## 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 GEN-702A



MANUFACTURER'S SPECIFICATIONS

| | |
|---|---|
| Semiconductors | 32 transistors, 27 diodes, 2 ICs, 2 FETs, 3 LEDs |
| Frequency Range | 26.965 MHz – 27.405 MHz (channels 1–40) |
| Antenna Impedance | 50 ohms |
| Modulation | AM (Amplitude Modulation) |
| Channel Display | 7-segement LEDs |
| Clock Display | 7-segement LEDs |
| Speaker | 3-1/2" (8.9 cm), 8 ohms |
| Microphone | Dynamic Microphone (500 ohms) |
| Power Supply | 120 VAC, 60 Hz or 13.8 VDC (positive or negative ground) |
| Dimensions | 14-3/16" (W) x 4-31/32" (H) x 10-1/16" (D)<br>36 cm (W) x 12.6 cm (H) x 25.5 cm (D) |
| Weight | 11 lbs, 11 oz. (5.3 kg) |
| Circuit | PLL synthesized dual conversion superheterodyne |
| IF Frequency | 1st IF (10.695 MHz); 2nd IF (455 KHz) |
| Sensitivity at S+N/N 10 db | 0.5 $\mu$V |
| S+N/N at 1 mV input | 50 db |
| Selectivity | 60 db (±10 KHz) |
| AGC | 80 db |
| Audio Power Output | 5.5 watts |
| Audio Frequency Response | 300–2500 Hz |
| Spurious Response | –50 db |
| Squelch Range | 1 $\mu$V to 350 $\mu$V |
| Current Drain (no signal) | 280 ma (DC) |
| RF Power Output | 4 watts maximum |
| Modulation Capability | 100% maximum |
| Spurious Response | –70 db |

Courtesy of the Manufacturer

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

 Printed in U. S. of America 8CE860

## 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.
Adjust VR1 for 13.8-volt at TPQ.(Q1 Emitter)
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 thru L105, L201 thru L207, L8 ..... | 9440 |
| TC101, TC102, TC201 ..... | 8276, 5000 |
| L106, T101, T201 thru T205, T1 thru T6 ..... | 5009, 8728, 8728A |
| L208 thru L212 ..... | 9091, 8728, 8728A |

## SYNTHESIZER ALIGNMENT

| TEST EQUIPMENT | TRANSCEIVER | ADJUST | REMARKS |
|---|---|---|---|
| Input of oscilloscope to TPJ (T101 Secondary). | Ch. 19 | T101 | Adjust for maximum. |
| Input of frequency counter to TPJ (T101 Secondary). | Ch. 19 | TC101 | Adjust for 10.240MHz ±50Hz. |
| Input of oscilloscope to TPK (L105 Secondary). | Ch. 19<br>Fine Tune 0 | L105 | Adjust for maximum. |
| Input of frequency counter to TPK (L105 Secondary). | Ch. 19<br>Fine Tune 0 | TC102 | Adjust for 36.190MHz ±50Hz. |
| Input of DC meter to TPN (Junction of R106 and R117). | Ch. 19<br>Fine Tune 0 | L102 | Adjust for 2.84 volts. |
| Input of oscilloscope to TPX (L101 **Secondary**). | Ch. 19<br>Fine Tune 0 | L101 | Adjust for maximum. |
| Input of oscilloscope to TPL (Q109 Collector). | Ch. 19<br>Fine Tune 0 | L106 | Adjust for symmetric square wave. |
| Input of oscilloscope to TPD (L104 Secondary). | Ch. 19<br>Fine Tune 0 | L103,L104 | Adjust for maximum. |
| Input of frequency counter to TPD (L104 Secondary). | Ch. 19<br>Fine Tune + | VR202 | Adjust for 37.881MHz. |
| | Ch. 19<br>Fine Tune - | VR203 | Adjust for 37.879MHz. |
| | Ch. 1<br>Fine Tune 0 | | Check for 37.660MHz. Check all channels. (See Truth Chart for correct frequencies.) |
| Input of frequency counter to TPL (Q109 Collector) | Ch. 1<br>Fine Tune 0 | | Check for 1.470MHz. Check all channels. (See Truth Chart for correct frequencies.) |
| Input of frequency counter to TPZ (Q216 Base). | Ch. 1, XMT | TC201 | Disconnect C274. Adjust for 10.695MHz. Reconnect C274. |
| Input of frequency counter to antenna jack. | Ch. 1, XMT | | Check for 26.965MHz. If necessary, readjust TC201 for 26.965MHz. |

## 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.
Fine Tune 0, ANL Off, Squelch MINIMUM

| TEST EQUIPMENT | TRANSCEIVER | ADJUST | REMARKS |
|---|---|---|---|
| Output of signal generator thru .01uF to TPA ( 203 Base). 455kHz, 1000Hz @ 30% modulation. | Ch. 19 | T205,T204, T203 | Adjust for maximum output. |
| Output of signal generator thru .01uF to antenna jack. 27.185MHz,1000Hz @ 30% modulation. | Ch. 19 | T20 ,T201 L202,L201 | Adjust for maximum output. If necessary readjust T203, T204 and T205. |

## RECEIVER ADJUSTMENTS

Connect an AC VTVM or AF wattmeter across speaker voice coil.
Adjust volume control to obtain a suitable indication.
Fine Tune 0, ANL Off

| TEST EQUIPMENT | TRANSCEIVER | ADJUST | REMARKS |
|---|---|---|---|
| Output of signal generator thru .01uF to antenna jack. 27.185MHz,1000Hz @ 30% modulation. Output 1000uV. | Ch. 19 Squelch Maximum | VR204 | SQUELCH RANGE Adjust VR204 so that squelch just breaks. |
| Output of signal generator thru .01uF to antenna jack. 27.185MHz,1000Hz @ 30% modulation. Output 100uV. | Ch. 19 Squelch MINIMUM S/RF/SWR/CAL S/RF | VR201 | SIGNAL METER Adjust VR201 for 9 on 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 |
|---|---|---|---|
| | Ch. 19 | L203,L204, L205,L206, L207,L208, L209,L210, L211 | Adjust for maximum. |
| | Ch. 19 | L208 | Adjust for 4 watts maximum. |
| Input of spectrum analyzer or harmonic meter to antenna jack. | Ch. 19 | L212 | Adjust for MINIMUM at 54MHz. |

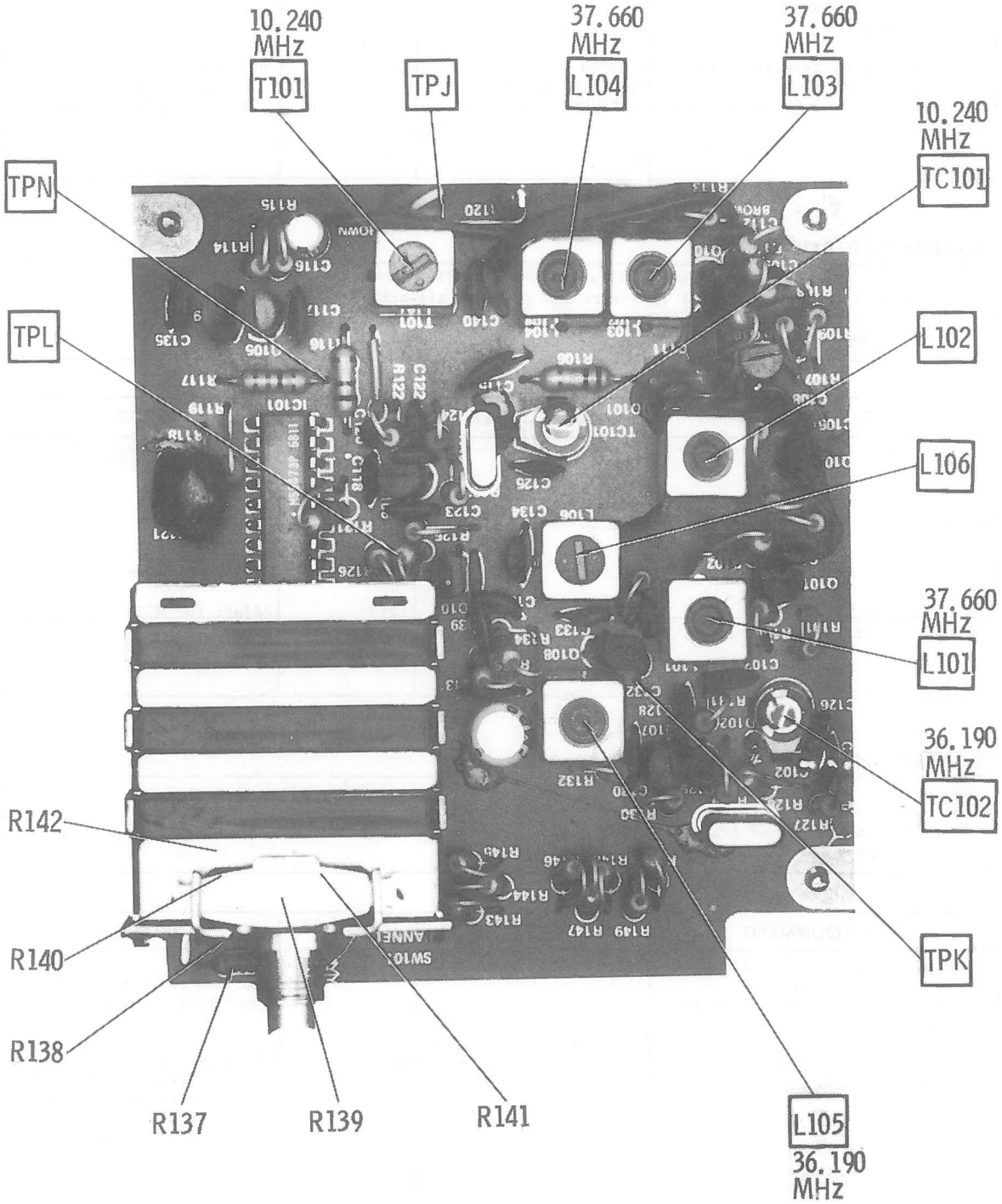
## TRANSMITTER ADJUSTMENTS

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.

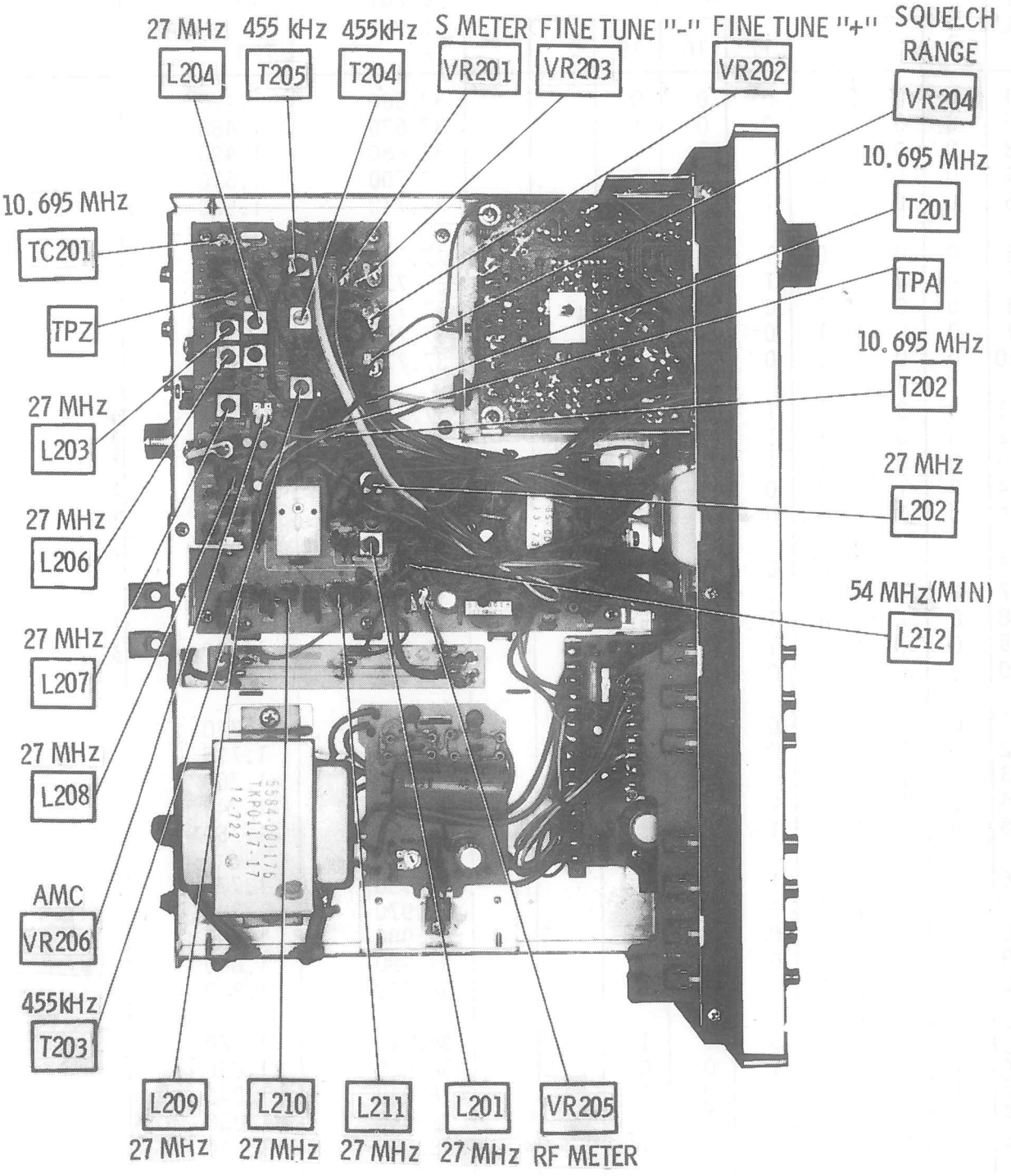
| TEST EQUIPMENT | TRANSCEIVER | ADJUST | REMARKS |
|---|---|---|---|
| Input of oscilloscope or modulation meter to antenna jack. Inject a 1000Hz, 180mV signal at Mic input. | Ch. 19 | VR206 | AMC Adjust VR206 for 100% modulation maximum. |
| Connect an RF wattmeter and 50-ohm, 25-watt dummy load to antenna connector. | Ch. 19 S/RF/SWR/CAL S/RF | VR205 | RF POWER METER Adjust VR205 so that RF POWER meter reads just below the red on the RF power scale of meter. |

ALARM ADJUST

Adjust VR701 for desired volume level of alarm.


10.240 MHz
T101
TPJ
37.660 MHz
L104
37.660 MHz
L103
10.240 MHz
TC101
TPN
TPL
L102
L106
37.660 MHz
L101
36.190 MHz
TC102
R142
R140
R138
R137
R139
R141
TPK
L105
36.190 MHz

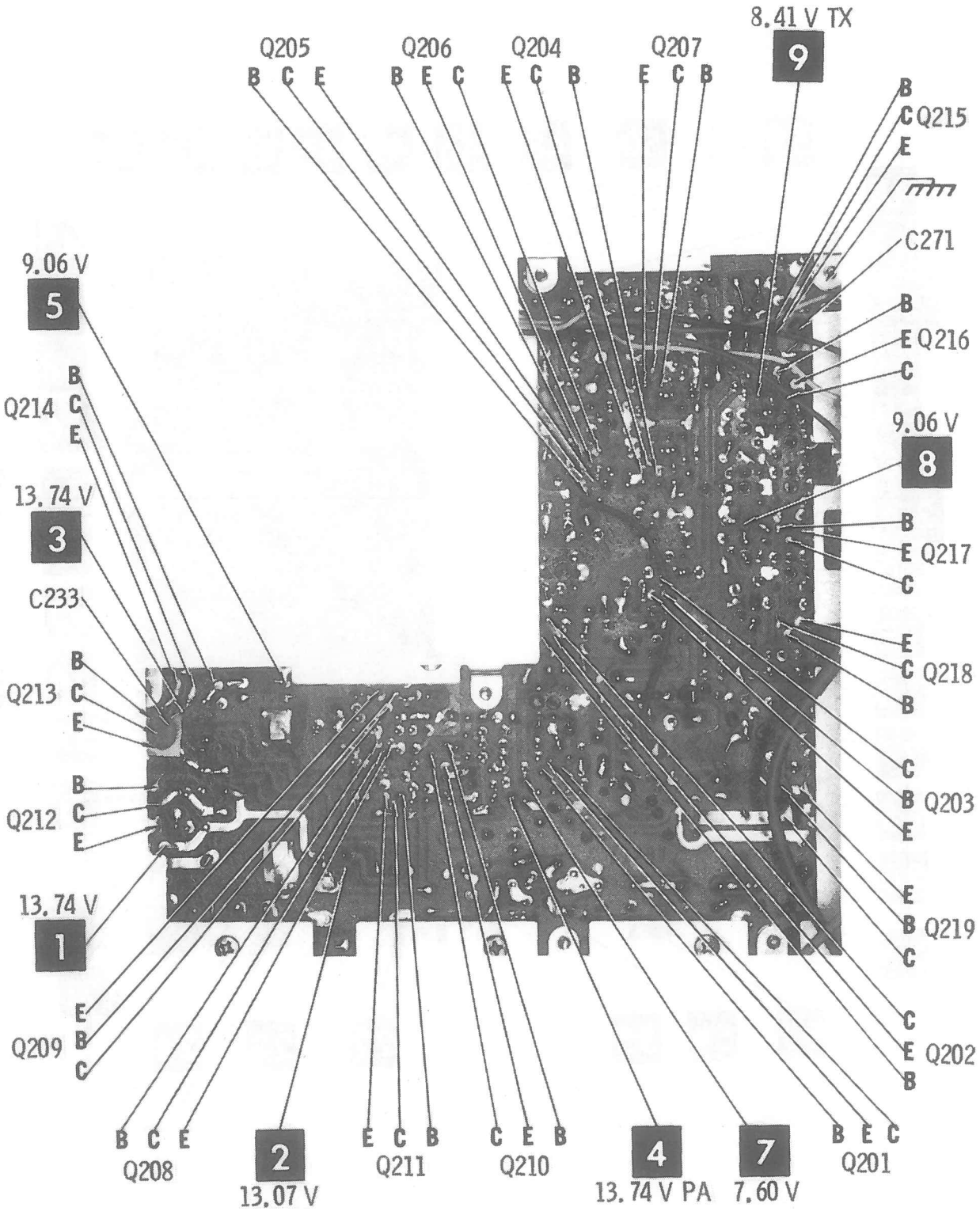
PLL BOARD


27 MHz
L204
455 kHz
T205
455kHz
T204
S METER
VR201
FINE TUNE "-"
VR203
FINE TUNE "+"
VR202
SQUELCH
RANGE
VR204
10.695 MHz
TC201
10.695 MHz
T201
TPZ
TPA
10.695 MHz
T202
27 MHz
L203
27 MHz
L202
27 MHz
L206
54 MHz(MIN)
L212
27 MHz
L207
27 MHz
L208
AMC
VR206
455kHz
T203
L209
27 MHz
L210
27 MHz
L211
27 MHz
L201
27 MHz
VR205
RF METER

