NOTE

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

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

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

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

MODEL TRC-57(21-157)

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

 Printed in U. S. of America 6CZ386

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 14-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:

CT1 thru CT4.....5000,8290
All tunable coils.....9440

SYNTHESIZER ALIGNMENT

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Input of frequency counter to IC12 Pin 10. NOTE: Couple as loosely as possible.	USB, Ch. 13, Rec.	CT4	Adjust for 10.000000MHz.
Input of RF VTVM to TP-1.	USB, Ch. 13, Rec.	L17	Turn core to top of coil. Turn core clockwise for maximum.
Input of frequency counter to TP-1.	USB, Ch. 13, Rec	CT3	Adjust for 7.7975MHz.
Input of frequency counter to TP-1.	LSB, Ch. 13, Rec	CT2	Adjust for 7.8025MHz.
Input of RF VTVM to TP-2.	LSB, Ch. 13, Rec	L14,L15	Adjust for maximum output.
Input of RF VTVM to TP-2.	AM Ch. 13, Rec	L16	Adjust for maximum output.
Input of VTVM to TP-3	USB, Ch. 23, Rec	L11	Adjust for 4 volts. (CRITICAL ADJUSTMENT)
Input of RF VTVM to TP-5.	USB, Ch. 13, Rec	L12,L13	Adjust for maximum output.
Input of frequency counter to TP-5.	USB, Ch. 1, Rec Clarifier Max. +	VR19	Adjust for 19.169MHz
Input of frequency counter to TP-5.	USB, Ch. 1, Rec Clarifier Max. -	VR16	Adjust for 19.166MHz
Input of frequency counter to TP-5.	USB, Ch. 1, Rec Clarifier 0	VR17	Adjust for 19.1675MHz
Input of frequency counter to TP-5.	AM, Ch. 1, Rec	CT-1	Adjust for 19.165MHz
Input of frequency counter to antenna jack.	AM, Ch. 13, Rec	VR18	Adjust for 27.115000MHz

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 TR11 base. 7.8MHz, 1000MHz @ 30% modulation.	USB, Ch. 13 Rec Squelch (VR9)-Off Clarifier (VR15)-0 Volume (VR6) & RF Gain (VR2)-maximum ANL & NB (SW7)-Off	L9,L8,L7	Adjust for maximum output.
Output of signal generator thru .01uF to antenna jack. 27.115MHz, 1000MHz @ 30% modulation	"	L6,L5,L4	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.
Set generator output low enough to prevent AGC limiting.

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Output of signal generator thru .01uF to antenna jack. 27.115MHz, 1000Hz @ 30% modulation.	USB, Ch. 13, Rec Squelch (VR9)-Off Clarifier (VR15)-0 ANL & NB (SW7)-Off Vol (VR6) & RF Gain (VR2)-maximum.	VR26	IF GAIN Adjust for maximum output.
Output of signal generator thru .01uF to antenna jack. 27.115MHz, 1000Hz @ 30% modulation. Output 0.125uV.	USB, Ch. 13, Rec Squelch (VR9)-Off Clarifier (VR15)-0 Vol (VR6) & RF Gain (VR2)-maximum. ANL & NB (SW7)-Off	 VR7 VR5 VR20	AGC Adjust for maximum. SSB LEVEL Adjust for maximum GAIN Adjust for maximum *NOTE: VR7, VR5 & VR20 adjusted for 0.5 watts audio power. Repeat above steps, if necessary.
Output of signal generator thru .01uF to antenna jack. 27.115MHz, 1000Hz @ 30% modulation. Output 1000uV.	USB, Ch. 13, Rec Vol (VR6) & Squelch (VR9)-maximum	VR8	SQUELCH RANGE Adjust for 2V audio output.
Output of signal generator thru .01uF to antenna jack. 27.115MHz, 1000Hz @ 30% modulation. Output 100uV.	USB, Ch. 13, Rec Squelch (VR9)-Off Clarifier (VR15)-0 Vol (VR6) & RF Gain (VR2)-maximum ANL & NB (SW7)-Off.	VR4	S METER Adjust for 9 on scale of meter.
Output of signal generator thru .01uF to antenna jack. 27.115MHz, 1000Hz @ 30% modulation. Output 0.5uV.	USB, Ch. 13, Rec Squelch (VR9)-Off Clarifier (VR15)-0 RF Gain (VR2)-maximum. ANL & NB (SW7)-Off	VR3	GAIN RANGE Set volume for 500mW audio output. Increas signal generator to 100uV. Adjust VR3 for 500mW audio output.
Input of VTVM to TP. Output of signal generator to antenna jack. 23.5MHz Output 1000uV.	USB, Ch. 13, Rec NB (SW7)-On	L1,L2,L3	NOISE BLANKER Adjust for maximum.

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 or adjustment of transmitter.

SSB

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Input of RF VTVM to antenna jack. Output of two tone generator to mic input. (500Hz-2400Hz) Output 2mV.	USB, Ch. 13, Xmit VR11 (SSB Mod), R13 (Mic Gain) & VR23 (Bias)-midrange. VR25 (SSB ALC)-maximum resistance.	L32,L31,L30, L29,L27,L24	Adjust for maximum output.

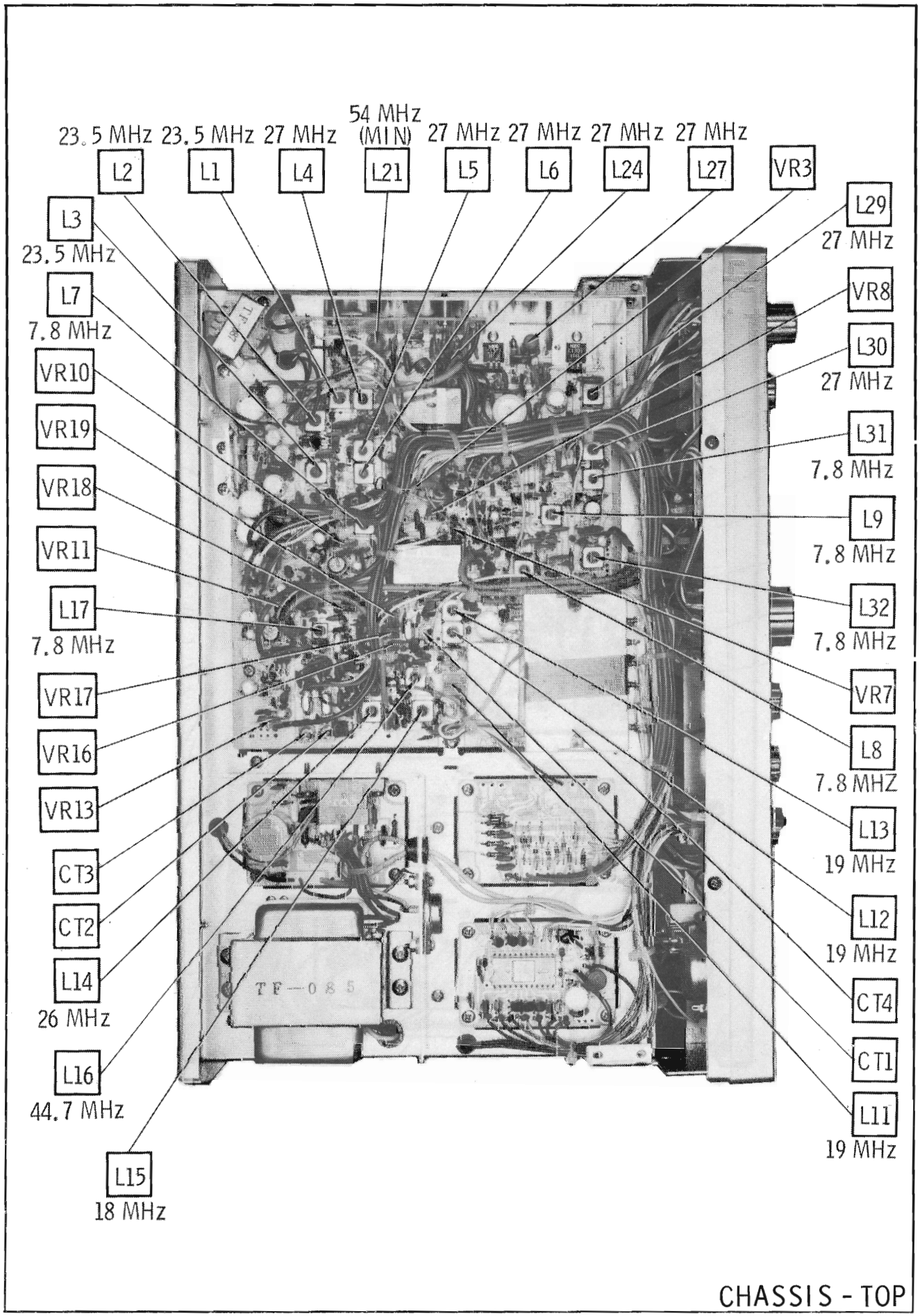
AM

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
TV Set (Ch. 2)	AM, Ch. 13, Xmit	L21	Adjust for MINIMUM.

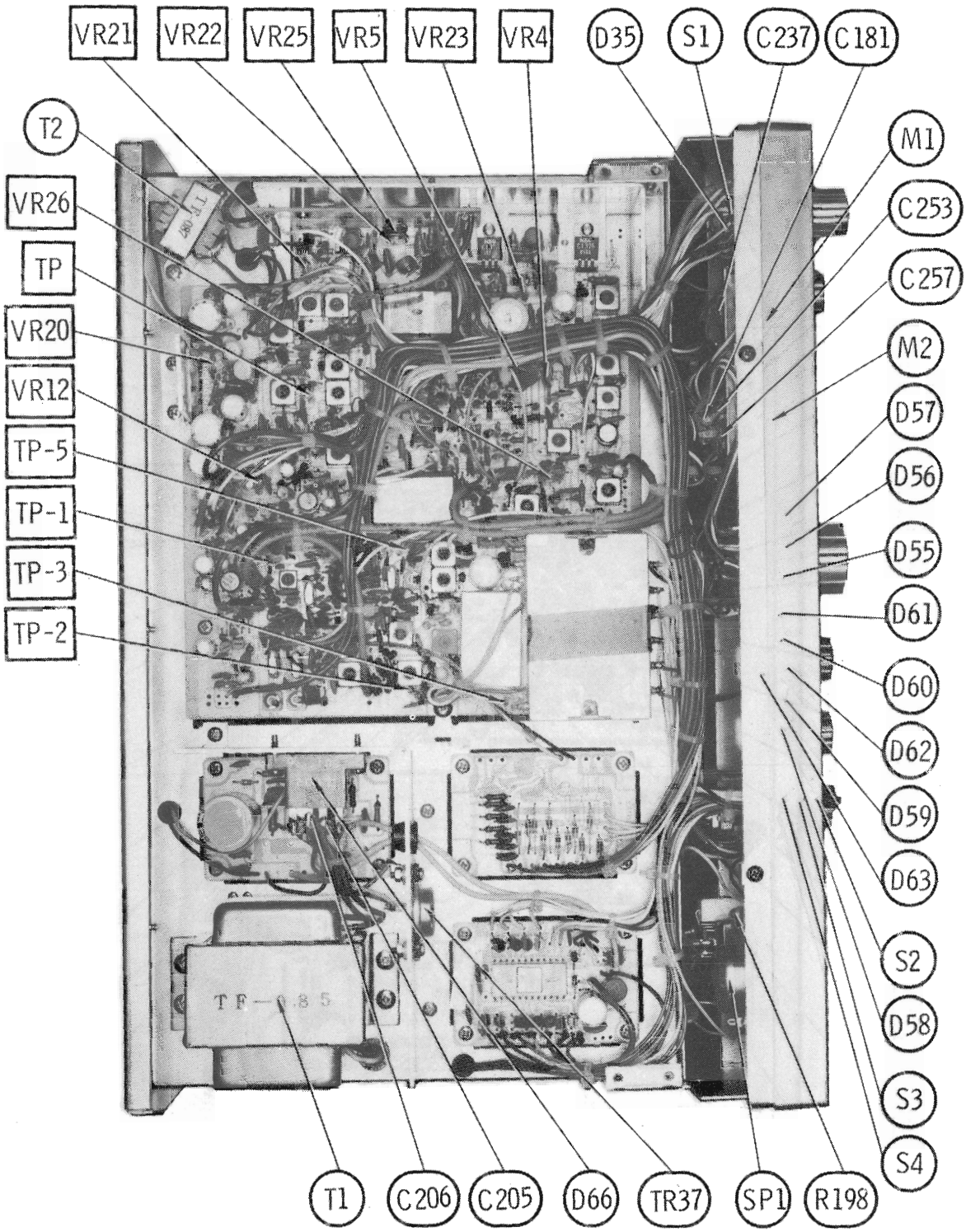
TRANSMITTER ADJUSTMENTS

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 alignment or adjustment of transmitter.

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Input of VTVM to F1.	USB, Ch. 13, Rec	VR24	VOLTAGE REG Adjust for 14.00 volts. Key transmitter, voltage should not change.
Input of RF VTVM to antenna jack. Output of two tone generator to mic input. (500Hz - 2400Hz) Output 2mV.	USB, Ch. 13, Xmit VR11 (SSB Mod), VR13 (Mic Gain) & VR23 (Bias)-midrange. VR25 (SSB ALC)-maximum resistance.	VR11	SSB MOD Adjust for 27 volts
"	USB, Ch. 13, Xmit	VR25	SSB ALC Adjust for 24.5 volts.
Input of RF VTVM to antenna jack	"	VR10	CARRIER BALANCE Adjust for MINIMUM.
Input of RF VTVM to antenna jack. Output of two tone generator to mic input. (500Hz - 2400Hz) Output 2mV.	"	VR13	MIC GAIN Adjust for 14.14 volts.
Input of oscilloscope to antenna jack. Output of two tone generator to mic input. (500Hz - 2400Hz) Output 2mV.	"	VR23	XMIT BIAS Adjust for no crossover on scope.
	AM, Ch. 13, Xmit	VR21	AM POWER Adjust for 4 watts maximum.
Input of oscilloscope to antenna jack. Output of signal generator to mic input. 1000Hz Output 8mV.	"	VR12	AM MOD Adjust for 90% modulation.
	"	VR22	RF METER Adjust so panel meter reads on red line of power scale.


23.5 MHz
L2
23.5 MHz
L1
27 MHz
L4
54 MHz (MIN)
L21
27 MHz
L5
27 MHz
L6
27 MHz
L24
27 MHz
L27
VR3
L3
23.5 MHz
L7
7.8 MHz
VR10
VR19
VR18
VR11
L17
7.8 MHz
VR17
VR16
VR13
CT3
CT2
L14
26 MHz
L16
44.7 MHz
L15
18 MHz
L29
27 MHz
VR8
L30
27 MHz
L31
7.8 MHz
L9
7.8 MHz
L32
7.8 MHz
VR7
L8
7.8 MHZ
L13
19 MHz
L12
19 MHz
CT4
CT1
L11
19 MHz
TF-085

CHASSIS - TOP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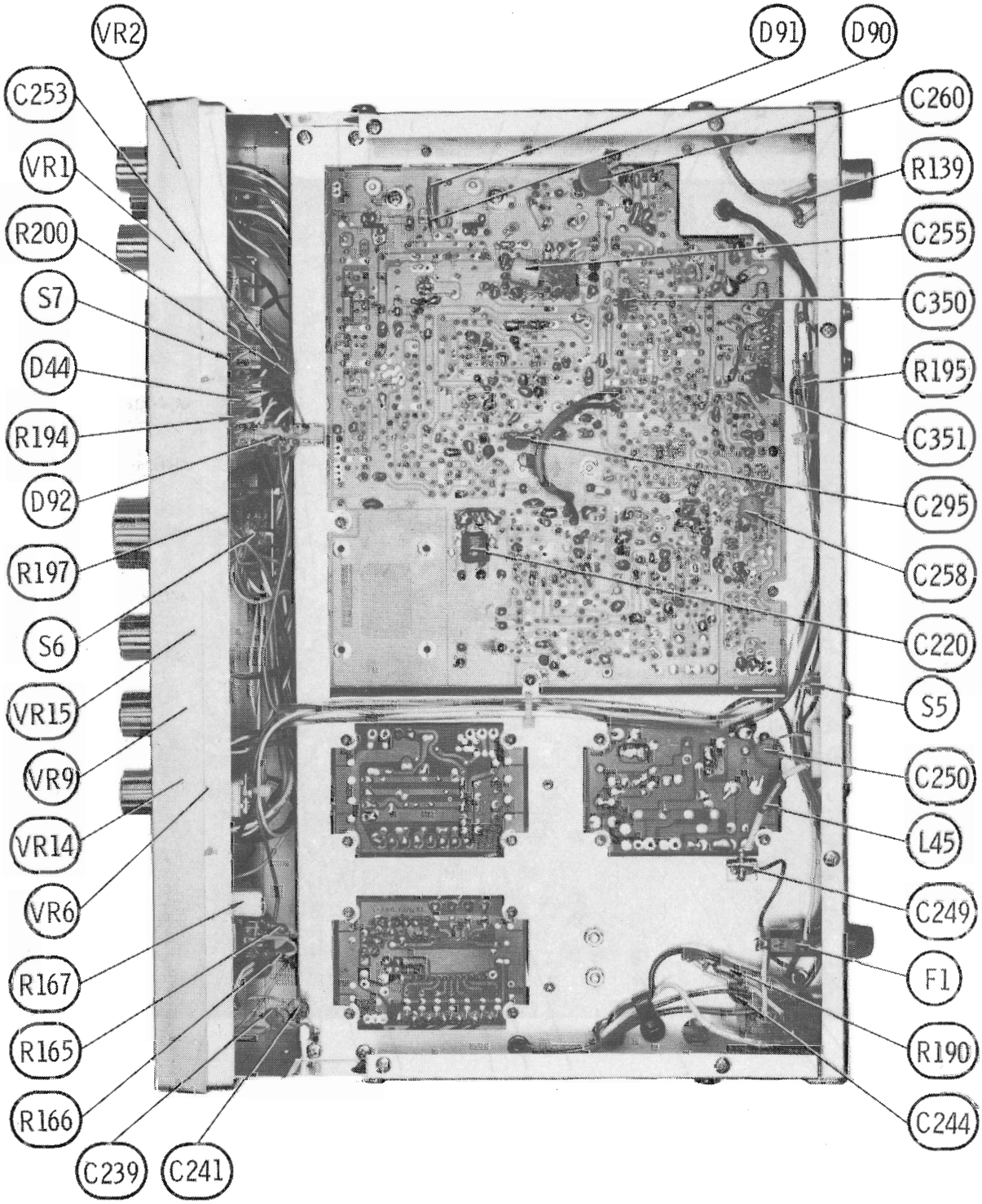
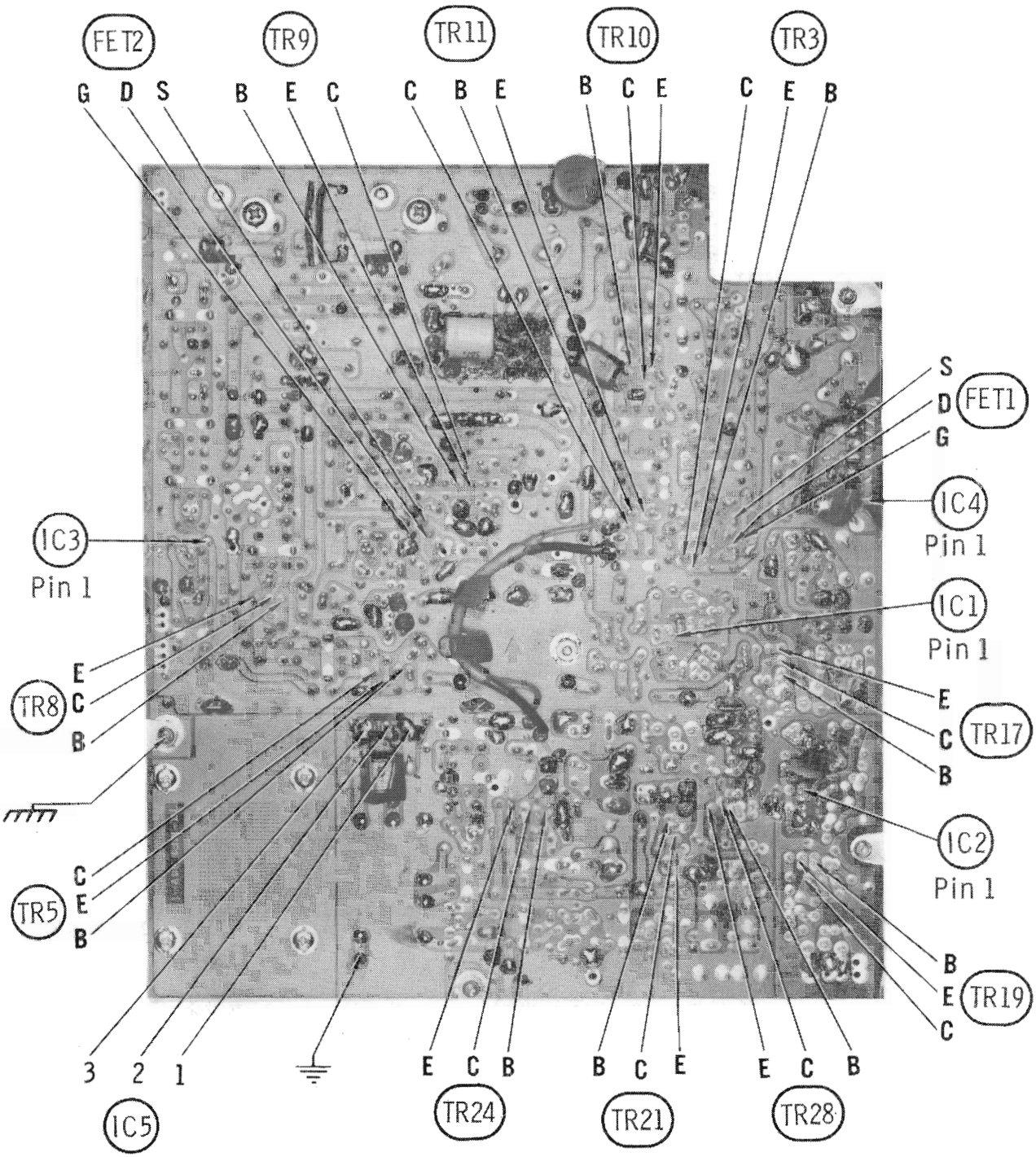
VR22
VR25
VR5
VR23
VR4
D35
S1
C237
C181
T2
M1
VR26
C253
TP
C257
VR20
M2
VR12
D57
TP-5
D56
TP-1
D55
TP-3
D61
TP-2
D60
D62
D59
D63
S2
D58
S3
S4
T1
C206
C205
D66
TR37
SP1
R198

