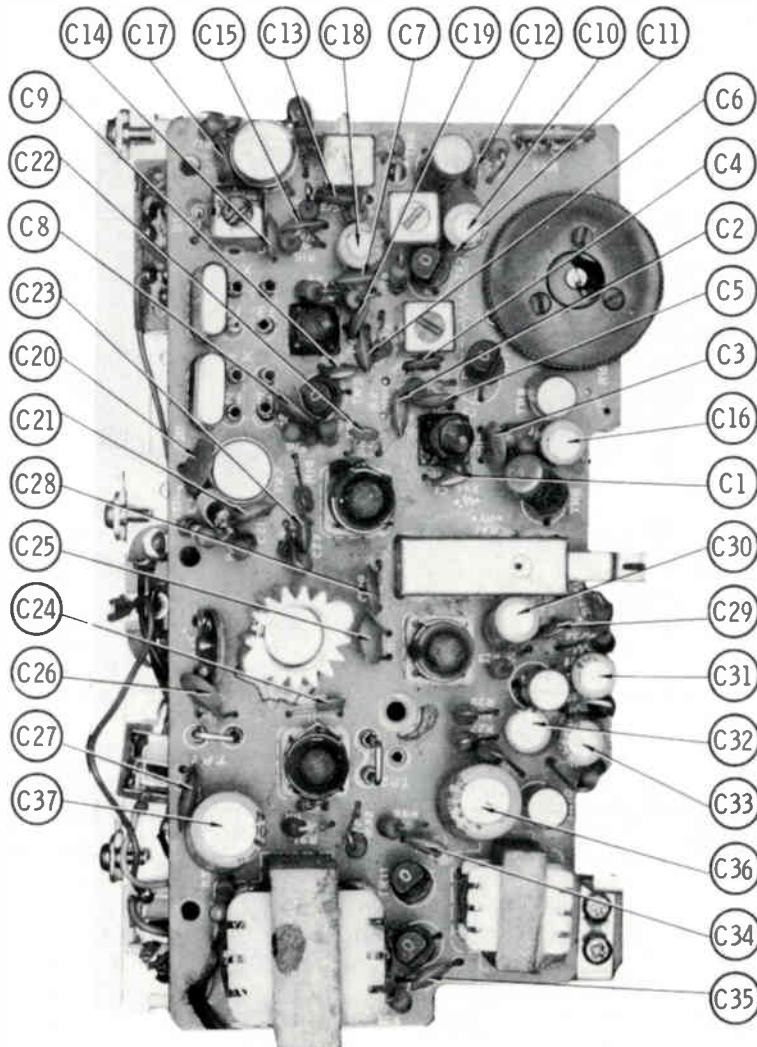
Connect an RF Wattmeter or 50 ohm 25 watt dummy load to antenna connector.
Adjustments are made with 12 volt DC input.

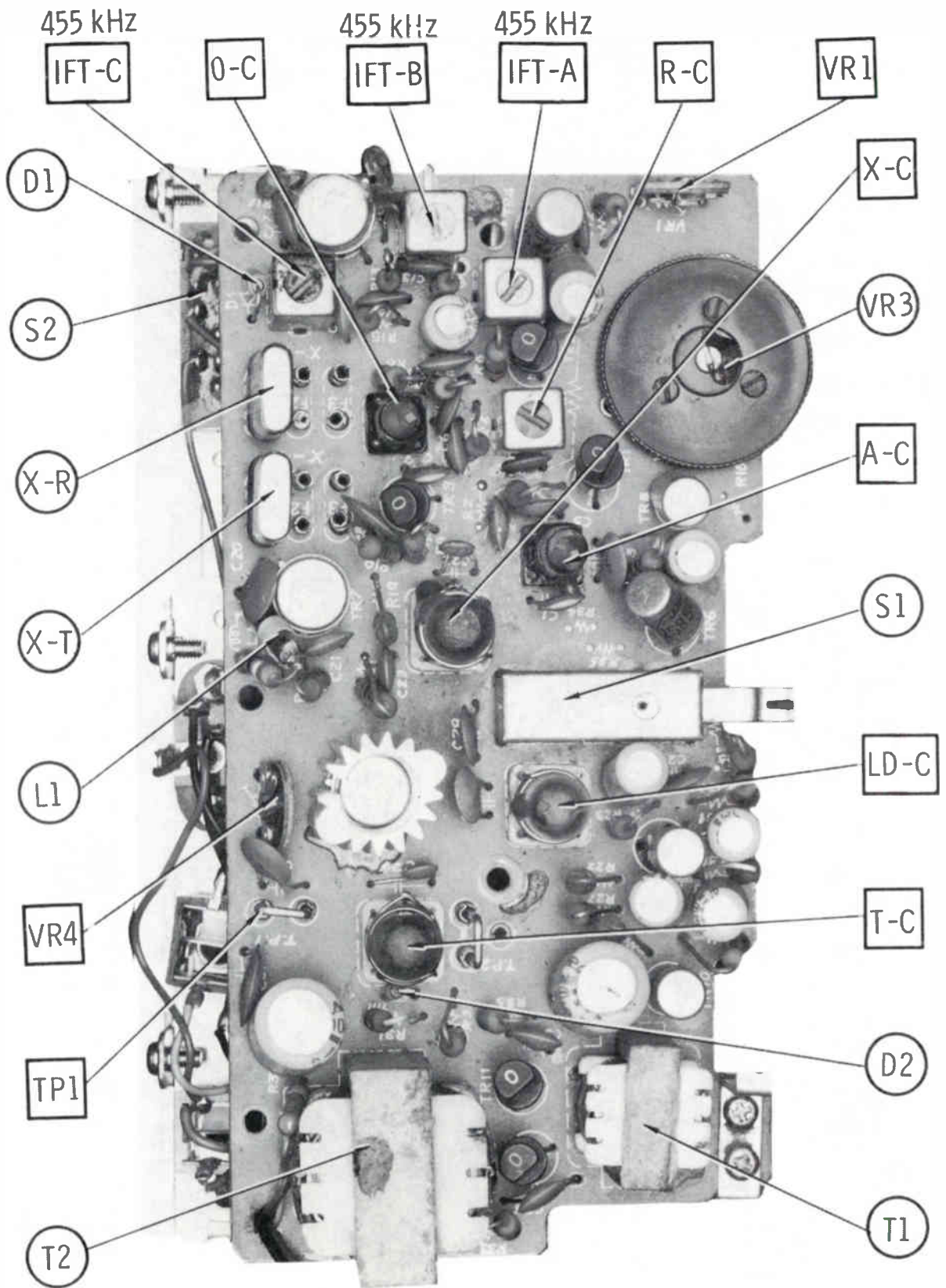
AM

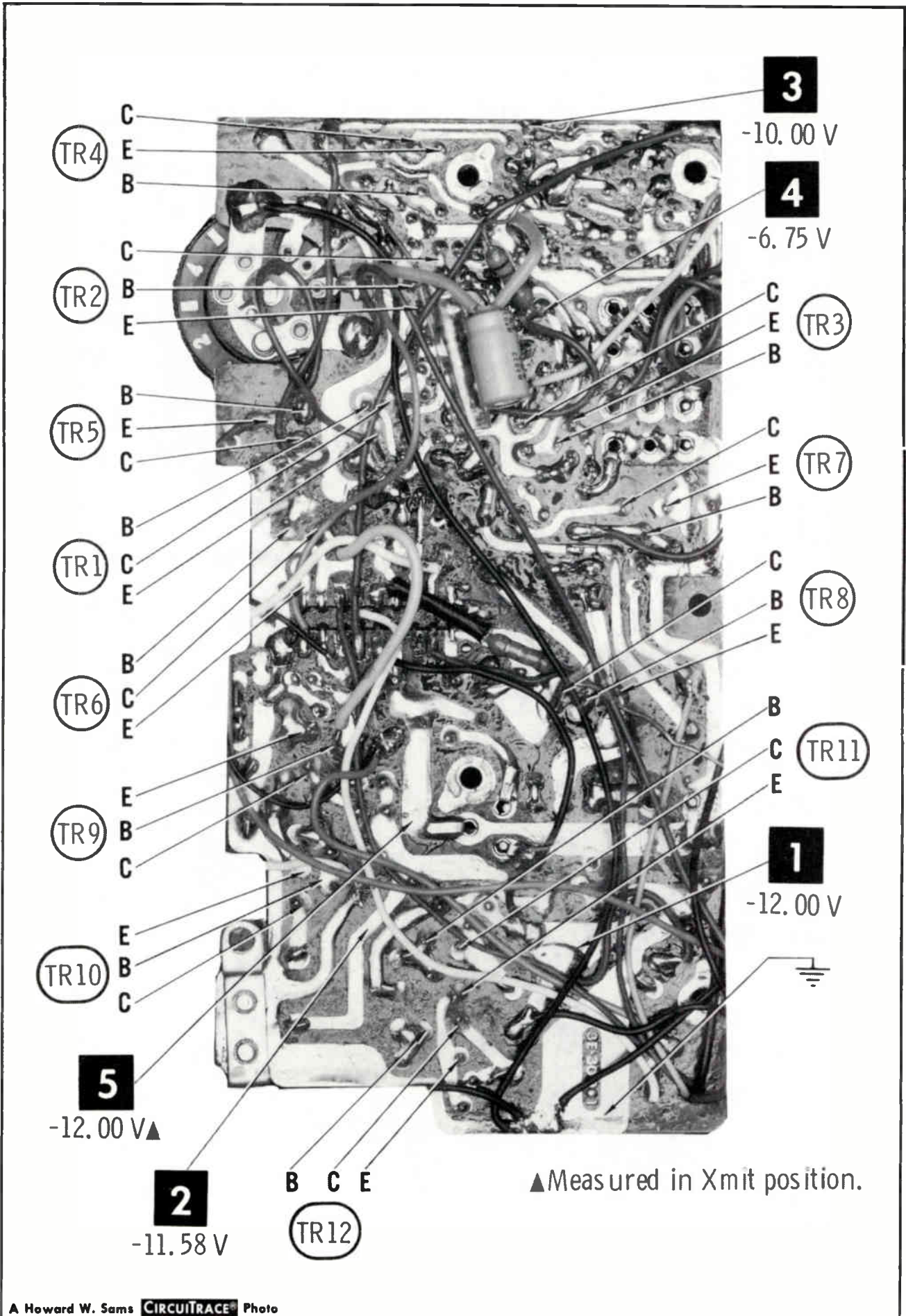
INDICATOR	ADJUST	REMARKS
OSC., FINAL AM RF Wattmeter or dummy load and RF VTVM.	X-C, T-C, LD-C	Connect wattmeter to antenna connector. Mode switch to AM. Channel Selector to Ch. 11. Key transmitter. Adjust for maximum.
FINAL INPUT POWER 0 - 500mA DC Milliammeter.	X-C	Insert meter between T-C and Source 5 (TP1). Key transmitter. Adjust for no more than 2 watts DC Input.

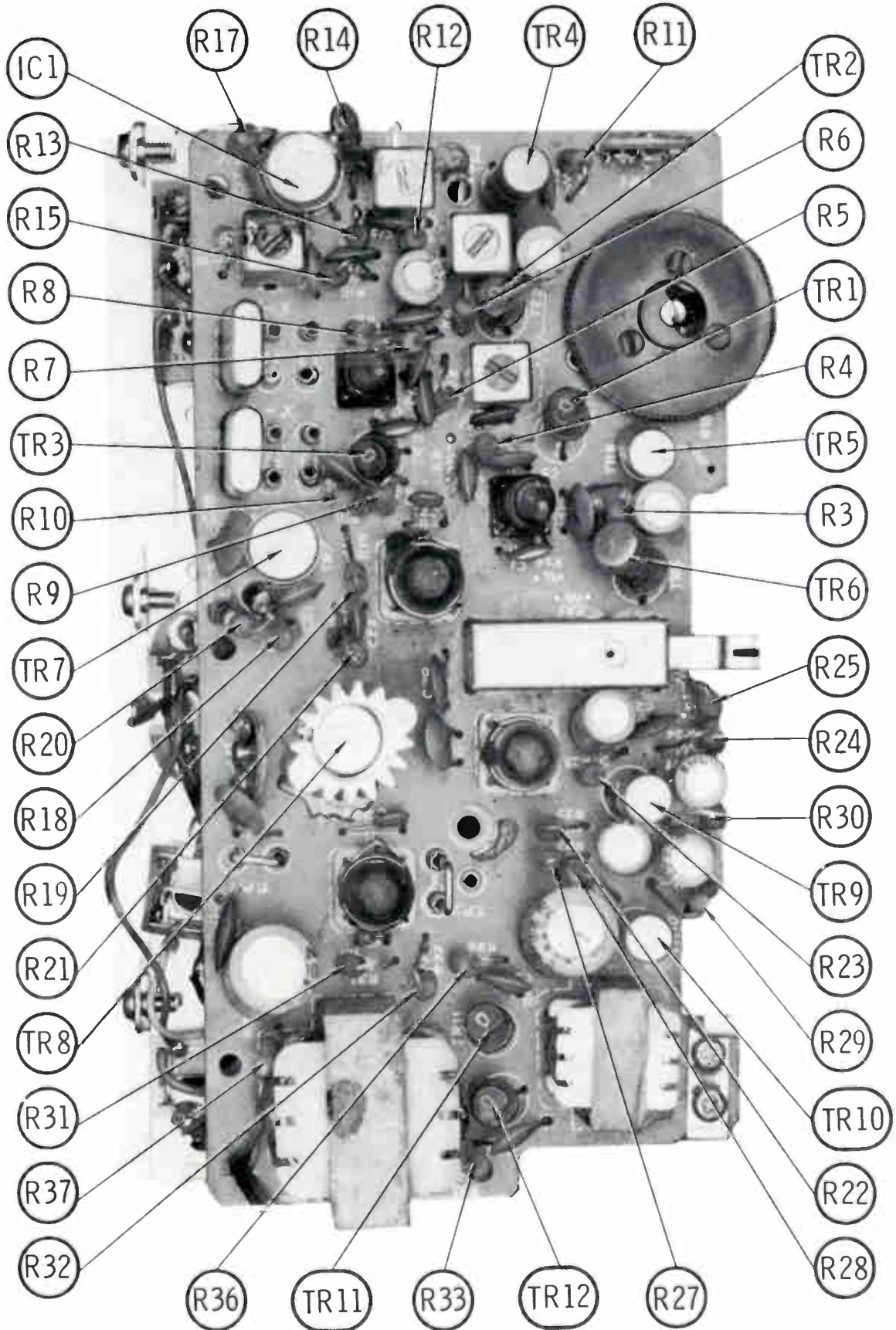
TRANSMITTER ADJUSTMENTS

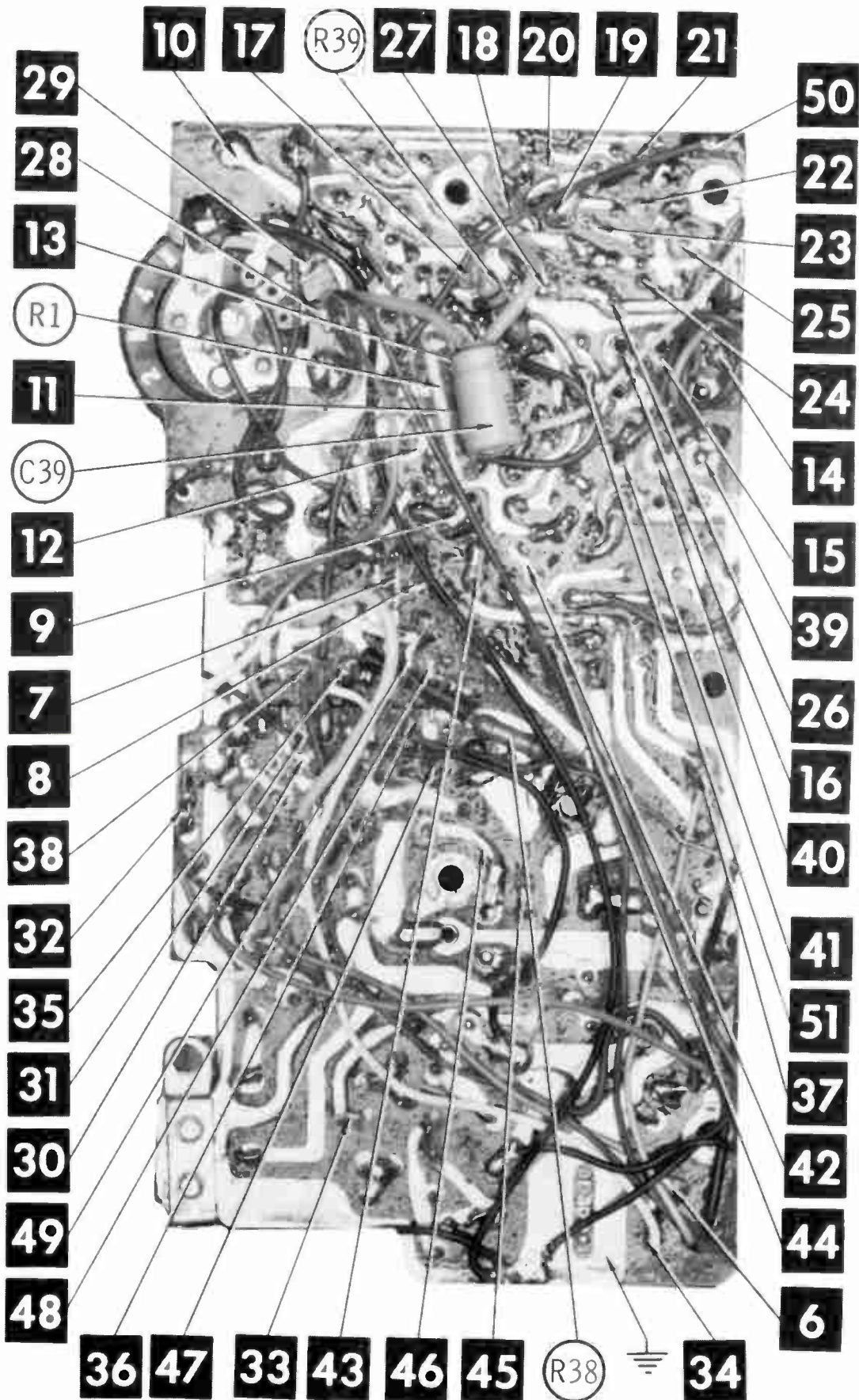
INDICATOR	ADJUST	REMARKS
MODULATION Modulator Meter.	VR4	Connect audio generator to microphone input. Inject a 1000Hz signal. Key transmitter. Adjust for 100% modulation maximum.











PARTS LIST AND DESCRIPTION

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

WIRING DATA

General-use Hook-up Wire	Use 8ELOEN No. 8530 (Solid) Available in 12 Colors 8524 (Stranded) Available in 12 Colors
Shielded Antenna Lead	Use 8ELDEN No. 8214 Lowest-Loss (RG-8/U Type) 8237 Low-loss (RG-8/U) 8240 (Solid) Miniature (RG-58/U) 8259 (Stranded) Miniature (RG-58A/U)
Coiled Microphone Cable	Use 8ELDEN No. 8499 Single-Conductor Shielded (Neoprene)
Ignition Noise Suppression	Use 8ELOEN No. 7300-Series Spark-Plug Sets
Bonding Strap	Use 8ELDEN No. 8661 (3/8 In.)

SEMICONDUCTORS (Select replacement transistor for best results)

ITEM No.	TYPE / MFG. No. / PART No.	REPLACEMENT DATA						
		GENERAL ELECTRIC PART No.	INTERNATIONAL RECTIFIER PART No.	MALLORY PART No.	MOTOROLA PART No.	RCA PART No.	SPRAGUE PART No.	SYLVANIA PART No.
D1	1N60	1N60	1N60	PTC206	HEP135	SK3088		ECG 109
D2	M8513A	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	ECG 177
IC1	TA7045M							ECG 724
TR1	2SA495(O)	GE-21	TR-30	PTC103	HEP52	SK3114	RT115	ECG 159
TR2	2SA945(O)	GE-21	TR-30	PTC103	HEP52	SK3114	RT115	ECG 159
TR3	2SA495(O)	GE-21	TR-30	PTC103	HEP52	SK3114	RT115	ECG 159
TR4	2SA49	GE-2	TR-12	PTC109	HEP639	SK3008		ECG 126
TR5	2S854(F)	GE-50	TR-85	PTC107	HEP632	SK3004	RT121	ECG 102A
TR6	2S854(F)	GE-50	TR-85	PTC107	HEP632	SK3004	RT121	ECG 102A
TR7	25C482(Y)	GE-45	TR-65		HEP75	SK3048		ECG 195
TR8	25C481	GE-45	TR-65		HEP53001	SK3047		ECG 195
TR9	2S854(F)	GE-50	TR-85	PTC107	HEP632	SK3004	RT121	ECG 102A
TR10	2S854(F)	GE-50	TR-85	PTC107	HEP632	SK3004	RT121	ECG 102A
TR11	2SA562(O)	GE-21	TR-54	PTC103	HEP715	SK3114	RT115	ECG 159
TR12	2SA562(O)	GE-21	TR-54	PTC103	HEP715	SK3114	RT115	ECG 159

MIDLAND MODEL 13-7248

ELECTROLYTIC CAPACITORS

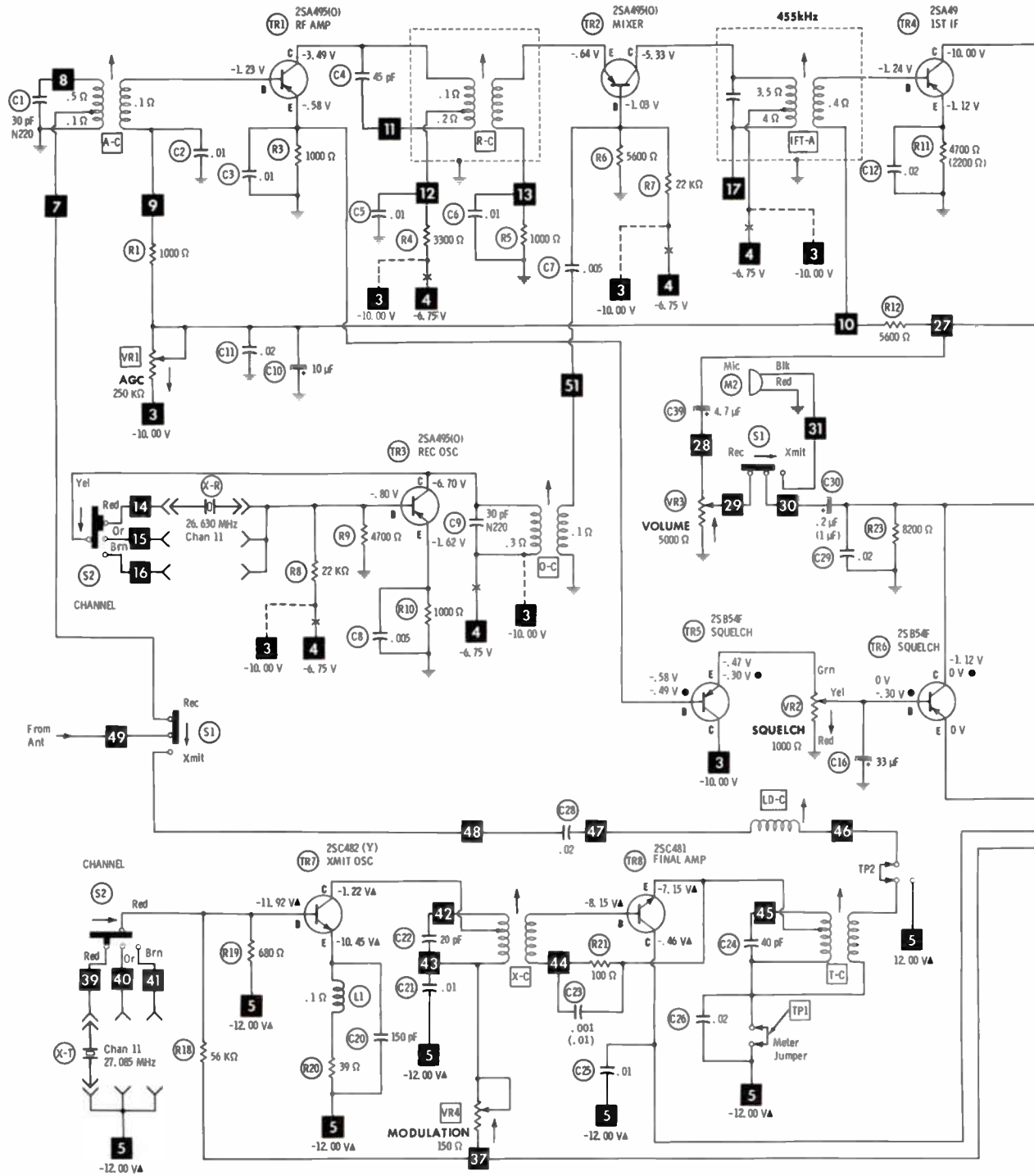
ITEM No.	RATING	REPLACEMENT DATA					
		MFG. PART No.	ARCO PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.
C10	10 6.3V		RME-A-8-010	EP6-10	PC10-25	VTT10A25	EV-1222
C16	33 6.3V		ME-2-8-035	EP6-25	PC30-25	VTT33A10	EV-1125
C18	33 6.3V		ME-2-8-035	EP6-25	PC30-25	VTT33A10	EV-1125
C30	.2 10V					TDC224M050EL	SD35-R229
C31	33 6.3V		ME-2-8-035	EP6-25	PC30-25	VTT33A10	EV-1125
C32	4.7 6.3V		RME-A-D-005	EP6-5	PC5-50	VTT4R7A50	EV-1319
C33	33 6.3V		ME-2-8-035	EP6-25	PC30-25	VTT33A10	EV-1125
C36	100 16V		RME-E-E-100	EP15-100	PC100-16	MTV100CD15	EV-1230
C37	100 16V		RME-E-E-100	EP15-100	PC100-16	MTV100CD15	EV-1230
C39	4.7 16V		RME-A-E-005	EP15-5	PC5-50	VTT4R7A50	EV-1319

CAPACITORS

ITEM No.	RATING	MFG. PART No.	REPLACEMENT DATA					
			ARCO/ELMenco PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1	30 N220		*					10TCR-Q30
C2	.01		CCD-103	DD-103	GP10000	JF110		10TS-S10
C3	.01		CCD-103	DD-103	GP10000	JF110		10TS-S10
C4	45							
C5	.01		CCD-103	DD-103	GP10000	JF110		10TS-S10
C6	.01		CCD-103	DD-103	GP10000	JF110		10TS-S10
C7	.005		CCD-502	DD-502	GP5000	JF250		10TS-D50
C8	.005		CCD-502	DD-502	GP5000	JF250		10TS-D50
C9	30 N220		*					10TCR-Q30
C11	.02		CCD-203	DD-203		GP120		10TS-S20
C12	.02		CCD-203	DD-203		GP120		10TS-S20
C13	.02		CCD-203	DD-203		GP120		10TS-S20
C14	.01		CCD-103	DD-103	GP10000	JF110		10TS-S10
C15	.01		CCD-103	DD-103	GP10000	JF110		10TS-S10
C17	.02		CCD-203	DD-203		GP120		10TS-S20
C19	.02		CCD-203	DD-203		GP120		10TS-S20
C20	150		CCD-151	DD-151	GP150	GP315		10TS-T15
C21	.01		CCD-103	DD-103	GP10000	JF110		10TS-S10
C22	20		CCD-203	DD-203		GP120		10TS-S20
C23	.001		CCD-102	DD-102	GP1000	GP210		10TS-D10
C24	40					CN0439		10TCC-Q39
C25	.01		CCD-103	DD-103	GP10000	JF110		10TS-S10
C26	.02		CCD-203	DD-203		GP120		10TS-S20
C27	.04			DD-403		GP140		
C28	.02		CCD-203	DD-203		GP120		10TS-S20
C29	.02		CCD-203	DD-203		GP120		10TS-S20
C34	.01		CCD-103	DD-103	GP10000	JF110		10TS-S10
C35	.01		CCD-103	DD-103	GP10000	JF110		10TS-S10

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

(CONTINUED ON PAGE 36)

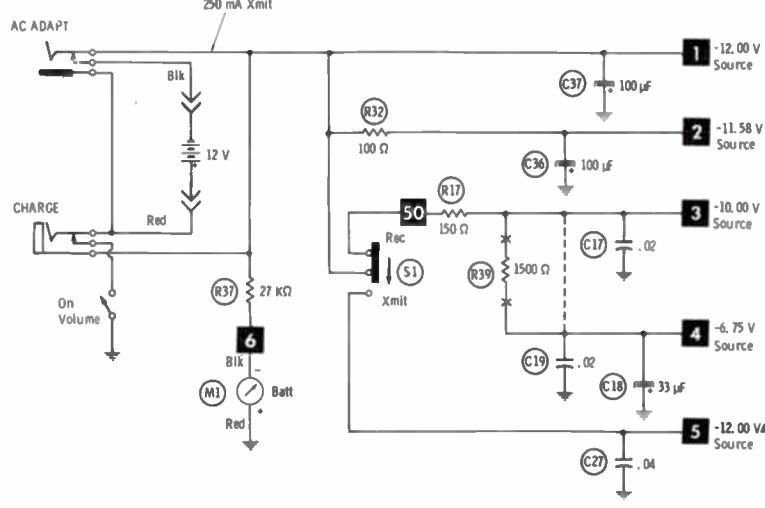
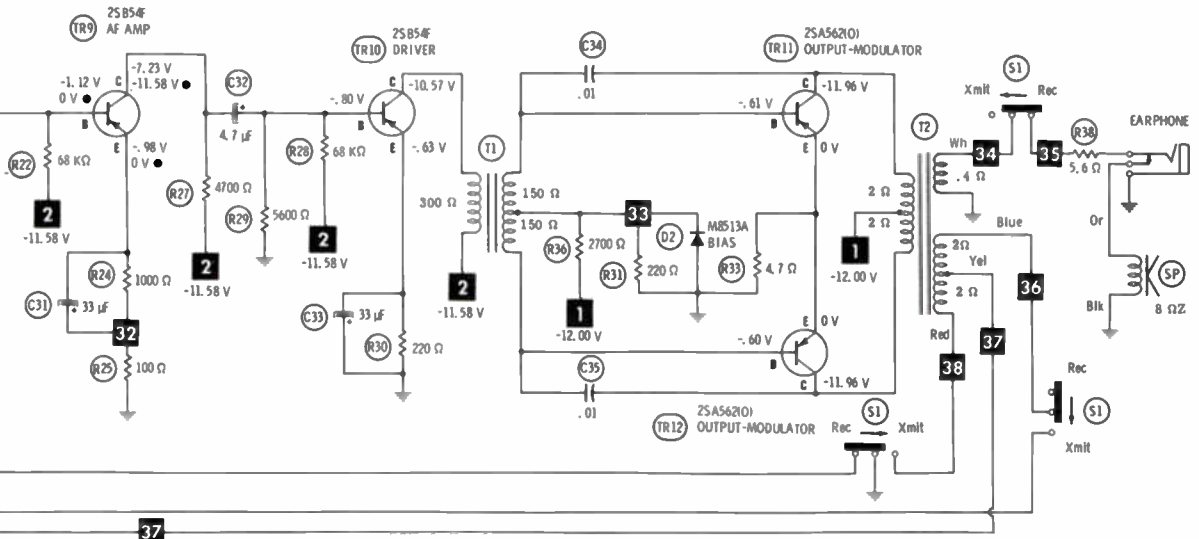
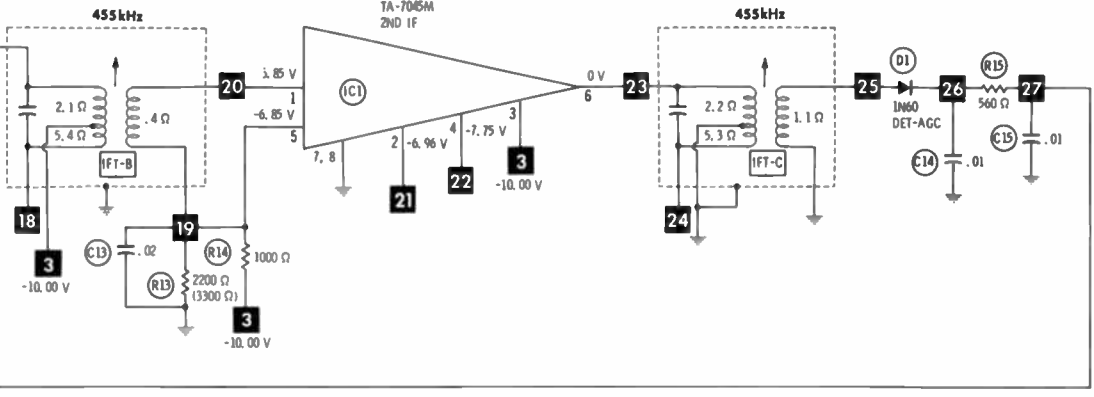


Measurements taken with switching in position shown unless otherwise indicated.
 Values shown in () are used in some applications.
 Resistors are 1/2W or less, 10% or 20%, unless otherwise indicated.
 Supply voltage maintained at rated value for measurements.
 Voltage and resistance measured with VTVM or equivalent meter, no signal applied and controls adjusted for normal operation.
 Arrow on control indicates direction of advance.
 Numbers assigned to terminals may not be found on the unit.
 Transistor resistances vary widely; no resistance measurements taken.
 Resistors are 1/2W or less, 5%, unless otherwise indicated.

A PHOTOFACIT STANDARD NOTATION SCHEMATIC
 with **CIRCUITRACE**

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- Denotes chassis.
- ⊥ Denotes ground. (Voltage reference unless otherwise indicated)
- - - Indicates connection used in some versions.
- Indicates connection not used in some versions.
- * Omitted in some versions.
- ⊙ See parts list.
- ⊛ Value varies; replace with original value.
- ▲ Measured in transmit position.
- Measured with unit squelched.
- NC No Connection.



Terminal Guides



TR1, TR2, TR3, TR11, TR12



TR4, TR5, TR6, TR9, TR10



TR7, TR8



IC1

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	RESIST-ANCE	REPLACEMENT DATA				
			MFGR. PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.
VR1	AGC	250K					
VR2	Squelch	1000					
VR3	Volume/Switch	5000		B16-214 (20)			
VR4	Modulation	150					

(20) Use original knob.

COILS (RF-IF)

ITEM No.	FUNCTION	REPLACEMENT DATA			REMARKS
		PART No.	OTHER IDENTIFICATION	MILLER PART No.	
A-C	Rec. Ant (27MHz)				
IFT-A	Mixer (455kHz)		2E-16002		
IFT-B	Input IF (455kHz)		2E-16003		
IFT-C	Output IF (455kHz)		2E-16004		
L1	RF Choke (1uH)				
LD-C	Xmit. Ant (27MHz)				
O-C	Rec. Osc (27MHz)				
R-C	Rec. RF (27MHz)		2E-16008		
T-C	Final (27MHz)				
X-C	Xmit. Osc (27MHz)				

TRANSFORMER (Driver)

ITEM No.	TURNS RATIO			REPLACEMENT DATA				NOTES
				MFGR. PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD Part No.	
	PRI.	SEC. 1	SEC. 2					
T1	1	1						

TRANSFORMER (Audio Output)

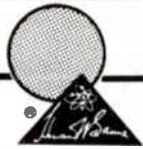
ITEM No.	IMPEDANCE		REPLACEMENT DATA				NOTES
			MFGR. PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
	PRI.	SEC.					
T2	128	8					

SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		MFGR. PART No.	QUAM PART No.	
SP	2-1/4" PM, 8 Ohms			

MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
M1	Meter		Battery
S1	Switch		Xmit/Rec
S2	Switch		Channel Selector
X-R	Crystal		26.630MHz Rec
X-T	Crystal		27.085MHz Xmit



PHOTOFACT[®] with

CIRCUITRACE[®]

For Supplier Address See PHOTOFACT Index

NOTE

ONLY THOSE PERSONS PROPERLY LICENSED ARE PERMITTED TO MAKE REPAIRS OR ADJUSTMENTS WHICH MAY RESULT IN ILLEGAL OPERATION. (REFER TO FCC RULES AND REGULATIONS PART 95, SUBPARTS 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 13-898

ALIGNMENT INSTRUCTIONS

Suggested Alignment Tools:

L1, L2, L101, L104, L105, L108, L109	GC ELECTRONICS: 9300
L116, L119, L120, L121, L123, MF	8290, 5000
L102, L103, L106, L107, L110, L111, L112, L113, L114, L115, L117, L118, L122, L124, L125	9440
TC1, TC101 thru TC117	8290

MIDLAND MODEL 13-898

SYNTHESIZER

INDICATOR	CHANNEL	ADJUST	FREQUENCY	REMARKS
Frequency Counter DC VTVM	1	TC101	23.330MHz	Connect counter to TP20 and ground. Set mode switch to AM. Set Fine Tune to center scale. Connect VTVM to TP201. Select Channel 13. Key transmitter. Adjust L101 for maximum.
	5	TC102	23.380MHz	
	9	TC103	23.430MHz	
	13	TC104	23.480MHz	
	17	TC105	23.530MHz	
	21	TC106	23.580MHz	
	1	TC107	14.910MHz	Connect counter to TP-103 and ground. Set mode switch to AM. Set Fine Tune to center scale. Connect VTVM to TP-103. Select Channel 1. Key transmitter. Adjust L102 2 turns counterclockwise from peak reading.
	2	TC108	14.920MHz	
	3	TC109	14.930MHz	
	4	TC110	14.950MHz	
	1	TC111	14.907MHz	Connect counter to TP-104 and ground. Set mode switch to LSB. Set Fine Tune to center scale. Connect VTVM to TP-104. Select Channel 1. Key transmitter. Adjust L103 2 turns counterclockwise from peak reading.
	2	TC112	14.917MHz	
3	TC113	14.927MHz		
4	TC114	14.947MHz		

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

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RECEIVER

Connect an AC VTVM or AF Wattmeter across speaker voice coil.
Adjustments are made with 14-volt DC input, and if used, 120-volt AC input to power supply.
Adjust volume control to obtain suitable reading.

SIGNAL GENERATOR	CHANNEL	GEN FREQ	ADJUST	REMARKS
High side thru a .01uF capacitor to antenna jack, low side to ground.	13	Set to 27.114MHz, @ 0% Mod. Output 10uV.	L117	Set mode switch to LSB. Set ANL/Blanker switch to ANL. Set squelch fully counterclockwise. Set Fine Tune for 1KHz beat. Adjust for maximum.
	Any		L125	Set mode switch to AM. Connect DC VTVM to TP121 and ground. Adjust for maximum, then 1/8 turn clockwise.
High side thru a .01uF capacitor to antenna jack, low side to ground.	13	Set to 27.115MHz, 1000Hz @ 30% mod. Output 1 uV.	L113,L114, L115,L116, L118,MF, L119,L120 L121	Set ANL/Blanker to ANL. Set Fine Tune to center. Set squelch control fully counterclockwise. Set RF gain control fully clockwise. Adjust for maximum.

RECEIVER ADJUSTMENTS

SIGNAL GENERATOR	CHANNEL	GEN FREQ	ADJUST	REMARKS
AGC High side thru a .01uF capacitor to antenna jack, low side to ground.	13	Set to 27.115MHz, 1000Hz @ 30% Mod. Output 3.2 uV.	RV304	Connect a DC VTVM between RV304 arm and ground. Adjust for 1.2V. Read voltage on voice coil VTVM. Increase generator output to 100mV. Adjust for a 10dB increase in voltage across voice coil.
			RV303	
SQUELCH RANGE High side thru a .01uF capacitor to antenna jack.	13	Set to 27.115MHz, 1000Hz @ 30% Mod. Output 10,000uV.	RV306 (SSB)	Set squelch control fully clockwise. Adjust so that squelch just breaks.
NOISE BLANKER High side thru a .01uF capacitor to antenna connector, low side to ground.	CH1	Set to 26.965MHz, 25MHz Mod 0. Mod.	L122 TC119	Connect a DC VTVM to TP120 and ground. Increase output until a -VDC is obtained. Adjust for MINIMUM.
			L123 L124	Same as above Adjust for maximum.
NOISE BLANKER Square wave generator or noise generator	CH1	Adjust amplitude for readable pulses on oscilloscope.	TC119, L123, L124	Connect oscilloscope to TP120. Adjust for maximum pulses.
			TC119,TC118 L123,L124	Connect oscilloscope to speaker voice coil. Adjust for MINIMUM pulses.
DELTA TUNE RANGE High side thru a .01uF capacitor to antenna jack low side to ground.	13	Set to 27.115MHz 1000Hz,30% Mod. 5uV.	VC2	Center dot on Fine Tune control and adjust for maximum deflection on "S" meter.
"S" METER High side thru a .01uF capacitor to antenna jack.	13	Set to 27.115MHz, 1000Hz @30% Mod. Output 100 uV.	RV305	Set mode switch to SSB. Adjust for "S9" on panel "S" meter.
			RV107	Set mode switch to AM. Adjust for "S9" on panel "S" meter.

TRANSMITTER

Connect an RF Wattmeter or 50-ohm, 25-watt dummy load to antenna connector.
Adjustments are made with 14-volt DC input, and if used, 120-volt AC input to power supply.

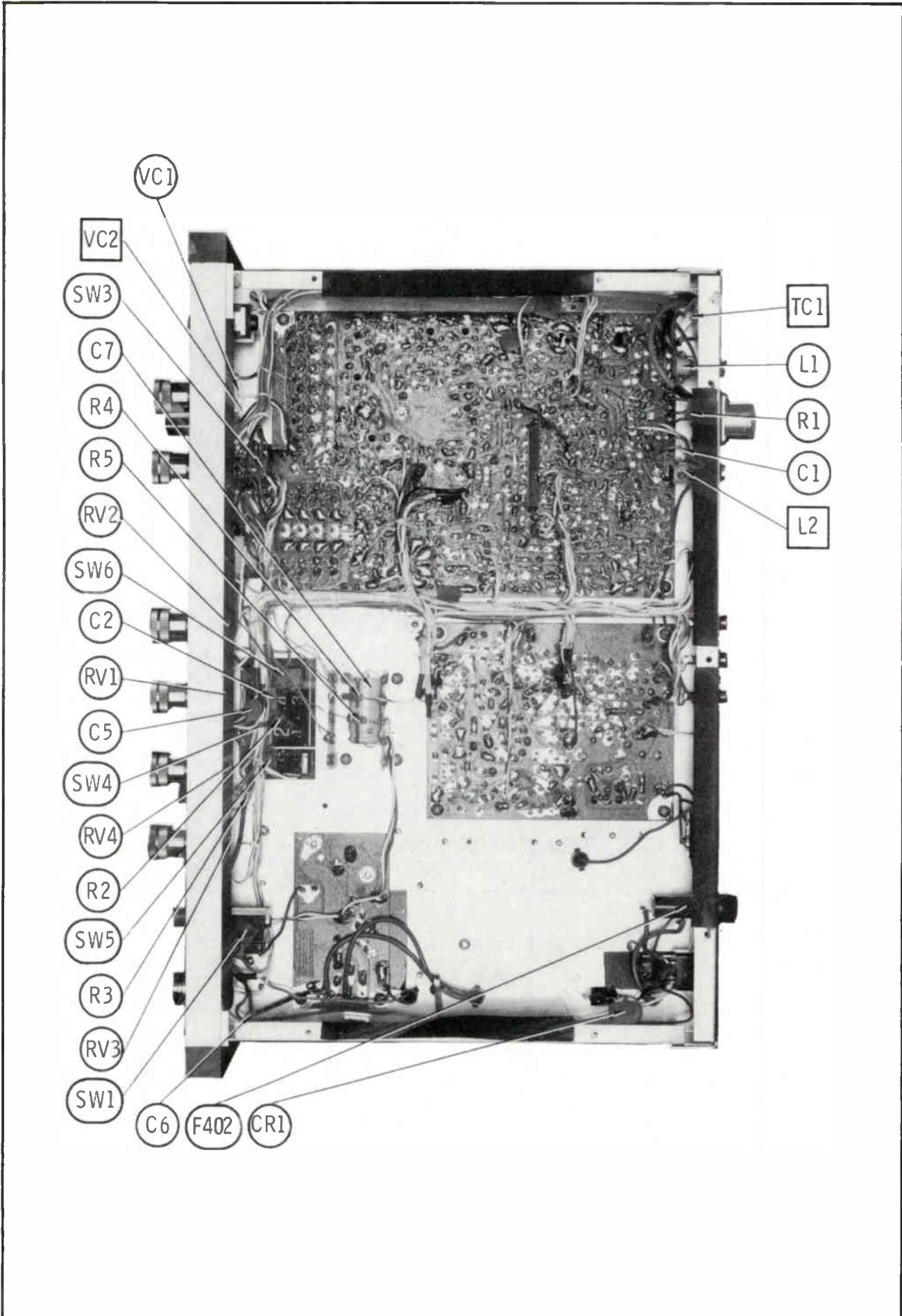
SSB

INDICATOR	ADJUST	REMARKS
USB CARRIER OSC. Frequency Counter RF VTVM	TC115	Connect frequency counter and VTVM to TP108 and ground. Set mode switch to USB. Adjust RV101 for 0.6V. Adjust for frequency of 11.275MHz.
LSB CARRIER OSC. Frequency Counter RF VTVM	TC116 RV102	Connect frequency counter and VTVM to TP108 and ground. Set mode switch to LSB. Adjust RV102 for 0.6V. Adjust for frequency of 11.272MHz.
CARRIER BALANCE Oscilloscope	RV103, TC117, L106	Short microphone input to ground. Set mode switch to either USB or LSB. Key transmitter and adjust for MINIMUM indication of scope. Output voltage should be less than 0.3V p-p.
DRIVER BIAS 0-1V DC VTVM	RV104	Connect meter to TP112 and ground. Short microphone input. Key transmitter. Adjust bias for 0.04 volts.
FINAL BIAS 0-25A DC Milliammeter	RV105	Remove jumper at TP113. Connect meter to RFC104 and C187. Short microphone input. Key transmitter. Adjust bias for 20mA.
RF AMP, DRIVER, FINAL RF Wattmeter	L104, L105, L108, L109, L110, L111	Channel Selector to CH 13, mode switch to AM. Key transmitter. Adjust for maximum.
OUTPUT POWER RF Wattmeter	L112, L1, TC1	Mode switch to AM. Key transmitter Adjust for 5-watt power output.
TVI TRAP TV Set CH2	L2	Key transmitter. Adjust for MINIMUM interference.

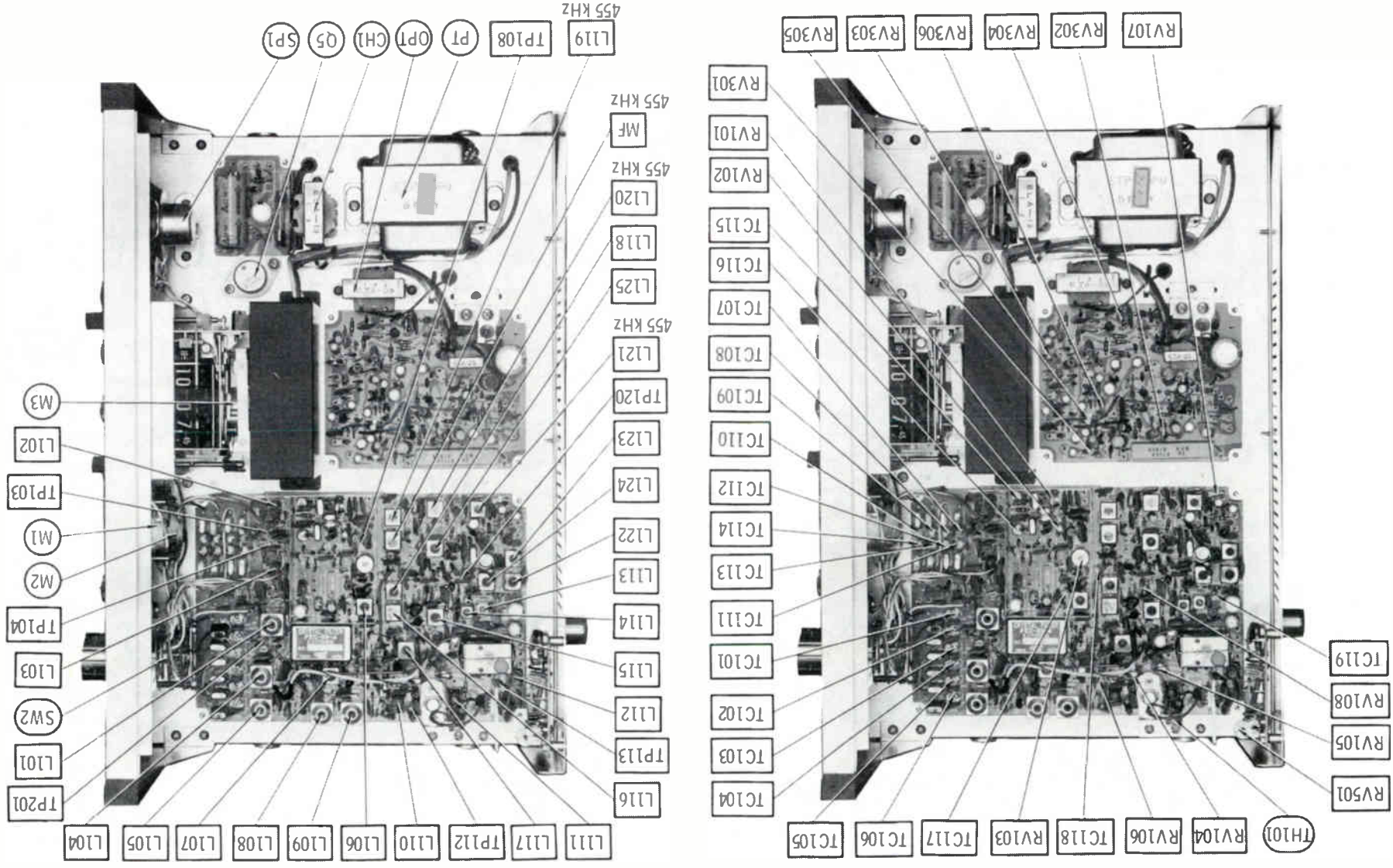
MIDLAND MODEL 13-898

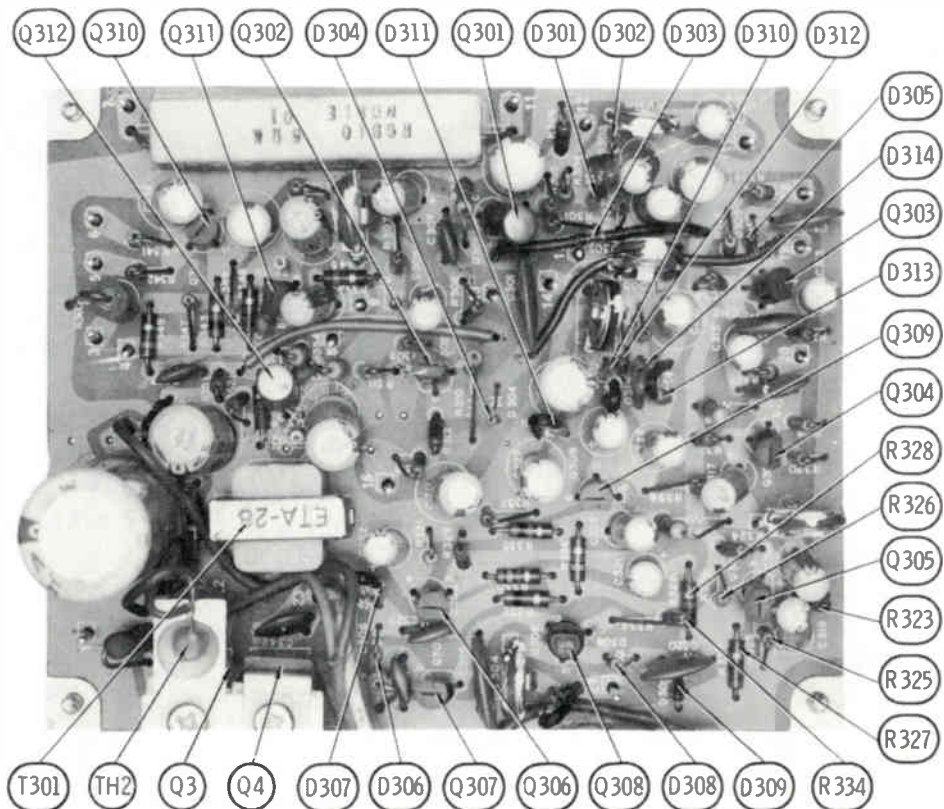
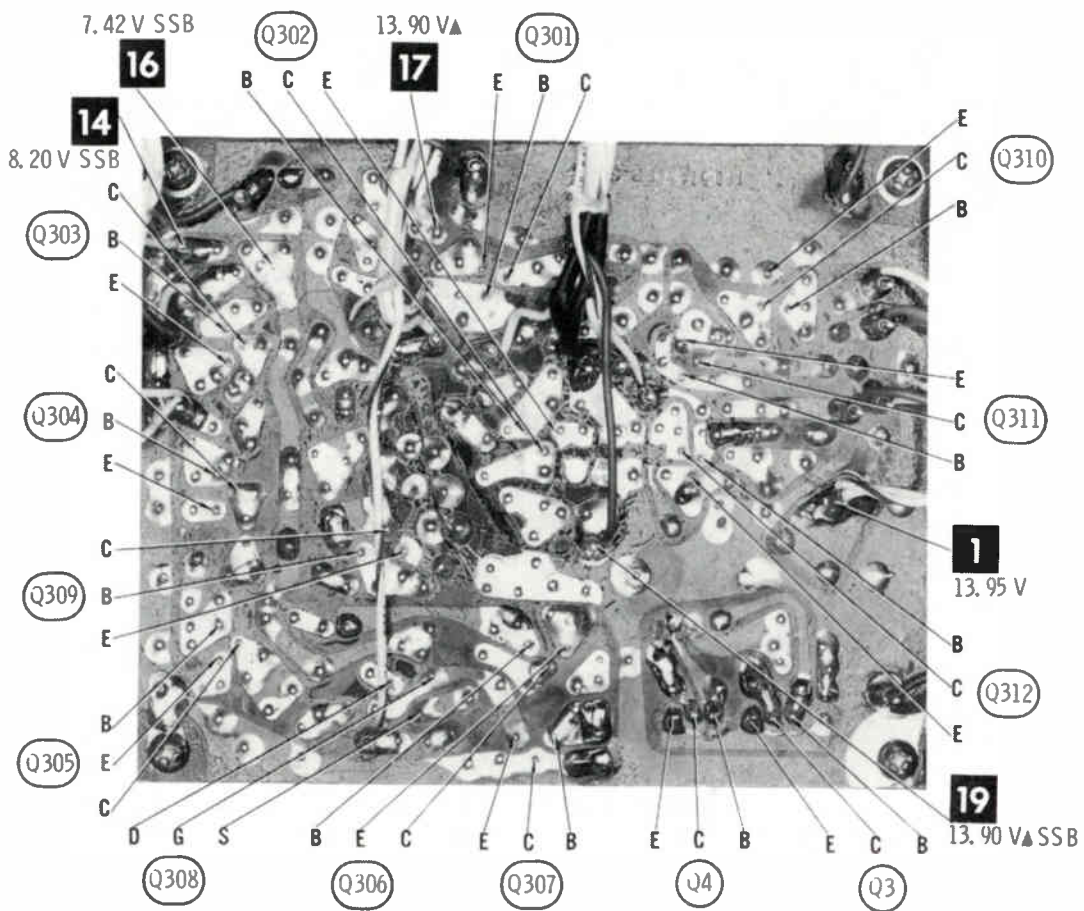
TRANSMITTER ADJUSTMENTS

INDICATOR	ADJUST	REMARKS
ALC RF Wattmeter Oscilloscope	L107 RV302	Set mode switch to LSB. Connect single tone to Pin 1 of microphone jack. Key transmitter. Adjust for maximum on wattmeter. Connect two tone generator to Pin 1 of microphone jack. Set generator for 10mV output. Key transmitter. Adjust for 100% modulation on oscilloscope.
PANEL SWR METER Panel SWR Meter	RV501	Set mode switch to AM. Set RF-SWR switch to SWR. Connect a 5W, 100-ohm noninductive dummy load to antenna. Key transmitter. Set SWR meter to "2" with calibrate control. Disconnect dummy load and reconnect normal load to antenna. Set RF-SWR switch to RF. Adjust meter to "Set" position.
AMC Modulator Meter	RV301	Set mode switch to AM. Connect audio generator to Pin 1 of microphone input. Inject a 1000Hz 200mV signal. Key transmitter. Adjust for 80% modulation maximum.

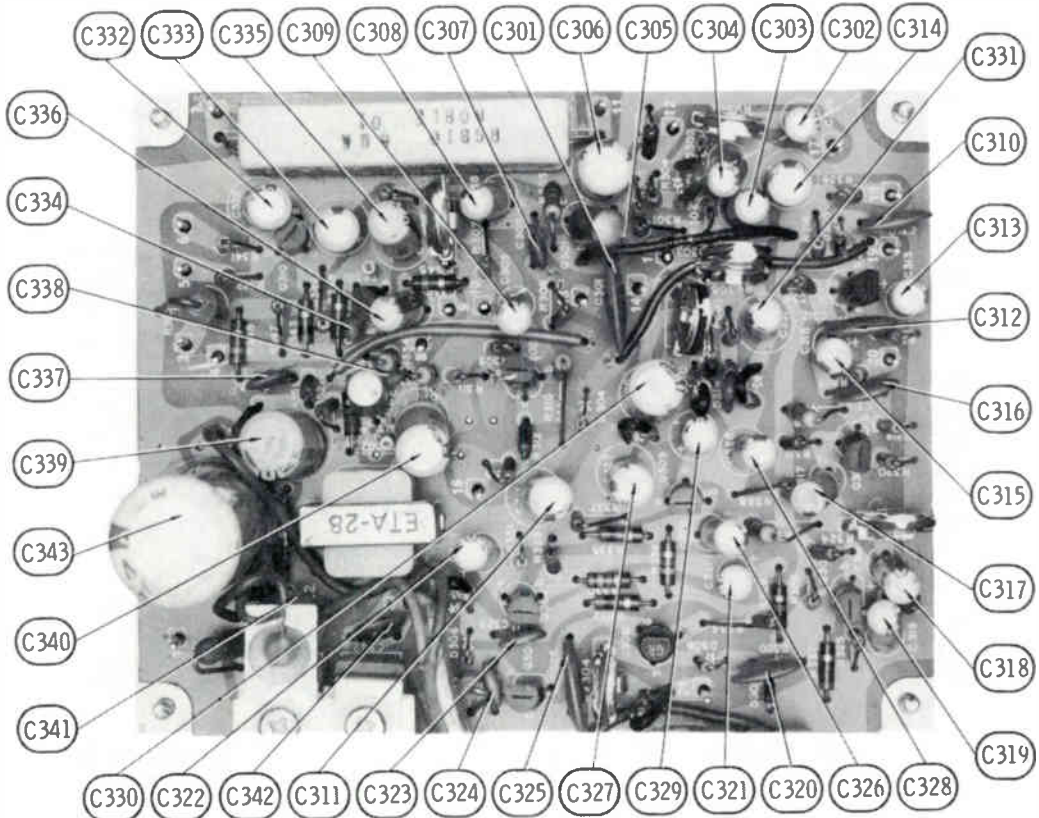
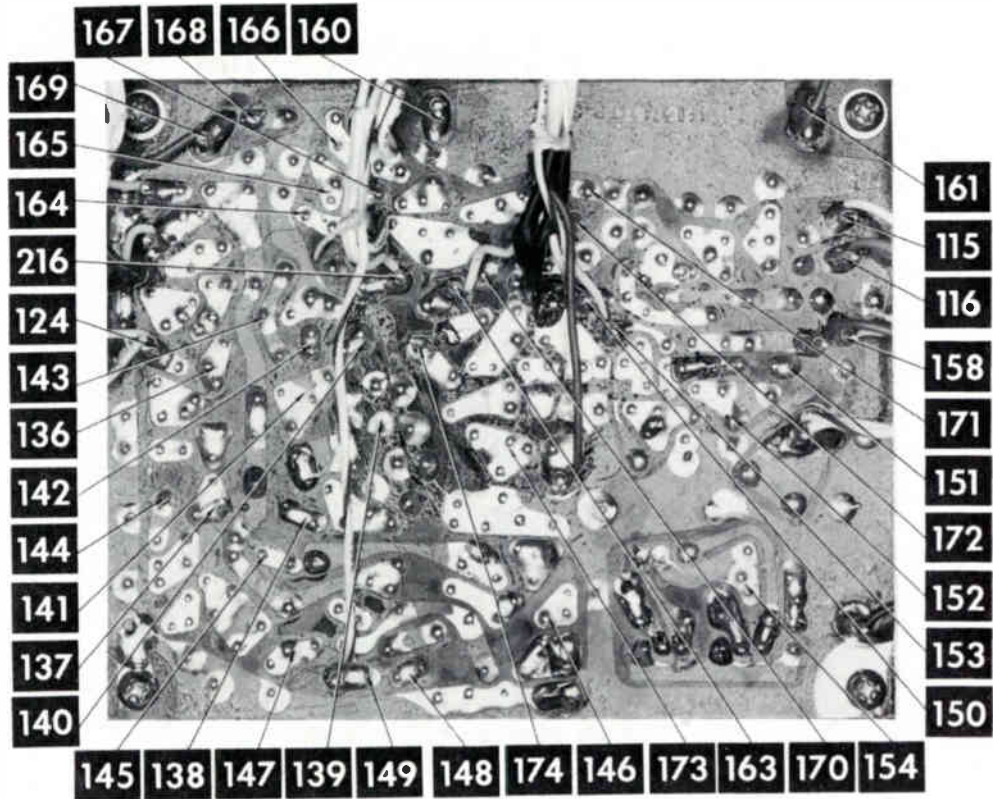


MIDLAND MODEL 13-898



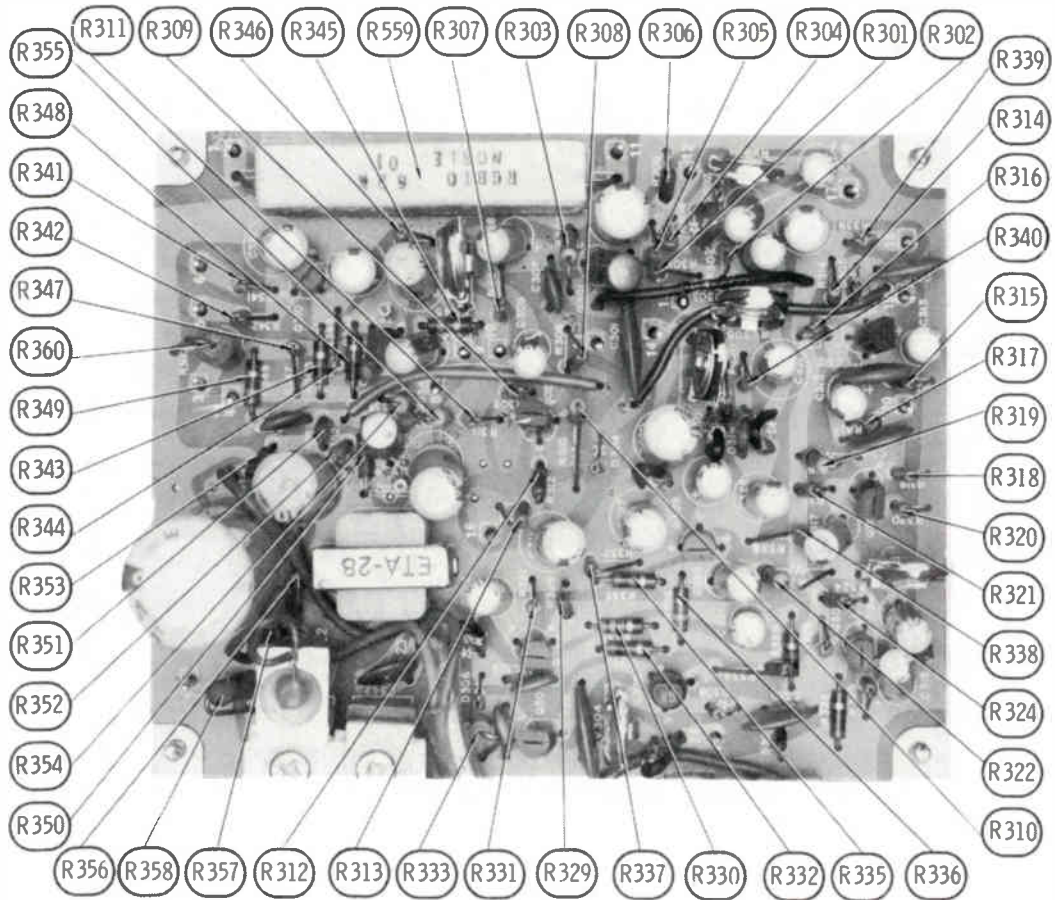


AUDIO-AGC BOARD

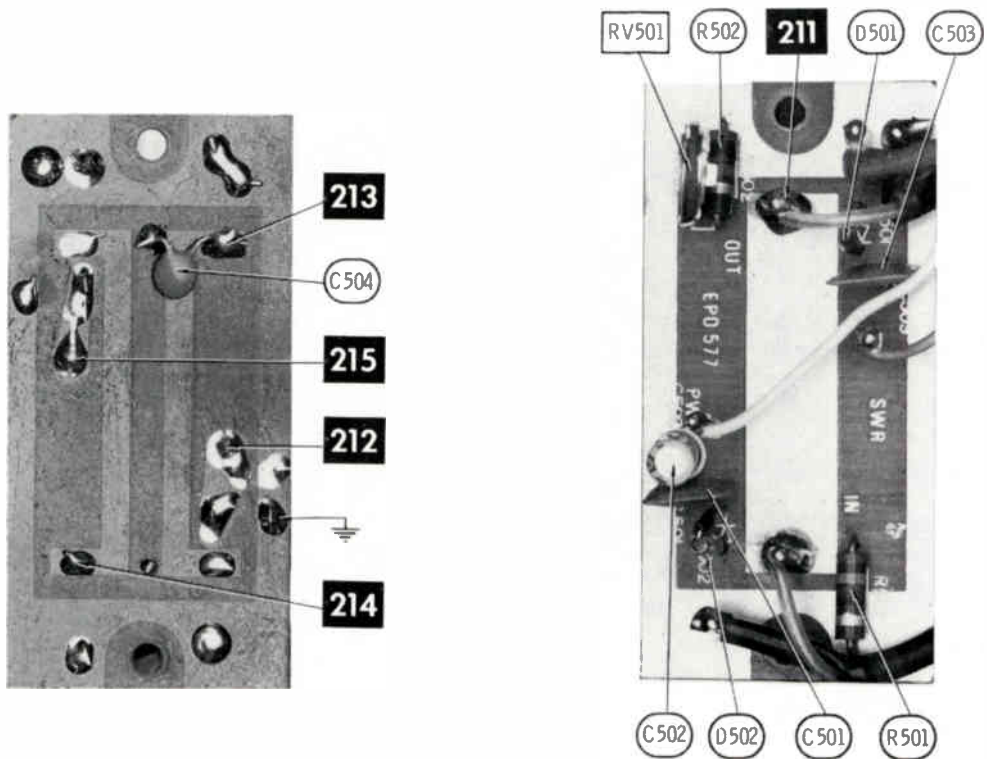


AUDIO-AGC BOARD

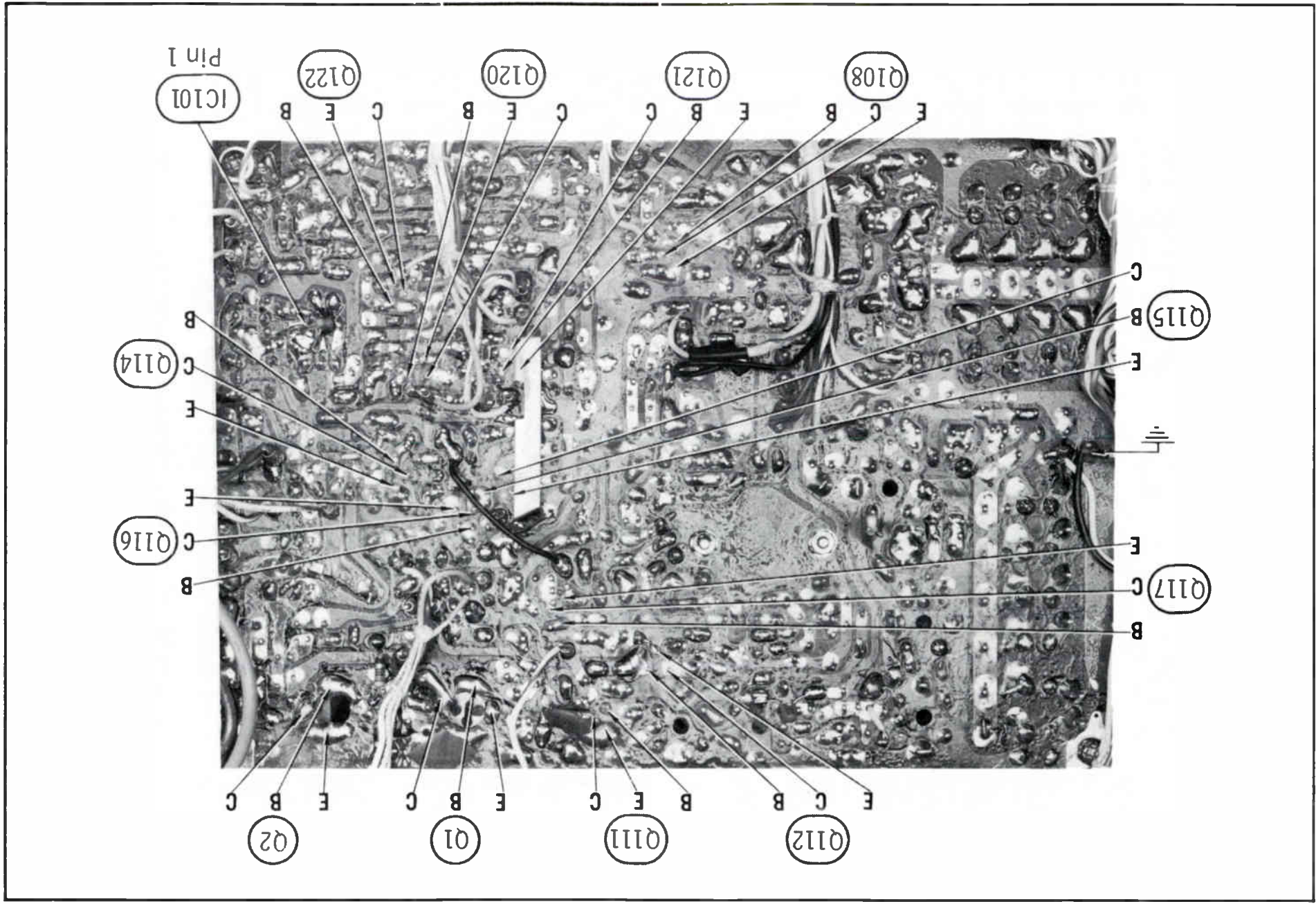
AUDIO-AGC BOARD

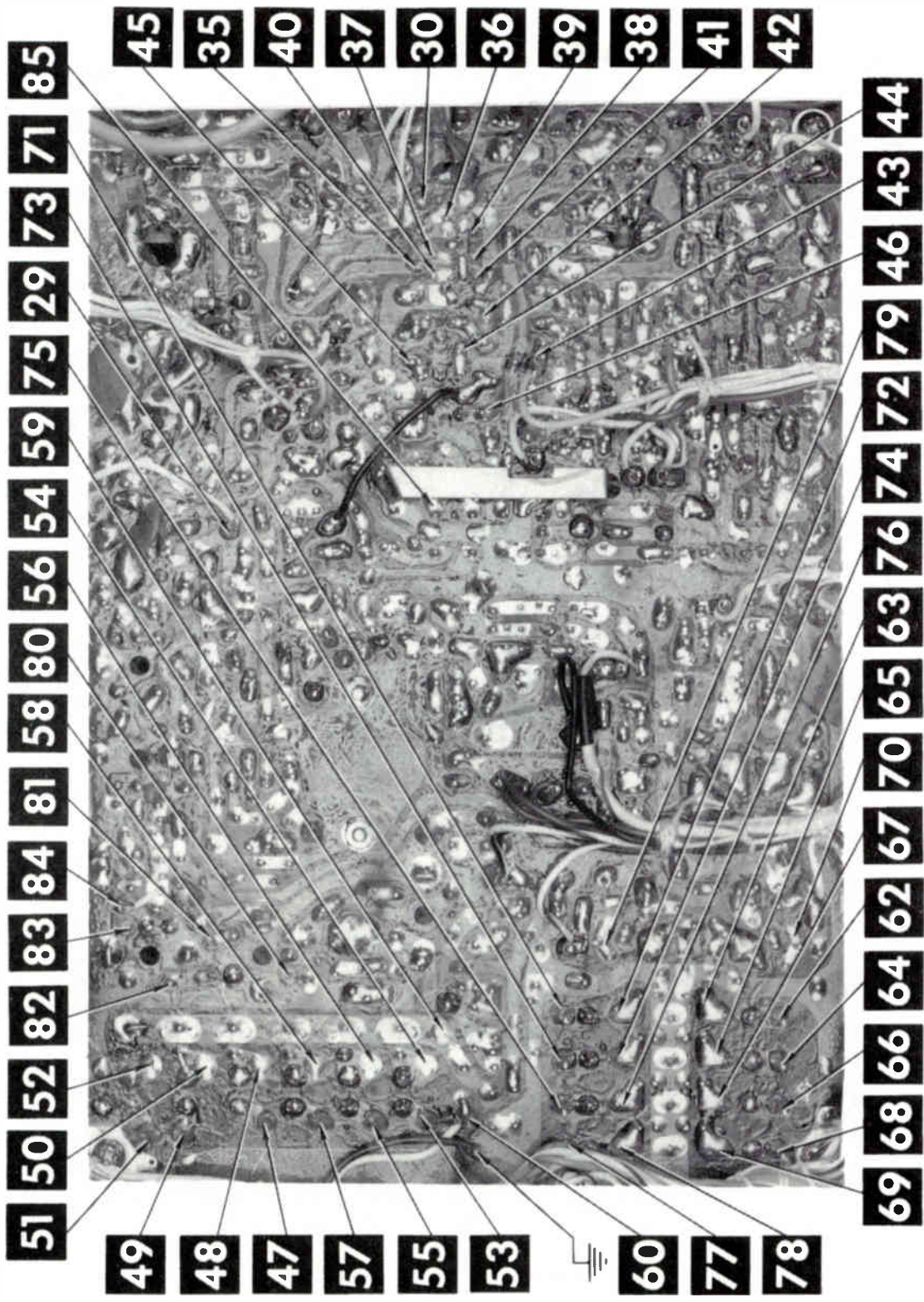


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SWR BOARD

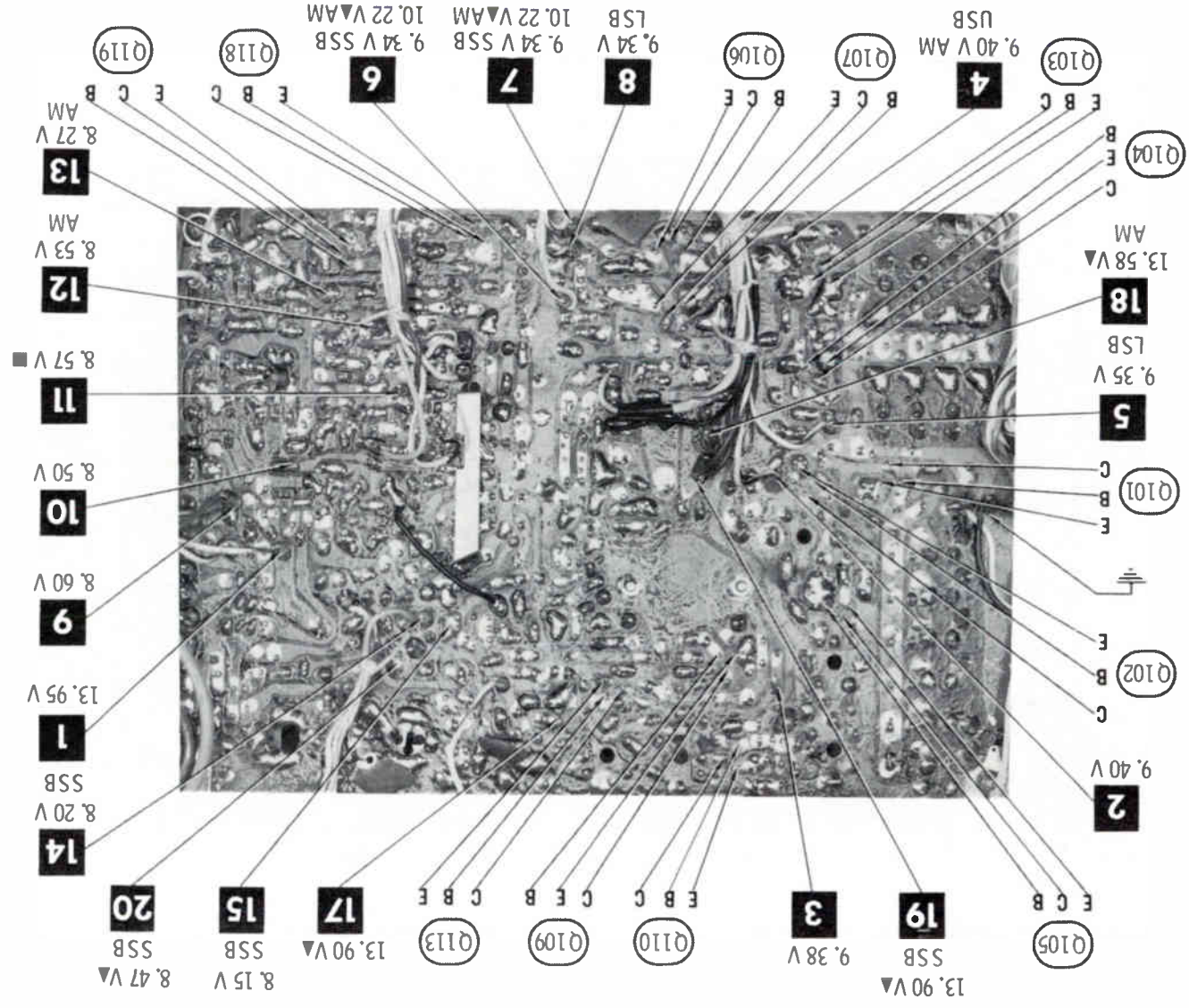


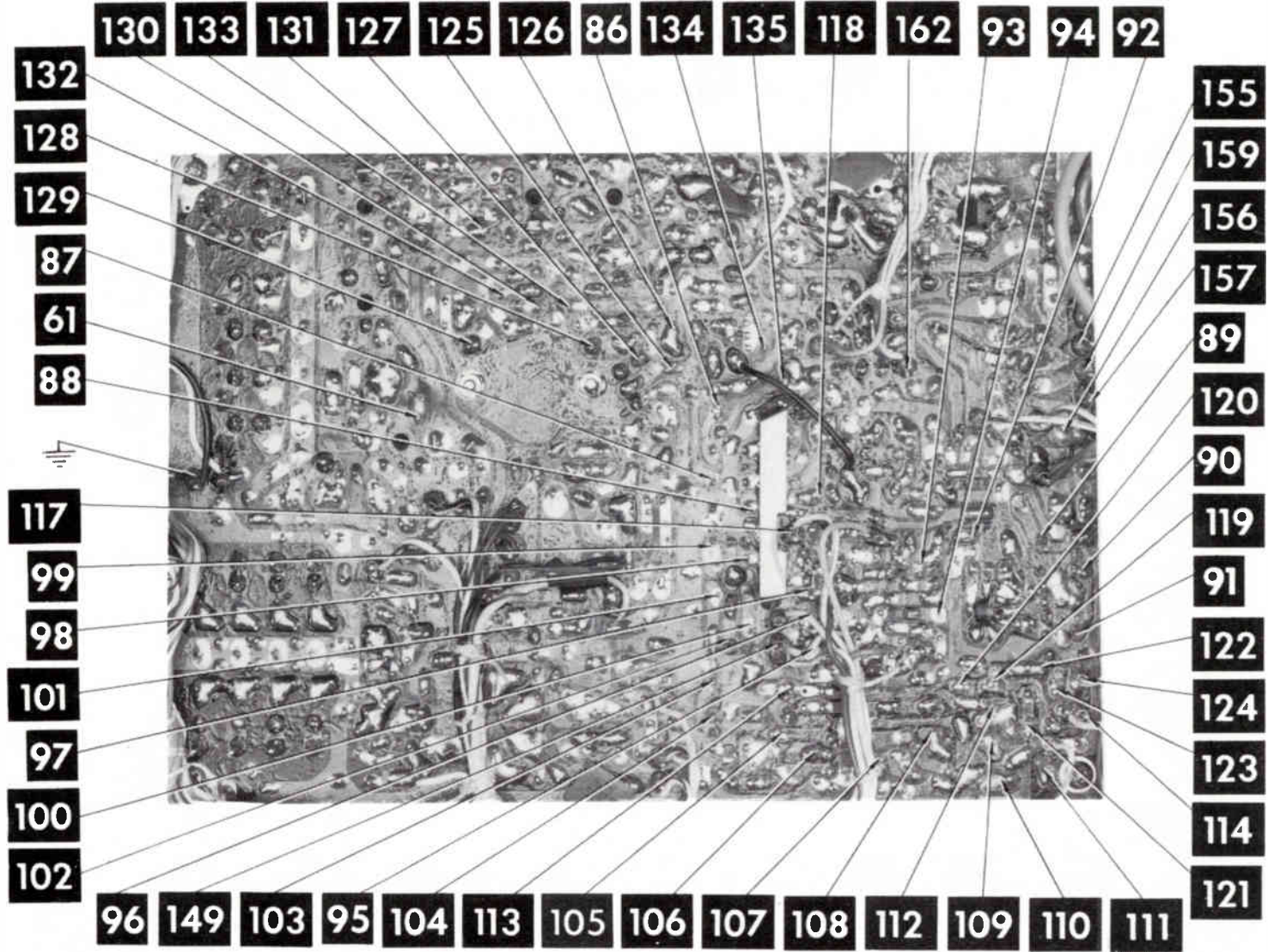


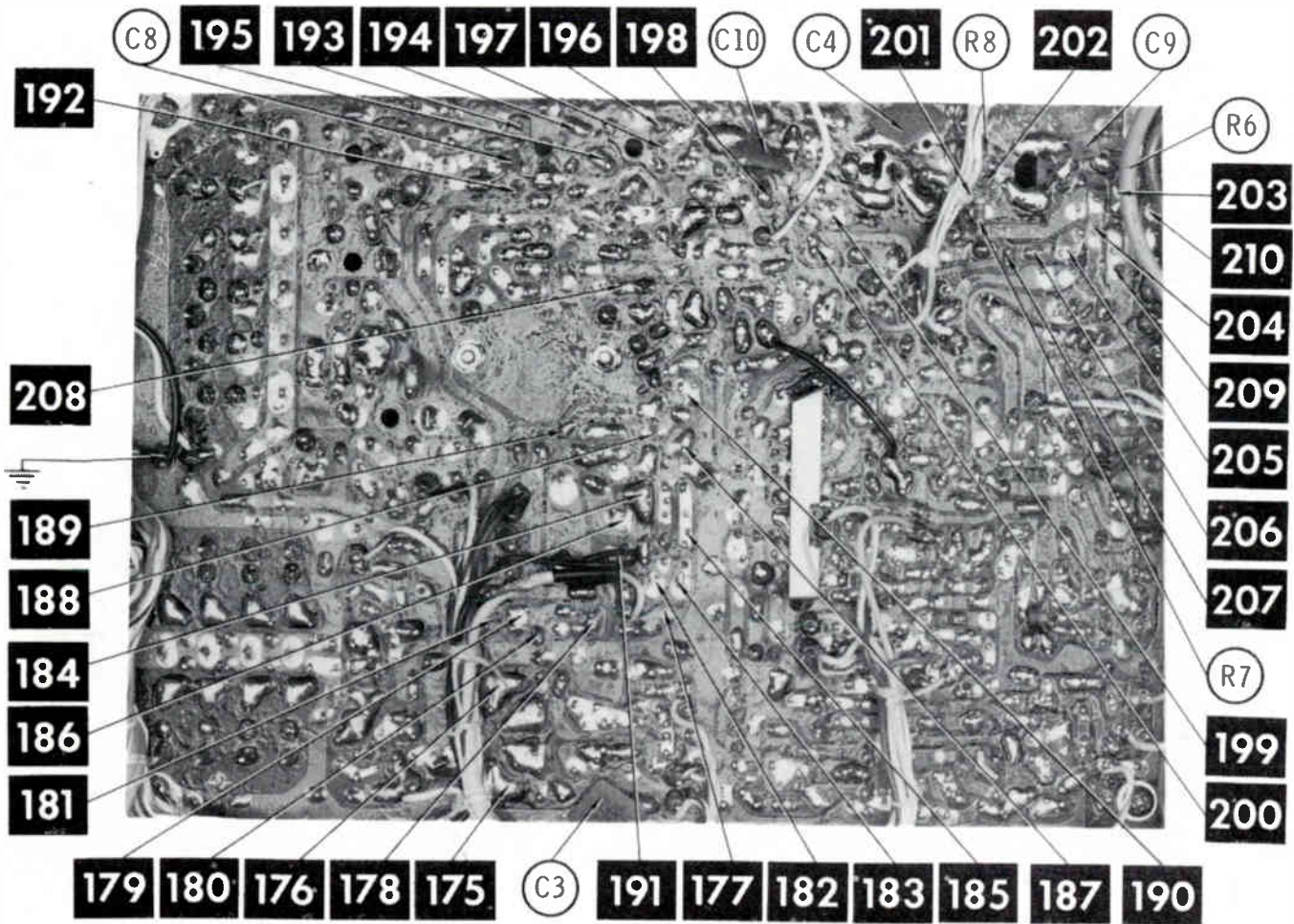
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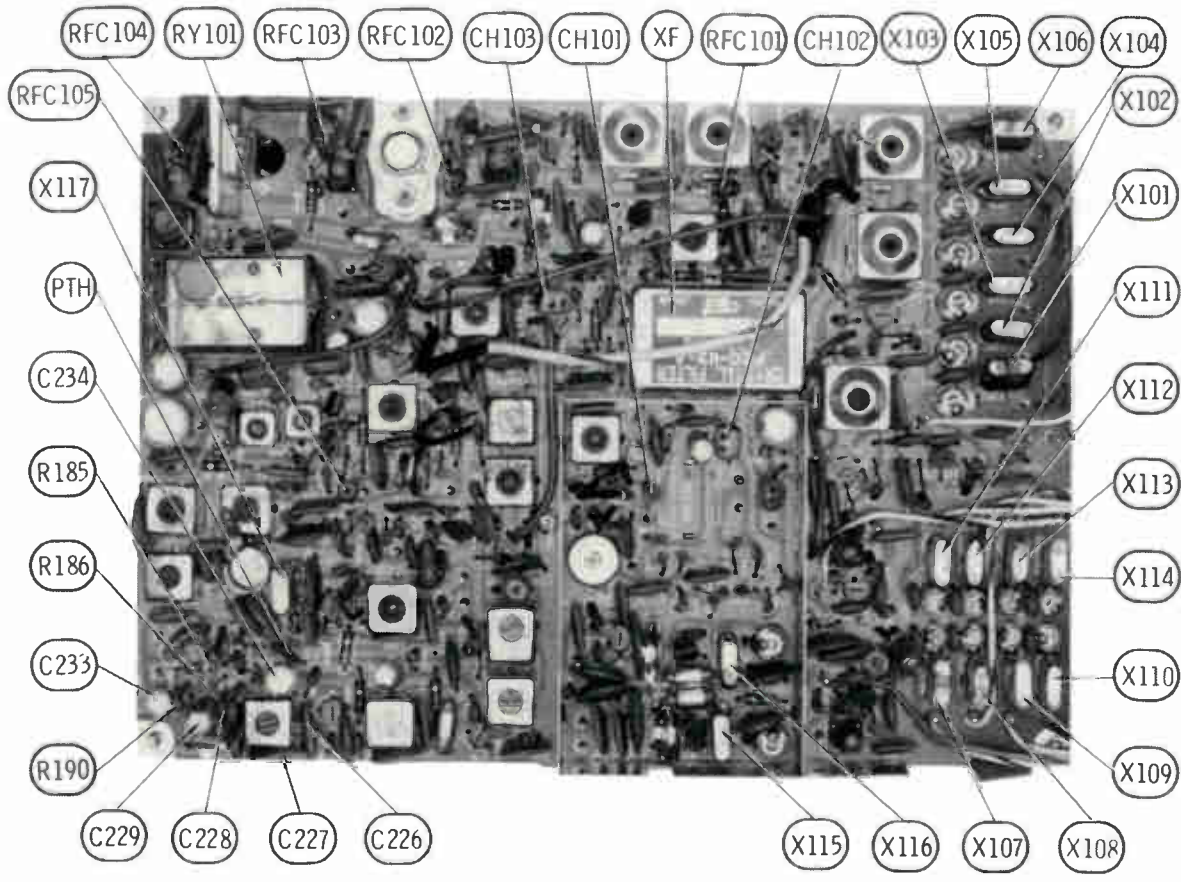
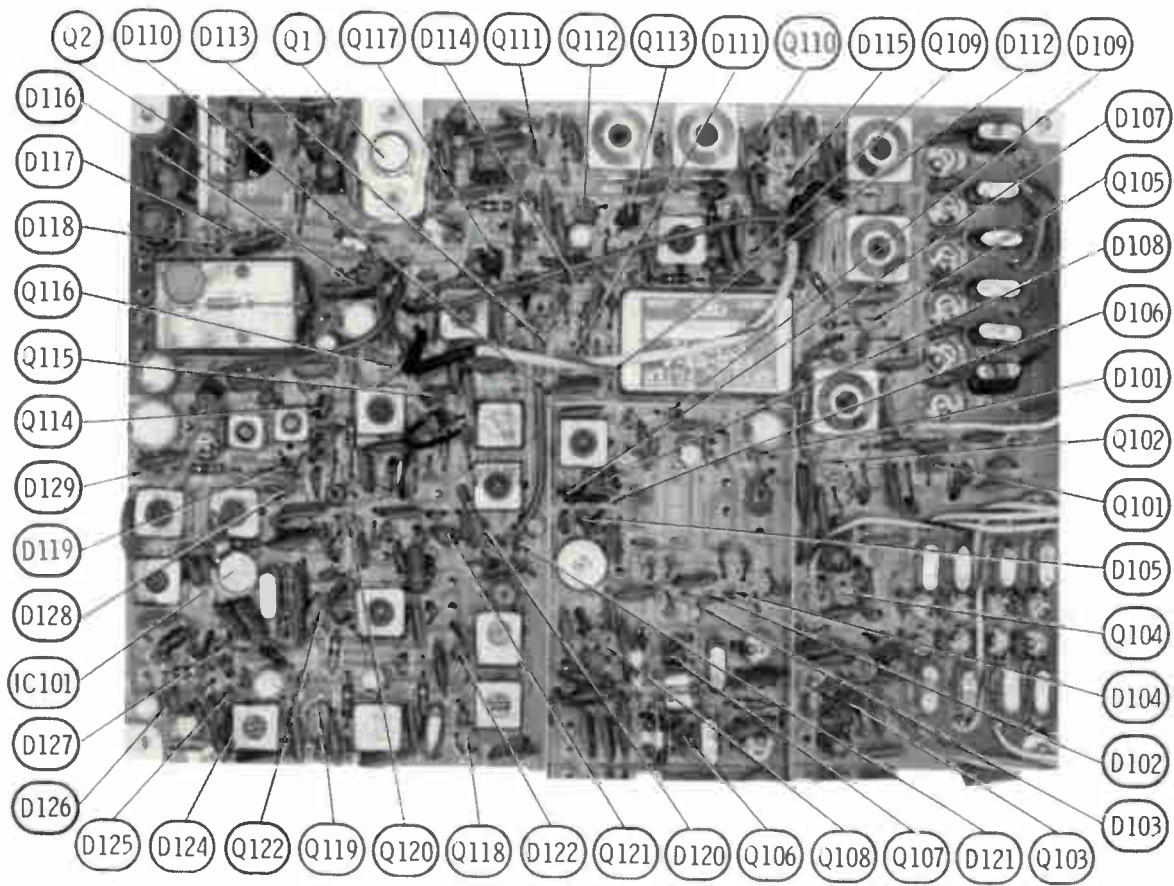
MIDLAND MODEL 13-898

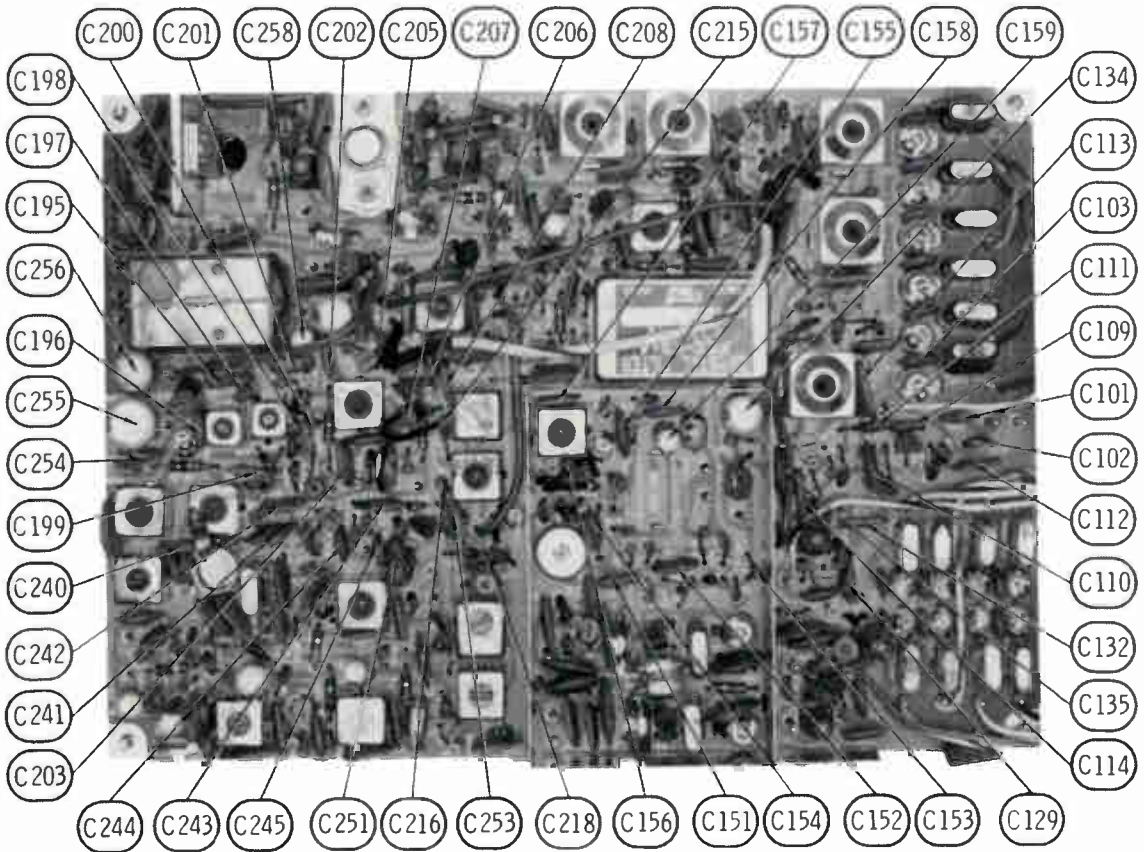
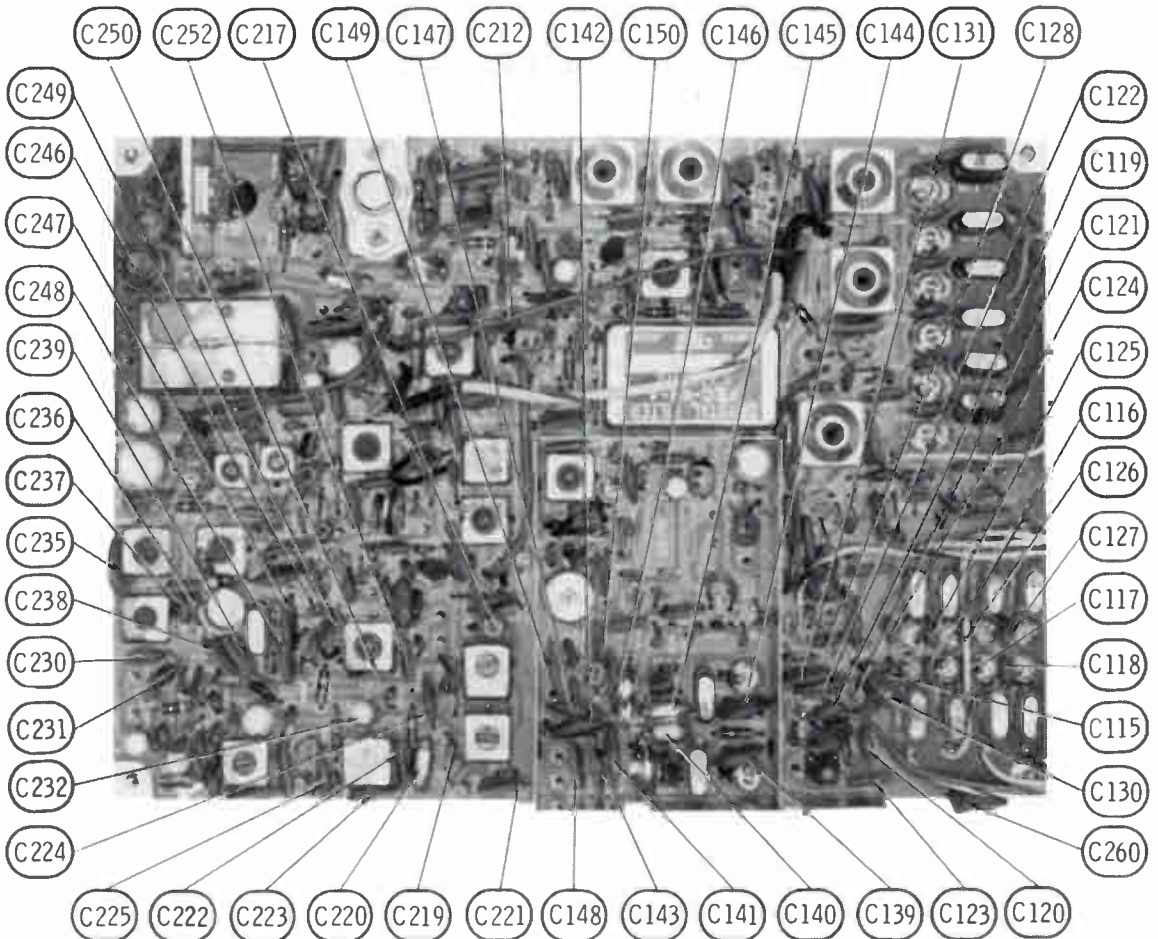
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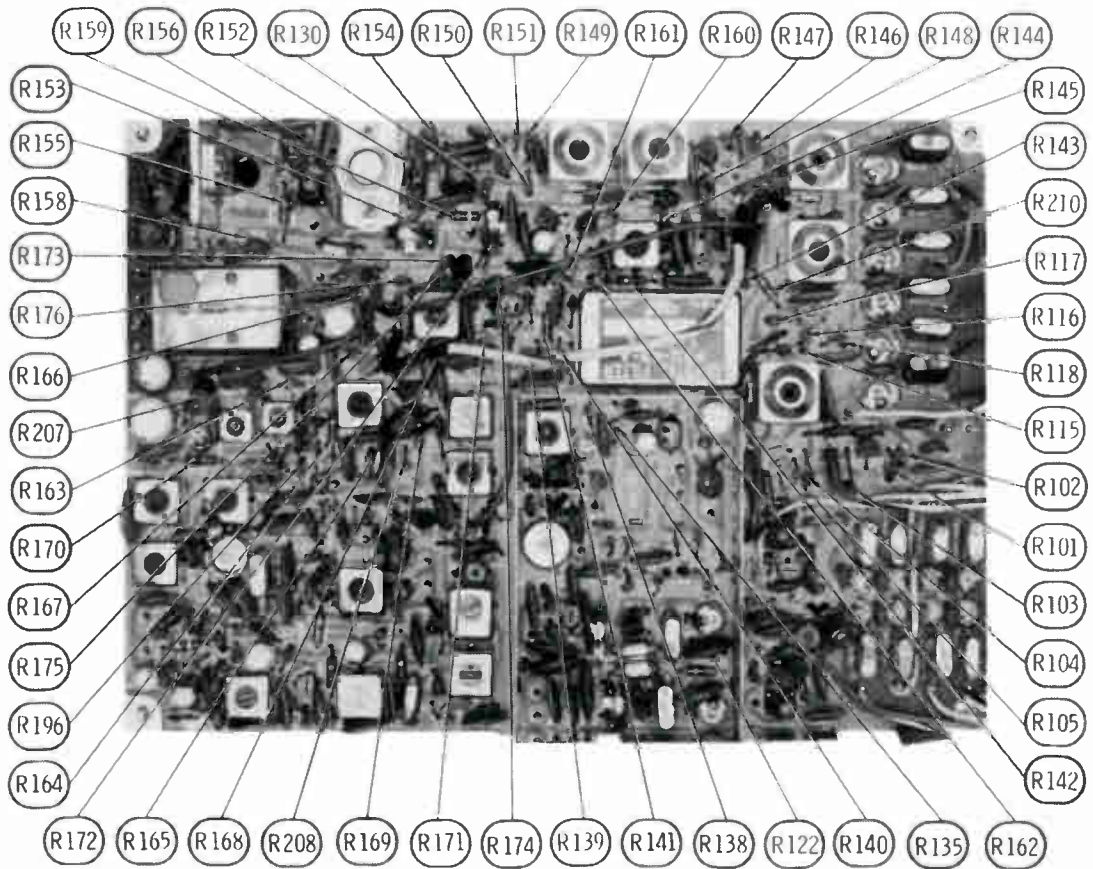
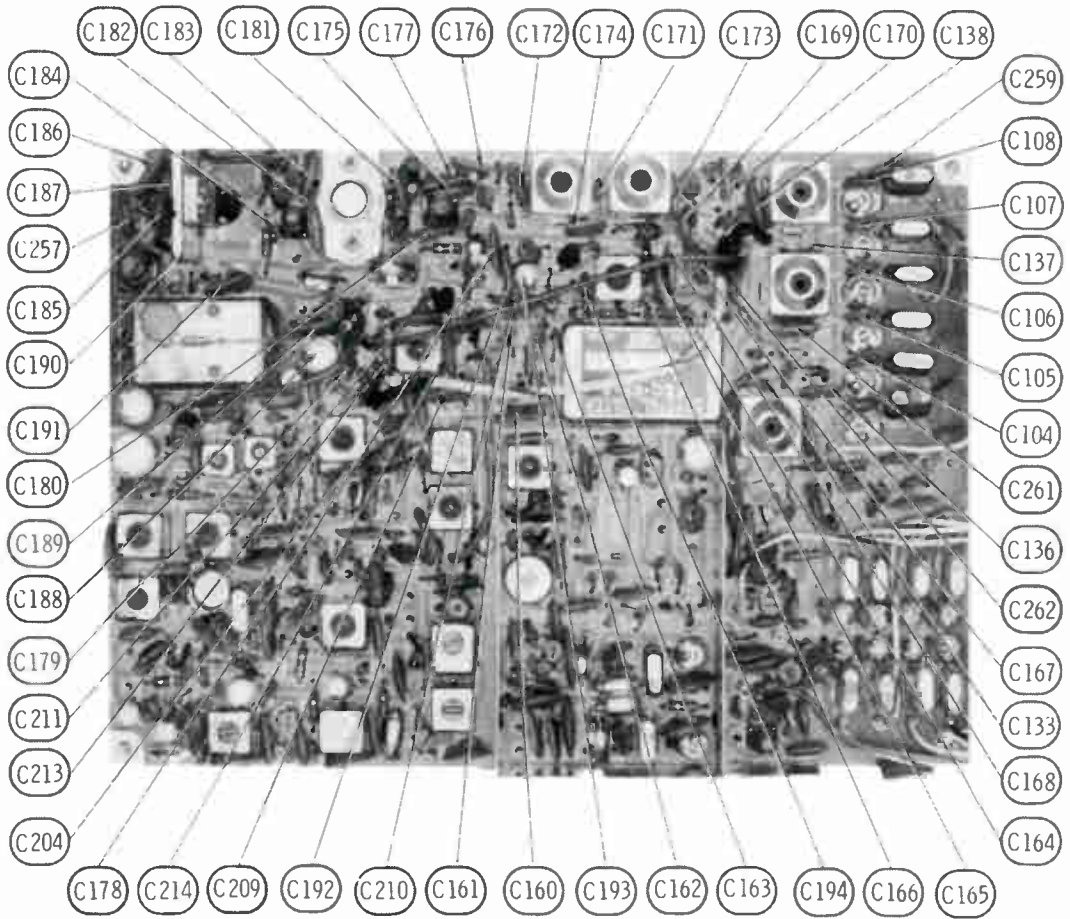