CHASSIS-TOP

## TRUTH CHART

| CHANNEL | 1 = 6.65 Volts 0 = 0 Volts PROGRAM DIVIDER PINS 3 | 2 | 1 | 17 | 16 | 15 | | | REC & XMT SYNTHESIZER OUTPUT IN MHz AT TPF | DIVIDER INPUT IN MHz AT TPD | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | | | 37.660 | 1.470 | |
| 2 | 0 | 0 | 0 | 0 | 0 | 1 | | | 37.670 | 1.480 | |
| 3 | 0 | 0 | 0 | 0 | 1 | 0 | | | 37.680 | 1.490 | |
| 4 | 0 | 0 | 0 | 1 | 0 | 0 | | | 37.700 | 1.510 | |
| 5 | 0 | 0 | 0 | 1 | 0 | 1 | | | 37.710 | 1.520 | |
| 6 | 0 | 0 | 0 | 1 | 1 | 0 | | | 37.720 | 1.530 | |
| 7 | 0 | 0 | 0 | 1 | 1 | 1 | | | 37.730 | 1.540 | |
| 8 | 0 | 0 | 1 | 0 | 0 | 1 | | | 37.750 | 1.560 | |
| 9 | 0 | 0 | 1 | 0 | 1 | 0 | | | 37.760 | 1.570 | |
| 10 | 0 | 0 | 1 | 0 | 1 | 1 | | | 37.770 | 1.580 | |
| 11 | 0 | 0 | 1 | 1 | 0 | 0 | | | 37.780 | 1.590 | |
| 12 | 0 | 0 | 1 | 1 | 1 | 0 | | | 37.800 | 1.610 | |
| 13 | 0 | 0 | 1 | 1 | 1 | 1 | | | 37.810 | 1.620 | |
| 14 | 0 | 1 | 0 | 0 | 0 | 0 | | | 37.820 | 1.630 | |
| 15 | 0 | 1 | 0 | 0 | 0 | 1 | | | 37.830 | 1.640 | |
| 16 | 0 | 1 | 0 | 0 | 1 | 1 | | | 37.850 | 1.660 | |
| 17 | 0 | 1 | 0 | 1 | 0 | 0 | | | 37.860 | 1.670 | |
| 18 | 0 | 1 | 0 | 1 | 0 | 1 | | | 37.870 | 1.680 | |
| 19 | 0 | 1 | 0 | 1 | 1 | 0 | | | 37.880 | 1.690 | |
| 20 | 0 | 1 | 1 | 0 | 0 | 0 | | | 37.900 | 1.710 | |
| 21 | 0 | 1 | 1 | 0 | 0 | 1 | | | 37.910 | 1.720 | |
| 22 | 0 | 1 | 1 | 0 | 1 | 0 | | | 37.920 | 1.730 | |
| 23 | 0 | 1 | 1 | 1 | 0 | 1 | | | 37.950 | 1.760 | |
| 24 | 0 | 1 | 1 | 0 | 1 | 1 | | | 37.930 | 1.740 | |
| 25 | 0 | 1 | 1 | 1 | 0 | 0 | | | 37.940 | 1.750 | |
| 26 | 0 | 1 | 1 | 1 | 1 | 0 | | | 37.960 | 1.770 | |
| 27 | 0 | 1 | 1 | 1 | 1 | 1 | | | 37.970 | 1.780 | |
| 28 | 1 | 0 | 0 | 0 | 0 | 0 | | | 37.980 | 1.790 | |
| 29 | 1 | 0 | 0 | 0 | 0 | 1 | | | 37.990 | 1.800 | |
| 30 | 1 | 0 | 0 | 0 | 1 | 0 | | | 38.000 | 1.810 | |
| 31 | 1 | 0 | 0 | 0 | 1 | 1 | | | 38.010 | 1.820 | |
| 32 | 1 | 0 | 0 | 1 | 0 | 0 | | | 38.020 | 1.830 | |
| 33 | 1 | 0 | 0 | 1 | 0 | 1 | | | 38.030 | 1.840 | |
| 34 | 1 | 0 | 0 | 1 | 1 | 0 | | | 38.040 | 1.850 | |
| 35 | 1 | 0 | 0 | 1 | 1 | 1 | | | 38.050 | 1.860 | |
| 36 | 1 | 0 | 1 | 0 | 0 | 0 | | | 38.060 | 1.870 | |
| 37 | 1 | 0 | 1 | 0 | 0 | 1 | | | 38.070 | 1.880 | |
| 38 | 1 | 0 | 1 | 0 | 1 | 0 | | | 38.080 | 1.890 | |
| 39 | 1 | 0 | 1 | 0 | 1 | 1 | | | 38.090 | 1.900 | |
| 40 | 1 | 0 | 1 | 1 | 0 | 0 | | | 38.100 | 1.910 | |


A Howard W. Sams CIRCUITRACE® Photo
8.41 V TX
9
Q205
B C E
Q206
B E C
Q204
E C B
Q207
E C B
B
C Q215
E
C271
9.06 V
5
B
E Q216
C
Q214
B
C
E
9.06 V
8
13.74 V
3
B
E Q217
C
C233
E
C Q218
B
Q213
B
C
E
C
B Q203
E
Q212
B
C
E
E
B Q219
13.74 V
1
C
E
C
Q209
E Q202
B
C
B C E
Q208
2
13.07 V
E C B
Q211
C E B
Q210
4
13.74 V PA
7
7.60 V
B E C
Q201
MAIN BOARD

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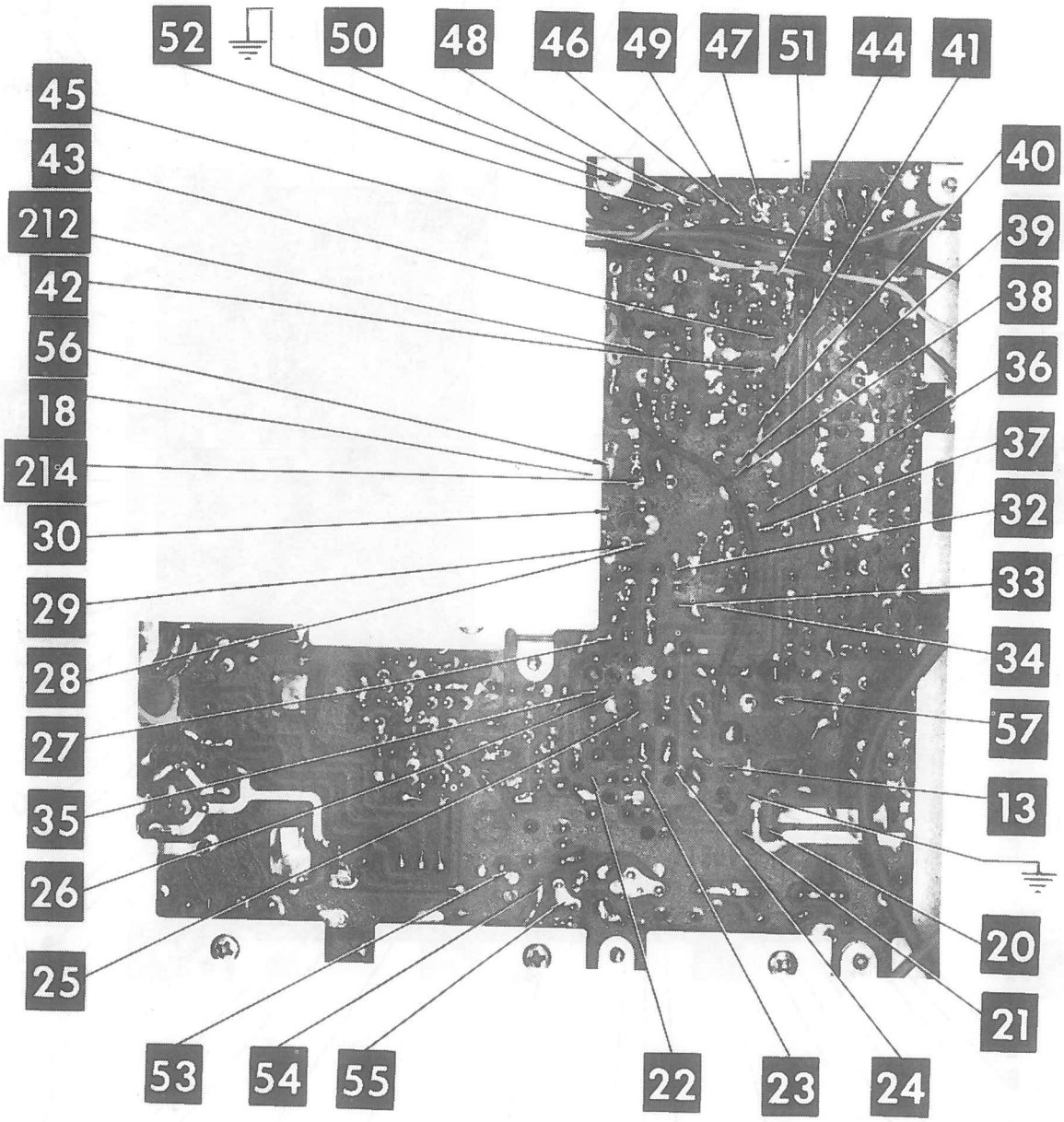
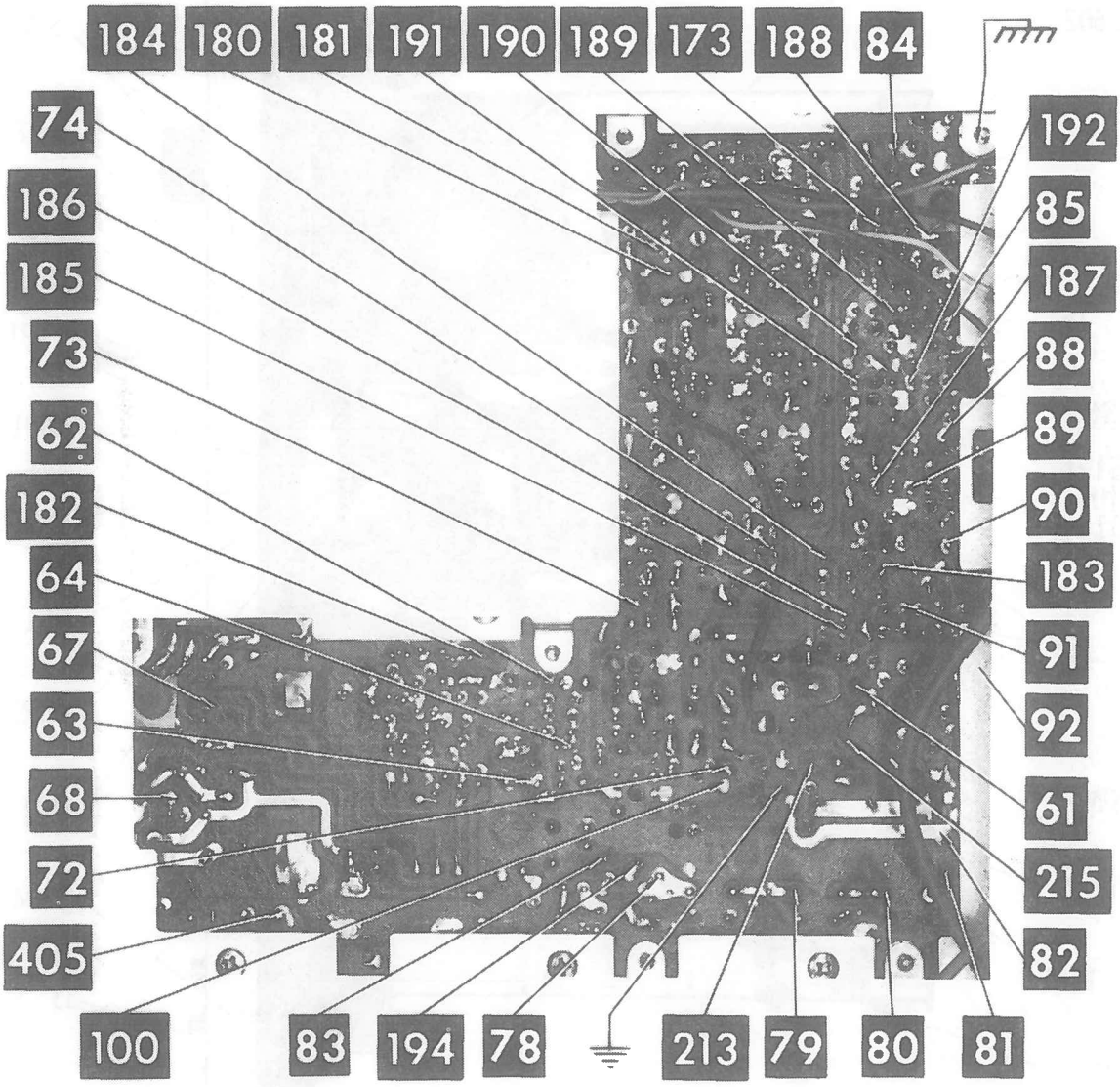