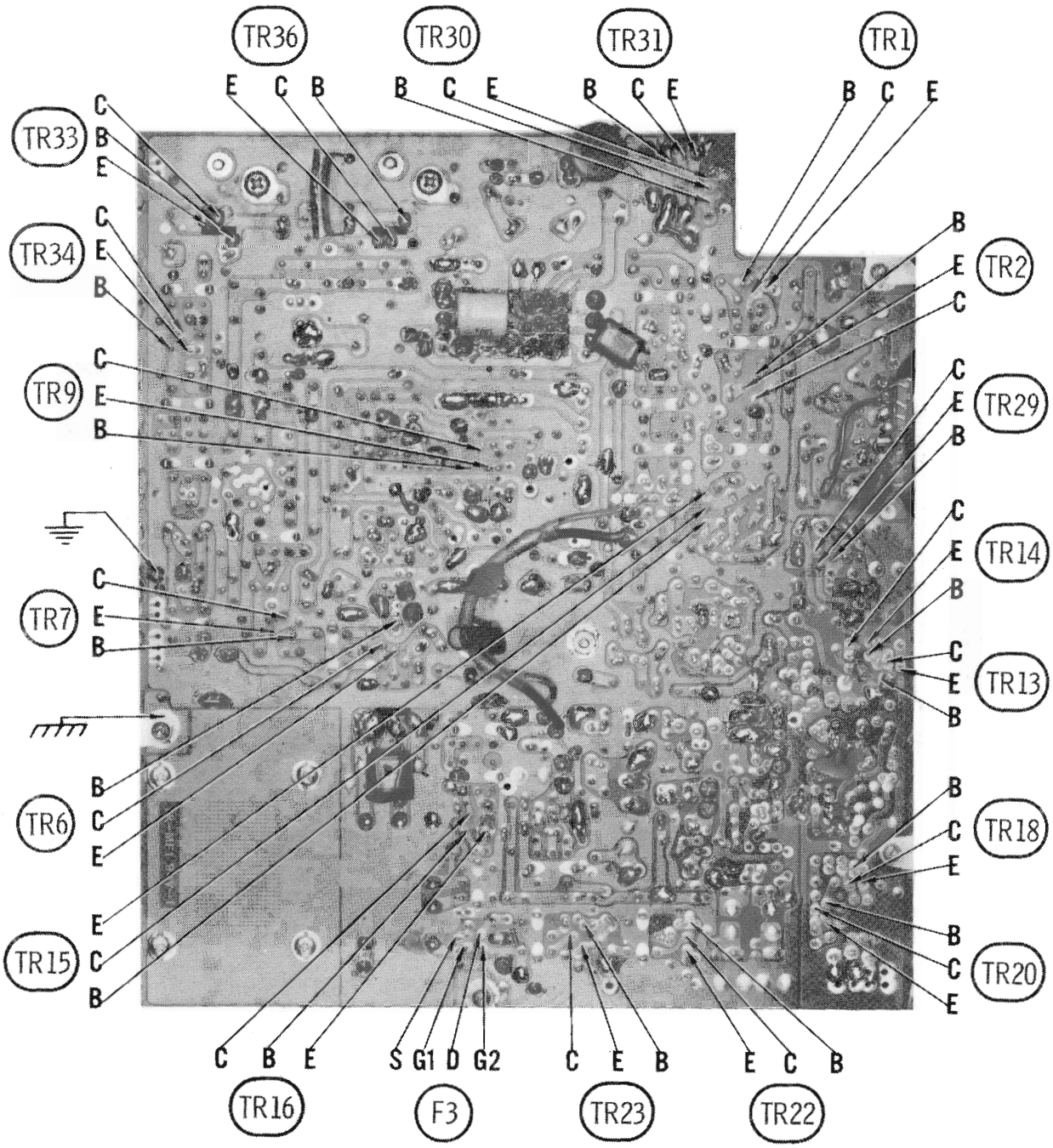
CHASSIS - TOP



CHASSIS - BOTTOM


FET2
G D S
TR9
B E C
TR11
C B E
TR10
B C E
TR3
C E B
S
D
G
FET1
IC4
Pin 1
IC3
Pin 1
IC1
Pin 1
E
C
B
TR8
E
C
B
TR17
C
E
B
TR5
IC2
Pin 1
B
E
C
TR19
3 2 1
IC5
E C B
TR24
B C E
TR21
E C B
TR28

MAIN BOARD


TR36
E C B
TR30
B C E
TR31
B C E
TR1
B C E
TR33
C B E
TR34
C E B
TR9
C E B
TR7
C E B
TR6
B C E
TR15
E C B
TR16
C B E
F3
S G1 D G2
TR23
C E B
TR22
E C B
TR20
B C E
TR18
B C E
TR13
C E B
TR14
C E B
TR29
C E B
TR2
B E C

MAIN BOARD

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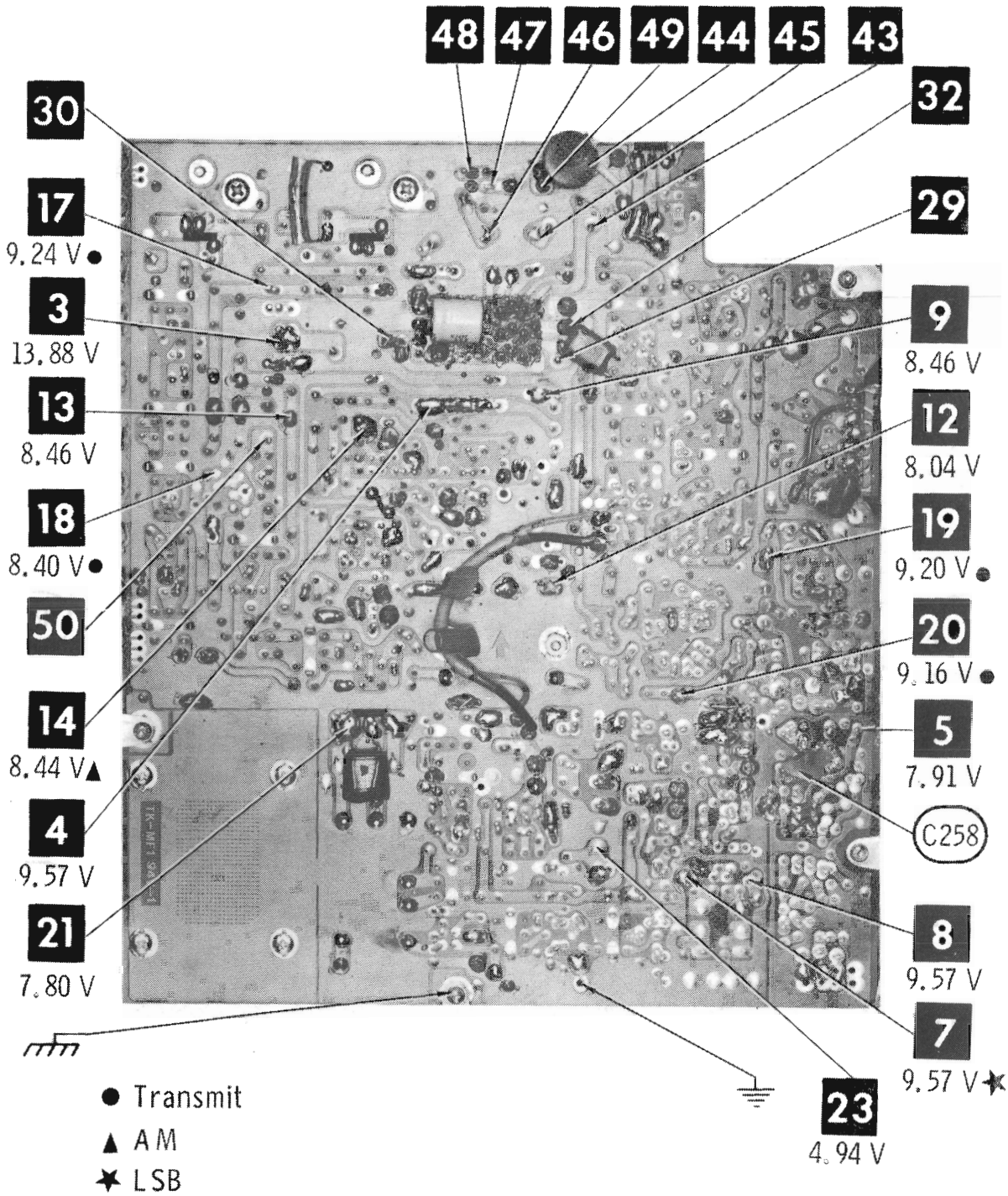

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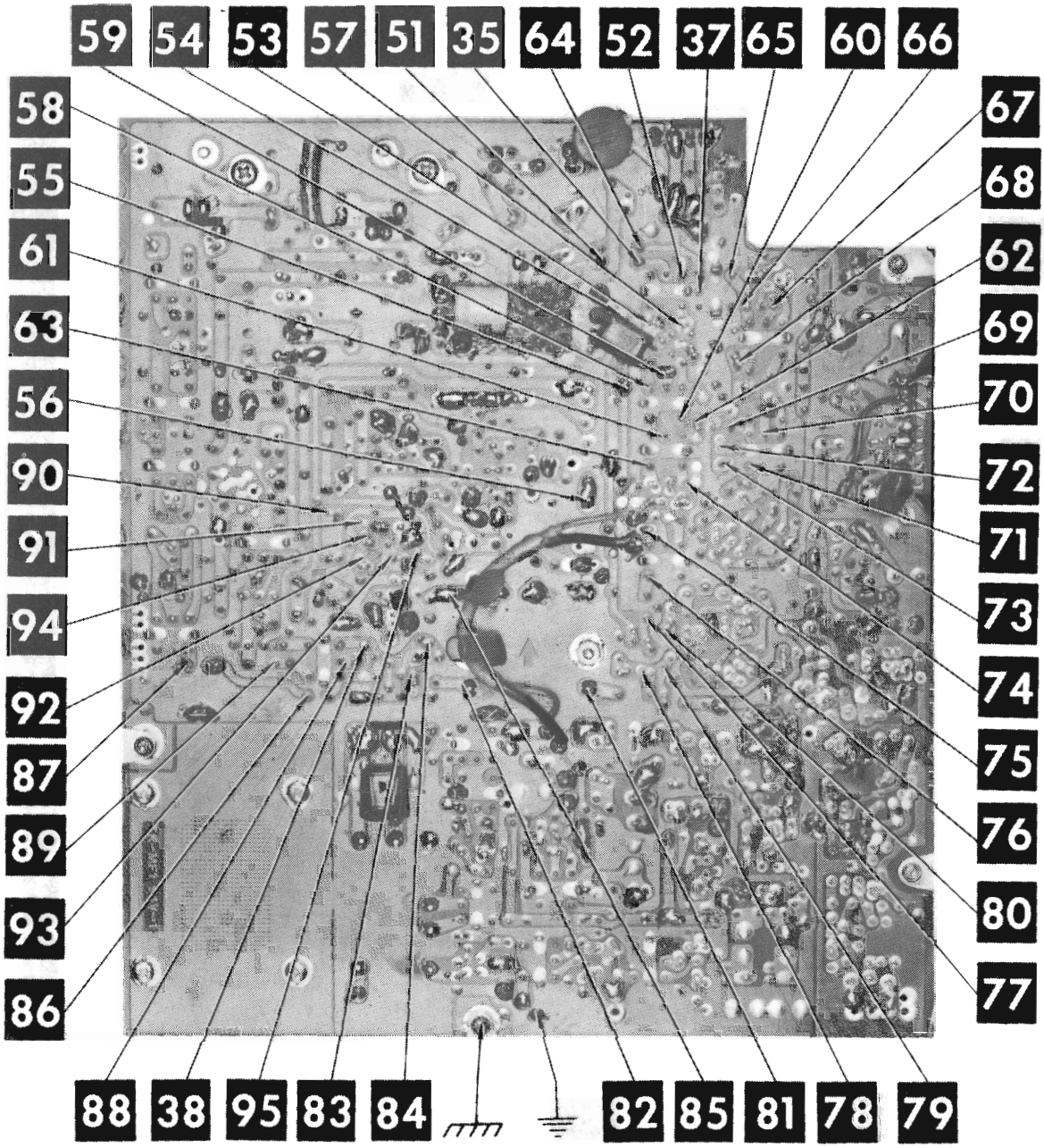
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MAIN BOARD

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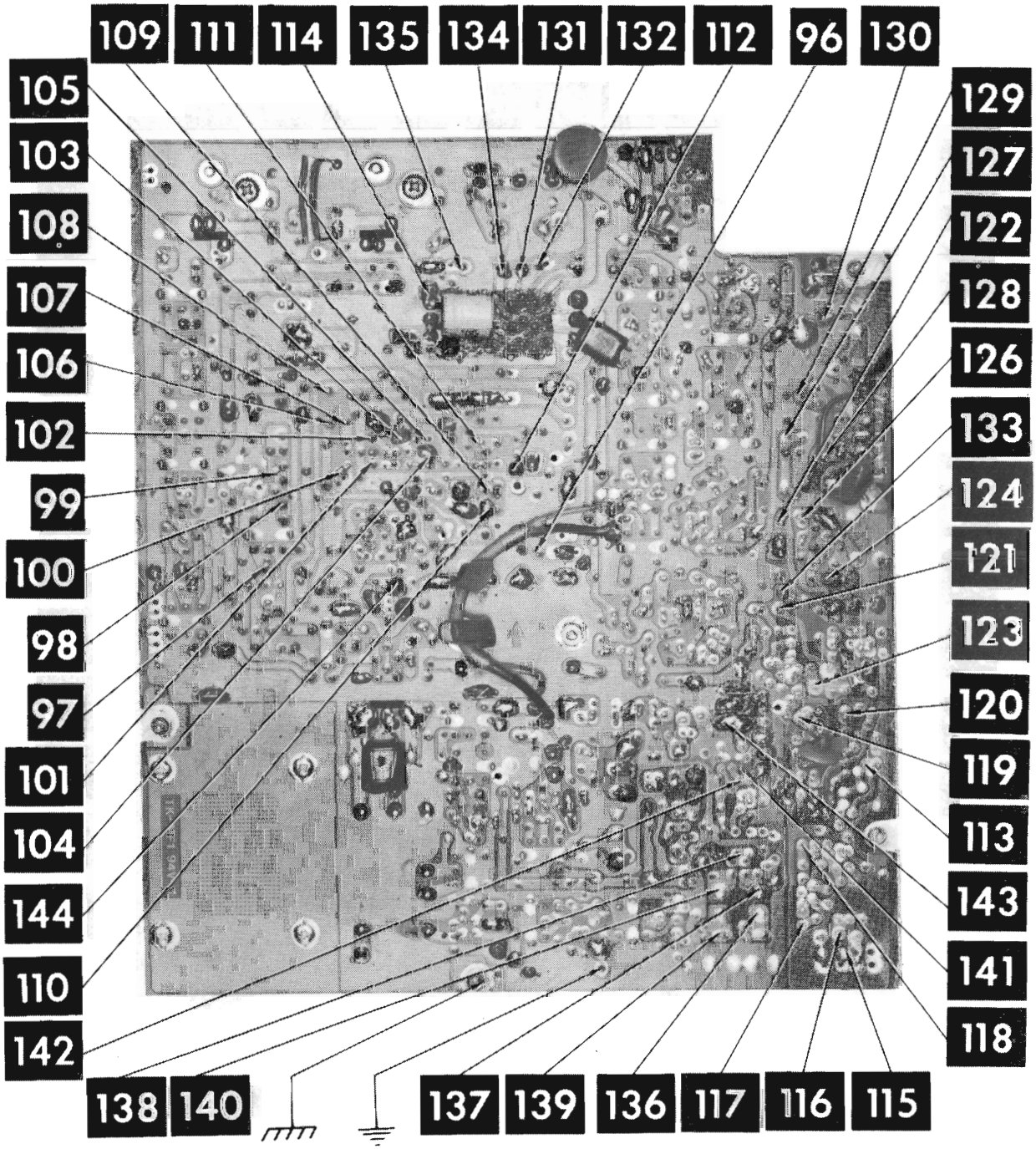

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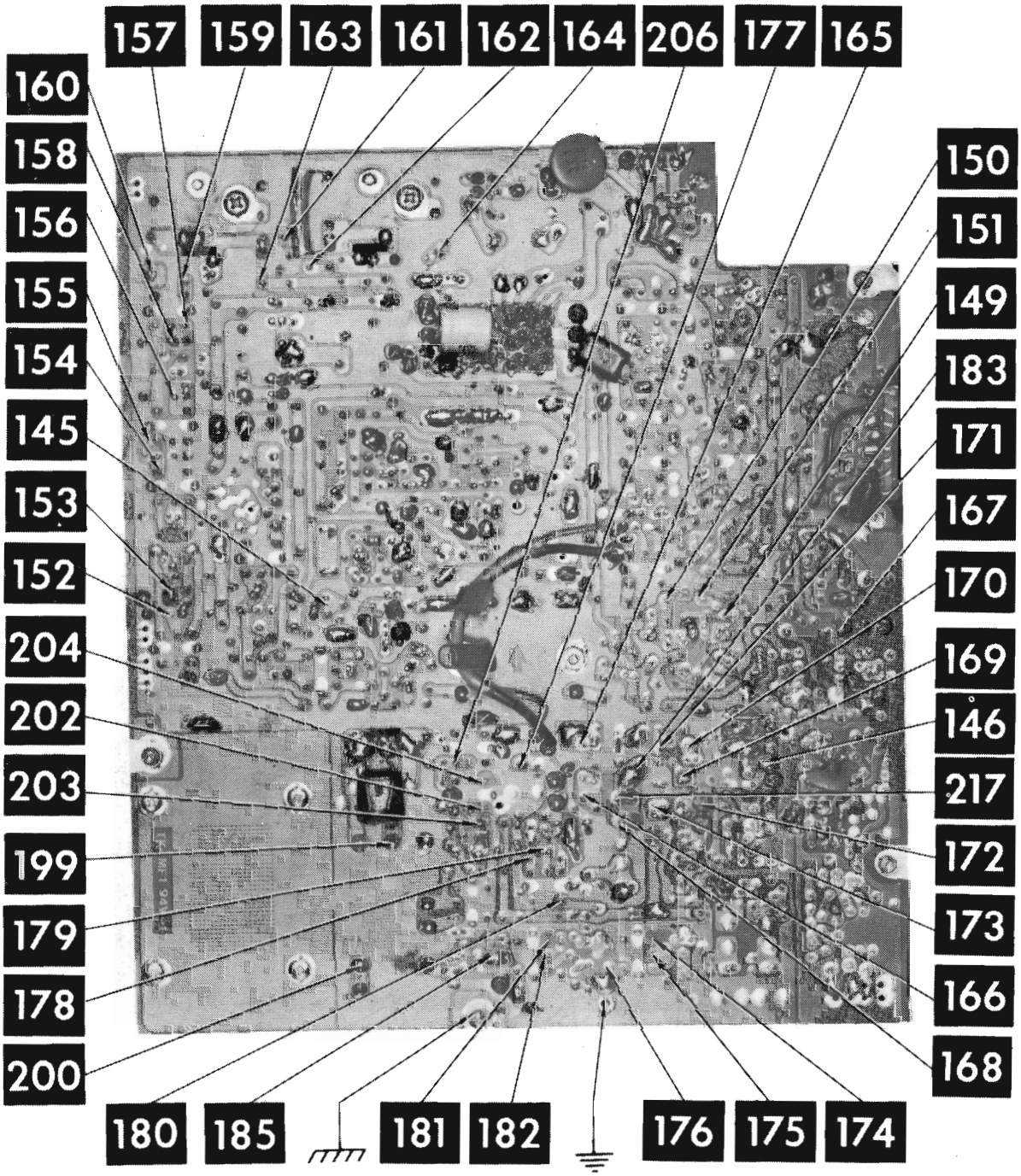
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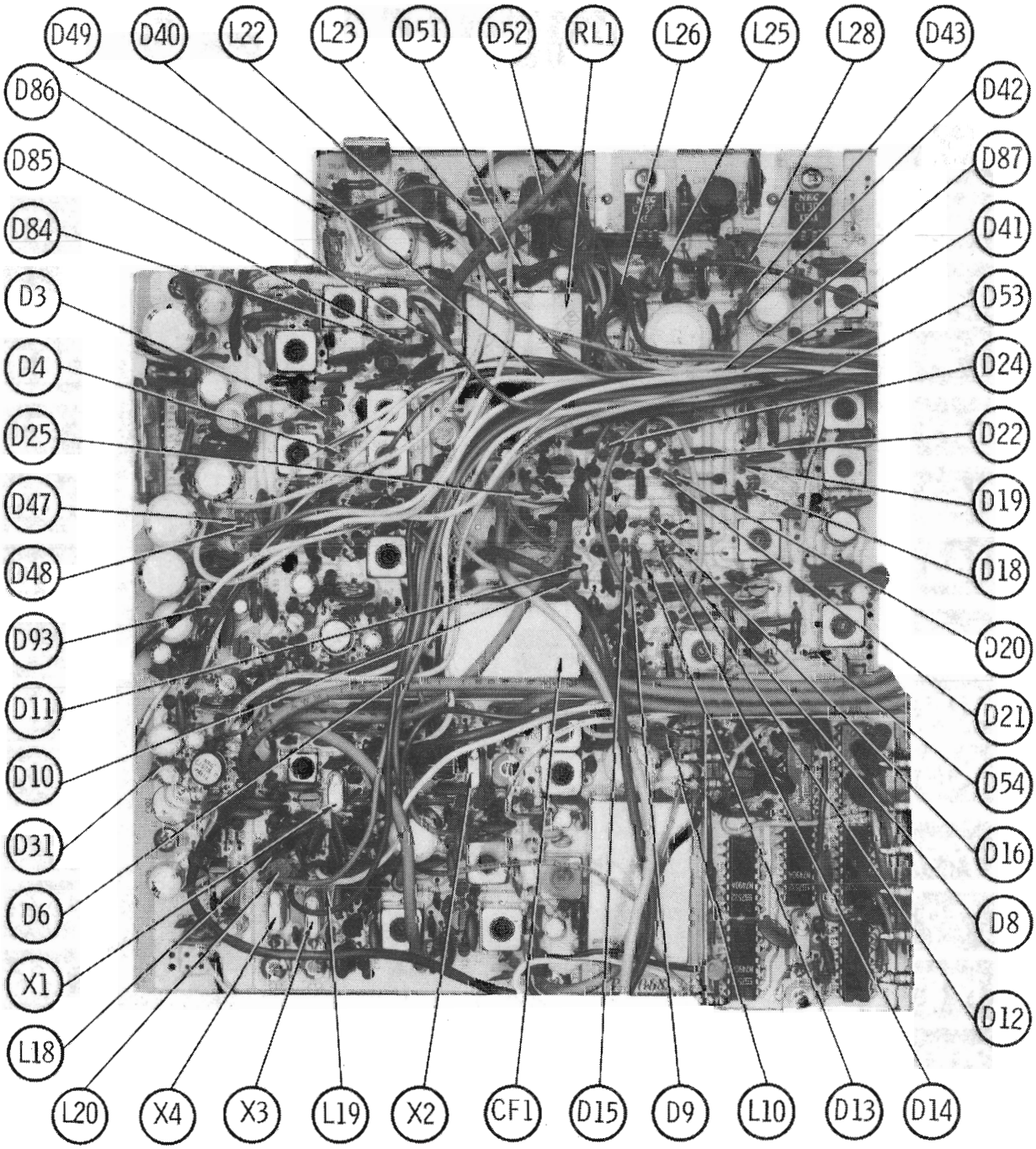
MAIN BOARD