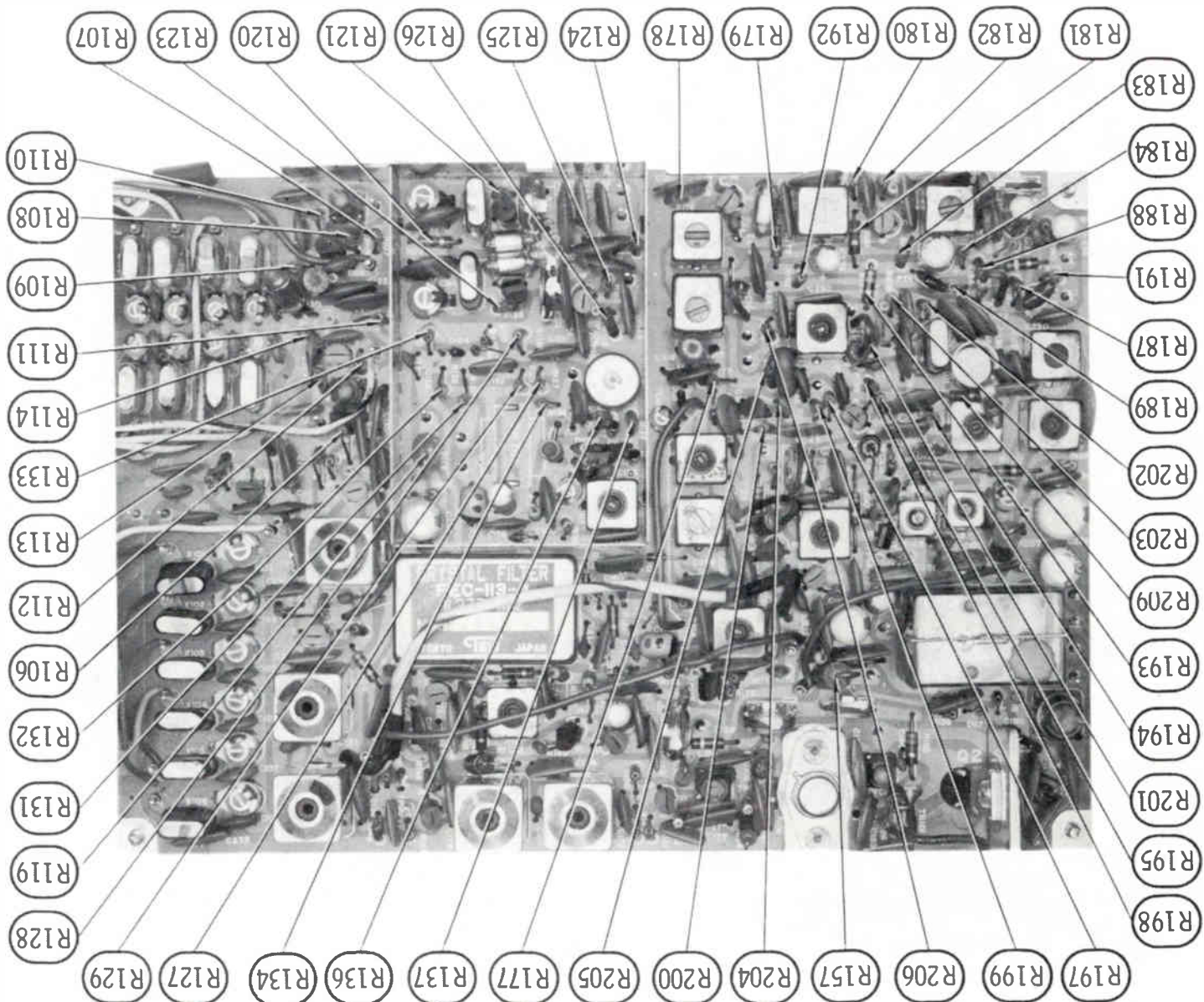




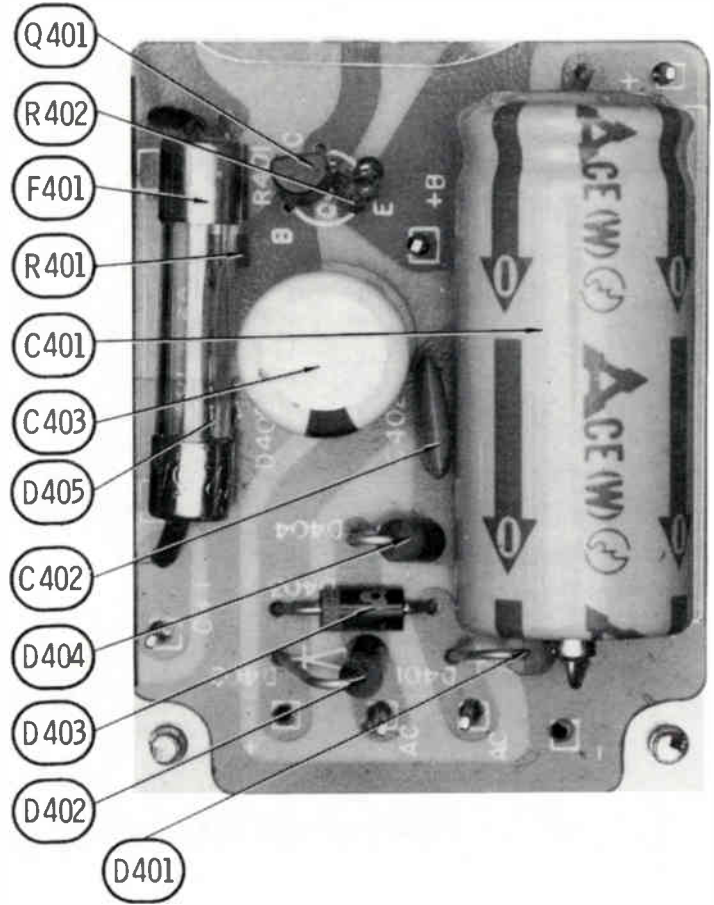
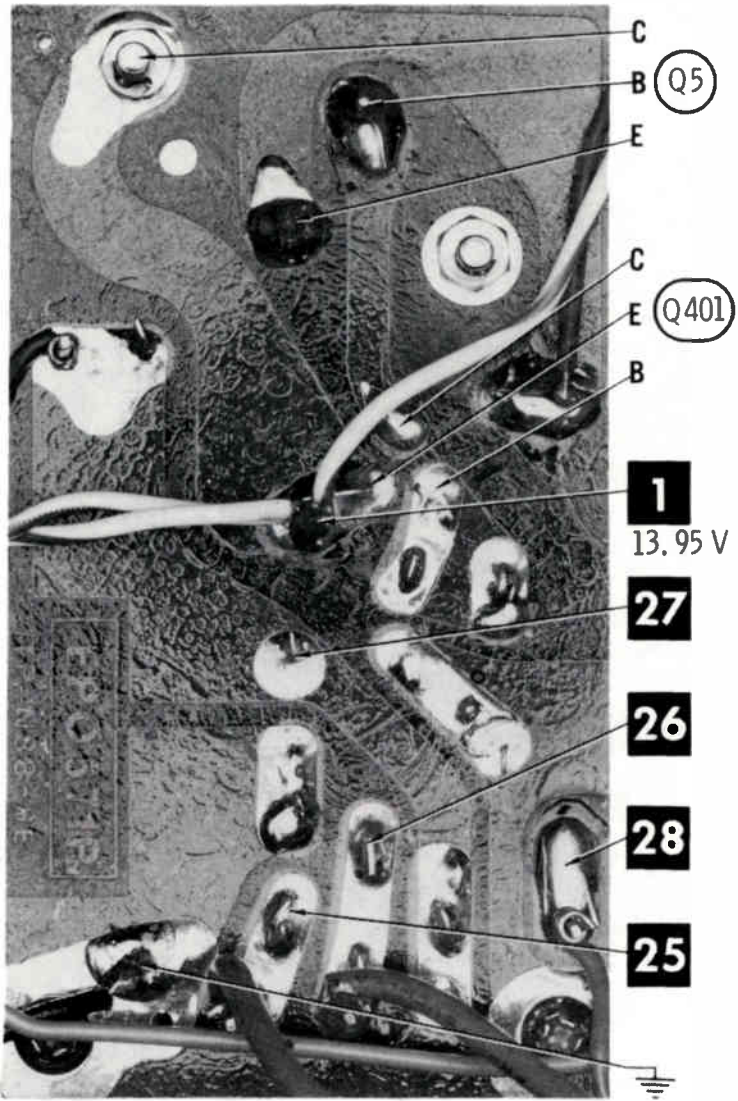




MIDLAND MODEL 13-898



AC POWER SUPPLY BOARD



PARTS LIST AND DESCRIPTION

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

WIRING DATA

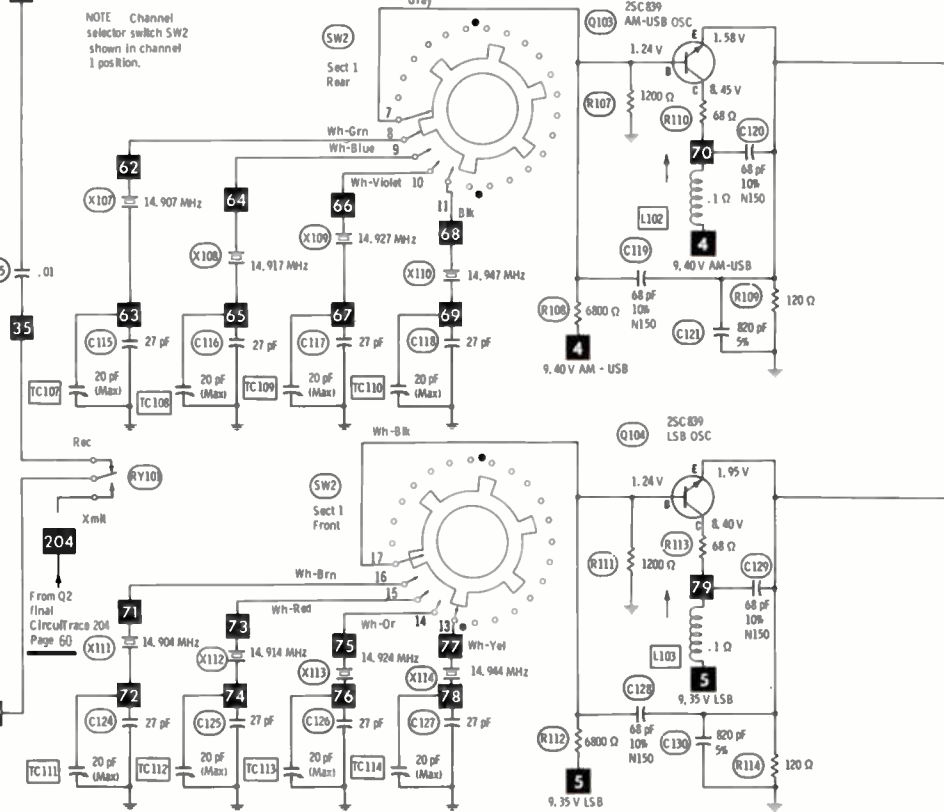
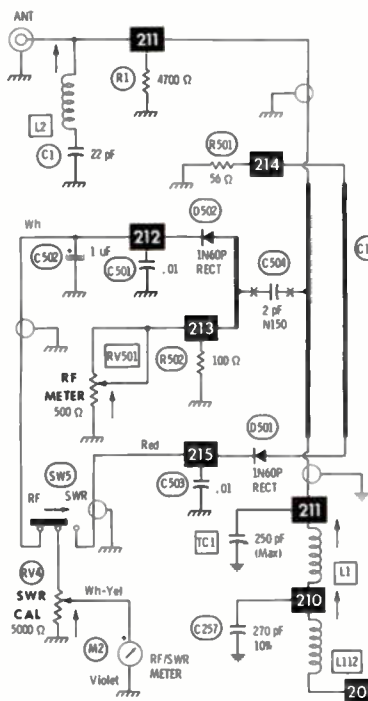
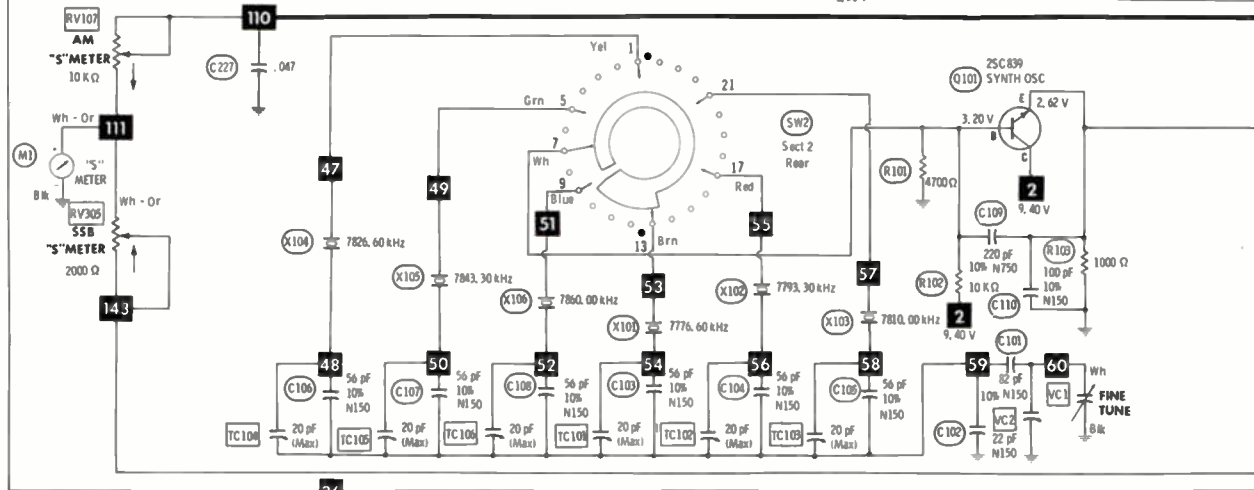
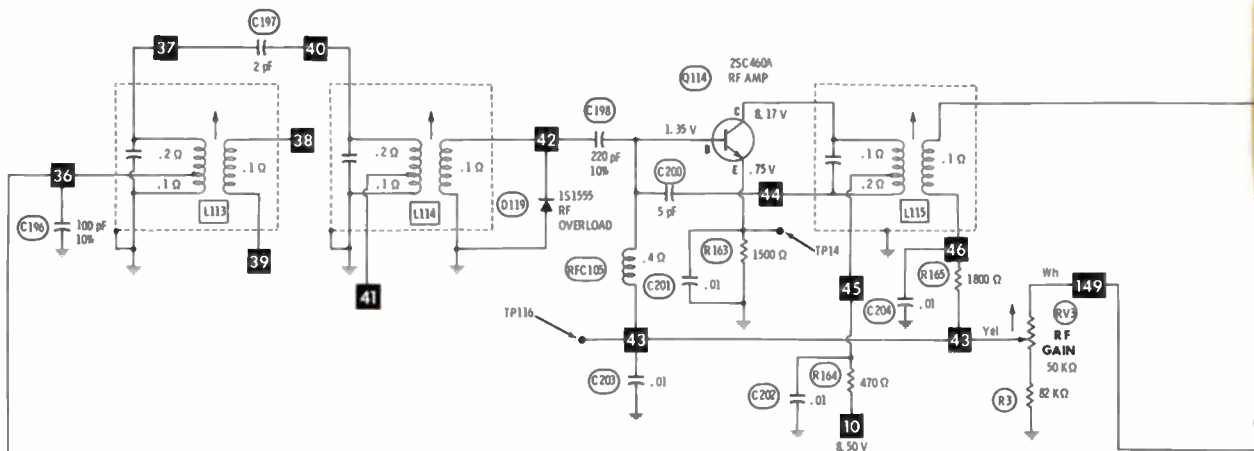
General-use Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in 12 Colors 8524 (Stranded) Available in 12 Colors
Power Cord, 2-Wire	Use BELOEN No. 17106 (Plastic) or 17126 (Rubber) -6 feet 17109 (Plastic) or 17129 (Rubber) -9 feet
Shielded Antenna Lead	Use BELOEN No. 8214 Lowest-Loss (RG-8/U Type) 8237 Low-loss (RG-8/U) 8240 (Solid) Miniature (RG-58/U) 8259 (Stranded) Miniature (RG-58A/U)
Coiled Microphone Cable	Use BELDEN No. 8497 3-Conductor (1 shielded for Press-to-Talk) Neoprene 8491 4-Conductor (2 shielded, 2 unshielded) Neoprene
Ignition Noise Suppression	Use BELDEN No. 7300-Series Spark-Plug Sets
Bonding Strap	Use BELOEN No. 8661 (3/8 Inch)

SEMICONDUCTORS (Select replacement transistor for best results)

ITEM No.	TYPE / MFR. No. / PART No.	REPLACEMENT DATA						
		GENERAL ELECTRIC PART No.	INTERNATIONAL RECTIFIER PART No.	MALLORY PART No.	MOTOROLA PART No.	RCA PART No.	SPRAGUE PART No.	SYLVANIA PART No.
D101	BZ-090/09-306180 9.1V Zener	GEZD-9.1	Z-1210	PTC505	HEPZ0412	SK3060	RT240	ECG 139
D102	1S2186/09-306276	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	ECG 177
D103	1S1555/09-306154	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	ECG 177
D104	1S2186/09-306276	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	ECG 177
D105	1N60/09-306019	1N60	1N60	PTC206	HEP135	SK3088		ECG 109
D106	1N60/09-306019	1N60	1N60	PTC206	HEP135	SK3088		ECG 109
D107	1N60/09-306019	1N60	1N60	PTC206	HEP135	SK3088		ECG 109
D108	1N60/09-306019	1N60	1N60	PTC206	HEP135	SK3088		ECG 109
D109	1S1555/09-306154	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	ECG 177
D110	1S1555/09-306154	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	ECG 177
D111	1S1555/09-306154	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	ECG 177
D112	1S1555/09-306154	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	ECG 177
D113	1S1555/09-306154	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	ECG 177
D114	1S1555/09-306154	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	ECG 177
D115	1S2186/09-306276	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	ECG 177
D116	BZ-081/09-306277 8.2V Zener	GE-X11	Z-1208	Z88.2	HEPZ0411	SK3059	RT239	ECG 5072
D117	1S1555/09-306154	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	ECG 177
D118	1S1555/09-306154	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	ECG 177
D119	1S1555/09-306154	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	ECG 177
D120	1S1555/09-306154	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	ECG 177
D121	1S1555/09-306154	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	ECG 177
D122	1N60/09-306019	1N60	1N60	PTC206	HEP135	SK3088		ECG 109
D124	1N60/09-306019	1N60	1N60	PTC206	HEP135	SK3088		ECG 109
D125	1N60/09-306019	1N60	1N60	PTC206	HEP135	SK3088		ECG 109
D126	1N60/09-306019	1N60	1N60	PTC206	HEP135	SK3088		ECG 109
D127	1N60/09-306019	1N60	1N60	PTC206	HEP135	SK3088		ECG 109
D128	1N60/09-306019	1N60	1N60	PTC206	HEP135	SK3088		ECG 109
D129	BZ-081/09-306277 8.2V Zener	GE-X11	Z-1208	Z88.2	HEPZ0411	SK3059	RT239	ECG 5072
D301	1N60/09-306019	1N60	1N60	PTC206	HEP135	SK3088		ECG 109
D302	1S1555/09-306154	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	ECG 177
D303	1S1555/09-306154	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	ECG 177
D304	1S1555/09-306154	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	ECG 177
D305	1S1555/09-306154	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	ECG 177
D306	1S1555/09-306154	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	ECG 177
D307	1N60/09-306154	1N60	1N60	PTC206	HEP135	SK3088		ECG 109
D308	1S1555/09-306154	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	ECG 177
D309	1S1555/09-306154	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	ECG 177
D310	1N60/09-306019	1N60	1N60	PTC206	HEP135	SK3088		ECG 109
D311	1N60/09-306019	1N60	1N60	PTC206	HEP135	SK3088		ECG 109
D312	1S1555/09-306154	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	ECG 177
D313	1N60/09-306019	1N60	1N60	PTC206	HEP135	SK3088		ECG 109
D314	1N60/09-306019	1N60	1N60	PTC206	HEP135	SK3088		ECG 109
D315	1S1555/09-306154 (1)	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	ECG 177
D401	SR1K-4/13-102001							
D402	SR1K-4/13-102001							
D403	SR1K-4/13-102001							
O404	SR1K-4/13-102001							
D405	WZ-140/09-306278 14V Zener	GEZD-15	Z-1214	PTC509	HEPZ0417	SK3094	RT245	ECG 144
D501	1N60/09-306019	1N60	1N60	PTC206	HEP135	SK3088		ECG 109
D502	1N60/09-306019	1N60	1N60	PTC206	HEP135	SK3088		ECG 109
IC101	TA7028M/09-308039							
Q1	2SC777/09-302050		TR-64		HEP75	SK3047		ECG 224
Q2		GE-66		PTC110				ECG 236
Q3	2SC1096/09-302126	GE-28	TR-55	PTC110	HEP55003	SK3054	RT154	ECG 186
Q4	2SC1096/09-302126 (2)	GE-28	TR-55	PTC110	HEP55003	SK3054	RT154	ECG 186
Q5	2S8407 (3)	GE-25	TR-02	PTC105	HEP232	SK3009	RT124	ECG 121
Q101	2SC839/09-302124	GE-20	TR-24	PTC121	HEP54	SK3122	RT102	ECG 123A
Q102	2SC839/09-302124	GE-20	TR-24	PTC121	HEP54	SK3122	RT102	ECG 123A
Q103	2SC839/09-302124	GE-20	TR-24	PTC121	HEP54	SK3122	RT102	ECG 123A
Q104	2SC839/09-302124	GE-20	TR-24	PTC121	HEP54	SK3122	RT102	ECG 123A
Q105	2SC815/09-302062	GE-20	TR-21	PTC139	HEP724	SK3038	RT102	ECG 123A
Q106	2SC839/09-302124	GE-20	TR-24	PTC121	HEP54	SK3122	RT102	ECG 123A
Q107	2SC839/09-302124	GE-20	TR-24	PTC121	HEP54	SK3122	RT102	ECG 123A
Q108	2SC839/09-302124	GE-20	TR-24	PTC121	HEP54	SK3122	RT102	ECG 123A

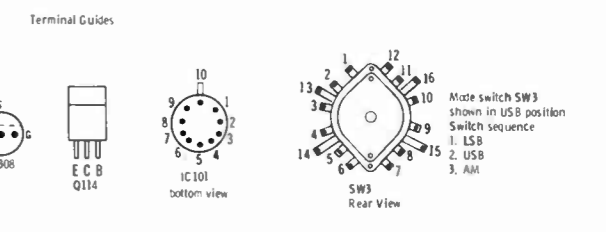
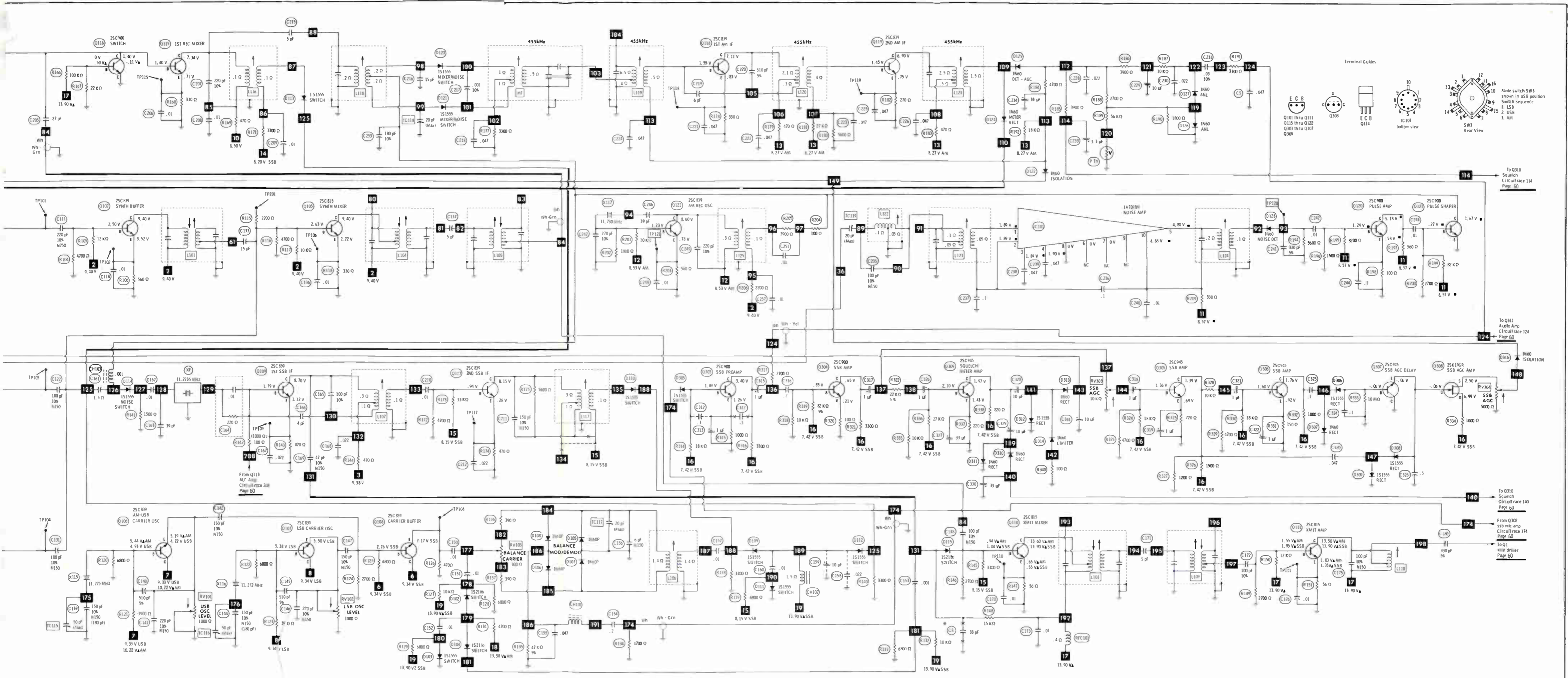
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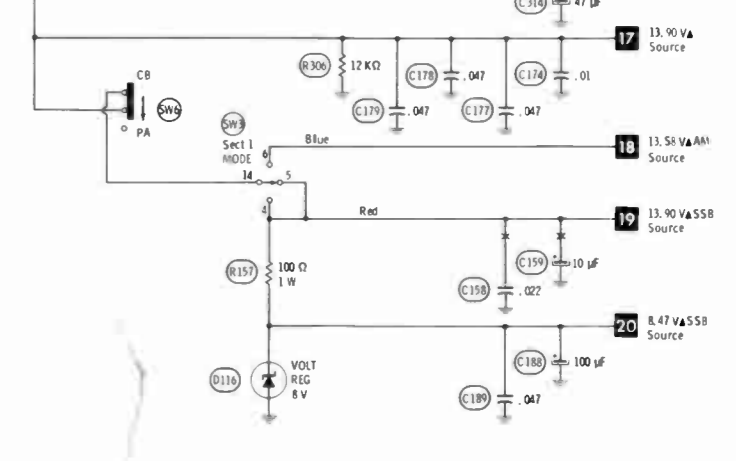
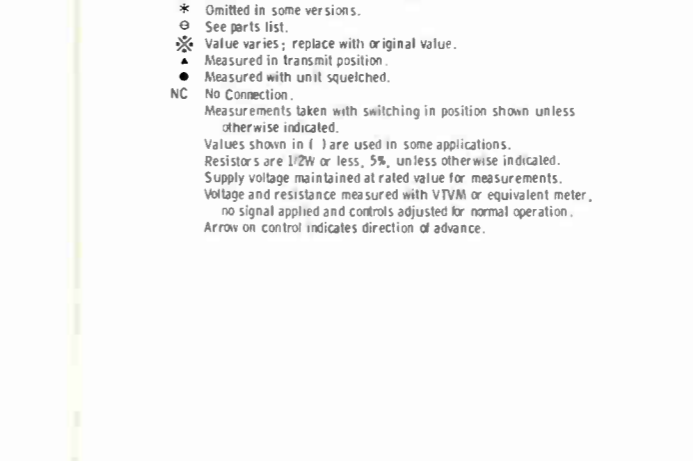
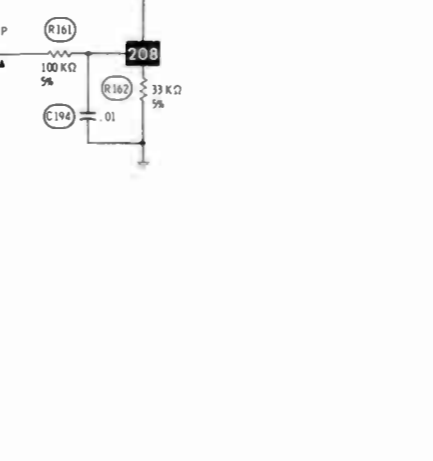
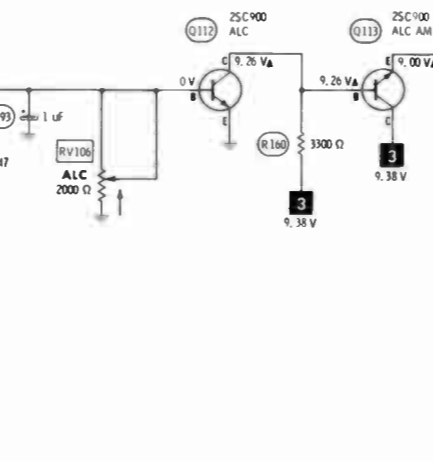
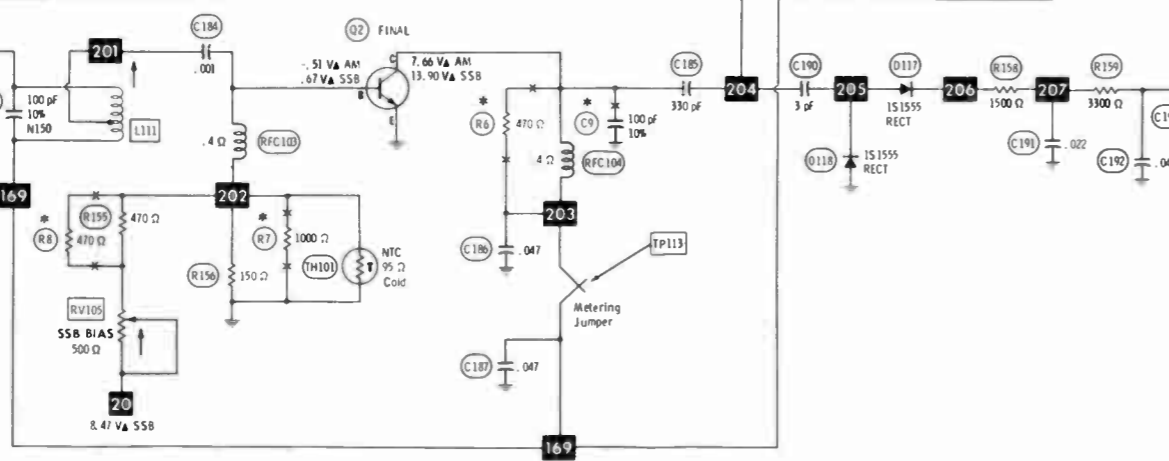
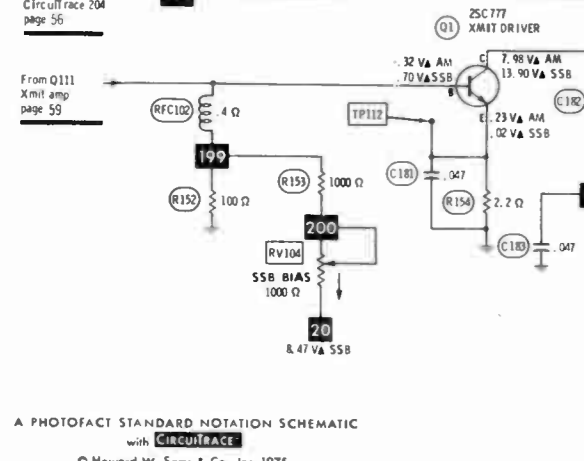
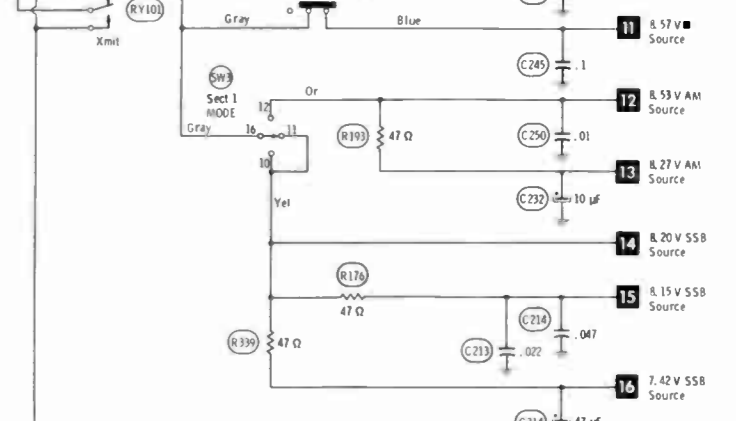
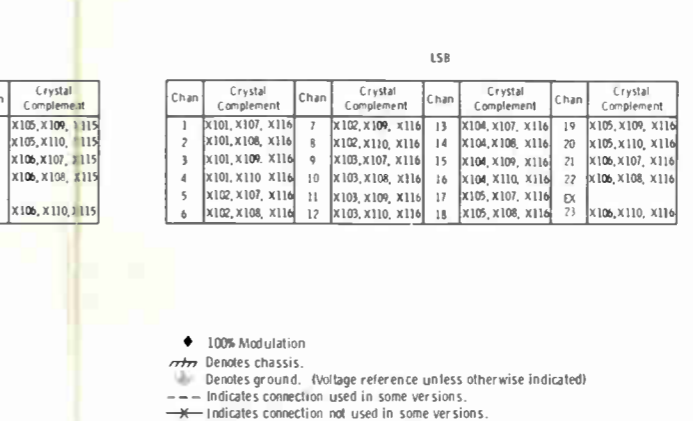
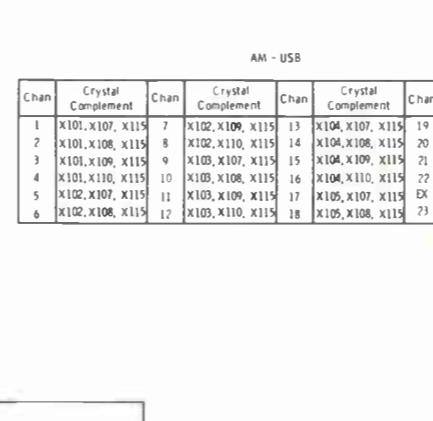
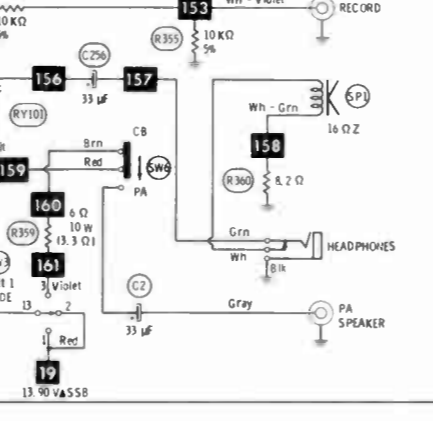
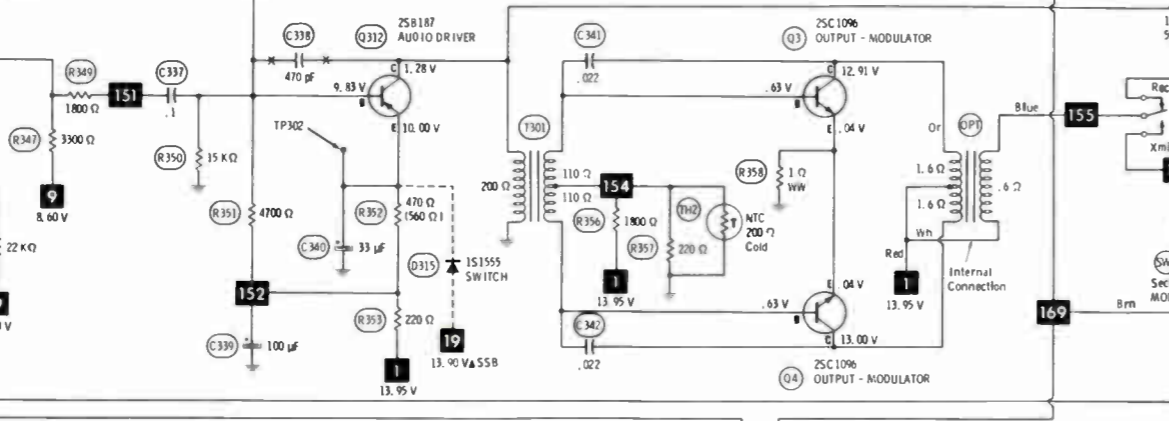
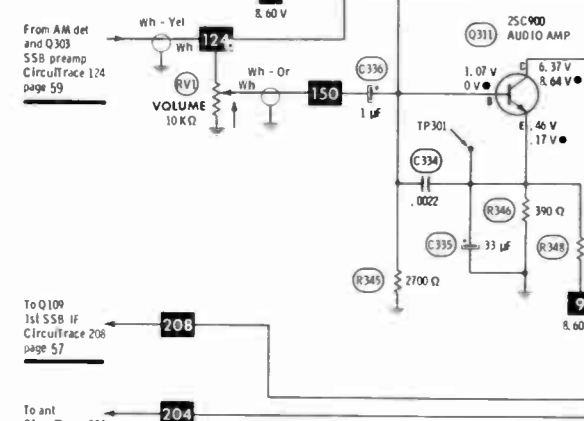
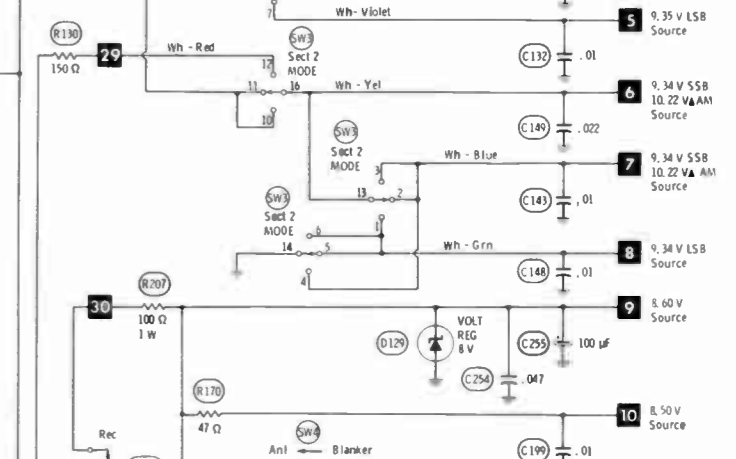
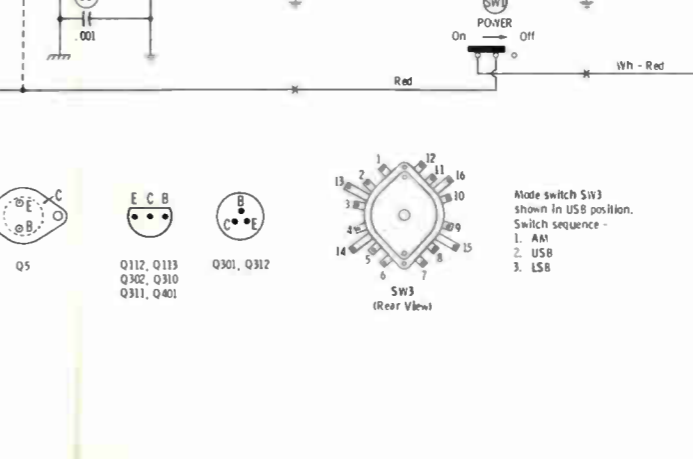
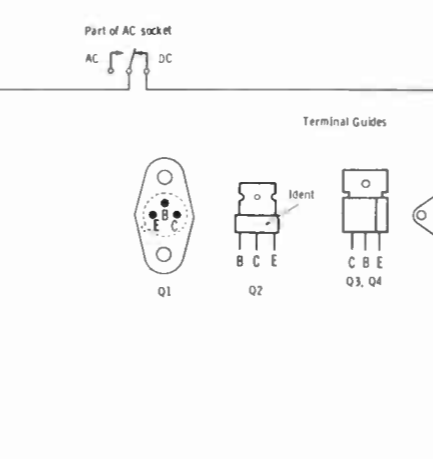
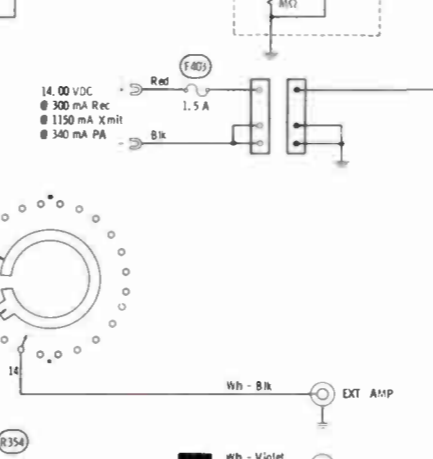
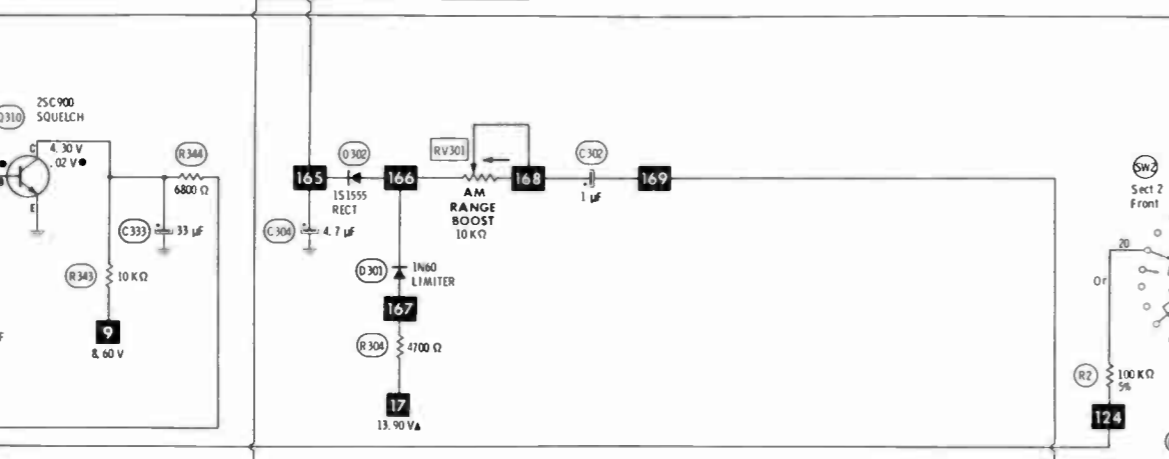
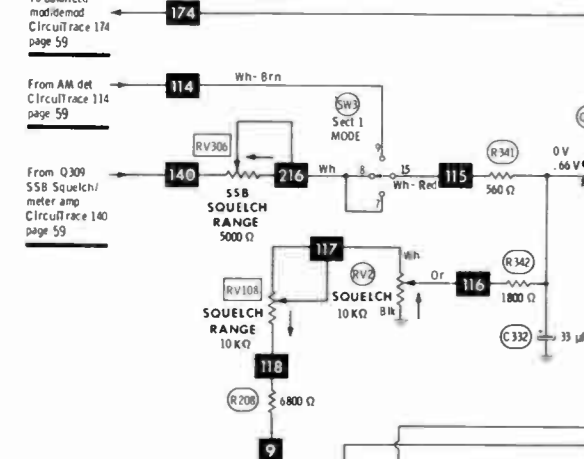
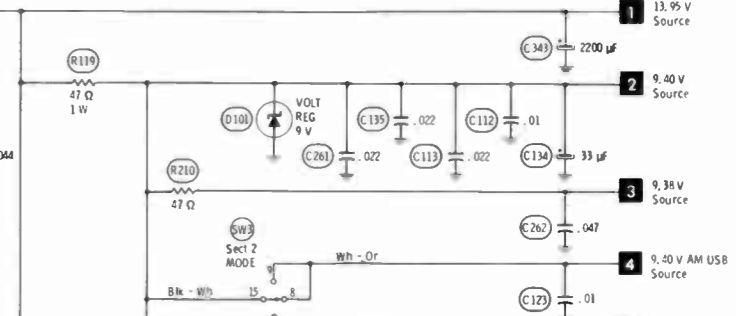
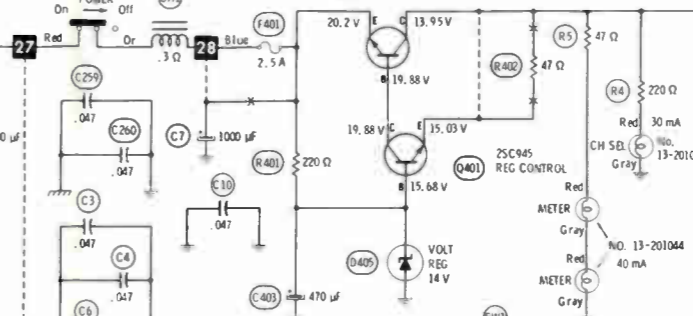
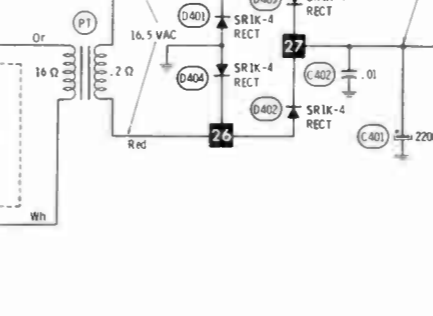
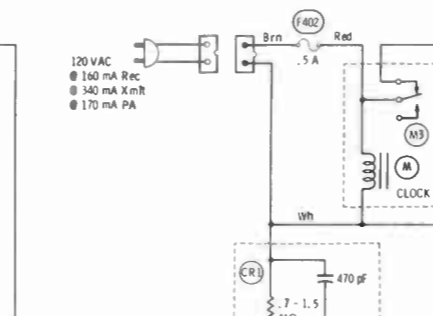
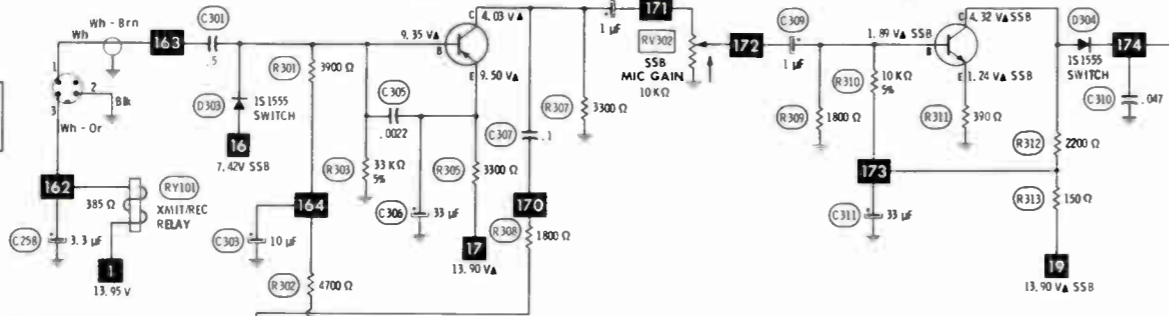
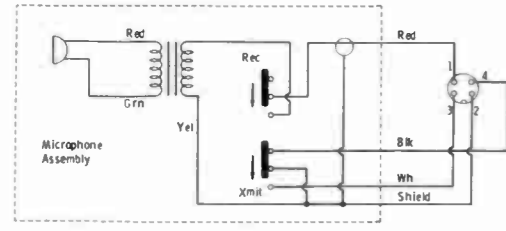
MIDLAND MODEL 13-898



A PHOTOFAC STANDARD NOTATION SCHEMATIC with CIRCUITRACE
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SEE NOTES ON PAGE 62





A PHOTOFAC STANDARD NOTATION SCHEMATIC with CIRCUITRACE
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AM - USB

Chan	Crystal Complement	Chan	Crystal Complement	Chan	Crystal Complement	Chan	Crystal Complement
1	X101, X107, X115	7	X102, X109, X115	13	X104, X107, X115	19	X105, X109, X115
2	X101, X108, X115	8	X102, X110, X115	14	X104, X108, X115	20	X105, X110, X115
3	X101, X109, X115	9	X103, X107, X115	15	X104, X109, X115	21	X106, X107, X115
4	X101, X110, X115	10	X103, X108, X115	16	X104, X110, X115	22	X106, X108, X115
5	X102, X107, X115	11	X103, X109, X115	17	X105, X107, X115	EX	
6	X102, X108, X115	12	X103, X110, X115	18	X105, X108, X115	23	X106, X110, X115

LSB

Chan	Crystal Complement	Chan	Crystal Complement	Chan	Crystal Complement	Chan	Crystal Complement
1	X101, X107, X116	7	X102, X109, X116	13	X104, X107, X116	19	X105, X109, X116
2	X101, X108, X116	8	X102, X110, X116	14	X104, X108, X116	20	X105, X110, X116
3	X101, X109, X116	9	X103, X107, X116	15	X104, X109, X116	21	X106, X107, X116
4	X101, X110, X116	10	X103, X108, X116	16	X104, X110, X116	22	X106, X108, X116
5	X102, X107, X116	11	X103, X109, X116	17	X105, X107, X116	EX	
6	X102, X108, X116	12	X103, X110, X116	18	X105, X108, X116	23	X106, X110, X116

- ◆ 100% Modulation
 - ⊕ Denotes chassis.
 - ⊖ Denotes ground. (Voltage reference unless otherwise indicated)
 - Indicates connection used in some versions.
 - ⊗ Indicates connection not used in some versions.
 - ⊙ Omitted in some versions.
 - ⊙ See parts list.
 - ⊙ Value varies; replace with original value.
 - ⊙ Measured in transmit position.
 - ⊙ Measured with unit squelched.
 - NC No Connection.
- Measurements taken with switching in position shown unless otherwise indicated.
Values shown in () are used in some applications.
Resistors are 1/2W or less, 5%, unless otherwise indicated.
Supply voltage maintained at rated value for measurements.
Voltage and resistance measured with VTM or equivalent meter, no signal applied and controls adjusted for normal operation.
Arrow on control indicates direction of advance.

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 / MFR. No. / PART No.	REPLACEMENT DATA						
		GENERAL ELECTRIC PART No.	INTERNATIONAL RECTIFIER PART No.	MALLORY PART No.	MOTOROLA PART No.	RCA PART No.	SPRAGUE PART No.	SYLVANIA PART No.
Q109	2SC839/09-302124	GE-20	TR-24	PTC121	HEP54	SK3122	RT102	ECG 123A
Q110	2SC815/09-302062	GE-20	TR-21	PTC139	HEP724	SK3038	RT102	ECG 123A
Q111	2SC815/09-302062	GE-20	TR-21	PTC139	HEP724	SK3038	RT102	ECG 123A
Q112	2SC900/09-302093	GE-62	TR-21	PTC139	HEP725	SK3124	RT102	ECG 199
Q113	2SC900/09-302093	GE-62	TR-21	PTC139	HEP725	SK3124	RT102	ECG 199
Q114	2SC460(A)/09-302004	GE-17	TR-24	PTC101	HEP720	SK3039	RT107	ECG 108
Q115	2SC839/09-302124	GE-20	TR-24	PTC121	HEP54	SK3122	RT102	ECG 123A
Q116	2SC900/09-302093	GE-62	TR-21	PTC139	HEP725	SK3124	RT102	ECG 199
Q117	2SC839/09-302124	GE-20	TR-24	PTC121	HEP54	SK3122	RT102	ECG 123A
Q118	2SC839/09-302124	GE-20	TR-24	PTC121	HEP54	SK3122	RT102	ECG 123A
Q119	2SC839/09-302124	GE-20	TR-24	PTC121	HEP54	SK3122	RT102	ECG 123A
Q120	2SC900/09-302093	GE-62	TR-21	PTC139	HEP729	SK3124	RT102	ECG 199
Q121	2SC900/09-302093	GE-62	TR-21	PTC139	HEP729	SK3124	RT102	ECG 199
Q122	2SC839/09-302124	GE-20	TR-24	PTC121	HEP54	SK3122	RT102	ECG 123A
Q301	2SB77(B)/09-301048	GE-2	TR-85	PTC109	HEP254	SK3004	RT121	ECG 102A
Q302	2SC900/09-302093	GE-62	TR-21	PTC139	HEP729	SK3124	RT102	ECG 199
Q303	2SC900/09-302093	GE-62	TR-21	PTC139	HEP729	SK3124	RT102	ECG 199
Q304	2SC900/09-302093	GE-62	TR-21	PTC139	HEP729	SK3124	RT102	ECG 199
Q305	2SC945/09-302125	GE-20	(1R)2SC945	PTC136	HEP728	SK3124	RT102	ECG 123A
Q306	2SC945/09-302125	GE-20	(1R)2SC945	PTC136	HEP728	SK3124	RT102	ECG 123A
Q307	2SC945/09-302125	GE-20	(1R)2SC945	PTC136	HEP728	SK3124	RT102	ECG 123A
Q308	2SK19(GR)/09-305014	GE-FET-2	FE-100	PTC152	HEPF0021	SK3116	RT175	ECG 132
Q309	2SC945/09-302125	GE-20	(1R)2SC945	PTC136	HEP728	SK3124	RT102	ECG 123A
Q310	2SC900/09-302093	GE-62	TR-21	PTC139	HEP729	SK3124	RT102	ECG 199
Q311	2SC900/09-302093	GE-62	TR-21	PTC139	HEP729	SK3124	RT102	ECG 199
Q312	2SB187(C)	GE-53	TR-17	PTC135	HEP632	SK3004	RT121	ECG 102A
Q401	2SC945/09-302125	GE-20	(1R)2SC945	PTC136	HEP728	SK3124	RT102	ECG 123A

(1) Used in some versions.

(2) Rating 10 Watts @ 2 Amps.

(3) Rating 30 Watts @ 7 Amps.

MIDLAND MODEL 13-898

ELECTROLYTIC CAPACITORS

ITEM No.	RATING	REPLACEMENT DATA					
		MFR. PART No.	ARCO PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	33 16V		ME-3-E-035	EP15-25	PC30-25	MTV30CB25	EV-1325
C7	1000 16V		ME-G1000	EA15-1000	WBR1000-16	MTA1000G25	TVA-1163
C134	33 16V		ME-3-E-035	EP15-25	PC30-25	MTV30CB25	EV-1325
C189	100 10V		RME-E-D-100	EP15-100	PC100-10	MTV100CB10	EV-1130
C193	1 50V		RME-A-J-001	EP50-1	PC1-50	MTV1CB50	EV-1615
C229	10 16V		RME-B-E-010	EP15-10	PC10-25	VTT10A25	EV-1222
C232	10 16V		RME-B-E-010	EP15-10	PC10-25	VTT10A25	EV-1222
C233	3.3 25V		RME-A-H-003	EP30-5	PC5-50	VTT3R3A50	EV-1618
C234	33 10V		ME-3-D-035	EP15-25	PC30-25	VTT33A10	EV-1125
C255	100 16V		RME-E-E-100	EP15-100	PC100-16	MTV100CD15	EV-1230
C256	33 16V		ME-3-E-035	EP15-25	PC30-25	MTV30CB25	EV-1325
C258	3.3 25V		RME-A-H-003	EP30-5	PC5-50	VTT3R3A50	EV-1618
C302	1 50V		RME-A-J-001	EP50-1	PC1-50	MTV1CB50	EV-1615
C303	10 16V		RME-B-E-010	EP15-10	PC10-25	VTT10A25	EV-1222
C304	4.7 25V		RME-A-G-005	EP30-5	PC5-50	VTT4R7A50	EV-1319
C306	33 16V		ME-3-E-035	EP15-25	PC30-25	MTV30CB25	EV-1325
C308	1 50V		RME-A-J-001	EP50-1	PC1-50	MTV1CB50	EV-1615
C309	1 50V		RME-A-J-001	EP50-1	PC1-50	MTV1CB50	EV-1615
C311	33 10V		ME-3-D-035	EP15-25	PC30-25	VTT33A10	EV-1125
C313	1 50V		RME-A-J-001	EP50-1	PC1-50	MTV1CB50	EV-1615
C314	47 10V		RME-O-D-050	EP15-50	PC50-10	MTV50CB15	EV-1226
C315	1 50V		RME-A-J-001	EP50-1	PC1-50	MTV1CB50	EV-1615
C317	1 50V		RME-A-J-001	EP50-1	PC1-50	MTV1CB50	EV-1615
C318	1 50V		RME-A-J-001	EP50-1	PC1-50	MTV1CB50	EV-1615
C319	1 50V		RME-A-J-001	EP50-1	PC1-50	MTV1CB50	EV-1615
C321	1 50V		RME-A-J-001	EP50-1	PC1-50	MTV1CB50	EV-1615
C322	1 50V		RME-A-J-001	EP50-1	PC1-50	MTV1CB50	EV-1615
C326	1 50V		RME-A-J-001	EP50-1	PC1-50	MTV1CB50	EV-1615
C327	33 10V		ME-3-D-035	EP15-25	PC30-25	VTT33A10	EV-1125
C328	10 16V		RME-B-E-010	EP15-10	PC10-25	VTT10A25	EV-1222
C329	10 16V		RME-B-E-010	EP15-10	PC10-25	VTT10A25	EV-1222
C330	33 16V		ME-3-E-035	EP15-25	PC30-25	MTV30CB25	EV-1325
C331	10 16V		RME-B-E-010	EP15-10	PC10-25	VTT10A25	EV-1222
C332	33 10V		ME-3-D-035	EP15-25	PC30-25	VTT33A10	EV-1125
C333	33 10V		ME-3-D-035	EP15-25	PC30-25	VTT33A10	EV-1125
C335	33 10V		ME-3-D-035	EP15-25	PC30-25	VTT33A10	EV-1125
C336	1 50V		RME-A-J-001	EP50-1	PC1-50	MTV1CB50	EV-1615
C339	100 16V		RME-E-E-100	EP15-100	PC100-16	MTV100CD15	EV-1230
C340	33 16V		ME-3-E-035	EP15-25	PC30-25	MTV30CB25	EV-1325
C343	2200 16V		RME-M-D-1000	EP15-1000	PC1000-16	MTA1000G25	EV-1160
C401	2200 16V		RME-M-D-1000	EP15-1000	PC1000-16	MTA1000G25	EV-1160
C403	470 16V		RME-L-E-500	EP15-500	PC500-16	MTV500DN15	EV-1250
C502	1 50V		RME-A-J-001	EP50-1	PC1-50	MTV1CB50	EV-1615

PARTS LIST AND DESCRIPTION (CONTINUED)

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

CAPACITORS

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA				
			ARCO/ELMENCO PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.
C1	22		CCT0-220	DTZ-22	NP022	CN0422	10TCC-Q22
C3	.047		CCD-403			GP140	5GA-S40
C4	.047		CCD-403			GP140	5GA-S40
C5	.047		CCD-403			GP140	5GA-S40
C6	.001		CCD-102	DD-102	GP1000	GP210	2SS-D10
C8	13					CN0412	10TCC-Q12
C9	100			DTZ-100	NP0100	CN0310	10TCC-T10
C10	.047		CCD-403			GP140	5GA-S40
C101	82 10% N150		*			*	10TCP-Q82
C102	22 N150		*			*	10TCP-Q22
C103	56 10% N150		*			*	10TCP-Q56
C104	56 10% N150		*			*	10TCP-Q56
C105	56 10% N150		*			*	10TCP-Q56
C106	56 10% N150		*			*	10TCP-Q56
C107	56 10% N150		*			*	10TCP-Q56
C108	56 10% N150		*			*	10TCP-Q56
C109	220 10% N750		CCTN-221	DTN-220	N220	CN7322	10TCU-T22
C110	100 10% N150		*			*	10TCP-T10
C111	220 10% N750		CCTN-221	DTN-220	N220	CN7322	10TCU-T22
C112	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C113	.022		CCD-203	DC-203		MAG5012	2SS-S20
C114	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C115	27					CN0427	10TCC-Q27
C116	27					CN0427	10TCC-Q27
C117	27					CN0427	10TCC-Q27
C118	27					CN0427	10TCC-Q27
C119	68 10% N150		*			*	10TCP-Q68
C120	68 10% N150		*			*	10TCP-Q68
C121	82 5%		DM10-820J	CPR-82J	CD10ED820J03	SX482	424MC820J501
C122	100 10% N150		*			*	10TCP-T10
C123	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C124	27					CN0427	10TCC-Q27
C125	27					CN0427	10TCC-Q27
C126	27					CN0427	10TCC-Q27
C127	27					CN0427	10TCC-Q27
C128	68 10% N150		*			*	10TCP-Q68
C129	68 10% N150		*			*	10TCP-Q68
C130	820 5%		DM19-821J	CPR-820J	CD19FD821J03	SX382	424ME820J501
C131	100 10% N150		*			*	10TCP-T10
C132	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C133	15			DTZ-15	NP015	CN0415	10TCC-Q15
C135	.022		CCD-203	DC-203		MAG5012	2SS-S20
C136	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C137	5		CCT0-050				10TCC-V50
C138	100 10% N150		*			*	10TCP-T10
C139	150 10% N150		*			*	10TCP-T15
C140	510 5%		DM15-511J	CPR-510J	CD15FD511J03	SX351	424ME510J501
C141	220 10% N150		*			*	10TCP-T22
C142	150 10% N150		*			*	10TCP-T15
C143	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C144	150 10% N150		*			*	10TCP-T15
C145	150 5%		DM10-151J	CPR-150J	CD7FD151J03	SX315	424MC150J501
C146	220 10% N150		*			*	10TCP-T15
C147	150 10% N150		*			*	10TCP-T15
C148	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C149	.022		CCD-203	DC-203		MAG5012	2SS-S20
C150	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C151	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C152	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C153	.001		CCD-102	DD-102		GP210	10TS-D10
C154	.2						
C155	.047		CCD-503	DC-503	MGP05	MAG5015	TGL-S50
C156	6 N150		*			*	10TCP-V56
C157	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C160	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C161	.001		CCD-102	DD-102		GP210	10TS-D10
C162	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C163	39		CCT0-390			CN0439	10TCC-Q39
C164	.01		*			*	
C165	100 10% N150		*			*	10TCP-T10
C166	4		CCT0-3R3	DTZ-3R3	NP03P3	CN0533	10TCC-V33
C167	.022		CCD-203	DC-203		MAG5012	2SS-S20
C168	.022		CCD-203	DC-203		MAG5012	2SS-S20
C169	47 10% N150		*			*	10TCP-Q39
C170	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C171	5		CCT0-050				10TCC-V50
C172	100 10%		CCT0-101	DTZ-100	NP0100	CN0310	10TCC-T10
C173	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C174	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C175	100 10% N150		*			*	10TCP-T10
C176	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C177	.047		CCD-503	DC-503	MGP05	MAG5015	TGL-S50
C178	.047		CCD-503	DC-503	MGP05	MAG5015	TGL-S50
C179	.047		CCD-503	DC-503	MGP05	MAG5015	TGL-S50
C180	330 5%			DTN-330	N330	CN7333	10TCU-T33
C181	.047		CCD-503	DC-503	MGP05	MAG5015	TGL-S50
C182	100 10% N150		*			*	10TCP-T10
C183	.047		CCD-503	DC-503	MGP05	MAG5015	TGL-S50
C184	.001		CCD-102	DD-102	GP1000	GP210	2SS-D10
C185	330		CCD-331	DD-331	GP330	GP333	10TS-T33
C186	.047		CCD-503	DC-503	MGP05	MAG5015	TGL-S50
C187	.047		CCD-503	DC-503	MGP05	MAG5015	TGL-S50
C189	.047		CCD-503	DC-503	MGP05	MAG5015	TGL-S50

PARTS LIST AND DESCRIPTION (CONTINUED)

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

CAPACITORS (cont)

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA				
			ARCO/ELMENCOPART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.
C190	3		CCT0-3R3	DTZ-3R3	NP03P3	CN0533	10TCC-V33
C191	.022		CCD-203			GP120	5GA-S20
C192	.047		CCD-503	DC-503	MGP05	MAG5015	TGL-S50
C194	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C195	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C196	100 10%		CCT0-101	DTZ-100	NP0100	CN0310	10TCC-T10
C197	2		CCT0-2R2	DTZ-2R2	NP02P2	CN0522	10TCC-V22
C198	220 10%		CCTN-221	OTN-220	N220	CN7322	10TCU-T22
C199	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C200	5		CCT0-050				10TCC-V50
C201	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C202	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C203	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C204	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C205	27					CN0427	10TCC-Q27
C206	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C207	220 10%		CCTN-221	DTN-220	N220	CN7322	10TCU-T22
C208	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C209	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C210	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C211	150 10% N150		*			*	10TCP-T15
C212	.022		CCD-203	DC-203		MAG5012	2SS-S20
C213	.022		CCD-203			GP120	5GA-S20
C214	.047		CCD-503	DC-503	MGP05	MAG5015	TGL-S50
C215	5		CCT0-050				10TCC-V50
C216	15		CCT0-150	DTZ-15	NP015	CN0415	10TCC-Q15
C217	.001 10%		DM19-102J	CPR-1000J	CD19FD102J03	SX210	424ME1001J501
C218	.047		CCD-503	DC-503	MGP05	MAG5015	TGL-S50
C219	6		CCT0-6R8	DTZ-6R8	NP06P8	CN0568	10TCC-V68
C220	510 5%		DM15-511J	CPR-510J	CD15FD511J03	SX351	424ME5100J501
C221	.047		CCD-503	DC-503	MGP05	MAG5015	TGL-S50
C222	.047		CCD-503	DC-503	MGP05	MAG5015	TGL-S50
C223	.047		CCD-503	DC-503	MGP05	MAG5015	TGL-S50
C224	.047		CCD-503	DC-503	MGP05	MAG5015	TGL-S50
C225	.047		CCD-503	DC-503	MGP05	MAG5015	TGL-S50
C226	.047		CCD-503	DC-503	MGP05	MAG5015	TGL-S50
C227	.047		CCD-503	DC-503	MGP05	MAG5015	TGL-S50
C228	.022		CCD-203			GP120	5GA-S20
C230	.022		CCD-203			GP120	5GA-S20
C231	.03 10%		6DP-3-333		DPMS6S33	EHF6133	6PS-S33
C235	100 10% N150		*			*	10TCP-T10
C236	.1			DC-104	MGP1	MAG5001	TG-P10
C237	.1			DC-104	MGP1	MAG5001	TG-P10
C238	.047		CCD-503	DC-503	MGP05	MAG5015	TGL-S50
C239	.047		CCD-503	DC-503	MGP05	MAG5015	TGL-S50
C240	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C241	330 5%		DM15-331J	CPR-330J	CD15FD331J03	SX333	424ME3300J501
C242	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C243	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C244	.1			DC-104	MGP1	MAG5001	TG-P10
C245	.1			DC-104	MGP1	MAG5001	TG-P10
C246	39		CCT0-390	CPR-270J	CD15FD271J03	CN0439	10TCC-Q39
C247	270 10%		DM15-271J	DC-103	GP10000	SX327	424ME2700J501
C248	.01		CCD-103	CPR-220J	CD10FD221J03	MAG5011	2SS-S10
C249	220 10%		DM10-221J	DC-103	GP10000	SX322	424ME2200J501
C250	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C251	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C252	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C253	180 10%		CCD-181	DD-181		GP318	10TS-T18
C254	.047		CCD-503	DC-503	MGP05	MAG5015	TGL-S50
C257	270 10%		CCD-271	DD-271	GR270	GP327	10TS-T27
C259	.047		CCD-503	DC-503	MGP05	MAG5015	TGL-S50
C260	.047		CCD-503	DC-503	MGP05	MAG5015	TGL-S50
C261	.022		CCD-203			GP120	5GA-S20
C262	.047		CCD-503	DC-503	MGP05	MAG5015	TGL-S50
C301	.5						
C305	.0022		CCD-222			GP222	10TS-022
C307	.1			DC-104	MGP1	MAG5001	TG-P10
C310	.047		CCD-503	DC-503	MGP05	MAG5015	TGL-S50
C312	.3						
C316	.2						
C320	.047		CCD-503	DC-503	MGP05	MAG5015	TGL-S50
C323	.1			DC-104	MGP1	MAG5001	TG-P10
C324	.1			DC-104	MGP1	MAG5001	TG-P10
C325	.5						
C334	.0022		CCD-222			GP222	10TS-022
C337	.1			DC-104	MGP1	MAG5001	TG-P10
C338	470		CCD-471	DD-471	GP470	GP347	10TS-T47
C341	.022		CCD-203			GP120	5GA-S20
C342	.022		CCD-203			GP120	5GA-S20
C402	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C501	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C503	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C504	2 N150		*			*	10TCP-V22

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

MIDLAND MODEL 13-898

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.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.
RV1	Volume	10K	13-160089	F2-10K (1), SSK012	A47-10K-Z (1), KSS-3 or [NP-10K-Z (1), UP-C-400]	BU1 (1),CF61, SS6A	RU14A,SL36 (1), SL1500 or [UA14A (1),SK750] or [U18 (1)]
RV2	Squelch	10K	13-166041	F5-10K (1), SSK012	A47-10K-V (1), KSS-3 or [NP-10K-V (1), UP-C-400]	BU1 (1),CF35, SS6A	RU14R,SL36 (1), SL1500 or [UA14R (1),SK750] or [U19 (1)]
RV3	RF Gain	50K	13-166042	F1-50K (1), SSK012	A47-50K-S (1), KSS-3 or [NP-50K-S (1), UP-C-400]	BU1 (1),CF12, SS6A	RU54L,SL36 (1), SL1500 or [UA54L (1),SK750] or [U35 (1)]
RV4	"SWR" Calibrate	5000	13-166043	F1-5000 (1), SSK012	A47-5000-S (1), KSS-3 or [NP-5000-S (1), UP-C-400]	BU1 (1),CFB, SS6A	RU53L,SL36 (1), SL1500 or [UA53L (1),SK750] or [U14 (1)]
RV101	USB Osc Level	1000	13-164083	TSV-1K (2) or T-1000 (2)	C-102 (2)	X201R102B (2)	MTC13L1 (2)
RV102	LSB Osc Level	1000	13-164083	TSV-1K (2) or T-1000 (2)	C-102 (2)	X201R102B (2)	MTC13L1 (2)
RV103	Carrier Balance	300	13-164084	TSV-1K (2) or T-1000 (2)	C-102 (2)	X201R102B (2)	MTC13L1 (2)
RV104	SSB Bias	1000	13-164083	TSV-1K (2) or T-1000 (2)	C-102 (2)	X201R102B (2)	MTC13L1 (2)
RV105	SSB Bias	500	13-164085	TSV-500 (2) or T-500 (2)	C-501 (2)	X201R501B (2)	MTC52L1 (2)
RV106	ALC	2000	13-164086	TSV-2.5K (2) or [T-2500 (2)]	C-252 (2)	X201R252B (2)	MTC23L1 (2)
RV107	AM "S" Meter	10K	13-164087	TSV-10K (2) or T-10K (2)	C-103 (2)	X201R103B (2)	MTC14L1 (2)
RV108	Squelch Range	10K	13-164087	TSV-10K (2) or T-10K (2)	C-103 (2)	X201R103B (2)	MTC14L1 (2)
RV301	AM Range Boost	10K	13-164087	TSV-10K (2) or T-10K (2)	C-103 (2)	X201R103B (2)	MTC14L1 (2)
RV302	SSB Mic Gain	10K	13-164088	TSV-10K or T-10K	C-103	X201R103B	MTC14L1
RV303	SSB AGC	10K	13-164088	TSV-10K or T-10K	C-103	X201R103B	MTC14L1
RV304	SSB AGC	5000	13-164089	TV-5K or T-5000	C-502	X201R502B	MTC53L1
RV305	SSB "S" Meter	2000	13-164090	TSV-2.5K (2) or [T-2500 (2)]	C-252 (2)	X201R252B (2)	MTC23L1 (2)
RV306	SSB Squelch Range	5000	13-164091	TSV-5K (2) or T-5000 (2)	C-502 (2)	X201R502B (2)	MTC53L1 (2)
RV501	RF Meter	500	13-164085	TSV-500 (2) or T-500 (2)	C-501 (2)	X201R501B (2)	MTC52L1 (2)

(1) Enlarge mounting hole.

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

RESISTORS (Power and Special)

ITEM No.	RATING	REPLACEMENT DATA		ITEM No.	RATING	REPLACEMENT DATA	
		WORKMAN PART No.	MFR. PART No.			WORKMAN PART No.	MFR. PART No.
R359	6 10W WW			TH101	95 Cold NTC		09-307066
PTH	Varistor		13-087009	TH2	200 Cold NTC		09-307067

COILS (RF-IF)

ITEM No.	FUNCTION	REPLACEMENT DATA			REMARKS
		PART No.	OTHER IDENTIFICATION	MILLER PART No.	
CH101	AF Choke (1mH)	13-178134			
CH102	RF Choke	13-178135			
CH103	RF Choke	13-178135			
L1	Pi Network (27MHz)	13-176385			
L2	TVI (54MHz)	13-176386			
L101	Synth. Buffer (23MHz)	13-094010	ETR-216-531		
L102	USB Osc. (15MHz)	13-170188			
L103	LSB Osc. (15MHz)	13-170188			
L104	Synth. Mixer (38MHz)	13-094011	ETR-217-531		
L105	Synth. Mixer (38MHz)	13-094011	ETR-217-531		
L106	Bal. Mod. (11MHz)	13-094012			
L107	1st SSB IF (11MHz)	13-090260	ETI-65-361Y		
L108	Xmit. Mixer (27MHz)	13-094013	ETR-218-43		
L109	Xmit. Mixer (27MHz)	13-094013	ETR-218-43		
L110	Xmit. Amp (27MHz)	13-094014			
L111	Xmit. Driver (27MHz)	13-094014			
L112	Final (27MHz)	13-094015			
L113	Rec. Ant (27MHz)	13-094016	R-12-353Q		
L114	Rec. Ant (27MHz)	13-094016	R-12-353Q		
L115	Rec. RF (27MHz)	13-094017	R-27-361Y		
L116	Rec. Mixer (11MHz)	13-090260	ETI-66-3615		
L117	2nd SSB IF (27MHz)	13-090261	ETI-65-361Y		
L118	Rec. Mixer (455kHz)	13-090262	I-32-361Y		
L119	Rec. IF (455kHz)	13-090263	I-33-3525		
L120	AM Input IF (455kHz)	13-090264	I-41-3535		
L121	AM Output IF (455kHz)	13-090265	I-23-3535		
L122	Noise Amp (455kHz)		R-42-361Y		

PARTS LIST AND DESCRIPTION (CONTINUED)

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

COILS (RF-IF)(cont)

ITEM No.	FUNCTION	REPLACEMENT DATA			REMARKS
		PART No.	OTHER IDENTIFICATION	MILLER PART No.	
L123	Noise Amp (455kHz)	13-094019	R-43-362L		
L124	Noise Amp (455kHz)	13-094020	R-44-361Y		
L125	Rec. Osc. (11MHz)	13-170189	R-28-361Y		
MF	Mech. Filter (455MHz)	13-179031	EFC-3		
RFC101	RF Choke	13-178136			
RFC102	RF Choke	13-178136			
RFC103	RF Choke	13-178136			
RFC104	RF Choke	13-178136			
RFC105	RF Choke	13-178136			

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (D CURRENT 1000~)	MFG. PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
CH	1450mA	.2	4mH	13-178133 (ELA-13)				

TRANSFORMER (Power)

ITEM No.	RATING		REPLACEMENT DATA				NOTES
	PRI.	SEC. 1	MFG. PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
PT	120V AC @ 400mA AC	16.5V AC @ 2000mA AC	13-098017 (ETP-48FU)				

TRANSFORMER (Driver)

ITEM No.	TURNS RATIO			REPLACEMENT DATA				NOTES
	PRI.	SEC. 1	SEC. 2	MFG. PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD Part No.	
T301	1	1		13-096145 (ETA-28)				

TRANSFORMER (Audio Output)

ITEM No.	IMPEDANCE		REPLACEMENT DATA				NOTES
	PRI.	SEC.	MFG. PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
OPT	256	16	13-096144 (ETA-39)				

SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		MFG. PART No.	QUAM PART No.	
SP1	3" PM, 16 Ohms	13-060084	30A05R216	

MIDLAND MODEL 13-898

PARTS LIST AND DESCRIPTION (CONTINUED)

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

FUSE DEVICES

ITEM No.	DESCRIPTION	REPLACEMENT DATA						
		PART No.		BUSS PART No.		LITTELFUSE PART No.		WORKMAN PART No.
		DEVICE	HOLDER	DEVICE	HOLDER	DEVICE	HOLDER	DEVICE
F401	2.5A Quick-Acting Pigtail	13-204008		GJV2-1/2		31802.5		
F402	.5A Quick-Acting			AGC1/2	HKP	312.500	150145	FG1/2-2

MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
M1	Meter	13-200043	"S"
M2	Meter	13-200043	RF/SWR
MF	Filter	13-179031	Mechanical (455kHz)
RY101	Relay	13-105016	Xmit/Rec
XF	Filter	13-179030	Crystal (11MHz)
X101	Crystal	13-128250	7.77660MHz
X102	Crystal	13-128251	7.79330MHz
X103	Crystal	13-128252	7.81000MHz
X104	Crystal	13-128253	7.82660MHz
X105	Crystal	13-128254	7.84330MHz
X106	Crystal	13-128255	7.86000MHz
X107	Crystal	13-128256	14.9070MHz
X108	Crystal	13-128257	14.9170MHz
X109	Crystal	13-128258	14.9270MHz
X110	Crystal	13-128259	14.9470MHz
X111	Crystal	13-128260	14.9040MHz
X112	Crystal	13-128261	14.9140MHz
X113	Crystal	13-128262	14.9240MHz
X114	Crystal	13-128263	14.9440MHz
X115	Crystal	13-128264	11.2750MHz
X116	Crystal	13-128265	11.2720MHz
X117	Crystal	13-128266	11.7300MHz
	Printed Circuit Board	13-070093	RF, Less Parts
	Printed Circuit Board	13-070094	AF, Less Parts
	Printed Circuit Board	13-070095	Power, Less Parts
	Printed Circuit Board	13-070096	SWR, Less Parts

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

ITEM	PART No.	ITEM	PART No.
Panel Assembly, Front	13-010190	Knob, RF Gain, Calibrate, Volume, Squelch, Mode	13-110138
Cabinet, Top	13-010191	Knob, Fine Tuning	13-110139
Chassis, Main	13-015031	Knob, RF/SWR, ANL/BLK, PA/CB	13-110141
Panel, Rear	13-013093	Knob, Power	13-110142
Panel, Bottom	13-013094	Bushing, Channel Disc	13-156077
Knob, Channel Selector	13-115075	Disc, Channel Number	13-115074

ACCESSORIES

ITEM	MFR. PART No.	REMARKS
Microphone	13-038050	
Cord, DC Power	13-034058	
Cord, AC Power	13-034059	



PHOTOFACT[®] with CIRCUITRACE[®]

For Supplier Address See PHOTOFACT Index

NOTE

ONLY THOSE PERSONS PROPERLY LICENSED ARE PERMITTED TO MAKE REPAIRS OR ADJUSTMENTS WHICH MAY RESULT IN ILLEGAL OPERATION. (REFER TO FCC RULES AND REGULATIONS PART 95, SUBPARTS 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 TOMCAT 23

ALIGNMENT

Suggested Alignment Tools: T5, T6, T7, T8GC ELECTRONICS #5000, 8290
All othersGC ELECTRONICS #9440

RECEIVER

Connect an AC VTVM or AF Wattmeter across speaker voice coil.
Adjustments are made with 12.6-volt DC input. Adjust volume control to obtain suitable reading.

SIGNAL GENERATOR	CHANNEL	ADJUST	REMARKS
High side thru a .01 uF cap to base of TR3, low side to ground. Set to 455 Hz, 1000 Hz @ 30% Modulation Output: MINIMUM uV.	Any	T5, T6, T7, T8	Set squelch maximum counterclockwise. Adjust for maximum.
High side thru a .01 uF capacitor to antenna jack, low side to ground. Set to 27.115 MHz, 1000 Hz @ 30% modulation output: 0.5 uV.	13	T1, T2, T3, T4	"
AGC High side thru a .01 uF capacitor to antenna jack, low side to ground. Set to 27.115 MHz, 1000Hz @ 30% Modulation Output: 0.4 uV.	13	VR1	Set volume control maximum clockwise. Set squelch control maximum counterclockwise. Adjust for 2V AF output.
Squelch Range High side thru .01 uF capacitor to antenna jack, low side to ground. Set to 27.115 MHz, 1000Hz, @ 30% Modulation Output: 200 uV.		VR3	Set squelch control fully counterclockwise. Adjust so that squelch just breaks.
"S" Meter High side thru .01 uF capacitor to antenna jack, low side to ground. Set to 27.115 MHz, 1000 Hz @ 30% Modulation Output: 100 uV.		VR7	Adjust for "S9" on panel "S" meter.

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

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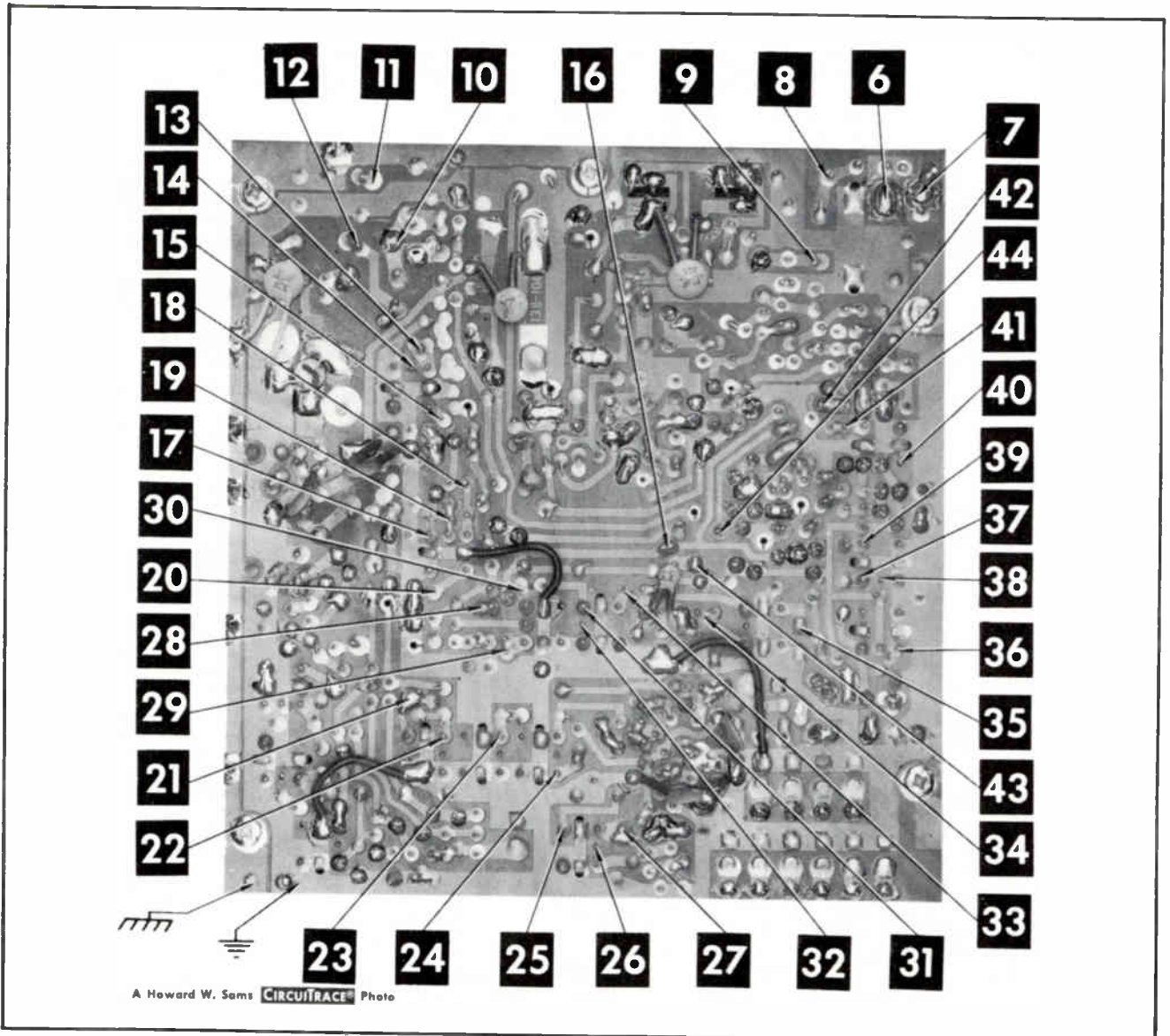
PEARCE-SIMPSON MODEL TOMCAT 23

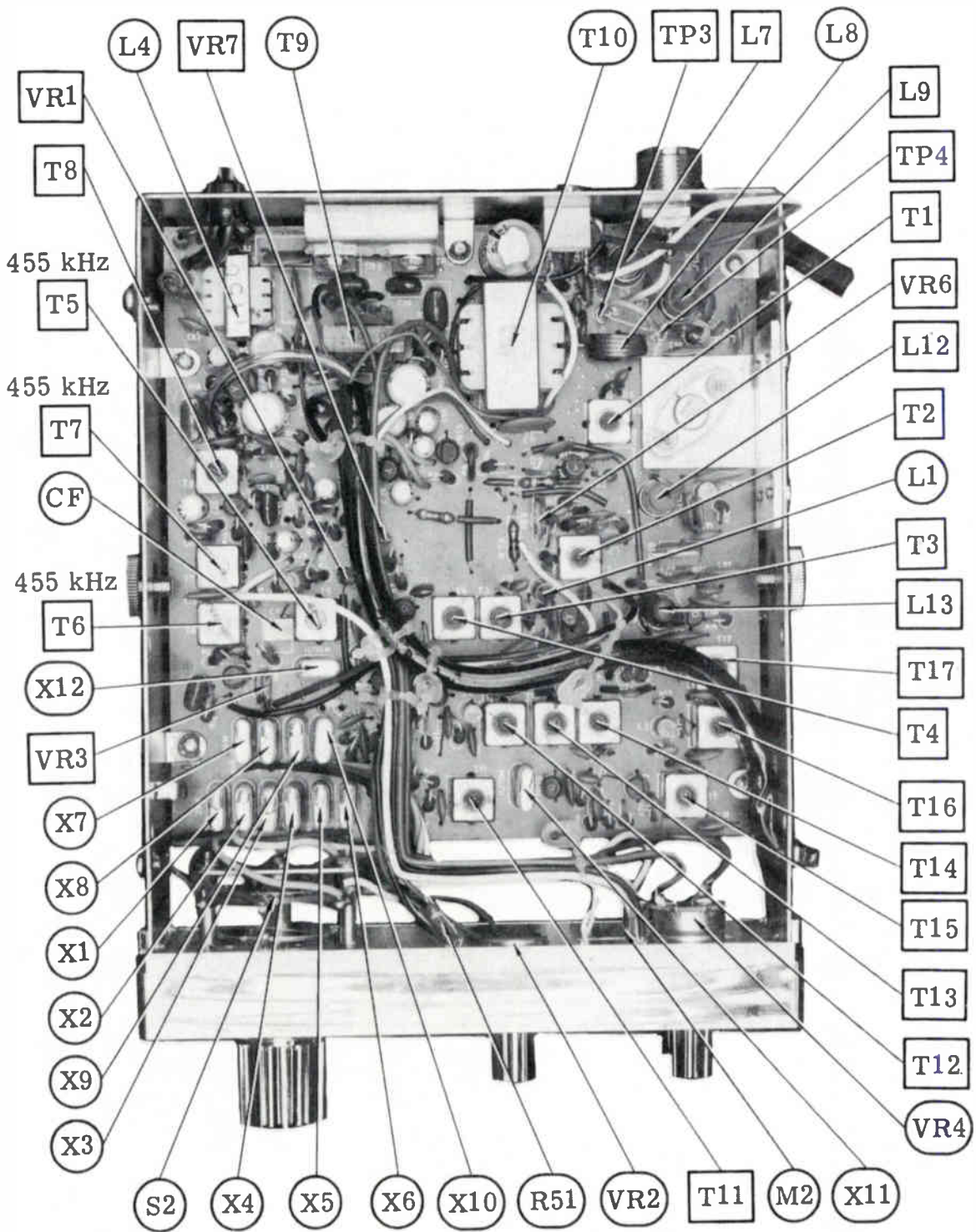
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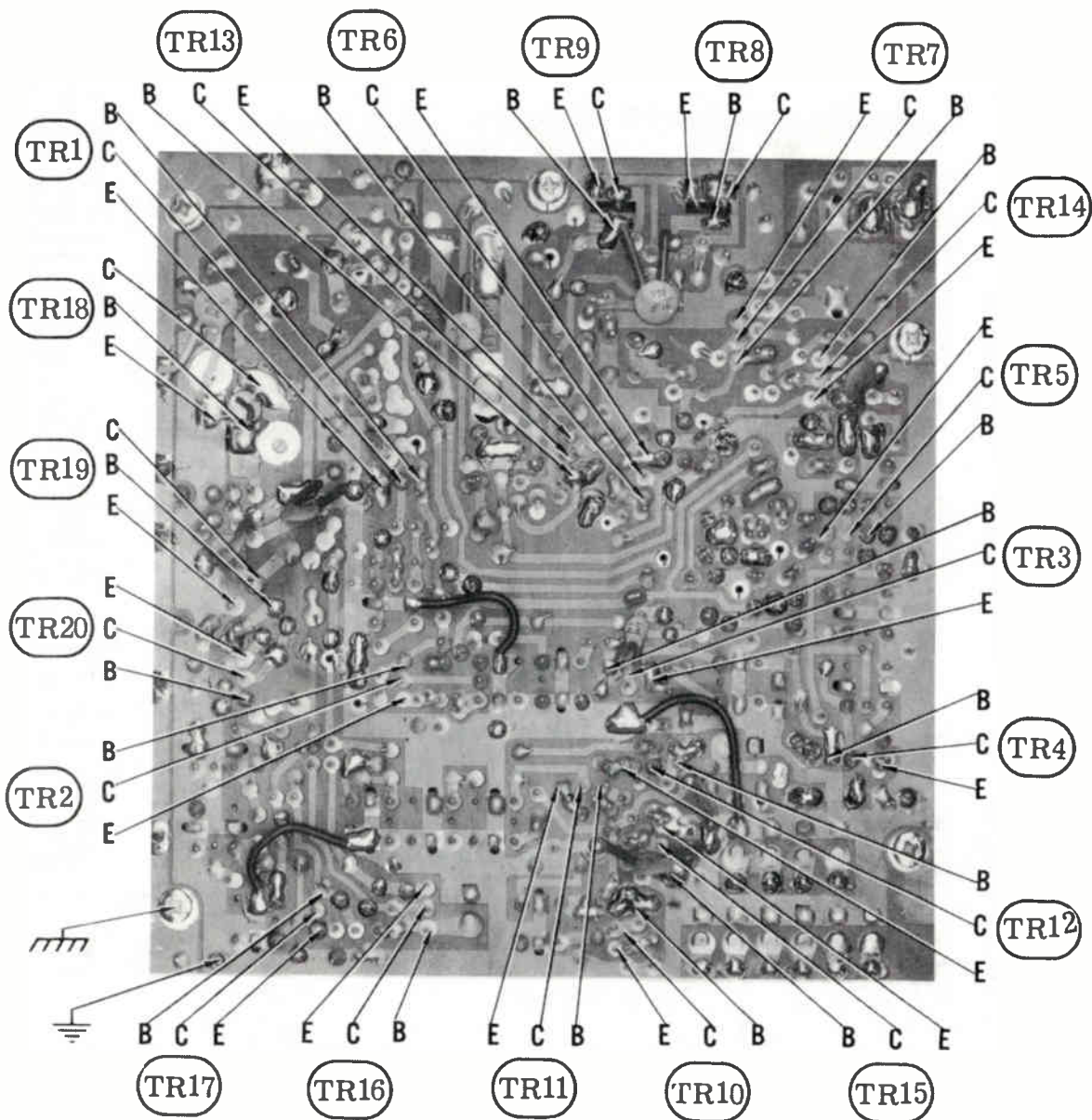
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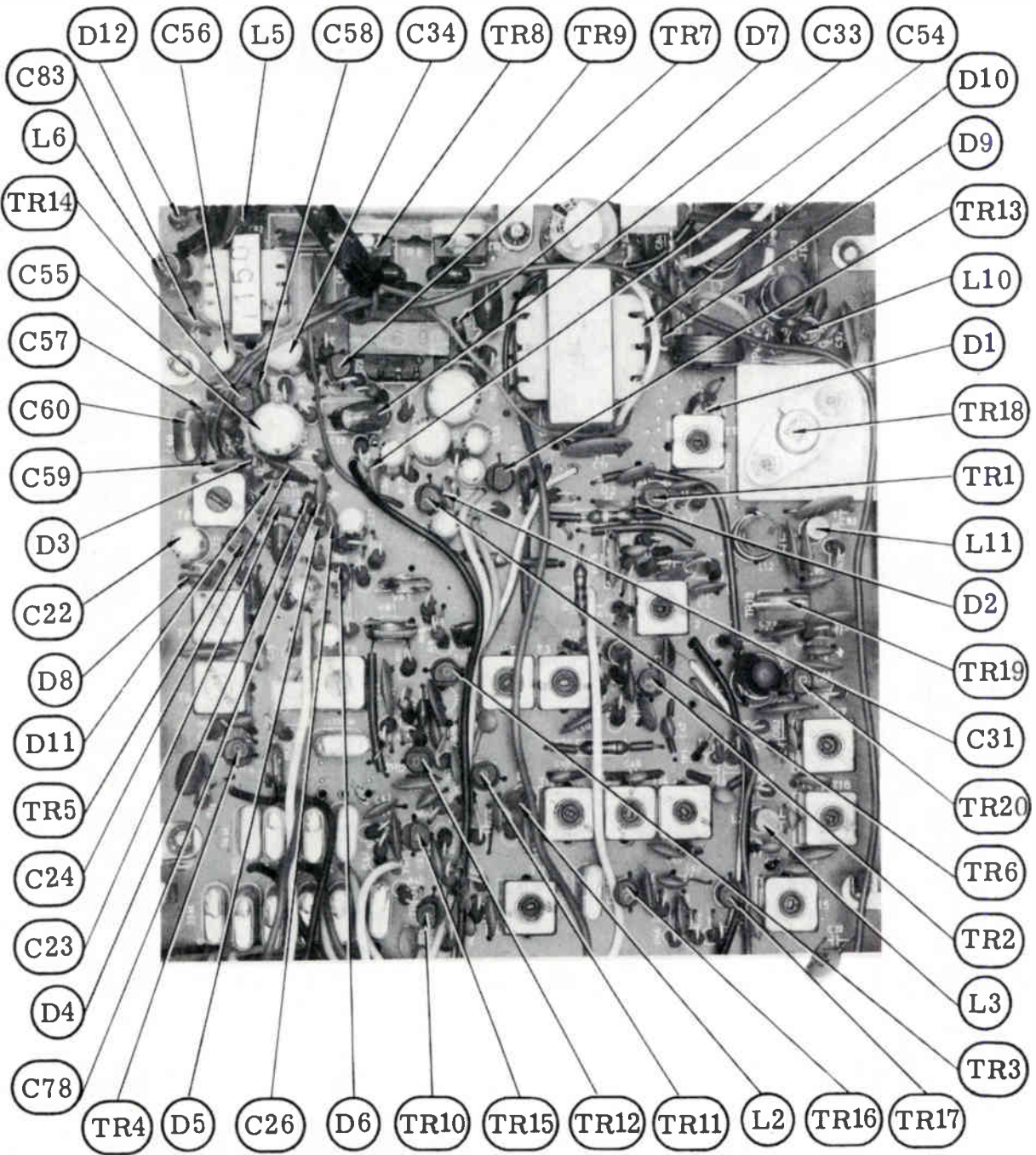
Connect an RF Wattmeter or 50-ohm 25-watt dummy load to antenna connector.
Adjustments are made with 12.6-volt DC input.