MAIN BOARD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173
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182
64
67
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72
405
100
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194
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80
81
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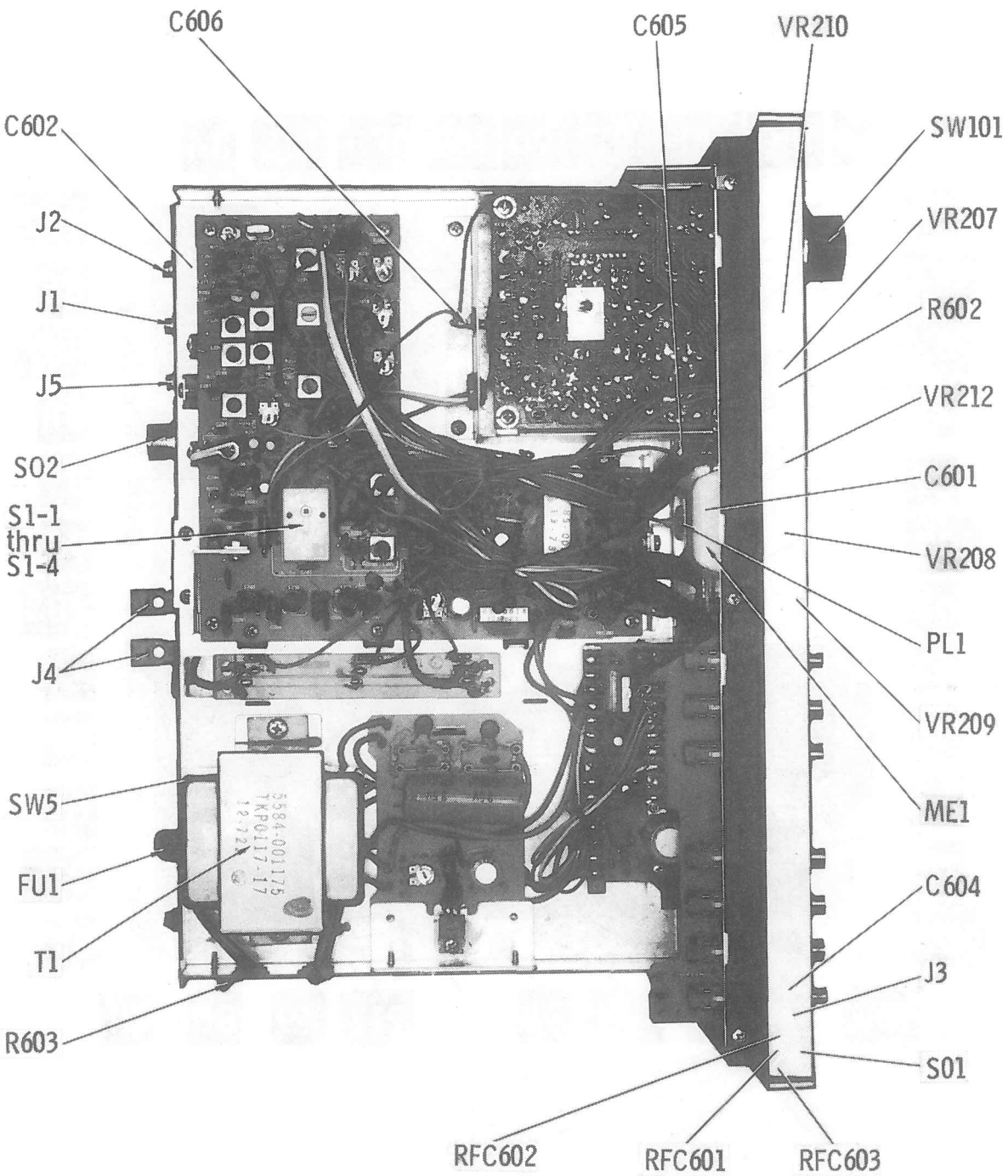
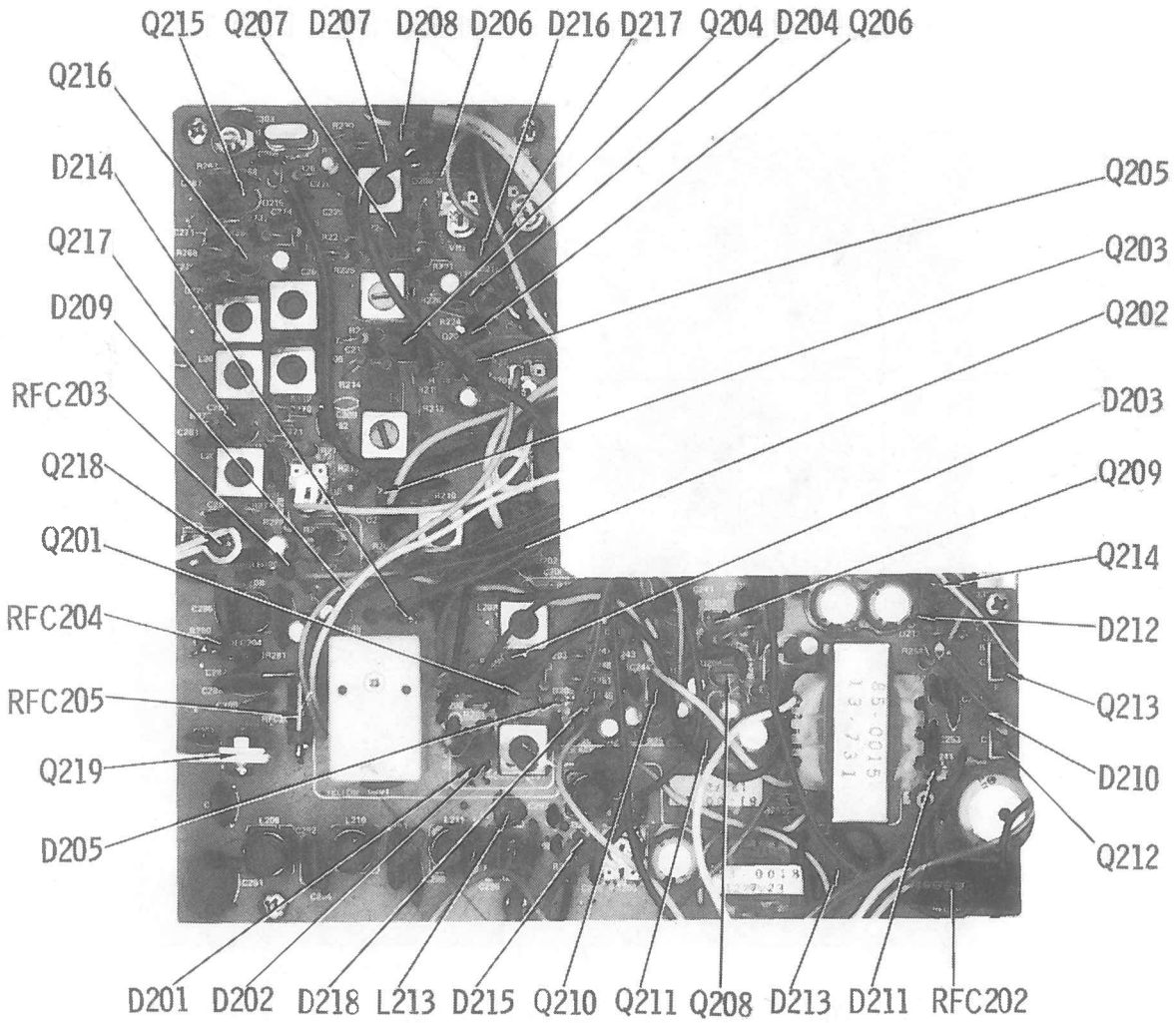
61
92
91
183
90
89
88
187
85
192

MAIN BOARD


C606
C605
VR210
C602
SW101
J2
VR207
J1
R602
J5
VR212
SO2
C601
S1-1
thru
S1-4
VR208
PL1
J4
VR209
ME1
SW5
C604
FU1
J3
T1
R603
S01
RFC602
RFC601
RFC603

CHASSIS-TOP


Q215
Q207
D207
D208
D206
D216
D217
Q204
D204
Q206
Q216
D214
Q217
D209
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Q218
Q201
RFC204
RFC205
Q219
D205
Q205
Q203
Q202
D203
Q209
Q214
D212
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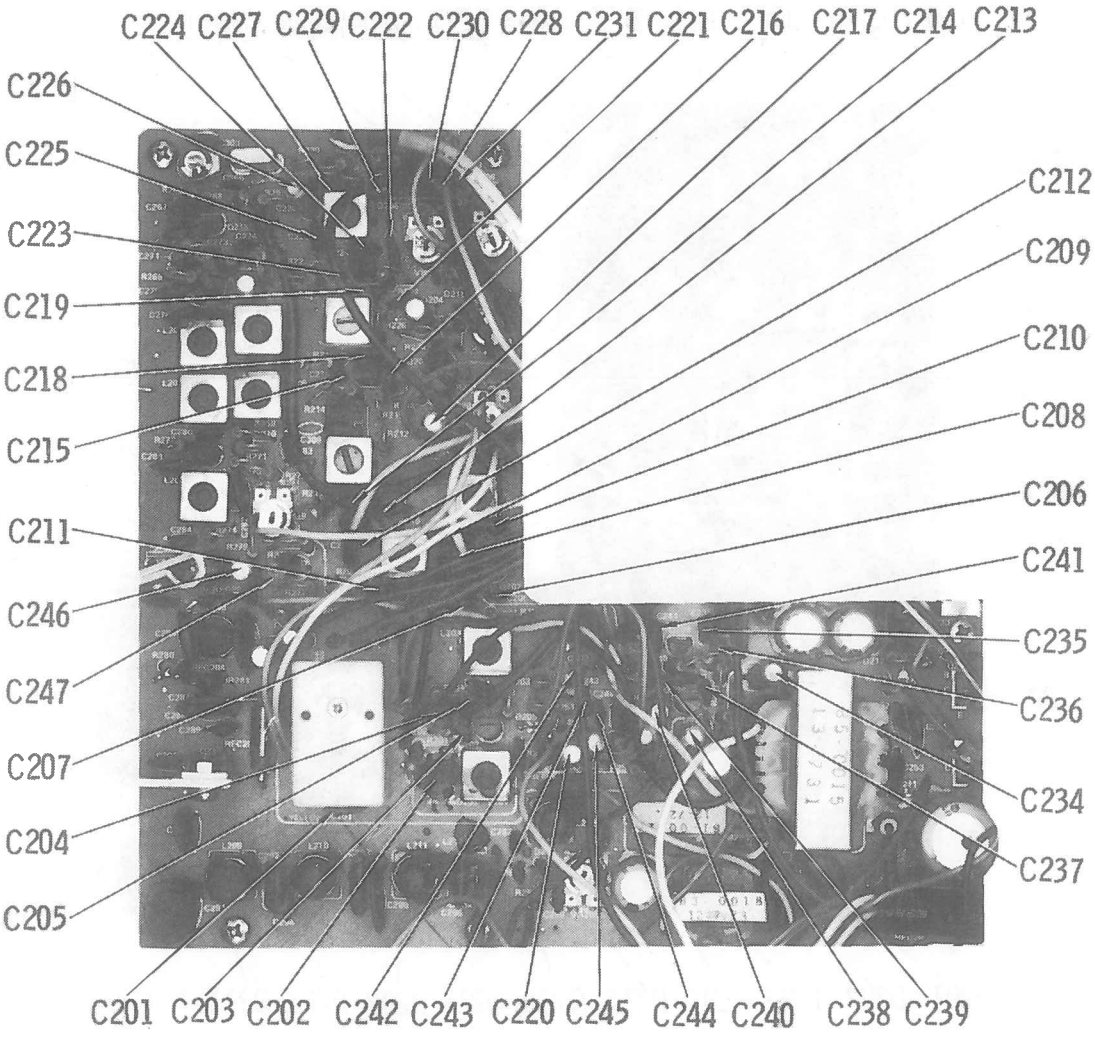
D211
RFC202

MAIN BOARD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C213
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C206
C241
C235
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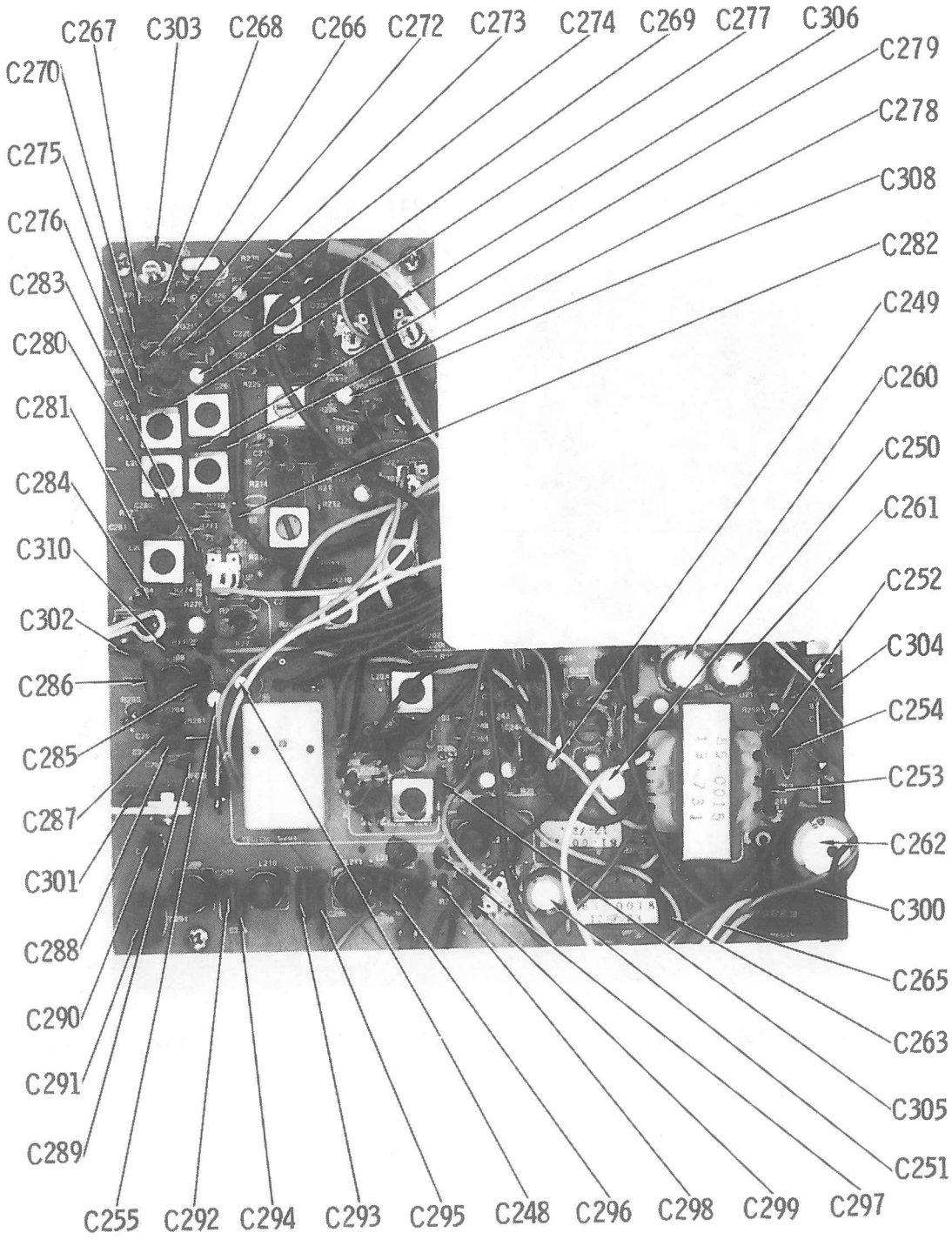
C238
C239

MAIN BOARD


C267
C303
C268
C266
C272
C273
C274
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C277
C306
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C279
C278
C275
C308
C276
C282
C283
C249
C280
C260
C281
C250
C284
C261
C310
C252
C302
C304
C286
C254
C285
C253
C287
C262
C301
C300
C288
C265
C290
C263
C291
C305
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C251
C255
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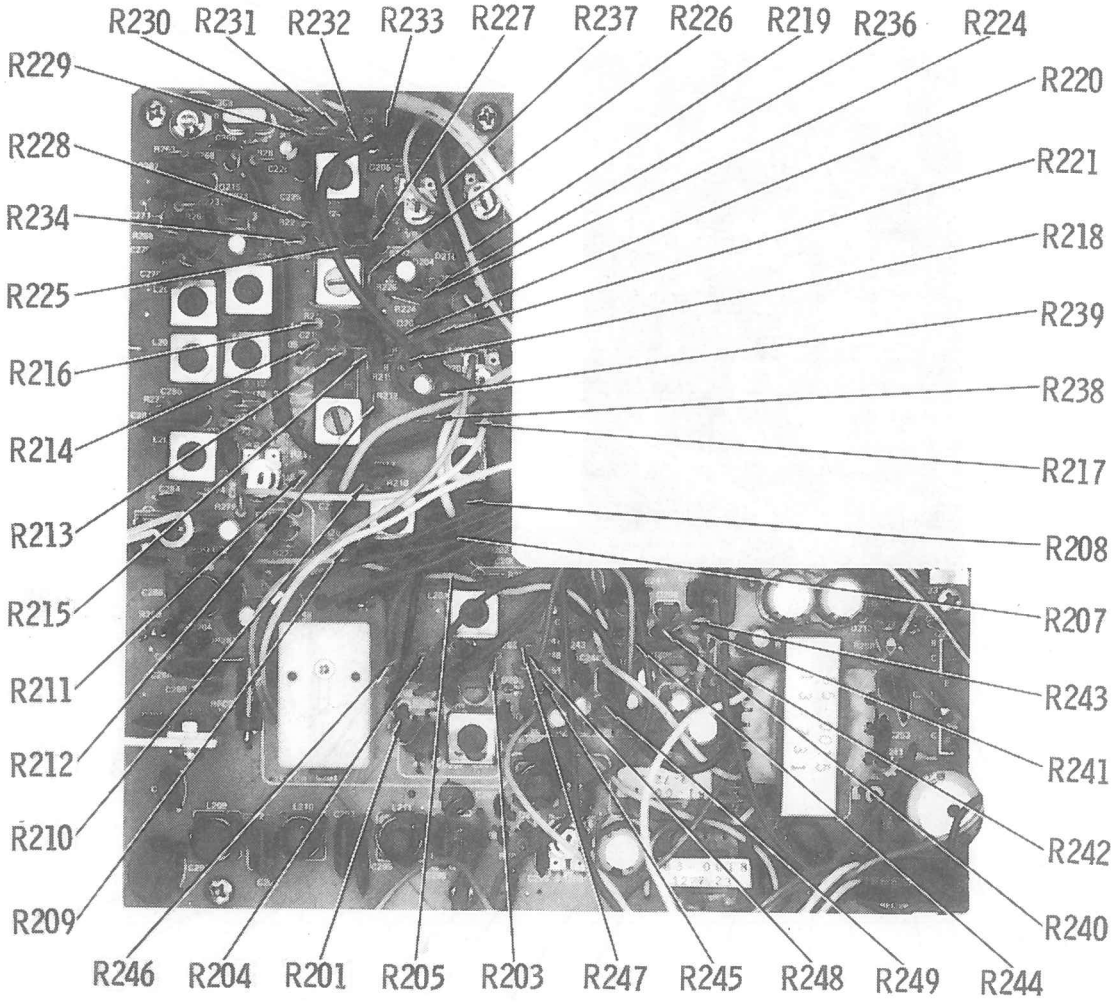
C294
C293
C295
C248
C296
C298
C299
C297

MAIN BOARD


R230
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R233
R227
R237
R226
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R236
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R220
R228
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R216
R238
R214
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R213
R208
R215
R207
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R243
R212
R241
R210
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R240
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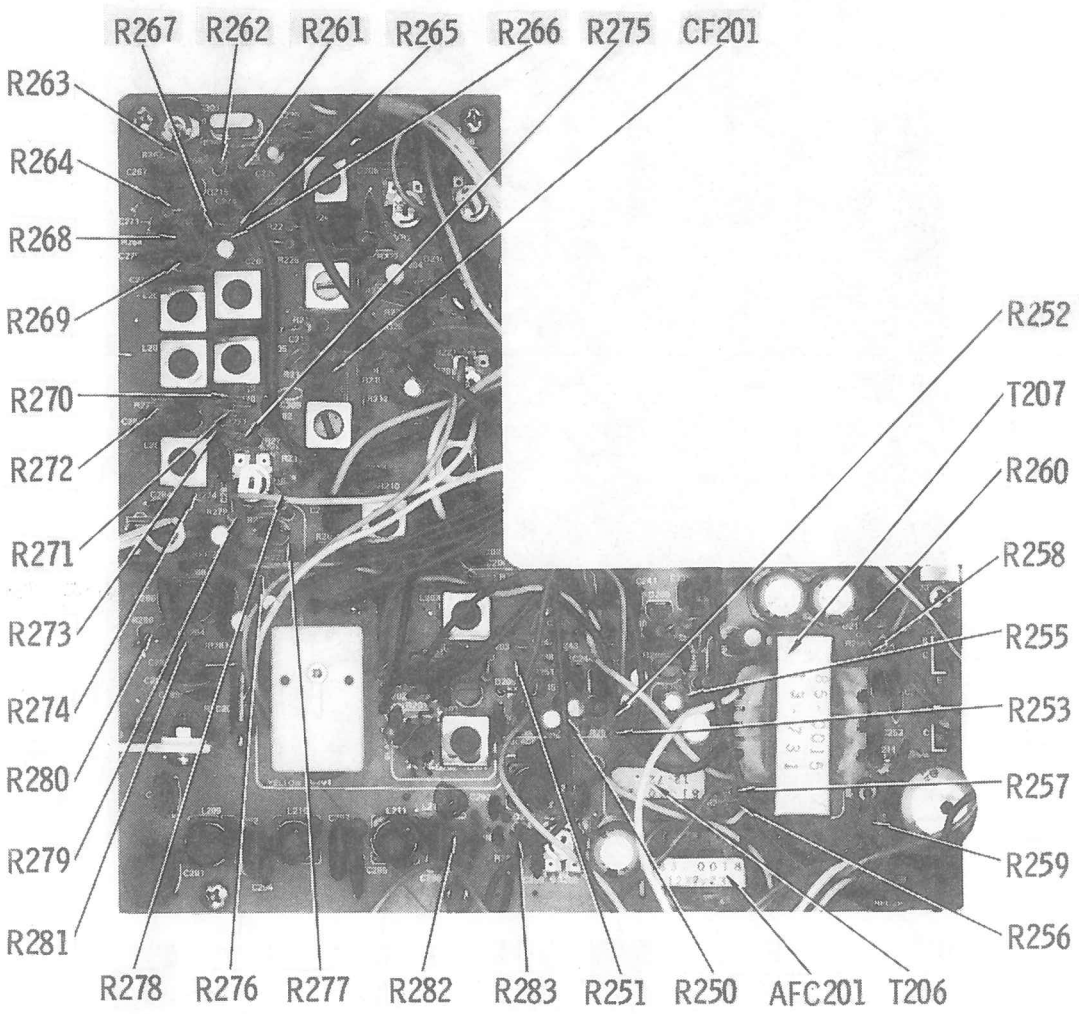
R201
R205
R203
R247
R245
R248
R249
R244

