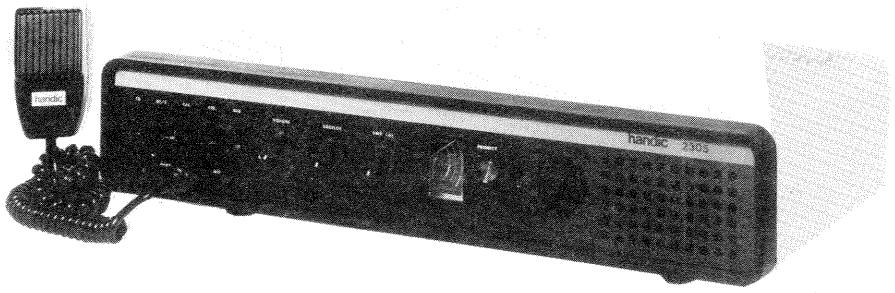
NOTE

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 2305

HOWARD W. SAMS & CO., INC. Indianapolis, Indiana 46206
 Printed in U. S. of America 7CY429

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.
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
L7, L8, T4, T5, T6, T11, T14 thru T18 8728
L3, L4, T1, T2, T3, T9, T10, T12, T13 9440

SYNTHESIZER ALIGNMENT

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Inputs of frequency counter and RF VTVM to TP6.	Ch. 13	T6	Adjust for 37.750MHz at maximum.
Input of frequency counter to TP6.	Ch. 17 Ch. 21 Ch. 1 Ch. 5 Ch. 9		Check for 37.800MHz. Check for 37.850MHz. Check for 37.600MHz. Check for 37.650MHz. Check for 37.700MHz.
Input of frequency counter to TP7.	Ch. 13 Ch. 14 Ch. 15 Ch. 16		Check for 10.180MHz. Check for 10.170MHz. Check for 10.160MHz. Check for 10.140MHz.
Input of frequency counter to TP8.	Ch. 13, Xmit Ch. 14, Xmit Ch. 15, Xmit Ch. 16, Xmit		Check for 10.635MHz. Check for 10.625MHz. Check for 10.615MHz. Check for 10.595MHz.
Input of frequency counter to TP10.	Ch. 13 SUB-SUB position.		Check for X16 crystal 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 TP2. 455kHz, 1000Hz @ 30% modulation.	Ch. 13 SUB-OFF position.	T5,T4	Adjust for maximum output.
Output of signal generator thru .01uF to Q2 base. 10.6MHz, 1000Hz @ 30% modulation.	Ch. 13	T3	Adjust for maximum output.
Output of signal generator thru .01uF to antenna jack. 27.115MHz, 1000Hz @ 30% modulation.	Ch. 13	T2,T1	Adjust for maximum output. Repeat above steps, if necessary.
SUB RECEIVER			
Output of signal generator thru .01uF to TP12. 255kHz, 1000Hz @ 30% modulation.	Ch. 13 SUB-SUB position. Disconnect R33 to disable source 4 (9.10V).	T18,T17,T16, T15,T14	Adjust for maximum output.
Output of signal generator thru .01uF to antenna jack. X16 crystal frequency, 1000Hz @ 30% modulation.	Ch. 13	T13,T12	Adjust for maximum output. Repeat above steps, if necessary.

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. 27.115MHz, 1000Hz @ 30% modulation. Output 1000uV.	Ch. 13 SUB-OFF position.	R20	SQUELCH RANGE Set squelch control R56 fully clockwise. Adjust R20 so that squelch just breaks.
Output of signal generator thru .01uF to antenna jack. 27.115MHz, 1000Hz @ 30% modulation. Output 100uV.	Ch. 13	R29	S METER Adjust R29 for 9 on S scale of meter.
SUB RECEIVER			
Output of signal generator thru .01uF to antenna jack. X16 crystal frequency, +255kHz @ 30% modulation. Output 1000uV.	Ch. 13 SUB-SUB position. Disconnect R33 to disable source 4 (9.10V). Reconnect R33.	R152	SUB SQUELCH RANGE Set SUB Squelch Control R151 fully clockwise. Adjust R152 so that squelch just breaks.
Output of signal generator thru .01uF to antenna jack. X16 crystal frequency, +255kHz 1000Hz @ 30% modulation. Output 200uV.	SUB Channel	R157	SUB AUDIO BALANCE SUB Switch to OFF position. Record audio level. SUB Switch to SUB position. Adjust R157 for equal audio level.

TRANSMITTER ALIGNMENT

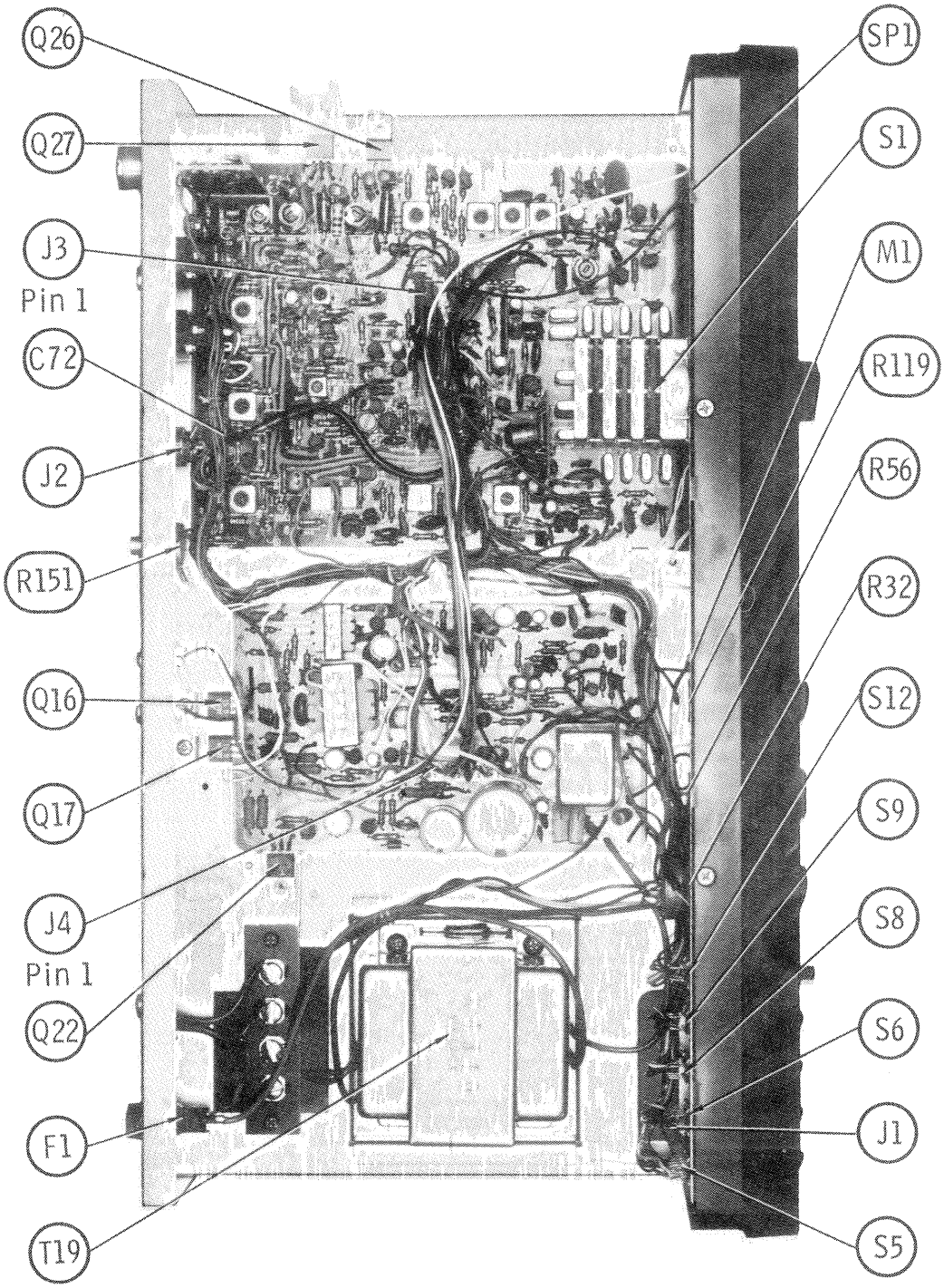
Connect an RF wattmeter and 50-ohm, 25-watt dummy load to antenna connector.
NOTE: Be sure to check transmit frequency and power on all active channels after alignment of transmitter.

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
	Ch. 13	L3,L4,T9, T10,T11,L7, L8	Adjust for maximum.
	Ch. 13	L8,L7	Adjust for 4 watts maximum.

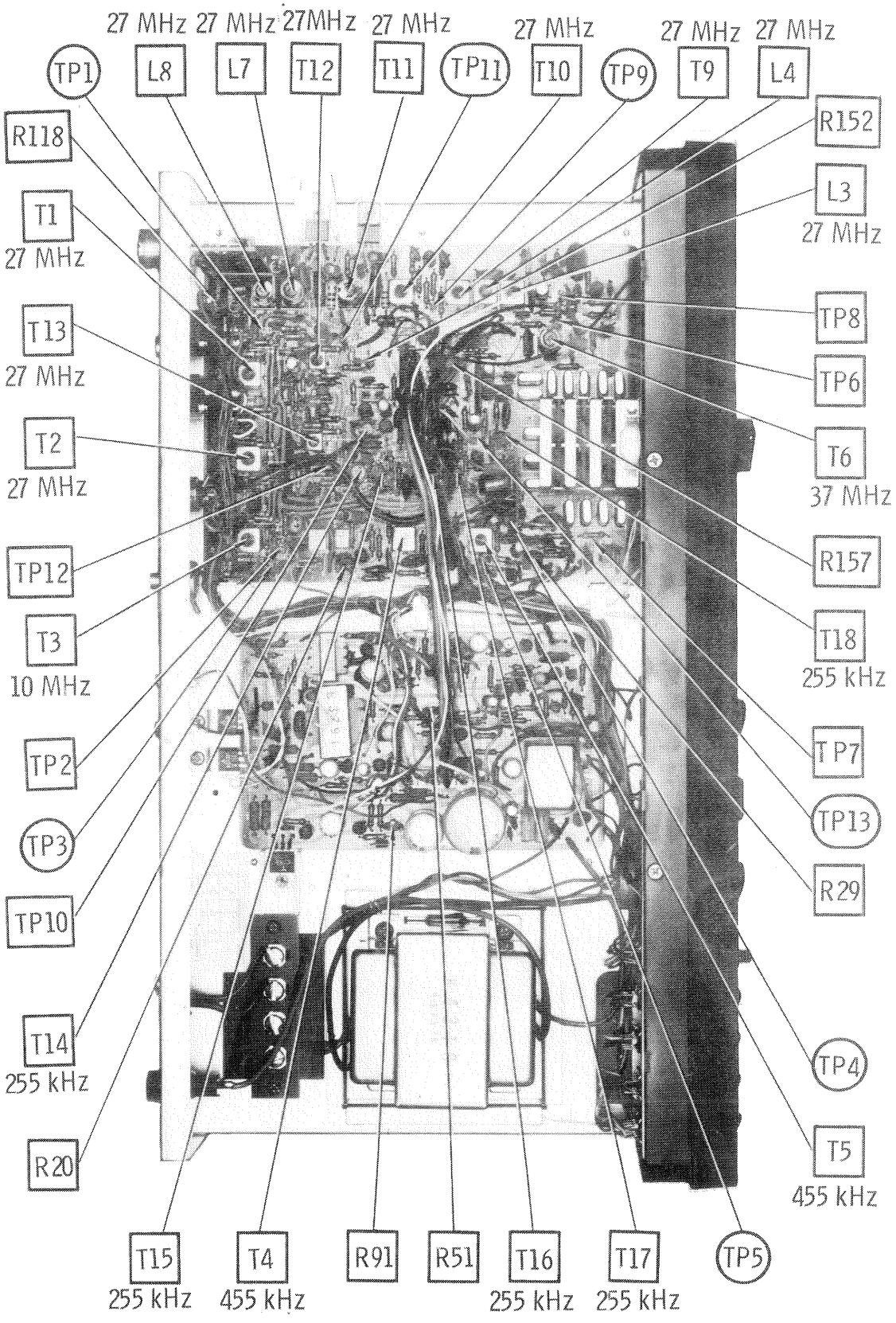
TRANSMITTER ADJUSTMENTS

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 adjustments of transmitter.

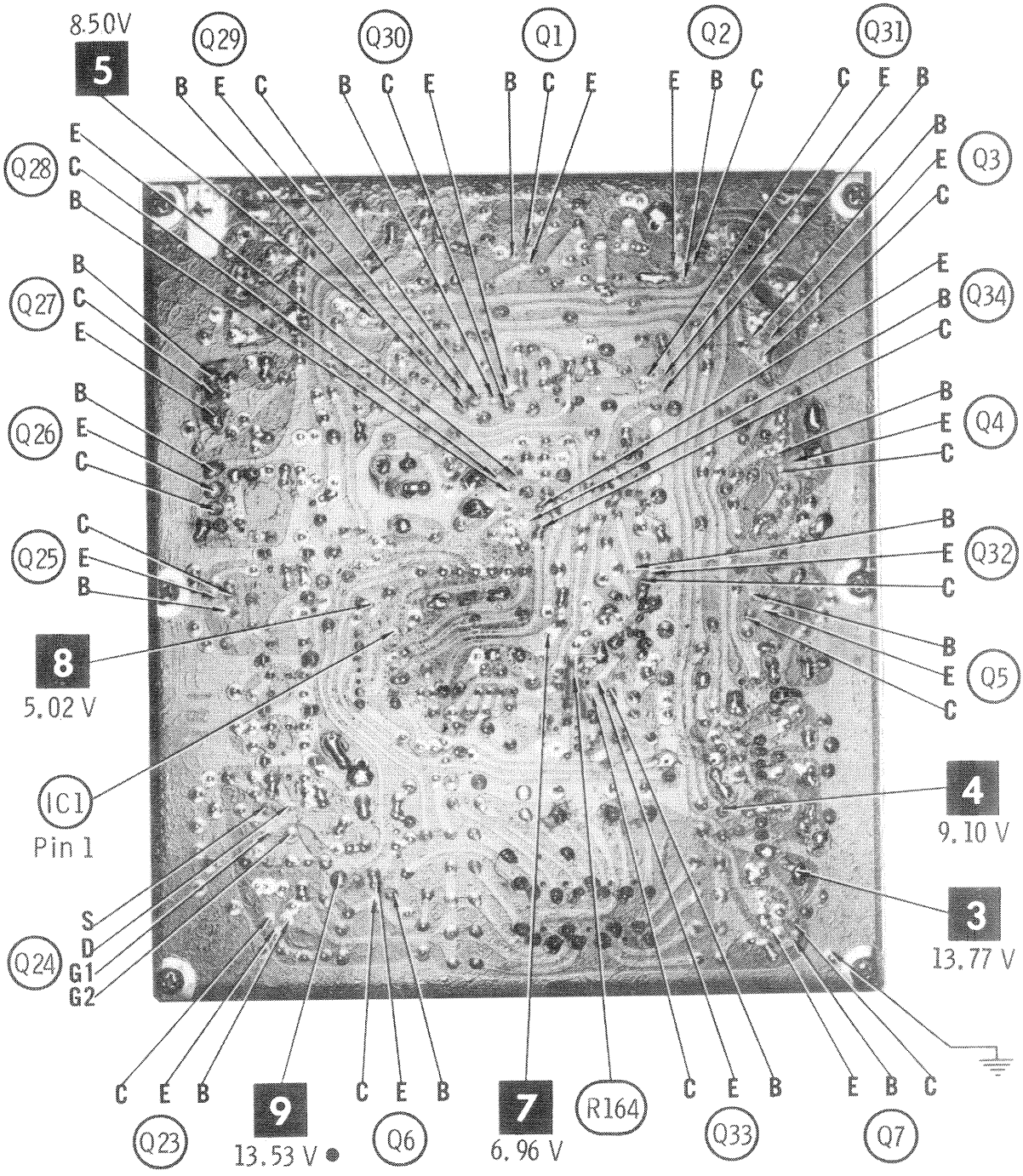
TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
DC voltmeter to Q22 emitter.	Ch. 13	R91	VOLTAGE REGULATOR Adjust R91 for 13.8 volts. Voltage should not vary when keying transmitter.
Modulation meter to antenna jack. Inject a 1000Hz signal at MIC input.	Ch. 13	R51	AMC Disconnect C54 to disable AMC. Adjust signal for overmodulation. Restore AMC operation. Adjust R51 for 100% modulation maximum.
	Ch. 13	R118	RF PANEL METER Adjust R118 so that panel RF meter agrees with RF wattmeter.