D49
D40
L22
L23
D51
D52
RL1
L26
L25
L28
D43
D86
D42
D85
D87
D84
D41
D3
D53
D4
D24
D25
D22
D47
D19
D48
D18
D93
D20
D11
D21
D10
D54
D31
D16
D6
D8
X1
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L20
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L19
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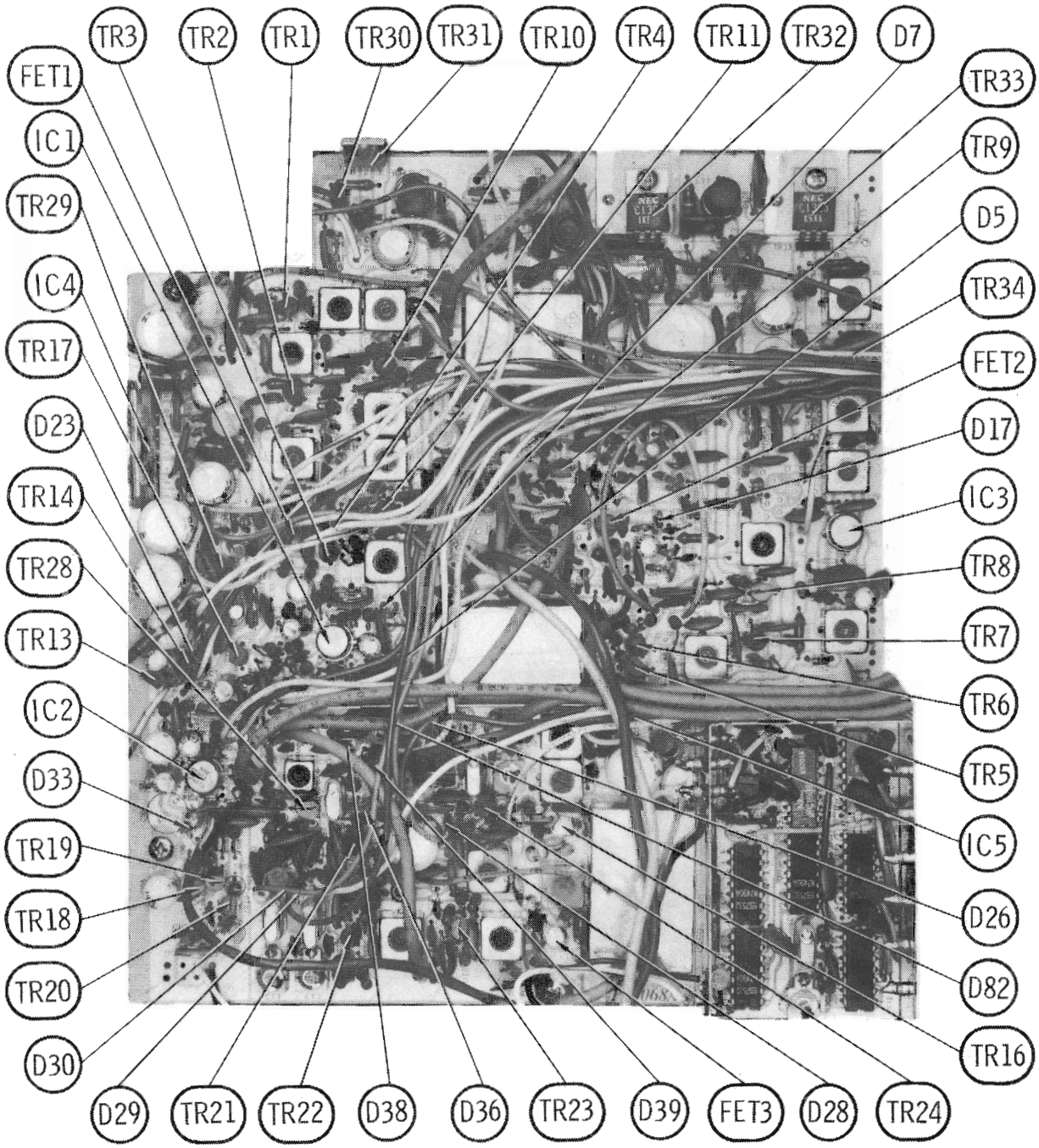
CF1
D15
D9
L10
D13
D14

MAIN BOARD


TR3
TR2
TR1
TR30
TR31
TR10
TR4
TR11
TR32
D7
FET1
IC1
TR29
IC4
TR17
D23
TR14
TR28
TR13
IC2
D33
TR19
TR18
TR20
D30
D29
TR21
TR22
D38
D36
TR23
D39
FET3
D28
TR24
TR16
D82
D26
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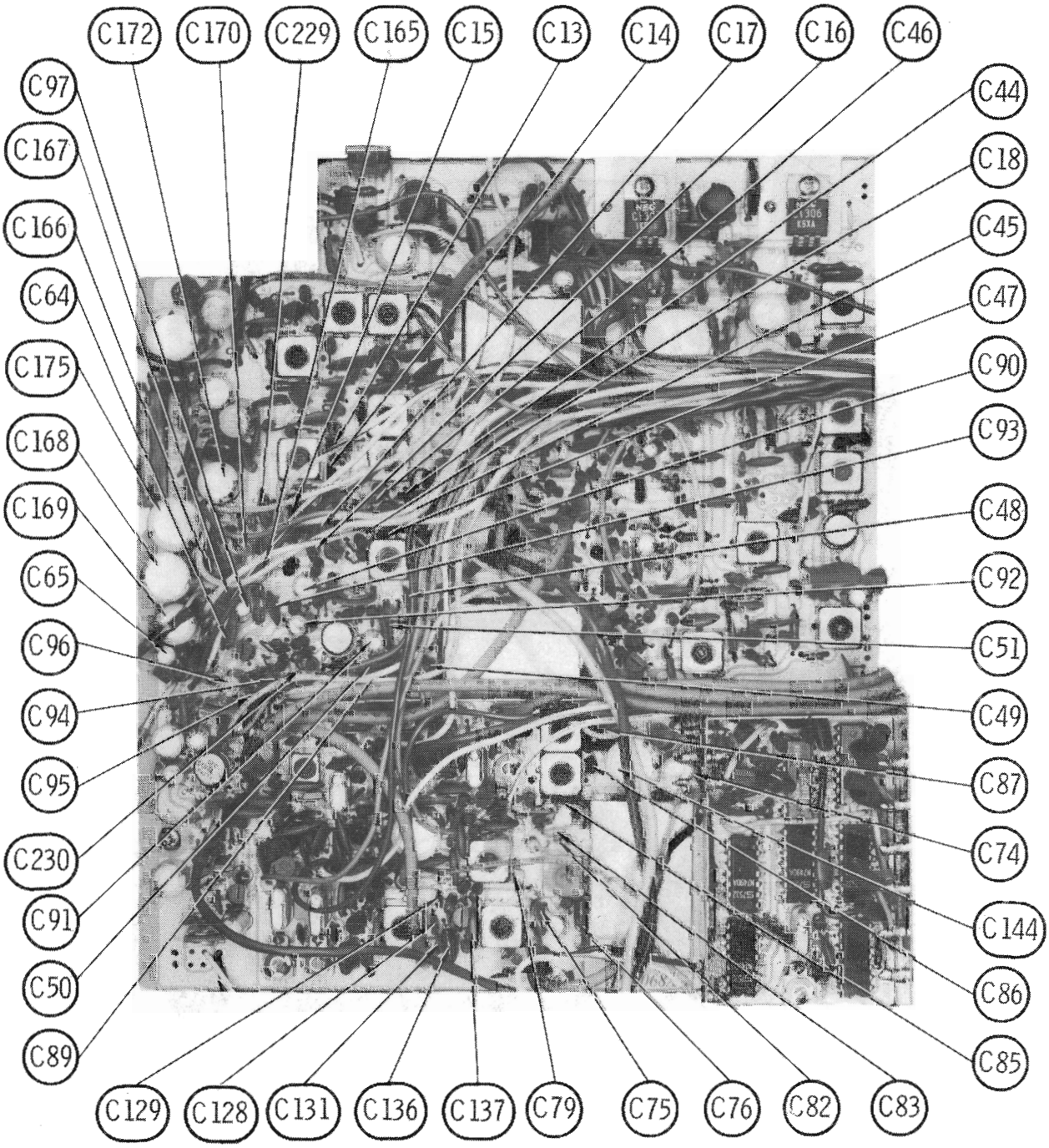
TR5
TR6
TR7
TR8
IC3
D17
FET2
TR34
D5
TR9
TR33

MAIN BOARD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C170
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C166
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C168
C169
C65
C96
C94
C95
C230
C91
C50
C89
C44
C18
C45
C47
C90
C93
C48
C92
C51
C49
C87
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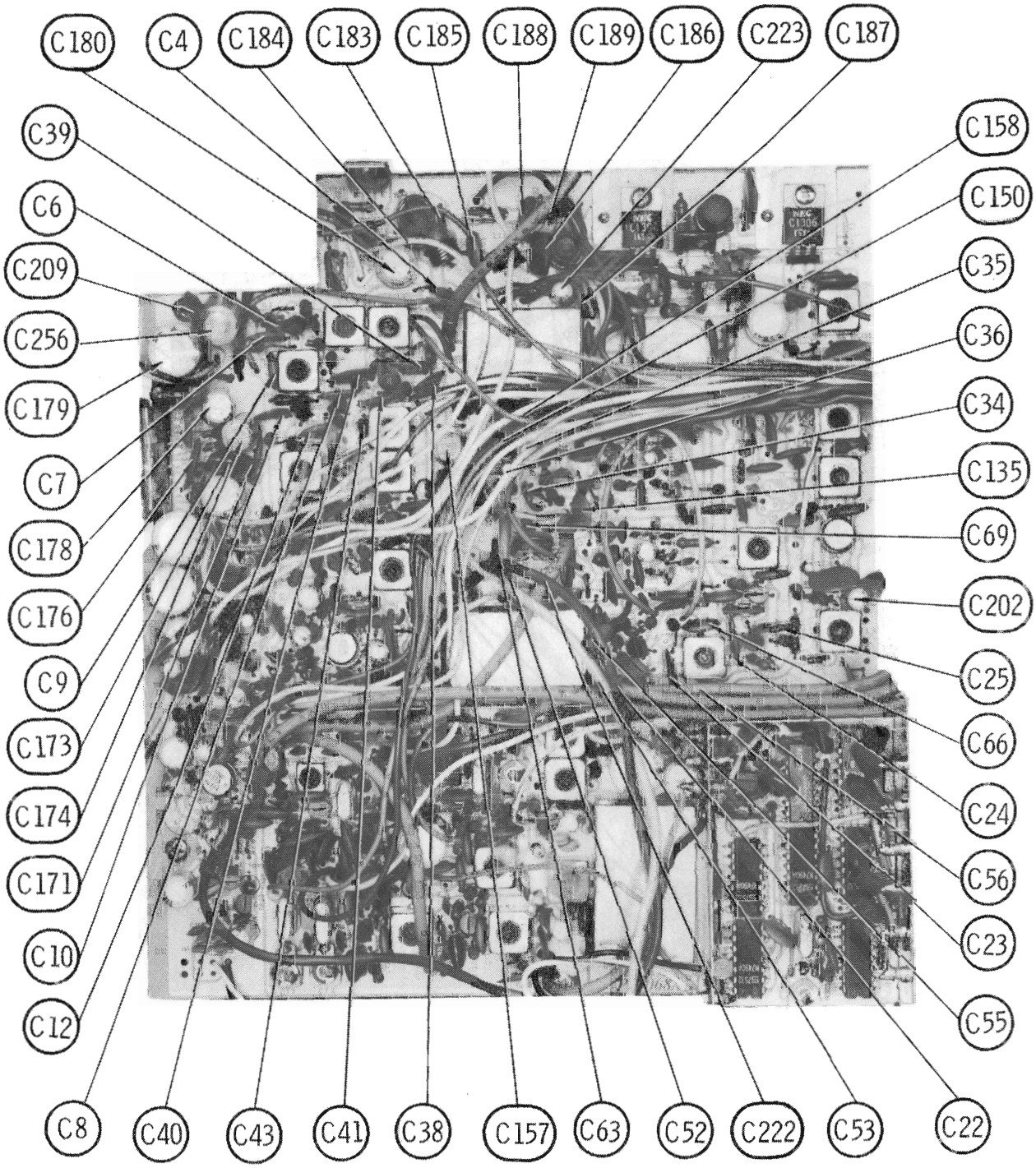
C82
C83

MAIN BOARD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C183
C185
C188
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C187
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C6
C209
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C178
C176
C9
C173
C174
C171
C10
C12
C158
C150
C35
C36
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C135
C69
C202
C25
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C24
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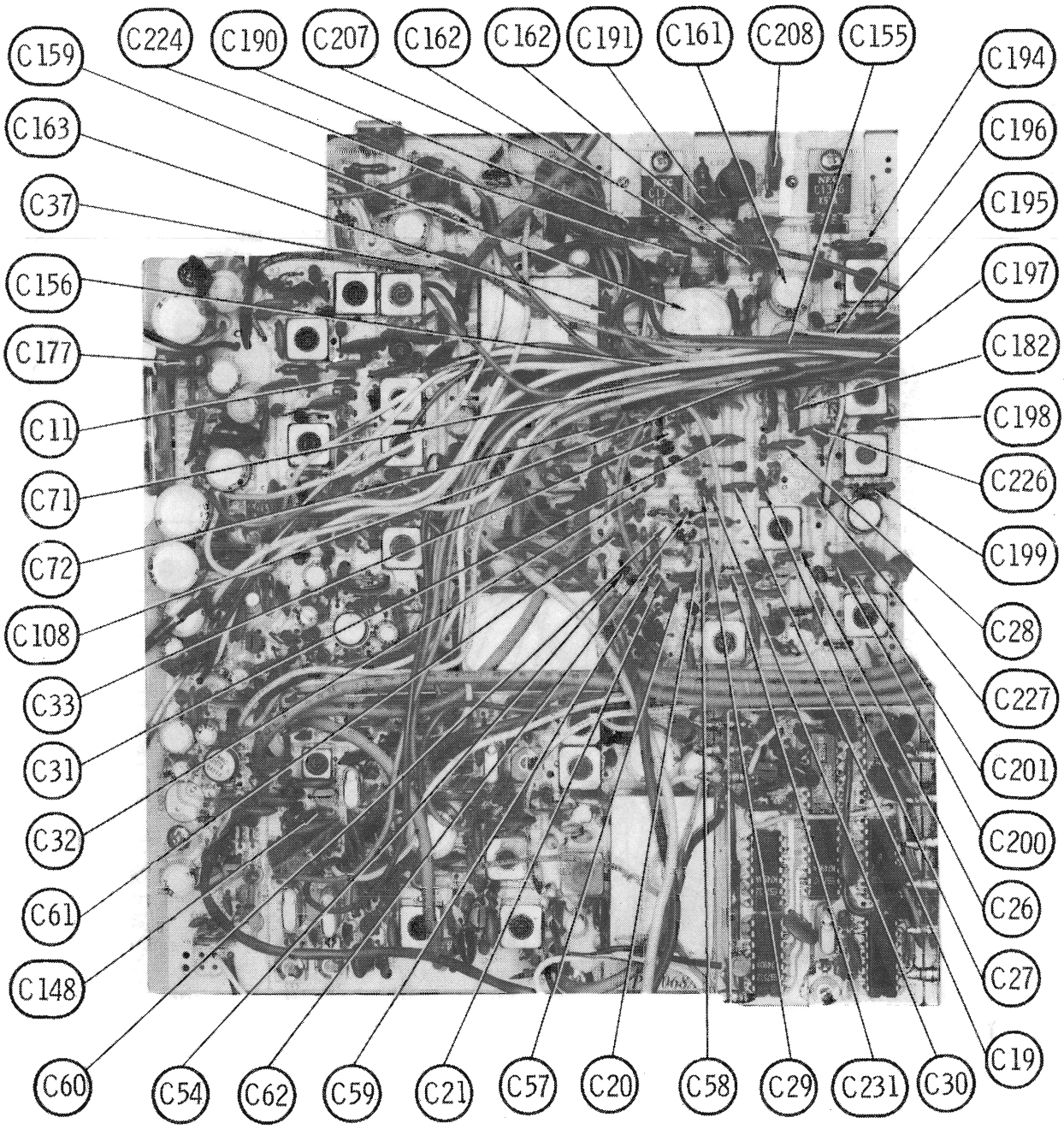
C222
C53
C22

MAIN BOARD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C177
C182
C11
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C71
C226
C72
C199
C108
C28
C33
C227
C31
C201
C32
C200
C61
C26
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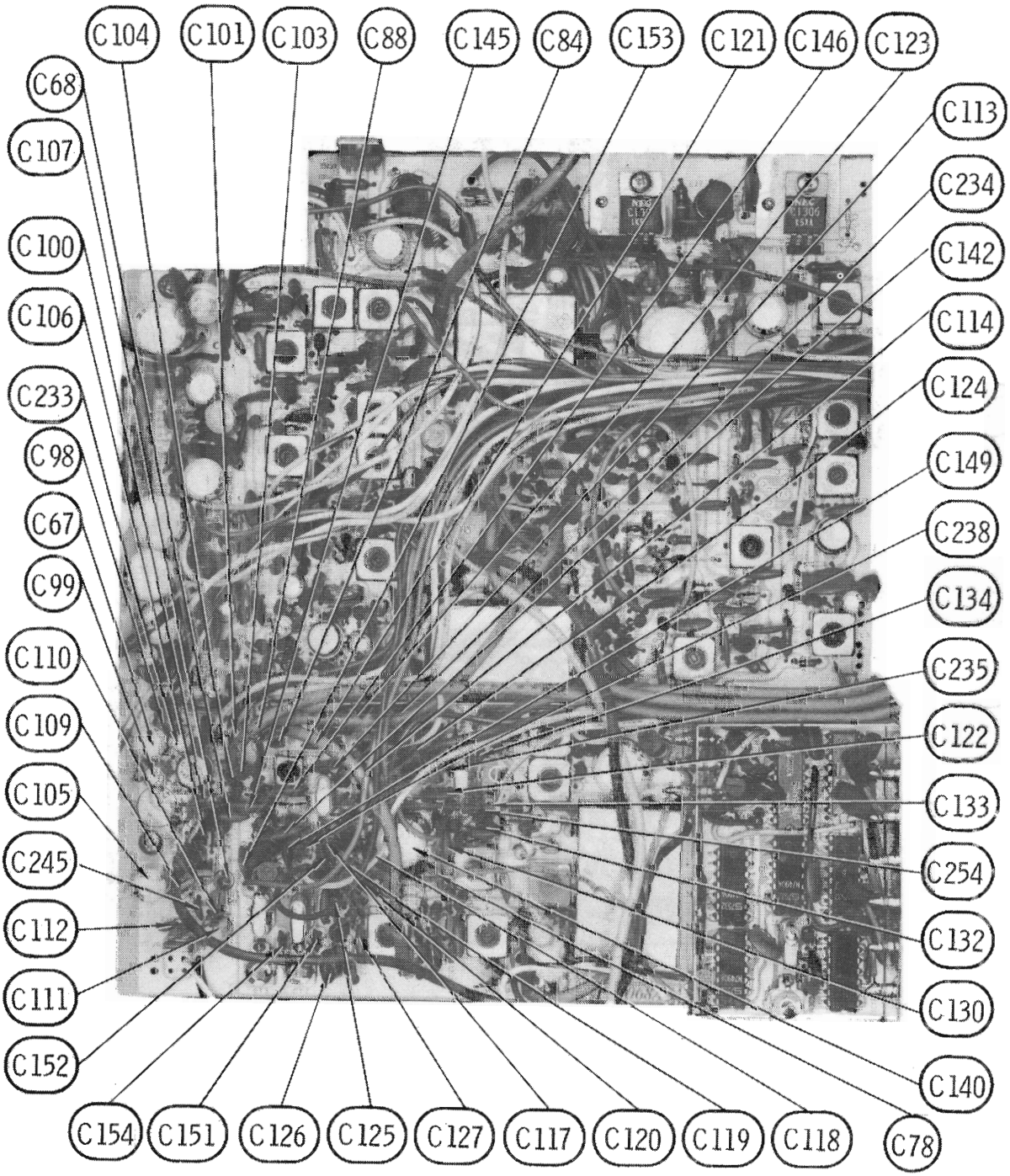
C231
C30