MAIN BOARD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R266
R275
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R264
R268
R269
R270
R272
R271
R273
R274
R280
R279
R281
R252
T207
R260
R258
R255
R253
R257
R259
R256
R278
R276
R277
R282
R283
R251
R250
AFC201
T206

MAIN BOARD

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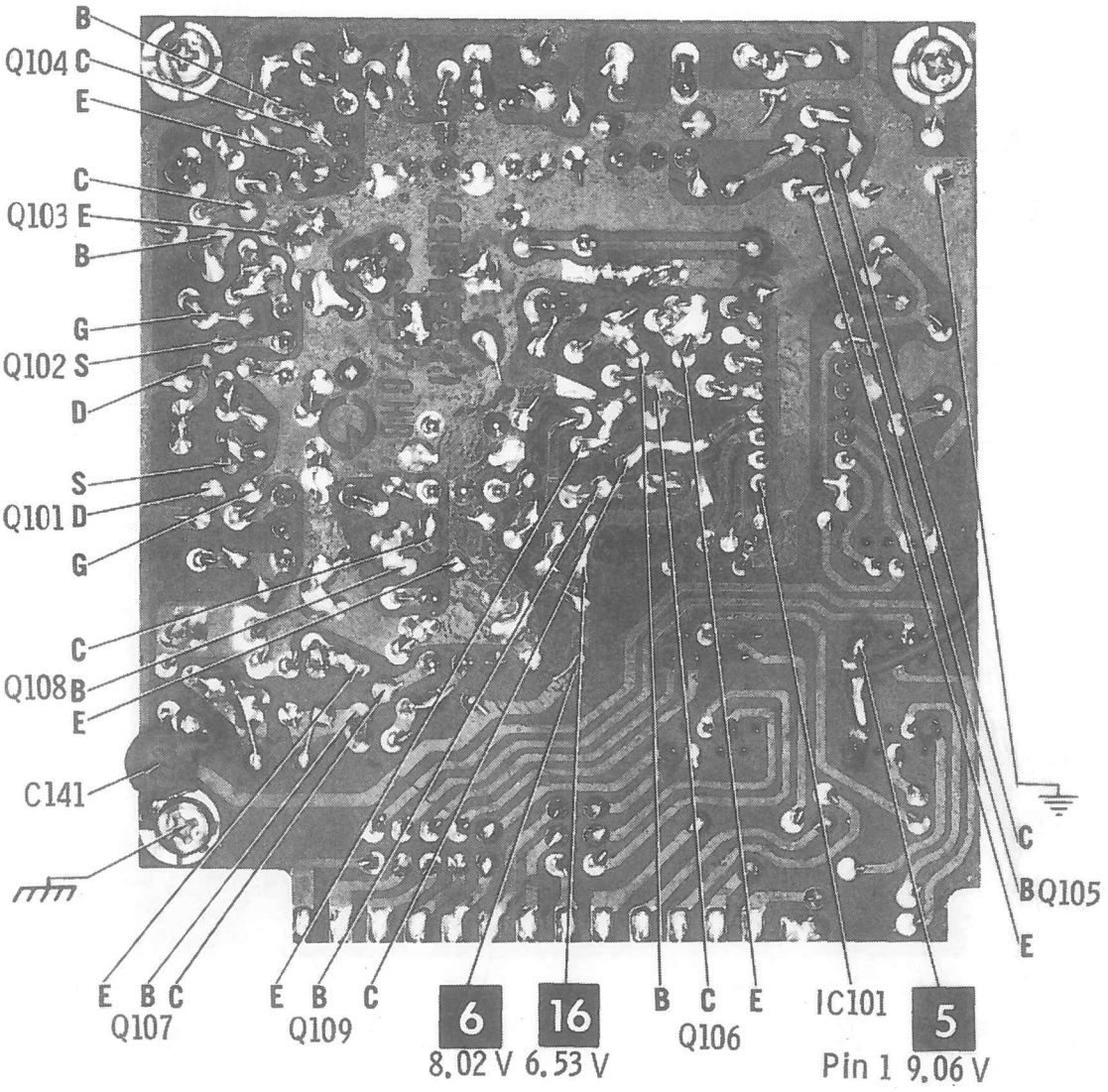
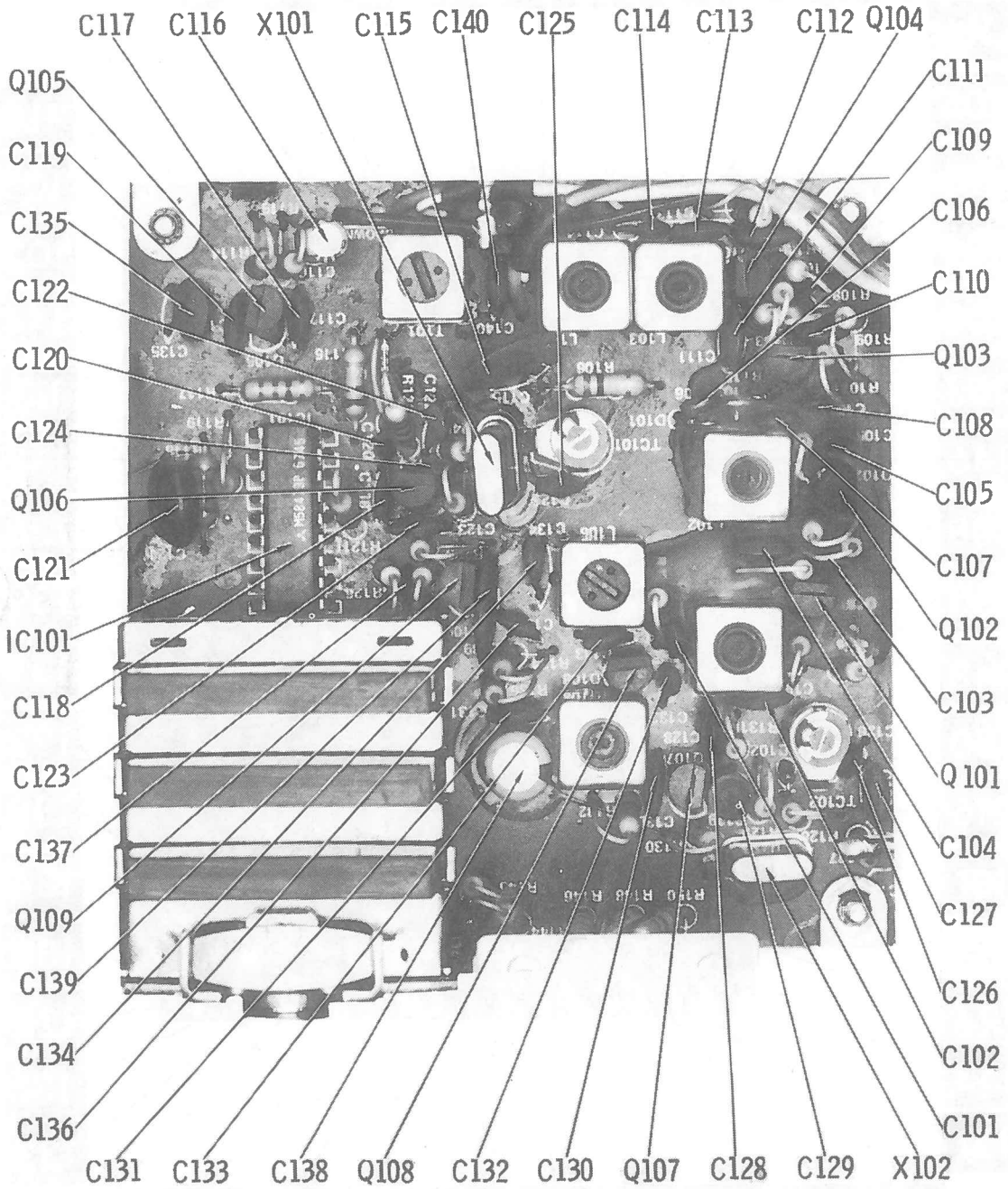



PLL BOARD


C117
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C140
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C113
C112
Q104
Q105
C111
C119
C109
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C122
C110
C120
Q103
C124
C108
Q106
C105
C121
C107
IC101
Q102
C118
C103
C123
Q101
C137
C104
Q109
C127
C139
C126
C134
C102
C136
C101
C131
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C138
Q108
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C130
Q107
C128
C129
X102

PLL BOARD

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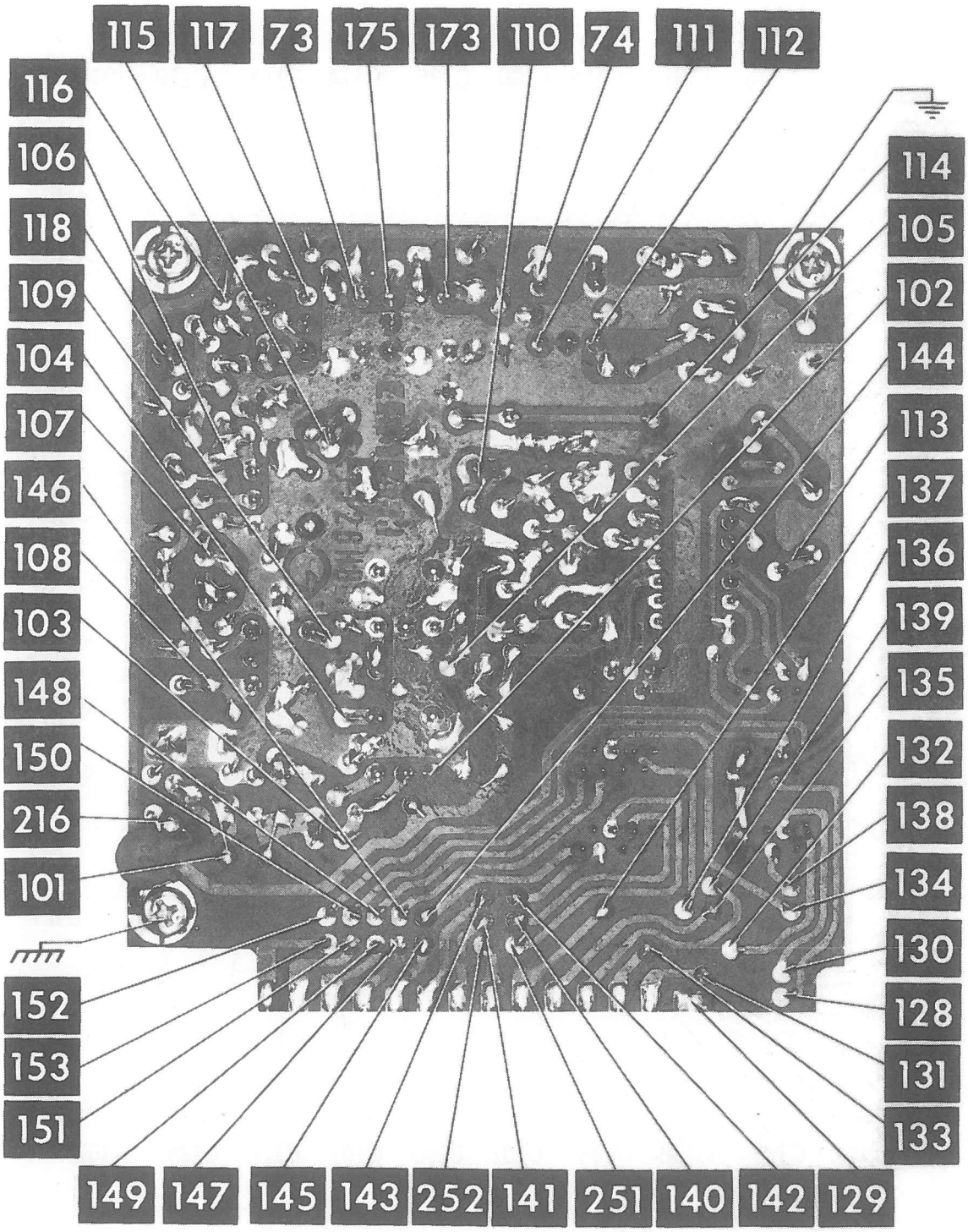
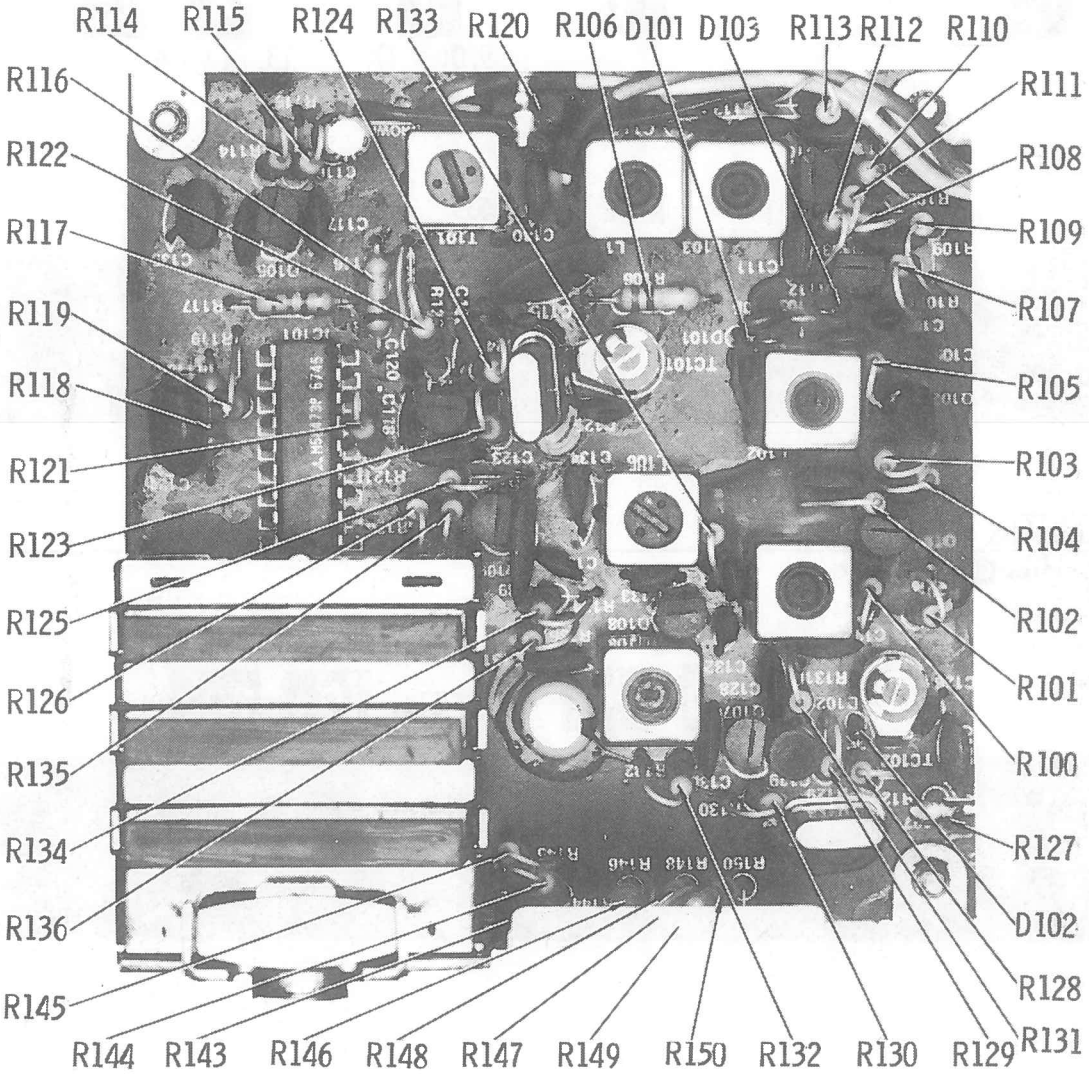



PLL BOARD


R114
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R133
R120
R106
D101
D103
R113
R112
R110
R116
R111
R122
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R109
R119
R107
R118
R105
R121
R103
R123
R104
R125
R102
R126
R101
R135
R100
R134
R127
R136
D102
R145
R128
R144
R143
R146
R148
R147
R149
R150
R132
R130
R129
R131