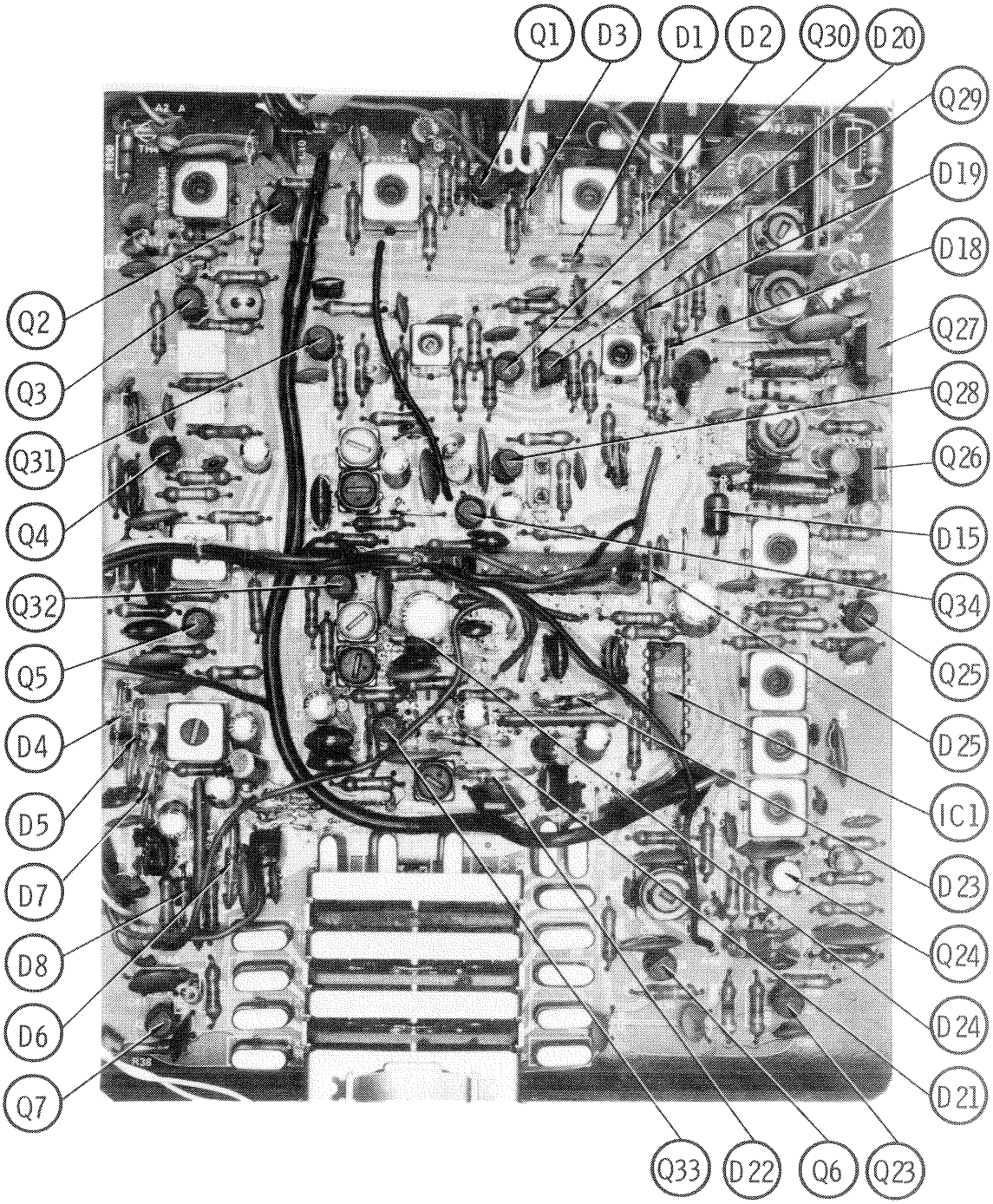
CHASSIS-BOTTOM



CHASSIS-BOTTOM


8.50V
5
Q29
Q30
Q1
Q2
Q31
Q28
Q3
Q27
Q34
Q26
Q4
Q25
Q32
8
5.02 V
Q5
IC1
Pin 1
4
9.10 V
3
13.77 V
Q24
S
D
G1
G2
Q23
9
13.53 V
Q6
7
6.96 V
R164
Q33
Q7
● - Transmit

MAIN BOARD


Q1
D3
D1
D2
Q30
D20
Q29
D19
D18
Q27
Q28
Q26
D15
Q34
Q25
D25
IC1
D23
Q24
D24
D21
Q23
Q6
D22
Q33
Q7
D6
D8
D7
D5
D4
Q5
Q32
Q4
Q31
Q3
Q2

MAIN BOARD

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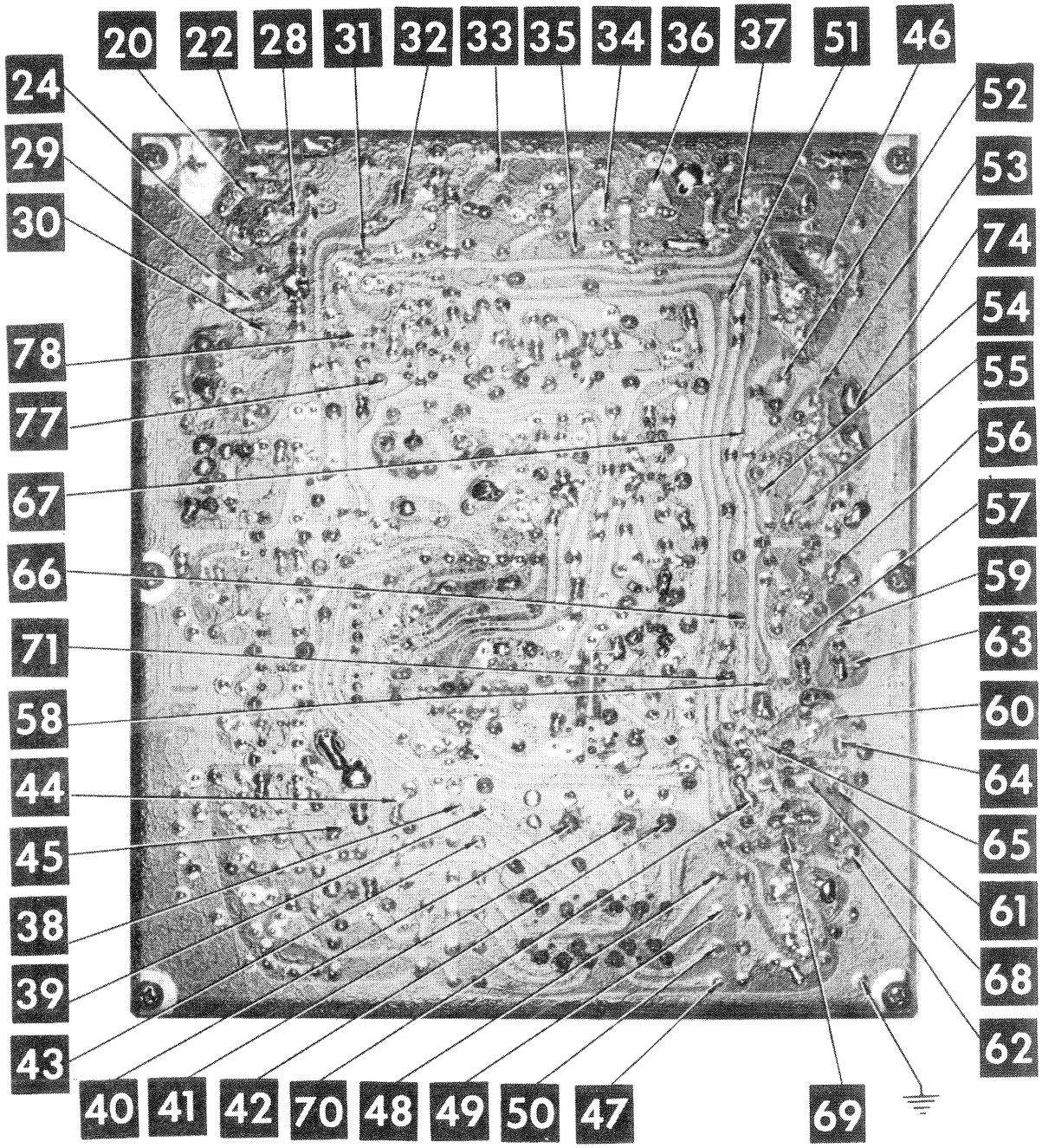
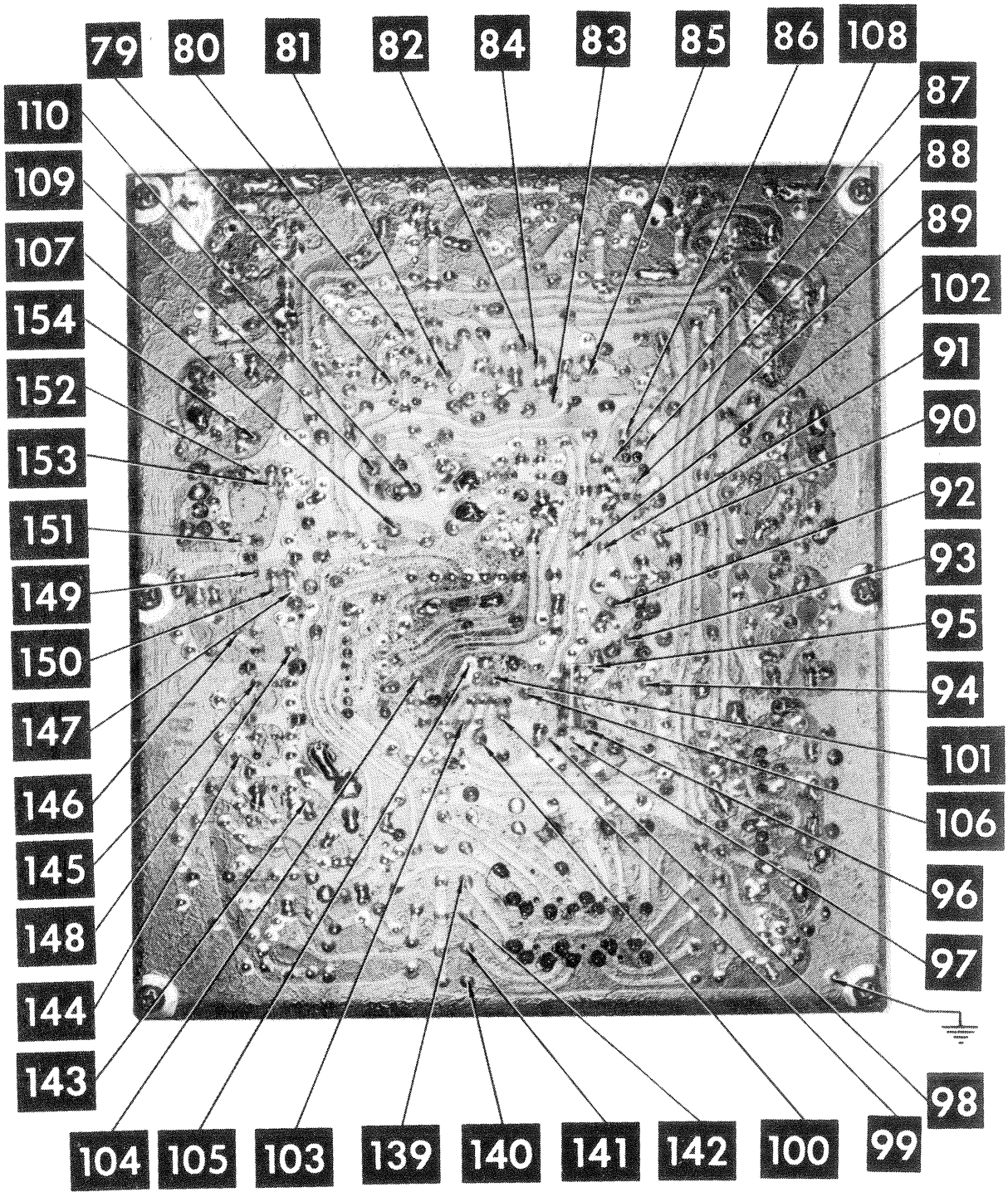