MAIN BOARD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C235
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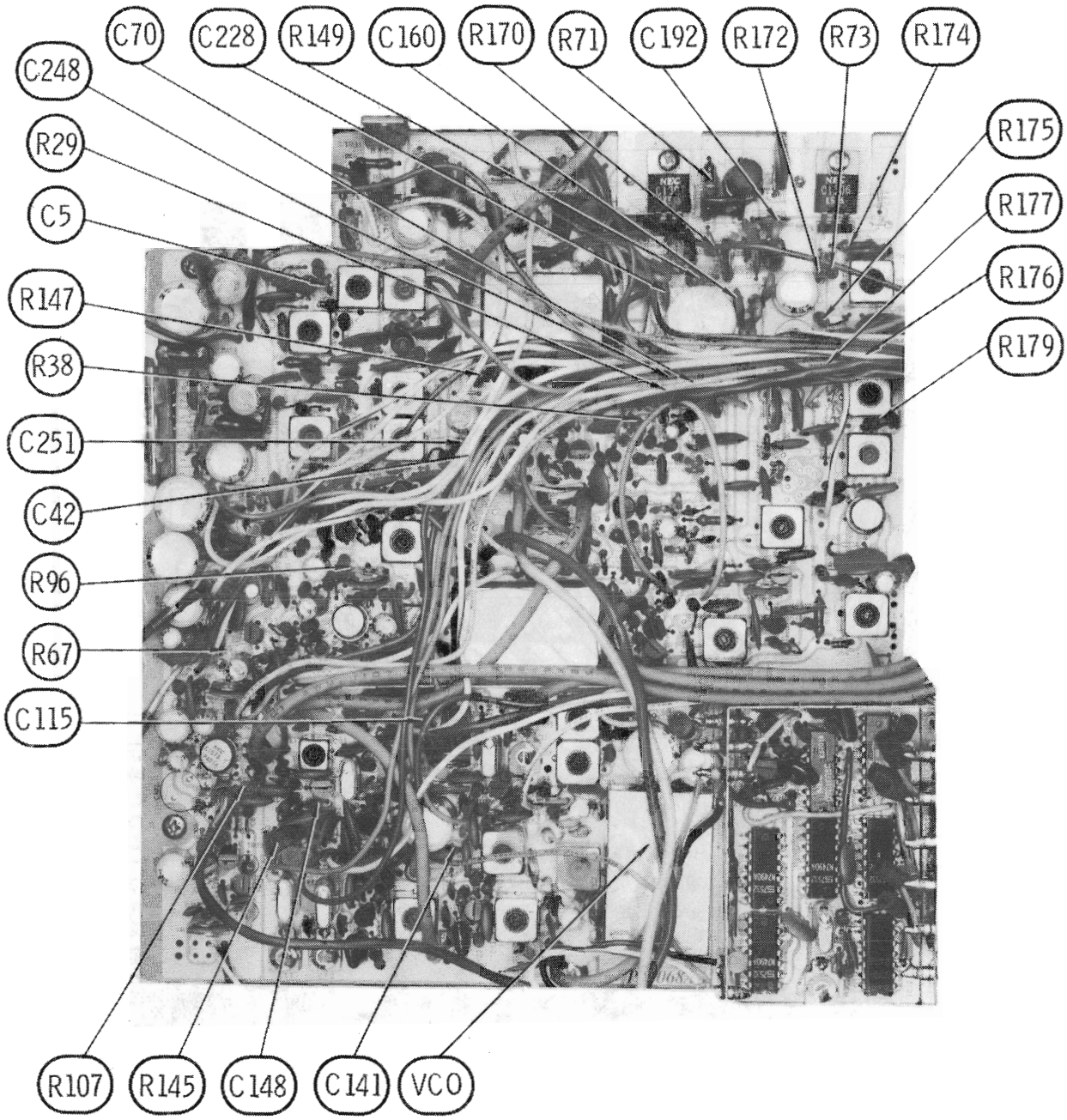
C119
C118
C78

MAIN BOARD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C160
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R71
C192
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R73
R174
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R29
C5
R147
R38
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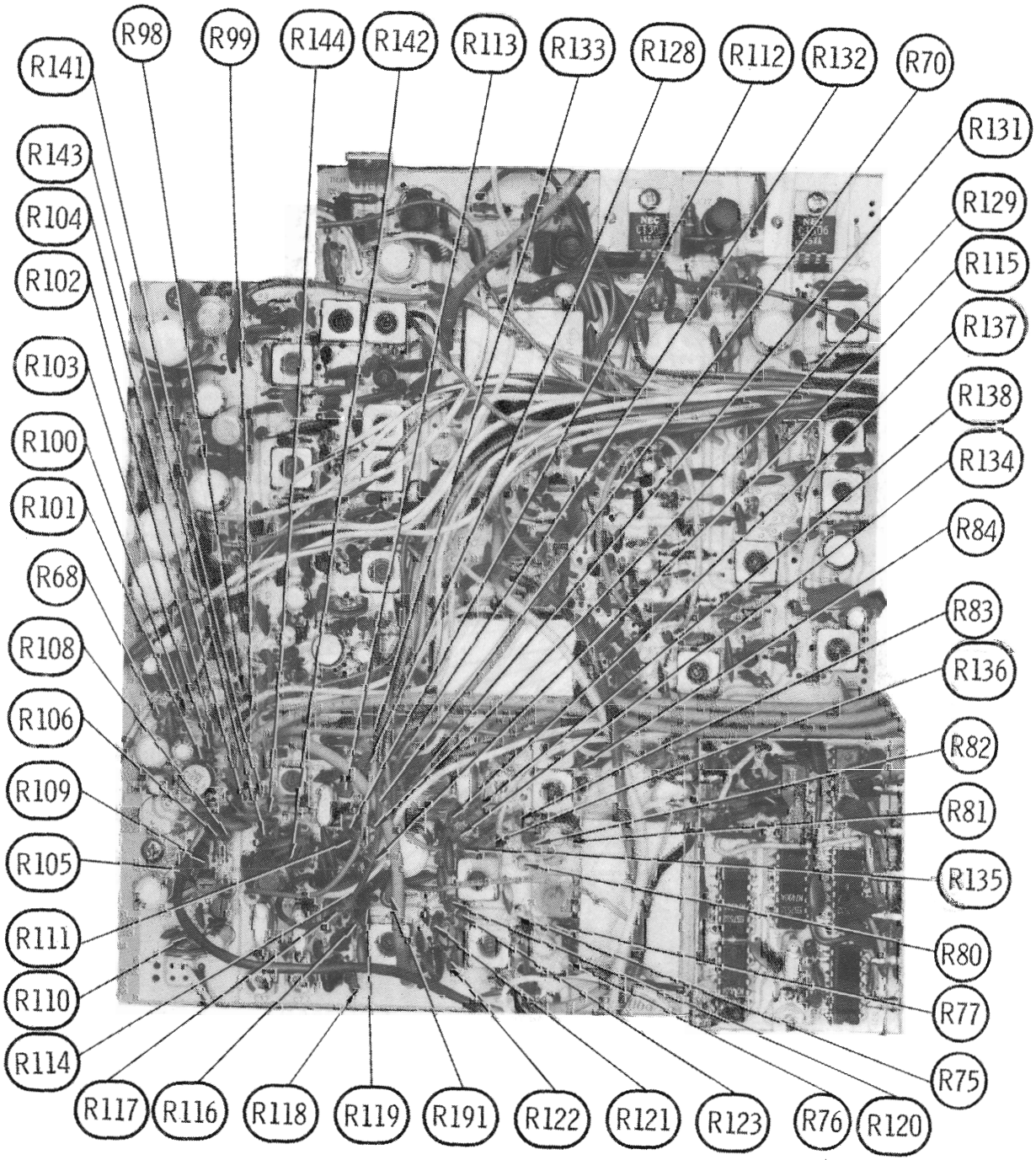
R67
C115
R175
R177
R176
R179
R107
R145
C148
C141
VCO

MAIN BOARD


R98
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R142
R113
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R128
R112
R132
R70
R141
R143
R104
R102
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R136
R82
R81
R135
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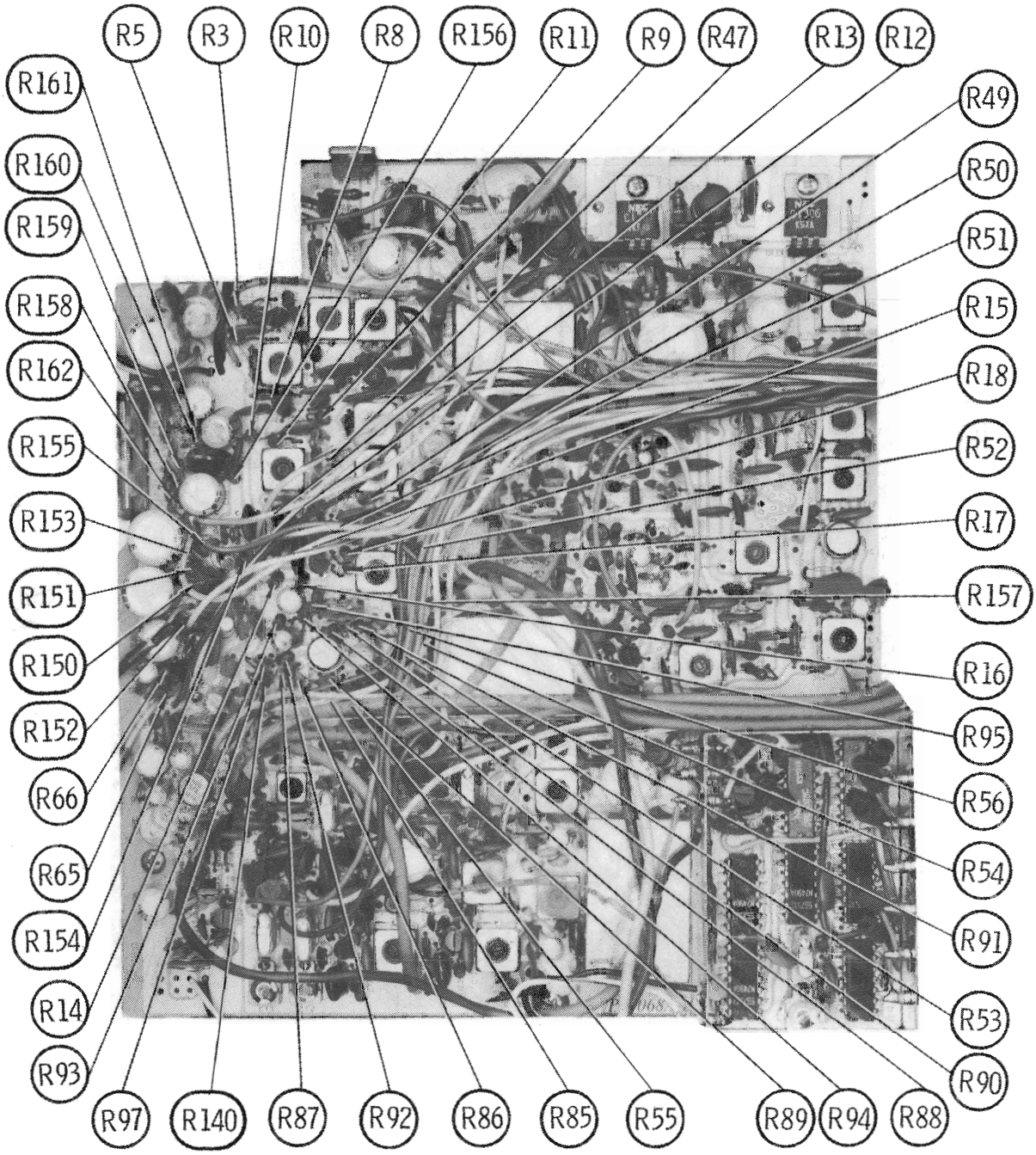
R118
R119
R191
R122
R121
R123
R76
R120

MAIN BOARD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R8
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R11
R9
R47
R13
R12
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R159
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R94
R88
R49
R50
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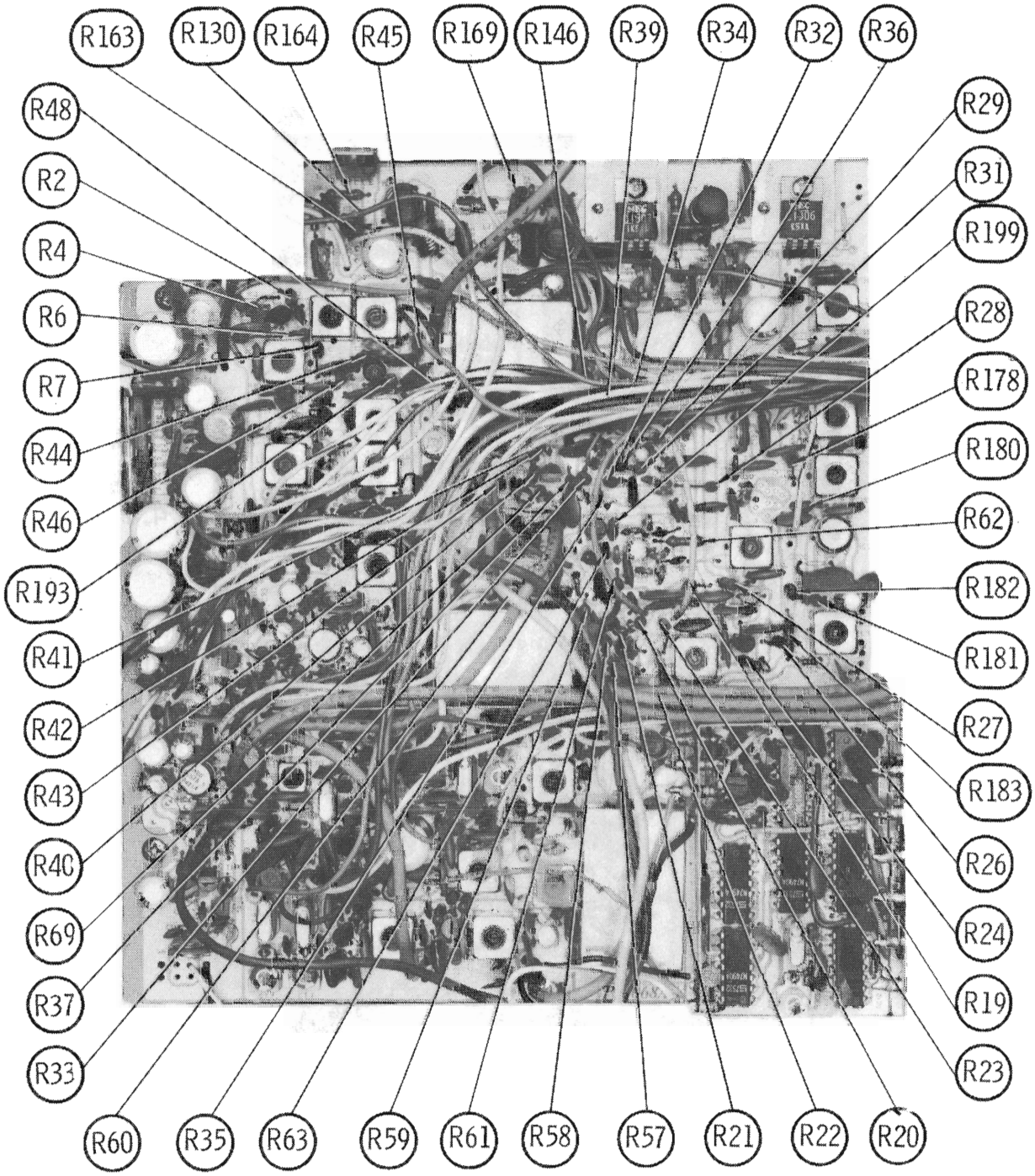
R56
R54
R91
R53
R90

MAIN BOARD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R32
R36
R48
R2
R4
R6
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R46
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R69
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R33
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R22
R20
R29
R31
R199
R28
R178
R180
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R182
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R183
R26
R24
R19
R23

MAIN BOARD

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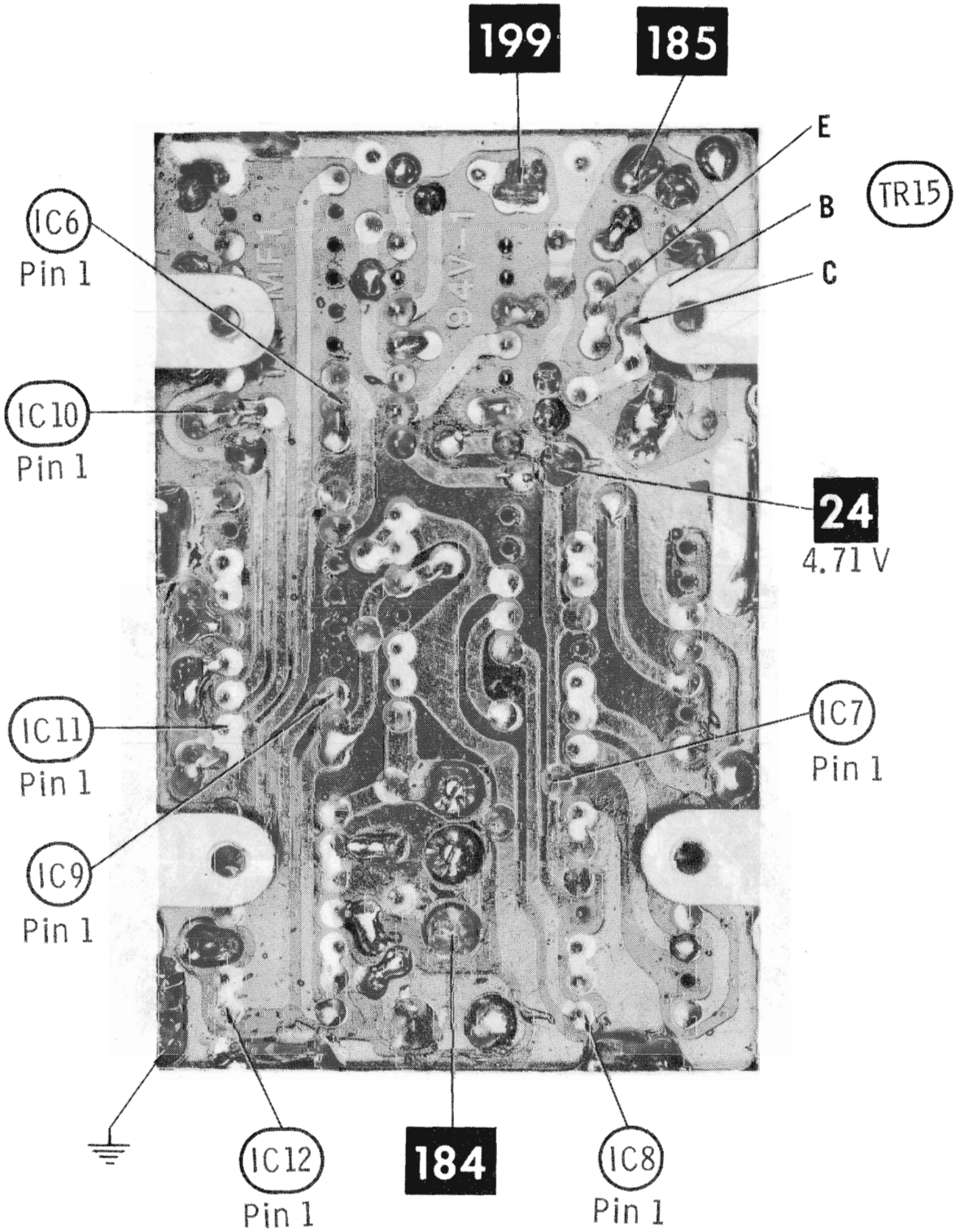
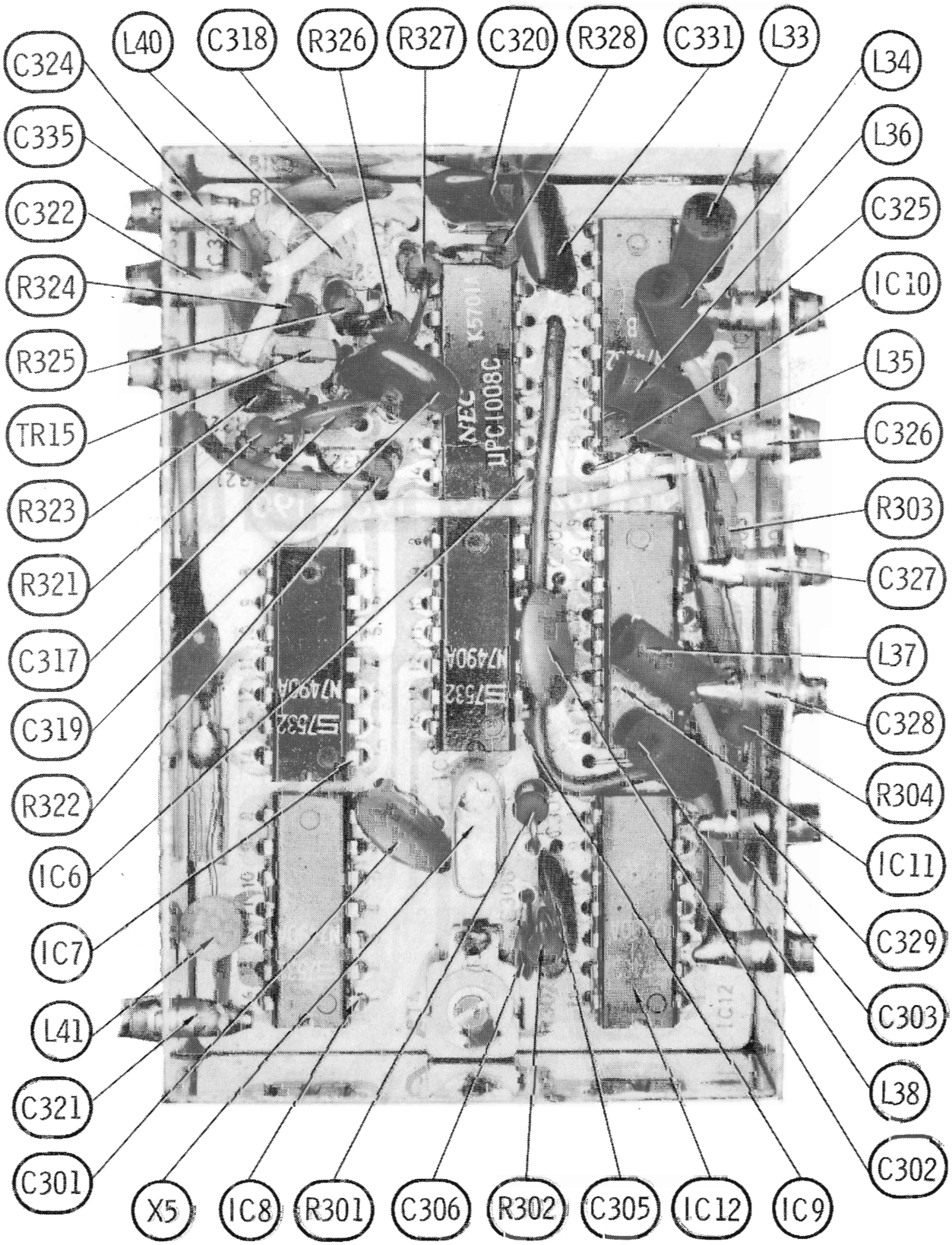
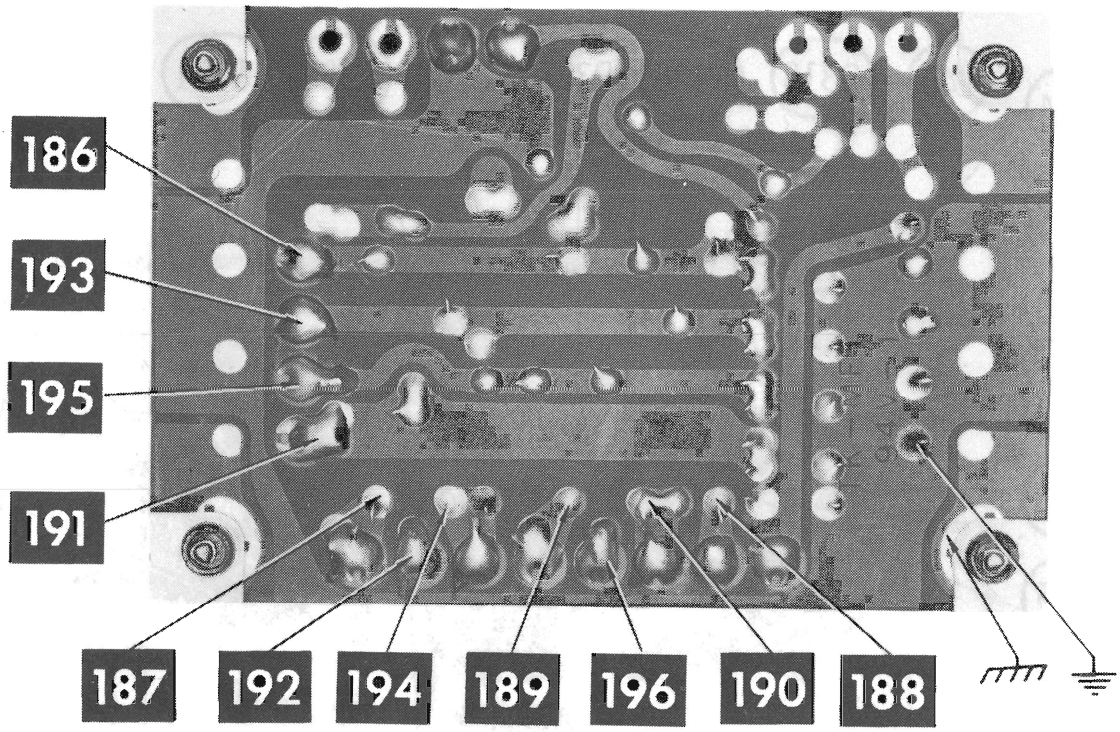