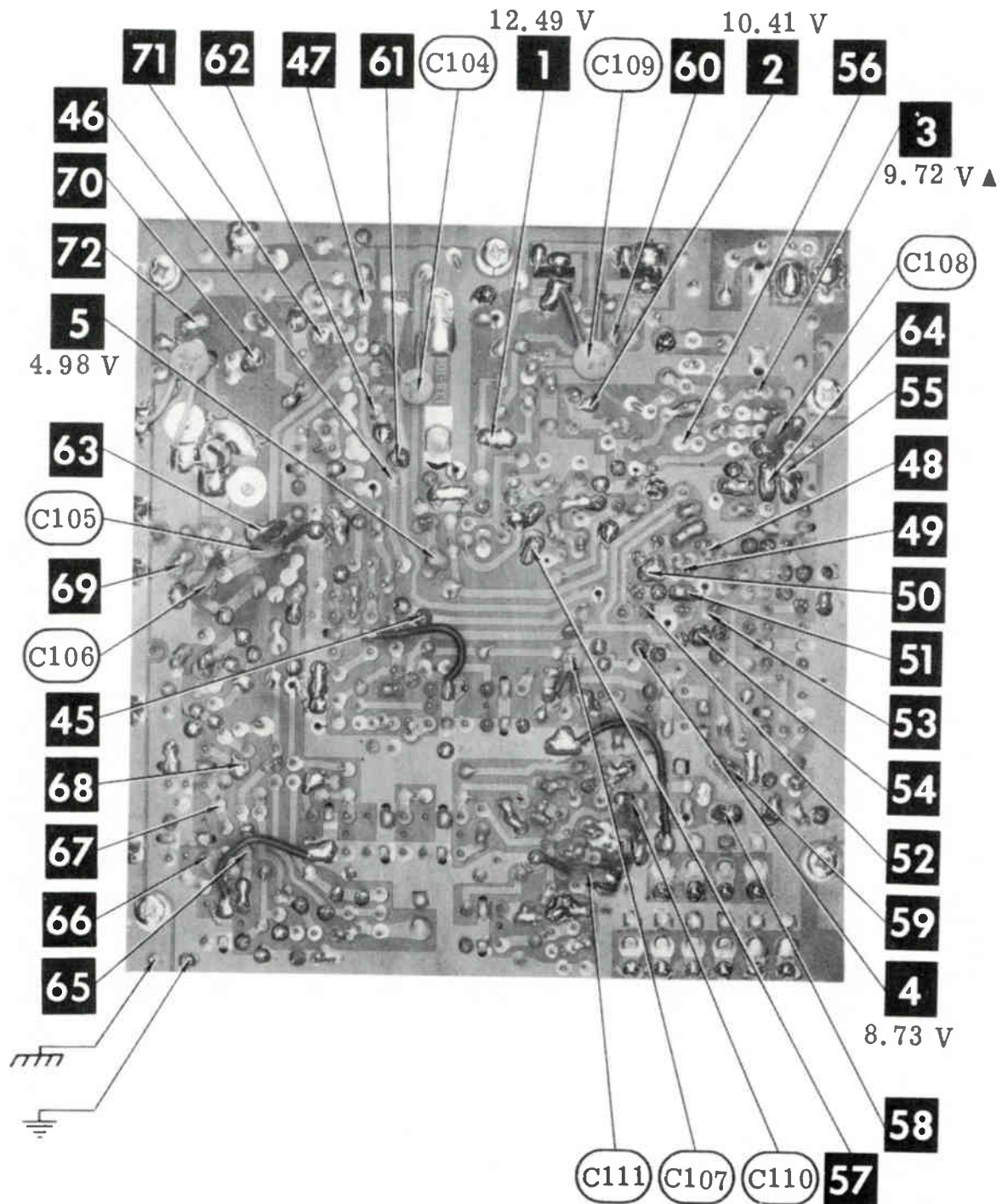
INDICATOR	ADJUST	REMARKS
Osc., Mixer, Buffer, Driver, Final RF Wattmeter or dummy load and RF VTVM.	T11, T12, T13, T14, T15, T16, T17, L12, L13	Connect wattmeter to antenna connector. Mode switch to AM. Channel Selector to Ch. 13. Key transmitter. Adjust for maximum. Detune T11 for stable oscillator starting.
Final Input Power 0-1 A DC Milliammeter	L9	Insert meter between TP4 and TP3. Key transmitter. Adjust for no more than 5 watts DC input.
TVI Trap TV Set Ch. 2	L7	Channel Selector to Ch. 23 key transmitter. Adjust for MINIMUM interference.
RF Panel Meter RF Wattmeter	VR6	Key transmitter. Adjust for a reading between 3 & 5.



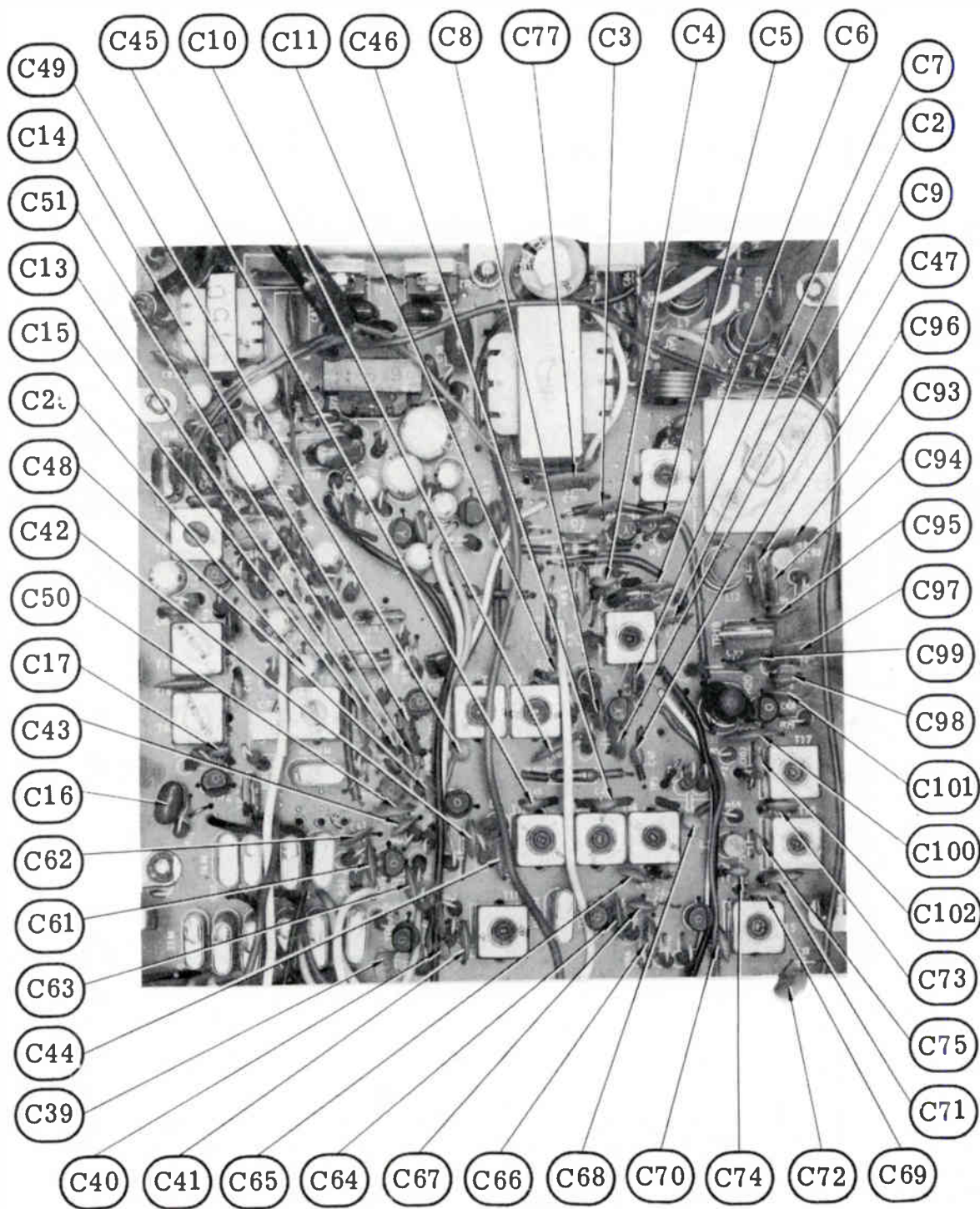


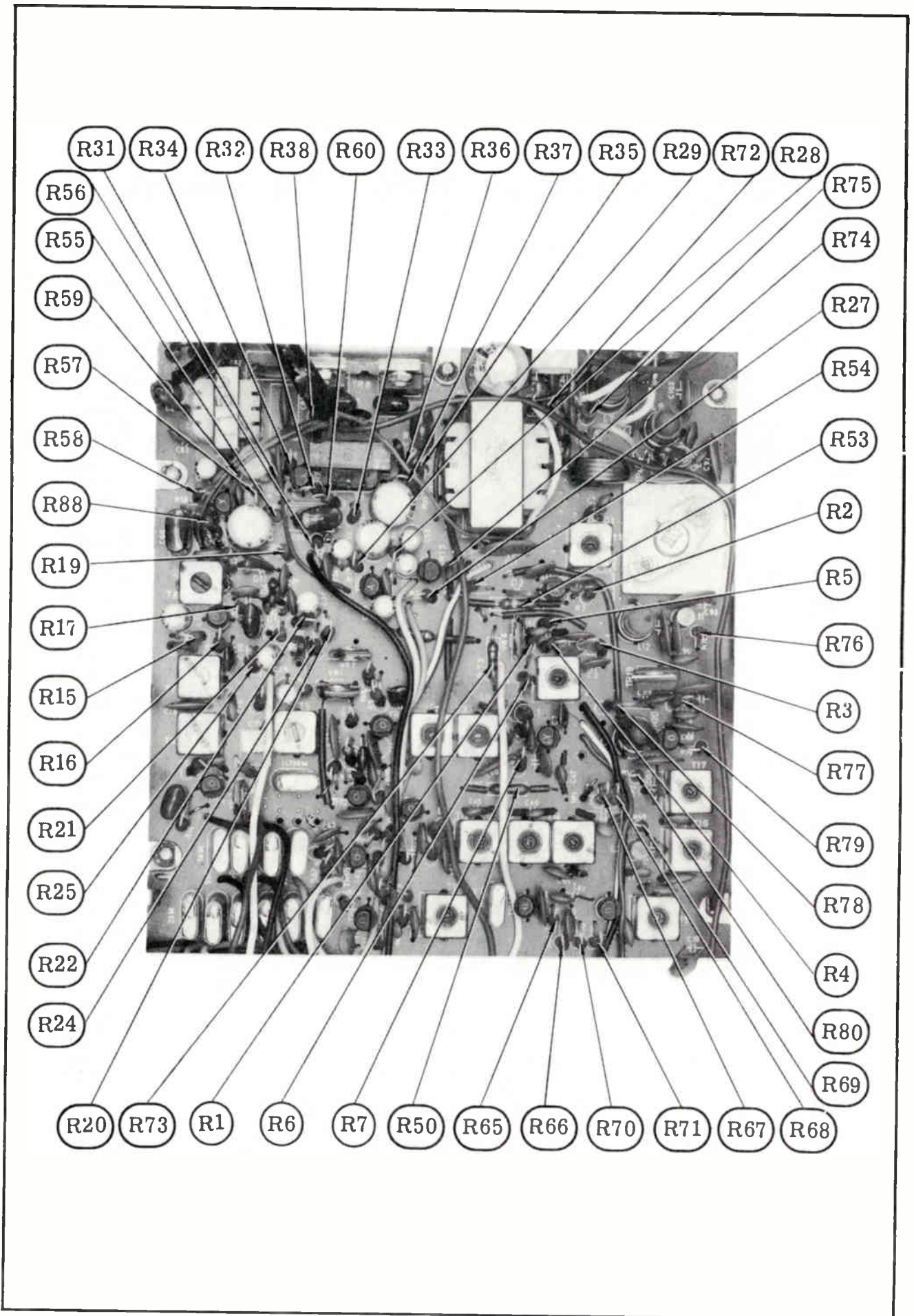


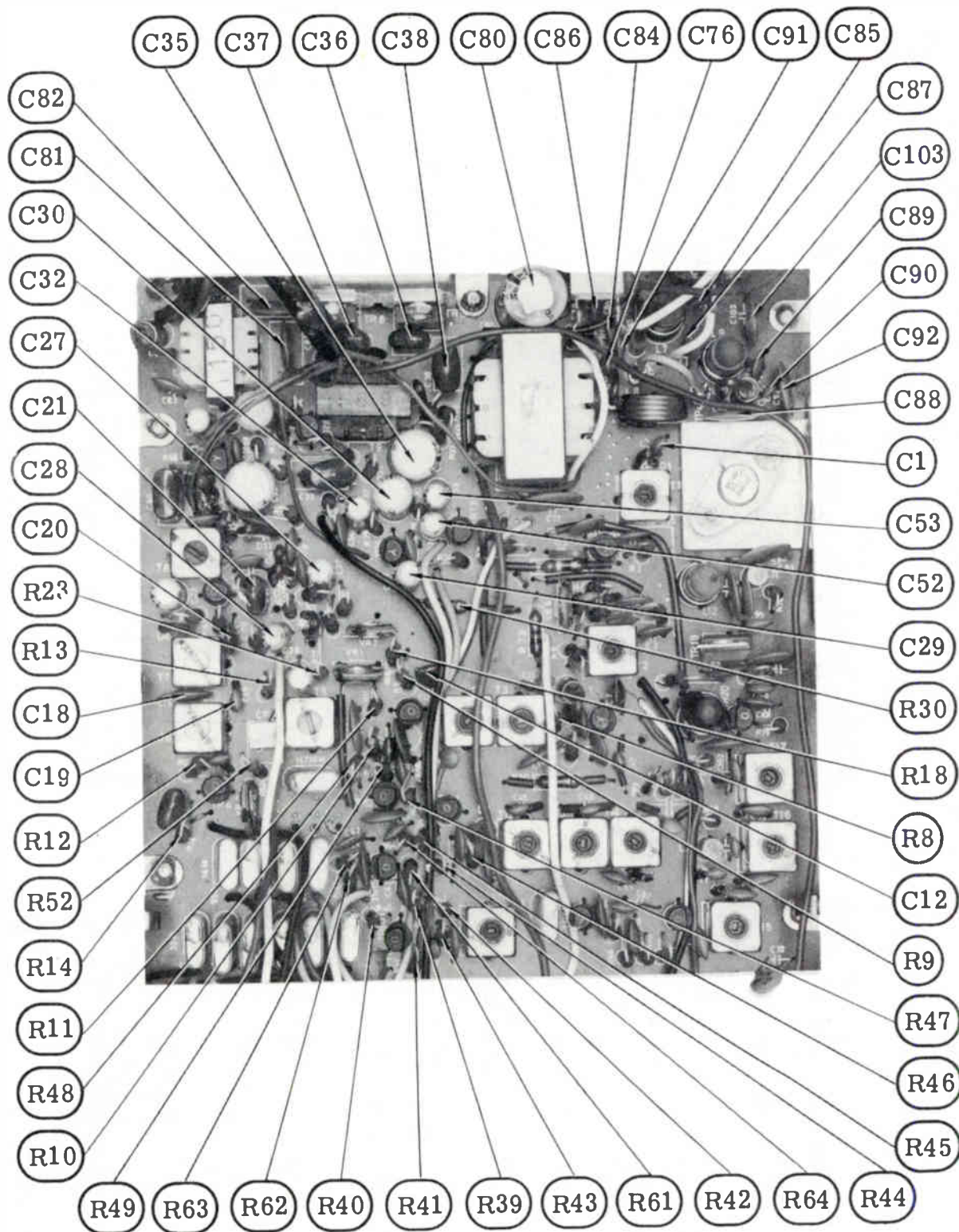


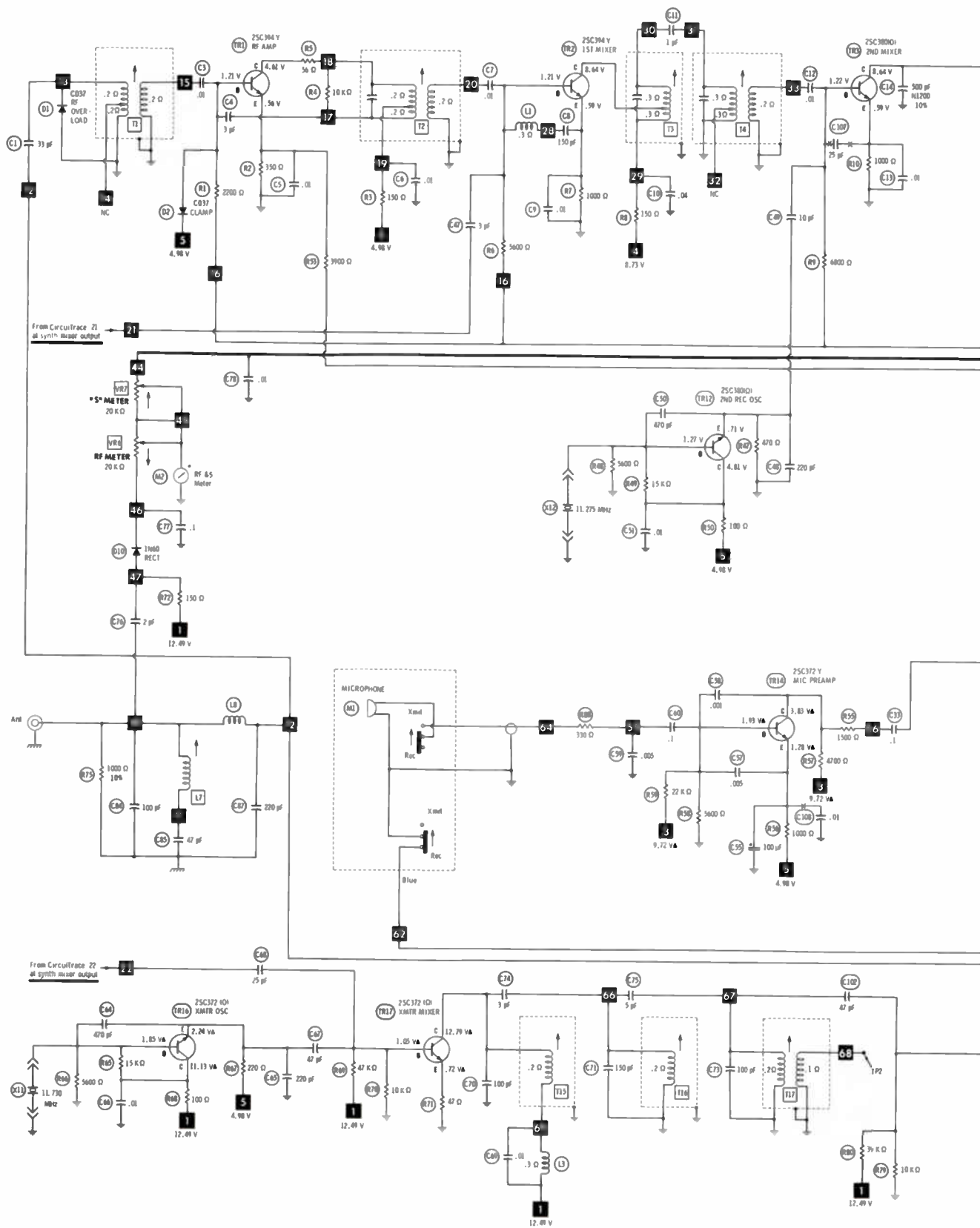


▲ TRANSMIT



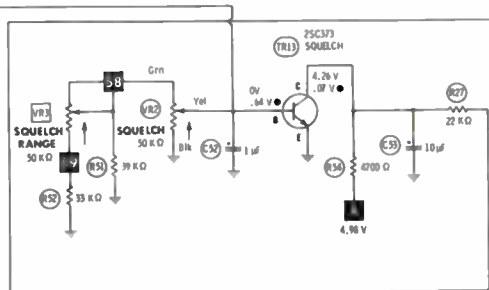
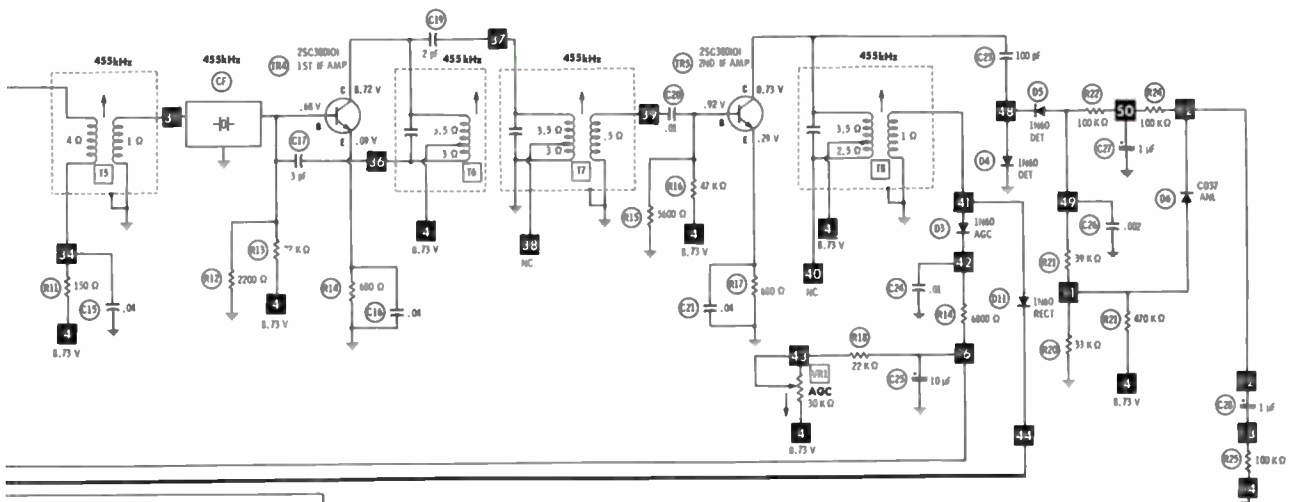




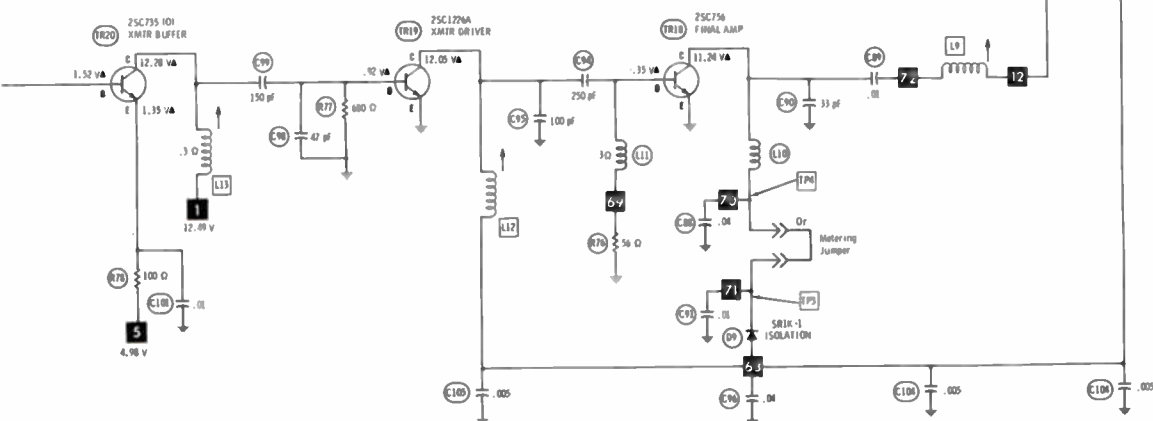
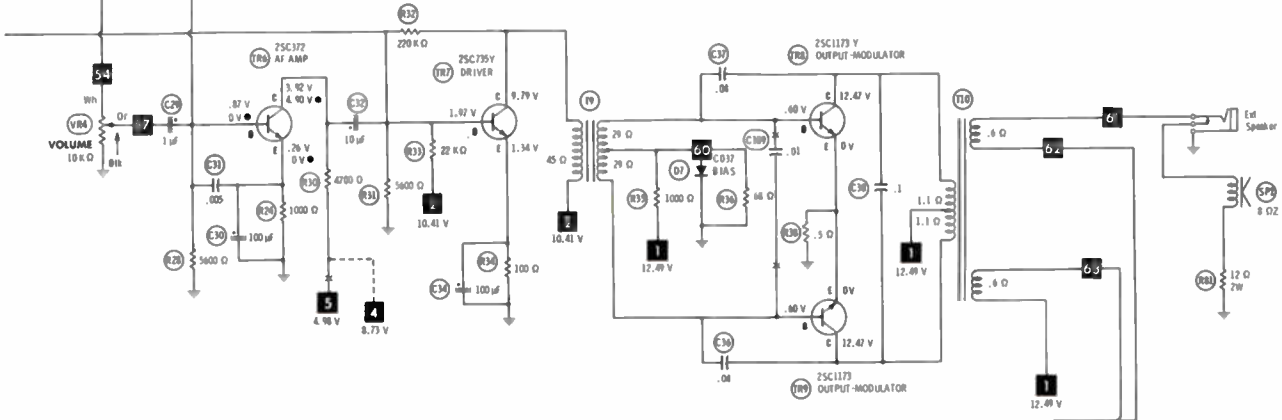
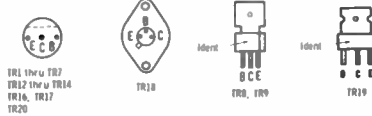


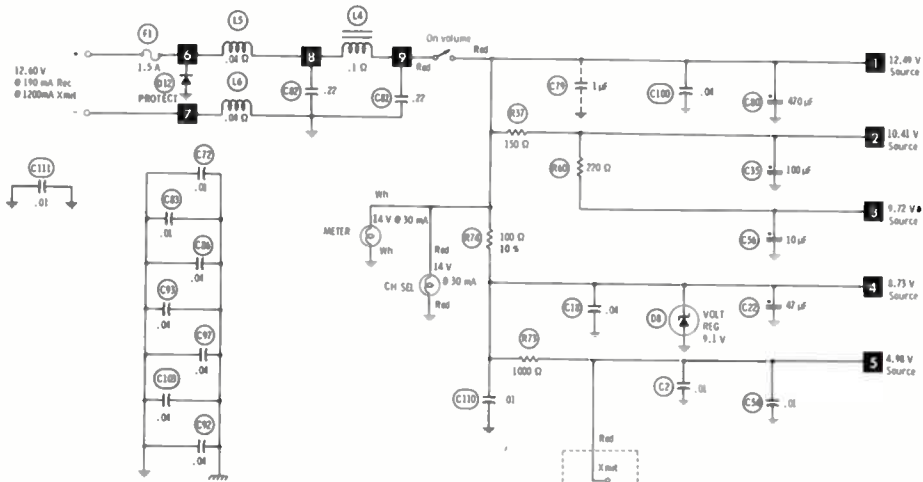
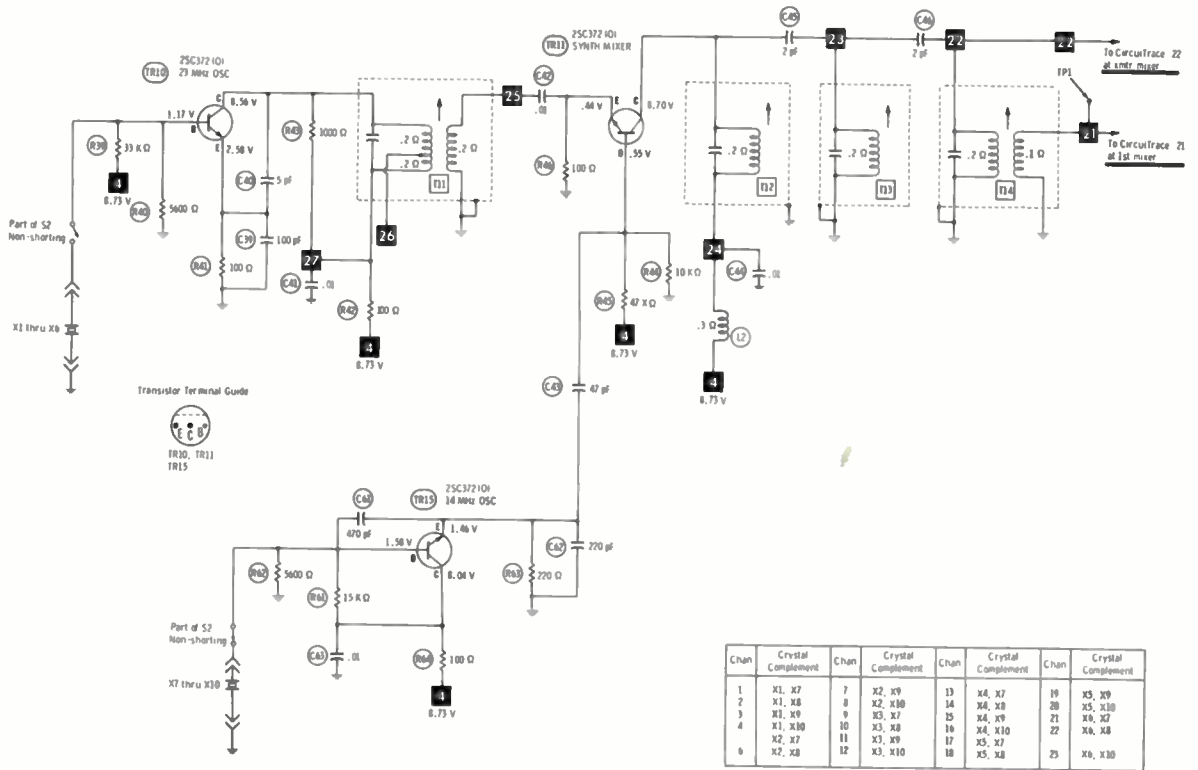
A PHOTOFAC STANDARD NOTATION SCHEMATIC
with **CIRCUITFACT**
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SEE NOTES ON PAGE 80



Transistor Terminal Guides





--- Denotes chassis.
 ⊕ Denotes ground. Voltage reference unless otherwise indicated.
 --- Indicates connection used in some versions.
 - - - Indicates connection not used in some versions.
 ⊕ Diminished in some versions.
 ⊙ See parts list.
 ⊕ Value wrong; replace with original value.
 ⊕ Measured in transient position.
 ⊕ Measured with unit squelched.
 NC No Connection.
 Measurements taken with switching in position shown unless otherwise indicated.
 Values shown in I I are used in some applications.
 Supply voltage maintained at rated value for measurements.
 Voltage and resistance measured with VTVM or equivalent meter.
 No signal applied and controls adjusted for normal operation.
 Arrows on control indicates direction of adjustment.
 Numbers assigned to terminals may not be found on the unit.
 Transistor resistances vary widely; no resistance measurements taken.
 Resistors are 1/2W or less, 5%, unless otherwise indicated.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
with **CIRCUITRACE**
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PEARCE-SIMPSON MODEL TOMCAT 23

PARTS LIST AND DESCRIPTION

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

SEMICONDUCTORS (Select replacement transistor for best results)

ITEM No.	TYPE / MFR. No. / PART No.	REPLACEMENT DATA						
		GENERAL ELECTRIC PART No.	INTERNATIONAL RECTIFIER PART No.	MALLORY PART No.	MOTOROLA PART No.	RCA PART No.	SPRAGUE PART No.	SYLVANIA PART No.
D1	CD37A	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	ECG 177
D2	CD37	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	ECG 177
D3	1N60	1N60	1N60	PTC206	HEP135	SK3088		ECG 109
D4	1N60	1N60	1N60	PTC206	HEP135	SK3088		ECG 109
D5	1N60	1N60	1N60	PTC206	HEP135	SK3088		ECG 109
D6	CD37	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	ECG 177
D7	CD37	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	ECG 177
D8	8Z-090 9.1 V Zener SR1K-1	GEZD-9.1	Z-1210	PTC505	HEP20412	SK3060	RT240	ECG 139
D9		GE-504A	8D4 or 5A4D	PTC201 or PTC202	HEPR0052	SK3030 or SK3031	RT213 or RT214	ECG 116 or ECG 117
D10	1N60	1N60	1N60	PTC206	HEP135	SK3088		ECG 109
D11	1N60	1N60	1N60	PTC206	HEP135	SK3088		ECG 109
D12	SR1K-1	GE-504A	8D4 or 5A4D	PTC201 or PTC202	HEPR0052	SK3030 or SK3031	RT213 or RT214	ECG 116 or ECG 117
TR1	2SC394Y	GE-17	TR-33	PTC139	HEP53	SK3018	RT108	ECG 107
TR2	2SC394Y	GE-17	TR-33	PTC139	HEP53	SK3018	RT108	ECG 107
TR3	2SC380 (0)	GE-61	TR-24	PTC121	HEP56	SK3018	RT107	ECG 107
	2SC839(F) (1)	GE-17	TR-24	PTC121	HEP728	SK3018	RT107	ECG 107
	2SC372 (0) (1)	GE-20	TR-24	PTC139	HEP55	SK3018	RT102	ECG 123A
	2SC380 (0)	GE-61	TR-24	PTC121	HEP56	SK3018	RT107	ECG 107
TR4	2SC839(F) (1)	GE-17	TR-24	PTC121	HEP728	SK3018	RT107	ECG 107
	2SC372(0) (1)	GE-20	TR-24	PTC139	HEP55	SK3018	RT102	ECG 123A
	2SC380(0)	GE-61	TR-24	PTC121	HEP56	SK3018	RT107	ECG 107
TR5	2SC839 (F) (1)	GE-17	TR-24	PTC121	HEP728	SK3018	RT107	ECG 107
	2SC372(0) (1)	GE-20	TR-24	PTC139	HEP55	SK3018	RT102	ECG 123A
	2SC380(Y) (1)	GE-20	TR-24	PTC136	HEP728	SK3124	RT102	ECG 123A
TR6	2SC945(R) (1)	GE-20	TR-24	PTC136	HEP728	SK3124	RT102	ECG 123A
	2SC380(Y) (1)	GE-20	TR-24	PTC123	HEP56	SK3039	RT108	ECG 108
TR7	2SC735(Y)	GE-63	TR-21	PTC123	HEP53	SK3124	RT102	ECG 123A
TR8	2SC1173(X)	GE-66	TR-55	PTC110		SK3054	RT154	ECG 152
TR9	2SC1173(X)	GE-66	TR-55	PTC110		SK3054	RT154	ECG 152
TR10	2SC372(0)	GE-20	TR-24	PTC139	HEP55	SK3018	RT102	ECG 123A
TR11	2SC372(0)	GE-20	TR-24	PTC139	HEP55	SK3018	RT102	ECG 123A
TR12	2SC380(0)	GE-61	TR-24	PTC121	HEP56	SK3018	RT107	ECG 107
	2SC839(F) (1)	GE-17	TR-24	PTC121	HEP728	SK3018	RT107	ECG 107
TR13	2SC373	GE-20	(1R)2SC373	PTC101	HEP75	SK3122	RT107	ECG 123A
TR14	2SC372(Y)	GE-20	TR-24	PTC139	HEP55	SK3018	RT102	ECG 123A
	2SC945(R) (1)	GE-20	TR-24	PTC136	HEP728	SK3124	RT102	ECG 123A
	2SC380(Y) (1)	GE-20	TR-24	PTC123	HEP56	SK3039	RT108	ECG 108
TR15	2SC372(0)	GE-20	TR-24	PTC139	HEP55	SK3018	RT102	ECG 123A
TR16	2SC372(0)	GE-20	TR-24	PTC139	HEP55	SK3018	RT102	ECG 123A
TR17	2SC372(0)	GE-20	TR-24	PTC139	HEP55	SK3018	RT102	ECG 123A
TR18	2SC756					SK3049		ECG 224
TR19	2SC1226(A)	GE-28	TR-55	PTC110	HEP23023	SK3054	RT154	ECG 186
TR20	2SC735(0)	GE-17	TR-24	PTC123	HEP53	SK3124	RT102	ECG 123A

(1) Used in some versions.

PEARCE-SIMPSON MODEL TOMCAT 23

ELECTROLYTIC CAPACITORS

ITEM No.	RATING	REPLACEMENT DATA					
		MFR. PART No.	ARCO PART No.	CENTRALLAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.
C22	47 10V	PL-022-099-9-001	RME-D-0-050	EP15-50	PC50-10	MTV50C815	EV-1226
C25	10 16V	PL-022-099-9-002	RME-B-E-010	EP15-10	PC10-25	VTT10A25	EV-1222
C27	1 50V	PL-022-099-9-003	RME-A-J-001	EP50-2	PC1-50	MTV1C850	EV-1615
C28	1 50V	PL-022-099-9-003	RME-A-J-001	EP50-2	PC1-50	MTV1C850	EV-1615
C29	1 50V	PL-022-099-9-003	RME-A-J-001	EP50-2	PC1-50	MTV1C850	EV-1615
C30	100 10V	PL-022-099-9-004	RME-E-D-100	EP15-100	PC100-10	MTV100C810	EV-1130
C32	10 16V	PL-022-099-9-002	RME-B-E-010	EP15-10	PC10-25	VTT10A25	EV-1222
C34	100 10V	PL-022-099-9-004	RME-E-D-100	EP15-100	PC100-10	MTV100C810	EV-1130
C35	100 16V	PL-022-099-9-005	RME-E-E-100	EP15-100	PC100-16	MTV100C015	EV-1230
C52	1 50V	PL-022-099-9-003	RME-A-J-001	EP50-2	PC1-50	MTV1C850	EV-1615
C53	10 16V	PL-022-099-9-002	RME-B-E-010	EP15-10	PC10-25	VTT10A25	EV-1222
C55	100 16V	PL-022-099-9-005	RME-E-E-100	EP15-100	PC100-16	MTV100C015	EV-1230
C56	10 16V	PL-022-099-9-002	RME-B-E-010	EP15-10	PC10-25	VTT10A25	EV-1222
C79	1 50V	PL-022-099-9-003	RME-A-J-001	EP50-2	PC1-50	MTV1C850	EV-1615
C80	470 16V	PL-022-099-9-006	RME-L-E-500	EA15-500	PC500-16	MTV500D15	EV-1250

CAPACITORS

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA				
			ARCO/ELMENDO PART No.	CENTRALLAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.
C1	33		CCT0-330	DTZ-33	NPO33	CN0433	10TCC-Q33
C2	.01		CCD-103	CK-103	MGP01	TA110	TG-S10
C3	.01		CCD-103	CK-103	MGP01	TA110	TG-S10
C4	3						10TCC-V30
C5	.01		CCD-103	CK-103	MGP01	TA110	TG-S10

PARTS LIST AND DESCRIPTION (CONTINUED)

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

CAPACITORS(cont)

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA				
			ARCO/ELMENC0 PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.
C6	.01		CCD-103	CK-103	MGP01	TA110	TG-S10
C7	.01		CCD-103	CK-103	MGP01	TA110	TG-S10
C8	150		CCD-151	DD-151	GP150	GP315	10TS-T15
C9	.01		CCD-103	DD-103	GP10000	JF110	10TS-S10
C10	.04			DD-403		GP140	
C11	1					CN0510	10TCC-V10
C12	.01		CCD-103	CK-103	MGP01	TA110	TG-S10
C13	.01		1DP-1-103	CPR-10000J	DPMS6S1	EMF1A110	225P10391WD3
C14	500		CCD-501	DD-501	GP500	GP350	10TS-T50
C15	.04			DD-403		GP140	
C16	.04	50V	1DP-1-403		DPMS6S4	PVC114	4PS-S40
C17	3						10TCC-V30
C18	.04			DD-403		GP140	
C19	2			DTZ-2R2	NP02P2	CN0522	10TCC-V22
C20	.01		CCD-103	CK-103	MGP01	TA110	TG-S10
C21	.04	50V	1DP-1-403		DPMS6S4	PVC114	4PS-S40
C23	100		CCT0-101	DTZ-100	NP0100	CN0310	10TCC-T10
C24	.01		CCD-103	CK-103	MGP01	TA110	TG-S10
C26	.002		CCD-202	DD-202	GP2000	GP220	2SS-D20
C31	.005		CCD-502	CK-502	MGP005	TA250	TG-D50
C33	.1	50V	1DP-2-104		DPMS2P1	EMF1A010	225P10491WD3
C36	.04	50V	1DP-1-403		DPMS6S4	PVC114	4PS-S40
C37	.04	50V	1DP-1-403		DPMS6S4	PVC114	4PS-S40
C38	.1	50V	1DP-2-104		DPMS2P1	EMF1A010	225P10491WD3
C39	100		CCT0-101	DTZ-100	NP0100	CN0310	10TCC-T10
C40	5				NP05		10TCC-V50
C41	.01		CCO-103	CK-103	MGP01	TA110	TG-S10
C42	.01		CCD-103	CK-103	MGP01	TA110	TG-S10
C43	47		CCT0-470	DTZ-47	NP047	CN0447	10TCC-Q47
C44	.01		CCD-103	CK-103	MGP01	TA110	TG-S10
C45	2			DTZ-2R2	NP02P2	CN0522	10TCC-V22
C46	2			DTZ-2R2	NP02P2	CN0522	10TCC-V22
C47	3						10TCC-V30
C48	220		CCD-221	DD-221	GP220	GP322	10TS-T22
C49	10		CCT0-100	DTZ-10	NP010	CN0410	10TCC-Q10
C50	470		CCD-471	DD-471	GP470	GP347	10TS-T47
C51	.01		CCD-103	CK-103	MGP01	TA110	TG-S10
C54	.01		CCD-103	CK-103	MGP01	TA110	TG-S10
C57	.005		CCD-502	CK-502	MGP005	TA250	TG-D50
C58	.001		6DP-1-102	CPR-1000J	DPMS6D1	EMF1A210	225P10291WD3
C59	.005		CCD-502	CK-502	MGP005	TA250	TG-D50
C60	.1		1DP-2-104		DPMS2P1	EMF1A010	225P10491WD3
C61	470		CCD-471	DD-471	GP470	GP347	10TS-T47
C62	220		CCD-221	DD-221	GP220	GP322	10TS-T22
C63	.01		CCD-103	CK-103	MGP01	TA110	TG-S10
C64	470		CCD-471	DD-471	GP470	GP347	10TS-T47
C65	220		CCD-221	DD-221	GP220	GP322	10TS-T22
C66	.01		CCD-103	CK-103	MGP01	TA110	TG-S10
C67	47		CCT0-470	DTZ-47	NP047	CN0447	10TCC-Q47
C68	25			DTZ-25		CN0425	10TCC-Q25
C69	100		CCD-103	CK-103	MGP01	TA110	TG-S10
C70	100		CCT0-101	DTZ-100	NP0100	CN0310	10TCC-T10
C71	150		CCD-151	DD-151	GP150	GP315	10TS-T15
C72	.01		CCD-103	CK-103	MGP01	TA110	TG-S10
C73	100		CCT0-101	DTZ-100	NP0100	CN0310	10TCC-T10
C74	3						10TCC-V30
C75	5				NP05		10TCC-V50
C76	2			DTZ-2R2	NP02P2	CN0522	10TCC-V22
C77	.1			CK-104		TA010	TG-P10
C78	.01		CCD-103	CK-103	MGP01	TA110	TG-S10
C81	.04			DD-403		GP140	
C82	.04			DD-403		GP140	
C83	.01		CCD-103	CK-103	MGP01	TA110	TG-S10
C84	100		CCT0-101	DTZ-100	NP0100	CN0310	10TCC-T10
C85	47		CCT0-470	DTZ-47	NP047	CN0447	10TCC-Q47
C86	.04			DD-403		GP140	
C87	220		CCD-221	DD-221	GP220	GP322	10TS-T22
C88	.04			DD-403		GP140	
C89	.01		CCD-103	CK-103	MGP01	TA110	TG-S10
C90	33		CCT0-330	DTZ-33	NP033	CN0433	10TCC-Q33
C91	.01		CCD-103	CK-103	MGP01	TA110	TG-S10
C92	.04			DD-403		GP140	
C93	.04			DD-403		GP140	
C94	250		CCD-251	DD-251		GP325	10TS-T25
C95	100		CCT0-101	DTZ-100	NP0100	CN0310	10TCC-T10
C96	.04			DD-403		GP140	
C97	.04			DD-403		GP140	
C98	47		CCT0-470	DTZ-47	NP047	CN0447	10TCC-Q47
C99	150		CCD-151	DD-151	GP150	GP315	10TS-T15
C100	.04			DD-403		GP140	
C101	.01		CCD-103	CK-103	MGP01	TA110	TG-S10
C102	47		CCT0-470	DTZ-47	NP047	CN0447	10TCC-Q47
C103	.04			DD-403		GP140	
C104	.005		CCD-502	CK-502	MGP005	TA250	TG-D50
C105	.005		CCD-502	CK-502	MGP005	TA250	TG-D50
C106	.005		CCD-502	CK-502	MGP005	TA250	TG-D50
C107	25			DTZ-25		CN0425	10TCC-Q25
C108	.01		CCD-103	DD-103	GP10000	JF110	10TS-S10
C109	.01		CCD-103	DD-103	GP10000	JF110	10TS-S10
C110	.01		CCD-103	DD-103	GP10000	JF110	10TS-S10
C111	.01		CCD-103	DD-103	GP10000	JF110	10TS-S10

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	RESIST-ANCE	REPLACEMENT DATA				
			MFGR. PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.
VR1	AGC	30K		TSV-50K (2) or T-50K (2)	C-503 (2)	X201R503B (2)	MTC54L1 (2)
VR2	Squelch	50K		F1-50K (1), SSK014			RU14L, SL36 (1), SL1500
VR3	Squelch Range	50K		TSV-50K (2) or T-50K (2)	C-503 (2)	X201R503B (2)	MTC54L1 (2)
VR4	Volume/Switch	10K		F1-10K (1), SSK014, KR1			RU14L, SL36 (1), SL1500
VR6	"RF" Meter	20K		T-20K (2) or TSV-25K (2)	C-253 (2)	X201R253B (2)	MTC24L1 (2)
VR7	"S" Meter	20K		T-20K (2) or TSV-25K (2)	C-253 (2)	X201R253B (2)	MTC24L1 (2)

(1) Enlarge mounting hole.

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

RESISTORS (Power and Special)

ITEM No.	RATING	REPLACEMENT DATA		ITEM No.	RATING	REPLACEMENT DATA	
		WORKMAN PART No.	MFGR. PART No.			WORKMAN PART No.	MFGR. PART No.
R38	.5 WW		PL-004-123-9-001				

COILS (RF-IF)

ITEM No.	FUNCTION	REPLACEMENT DATA			REMARKS
		PART No.	OTHER IDENTIFICATION	MILLER PART No.	
L1	14MHz Trap		TC-71096		
L2	RF Choke (2.2uH)		LF42R2K	74F226AP	
L3	RF Choke (2.2uH)		LF42R2K	74F226AP	
L5	Line Choke (18uH)		TC-71095	74F185AP	
L6	Line Choke (18uH)		TC-71095	74F185AP	
L7	TVI Trap (54MHz)		TC-71024		
L8	Antenna Coil (27MHz)		NS-1344		
L9	Final Tand (27MHz)		TC-71025		
L10	RF Choke (1uH)		TC-71029	4602	
L11	RF Choke (2.2uH)		LF42R2K	74F226AP	
L12	Xmit. Drive (27MHz)		TC-71023		
L13	Xmit. Buffer (27MHz)		TC-71026		
T1	Rec. Antenna (27MHz)		TKXN-22160BU		
T2	Rec. RF (27MHz)		TKXC-22534BU		
T3	Rec. Mixer (11MHz)		TKAC-22536IE		
T4	Rec. Mixer (11MHz)		TKAC-21165A		
T5	Input IF (455KHz)		YLN-20844BM		
T6	Interstage IF (455KHz)		YMC-20845AC		
T7	Interstage IF (455KHz)		YMC-20845AC		
T8	Output IF (455KHz)		YMC-20846AC		
T11	23MHz Osc		KXC-23169F		
T12	Synth Output (38MHz)		KXC-23107Z		
T13	Synth Output (38MHz)		KXC-23107Z		
T14	Synth Output (38MHz)		TKXC-23535BM		
T15	Xmit Mix Output(27MHz)		KXN-13638HM		
T16	Xmit Mix Output(27MHz)		KXN-13638HM		
T17	Xmit Mix Output(27MHz)		KXN-13636BM		

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (O CURRENT 1000~)	MFGR. PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
L4	800mA	.1	1.1mH	115c				

TRANSFORMER (Driver)

ITEM No.	TURNS RATIO			REPLACEMENT DATA				NOTES
	PRI.	SEC. 1	SEC. 2	MFGR. PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD Part No.	
T9	1	1		69M				

PEARCE-SIMPSON MODEL TOMCAT 23

PARTS LIST AND DESCRIPTION (CONTINUED)

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

TRANSFORMER (Audio Output)

ITEM No.	IMPEDANCE		REPLACEMENT DATA				NOTES
	PRI.	SEC.	MFR. PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
T10	50	8	N28-7518BM UT115 (1)				(1) Number on Unit.

SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		MFR. PART No.	QUAM PART No.	
SP1	3 1/2" PM 8 ohms	92-62D		

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	1.5A Quick-acting		RF-104	AGC 1 1/2	HDJ	31201.5	150145	FG1 1/2-2

MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
CF	Ceramic Filter	LF-A6	
M	Meter	A-11	
S2	Switch	4532C000-A	
X1	Crystals		23.290MHz
X2	Crystals		23.340MHz
X3	Crystals		23.390MHz
X4	Crystals		23.440MHz
X5	Crystals		23.490MHz
X6	Crystals		23.540MHz
X7	Crystals		14.950MHz
X8	Crystals		14.960MHz
X9	Crystals		14.970MHz
X10	Crystals		14.990MHz
X11	Crystals		11.275MHz
X12	Crystals		11.730MHz

ACCESSORIES

ITEM	MFR. PART No.	REMARKS
Microphone	22-115-50	

WIRING DATA

General-use Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in 12 Colors 8524 (Stranded) Available in 12 Colors
Power Cord, 2-Wire	Use BELDEN No. 17106 (Plastic) or 17126 (Rubber) -6 feet 17109 (Plastic) or 17129 (Rubber) -9 feet
Shielded Antenna Lead	Use BELDEN No. 8214 Lowest-loss (RG-8/U Type) 8237 Low-loss (RG-8/U) 8240 (Solid) Miniature (RG-58/U) 8259 (Stranded) Miniature (RG-58A/U)
Coiled Microphone Cable	Use BELDEN No. 8497 3-Conductor (1 shielded for Press-to-Talk) Neoprene 8491 4-Conductor (2 shielded, 2 unshielded) Neoprene
Ignition Noise Suppression	Use BELDEN No. 7300-Series Spark-Plug Sets
Bonding Strap	Use BELDEN No. 8661 (3/8 inch)



PHOTOFACT[®] with

CIRCUITRACE[®]

For Supplier Address See PHOTOFACT Index

NOTE

ONLY THOSE PERSONS PROPERLY LICENSED ARE PERMITTED TO MAKE REPAIRS OR ADJUSTMENTS WHICH MAY RESULT IN ILLEGAL OPERATION. (REFER TO FCC RULES AND REGULATIONS PART 95, SUBPARTS 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 DIAMOND 60

ALIGNMENT INSTRUCTIONS

Suggested Alignment Tools:	GC ELECTRONICS:
L2, L5, L6, T14	9440
ALL Others	5000, 8290
ALL Trimmers	8290

SYNTHESIZER

INDICATOR	CHANNEL	ADJUST	FREQUENCY	REMARKS
Frequency Counter	1	C320	6.000MHz	Short between TP301 and TP305. Connect counter between TP303 and TP305. Set mode selector to USB or LSB.
	2	C318	6.010MHz	
	3	C316	6.020MHz	
	4	C314	6.040MHz	
	1	C312	15.965MHz	Disconnect TP301 and TP305. Short TP302 and TP305. Mode switch to LSB or USB.
	5	C310	16.015MHz	
	9	C308	16.065MHz	
	13	C306	16.115MHz	
	17	C304	16.165MHz	
			C302	16.215MHz
	L301		12.8023MHz	Disconnect TP302 and TP305. Disconnect counter from TP303 and TP305. Short TP303 and TP305. Connect counter between TP304 and TP305. Set mode selector to USB. Delta tune maximum clockwise.
	R327		12.7977MHz	Mode selector switch to LSB. Delta tune maximum counterclockwise.
	R325		12.8007MHz	Mode selector switch to USB. Delta tune maximum counterclockwise.
	R323		12.7993MHz	Mode selector switch to LSB. Delta tune maximum clockwise.
Oscilloscope (Usable to 30MHz)		T301, T302		Remove counter from TP304 and TP305. Remove short between TP303 and TP305. Short between TP306 and TP305. Connect scope between TP304 and TP305. Adjust for maximum.
		T303, T304, T305		Disconnect short from TP306 and TP305. Disconnect scope from TP304 and TP305. Connect scope to output of TP"A". Adjust for maximum.

TRAM MODEL DIAMOND 60

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

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RECEIVER

Connect an AC VTVM or AF Wattmeter across speaker voice coil. Adjustments are made with 14 volt DC input. Adjust volume control to obtain suitable reading.				
SIGNAL GENERATOR	CHANNEL	GEN FREQ	ADJUST	REMARKS
High side thru a .01uF cap to TP7, low side to TP6.	Any	Set to 455kHz, 1000Hz @ 30% Modulation Output 10uV.	T12, T13	Adjust for maximum.
High side thru a .01uF cap to base of Q10, low side to ground.	Any	Set to 7.8MHz, 1000Hz @ 30% Modulation Output 3uV.	T10, T11	Adjust for maximum.
High side thru a .01uF cap to antenna jack, low side to ground.	11	Set to 27.085Hz, 1000Hz @ 30% Modulation Output .5uV.	T7, T8, T9	Adjust for maximum.

RECEIVER ADJUSTMENTS

SIGNAL GENERATOR	CHANNEL	GEN FREQ	ADJUST	REMARKS
AGC High side thru a .01uF capacitor to antenna jack, low side to ground.	11	Set to 27.085MHz, 1000Hz @ 30% Modulation Output 10000uV.	No adjustment.*	Set mode switch to AM. Adjust volume control to obtain 0dB. Decrease generator to 10uV. Signal should not drop more than 6db. *If so, check AGC circuits.
SQUELCH RANGE High side thru a .01uF capacitor to antenna jack, low side to ground.	11	Set to 27.085MHz, 1000Hz @ 30% Modulation Output 300uV.	R186	Set squelch control fully clockwise. Adjust so that squelch just breaks.
"S" METER High side thru a .01uF capacitor to antenna connector, low side to ground.		Set to 27.085MHz, 1000Hz @ 30% Modulation Output 100uV.	R72/R159	Set mode switch to AM/SSB. Adjust for "S9" on panel "S" meter

TRANSMITTER

Connect an RF Wattmeter or 50 ohm 25 watt dummy load to antenna connector. Adjustments are made with 14 volt DC input.

SSB

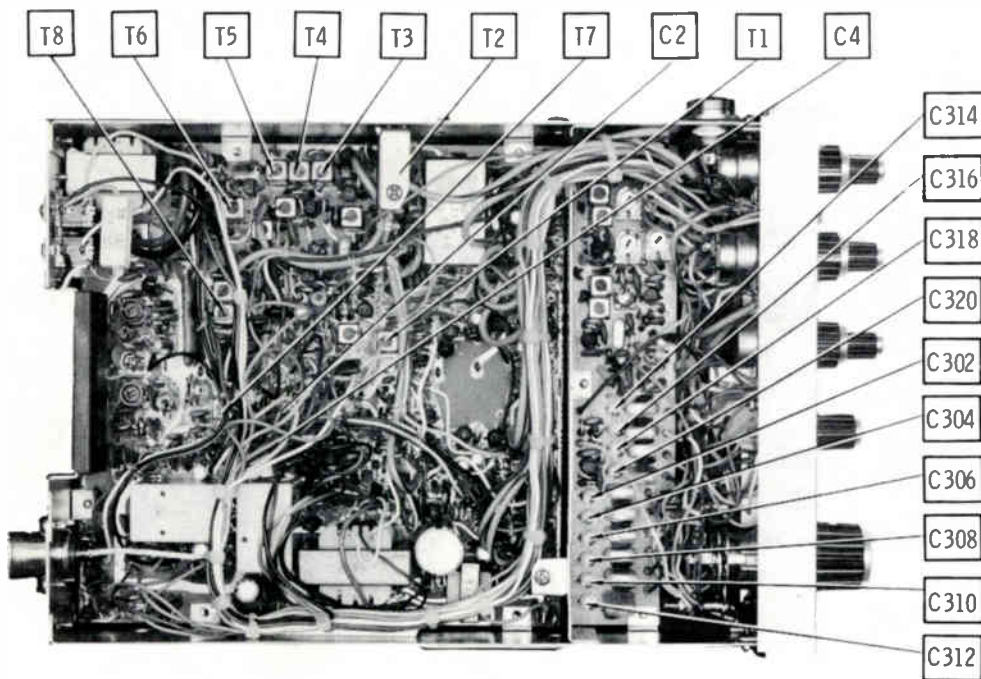
INDICATOR	ADJUST	REMARKS
USB CARRIER OSC. Frequency Counter.	C4	Connect frequency counter to TP1 and TP2. Set mode switch to USB. Adjust for frequency of 7.8015MHz.
LSB CARRIER OSC. Frequency Counter.	C2	Connect frequency counter to TP1 and TP2. Set mode switch to LSB. Adjust for frequency of 7.7985MHz.
CARRIER BALANCE Oscilloscope.	R20, C15	Short microphone input to ground. Set mode switch to either USB or LSB. Key transmitter and adjust for MINIMUM indication on scope. Output voltage should be less than 0.6V p-p.

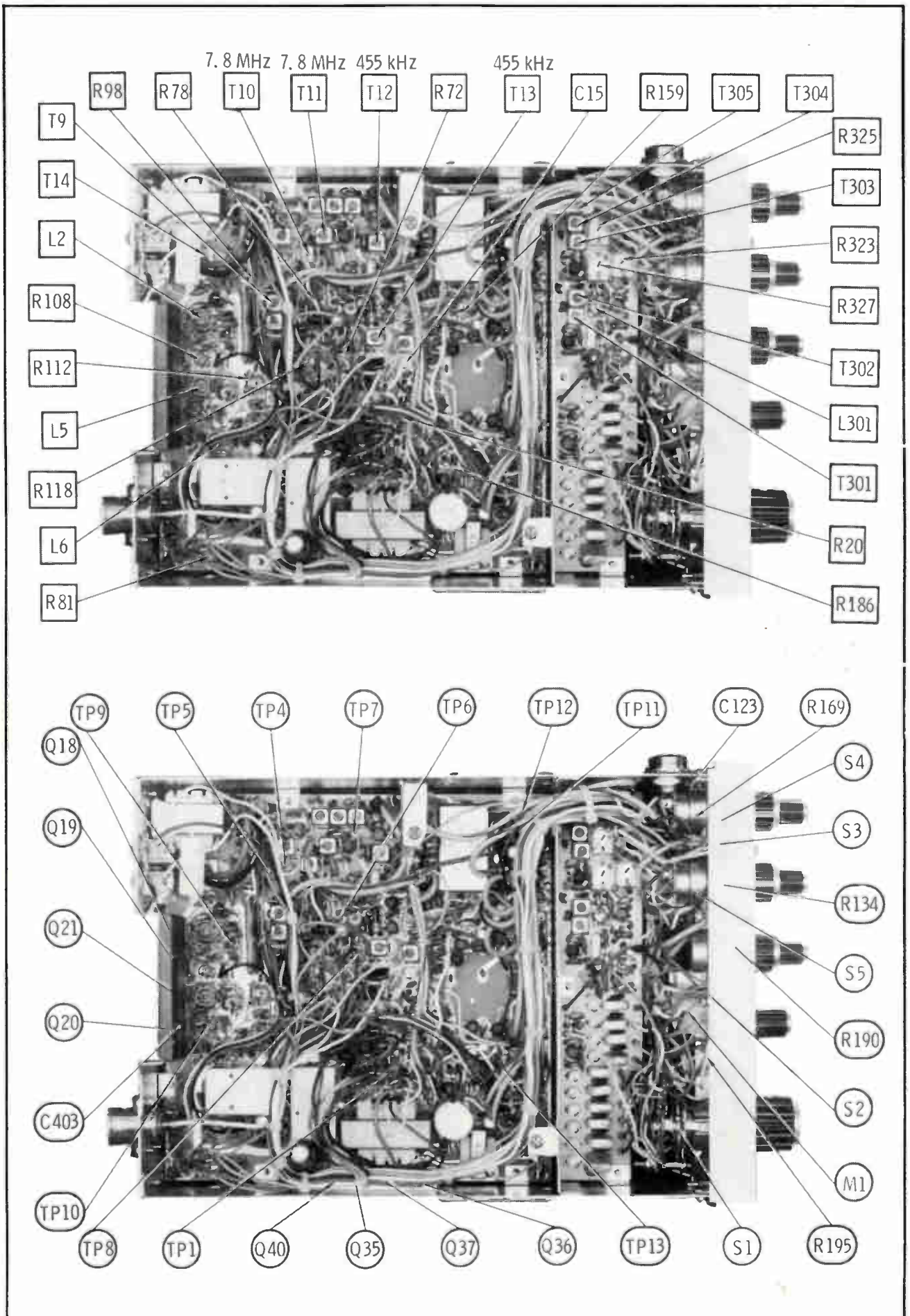
SSB EXCITER Oscilloscope (Response to 30MHz)	T1, T2, T3, T4, T5, T6	Remove jumper at TP4. Connect oscilloscope between TP4 and TP5. Set channel selector to 11. Set mode switch to either USB or LSB. Connect audio signal generator to input terminal of microphone connector. Inject a 1kHz 3mV signal. Key transmitter and adjust for maximum. After T6 has been adjusted for maximum, rotate 3 full turns clockwise. Reconnect TP4.
FINAL OUTPUT POWER Peak RF Wattmeter.	T14, L2, L5	Short TP11 and TP12. Inject 1kHz 10mV to microphone input. Adjust for maximum.
FINAL BIAS 0 - 10mA DC Milliammeter.	R108	Remove jumper at TP10. Connect meter to L4 and B+. Short microphone input. Key transmitter. Adjust bias for 5mA.

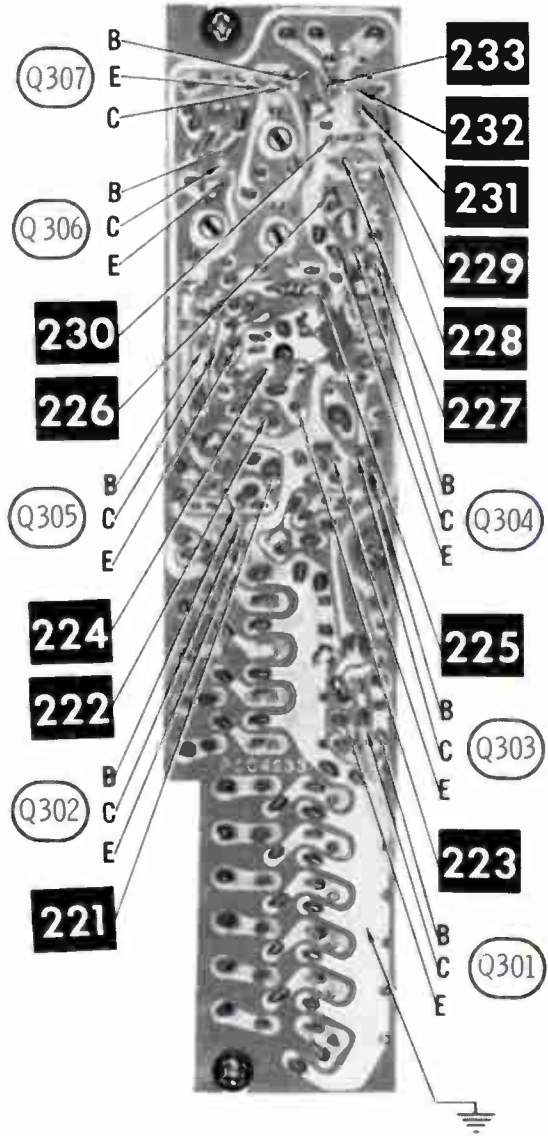
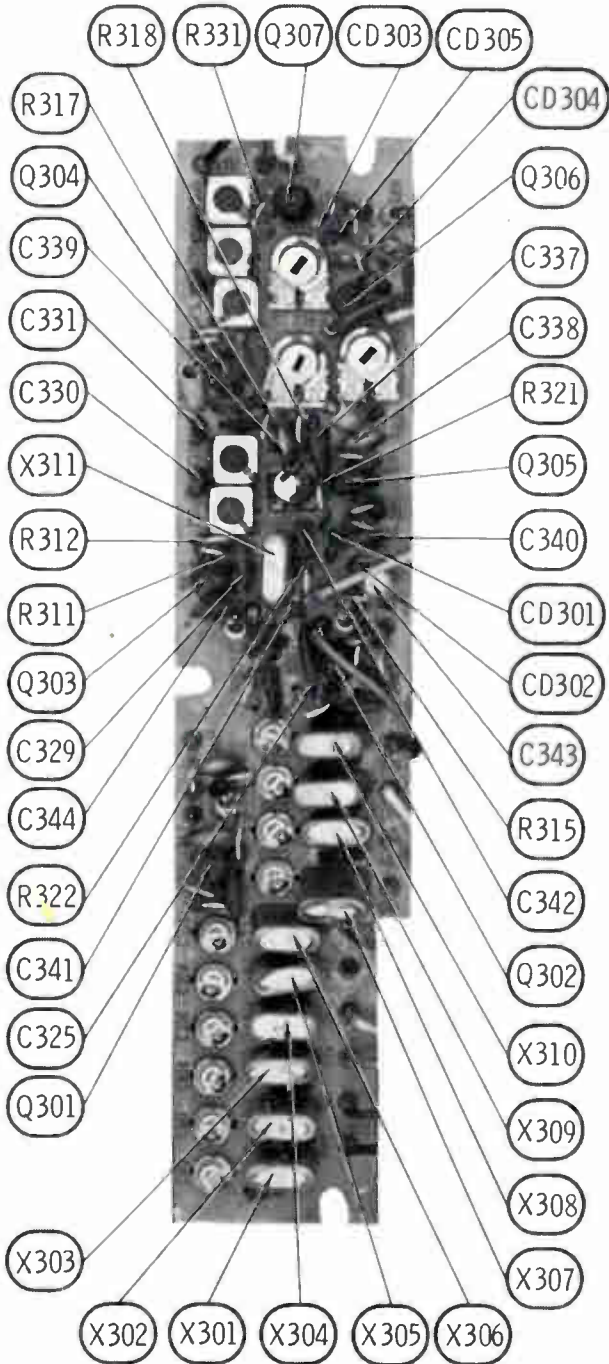
TRANSMITTER ADJUSTMENTS

INDICATOR	ADJUST	REMARKS
ALC RF Wattmeter Oscilloscope.	R112	Connect audio generator to microphone input. Inject a 1000Hz signal. Disconnect TP11 and TP12. Key transmitter. Adjust for 8 watts.
RF PANEL METER RF Wattmeter.	R118	Set mode switch to AM. Key transmitter. Adjust so that panel "RF" meter agrees with RF Wattmeter.
AMC Modulator Meter.	R98	Connect audio generator to microphone input. Inject a 1000Hz signal at 10mV. Key transmitter. Adjust for 100% modulation maximum.
FINAL OVERLOAD PROTECTION RF Wattmeter.	R81	Connect a 250 ohm 5 watt resistor across antenna connector. Key transmitter. Adjust for zero power output.

TRAM MODEL DIAMOND 60

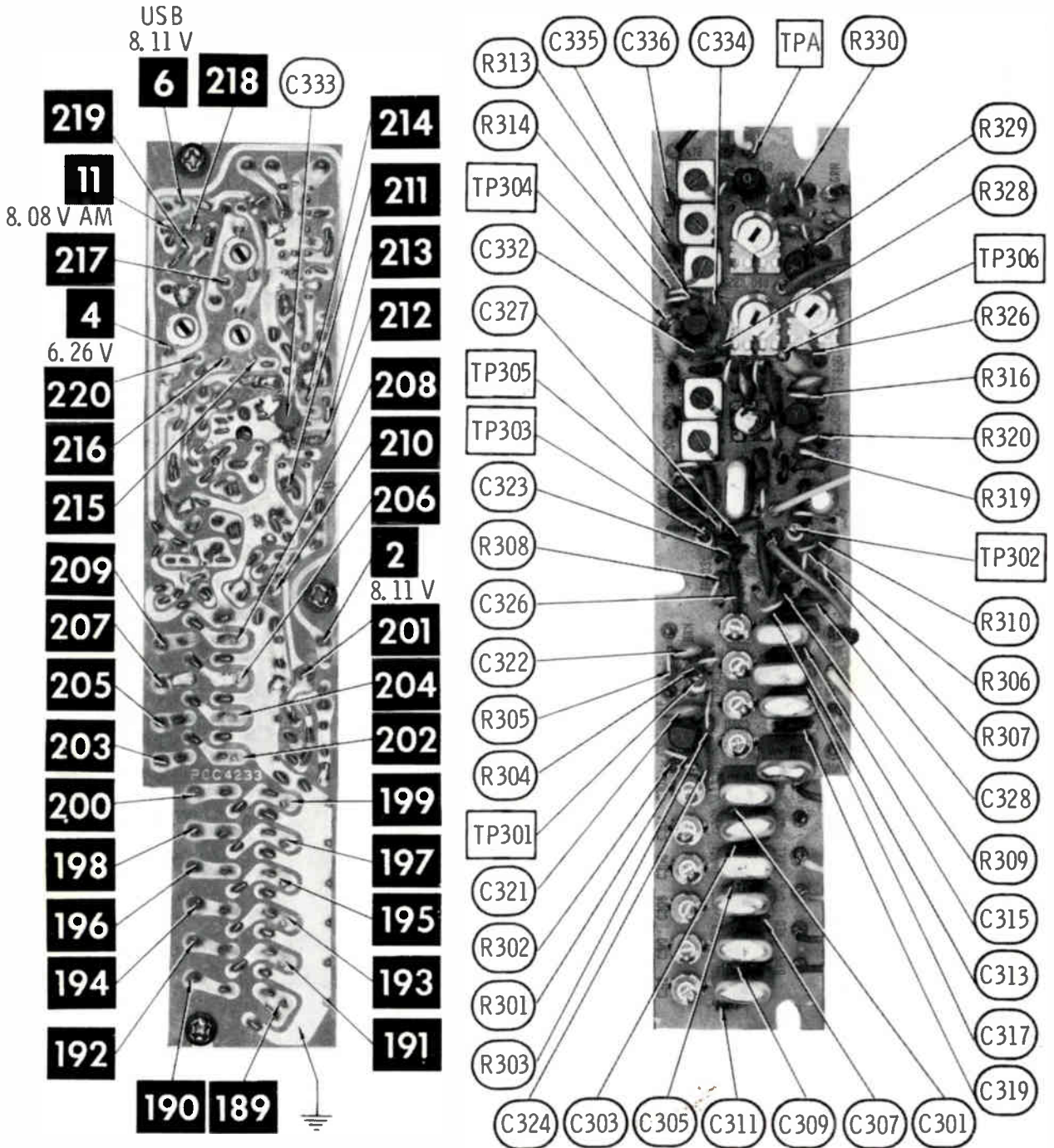




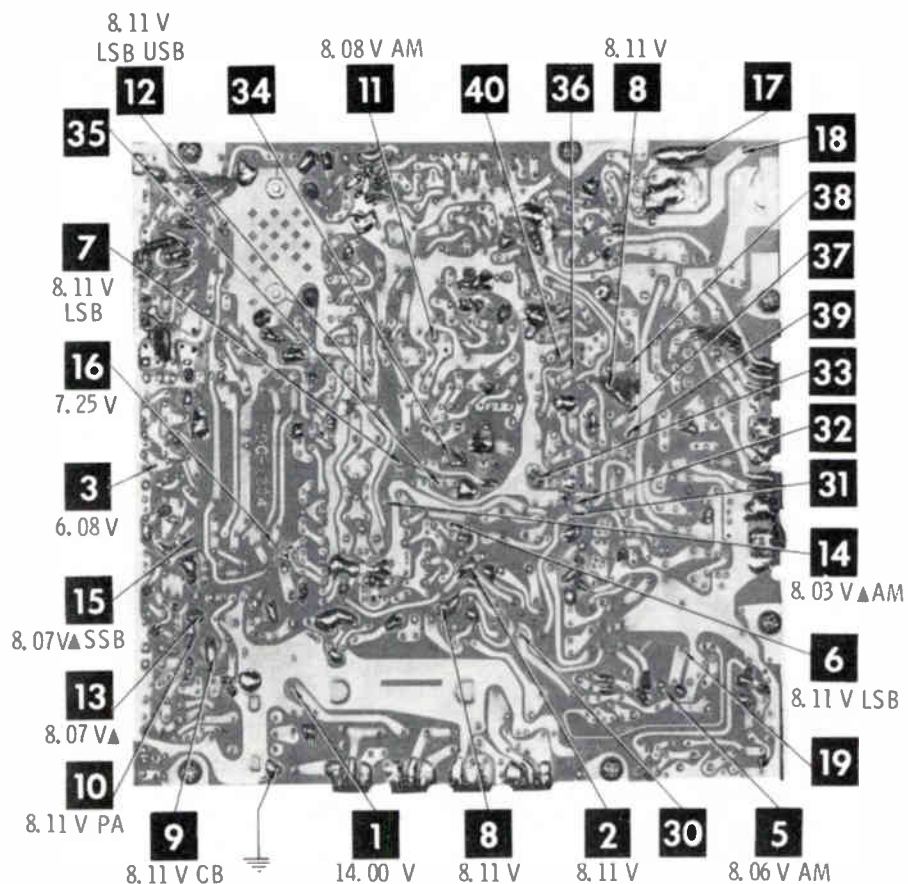


TRAM MODEL DIAMOND 60

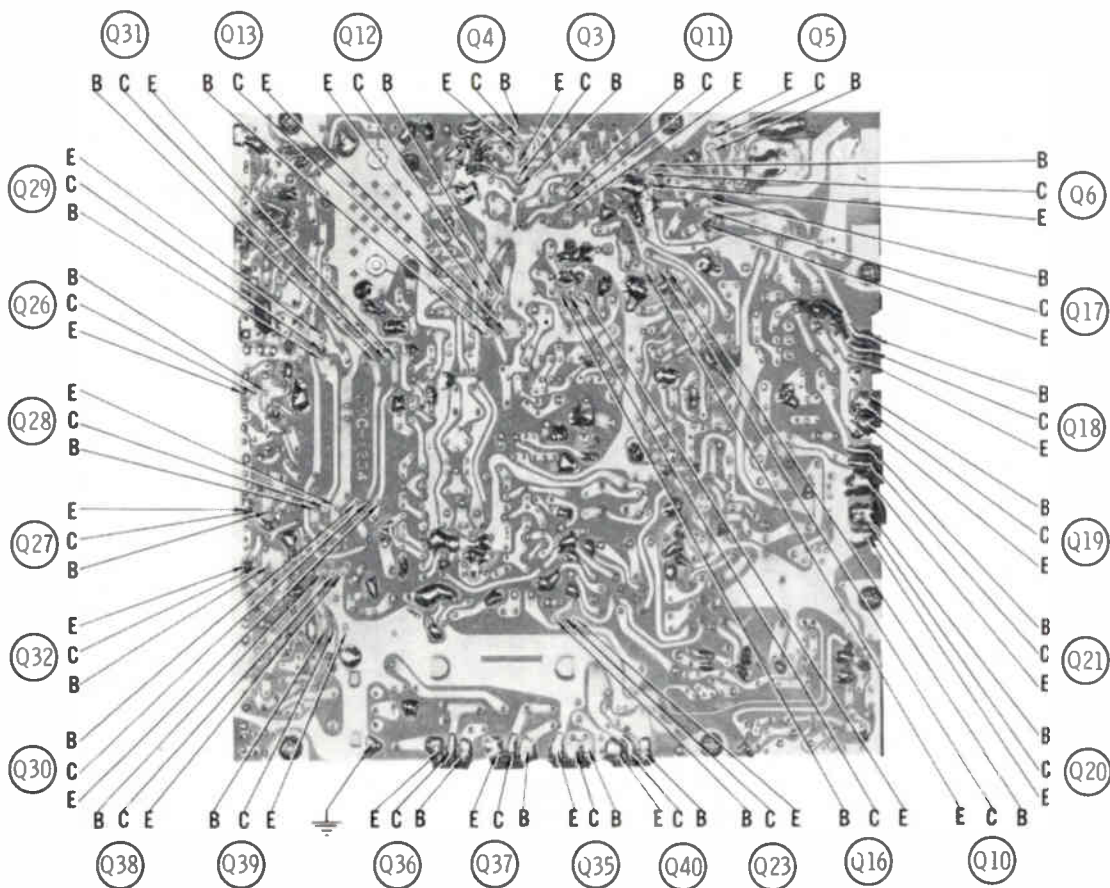
SYNTHESIZER BOARD

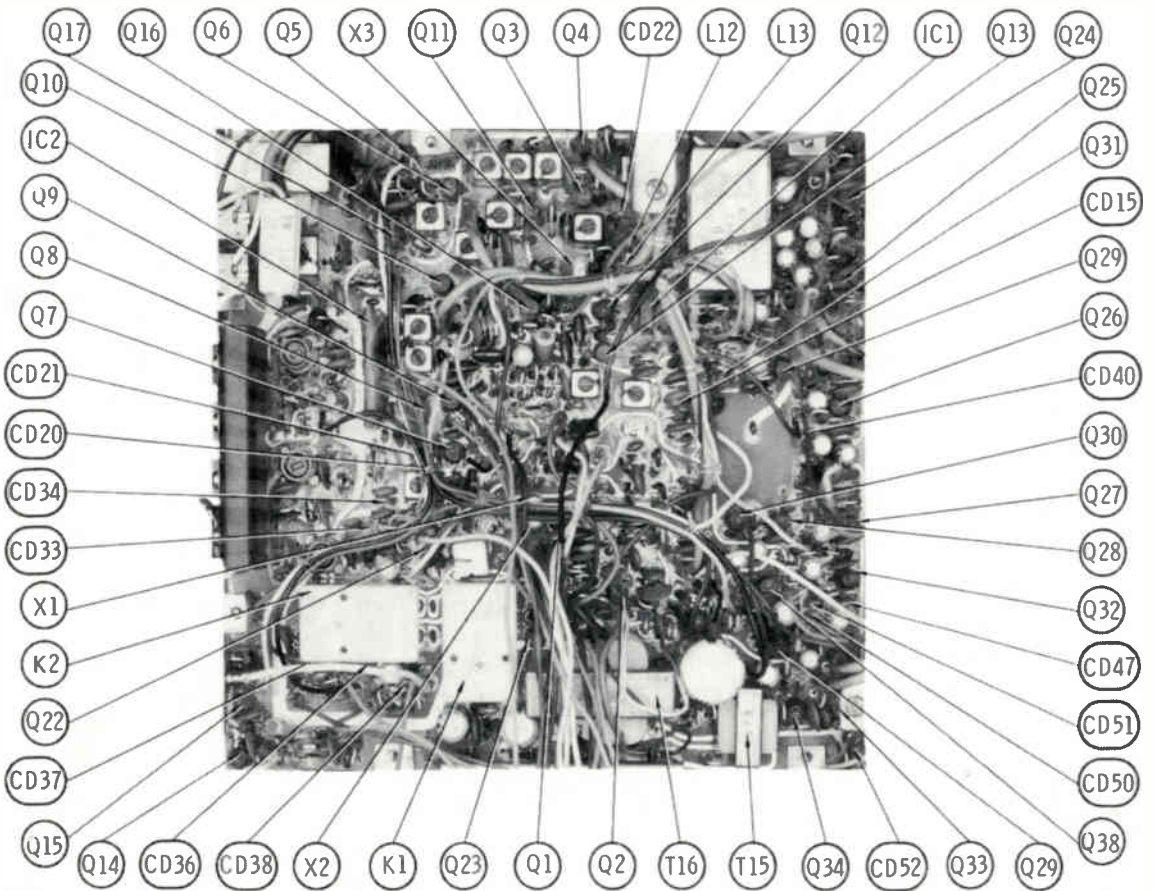
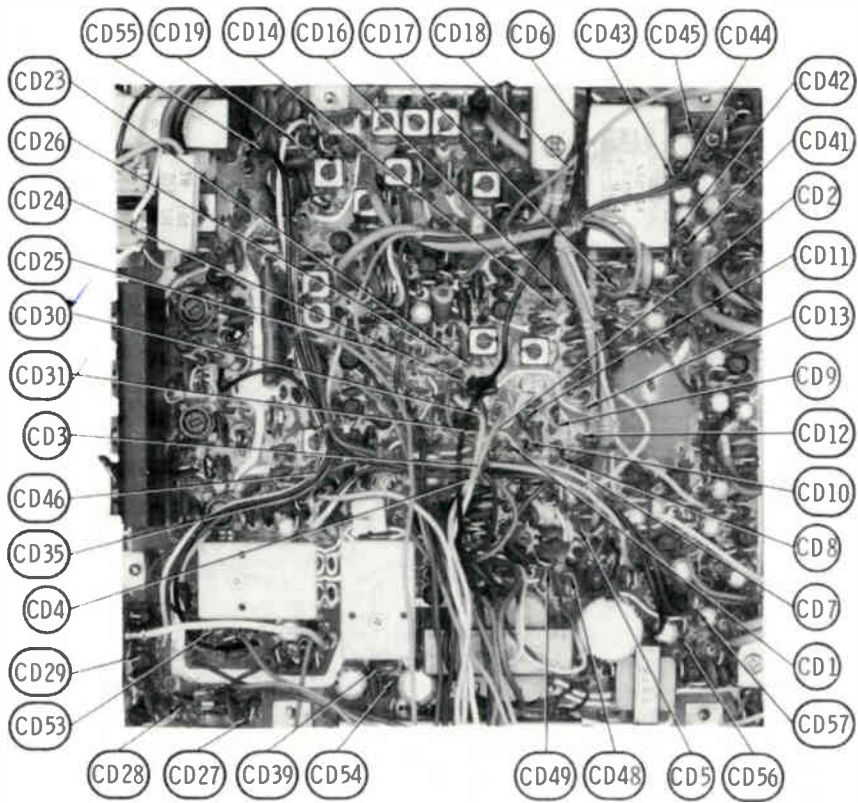


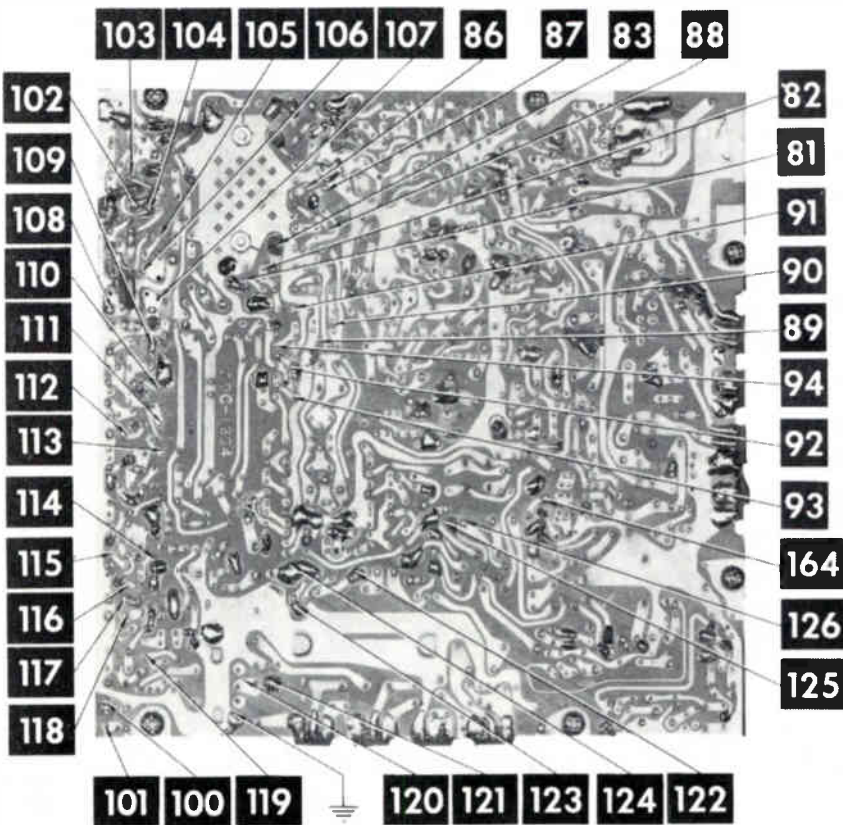
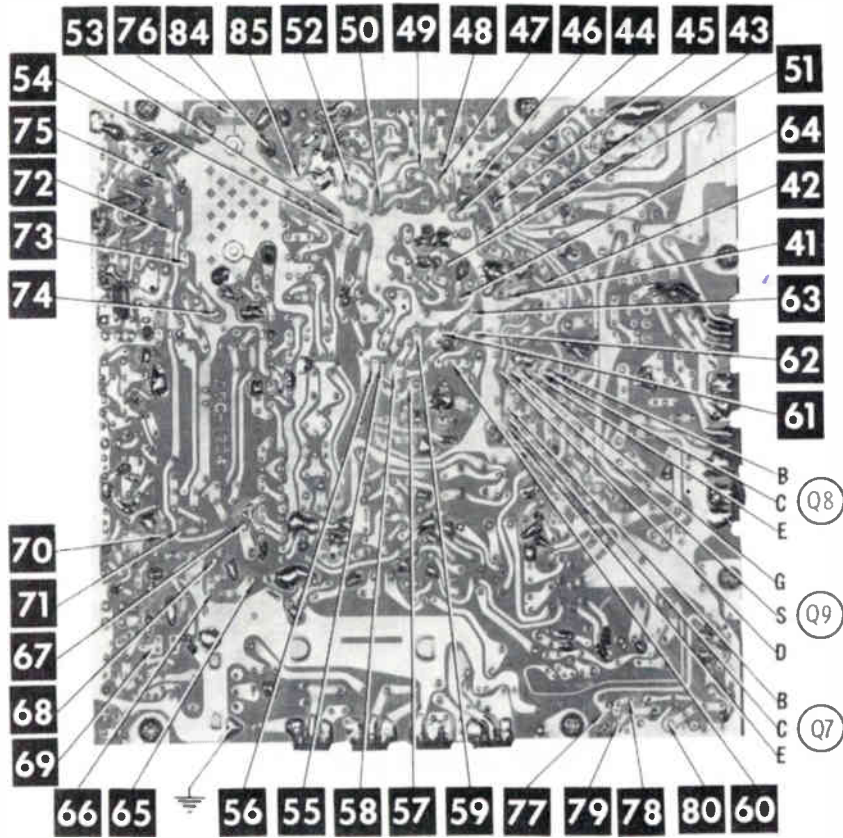
SYNTHESIZER BOARD



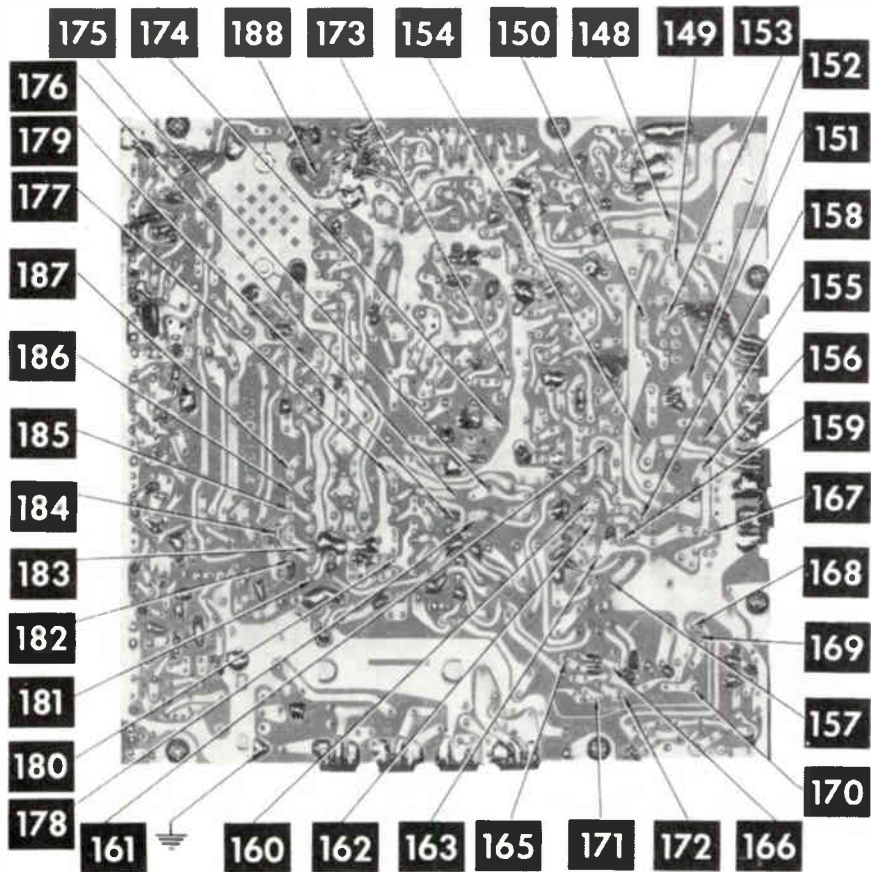
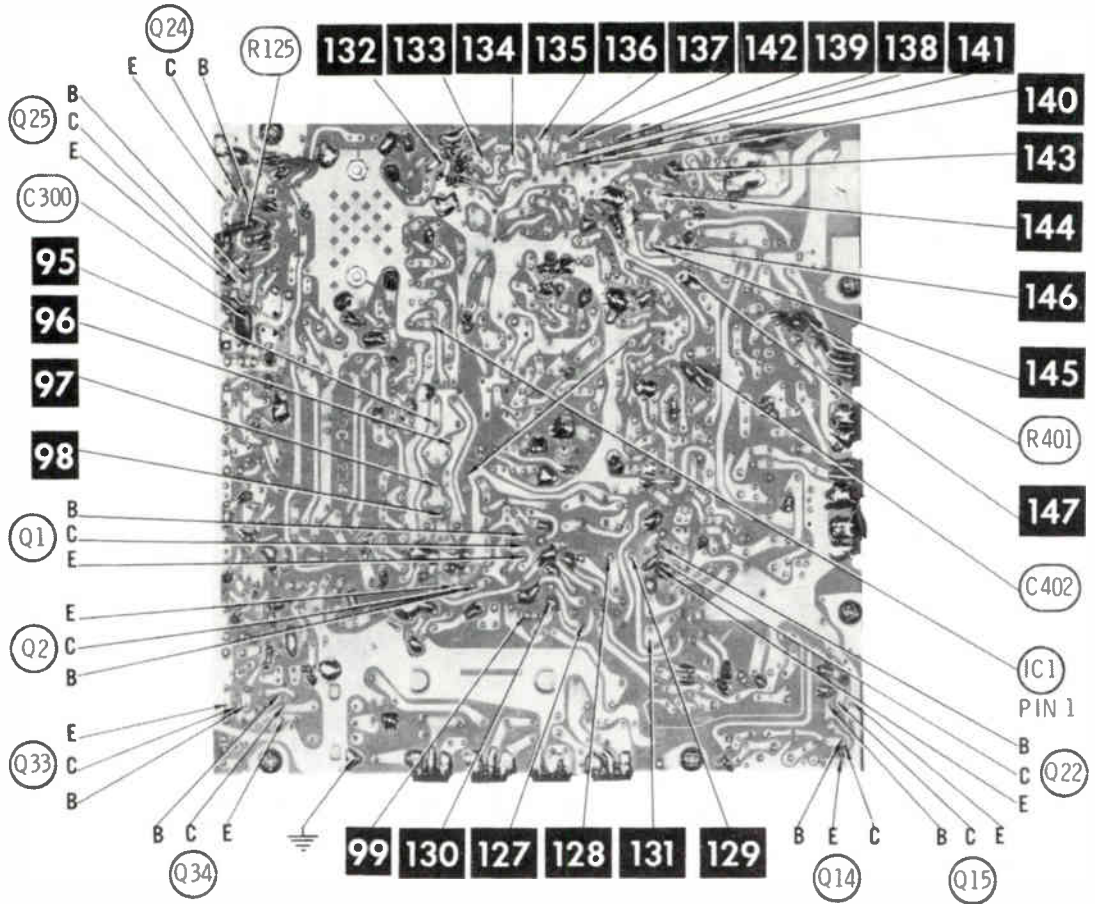
TRAM MODEL DIAMOND 60

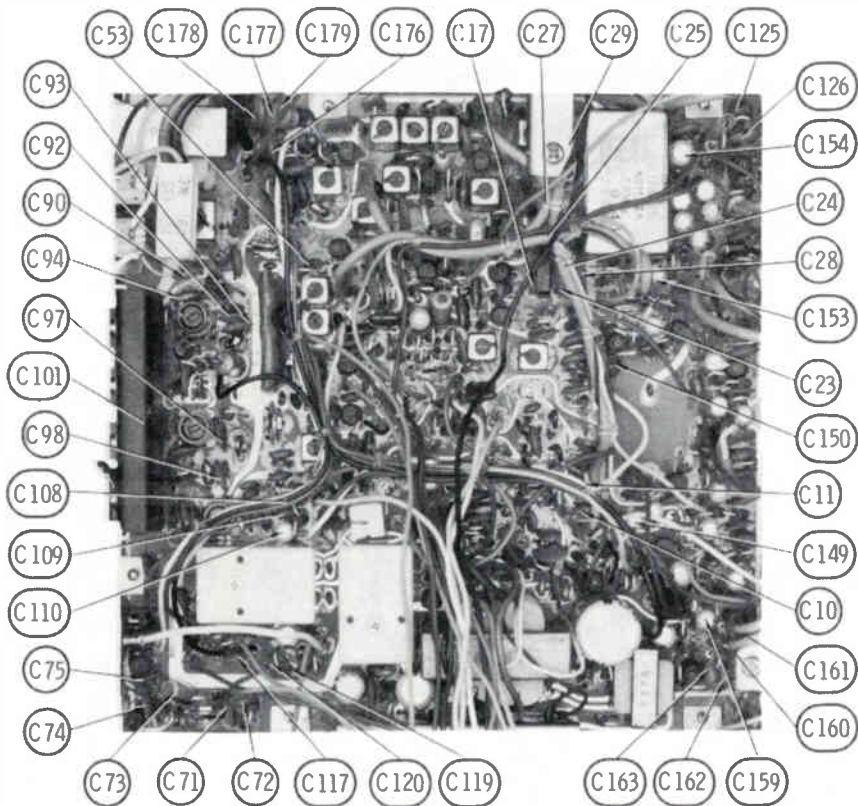
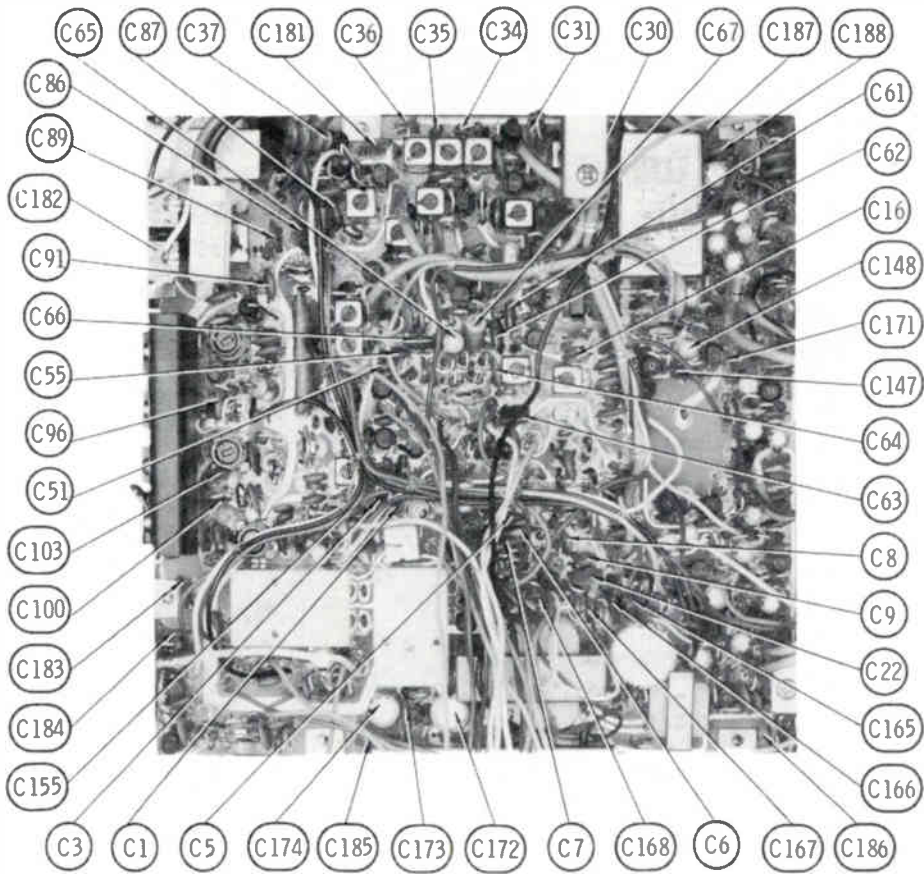