MAIN BOARD


79
80
81
82
84
83
85
86
108
110
109
107
154
152
153
151
149
150
147
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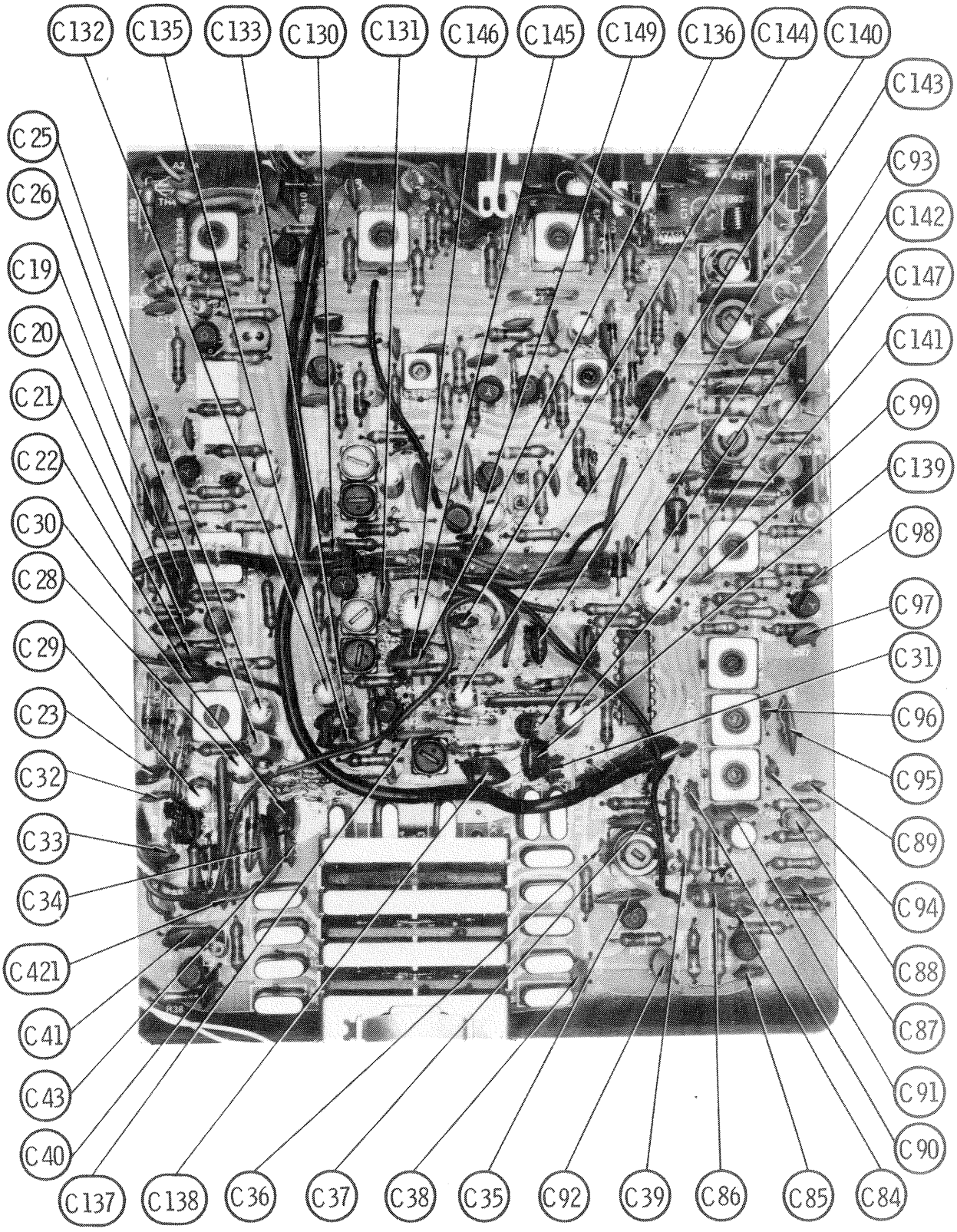
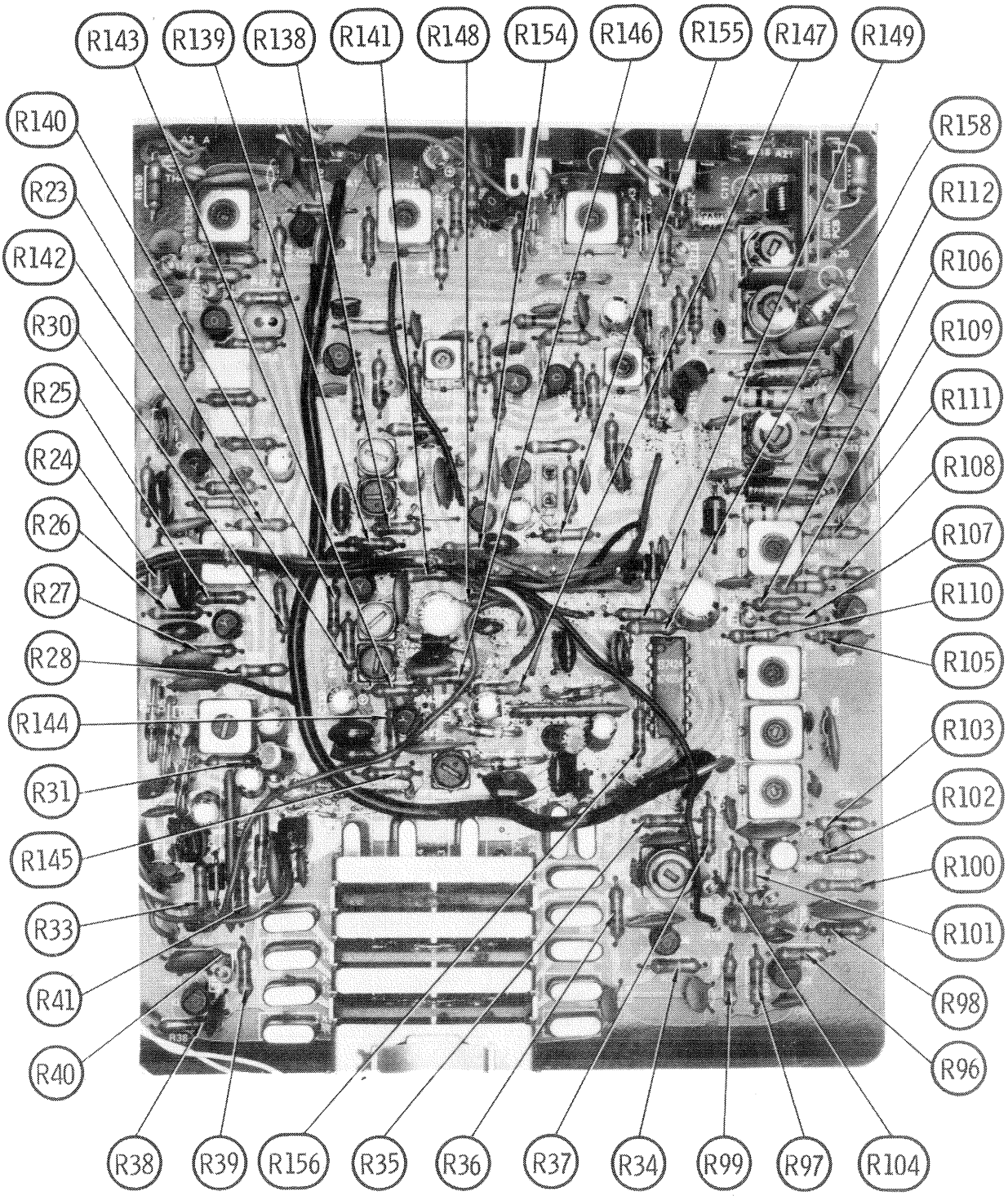
145
148
144
143
87
88
89
102
91
90
92
93
95
94
101
106
96
97
98
104
105
103
139
140
141
142
100
99

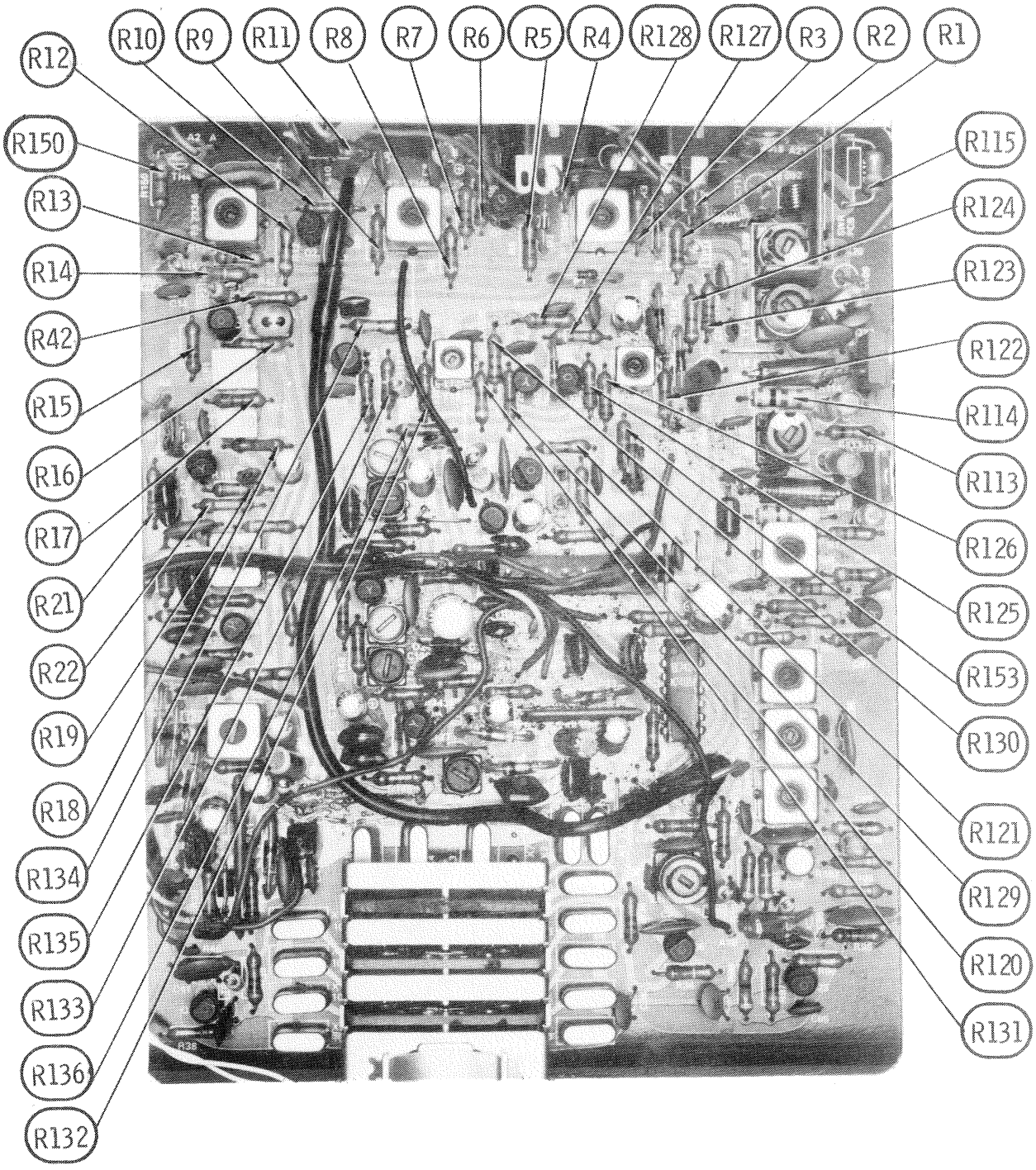
MAIN BOARD


C132
C135
C133
C130
C131
C146
C145
C149
C136
C144
C140
C143
C25
C26
C93
C142
C19
C147
C20
C141
C21
C99
C22
C139
C30
C98
C28
C97
C29
C31
C23
C96
C32
C95
C33
C89
C34
C94
C421
C88
C41
C87
C43
C91
C40
C90
C137
C138
C36
C37
C38
C35
C92
C39
C86
C85
C84

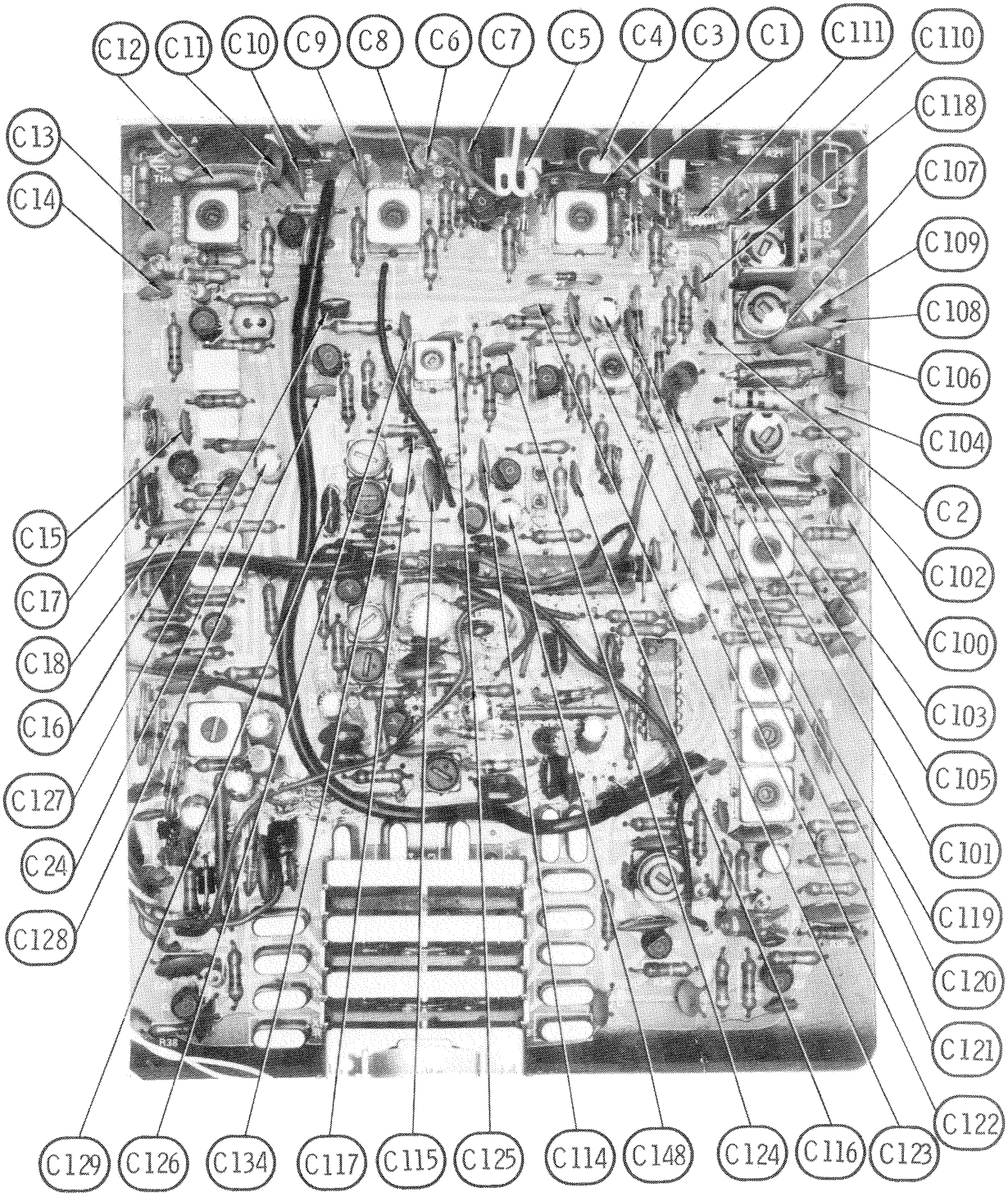
MAIN BOARD


R143
R139
R138
R141
R148
R154
R146
R155
R147
R149
R140
R23
R142
R30
R25
R24
R26
R27
R28
R144
R31
R145
R33
R41
R40
R158
R112
R106
R109
R111
R108
R107
R110
R105
R103
R102
R100
R101
R98
R96
R38
R39
R156
R35
R36
R37
R34
R99
R97
R104