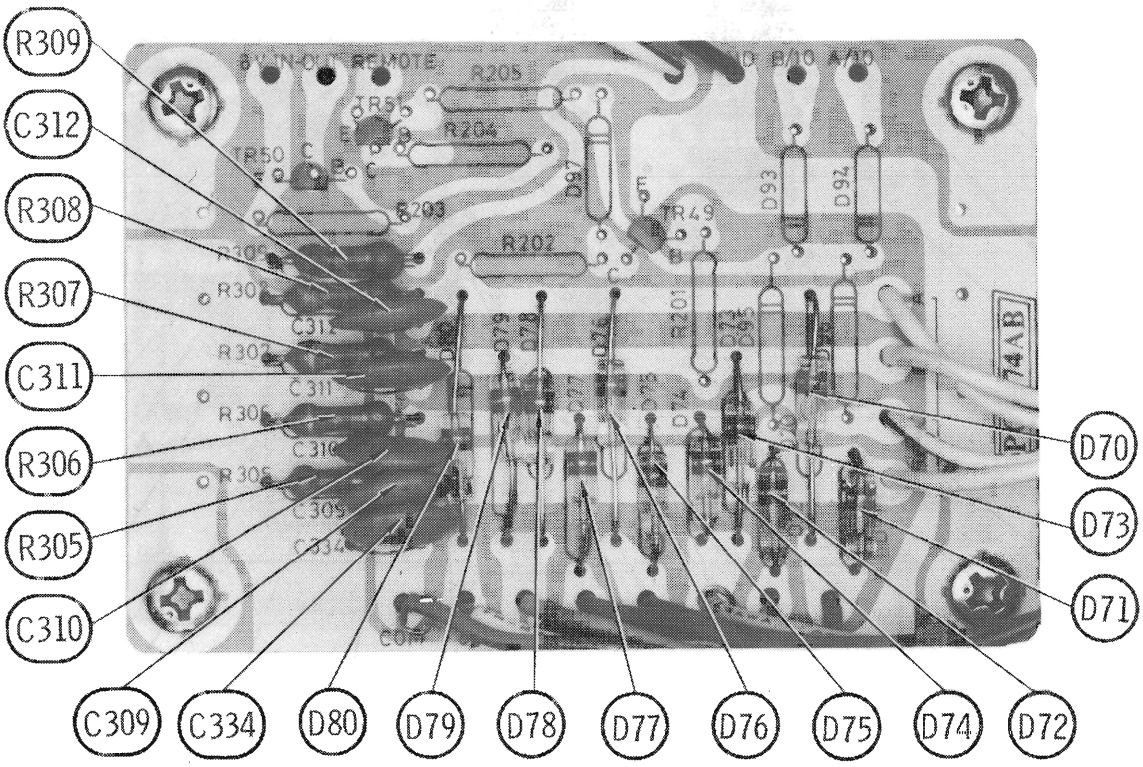
PHASE LOCK LOOP BOARD



PHASE LOCK LOOP BOARD

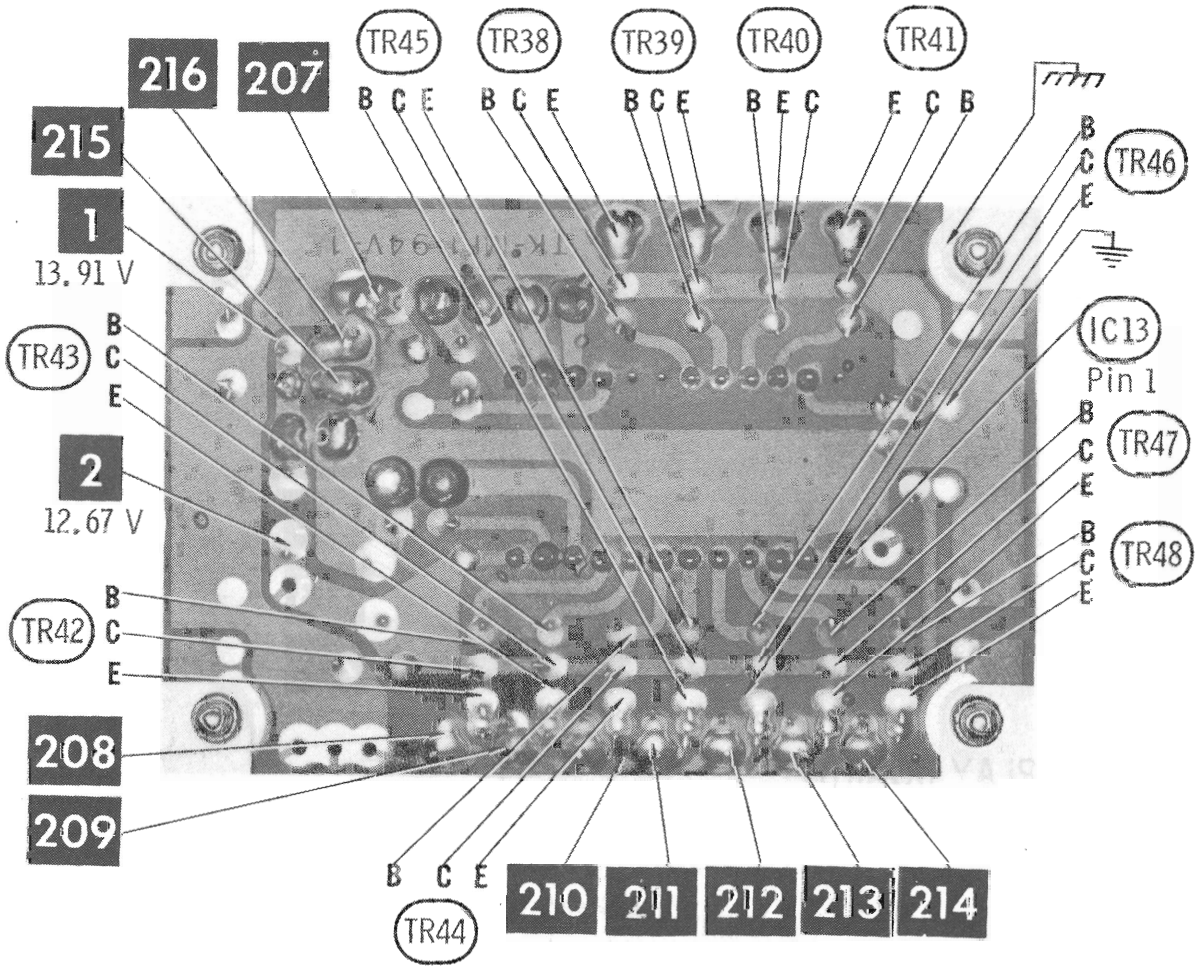
A Howard W. Sams CIRCUITRACE® Photo

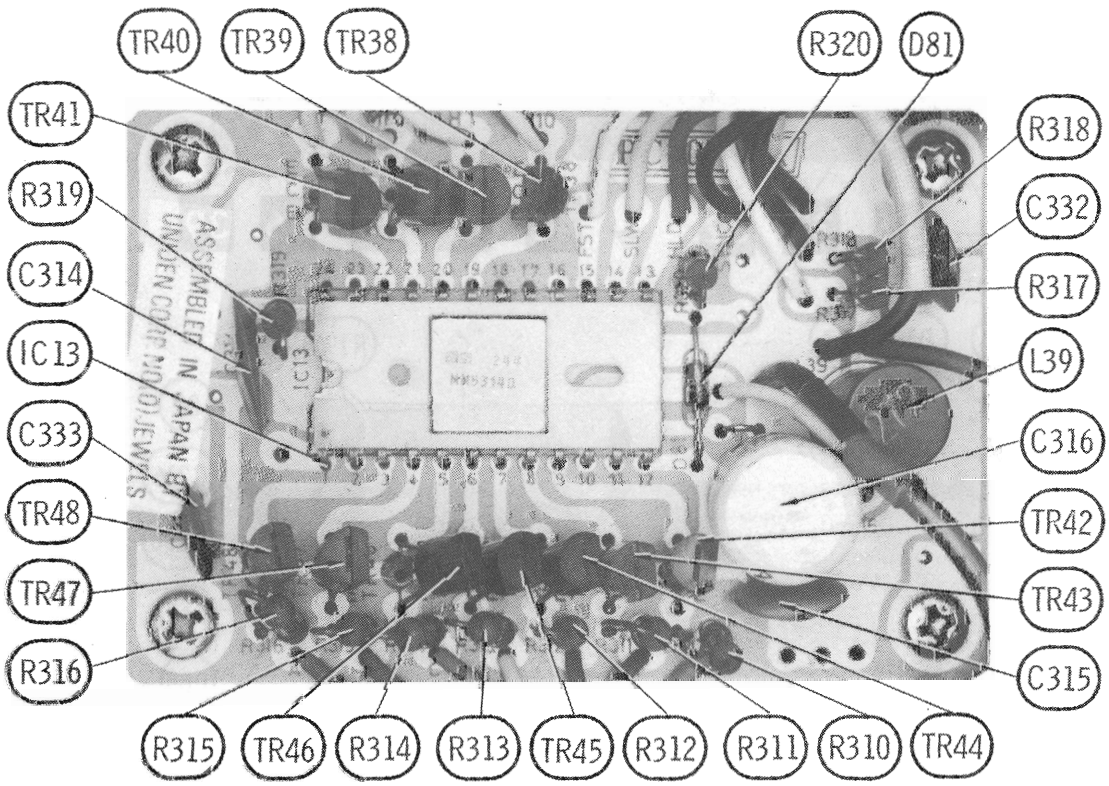




PHASE LOCK LOOP MATRIX BOARD

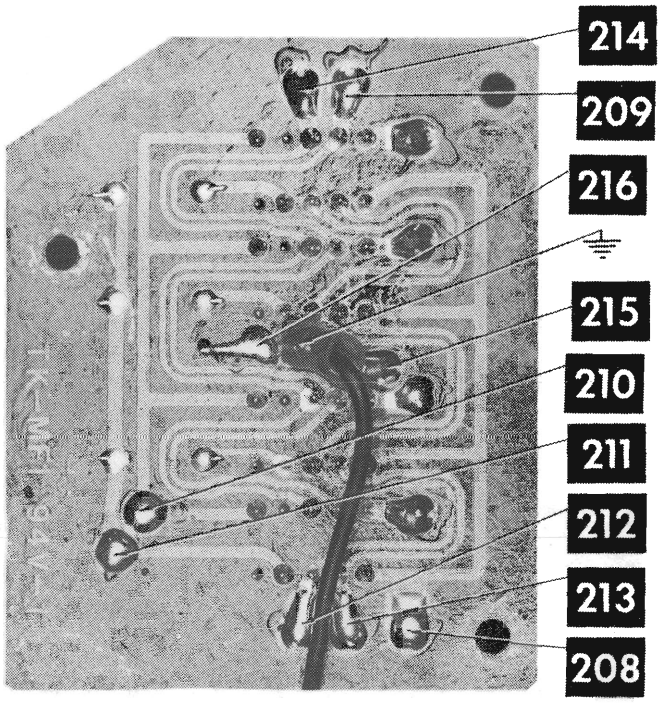
A Howard W. Sams CIRCUITRACE® Photo





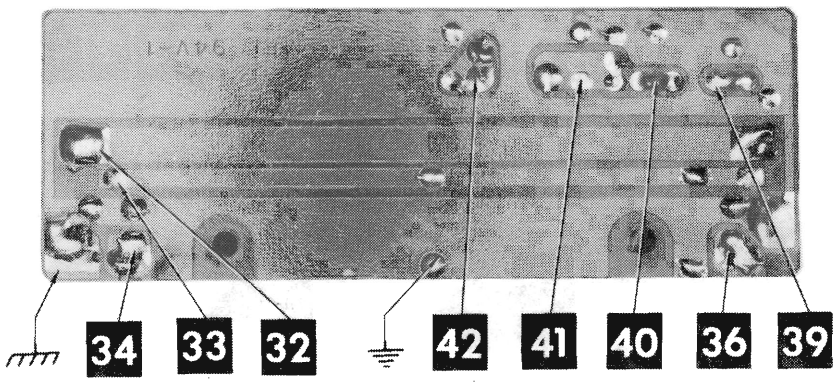
DIGITAL CLOCK BOARD

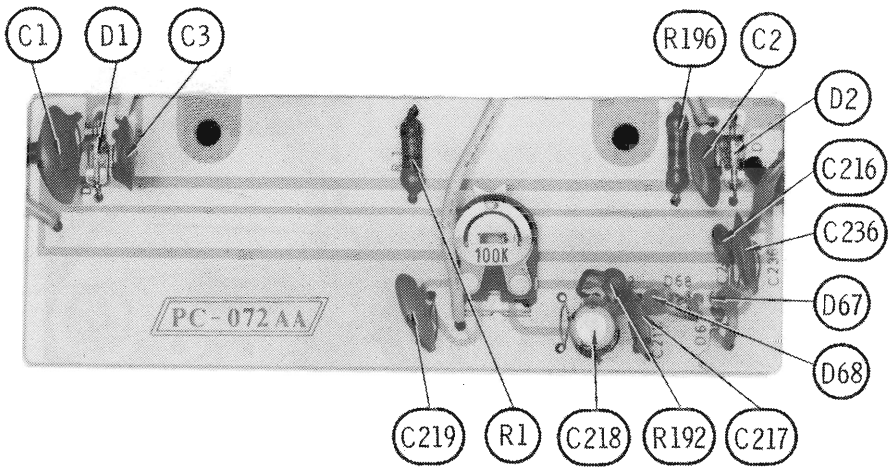
A Howard W. Sams CIRCUITRACE® Photo



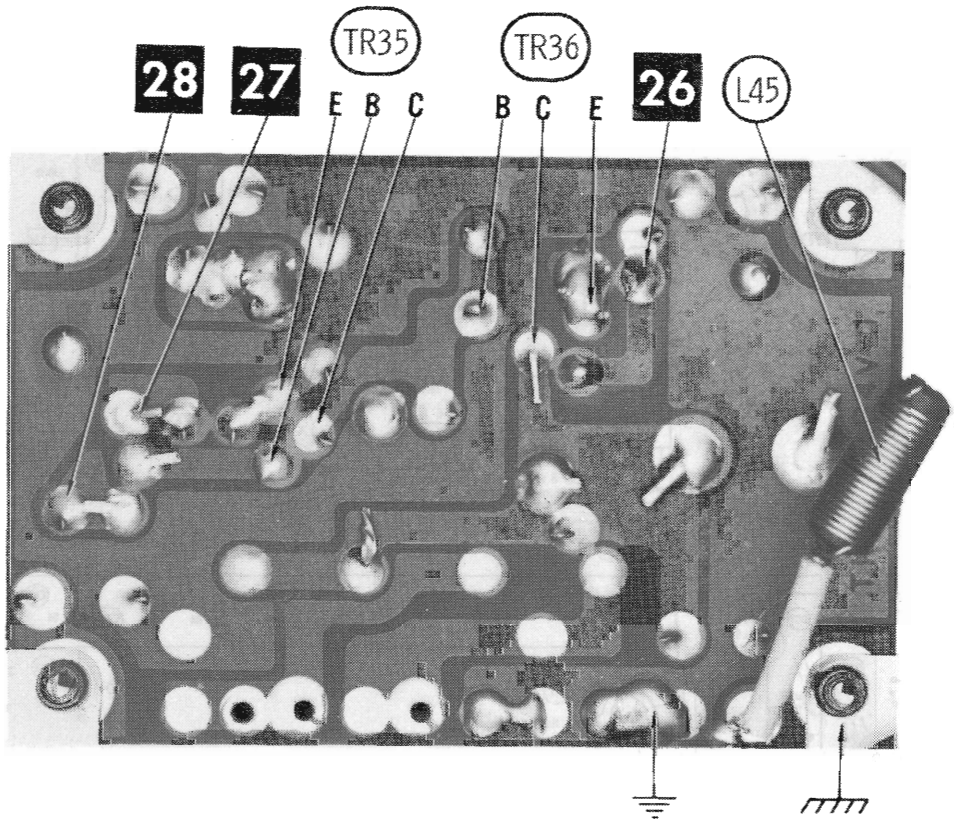
CLOCK DISPLAY BOARD

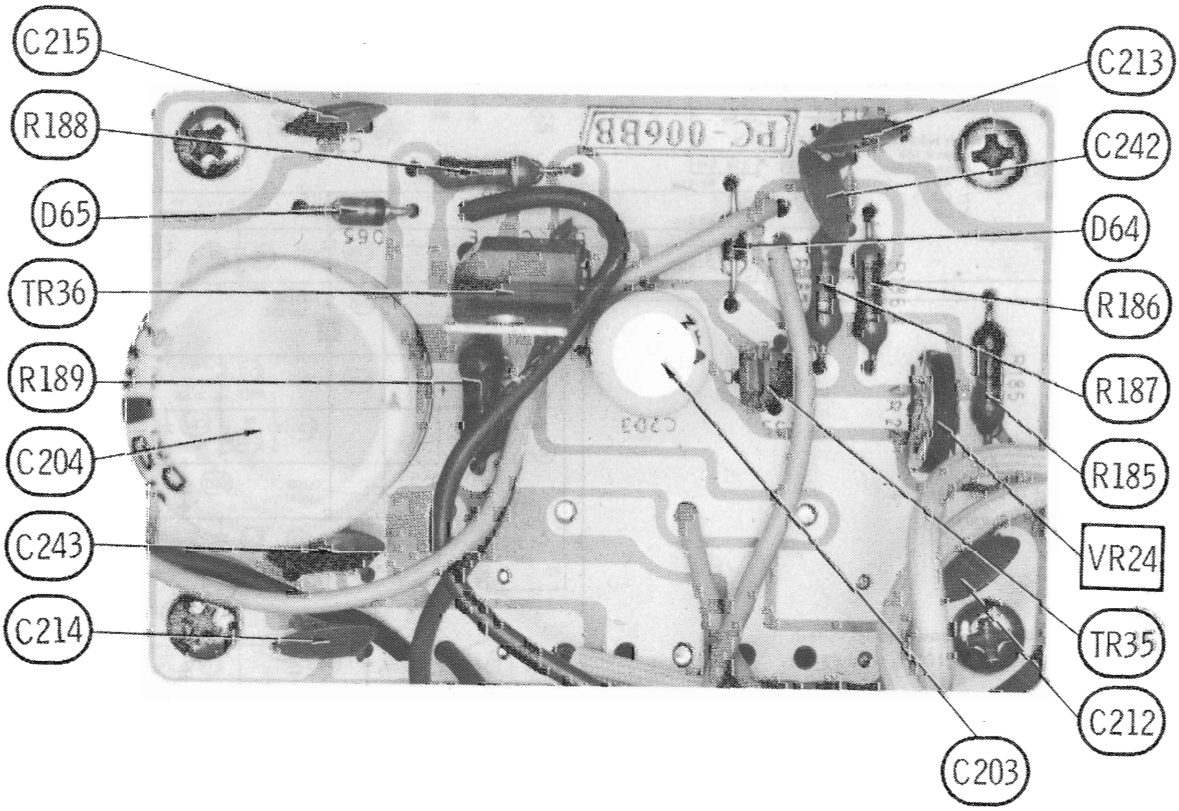
A Howard W. Sams CIRCUITRACE® Photo



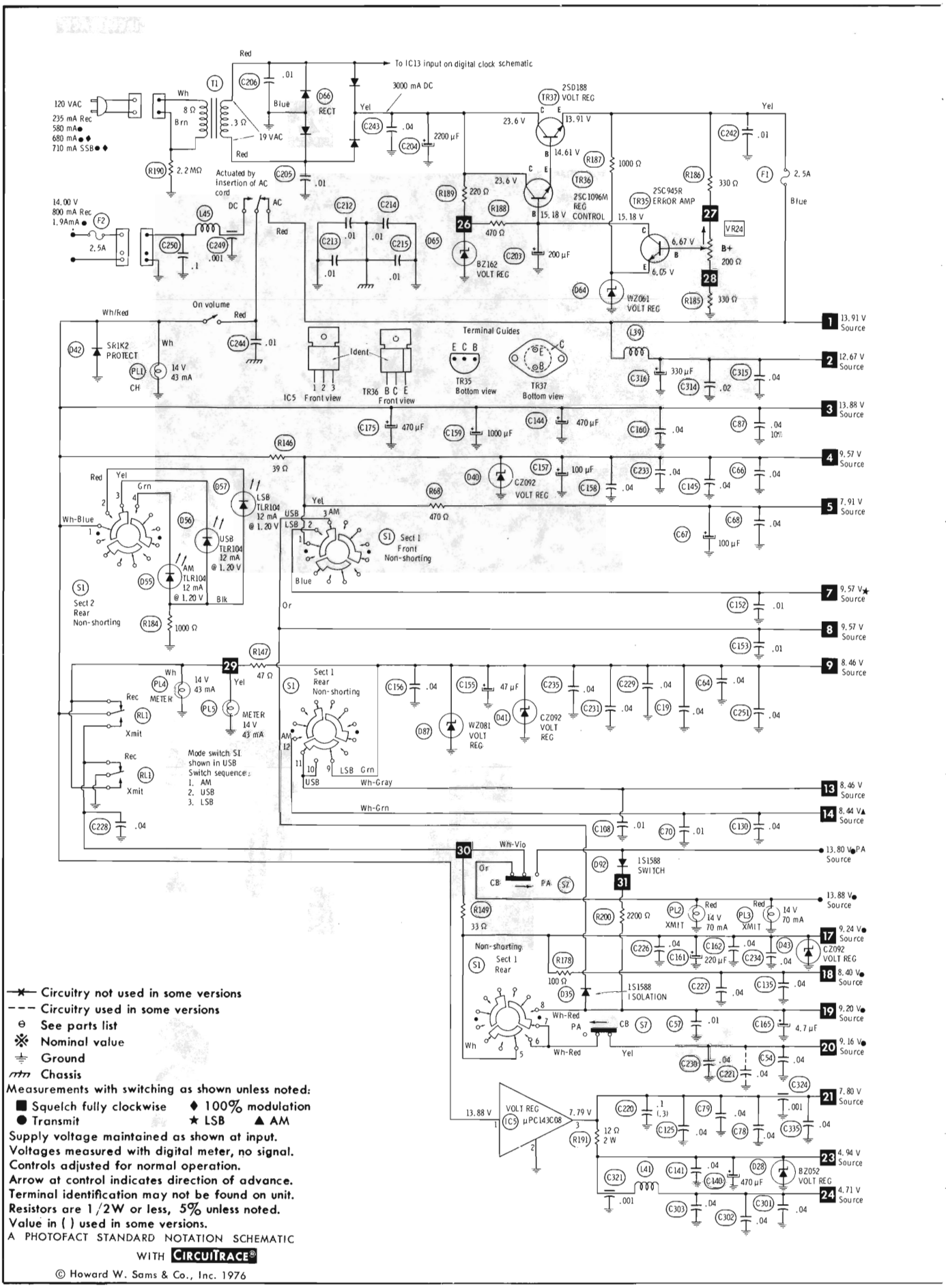


SWR - ALC BOARD





POWER SUPPLY BOARD



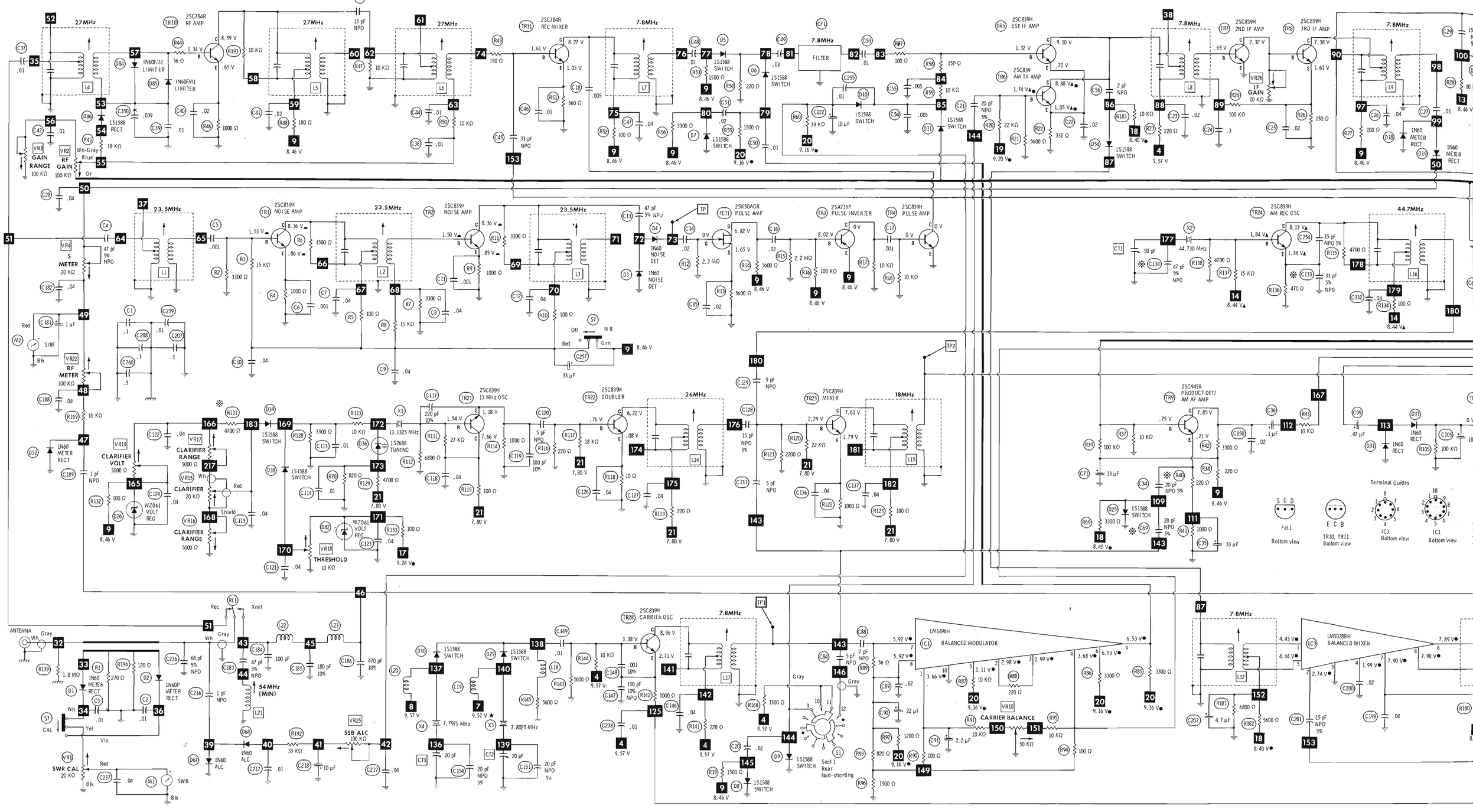
Circuitry not used in some versions
Circuitry used in some versions
⊖ See parts list
※ Nominal value
⏚ Ground
Chassis

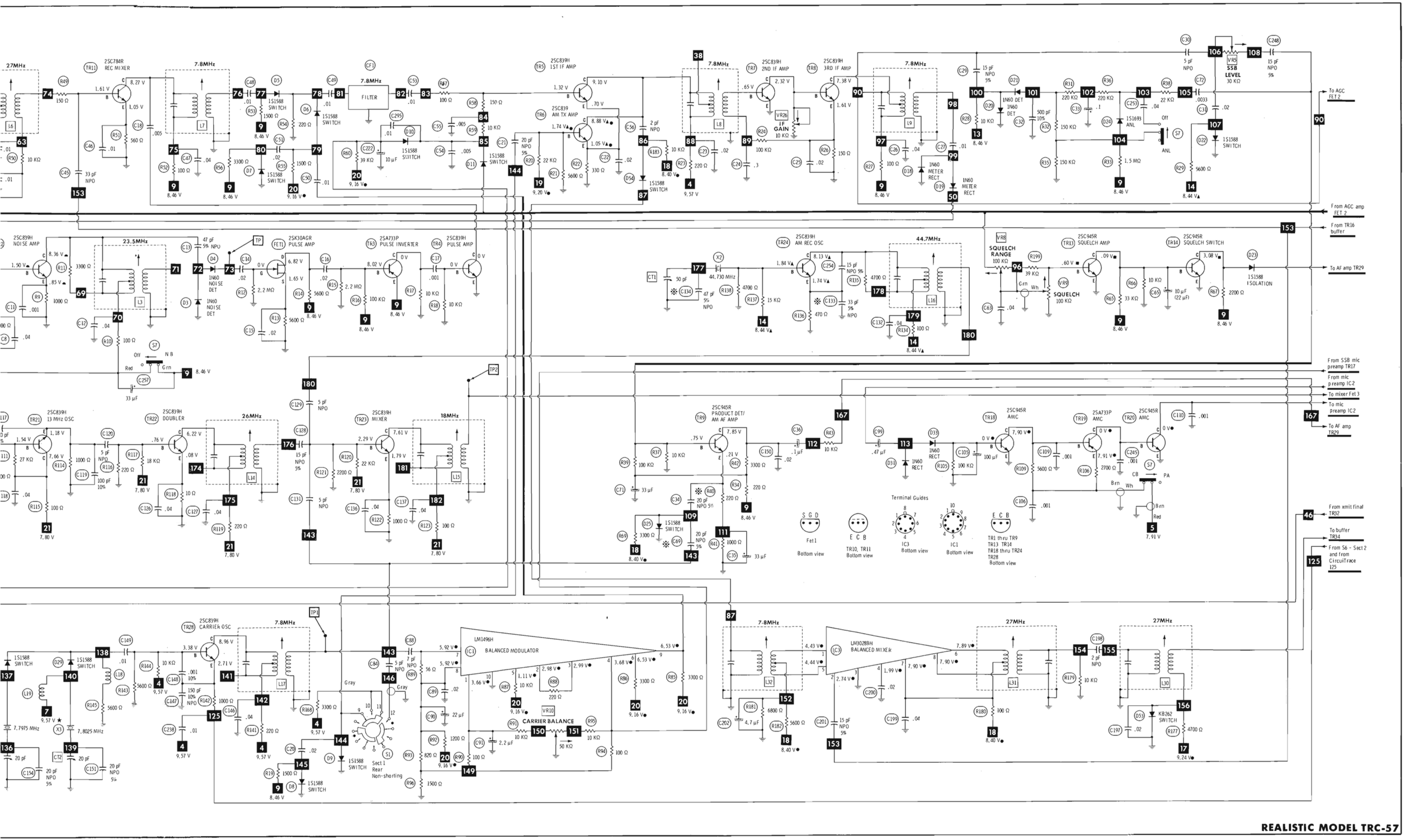
Measurements with switching as shown unless noted:

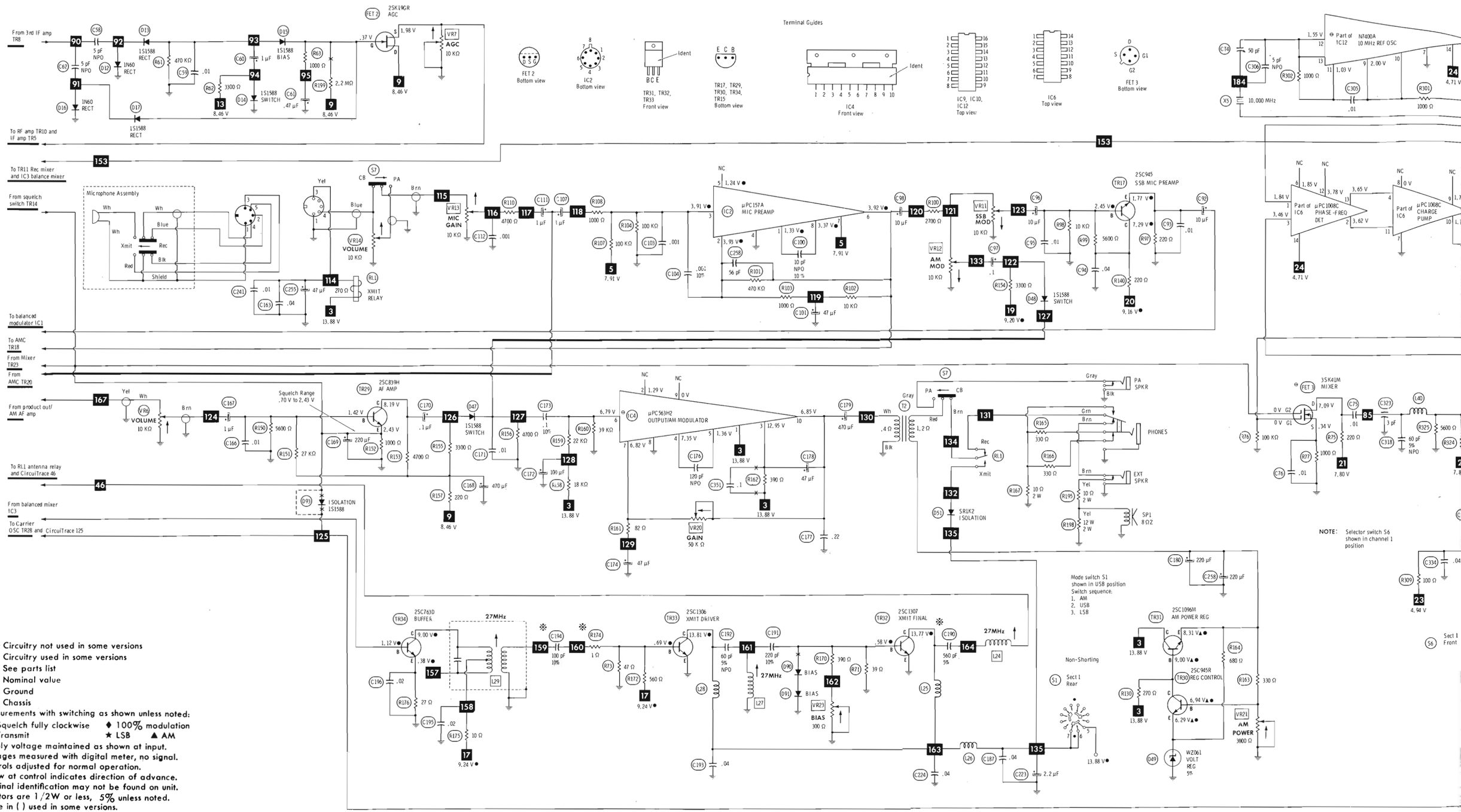
■ Squelch fully clockwise ◆ 100% modulation
● Transmit ★ LSB ▲ AM

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®


27MHz
2SC784R RF AMP
IN60FM1 LIMITER
IN60FM1 LIMITER
1S1588 RECT
GAIN RANGE 100 KΩ
RF GAIN 100 KΩ
2SC784R REC MIXER
7.8MHz
1S1588 SWITCH
FILTER
2SC839H 1ST IF AMP
2SC839 AM TX AMP
2SC839H 2ND IF AMP
2SC839H 3RD IF AMP
IF GAIN 10 KΩ
1N60 METER RECT
23.5MHz
2SC839H NOISE AMP
1N60 NOISE DET
2SK30AGR PULSE AMP
2SA733P PULSE INVERTER
2SC839H PULSE AMP
S METER 20 KΩ
S/RF
RF METER 100 KΩ
N B
44.7MHz
2SC839H AM REC OSC
44.730 MHz
2SC839H 13 MHz OSC
13.1325 MHz
1S2688 TUNING