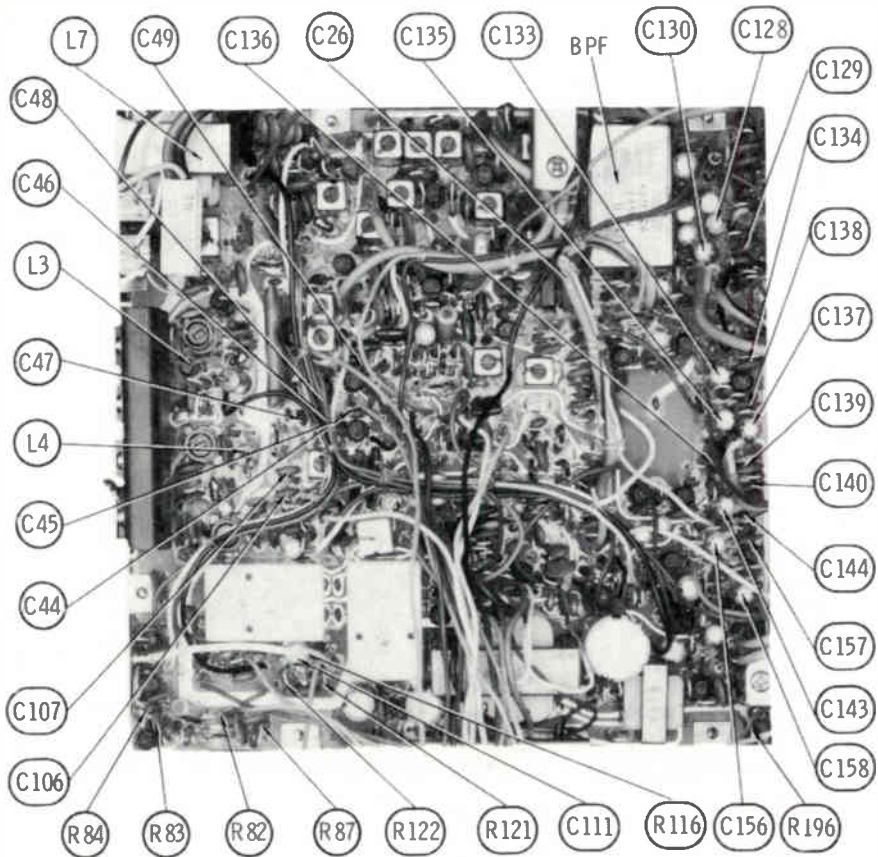
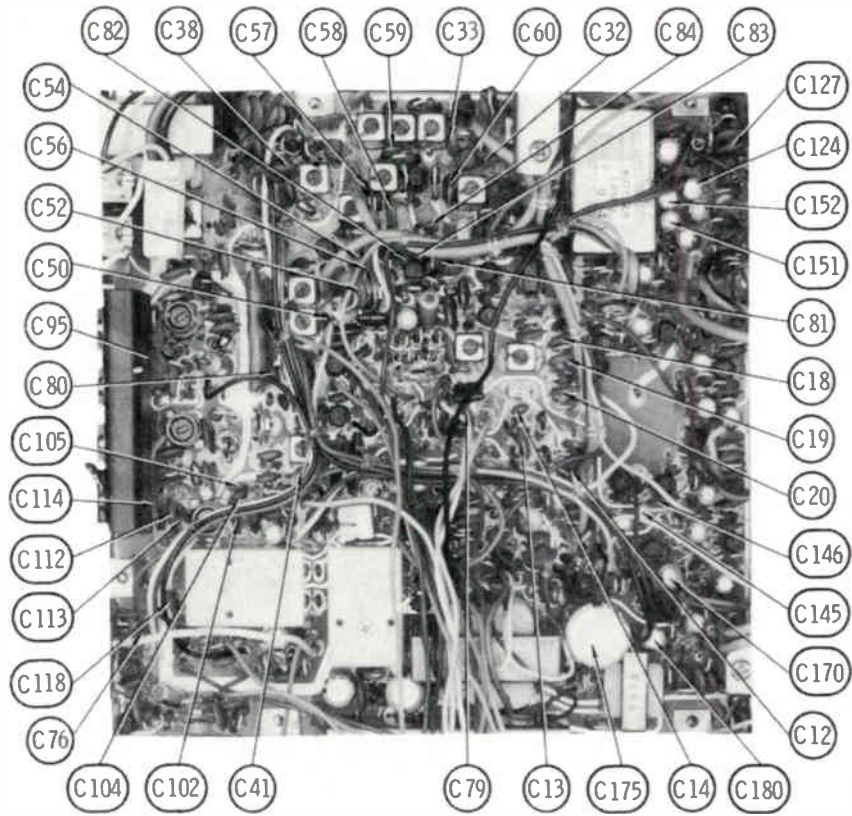


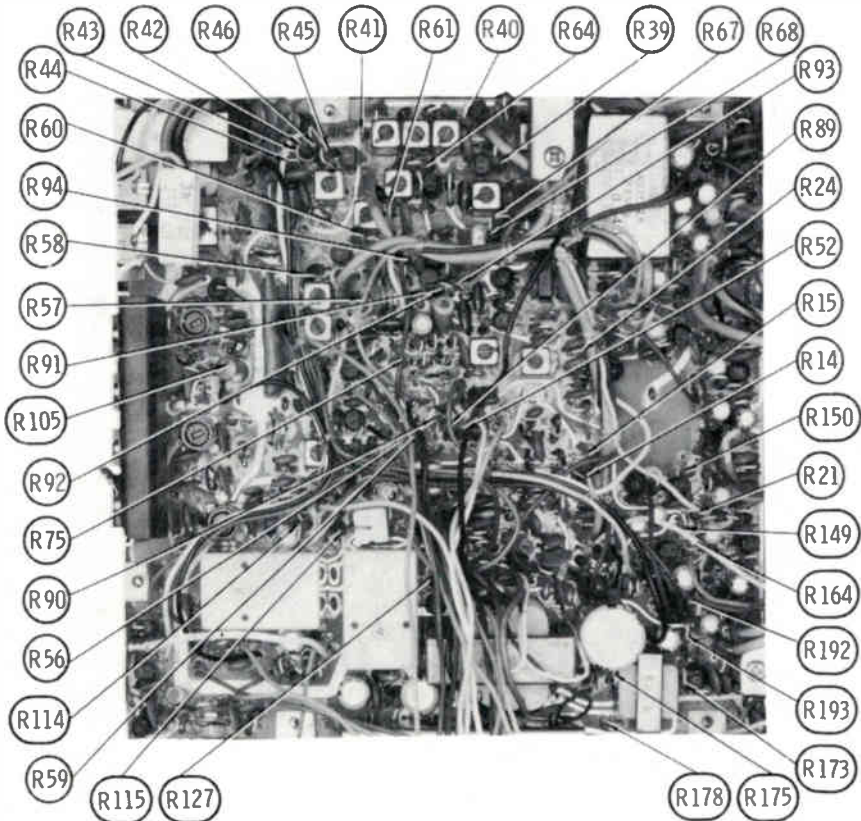
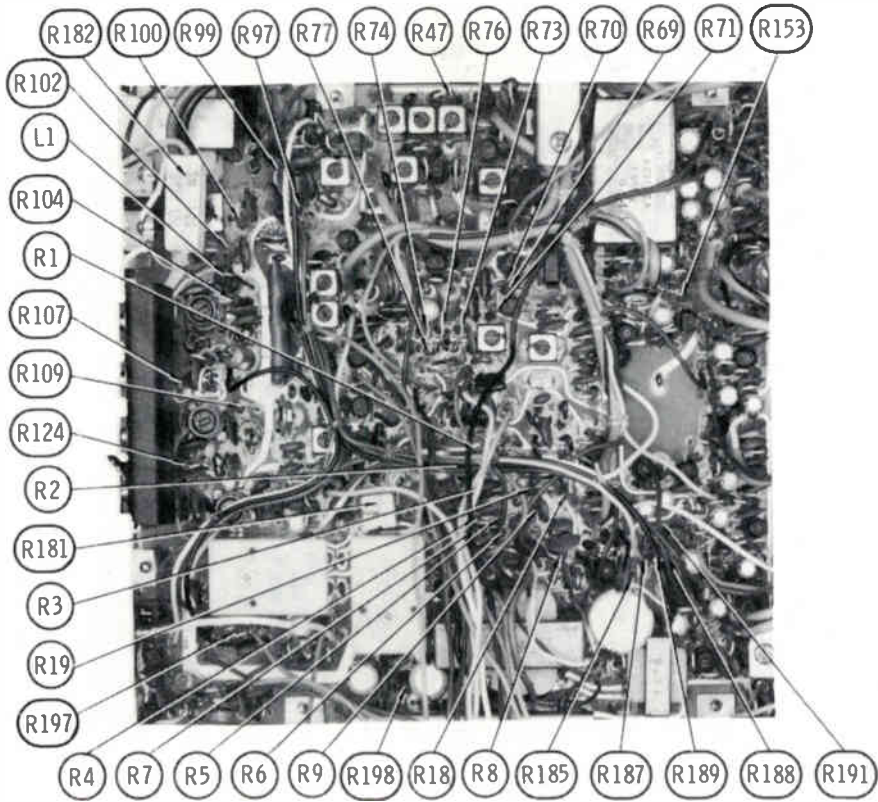


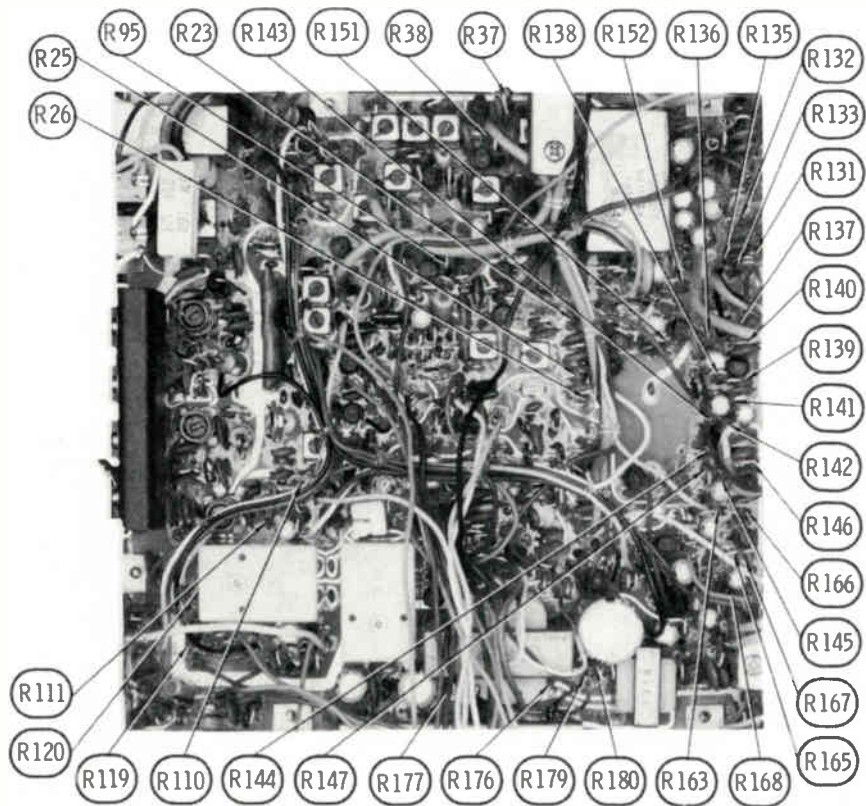
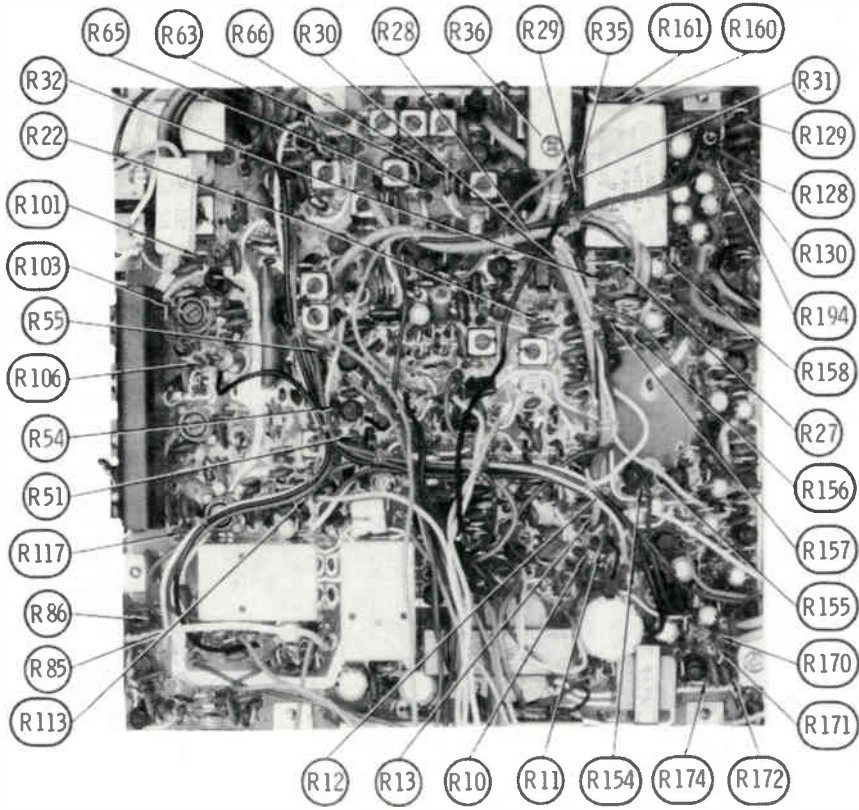
TRAM MODEL DIAMOND 60











PARTS LIST AND DESCRIPTION

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

WIRING DATA

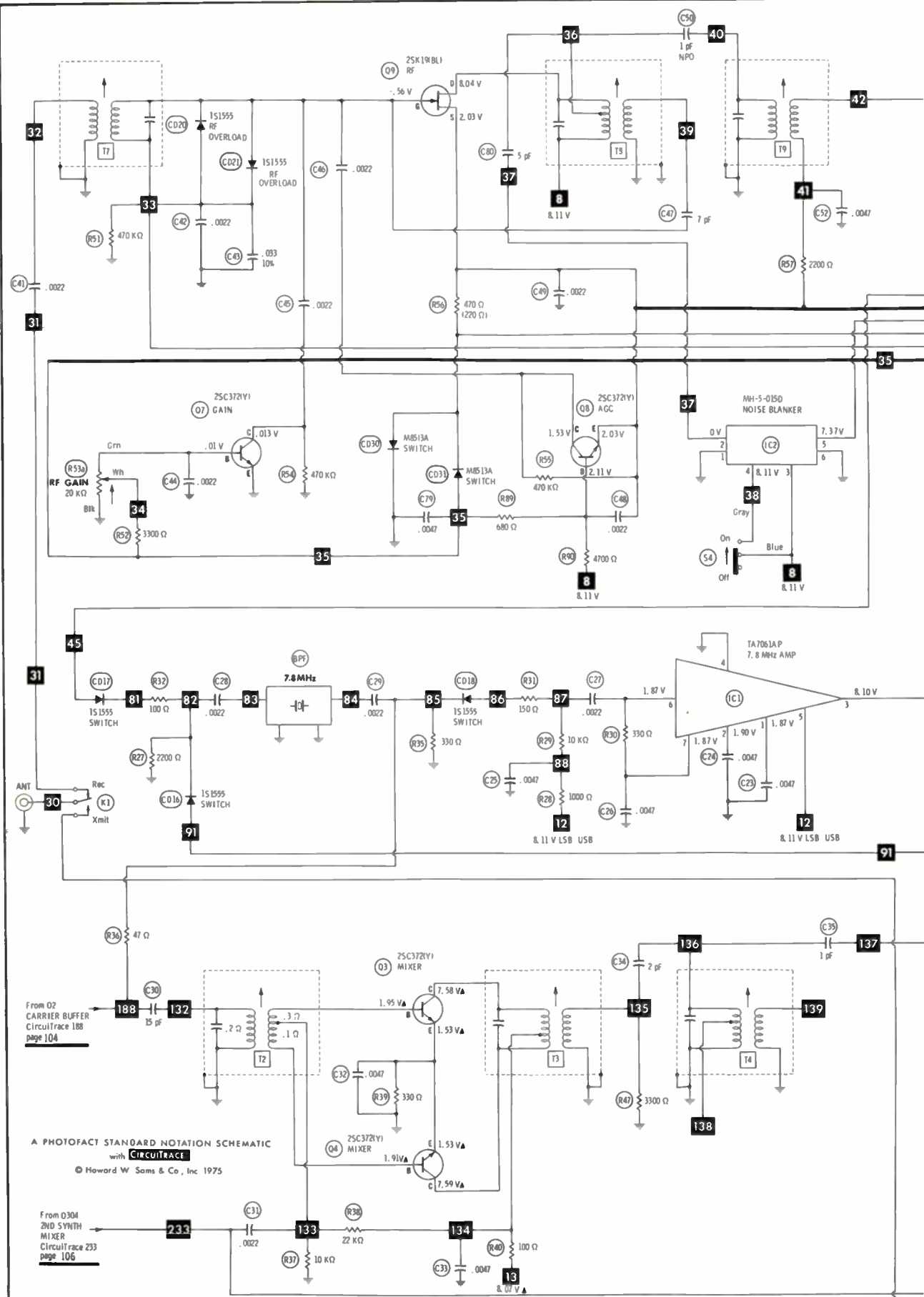
General-use Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in 12 Colors 8524 (Stranded) Available in 12 Colors
Power Cord, 2-Wire	Use BELDEN No. 17106 (Plastic) or 17126 (Rubber) -6 feet 17109 (Plastic) or 17129 (Rubber) -9 feet
Shielded Antenna Lead	Use BELDEN No. 8214 Lowest-loss (RG-8/U Type) 8237 Low-loss (RG-8/U) 8240 (Solid) Miniature (RG-58/U) 8259 (Stranded) Miniature (RG-58A/U)
Coiled Microphone Cable	Use BELDEN No. 8497 3-Conductor (1 shielded for Press-to-Talk) Neoprene 8491 4-Conductor (2 shielded, 2 unshielded) Neoprene
Ignition Noise Suppression	Use BELDEN No. 7300-Series Spark-Plug Sets
Bonding Strap	Use BELDEN No. 8661 (3/8 inch)

SEMICONDUCTORS (Select replacement transistor for best results)

ITEM No.	TYPE / MFRG. No./PART No.	REPLACEMENT DATA						
		GENERAL ELECTRIC PART No.	INTERNATIONAL RECTIFIER PART No.	MALLORY PART No.	MOTOROLA PART No.	RCA PART No.	SPRAGUE PART No.	SYLVANIA PART No.
CD1	1S1555/260-61-067	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	EGG 177
CD2	1S1555/260-61-067	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	EGG 177
CD3	1S1555/260-61-067	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	EGG 177
CD4	1S1555/260-61-067	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	EGG 177
CD5	1S1555/260-61-067	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	EGG 177
CD6	1S1555/260-61-067	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	EGG 177
CD7	1S1555/260-61-067	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	EGG 177
CD8	1N60P/260-10-048	1N6D	1N60	PTC206	HEP135	SK3088		EGG 109
CD9	1N60P/260-10-048	1N60	1N60	PTC206	HEP135	SK3088		EGG 109
CD10	1N60P/260-10-048	1N60	1N60	PTC206	HEP135	SK3088		EGG 109
CD11	1N60P/260-10-048	1N60	1N60	PTC206	HEP135	SK3088		EGG 109
CD12	1S1553/260-61-067	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	EGG 177
CD13	1S1553/260-61-067	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	EGG 177
CD14	1S1553/260-61-067	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	EGG 177
CD15	1S1553/260-61-067	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	EGG 177
CD16	1S1553/260-61-067	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	EGG 177
CD17	1S1553/260-61-067	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	EGG 177
CD18	1S1553/260-61-067	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	EGG 177
CD19	1S1553/260-61-067	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	EGG 177
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CD22	1S1553/260-61-067	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	EGG 177
CD23	1S1553/260-61-067	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	EGG 177
CD24	1N60/260-10-025	1N60	1N60	PTC206	HEP135	SK3088		EGG 109
CD25	1S1553/260-61-067	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	EGG 177
CD26	1N60/260-10-025	1N60	1N60	PTC206	HEP135	SK3088		EGG 109
CD27	1N60/260-10-025	1N60	1N60	PTC206	HEP135	SK3088		EGG 109
CD28	1S1555/260-10-011	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	EGG 177
CD29	1S1555/260-10-011	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	EGG 177
CD30	M8513A/260-10-049	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	EGG 177
CD31	M8513A/260-10-049	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	EGG 177
CD32	1S1553/260-10-047	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	EGG 177
CD33	1S1553/260-10-047	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	EGG 177
CD34	1S1555/260-10-011	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	EGG 177
CD35	1S1553/260-10-047	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	EGG 177
CD36	1S1555/260-10-011	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	EGG 177
CD37	1N60/260-10-025	1N60	1N60	PTC206	HEP135	SK3088		EGG 109
CD38	1N60/260-10-025	1N60	1N60	PTC206	HEP135	SK3088		EGG 109
CD39	1S1885/260-10-033	GE-504A	8D4 or 5A4D	PTC201 or PTC202	HEPR0052	SK3030 or SK3031	RT213 or RT214	EGG 116 or EGG 117
CD40	1S1555/260-10-011	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	EGG 177
CD41	1N60/260-10-025	1N6D	1N6D	PTC206	HEP135	SK3088		EGG 109
CD42	1N60/260-10-025	1N60	1N60	PTC206	HEP135	SK3088		EGG 109
CD43	1N60/260-10-025	1N60	1N60	PTC206	HEP135	SK3088		EGG 109
CD44	1S1555/260-10-011	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	EGG 177
C045	1N60/260-10-025	1N60	1N60	PTC206	HEP135	SK3088		EGG 109
CD46	1S1555/260-10-011	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	EGG 177
CD47	1S1555/260-10-011	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	EGG 177
C048	1S1885/260-10-033	GE-504A	8D4 or 5A4D	PTC201 or PTC202	HEPR0052	SK3030 or SK3031	RT213 or RT214	EGG 116 or EGG 117
CD49	1S1885/260-10-033	GE-5D4A	8D4 or 5A4D	PTC201 or PTC202	HEPR0052	SK3030 or SK3031	RT213 or RT214	EGG 116 or EGG 117
CD50	1S1555/260-10-011	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	EGG 177
CD51	1S1555/260-10-011	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	EGG 177
CD52	1S1885/260-10-033	GE-504A	8D4 or 5A4D	PTC201 or PTC202	HEPR0052	SK3030 or SK3031	RT213 or RT214	EGG 116 or EGG 117
CD53	1S1885/260-10-033	GE-504A	8D4 or 5A4D	PTC201 or PTC202	HEPR0052	SK3030 or SK3031	RT213 or RT214	EGG 116 or EGG 117
CD54	0228.2A/260-10-044 8.2V Zener	GE-X11	Z-1208	Z88.2	HEPZ0411	SK3059	RT239	EGG 5072
CD55	1S1885/260-10-033	GE-504A	8D4 or 5A4D	PTC201 or PTC202	HEPR0052	SK3030 or SK3031	RT213 or RT214	EGG 116 or EGG 117
CD56	1S1555/260-10-011	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	EGG 177
CD57	1S1555/260-10-011	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	EGG 177
CD301	1S1658/260-10-031	GE-90 (8)	D201 (8)	PTC214	HEPR2503(8)	SK3126 (8)		
CD302	0226.2A/260-10-046	GEZD-6.2	Z-1204	PTC503	HEPZD408	SK3058	RT237	EGG 137
CD303	1S1555/260-10-011	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	EGG 177
CD304	1S1555/260-10-011	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	EGG 177
CD305	1S1555/260-10-011	GE-300	D200	PTC214	HEPR0602	SK3100	RT218	EGG 177
IC1	TA7061(AP)/ 26D-10-036							
Q1	25C372(Y)/ 260-10-02D	GE-20	TR-24	PTC139	HEP55	SK3018	RT102	EGG 123A
Q2	25C372(Y)/ 260-10-020	GE-20	TR-24	PTC139	HEP55	SK3018	RT102	EGG 123A
Q3	25C372(Y)/ 260-10-020	GE-20	TR-24	PTC139	HEP55	SK3018	RT102	EGG 123A

(CONTINUED ON PAGE 107)

TRAM MODEL DIAMOND 60

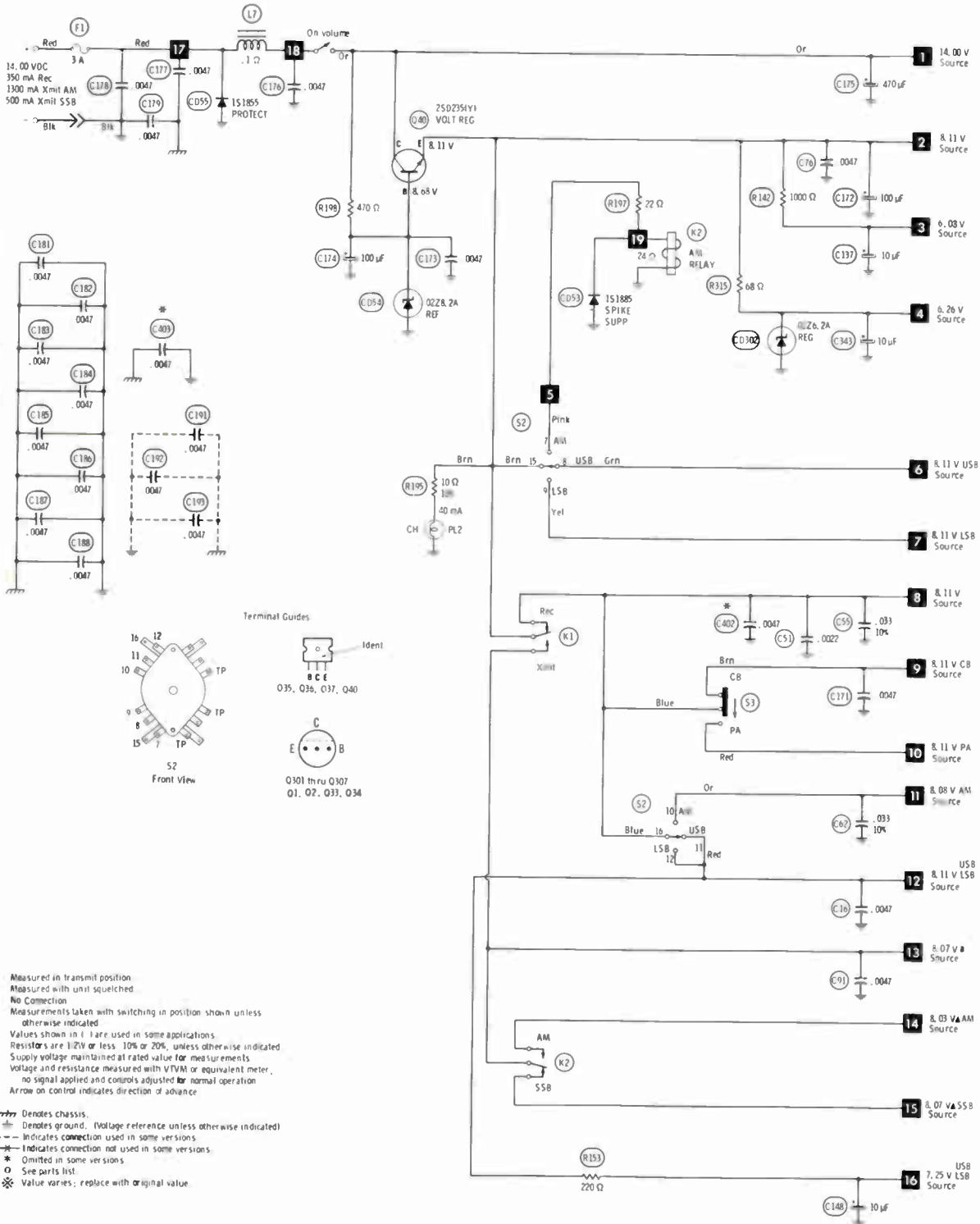


A PHOTOFAC STANDARD NOTATION SCHEMATIC
with **CIRCUITRACE**
© Howard W. Sams & Co., Inc. 1975

From Q304
2ND SYNTH
MIXER
CircuitTrace 233
page 106

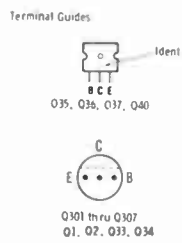
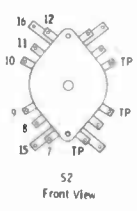
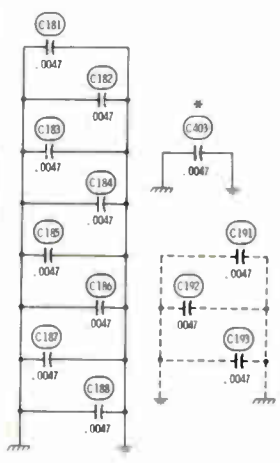
SEE NOTES ON PAGE 106

To Q3 & Q4
Circuit Trace 233
page 100

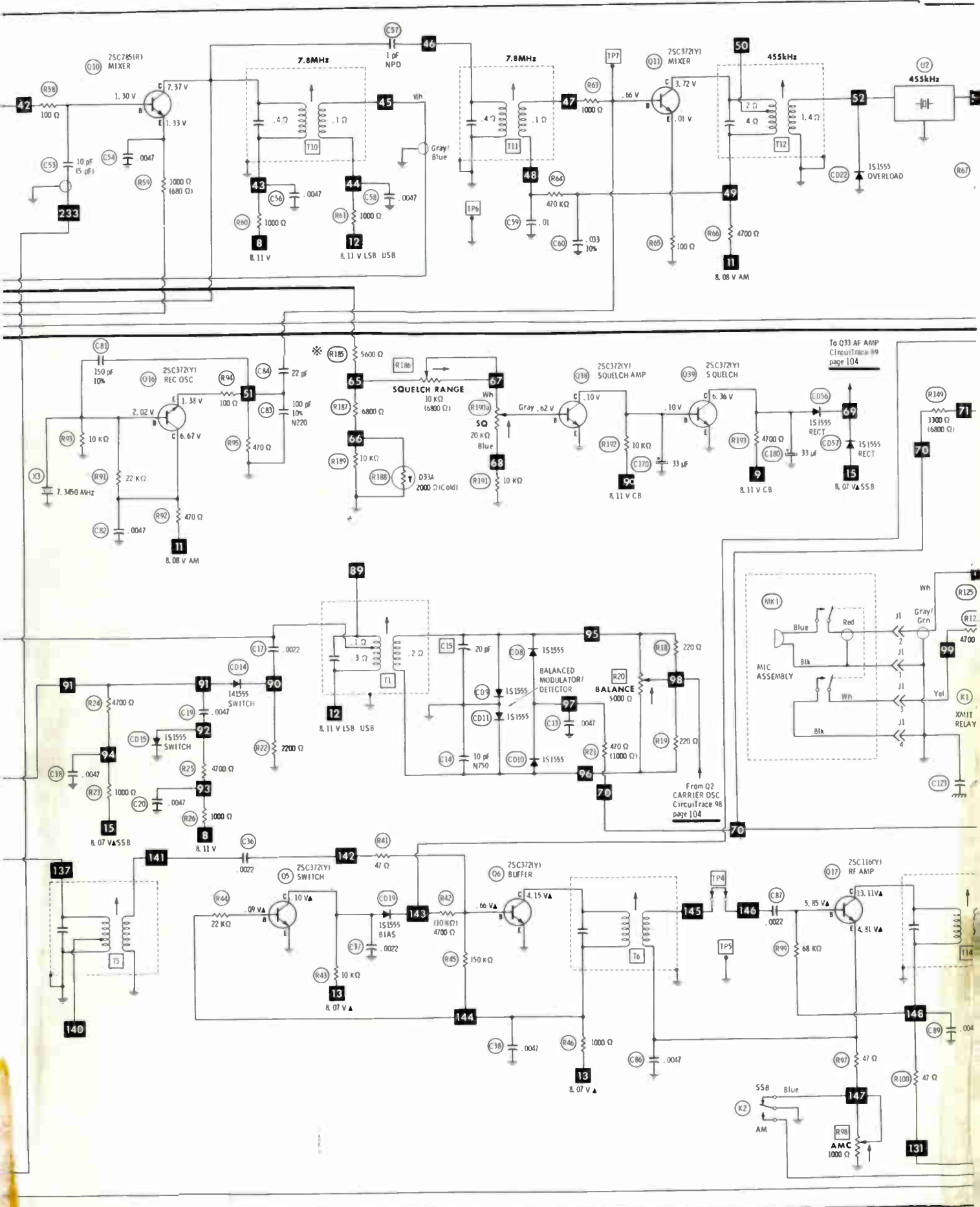


CRYSTAL GUIDE

CHANNEL	CRYSTAL
11	x304
12	x307
13	x304
14	x308
15	x304
16	x309
17	x304
18	x310
19	x305
20	x307
21	x305
22	x308
23	x306
	x310

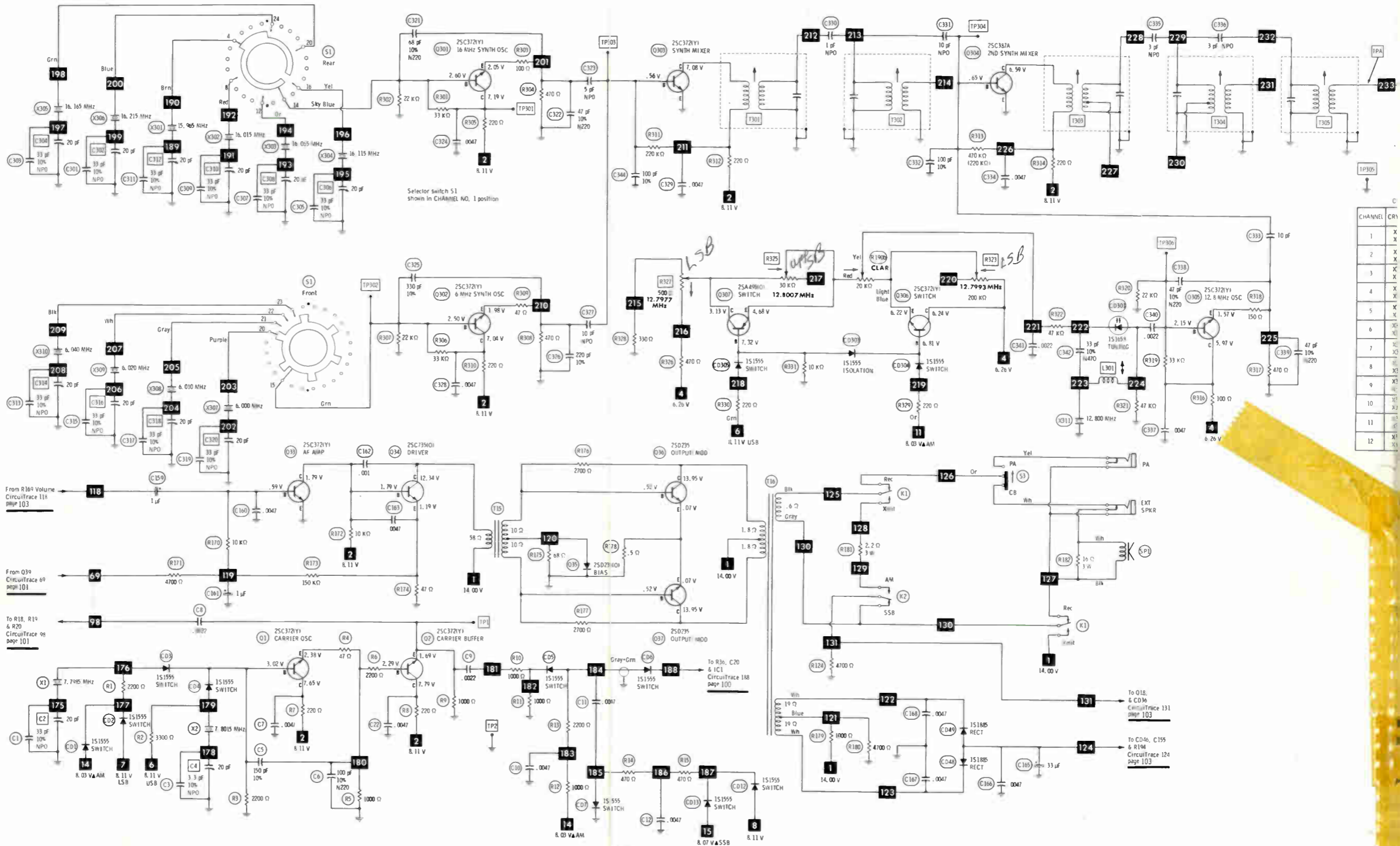


- ▲ Measured in transmit position
- Measured with unit squelched
- NC No Connection
- Measurements taken with switching in position shown unless otherwise indicated
- Values shown in () are used in some applications
- Resistors are 1/2W or less, 10% or 20%, unless otherwise indicated
- Supply voltage maintained at rated value for measurements
- Voltage and resistance measured with VVM or equivalent meter, no signal applied and controls adjusted for normal operation
- Arrow on control indicates direction of advance
- ⚡ Denotes chassis
- ⊕ Denotes ground, (Voltage reference unless otherwise indicated)
- - - Indicates connection used in some versions
- ⚡ Indicates connection not used in some versions
- * Omitted in some versions
- See parts list
- ⊗ Value varies; replace with original value

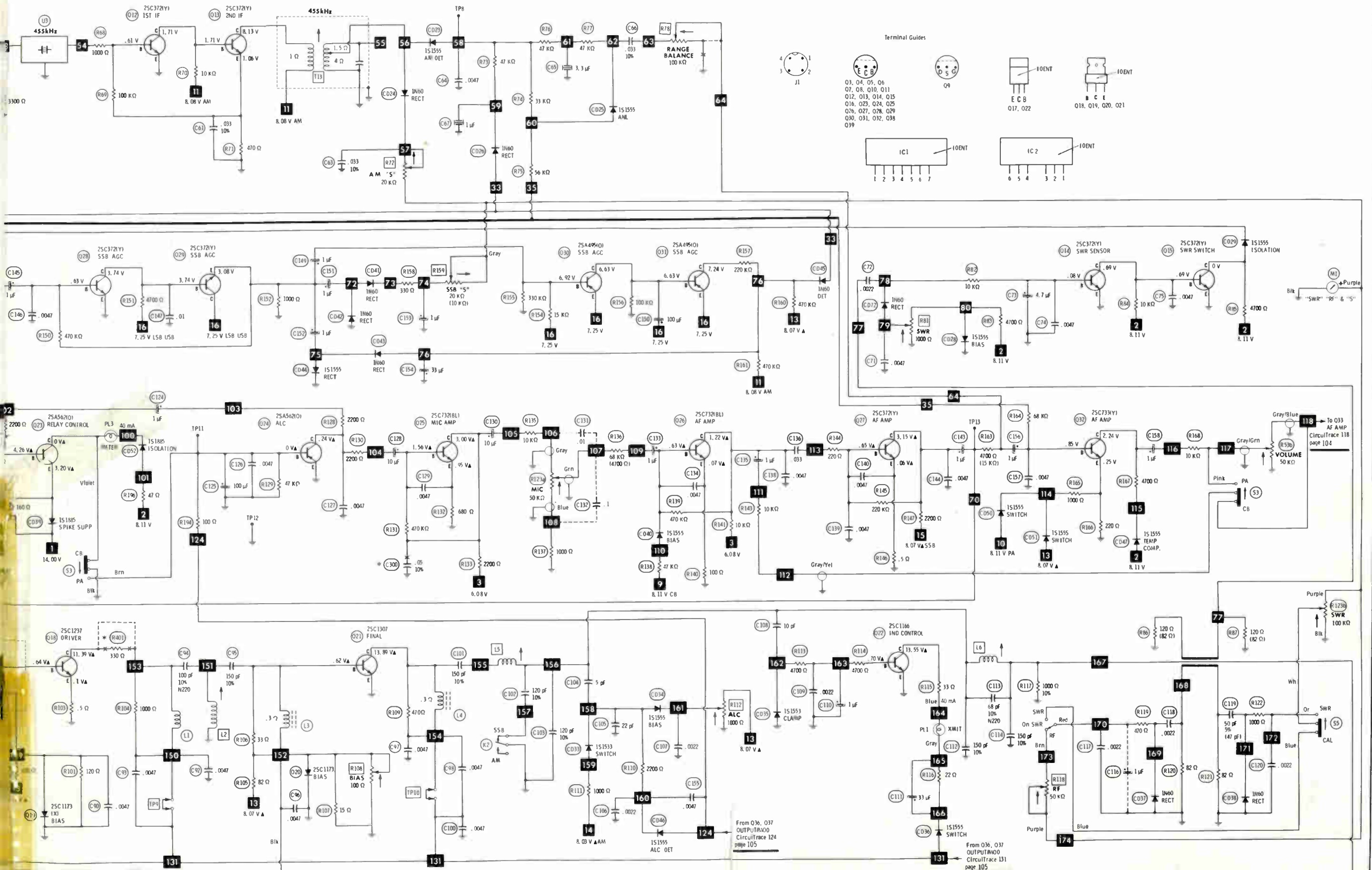


To Q33 AF AMP
Circuit trace 99
page 104

From Q2
CARRIER OSC
Circuit trace 98
page 104



CHANNEL	CRY
1	X
2	X
3	X
4	X
5	X
6	X
7	X
8	X
9	X
10	X
11	X
12	X



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 / MFR. No./PART No.	REPLACEMENT DATA						
		GENERAL ELECTRIC PART No.	INTERNATIONAL RECTIFIER PART No.	MALLORY PART No.	MOTOROLA PART No.	RCA PART No.	SPRAGUE PART No.	SYLVANIA PART No.
Q4	2SC372(Y)/ 260-10-020	GE-20	TR-24	PTC139	HEP55	SK3018	RT102	ECG 123A
Q5	2SC372(Y)/ 260-10-020	GE-20	TR-24	PTC139	HEP55	SK3018	RT102	ECG 123A
Q6	2SC372(Y)/ 260-10-020	GE-20	TR-24	PTC139	HEP55	SK3018	RT102	ECG 123A
Q7	2SC372(Y)/ 260-10-020	GE-20	TR-24	PTC139	HEP55	SK3018	RT102	ECG 123A
Q8	2SC372(Y)/ 260-10-020	GE-20	TR-24	PTC139	HEP55	SK3018	RT102	ECG 123A
Q9	2SK19(BL)/ 260-10-006	GE-FET-2	FE-100	PTC152	HEPF0021	SK3116	RT175	ECG 132
Q10	2SC785(R)/ 260-10-051	GE-20	TR-71	PTC121	HEP53	SK3018	RT108	ECG 107
Q11	2SC372(Y)/ 260	GE-20	TR-24	PTC139	HEP55	SK3018	RT102	ECG 123A
Q12	2SC372(Y)/ 260-10-020	GE-20	TR-24	PTC139	HEP55	SK3018	RT102	ECG 123A
Q13	2SC372(Y)/ 260-10-020	GE-20	TR-24	PTC139	HEP55	SK3018	RT102	ECG 123A
Q14	2SC372(Y)/ 260-10-020	GE-20	TR-24	PTC139	HEP55	SK3018	RT102	ECG 123A
Q15	2SC372(Y)/ 260-10-020	GE-20	TR-24	PTC139	HEP55	SK3018	RT102	ECG 123A
Q16	2SC372(Y)/ 260-10-020	GE-20	TR-24	PTC139	HEP55	SK3018	RT102	ECG 123A
Q17	2SC1166(Y)/ 260-10-052	GE-18	TR-63	PTC143	HEP713	SK3024	RT110	ECG 154
Q18	2SC1237/260-10-053	GE-28	TR-55	PTC110	HEPS3020	SK3054		ECG 210
Q19	2SC1173(X)/ 260-10-054(1)	GE-66	TR-55	PTC110		SK3054	RT154	ECG 152
Q20	2SC1173(X)/ 260-10-054(1)	GE-66	TR-55	PTC110		SK3054	RT154	ECG 152
Q21	2SC1307/ 260-10-055(2)	GE-66		PTC110				ECG 236
Q22	2SC1166(Y)/ 260-10-052	GE-18	TR-63	PTC143	HEP713	SK3024	RT110	ECG 154
Q23	2SA562(O)/ 260-10-039	GE-21	TR-54	PTC103	HEP715	SK3114	RT115	ECG 159
Q24	2SA562(O)/ 260-10-039	GE-21	TR-54	PTC103	HEP715	SK3114	RT115	ECG 159
Q25	2SC732(BL)/ 260-10-023	GE-20	TR-21	PTC123	HEP730	SK3124	RT102	ECG 123A
Q26	2SC732(BL)/ 260-10-023	GE-20	TR-21	PTC123	HEP730	SK3124	RT102	ECG 123A
Q27	2SC372(Y)/ 260-10-020	GE-20	TR-21	PTC123	HEP730	SK3018	RT102	ECG 123A
Q28	2SC372(Y)/ 260-10-020	GE-20	TR-24	PTC139	HEP55	SK3018	RT102	ECG 123A
Q29	2SC372(Y)/ 260-10-020	GE-20	TR-24	PTC139	HEP55	SK3018	RT102	ECG 123A
Q30	2SA495(O)/ 260-10-016	GE-21	TR-30	PTC103	HEP52	SK3114	RT115	ECG 159
Q31	2SA495(O)/ 260-10-016	GE-21	TR-30	PTC103	HEP52	SK3114	RT115	ECG 159
Q32	2SC733(Y)/ 260-10-042	GE-20	TR-21	PTC123	HEP729	SK3122	RT100	ECG 123A
Q33	2SC372(Y)/ 260-10-020	GE-20	TR-24	PTC139	HEP55	SK3018	RT102	ECG 123A
Q34	2SC735(O)/ 260-10-021	GE-17	TR-24	PTC123	HEP55	SK3124	RT102	ECG 123A
Q35	2SD235(Y)/ 260-10-024(1)	GE-66	TR-92	PTC110	HEP701	SK3054	RT154	ECG 152
Q36	2SD235(Y)/ 260-10-024	GE-66	TR-92	PTC110	HEP701	SK3054	RT154	ECG 152
Q37	2SD235(Y)/ 260-10-024	GE-66	TR-92	PTC110	HEP701	SK3054	RT154	ECG 152
Q38	2SC372(Y)/ 260-10-020	GE-20	TR-24	PTC139	HEP55	SK3018	RT102	ECG 123A
Q39	2SC372(Y)/ 260-10-020	GE-20	TR-24	PTC139	HEP55	SK3018	RT102	ECG 123A
Q40	2SD235(Y)/ 260-10-024	GE-66	TR-92	PTC110	HEP701	SK3054	RT154	ECG 152
Q301	2SC372(Y)/ 260-10-020	GE-20	TR-24	PTC139	HEP55	SK3018	RT102	ECG 123A
Q302	2SC372(Y)/ 260-10-020	GE-20	TR-24	PTC139	HEP55	SK3018	RT102	ECG 123A
Q303	2SC372(Y)/ 260-10-020	GE-20	TR-24	PTC139	HEP55	SK3018	RT102	ECG 123A
Q304	2SC387(A)/ 260-10-020	GE-11	TR-83	PTC133	HEP720	SK3019	RT108	ECG 108
Q305	2SC372(Y)/ 260-10-020	GE-20	TR-24	PTC139	HEP55	SK3018	RT102	ECG 123A
Q306	2SC372(Y)/ 260-10-020	GE-20	TR-24	PTC139	HEP55	SK3018	RT102	ECG 123A
Q307	2SA495(O)/ 260-10-016	GE-21	TR-30	PTC103	HEP52	SK3114	RT115	ECG 159

(1) Transistor used as a diode rating 10 watt @ 3 amp.

(2) Rating 25 watt @ 3 amp.

(8) Varactor.

TRAM MODEL DIAMOND 60

PARTS LIST AND DESCRIPTION (CONTINUED)

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

ELECTROLYTIC CAPACITORS

ITEM No.	RATING	REPLACEMENT DATA					
		MFGR. PART No.	ARCO PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.
C65	3.3 NP 16V	260-43-023				TCN503A	TVAN-1302-1
C67	1 NP 6V	260-43-024				TCN501A	TVAN-1200
C73	4.7 35V	260-43-044	RME-B-H-005	EN50-105	WNP1-50	VTT4R7A50	EV-1519
C110	1 50V	260-43-027	RME-A-J-001	EP50-5	PC5-50	MTV1CB50	EV-1615
C111	33 16V	260-43-040	ME-3-E-035	EP50-1	PC1-50	MTV30CB25	EV-1325
C124	1 50V	260-43-027	RME-A-J-001	EP15-25	PC30-25	MTV1CB50	EV-1615
C125	100 3V	260-40-002		EP50-1	PC1-50	SD10-1009	SD10-1009
C128	10 16V	260-43-030	RME-B-E-010	EP15-10	PC10-25	TDC107M010GL	EV-1222
C130	10 16V	260-43-030	RME-B-E-010	EP15-10	PC10-25	VTT10A25	EV-1222
C133	1 50V	260-43-027	RME-A-J-001	EP50-1	PC1-50	MTV1CB50	EV-1615
C135	1 50V	260-43-027	RME-A-J-001	EP50-1	PC1-50	MTV1CB50	EV-1615
C137	10 16V	260-43-030	RME-B-E-010	EP15-10	PC10-25	VTT10A25	EV-1222
C143	1 50V	260-43-027	RME-A-J-001	EP50-1	PC1-50	MTV1CB50	EV-1615
C145	1 50V	260-43-027	RME-A-J-001	EP50-1	PC1-50	MTV1CB50	EV-1615
C148	10 16V	260-43-030	RME-B-E-010	EP15-10	PC10-25	VTT10A25	EV-1222
C149	1 50V	260-43-027	RME-A-J-001	EP50-1	PC1-50	MTV1CB50	EV-1615
C150	100 3V	260-40-002				TDC107M010GL	SD10-1009
C151	1 50V	260-43-027	RME-A-J-001	EP50-1	PC1-50	MTV1CB50	EV-1615
C152	1 50V	260-43-027	RME-A-J-001	EP50-1	PC1-50	MTV1CB50	EV-1615
C153	1 50V	260-43-027	RME-A-J-001	EP50-1	PC1-50	MTV1CB50	EV-1615
C154	33 16V	260-43-040	ME-3-E-035	EP15-25	PC30-25	MTV30CB25	EV-1325
C156	1 50V	260-43-027	RME-A-J-001	EP50-1	PC1-50	MTV1CB50	EV-1615
C158	1 50V	260-43-027	RME-A-J-001	EP50-1	PC1-50	MTV1CB50	EV-1615
C159	1 50V	260-43-027	RME-A-J-001	EP50-1	PC1-50	MTV1CB50	EV-1615
C161	1 50V	260-43-027	RME-A-J-001	EP50-1	PC1-50	MTV1CB50	EV-1615
C165	33 10V	260-40-001				TDC336M010FL	SD10-339
C170	33 16V	260-43-040	ME-3-E-035	EP15-25	PC30-25	MTV30CB25	EV-1325
C172	100 16V	260-43-035	RME-E-E-100	EP15-100	PC100-16	MTV100CB15	EV-1230
C174	100 10V	260-43-036	RME-E-D-100	EP15-100	PC100-10	MTV100CB10	EV-1130
C175	470 25V	260-43-043	RME-N-G-500	EP30-500	WBR500-25	MTA500G25	EV-1350
C180	33 16V	260-43-040	ME-3-E-035	EP15-25	PC30-25	MTV30CB25	EV-1325
C343	10 16V	260-43-030	RME-B-E-010	EP15-10	PC10-25	VTT10A25	EV-1222

CAPACITORS (cont)

ITEM No.	RATING	MFGR. PART No.	REPLACEMENT DATA				
			ARCO/ELMENCO PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.
C1	33 NPO 10%		CCT0-330	DTZ-33	NPO33	CN0433	10TCC-Q33
C2	20						
C3	33 NPO 10%		CCT0-330	DTZ-33	NPO33	CN0433	10TCC-Q33
C4	20						
C5	150 10%		CCD-151	00-151	GP150	GP315	10TS-T15
C6	100 N220 10%		*			*	10TCR-T10
C7	.0047		CCO-472	00-472G	GP4700	JF247	10TS-D47
C8	.0022		CCD-222	DD-222	GP2200	GP222	10TS-D22
C9	.0022		CCD-222	DD-222	GP2200	GP222	10TS-D22
C10	.0047		CCD-472	00-472G	GP4700	JF247	10TS-D47
C11	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C12	.0047		CCD-472	00-472G	GP4700	JF247	10TS-D47
C13	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C14	10 N750		CCTN-100	DTN-10	N10	CN7410	10TCUQ10
C15	20		CCT0-200	DTZ-20	NPO20	CN0420	10TCC-Q20
C16	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C17	.0022		CCD-222	DD-222	GP2200	GP222	10TS-D22
C18	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C19	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C20	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C22	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C23	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C24	.0047		CCO-472	00-472G	GP4700	JF247	10TS-D47
C25	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C26	.0047		CCD-472	00-472G	GP4700	JF247	10TS-D47
C27	.0022		CCD-222	DD-222	GP2200	GP222	10TS-D22
C28	.0022		CCD-222	DD-222	GP2200	GP222	10TS-D22
C29	.0022		CCD-222	DD-222	GP2200	GP222	10TS-D22
C30	15		CCT0-150	DTZ-15	NPO15	CN0415	10TCC-Q15
C31	.0022		CCD-222	00-222	GP2200	GP222	10TS-D22
C32	.0047		CCD-472	00-472G	GP4700	JF247	10TS-D47
C33	.0047		CCD-472	00-472G	GP4700	JF247	10TS-D47
C34	2			DTZ-2R2	NPO2P2	CN0522	10TCC-V22
C35	1				CN0510		10TCC-V10
C36	.0022		CCD-222	DD-222	GP2200	GP222	10TS-D22
C37	.0022		CCD-222	DD-222	GP2200	GP222	10TS-D22
C38	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C41	.0022		CCD-222	00-222	GP2200	GP222	10TS-D22
C42	.0022		CCD-222	00-222	GP2200	GP222	10TS-D22
C43	.033 10%		4DP-2-333		DPMS6S33	EMF4133	4PS-S33
C44	.0022		CCD-222	DD-222	GP2200	GP222	10TS-D22
C45	.0022		CCD-222	00-222	GP2200	GP222	10TS-D22
C46	.0022		CCD-222	DD-222	GP2200	GP222	10TS-D22
C47	7 NPO			DTZ-6R8	NPO6P8	CN0568	10TCC-V68
C48	.0022		CCD-222	DD-222	GP2200	GP222	10TS-D22
C49	.0022		CCD-222	DD-222	GP2200	GP222	10TS-D22

PARTS LIST AND DESCRIPTION (CONTINUED)

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

CAPACITORS(cont)

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA				
			ARCO/ELMENCO PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.
C50	1 NPO				CNO510		10TCC-V10
C51	.0022		CCD-222	DD-222	GP2200	GP222	10TS-D22
C52	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C53	10 NPO		CCTO-100	DTZ-10	NPO10	CNO410	10TCC-Q10
C54	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C55	.033 10%		4DP-2-333		DPMS6S33	EMF4133	4PS-S33
C56	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C57	.1 NPO						
C58	.0047		CCD-203	CK-203	MGPO2	TA120	TG-S20
C59	.01		1DP-1-103	CPR-10000J	DPMS6S1	EMF1A110	225P10391WD3
C60	.033 10%		4DP-2-333		DPMS6S33	EMF4133	4PS-S33
C61	.033 10%		4OP-2-333		DPMS6S33	EMF4133	4PS-S33
C62	.033 10%		4DP-2-333		OPMS6S33	EMF4133	4PS-S33
C63	.033 10%		4DP-2-333		DPMS6S33	EMF4133	4PS-S33
C64	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C66	.033 10%		4DP-2-333		DPMS6S33	EMF4133	4PS-S33
C71	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C72	.0022		CCD-222	DD-222	GP2200	GP222	10TS-D22
C74	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C75	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C76	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C79	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C80	5				NPO5		10TCC-V50
C81	150 10%		CCD-151	DD-151	GP150	GP315	10TS-T15
C82	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C83	100 N220 10%		*			*	10TCC-R1100
C84	22		CCTO-200	DTZ-20	NPO20	CNO420	10TCC-Q20
C86	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C87	.0022		CCD-222	DD-222	GP2200	GP222	10TS-D22
C89	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C90	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C91	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C92	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C93	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C94	100 N220 10%		*			*	10TCC-R110
C95	150 10%		CCD-151	DD-151	GP150	GP315	10TS-T15
C96	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C97	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C98	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C100	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C101	150 10%		CCD-151	DD-151	GP150	GP315	10TS-T15
C102	120 10%		CCTO-121	DTZ-120		CNO312	10TCC-T15
C103	120 10%		CCTO-121	DTZ-120		CNO312	10TCC-T15
C104	5				NPO5		10TCC-V50
C105	22		CCTO-200	DTZ-20	NPO20	CNO420	10TCC-Q20
C106	.0022		CCD-222	DD-222	GP2200	GP222	10TS-D22
C107	.0022		CCD-222	DD-222	GP2200	GP222	10TS-D22
C108	10		CCTO-100	DTZ-10	NPO10	CNO410	10TCC-Q10
C109	.0022		CCD-222	DD-222	GP2200	GP222	10TS-D22
C112	150 10%		CCD-151	DD-151	GP150	GP315	10TS-T15
C113	68 N220 10%		*			*	10TCC-R110
C114	150 10%		CCD-151	DD-151	GP150	GP315	10TS-T15
C117	.0022		CCD-222	DD-222	GP2200	GP222	10TS-D22
C118	.0022		CCD-222	DD-222	GP2200	GP222	10TS-D22
C119	50 5%		CCTO-510	DTZ-50	NPO50	CNO450	10TCC-Q50
C120	.0022		CCD-222	DD-222	GP2200	GP222	10TS-D22
C123	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C126	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C127	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C129	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C134	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C136	.033		4DP-2-333		DPMS6S33	EMF4133	4PS-S33
C138	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C139	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C140	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C144	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C146	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C147	.01		1DP-1-103	CPR-10000J	DPMS6S1	EMF1A110	225P10391WD3
C155	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C157	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C160	.0047		CCO-472	DD-472G	GP4700	JF247	10TS-D47
C162	.001		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C163	.0047		CCO-472	DD-472G	GP4700	JF247	10TS-D47
C166	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C167	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C168	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C171	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C173	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C176	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C177	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C178	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C179	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C181	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C182	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C183	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C184	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C185	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C186	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C187	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C188	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C301	33 NPO 10%		CCTO-330	DTZ-33	NPO33	CNO433	10TCC-Q33
C302	2			DTZ-2R2	NPO2P2	CNO522	10TCC-V22
C303	33 NPO			DTZ-33	NPO33	CNO433	10TCC-Q33
C304	2		CCTO-330	DTZ-2R2	NPO2P2	CNO522	10TCC-V22

TRAM MODEL DIAMOND 60

PARTS LIST AND DESCRIPTION (CONTINUED)

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

CAPACITORS (cont)

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA				
			ARCO/ELMENCO PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.
C305	33 NPO		CCTO-330	DTZ-33	NPO33	CN0433	10TCC-Q33
C306	20						
C307	33 NPO		CCTO-33D	DTZ-33	NPO33	CN0433	10TCC-Q33
C308	20						
C309	33 NPO		CCTO-330	DTZ-33	NPO33	CN0433	10TCC-Q33
C310	20						
C311	33 NPO		CCTO-330	DTZ-33	NPO33	CN0433	10TCC-Q33
C312	2						
C313	33 NPO		CCTO-330	DTZ-33	NPO33	CN0433	10TCC-Q33
C314	20						
C315	33 NPO		CCTO-330	DTZ-33	NPO33	CN0433	10TCC-Q33
C316	20						
C317	33 NPO		CCTO-330	DTZ-33	NPO33	CN0433	10TCC-Q33
C318	20						
C319	33 NPO		CCTO-330	DTZ-33	NPO33	CN0433	10TCC-Q33
C320	20						
C321	68 N220		*			*	10TCR-Q6B
C322	47 N220		*			*	10TCR-Q47
C323	5 NPO						10TCC-V50
C324	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C325	330 10%		CCD-331	DD-331	GP330	GP333	10TS-T33
C326	220 10%		CCD-221	DD-221	GP220	GP322	10TS-T22
C327	10 NPO		CCTO-100	DTZ-10	NPO10	CN0410	10TCC-Q10
C328	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C329	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C330	1 NPO				CN0510		10TCC-V10
C331	10 NPO		CCTO-100	DTZ-10	NPO10	CN0410	10TCC-Q10
C332	100 10%		CCTO-101	DTZ-100	NPO100	CN0310	10TCC-T10
C333	10		CCTO-100	D1Z-10	NPO10	CN0410	10TCC-Q10
C334	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C335	3 NPO						10TCC-V30
C336	3 NPO						10TCC-V30
C337	.0047		CCD-472	DD-472G	GP4700	JF247	10TS-D47
C338	47 N220		*			*	10TCR-Q47
C339	47 N220		*			*	10TCR-Q47
C340	.0022		CCD-222	DD-222	GP2200	GP222	10TS-D22
C341	.0022		CCD-222	DD-222	GP2200	GP222	10TS-D22
C342	33 N470		*			*	10TCT-Q33
C344	100 10%		CCTO-101	DTZ-100	NPO100	CN0310	10TCC-T10

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

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

ITEM No.	FUNCTION	RESIST- ANCE	REPLACEMENT DATA				
			MFR. PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.
R20	Balance	5000	260-61-064	TSV-5K or T-5000	C-502	X201R502B	MTC53L1
R53a	RF Gain	20K	260-61-044				
b	Volume/Switch	50K					
R72	AM "S"	20K	260-61-079	T-20K (2) or TSV-25K (2)	C-253 (2)	X201R253B (2)	MTC24L1 (2)
R7B	Range Balance	100K	260-61-066	TSV-100K (2) or T-100K (2)	C-104 (2)	X201R104B (2)	MTC15L1 (2)
RB1	"SWR"	1000	260-61-068	TSV-1K or T-1000	C-102	X201R102B	MTC13L1
R9B	"AMC"	1000	260-61-067	TSV-1K (2) or T-1000 (2)	C-102 (2)	X201R102B (2)	MTC13L1 (2)
R10B	Bias	100	260-61-063	TSV-100K (20) or [T-100 (20)]		X201R101B (20)	MTC12L1 (20)
R112	ALC	1000	260-61-068	TSV-1K or T-1000	C-102	X201R102B	MTC13L1
R11B	RF	20K	260-61-079	T-20K (2) or TSV-25K (2)	C-253 (2)	X201R253B (2)	MTC24L1 (2)
R123a	Mic Gain	50K	260-61-075				
b	SWR/Switch	100K					
R159	SSB "S"	20K	260-61-079	T-20K (2) or TSV-25K (2)	C-253 (2)	X201R253B (2)	MTC24L1 (2)
R186	Squelch Range	10K	260-61-071	TSV-10K (2) or T-10K (2)	C-103 (2)	X201R103B (2)	MTC14L1 (2)
R190a	Squelch	20K	260-61-043				
b	Clarifier	20K					
R323	17.7993MHz Adjust	200K	260-61-074				
R325	17.8007MHz Adjust	30K	260-61-072				
R327	12.7977MHz Adjust	500	260-61-073				

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

(20) Cut off one of the end terminals and use jumper wires to "PC" board.

PARTS LIST AND DESCRIPTION (CONTINUED)

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

RESISTORS (Power and Special)

ITEM No.	RATING	REPLACEMENT DATA		ITEM No.	RATING	REPLACEMENT DATA	
		WORKMAN PART No.	MFGR. PART No.			WORKMAN PART No.	MFGR. PART No.
R188	2000 Cold NTC		260-69-002				

COILS (RF-IF)

ITEM No.	FUNCTION	REPLACEMENT DATA			REMARKS
		PART No.	OTHER IDENTIFICATION	MILLER PART No.	
L1	RF Choke (13uH)	260-20-001		72F125AP	
L2	Xmit. Driver (27MHz)	260-25-050			
L3	RF Choke (1uH)	260-25-060		74F106AP	
L4	RF Choke (1uH)	260-25-061		74F106AP	
L5	Final Amp (27MHz)	260-25-051			
L6	Pi Network (27MHz)	260-25-050			
L301	12.8MHz Osc	260-25-063			
T1	7.8MHz Amp	260-25-054			
T2	Carrier Buffer (7.8MHz)	260-25-055			
T3	Xmit. Mixer (27MHz)	260-25-044			
T4	Xmit. Mixer (27MHz)	260-25-037			
T5	Xmit. Mixer (27MHz)	260-25-037			
T6	Xmit. Buffer (27MHz)	260-25-031			
T7	Rec Ant. (27MHz)	260-25-045			
T8	Rec RF (27MHz)	260-25-046			
T9	Rec RF (27MHz)	260-25-037			
T10	Rec Mixer (7.8MHz)	260-25-047			
T11	Rec Mixer (7.8MHz)	260-25-047			
T12	Input IF (455kHz)	260-27-008			
T13	Output IF (455kHz)	260-27-008			
T14	Xmit RF Amp (27MHz)	260-25-048			
T301	Syn Mixer (21MHz)	260-25-056			
T302	Syn Mixer (21MHz)	260-25-057			
T303	Syn Mixer (34MHz)	260-25-058			
T304	Syn Mixer (34MHz)	260-25-058			
T305	Syn Mixer (34MHz)	260-25-059			

TRAM MODEL DIAMOND 60

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000~)	MFGR. PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
L7	1300mA	.1	1mH	260-25-062 7966 (1)				(1) On unit.

TRANSFORMER (Driver)

ITEM No.	TURNS RATIO			REPLACEMENT DATA				NOTES
	PRI.	SEC. 1	SEC. 2	MFGR. PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD Part No.	
T15	2	1CT		260-22-010 7378 (1)				(1) On unit.

TRANSFORMER (Audio Output)

ITEM No.	IMPEDANCE		REPLACEMENT DATA				NOTES
	PRI.	SEC.	MFGR. PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
T16	64	16	260-23-014 8494 (1)				(1) On unit.

PARTS LIST AND DESCRIPTION (CONTINUED)

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

SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		MFR. PART No.	QUAM PART No.	
SP1	6.3" X 2.35" PM, 16 Ohms	260-15-175		

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	3A Quick-Acting	260-14-045	260-16-027	AGC3	HDJ	312003	150145	FG3-2

MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
K1	Relay	260-14-032	Xmit (12V DC)
K2	Relay	260-14-049	AM (6V DC)
M1	Meter	260-19-025	SWR/RF/"S"
S1	Switch	260-14-063	Channel Selector
S2	Switch	260-14-044	Mode
S3	Switch	260-14-065	CB/PA
S4	Switch	260-14-065	Noise Blanker
S5	Switch	260-14-065	SWR/Cal.
U1	Filter	260-15-174	Crystal (7.8MHz)
U2	Filter	260-19-004	Ceramic (455kHz)
U3	Filter	260-19-007	Ceramic (455kHz)
X1	Crystal	260-15-215	7.7985MHz
X2	Crystal	260-15-216	7.8015MHz
X3	Crystal	260-15-217	7.3450MHz
X301	Crystal	260-15-208	15.695MHz
X302	Crystal	260-15-209	16.015MHz
X303	Crystal	260-15-210	16.065MHz
X304	Crystal	260-15-211	16.115MHz
X305	Crystal	260-15-212	16.165MHz
X306	Crystal	260-15-213	16.215MHz
X307	Crystal	260-15-204	6.000MHz
X308	Crystal	260-15-205	6.010MHz
X309	Crystal	260-15-206	6.020MHz
X310	Crystal	260-15-207	6.040MHz
X311	Crystal	260-15-214	12.800MHz

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

ITEM	PART No.	ITEM	PART No.
Knob-Channel	260-86-052	Knob-Volume, SWR Cal, Clarifier	260-86-055
Knob-Mode	260-86-053	Dial-Channel Indicator	260-82-004
Knob-RF Gain, Squelch, Mic Gain	260-86-054		

ACCESSORIES

ITEM	MFR. PART No.	REMARKS
Microphone	260-15-229	



PHOTOFACT[®] with

CIRCUITRACE[®]

For Supplier Address See PHOTOFACT Index

NOTE

ONLY THOSE PERSONS PROPERLY LICENSED ARE PERMITTED TO MAKE REPAIRS OR ADJUSTMENTS WHICH MAY RESULT IN ILLEGAL OPERATION. (REFER TO FCC RULES AND REGULATIONS PART 95, SUBPARTS 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 4530(Late Prod.)

ALIGNMENT INSTRUCTIONS

Suggested Alignment Tools:	GC ELECTRONICS:
T5, T6, T7	9087, 5000
T1, T2, T3, T4, T8, L2	9440
C1, C4	8290

RECEIVER

Connect an AC-VTVM across speaker voice coil.
 Set squelch control fully counterclockwise.
 Set channel selector to Channel A.
 Set volume control to obtain suitable reading.

SIGNAL GENERATOR	CHANNEL	ADJUST	REMARKS
Connect high side thru a .01 uF to base of TR5, low side to ground. Set to 455 kHz (1000 Hz @ 30% mod.).	Any	T5, T6 T7	Adjust for maximum.
Connect high side thru a .01 uF to antenna connector, low side to ground. Set to 27.065 MHz (1000 Hz @ 30% mod.).	9	T3, T4, T8	Adjust for maximum

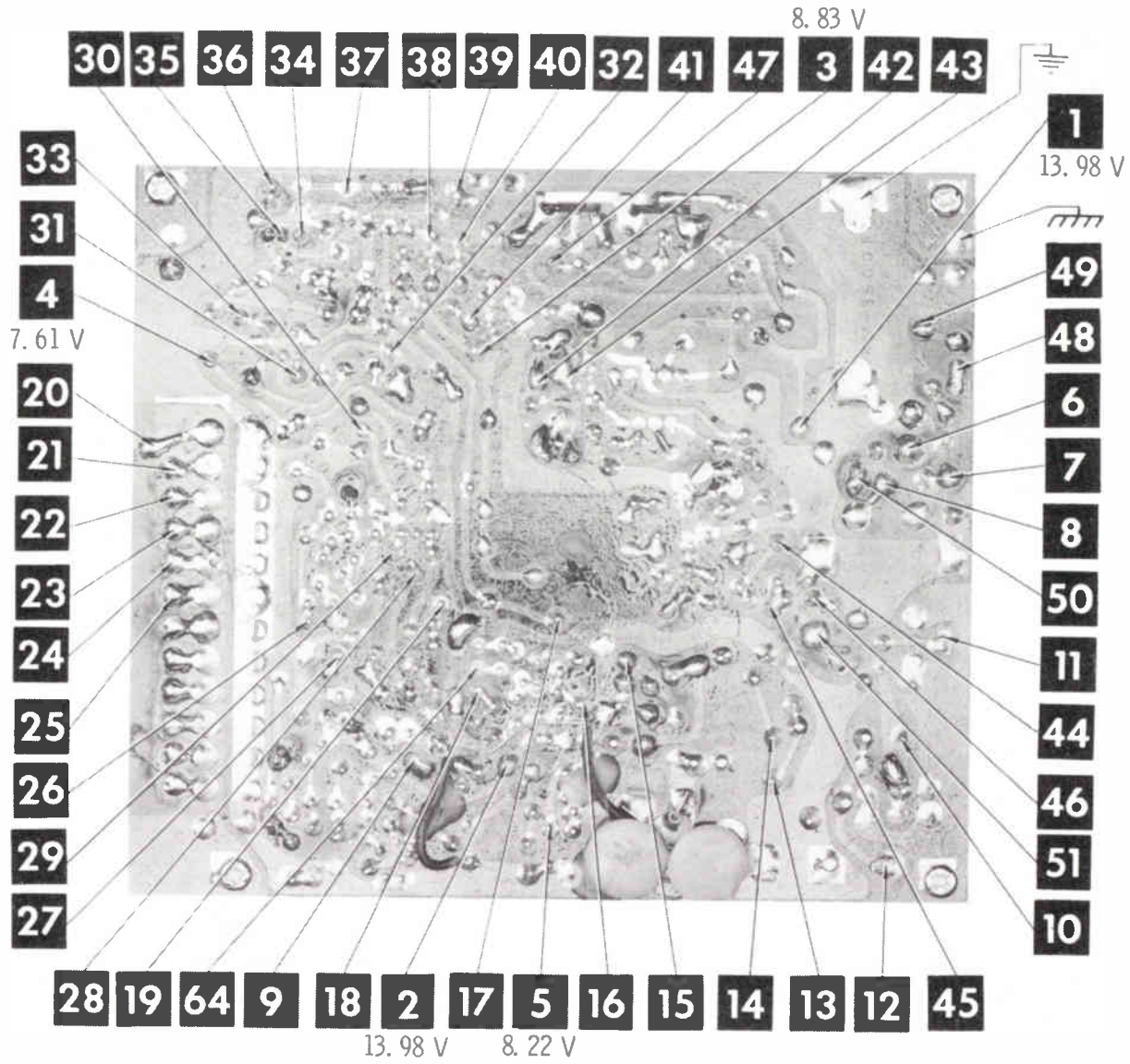
TRANSMITTER

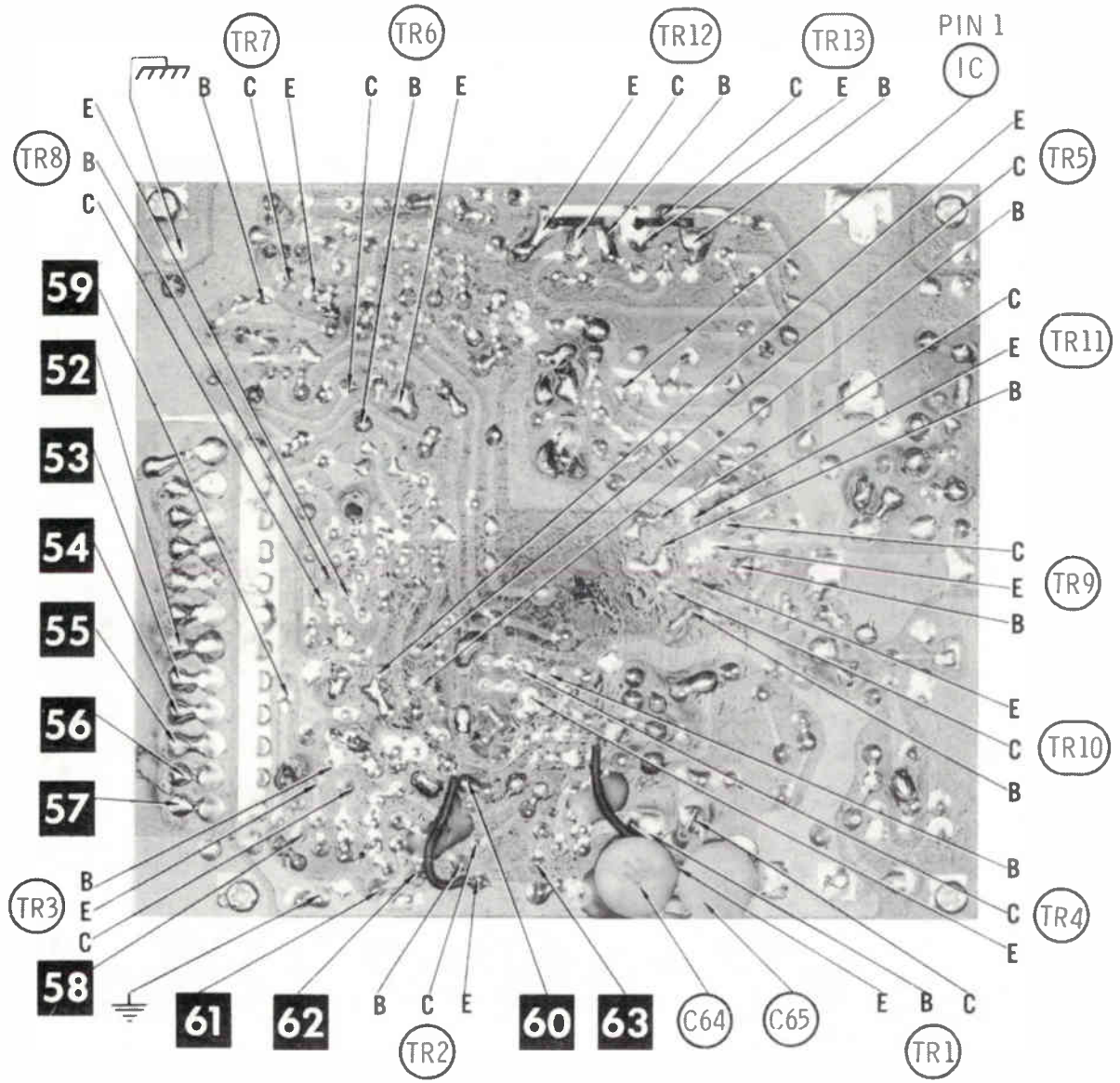
INDICATOR	ADJUST	REMARKS
RF Wattmeter	T2, T1, L2, C4	Connect wattmeter to antenna connector. Set channel selector to CH. 9. Key transmitter. Adjust for maximum.
0-1000 mA DC Milliammeter	L2	Insert milliammeter at TP1 between R3 and L5. Key transmitter. Adjust for no more than 5 watts DC input.
TV (CH. 2)	C1	Key transmitter. Adjust for MINIMUM interference.

HOWARD W. SAMS & CO., INC. Indianapolis, Indiana 46208

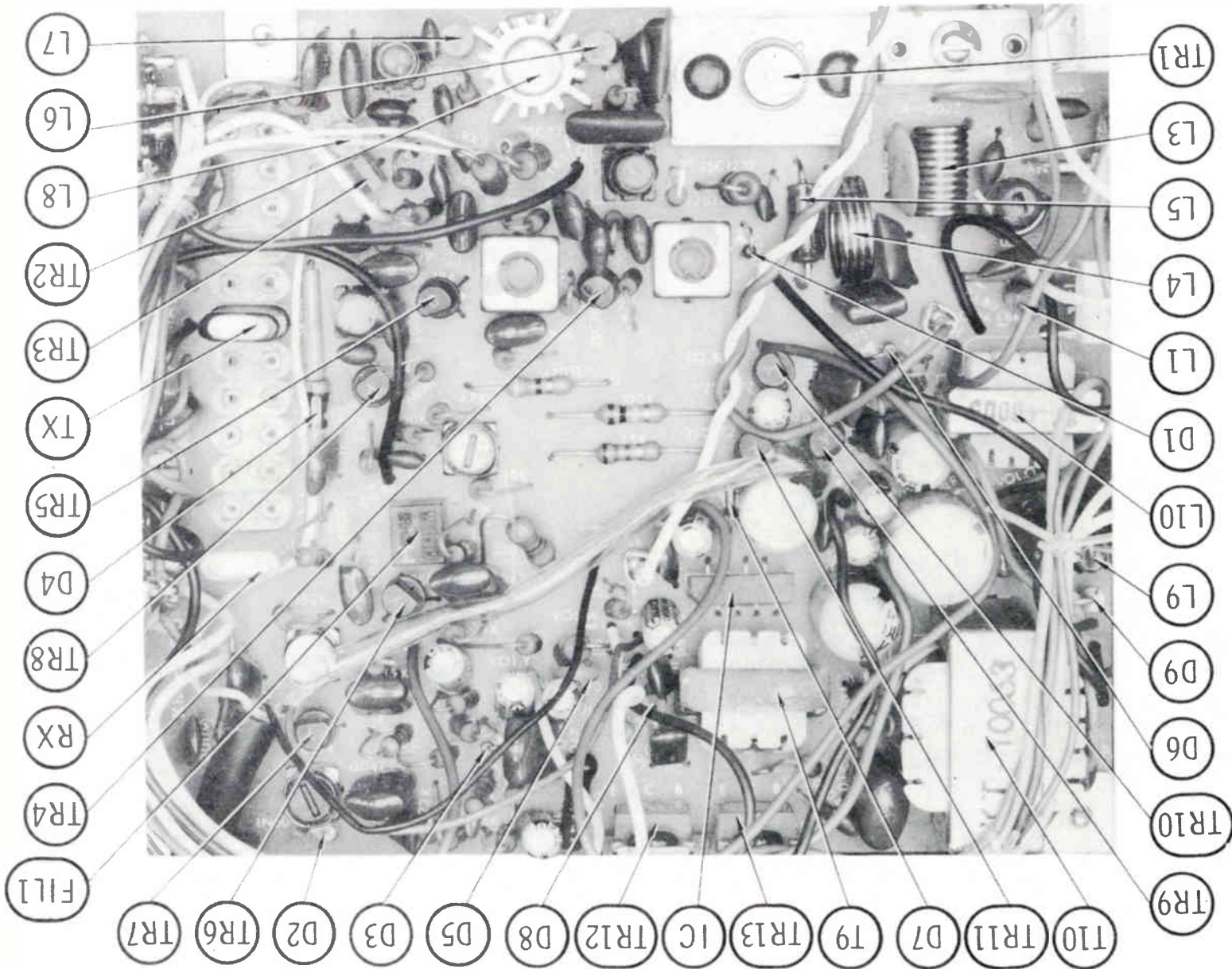
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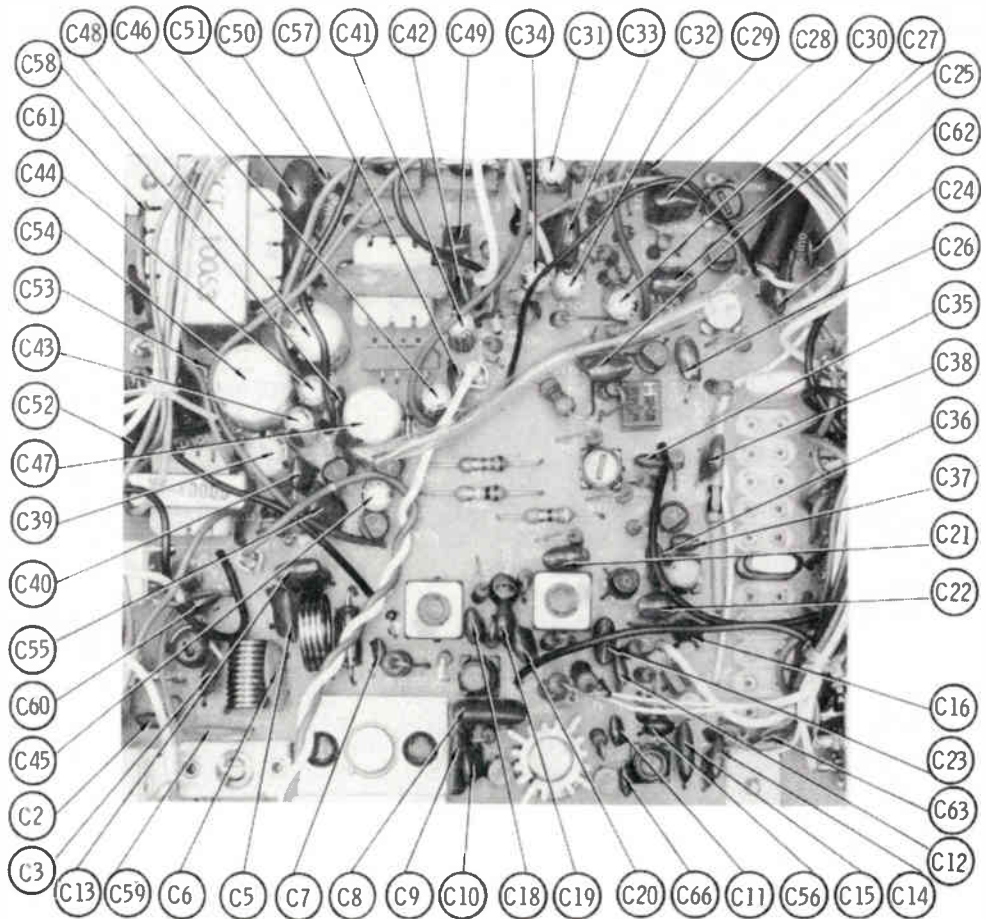
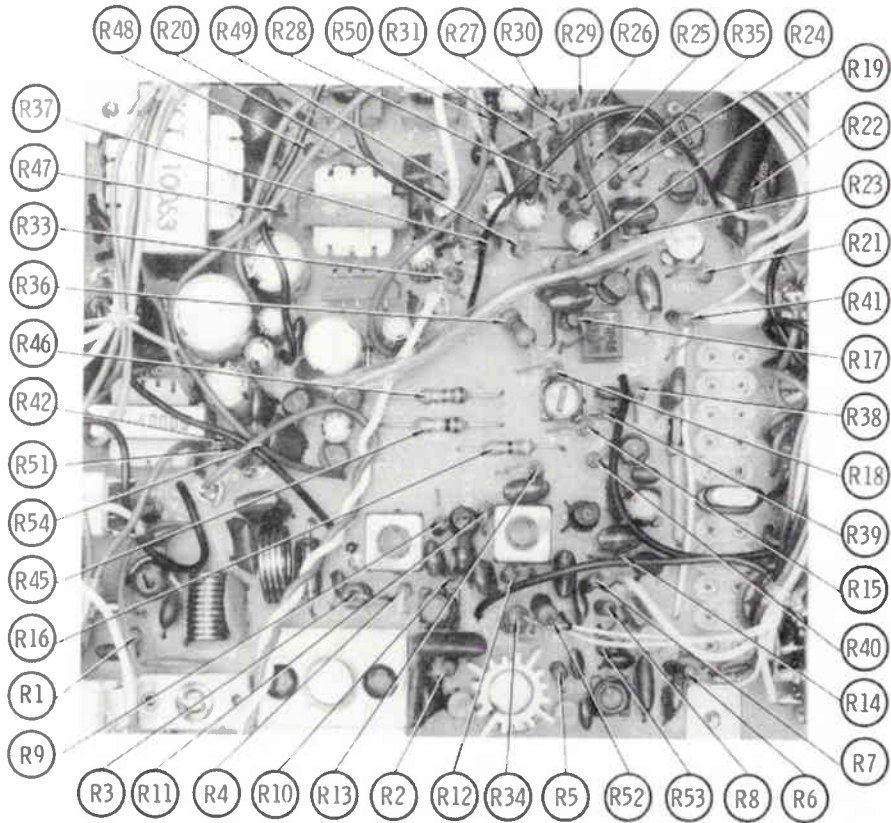
TRUETONE MODEL DC4530 (LATE PROD.)





TRUETONE MODEL DC4530 (LATE PROD.)





PARTS LIST AND DESCRIPTION (CONTINUED)

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

WIRING DATA

General-use Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in 12 Colors 8524 (Stranded) Available in 12 Colors
Power Cord, 2-Wire	Use BELDEN No. 17106 (Plastic) or 17126 (Rubber) -6 feet 17109 (Plastic) or 17129 (Rubber) -9 feet
Shielded Antenna Lead	Use BELDEN No. 8214 Lowest-loss (RG-8/U Type) 8237 Low-loss (RG-8/U) 8240 (Solid) Miniature (RG-58/U) 8259 (Stranded) Miniature (RG-58A/U)
Coiled Microphone Cable	Use BELDEN No. 8497 3-Conductor (1 shielded for Press-to-Talk) Neoprene 8491 4-Conductor (2 shielded, 2 unshielded) Neoprene
Ignition Noise Suppression	Use BELDEN No. 7300-Series Spark-Plug Sets
Bonding Strap	Use BELDEN No. 8661 (3/8 inch)

SEMICONDUCTORS (Select replacement transistor for best results)

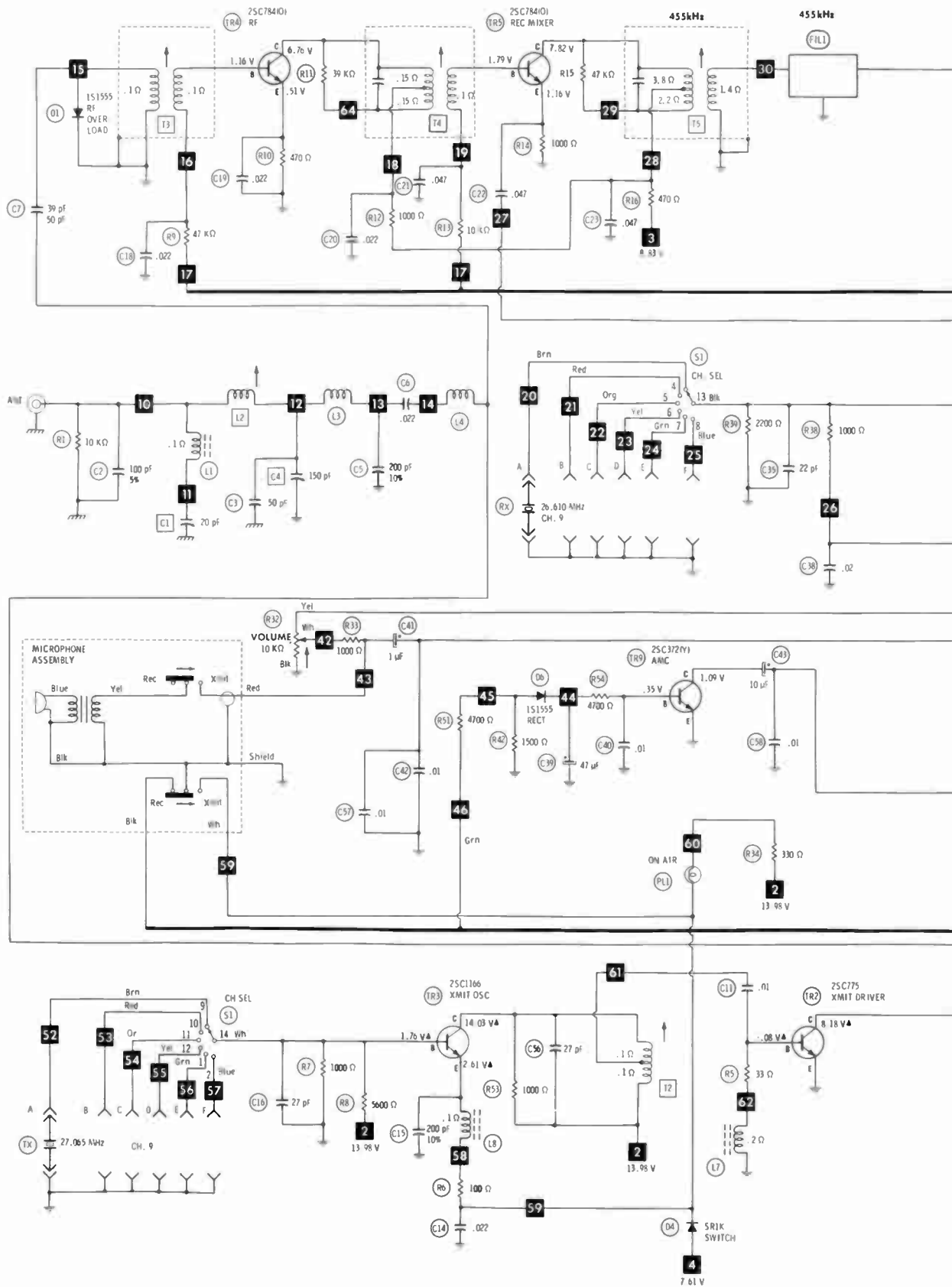
ITEM No.	TYPE / MFR. No./PART No.	REPLACEMENT DATA						
		GENERAL ELECTRIC PART No.	INTERNATIONAL RECTIFIER PART No.	MALLORY PART No.	MOTOROLA PART No.	RCA PART No.	SPRAGUE PART No.	SYLVANIA PART No.
D1	1S1555/09-306154	GE-300	D200	PTC214	HEPRO602	SK3100	RT218	ECG 177
D2	1N60/09-306336	1N60	1N60	PTC206	HEP135	SK3088		ECG 109
D3	1S1555/09-306154	GE-300	D200	PTC214	HEPRO602	SK3100	RT218	ECG 177
D4	SR1K/09-306333	GE-504A	8D4 or 5A4D	PTC201 or PTC202	HEPR0052	SK3030 or SK3031	RT213 or RT214	ECG 116 or ECG 117
D5	WZ090/09-306332 (9.1 V Zener)	GEZD-9.1	Z-1210	PTC505	HEPZ0412	SK3060	RT240	ECG 139
D6	1S1555/09-306154	GE-300	D200	PTC214	HEPRO602	SK3100	RT218	ECG 177
D7	1S1555/09-306154	GE-300	D200	PTC214	HEPRO602	SK3100	RT218	ECG 177
D8	SR1K/09-306333	GE-504A	8D4 or 5A4D	PTC201 or PTC202	HEPR0052	SK3030 or SK3031	RT213 or RT214	ECG 116 or ECG 117
D9	SR1K/09-306333	GE-504A	8D4 or 5A4D	PTC201 or PTC202	HEPR0052	SK3030 or SK3031	RT213 or RT214	ECG 116 or ECG 117
IC	LD3001/09-308065							
TR1	25C1239/09-302169				HEPS3001	SK3049		ECG 224
TR2	25C775/09-309062	GE-17	TR-25		HEPS3001	SK3047	RT114	ECG 128
TR3	25C1166/09-309063	GE-18	TR-63	PTC143	HEP713	SK3024	RT110	ECG 154
TR4	25C784(0)/09-302095	GE-11	TR-70	PTC132	HEP56	SK3018	RT108	ECG 107
TR5	25C784(0)/09-302095	GE-11	TR-70	PTC132	HEP56	SK3018	RT108	ECG 107
TR6	25C394(Y)/09-302207	GE-17	TR-33	PTC139	HEP53	SK3018	RT108	ECG 107
TR7	25C394(Y)/09-302207	GE-17	TR-33	PTC139	HEP53	SK3018	RT108	ECG 107
TR8	25C394(Y)/09-302207	GE-17	TR-33	PTC139	HEP53	SK3018	RT108	ECG 107
TR9	25C372(Y)/09-309064	GE-20	(1R)25C372	PTC139	HEP55	SK3018	RT102	ECG 123A
TR10	25C372(Y)/09-309064	GE-20	(1R)25C372	PTC139	HEP55	SK3018	RT102	ECG 123A
TR11	25C372(Y)/09-309064	GE-20	(1R)25C372	PTC139	HEP55	SK3018	RT102	ECG 123A
TR12	25D325E/09-303022	GE-28	TR-55	PTC110	HEP245	SK3054	RT154	ECG 152
TR13	25D325E/09-303022	GE-28	TR-55	PTC110	HEP245	SK3054	RT154	ECG 152

TRUESTONE MODEL DC4530 (LATE PROD.)

ELECTROLYTIC CAPACITORS

ITEM No.	RATING	REPLACEMENT DATA						
		MFR. PART No.	ARCO PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C30	3.3 50 V		RME-B-J-003				VTT3R3A50	EV-1618
	3.3 16 V	79-337336	RME-A-E-003	EP15-5	PC5-50		VTT3R3A50	EV-1318
C31	1 50 V	79-333105	RME-A-J-001	EP50-1	PC1-50		MTV1CB50	EV-1615
C32	1 50 V	79-333105	RME-A-J-001	EP50-1	PC1-50		MTV1CB50	EV-1615
C34	10 16 V	79-337106	RME-B-E-010	EP15-10	PC10-25		VTT10A25	EV-1222
C39	47 16 V	79-337476	RME-E-E-050	EP15-50	PC50-16		MTV50CB15	EV-1226
C41	1 50 V	79-333105	RME-A-J-001	EP50-1	PC1-50		MTV1CB50	EV-1615
C43	10 16 V	79-337106	RME-B-E-010	EP15-10	PC10-25		VTT10A25	EV-1222
C44	1 50 V	79-333105	RME-A-J-001	EP50-1	PC1-50		MTV1CB50	EV-1615
C45	10 16 V	79-337106	RME-B-E-010	EP15-10	PC10-25		VTT10A25	EV-1222
C46	10 16 V	79-337106	RME-B-E-010	EP15-10	PC10-25		VTT10A25	EV-1222
C47	100 16 V	79-337107	RME-E-E-100	EP15-100	PC100-16		MTV100CD15	EV-1230
C48	220 16 V	79-337227	RME-J-E-250	EP15-250	PC250-25		MTV250DE15	EV-1245
C54	470 16 V	79-337477	RME-L-E-500	EP15-500	PC500-16		MTV500DN15	EV-1250

(CONTINUED ON PAGE 123)



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WITH **CIRCUITRACE**

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PARTS LIST AND DESCRIPTION

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

CAPACITORS

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA				
			ARCO/ELMENCO PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.
C1	20 (Max.)	13-123042					
C2	100		DM-15-101J	CPR-100J	CD15FD101J03	SX310	424MC1000J501
C3	50	78-551500	DM-15-500J	CPJ-510			
C4	150 (Max.)	13-123034					
C5	200		DM-19-201J	CPR-200J	CD15FD201J03	SX320	424ME2000J501
C6	.022		CCD-203	CK-203	MGP02	TA120	TG-S20
C7	39		DM-15-390J	CPR-39J	CD15ED390J03	SX439	
C8	390		DM-19-391J	CPR-390J	CD15FD391J03	SX339	424ME3900J501
C9	330		DM-19-331J	CPR-330J	CD15FD331J03	SX333	424ME3300J501
C10	.01		1DP-1-103	CPR-10000J	DPMS6S1	EFW1A110	225P10391WD3
C11	.01		1DP-1-103	CPR-10000J	DPMS6S1	EFW1A110	225P10391WD3
C12	.01		1DP-1-103	CPR-10000J	DPMS6S1	EFW1A110	225P10391WD3
C13	.047		1DP-2-473		DPMS6S47	EFW1A147	225P47391WD3
C14	.022		1DP-1-223		DPMS6S22	EFW1A122	225P22391WD3
C15	200		DM-19-201J	CPR-200J	CD15FD201J03	SX320	424ME2000J501
C16	27		DM-15-270J	CPR-27J	CD15ED270J03	SX427	MS-427
C18	.022		1DP-1-223		DPMS6S22	EFW1A122	225P22391WD3
C19	.022		1DP-1-223		DPMS6S22	EFW1A122	225P22391WD3
C20	.022		1DP-1-223		DPMS6S22	EFW1A122	225P22391WD3
C21	.047		1DP-2-473		DPMS6S47	EFW1A147	225P47391WD3
C22	.047		1DP-2-473		DPMS6S47	EFW1A147	225P47391WD3
C23	.047		1DP-2-473		DPMS6S47	EFW1A147	225P47391WD3
C24	.01		1DP-1-103	CPR-10000J	DPMS6S1	EFW1A110	225P10391WD3
C25	.047		1DP-2-473		DPMS6S47	EFW1A147	225P47391WD3
C26	.047		1DP-2-473		DPMS6S47	EFW1A147	225P47391WD3
C27	.047		1DP-2-473		DPMS6S47	EFW1A147	225P47391WD3
C28	.047		1DP-2-473		DPMS6S47	EFW1A147	225P47391WD3
C29	.01		1DP-1-103	CPR-10000J	DPMS6S1	EFW1A110	225P10391WD3
C33	.047		1DP-2-473		DPMS6S47	EFW1A147	225P47391WD3
C35	22		DM-15-220J	CPR-22J	CD15ED220J03	SX422	
C36	100		DM-15-101J	CPR-100J	CD15FD101J03	SX310	424MC1000J501
C37	50	78-551500	DM-15-500J	CPJ-510			
C38	.02		1DP-1-203		DPMS2S2	PVC212	2PS-S20
C40	.01		1DP-1-103	CPR-10000J	DPMS6S1	EFW1A110	225P10391WD3
C42	.01		1DP-1-103	CPR-10000J	DPMS6S1	EFW1A110	225P10391WD3
C49	.005		1DP-1-502	CPR-5000J	DPMS6D5	EFW1A250	6PS-D50
C50	.005		1DP-1-502	CPR-5000J	DPMS6D5	EFW1A250	6PS-D50
C51	.1		1DP-2-104		DPMS2P1	EFW1A010	225P10491WD3
C52	.047		1DP-2-473		DPMS6S47	EFW1A147	225P47391WD3
C53	.047		1DP-2-473		DPMS6S47	EFW1A147	225P47391WD3
C55	.02		1DP-1-203		DPMS2S2	PVC212	2PS-S20
C56	27		DM-15-270J	CPR-27J	CD15ED270J03	SX427	MS-427
C57	.01		1DP-1-103	CPR-10000J	DPMS6S1	EFW1A110	225P10391WD3
C58	.01		1DP-1-103	CPR-10000J	DPMS6S1	EFW1A110	225P10391WD3
C59	.022		CCD-203	CK-203	MGP02	TA120	TG-S20
C60	.01		1DP-1-103	CPR-10000J	DPMS6S1	EFW1A110	225P10391WD3
C61	.01		1DP-1-103	CPR-10000J	DPMS6S1	EFW1A110	225P10391WD3
C62	.01		1DP-1-103	CPR-10000J	DPMS6S1	EFW1A110	225P10391WD3
C63	.01		1DP-1-103	CPR-10000J	DPMS6S1	EFW1A110	225P10391WD3
C64	.022		CCD-203	CK-203	MGP02	TA120	TG-S20
C65	.022		CCO-203	CK-203	MGP02	TA120	TG-S20
C66	.01		1DP-1-103	CPR-10000J	DPMS6S1	EFW1A110	225P10391WD3

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

ITEM No.	FUNCTION	RESIST-ANCE	REPLACEMENT DATA				
			MFR. PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.
R32	Volume/Power Switch	10 K	13-160102				
R44	Source/PA Switch	10 K	13-160103				

RESISTORS (Power and Special)

ITEM No.	RATING	REPLACEMENT DATA		ITEM No.	RATING	REPLACEMENT DATA	
		WORKMAN PART No.	MFR. PART No.			WORKMAN PART No.	MFR. PART No.
R50	.3 1/4 W.WW		77-301308	R51	22 1 W.Film		77-604220

PARTS LIST AND DESCRIPTION (CONTINUED)

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

COILS (RF-IF)

ITEM No.	FUNCTION	REPLACEMENT DATA			
		MFGR. PART No.	OTHER IDENTIFICATION	MILLER PART No.	REMARKS
L1	TVI Trap (54 MHz)	13-176420			
L2	Antenna (27 MHz)	13-176421			
L3	Pi Network (27 MHz)	13-176422			
L4	Final Tank (27 MHz)	13-096161			
L5	RF Choke	13-178178			
L6	RF Choke (2.2 uH)	13-176419	2R2		
L7	RF Choke (2.2 uH)	13-176419	2R2		
L8	RF Choke (1 uH)	13-176420	010		
L9	Line Choke	13-178179			
T1	Xmit. Driver (27 MHz)	13-096162			
T2	Xmit. Osc (27 MHz)	13-090301			
T3	Rec. Antenna (27 MHz)	13-176423	1867A		
T4	Rec. RF (27 MHz)	13-090302	1849A		
T5	Rec. Mixer (455 kHz)	13-090303			
T6	Input IF (455 kHz)	13-090304			
T7	Output IF (455 kHz)	13-090305			
T8	Rec. Osc (26 MHz)	13-170198			

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000~)	MFGR. PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
L10	690 mA	.05	.5 mH	13-178180 (KT-40005) (1)				(1) Number on unit.