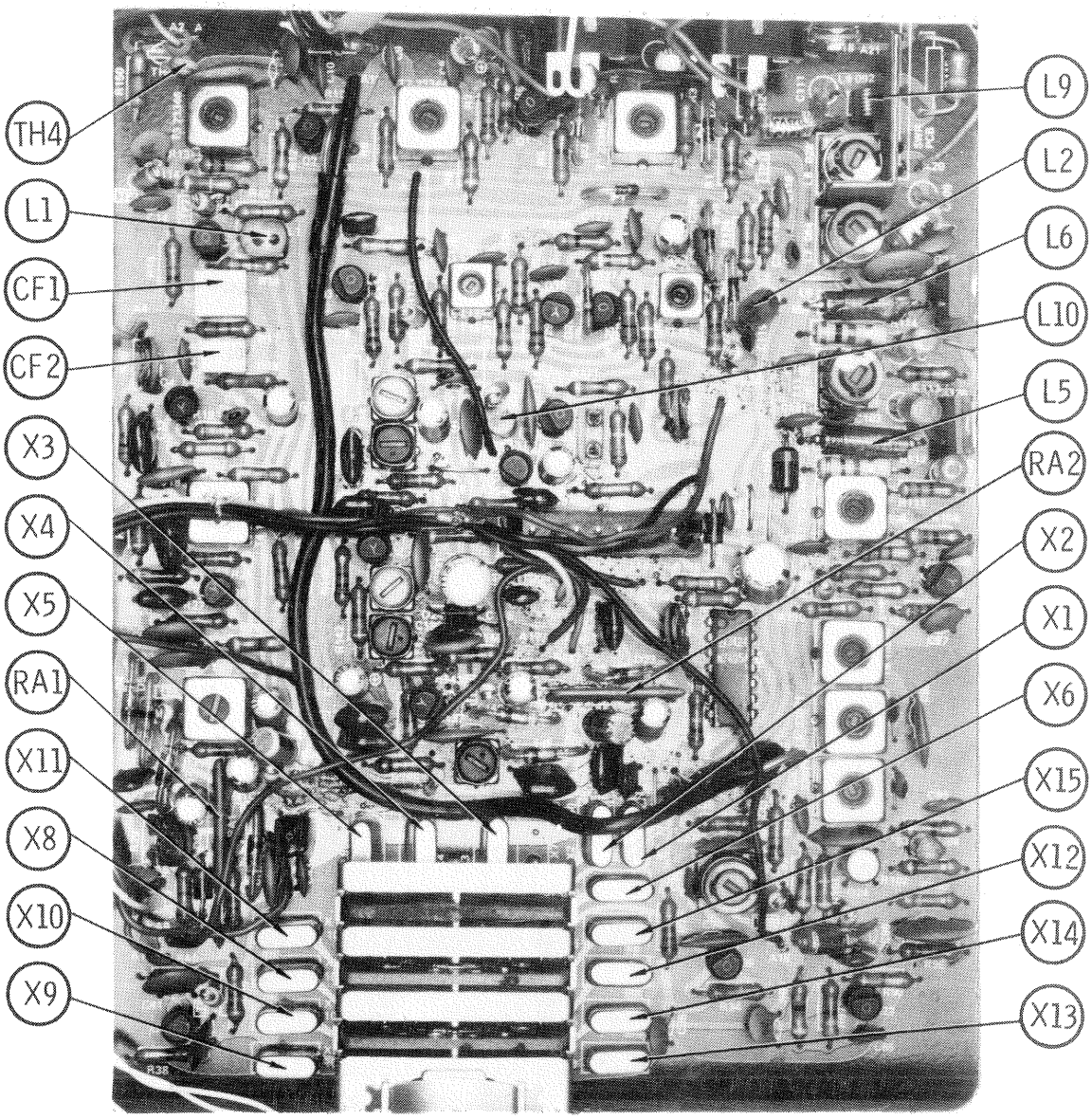
MAIN BOARD


R10
R9
R11
R8
R7
R6
R5
R4
R128
R127
R3
R2
R1
R12
R150
R13
R14
R42
R15
R16
R17
R21
R22
R19
R18
R134
R135
R133
R136
R132
R115
R124
R123
R122
R114
R113
R126
R125
R153
R130
R121
R129
R120
R131

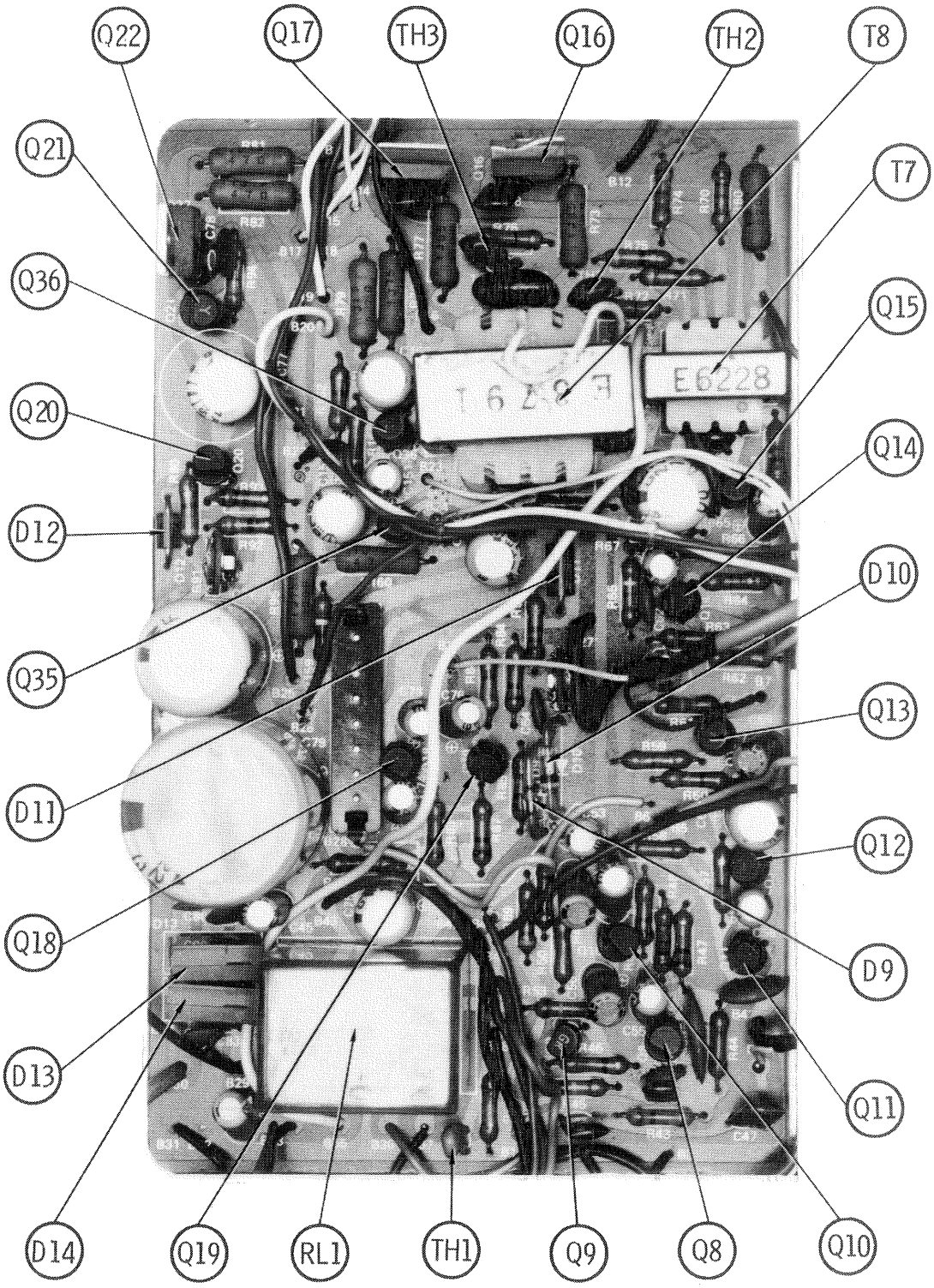
MAIN BOARD


C12
C11
C10
C9
C8
C6
C7
C5
C4
C3
C1
C111
C110
C13
C14
C118
C107
C109
C108
C106
C104
C2
C102
C100
C103
C105
C101
C119
C120
C121
C122
C15
C17
C18
C16
C127
C24
C128
C129
C126
C134
C117
C115
C125
C114
C148
C124
C116
C123

MAIN BOARD


TH4
L1
CF1
CF2
X3
X4
X5
RA1
X11
X8
X10
X9
L9
L2
L6
L10
L5
RA2
X2
X1
X6
X15
X12
X14
X13

MAIN BOARD


Q22
Q17
TH3
Q16
TH2
T8
Q21
T7
Q36
Q15
Q20
Q14
D12
D10
Q35
Q13
D11
Q12
Q18
D9
D13
Q11
D14
Q19
RL1
TH1
Q9
Q8
Q10

AUDIO BOARD

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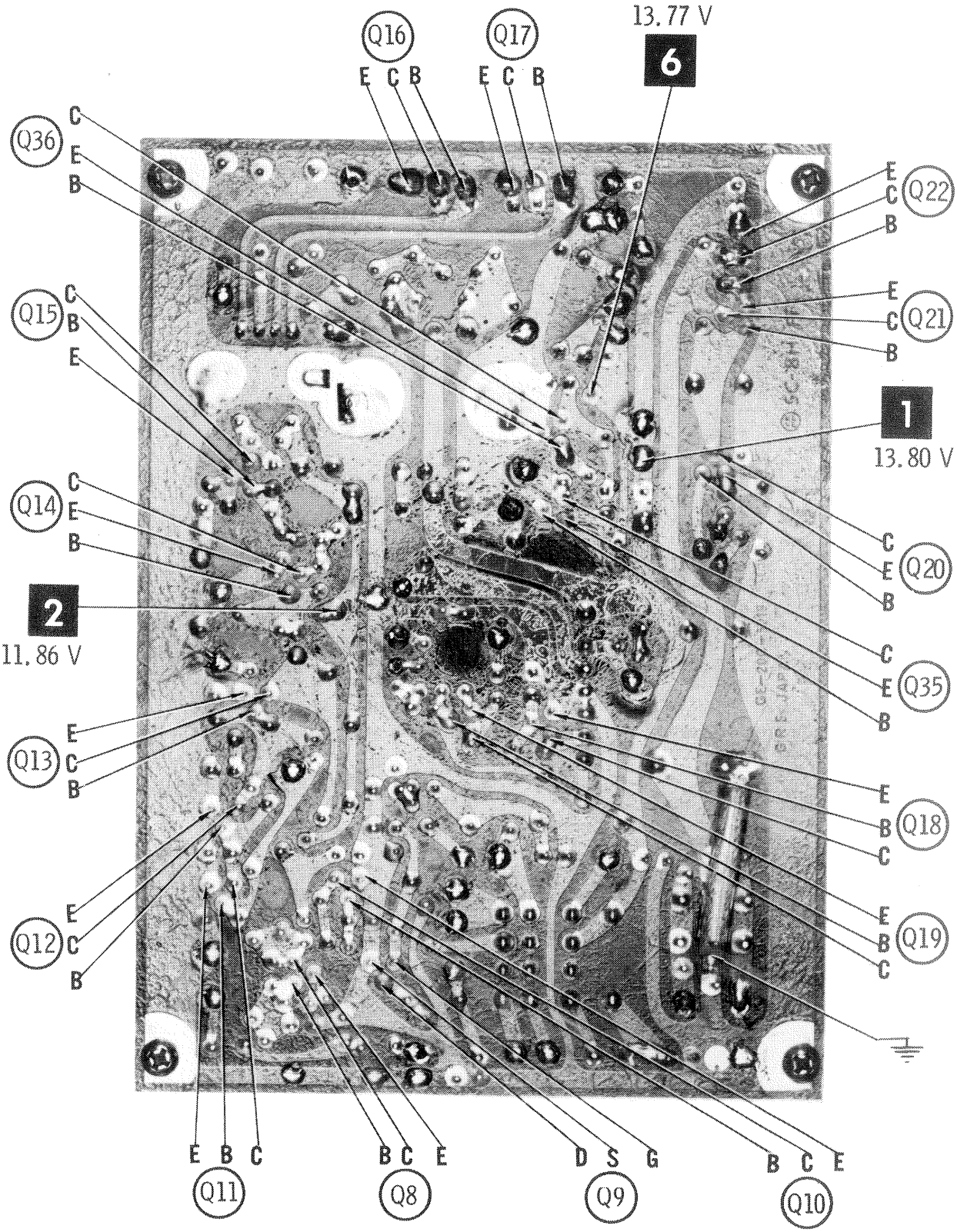
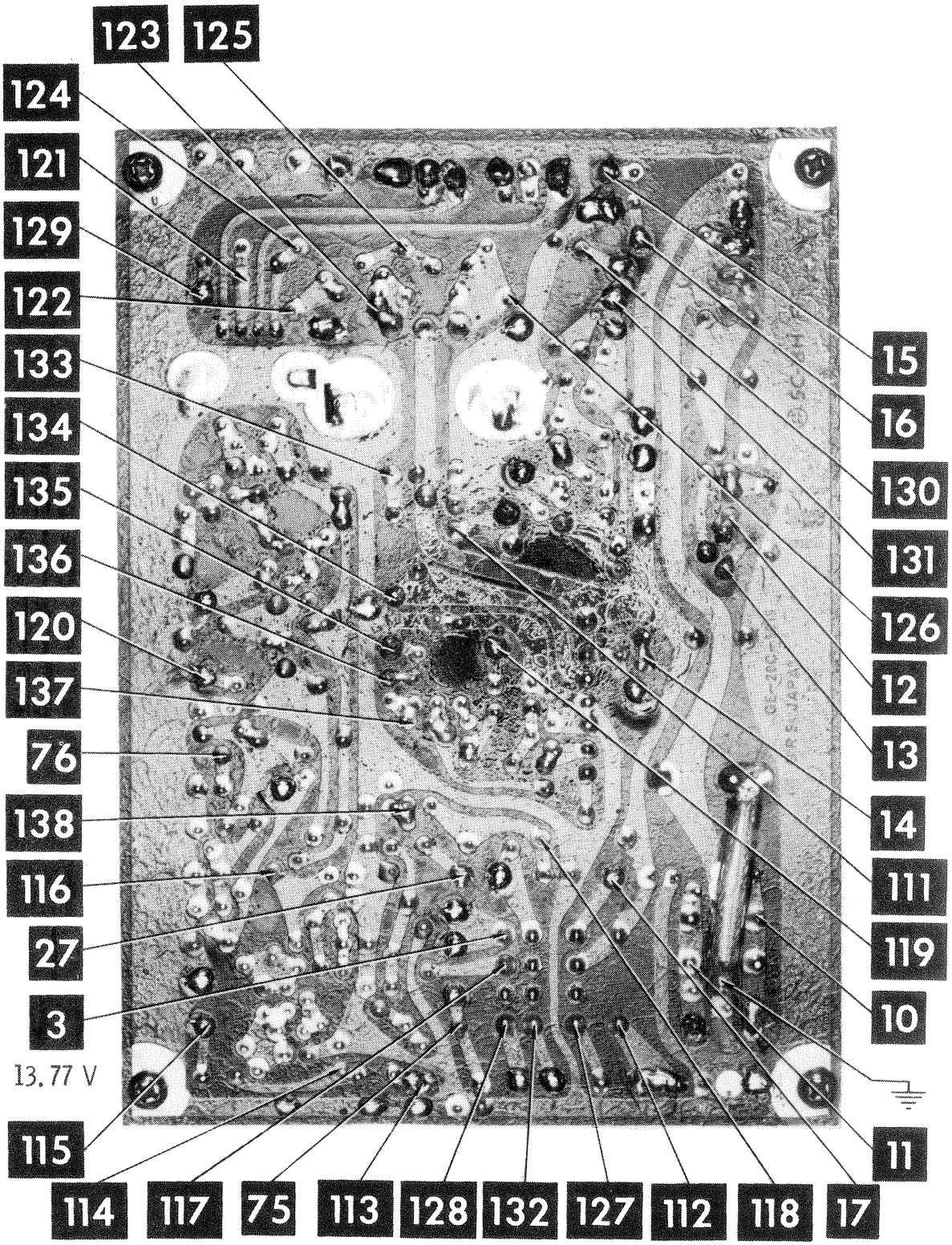
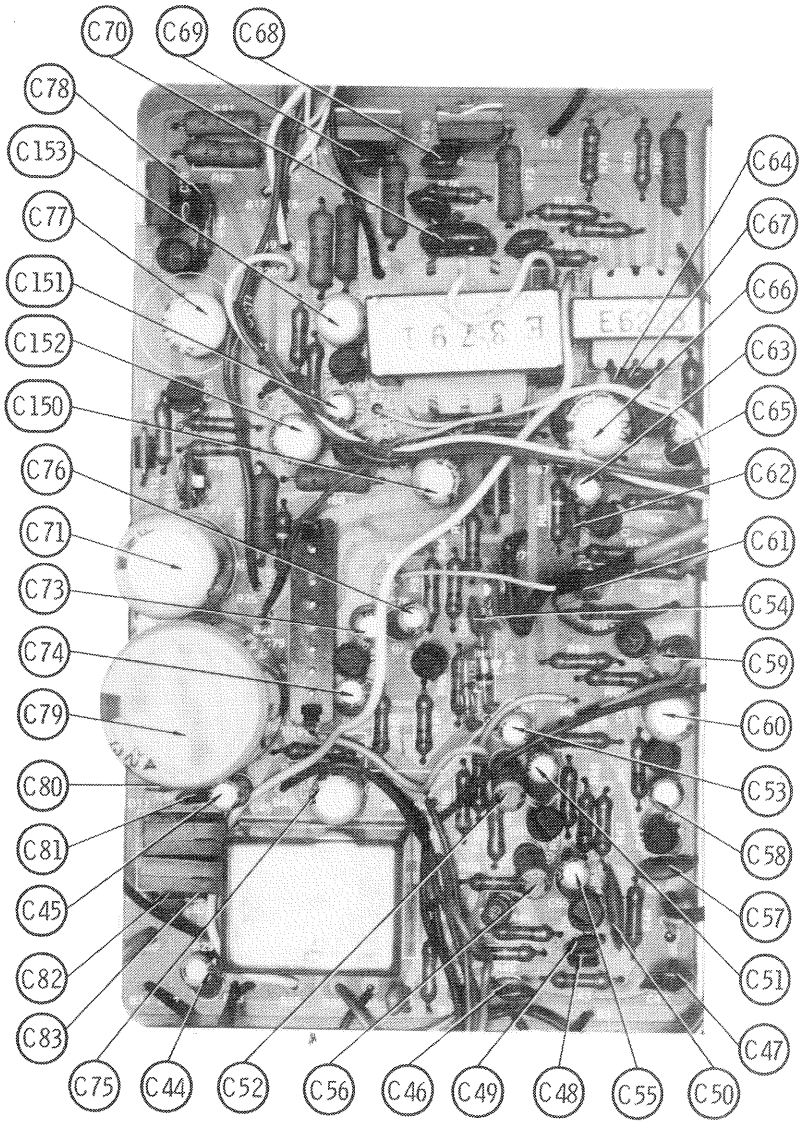