PLL BOARD

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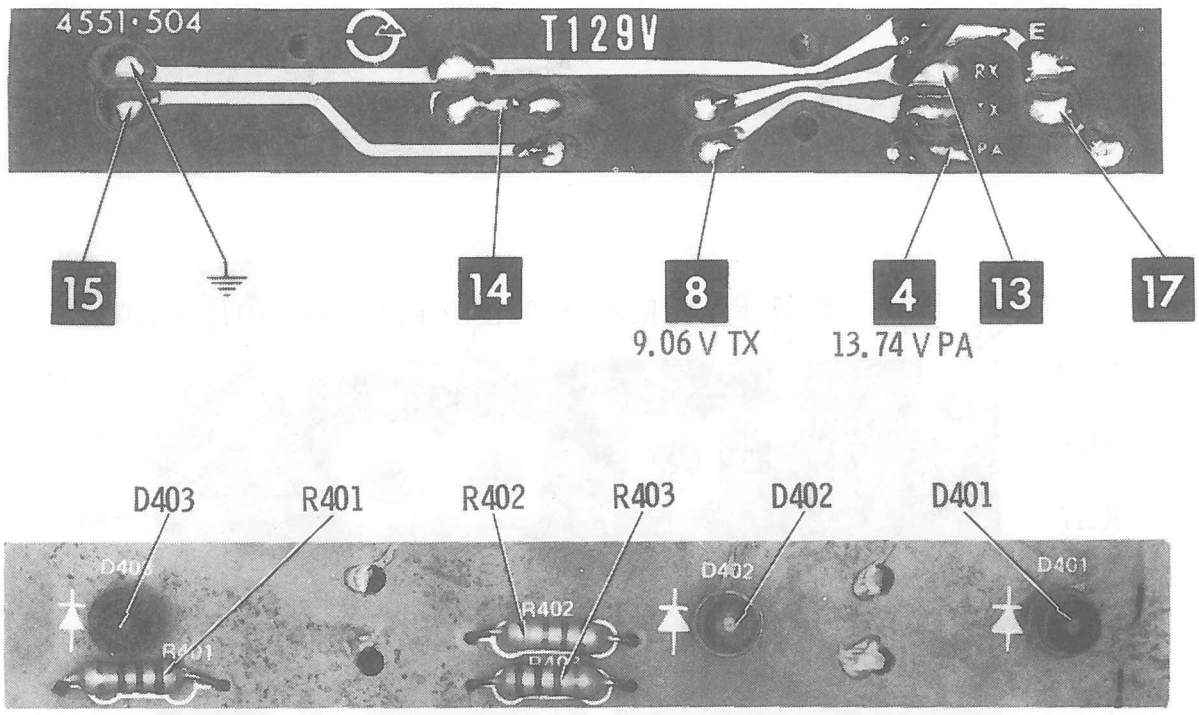


INDICATOR BOARD

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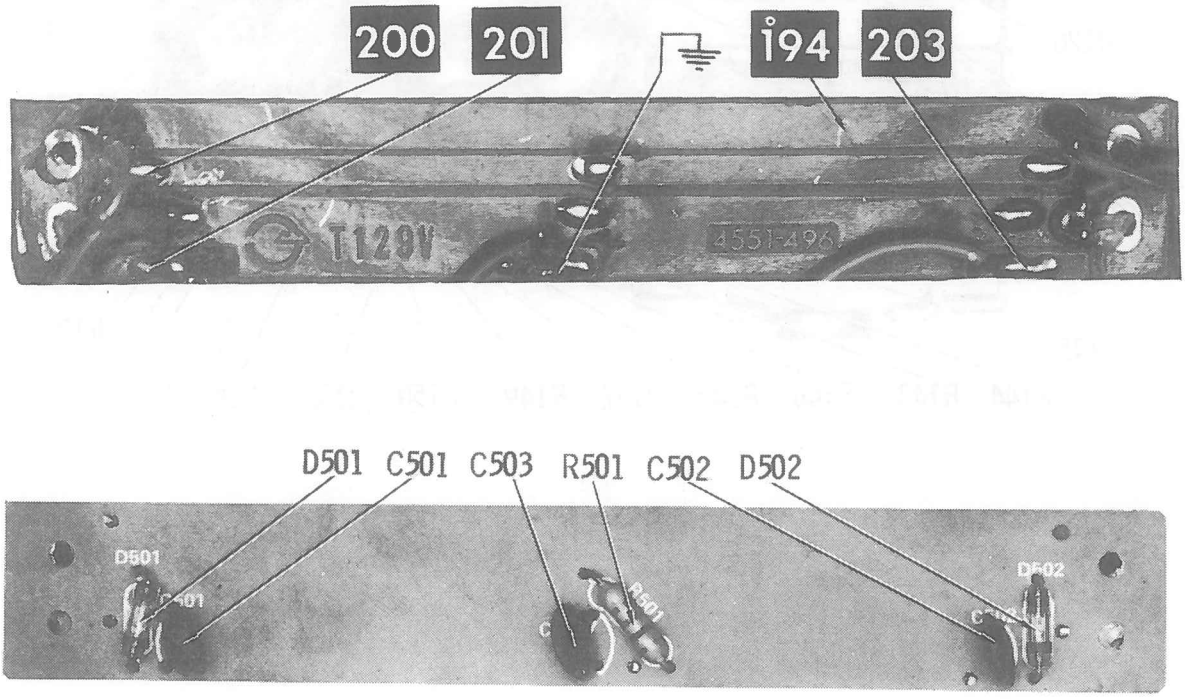


SWR BOARD

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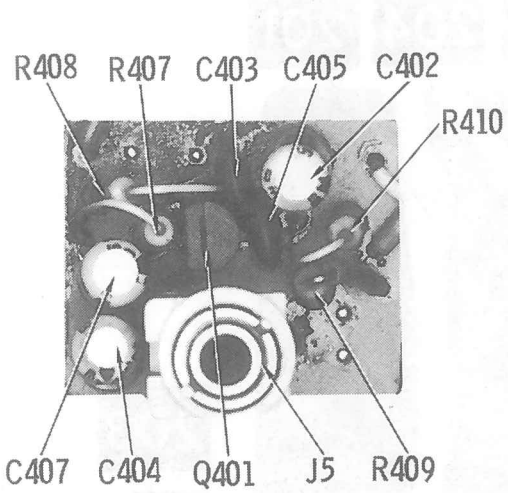
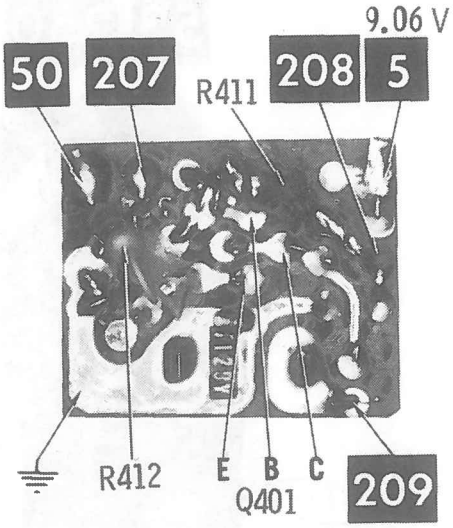
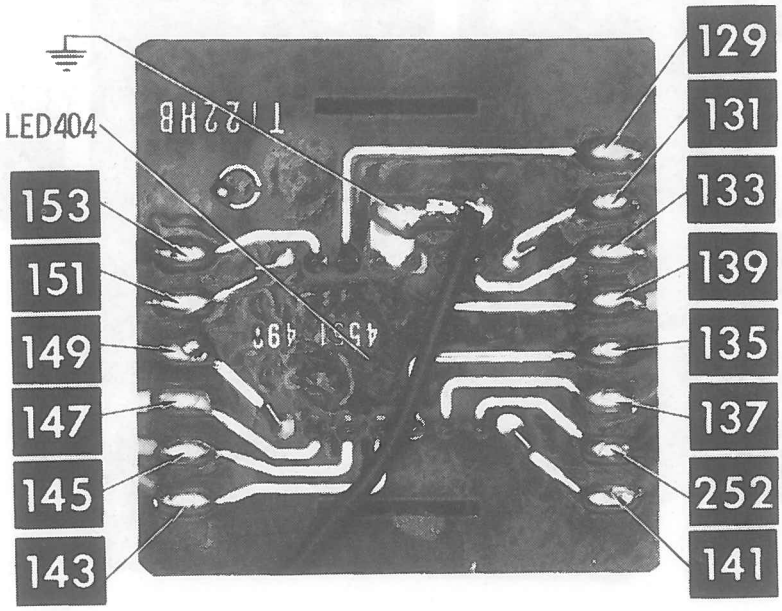