TRANSFORMER (Driver)

ITEM No.	TURNS RATIO			REPLACEMENT DATA				NOTES
	PRI.	SEC. 1	SEC. 2	MFGR. PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD Part No.	
T9	2	1		13-096142				

TRANSFORMER (Audio Output)

ITEM No.	IMPEDANCE		REPLACEMENT DATA				NOTES
	PRI.	SEC.	MFGR. PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
T10	32	8	13-096163 (KT-10053) (1)				(1) Number on unit.

PARTS LIST AND DESCRIPTION (CONTINUED)

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

SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		MFGR. PART No.	QUAM PART No.	
SP1	2-5/8" PM 8 ohms	13-060095		

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	2 A Fast Acting			AGC2	HDJ	312002	150145	FG2-2

MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
FIL1	Ceramic Filter	13-179044	455 kHz
RX	Crystal	13-128301	26.610 MHz
S1	Switch	13-183185	Channel Selector
TX	Crystal	13-128300	27.065 MHz
	Printed Circuit Board	13-070106	

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

ITEM	PART No.	ITEM	PART No.
Cabinet	13-010233	Knob, Select, Squelch, Volume	13-110160
Chassis	13-015044		

ACCESSORIES

ITEM	MFGR. PART No.	REMARKS
DC Power Cord w/Fuse	13-034068	

TRUETONE MODEL DC4530 (LATE PROD.)

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THIS INDEX LISTS ALL RADIOS APPEARING IN
"CITIZENS BAND MANUALS" AND "PHOTOFACT CB RADIO SERIES"

KEY------(REV) REVISED (EP) EARLY PRODUCTION (LP) LATE PRODUCTION

AIRCRAFT	VOL.	CHANNEL MASTER	VOL.	DEMCO (CONT.)	VOL.	GONSET (CONT.)	VOL.	JOHNSON (CONT.)	VOL.
JE321	15	6423	40	Satellite M-10A,		G-15 (3428),(3429)	4	Messenger 123	
23-02	38	6553	9	R-101A, T-110A,,		HALLICRAFTERS		(242-0123A & B)	24
AIRLINE		6554	13	VM-12-120	7	BC-8	10	Messenger 123	
GAS-587	4			Travelier (Series B)	8	CB-1	1	(242-123) (Rev.)	
ALLIED		CITI-FONE		DEWALD		CB-3	3	-C/-D/-E/-F/-G	42
A-2507 (17B6790X)	20	CD-5/6/-5/12	1	TR-6/-12/910	2	CB-3A	5	Messenger 123A	
A-2530 (17B6825X)	19	CD-6/6,CD-5A/12	9	DUO COM		CB-4 (Littlefone)	3	(242-0123)	47
A-2533 (17B6440X)	22	CD11/6,CD11/12	12	100	2	CB-5	5	Messenger 124	
A-2543 (17-9801S)	21	SS	9	DYNASCAN		CB-5A	5	(242-124)	28
A-2544 (17B9802S)	23	99/6,99/12	12	(See Cobra)		CB-5 Mark II, HA-14,		Messenger 124-M	
A-2545 (17B9803S)	18	CLARICON		EICO		P-5-120	6	(242-0134)	39
A-2559 (21B5559U)	34	II (1103-01)	15	712	13	CB-7	7	Messenger 125	
A-2561 (21B5561)	35	14-523	27	740	4	CB-8	10	(242-125)	28
A-2564 (17A6966U)	29	15-200	16	760/61W/62/62W	2	CB-9	8	Messenger 223	
A-2567 (17B6435X)	22	15-410	14	770/W	3	CB-10	9	(242-223)	23
A-2568 (17A6965U)	29	15-500	23	771W,772W	4	CB-12	11	Messenger 250	
A-2569 (17C6469U)	24	15-600	33	777	7	CB-14/-17	12	(242-0250)	60
ALLSTATE		COBRA		779	9	CB-19	13	Messenger 250A/B (Rev)	
832.62270	7	CAM-88	9	779A	17	CB-20	14	(See Page 39)	60
893.62910/11/21/31/41.	6	CAM-89	58	7923 (Nova 23)	18	CB-21	20	Messenger 300	
AMPHENOL		V	13	ELECTRONIC 2000		CB-24	22	(242-0149),323	
C-75	12	6	34	Contact CB-23CH	56	PS-20	20	(242-0153-002)	17
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600,625	11	21	51	CHB-3	35	512	5	(242-320)	21
650	13	23, PAC-V	16	CHB-4	37	1250B	10	Messenger 323-M	
675	14	24	26	Fanfare 100	54	HAMMARLUND		(242-0158-001)	40
725	15	25	33	Fanfare 700	53	CB-SIX (CB-6)	7	Messenger 350	
750	19	27	23	FCB-9	4	HEATHKIT (HEATH)		(242-0154)	14
777	18	28, PAC-24	43	IC-3000	24	CB-1	1	Messenger 351	
APELCO		29	56	IC-5000	25	GRS-65A	14	Personal Messenger	
AR-9	1	98	23	L-1000	18	GW-10A/D,GW-10A/D	3	(242-101-1)	2
AR-10	7	130	44	L-2000	17	GW-11A/-11D,GW-11A/		239-0125	
ARKAY		131	45	SFT-400	35	-11D	4	(Power Supply)	15
SQ-9/-9W	2	132 (EP & LP)	54	SFT-500	35	GW-12A/-12D,GW-12A/		239-0125 (Rev.)	25
ARVIN		135 (EP & LP)	54	SFT-600	31	GW-12A/-12D,GW-12A/		KAAR	
20Y33-19 (1.45501)	27	138	57	SFT-800A	34	GW-14,GWA-14-1,GW-14.11	5	TR327/A/B	5
20Y55-19 (1.45601)	29	139	59	SFT-900	37	GW-14A,GW-14A/14AS...	29	TR336 (SkyLark I)	18
AUTOMATIC		880	47	(Guardman)	37	GW-21,GW-21	5	TR337 (Skyhawk II)	20
MCE-6510	25	CONCORD		T-606	41	GW-22A/-22D,GW-22A/		6/117TR333/B,12/	
MCR-6450	17	TG-132B	12	T-707	43	-22D (Rev.)	4	117TR333/B,32/TR333B	8
PCR-6452	22	COURIER (E.C.I.)		T-808	38	ITT		12TR335 (Skyhawk)	10
PCR-6452	25	Cadet 23	46	T-909	40	JCPenney		KNIGHT	
TRC-6448, TRR-6454/A	15	Caravelle	38	T-1000	45	981-6051		KN-2500 (90SU413)	7
TRE-6500	27	CCT-2 W/CHB-3	35	FIELDMASTER		(Golden Pinto)	28	KN-2520 (17A6810X/	
BENDIX		CCT-3	37	MF-1001	60	981-6075		KN-2522 (17A6812X)	15
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BROWNING		Centurion	52	Micro Mini 6	58	985-6050 (Pinto Jr.)	27	KN-2550 (90SU456),	
Eaglette	20	Chief 23	35	Micro Mini 23	56	985-6055 (Pinto 23)	30	KN-2560 (90SX467)	7
Eaglette 2	29	Citation	34	TR-18M	57	985-6060 (Pinto-23B)	28	KN-2565 (86SX568)	8
Mark II Series B,		Classic	25	GENERAL ELECTRIC		JOHNSON		KN-2567 (17B6435X)	22
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Eagle Mark II)	27	Courier Royale	14	Super MC-9	16	(242-143) (Rev.)	30	KRIS	
CADRE		Courier TR-5	16	Super MC-11/A	22	Messenger 100	12	TR-23 (516-123)	47
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500/C	3	Courier 1M, 23	8	GLOBE		(242-102)	32	99'er	49
510	4	Courier 23 Plus	18	CB-100	1	Messenger 108		LAFAYETTE	
510A,515	6	CWT-30	29	CB-100A	3	Messenger 109		Comstat 19 (99-3067WX)	14
525 (500-1,520)	7	CWT-40	27	CB-200	2	Messenger 110		Comstat 23	12
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		Gladiator	49	65-228		(242-0110)	19	Comstat 23 Mark VI	
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		Rebel - 23+	54	GONSET		Messenger 121		Comstat 25A (99-3130WX)	20
		Spartan SSB	56	G-11-3303/-04/-05,		Messenger 122		Comstat 25B	
		Traveller (ML-100)	24	G-12 (3316),(3329)	1	(242-0120)	41	Dyna-Com 2 (99-3133L)	21
		Traveller II	31	G-14 (3430),(3433)	3	Messenger 122		Dyna-Com 3 (99-3134L)	22
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		CH-300	11					Dyna-Com 3B	
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		Ravelle	11					Dyna-Com 3C	
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		Satelite Deluxe	19					Dyna-Com 5a (99-32096L)	35

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HA-303 (99-3091L)	13	13-130	16	Skipper 71B	46	TRC-X23A (21-1136)	15	6469 (Ch.787.10070)	17
HA-310 (99-31510L)	29	13-132	12	Skipper 73	59	TRC-5	7	6471 (Ch.787.10080)	18
HA-310A (99-31593L)	42	13-133B	11			TRC-8D	6	6550 (Ch.549.30500)	10
HA-420 (99-32674L)	48	13-133C	17	PANASONIC		TRC-9 (21-139)	60	6552 (Ch.549.65520),	
HA-450 (99-3063L)	18	13-133E	34			TRC-10A (21-126)	53	6553	9
HB-23	19	13-150	21	RJ-22	13	TRC-12 (21-909)	13	6554 (Ch.549.30001)	14
HB-23A(99-32351WX)	38	13-160	8	T-1	5	TRC-14 (21-032)	18	6556 (Ch.789.10010)	15
HB-115A	6	13-177	61			TRC-15 (21-003)	15	6558 (Ch.789.10010)	16
HB-200	10	13-700	31	PEARCE-SIMPSON		TRC-18 (21-120)	19	6562 (Ch.789.10040/41),	
HB-222	6	13-700 (Rev.)	52			TRC-23B (21-128)	44	6563 (Ch.789.10050)	18
HB-333 Series a	8	13-701	55	AC Power Supply	20	TRC-24 (21-124)	24	7203 (562.30010)	25
HB-400 (99-3001WX)	9	13-701B	55	Bearcat 23	32	TRC-27 (94L595)	1	7204 (Ch.562.30020)	24
HB-444 (99-3059WX)	11	13-720	20	Bearcat 23B	25	TRC-27A	5	7531 (Ch.789.10080)	26
HB-444/25A (99-3074WX) 13		13-722	25	(Similar to page 89)	32	TRC-28 (21-116)	31	7535 (Ch.789.10090)	27
HB-500/-501	9	13-723	56	Bengal SSB	60	TRC-29 (21-135)	25		
HB-501	10	13-724	32	Bobcat 23	33	TRC-35C (21-117)			
HB-502A	19	13-724B	62	Bobcat 23B	42	(Rover-1500)	52	SEARS SILVERTONE	
HB-525A/B	15	13-762	41	Cheetah SSB	46	TRC-40 (21-140)	42	(See SEARS)	
HB-525C (99-3156WX)	23	13-770 (6 Ch.)	28	Companion	4	TRC-44 (21-1137)	14		
HB-525D (99-31759WX)	31	13-772 (12 Ch.)	28	Companion II	6	TRC-44B (21-106)	20		
HB-525E (99-32369WX)	43	13-775B	24	Companion III	14	TRC-46 (21-146)	55		
HB-525F (99-32492W)	49	13-778	36	Companion IV	16	TRC-47 (21-147)	61		
HB-555 (99-3049WX)	10	13-790	26	Cougar 23	38	TRC-49 (21-149)		SHARP	
HB-555 (99-3049WX)		13-795	59	Cougar 23 (LP)	58	(navaho pro niner)	51		
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HB-600 (99-3051WX)	11	13-845	51	Director (Rev.)	15	TRC-66 (21-105)	23		
HB-625 (99-3148WX)	21	13-854	59	Escort	6	TRC-88 (21-188)	14		
HB-625A (99-32468W)	53	13-855	44	Escort II	12	TRC-99 (21-107)	24	SILTRONIX	
HB-700 (99-3273W)	59	13-856	46	Guardian 23	8	TRC-99C (21-133)	36		
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HE-15B	4	13-864	60	Panther	26	TRC-101 (21-137)	43		
HE-16/-18	1	13-867	55	Panther SSB	61	REALTONE			
HE-20AMX	2	13-868	37	Power Match	21	TR-6134	4		
HE-20B	4	13-870C	27	Puma 23	43	TR-6436	7		
HE-20C	5	13-870D	50	Sentry	11	REGENCY			
HE-20T (99-3088WX)	16	13-871	50	Sentry II	17	CB-27, CBM-27-6/-12	1	E	2
HE-20TA (99-32724WX)	61	13-872	31	Simba SSB (L.P.)	53	Formula/23 (CB-292)	36	E (Rev.)	4
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HE-90	5	13-877	30	Wildcat	29	Imperial II (CB-254)	33	H	10
Micro-12	34	13-878	54	Wildcat II	40	Range Gain	5	J-23	15
Micro-23 (99-32575W)	48	13-879	58			Ranger CB270	16	T-2	12
Micro-66 (99-32716W)	55	13-880B	39	PENNCREST		Romper (A-3)	8	T-6	30
Micro-723 (99-32807W)	54	13-885	42	(See JCPenney)		Sprint/23 (CB-291)	37		
Micro-923 (99-32781W)	56	13-898	62	PHILMORE		Sprint/23 II (CB-293)	42W	SONARCOM	
Telsat SSB-25		18-143C	25			500 (CB-282)	20	CBP	2
(99-32377W)	37			CC-1/-1W,CT-1/-1W,		ROBYN			
Telsat SSB-25A		MONITORADIO		TC-11/-11W,TC-612/		BB-123	39	SONY	
(99-32559W)	52	TG-1	4	-612W	3	J-123	34	CB-901	4
Telsat SSB-50		MORROW				K-123	35		
(99-32666W)	50	CB-1/-2/-3	1	POLY-COMM		SS-747B	53		
Telsat 23 (99-3157WX)	25	VP-100-4A	2			T-123	35		
Telsat 50 (99-3217WX)	36	5W1-6/-12/-117, 5W3-6/		PC-2-6/-12	2	TR-123B	28		
Telsat 150 (99-3215WX)	26	-12/-117	1	PC-N-6/-12(4 channel)	3	TR-123C	38		
Telsat 924 (99-32435)	44			Pro	8	XL-ONE	42		
Telsat 925 (99-32856W)	62			Senior 23	4	605	57		
						ROSS		SPOKESMAN	
LA SALLE		OLSON		RADIOCOM		RE-025	31		
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LINCOLN		RA-530/-590	5	RCA		M10, R101A/102, T110A,			
L-2542 (17A0766S)	15	RA-590 (Slide-Bander		CRM-P2A-5	2	VM12-120	5		
		I) (Rev.)	11	CRM-P2B-5 (M1-555528,		SBE			
LLOYD'S		RA-717	10	M1-555529), CRM-P3A-5	1	SBE-1CB (Coronado)	29		
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		OSBORNE		Mark Nine	9	SBE-3CB (Cascade)	31		
MAGNAVOX		300	2	Mark 10 (CB-2601A)	10	SBE-5CB (Cascade II)	49		
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Bronco (CB-280)	21	DX2300B	50	Raycom II	6	II)	50		
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Colt 23	13	Plus 23	15	Raycom IV	36	Console)	51		
Mustang, Pacer	9	TA2300/B	32	Ray-Tel TWR-1	1	SBE-15CB			
Pacer II	13	I, II, II-S	12	Ray-Tel TWR-2	4	(Cascade III)	60		
		10-2	48	Ray-Tel TWR-3	5	SBE-18CB			
		100	19	Ray-Tel TWR-4	6	(Sidebender III)	61		
		100ASA	53	Ray-Tel TWR-5	8	SBE-21CB (Cortez)	58		
		100-S	41	TWR-6	10				
		123,123A	44	TWR-7	12				
		200	19	TWR-8	14				
		223	46	TWR-9	13				
		2300	17	TWR-11	15				
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		2376	32	REALISTIC					
		2376A	43						
		5000	12	Americana 23-Plus					
				(21-023)	12				

TELECON	VOL.	TRIUMPH	VOL.	TRUETONE (CONT.)	VOL.	UTICA (CONT.)	VOL.	WEBCOR	VOL.
TMC-206	10	TC-900/A	4	512 Series B (DX4101) .	7	T & CII	4	ET-350	3
TRAM		TRUETONE		1250A	10	T & CIII	9		
				1250B	11	VIKING			
Corsair 464	30	DC4530(13-854) (LP) ..	62			242-126/-127/-128/ -129	1	WEBSTER	
Diamond 60	62	DX4370	59	U.S.L.				Bandspanner 412	6
Titan	13	MCC4434A-57 (DC4434) .	58	TR-800	1	VOCALINE		Four-Eleven	2
Titan II (5320)	24	MCC4532A-57 (DC4532) .	55			ED-27-6/-12/-27M-6/ -12	1	WT-2	11
Titan IIA	40	MIC4322A-37 (DC4322) .	45	UTICA		ED-276/-278	8	440	5
Titan III	34	MIC4812B-17 (DC4812B) .	34	MC-27	2	JRC-400/-425	2	550	8
Titan IV	49	MIC4820A-86	19			PT-27	3		
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		MIC4920B-37 (DC4920) .	44						
		MID4820A-86	19						

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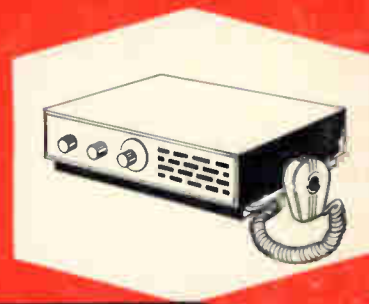


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CB-184
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SAMS PHOTOFACT[®]

CB RADIO SERIES

VOLUME
184

by the *Howard W. Sams* ENGINEERING STAFF



HOWARD W. SAMS & CO., INC.
INDIANAPOLIS, INDIANA

**FIRST EDITION
FIRST PRINTING—APRIL 1978**

**C B RADIO SERIES
VOLUME 184**

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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.)

C B RADIO SERIES

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CHANNEL FREQUENCIES

FREQUENCY	CHANNEL	FREQUENCY	CHANNEL
26.965 MHz	1	27.215 MHz	21
26.975 MHz	2	27.225 MHz	22
26.985 MHz	3	27.235 MHz	24
27.005 MHz	4	27.245 MHz	25
27.015 MHz	5	27.255 MHz	23
27.025 MHz	6	27.265 MHz	26
27.035 MHz	7	27.275 MHz	27
27.055 MHz	8	27.285 MHz	28
27.065 MHz	9	27.295 MHz	29
27.075 MHz	10	27.305 MHz	30
27.085 MHz	11	27.315 MHz	31
27.105 MHz	12	27.325 MHz	32
27.115 MHz	13	27.335 MHz	33
27.125 MHz	14	27.345 MHz	34
27.135 MHz	15	27.355 MHz	35
27.155 MHz	16	27.365 MHz	36
27.165 MHz	17	27.375 MHz	37
27.175 MHz	18	27.385 MHz	38
27.185 MHz	19	27.395 MHz	39
27.205 MHz	20	27.405 MHz	40

HY GAIN CB-70, Page 42, Miscellaneous
Delete frequencies for X1 thru X17.

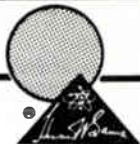
MIDLAND CB-70, Page 96, Miscellaneous
Delete frequencies for X1 thru X14.

MIDLAND CB-68, Page 31, Alignment Instructions, Receiver
Under Adjust column, change second T3 to T4.

CB-68, Page 38, Schematic
Change S1 Section 1 Front, terminal 6 to a short contact.
Change S1 Section 2 Front, terminals 6 and 7 to short
contacts, terminal 2 to a long contact.
Change S1 Section 2 Rear, terminals 8 and 9 to short contacts,
terminal 2 to a long contact.

PACE CB-68, Page 70, Semiconductors
Change Sylvania replacement for IC1 from ECG 1162 to ECG 1102.
Change Sylvania replacement for Q19 from ECG 195 to ECG 128.

ROYCE CB-68, Page 118, Schematic
Change X5 frequency from 23.540 MHz to 23.490 MHz.



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 46XLR

COBRA MODEL 46XLR

MANUFACTURER'S SPECIFICATIONS

GENERAL

Input Voltage	13.8 VDC nom. (negative ground).
Current Drain	<i>Transmit:</i> 2.0A. <i>Receive:</i> 1.5A. <i>AM Radio:</i> 1.5A. <i>FM Radio:</i> 1.5A.
Size	7¼ x 2 x 5" deep.
Weight	3.3 lbs. (1.5kg.)
Antenna Connector	UFH, SO239.
Semiconductors	24 transistors, 3 field effect transistors, 20 diodes, and 8 integrated circuits.
Meter	Illuminated; indicates relative power output and received signal strength.

CB SECTION

TRANSMITTER

Power Output	4 watts.
Frequency Response	300 to 3000 Hz.
Output Impedance	50 ohms, unbalanced.
Harmonic Suppression	Better than 60 dB.
Channels	40.
Frequency Range	26.965 to 27.405 MHz.
Frequency Control	Phase Locked Loop (PLL).
Frequency Tolerance	0.005%.

RECEIVER

Sensitivity	0.5µV.
Selectivity	5 kHz at -6 dB.
Image Rejection	-60 dB.
IF Frequency	Double conversion, 1st: 10.695 MHz 2nd: 455 kHz.
Audio Output Power	5 watts/channel.
Frequency Response	300 to 3000 Hz.
Distortion	10%.

FM RADIO SECTION

FM Sensitivity	8µV.
FM Selectivity	300 kHz.
Stereo Separation	35 dB.
Audio Output	5 watts per channel.

AM RADIO SECTION

AM Sensitivity	20µV.
AM Selectivity	5 kHz at -6 dB.
Audio Output	5 watts

Courtesy of the Manufacturer

C B 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.

Suggested Alignment Tools: GC Electronics:
 L101,L102,L103,L112 thru L115,L118,L119,L120.9440
 L104,L105,L106.....5000,5009,8276,8728,8728A
 L109.....5009,8728,8728A

SYNTHESIZER ALIGNMENT

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Input of frequency counter to TP12 (IC101, pin 8).	Ch. 19		Check for 10.240MHz.
Input of oscilloscope to TP1 (TR103 Emitter).	Ch. 19	L115	Adjust for maximum RF output.
Input of frequency counter to TP3 (TR115 gate).	Ch. 19	L118	Adjust for 36.570MHz.
Input of DC meter to TP4 (IC101, pin 1).	Ch. 1	L119	Adjust for 1.90 volts.
Input of oscilloscope to TP6 (TR102 source).	Ch. 19	L120	Adjust for maximum RF output.
Input of frequency coujnter to TP6 (TR102 source).	Ch. 1		Check for 37.660MHz. If necessary readjust L118 for 37.660MHz. Check all channels. (See Truth Chart for cor correct frequencies).
Input of frequency counter to TP2	Ch. 1		Check for 1.090MHz. Check all channels. (See Truth Chart for correct frequencies).
Input of oscilloscope to TP7 (L114 tap).	Ch. 19, XMT	L114	Adjust for maximum RF output.
Input of frequency counter to TP7 (L114 tap).	Ch. 19, XMT		Check for 10.695MHz.

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.

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Output of signal generator thru .01uF to TP1 (TR103 Emitter). 455kHz,1000Hz @ 30% modulation.	Ch. 19	L106,L105, L104	Adjust for maximum output.
Output of signal generator thru .01uF to antenna jack. 27.185MHz,1000Hz @ 30% modulation.	Ch. 19	L103,L102, L101	Adjust for maximum output. If necessary readjust L104, L105, and L106.

RECEIVER ADJUSTMENTS

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

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Output of signal generator thru .01uF to antenna jack. 27.185MHz, 1000Hz @ 30% modulation. Output 50,000uV.	Ch. 19, Squelch MINIMUM ANL Off	VR102	AGC Set Volume VR1 for 0db. Decrease generator output to 10uV. Adjust so that audio does not drop more than 6db.
Output of signal generator thru .01uF to antenna jack. 27.185MHz, 1000Hz @ 30% modulation. Output 180uV.	Ch. 19, Squelch Maximum ANL Off	VR103	SQUELCH RANGE Adjust so that squelch just breaks.
Output of signal generator thru .01uF to antenna jack. 27.185MHz, 1000Hz @ 30% modulation. Output 30uV.	Ch. 19, Squelch MINIMUM ANL Off	VR101	S METER Adjust for 9 on SIG scale of panel 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
	Ch. 19	L113, L112, L109	Adjust for maximum RF output.
	Ch. 19	L109	Adjust for 4.0 watts. RF output maximum.

TRANSMITTER ADJUSTMENTS

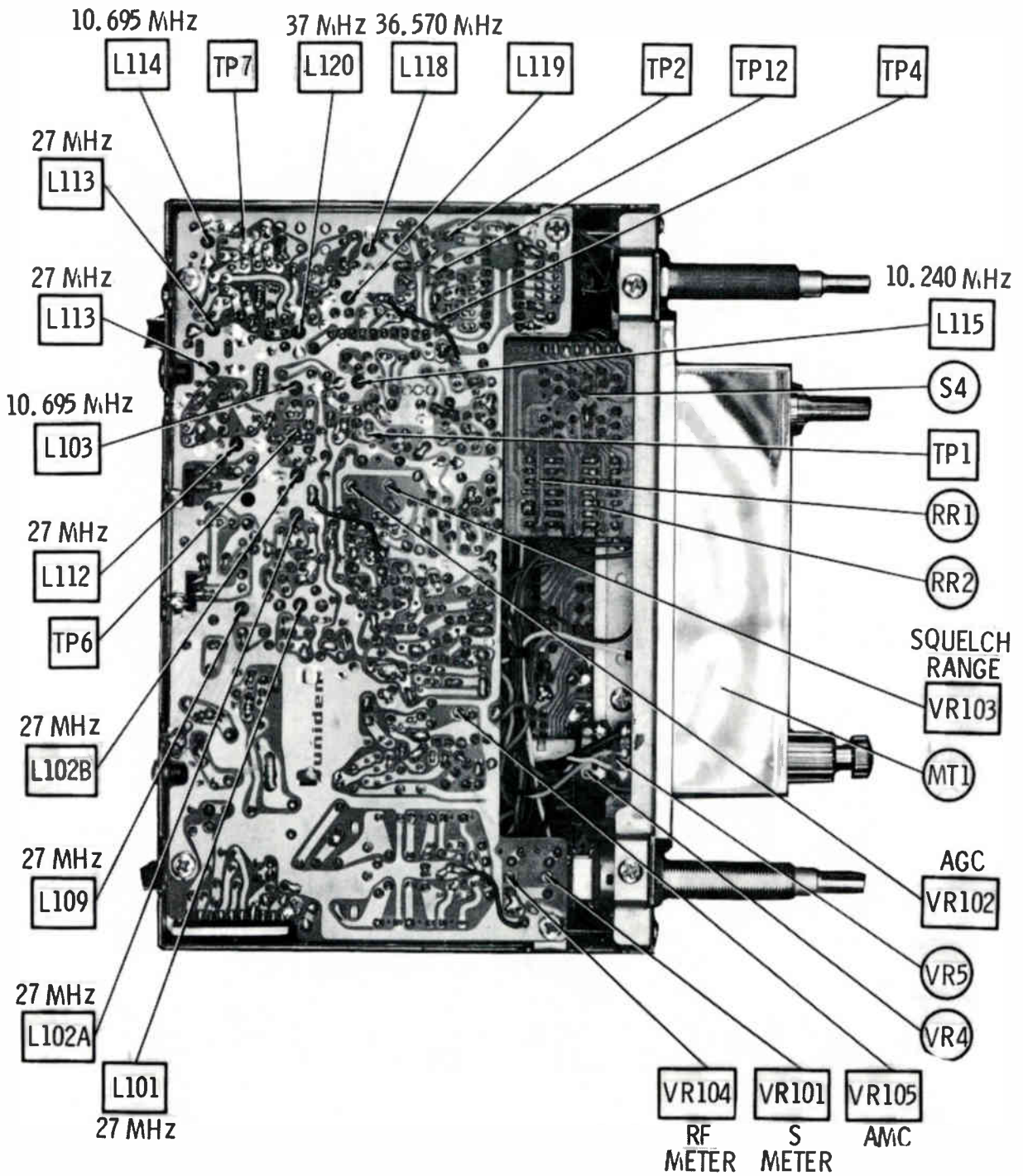
Connect an RF wattmeter and 50-ohm, 25-watt dummy load to antenna connector.
NOTE: Be sure to check transmit frequency and power on all active channels after adjustment of transmitter.
See page 4 for channel frequencies.

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Input of oscilloscope or modulation meter to antenna jack. Inject a 1000Hz 10mV signal at mic input.	Ch. 19, Dynamike Maximum	VR105	AMC Adjust for 80% modulation maximum. See Figure 1.
Input of RF wattmeter and 50 ohm, 25 watt dummy load to antenna jack.	Ch. 19	VR104	RF METER Adjust so that panel meter agrees with RF wattmeter.

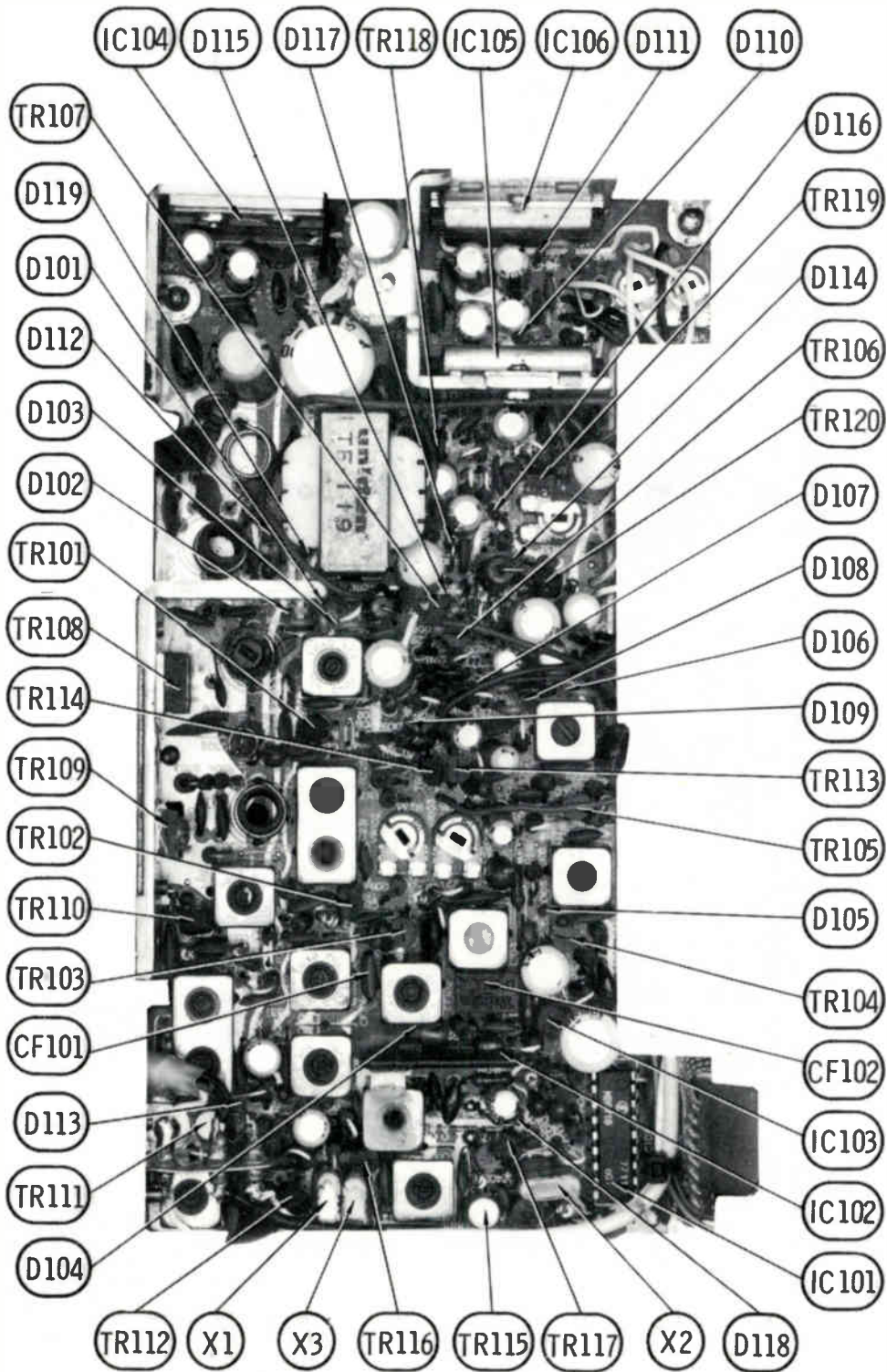
COBRA MODEL 46XLR

TRUTH CHART

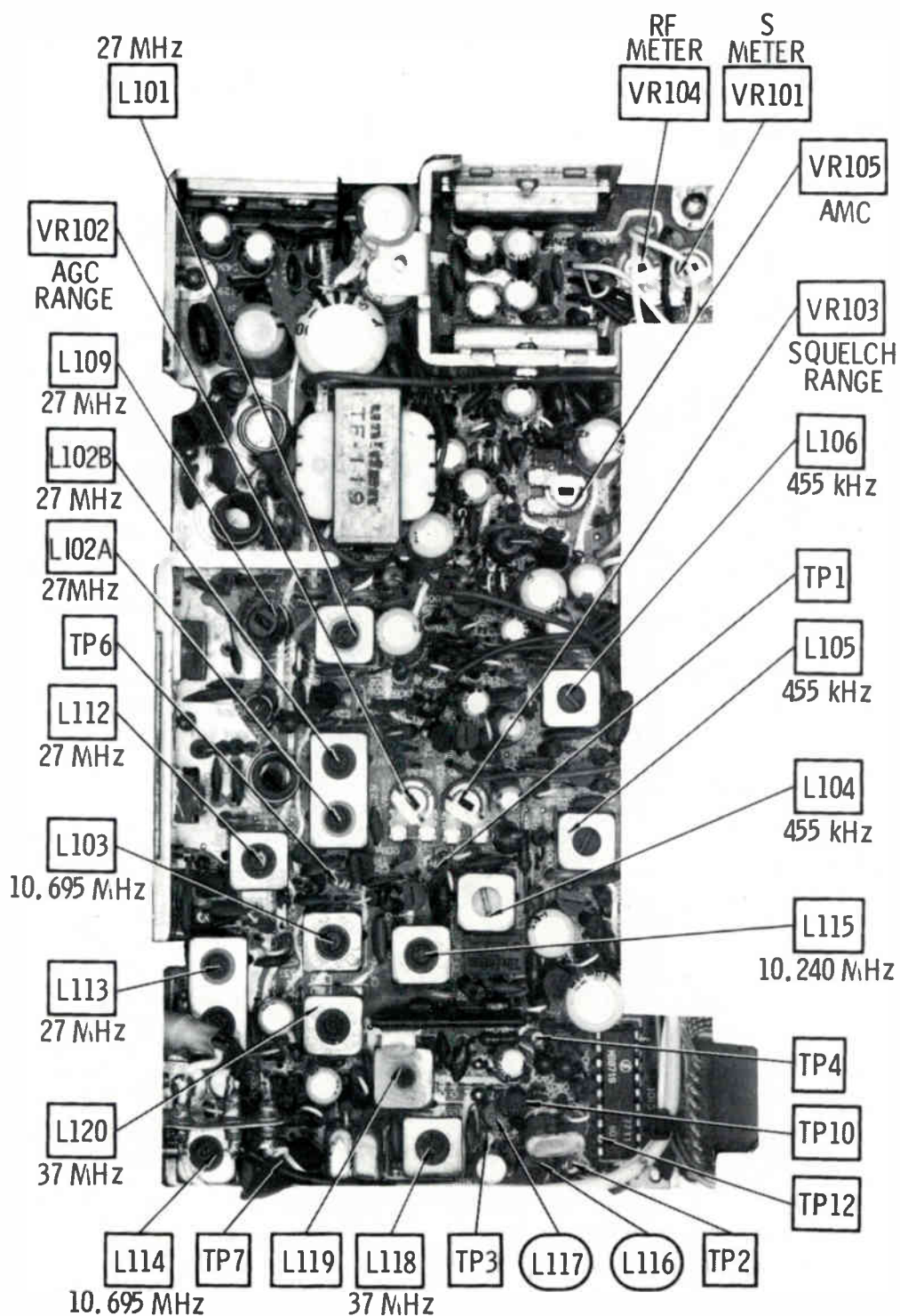
C H A N N E L	1 - 4.83 Volts 0 = 0 Volts							REC & XMT VCO OUTPUT IN MHz AT TP6	DIVIDER INPUT VCO OUTPUT IN MHz AT TP2
	IC101 PROGRAM DIVIDER								
	PINS								
	11	12	13	14	15	16			
1	1	0	1	1	0	1		37.660	1.090
2	1	0	1	1	1	0		37.670	1.100
3	1	0	1	1	1	1		37.680	1.110
4	1	1	0	0	0	1		37.700	1.130
5	1	1	0	0	1	0		37.710	1.140
6	1	1	0	0	1	1		37.720	1.150
7	1	1	0	1	0	0		37.730	1.160
8	1	1	0	1	1	0		37.750	1.180
9	1	1	0	1	1	1		37.760	1.190
10	1	1	1	0	0	0		37.770	1.200
11	1	1	1	0	0	1		37.780	1.210
12	1	1	1	0	1	1		37.800	1.230
13	1	1	1	1	0	0		37.810	1.240
14	1	1	1	1	0	1		37.820	1.250
15	1	1	1	1	1	0		37.830	1.260
16	0	0	0	0	0	0		37.850	1.280
17	0	0	0	0	0	1		37.860	1.290
18	0	0	0	0	1	0		37.870	1.300
19	0	0	0	0	1	1		37.880	1.310
20	0	0	0	1	0	1		37.900	1.330
21	0	0	0	1	1	0		37.910	1.340
22	0	0	0	1	1	1		37.920	1.350
23	0	0	1	0	1	0		37.950	1.380
24	0	0	1	0	0	0		37.930	1.360
25	0	0	1	0	0	1		37.940	1.370
26	0	0	1	0	1	1		37.960	1.390
27	0	0	1	1	0	0		37.970	1.400
28	0	0	1	1	0	1		37.980	1.410
29	0	0	1	1	1	0		37.990	1.420
30	0	0	1	1	1	1		38.000	1.430
31	0	1	0	0	0	0		38.010	1.440
32	0	1	0	0	0	1		38.020	1.450
33	0	1	0	0	1	0		38.030	1.460
34	0	1	0	0	1	1		38.040	1.470
35	0	1	0	1	0	0		38.050	1.480
36	0	1	0	1	0	1		38.060	1.490
37	0	1	0	1	1	0		38.070	1.500
38	0	1	0	1	1	1		38.080	1.510
39	0	1	1	0	0	0		38.090	1.520
40	0	1	1	0	0	1		38.100	1.530



CHASSIS-TOP



CB MAIN BOARD



CB MAIN BOARD

AM-FM ALIGNMENT INSTRUCTIONS

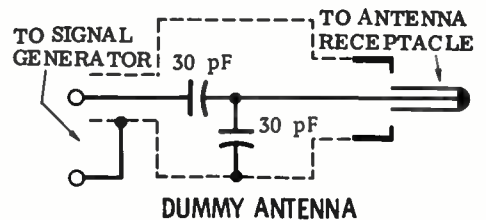
Check for specified source voltage.
 Connect low sides of generator and indicator to ground unless specified otherwise.
 Use only enough generator output to provide a usable indication.
 Suggested Alignment Tools: GC ELECTRONICS:
 L1,L2,L3,IFT.....5000,5009,8276,8728,8728A
 CF3.....5000,5009,8276,8728,8728A
 RT,OT,VC1,VC2,VC3.....5000,8276

AM ALIGNMENT—SELECTOR IN AM POSITION

Connect output meter across speaker voice coil.

GENERATOR COUPLING	GENERATOR FREQUENCY	RADIO DIAL SETTING	ADJUST	REMARKS
High side thru .1uF to antenna input.	250kHz 400-Hz mod.	High freq end stop	L2,CF3, L3	Adjust for maximum.
Thru dummy antenna to antenna input.	1600kHz 400Hz mod.	1600kHz	VC3	"
Thru dummy antenna to antenna input.	540kHz 400Hz mod.	540kHz		Check for proper tracking. If necessary readjust VC3 until no further improvement is noted.
Thru dummy antenna to antenna input.	1400kHz 400Hz mod.	1400kHz	VC2	Adjust for maximum. Repeat alignment until no further improvement is noted.

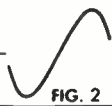
With radio installed in car and antenna extended 36", tune in a weak station near 1400kHz and adjust VC1 for maximum output. Antenna adjustment is located beneath CB transmit indicator on front panel.



FM IF ALIGNMENT USING FM SIGNAL GENERATOR—SELECTOR IN FM POSITION

High side of generator thru .001uF to TP.
 Use 60-hertz, frequency-modulated signal, 450kHz sweep.
 Use 60-hertz sawtooth voltage in scope for horizontal deflection.

GENERATOR FREQUENCY	RADIO DIAL SETTING	INDICATOR	ADJUST	REMARKS
10.7MHz 450kHz Sweep	Point of non-interference	Vert input of scope to TP10 (Junction of C10 and C11).	(1) IFT,L1	Adjust IFT,L1 for maximum amplitude and straightness of line, similar to Fig. 2.



(1) Before adjusting, vary generator frequency slightly. Maximum output indicates exact IF.

FM RF ALIGNMENT—SELECTOR IN FM POSITION

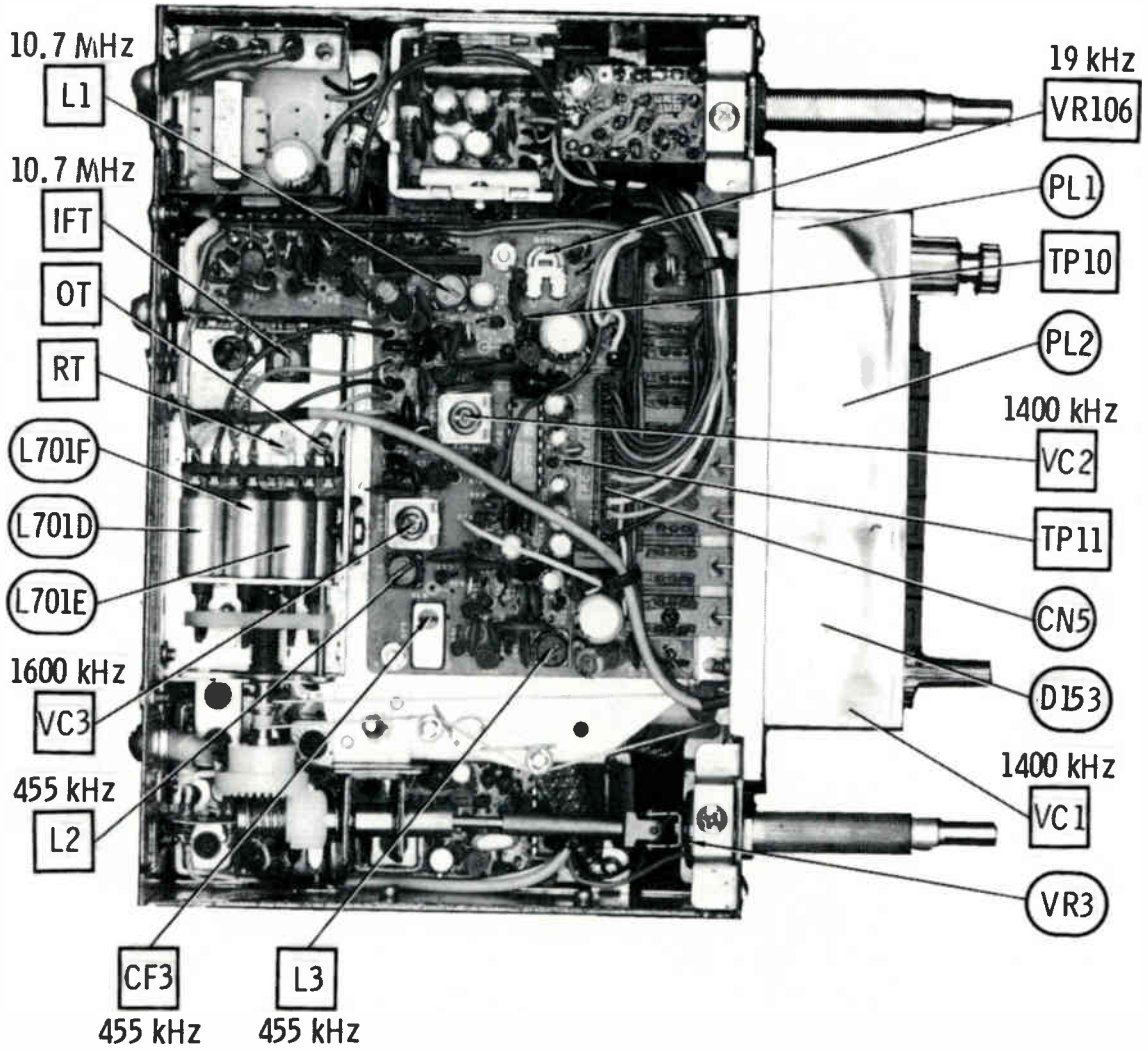
Connect generator across antenna terminals with 120-ohm carbon resistor in series with each lead. Adjustment of coils by bending should not be attempted unless the coil is deformed or replaced.

GENERATOR FREQUENCY	RADIO DIAL SETTING	INDICATOR	ADJUST	REMARKS
108MHz Modulated	108MHz	AC probe of VTVM to TP10 (Junction of C10 and C11).	OT,RT	Adjust for maximum.

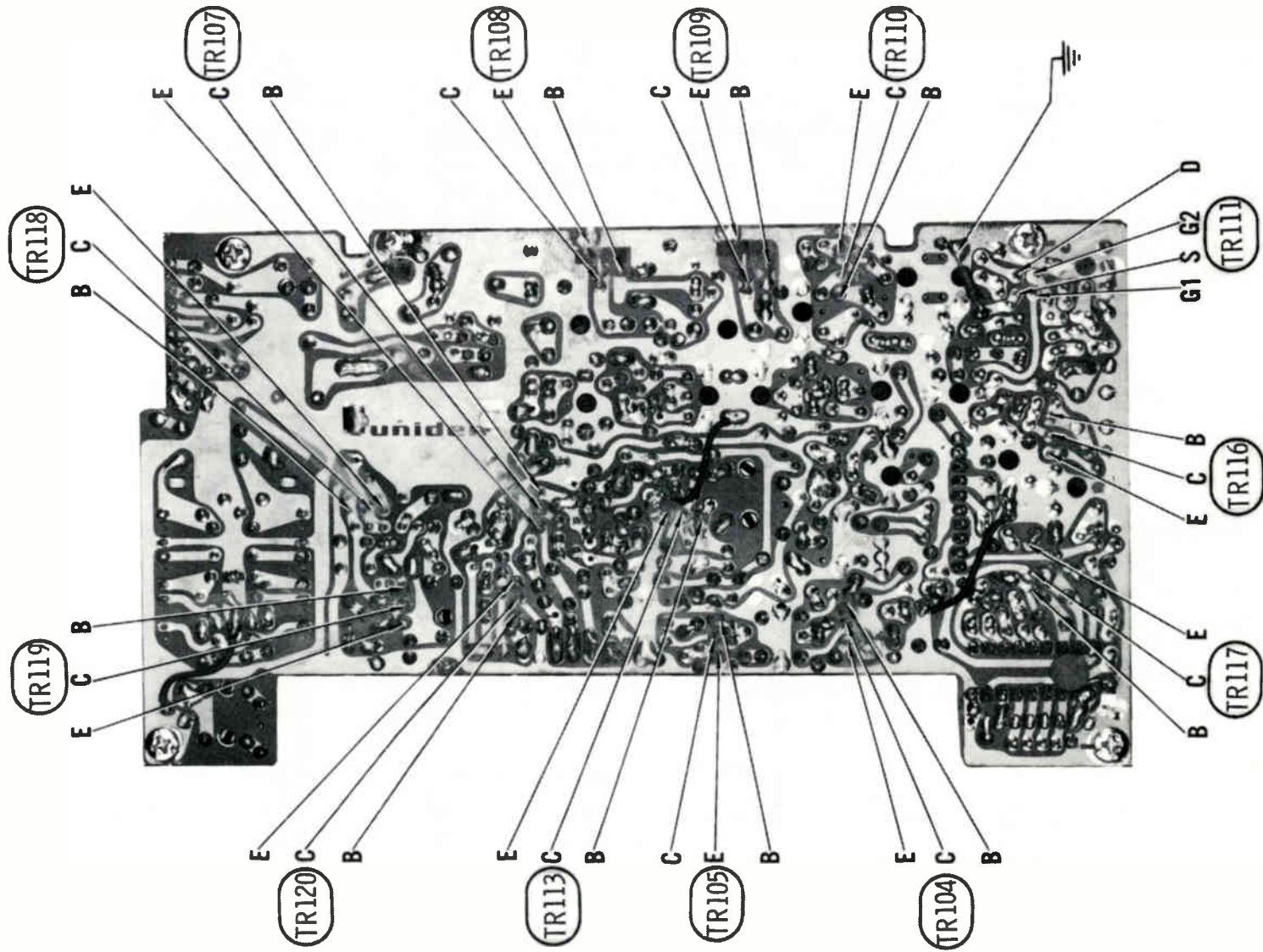
FM STEREO ALIGNMENT USING AUDIO GENERATOR

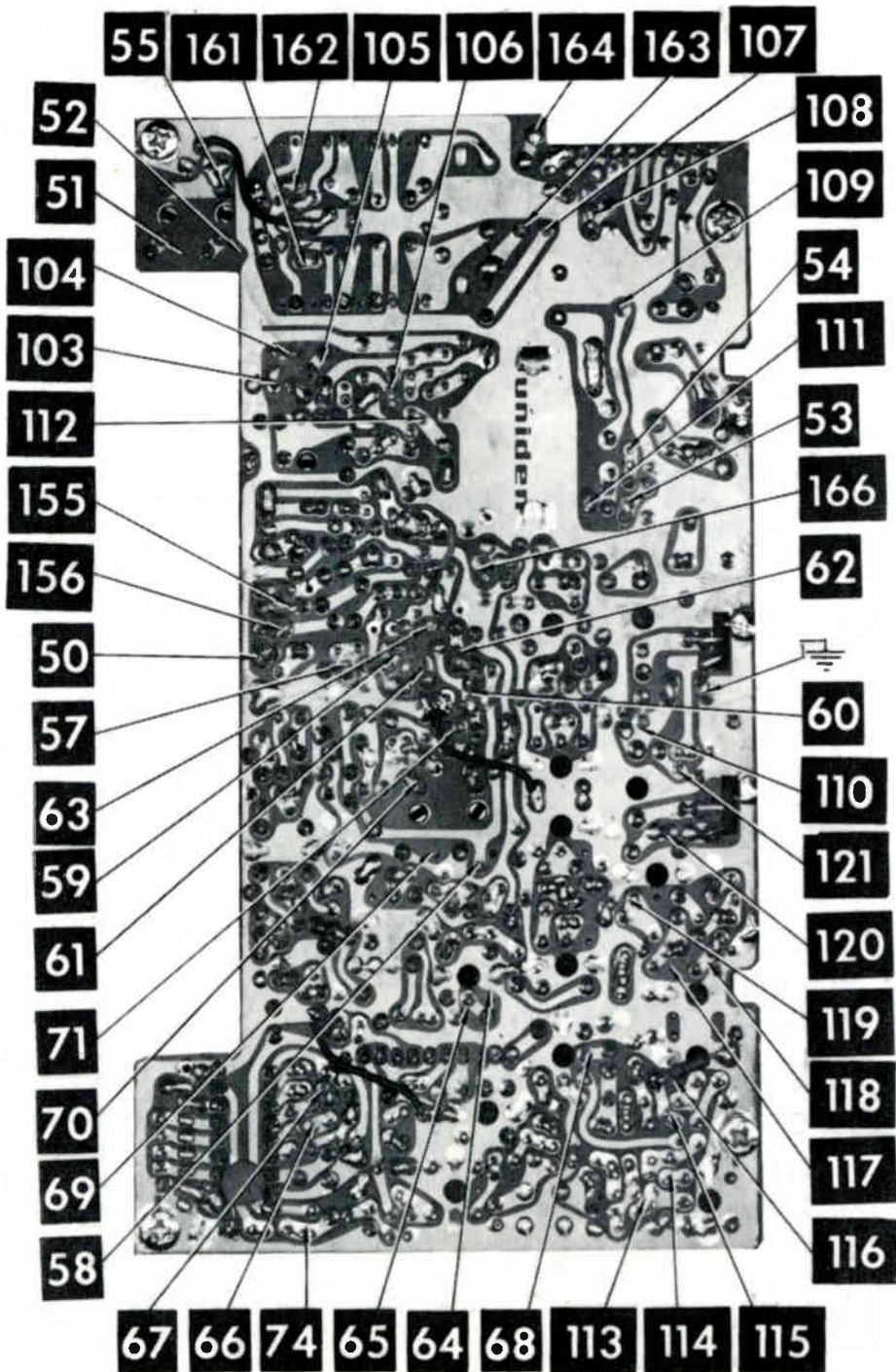
Connect TP10 to ground.

GENERATOR FREQUENCY	INDICATOR	ADJUST	REMARKS
	Input of frequency counter to TP11.	VR106	Adjust for 19kHz \pm 20Hz.



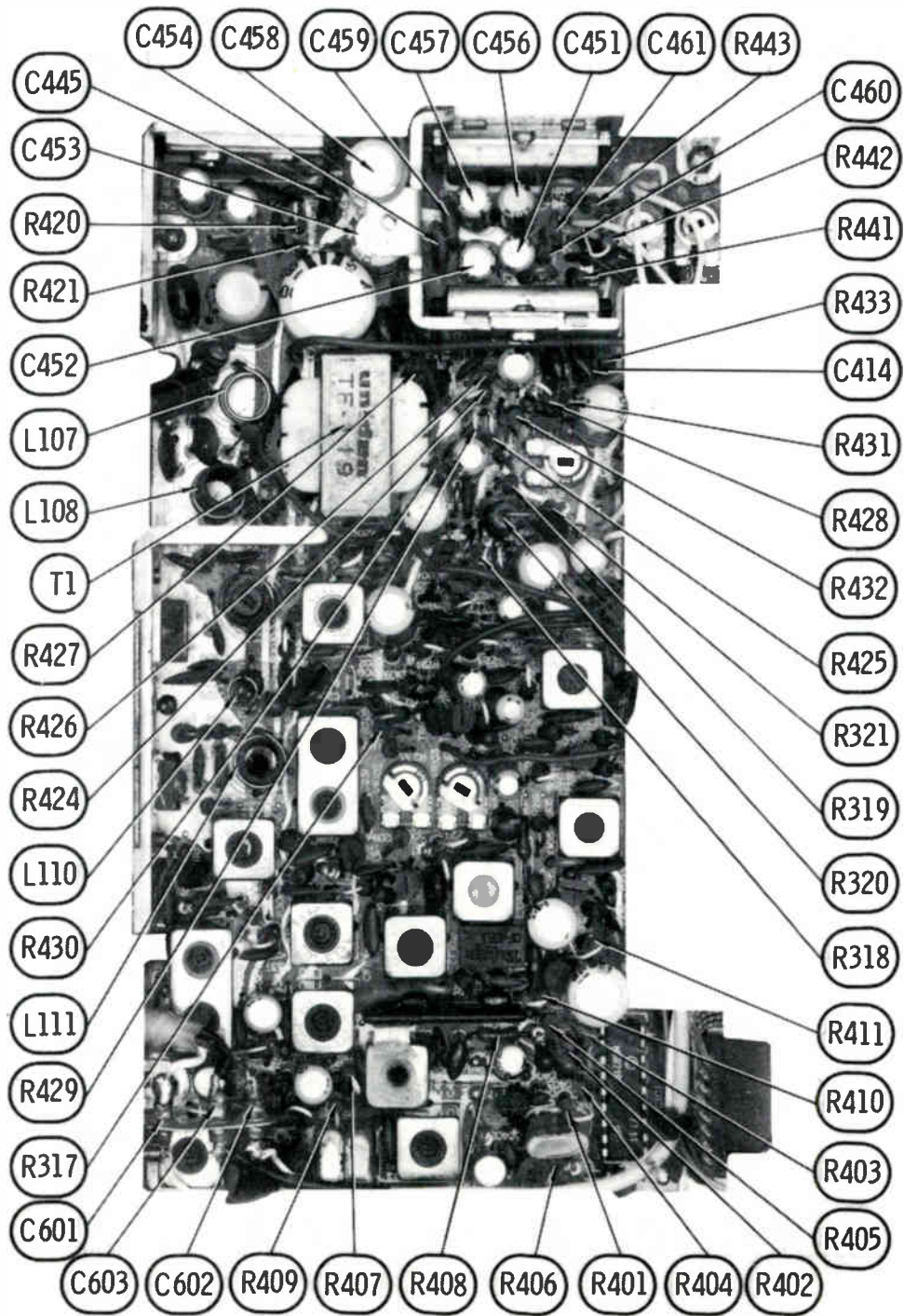
CHASSIS-BOTTOM



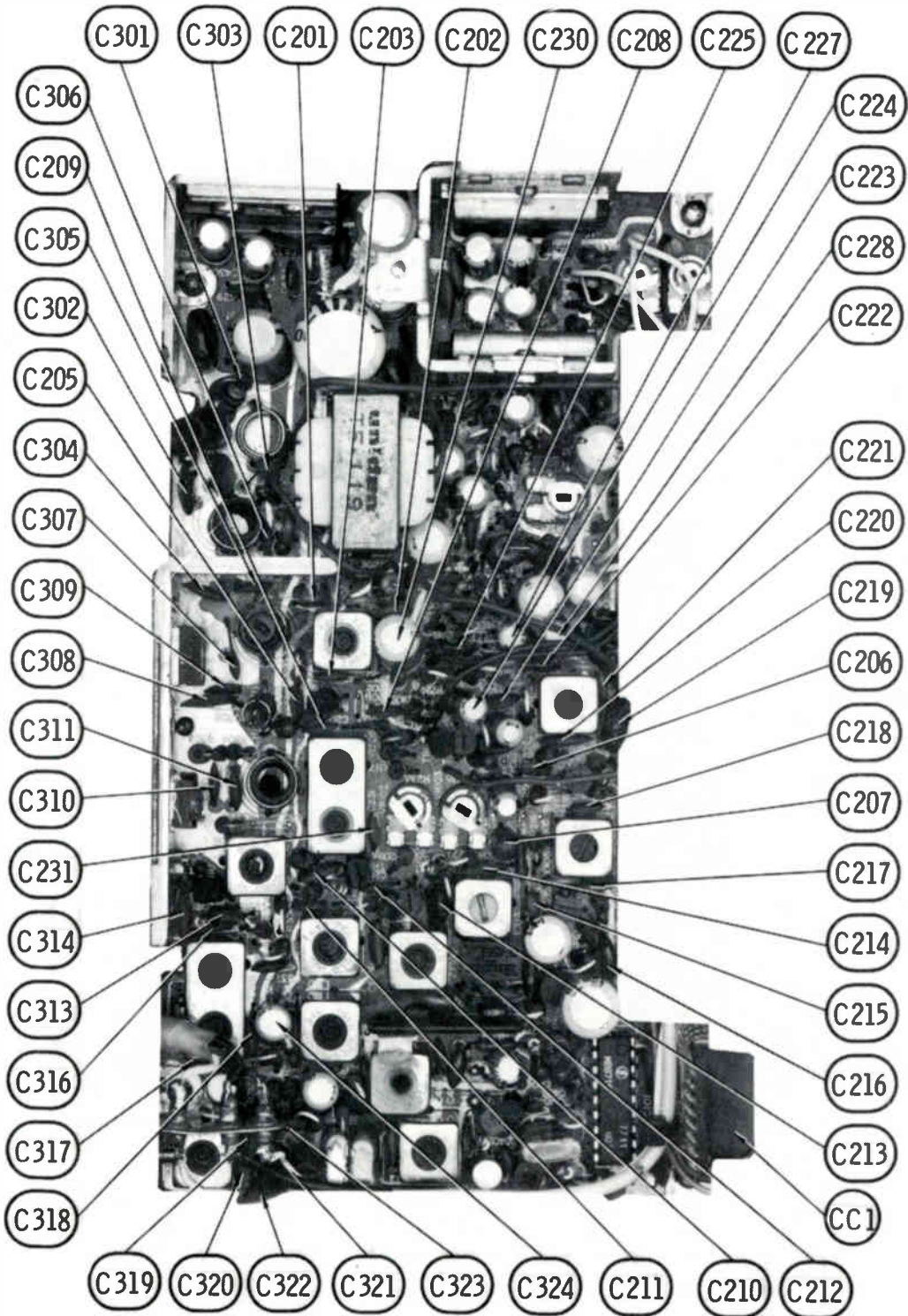


COBRA MODEL 46X1R

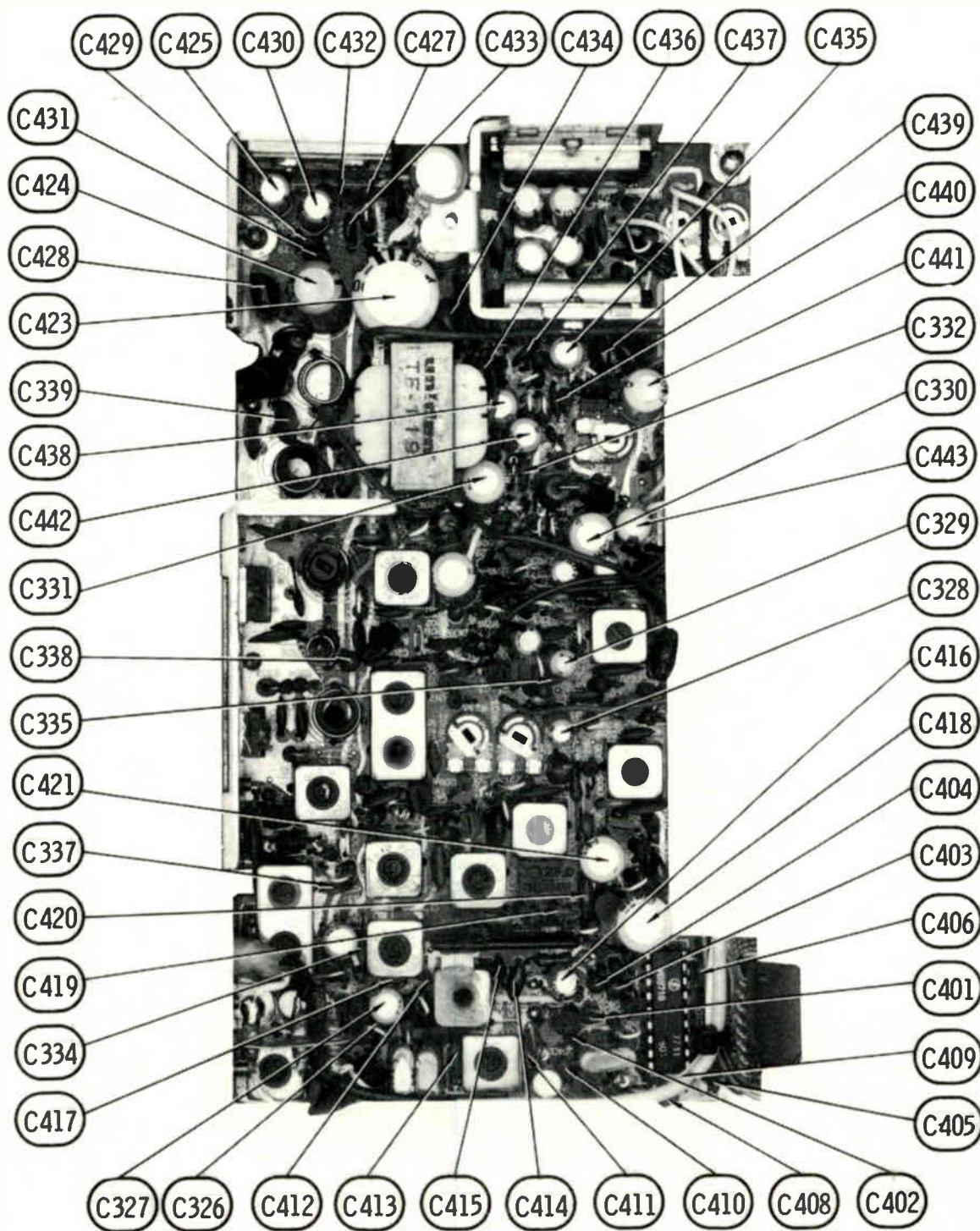
CB MAIN BOARD



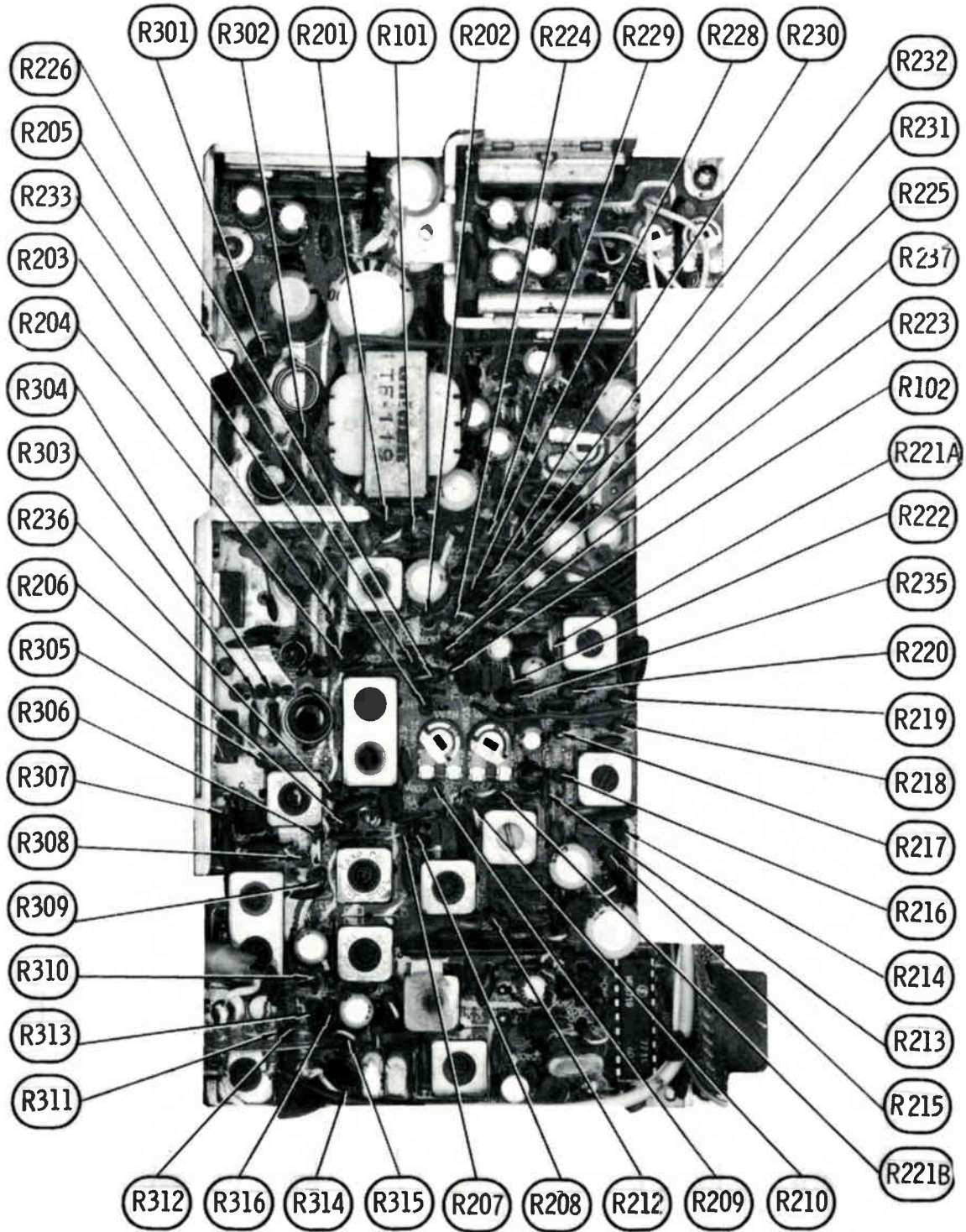
CB MAIN BOARD



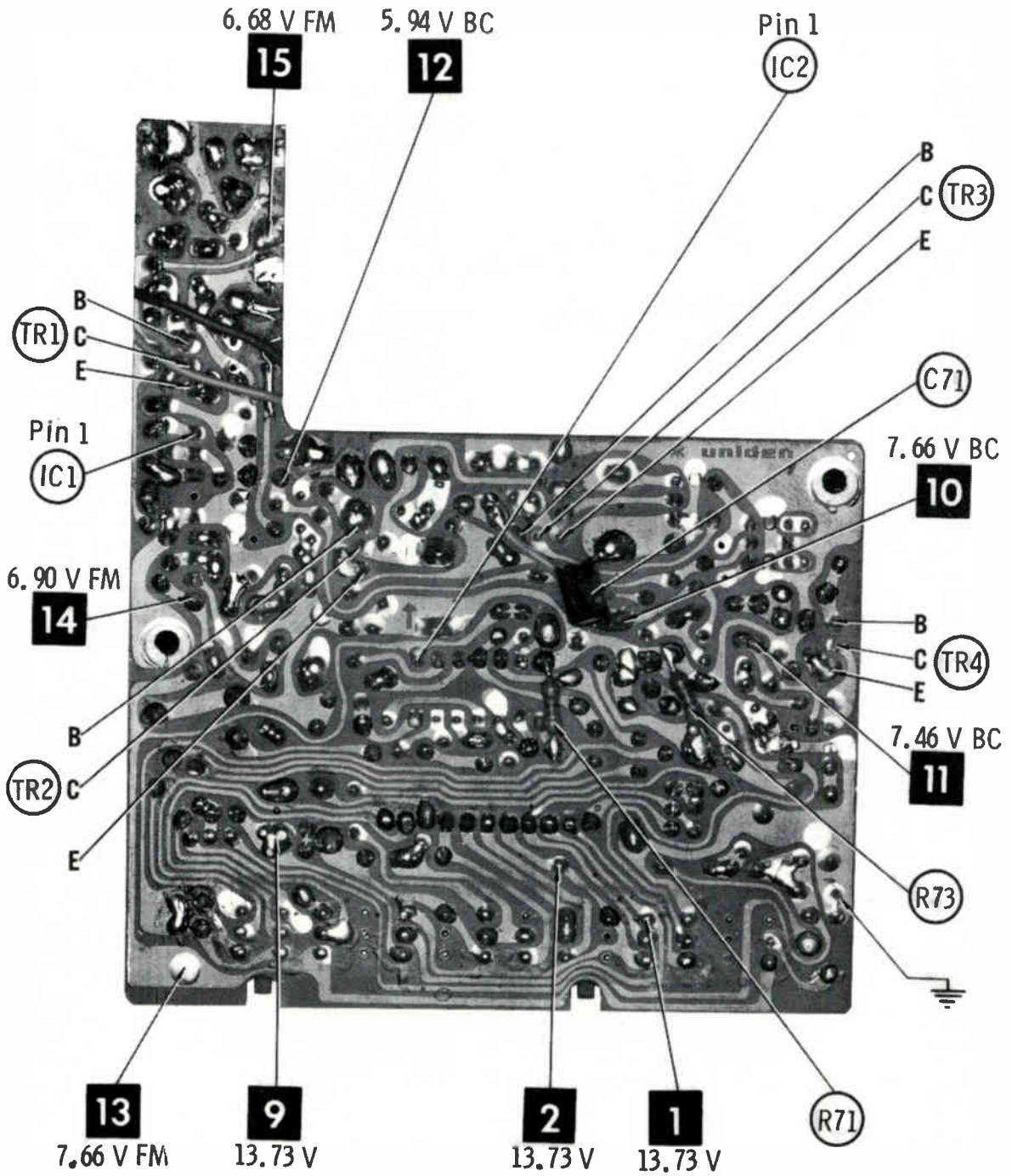
CB MAIN BOARD



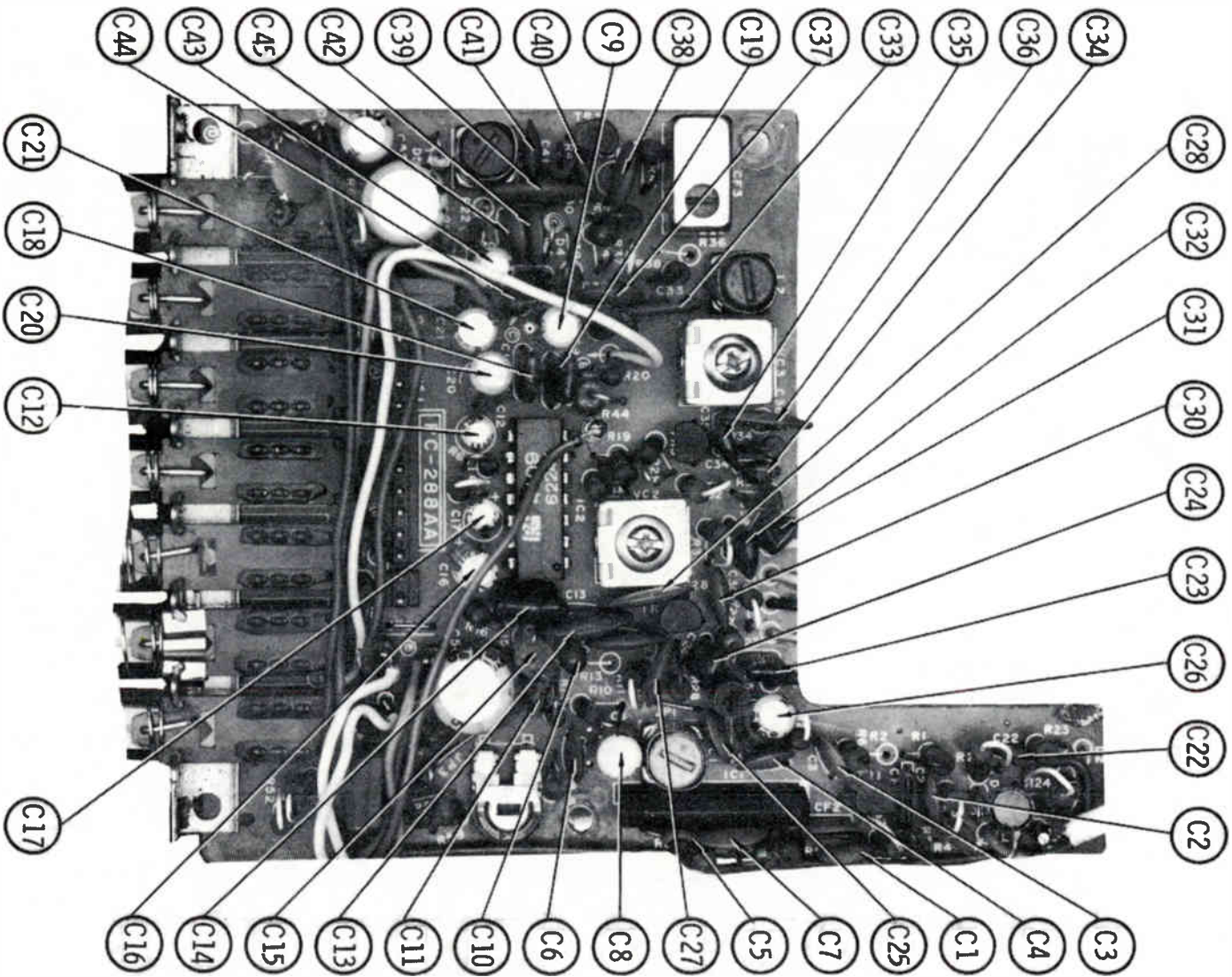
CB MAIN BOARD



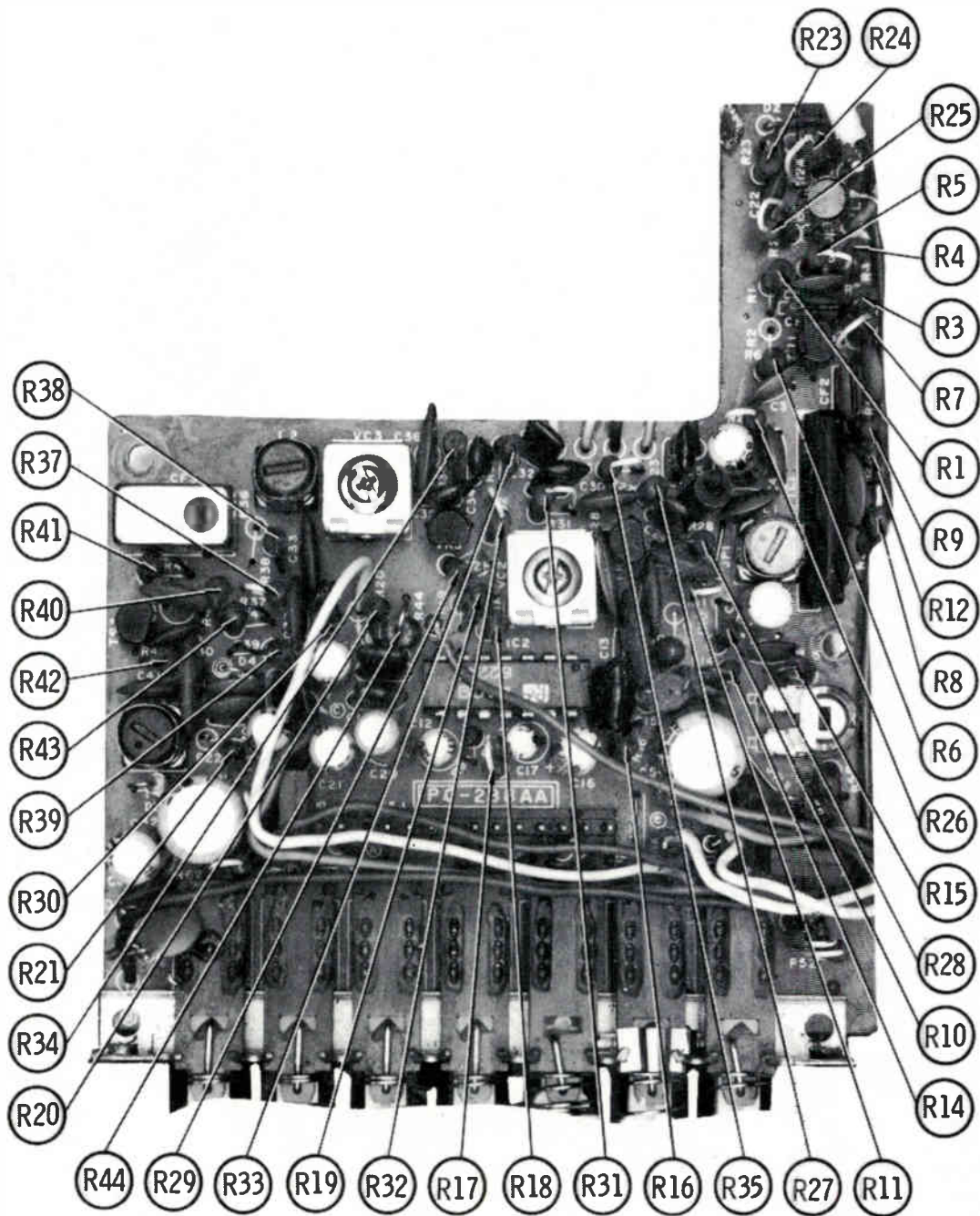
CB MAIN BOARD



AM-FM BOARD

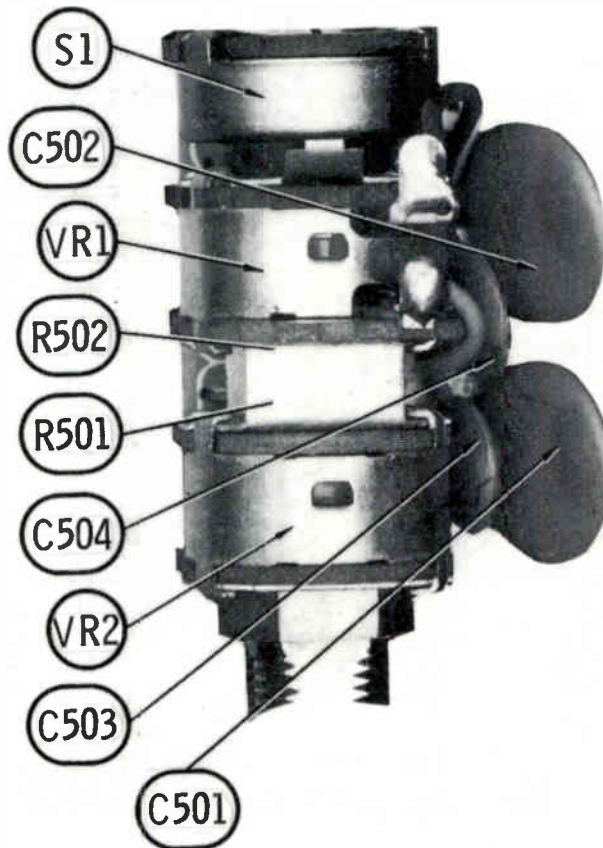
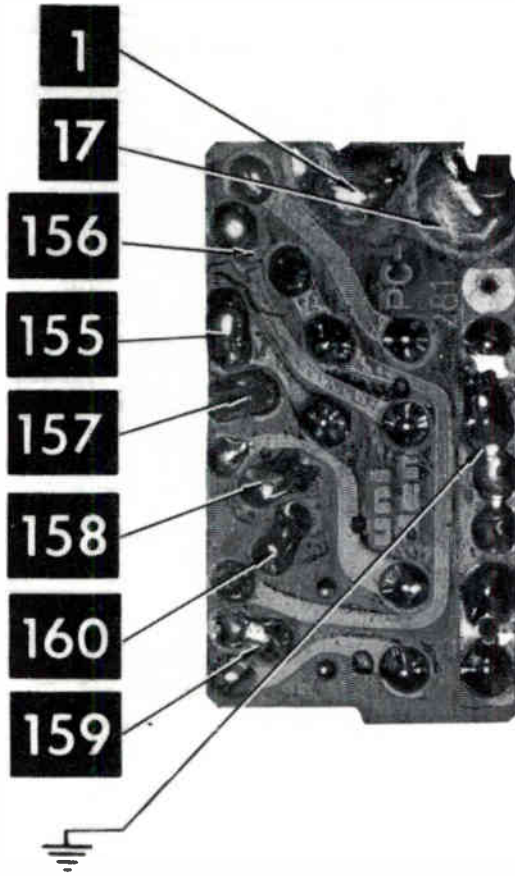


AM-FM BOARD



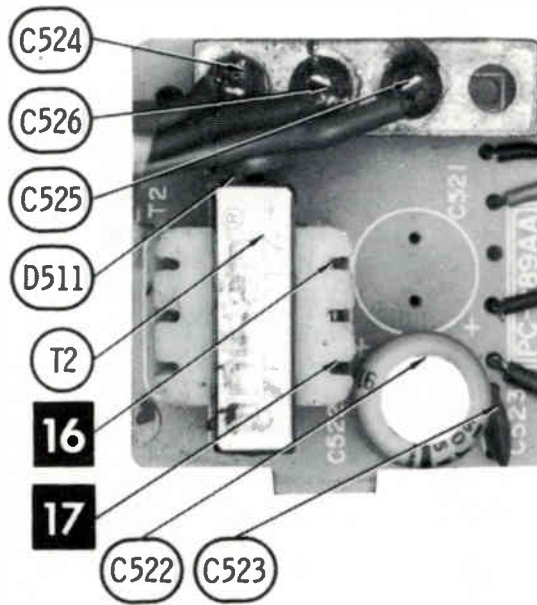
AM-FM BOARD

13.73 V

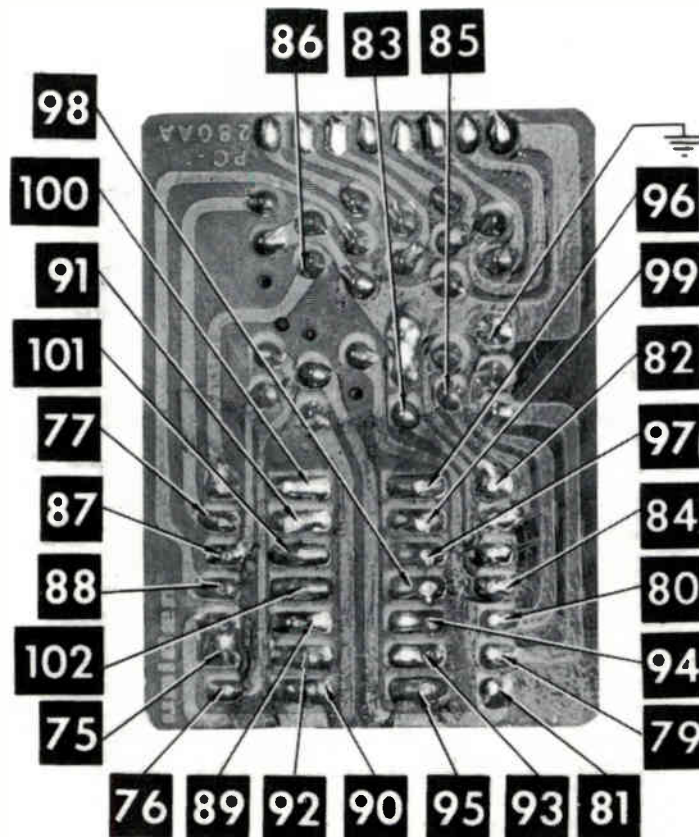


CONTROL BOARD

COBRA MODEL 46XLR

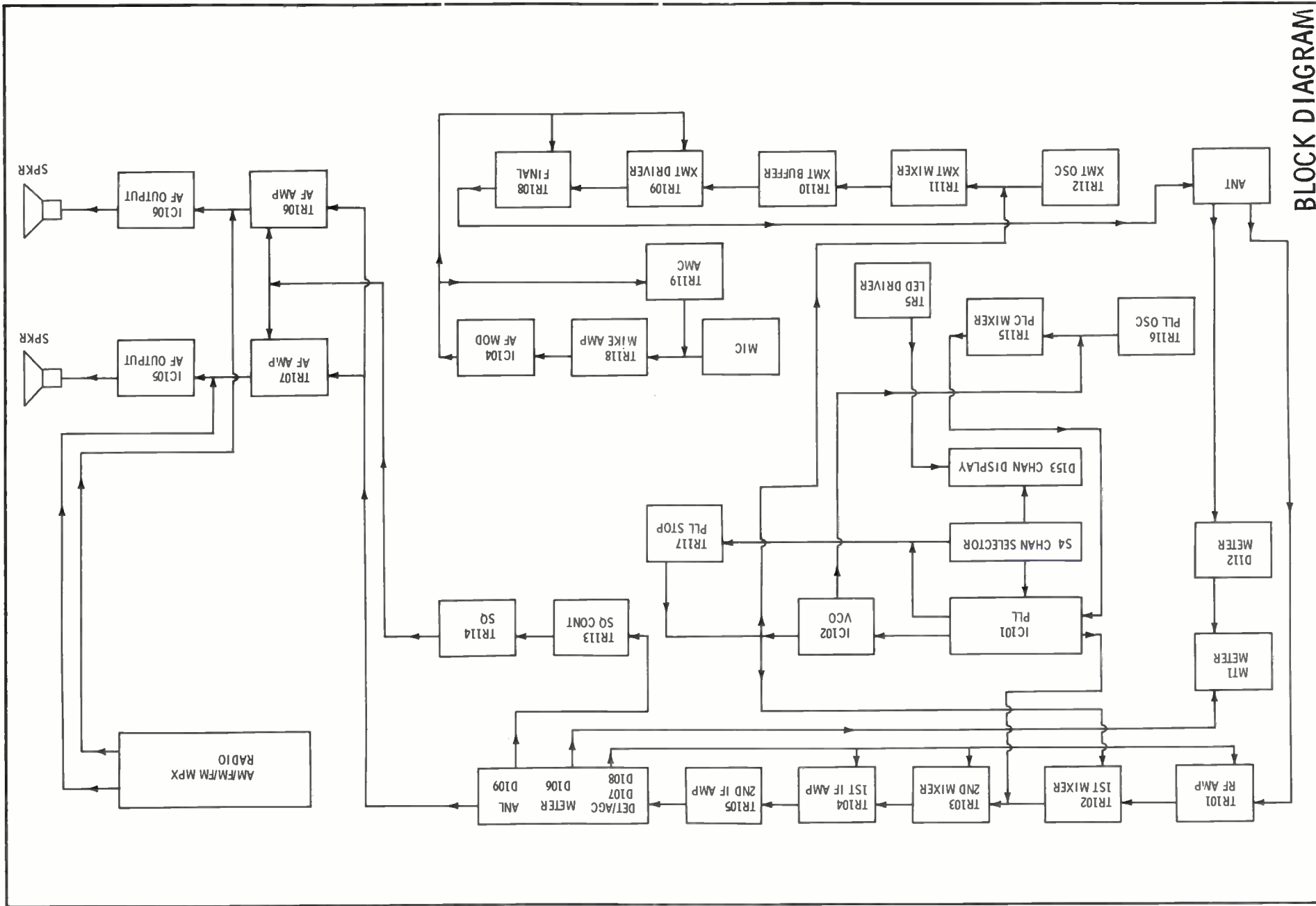


FILTER BOARD

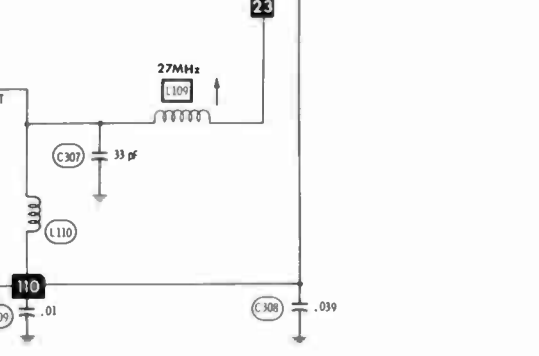
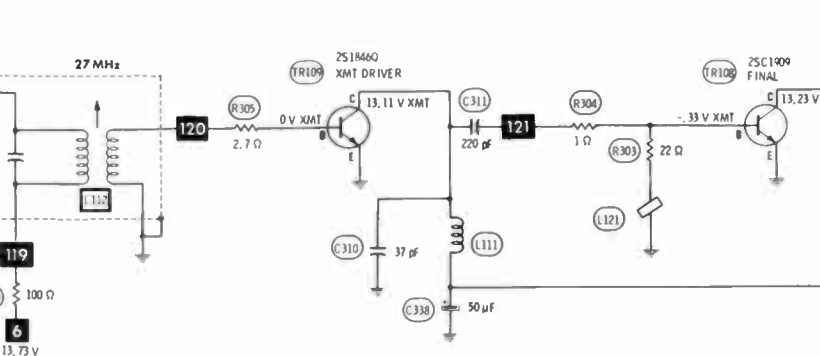
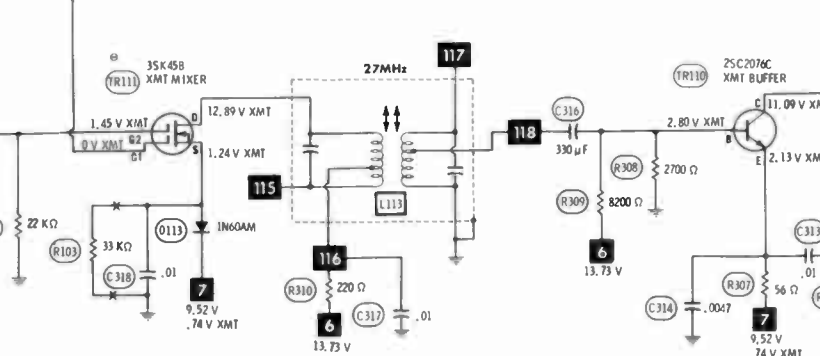
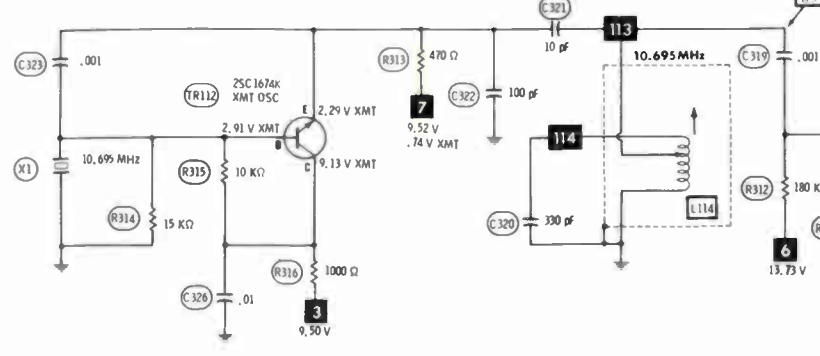
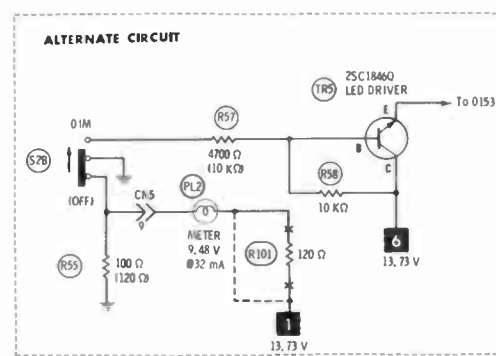
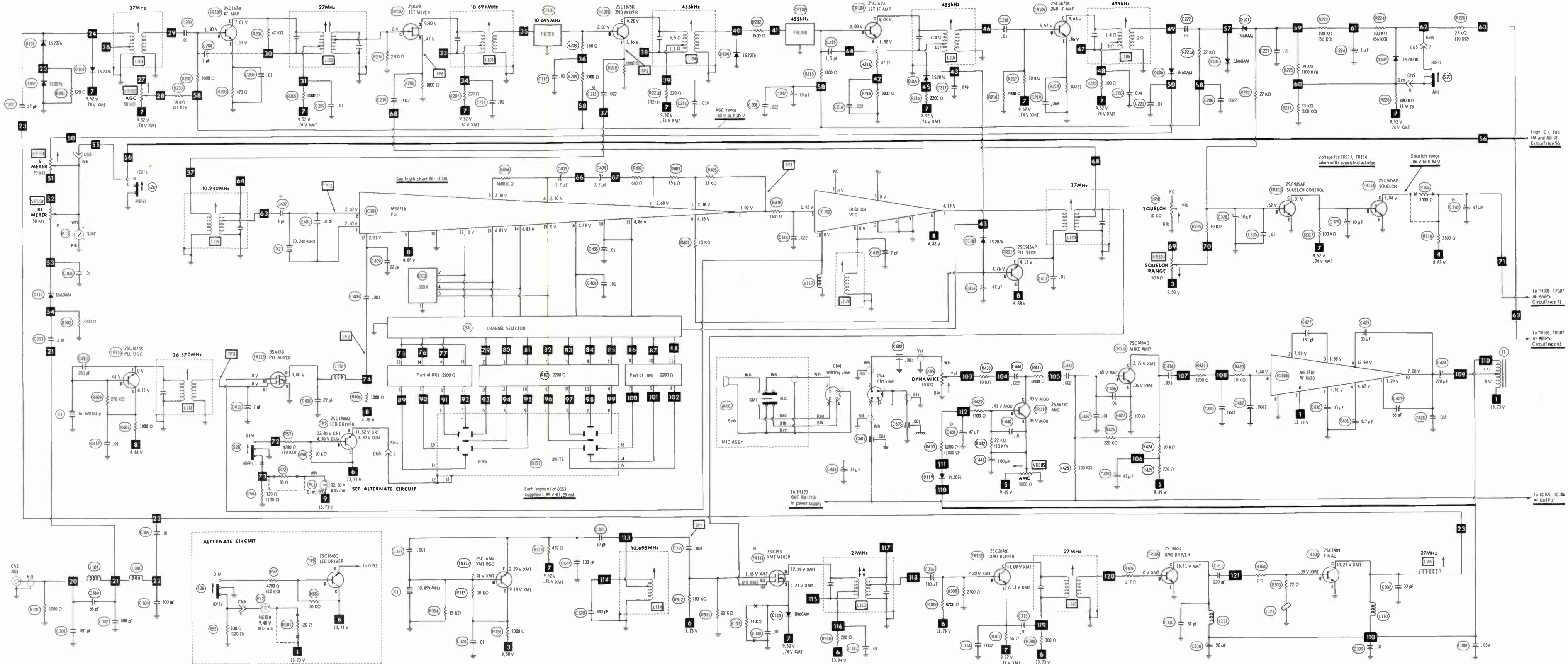


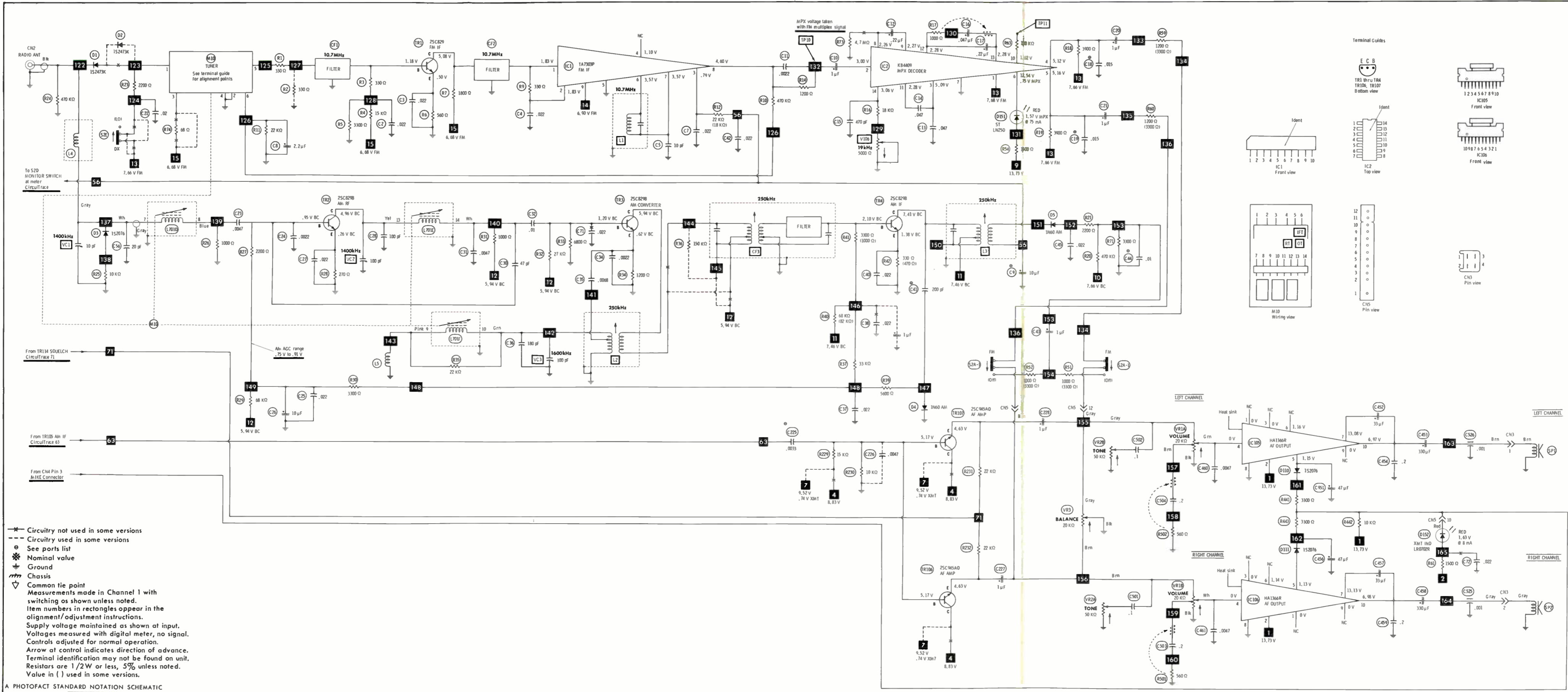
SWITCH BOARD

COBRA MODEL 46XLR



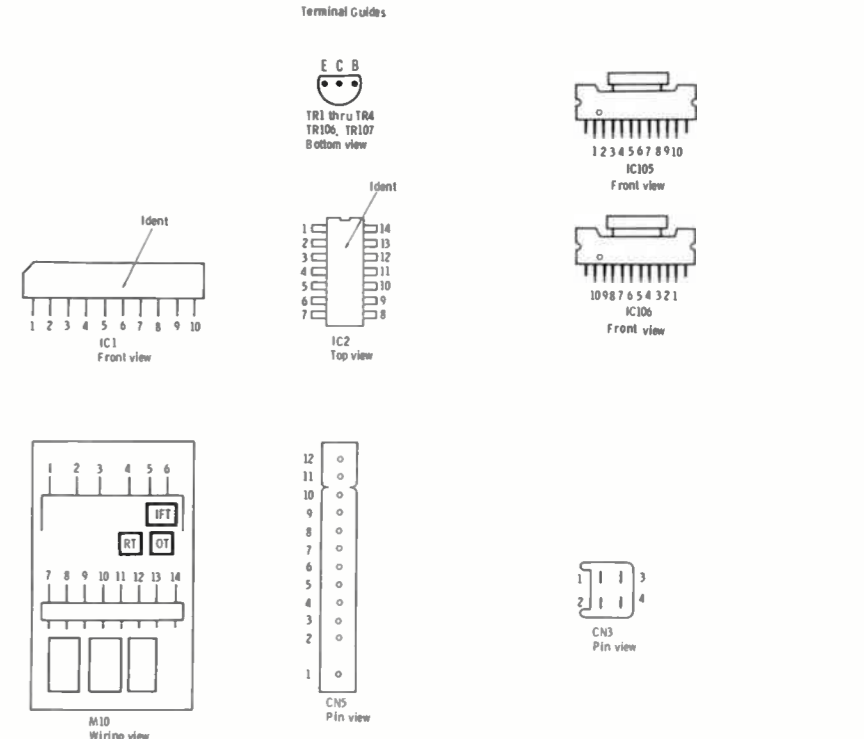
BLOCK DIAGRAM





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

A PHOTOFACIT STANDARD NOTATION SCHEMATIC
 WITH **CIRCUITRACE**
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PARTS LIST AND DESCRIPTION