26MHz
2SC839H DOUBLER
2SC839H MIXER
18MHz
CLARIFIER VOLT 5000 Ω
CLARIFIER RANGE 5000 Ω
CLARIFIER 20 KΩ
WZ061 VOLT REG
THRESHOLD 10 KΩ
2SC945R PRODUCT DET/ AM AF AMP
Terminal Guides
Fet1 Bottom view
TR10, TR11 Bottom view
IC3 Bottom view
IC1 Bottom view
ANTENNA
54 MHz (MIN)
SSB ALC 100 KΩ
SWR CAL 20 KΩ
SWR
2SC839H CARRIER OSC
7.7975 MHz
7.8025 MHz
LM1496H BALANCED MODULATOR
CARRIER BALANCE
LM3028BH BALANCED MIXER
Sect 1 Rear Non-shorting


2SC784R REC MIXER
7.8MHz
FILTER
2SC839H 1ST IF AMP
2SC839 AM TX AMP
2SC839H 2ND IF AMP
2SC839H 3RD IF AMP
IF GAIN 10 KΩ
SSB LEVEL 30 KΩ
To AGC FET 2
From AGC amp FET 2
From TR16 buffer
2SC839H NOISE AMP
23.5MHz
2SK30AGR PULSE AMP
2SA733P PULSE INVERTER
2SC839H PULSE AMP
2SC839H AM REC OSC
44.7MHz
SQUELCH RANGE 100 KΩ
2SC945R SQUELCH AMP
2SC945R SQUELCH SWITCH
SQUELCH 100 KΩ
To AF amp TR29
From SSB mic preamp TR17
From mic preamp IC2
To mixer Fet 3
To mic preamp IC2
To AF amp TR29
2SC839H 13 MHz OSC
2SC839H DOUBLER
26MHz
2SC839H MIXER
18MHz
2SC945R PRODUCT DET/ AM AF AMP
2SC945R AMC
2SC945R AMC
Terminal Guides
Fet1 Bottom view
TR10, TR11 Bottom view
IC3 Bottom view
IC1 Bottom view
TR1 thru TR9 TR13 TR14 TR18 thru TR24 TR28 Bottom view
From xmit final TR32
To buffer TR34
From S6 - Sect 2 and from CircuitTrace 125
2SC839H CARRIER OSC
LM1496H BALANCED MODULATOR
CARRIER BALANCE
LM3028H BALANCED MIXER
27MHz
KB262 SWITCH
Sect 1 Rear Non-shorting



- Circuitry not used in some versions
- Circuitry used in some versions
- See parts list
- Nominal value
- Ground
- Chassis

Measurements with switching as shown unless noted:

- Squelch fully clockwise
- Transmit
- 100% modulation
- LSB
- AM

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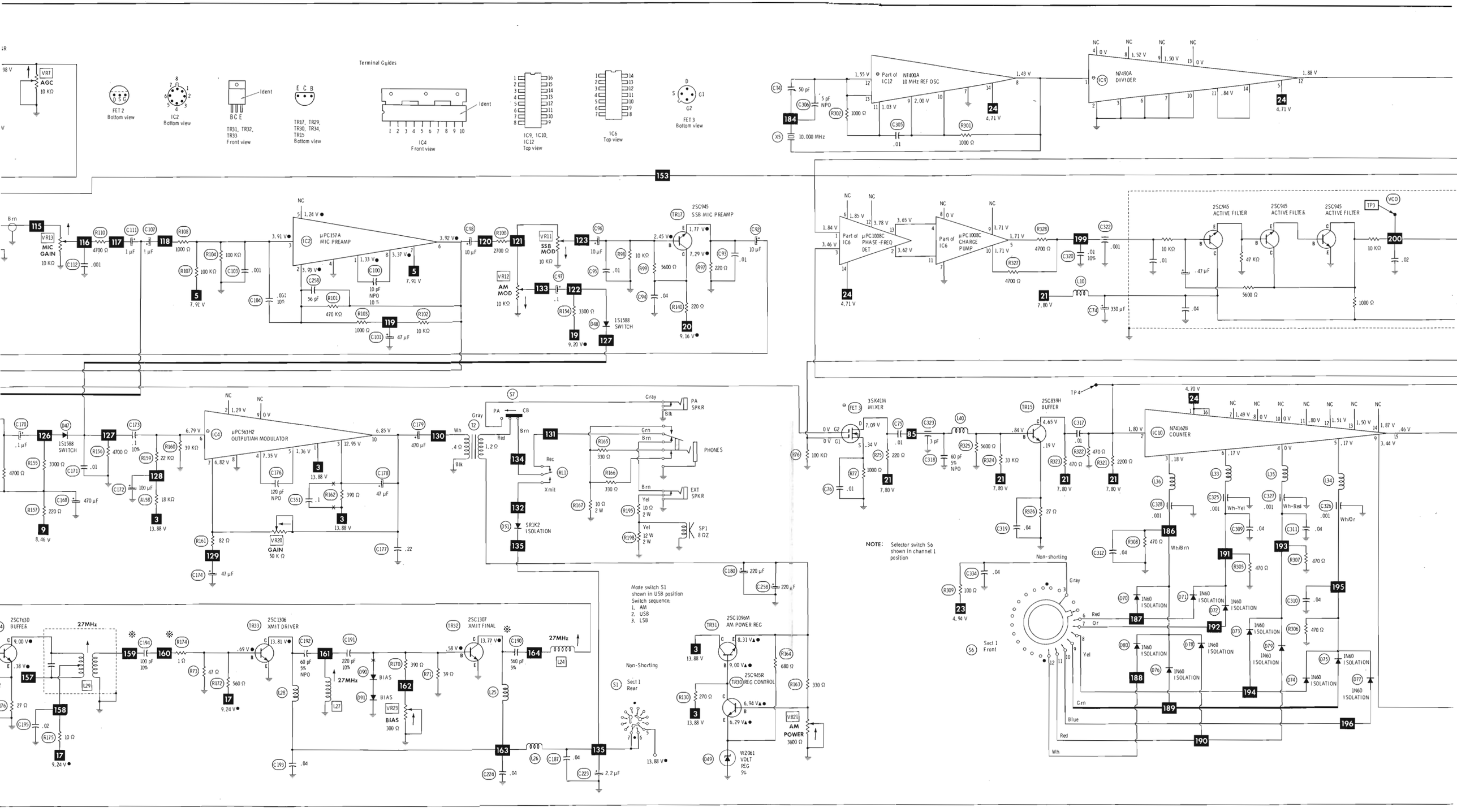
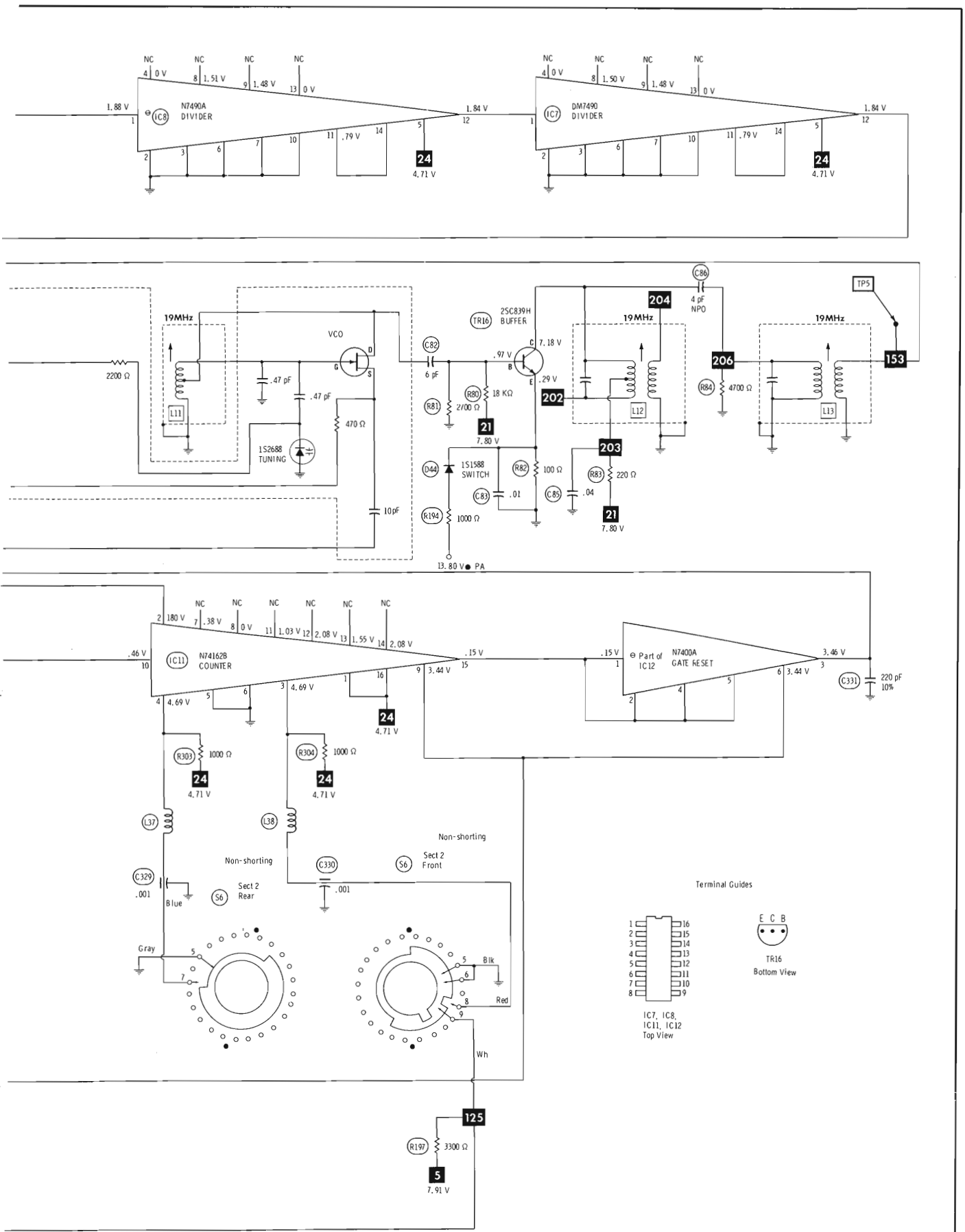
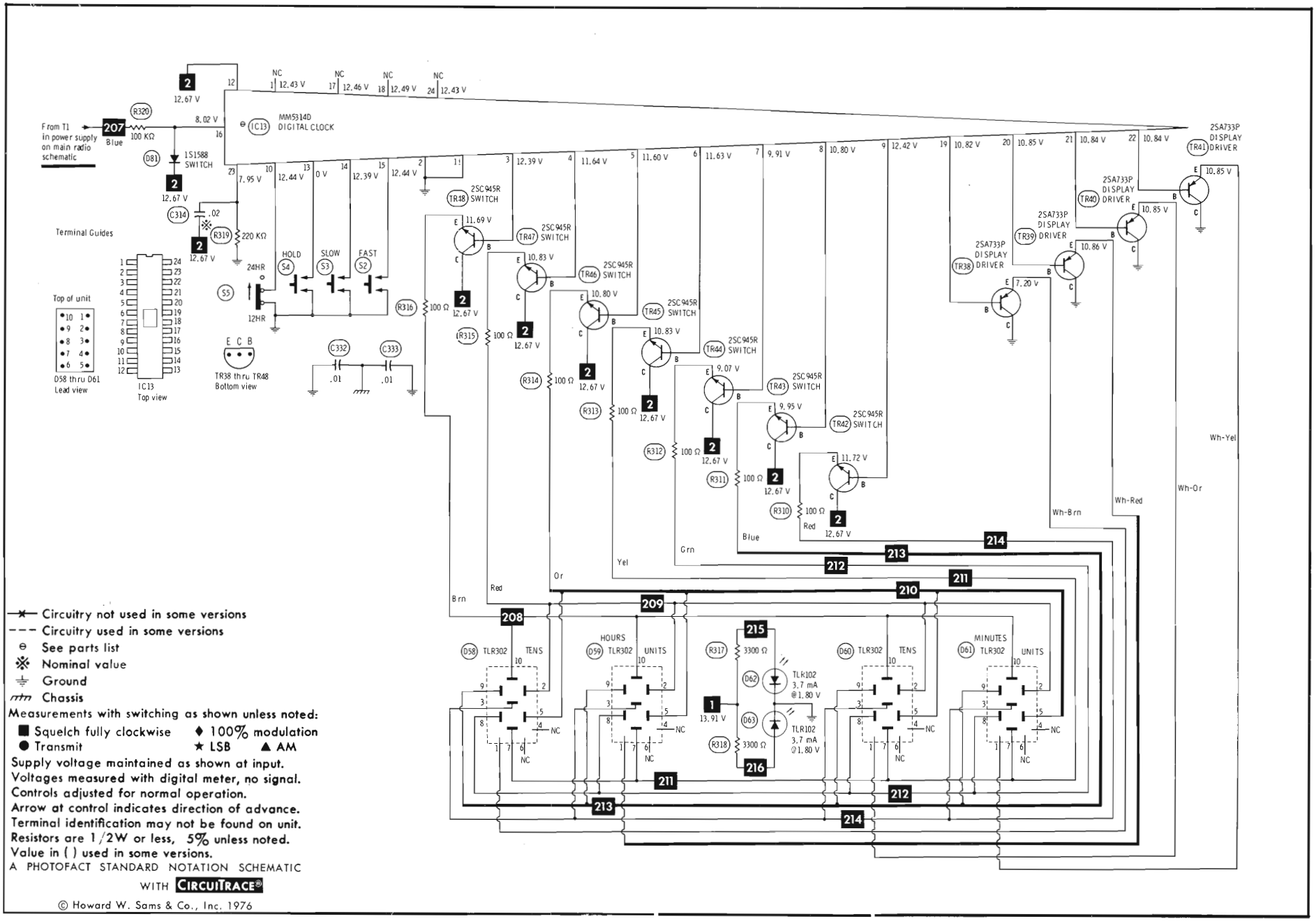
A PHOTOFACT STANDARD NOTATION SCHEMATIC WITH CIRCUITRACE®


Terminal Guides
FET 2 Bottom view
IC2 Bottom view
TR31, TR32, TR33 Front view
TR17, TR29, TR30, TR34, TR15 Bottom view
IC4 Front view
IC9, IC10, IC12 Top view
IC6 Top view
FET 3 Bottom view
VR7 AGC 10 KΩ
VR13 MIC GAIN 10 KΩ
μPC157A MIC PREAMP
2SC945 SSB MIC PREAMP
VR11 SSB MOD 10 KΩ
VR12 AM MOD 10 KΩ
1S1588 SWITCH
μPC563H2 OUTPUT/AM MODULATOR
VR20 GAIN 50 K Ω
VR23 BIAS 300 Ω
PA SPKR
PHONES
EXT SPKR
SP1 8 ΩZ
Part of IC12 N7400A 10 MHz REF OSC
10.000 MHz
N7490A DIVIDER
3SK41M MIXER
2SC839H BUFFER
N74162B COUNTER
1N60 ISOLATION
2SC945 ACTIVE FILTER
VCO
2SC763D BUFFER
2SC1306 XMIT DRIVER
2SC1307 XMIT FINAL
2SC1096M AM POWER REG
2SC945R REG CONTROL
VR21 AM POWER 3000 Ω
WZ061 VOLT REG 5%
Mode switch S1 shown in USB position
Switch sequence:
1. AM
2. USB
3. LSB
Non-Shorting
Sect 1 Rear
Sect 1 Front
Selector switch S6 shown in channel 1 position
Non-shorting


IC8
N7490A
DIVIDER
IC7
DM7490
DIVIDER
19MHz
VCO
2200 Ω
.47 pF
470 Ω
1S2688
TUNING
10pF
L11
TR16
2SC839H
BUFFER
C82
6 pF
R80
18 KΩ
R81
2700 Ω
D44
1S1588
SWITCH
R82
100 Ω
C83
.01
C85
.04
k194
1000 Ω
13.80 V PA
C86
4 pF
NPO
R83
220 Ω
R84
4700 Ω
L12
L13
TP5
IC11
N74162B
COUNTER
Part of IC12
N7400A
GATE RESET
C331
220 pF
10%
R303
1000 Ω
R304
1000 Ω
L37
L38
C329
.001
C330
.001
S6
Sect 2
Rear
Sect 2
Front
Non-shorting
Blue
Gray
Blk
Red
Wh
R197
3300 Ω
Terminal Guides
IC7, IC8,
IC11, IC12
Top View
E C B
TR16
Bottom View



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A PHOTOFACT STANDARD NOTATION SCHEMATIC WITH CIRCUITRACE®

PARTS LIST AND DESCRIPTION

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

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	1N60P	DDAY001002	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D2	1N60P	DDAY001002	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D3	1N60AM	DDAY001001	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D4	1N60AM	DDAY001001	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D5	1S1588	DDAY047001	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D6	1S1588	DDAY047001	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D7	1S1588	DDAY047001	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D8	1S1588	DDAY047001	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D9	1S1588	DDAY047001	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D10	1S1588	DDAY047001	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D11	1S1588	DDAY047001	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D12	1N60AM	DDAY001001	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D13	1S1588	DDAY047001	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D14	1S1588	DDAY047001	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D15	1S1588	DDAY047001	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D16	1N60AM	DDAY001001	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D17	1S1588	DDAY047001	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D18	1N60AM	DDAY001001	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D19	1N60AM	DDAY001001	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D20	1N60AM	DDAY001001	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D21	1N60AM	DDAY001001	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D22	1S1588	DDAY047001	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D23	1S1588	DDAY047001	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D24	1S1693	DDAY049001	GE-504A	5A4D	PTC201	HEPR0052	RE 49	SK3030	RT-213	ECG116
D25	1S1588	DDAY047001	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D26	WZ061	DDAY008001	GEZD-6.2		ZB6.2B				RT-237	ECG137
D28	BZ052	DDAY009001	GEZD-5.1	Z1203		HEPZ0406		SK3056	RT-235	
D29	1S1588	DDAY047001	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D30	1S1588	DDAY047001	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D31	1N60AM	DDAY001001	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D33	1N60AM	DDAY001001	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D35	1S1588	DDAY047001	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D36	1S2688B	DDAY006002	GE-90	D201		HEPR2503	RE 195	SK3126	RT-262	
D38	1S1588	DDAY047001	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D39	1S1588	DDAY044001	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D40	CZ092	DDAY010002	GEZD-9.1	Z1209	ZB9.1A	HEPZ0412	RE 114	SK3060	RT-240	ECG139
D41	CZ092	DDAY010002	GEZD-9.1	Z1209	ZB9.1A	HEPZ0412	RE 114	SK3060	RT-240	ECG139
D42	SR1K-2	DDAY002002	GE-504A	5A4D	PTC201	HEPR0052	RE 49	SK3030	RT-213	ECG116
D43	CZ092	DDAY010002	GEZD-9.1	Z1209	ZB9.1A	HEPZ0412	RE 114	SK3060	RT-240	ECG139
D44	1S1588	DDAY047001	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D47	1S1588	DDAY047001	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D48	1S1588	DDAY047001	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D49	WZ061	DDAY008001	GEZD-6.2		ZB6.2B				RT-237	ECG137
D51	SR1K-2	DDAY002002	GE-504A	5A4D	PTC201	HEPR0052	RE 49	SK3030	RT-213	ECG116
D52	1N60AM	DDAY001001	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D53	KB262	DDAY004002								
D54	1S1588	DDAY047001	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D55	TLR104	DDAY007001								
D56	TLR104	DDAY007001								
D57	TLR104	DDAY007001								
D58	TLR302	DDAY041001								
D59	TLR302	DDAY041001								
D60	TLR302	DDAY041001								
D61	TLR302	DDAY041001								
D62	TLR102	DDAY04001								
D63	TLR102	DDAY04001								
D64	WZ061	DDAY008001	GEZD-6.2		ZB6.2B				RT-237	ECG137
D65	BZ162	DDAY009003			ZB16B				RT-246	ECG5075
D66	5B-1	DDAY042001	GE-504A(4)	5A4D(4)	PTC201(4)	HEPR0052(4)	RE 49(4)	SK3030(4)	RT-213(4)	ECG116(4)
D67	1N60AM	DDAY001001	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D68	1N60AM	DDAY001001	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D70	1N60AM	DDAY001001	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D71	1N60AM	DDAY001001	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D72	1N60AM	DDAY001001	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D73	1N60AM	DDAY001001	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D74	1N60AM	DDAY001001	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D75	1N60AM	DDAY001001	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D76	1N60AM	DDAY001001	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D77	1N60AM	DDAY001001	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D78	1N60AM	DDAY001001	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D79	1N60AM	DDAY001001	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D80	1N60AM	DDAY001001	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D81	1S1588	DDAY047001	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D82	WZ061	DDAY008001	GEZD-6.2		ZB6.2B				RT-237	ECG137
D84	1N60FM1	DDAY001003	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D85	1N60FM1	DDAY001003	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D86	1S1588	DDAY047001	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D87	WZ081	DDAY008003	GEZD-8.2		ZB8.2B				RT-257	ECG5072
D90			GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D91			GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D92	1S1588	DDAY047001	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177

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.	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.
D93	1S1588	DDAY047001	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
FET1	2SK30AGR	DDCY002002	GE-FET-1	FE-100	PTC151	HEPF0010	RE 46	SK3112	RT-176	ECG133
FET2	2SK19GR	DDCY001001	GE-FET-2	FE-100	PTC161	HEPF0021	RE 45	SK3116	RT-175	ECG312
FET3	3SK41M	DDCY103001	GE-FET-4		PTC181	HEPF2004	RE 199	SK3050	RT-181	ECG222
IC1	LM1496H	DDEY001001				HEPC6050G				
	MC1496					HEPC6050G				
IC2	uPC157A	DDEY026001								
IC3	LM3028BH	DDEY002001			PTC744			SK3525	TVCM-48	ECG724
	TA7045				PTC744			SK3525	TVCM-48	ECG724
IC4	uPC563H2	DDEY027001								ECG1081
	uPC1020									
IC5	uPC143C08	DDEY028001				HEPC6112P				
	MC7808					HEPC6112P				
IC6	uPC1008C	DDEY017001								
IC7	N7490A					HEPC3800P			TVCM-505	ECG7490
	DM7490N	DDEY029001				HEPC3800P			TVCM-505	ECG7490
IC8	N7490A					HEPC3800P			TVCM-505	ECG7490
	DM7490N	DDEY029001				HEPC3800P			TVCM-505	ECG7490
IC9	N7490A					HEPC3800P			TVCM-505	ECG7490
	DM7490N	DDEY029001				HEPC3800P			TVCM-505	ECG7490
IC10	N74162B	DDEY015001								ECG74162
IC11	N74162B	DDEY015001								ECG74162
IC12	N7400A					HEPC3000P				ECG7400
	DM7400N	DDEY030001				HEPC3000P				ECG7400
IC13	MM5314D									
	MM5314N	DDEY031001								
TR1	2SC839H	DDBY222002	GE-61	(IR)2SC644	PTC132	HEPS0015	RE 13	SK3018	RT-308	ECG123A
TR2	2SC839H	DDBY222002	GE-61	(IR)2SC644	PTC132	HEPS0015	RE 13	SK3018	RT-308	ECG123A
TR3	2SA733P	DDBY003001	GE-22	TR-20	PTC127	HEPS0019	RE 26	SK3114	RT-303	ECG159
TR4	2SC839H	DDBY222002	GE-61	(IR)2SC644	PTC132	HEPS0015	RE 13	SK3018	RT-308	ECG123A
TR5	2SC839H	DDBY222002	GE-61	(IR)2SC644	PTC132	HEPS0015	RE 13	SK3018	RT-308	ECG123A
TR6	2SC839H	DDBY222002	GE-61	(IR)2SC644	PTC132	HEPS0015	RE 13	SK3018	RT-308	ECG123A
TR7	2SC839H	DDBY222002	GE-61	(IR)2SC644	PTC132	HEPS0015	RE 13	SK3018	RT-308	ECG123A
TR8	2SC839H	DDBY222002	GE-61	(IR)2SC644	PTC132	HEPS0015	RE 13	SK3018	RT-308	ECG123A
TR9	2SC945R	DDBY224002	GE-20	(IR)2SC945	PTC121	HEPS0015	RE 192	SK3124	RT-107A	ECG199
TR10	2SC784R	DDBY219001	GE-61	(IR)2SC380A0	PTC132	HEPS0016	RE 9	SK3018	RT-187	ECG107
TR11	2SC784R	DDBY219001	GE-61	(IR)2SC380A0	PTC132	HEPS0016	RE 9	SK3018	RT-187	ECG107
TR13	2SC945R	DDBY224002	GE-20	(IR)2SC945	PTC121	HEPS0015	RE 192	SK3124	RT-107A	ECG199
TR14	2SC945R	DDBY224002	GE-20	(IR)2SC945	PTC121	HEPS0015	RE 192	SK3124	RT-107A	ECG199
TR15	2SC839H	DDBY222002	GE-61	(IR)2SC644	PTC132	HEPS0015	RE 13	SK3018	RT-308	ECG123A
TR16	2SC839H	DDBY222002	GE-61	(IR)2SC644	PTC132	HEPS0015	RE 13	SK3018	RT-308	ECG123A
TR17	2SC945R	DDBY224002	GE-20	(IR)2SC945	PTC121	HEPS0015	RE 192	SK3124	RT-107A	ECG199
TR18	2SC945R	DDBY224002	GE-20	(IR)2SC945	PTC121	HEPS0015	RE 192	SK3124	RT-107A	ECG199
TR19	2SA733P	DDBY003001	GE-22	TR-20	PTC127	HEPS0019	RE 26	SK3114	RT-303	ECG159
TR20	2SC945R	DDBY224002	GE-20	(IR)2SC945	PTC121	HEPS0015	RE 192	SK3124	RT-107A	ECG199
TR21	2SC839H	DDBY222002	GE-61	(IR)2SC644	PTC132	HEPS0015	RE 13	SK3018	RT-308	ECG123A
TR22	2SC839H	DDBY222002	GE-61	(IR)2SC644	PTC132	HEPS0015	RE 13	SK3018	RT-308	ECG123A
TR23	2SC839H	DDBY222002	GE-61	(IR)2SC644	PTC132	HEPS0015	RE 13	SK3018	RT-308	ECG123A
TR24	2SC839H	DDBY222002	GE-61	(IR)2SC644	PTC132	HEPS0015	RE 13	SK3018	RT-308	ECG123A
TR28	2SC839H	DDBY222002	GE-61	(IR)2SC644	PTC132	HEPS0015	RE 13	SK3018	RT-308	ECG123A
TR29	2SC839H	DDBY222002	GE-61	(IR)2SC644	PTC132	HEPS0015	RE 13	SK3018	RT-308	ECG123A
TR30	2SC945R	DDBY224002	GE-20	(IR)2SC945	PTC121	HEPS0015	RE 192	SK3124	RT-107A	ECG199
TR31	2SC1096M	DDBY227001 (10)	GE-28	TR-55	PTC110		RE 42	SK3054	RT-167	ECG186A
TR32	2SC1307	DDBY231002 (11)	GE-216		PTC186		RE 201	SK3197	RT-158	ECG236
TR33	2SC1306	DDBY230001 (12)	GE-215		PTC186		RE 203	SK3197	RT-146	ECG235
TR34	2SC763D	DDBY216002	GE-61	(IR)2SC710	PTC136	HEPS0033	RE 10	SK3018	RT-309	ECG108
TR35	2SC945R	DDBY224002	GE-20	(IR)2SC945	PTC121	HEPS0015	RE 192	SK3124	RT-107A	ECG123A
TR36	2SC1096M	DDBY227001 (10)	GE-28	TR-55	PTC110		RE 42	SK3054	RT-167	ECG186A
TR37	2SD188M	DDBY403001 (13)	GE-75	TR-59	PTC140	HEPS7004	RE 19	SK3027	RT-131	ECG130
TR38	2SA733P	DDBY003001	GE-22	TR-20	PTC127	HEPS0019	RE 26	SK3114	RT-303	ECG159
TR39	2SA733P	DDBY003001	GE-22	TR-20	PTC127	HEPS0019	RE 26	SK3114	RT-303	ECG159
TR40	2SA733P	DDBY003001	GE-22	TR-20	PTC127	HEPS0019	RE 26	SK3114	RT-303	ECG159
TR41	2SA733P	DDBY003001	GE-22	TR-20	PTC127	HEPS0019	RE 26	SK3114	RT-303	ECG159
TR42	2SC945R	DDBY224002	GE-20	(IR)2SC945	PTC121	HEPS0015	RE 192	SK3124	RT-107A	ECG199
TR43	2SC945R	DDBY224002	GE-20	(IR)2SC945	PTC121	HEPS0015	RE 192	SK3124	RT-107A	ECG199
TR44	2SC945R	DDBY224002	GE-20	(IR)2SC945	PTC121	HEPS0015	RE 192	SK3124	RT-107A	ECG199
TR45	2SC945R	DDBY224002	GE-20	(IR)2SC945	PTC121	HEPS0015	RE 192	SK3124	RT-107A	ECG199
TR46	2SC945R	DDBY224002	GE-20	(IR)2SC945	PTC121	HEPS0015	RE 192	SK3124	RT-107A	ECG199
TR47	2SC945R	DDBY224002	GE-20	(IR)2SC945	PTC121	HEPS0015	RE 192	SK3124	RT-107A	ECG199
TR48	2SC945R	DDBY224002	GE-20	(IR)2SC945	PTC121	HEPS0015	RE 192	SK3124	RT-107A	ECG199

(1) Used in some versions.
(4) Four required.
(10) Rating, 10 watts @ 2.0 amps.
(11) Rating, 25 watts @ 8.0 amps.
(12) Rating, 12 watts @ 3.0 amps.
(13) Rating, 60 watts @ 7.0 amps.