AUDIO BOARD


123
125
124
121
129
122
133
134
135
136
120
137
76
138
116
27
3
13.77 V
115
114
117
75
113
128
132
127
112
118
17
15
16
130
131
126
12
13
14
111
119
10
11

AUDIO BOARD



AUDIO BOARD

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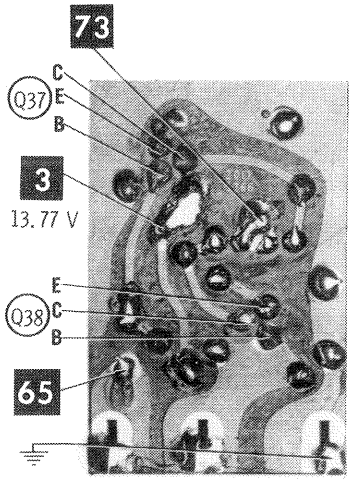
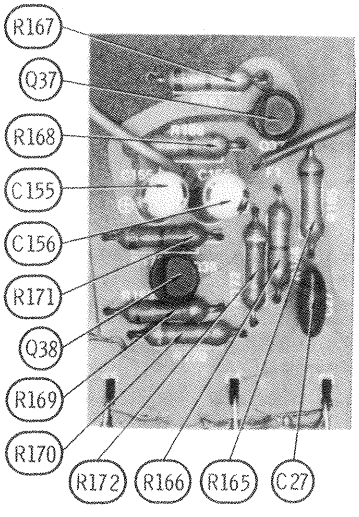
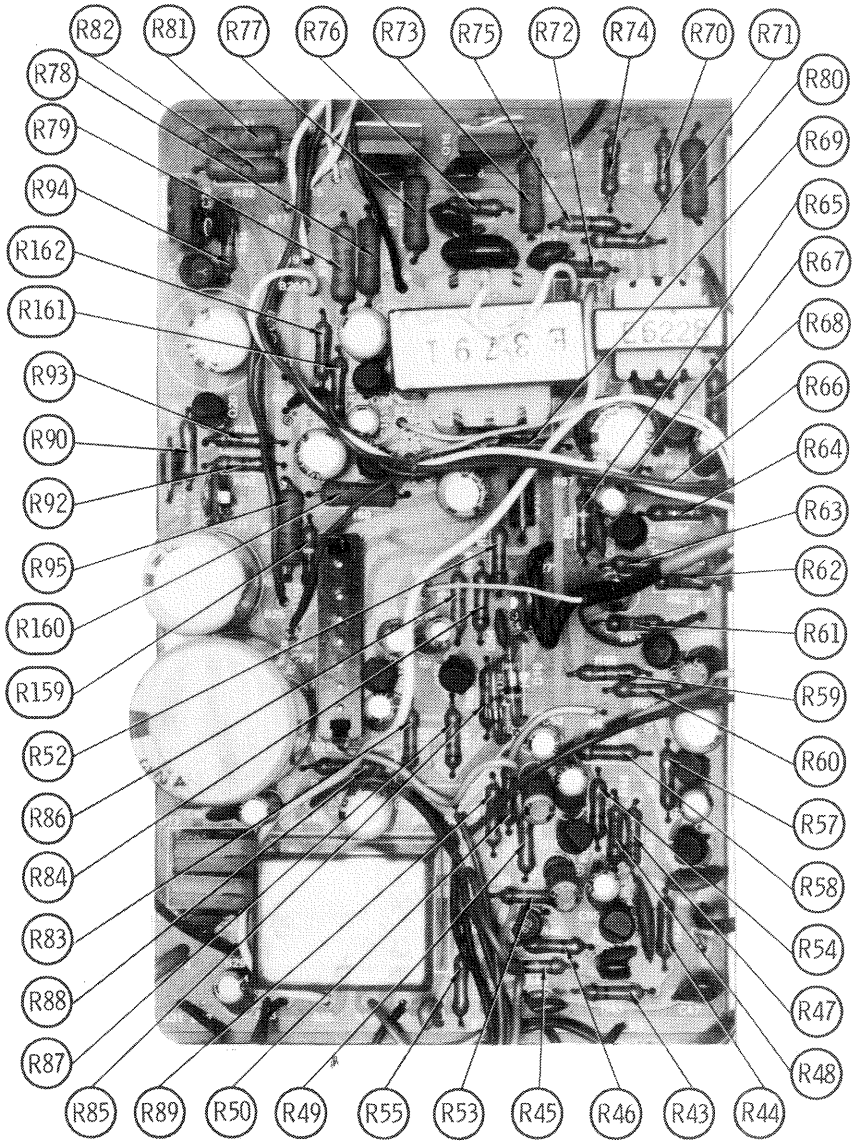




PREAMP BOARD



AUDIO BOARD

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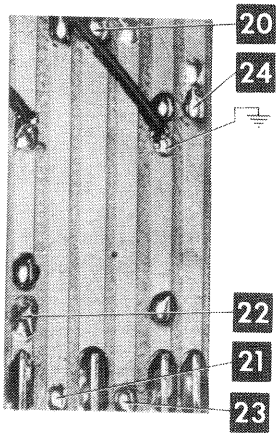
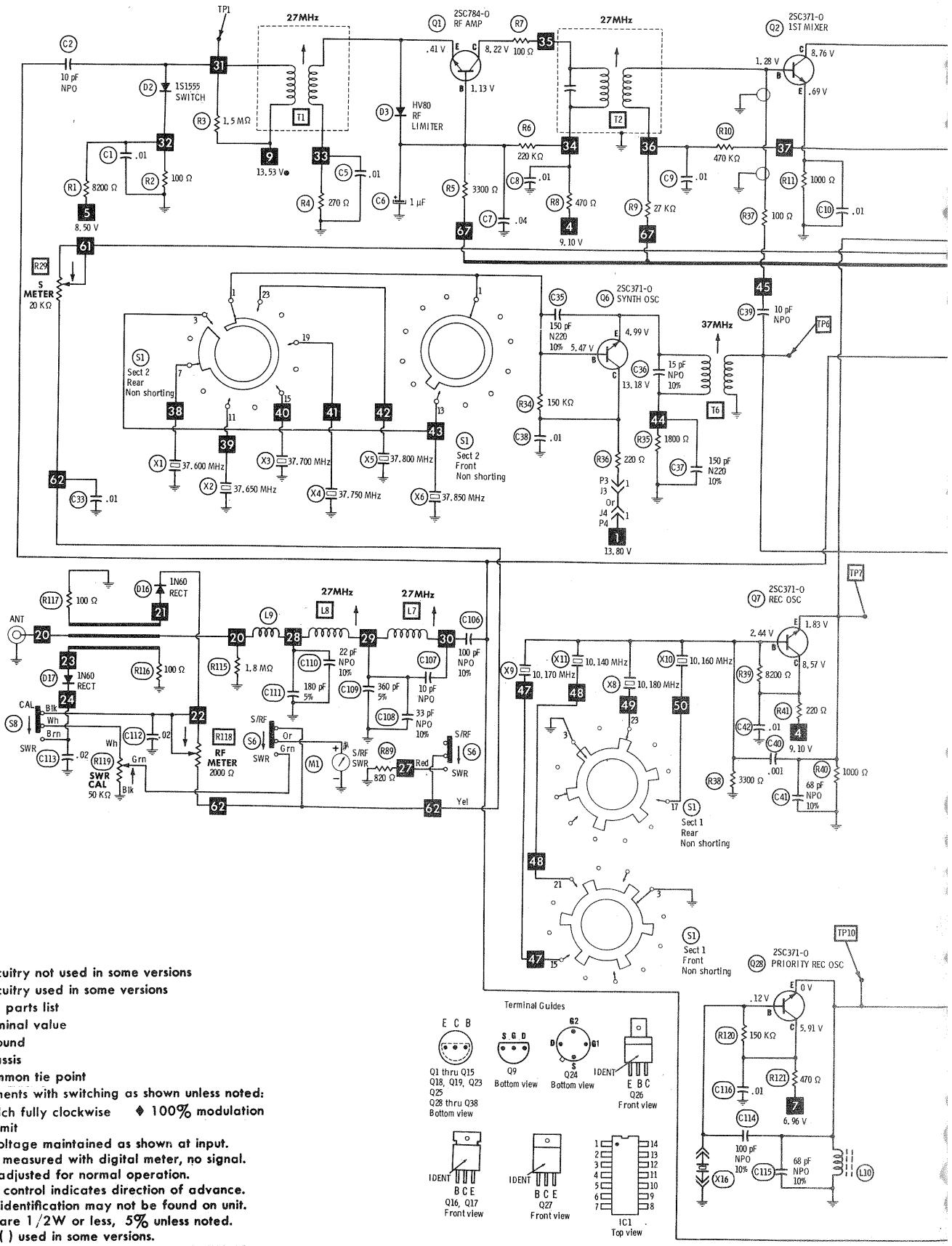