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

SEMICONDUCTORS (Select replacement transistor for best results)

ITEM No.	TYPE No.	MFR. PART No.	REPLACEMENT DATA									
			GENERAL ELECTRIC PART No.	MALLORY PART No.	MOTOROLA PART No.	RAYTHEON PART No.	RCA PART No.	SPRAGUE PART No.	SYLVANIA PART No.	THORDARSON PART No.	WORKMAN PART No.	ZENITH PART No.
D1	1S2473K	151-069-9-001	GE-514	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519	1N4148	WEP925	
D2	1S2473K	151-069-9-001	GE-514	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519	1N4148	WEP925	
D3	1S2076	151-067-9-001	GE-514	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519	1N4148	WEP925	
D4	1N60AM	150-014-9-001	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109	1N60	WEP134	ZEN-430
D5	1N60AM	150-014-9-001	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109	1N60	WEP134	ZEN-430
D6	RD9.1EC	152-085-9-001	GEZD-9.1	ZM9.18		RE 114	SK3060	RT-240	ECG5018	1N4739A	WEP1419	103-279-18
	RD9.1FC	152-085-9-001	GEZD-9.1	ZM9.18		RE 114	SK3060	RT-240	ECG5018	1N4739A	WEP1419	103-279-18
O101	1S2076	151-067-9-001	GE-514	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519	1N4148	WEP925	
D102	1S2076	151-067-9-001	GE-514	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519	1N4148	WEP925	
D103	1S2076	151-067-9-001	GE-514	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519	1N4148	WEP925	
D104	1S2076	151-067-9-001	GE-514	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519	1N4148	WEP925	
D105	1S2076	151-067-9-001	GE-514	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519	1N4148	WEP925	
D106	1N60AM	150-014-9-001	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109	1N60	WEP134	ZEN-430
D107	1N60AM	150-014-9-001	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109	1N60	WEP134	ZEN-430
D108	1N60AM	150-014-9-001	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109	1N60	WEP134	ZEN-430
D109	1S2473K	151-069-9-001	GE-514	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519	1N4148	WEP925	
O110	1S2076	151-067-9-001	GE-514	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519	1N4148	WEP925	
D111	1S2076	151-067-9-001	GE-514	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519	1N4148	WEP925	
D112	1N60AM	150-014-9-001	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109	1N60	WEP134	ZEN-430
O113	1N60AM	150-014-9-001	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109	1N60	WEP134	ZEN-430
D114	1S2076	151-067-9-001	GE-514	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519	1N4148	WEP925	
O115	1S2076	151-067-9-001	GE-514	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519	1N4148	WEP925	
D116	1S2076	151-067-9-001	GE-514	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519	1N4148	WEP925	
D117	RD8.2FC	153-085-9-002	GEZD-8.2	ZM8.28		RE 112	SK3100	RT-257	ECG5016	1N4738A	WEP1417	
	RD8.2F	153-085-9-002	GEZD-8.2	ZM8.28		RE 112	SK3100	RT-257	ECG5016	1N4738A	WEP1417	
O118	1S2076	151-067-9-001	GE-514	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519	1N4148	WEP925	
D119	1S2076	151-067-9-001	GE-514	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519	1N4148	WEP925	
D511	SR1K-1		GE-504A	PTC202	HEPR0054	RE 49	SK3017A	RT-215	ECG116	1N4007	WEP158	212-76
IC1	TA7303P	307-128-9-001										
IC2	KB4409	307-120-9-002	GEIC-155	PTC735	HEPC6096P	RE 334-IC	SK3160	TVCM-73	ECG801	MC1310P	WEP2075	
IC101	MB8719	307-128-9-002										
IC102	UH1C-004	307-113-9-002							ECG1203			
IC103	NJM78L05A	307-113-9-003							ECG977			
IC104	MB3710	307-128-9-003				RE 387-IC						
IC105	HA1366	307-128-9-004										
IC106	HA1366R	307-128-9-005										
TR1	2SC829B	176-075-9-002	GE-20*	PTC121*	2SC829	RE 9*	SK3444	RT-308	ECG229*	2SC829	WEP829	ZEN-127
	2SC829		GE-20*	PTC121*	2SC829	RE 9*	SK3444	RT-308	ECG229*	2SC829	WEP829	ZEN-127
TR2	2SC829B	176-075-9-002	GE-20*	PTC121*	2SC829	RE 9*	SK3444	RT-308	ECG229*	2SC829	WEP829	ZEN-127
	2SC829		GE-20*	PTC121*	2SC829	RE 9*	SK3444	RT-308	ECG229*	2SC829	WEP829	ZEN-127
TR3	2SC829B	176-075-9-002	GE-20*	PTC121*	2SC829	RE 9*	SK3444	RT-308	ECG229*	2SC829	WEP829	ZEN-127
	2SC829		GE-20*	PTC121*	2SC829	RE 9*	SK3444	RT-308	ECG229*	2SC829	WEP829	ZEN-127
TR4	2SC829B	176-075-9-002	GE-20*	PTC121*	2SC829	RE 9*	SK3444	RT-308	ECG229*	2SC829	WEP829	ZEN-127
	2SC829		GE-20*	PTC121*	2SC829	RE 9*	SK3444	RT-308	ECG229*	2SC829	WEP829	ZEN-127
TR5	2SC1846Q	176-075-9-006	GE-336		2SC1846	RE 209	SK3253		ECG295	2SC496	WEP913	800-767
	2SC1846		GE-336		2SC1846	RE 209	SK3253		ECG295	2SC496	WEP913	800-767
TR7	2SC1846Q	176-075-9-006	GE-336		2SC1846	RE 209	SK3253		ECG295	2SC496	WEP913	800-767
	2SC1846		GE-336		2SC1846	RE 209	SK3253		ECG295	2SC496	WEP913	800-767
TR101	2SC1674L		GE-61	PTC132*	HEPS0010*	RE 9*	SK3275*	RT-308	ECG229*		WEP956*	
	2SC1674		GE-61	PTC132*	HEPS0010*	RE 9*	SK3275*	RT-308	ECG229*		WEP956*	
TR102	2SK49F	182-048-9-001	GE-FET-2	PTC161	HEPF0021	RE 45	SK3116	RT-175	ECG312		WEP920	ZEN-123
	2SK49		GE-FET-2	PTC161	HEPF0021	RE 45	SK3116	RT-175	ECG312		WEP920	ZEN-123
TR103	2SC1675K	176-081-9-003	GE-213	PTC139*	2SC1675	RE 13*	SK3124	RT-308	ECG229*		WEP956*	ZEN-127
	2SC1675		GE-213	PTC139*	2SC1675	RE 13*	SK3124	RT-308	ECG229*		WEP956*	ZEN-127
TR104	2SC1675L	176-065-9-001	GE-213	PTC139*	2SC1675	RE 13*	SK3124	RT-308	ECG229*		WEP956*	ZEN-127
	2SC1675		GE-213	PTC139*	2SC1675	RE 13*	SK3124	RT-308	ECG229*		WEP956*	ZEN-127
TR105	2SC1675K	176-081-9-003	GE-213	PTC139*	2SC1675	RE 13*	SK3124	RT-308	ECG229*		WEP956*	ZEN-127
	2SC1675		GE-213	PTC139*	2SC1675	RE 13*	SK3124	RT-308	ECG229*		WEP956*	ZEN-127
TR106	2SC945AQ	176-062-9-001	GE-212	PTC121*	2SC945	RE 192	SK3124	RT-107A	ECG199	2SC945	WEP1945	121-29000
	2SC945		GE-212	PTC121*	2SC945	RE 192	SK3124	RT-107A	ECG199	2SC945	WEP1945	121-29000
TR107	2SC945AQ	176-062-9-001	GE-212	PTC121*	2SC945	RE 192	SK3124	RT-107A	ECG199	2SC945	WEP1945	121-29000
	2SC945		GE-212	PTC121*	2SC945	RE 192	SK3124	RT-107A	ECG199	2SC945	WEP1945	121-29000
TR108	2SC1909	176-081-9-001(12)	GE-215	PTC186		RE 203	SK3197	RT-146	ECG235		WEP785	
TR109	2SC1846-Q	176-075-9-006(12)	GE-336			RE 209	SK3253		ECG295	2SC496	WEP913	800-767
	2SC1846		GE-336			RE 209	SK3253		ECG295	2SC496	WEP913	800-767
TR110	2SC2076C	176-060-9-004	GE-210*	PTC121*	HEPS0015*	RE 13*	SK3122	RT-308	ECG123A		WEP736	121-722
	2SC2076		GE-210*	PTC121*	HEPS0015*	RE 13*	SK3122	RT-308	ECG123A		WEP736	121-722
TR111	3SK45B	182-038-9-001	GE-FET-4	PTC182	HEPF2004	RE 199	SK3050	RT-181	ECG222		WEP905	121-826
	3SK45		GE-FET-4	PTC182	HEPF2004	RE 199	SK3050	RT-181	ECG222		WEP905	121-826
TR112	2SC1674K	176-081-9-001	GE-62*	PTC136	HEPS0015	RE 13	SK3018	RT-105*	ECG123A		WEP736	ZEN-128
	2SC1674		GE-61	PTC132*	HEPS0010*	RE 9*	SK3275*	RT-308	ECG229*		WEP956*	
TR113	2SC945AP	176-060-9-003	GE-212	PTC121*	2SC945	RE 192	SK3124	RT-107A	ECG199	2SC945	WEP1945	121-29000
	2SC945		GE-212	PTC121*	2SC945	RE 192	SK3124	RT-107A	ECG199	2SC945	WEP1945	121-29000
TR114	2SC945AP	176-060-9-003	GE-212	PTC121*	2SC945	RE 192	SK3124	RT-107A	ECG199	2SC945	WEP1945	121-29000
	2SC945		GE-212	PTC121*	2SC945	RE 192	SK3124	RT-107A	ECG199	2SC945	WEP1945	121-29000
TR115	3SK45B	182-038-9-001	GE-FET-4	PTC182	HEPF2004	RE 199	SK3050	RT-181	ECG222		WEP905	121-826
	3SK45		GE-FET-4	PTC182	HEPF2004	RE 199	SK3050	RT-181	ECG222		WEP905	121-826
TR116	2SC1674K	176-081-9-001	GE-61	PTC132*	HEPS0010*	RE 9*	SK3275*	RT-308	ECG229*		WEP956*	
	2SC1674		GE-61	PTC132*	HEPS0010*	RE 9*	SK3275*	RT-308	ECG229*		WEP956*	
TR117	2SC945AP	176-060-9-003	GE-212	PTC121*	2SC945	RE 192	SK3124	RT-107A	ECG199	2SC945	WEP1945	121-29000
	2SC945		GE-212	PTC121*	2SC945	RE 192	SK3124	RT-107A	ECG199	2SC945	WEP1945	121-29000

COBRA MODEL 46XLR

PARTS LIST AND DESCRIPTION (CONTINUED)

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

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

ITEM No.	TYPE No.	MFR. PART No.	REPLACEMENT DATA									
			GENERAL ELECTRIC PART No.	MALLORY PART No.	MOTOROLA PART No.	RAYTHEON PART No.	RCA PART No.	SPRAGUE PART No.	SYLVANIA PART No.	THORDARSON PART No.	WORKMAN PART No.	ZENITH PART No.
TR118	2SC945A0 2SC945	176-062-9-001	GE-212	PTC121*	2SC945	RE 192	SK3124	RT-107A	ECG199	2SC945	WEP1945	121-Z9000
TR119	2SA673C 2SA673	177-025-9-001	GE-212	PTC121*	2SC945	RE 192	SK3124	RT-107A	ECG199	2SC945	WEP1945	121-Z9000
TR120	2SA673C 2SA673	177-025-9-001	GE-269	PTC103*	HEPS0026*	RE 197*	SK3114	RT-115*	ECG290		WEP911	
			GE-269	PTC103*	HEPS0026*	RE 197*	SK3114	RT-115*	ECG290		WEP911	
			GE-269	PTC103*	HEPS0026*	RE 197*	SK3114	RT-115*	ECG290		WEP911	

* Lead configuration may vary from original.
(12) 10 WATTS @ 3 AMPS
(13) 1.2 WATTS @ 1 AMP

ELECTROLYTIC CAPACITORS

ITEM No.	RATING	REPLACEMENT DATA				
		MFR. PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
					Q-LINE	GENERAL LINE
C8	2.2 25V	022-158-9-002	PC2-100	VTT2R2A50	QV1-19	EV-1517
C9	10 16V	022-157-9-004	PC100-25	VTT10B25	QV1-41	EV-1222
	1 50V	022-157-9-002	PC1-50	VTT1A50	QV1-11	EV-1615
C10	1 16V	C27-027-9-002		TDC105M035EL		SD35-19
C12	.22 16V	022-158-9-001	PC1-50	VTT47A63	QV1-3	EV-1610
C16	.47 16V	022-161-9-002	PC1-50	VTT47A63	QV1-3	EV-1610
C17	.22 16V	022-158-9-001	PC1-50	VTT47A63	QV1-3	EV-1610
C20	1 50V	022-157-9-002	PC1-50	VTT1A50	QV1-11	EV-1615
C21	1 50V	022-157-9-002	PC1-50	VTT1A50	QV1-11	EV-1615
C26	10 16V	022-157-9-004	PC100-25	VTT10B25	QV1-41	EV-1222
C38	1 50V	022-157-9-002	PC1-50	VTT1A50	QV1-11	EV-1615
	1 16V	027-027-9-002		TDC105M035EL		SD95-19
C43	1 50V	022-157-9-002	PC1-50	VTT1A50	QV1-11	EV-1615
C52	47 10V	002-120-9-002	PC50-16	VTT47D1E	QV1-73	EV-1226
	100 16V	022-157-9-009	PC100-16	VTT100F1E	QV1-95	EV-1230
C54	100 16V	022-157-9-009	PC100-16	VTT100F1E	QV1-95	EV-1230
C55	100 16V	022-157-9-009	PC100-16	VTT100F1E	QV1-95	EV-1230
C207	10 16V	022-157-9-004	PC100-16	VTT100F1E	QV1-95	EV-1230
C224	1 50V	022-157-9-002	PC10-25	VTT10B25	QV1-41	EV-1222
C227	1 50V	022-157-9-002	PC1-50	VTT1A50	QV1-11	EV-1615
C228	1 50V	022-157-9-002	PC1-50	VTT1A50	QV1-11	EV-1615
C229	33 16V	022-157-9-002	PC1-50	VTT1A50	QV1-11	EV-1615
C230	47 16V	022-157-9-006	PC30-25	VTT33D25	QV1-63	EV-1325
C315	2.2 25V	022-155-9-001	PC50-16	VTT47D1E	QV1-73	EV-1226
C324	33 16V	022-158-9-002	PC2-100	VTT2R2A50	QV1-19	EV-1517
C327	33 16V	022-157-9-006	PC30-25	VTT33D25	QV1-63	EV-1325
C328	10 16V	002-157-9-004	PC30-25	VTT33D25	QV1-63	EV-1325
C329	10 16V	002-157-9-004	PC10-25	VTT10B25	QV1-41	EV-1222
	1 50V	022-157-9-002	PC10-25	VTT10B25	QV1-41	EV-1222
C330	47 16V	022-155-9-001	PC1-50	VTT1A50	QV1-11	EV-1615
	10 16V	022-157-9-004	PC50-16	VTT47D1E	QV1-73	EV-1226
C331	47 16V	022-155-9-001	PC30-25	VTT33D25	QV1-63	EV-1325
C338	1 50V	022-157-9-002	PC50-16	VTT47D1E	QV1-73	EV-1226
C403	2.2 25V	027-021-9-001		TDC105M05OEL	QDT1-25	SD50-19
				TDC225M035FL		SD35-2R29
C404	2.2 25V	027-021-9-001		TDC225M035FL		SD35-2R29
C407	4.7 50V	022-161-9-001	PC5-50	VTT47B50	QV1-29	EV-1519
C416	.47 16V	022-161-9-002	PC1-50	VTT47A63	QV1-3	EV-1250
C418	470 6.3V	022-158-9-008	PC500-16	VTT470K1E	QV1-73	EV-1226
C421	47 16V	022-155-9-001	PC50-16	VTT47D1E	QV1-151	EV-1260
C423	1000 16V	022-152-9-002	PC1000-1E	VTT1000L16	QV1-183	EV-1260
C424	220 16V	022-122-9-008	PC250-25	VTT22M1E	QV1-117	EV-1240
C425	33 16V	022-157-9-006	PC30-25	VTT33D25	QV1-63	EV-1325
C430	33 16V	022-157-9-006	PC30-25	VTT33D25	QV1-63	EV-1325
C431	4.7 16V	027-026-9-004	PC5-50	VTT47B50	QV1-27	EV-1319
C435	47 10V	022-120-9-002	PC50-16	VTT47D1E	QV1-73	EV-1226
C438	47 10V	002-120-9-002	PC50-16	VTT47D1E	QV1-73	EV-1226
	33 10V	022-158-9-005	PC30-25	VTT33D25	QV1-63	EV-1325
C441	100 1CV	022-157-9-008	PC100-10	VTT100E10	QV1-93	EV-1130
C442	47 10V	002-120-9-002	PC50-16	VTT47D1E	QV1-73	EV-1226
C443	33 16V	022-157-9-006	PC30-25	VTT33D25	QV1-63	EV-1325
	1 50V	022-157-9-002	PC1-50	VTT1A50	QV1-11	EV-1615
C451	47 10V	002-120-9-002	PC50-16	VTT47D1E	QV1-73	EV-1226
	10 16V	022-157-9-004	PC10-25	VTT10B25	QV1-41	EV-1222
C452	33 16V	022-157-9-006	PC30-25	VTT33D25	QV1-63	EV-1325
C453	330 16V	022-158-9-003	PC30-25	VTT33D25	QV1-63	EV-1325
C456	47 10V	002-120-9-002	MWR300-35	VTT4701E	QV1-135	EV-1345
	10 16V	022-157-9-004	PC50-16	VTT47D1E	QV1-73	EV-1226
C457	33 16V	022-157-9-006	PC10-25	VTT10B25	QV1-41	EV-1222
C458	330 16V	022-158-9-003	PC30-25	VTT33D25	QV1-63	EV-1325
C503	.47 6.3V	027-027-9-001	MWR300-35	VTT33D25	QV1-135	EV-1345
C504	.47 6.3V	027-027-9-001		TDC104M05OEL	QDT1-2	SD50-R109
C522	100 25V	022-155-9-002		TDC104M05OEL	QNT1-2	SD50-P109
			PC100-25	VTT100G25	QV1-97	EV-1330

PARTS LIST AND DESCRIPTION (CONTINUED)

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

CAPACITORS

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA				
			CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
						Q-LINE	GENERAL LINE
C1	.02		UK50-223		MAG5012		
C2	.02		UK50-223		MAG5012		
C3	.022		UK25-223				HY-725
C4	.02		UK50-223		MAG5012		
C5	10 NPO		DTZ-10	NP010	CN0410		10TCC-Q10
C6	.022		UK25-223				HY-725
C7	.022		UK25-223				HY-725
C11	.022 10%				GP222		10TS-D22
C13	680		DD-681	GP680	GP368	QFT2-271	10TS-T68
C14	.047 10%	025-121-9-006					1FT-S47
C15	470 10%		DD-471	GP470	GP347		10TS-T47
C18	.015 10%	025-121-9-004				QFT2-105	1FT-S15
	.047	025-121-9-006				QFT2-271	1FT-S47
C19	.015 10%	025-121-9-004				QFT2-105	1FT-S15
	.047	025-121-9-006				QFT2-271	1FT-S47
C22	.02		UK50-223		MAG5012		
C23	.0047 10%	025-126-9-001				QFT2-63	1FT-D47
C24	.0022 10%	030-041-9-003			GP222		10TS-D22
C25	.02		UK50-223		MAG5012		
C27	.022		UK25-223				HY-725
C28	100 10%		DD-101	GP100	GP310		10TS-T10
C30	47 5%		DTZ-47	NP047	CN0447		10TCC-Q47
C31	.0047 10%	025-126-9-001				QFT2-63	1FT-D47
C32	.01 10%	025-121-9-002				QFT2-91	1FT-S10
C33	.047		UK16-503		MAG1615		HY-635
C34	.0022 10%	030-041-9-003				QFT2-27	1FT-D22
C35	.0068 10%	025-122-9-003				QFT2-73	1FT-D68
C36	180 10%		DD-181		GP318		10TS-T18
C37	.022		UK25-223				HY-725
C38	.022		UK25-223				HY-725
C39	.047		UK25-503		MAG2515		HY-735
C40	.022		UK25-223				HY-725
C41	200		OTZ-200				10TCC-T20
	220		OD-221		GP322		10TS-T22
C42	.022		UK25-223				HY-725
C44	.01 1%	025-121-9-002				QFT2-91	1FT-S10
	.022					QFT2-127	1FT-S22
C45	.022 10%	025-121-9-003	UK25-223				HY-725
C51	.01		UK25-103		MAG2511		HY-520
C53	.047		UK25-503		MAG2515		HY-735
C71	.0033					QFT2-43	1FT-D33
C72	.022		UK25-223				HY-725
C101	.01		UK25-103		MAG2511		HY-520
C201	27				CN0427		10TCC-Q27
C202	.01		UK25-103		MAG2511		HY-520
C203	.01		UK25-103		MAG2511		HY-520
C204	1				CN0510		10TCC-V10
C205	.01		UK25-103		MAG2511		HY-520
C206	.0022				GP222		10TS-O22
C208	.022		UK25-223				HY-725
C209	.01		UK25-103		MAG2511		HY-520
C210	.0047		DD-472	GP4700	GP247		5GA-D47
C211	.01		UK25-103		MAG2511		HY-520
C212	.01		UK25-103		MAG2511		HY-520
C213	.022 10%	025-121-9-003				QFT2-127	1FT-S22
C214	.039				GP140		5GA-S40
C215	1.5		DTZ-1R5	NP01P5	CN0515		10TCC-V15
C216	.022 10%	025-121-9-003				QFT2-127	1FT-S22
C217	.039				GP140		5GA-S40

COBRA MODEL 46XLR

PARTS LIST AND DESCRIPTION (CONTINUED)

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

CAPACITORS (cont)

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA					
			CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.		
						Q-LINE	GENERAL LINE	
C218	.01	025-125-9-001	UK25-103		MAG2511		HY-520	
C219	.068 10%				GP140		5GA-S40	
C220	.039				MAG2511		HY-520	
C221	.01	025-121-9-002	UK25-103			QFT2-1	1FT-D10	
C222	.01 10%						HY-520	
C223	.01						1FT-D33	
C225	.0033 10%	025-126-9-001	UK25-103		MAG2511	QFT2-43	1FT-D47	
C226	.0047 10%					QFT2-63	5GA-D47	
C226	.0047		DD-472	GP4700	GP247		HY-520	
C231	.01		UK25-103		MAG2511		10TS-T18	
C301	180		DD-181		GP318		10TS-T30	
C302	300 10%		DD-301	GP300	GP330		10TCC-V22	
C303	2		DTZ-2R2	NP02P2	CN0522		10TS-T30	
C304	300 10%		DD-301	GP300	GP330		HY-520	
C305	.01		UK25-103		MAG2511		HY-520	
C306	.01		UK25-103		MAG2511		10TCC-Q33	
C307	33		DTZ-33	NP033	CN0433		5GA-S40	
C308	.039				GP140		HY-520	
C309	.01		UK25-103		MAG2511		10TCC-Q47	
C310	47 10%		DTZ-47	NP047	CN0447		10TS-T22	
C311	220		DD-221		GP322		HY-520	
C313	.01		UK25-103		MAG2511		5GA-D47	
C314	.0047		DD-472	GP4700	GP247		10TS-T33	
C316	330		DD-331	GP330	GP333		HY-520	
C317	.01		UK25-103		MAG2511		HY-520	
C318	.01		UK25-103		MAG2511		HY-520	
C319	.001		DD-102		GP210		10TS-D10	
C320	330 10%		DD-331	GP330	GP333		10TS-T33	
C321	10		DTZ-10	NP010	CN0410		10TCC-Q10	
C322	100		DD-101	GP100	GP310		10TS-T10	
C323	.001		DD-102G	GP1000	GP210	QC2-81	5GA-D10	
C326	.01		UK25-103		MAG2511		HY-520	
C332	.01		UK25-103		MAG2511		HY-520	
C334	.01		UK25-103		MAG2511		HY-520	
C335	.01		UK25-103		MAG2511		HY-520	
C337	.01		UK25-103		MAG2511		HY-520	
C339	68 5%		DTZ-68	NP068	CN0468		10TCC-Q68	
C401	10		DTZ-10	NP010	CN0410		10TCC-Q10	
C402	3		DTZ-3R3	NP03P3	CN0533		10TCC-V33	
	5		DTZ-4R7	NP04P7	CN0547		10TCC-V47	
C405	.01		UK25-103		MAG2511		HY-520	
C406	.01		UK25-103		MAG2511		HY-520	
C408	.001		DD-102G	GP1000	GP210	QC2-81	5GA-D10	
C409	22		DTZ-22	NP022	CN0422		10TCC-Q22	
C410	22		DTZ-22	NP022	CN0422		10TCC-Q22	
C411	7		DTZ-6R8	NP06P8	CN0568		10TCC-V68	
C412	.01		UK25-103		MAG2511		HY-520	
C413	250			CD15FD241J03	SX324	QW1-36	MMA-241	
C414	.022 10%	025-121-9-003	DTZ-6R8	NP06P8	CN0568	QFT2-127	1FT-S22	
C415	7						10TCC-V68	
C417	.01			UK25-103		MAG2511		HY-520
C419	.01	025-121-9-003	UK25-103		MAG2511		HY-520	
C420	.022 10%					QFT2-127	1FT-S22	
C427	180 5%			DTZ-180			10TCC-T18	
C428	.068 10%	025-125-9-001					10TS-Q68	
C429	68		DD-680	GP68	GP468		5GA-D47	
C432	.0047 10%		DD-472	GP4700	GP247		1FT-D47	
C433	.0047 10%	025-126-9-001				QFT2-63	1FT-S33	
C434	.033 10%	025-121-9-004				QFT2-149	HY-520	
C436	.01		UK25-103		MAG2511		HY-520	
C437	.01		UK25-103		MAG2511		HY-520	
C439	.022 10%	025-121-9-003				QFT2-127	1FT-S22	
C440	.01			UK25-103		MAG2511		HY-520
C444	.022 10%						QFT2-127	1FT-S22
C445	.022	025-121-9-003	UK25-223				HY-725	
C454	.2 12V		UK12-2D4		MAG12022		HY-370	

PARTS LIST AND DESCRIPTION (CONTINUED)

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

CAPACITORS (cont)

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA				
			CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
						Q-LINE	GENERAL LINE
C459	.2 12V		UK12-204		MAG12022		HY-370
C460	.0047		0D-472	GP4700	GP247		5GA-047
C461	.0047		0D-472	GP4700	GP247		5GA-047
C501	.1		UK12-104		MAG1201		HY-360
C502	.1		UK12-104		MAG1201		HY-360
C503	.2 12V		UK12-204		MAG12022		HY-370
C504	.2 12V		UK12-204		MAG12022		HY-370
C523	.01		UK25-103		MAG2511		HY-520
C524	.001 50V	033-032-9-001 (1)					
C525	.001 50V						
C526	.001 50V						
C601	.001 50V	033-032-9-002 (2)					
C602	.001 50V						
C603	.001 50V						
VC1	70	028-047-9-001					
VC2	70	028-047-9-001					
VC3	70	028-047-9-001					

- (1) Assembly, includes C524, C525, C526.
- (2) Assembly, includes C601, C602, C603.

COBRA MODEL 46XLR

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

ITEM No.	FUNCTION	RESISTANCE	REPLACEMENT DATA				TRW PART No.
			MFR. PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	MALLORY PART No.	
VR1A	Volume-Left	20K	008-323-9-002				
B	Volume-Right	20K	(18)				
VR2A	Tone-Left	50K					
B	Tone-Right	50K					
VR3	Switch	20K	008-323-9-003				
VR4	Balance	10K	008-323-9-004				
	Squelch		(19)				
VR5	DynamiKe	10K					U260R2538
VR101	S Meter	20K	008-316-9-003				U260R5038
VR102	AGC Range	50K	008-316-9-002				U260R5038
VR103	Squelch Range	50K	008-316-9-002				U260R5038
VR104	RF Meter	50K	008-316-9-002				U260R5038
VR105	AMC	3000	008-323-9-001				U260R502B
VR106	19kHz	5000	008-316-9-004				U260R502B

- (18) Includes VR1A, VR1B, VR2A, VR2B and Switch.
- (19) Includes VR4 and VR5.

RESISTORS (Power and Special)

ITEM No.	RATING	REPLACEMENT DATA		ITEM No.	RATING	REPLACEMENT DATA	
		WORKMAN PART No.	MFR. PART No.			WORKMAN PART No.	MFR. PART No.
RR1	Resistor Network		527-079-9-001 (1)	RR2	Resistor Network		527-079-9-001 (1)

- (1) Consists of seven 2.2K Ohm 1/8 Watt resistors.

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.	
CF3	Filter	140-020-9-002	FL-033		
L1	IF (10.7MHz)	046-020-9-002	LB-095		
L2	AM Convergence (250kHz)	046-020-9-001	LB-094		
L3	AM IF (250kHz)	046-019-9-004	LB-077		
L4	RF Choke (4.7uH)	041-088-9-002	LZ-002		
L5	RF Choke (4.7uH)	041-088-9-002	LZ-002		
L101	Rec Antenna (27MHz)	066-017-9-001	LA-029	CBS740T	
L102	RF Amp (27MHz)	060-027-9-001	LA-197		
L103	IF (10.695MHz)	060-024-9-001	LA-180	CBS715-TC	
L104	IF (455kHz)	060-022-9-001	LA-163		
L105	IF (455kHz)	060-024-9-004	LA-183		
L106	IF (455kHz)	060-024-9-005	LA-184		
L107	Antenna Match	041-093-9-001	LE-064		
L108	Pi Filter	041-078-9-001	LC-110		
L109	Final (27MHz)	041-088-9-001	LC-019	CB305	
L110	RF Choke	044-028-9-003	LD-012	4588	
L111	RF Choke	041-094-9-001	LC-051		
L112	XMT Driver (27MHz)	060-024-9-010	LA-189		
L113	XMT Buffer (27MHz)	060-024-9-006	LA-185		
L114	XMT Mixer (10MHz)	060-024-9-011	LA-193		
L115	PLL Input (10.240MHz)	060-024-9-003	LA-182		
L116	RF Choke (100uH)	041-087-9-002	LZ-012		
L117	RF Choke (1uH)	041-062-9-001	LZ-002	4622	
L118	PLL Mixer (36MHz)	060-027-9-002	LA-196		
L119	VCO	060-024-9-008	LA-187		
L120	VCO (36MHz)	060-024-9-009	LA-188		

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000~)	MFGR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T2	1050mA	.114	1mH	042-014-9-001 TF-017 (1)	TR507		(1) Number on unit.

TRANSFORMER (Audio Output)

ITEM No.	IMPEDANCE		REPLACEMENT DATA			NOTES
	PRI.	SEC.	MFGR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T1	8	8	061-037-9-001 TF-119 (1)			(1) Number on unit.

FUSE DEVICES

ITEM No.	DESCRIPTION	REPLACEMENT DATA						
		PART No.		BUSS PART No.		LITTELFUSE PART No.		WORKMAN PART No.
		DEVICE	HOLDER	DEVICE	HOLDER	DEVICE	HOLDER	DEVICE
F1	2A Quick Acting	191-251-9-002		AGC2	HDJ	312002	150145	FG2-2

PARTS LIST AND DESCRIPTION (CONTINUED)

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

MICROPHONE

ITEM No.	REPLACEMENT DATA				CONNECTION DATA						
	MFGR. PART No.	GC PART No.	GC NOISE CANCEL	GC POWER	GC CONNECTOR	GC Red	GC Shield	GC Yellow	GC Blue	GC White	GC Black
MIC	562-020-9-001	18-032	18-034	18-010	18-092	2	1	3	NC	NC	1

MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
CF1	Filter	140-020-9-003	10.7MHz
CF2	Filter	140-020-9-003	10.7MHz
CF101	Filter	140-020-9-001	10.7MHz
CF102	Filter	140-018-9-002	455kHz
CN1	Socket	426-023-9-001	CB
CN2	Socket	426-026-9-001	Radio
CN3	Socket	426-026-9-004	Speaker/Power Cord
CN4	Socket	426-026-9-002	Mic
D151	LED	158-016-9-001	Lamp (1.57V @ 7.5mA)
D152	LED	151-064-9-003	Lamp (1.63V @ 8mA)
D153	LED	158-014-9-001	Number Display
MT1	Meter	320-092-9-001	S/RF
PL1	Lamp	400-049-9-001	Dial (12.30V @ 45mA)
PL2	Lamp		Meter (9.84V @ 32mA)
S2	Switch	088-037-9-001	FM/AM/CB/DIM/ANL/Moni/DX
S4	Switch	083-228-9-001	Channel Selector
X1	Crystal	133-014-9-002	10.695MHz
X2	Crystal	133-014-9-001	10.240MHz
X3	Crystal	133-014-9-003	36.570MHz
	Printed Circuit Board	302-261-9-001	CB Main
	Printed Circuit Board	302-265-9-001	Channel Display
	Printed Circuit Board	302-266-9-001	Channel Selector
	Printed Circuit Board	302-264-9-001	Noise Filter
	Printed Circuit Board	302-263-9-001	Variable Resistors
	Printed Circuit Board	302-262-9-001	Radio Main

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

ITEM	PART No.	ITEM	PART No.
Button (AM)	384-022-9-006	Chassis (Main)	257-096-9-001
Button (ANL)	384-022-9-002	Chassis (Radio)	523-204-9-004
Button (CB)	384-022-9-007	Chassis (Rear)	258-025-9-001
Button (DIM)	384-022-9-001	Knob (Channel)	751-154-9-001
Button (DX)	384-022-9-004	Knob (Dynamike)	751-154-9-003
Button (FM)	384-022-9-005	Knob (Squelch)	751-154-9-002
Button (MON)	384-022-9-003	Panel (Dull Black)	260-133-9-001
Chassis (Front)	258-024-9-001	Panel (Wood Grain)	260-134-9-001

COBRA MODEL 46XLR

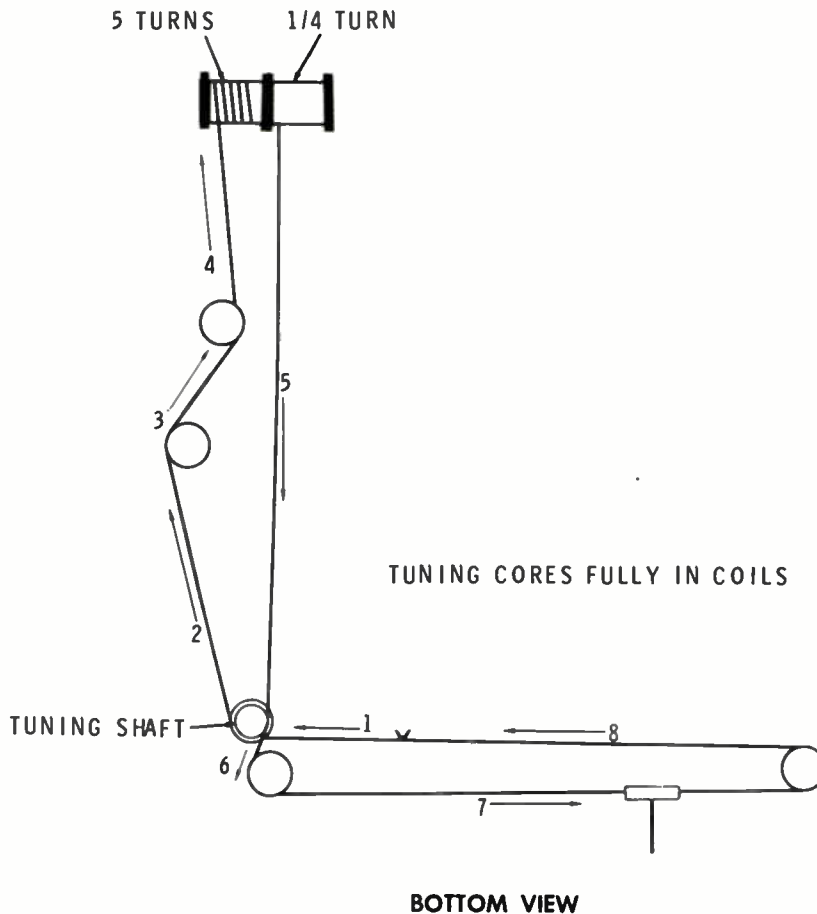
PARTS LIST AND DESCRIPTION (CONTINUED)

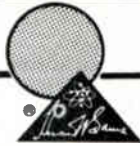
(When ordering parts, state Model, Part Number, and Description.)

WIRING DATA

General-use Hook-up Wire (available in 5 colors)	BELDEN No. 8523	Coiled Microphone Cable	
Shielded Hook-up Wire (spiral wrapped)	BELDEN No. 8421	3-conductor (1 shielded)	23AWG BELDEN No. 9471 (5')
(braided)	BELDEN No. 8401		BELDEN No. 8497 (6')
Speaker Cable (available in 4 colors)	BELDEN No. 8782		BELDEN No. 9472 (7-1/2')
Bonding Strap	BELDEN No. 8672		28AWG BELDEN No. 9466 (6')
AC Power Cord	(6') BELDEN No. 17106		31AWG BELDEN No. 9468 (10')
	(9') BELDEN No. 17109	4-conductor (unshielded)	23AWG BELDEN No. 8415 (6')
		5-conductor (1 shielded)	28AWG BELDEN No. 9467 (6')
			BELDEN No. 9465 (7-1/2')

DIAL CORD STRINGING





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 1000 (Black Shadow)

MANUFACTURER'S SPECIFICATIONS

MODEL 480

TRANSMITTER

Power:	4 Watts -- AM (max. allowed by FCC) 12 Watts PEP -- SSB (max. allowed by FCC)
Modulation:	High and low level Class B amplitude modulation (AM)
Modulation Capability:	95% Typical (AM)
Harmonic Suppression and Spurious Emissions:	Better than FCC requirement
Frequency Response:	400 Hz to 5 kHz -- AM 400 Hz to 3 kHz -- SSB
Output Impedance:	50 Ohms, unbalanced
Output indicators:	Meter shows relative RF output power, receiving signal strength. Tx red lamp indicates transmit mode.

RECEIVER

Sensitivity -- AM:	.7 μ V for 10 db S/N
Sensitivity -- SSB:	.25 μ V for 10 db S/N

Selectivity:	5 db at 4 kHz (AM), 5 db at 2 kHz (SSB), 50 db at \pm 10 kHz (AM and SSB)
Image Rejection:	More than 50 db
IF Rejection:	More than 80 db at 455 kHz
Automatic Gain Control (AGC):	Change in audio output less than 12 db from 10 μ V to .4 volts
Squelch:	Adjustable -- threshold less than .5 μ V
Audio Frequency Response:	400 to 2.5 kHz
Distortion:	Less than 10% at 3.0 watts output
Adjacent Channel Rejection:	More than 50 db at .3 μ V
Cross Modulation:	More than 50 db
IF Frequency:	10.695 MHz, 455 kHz
Clarifier:	\pm 800 Hz
Noise Blanker:	IF single gate type
Audio Output Power:	More than 3 watts into 8 Ohms
Built-in Speaker:	8 Ohms, dynamic
External Speaker (optional):	Disables internal speaker when connected

COLT MODELS 480, 1000

MODEL 1000

RECEIVER

System	SSB: Single conversion superheterodyne AM: Double conversion superheterodyne
Sensitivity	SSB: 0.3 μ V for 10 dB S/N AM: 1 μ V for 10 dB S/N
Selectivity	SSB: 2 kHz at 6 dB down AM: 6 kHz at 6 dB down
Clarifier	\pm 800 Hz
Audio Output	3 W at 8 ohms
Squelch Range	SSB: 0.7 μ V to 300 μ V AM: 1 μ V to 300 μ V
Intermediate Frequency	SSB: 10.695 MHz AM: 1st/10.695 MHz, 2nd/455 kHz

SSB TRANSMITTER

Generation	Double balanced modulator with crystal lattice filter
RF Output Power	12 W PEP FCC maximum, at 13.8 V DC or 117 V AC 50/60 Hz
Carrier Suppression	More than 40 dB down

Unwanted Sideband

Suppression	More than 60 dB down
Harmonic Suppression	More than 60 dB down

AM TRANSMITTER

RF Output power	4 W FCC maximum, at 13.8 V DC or 117 V AC 50/60 Hz
Harmonic Suppression	More than 60 dB down
Modulation	High level class B

Courtesy of the Manufacturer

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-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:
 L7,L11,L13,T6,T10,T13,T14,T15.....5009
 T1 thru T5,T7,T8,T9,T11,T12.....9440
 CT1 thru CT5.....5000

SYNTHESIZER ALIGNMENT

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Input of frequency counter to TP2.	Ch. 19, USB	CT3	Adjust for 10.240MHz +50Hz.
Input of oscilloscope to TP3.	Ch. 19, USB	T3	Adjust for maximum.
Input of frequency counter to TP3.	Ch. 19, USB Clarifier Centered	CT1	Adjust for 20.105MHz +40Hz.
	Ch. 19, LSB Clarifier Centered	CT2	Adjust for 20.1035MHz +40Hz.
Input of frequency counter to TP5.	Ch. 19, USB	CT5	Adjust for 10.695MHz +50Hz.
	Ch. 19, LSB	CT4	Adjust for 10.692MHz +50Hz.
Input of DC meter to TP1	Ch. 1, USB	VCO	Adjust for 3.6 volt +0.1 volt.
Input of frequency counter to TP13 (IC3, Pin 4).	Ch. 1, USB		Check for 37.660MHz. Check all channels. (See Truth Chart for correct frequencies).
	Ch. 1, LSB		Check for 37.657MHz. Check all channels. (See Truth Chart for correct frequencies).
Inject a 2400Hz, 2.5mV signal at MIC input. Input of RF VTVM to antenna jack.	Ch. 40, USB XMT	T1	Adjust for maximum.
	Ch. 1, USB XMT	T2	Adjust for maximum.

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.

AM

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Output of signal generator thru .01uF to TP11. 455kHz,1000Hz @ 30% modulation.	Ch. 19, AM Clarifier Midrange LOC/DX DX Squelch MINIMUM NB & ANL Off	T14,T15	Adjust for maximum output.
Output of signal generator thru .01uF to antenna jack. 27.185MHz,1000Hz @ 30% modulation.	Ch. 19, AM Clarifier Midrange LOC/DX DX Squelch MINIMUM NB & ANL Off	T13,T10, T9,T8,T7	Adjust for maximum output. Repeat above steps, if necessary.

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.

SSB

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Output of signal generator thru .01uF to antenna jack. 27.186MHz, no modulation.	Ch. 19, USB Clarifier Midrange LOC/DX DX Squelch MINIMUM NB & ANL Off	T12	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.			
TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Input of DC meter to terminal 15. No signal input.	Ch. 19, USB LOC/DX DX Squelch MINIMUM NB & ANL Off	RV8	SSB AGC Adjust RV8 for 2 volts.
Output of signal generator thru .01uF to antenna jack. 27.185MHz, 1000Hz @ 30% modulation. Output 500uV.	Ch. 19, AM LOC/DX DX NB & ANL Off	RV9	AM SQUELCH RANGE Set Squelch Control VR2 fully clockwise. Adjust RV9 so that squelch just breaks.
Output of signal generator thru .01uF to antenna jack. 27.186MHz, no modulation. Output 500uV.	Ch. 19, USB LOC/DX DX NB & ANL Off	RV10	SSB SQUELCH RANGE Set Squelch Control VR2 fully clockwise. Adjust VR10 so that squelch just breaks.
Output of signal generator thru .01uF to antenna jack. 27.185MHz, 1000Hz @ 30% modulation. Output 100uV.	Ch. 19, AM LOC/DX DX NB & ANL Off	RV6	AM S METER Adjust RV6 for 9 on S scale of meter.
Output of signal generator thru .01uF to antenna jack. 27.186MHz, no modulation. Output 100uV.	Ch. 19, USB LOC/DX DX NB & ANL Off	RV7	SSB S METER Adjust RV7 for 9 on S scale of meter.

TRANSMITTER ALIGNMENT

Connect an RF wattmeter and 50-ohm, 25-watt dummy load to antenna connector at all times.
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	TRANSCEIVER	ADJUST	REMARKS
Inject a 2400Hz, 2.5mV signal at MIC input.	Ch. 40 Ch. 1	T4 T5	Adjust for maximum. Adjust for maximum.
Input of oscilloscope to TP10 (Q7 Emitter). Inject a 2400Hz, 25mV signal at MIC input.	Ch. 19, USB Ch. 19, USB	T11 RV11	Adjust for maximum. Turn core of T6 to tap. Adjust RV11 for .150 volt P-P.
Inject a 2400Hz, 25mV signal at MIC input.	Ch. 19, USB	T6,L7, L11,L13	Adjust for maximum RF output.

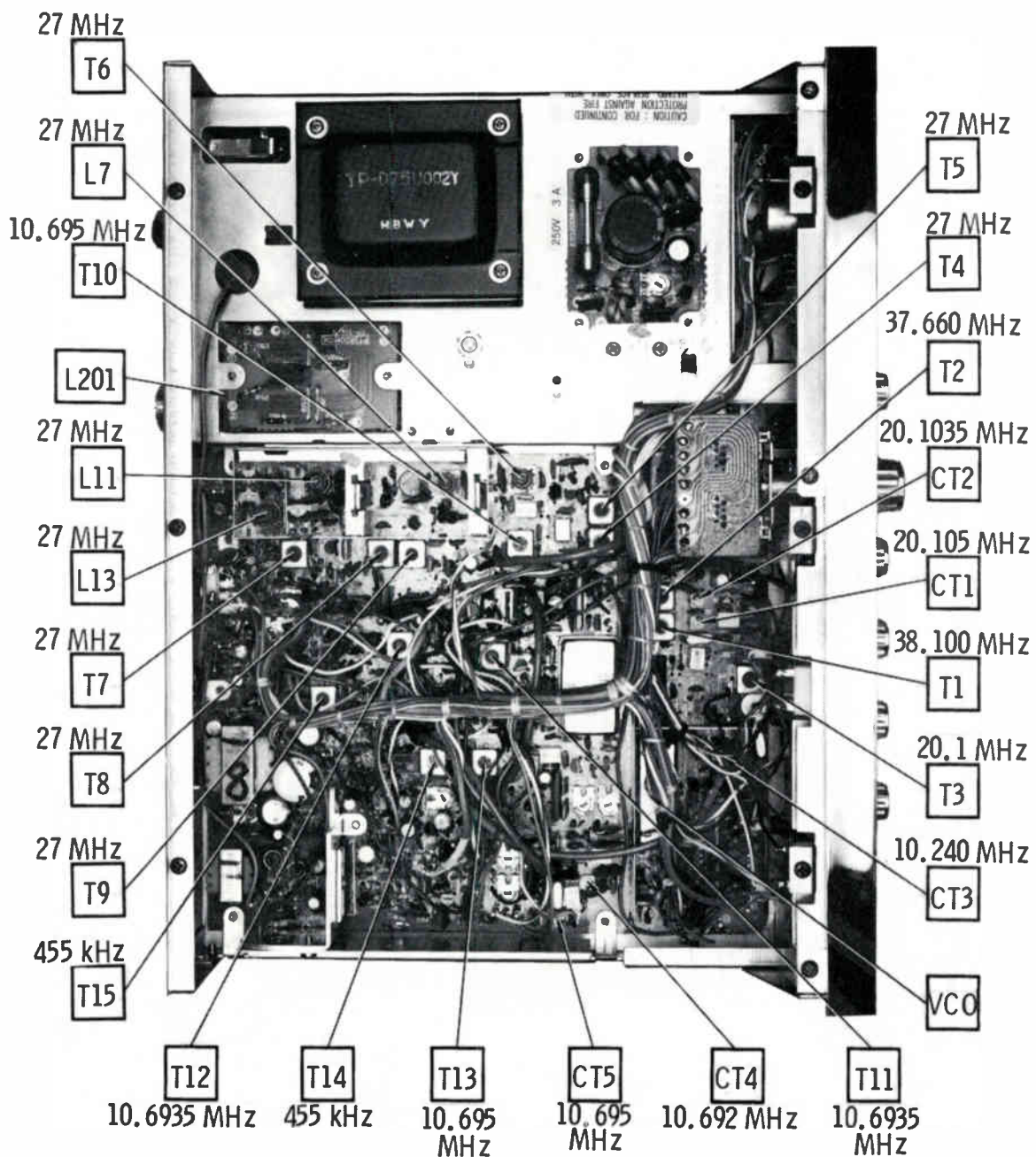
TRANSMITTER ADJUSTMENTS

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.

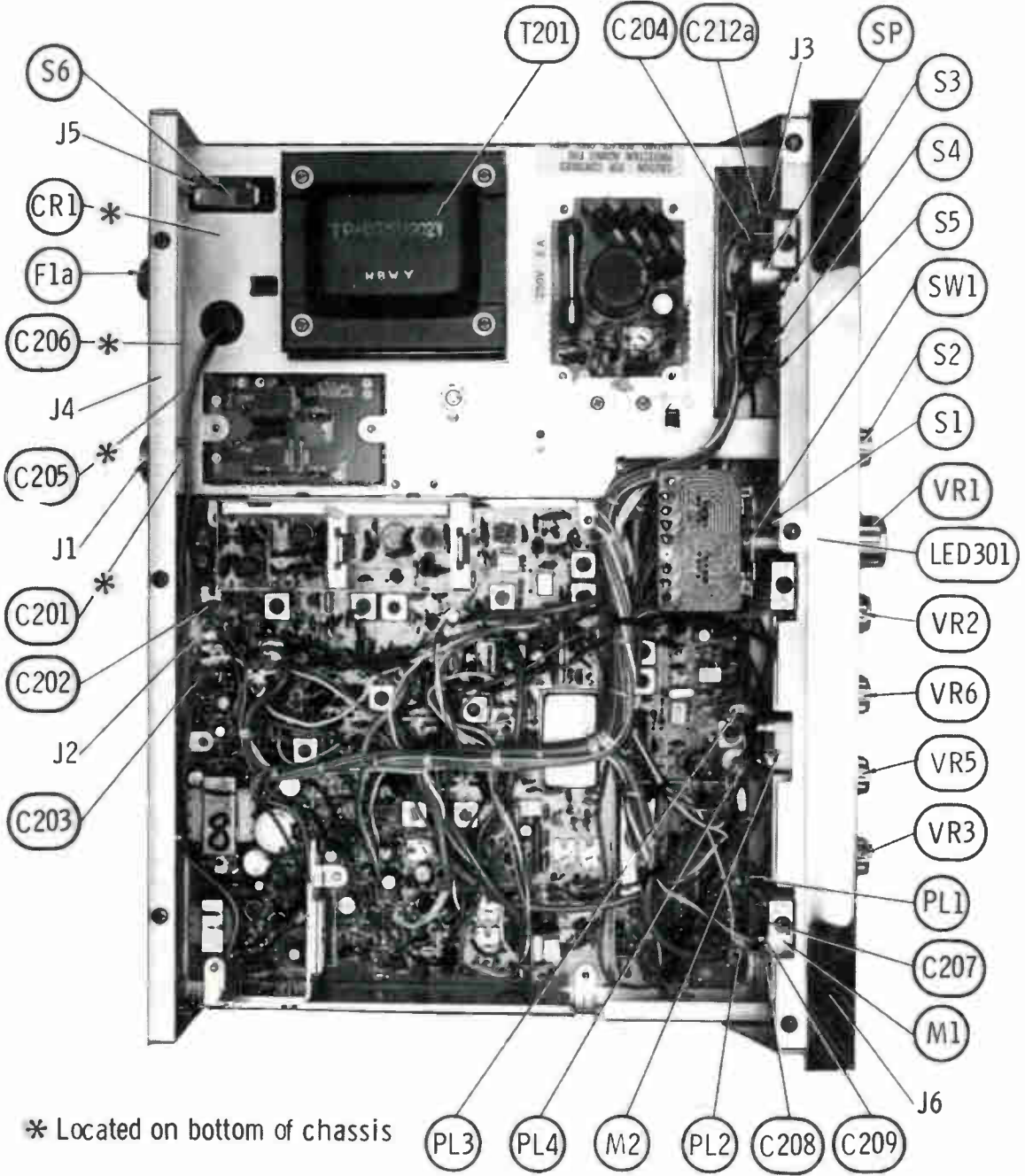
TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Input of DC meter to TP12 (Q201 Emitter).	Ch. 19, AM (1)	RV1 (Power Supply Board)	AWI Adjust RV1 for 13.8V. Voltage should not vary when keying transmitter.
Connect a 100 Ohm 5 watt non-inductive resistor to antenna connector.	C19, AM (1)	RV501	SWR Set SWR-CAL switch to cal position. Adjust SWR CAL control to SET on an SWR scale of meter. Set SWR-CAL to SWR position. Adjust RV501 for 2 on SWR scale of meter.
Inject a 2400Hz, 2.5mV signal at MIC input. Connect a milliammeter between Q10 emitter and ground.	Ch. 19, USB	RV1	BIAS Adjust for 35mA \pm 10mA.
RF wattmeter (See connection above). No signal input.	Ch. 19, USB	RV4, RV5	BALANCE Adjust for MINIMUM RF
Output of 2 tone generator to MIC input 500Hz and 2400Hz. Output 25mV.	Ch. 19, USB	RV2	SSB POWER Adjust for 10 watts.
Connect an RF wattmeter and 50-Ohm, 25 watt dummy load to antenna connector.	Ch. 19, AM	VR4	AM POWER Adjust for 3.7 watts.
Modulation meter to antenna jack. Inject a 2500Hz, 25mV signal at MIC input.	Ch. 19, AM	RV12	AMC Adjust for 95% modulation.
Connect an RF wattmeter and 50-Ohm, 25 watt dummy load to antenna connector.	Ch. 19, AM	RV3	POWER METER Adjust RV3 so that RF panel meter agrees with RF wattmeter.

TRUTH CHART

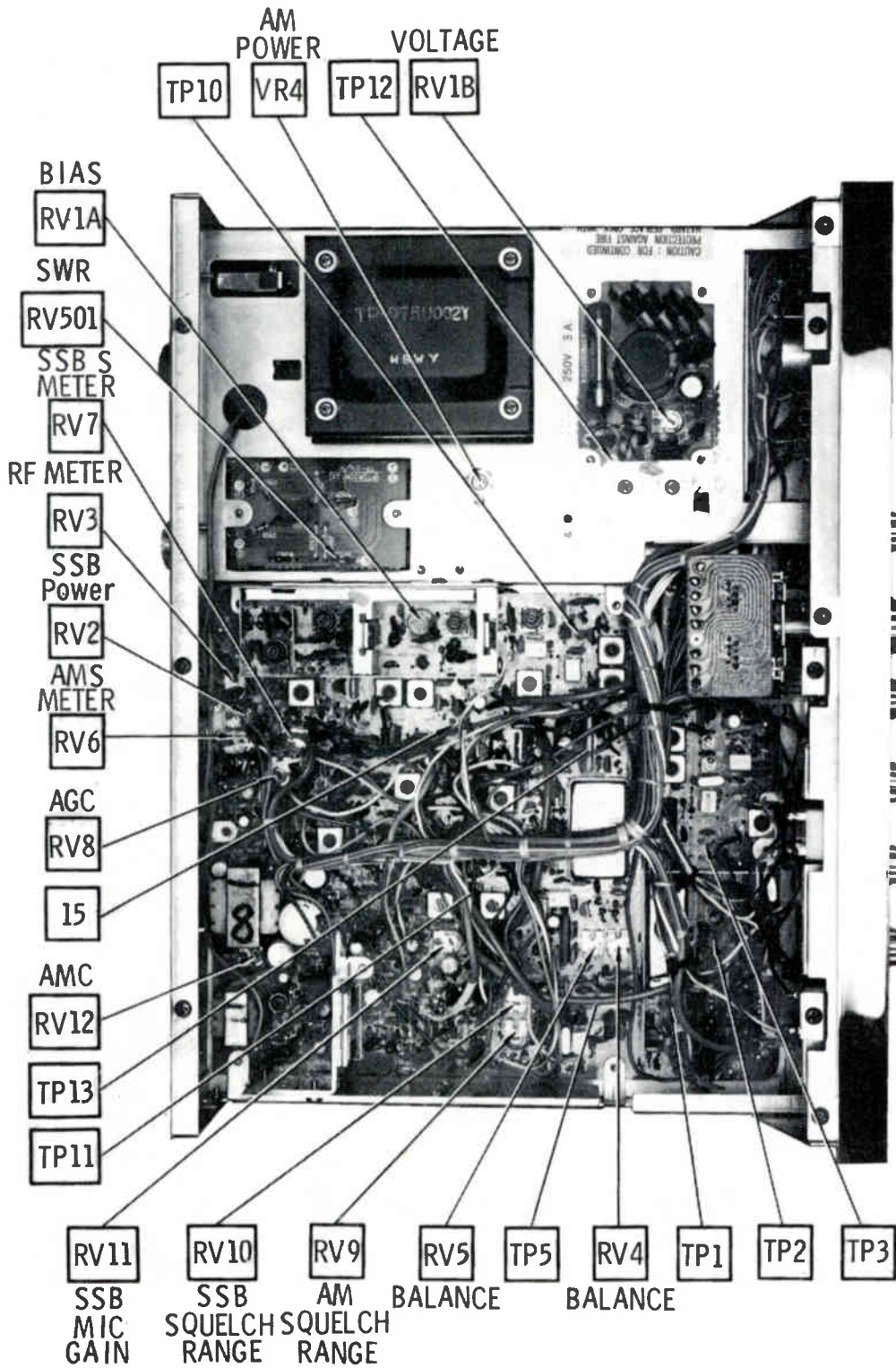
C H A N N E L	1 = 5.40 Volts 0 = 0 Volts IC1 Program Divider							REC & XMT AM & USB VCO OUTPUT IN MHz AT TP13	REC & XMT LSB VCO OUTPUT IN MHz AT TP13
	PINS								
	10	11	12	13	14	15			
1	1	1	1	1	1	1		37.660	37.657
2	1	1	1	1	1	0		37.670	37.667
3	1	1	1	1	0	1		37.680	37.677
4	1	1	1	0	1	1		37.700	37.697
5	1	1	1	0	1	0		37.710	37.707
6	1	1	1	0	0	1		37.720	37.717
7	1	1	1	0	0	0		37.730	37.727
8	1	1	0	1	1	0		37.750	37.747
9	1	1	0	1	0	1		37.760	37.757
10	1	1	0	1	0	0		37.770	37.767
11	1	1	0	0	1	1		37.780	37.777
12	1	1	0	0	0	1		37.800	37.797
13	1	1	0	0	0	0		37.810	37.807
14	1	0	1	1	1	1		37.820	37.817
15	1	0	1	1	1	0		37.830	37.827
16	1	0	1	1	0	0		37.850	37.847
17	1	0	1	0	1	1		37.860	37.857
18	1	0	1	0	1	0		37.870	37.867
19	1	0	1	0	0	1		37.880	37.877
20	1	0	0	1	1	1		37.900	37.897
21	1	0	0	1	1	0		37.910	37.907
22	1	0	0	1	0	1		37.920	37.917
23	1	0	0	0	1	0		37.950	37.947
24	1	0	0	1	0	0		37.930	37.927
25	1	0	0	0	1	1		37.940	37.937
26	1	0	0	0	0	1		37.960	37.957
27	1	0	0	0	0	0		37.970	37.967
28	0	1	1	1	1	1		37.980	37.977
29	0	1	1	1	1	0		37.990	37.987
30	0	1	1	1	0	1		38.000	37.997
31	0	1	1	1	0	0		38.010	38.007
32	0	1	1	0	1	1		38.020	38.017
33	0	1	1	0	1	0		38.030	38.027
34	0	1	1	0	0	1		38.040	38.037
35	0	1	1	0	0	0		38.050	38.047
36	0	1	0	1	1	1		38.060	38.057
37	0	1	0	1	1	0		38.070	38.067
38	0	1	0	1	0	1		38.080	38.077
39	0	1	0	1	0	0		38.090	38.087
40	0	1	0	0	1	1		38.100	38.097



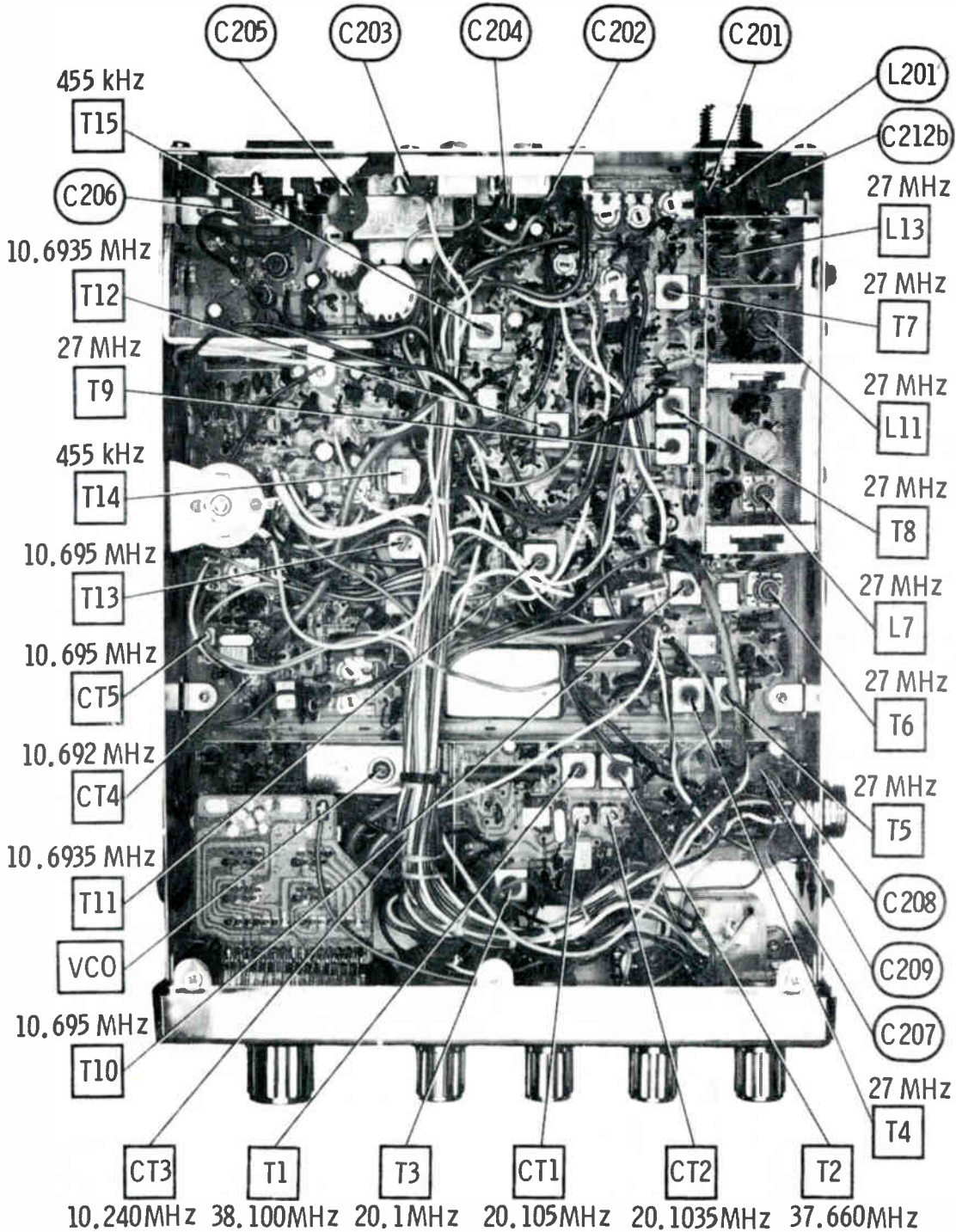
MODEL 1000 CHASSIS-TOP



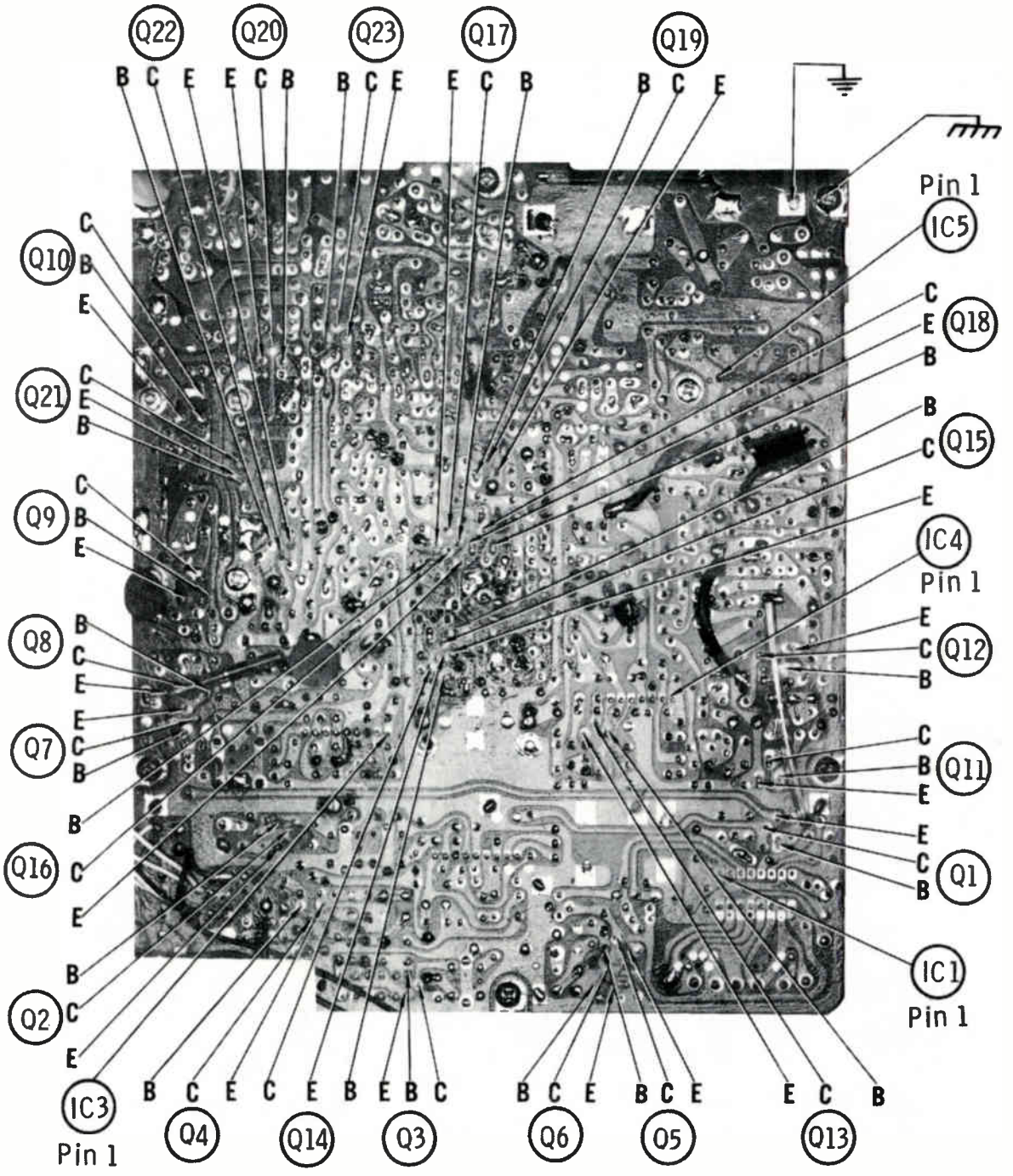
MODEL 1000 CHASSIS-TOP



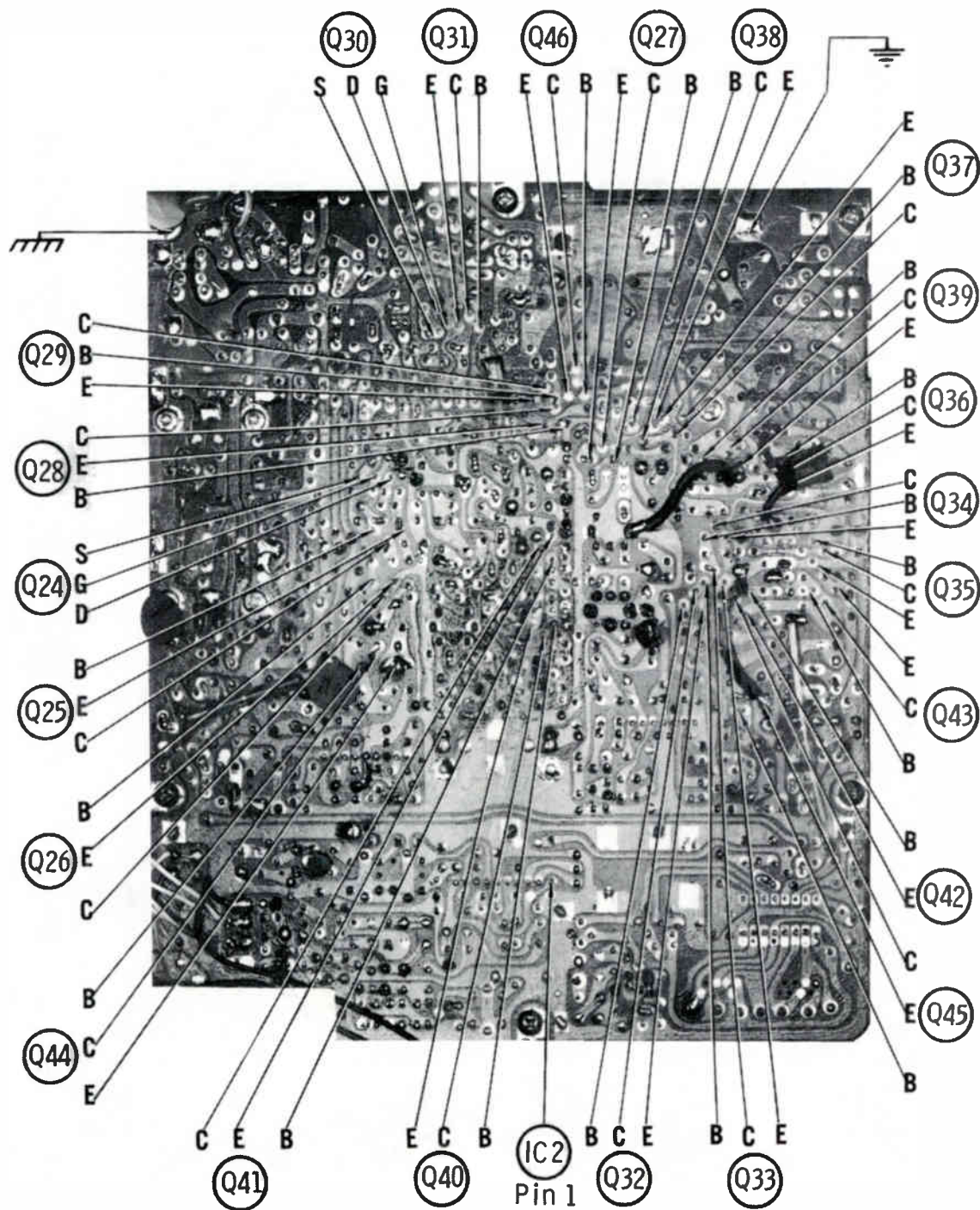
MODEL 1000 CHASSIS-TOP



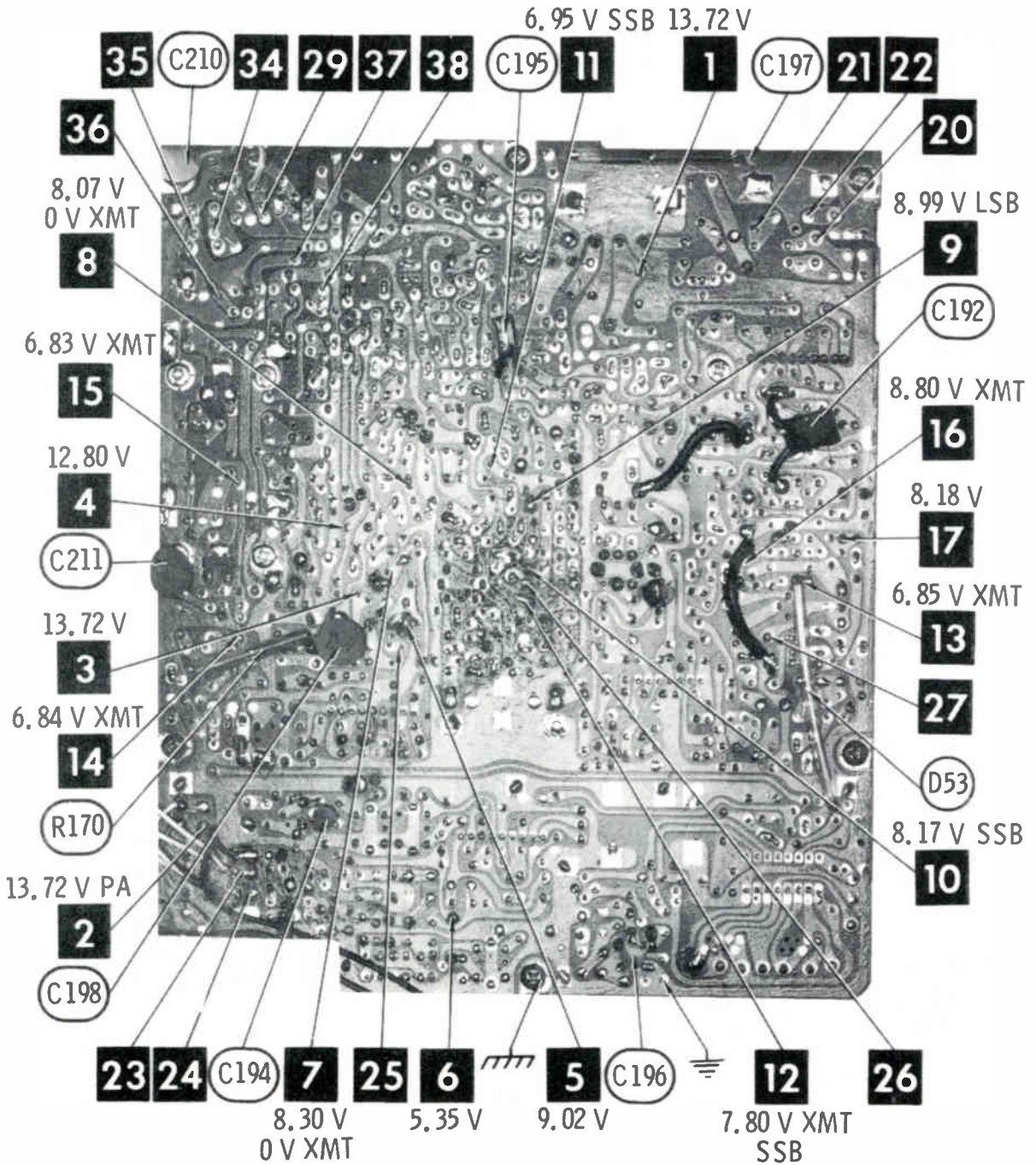
MODEL 480 CHASSIS-BOTTOM



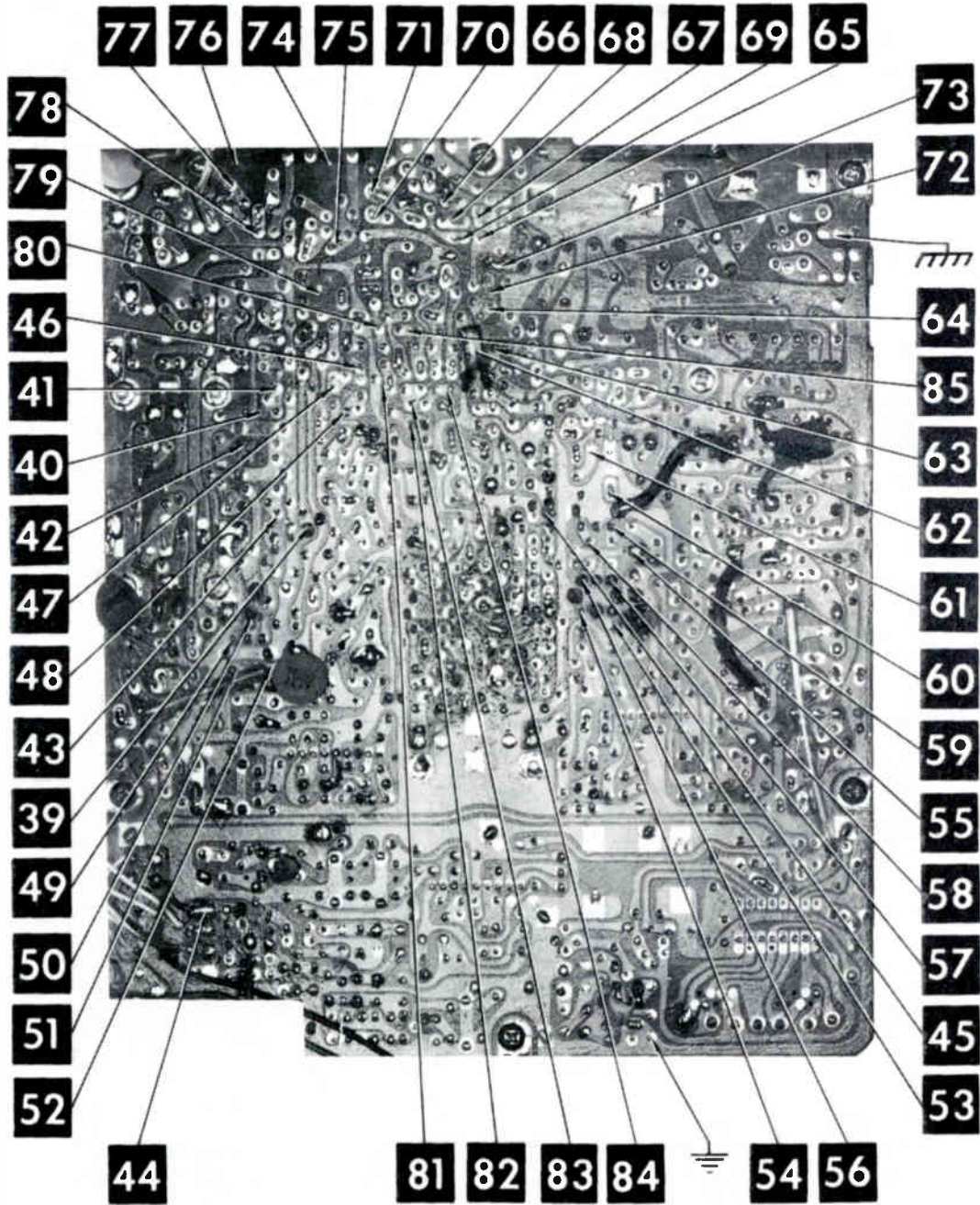
MAIN BOARD



MAIN BOARD

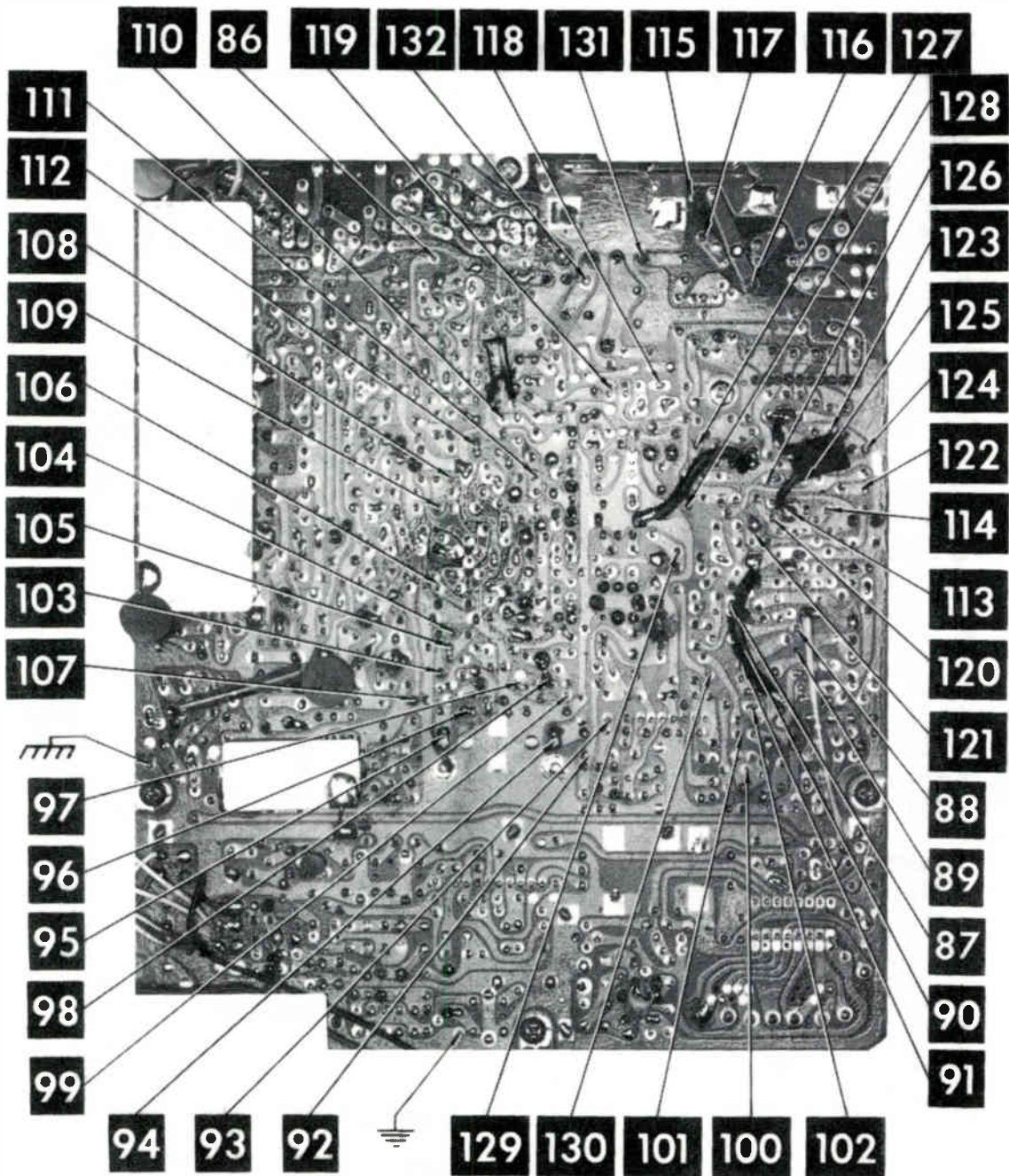


MAIN BOARD

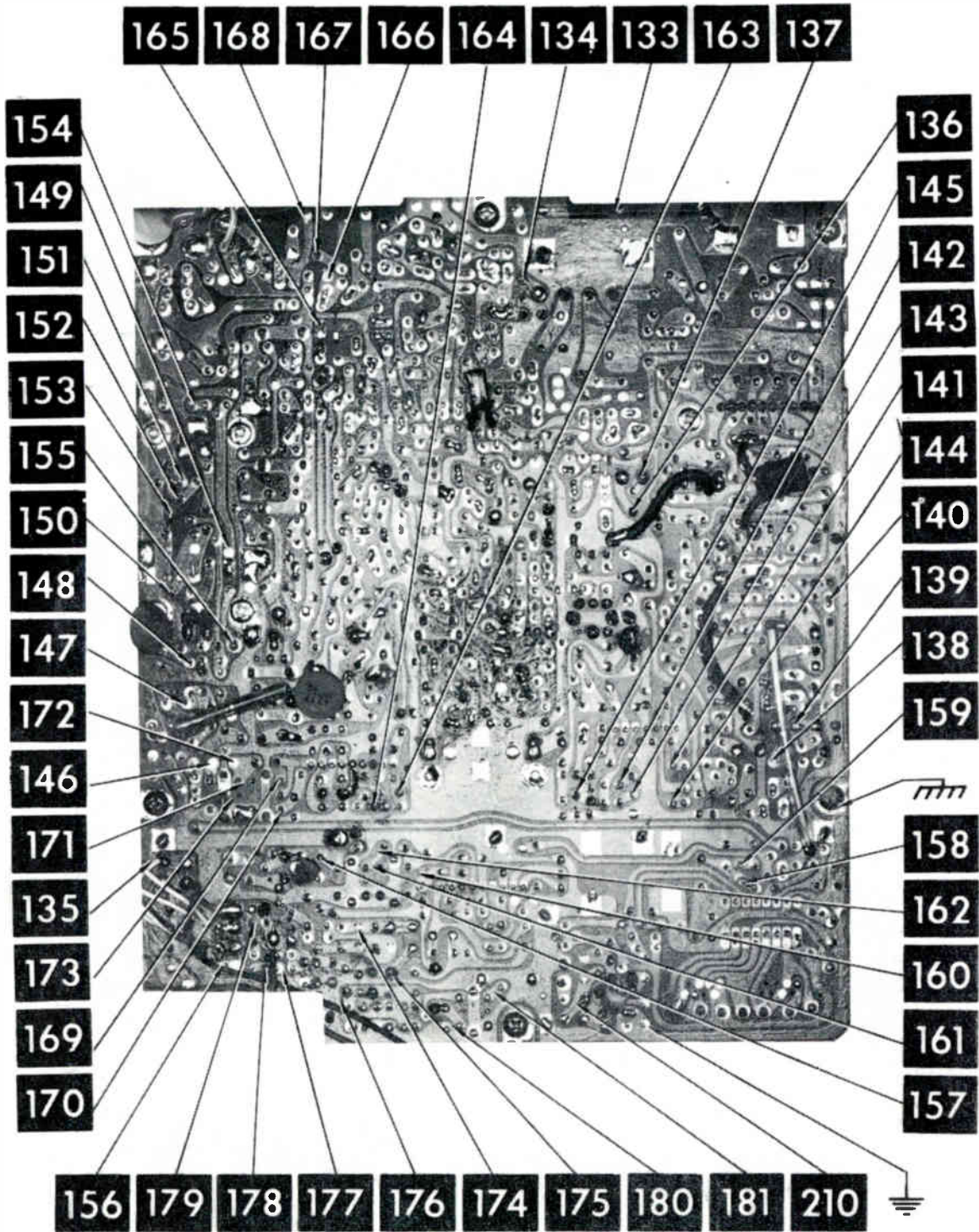


COLT MODELS 480, 1000

MAIN BOARD

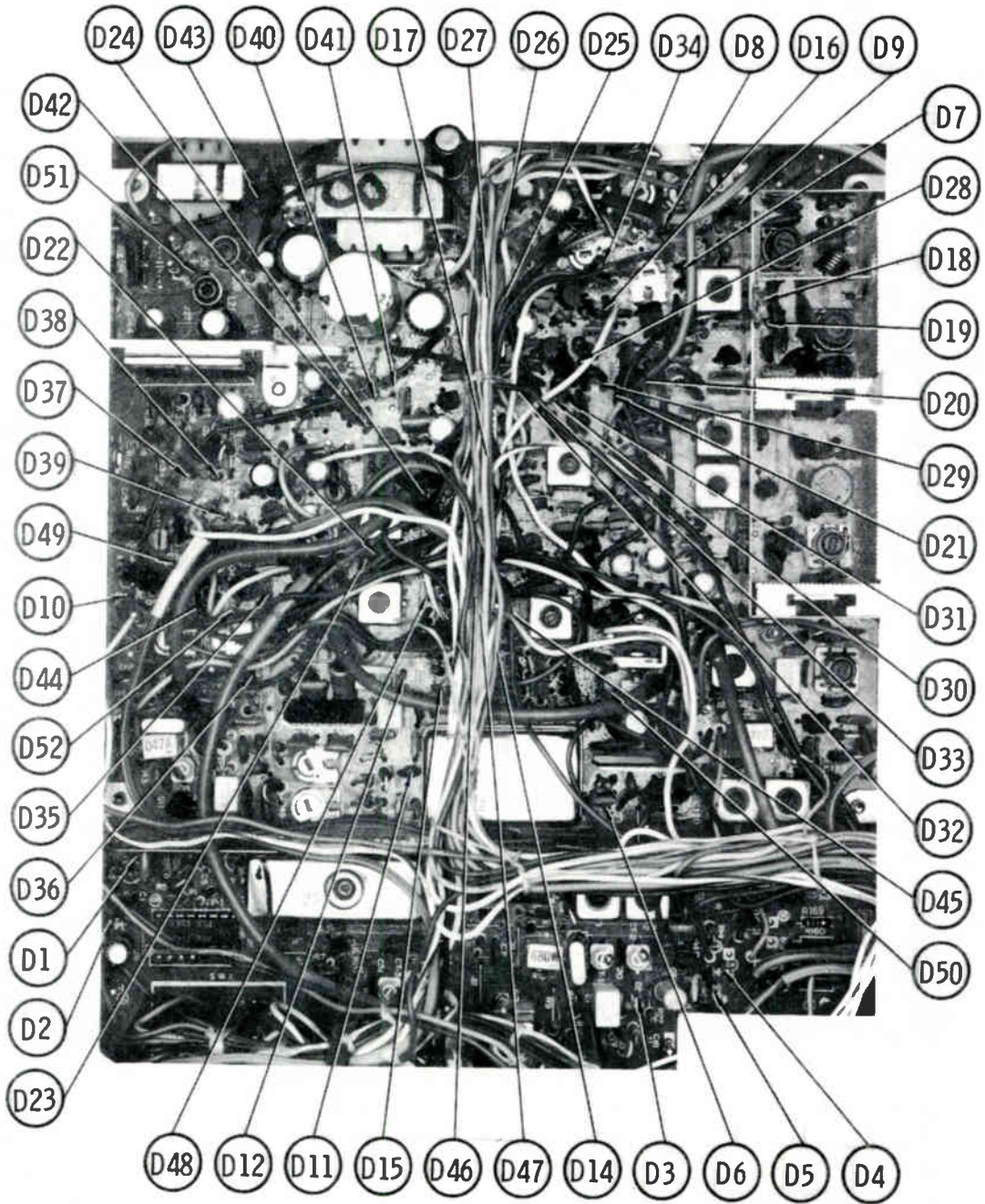


MAIN BOARD



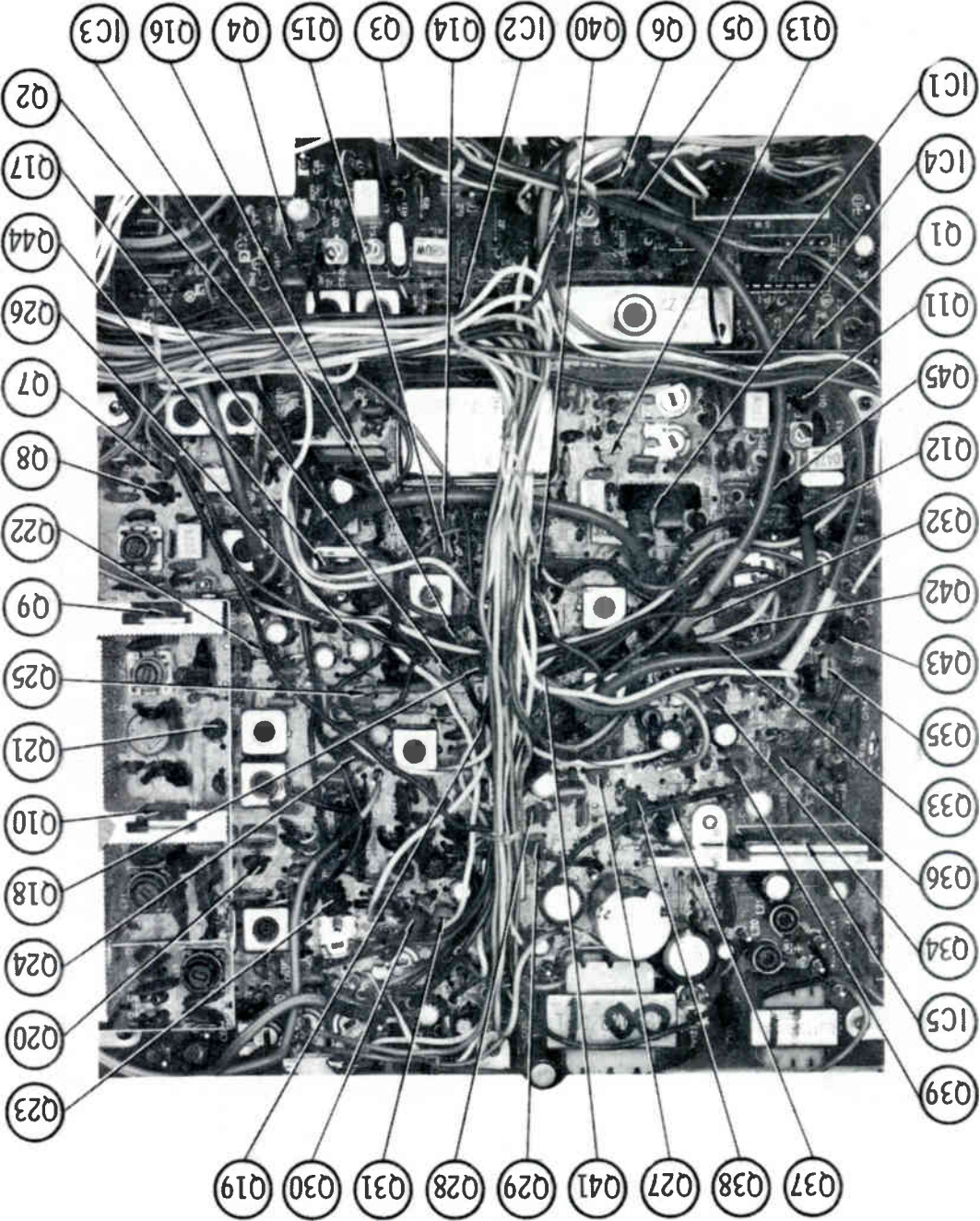
COLT MODELS 480, 1000

MAIN BOARD

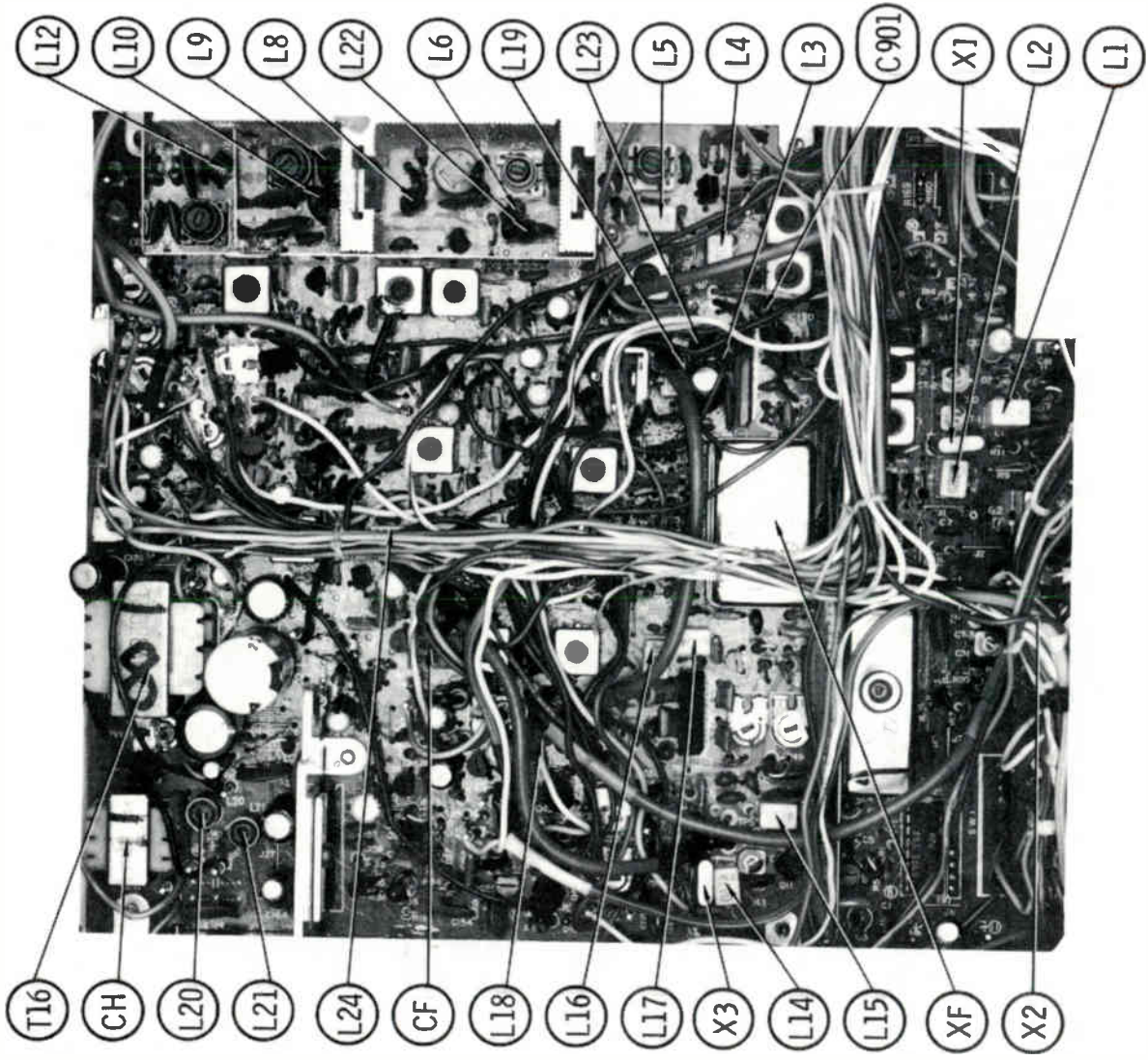


MAIN BOARD

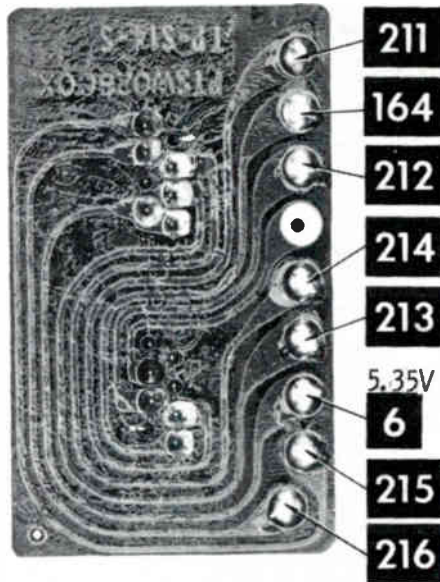
MAIN BOARD



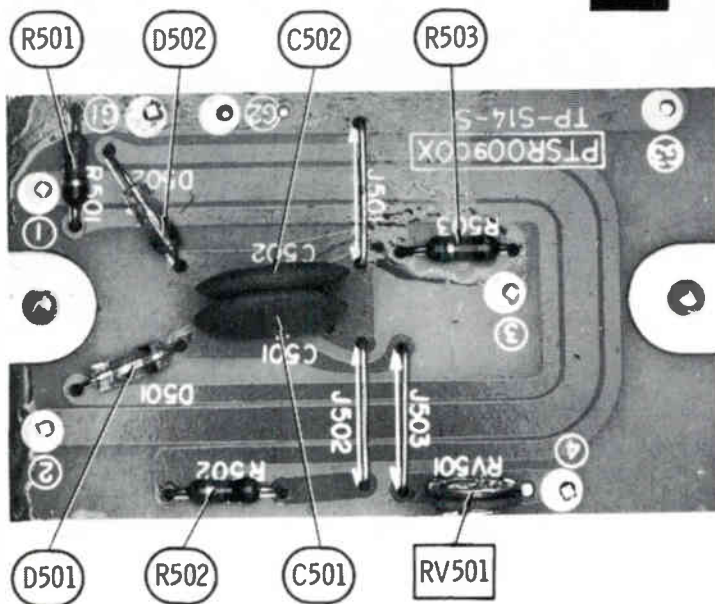
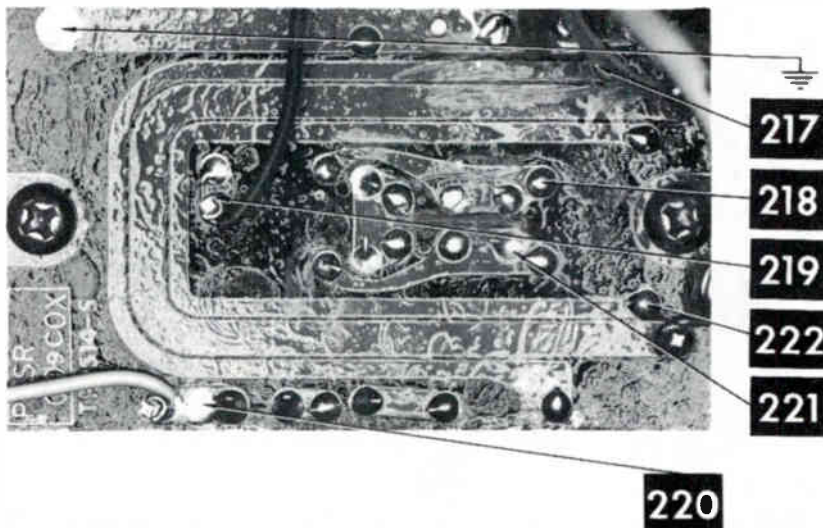
COLT MODELS 480, 1000