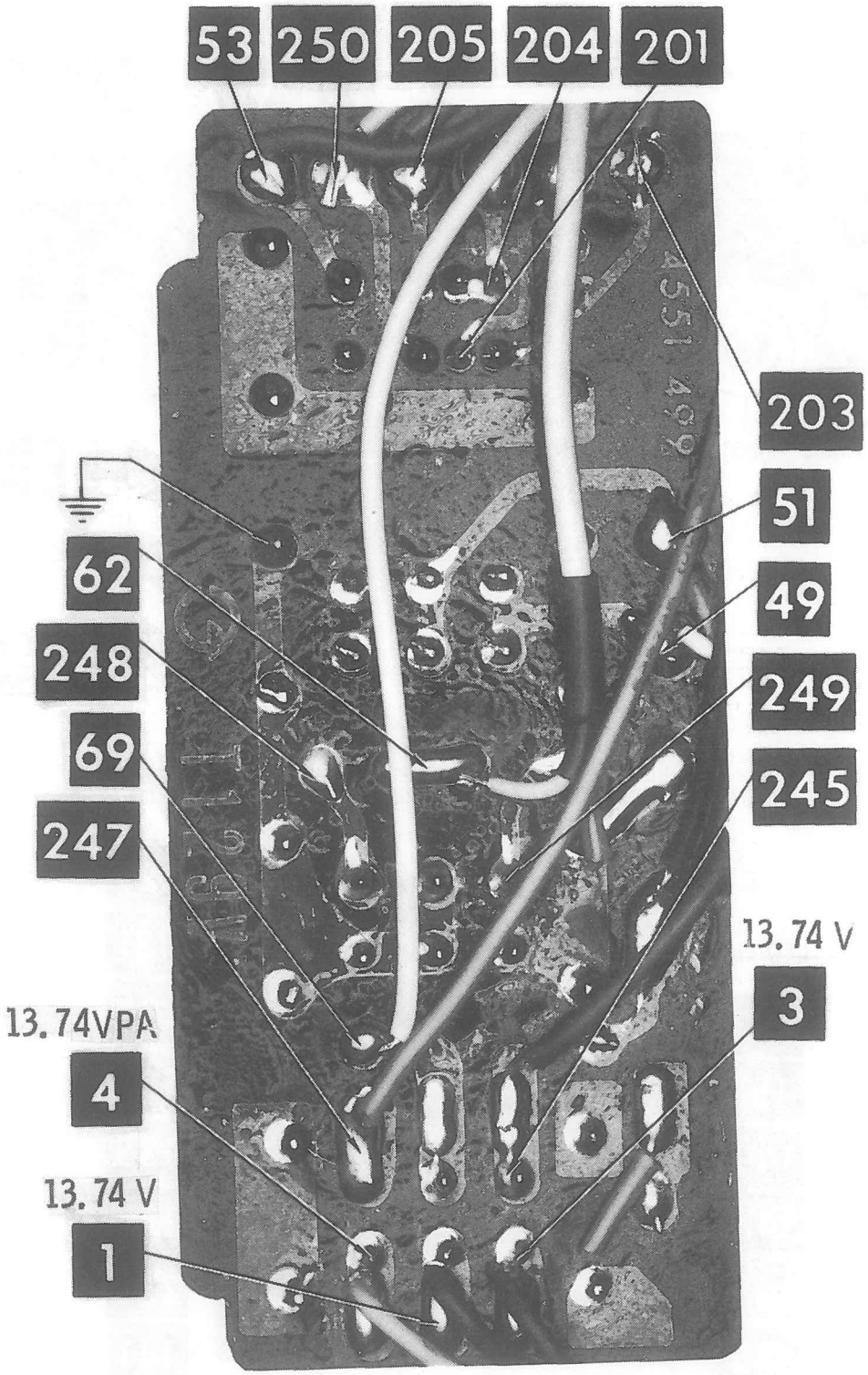

TAPE JACK BOARD

A Howard W. Sams CIRCUITRACE® Photo

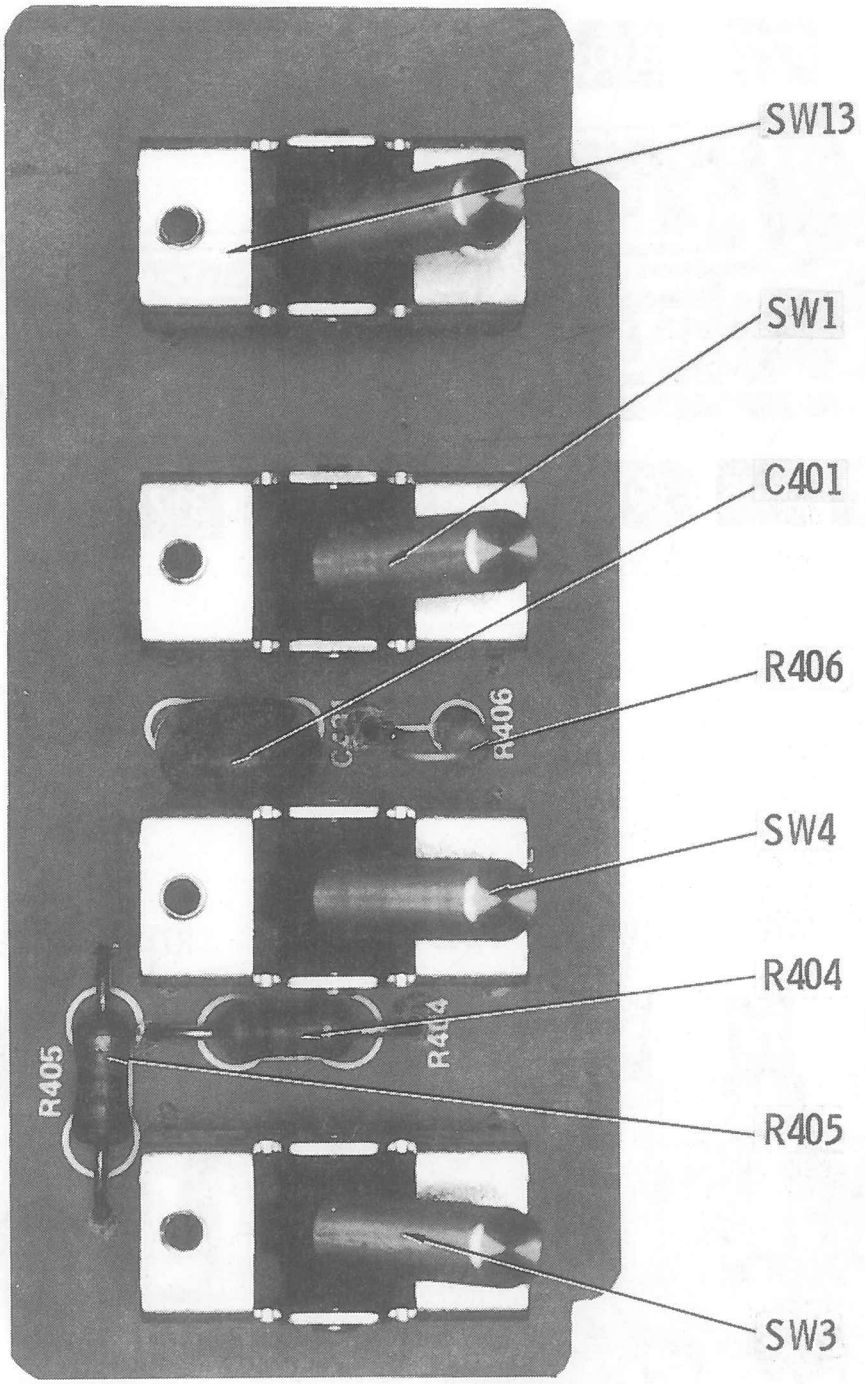



LED BOARD

A Howard W. Sams CIRCUITRACE® Photo

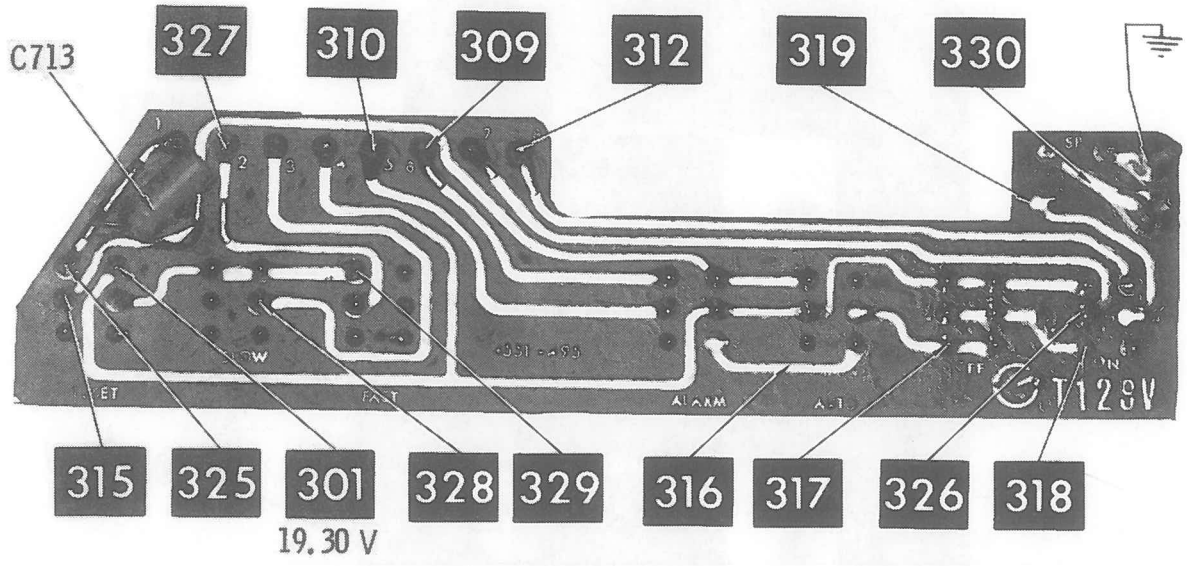


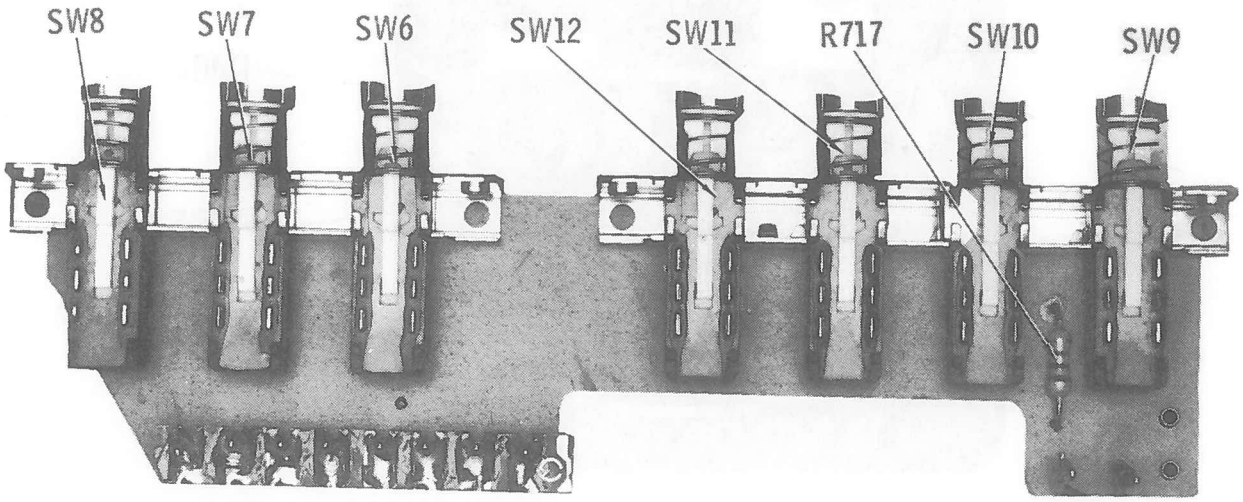

SWITCH BOARD



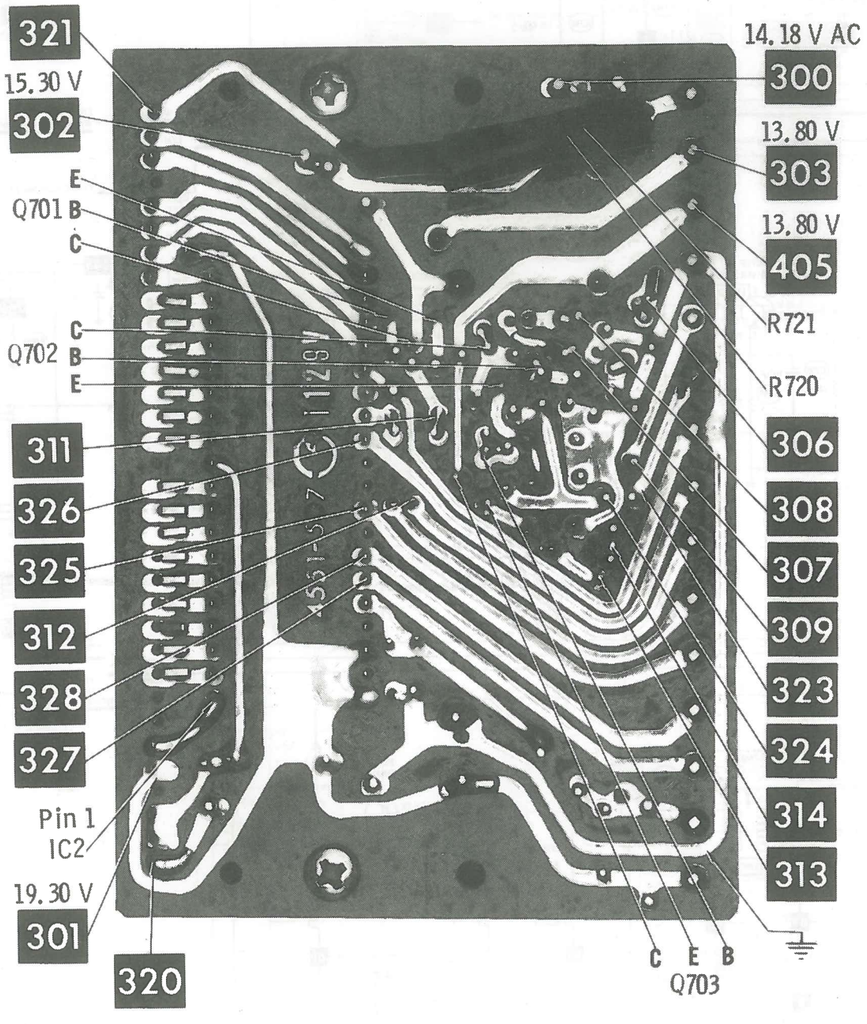

SWITCH BOARD

A Howard W. Sams CIRCUITRACE® Photo



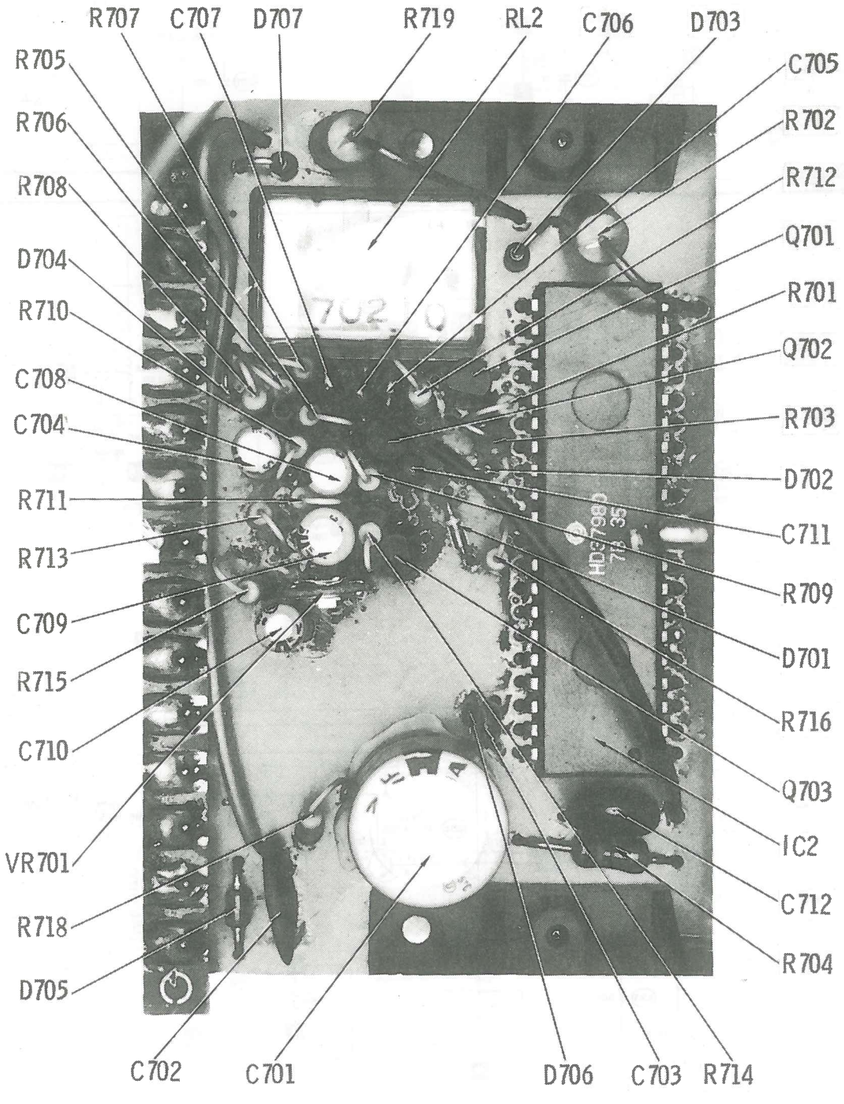




CLOCK SWITCH BOARD



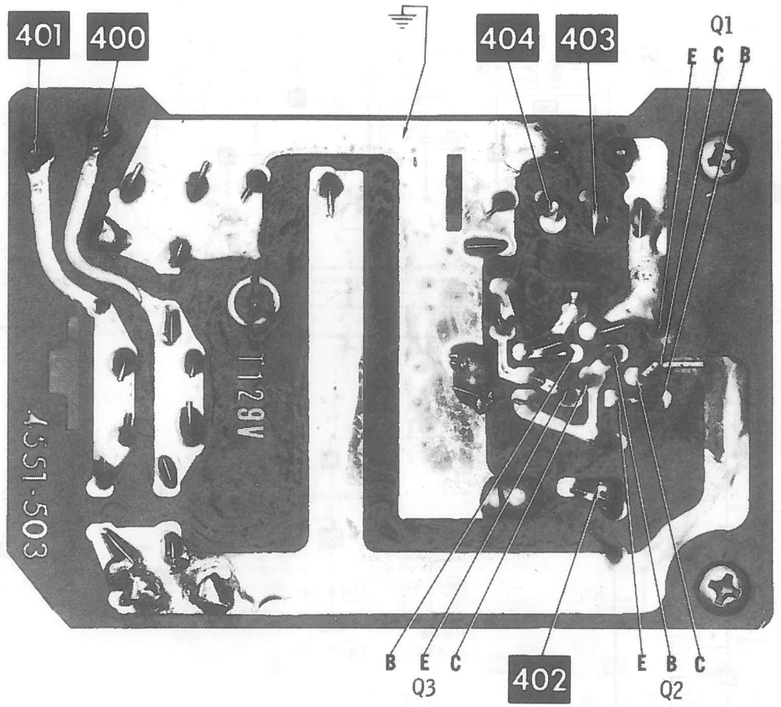

CLOCK BOARD





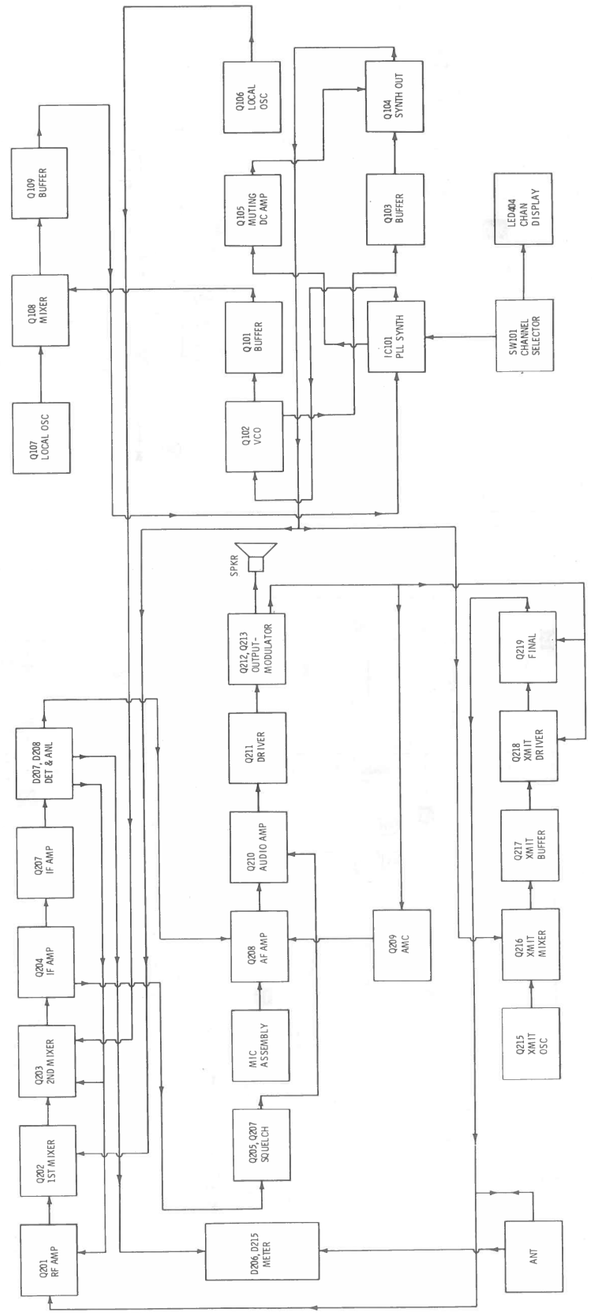

CLOCK BOARD

A Howard W. Sams CIRCUITRACE® Photo

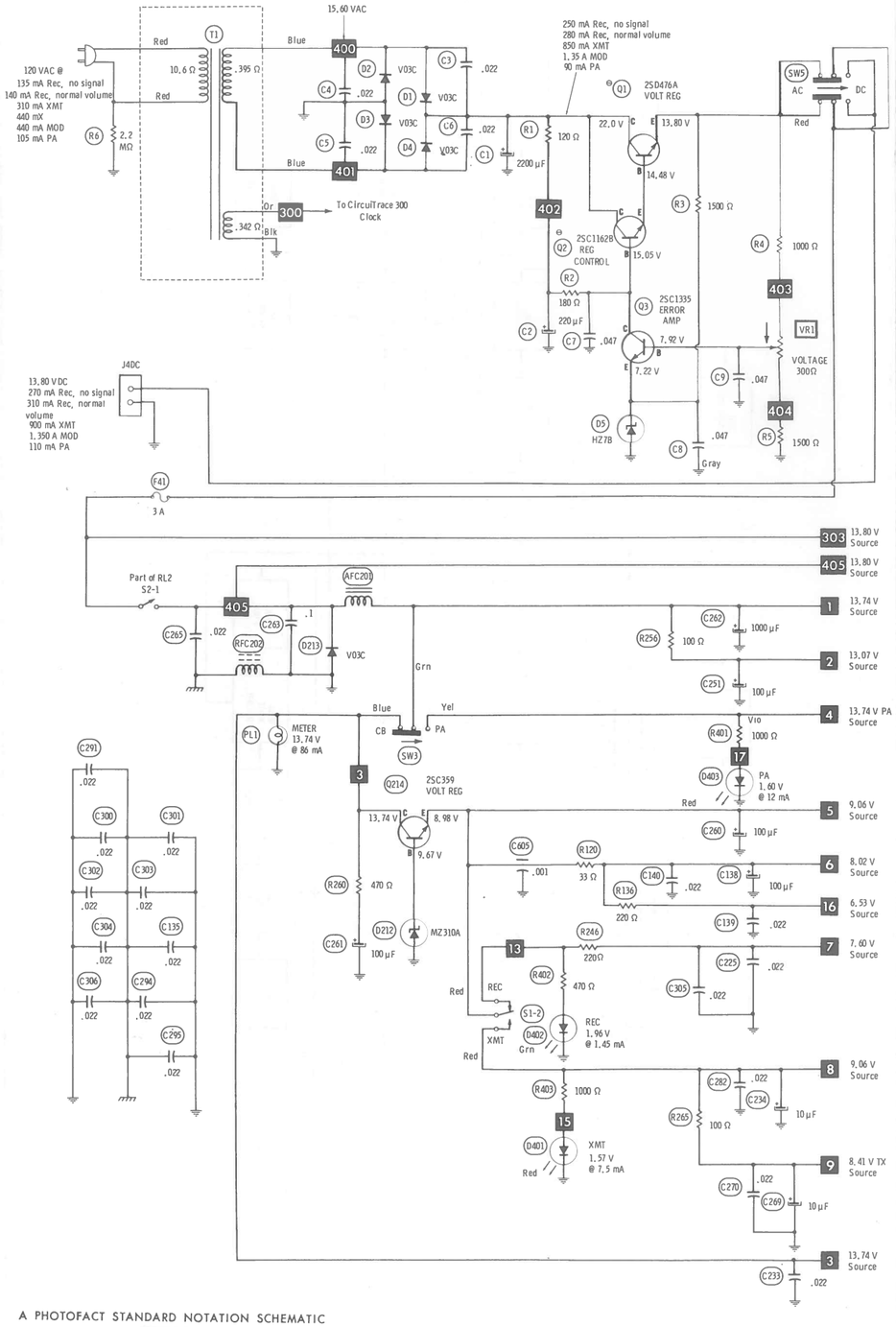



POWER SUPPLY BOARD






BLOCK DIAGRAM




A PHOTOFACT STANDARD NOTATION SCHEMATIC
WITH CIRCUITRACE®
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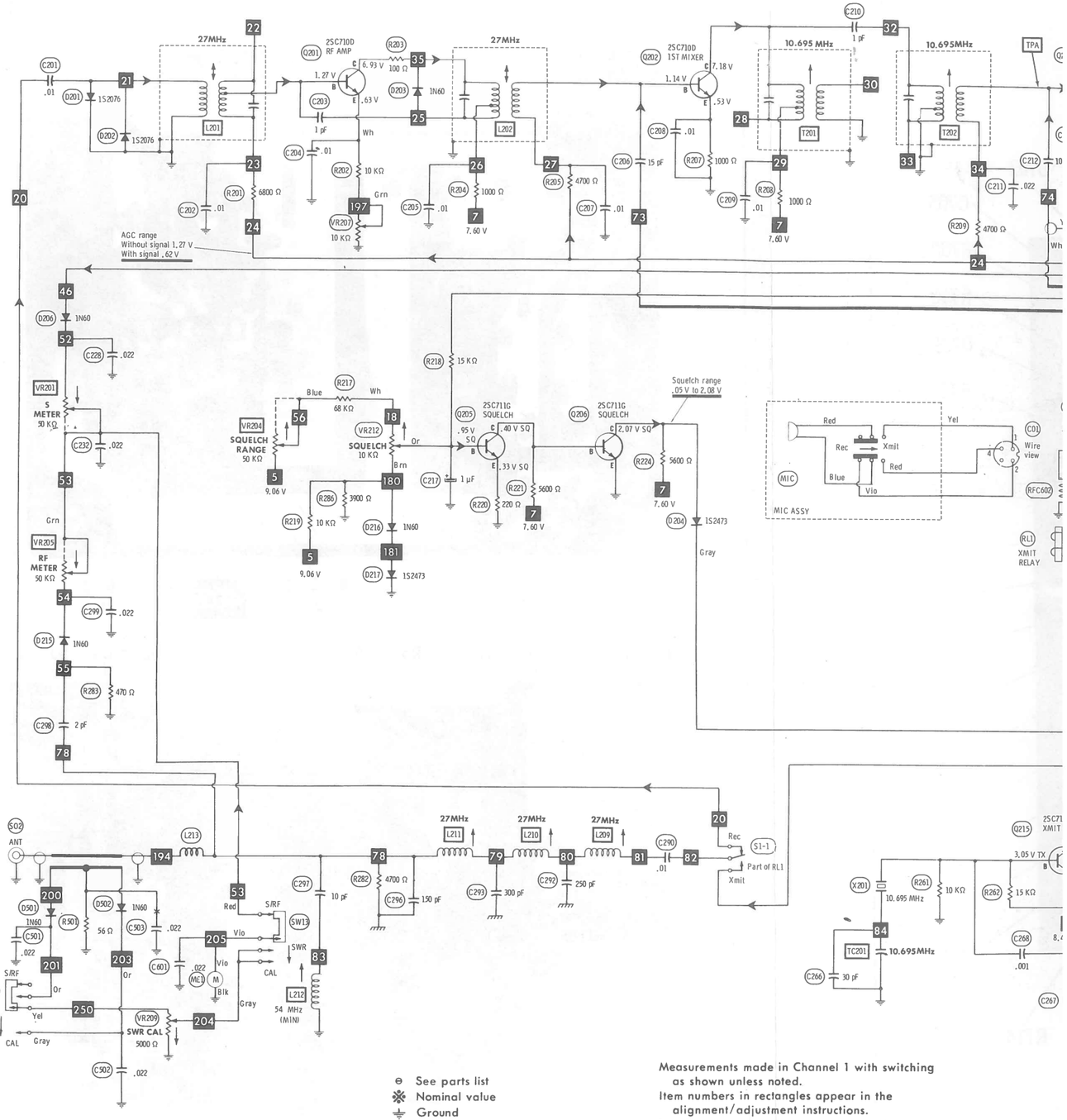
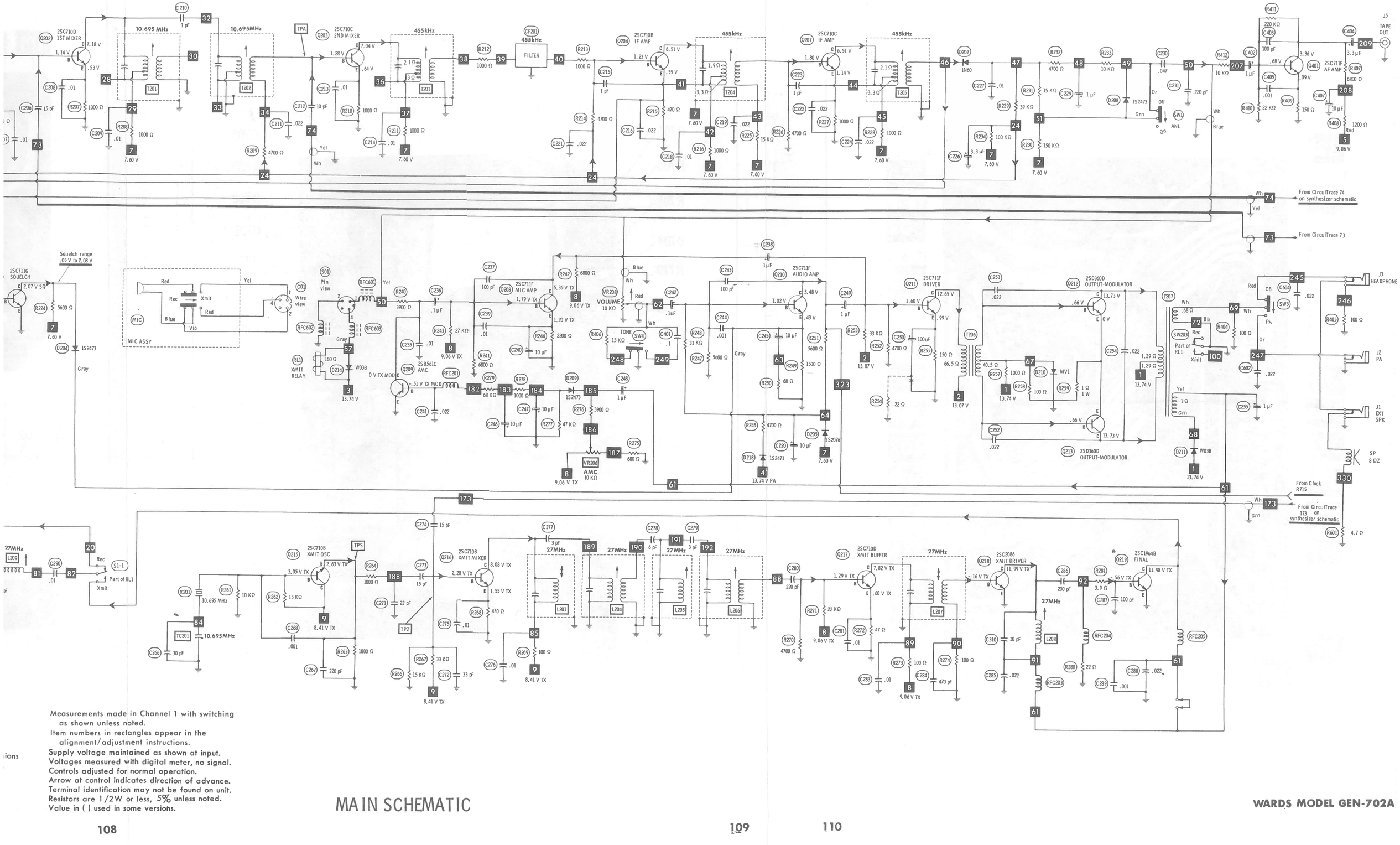