SWR BOARD

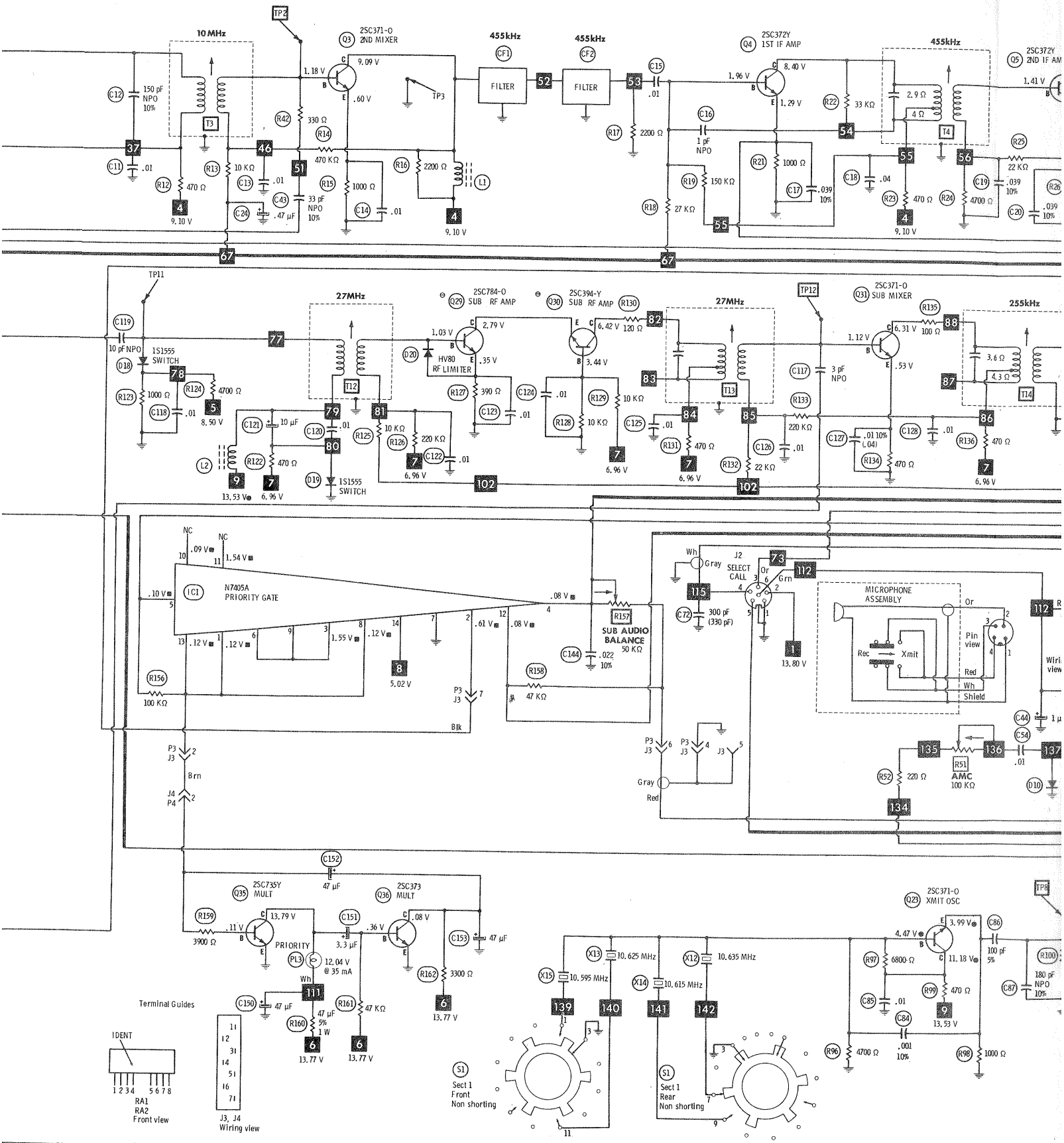


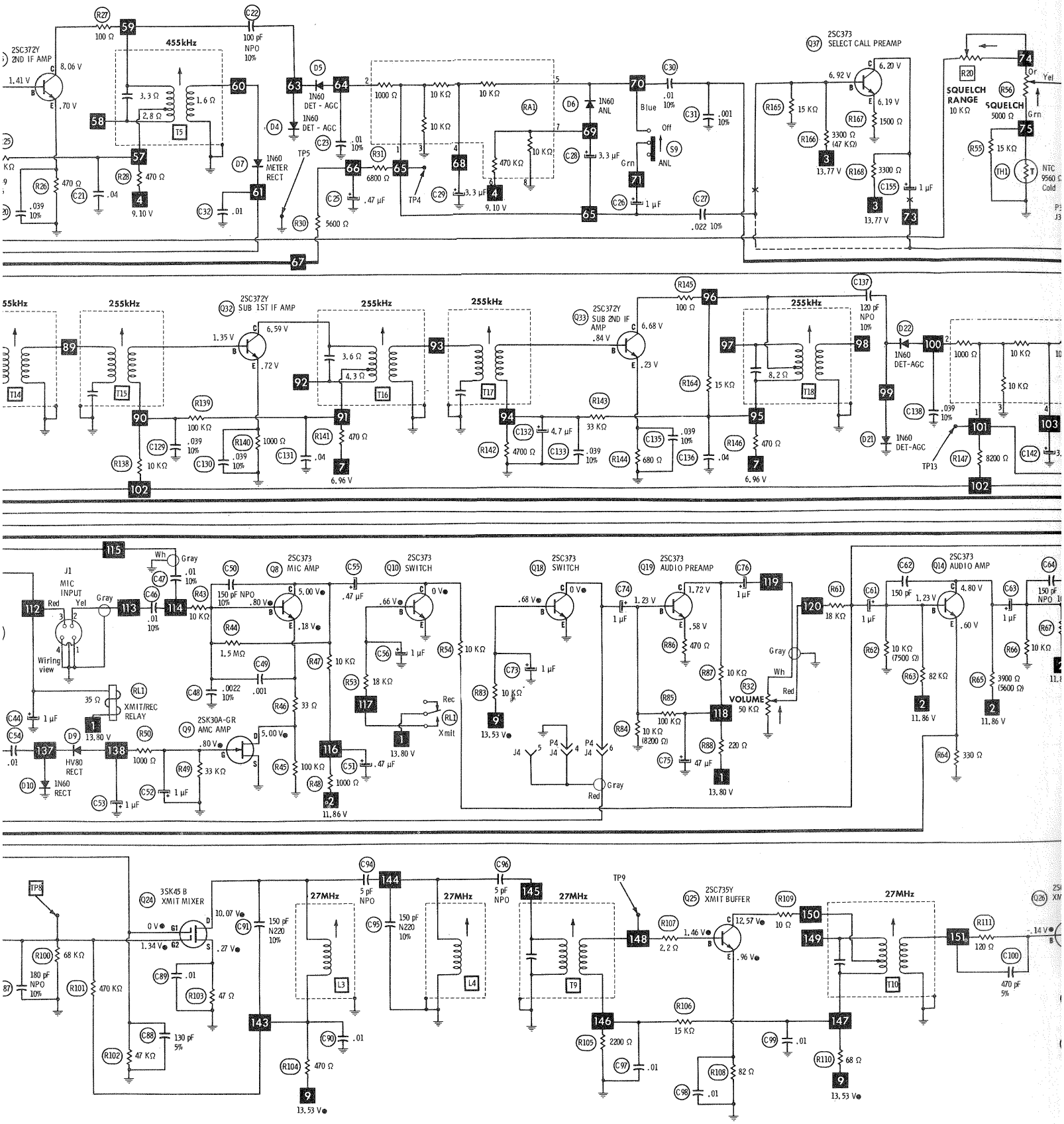
—✕— Circuitry not used in some versions
– – – Circuitry used in some versions
⊖ See parts list
※ Nominal value
⏚ Ground
Chassis
▽ Common tie point

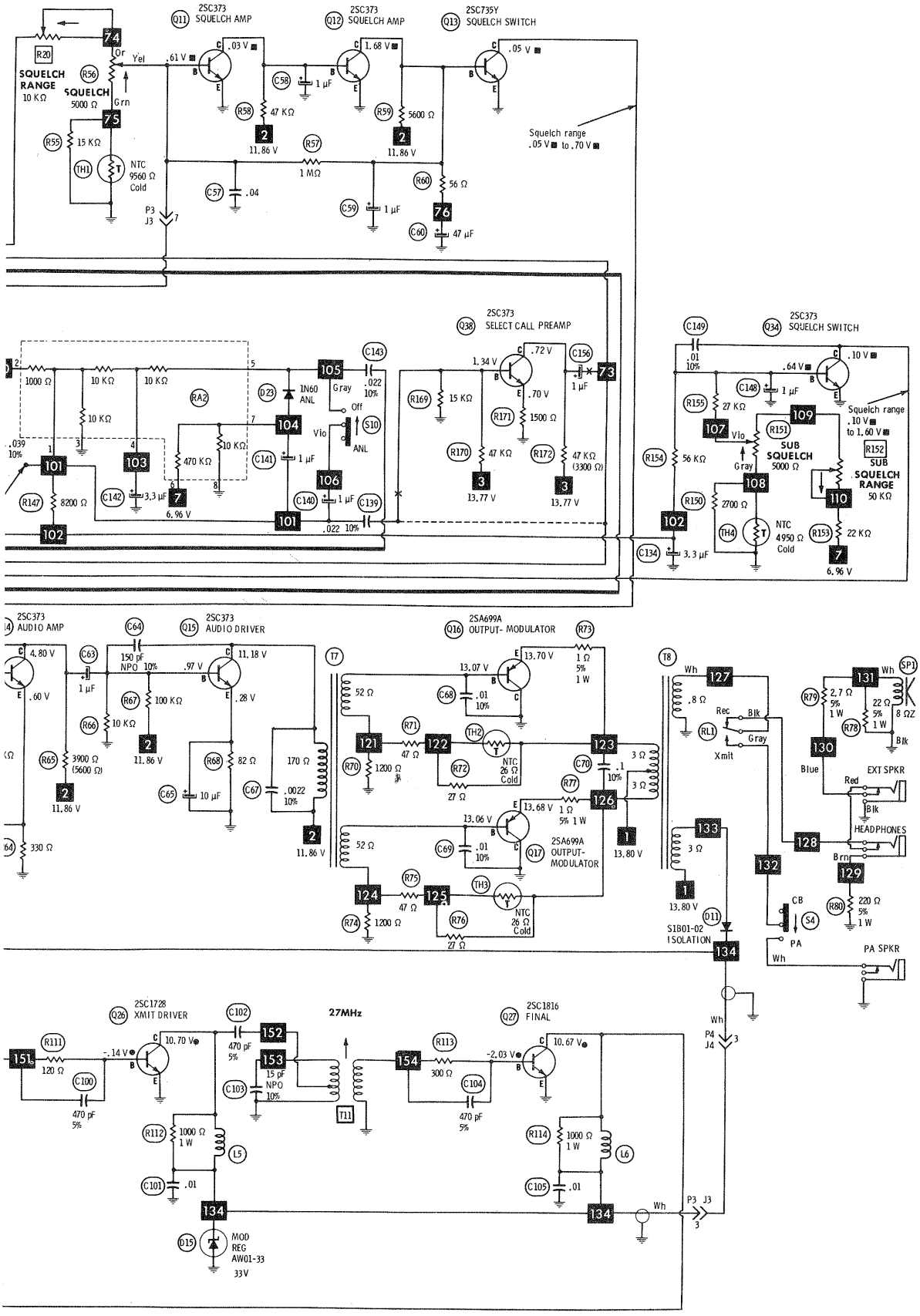
Measurements with switching as shown unless noted:
■ Squelch fully clockwise ♦ 100% modulation
● Transmit

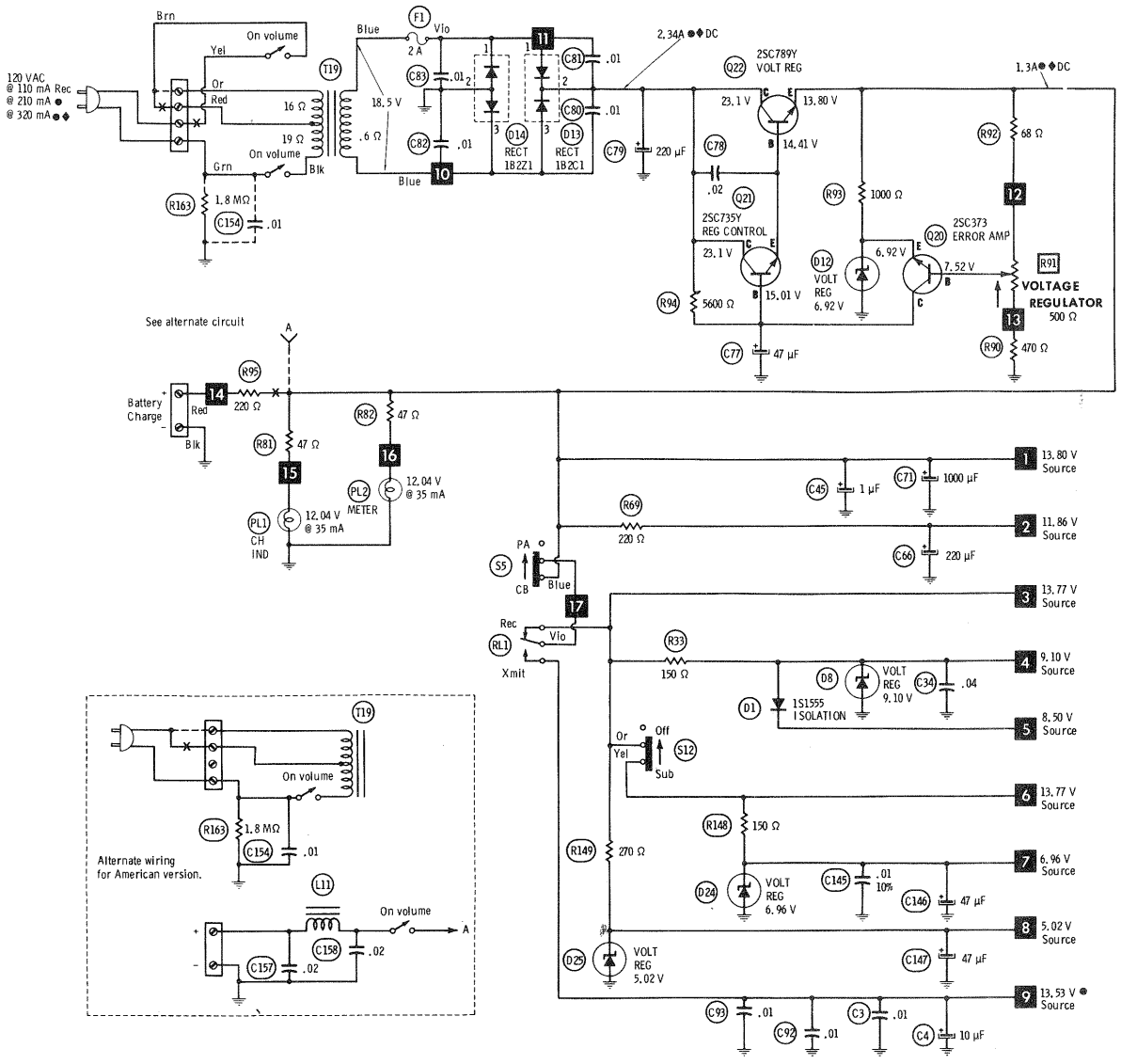
Supply voltage maintained as shown at input.
Voltages measured with digital meter, no signal.
Controls adjusted for normal operation.
Arrow at control indicates direction of advance.
Terminal identification may not be found on unit.
Resistors are 1/2W or less, 5% unless noted.
Value in ( ) used in some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

A PHOTOFACT STANDARD NOTATION SCHEMATIC WITH CIRCUITRACE®


10 MHz
TP2
Q3 2SC371-O 2ND MIXER
455kHz
CF1
FILTER
CF2
FILTER
Q4 2SC372Y 1ST IF AMP
Q5 2SC372Y 2ND IF AM
TP3
T3
T4
C12 150 pF NPO 10%
C11 .01
R12 470 Ω
R13 10 KΩ
C13 .01
C43 33 pF NPO 10%
C24 .47 µF
R42 330 Ω
R14 470 KΩ
R15 1000 Ω
C14 .01
R16 2200 Ω
L1
R17 2200 Ω
C15 .01
C16 1 pF NPO
R18 27 KΩ
R19 150 KΩ
R21 1000 Ω
C17 .039 10%
R22 33 KΩ
R23 470 Ω
R24 4700 Ω
C18 .04
C19 .039 10%
C20 .039 10%
R25 22 KΩ
1.18 V
9.09 V
.60 V
1.96 V
8.40 V
1.29 V
2.9 Ω
4 Ω
1.41 V
9.10 V
37
46
51
54
55
56
67
TP11
27MHz
Q29 2SC784-O SUB RF AMP
Q30 2SC394-Y SUB RF AMP
Q31 2SC371-O SUB MIXER
TP12
T12
T13
T14
C119 10 pF NPO
D18 1S1555 SWITCH
R123 1000 Ω
R124 4700 Ω
C118 .01
L2
C121 10 µF
C120 .01
R122 470 Ω
D19 1S1555 SWITCH
R125 10 KΩ
R126 220 KΩ
C122 .01
D20 HV80 RF LIMITER
R127 390 Ω
C123 .01
C124 .01
R128 10 KΩ
R129 10 KΩ
R130 120 Ω
C125 .01
R131 470 Ω
R132 22 KΩ
C126 .01
C117 3 pF NPO
R133 220 KΩ
C127 .01 10% (.04)
C128 .01
R134 470 Ω
R135 100 Ω
R136 470 Ω
3.6 Ω
4.3 Ω
1.03 V
2.79 V
.35 V
6.42 V
3.44 V
1.12 V
6.31 V
.53 V
8.50 V
13.53 V
6.96 V
77
78
79
80
81
82
83
84
85
86
87
88
102
NC
.09 V
1.54 V
IC1 N7405A PRIORITY GATE
.10 V
.12 V
1.55 V
.61 V
.08 V
5.02 V
R156 100 KΩ
R157 SUB AUDIO BALANCE 50 KΩ
R158 47 KΩ
C144 .022 10%
P3 J3
Blk
Brn
J4 P4
Wh
Gray
J2 SELECT CALL
Or
Grn
C72 300 pF (330 pF)
13.80 V
MICROPHONE ASSEMBLY
Rec
Xmit
Pin view
Red
Wh
Shield
Wiring view
C44 1 µ
C54 .01
R51 AMC 100 KΩ
R52 220 Ω
D10
73
112
115
1
134
135
136
137
C152 47 µF
Q35 2SC735Y MULT
Q36 2SC373 MULT
R159 3900 Ω
C151 3.3 µF
C153 47 µF
R162 3300 Ω
PRIORITY
PL3 12.04 V @ 35 mA
C150 47 µF
R160 47 µF 5% 1 W
R161 47 KΩ
13.79 V
.11 V
.36 V
.08 V
13.77 V
Terminal Guides
IDENT
1 2 3 4 5 6 7 8
RA1
RA2
Front view
J3, J4
Wiring view
X13 10.625 MHz
X12 10.635 MHz
X15 10.595 MHz
X14 10.615 MHz
139
140
141
142
S1 Sect 1 Front Non shorting
S1 Sect 1 Rear Non shorting
Q23 2SC371-O XMIT OSC
TP9
C86 100 pF 5%
C87 180 pF NPO 10%
R100
R97 6800 Ω
R99 470 Ω
C85 .01
C84 .001 10%
R96 4700 Ω
R98 1000 Ω
4.47 V
3.99 V
11.18 V
13.53 V