MAIN BOARD

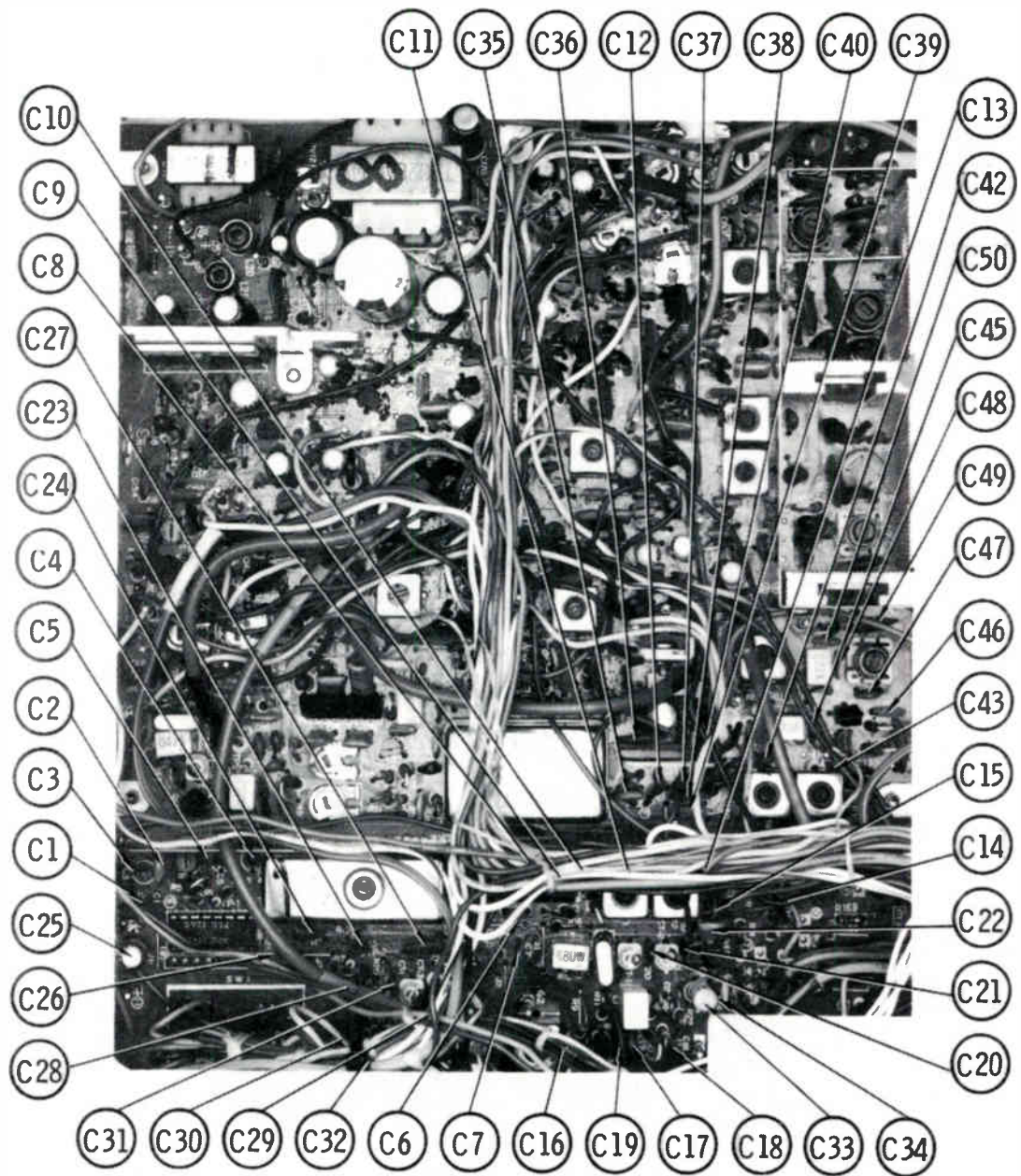


SWR BOARD

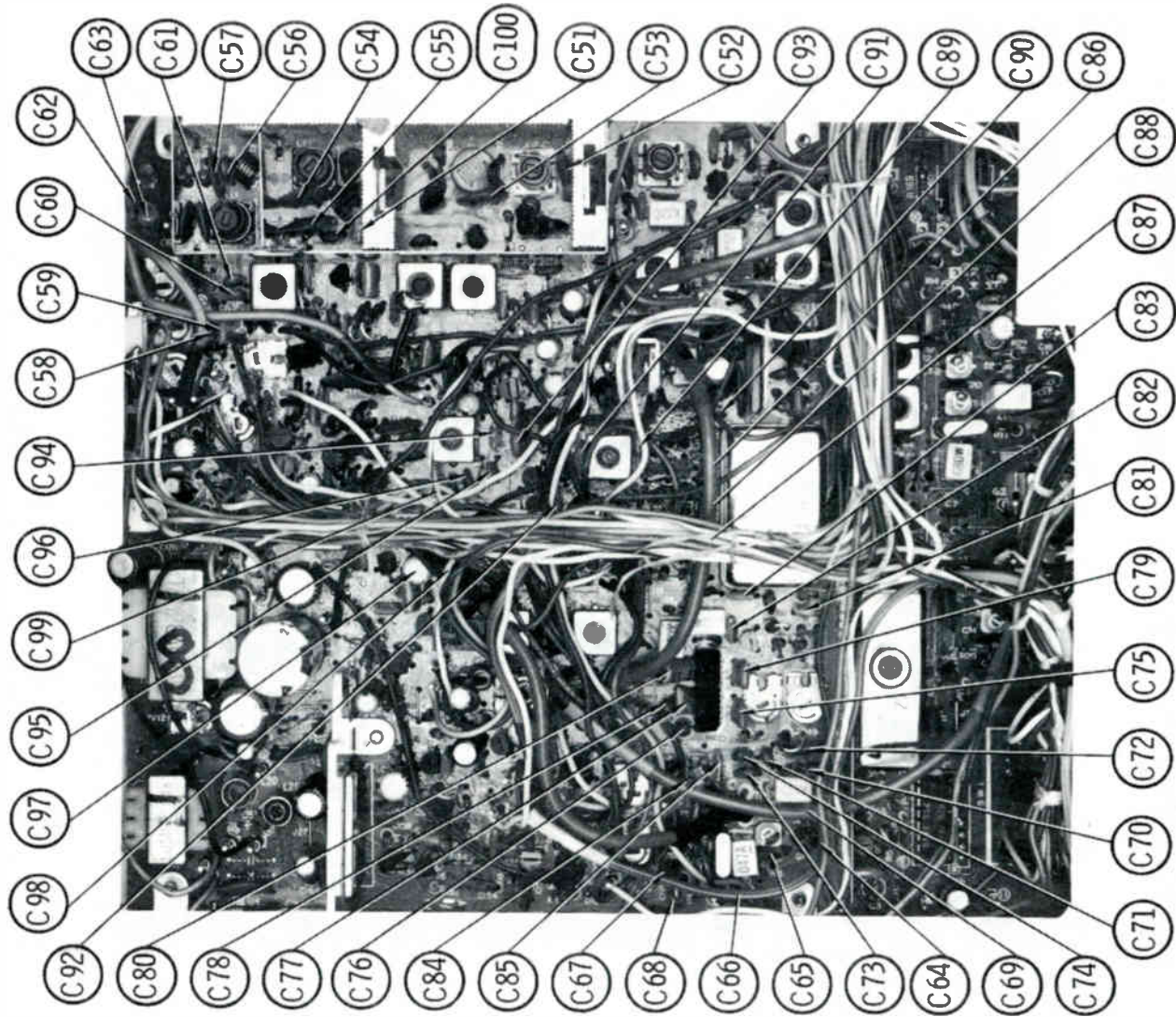


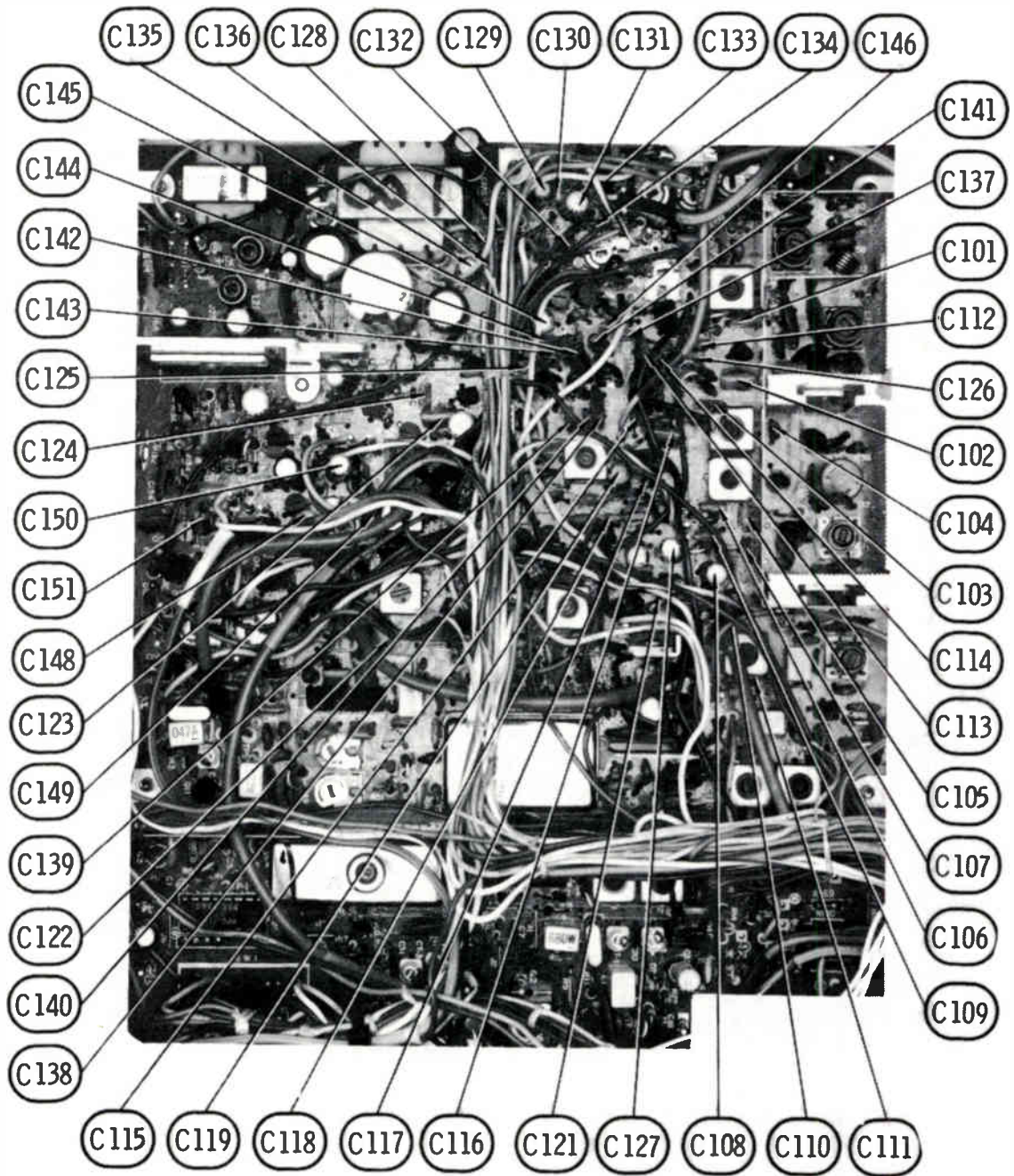
SWR BOARD

COLT MODELS 480, 1000

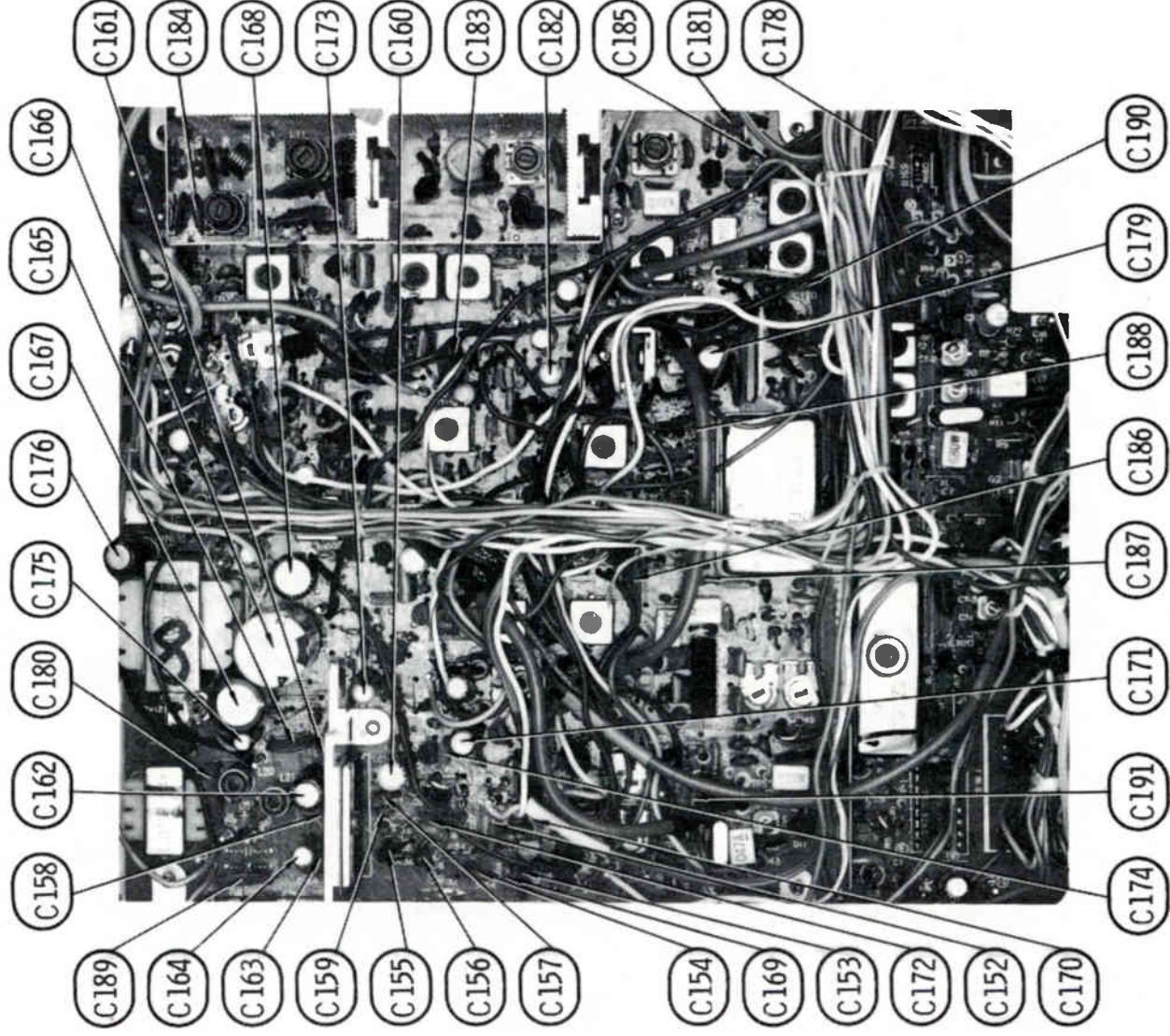


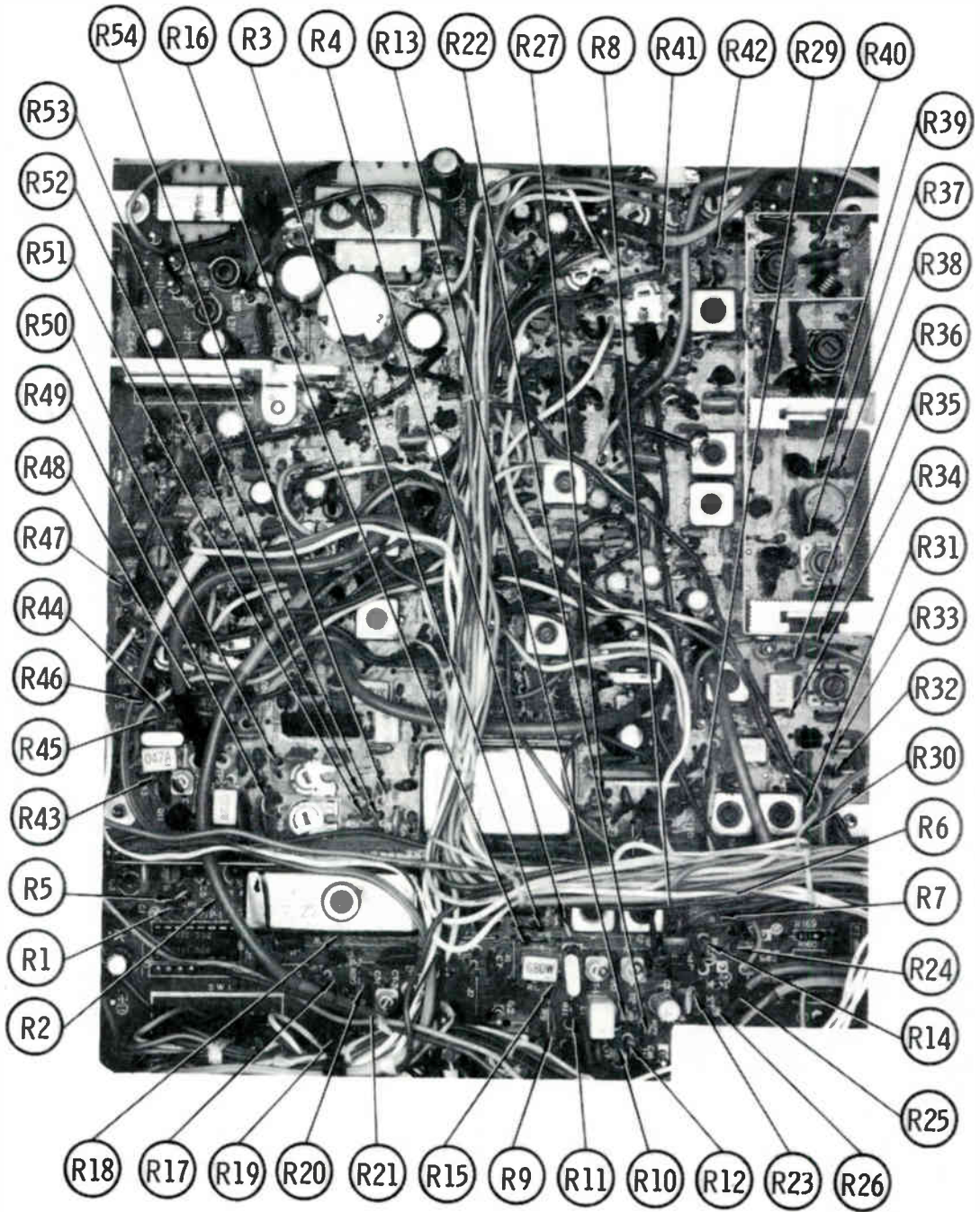
MAIN BOARD



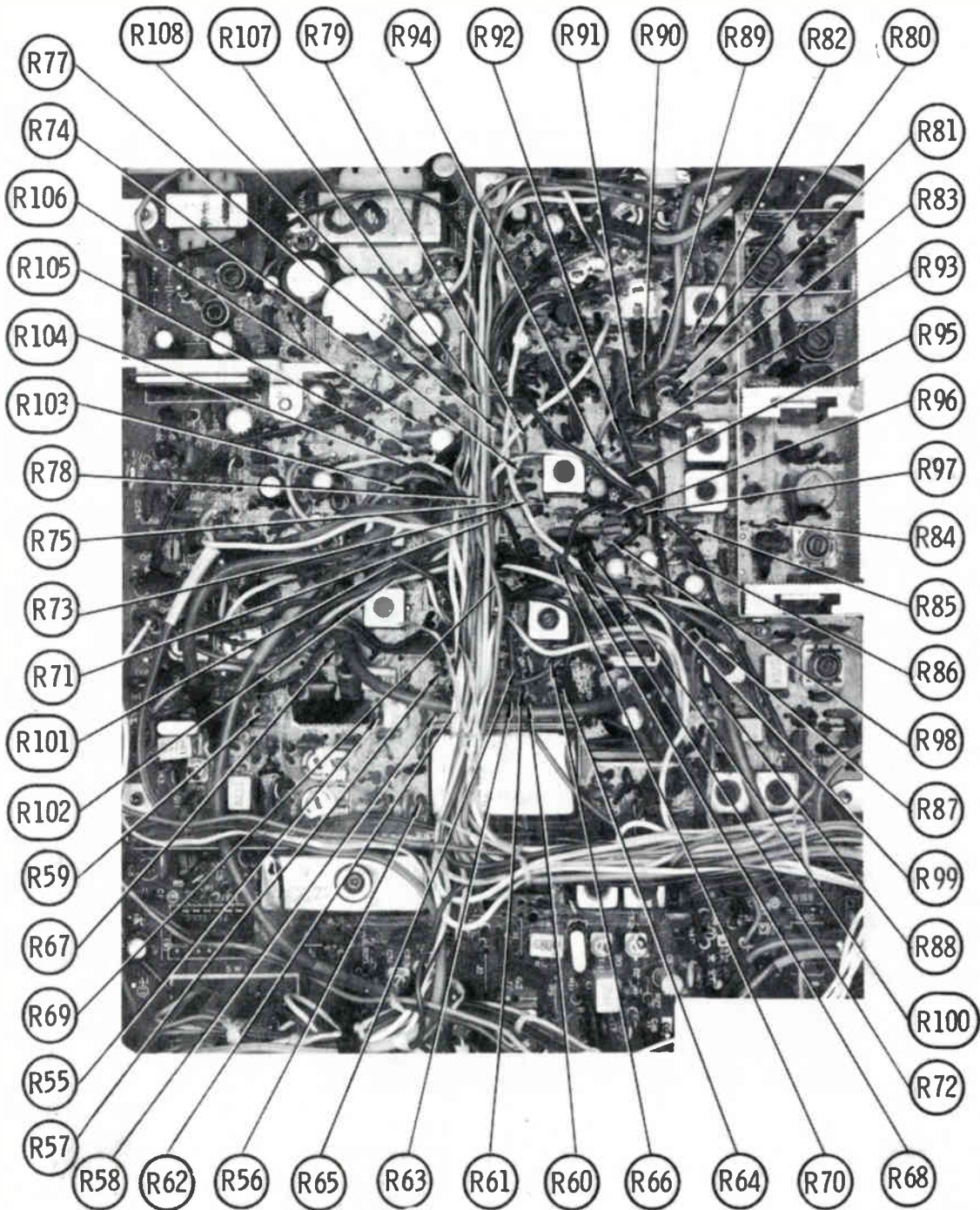


MAIN BOARD

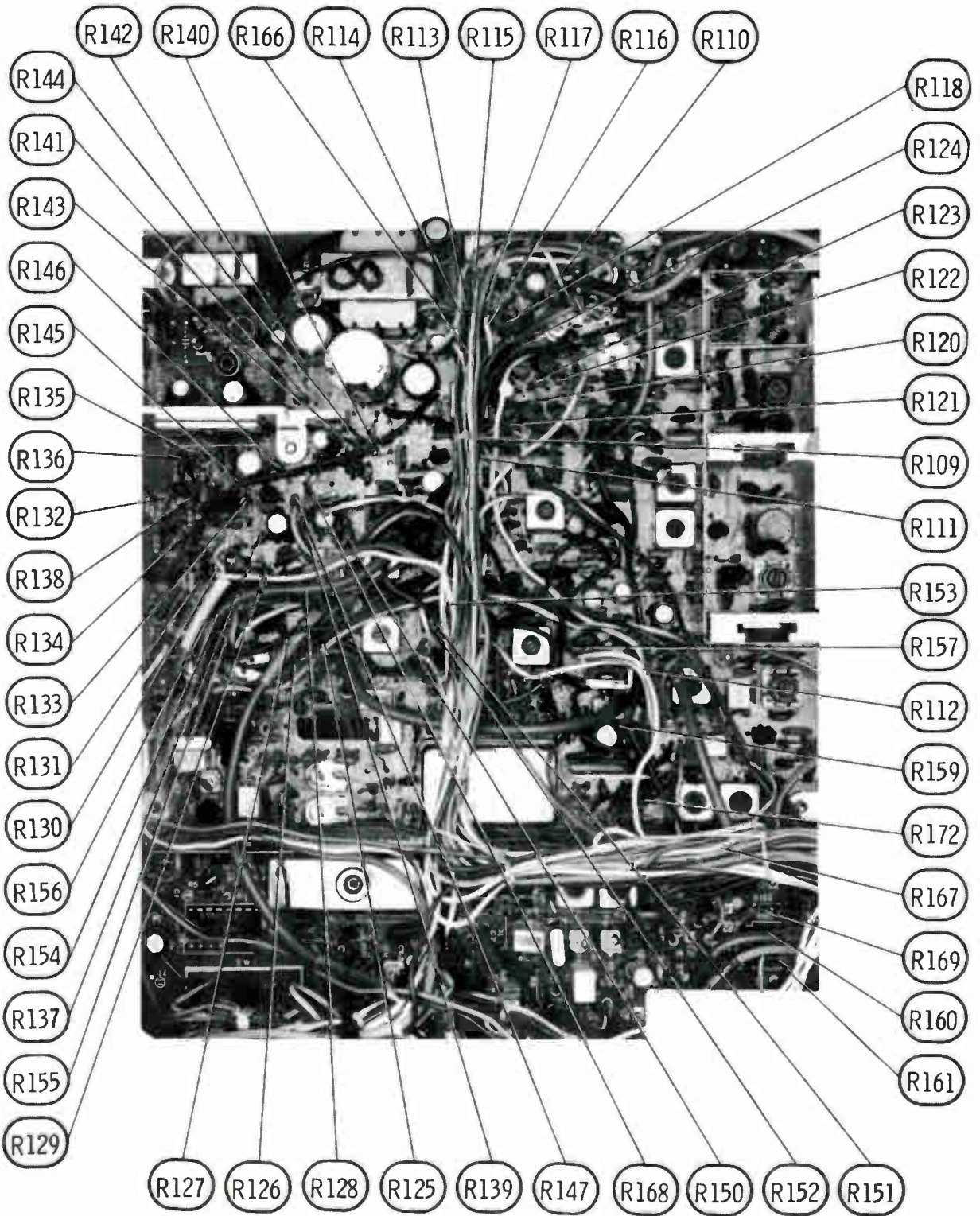




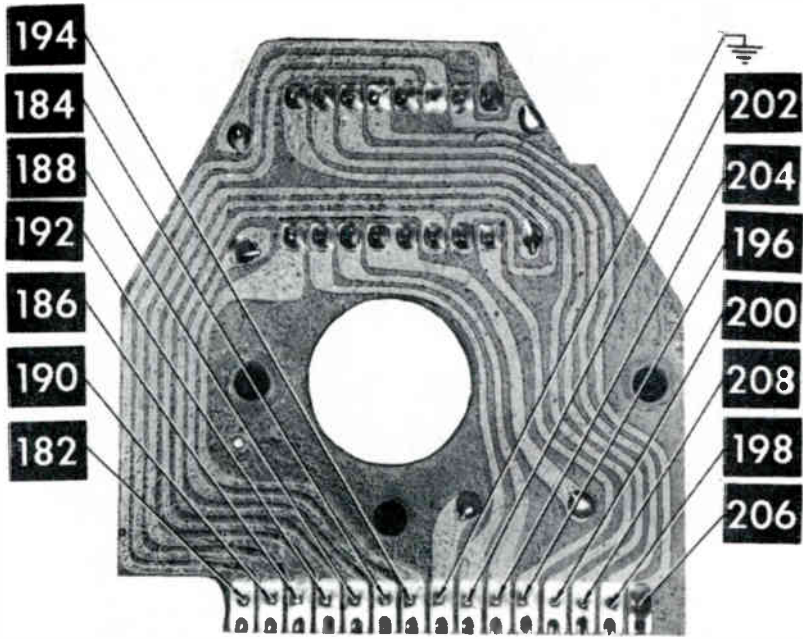
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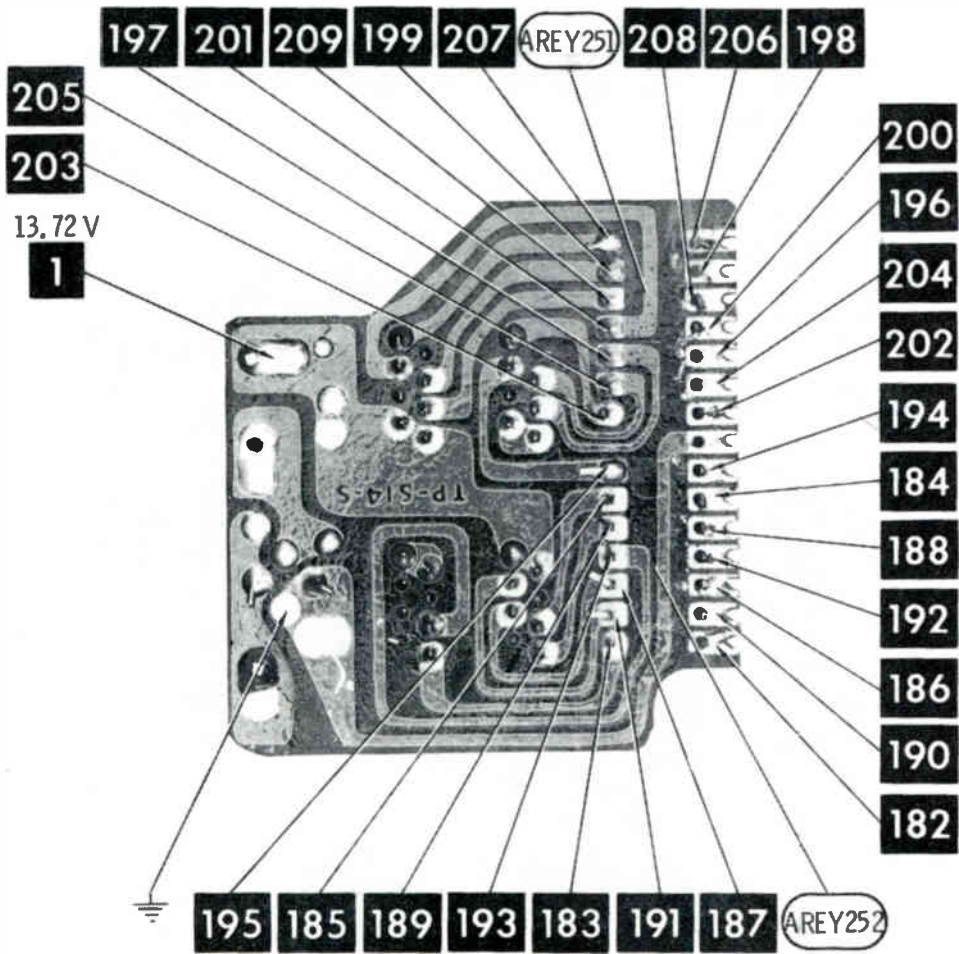
MAIN BOARD



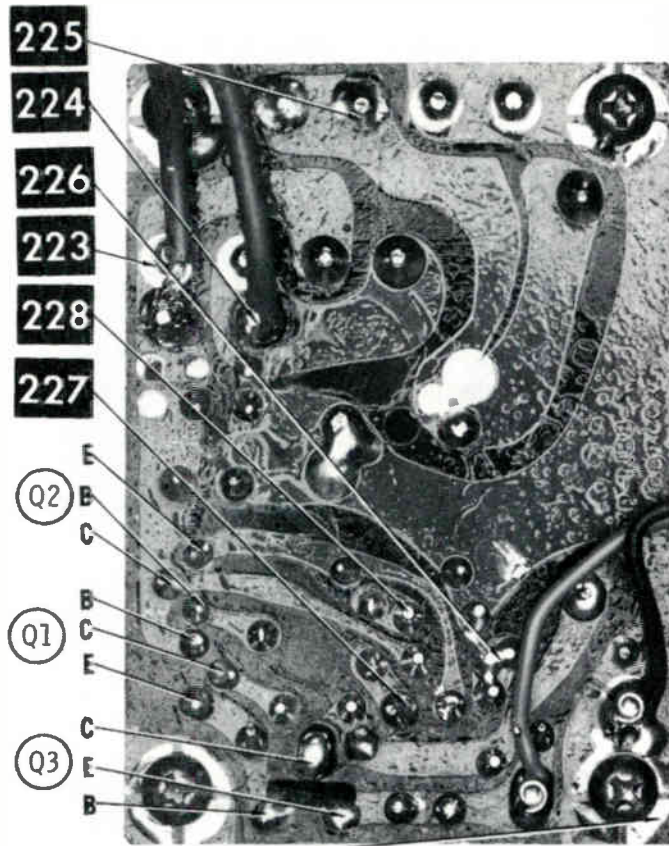
MAIN BOARD



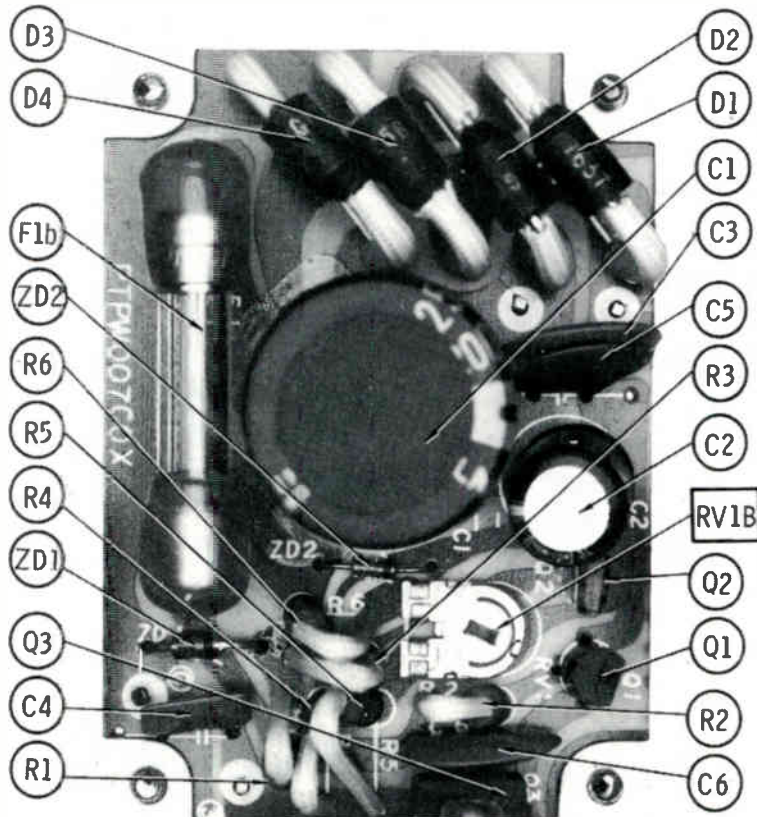
LED BOARD



LED SWITCH BOARD

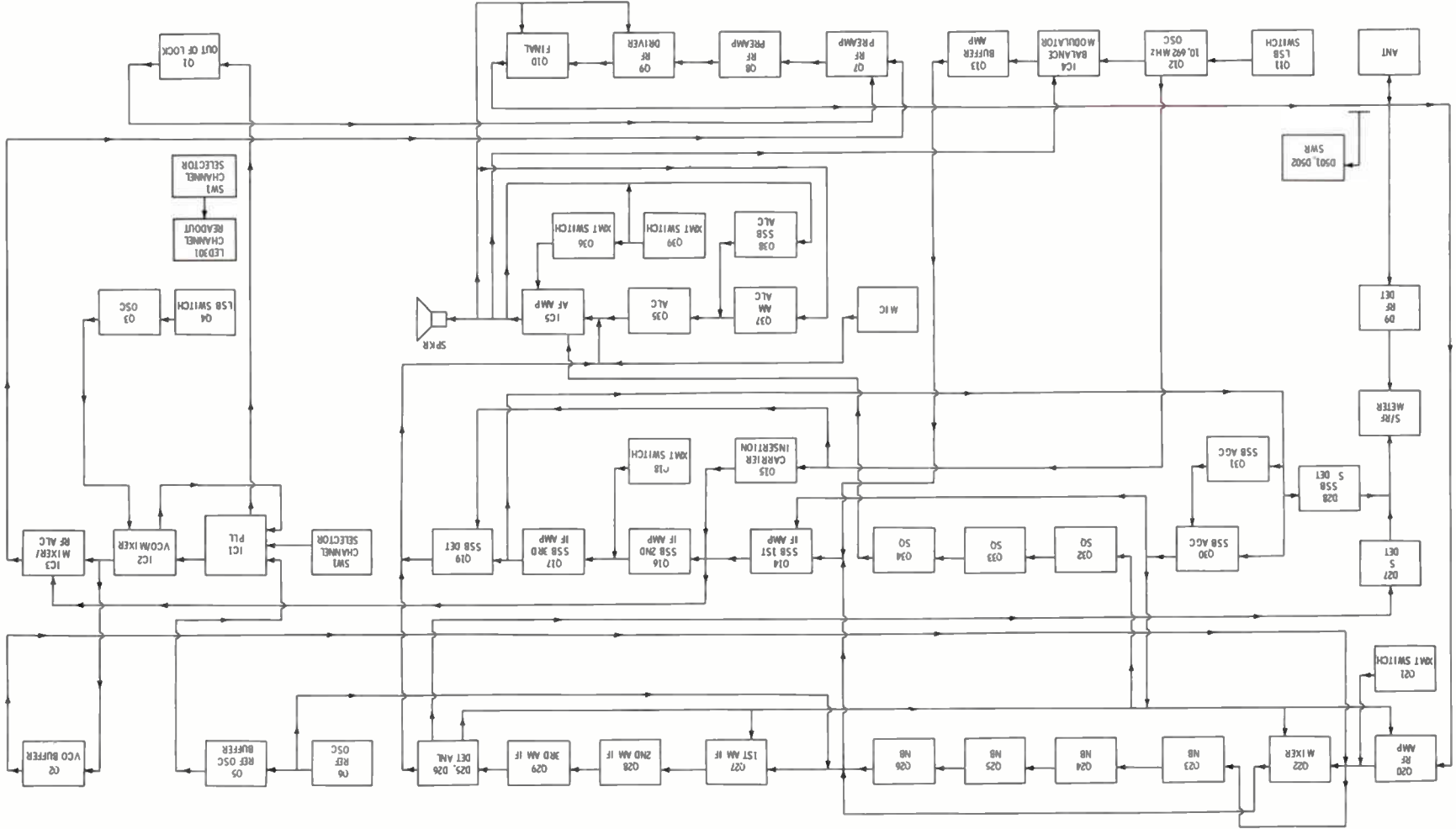


rtm

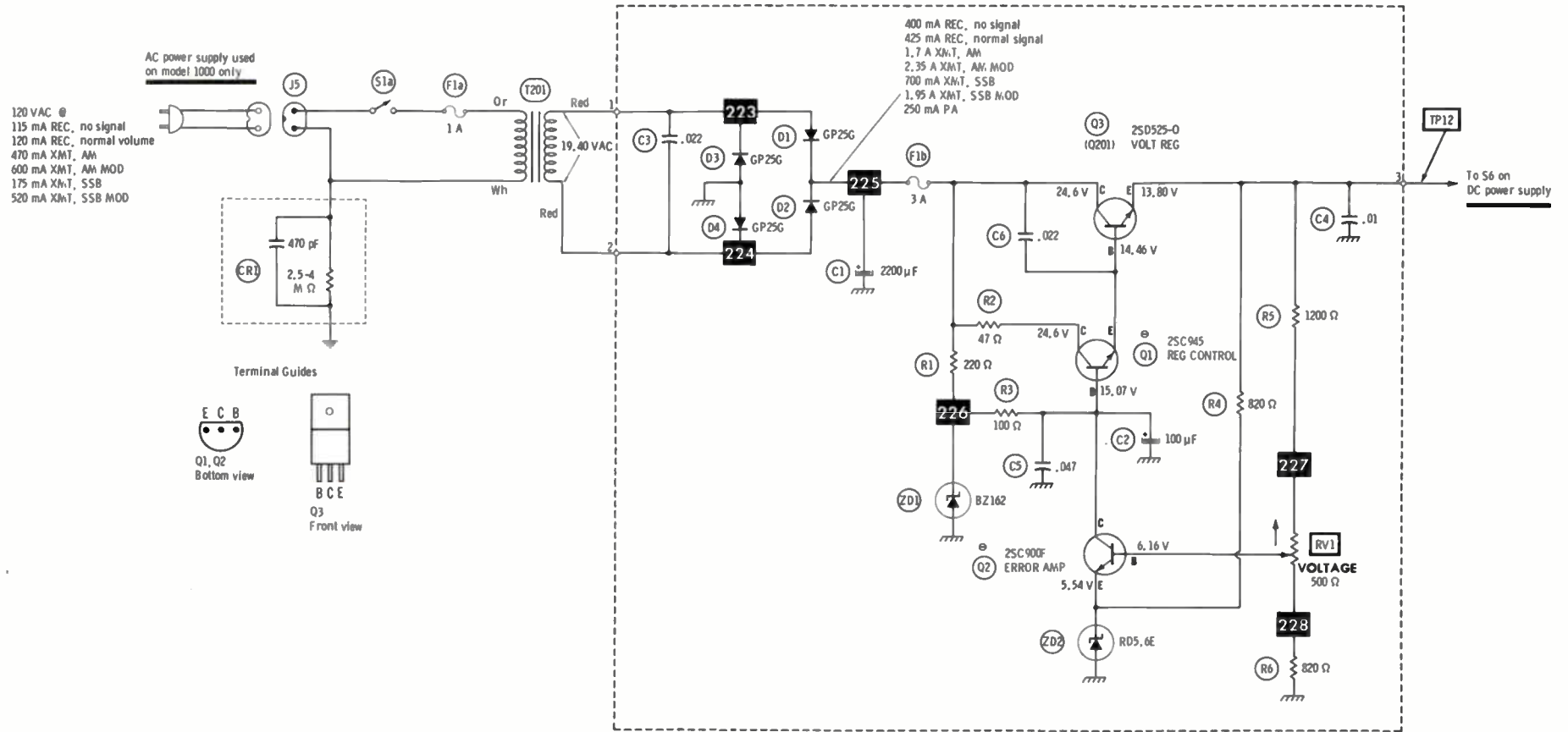


POWER SUPPLY BOARD

COLT MODELS 480, 1000



BLOCK DIAGRAM



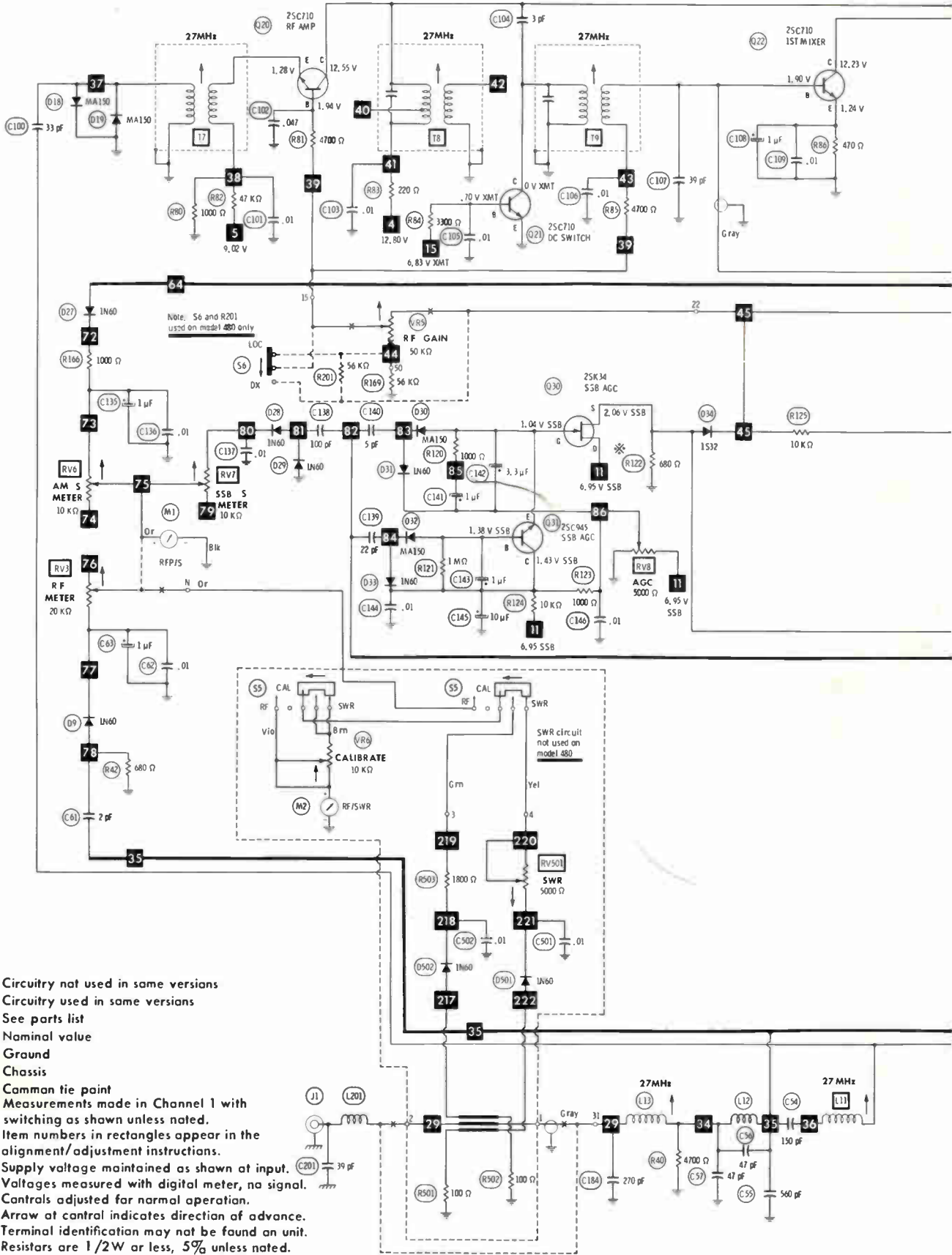
- ✱ Circuitry not used in same versions
- Circuitry used in same versions
- ⊙ See parts list
- ⊛ Nominal value
- ⊕ Ground
- ⊔ Chassis
- ∇ Common tie point

A PHOTOFAC STANDARD NOTATION SCHEMATIC WITH **CIRCUITRACE**

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Measurements made in Channel 1 with switching as shown unless noted. Item numbers in rectangles appear in the alignment/adjustment instructions. Supply voltage maintained as shown at input. Voltages measured with digital meter, no signal. Controls adjusted for normal operation. Arrow at control indicates direction of advance. Terminal identification may not be found on unit. Resistors are 1/2W or less, 5% unless noted. Value in () used in some versions.

MODEL 1000



✖ Circuitry not used in some versions

--- Circuitry used in some versions

⊕ See parts list

⊛ Nominal value

⊕ Ground

⊞ Chassis

▽ Common tie point

Measurements made in Channel 1 with switching as shown unless noted. Item numbers in rectangles appear in the alignment/adjustment instructions.

Supply voltage maintained as shown at input.

Voltages measured with digital meter, no signal.

Controls adjusted for normal operation.

Arrow at control indicates direction of advance.

Terminal identification may not be found an unit.

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

Value in () used in some versions.

A PHOTOFAC STANDARD NOTATION SCHEMATIC
WITH **CIRCUITACE**

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PARTS LIST AND DESCRIPTION (CONTINUED)

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

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

ITEM No.	TYPE No.	MFR. PART No.	REPLACEMENT DATA									
			GENERAL ELECTRIC PART No.	MALLORY PART No.	MOTOROLA PART No.	RAYTHEON PART No.	RCA PART No.	SPRAGUE PART No.	SYLVANIA PART No.	THORDARSON PART No.	WORKMAN PART No.	ZENITH PART No.
Q32	2SA733		GE-48	PTC103*	2SA733	RE 219	SK3138	RT-303	ECG294	2SA733	WEP916	
Q33	2SC945		GE-212	PTC121*	2SC945	RE 192	SK3124	RT-107A	ECG199	2SC945	WEP1945	121-29000
Q34	2SC945		GE-212	PTC121*	2SC945	RE 192	SK3124	RT-107A	ECG199	2SC945	WEP1945	121-29000
Q35	2SC900		GE-62	PTC139*	2SC900	RE 192	SK3124	RT-302	ECG199	2SC900	WEP66	ZEN-119
Q36	2SC945		GE-212	PTC121*	2SC945	RE 192	SK3124	RT-107A	ECG199	2SC945	WEP1945	121-29000
Q37	2SA719		GE-269	PTC103*	HEPS0019*	RE 26*	SK3114	RT-305	ECG290		WEP911	121-879
Q38	2SA719		GE-269	PTC103*	HEPS0019*	RE 26*	SK3114	RT-305	ECG290		WEP911	121-879
Q39	2SC945		GE-212	PTC121*	2SC945	RE 192	SK3124	RT-107A	ECG199	2SC945	WEP1945	121-29000
Q40	2SA683		GE-48			RE 219			ECG294		WEP916	
Q41	2SC1383		GE-47	PTC143*	HEPS3001*	RE 220	SK3024*	RT-302	ECG293		WEP912	
Q42	2SA683		GE-48			RE 219			ECG294		WEP916	
Q43	2SC1383		GE-47	PTC143*	HEPS3001*	RE 220	SK3024*	RT-302	ECG293		WEP912	
Q44	2SC1398	(15)	GE-66	PTC154	HEPS5000	RE 21	SK3054	RT-197	ECG152		WEP745	
Q45	2SC710		GE-211*	PTC132	2SC710	RE 13*	SK3444*	RT-308*	ECG123A*	2SC710	WEP710	ZEN-114
Q46	2SC945		GE-212	PTC121*	2SC945	RE 192	SK3124	RT-107A	ECG199	2SC945	WEP1945	121-29000
POWER SUPPLY BOARD												
D1	GP256	(14)	GE-512	PTC204	HEPRO098	RE 92	SK3051	RT-201	ECG156		WEP4008	
D2	GP256	(14)	GE-512	PTC204	HEPRO098	RE 92	SK3051	RT-201	ECG156		WEP4008	
D3	GP256	(14)	GE-512	PTC204	HEPRO098	RE 92	SK3051	RT-201	ECG156		WEP4008	
D4	GP256	(14)	GE-512	PTC204	HEPRO098	RE 92	SK3051	RT-201	ECG156		WEP4008	
Q1	2SC945	(14)	GE-212	PTC121*	2SC945	RE 192	SK3124	RT-107A	ECG199	2SC945	WEP1945	121-29000
Q2	2SC900	(14)	GE-62	PTC139*	2SC900	RE 192	SK3124	RT-302	ECG199	2SC900	WEP66	ZEN-119
Q3	2SD525-0	(14)	GE-66	PTC167	HEPS5000	RE 21	SK3054	RT-197	ECG152		WEP745	
	2SD525	(14)	GE-66	PTC167	HEPS5000	RE 21	SK3054	RT-197	ECG152		WEP745	
ZD1	BZ162	(14)	GEZD-16	ZB168		RE 122		RT-246	ECG5075A	1N4745A	WEP1160	
ZD2	RD5.6E	(14)	GEZD-5.6	ZM5.68		RE 107		RT-236	ECG5011	1N4734A	WEP1412	

* Lead configuration may vary from original.

- (12) 1.5 WATTS @ 4 AMPS.
- (13) 20 WATTS @ 6 AMPS.
- (14) Use in Model 1000 Base only.
- (15) 15 WATTS @ 3 AMPS.

COLT MODELS 480, 1000

ELECTROLYTIC CAPACITORS

ITEM No.	RATING	REPLACEMENT DATA				
		MFR. PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
					Q-LINE	GENERAL LINE
C3	.1 35V			TDC104M050EL	QDT1-2	SD50-R109
C4	.22 35V			TDC224M050EL	QDT1-10	SD50-R229
C5	10 16V			TDC106M025FL	QDT1-64	SD25-109
C8	1 50V		PC1-50	VTT1A50	QV1-11	EV-1615
C25	47 6.3V		PC50-16	VTT47D16	QV1-73	EV-1226
C33	1 50V		PC1-50	VTT1A50	QV1-11	EV-1615
C58	.22 35V			TDC224M050EL	QDT1-10	SD50-R229
C63	1 50V		PC1-50	VTT1A50	QV1-11	EV-1615
C76	.22 35V			TDC224M050EL	QDT1-10	SD50-R229
C78	.22 35V			TDC224M050EL	QDT1-10	SD50-R229
C80	10 16V		PC10-25	VTT10825	QV1-41	EV-1222
C87	.22 35V			TDC224M050EL	QDT1-10	SD50-R229
C97	33 6.3V		PC30-25	VTT33810	QV1-61	EV-1125
C108	1 50V		PC1-50	VTT1A50	QV1-11	EV-1615
C119	10 16V		PC10-25	VTT10825	QV1-41	EV-1222
C127	10 16V		PC10-25	VTT10825	QV1-41	EV-1222
C129	3.3 25V		PC5-50	VTT3R3A50	QV1-23	EV-1318
C131	4.7 25V		PC5-50	VTT4R7B50	QV1-27	EV-1319
C135	1 50V		PC1-50	VTT1A50	QV1-11	EV-1615
C141	1 25V			TDC105M035EL	QDT1-25	SD35-19
C142	3.3 25V		PC5-50	VTT3R3A50	QV1-23	EV-1318
C143	1 25V			TDC105M035EL	QDT1-25	SD35-19
C145	10 16V		PC10-25	VTT10825	QV1-41	EV-1222
C148	47 10V		PC50-16	VTT47D16	QV1-73	EV-1226
C150	4.7 25V		PC5-50	VTT4R7B50	QV1-27	EV-1319
C156	3.9 10V			TDC475M010EL	QDT1-44	SD15-3R99
C160	33 6.3V		PC30-25	VTT33810	QV1-61	EV-1125
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
C168	100 16V		PC100-16	VTT100F16	QV1-95	EV-1230
C170	.47 50V		PC1-50	VTT4R7A63	QV1-3	EV-1610
C171	47 6.3V		PC50-16	VTT47D16	QV1-73	EV-1226
C173	1 50V		PC1-50	VTT1A50	QV1-1	EV-1615
C175	2.2 25V		PC2-100	VTT2R2A50	QV1-19	EV-1517
C176	47 16V		PC50-16	VTT47D16	QV1-73	EV-1226
C178	33 16V		PC30-25	VTT33D25	QV1-63	EV-1325
C179	47 16V		PC50-16	VTT47D16	QV1-73	EV-1226
C182	.47 50V		PC1-50	VTT4R7A63	QV1-3	EV-1610
C901	.22 35V			TDC224M050EL	QDT1-10	SD50-R229
POWER SUPPLY BOARD						
C1	2200 25V	(1)		TC2520A	QE1-645	TVA-1213.5
C2	100 25V	(1)	WBR2000-25 PC100-25	VTT100G25	QV1-97	EV-1330

(1) Used in Model 1000

PARTS LIST AND DESCRIPTION (CONTINUED)

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

CAPACITORS

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA				
			CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
						Q-LINE	GENERAL LINE
C1	.0047			WMF1D47	EFW1A247	QF1-57	1PB-D47
C2	.022			DPMS2S22	EFW1A122	QF1-127	1PB-S22
C6	33 N150			*	*	*	10TCP-Q33
C7	12 N150			*	*	*	10TCP-Q12
C9	.001			DPMS6D1	EFW1A210	QF1-1	1PB-D10
C10	.0012			DPMS6D12	PVC6212	*	6PS-D12
C11	2 N150			*	*	*	10TCP-V22
C12	33 N150	(1)		*	*	*	10TCP-Q33
C13	33 N150			*	*	*	10TCP-Q33
C14	10 N150			*	*	*	10TCP-Q10
C15	.01	(1)		WMF1S1	EFW1A110	QF1-91	1PB-S10
C16	.01			WMF1S1	EFW1A110	QF1-91	1PB-S10
C17	33 N150			*	*	*	10TCP-Q33
C18	.001			DPMS6D1	EFW1A210	QF1-1	1PB-D10
C19	220 N150			*	*	*	10TCP-T22
C20	22 N150			*	*	*	10TCP-Q22
C21	15 NPO		DTZ-15	NP015	CN0415		10TCC-Q15
C22	.01			WMF1S1	EFW1A110	QF1-91	1PB-S10
C23	.001			DPMS6D1	EFW1A210	QF1-1	1PB-D10
C24	68 N150			*	*	*	10TCP-Q68
C26	.047			DPMS2S47	EFW1A147	QF1-171	1PB-S47
C27	.047			DPMS2S47	EFW1A147	QF1-171	1PB-S47
C28	.001			DPMS6D1	EFW1A210	QF1-1	1PB-D10
C29	5 N150			*	*	*	10TCP-V50
C30	68 N150			*	*	*	10TCP-Q68
C31	27 NPO				CN0427		10TCC-Q27
C32	560		DD-561		GP356		10TS-T56
C34	.01			WMF1S1	EFW1A110	QF1-91	1PB-S10
C35	.01			WMF1S1	EFW1A110	QF1-91	1PB-S10
C36	150 N150			*	*	*	10TCP-T15
C37	82 N150			*	*	*	10TCP-Q82
C38	56 N150			*	*	*	10TCP-Q56
C39	.01			WMF1S1	EFW1A110	QF1-91	1PB-S10
C40	.01			WMF1S1	EFW1A110	QF1-91	1PB-S10
C42	3 N150			*	*	*	10TCP-V30
C43	47 N150			*	*	*	10TCP-Q47
C45	.01			WMF1S1	EFW1A110	QF1-91	1PB-S10
C46	.01			WMF1S1	EFW1A110	QF1-91	1PB-S10
C47	47 N150			*	*	*	10TCP-Q47
C48	.01			WMF1S1	EFW1A110	QF1-91	1PB-S10
C49	390		DD-391	GP390	GP339		10TS-T39
C50	.01			WMF1S1	EFW1A110	QF1-91	1PB-S10
C51	.047			DPMS2S47	EFW1A147	QF1-171	1PB-S47
C52	82 N150			*	*	*	10TCP-Q82
C53	220 N150			*	*	*	10TCP-T22
C54	150 N150			*	*	*	10TCP-T15
C55	560		DD-561		GP356		10TS-T56
C56	47 N150			*	*	*	10TCP-Q47
C57	470		DD-471	GP470	GP347		10TS-T47
C59	.01			WMF1S1	EFW1A110	QF1-91	1PB-S10
C60	5 N150			*	*	*	10TCP-V50
C61	2 N150			*	*	*	10TCP-V22
C62	.01			WMF1S1	EFW1A110	QF1-91	1PB-S10
C64	.01			WMF1S1	EFW1A110	QF1-91	1PB-S10
C65	39 N150			*	*	*	10TCP-Q39
C66	10 NPO		DTZ-10	NP010	CN0410		10TCC-Q10
C67	.001			DPMS6D1	EFW1A210	QF1-1	1PB-D10
C68	22 N150			*	*	*	10TCP-Q22
C69	220 N150			*	*	*	10TCP-T22
C70	220 N150			*	*	*	10TCP-T22
C71	8 N150			*	*	*	10TCP-V82
C72	100 N150			*	*	*	10TCP-T10
C73	33 N150			*	*	*	10TCP-Q33
C74	22 N150			*	*	*	10TCP-Q22
C75	.01			WMF1S1	EFW1A110	QF1-91	1PB-S10
C77	.01			WMF1S1	EFW1A110	QF1-91	1PB-S10
C79	.01			WMF1S1	EFW1A110	QF1-91	1PB-S10
C81	.01			WMF1S1	EFW1A110	QF1-91	1PB-S10
C82	.01			WMF1S1	EFW1A110	QF1-91	1PB-S10
C83	.01			WMF1S1	EFW1A110	QF1-91	1PB-S10
C84	.01			WMF1S1	EFW1A110	QF1-91	1PB-S10
C85	.01			WMF1S1	EFW1A110	QF1-91	1PB-S10
C86	.01			WMF1S1	EFW1A110	QF1-91	1PB-S10
C88	.01			WMF1S1	EFW1A110	QF1-91	1PB-S10
C89	.01			WMF1S1	EFW1A110	QF1-91	1PB-S10
C90	.01			WMF1S1	EFW1A110	QF1-91	1PB-S10
C91	.01			WMF1S1	EFW1A110	QF1-91	1PB-S10
C92	.01			WMF1S1	EFW1A110	QF1-91	1PB-S10
C93	.01			WMF1S1	EFW1A110	QF1-91	1PB-S10
C94	.01			WMF1S1	EFW1A110	QF1-91	1PB-S10
C95	6 N150			*	*	*	10TCP-V56
C96	33 N150			*	*	*	10TCP-Q33
C98	.001			DPMS6D1	EFW1A210	QF1-1	1PB-D10
C99	.01			WMF1S1	EFW1A110	QF1-91	1PB-S10
C100	33 N150			*	*	*	10TCP-Q33
C101	.01			WMF1S1	EFW1A110	QF1-91	1PB-S10
C102	.047			DPMS2S47	EFW1A147	QF1-171	1PB-S47
C103	.01			WMF1S1	EFW1A110	QF1-91	1PB-S10
C104	3 N150			*	*	*	10TCP-V30
C105	.01			WMF1S1	EFW1A110	QF1-91	1PB-S10
C106	.01			WMF1S1	EFW1A110	QF1-91	1PB-S10
C107	39 N150			*	*	*	10TCP-Q39
C109	.01			WMF1S1	EFW1A110	QF1-91	1PB-S10
C110	.01			WMF1S1	EFW1A110	QF1-91	1PB-S10
C111	.01			WMF1S1	EFW1A110	QF1-91	1PB-S10
C112	5 N150			*	*	*	10TCP-V50
C113	220			*	*	*	10TCP-T22

PARTS LIST AND DESCRIPTION (CONTINUED)

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

CAPACITORS (cont)

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA				
			CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
						Q-LINE	GENERAL LINE
C114	.0047			WMF1D47	EWFA247	QF1-57	1PB-D47
C115	.001			DPMS6D1	EWFA210	QF1-1	1PB-D10
C116	.033			DPMS6S33	EWFA110		6PS-S33
C117	.0047			WMF1D47	EWFA247	QF1-57	1PB-D47
C118	.01			WMF1S1	EWFA110	QF1-91	1PB-S10
C121	.001			OPMS601	EWFA210	QF1-1	1PB-D10
C122	27 N150				*		10TCP-Q27
C123	.033			OPMS6S33	EWFA110		6PS-S33
C124	.01			WMF1S1	EWFA110	QF1-91	1PB-S10
C125	.033			OPMS6S33	EWFA110		6PS-S33
C126	.01			WMF1S1	EWFA110	QF1-91	1PB-S10
C128	.0047			WMF1D47	EWFA247	QF1-57	1PB-D47
C130	.033			OPMS6S33	EWFA110		6PS-S33
C132	.0047			WMF1D47	EWFA247	QF1-57	1PB-D47
C133	220				GP322		10TS-T22
C134	.0082		DD-221	WMF1D82	EWFA282		1PB-D82
C136	.01			WMF1S1	EWFA110	QF1-91	1PB-S10
C137	.01			WMF1S1	EWFA110	QF1-91	1PB-S10
C138	100 N150				*		10TCP-T10
C139	22 N150				*		10TCP-Q22
C140	5 N150				*		10TCP-V50
C144	.01			WMF1S1	EWFA110	QF1-91	1PB-S10
C146	.01			WMF1S1	EWFA110	QF1-91	1PB-S10
C149	.01			WMF1S1	EWFA110	QF1-91	1PB-S10
C151	.0022			DPMS6D22	EWFA110		6PS-D22
C152	.022			DPMS2S22	EWFA122	QF1-127	1PB-S22
C153	220		DD-221		GP322		10TS-T22
C154	.01			WMF1S1	EWFA110	QF1-91	1PB-S10
C155	.002			DPMS6D22	EWFA110		6PS-D22
C157	68		DD-680	GP68	GP468		10TS-Q68
C158	150		DD-151		GP315		10TS-T15
C159	68		DD-680	GP68	GP468		10TS-Q68
C161	.068			WMF1S68	EWFA168	QF1-195	1PB-S68
C163	100		DD-101	GP100	GP310		10TS-T10
C165	.047			DPMS2S47	EWFA147	QF1-171	1PB-S47
C169	.01			WMF1S1	EWFA110	QF1-91	1PB-S10
C172	.01			WMF1S1	EWFA110	QF1-91	1PB-S10
C174	.01			WMF1S1	EWFA110	QF1-91	1PB-S10
C180	.047		DC-503	MGP05	TA150	QC2-207	TG-S50
C181	.047		DC-503	MGP05	TA150	QC2-207	TG-S50
C183	.001			DPMS6D1	EWFA210	QF1-1	1PB-D10
C184	270		DD-271	GP270	GP327		10TS-T27
C185	39 N150				*		10TCP-Q39
C186	220 N150				*		10TCP-T22
C187	18 N150				*		10TCP-Q18
C188	18				*		10TCP-Q18
C189	.047		DC-503	MGP05	TA150	QC2-207	TG-S50
C190	.01			WMF1S1	EWFA110	QF1-91	1PB-S10
C191	.01			WMF1S1	EWFA110	QF1-91	1PB-S10
C192	.047			DPMS2S47	EWFA147	QF1-171	1PB-S47
C194	100		DD-101	GP100	GP310		10TS-T10
C195	.0022	(1)		DPMS6D22	EWFA110		6PS-D22
C196	82		DD-820		GP482		10TS-Q82
C197	.0022		DC-203	MGP02	TA120	QC2-157	TG-S20
C198	.047		DC-503	MGP05	TA150	QC2-207	TG-S50
C201	39 N150				*		10TCP-Q39
C202	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C203	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C204	.001		DD-102G	GP1000	GP210	QC2-81	5GA-D10
C205	.047		DC-503	MGP05	TA150	QC2-207	TG-S50
C206	.047		DC-503	MGP05	TA150	QC2-207	TG-S50
C207	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C208	.001		DD-102G	GP1000	GP210	QC2-81	5GA-D10
C209	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C210	.047		DC-503	MGP05	TA150	QC2-207	TG-S50
C211	.047		DC-503	MGP05	TA150	QC2-207	TG-S50
C212	.01	(1)	DC-103	MGP01	TA110	QC2-141	TG-S10
	.047	(2)	DC-503	MGP05	TA150	QC2-207	TG-S50
C501	.01	(1)	DC-103	MGP01	TA110	QC2-141	TG-S10
C502	.01	(1)	DC-103	MGP01	TA110	QC2-141	TG-S10
CT1	20						
CT2	20						
CT3	20						
CT4	20						
CT5	20						
POWER SUPPLY BOARD							
C3	.022	(1)	DC-203	MGP02	TA120	QC2-157	TG-S20
C4	.01	(1)	DC-103	MGP01	TA110	QC2-141	TG-S10
C5	.047	(1)	DC-503	MGP05	TA150	QC2-207	TG-S50
C6	.022	(1)	DC-203	MGP02	TA120	QC2-157	TG-S20

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
 (1) Used in Model 1000 only.
 (2) Used in Model 480 only.

COLT MODELS 480, 1000

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	RESIST-ANCE	REPLACEMENT DATA				
			MFRG. PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	MALLORY PART No.	TRW PART No.
RV1A	Bias	100					
RV1B	Voltage	500	(18)				U260R501B
RV2	SSB Power	5000					U260R502B
RV3	RF Meter	20K					U260R252B
RV4	Balance	1000					U260R102B
RV5	Balance	10K					U260R103B
RV6	AM S Meter	10K					U260R103B
RV7	SSB S Meter	10K					U260R103B
RV8	AGC	5000					U260R502B
RV9	AM Squelch Range	20K					U260R253B
RV10	SSB Squelch Range	200K					U260R254B
RV11	SSB Mic Gain	500					U260R501B
RV12	AMC	2000					U260R252B
RV501	SWR	5000	(18)				U260R502B
VR1	Volume/Power Switch	50K					
VR2	Squelch	50K					
VR3	Slide-0-Tune	50K	(18)				
VR3	Clarifier	50K					
VR4	AM Power	6 10W					
VR5	RF Gain	50K	(18)				
VR6	Calibrate	10K	(18)				

(18) Used in Model 1000.

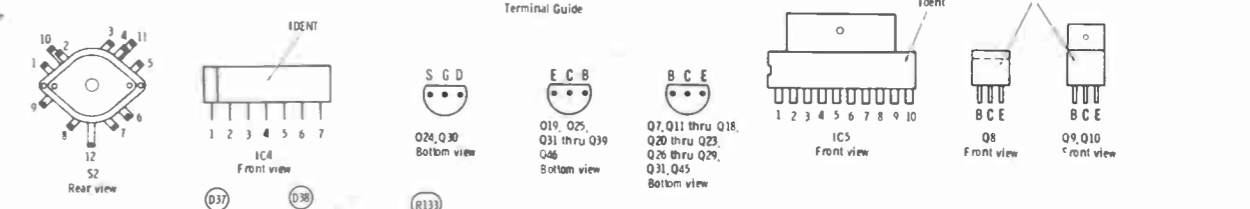
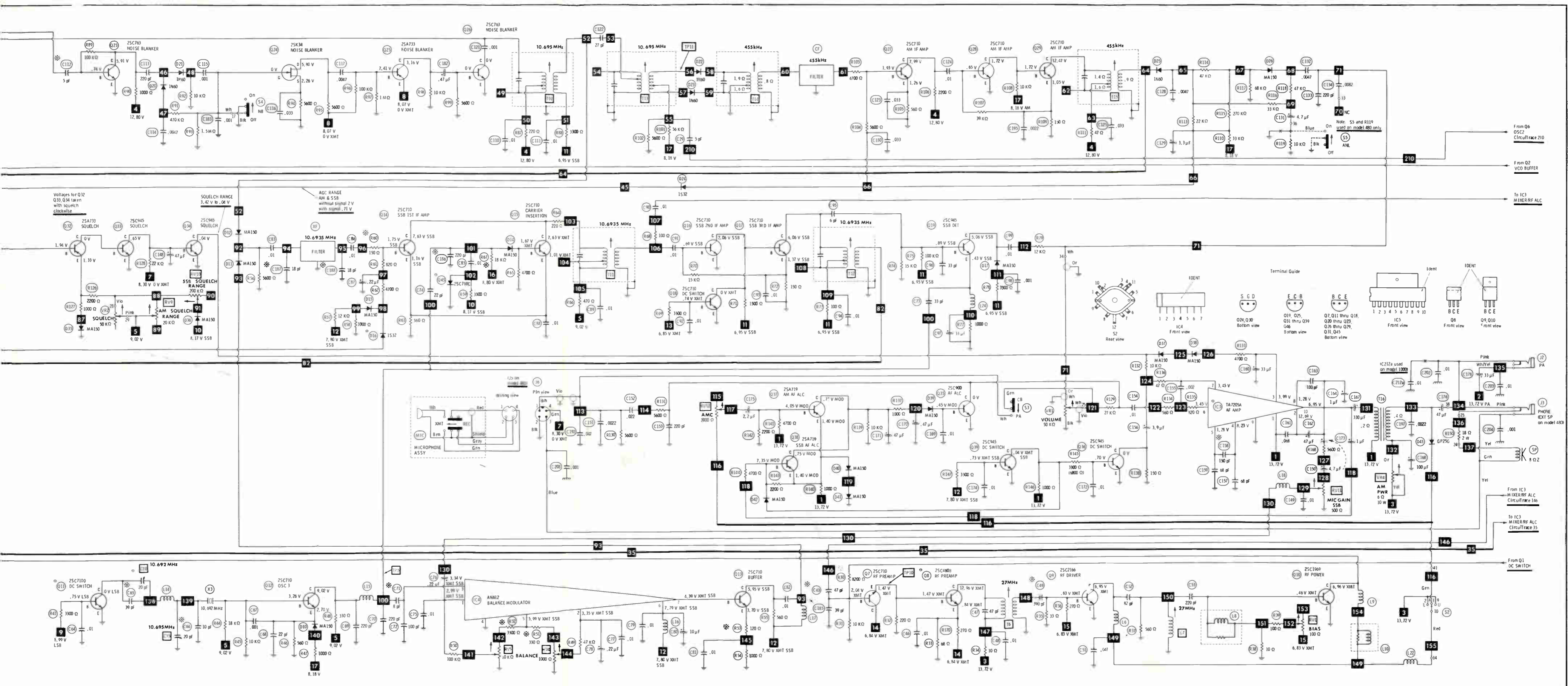
RESISTORS (Power and Special)

ITEM No.	RATING	REPLACEMENT DATA		ITEM No.	RATING	REPLACEMENT DATA	
		WORKMAN PART No.	MFRG. PART No.			WORKMAN PART No.	MFRG. PART No.
AREY 251	Resistor Network		(1)	AREY 252	Resistor Network		(1)

(1) Consists of Seven 1800 Ohm Resistors.

COILS (RF-IF)

ITEM No.	FUNCTION	REPLACEMENT DATA			REMARKS
		PART No.	OTHER IDENTIFICATION	MILLER PART No.	
L1	RF Choke (2.2uH)				
L2	RF Choke (68uH)				
L3	RF Choke (.75uH)				
L4	RF Choke (2.2uH)				
L5	RF Choke (2.2uH)				
L6	RF Choke (1.95uH)				
L7	Xmit Driver (27MHz)				
L8	RF Choke (.75uH)				
L9	RF Choke (.75uH)				
L10	RF Choke (.75uH)				
L11	Final (27MHz)				
L12	RF Choke (.11uH)				
L13	Pi Filter (27MHz)				
L14	RF Choke (4.7uH)				
L15	RF Choke (2.2uH)				
L16	RF Choke (1uH)				
L17	RF Choke (68uH)				
L18	RF Choke (1mH)				
L19	RF Choke (68uH)				
L20	RF Choke (1.15uH)				
L21	RF Choke (1.15uH)				
L22	RF Choke (.75uH)				
L23	RF Choke (.75uH)				
L24	RF Choke (68uH)				
L201	RF Choke (.1uH)				
T1	VCO Mixer (38.100MHz)				
T2	VCO Mixer (38.100MHz)				
T3	OSC (20.100MHz)				
T4	Mixer (27MHz)				
T5	Mixer (27MHz)				
T6	Xmit Buffer (27MHz)				
T7	Rec Antenna (27MHz)				
T8	Rec RF (27MHz)				
T9	Rec RF (27MHz)				
T10	IF (10.695MHz)				
T11	IF (10.695MHz)				
T12	IF (10.695MHz)				
T13	IF (10.695MHz)				
T14	IF (455kHz)				
T15	IF (455kHz)				



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~)	MFG. PART No.	THORDARSON PART No.	TRIAD PART No.	
CH	2.125A	.241	3.72mH	LJ119H004W			

TRANSFORMER (Audio Output)

ITEM No.	IMPEDANCE		REPLACEMENT DATA			NOTES
	PRI.	SEC.	MFG. PART No.	THORDARSON PART No.	TRIAD PART No.	
T16	8	8	TBG-28A004W			

TRANSFORMER (Power)

ITEM No.	RATING		REPLACEMENT DATA			NOTES
	PRI.	SEC. 1	MFG. PART No.	THORDARSON PART No.	TRIAD PART No.	
T201	120V AC @ 600mA	19.40V AC @ 2350mA DC	TP-D75U0024 (1)			(1) Model 1000 only.

SPEAKER MODEL 1000

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		MFG. PART No.	QUAM PART No.	
SP	2" X 3 3/4" PM 8 Ohms 3" PM 8 Ohms		30A05Z8R	Model 1000 Model 480

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	
F1a F1b F1c	1 Amp 3 Amp 3 Amp	(1) (1)	(1)	AGC1 GJV3 AGC3	HKP HDJ	312001 318003 312003	342001L 150145	FG1-2 FG3-2	

(1) Used in Model 1000 only.

COLT MODELS 480, 1000

PARTS LIST AND DESCRIPTION (CONTINUED)

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

MICROPHONE

ITEM No.	REPLACEMENT DATA				CONNECTION DATA						
	MFGR. PART No.	GC PART No.	GC NOISE CANCEL	GC POWER	GC CONNECTOR	GC Red	GC Shield	GC Yellow	GC Blue	GC White	GC Black
MIC		18-032	18-034	18-010	18-092	1	2	4	3	NC	2

MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
CF	Ceramic Filter		455kHz
CR1	A.C. Isolation		470PF/2.5-4meg (Model 1000 only)
LED301	LED		Channel Display
M1	Meter		S (Model 1000)
M2	Meter		S/RF (Model 480)
PL1	Lamp		RF/SWR (Model 1000)
PL2	Lamp		S Meter (Model 1000)(5.60V @ 34mA)
	Lamp		S/RF Meter (Model 480)(5.60V @ 34mA)
PL3	Lamp		S Meter (Model 1000)(5.60V @ 34mA)
	Lamp		TX Indicator (Model 480)(5.13V @ 30mA)
PL4	Lamp		RF/SWR Meter (Model 1000 only)(5.50V @ 34mA)
	Lamp		RF/SWR Meter (Model 1000 only)(5.50V @ 34mA)
S1	Switch		Power (Part of Volume Control)
S2	Switch		Mode AM-USB-LSB
S3	Switch		CB/PA
S4	Switch		NB
S5	Switch		RF-CAL-SWR (Model 1000)
S6	Switch		ANL (Model 480)
	Switch		Power Conversion (Part of J5) (Model 1000)
SW1	Switch		DX/LOC (Model 480)
VCO	VCO Oscillator		Channel Selector
X1	Crystal		10.0525MHz
X2	Crystal		10.240MHz
X3	Crystal		10.692MHz
XF	Crystal Filter		10.6935MHz (SC-107A)
	Printed Circuit Board		Main (PTBM05BCDX, Model 1000)
	Printed Circuit Board		Main (PTBM04BAOX, Model 480)
	Printed Circuit Board		Channel Display (PTLD010COX)
	Printed Circuit Board		Channel Switch (PTSM020COX)
	Printed Circuit Board		Channel Switch Sub (PTSM026COX, Model 1000 only)
	Printed Circuit Board		SWR (PTSR009COX, Model 1000 only)
	Printed Circuit Board		Power Supply (PTPM007COX, Model 1000 only)

WIRING DATA

General-use Hook-up Wire (available in 5 colors)	BELDEN No. 8523	Coiled Microphone Cable	
Shielded Hook-up Wire (spiral wrapped)	BELDEN No. 8421	3-conductor (1 shielded)	23AWG BELDEN No. 9471 (5')
(braided)	BELDEN No. 8401		BELDEN No. 8497 (6')
Speaker Cable (available in 4 colors)	BELDEN No. 8782		BELDEN No. 9472 (7-1/2')
Bonding Strap	BELDEN No. 8672		28AWG BELDEN No. 9466 (6')
AC Power Cord	BELDEN No. 17106		31AWG BELDEN No. 9468 (10')
	(6') BELDEN No. 17109	4-conductor (unshielded)	23AWG BELDEN No. 8415 (6')
		5-conductor (1 shielded)	28AWG BELDEN No. 9467 (6')
			BELDEN No. 9465 (7-1/2')



PHOTOFACT[®] with

CIRCUITRACE[®]

For Supplier Address See PHOTOFACT Index

NOTE

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

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

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

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

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



MODEL FANFARE 190DF

MANUFACTURER'S SPECIFICATIONS

RECEIVER SECTION

- | | |
|-----------------------------|---|
| * Frequency Range | 26.965 to 27.405 MHz |
| * Sensitivity | 0.25uV for 10db S/N at 1 kHz
at 30% Modulation |
| * Selectivity | BW 2.5 kHz min. at 6db dwn. |
| * Adj. Channel Rejection | Better than 60db |
| * Audio Distortion at 1 kHz | Less than 10% at 3W |
| * Squelch Sensitivity | 0.2uV |
| * Squelch Stop Sensitivity | 45 to 30,000uV (adjustable) |
| * Noise Limiter | Series Gate |

TRANSMITTER SECTION

- | | |
|-----------------------------|---|
| * Frequency Range | 26.965 to 27.405 MHz |
| * Power Output at 13.8 V DC | 3.5 to 4 watts |
| * Modulation | 100% |
| (4mV at microphone) | |
| * Emission | 6A3 |
| (Class D operation) | |
| * Hum and Noise | Better than 40db down |
| * Frequency Tolerance | Better than ±.005% |
| * Antenna Impedance | 50 ohms |
| * Switching | Electronic |
| * Modulation Distortion | Less than 10% at 95%
modulation at 1 kHz |

Courtesy of the Manufacturer

FANON MODEL FANFARE 190DF

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:
 L108, L109, L110, L402, L403.....5009
 L101 thru L106, L112, L113, L114, L201, L202.....9440
 L111, L115, L116, L118 thru L121.....9304

SYNTHESIZER ALIGNMENT

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Input of frequency counter to TP1.	Ch. 19		Check for 10.240MHz.
Input of RF VTVM to TP4.	Ch. 19	L202	Adjust for maximum RF voltage.
Input of frequency to TP4.	Ch. 19		Check for 36.380MHz.
Input of DC meter to TP3.	Ch. 19	L201	Adjust for 2.80 volts.
Input of RF VTVM to TP105.	Ch. 19	L104	Adjust for maximum RF voltage.
Input of frequency counter to TP105.	Ch. 1		Check for 37.660MHz. Repeat for all channels. (Channel frequency + 10.695MHz = frequency on counter).
Input of RF VTVM to TP106.	Ch. 19, XMT	L111	Adjust for maximum RF voltage.
Input of frequency counter to TP106.	Ch. 19, XMT		Check for 10.695MHz.

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.

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Output of signal generator thru .01uF to TP101. 455kHz, 1000Hz @ 30% modulation.	Ch. 19, Squelch MINIMUM LOC/DX DX NL/B Off	L110, L109, L108	Adjust for maximum output.
Output of signal generator thru .01uF to antenna jack. 27.185MHz, 1000Hz @ 30% modulation.	Ch. 19, Squelch MINIMUM LOC/DX DX NL/B Off	L106, L105, L103, L102, L101	Adjust for maximum output. It may be necessary to readjust L108, L109, and L110.
Output of signal generator thru .01uF to antenna jack. 19.300MHz, no modulation. Input of DC meter to TP401 (D404, Cathode).	Ch. 19, NL/B On	L402, L403	Adjust for maximum.

RECEIVER ADJUSTMENTS

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

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Output of signal generator thru .01uF to antenna jack. 27.185MHz, 1000Hz @ 30% modulation. Output 10uV. Input of oscilloscope to voice coil.	Ch. 19, LOC/DX DX NL/B On Squelch MINIMUM	VR101	NOISE Adjust VR101 for best signal to noise ratio.
Output of signal generator thru .01uF to antenna jack. 27.185MHz, 1000Hz @ 30% modulation. Output 1000uV.	Ch. 19, LOC/DX DX NL/B Off	VR302	SQUELCH RANGE Set Squelch Control VR1 fully clockwise. Adjust VR302 so that squelch just breaks.
Output of signal generator thru .01uF to antenna jack. 27.185MHz, 1000Hz @ 30% modulation. Output 100uV.	Ch. 19, LOC/DX DX NL/B Off	VR102	S METER Adjust VR102 for 9 on S scale of meter.

TRANSMITTER ALIGNMENT

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

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

See page 4 for channel frequencies.

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Tunable field strength meter set at 54MHz.	Ch. 19	L112, L113, L114, L115, L116, L118, L119, L120	Adjust for maximum.
	Ch. 19	L120, L119	Adjust for 4 watts maximum.
	Ch. 19	L121	Adjust for MINIMUM signal.

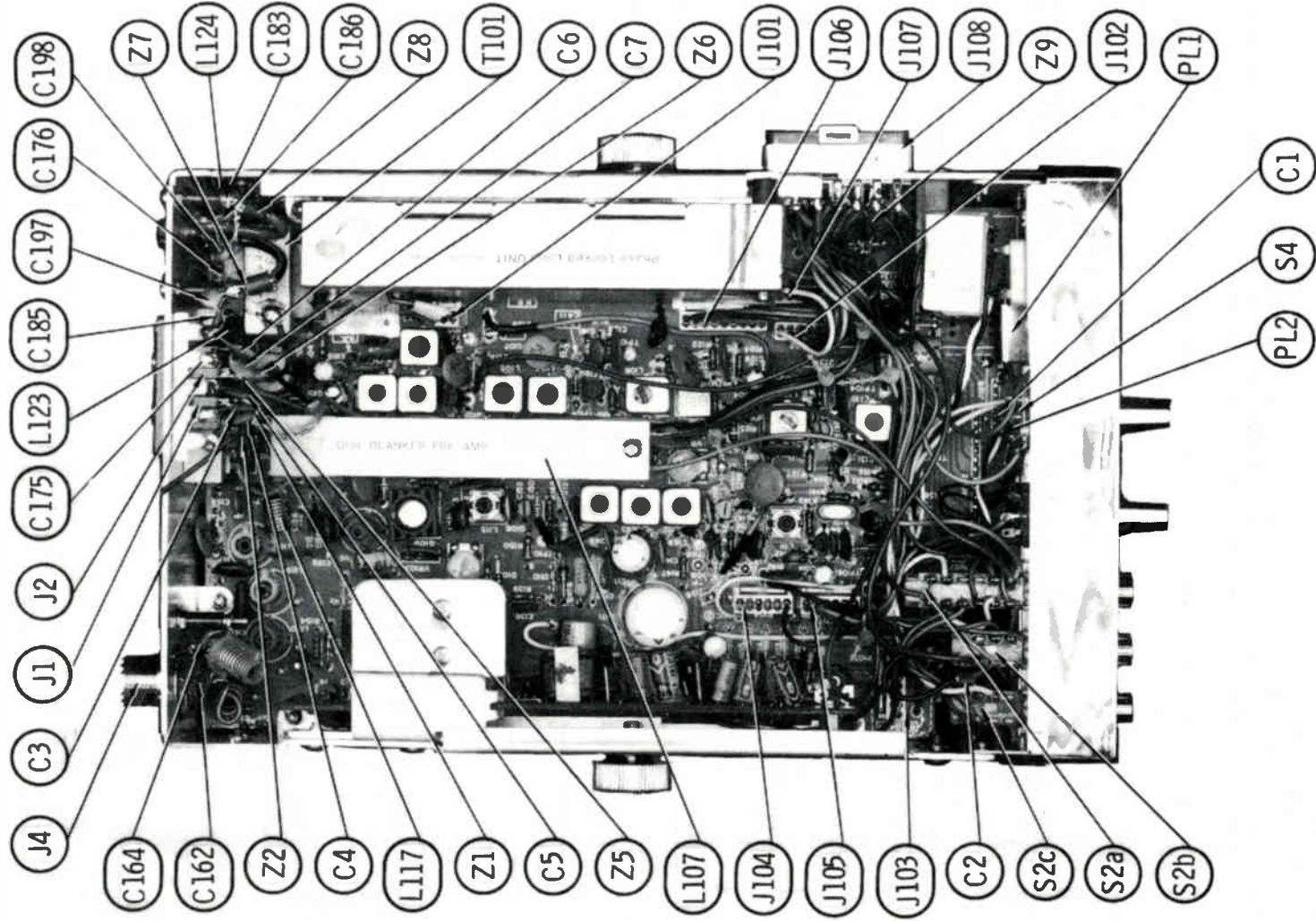
TRANSMITTER ADJUSTMENTS

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

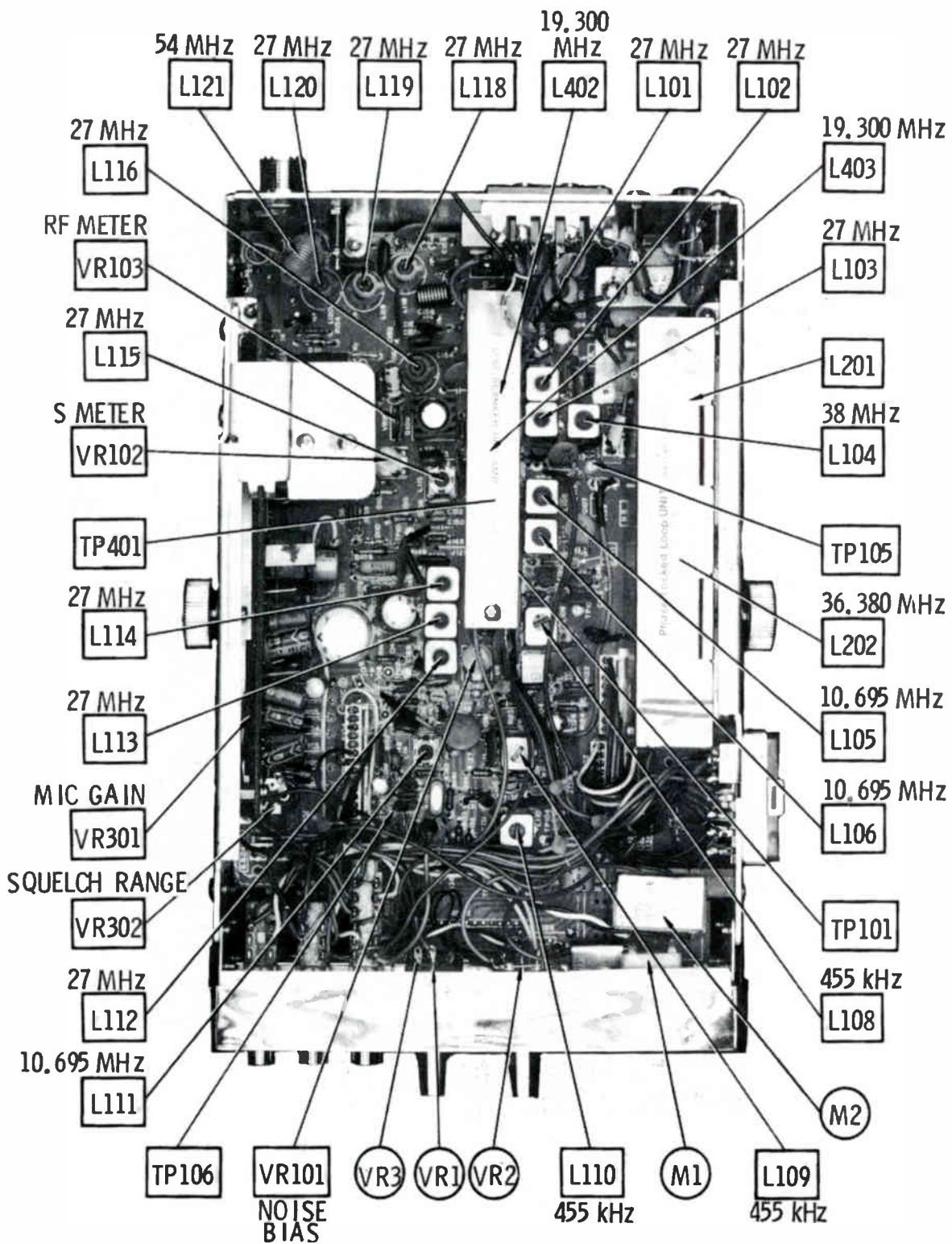
NOTE: Be sure to check transmit frequency and power on all active channels after adjustment of transmitter.

See page 4 for channel frequencies.

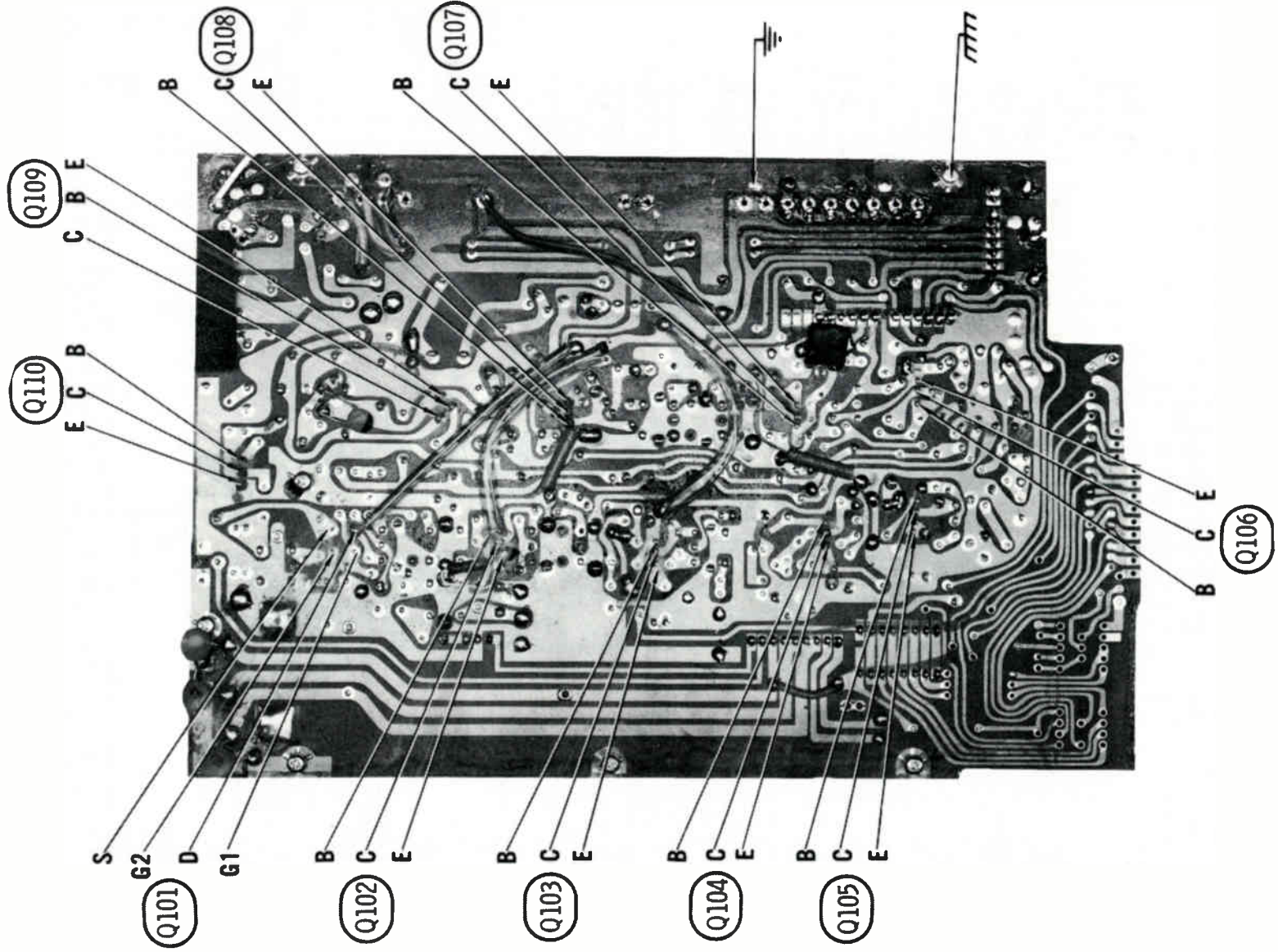
TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Modulation meter to antenna jack. Inject a 1000Hz, 20mV signal at MIC input.	Ch. 19	VR103	RF PANEL METER Adjust VR103 so that RF panel meter agrees with RF wattmeter.
	Ch. 13	VR301	MIC GAIN Adjust VR301 for 100% modulation maximum.