# POWER SUPPLY SCHEMATIC



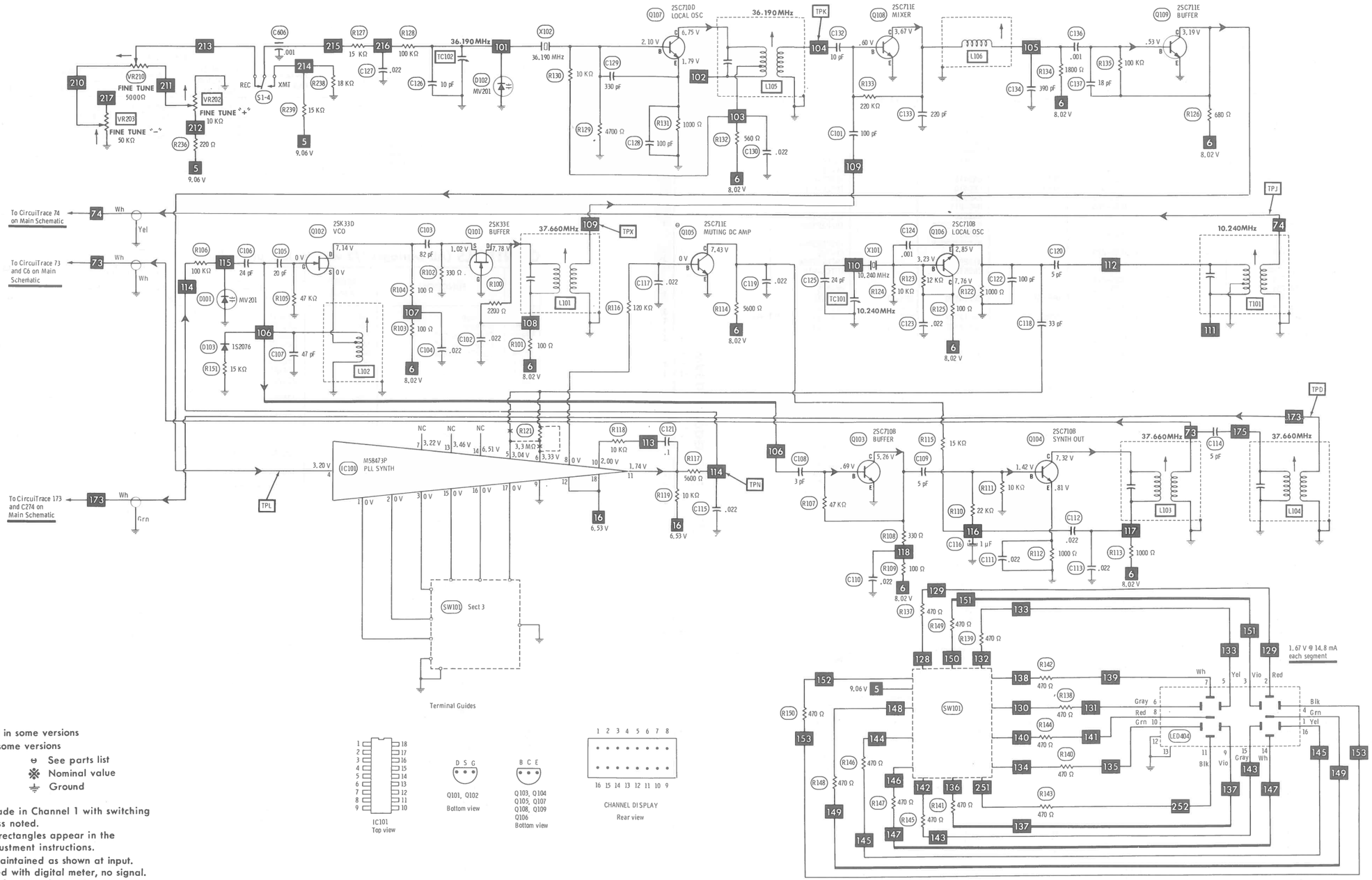



- ⊖ See parts list
- ※ Nominal value
- ⏚ Ground
- —✕— Circuitry not used in some versions
- – – – Circuitry used in some versions
- Chassis
- Common tie point
- Signal path
- Voltage path

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.




# MAIN SCHEMATIC




- Circuitry not used in some versions
- Circuitry used in some versions
- Chassis
- Common tie point
- Signal path
- Voltage path
- See parts list
- Nominal value
- Ground

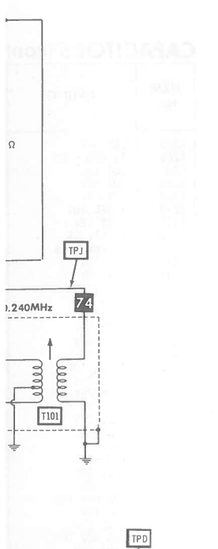
Measurements made in Channel 1 with switching as shown unless noted.
Item numbers in rectangles appear in the alignment/adjustment instructions.
Supply voltage maintained as shown at input.
Voltages measured with digital meter, no signal.
Controls adjusted for normal operation.
Arrow at control indicates 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.