2SC372Y
2ND IF AMP
455kHz
2SC373
SELECT CALL PREAMP
SQUELCH
RANGE
SQUELCH
1N60
DET - AGC
1N60
METER
RECT
1N60
ANL
Blue
Off
ANL
Grn
TP4
TP5
NTC
9560 Ω
Cold
2SC372Y
SUB 1ST IF AMP
255kHz
2SC372Y
SUB 2ND IF
AMP
1N60
DET-AGC
TP13
J1
MIC
INPUT
Red
Yel
Gray
Wh
Wiring
view
2SC373
MIC AMP
2SC373
SWITCH
2SC373
AUDIO PREAMP
2SC373
AUDIO AMP
XMIT/REC
RELAY
Rec
Xmit
2SK30A-GR
AMC AMP
HV80
RECT
1N60
RECT
VOLUME
50 KΩ
3SK45 B
XMIT MIXER
27MHz
2SC735Y
XMIT BUFFER
TP8
TP9


Q11 2SC373 SQUELCH AMP
Q12 2SC373 SQUELCH AMP
Q13 2SC735Y SQUELCH SWITCH
SQUELCH RANGE 10 KΩ
R20
R56 SQUELCH 5000 Ω
Or
Yel
Grn
74
75
R55 15 KΩ
TH1 NTC 9560 Ω Cold
.61 V
.03 V
1.68 V
.05 V
C58 1 µF
R58 47 KΩ
R59 5600 Ω
11.86 V
R57 1 MΩ
C57 .04
C59 1 µF
R60 56 Ω
C60 47 µF
76
P3 J3
Squelch range .05 V to .70 V
Q38 2SC373 SELECT CALL PREAMP
C149 .01 10%
Q34 2SC373 SQUELCH SWITCH
1000 Ω
10 KΩ
RA2
.039 10%
101
R147 8200 Ω
102
103
470 KΩ
C142 3.3 µF
6.96 V
104
C141 1 µF
105
D23 1N60 ANL
Gray
Off
Vio
S10
ANL
C143 .022 10%
106
C140 1 µF
C139 .022 10%
1.34 V
.72 V
.70 V
C156 1 µF
73
R169 15 KΩ
R171 1500 Ω
R170 47 KΩ
R172 47 KΩ (3300 Ω)
13.77 V
.64 V
.10 V
C148 1 µF
R155 27 KΩ
107
109
R151 SUB SQUELCH 5000 Ω
R152 SUB SQUELCH RANGE 50 KΩ
Squelch range .10 V to 1.60 V
R154 56 KΩ
R150 2700 Ω
TH4 NTC 4950 Ω Cold
R153 22 KΩ
C134 3.3 µF
6.96 V
2SC373 AUDIO AMP
Q15 2SC373 AUDIO DRIVER
Q16 2SA699A OUTPUT- MODULATOR
R73
C64 150 pF NPO 10%
C63 1 µF
4.80 V
.60 V
.97 V
11.18 V
.28 V
R67 100 KΩ
R66 10 KΩ
R65 3900 Ω (5600 Ω)
R68 82 Ω
C65 10 µF
C67 .0022 10%
170 Ω
330 Ω
11.86 V
T7
52 Ω
121
122
123
124
125
126
R71 47 Ω
R70 1200 Ω
R72 27 Ω
TH2 NTC 26 Ω Cold
TH3 NTC 26 Ω Cold
R74 1200 Ω
R75 47 Ω
R76 27 Ω
C68 .01 10%
C69 .01 10%
13.07 V
13.70 V
13.06 V
13.68 V
1 Ω 5% 1 W
3 Ω
C70 .1 10%
Q17 2SA699A OUTPUT- MODULATOR
13.80 V
T8
Wh
127
.8 Ω
Rec
Blk
RL1
Gray
Xmit
133
3 Ω
132
128
131
SP1
8 Ω
R79 2.7 Ω 5% 1 W
22 Ω 5% 1 W
R78
Blk
130
Blue
EXT SPKR
Red
Blk
HEADPHONES
Brn
129
R80 220 Ω 5% 1 W
CB
S4
PA
PA SPKR
D11 S1B01-02 ISOLATION
134
P4 J4
3
Q26 2SC1728 XMIT DRIVER
Q27 2SC1816 FINAL
27MHz
C102 470 pF 5%
152
153
15 pF NPO 10%
C103
T11
151
R111 120 Ω
C100 470 pF 5%
-.14 V
10.70 V
-2.03 V
10.67 V
154
R113 300 Ω
C104 470 pF 5%
R112 1000 Ω 1 W
L5
C101 .01
R114 1000 Ω 1 W
L6
C105 .01
P3 J3
D15 MOD REG AW01-33 33V



Terminal Guides

—✕— Circuitry not used in some versions
– – – Circuitry used in some versions
⊖ See parts list
※ Nominal value
⏚ Ground
Chassis
▽ Common tie point

Measurements with switching as shown unless noted:
■ Squelch fully clockwise ♦ 100% modulation
● Transmit

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.

Chan	Crystal Complement	Chan	Crystal Complement	Chan	Crystal Complement	Chan	Crystal Complement
1	X1, X8, X12	7	X2, X10, X14	13	X4, X8, X12	19	X5, X10, X14
2	X1, X9, X13	8	X2, X11, X15	14	X4, X9, X13	20	X5, X11, X15
3	X1, X10, X14	9	X3, X8, X12	15	X4, X10, X14	21	X6, X8, X12
4	X1, X11, X15	10	X3, X9, X13	16	X4, X11, X15	22	X6, X9, X13
5	X2, X8, X12	11	X3, X10, X14	17	X5, X8, X12		
6	X2, X9, X13	12	X3, X11, X15	18	X5, X9, X13	23	X6, X11, X15

A PHOTOFACT 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	Use BELDEN No.	8530 (Solid) Available in 13 Colors 8524 (Stranded) Available in 13 Colors
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

SEMICONDUCTORS (Select replacement transistor for best results)

ITEM No.	TYPE No.	MFGR. PART No.	REPLACEMENT DATA							
			GENERAL ELECTRIC PART No.	IR WORKMAN PART No.	MALLORY PART No.	MOTOROLA PART No.	RAYTHEON PART No.	RCA PART No.	SPRAGUE PART No.	SYLVANIA PART No.
D1	1S1555		GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D2	1S1555		GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D3	HV80		GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D4	1N60		1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D5	1N60		1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D6	1N60		1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D7	1N60		1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D8	EQA01-09S		GEZD-9.1	Z1209	ZB9.1A	HEPZ0412	RE 114	SK3060	RT-240	ECG139
D9	HV80		GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D10	1N60		1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D11	S1B01-02		GE-504A	5A4D	PTC201	HEPR0052	RE 49	SK3030	RT-213	ECG116
D12	EQA01-07X		GEZD-6.8	Z1206	ZB6.8A	HEPZ0409	RE 110		RT-238	ECG5071
D13	1B2C1		GE-504A(2)	5A4D(2)	PTC201(2)	HEPR0052(2)	RE 49(2)	SK3030(2)	RT-213(2)	ECG116(2)
D14	1B2Z1		GE-504A(2)	5A4D(2)	PTC201(2)	HEPR0052(2)	RE 49 (2)	SK3030(2)	RT-213(2)	ECG116(2)
D15	AW01-33		GEZD-33	Z1222	ZB33A	HEPZ0426	RE 130	SK3095	RT-250	ECG147
D16	1N60		1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D17	1N60		1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D18	1S1555		GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D19	1S1555		GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D20	HV80		GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D21	1N60		1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D22	1N60		1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D23	1N60		1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D24	EQA01-075		GEZD-6.8	Z1206	ZB6.8A	HEPZ0409	RE 110		RT-238	ECG5071
D25	EQA01-055		GEZD-5.1	Z1203		HEPZ0406		SK3056	RT-235	
IC1	N7405A SN7405A									ECG7405 ECG7405
Q1	2SC784-0		GE-60	(IR)2SC380A0	PTC132	HEPS0008	RE 28	SK3018	RT-187	ECG229
Q2	2SC371-0		GE-61	(IR)2SC537B	PTC101	HEPS0011	RE 13	SK3124	RT-302	ECG123A
Q3	2SC371-0		GE-61	(IR)2SC537B	PTC101	HEPS0011	RE 13	SK3124	RT-302	ECG123A
Q4	2SC372Y		GE-61	(IR)2SC372	PTC121	HEPS0015	RE 13	SK3122	RT-308	ECG123A
Q5	2SC372Y		GE-61	(IR)2SC372	PTC121	HEPS0015	RE 13	SK3122	RT-308	ECG123A
Q6	2SC371-0		GE-61	(IR)2SC537B	PTC101	HEPS0011	RE 13	SK3124	RT-302	ECG123A
Q7	2SC371-0		GE-61	(IR)2SC537B	PTC101	HEPS0011	RE 13	SK3124	RT-302	ECG123A
Q8	2SC373		GE-212	(IR)2SC373	PTC121	HEPS0015	RE 192	SK3122	RT-105	ECG199
Q9	2SK30AGR		GE-FET-1	FE-100	PTC151	HEPF0010	RE 46	SK3112	RT-176	ECG133
Q10	2SC373		GE-212	(IR)2SC373	PTC121	HEPS0015	RE 192	SK3122	RT-105	ECG199
Q11	2SC373		GE-212	(IR)2SC373	PTC121	HEPS0015	RE 192	SK3122	RT-105	ECG199
Q12	2SC373		GE-212	(IR)2SC373	PTC121	HEPS0015	RE 192	SK3122	RT-105	ECG199
Q13	2SC735Y		GE-210	TR-21	PTC123	HEPS0014	RE 13	SK3122	RT-308	ECG289
Q14	2SC373		GE-212	(IR)2SC373	PTC121	HEPS0015	RE 192	SK3122	RT-105	ECG199
Q15	2SC373		GE-212	(IR)2SC373	PTC121	HEPS0015	RE 192	SK3122	RT-105	ECG199
Q16	2SA699A	(10)	GE-29	TR-56	PTC111	HEPS5028	RE 43	SK3084	RT-167	ECG187A
Q17	2SA699A	(10)	GE-29	TR-56	PTC111	HEPS5028	RE 43	SK3084	RT-167	ECG187A
Q18	2SC373		GE-212	(IR)2SC373	PTC121	HEPS0015	RE 192	SK3122	RT-105	ECG199
Q19	2SC373		GE-212	(IR)2SC373	PTC121	HEPS0015	RE 192	SK3122	RT-105	ECG199
Q20	2SC373		GE-212	(IR)2SC373	PTC121	HEPS0015	RE 192	SK3122	RT-105	ECG199
Q21	2SC735Y		GE-210	TR-21	PTC123	HEPS0014	RE 13	SK3122	RT-308	ECG289
Q22	2SC789Y	(11)	GE-66	TR-76	PTC154		RE 21	SK3054	RT-197	ECG152
Q23	2SC371-0		GE-61	(IR)2SC537B	PTC101	HEPS0011	RE 13	SK3124	RT-302	ECG123A
Q24	3SK45B		GE-FET-4		PTC181	HEPF2004	RE 199	SK3050	RT-181	ECG222
Q25	2SC735Y		GE-210	TR-21	PTC123	HEPS0014	RE 13	SK3122	RT-308	ECG289
Q26	2SC1728						RE 204		RT-310	ECG302
Q27	2SC1816	(12)	GE-216		PTC186		RE 201	SK3197	RT-146	ECG235
Q28	2SC371-0		GE-61	(IR)2SC537B	PTC101	HEPS0011	RE 13	SK3124	RT-302	ECG123A
Q29	2SC784-0		GE-60	(IR)2SC380A0	PTC132	HEPS0008	RE 28	SK3018	RT-187	ECG229
	2SC786-0	(1)	GE-86	TR-70	PTC126	HEPS0017	RE 28	SK3018	RT-112	ECG161
Q30	2SC394Y, -0		GE-61	(IR)2SC372	PTC121	HEPS0014	RE 9	SK3018	RT-309	ECG229
Q31	2SC371-0		GE-61	(IR)2SC537B	PTC101	HEPS0011	RE 13	SK3124	RT-302	ECG123A
Q32	2SC372Y		GE-61	(IR)2SC372	PTC121	HEPS0015	RE 13	SK3122	RT-308	ECG123A
Q33	2SC372Y		GE-61	(IR)2SC372	PTC121	HEPS0015	RE 13	SK3122	RT-308	ECG123A
Q34	2SC373		GE-212	(IR)2SC373	PTC121	HEPS0015	RE 192	SK3122	RT-105	ECG199
Q35	2SC735Y		GE-210	TR-21	PTC123	HEPS0014	RE 13	SK3122	RT-308	ECG289
Q36	2SC373		GE-212	(IR)2SC373	PTC121	HEPS0015	RE 192	SK3122	RT-105	ECG199
Q37	2SC373		GE-212	(IR)2SC373	PTC121	HEPS0015	RE 192	SK3122	RT-105	ECG199
Q38	2SC373		GE-212	(IR)2SC373	PTC121	HEPS0015	RE 192	SK3122	RT-105	ECG199

(1) Used in some versions.
(2) Two required.
(10) Rating, 10 Watt @ 3.0 Amp.
(11) Rating, 30 Watt @ 4.0 Amp.
(12) Rating, 16 Watt @ 4.0 Amp.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING	REPLACEMENT DATA			
		MFGR. PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	10 16V		PC10-25	VTT10A25	EV-1222
C6	1 50V		PC1-50	VTT1B63	EV-1615
C24	.47 50V		PC1-50	VTTR47B63	EV-1610
C25	.47 50V		PC1-50	VTTR47B63	EV-1610
C26	1 50V		PC1-50	VTT1B63	EV-1615
C28	3.3 35V		PC5-50	VTT3R3A50	EV-1618
C29	3.3 35V		PC5-50	VTT3R3A50	EV-1618
C44	1 50V		PC1-50	VTT1B63	EV-1615
C45	1 50V		PC1-50	VTT1B63	EV-1615
C51	.47 50V		PC1-50	VTTR47B63	EV-1610
C52	1 50V		PC1-50	VTT1B63	EV-1615
C53	1 50V		PC1-50	VTT1B63	EV-1615