PARTS LIST AND DESCRIPTION (CONTINUED)

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

ELECTROLYTIC CAPACITORS

ITEM No.	RATING	REPLACEMENT DATA			
		MFGR. PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.
C33	.1 25V			TDC104M050EL	SD50-R109
C35	33 10V		PC30-25	VTT33A10	EV-1125
C36	.1 25V			TDC104M050EL	SD50-R109
C60	1 50V		PC1-50	VTT1B63	EV-1615
C61	.47 50V		PC1-50	VTTR47B63	EV-1610
C65	10 10V		PC10-25	VTT10A25	EV-1222
C67	100 10V		PC100-16	VTT100F16	EV-1230
C71	33 10V		PC30-25	VTT33A10	EV-1125
C74	330 10V		WBR300-35	VTT330G10	EV-1145
C90	22 10V		PC25-25	VTT22A16	EV-1224
C91	2.2 25V		PC2-100	VTT2R2A50	EV-1317
C92	10 16V		PC10-25	VTT10A25	EV-1222
C96	10 16V		PC10-25	VTT10A25	EV-1222
C97	.1 25V			TDC104M050EL	SD50-R109
C98	100 16V		PC100-16	VTT100F16	EV-1230
C99	.47 50V		PC1-50	VTTR47B63	EV-1310
C101	47 10V		PC50-16	VTT47D16	EV-1226
C105	100 10V		PC100-16	VTT100F16	EV-1230
C107	1 50V		PC1-50	VTT1B63	EV-1615
C111	1 50V		PC1-50	VTT1B63	EV-1615
C140	470 10V		PC500-16	VTT470J16	EV-1150
C144	470 16V		PC500-16	VTT470J16	EV-1250
C155	47 10V		PC50-16	VTT47D16	EV-1226
C157	100 10V		WBR100-16	MTA100E10	TVA-1130
C159	1000 16V		PC1000-16	VTT1000L16	EV-1260
C161	220 10V		PC250-10	VTT220F10	EV-1140
C165	4.7 25V		PC5-50	VTT4R7A50	EV-1319
C167	1 50V		PC1-50	VTT1B63	EV-1615
C168	470 10V		PC500-16	VTT470J16	EV-1150
C169	220 63V		PC250-10	VTT220F10	EV-1140
C170	.1 25V			TDC104M050EL	SD50-R109
C172	100 16V		PC100-16	VTT100F16	EV-1230
C174	47 16V		PC50-16	VTT47D16	EV-1226
C175	470 16V		PC500-16	VTT470J16	EV-1250
C178	47 16V		PC50-16	VTT47D16	EV-1226
C179	470 16V		PC500-16	VTT470J16	EV-1250
C180	220 16V		PC250-25	VTT220G16	EV-1240
C181	1 50V		PC1-50	VTT1B63	EV-1615
C202	4.7 25V		PC5-50	VTT4R7A50	EV-1319
C203	220 16V		PC250-25	VTT220G16	EV-1240
C204	2200 25V		WBR2000-25	TC2520A	TVA-1213.5
C218	10 16V		PC10-25	VTT10A25	EV-1222
C222	10 16V		PC10-25	VTT10A25	EV-1222
C223	2.2 25V		PC2-100	VTT2R2A50	EV-1317
C255	47 16V		PC50-16	VTT47D16	EV-1226
C256	220 16V		PC250-25	VTT220G16	EV-1240
C257	33 10V		PC30-25	VTT33A10	EV-1125
C316	330 10V		WBR300-35	VTT330G10	EV-1145

CAPACITORS

ITEM No.	RATING	MFGR. PART No.	REPLACEMENT DATA			
			CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.
C1	.1		CK-104		MAG5001	
C2	.01		UK50-103		MAG5011	
C3	.01		UK50-103		MAG5011	
C4	47 5% NPO		DTZ-47	NP047	CN0447	10TCC-Q47
C5	.001		DD-102G	GP1000	GP210	5GA-D10
C6	.001		DD-102G	GP1000	GP210	5GA-D10
C7	.04					
C8	.04					
C9	.04					
C10	.04					
C11	.001		DD-102G	GP1000	GP210	5GA-D10
C12	.04					
C13	47 5% NPO		DTZ-47	NP047	CN0447	10TCC-Q47
C14	.02		UK50-223		MAG5012	
C15	.02		UK50-223		MAG5012	
C16	.02		UK50-223		MAG5012	
C17	.001		DD-102G	GP1000	GP210	5GA-D10
C18	.001		DD-102G	GP1000	GP210	5GA-D10
C19	.01		UK50-103		MAG5011	
C20	.02		UK50-223		MAG5012	
C21	20 5% NPO		DTZ-20	NP020	CN0420	10TCC-Q20
C22	.02		UK50-223		MAG5012	
C23	.02		UK50-223		MAG5012	
C24	.3					
C25	.02		UK50-223		MAG5012	

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.
C26	.04					
C27	.01		UK50-103		MAG5011	
C28	.04					
C29	15 5% NPO		DTZ-15	NP015	CN0415	10TCC-Q15
C30	5 NPO		DTZ-4R7	NP04P7	CN0547	10TCC-V47
C31	.02		UK50-223		MAG5012	
C32	500 10%		DD-501	GP500	GP350	10TS-T50
C34	20 5% NPO		DTZ-20	NP020	CN0420	10TCC-Q20
C37	.01		UK50-103		MAG5011	
C38	.01		UK50-103		MAG5011	
C39	.01		UK50-103		MAG5011	
C40	.02		UK50-223		MAG5012	
C41	.02		UK50-223		MAG5012	
C42	.01		UK50-103		MAG5011	
C43	15 NPO		DTZ-15	NP015	CN0415	10TCC-Q15
C44	.01		UK50-103		MAG5011	
C45	33 NPO		DTZ-33	NP033	CN0433	10TCC-Q33
C46	.01		UK50-103		MAG5011	
C47	.04					
C48	.01		UK50-103		MAG5011	
C49	.01		UK50-103		MAG5011	
C50	.01		UK50-103		MAG5011	
C51	.02		UK50-223		MAG5012	
C52	.04					
C53	.01		UK50-103		MAG5011	
C54	.005		DC-502	MGP005	TA250	TG-D50
C55	.005		DC-502	MGP005	TA250	TG-D50
C56	2 NPO		DTZ-2R2	NP02P2	CN0522	10TCC-V22
C57	.01		UK50-103		MAG5011	
C58	5 NPO		DTZ-4R7	NP04P7	CN0547	10TCC-V47
C59	.01		UK50-103		MAG5011	
C62	5 NPO		DTZ-4R7	NP04P7	CN0547	10TCC-V47
C63	.05		UK50-503		MAG5015	
C64	.04					
C66	.04					
C68	.04					
C69	20 5% NPO		DTZ-20	NP020	CN0420	10TCC-Q20
C70	.01		UK50-103		MAG5011	
C72	.0033		DD-332	GP3300	GP233	5GA-D33
C75	.01		UK50-103		MAG5011	
C76	.01			WMF1S1	EWF1A110	1PB-S10
C78	.04					
C79	.04					
C82	6			CD15CD060D03		MWA-060
C83	.01		UK50-103		MAG5011	
C84	5 NPO		DTZ-4R7	NP04P7	CN0547	10TCC-V47
C85	.04					
C86	4 NPO		DTZ-4R7	NP04P7	CN0547	10TCC-V47
C87	.04 10%					
C88	7 NPO		DTZ-6R8	NP06P8	CN0568	10TCC-V68
C89	.02		UK50-223		MAG5012	
C93	.01		UK50-103		MAG5011	
C94	.04					
C95	.01		UK50-103		MAG5011	
C100	10		DTZ-10	NP010	CN0410	10TCC-Q10
C103	.001		DD-102G	GP1000	GP210	5GA-D10
C104	.001 10%			DPMS6D1	EWF1A210	1PB-D10
C106	.001		DD-102G	GP1000	GP210	5GA-D10
C108	.01		UK50-103		MAG5011	
C109	.001		DD-102G	GP1000	GP210	5GA-D10
C110	.001		DD-102G	GP1000	GP210	5GA-D10
C112	.001		DD-102G	GP1000	GP210	5GA-D10
C113	.01		UK50-103		MAG5011	
C114	.01		UK50-103		MAG5011	
C115	.04					
C117	220 10%		DD-221		GP322	10TS-T22
C118	.04					
C119	100 10% NPO		DTZ-100	NP0100	CN0310	10TCC-T10
C120	5 NPO		DTZ-4R7	NP04P7	CN0547	10TCC-V47
C121	.04					
C122	.04					
C123	.04					
C124	.04					
C125	.04					
C126	.04				M192P3939R8	192P3939R8
C127	.04					
C128	15 NPO		DTZ-15	NP015	CN0415	10TCC-Q15
C129	5 NPO		DTZ-4R7	NP04P7	CN0547	10TCC-V47
C130	.04					
C131	5 NPO		DTZ-4R7	NP04P7	CN0547	10TCC-V47
C132	.04					
C133	33 5% NPO		DTZ-33	NP033	CN0433	10TCC-Q33
C134	47 5% NPO		DTZ-47	NP047	CN0447	10TCC-Q47

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.
C135	.04					
C136	.04					
C137	.04					
C141	.04					
C145	.04					
C146	.04					
C147	150 10% NPO		DD-151		GP315	10TS-T15
C148	.001 10%			DPMS6D1	EWF1A210	1PB-D10
C149	.01 10%			WMF1S1	EWF1A110	1PB-S10
C150	.02		UK50-223		MAG5012	
C151	20 5% NPO		DTZ-20	NP020	CN0420	10TCC-Q20
C152	.01		UK50-103		MAG5011	
C153	.01		UK50-103		MAG5011	
C154	20 5% NPO		DTZ-20	NP020	CN0420	10TCC-Q20
C156	.04					
C158	.04					
C160	.04					
C162	.04					
C163	.04					
C166	.01		UK50-103		MAG5011	
C171	.01		UK50-103		MAG5011	
C173	.1 10%			WMF05P1	EWF05010	431P1049R5
C176	120 10% NPO		DTZ-120		CN0312	10TCC-T12
C177	.22			WMF05P22	EWF05022	431P2249R5
C182	.04					
C183	47 5% NPO		DTZ-47	NP047	CN0447	10TCC-Q47
C184	100		DTZ-100	NP0100	CN0310	10TCC-T10
C185	180 10%			CD15FD181J03	SX318	MWA-181
C186	470 10%			DPMS6D68	EWF6268	6PS-D68
C187	.04					
C188	.04					
C189	1 NPO				CN0510	10TCC-V10
C190	560 5%			CD19FD561J03	SX356	MWC-561
C191	220 10%			CD15FD221J03	SX322	MWA-221
C192	60 5% NPO		DD-560		GP456	10TS-Q56
C193	.04					
C194	100 10%			CD15FD101J03	SX310	MWA-101
C195	.02		UK50-223		MAG5012	
C196	.02		UK50-223		MAG5012	
C197	.02		UK50-223		MAG5012	
C198	2 NPO		DTZ-2R2	NP02P2	CN0522	10TCC-V22
C199	.04					
C200	.02		UK50-223		MAG5012	
C201	15 5% NPO		DTZ-15	NP015	CN0415	10TCC-Q15
C205	.01		UK50-103		MAG5011	
C206	.01		UK50-103		MAG5011	
C207	.3					
C208	.3					
C212	.01		UK50-103		MAG5011	
C213	.04					
C214	.01		UK50-103		MAG5011	
C215	.01		UK50-103		MAG5011	
C216	1 NPO				CN0510	10TCC-V10
C217	.01		UK50-103		MAG5011	
C219	.01		UK50-103		MAG5011	
C220	.1		CK-104		MAG5001	
C221	.04					
C224	.04					
C226	.04					
C227	.04					
C228	.04					
C229	.04					
C230	.04					
C231	.04					
C233	.04					
C234	.04					
C235	.04					
C236	68 5% NPO		DTZ-68	NP068	CN0468	10TCC-Q68
C237	.04					
C239	.01		UK50-103		MAG5011	
C241	.01		UK50-103		MAG5011	
C242	.02		UK50-223		MAG5012	
C243	.04					
C244	.01		UK50-103		MAG5011	
C245	.001		DD-102G	GP1000	GP210	5GA-D10
C248	15 5% NPO		DTZ-15	NP015	CN0415	10TCC-Q15
C249	.001					
C250	.1		CK-104		MAG5001	
C251	.01			WMF1S1	EWF1A110	1PB-S10
C253	.04			DPMS6S39	PVC6139	6PS-S39
C254	15 5% NPO		DTZ-15	NP015	CN0415	10TCC-Q15
C258	56		DD-560		GP456	10TS-Q56
C260	.03		DC-303	MGP03		TG-S30
C295	.01		UK50-103		MAG5011	
C301	.04					
C302	.04					
C303	.04					
C305	.01		UK50-103		MAG5011	
C306	5 NPO		DTZ-4R7	NP04P7	CN0547	10TCC-V47

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.
C309	.04					
C310	.04					
C311	.04					
C312	.04					
C314	.02		UK50-103		MAG5011	
C315	.04					
C317	.01		UK50-103		MAG5011	
C318	60 5% NPO		DD-560		GP456	10TS-Q56
C319	.04				M192P3939R8	192P3939R8
C320	.01 10%			WMF1S1	EWF1A110	1PB-S10
C321	.001	CZZY006102				
C322	.001	CZZY006102				
C323	3	CZZY023309				
C324	.001	CZZY006102				
C325	.001	CZZY006102				
C326	.001	CZZY006102				
C327	.001	CZZY006102				
C328	.001	CZZY006102				
C329	.001	CZZY006102				
C330	.001	CZZY006102				
C332	.02		UK50-223		MAG5012	
C333	.02		UK50-223		MAG5012	
C334	.04					
C335	.04					
C350	.039			DPMS6S39	PVC6139	6PS-S39
C351	.1			WMF05P1	EWF05010	431P1049R5
CT1	50	C-0437				
CT2	20	C-0436				
CT3	20	C-0436				
CT4	50	C-0437				

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.
VR1	SWR Cal	20K	P-1602	F1-25K (1) SSK012	A47-20K-S (1), KSS-3 or [NP-20K-S (1), UP-C-400]	RU253L,SL36 (1), SL3250 or [UA24L (1), SK750] or U26	BU1 (1),CF62, SS1,DC1
VR2	RF Gain	100K	P-1603	F1-100K (1), SSK012	A47-100K-S (1), KSS-3 or [NP-100K-S (1), UP-C-400]	RU15L,SL36 (1), SL3250 or [UA15L (1), SK750] or U41 (1)	BU1 (1),CF13, SS1,DC1
VR3	Gain Range	100K	P-6320	T-100K (2)	C-104 (2)	MTC15L1 (2)	X201R104B (2)
VR4	S Meter	20K	P-6318	T-20K (2)	C-253 (2)	MTC24L1 (2)	X201R253B (2)
VR5	SSB Level	30K	P-6319	T-50K	C-503	MTC54L1	X201R503B
VR6	Volume	10K	P-1401				
VR14	PA Volume/Switch	10K					
VR7	AGC	10K	P-6317	T-10K (2)	C-103 (2)	MTC14L1 (2)	X201R103B (2)
VR8	Squelch Range	100K	P-6320	T-100K (2)	C-104 (2)	MTC15L1 (2)	X201R104B (2)
VR9	Squelch	100K	P-1603	F1-100K (1), SSK012	A47-100K-S (1), KSS-3 or [NP-100K-S (1), UP-C-400]	RU15L,SL36 (1), SL3250 or [UA15L (1), SK750] or U41 (1)	BU1 (1),CF13, SS1,DC1
VR10	Carrier Balance	50K	P-6313	T-50K	C-503	MTC54L1	X201R503B
VR11	SSB Mod	10K	P-6312	T-10K	C-103	MTC14L1	X201R103B
VR12	AM Mod	10K	P-6312	T-10K	C-103	MTC14L1	X201R103B
VR13	Mic Gain	10K		T-10K	C-103	MTC14L1	X201R103B
VR15	Clarifier	20K	P-1602	F1-25K (1), SSK012	A47-20K-S (1), KSS-3 or [NP-20K-S (1), UP-C-400]	RU253L,SL36 (1), SL3250 or [UA24L (1),SK750] or U26 (1)	BU1 (1),CF62, SS1,DC1
VR16	Clarifier Range	5000	P-6316	T-5000	C-502	MTC53L1	X201R502B
VR17	Clarifier Range	5000	P-6316	T-5000	C-502	MTC53L1	X201R502B
VR18	Threshold	10K	P-6317	T-10K (2)	C-103 (2)	MTC14L1 (2)	X201R103B (2)
VR19	Clarifier Voltage	5000	P-6316	T-5000	C-502	MTC53L1	X201R502B
VR20	Gain	50K	P-6313	T-50K	C-503	MTC54L1	X201R503B
VR21	AM Power	3000	P-6315	T-5000 (2)	C-502 (2)	MTC33L1 (2)	X201R302B (2)
VR22	RF Meter	100K	P-6320	T-100K (2)	C-104 (2)	MTC15L1 (2)	X201R104B (2)
VR23	Bias	300	P-6314	T-300 (2)	C-501 (2)	MTC32L1 (2)	X201R351B (2)
VR24	B+	200	P-6311	T-200 (2)		MTC22L1 (2)	X201R251B (2)
VR25	SSB ALC	100K	P-6320	T-100K (2)	C-104 (2)	MTC15L1 (2)	X201R104B (2)
VR26	IF Gain	10K	P-6317	T-10K (2)	C-103 (2)	MTC14L1 (2)	X201R103B (2)

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

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	Noise Amp (23.5MHz)	CA-3427	LA-104		
L2	Noise Amp (23.5MHz)	CA-3428	LA-060		
L3	Noise Amp (23.5MHz)	CA-3428	LA-060		
L4	Rec Ant (27MHz)	CA-3417	LA-080		
L5	Rec RF (27MHz)	CA-3420	LA-088		
L6	Rec RF (27MHz)	CA-3420	LA-088		
L7	Rec Mixer (7.8MHz)	CA-3414	LA-038		
L8	IF (7.8MHz)	CA-3423	LA-094		
L9	IF (7.8MHz)	CA-3424	LA-096		
L10	RF Choke	C-0633	LF1-470		
L11	VCO Osc (19MHz)	CA-3407	LA-141		
L12	VCO Buffer (19MHz)	CA-3421	LA-091		
L13	VCO Buffer (19MHz)	CA-3422	LA-092		
L14	Doubler (26MHz)	CA-3426	LA-138		
L15	Clarifier Mixer (18MHz)	CA-3421	LA-091		
L16	AM Rec Osc (44.7MHz)	CA-3425	LA-103		
L17	Carrier Osc (7.8MHz)	CA-3408	LB-013		
L18	RF Choke (470MHz)	C-0633			
L19	RF Choke (470MHz)	C-0633			
L20	RF Choke (470MHz)	C-0633			
L21	TVI Trap (54MHz)	CA-3409	LC-018		
L22	Pi Filter	CA-3411	LE-008		
L23	Pi Filter	CA-3411	LE-008		
L24	Final Tank (27MHz)	CA-3409	LC-018		
L25	RF Choke	CA-3410	LD-021		
L26	RF Choke	CA-3410	LD-021		
L27	Xmit Driver (27MHz)	CA-3409	LC-018		
L28	RF Choke	CA-3410	LD-021		
L29	Xmit Buffer (27MHz)	CA-3416	LA-069		
L30	Balance Mixer (27MHz)	CA-3419	LA-087		
L31	Balance Mixer (2.7MHz)	CA-3418	LA-082		
L32	Balance Mixer (7.8MHz)	CA-3415	LA-068		
L33	RF Choke (4.7uH)	C-0634			
L34	RF Choke (4.7uH)	C-0634			
L35	RF Choke (4.7uH)	C-0634			
L36	RF Choke (4.7uH)	C-0634			
L37	RF Choke (4.7uH)	C-0634			
L38	RF Choke (4.7uH)	C-0634			
L39	RF Choke (2.7uH)	C-0435			
L40	RF Choke (100uH)	C-0432			
L41	RF Choke (68uH)	C-0431			
L45	RF Choke	CA-3412	LE-003		

TRANSFORMER (Power)

ITEM No.	RATING		REPLACEMENT DATA			NOTES
	PRI.	SEC. 1	MFGR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T1	120V AC @ 710mA AC	19V AC @ 5.4A AC	TA-0529 TF-085 (1)			(1) Number on unit.

TRANSFORMER (Audio Output)

ITEM No.	IMPEDANCE		REPLACEMENT DATA			NOTES
	PRI.	SEC.	MFGR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T2	8	8	TN-0091 TF-087 (1)	TR797		(1) Number on unit.

SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		MFGR. PART No.	QUAM PART No.	
SP	2 3/4" PM 8 Ohms	S-1404	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 F2	2.5 Amp Fast Acting 2.5 Amp Fast Acting		F-1112	AGC2-1/2 AGC2-1/2	HKP HDJ	31202.5 31202.5	342012AL 150145	FG2-1/2-2 FG2-1/2-2

PARTS LIST AND DESCRIPTION (CONTINUED)

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

CRYSTALS

ITEM No.	CRYSTAL FREQUENCY IN MHz	MFGR. PART No.	CTS KNIGHTS PART No.	CHANNEL
X1	13.1325	CX-0173	AWB20W13.1325	13MHz Osc
X2	44.730	CX-0174	AWA80W44.730	AM Rec Osc

ITEM No.	CRYSTAL FREQUENCY IN MHz	MFGR. PART No.	CTS KNIGHTS PART No.	CHANNEL
X3	7.8025	CX-0171	AWC32M7.8025	LSB Osc
X4	7.7975	CX-0172	AWC32M7.7975	USB Osc
X5	10.000		AWD32W10.000	P.L.L. Osc

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	18-105	4	1	3	NC	NC	1

MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
CF1	Filter	C-0440	(7.8MHz)
M1	Meter	M-0274	SWR
M2	Meter	M-0277	S/RF
RL1	Relay	R-8072	Xmit/Rec
S1	Switch	S-1202	Mode (LSB/USB/AM)
S2	Switch	S-7254	Fast
S3	Switch	S-7254	Slow
S4	Switch	S-7254	Hold
S5	Switch	S-2304	12/24 Hr
S6	Switch	S-1201	Channel Selector
S7	Switch	S-7255	CB/PA/ANL/NB/SWR CAL
	Printed Circuit Board	X-4988	Main
	Printed Circuit Board	X-4992	SWR
	Printed Circuit Board	X-4993	VCO
	Printed Circuit Board	X-4994	Matrix
	Clock	X-4989	

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

ITEM	PART No.
Cabinet (Assembly	Z-2589
Rear Panel	Z-2590
Bottom Panel	Z-2591
Front Panel	Z-2592

ITEM	PART No.
Knob	K-2043
Knob Channel	K-2592
Channel Disk	K-2044

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
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