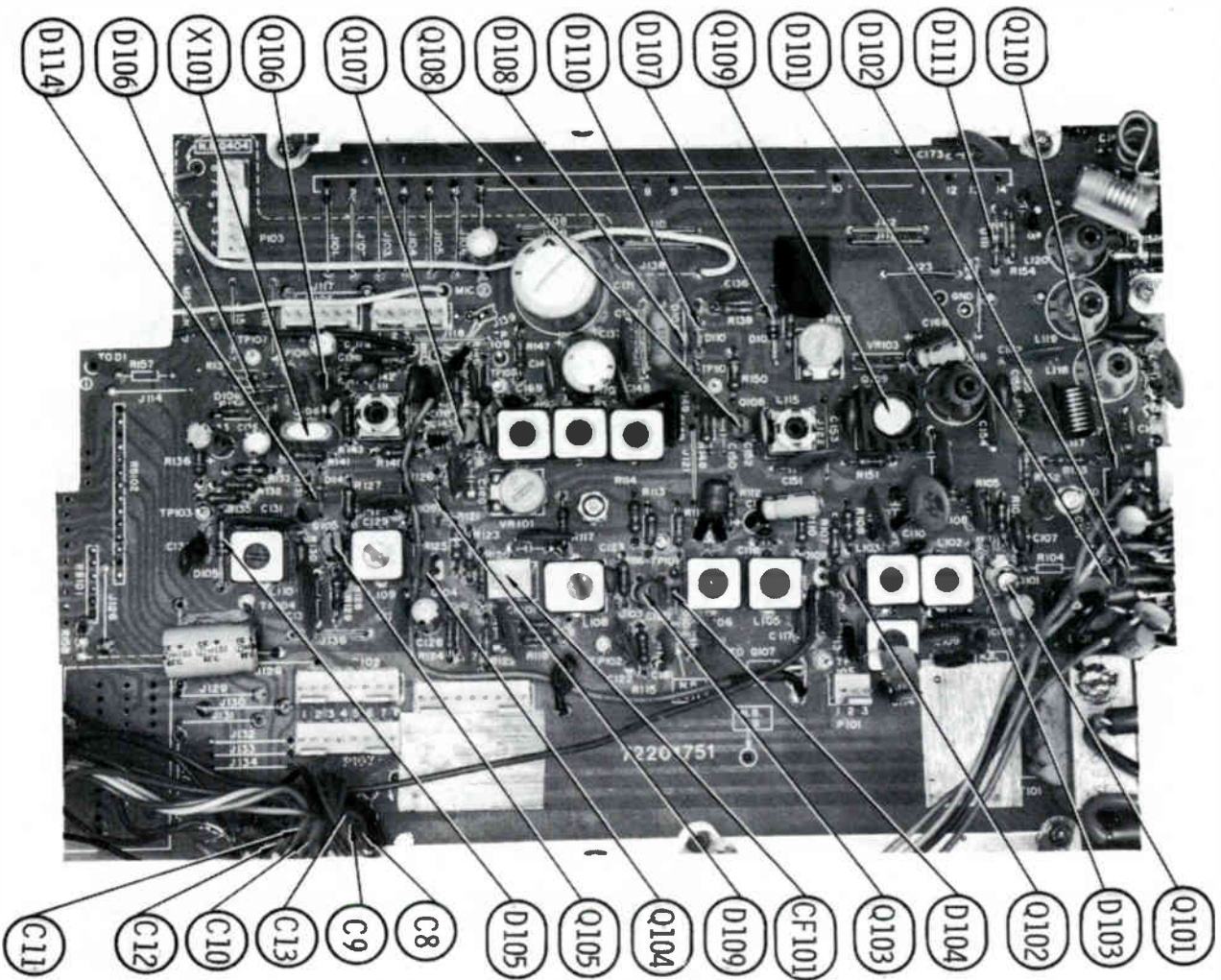
CHASSIS - BOTTOM



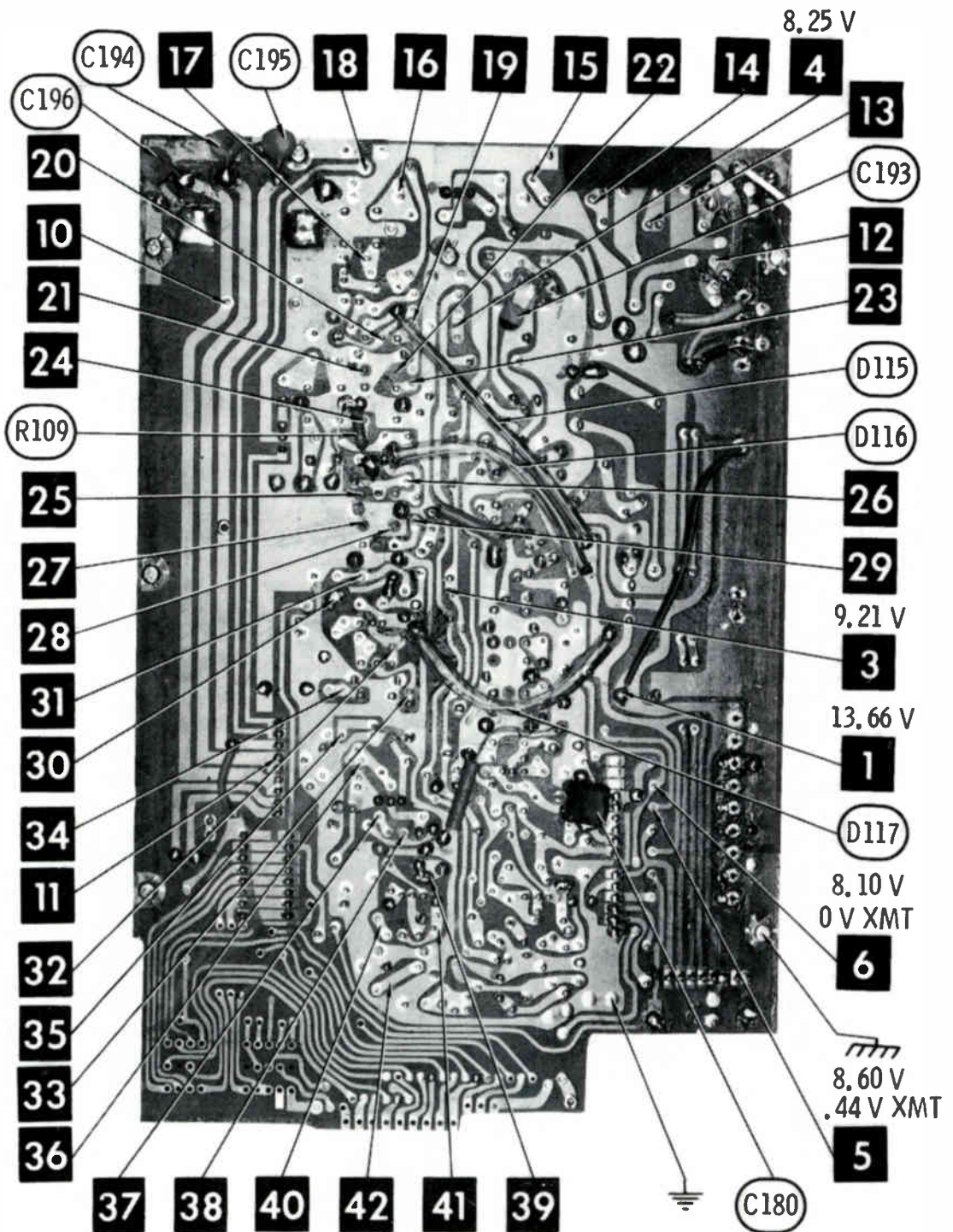
CHASSIS - BOTTOM



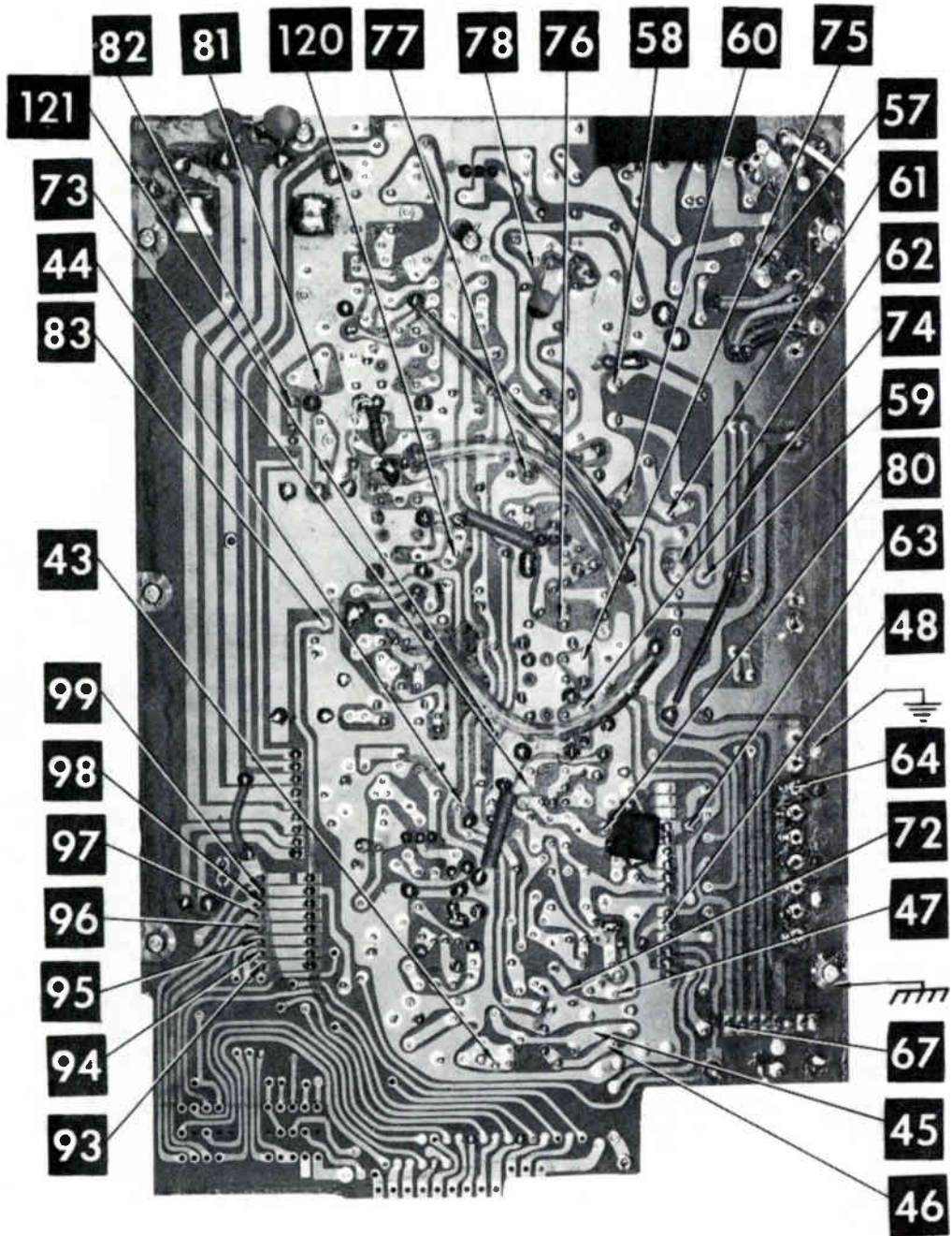
MAIN BOARD



MAIN BOARD

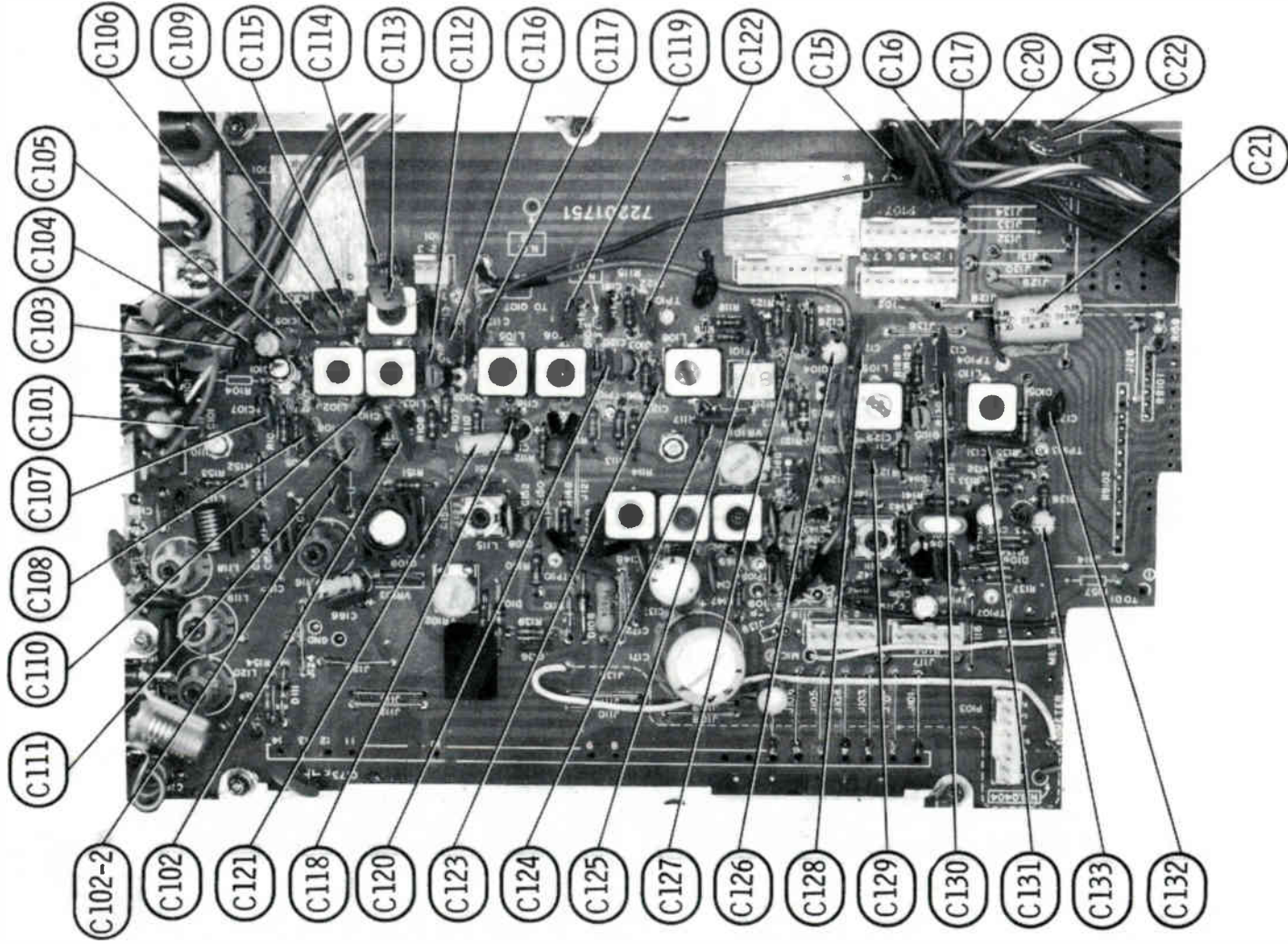


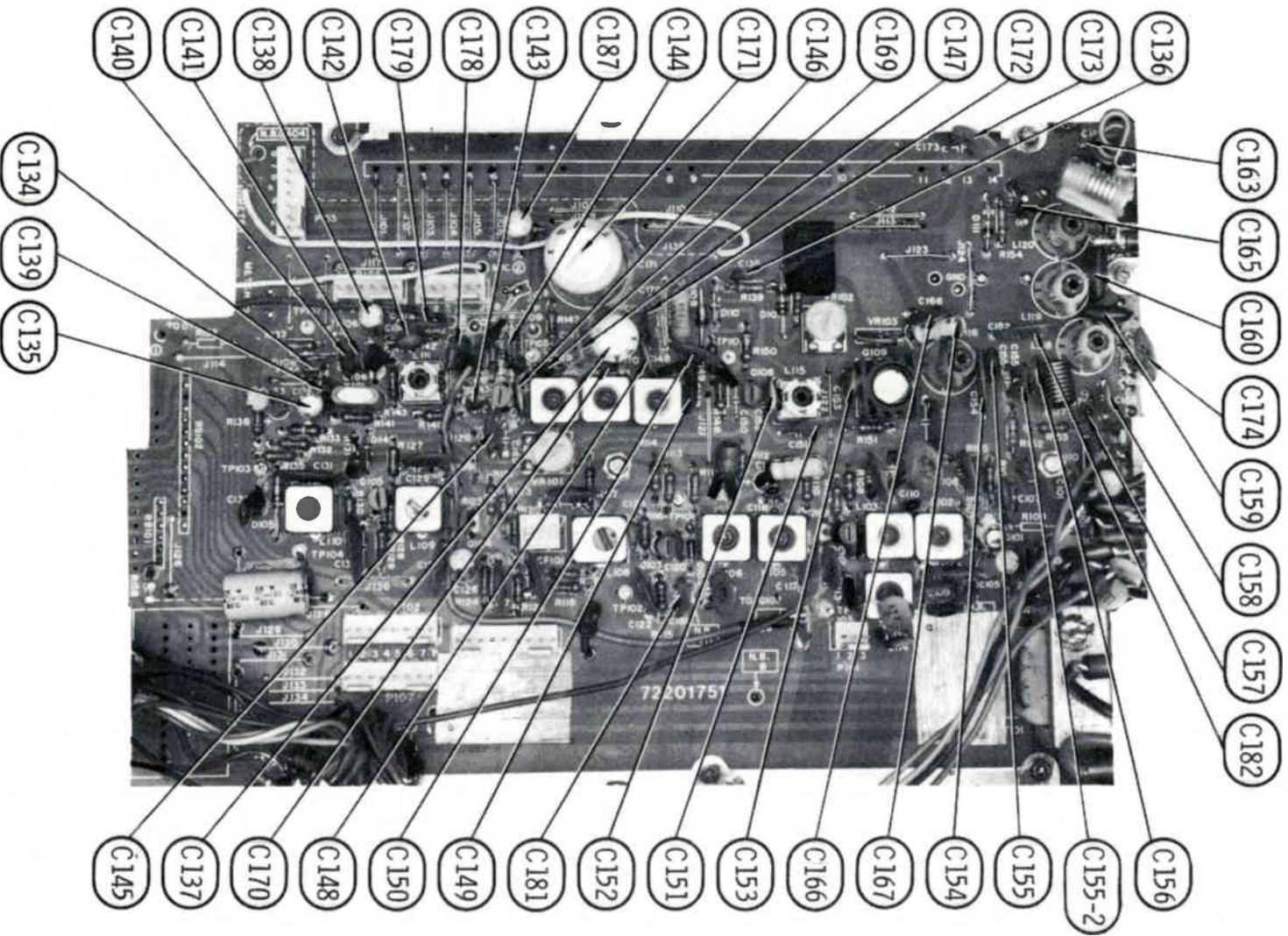
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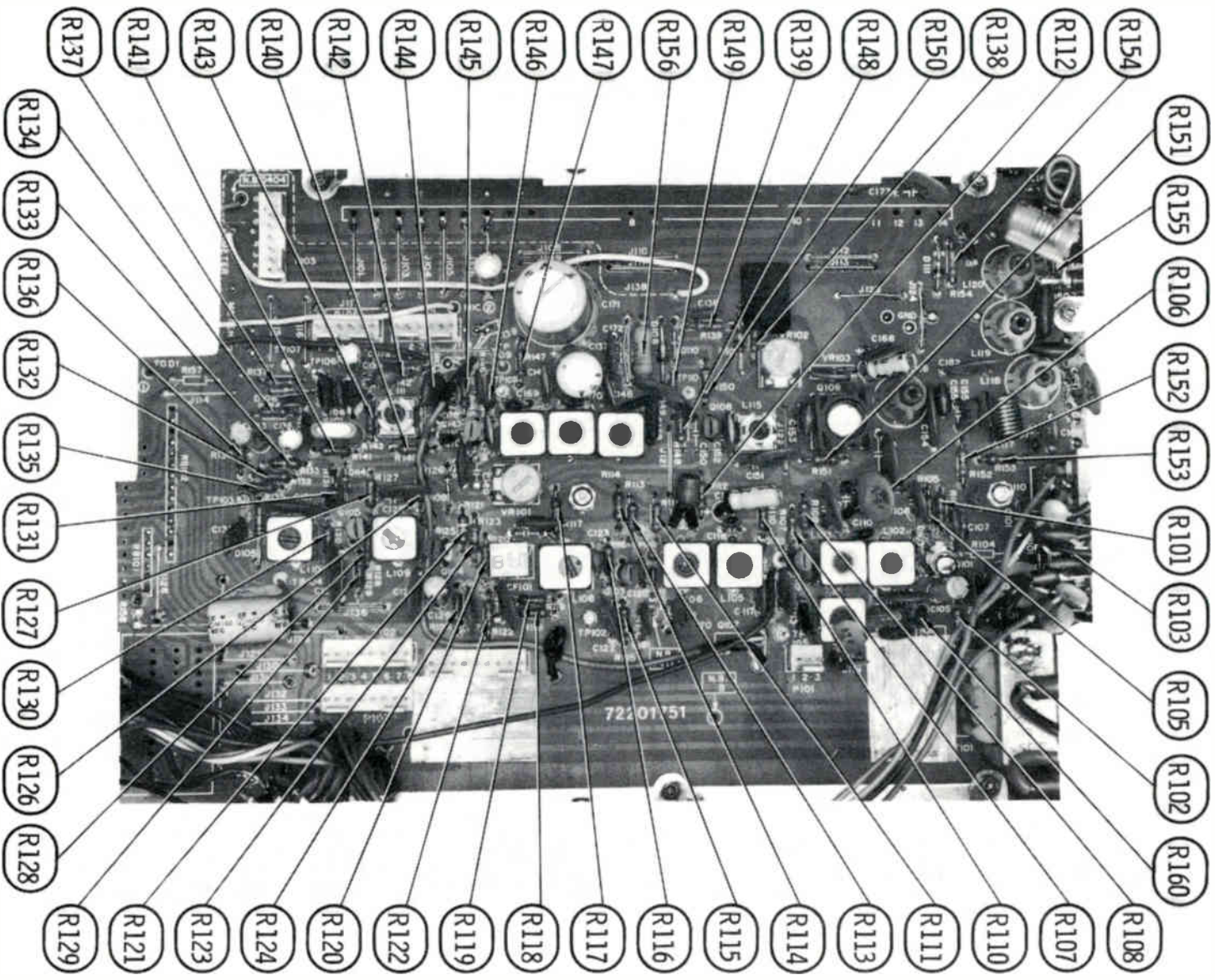
FANON MODEL FANFARE 190DF

MAIN BOARD

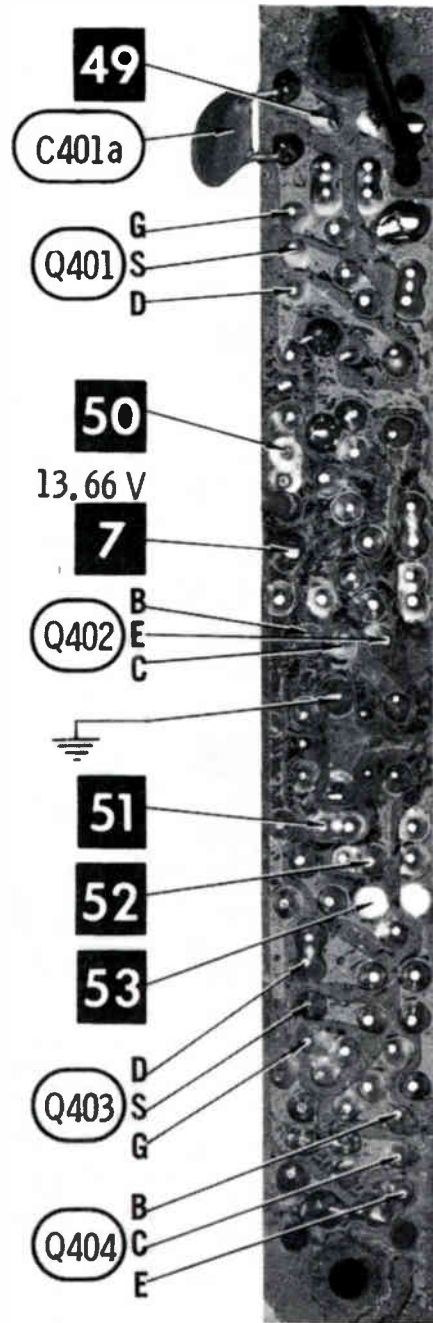
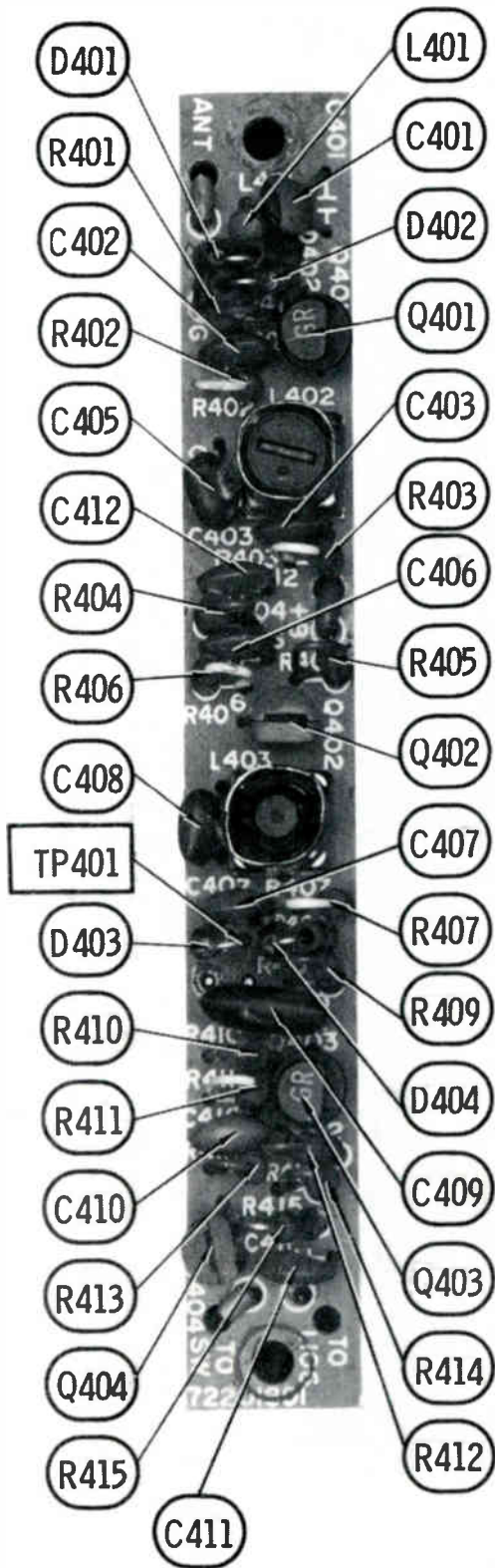




MAIN BOARD

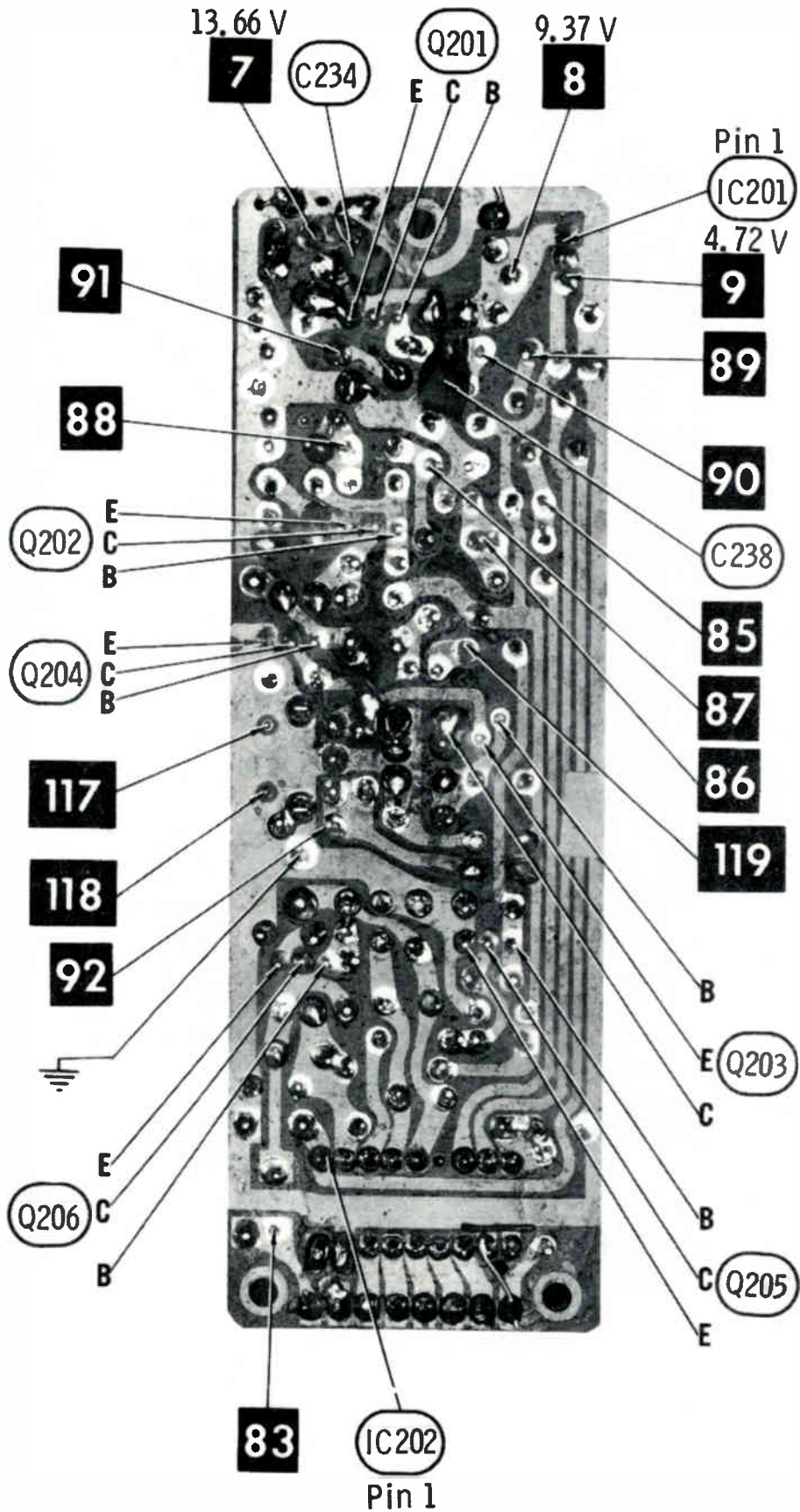


MAIN BOARD

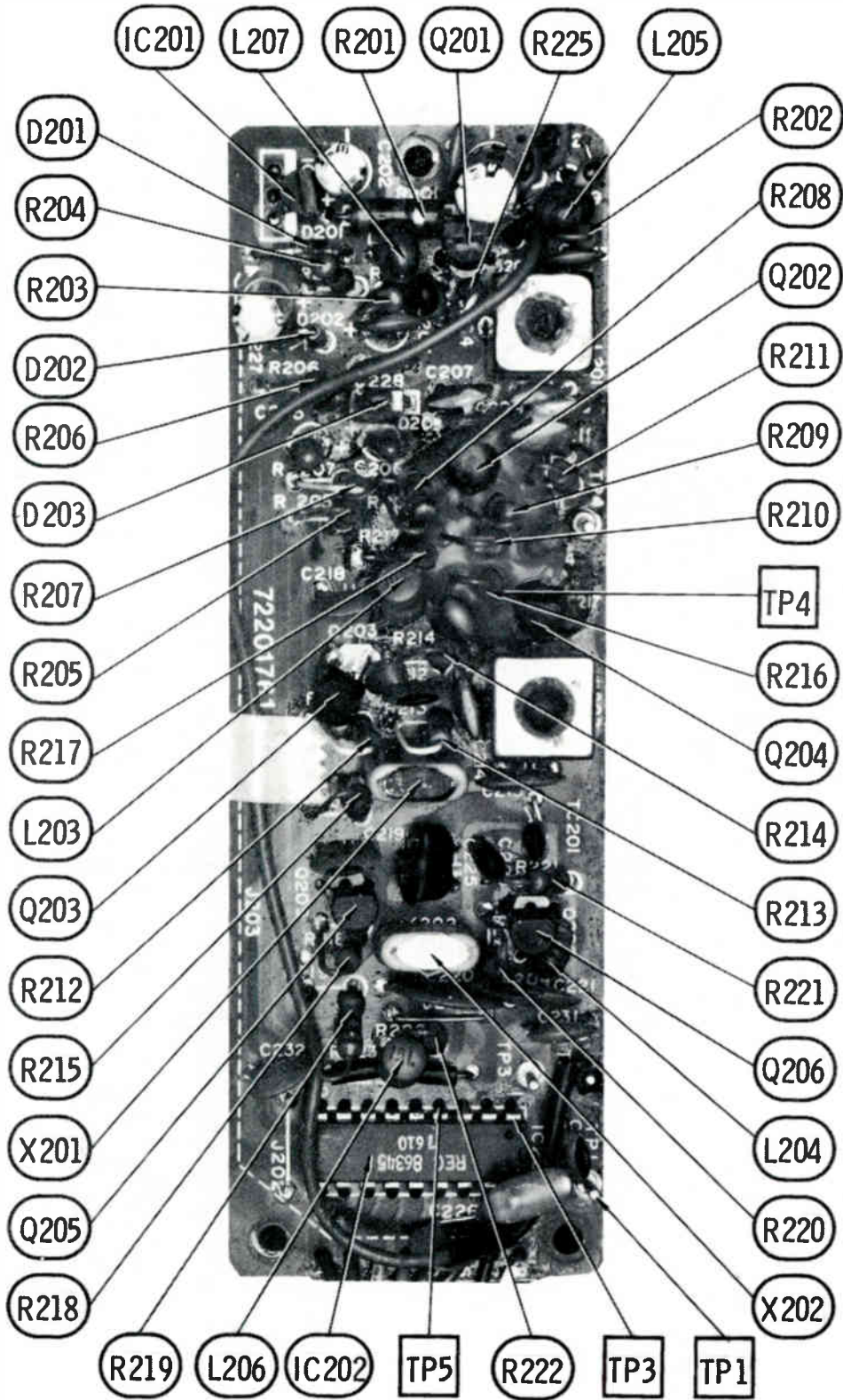


FANON MODEL FANFARE 190DF

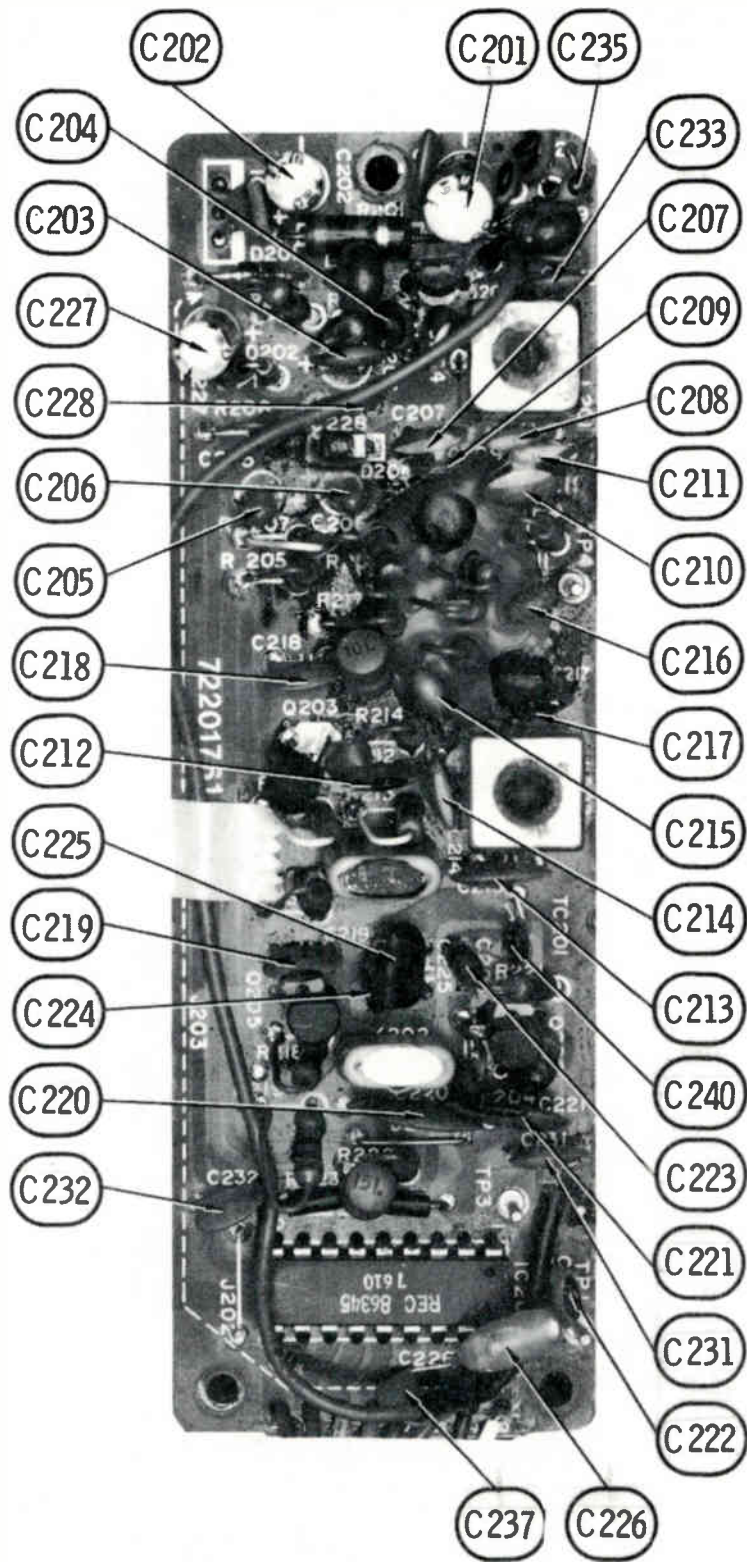
NOISE BLANKER BOARD



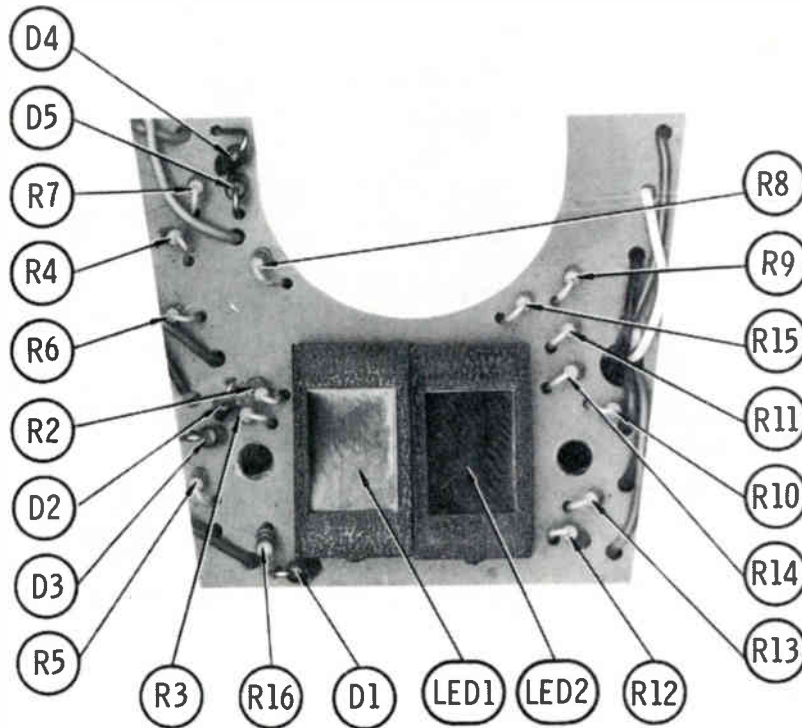
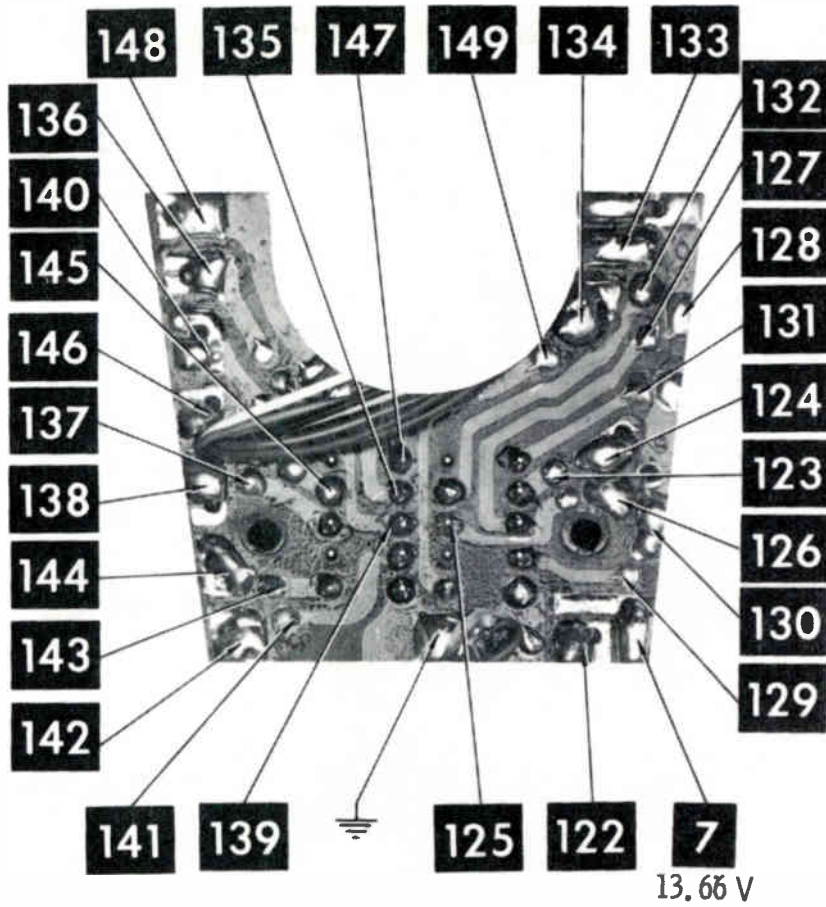
PLL BOARD



PLL BOARD

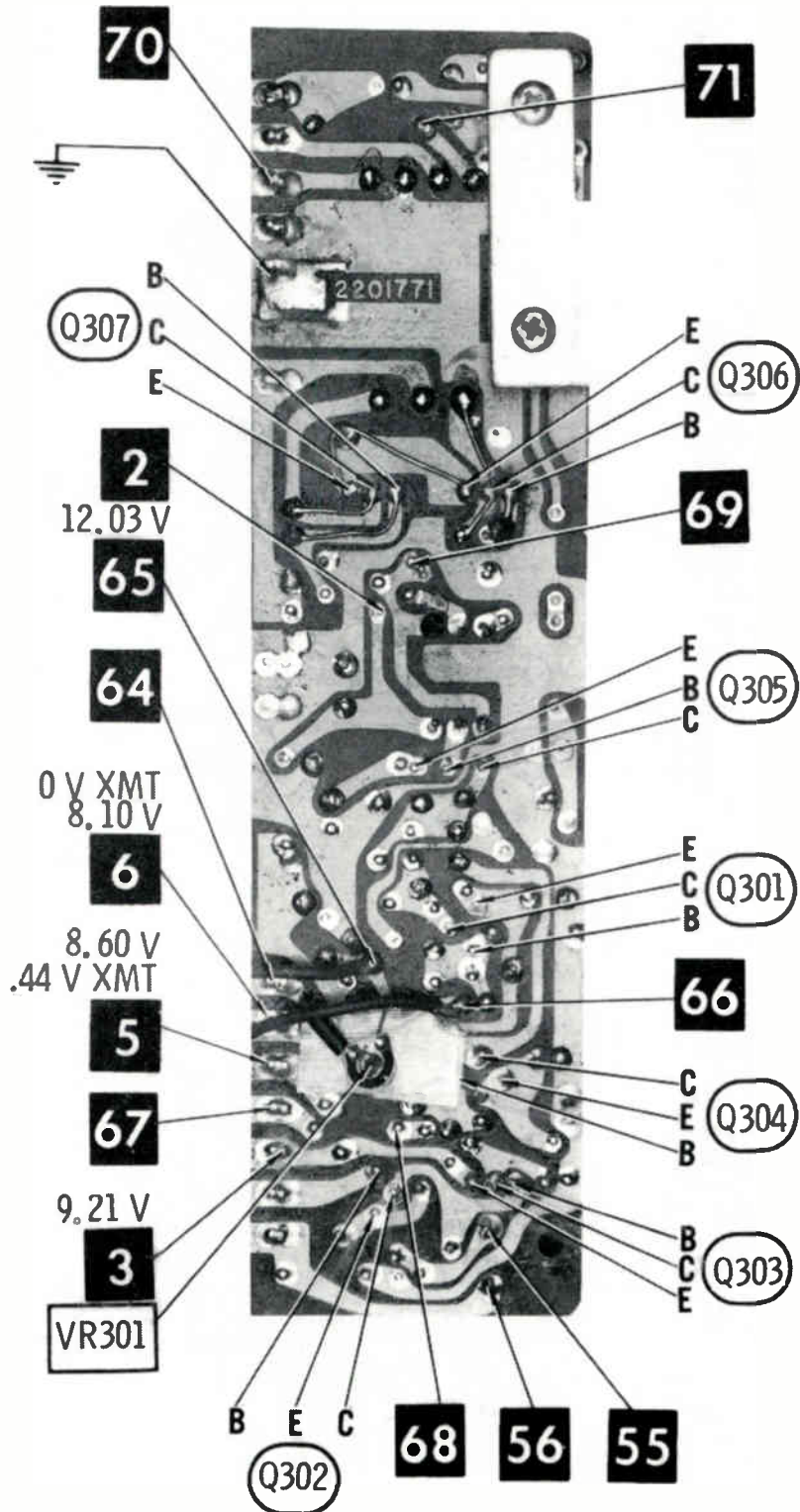


PLL BOARD

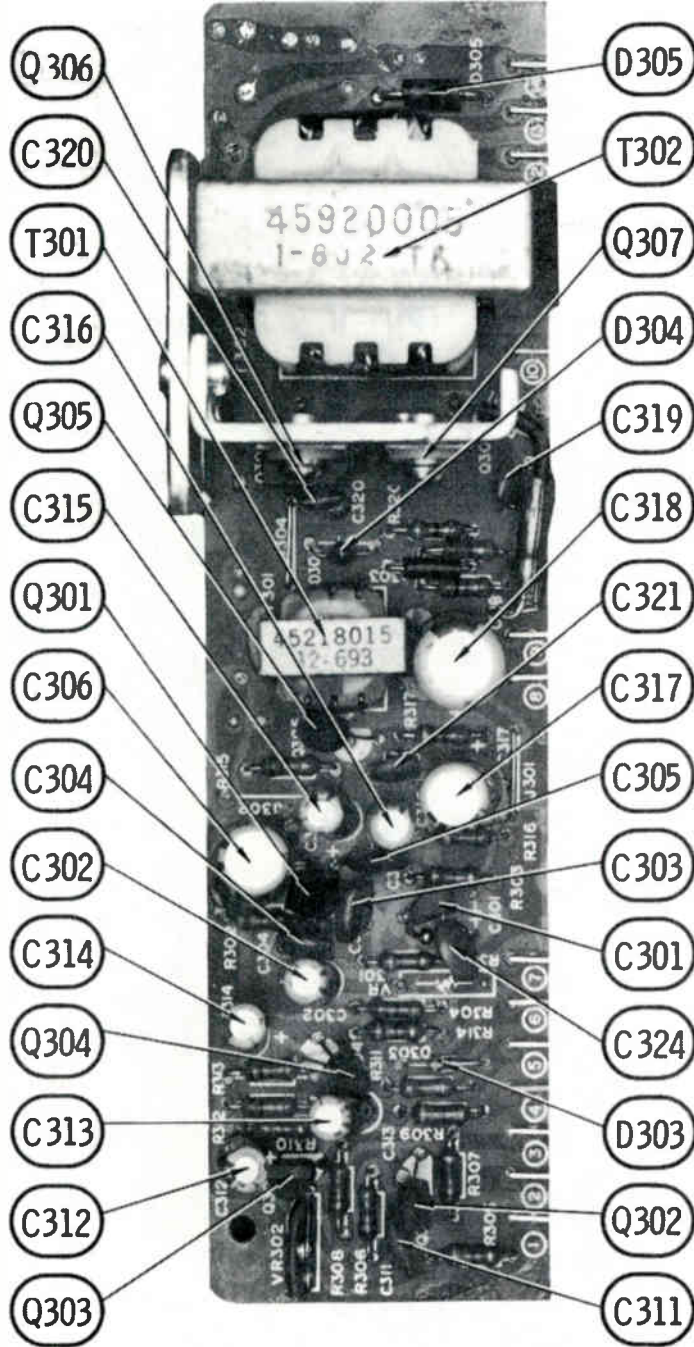


LED READOUT BOARD

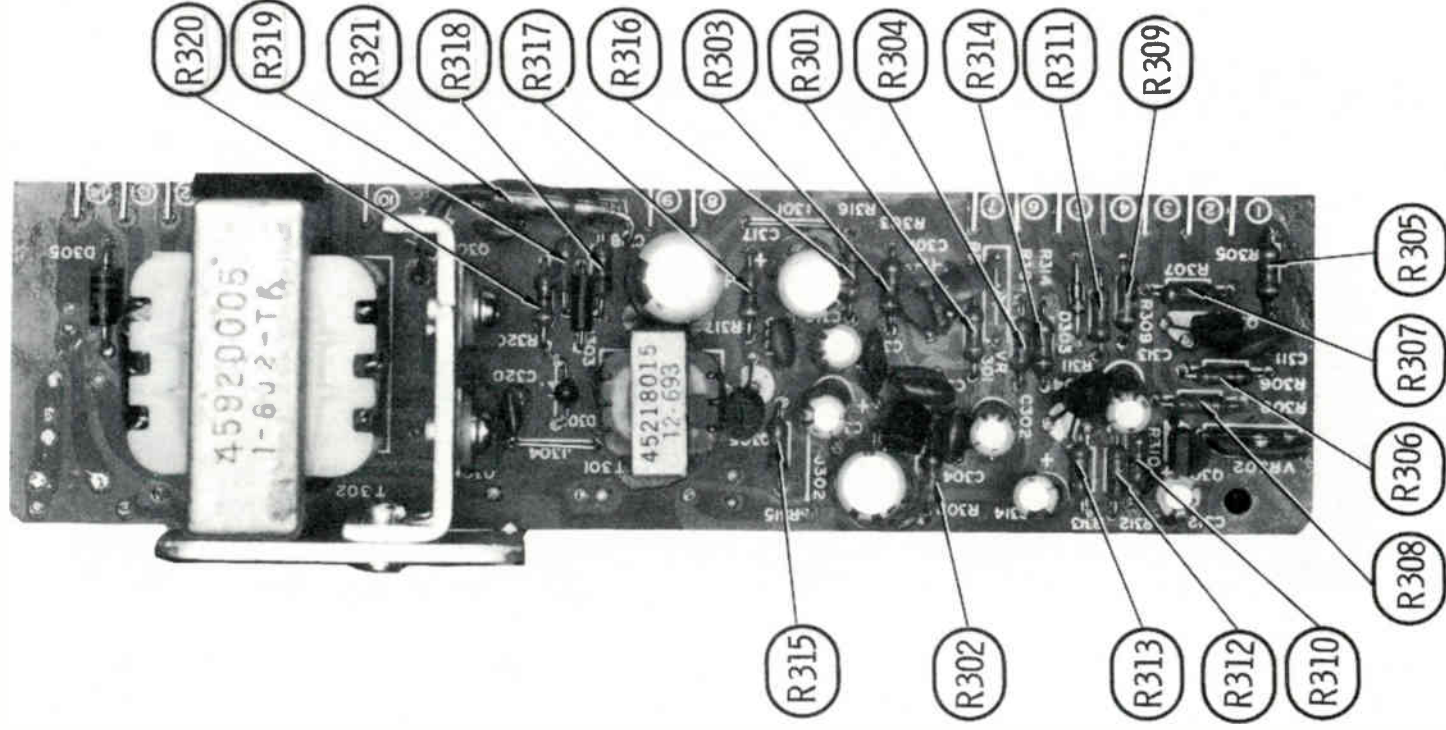
FANON MODEL FANFARE 190DF



AUDIO BOARD

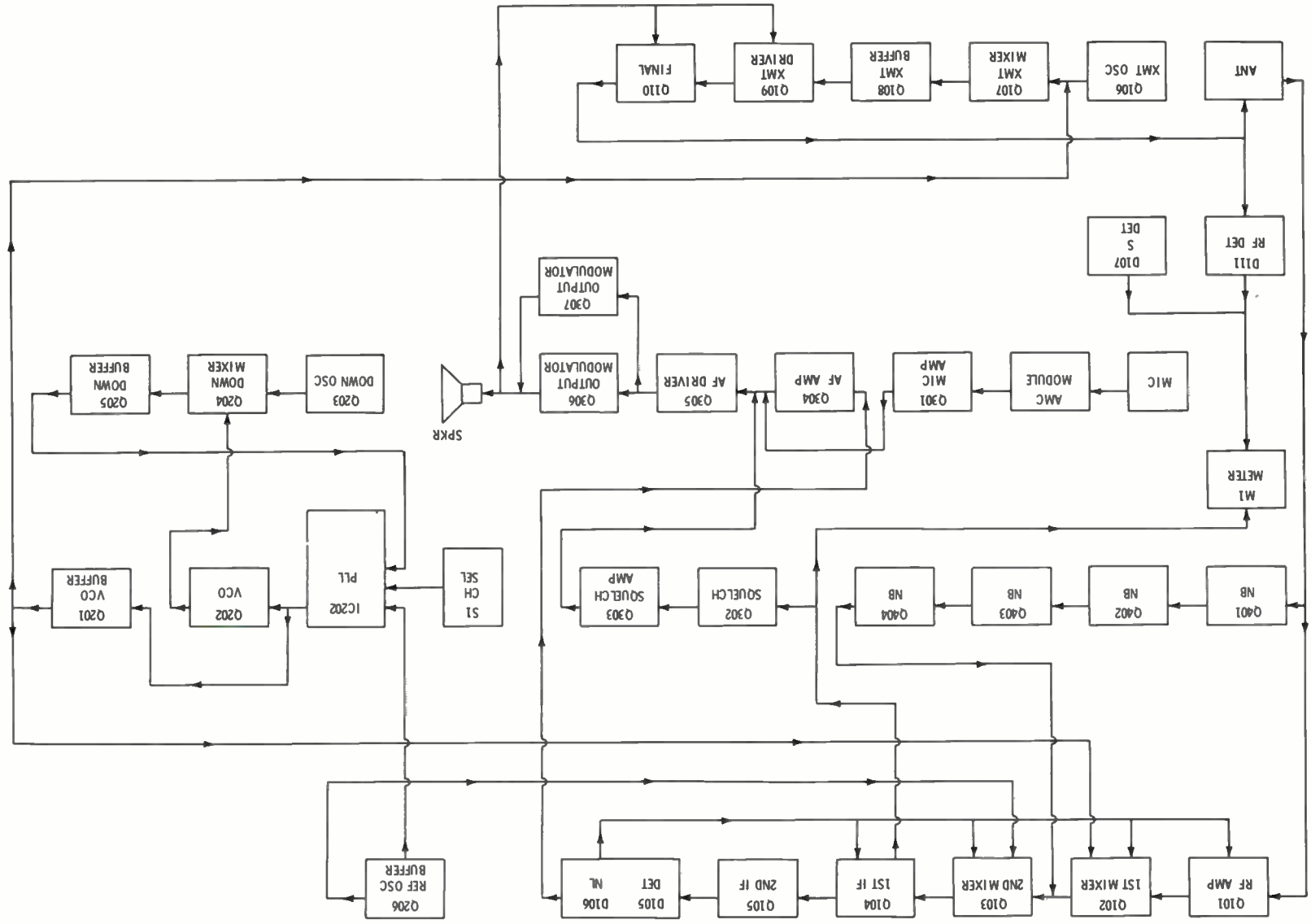


AUDIO BOARD

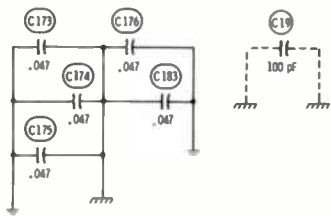
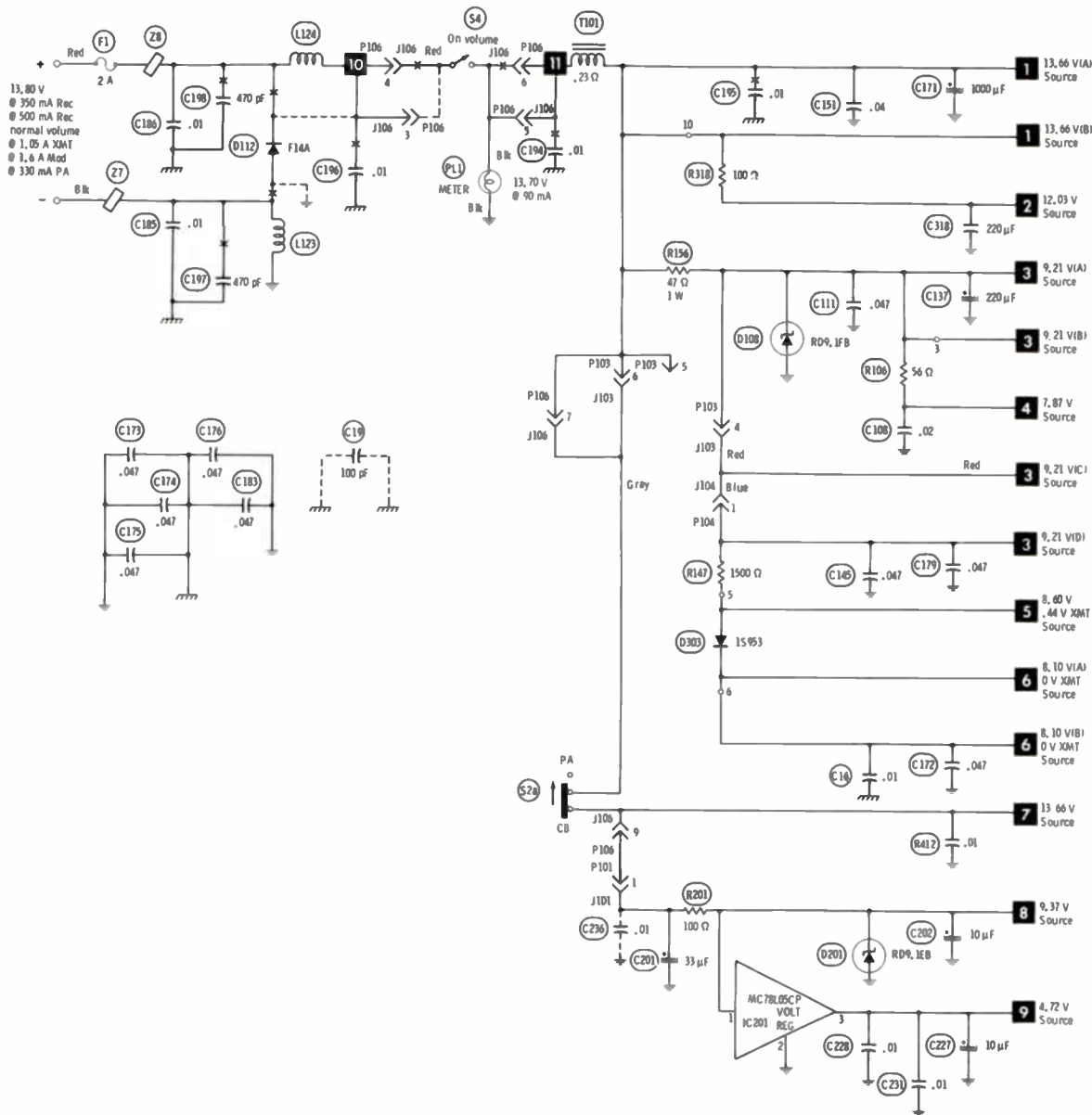


AUDIO BOARD

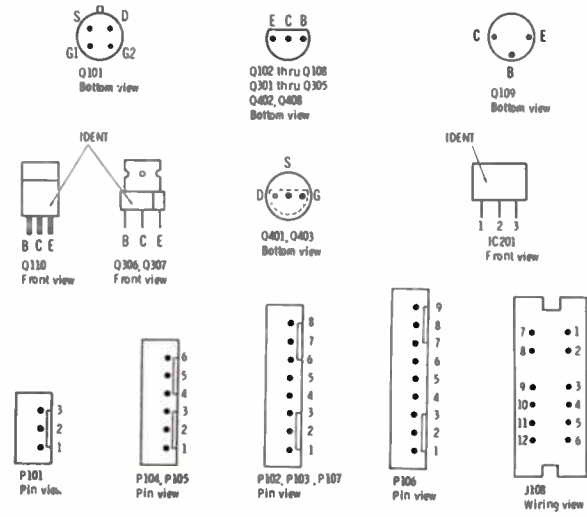
FANON MODEL FANFARE 190DF



BLOCK DIAGRAM



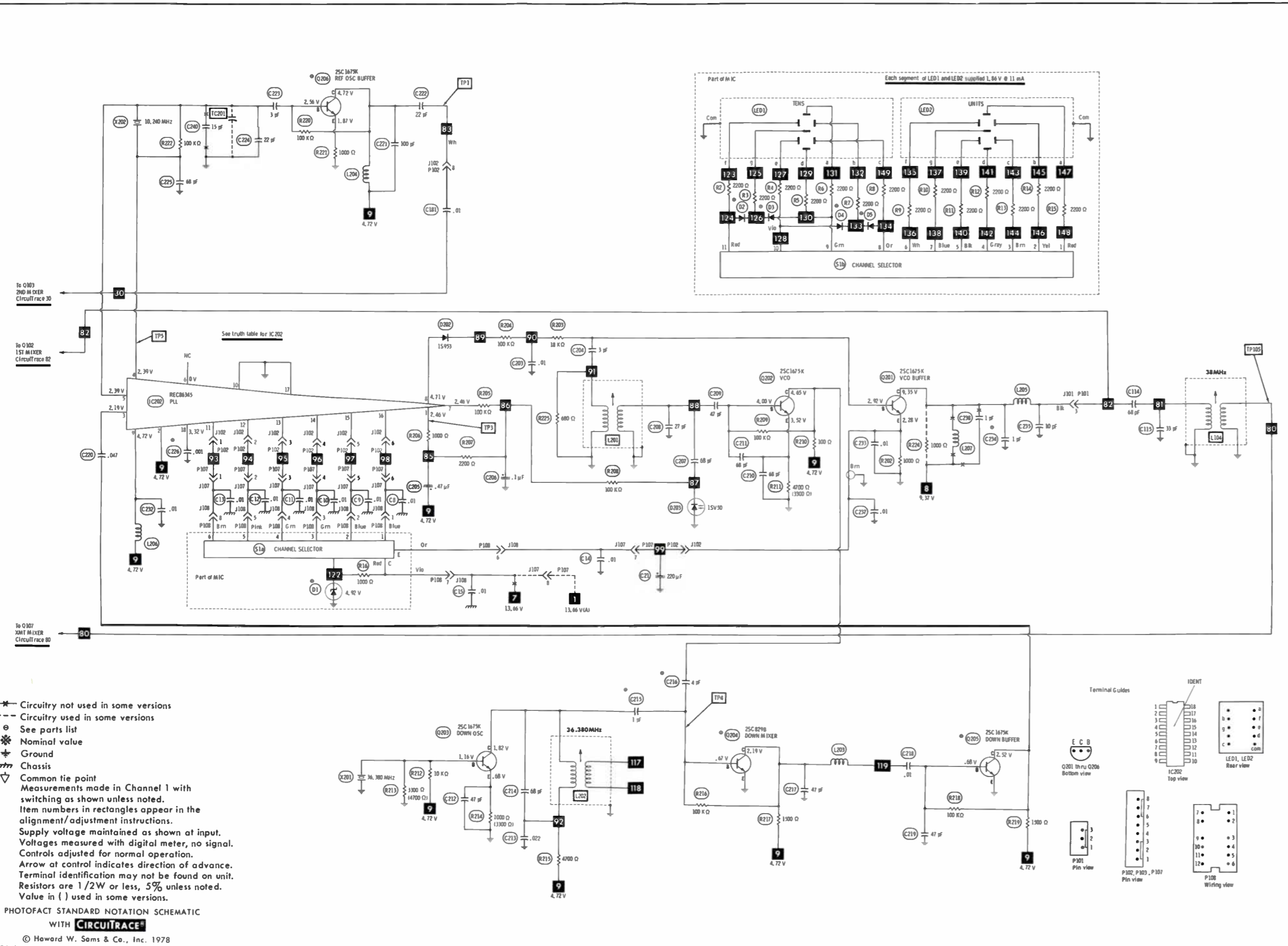
Terminal Guides



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

A PHOTOFACIT STANDARD NOTATION SCHEMATIC
WITH **CIRCUITRACE**

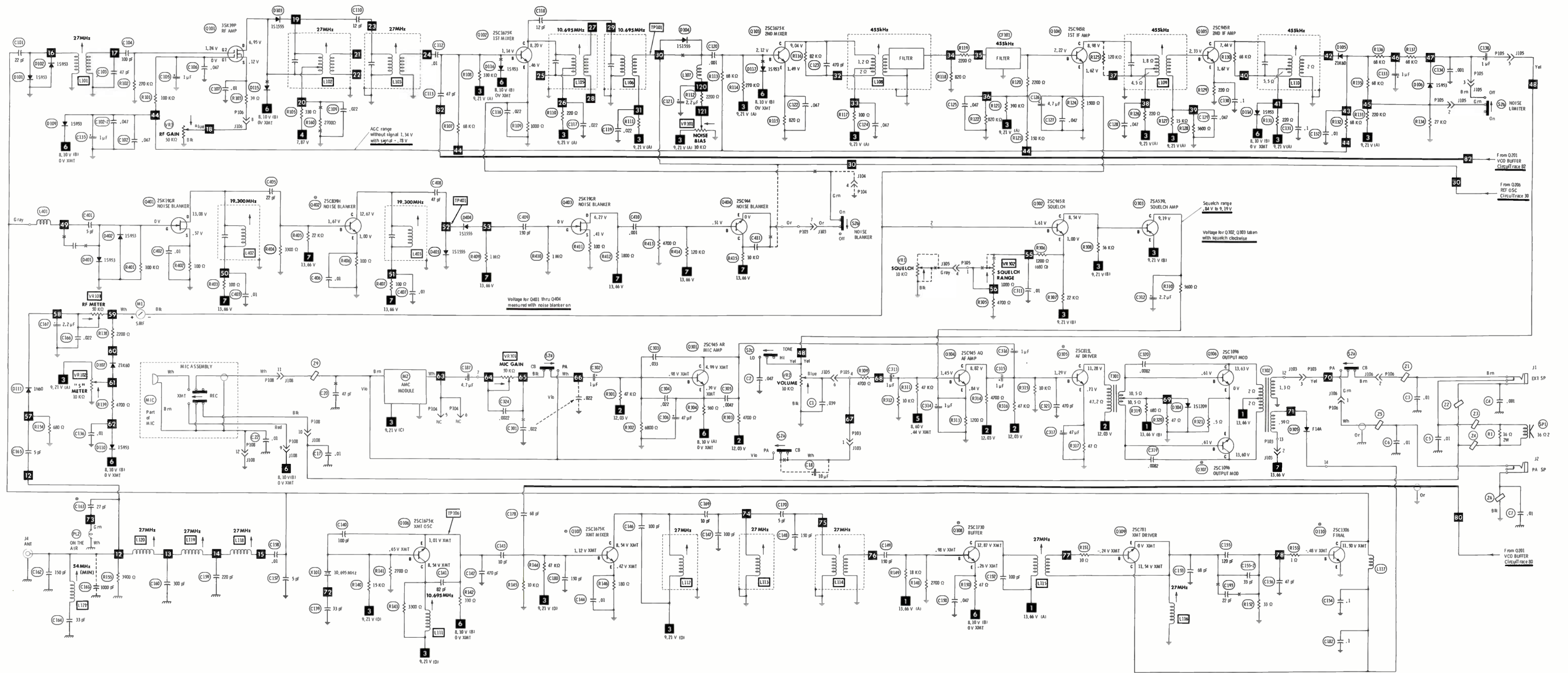
TRUTH CHART



FANON MODEL FANFARE 190DF

CHANNEL	IC202 PROGRAM DIVIDER PINS						REC & XMT VCO OUTPUT IN MHz AT TP105
	11	12	13	14	15	16	
	1 = 4.72 Volts 0 = 0 Volts						
1	0	0	0	0	0	0	37.660
2	0	0	0	0	0	1	37.670
3	0	0	0	0	1	0	37.680
4	0	0	0	1	0	0	37.700
5	0	0	0	1	0	1	37.710
6	0	0	0	1	1	0	37.720
7	0	0	0	1	1	1	37.730
8	0	0	1	0	0	1	37.750
9	0	0	1	0	1	0	37.760
10	0	0	1	0	1	1	37.770
11	0	0	1	1	0	0	37.780
12	0	0	1	1	1	0	37.800
13	0	0	1	1	1	1	37.810
14	0	1	0	0	0	0	37.820
15	0	1	0	0	0	1	37.830
16	0	1	0	0	1	1	37.850
17	0	1	0	1	0	0	37.860
18	0	1	0	1	0	1	37.870
19	0	1	0	1	1	0	37.880
20	0	1	1	0	0	0	37.900

CHANNEL	IC202 PROGRAM DIVIDER PINS						REC & XMT VCO OUTPUT IN MHz AT TP105
	11	12	13	14	15	16	
	1 = 4.72 Volts 0 = 0 Volts						
21	0	1	1	0	0	1	37.910
22	0	1	1	0	1	0	37.920
23	0	1	1	1	0	1	37.950
24	0	1	1	0	1	1	37.930
25	0	1	1	1	0	0	37.940
26	0	1	1	1	1	0	37.960
27	0	1	1	1	1	1	37.970
28	1	0	0	0	0	0	37.980
29	1	0	0	0	0	1	37.990
30	1	0	0	0	1	0	38.000
31	1	0	0	0	1	1	38.010
32	1	0	0	1	0	0	38.020
33	1	0	0	1	0	1	38.030
34	1	0	0	1	1	0	38.040
35	1	0	0	1	1	1	38.050
36	1	0	1	0	0	0	38.060
37	1	0	1	0	0	1	38.070
38	1	0	1	0	1	0	38.080
39	1	0	1	0	1	1	38.090
40	1	0	1	1	0	0	38.100



PARTS LIST AND DESCRIPTION

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

WIRING DATA

General-use Hook-up Wire (available in 5 colors)	BELDEN No. 8523	Coiled Microphone Cable	
Shielded Hook-up Wire (spiral wrapped)	BELDEN No. 8421	3-conductor (1 shielded) 23AWG	BELDEN No. 9471 (5')
(braided)	BELDEN No. 8401		BELDEN No. 8497 (6')
Speaker Cable (available in 4 colors)	BELDEN No. 8782		BELDEN No. 9472 (7-1/2')
Bonding Strap	BELDEN No. 8672		28AWG BELDEN No. 9466 (6')
AC Power Cord	(6') BELDEN No. 17106		31AWG BELDEN No. 9468 (10')
	(9') BELDEN No. 17109	4-conductor (unshielded) 23AWG	BELDEN No. 8415 (6')
		5-conductor (1 shielded) 28AWG	BELDEN No. 9467 (6')
			BELDEN No. 9465 (7-1/2')

SEMICONDUCTORS (Select replacement transistor for best results)

ITEM No.	TYPE No.	MFR. PART No.	REPLACEMENT DATA										
			GENERAL ELECTRIC PART No.	MALLORY PART No.	MOTOROLA PART No.	RAYTHEON PART No.	RCA PART No.	SPRAGUE PART No.	SYLVANIA PART No.	THORDARSON PART No.	WORKMAN PART No.	ZENITH PART No.	
D2			GE-300	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177			WEP1062	
D3			GE-300	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177			WEP1062	
D4			GE-300	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177			WEP1062	
D5			GE-300	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177			WEP1062	
D101	1S953		GE-300	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177			WEP1062	
D102	1S953		GE-300	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177			WEP1062	
D103	1S1555		GE-300	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177			WEP1062	
D104	1S1555		GE-300	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177			WEP1062	
D105	21K60		1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109	1N60	WEP134	ZEN-430	
D106	1S953		GE-300	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177		WEP1062		
D107	21K60	2022-07	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109	1N60	WEP134	ZEN-430	
D108	RD9.1FB	2023-41	GE-ZD-9.1	ZM9.1B	HEPR0602	RE 114	SK3060	RT-240	ECG5018	1N4739A	WEP1419	103-279-18	
D109	1S953		GE-514	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519	1N4148	WEP925		
D110	1S953		GE-514	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519	1N4148	WEP925		
D111	1N60	294-42-9	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109	1N60	WEP134	ZEN-430	
D112	F14A	2022-08	GE-504A	PTC201	HEPR0052	RE 49	SK3030	RT-213	ECG116	1N4004	WEP156	212-61	
D113	1S953		GE-300	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177		WEP1062		
D201	RD9.1EB	2023-41	GE-ZD-9.1	ZM9.1B	HEPR0602	RE 114	SK3060	RT-240	ECG5018	1N4739A	WEP1419	103-279-18	
D202	1S953		GE-300	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177		WEP1062		
D203	1S553	2061-44	GE-300	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177		WEP1062		
D204	1S953	2061-45	GE-90	HEPR2503	HEPR0602	RE 52	SK3100	RT-262	ECG614		WEP200	ZEN-453	
D303	1S953		GE-300	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177		WEP1062		
D304	1S1209	2017-111		PTC301		RE 250			ECG601				
D305	SR1K-2	1042-17	GE-504A	PTC201	HEPR0052	RE 49	SK3030	RT-213	ECG116	1N4004	WEP156	212-61	
D401	1S953	2022-08	GE-300	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177	1N4004	WEP1062	212-61	
D402	1S953		GE-300	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177		WEP1062		
D403	1S1555		GE-300	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177		WEP1062		
D404	1S1555		GE-300	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177		WEP1062		
IC201	MC78L05CP					RE 387-1C			ECG977				
IC202	UPC14305	2061-42				RE 387-1C			ECG977				
Q101	REC86345	2061-43											
Q101	35K39P	2022-06	GE-FET-4	PTC182	HEPF2004	RE 199	SK3050	RT-181	ECG222		WEP905	121-826	
Q102	35K39		GE-FET-4	PTC182	HEPF2004	RE 199	SK3050	RT-181	ECG222		WEP905	121-826	
Q103	25C1675	2022-03	GE-213	PTC139*	25C1675	RE 13*	SK3124	RT-308	ECG229*		WEP956*	ZEN-127	
Q103	25C1675		GE-213	PTC139*	25C1675	RE 13*	SK3124	RT-308	ECG229*		WEP956*	ZEN-127	
Q104	25C945R	1043-07	GE-212	PTC121*	25C945	RE 192	SK3124	RT-107A	ECG199	25C945	WEP1945	121-29000	
Q104	25C945		GE-212	PTC121*	25C945	RE 192	SK3124	RT-107A	ECG199	25C945	WEP1945	121-29000	
Q105	25C945R	1043-07	GE-212	PTC121*	25C945	RE 192	SK3124	RT-107A	ECG199	25C945	WEP1945	121-29000	
Q105	25C945		GE-212	PTC121*	25C945	RE 192	SK3124	RT-107A	ECG199	25C945	WEP1945	121-29000	
Q106	25C1675	2022-03	GE-213	PTC139*	25C1675	RE 13*	SK3124	RT-308	ECG229*		WEP956*	ZEN-127	
Q107	25C1675	2022-03	GE-213	PTC139*	25C1675	RE 13*	SK3124	RT-308	ECG229*		WEP956*	ZEN-127	
Q108	25C1730		GE-17*	PTC136*	HEPS0025*	RE 9	SK3018*	RT-107A	ECG107		WEP535	121-881	
Q109	25C815L	1040-155	GE-210*	PTC121*	25C815	RE 13*	SK3038*	RT-302	ECG123A*	25C815	WEP736*	121-1014	
Q109	25C781	1009-03	GE-219	PTC179	25C781	RE 79A	SK3048	RT-306	ECG195A	25C781	WEP755		
Q110	25C1306I	2022-04(12)	GE-215	PTC186	25C1306	RE 203	SK3197	RT-146	ECG235	25C1306	WEP785		
Q110	25C1306		GE-215	PTC186	25C1306	RE 203	SK3197	RT-146	ECG235	25C1306	WEP785		
Q201	25C1675	2022-03	GE-213	PTC139*	25C1675	RE 13*	SK3124	RT-308	ECG229*		WEP956*	ZEN-127	
Q202	25C1675	2022-03	GE-213	PTC139*	25C1675	RE 13*	SK3124	RT-308	ECG229*		WEP956*	ZEN-127	
Q203	25C1675	2022-03	GE-213	PTC139*	25C1675	RE 13*	SK3124	RT-308	ECG229*		WEP956*	ZEN-127	
Q204	25C829B		GE-20*	PTC121*	25C829	RE 9*	SK3444	RT-308	ECG229*	25C829	WEP829	ZEN-127	
Q205	25C1675	2022-03	GE-213	PTC139*	25C1675	RE 13*	SK3124	RT-308	ECG229*		WEP956*	ZEN-127	
Q205	25C829B		GE-20*	PTC121*	25C829	RE 9*	SK3444	RT-308	ECG229*	25C829	WEP829	ZEN-127	
Q206	25C1675	2022-03	GE-213	PTC139*	25C1675	RE 13*	SK3124	RT-308	ECG229*		WEP956*	ZEN-127	
Q206	25C829B		GE-20*	PTC121*	25C829	RE 9*	SK3444	RT-308	ECG229*	25C829	WEP829	ZEN-127	
Q301	25C945R	2022-03	GE-212	PTC121*	25C945	RE 192	SK3124	RT-107A	ECG199	25C945	WEP1945	121-29000	
Q301	25C945	1043-07	GE-212	PTC121*	25C945	RE 192	SK3124	RT-107A	ECG199	25C945	WEP1945	121-29000	
Q302	25C945R	1043-07	GE-212	PTC121*	25C945	RE 192	SK3124	RT-107A	ECG199	25C945	WEP1945	121-29000	
Q302	25C945		GE-212	PTC121*	25C945	RE 192	SK3124	RT-107A	ECG199	25C945	WEP1945	121-29000	
Q303	25A539L	2020-01	GE-82*	PTC103*	HEPS0026*	RE 26*	SK3114*	RT-303*	ECG159*		WEP62*	921-383	
Q303	25A539		GE-82*	PTC103*	HEPS0026*	RE 26*	SK3114*	RT-303*	ECG159*		WEP62*	921-383	
Q304	25C945AQ		GE-212	PTC121*	25C945	RE 192	SK3124	RT-107A	ECG199	25C945	WEP1945	121-29000	
Q304	25C945R	1043-07	GE-212	PTC121*	25C945	RE 192	SK3124	RT-107A	ECG199	25C945	WEP1945	121-29000	
Q304	25C945		GE-212	PTC121*	25C945	RE 192	SK3124	RT-107A	ECG199	25C945	WEP1945	121-29000	
Q305	25C815L	1040-155	GE-210*	PTC121*	25C815	RE 13*	SK3038*	RT-302	ECG123A*	25C815	WEP736*	121-1014	
Q305	25C815		GE-210*	PTC121*	25C815	RE 13*	SK3038*	RT-302	ECG123A*	25C815	WEP736*	121-1014	
Q306	25C1096		GE-28	PTC110	25C1096	RE 42	SK3197	RT-166	ECG186A	25C1096	WEP1096		
Q306	25C1096ZL	2017-108	GE-28	PTC110	25C1096	RE 42	SK3197	RT-166	ECG186A	25C1096	WEP1096		
Q307	25C1096		GE-28	PTC110	25C1096	RE 42	SK3197	RT-166	ECG186A	25C1096	WEP1096		
Q307	25C1096ZL	2017-108	GE-28	PTC110	25C1096	RE 42	SK3197	RT-166	ECG186A	25C1096	WEP1096		
Q401	25K196R	1009-127	GE-FET-2	PTC161	HEPF0021	RE 45	SK3116	RT-175	ECG312		WEP920	ZEN-123	
Q402	25C839		GE-61*	PTC132*	25C839	RE 13*	SK3444*	RT-308	ECG123A*	25C839	WEP736*	ZEN-120	
Q402	25C839H	1077-07	GE-61*	PTC132*	25C839	RE 13*	SK3444*	RT-308	ECG123A*	25C839	WEP736*	ZEN-120	
Q403	25K196R	1009-127	GE-FET-2	PTC161	HEPF0021	RE 45	SK3116	RT-175	ECG312		WEP920	ZEN-123	
Q404	25C944	2022-05	GE-20*	PTC121*	HEPS0025*	RE 13*	SK3122	RT-302	ECG123A*		WEP736*		

* Lead configuration may vary from original.
(12) 12 WATTS @ 3 AMPS.

FANON MODEL FANFARE 190DF

PARTS LIST AND DESCRIPTION (CONTINUED)

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

ELECTROLYTIC CAPACITORS

ITEM No.	RATING	REPLACEMENT DATA				
		MFRG. PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
					Q-LINE	GENERAL LINE
C18	10 16V	170-23-9	PC10-25	VTT10825	QV1-41	EV-1222
C21	220 16V	2022-109	PC250-25	VTT220H16	QV1-117	EV-1240
C105	1 16V	2022-104	PC1-50	VTT1A50	QV1-9	EV-1315
C121	2.2 16V	2022-105	PC2-100	VTT2R2A50	QV1-19	EV-1517
C126	4.7 16V	2022-107	PC5-50	VTT4R7B50	QV1-27	EV-1319
C133	1 16V	2022-104	PC1-50	VTT1A50	QV1-9	EV-1315
C135	1 16V	2022-104	PC1-50	VTT1A50	QV1-9	EV-1315
C137	220 16V	2022-109	PC250-25	VTT220H16	QV1-117	EV-1240
C138	1 16V	2022-104	PC1-50	VTT1A50	QV1-9	EV-1315
C167	2.2 16V	2022-105	PC2-100	VTT2R2A50	QV1-19	EV-1517
C171	1000 16V	2022-111	PC1000-16	VTT1000L16	QV1-183	EV-1260
C187	4.7 50V		PC5-50	VTT4R7B50	QV1-29	EV-1519
C201	33 16V	170-48-9	PC30-25	VTT33D25	QV1-63	EV-1325
C202	10 16V	170-23-9	PC10-25	VTT10825	QV1-41	EV-1222
C205	.47 35V			TDC474M050EL	QDT1-19	SD50-R479
C206	.1 35V	2061-54		TDC104M050EL	QDT1-2	SD50-R109
C227	10 16V	170-23-9	PC10-25	VTT10825	QV1-41	EV-1222
C302	1 50V	170-53-9	PC1-50	VTT1A50	QV1-11	EV-1615
C306	47 16V	2022-108	PC50-16	VTT47D16	QV1-73	EV-1226
C312	2.2 50V	2061-66	PC2-100	VTT2R2A50	QV1-19	EV-1517
C313	1 16V	170-53-9	PC1-50	VTT1A50	QV1-9	EV-1315
C314	1 16V	170-53-9	PC1-50	VTT1A50	QV1-9	EV-1315
C315	1 16V	170-53-9	PC1-50	VTT1A50	QV1-9	EV-1315
C316	1 16V	170-53-9	PC1-50	VTT1A50	QV1-9	EV-1315
C317	47 16V	2022-108	PC50-16	VTT47D16	QV1-73	EV-1226
C318	220 16V	2022-109	PC250-25	VTT220H16	QV1-117	EV-1240

CAPACITORS

ITEM No.	RATING	MFRG. PART No.	REPLACEMENT DATA				
			CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
						Q-LINE	GENERAL LINE
C1	.039			DPMS6S39	PVC6139		6PS-S39
C2	.047			DPMS2S47	EWFA1A47	QF1-171	1PB-S47
C3	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C4	.001		DD-102G	GP1000	GP210	QC2-81	5GA-D10
C5	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C6	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C7	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C8	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C9	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C10	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C11	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C12	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C13	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C14	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C15	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C16	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C17	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C19	100		DTZ-100	NPO100	CNO310		10TCC-T10
C20	47		DTZ-47	NPO47	CNO447		10TCC-Q47
C22	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C101	22 NPO		DTZ-22	NPO22	CNO422		10TCC-Q22
C102	.047		DC-503	MGP05	TA150	QC2-207	TG-S50
C102-2	.047		DC-503	MGP05	TA150	QC2-207	TG-S50
C103	47 NPO		DTZ-47	NPO47	CNO447		10TCC-Q47
C104	100 NPO		DTZ-100	NPO100	CNO310		10TCC-T10
C106	.047		DC-503	MGP05	TA150	QC2-207	TG-S50
C107	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C108	.02		DC-203	MGP02	TA120	QC2-157	TG-S20
C109	.02		DC-203	MGP02	TA120	QC2-157	TG-S20
C110	12 NPO				CNO412		10TCC-Q12
C111	.047		DC-503	MGP05	TA150	QC2-207	TG-S50
C112	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C113	47 NPO		DTZ-47	NPO47	CNO447		10TCC-Q47
C114	68 N220				*		10TCR-Q68
C115	33 NPO		DTZ-33	NPO33	CNO433		10TCC-Q33
C116	.02		DC-203	MGP02	TA120	QC2-157	TG-S20
C117	.02		DC-203	MGP02	TA120	QC2-157	TG-S20
C118	12 NPO				CNO412		10TCC-Q12
C119	.02		DC-203	MGP02	TA120	QC2-157	TG-S20
C120	.001		DD-102G	GP1000	GP210	QC2-81	5GA-D10
C122	.047		DC-503	MGP05	TA150	QC2-207	TG-S50
C123	470		DD-471	GP470	GP347		10TS-T47
C124	.047		DC-503	MGP05	TA150	QC2-207	TG-S50
C125	.047		DC-503	MGP05	TA150	QC2-207	TG-S50
C127	.047		DC-503	MGP05	TA150	QC2-207	TG-S50
C128	.047		DC-503	MGP05	TA150	QC2-207	TG-S50
C129	.047		DC-503	MGP05	TA150	QC2-207	TG-S50
C130	.1		DC-104	MGP1	TA010	QC2-233	TG-P10
C131	.1		DC-104	MGP1	TA010	QC2-233	TG-P10
C132	.01			WMF1S1	EWFA1A110	QF1-91	1PB-S10
C134	.001			DPMS6D1	EWFA1A210	QF1-1	1PB-D10
C136	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C139	33 NPO		DTZ-33	NPO33	CNO433		10TCC-Q33
C140	100 NPO		DTZ-100	NPO100	CNO310		10TCC-T10
C141	82 N220	2022-84			*		10TCR-Q82
C142	470		DD-471	GP470	GP347		10TS-T47
C143	10 NPO		DTZ-10	NPO10	CNO410		10TCC-Q10
C144	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C145	.047		DC-503	MGP05	TA150	QC2-207	TG-S50
C146	100 N220	2022-82			*		10TCR-T10
C147	100 N220	2022-82			*		10TCR-T10
C148	150 N220	2022-86			*		10TCR-T15
C149	150			CD15FD151J03	SX315	QW1-31	MMA-151
C150	.047		DC-503	MGP05	TA150	QC2-207	TG-S50

PARTS LIST AND DESCRIPTION (CONTINUED)

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

CAPACITORS (cont)

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA				
			CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
						Q-LINE	GENERAL LINE
C151	.047		DC-503	MGP05	TA150	QC2-207	TG-S50
C152	100			CD15FD101J03	SX310	QW1-27	MMA-101
C153	68			CD15ED680J03	SX468	QW1-23	MMA-680
C154	.1		DC-104	MGP1	TA010	QC2-233	TG-P10
C155	120			CD15FD121J03	SX312	QW1-29	MMA-121
C155-2	33 NPO		DTZ-33	NPO33	CN0433		10TCC-033
C156	47 NPO		DTZ-47	NPO47	CN0447		10TCC-047
C157	5 NPO		DTZ-4R7	NPO4P7	CN0547		10TCC-V47
C158	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C159	220			CD15FD221J03	SX322	QW1-35	MMA-221
C160	300			CD15FD301J03	SX330	QW1-38	MMA-301
C161	100			CD15FD101J03	SX310	QW1-27	MMA-101
C162	150			CD15FD151J03	SX315	QW1-31	MMA-151
C163	27 NPO				CN0427		10TCC-Q27
	15		DTZ-15	NPO15	CN0415		10TCC-Q15
C164	33 NPO		DTZ-33	NPO33	CN0433		10TCC-Q33
C165	5 NPO		DTZ-4R7	NPO4P7	CN0547		10TCC-V47
C166	.022		DC-203	MGP02	TA120	QC2-157	TG-S20
C169	10 NPO		DTZ-10	NPO10	CN0410		10TCC-Q10
C170	5 NPO		DTZ-4R7	NPO4P7	CN0547		10TCC-V47
C172	.047		DC-503	MGP05	TA150	QC2-207	TG-S50
C173	.047		DC-503	MGP05	TA150	QC2-207	TG-S50
C174	.047		DC-503	MGP05	TA150	QC2-207	TG-S50
C175	.047		DC-503	MGP05	TA150	QC2-207	TG-S50
C176	.047		DC-503	MGP05	TA150	QC2-207	TG-S50
C178	68			CD15ED680J03	SX468	QW1-23	MMA-680
C179	.047		DC-503	MGP05	TA150	QC2-207	TG-S50
C180	150			CD15FD151J03	SX315	QW1-31	MMA-151
C181	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C182	.1		DC-104	MGP1	TA010	QC2-233	TG-P10
C183	.047		DC-503	MGP05	TA150	QC2-207	TG-S50
C185	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C186	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C193	220 NPO		DTZ-220				10TCC-T22
C194	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C195	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C196	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C197	470		DD-471	GP470	GP347		10TS-T47
C198	470		DD-471	GP470	GP347		10TS-T47
C203	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C204	3 NPO		DTZ-3R3	NPO3P3	CN0533		10TCC-V33
C207	68 N220				*		10TCR-Q68
C208	27 N220	2061-64			*		10TCR-Q27
C209	47 N330	2022-81			*		10TCS-Q47
C210	68 N220	2061-55			*		10TCR-Q68
C211	68 N220	2061-55			*		10TCR-Q68
C212	47 NPO		DTZ-47	NPO47	CN0447		10TCC-Q47
C213	.022		DC-203	MGP02	TA120	QC2-157	TG-S20
C214	68 N220				CN0533		10TCR-Q68
C215	3	2022-83	DTZ-3R3	NPO3P3	CN0510		10TCC-V10
	1				*		10TCS-V39
C216	4 N330				CN0510		10TCC-V10
	1				CN0447		10TCC-Q47
C217	47 NPO		DTZ-47	NPO47	CN0447		10TCC-Q47
C218	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C219	47 NPO		DTZ-47	NPO47	CN0447		10TCC-Q47
C220	.047		DC-503	MGP05	TA150	QC2-207	TG-S50
C221	100 NPO		DTZ-100	NPO100	CN0310		10TCC-T10
C222	22 NPO		DTZ-22	NPO22	CN0422		10TCC-Q22
C223	3 NPO		DTZ-3R3	NPO3P3	CN0533		10TCC-V33
C224	22 NPO		DTZ-22	NPO22	CN0422		10TCC-Q22
C225	68			CD15ED680J03	SX468	QW1-23	MMA-680
C226	820			CD19FD821J03	SX382		MWC-821
	.001			CD19FD102J03	SX210		MWC-102
C228	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C231	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C232	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C233	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C234	1 NPO				CN0510		10TCC-V10
	22		DTZ-22	NPO22	CN0422		10TCC-Q22
C235	10 NPO		DTZ-10	NPO10	CN0410		10TCC-Q10
C236	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C237	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C238	10			CD15CD100J03		QW1-6	MMA-100
C240	15 NPO		DTZ-15	NPO15	CN0415		10TCC-Q15
C301	.022		DC-203	MGP02	TA120	QC2-157	TG-S20
C303	.033			DPMS6S33	EMF6133		6PS-S33
C304	.022			DPMS2S22	EMF1A122	QF1-127	1PB-S22
C305	.047			DPMS2S47	EMF1A147	QF1-171	1PB-S47
C311	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C319	.0082			WMF1D82	EMF1A282		1PB-D82
C320	.0082			WMF1D82	EMF1A282		1PB-D82
C321	470		DD-471	GP470	GP347		10TS-T47
C324	.0022		DD-222		GP222	QC2-97	5GA-D22
C401	5 NPO		DTZ-4R7	NPO4P7	CN0547		10TCC-V47
C401a	68 N220				*		10TCR-Q68
C402	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C403	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C405	22			CD15ED220J03	SX422	QW1-11	MMA-220
C406	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C407	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C408	47			CD15ED470J03	SX447	QW1-19	MMA-470
C409	150			CD15FD151J03	SX315	QW1-31	MMA-151
C410	.001		DD-102G	GP1000	GP210	QC2-81	5GA-D10
C411	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C412	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
TC201		2061-60					

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

FANON MODEL FANFARE 190DF

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.	CENTRALAB PART No.	CLAROSTAT PART No.	MALLORY PART No.	TRW PART No.
VR1	Squelch	10K	2063-10				
VR2	Volume/Switch	10K	2061-25				
VR3	RF Gain	50K					
VR101	Noise Balance	10K	2061-41				
VR102	S Meter	10K	2061-41				
VR103	RF Meter	50K	2022-67				
VR301	Mic Gain	50K					
VR302	Squelch Range	1000					
				T-1000 (2)	C-102 (2)	MTC13L1 (2)	U260R103B U260R103B U260R503B X260R503B X201R102B (2)

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

RESISTORS (Power and Special)

ITEM No.	RATING	REPLACEMENT DATA		ITEM No.	RATING	REPLACEMENT DATA	
		WORKMAN PART No.	MFGR. PART No.			WORKMAN PART No.	MFGR. PART No.
RB101	Resistor AREY (1)			RB102	Resistor AREY (2)		

(1) Consists of three 2200-ohms.

(2) Consists of seven 2200-ohms.

COILS (RF-IF)

ITEM No.	FUNCTION	REPLACEMENT DATA			REMARKS
		PART No.	OTHER IDENTIFICATION	MILLER PART No.	
L101	Rec Antenna (27MHz)	2022-132			
L102	Rec RF (27MHz)	2022-116			
L103	Rec RF (27MHz)	2022-116			
L104	VCO Buffer (38MHz)	2022-134			
L105	IF (10.695MHz)	2022-135		CBS508-1TC	
L106	IF (10.695MHz)	2022-135		CBS508-1TC	
L107	RF Choke (150uH)	2022-122			
L108	IF (455kHz)	2022-117		CBS603-4TCC	
L109	IF (455kHz)	2022-123		2067	
L110	IF (455kHz)	2022-125			
L111	Xmit Oscillator (10.695MHz)	2022-133			
L112	Xmit Mixer (27MHz)	2022-126		CBS121	
L113	Xmit Mixer (27MHz)	2022-126		CBS121	
L114	Xmit Mixer (27MHz)	2022-127		CBS701	
L115	Xmit Buffer (27MHz)	2022-128			
L116	Xmit Oriver (27MHz)	2022-129		7516-E	
L117	RF Choke	2022-119			
L118	Final (27MHz)	2022-130		CB307	
L119	P1 Filter (27MHz)	2022-131		CB307	
L120	Ant Matching (27MHz)	2022-129		7516-E	
L121	TVI Trap (54MHz)				
L123	RF Choke				
L124	RF Choke				
L201	VCO	2022-134			
L202	Down Oscillator (36.380MHz)	2022-134			
L203	RF Choke (100uH)	2061-46	S101K		
L204	RF Choke (2.2uH)	2061-47	S2R2K		
L205	RF Choke (1uH)	2061-48	S330K		
L206	RF Choke (150uH)				
L207	RF Choke				
L401	RF Choke (1uH)	2061-67	SD10M		
L402	Noise Blanker (19.300MHz)	2061-68			
L403	Noise Blanker (19.300MHz)	2061-69			

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.	
T101	1.6A	.236	1.45mH	2061-39 46911012(1)			(1) Number on unit.

TRANSFORMER (Driver)

ITEM No.	TURNS RATIO			REPLACEMENT DATA			NOTES
	PRI.	SEC. 1	SEC. 2	MFGR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T301	3	1	1	2022-114 45218015(1)			(1) Number on unit.

PARTS LIST AND DESCRIPTION (CONTINUED)

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

TRANSFORMER (Audio Output)

ITEM No.	IMPEDANCE		REPLACEMENT DATA			NOTES
	PRI.	SEC.	MFGR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T302	64	1 2 16 46.24	45920005(1)		MCB-30	(1) Number on unit.

SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		MFGR. PART No.	QUAM PART No.	
SP1	3 1/2" PM, 16 Ohms	2061-22		

FUSE DEVICES

ITEM No.	DESCRIPTION	REPLACEMENT DATA						
		PART No.		BUSS PART No.		LITTELFUSE PART No.		WORKMAN PART No.
		DEVICE	HOLDER	DEVICE	HOLDER	DEVICE	HOLDER	DEVICE
F1	2A			AGC2	HDJ	312002	150145	FG2-2

MICROPHONE

ITEM No.	REPLACEMENT DATA				CONNECTION DATA						
	MFGR. PART No.	GC PART No.	GC NOISE CANCEL	GC POWER	GC CONNECTOR	GC Red	GC Shield	GC Yellow	GC Blue	GC White	GC Black
MIC	2063-17										

MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
CF101	Ceramic Filter		455kHz
J1	Jack	2022-225	External Speaker
J2	Jack	2022-225	PA
J4	Jack	2061-27	Antenna
J108	Jack	2022-224	Microphone
LED1	LED		Channel Display (Tens)
LED2	LED		Channel Display (Units)
M1	Meter	2063-09	S/R/F
M2	Module	2061-79	AMC
PL1	Lamp	2022-227	Meter (13.70V @ 90mA)
S1	Switch		Channel Selector
S2a	Switch		CB/PA
S2b	Switch		NL/B
S2c	Switch		Tone
S4	Switch		Power (Part of Volume Control)
X101	Crystal	2061-29	10.695MHz
X201	Crystal	2061-49	36.380MHz
X202	Crystal	2049-05	10.240MHz

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

ITEM	PART No.	ITEM	PART No.
Mounting Bracket	2022-217	Cabinet Bottom	2063-04
Escutcheon	2063-02	Knob, Control	2063-05
Cabinet Top	2063-03	Knob, Push Switch	2063-06

FANON MODEL FANFARE 190DF

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Listing all models/chassis covered in
PHOTOFACT CB (Citizens Band) Series volumes

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AIMOR		BOMAN		JC-20ZE (RE-367E) ...	150	Centurion Plus		(See Ross/Electroponic)	
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B-1100	108	BROWNING		RE-366E	117	Classic PLL40	186	Fanfare 185DF	169
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A-2530 (17B6425X) ...	19	Eaglette 2	29	CAM-89	58	Conqueror 40D	157	Fanfare 880	73
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		JC-201E (RCJ-001) ...	172	Caravelle	38	777	7	3-5814A	154
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		RCJ-003)	173	Caravelle 40D	157	779A	17	3-5819A	156
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CB-100	1	HANDIC		JET SOUNDS		HB-23A (99-32351WX)	38	
CB-100A	3	21	105	CB-7000	140	HB-115A	6	
CB-200	2	23	105	J.I.L.		HB-200	10	
Globe Master 65-220	6	43C	100	606CB	98	HB-222	6	
X-90 (Pocketphone)	1	65C	108	852CB	86	HB-333 Series a	8	
65-228		235	109	JOHNSON		HB-400 (99-3001WX)	9	
(President VIII)	7	305	110	KN-2500 (90SU413)	7	HB-444 (99-3091L)	11	
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GM		2305	111	KN-2550 (90SU456), KN-2560 (90SX467)	7	HB-501	10	
CBD-10	112	HEATHKIT (HEATH)		KN-2565 (86SX568)	8	HB-502A	19	
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CBD-20	149	GRS-65A	14	KN-2580 (86SX625)	9	HB-525C (99-3156WX)	23	
CBD-20A	164	GN-10A/D, GWN-10A/D	3	KN-2585 (86SU774)	14	HB-525D (99-31759WX)	31	
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GM23C	134	GN-12A/-12D, GWN-12A/ -12D	5	24SC180	9	HB-525F (99-32492W)	49	
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76CFMC1/2	149	HY-GAIN		KCB-1401	137	HE-15B	4	
76CFMC3	164	VIII (3078)	136	KCB-2310A	106	HE-16/-18	1	
76KFCM1/2	149	623	71	KCB-2320A	152	HE-20AWX	2	
76KFCM3	164	623A (Pg.5)	71	KCB-2320B	153	HE-20B	4	
994856	95	670 (Hy-Range I)	63	KCB-2330B	116	HE-20C	5	
995107	134	670A (Pg. 5)	63	KCB-2340	162	HE-20T (99-3088WX)	16	
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7898426	149	671 (Hy-Range II)	63	KCB-4010	168	HE-29A	3	
7898436	149	671A (Pg. 5)	63	KCB-4020	175	HE-90	5	
7898530	112	671B (Hy-Range II)	118	KCB-4030	167	Micro-12	34	
7898540	111	672 (Hy-Range III)	65	KCB-4070	155	Micro-23 (99-32575W)	48	
7898570	149	672A (Pg. 5)	65	KRIS		Micro-66 (99-32716W)	55	
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CB-7	113	2682	157	Com-Phone Mark II	94	Telsat 50 (99-3217WX)	36	
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