PARTS LIST AND DESCRIPTION (CONTINUED)

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

ELECTROLYTIC CAPACITORS (cont)

ITEM No.	RATING	REPLACEMENT DATA			
		MFGR. PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.
C55	.47 50V		PC1-50	VTTR47B63	EV-1610
C56	1 50V		PC1-50	VTT1B63	EV-1615
C58	1 50V		PC1-50	VTT1B63	EV-1615
C59	1 50V		PC1-50	VTT1B63	EV-1615
C60	47 16V		PC50-16	VTT47D16	EV-1226
C61	1 50V		PC1-50	VTT1B63	EV-1615
C63	1 50V		PC1-50	VTT1B63	EV-1615
C65	10 16V		PC10-25	VTT10A25	EV-1222
C66	220 16V		PC250-25	VTT220G16	EV-1240
C71	1000 16V		PC1000-16	VTT1000L16	EV-1260
C73	1 50V		PC1-50	VTT1B63	EV-1615
C74	1 50V		PC1-50	VTT1B63	EV-1615
C75	47 16V		PC50-16	VTT47D16	EV-1226
C76	1 50V		PC1-50	VTT1B63	EV-1615
C77	47 25V		PC50-25	VTT47E25	EV-1326
C79	2200 35V		WBR2000-50	TC50200A	TVA-1318.2
C121	10 16V		PC10-25	VTT10A25	EV-1222
C132	4.7 16V		PC5-50	VTT4R7A50	EV-1319
C134	3.3 35V		PC5-50	VTT3R3A50	EV-1618
C140	1 50V		PC1-50	VTT1B63	EV-1615
C141	1 50V		PC1-50	VTT1B63	EV-1615
C142	3.3 35V		PC5-50	VTT3R3A50	EV-1618
C146	47 16V		PC50-16	VTT47D16	EV-1226
C147	47 16V		PC50-16	VTT47D16	EV-1226
C148	1 50V		PC1-50	VTT1B63	EV-1615
C150	47 16V		PC50-16	VTT47D16	EV-1226
C151	3.3 25V		PC5-50	VTT3R3A50	EV-1318
C152	47 16V		PC50-16	VTT47D16	EV-1226
C153	47 16V		PC50-16	VTT47D16	EV-1226
C155	1 50V		PC1-50	VTT1B63	EV-1615
C156	1 50V		PC1-50	VTT1B63	EV-1615

CAPACITORS

ITEM No.	RATING	MFGR. PART No.	REPLACEMENT DATA			
			CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.
C1	.01		UK50-103		MAG5011	
C2	10		DTZ-10	NP010	CN0410	10TCC-Q10
C3	.01		UK50-103		MAG5011	
C5	.01		UK50-103		MAG5011	
C7	.04		UK12-503		MAG1215	HY-350
C8	.01		UK50-103		MAG5011	
C9	.01		UK50-103		MAG5011	
C10	.01		UK50-103		MAG5011	
C11	.01		UK50-103		MAG5011	
C12	150 10% NPO		DTZ-150		CN0315	10TCC-T15
C13	.01		UK50-103		MAG5011	
C14	.01		UK50-103		MAG5011	
C15	.01		UK50-103		MAG5011	
C16	1 NPO					
C17	.039 10%				M192P3939R8	192P3939R8
C18	.04		UK12-503		MAG1215	HY-350
C19	.039 10%				M192P3939R8	192P3939R8
C20	.039 10%				M192P3939R8	192P3939R8
C21	.04		UK12-503		MAG1215	HY-350
C22	100 10% NPO		DTZ-100	NP0100	CN0310	10TCC-T10
C23	.01 10%			WMF1S1	EWF1A110	1PB-S10
C27	.022 10%				M192P2239R8	192P2239R8
C30	.01 10%			WMF1S1	EWF1A110	1PB-S10
C31	.001 10%			DPMS6D1	EWF1A210	1PB-D10
C32	.01		UK50-103		MAG5011	
C33	.01		UK50-103		MAG5011	
C34	.04		UK12-503		MAG1215	HY-350
C35	150 10% N220		*		*	10TCR-T15
C36	15 10% NPO		DTZ-15	NP015	CN0415	10TCC-Q15
C37	150 10% N220		*		*	10TCR-T15
C38	.01		UK50-103		MAG5011	
C39	10 NPO		DTZ-10	NP010	CN0410	10TCC-Q10
C40	.001 10%			DPMS6D1	EWF1A210	1PB-D10
C41	68 10% NPO		DTZ-68	NP068	CN0468	10TCC-Q68
C42	.01		UK50-103		MAG5011	
C43	33 10% NPO		DTZ-33	NP033	CN0433	10TCC-Q33
C46	.01 10%			WMF1S1	EWF1A110	1PB-S10
C47	.01 10%			WMF1S1	EWF1A110	1PB-S10
C48	.0022 10%				M192P2229R8	192P2229R8
C49	.001		DD-102G	GP1000	GP210	5GA-D10
C50	150 10% NPO		DD-151		GP315	10TS-T15
C54	.01		UK50-103		MAG5011	
C57	.04		UK12-503		MAG1215	HY-350
C62	150		DD-151		GP315	10TS-T15
C64	150 10% NPO		DTZ-150		CN0315	10TCC-T15
C67	.0022 10%				M192P2229R8	192P2229R8
C68	.01 10%			WMF1S1	EWF1A110	1PB-S10
C69	.01 10%			WMF1S1	EWF1A110	1PB-S10
C70	.1 10%			WMF05P1	EWF05010	431P1049R5
C72	300		DD-301	GP300	GP330	10TS-T30
C78	.02		UK50-223		MAG5012	
C80	.01		UK50-103		MAG5011	
C81	.01		UK50-103		MAG5011	
C82	.01		UK50-103		MAG5011	
C83	.01		UK50-103		MAG5011	
C84	.001 10%			DPMS6D1	EWF1A210	1PB-D10
C85	.01		UK50-103		MAG5011	
C86	100 5%			CD15FD101J03	SX310	MWA-101
C87	180 10% NPO		DTZ-180			10TCC-T18
C88	130 5%			CD15FD131J03	SX313	MWA-131
C89	.01		UK50-103		MAG5011	

PARTS LIST AND DESCRIPTION (CONTINUED)

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

CAPACITORS (cont)

ITEM No.	RATING	MFGR. PART No.	REPLACEMENT DATA			
			CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.
C90	.01		UK50-103		MAG5011	
C91	150 10% N220		*		*	10TCR-T15
C92	.01		UK50-103		MAG5011	
C93	.01		UK50-103		MAG5011	
C94	5 NPO		DTZ-4R7	NP04P7	CN0547	10TCC-V47
C95	150 10% N220		*		*	10TCR-T15
C96	5 NPO		DTZ-4R7	NP04P7	CN0547	10TCC-V47
C97	.01		UK50-103		MAG5011	
C98	.01		UK50-103		MAG5011	
C99	.01		UK50-103		MAG5011	
C100	470 5%			CD15FD471J03	SX347	MWA-471
C101	.01		UK50-103		MAG5011	
C102	470 5%			CD15FD471J03	SX347	MWA-471
C103	15 10% NPO		DTZ-15	NP015	CN0415	10TCC-Q15
C104	470 5%			CD15FD471J03	SX347	MWA-471
C105	.01		UK50-103		MAG5011	
C106	100 10% NPO		DTZ-100	NP0100	CN0310	10TCC-T10
C107	10 NPO		DTZ-10	NP010	CN0410	10TCC-Q10
C108	33 10% NPO		DTZ-33	NP033	CN0433	10TCC-Q33
C109	360 5%			CD15FD361J03	SX336	MWA-361
C110	22 10% NPO		DTZ-22	NP022	CN0422	10TCC-Q22
C111	180 5%			CD15FD181J03	SX318	MWA-181
C112	.02		UK50-223		MAG5012	
C113	.02		UK50-223		MAG5012	
C114	100 10% NPO		DTZ-100	NP0100	CN0310	10TCC-T10
C115	68 10% NPO		DTZ-68	NP068	CN0468	10TCC-Q68
C116	.01		UK50-103		MAG5011	
C117	3 NPO		DTZ-3R3	NP03P3	CN0533	10TCC-V33
C118	.01		UK50-103		MAG5011	
C119	10 NPO		DTZ-10	NP010	CN0410	10TCC-Q10
C120	.01		UK50-103		MAG5011	
C122	.01		UK50-103		MAG5011	
C123	.01		UK50-103		MAG5011	
C124	.01		UK50-103		MAG5011	
C125	.01		UK50-103		MAG5011	
C126	.01		UK50-103		MAG5011	
C127	.01 10%			WMF1S1	EWF1A110	1PB-S10
C128	.01		UK50-103		MAG5011	
C129	.039 10%				M192P3939R8	192P3939R8
C130	.039 10%				M192P3939R8	192P3939R8
C131	.04		UK12-503		MAG1215	HY-350
C133	.039 10%				M192P3939R8	192P3939R8
C135	.039 10%				M192P3939R8	192P3939R8
C136	.04		UK12-503		MAG1215	HY-350
C137	120 10% NPO		DTZ-120		CN0312	10TCC-T12
C138	.039 10%				M192P3939R8	192P3939R8
C139	.022 10%				M192P2239R8	192P2239R8
C143	.022 10%				M192P2239R8	192P2239R8
C144	.022 10%				M192P2239R8	192P2239R8
C145	.01 10%			WMF1S1	EWF1A110	1PB-S10
C149	.01 10%			WMF1S1	EWF1A110	1PB-S10
C154	.01		UK50-103		MAG5011	

* 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				
			MFGR. PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	MALLORY PART No.	TRW PART No.
R20	Squelch Range	10K		T-10K (2)	C-103 (2)	MTC14L1 (2)	X201R103B (2)
R29	S Meter	20K					
R32	Volume/Switch	50K		F2-50K (1), SSK104,KR-2	A47-50K-Z (1), KSS-3,SW6-20 or NP-50K-Z (1), UP-C-400,NWE-20	RU54A,SL36,SL1500	BU1 (1),CF63, SS1,WF
R51	AMC	100K		T-100K (2)	C-104 (2)	MTC15L1 (2)	X201R104B (2)
R56	Squelch .	5000					
R91	Voltage Regulator	500					
R118	RF Meter	2000		T-2500 (2)	C-252 (2)	MTC23L1 (2)	X201R252B (2)
R119	SWR CAL	50K					
R151	SUB Squelch	5000					
R152	SUB Squelch Range	50K		T-50K (2)	C-503 (2)	MTC54L1 (2)	X201R503B (2)
R157	SUB Audio Balance	50K		T-50K (2)	C-503 (2)	MTC54L1 (2)	X201R503B (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	
		WORKMAN PART No.	MFGR. PART No.
TH1	9560 Cold NTC		
TH2	26 Cold NTC	FR26.5	

ITEM No.	RATING	REPLACEMENT DATA	
		WORKMAN PART No.	MFGR. PART No.
TH3	26 Cold NTC	FR26.5	
TH4	4950 Cold NTC		

COILS (RF-IF)

ITEM No.	FUNCTION	REPLACEMENT DATA			REMARKS
		PART No.	OTHER IDENTIFICATION	MILLER PART No.	
L3	Harmonic Suppressor (27MHz)				
L4	Harmonic Suppressor (27MHz)				
L5	RF Choke				
L6	RF Choke				
L7	Pi Filter (27MHz)				
L8	Ant. Match (27MHz)				
L9	RF Choke				

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.	
T1	Rec. Ant. (27MHz)		TKXN-23345X-5814		
T2	Rec. RF (27MHz)		TKXC-23344X-5825		
T3	Rec. Mixer (10MHz)		TKXC-23346X-5824		
T4	IF (455kHz)		YOO-15001-A-5722		
T5	IF (455kHz)		YMO-15002-A-5735		
T6	Synth Osc. (37MHz)				
T9	Xmit Mixer (27MHz)		TKXC-15950-N-5825		
T10	Xmit Buffer (27MHz)		TKXC-23343-N-5825		
T11	Xmit Driver (27MHz)				
T12	SUB RF (27MHz)		113CN-2544-A0		
T13	SUB RF (27MHz)		1624B		
T14	SUB Rec. Mixer (255kHz)				
T15	SUB Rec. Mixer (255kHz)				
T16	SUB IF (255kHz)				
T17	SUB IF (255kHz)				
T18	SUB IF (255kHz)				

TRANSFORMER (Driver)

ITEM No.	TURNS RATIO			REPLACEMENT DATA			NOTES
	PRI.	SEC. 1	SEC. 2	MFGR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T7	2.5	1	1	E6228 (1)	TR645		(1) Number on unit.

TRANSFORMER (Audio Output)

ITEM No.	IMPEDANCE		REPLACEMENT DATA			NOTES
	PRI.	SEC.	MFGR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T8	72	8	E3791 (1)			(1) Number on unit.

TRANSFORMER (Power)

ITEM No.	RATING		REPLACEMENT DATA			NOTES
	PRI.	SEC. 1	MFGR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T19	120V AC @ 380mA AC	18.5V AC @ 2.34A AC	K4310 (1)			(1) Number on unit.

SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		MFGR. PART No.	QUAM PART No.	
SP1	2 3/4" PM, 8 Ohms		27A05Z8	

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 Miniature Fast Acting					212002		

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		2	1	3	NC	NC	4

CRYSTALS

ITEM No.	CRYSTAL FREQUENCY IN MHz	MFGR. PART No.	CTS KNIGHTS PART No.	CHANNEL
X1	37.600		DA14W37.600	1,2,3,4
X2	37.650		DA14W37.650	5,6,7,8
X3	37.700		DA14W37.700	9,10,11,12
X4	37.750		DA14W37.750	13,14,15,16
X5	37.800		DA14W37.800	17,18,19,20
X6	37.850		DA14W37.850	21,22,23
X8	10.180		DC65W10.180	1,5,9,13,17,21
X9	10.170		DC65W10.170	2,6,10,14,18,22

ITEM No.	CRYSTAL FREQUENCY IN MHz	MFGR. PART No.	CTS KNIGHTS PART No.	CHANNEL
X10	10.160		DC65W10.160	3,7,11,15,19
X11	10.140		DC65W10.140	4,8,12,16,20,23
X12	10.635		DB65W10.635	1,5,9,13,17,21
X13	10.625		DB65W10.625	2,6,10,14,18,22
X14	10.615		DB65W10.615	3,7,11,15,19
X15	10.595		DB65W10.595	4,8,12,16,20,23
X16	(1)			

(1) This unit incorporates a crystal for separate SUB (Monitor) receive using crystal frequency of:
SUB (Monitor) Frequency = FR crystal frequency = FR-255kHz.

MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
CF1	Filter		(455kHz)
CF2	Filter		(455kHz)
M1	Meter		S/RF
RL1	Relay		Xmit/Rec (35 Ohms)
S1	Switch		Channel Selector
S4	Switch		CB/PA
S6	Switch		SWR/S/RF
S8	Switch		SWR/CAL
S10	Switch		ANL/OFF
S12	Switch		SUB/OFF
	Printed Circuit Board		Main (GE-20B-5013)
	Printed Circuit Board		Power Supply and Audio (GE-20C-5019)