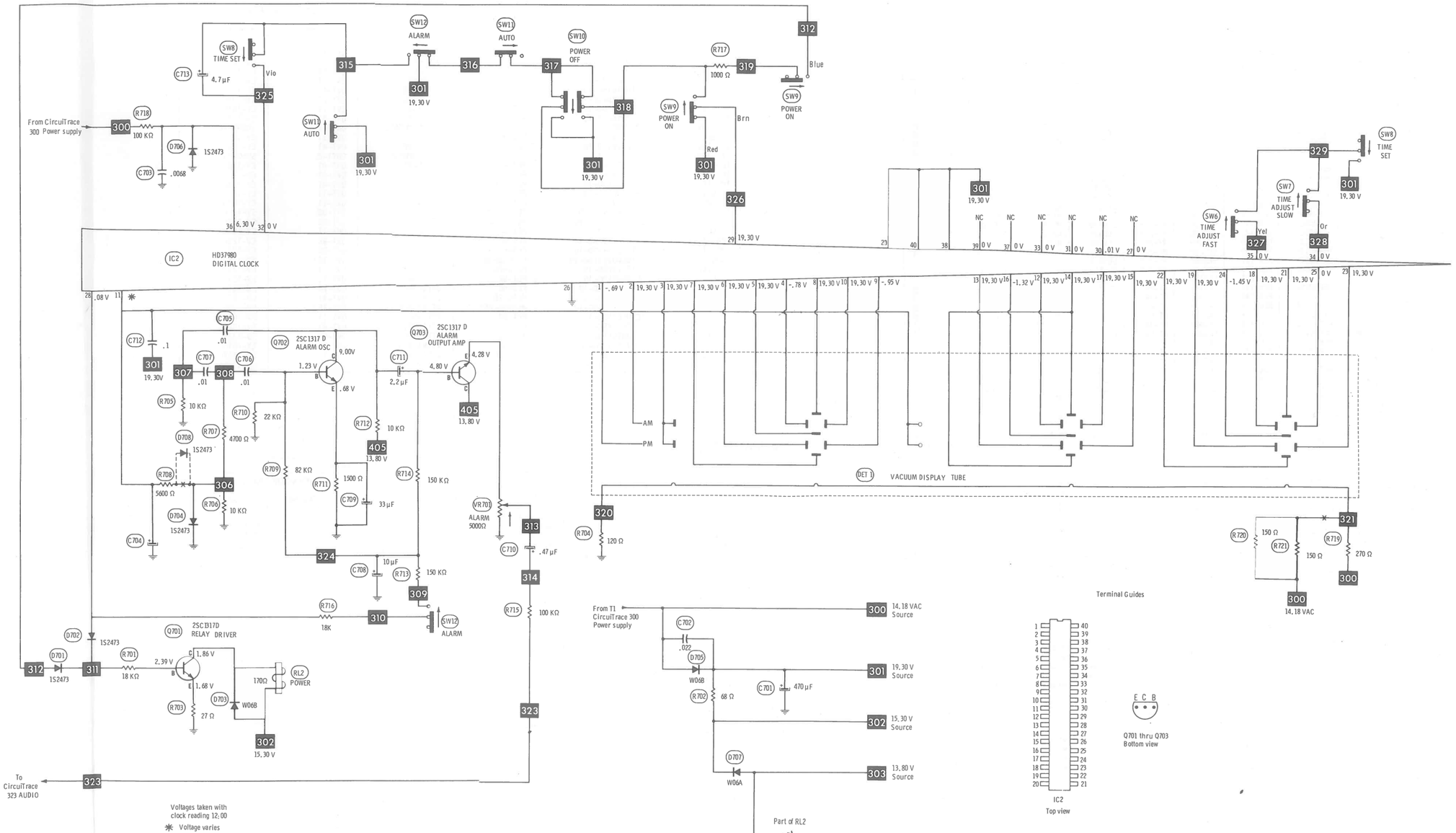
A PHOTOFACT STANDARD NOTATION SCHEMATIC WITH CIRCUITRACE®





# PLL & CLOCK SCHEMATIC




PLL & CLOCK SCHEMATIC

## SEMICONDUCTORS (Select replacement transistor for best results)

| ITEM No. | TYPE No. | MFGR. 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 | VO3C | | GE-504A | PTC202 | HEPR0054 | REN 116 | SK3313 | RT-215 | ECG116 | TM116 | WEP158 | 212-76-02 |
| D2 | VO3C | | GE-504A | PTC202 | HEPR0054 | REN 116 | SK3313 | RT-215 | ECG116 | TM116 | WEP158 | 212-76-02 |
| D3 | VO3C | | GE-504A | PTC202 | HEPR0054 | REN 116 | SK3313 | RT-215 | ECG116 | TM116 | WEP158 | 212-76-02 |
| D4 | VO3C | | GE-504A | PTC202 | HEPR0054 | REN 116 | SK3313 | RT-215 | ECG116 | TM116 | WEP158 | 212-76-02 |
| D5 | HZ7B | | | | | | | | | | | |
| D101 | MV201 | | | | HEPR2502 | REN 612 | | | ECG612 | | | 103-176 |
| D102 | MV201 | | | | HEPR2502 | REN 612 | | | ECG612 | | | 103-176 |
| D103 | 1S2076 | | GE-514 | PTC214 | HEPR0602 | REN 177 | SK3100 | RT-218 | ECG519 | TM519 | WEP925 | 103-287 |
| D201 | 1S2076 | | GE-514 | PTC214 | HEPR0602 | REN 177 | SK3100 | RT-218 | ECG519 | TM519 | WEP925 | 103-287 |
| D202 | 1S2076 | | GE-514 | PTC214 | HEPR0602 | REN 177 | SK3100 | RT-218 | ECG519 | TM519 | WEP925 | 103-287 |
| D203 | 1N60 | | 1N60 | PTC206 | HEPR9135 | REN 109 | SK3088 | RT-263 | ECG109 | TM109/** | WEP134 | 103-Z9001 |
| D204 | 1S2473 | | GE-514 | PTC214 | HEPR0602 | REN 177 | SK3100 | RT-218 | ECG519 | TM519 | WEP925 | 103-287 |
| D205 | 1S2473 | | GE-514 | PTC214 | HEPR0602 | REN 177 | SK3100 | RT-218 | ECG519 | TM519 | WEP925 | 103-287 |
| D206 | 1N60 | | 1N60 | PTC206 | HEPR9135 | REN 109 | SK3088 | RT-263 | ECG109 | TM109/** | WEP134 | 103-Z9001 |
| D207 | 1N60 | | 1N60 | PTC206 | HEPR9135 | REN 109 | SK3088 | RT-263 | ECG109 | TM109/** | WEP134 | 103-Z9001 |
| D208 | 1S2473 | | GE-514 | PTC214 | HEPR0602 | REN 177 | SK3100 | RT-218 | ECG519 | TM519 | WEP925 | 103-287 |
| D209 | 1S2473 | | GE-514 | PTC214 | HEPR0602 | REN 177 | SK3100 | RT-218 | ECG519 | TM519 | WEP925 | 103-287 |
| D210 | MV1 | | | PTC301 | | REN 601 | SK3463 | | ECG601 | | | |
| D211 | WO3B | | GE-504A | PTC201 | HEPR0052 | REN 116 | SK3311 | RT-213 | ECG116 | TM116 | WEP156 | 212-76-02 |
| D212 | MZ310A | | GEZD-10 | ZB10B | | REN 140 | SK3061 | RT-241 | ECG140A | TM140/** | WEP1110 | 103-Z9010 |
| D213 | VO3C | | GE-504A | PTC202 | HEPR0054 | REN 116 | SK3313 | RT-215 | ECG116 | TM116 | WEP158 | 212-76-02 |
| D214 | WO3B | | GE-504A | PTC201 | HEPR0052 | REN 116 | SK3311 | RT-213 | ECG116 | TM116 | WEP156 | 212-76-02 |
| D215 | 1N60 | | 1N60 | PTC206 | HEPR9135 | REN 109 | SK3088 | RT-263 | ECG109 | TM109/** | WEP134 | 103-Z9001 |
| D216 | 1N60 | | 1N60 | PTC206 | HEPR9135 | REN 109 | SK3088 | RT-263 | ECG109 | TM109/** | WEP134 | 103-Z9001 |
| D217 | 1S2473 | | GE-514 | PTC214 | HEPR0602 | REN 177 | SK3100 | RT-218 | ECG519 | TM519 | WEP925 | 103-287 |
| D218 | 1S2473 | | GE-514 | PTC214 | HEPR0602 | REN 177 | SK3100 | RT-218 | ECG519 | TM519 | WEP925 | 103-287 |
| D501 | 1N60 | | 1N60 | PTC206 | HEPR9135 | REN 109 | SK3088 | RT-263 | ECG109 | TM109/** | WEP134 | 103-Z9001 |
| D502 | 1N60 | | 1N60 | PTC206 | HEPR9135 | REN 109 | SK3088 | RT-263 | ECG109 | TM109/** | WEP134 | 103-Z9001 |
| D701 | 1S2473 | | GE-514 | PTC214 | HEPR0602 | REN 177 | SK3100 | RT-218 | ECG519 | TM519 | WEP925 | 103-287 |
| D702 | 1S2473 | | GE-514 | PTC214 | HEPR0602 | REN 177 | SK3100 | RT-218 | ECG519 | TM519 | WEP925 | 103-287 |
| D703 | WO6B | | GE-509 | PTC203 | HEPR0055 | REN 125 | SK3032 | RT-210 | ECG125 | TM125 | WEP159 | 212-95 |
| D704 | 1S2473 | | GE-514 | PTC214 | HEPR0602 | REN 177 | SK3100 | RT-218 | ECG519 | TM519 | WEP925 | 103-287 |
| D705 | WO6B | | GE-509 | PTC203 | HEPR0055 | REN 125 | SK3032 | RT-210 | ECG125 | TM125 | WEP159 | 212-95 |
| D706 | 1S2473 | | GE-514 | PTC214 | HEPR0602 | REN 177 | SK3100 | RT-218 | ECG519 | TM519 | WEP925 | 103-287 |
| D707 | WO6A | | GE-504A | PTC201 | HEPR0052 | REN 116 | SK3311 | RT-213 | ECG116 | TM116 | WEP156 | 212-76-02 |
| D708 | 1S2473 | | GE-514 | PTC214 | HEPR0602 | REN 177 | SK3100 | RT-218 | ECG519 | TM519 | WEP925 | 103-287 |
| IC2 | HD37980 | | | | | | | | | | | |
| IC101 | M58473P | | | | | | | | | | | |
| Q1 | 2SD476A | | GE-241 | PTC154 | HEPS3060 | REN 196 | SK3054 | RT-197 | ECG196 | TM196 | WEP756 | 121-987-02 |
| | 2SD476B | | GE-241 | PTC154 | HEPS3060 | REN 196 | SK3054 | RT-197 | ECG196 | TM196 | WEP756 | 121-987-02 |
| Q2 | 2SC1162B | | GE-247 | PTC904 | | | SK3190 | RT-162 | ECG186A | TM186A | WEP900 | 121-Z9008 |
| | 2SC1162 | | GE-247 | PTC904 | | | SK3190 | RT-162 | ECG186A | TM186A | WEP900 | 121-Z9008 |
| Q3 | 2SC1335E | | GE-210 | PTC121* | HEPS0025* | REN 199 | SK3122 | RT-107A | ECG199 | TM199 | WEP66 | 121-972 |
| | 2SC1335 | | GE-210 | PTC121* | HEPS0025* | REN 199 | SK3122 | RT-107A | ECG199 | TM199 | WEP66 | 121-972 |
| Q101 | 2SK33E | | GE-FET-2 | PTC161 | HEPF0021 | REN 132 | SK3448 | RT-175 | ECG312 | TM312 | | 121-756 |
| Q102 | 2SK33D | | GE-FET-2 | PTC161 | HEPF0021 | REN 132 | SK3448 | RT-175 | ECG312 | TM312 | | 121-756 |
| Q103 | 2SC710B | | GE-211* | PTC132 | HEPS0016* | REN 123A* | SK3444 | RT-308* | ECG123A* | TM123A*/** | WEP710 | 121-Z9000A |
| Q104 | 2SC710B | | GE-211* | PTC132 | HEPS0016* | REN 123A* | SK3444 | RT-308* | ECG123A* | TM123A*/** | WEP710 | 121-Z9000A |
| Q105 | 2SC711E | | GE-62* | PTC121 | HEPS0024* | REN 199* | SK3124* | RT-302* | ECG199* | TM199*/** | WEP66* | 121-972 |
| | 2SC710E | | GE-211* | PTC132 | HEPS0016* | REN 123A* | SK3444 | RT-308* | ECG123A* | TM123A*/** | WEP710 | 121-Z9000A |
| Q106 | 2SC710B | | GE-211* | PTC132 | HEPS0016* | REN 123A* | SK3444 | RT-308* | ECG123A* | TM123A*/** | WEP710 | 121-Z9000A |
| Q107 | 2SC710D | | GE-211* | PTC132 | HEPS0016* | REN 123A* | SK3444 | RT-308* | ECG123A* | TM123A*/** | WEP710 | 121-Z9000A |
| Q108 | 2SC711E | | GE-62* | PTC121 | HEPS0024* | REN 199* | SK3124* | RT-302* | ECG199* | TM199*/** | WEP66* | 121-972 |
| Q109 | 2SC711E | | GE-62* | PTC121 | HEPS0024* | REN 199* | SK3124* | RT-302* | ECG199* | TM199*/** | WEP66* | 121-972 |
| Q201 | 2SC710D | | GE-211* | PTC132 | HEPS0016* | REN 123A* | SK3444 | RT-308* | ECG123A* | TM123A*/** | WEP710 | 121-Z9000A |
| Q202 | 2SC710D | | GE-211* | PTC132 | HEPS0016* | REN 123A* | SK3444 | RT-308* | ECG123A* | TM123A*/** | WEP710 | 121-Z9000A |
| Q203 | 2SC710C | | GE-211* | PTC132 | HEPS0016* | REN 123A* | SK3444 | RT-308* | ECG123A* | TM123A*/** | WEP710 | 121-Z9000A |
| Q204 | 2SC710B | | GE-211* | PTC132 | HEPS0016* | REN 123A* | SK3444 | RT-308* | ECG123A* | TM123A*/** | WEP710 | 121-Z9000A |
| Q205 | 2SC711G | | GE-62* | PTC121 | HEPS0024* | REN 199* | SK3124* | RT-302* | ECG199* | TM199*/** | WEP66* | 121-972 |
| Q206 | 2SC711G | | GE-62* | PTC121 | HEPS0024* | REN 199* | SK3124* | RT-302* | ECG199* | TM199*/** | WEP66* | 121-972 |
| Q207 | 2SC710C | | GE-211* | PTC132 | HEPS0016* | REN 123A* | SK3444 | RT-308* | ECG123A* | TM123A*/** | WEP710 | 121-Z9000A |
| Q208 | 2SC711F | | GE-62* | PTC121 | HEPS0024* | REN 199* | SK3124* | RT-302* | ECG199* | TM199*/** | WEP66* | 121-972 |
| Q209 | 2SB561C | | GE-244* | PTC103* | HEPS0019* | REN 159* | SK3466* | RT-126A* | ECG159* | TM159* | WEP62* | 121-Z9003* |
| Q210 | 2SC711F | | GE-62* | PTC121 | HEPS0024* | REN 199* | SK3124* | RT-302* | ECG199* | TM199*/** | WEP66* | 121-972 |
| Q211 | 2SC711F | | GE-62* | PTC121 | HEPS0024* | REN 199* | SK3124* | RT-302* | ECG199* | TM199*/** | WEP66* | 121-972 |
| Q212 | 2SD360D | | GE-337 | PTC186 | | REN 235 | SK3197 | RT-146 | ECG235 | TM235 | WEP785 | 121-Z9039 |
| Q213 | 2SD360D | | GE-337 | PTC186 | | REN 235 | SK3197 | RT-146 | ECG235 | TM235 | WEP785 | 121-Z9039 |
| Q214 | 2SD359C | | GE-247 | PTC110 | HEPS5027 | REN 186 | SK3041 | RT-158 | ECG186A | TM186A | WEP900 | 121-Z9008 |
| Q215 | 2SC710B | | GE-211* | PTC132 | HEPS0016* | REN 123A* | SK3444 | RT-308* | ECG123A* | TM123A*/** | WEP710 | 121-Z9000A |
| Q216 | 2SC710B | | GE-211* | PTC132 | HEPS0016* | REN 123A* | SK3444 | RT-308* | ECG123A* | TM123A*/** | WEP710 | 121-Z9000A |
| Q217 | 2SC710D | | GE-211* | PTC132 | HEPS0016* | REN 123A* | SK3444 | RT-308* | ECG123A* | TM123A*/** | WEP710 | 121-Z9000A |
| Q218 | 2SC2086 | | GE-47* | PTC143* | HEPS3001* | REN 293* | | | ECG293* | TM293* | WEP912* | |
| Q219 | 2SC1964D | | GE-215 | PTC186 | | REN 235 | SK3197 | RT-146 | ECG235 | TM235 | WEP785 | 121-Z9039 |
| | 2SC1964 | | GE-215 | PTC186 | | REN 235 | SK3197 | RT-146 | ECG235 | TM235 | WEP785 | 121-Z9039 |
| Q401 | 2SC711F | | GE-62* | PTC121 | HEPS0024* | REN 199* | SK3124* | RT-302* | ECG199* | TM199*/** | WEP66* | 121-972 |
| Q701 | 2SC1317D | | GE-210 | PTC123 | HEPS0015* | REN 128 | SK3122 | RT-107A | ECG289 | TM289 | WEP910 | 121-773 |
| | 2SC1317Q | | GE-210 | PTC123 | HEPS0015* | REN 128 | SK3122 | RT-107A | ECG289 | TM289 | WEP910 | 121-773 |
| Q702 | 2SC1317D | | GE-210 | PTC123 | HEPS0015* | REN 128 | SK3122 | RT-107A | ECG289 | TM289 | WEP910 | 121-773 |
| | 2SC1317Q | | GE-210 | PTC123 | HEPS0015* | REN 128 | SK3122 | RT-107A | ECG289 | TM289 | WEP910 | 121-773 |
| Q703 | 2SC1317D | | GE-210 | PTC123 | HEPS0015* | REN 128 | SK3122 | RT-107A | ECG289 | TM289 | WEP910 | 121-773 |
| | 2SC1317Q | | GE-210 | PTC123 | HEPS0015* | REN 128 | SK3122 | RT-107A | ECG289 | TM289 | WEP910 | 121-773 |

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





## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING | REPLACEMENT DATA | | | | |
|---|---|---|---|---|---|---|
| | | MFGR. PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | SPRAGUE PART No. Q-LINE | SPRAGUE PART No. GENERAL LINE |
| C1 | 2200 35V | CE2200U35V100-10 | WBR2000-50* | TC50200A* | QE1-648* | TVA-1318.3* |
| C2 | 220 25V | CE220U25V100-10 | PC250-25 | VTT220K25 | QV1-119 | EV-1340 |
| C116 | 1 50V | CE1U50V100-10 | PC1-50 | VTT1A50 | QV1-11 | EV-1615 |
| C138 | 100 10V | CE100U10V100-10 | PC100-10 | VTT100E10 | QV1-93 | EV-1130 |
| C217 | 1 50V | CE1U50V100-10 | PC1-50 | VTT1A50 | QV1-11 | EV-1615 |
| C220 | 10 16V | CE10U16V50-10 | PC10-25 | VTT10B25 | QV1-41 | EV-1222 |
| C226 | 3.3 25V | CE3.3U25V50-10 | PC5-50 | VTT3R3A50 | QV1-23 | EV-1318 |
| C229 | 1 50V | CE1U50V100-10 | PC1-50 | VTT1A50 | QV1-11 | EV-1615 |
| C234 | 10 16V | CE10U16V50-10 | PC10-25 | VTT10B25 | QV1-41 | EV-1222 |
| C236 | .1 35V | CT.1U35V20 | | TDC104M050EL | QDT1-2 | SD50-R109 |
| C238 | 1 50V | CE1U50V100-10 | PC1-50 | VTT1A50 | QV1-11 | EV-1615 |
| C240 | 10 16V | CE10U16V50-10 | PC10-25 | VTT10B25 | QV1-41 | EV-1222 |
| C242 | .1 35V | CT.1U35V20 | | TDC104M050EL | QDT1-2 | SD50-R109 |
| C245 | 10 16V | CE10U16V50-10 | PC10-25 | VTT10B25 | QV1-41 | EV-1222 |
| C246 | 10 16V | CE10U16V50-10 | PC10-25 | VTT10B25 | QV1-41 | EV-1222 |
| C247 | 10 16V | CE10U16V50-10 | PC10-25 | VTT10B25 | QV1-41 | EV-1222 |
| C248 | 1 50V | CE1U50V100-10 | PC1-50 | VTT1A50 | QV1-11 | EV-1615 |
| C249 | 1 50V | CE1U50V100-10 | PC1-50 | VTT1A50 | QV1-11 | EV-1615 |
| C250 | 100 10V | CE100U10V50-10 | PC100-10 | VTT100E10 | QV1-93 | EV-1130 |
| C251 | 100 16V | CE100U16V100-10 | PC100-16 | VTT100F16 | QV1-95 | EV-1230 |
| C255 | 1 50V | CE1U50V100-10 | PC1-50 | VTT1A50 | QV1-11 | EV-1615 |
| C260 | 100 16V | CE100U16V100-10 | PC100-16 | VTT100F16 | QV1-95 | EV-1230 |
| C261 | 100 16V | CE100U16V100-10 | PC100-16 | VTT100F16 | QV1-95 | EV-1230 |
| C262 | 1000 16V | CE1000U16V100-10 | PC1000-16 | VTT1000L16 | QV1-183 | EV-1260 |
| C269 | 10 16V | CE10U16V50-10 | PC10-25 | VTT10B25 | QV1-41 | EV-1222 |
| C402 | 1 50V | CE1U50V100-10 | PC1-50 | VTT1A50 | QV1-11 | EV-1615 |
| C404 | 3.3 25V | CE3.3U25V50-10 | PC5-50 | VTT3R3A50 | QV1-23 | EV-1318 |
| C407 | 10 16V | CE10U16V50-10 | PC10-25 | VTT10B25 | QV1-41 | EV-1222 |
| C701 | 470 25V | CE470U25V100-10 | WBR500-25* | VTT470M25 | QV1-153 | EV-1350 |
| C704 | 1 50V | CE1U50V100-10 | PC1-50 | VTT1A50 | QV1-11 | EV-1615 |
| C708 | 10 16V | CE10U16V50-10 | PC10-25 | VTT10B25 | QV1-41 | EV-1222 |
| C709 | 33 16V | CE33U16V100-10 | PC30-25 | VTT33D25 | QV1-63 | EV-1325 |
| C710 | .47 50V | CE47U50V100-10 | PC1-50 | VTTR47A63 | QV1-3 | EV-1610 |
| C711 | 2.2 25V | CT2.2U25V20 | PC2-100 | VTT2R2A50 | QV1-19 | EV-1517 |
| C713 | 4.7 25V | CE4.7U25V100-10 | PC5-50 | VTT4R7B50 | QV1-27 | EV-1319 |

## CAPACITORS

| ITEM No. | RATING | MFGR. PART No. | REPLACEMENT DATA | | | | |
|---|---|---|---|---|---|---|---|
| | | | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | SPRAGUE PART No. Q-LINE | SPRAGUE PART No. GENERAL LINE |
| C3 | .022 25V | | UK25-223 | | | | HY-725 |
| C4 | .022 25V | | UK25-223 | | | | HY-725 |
| C5 | .022 25V | | UK25-223 | | | | HY-725 |
| C6 | .022 25V | | UK25-223 | | | | HY-725 |
| C7 | .047 25V | | UK25-503 | | MAG2515 | | HY-735 |
| C8 | .047 25V | | UK25-503 | | MAG2515 | | HY-735 |
| C9 | .047 25V | | UK25-503 | | MAG2515 | | HY-735 |
| C101 | 100 50V | | DTZ-100 | NP0100 | CN0310 | | 10TCC-T10 |
| C102 | .022 25V | | UK25-223 | | | | HY-725 |
| C103 | 82 50V 10% | | DTZ-82 | NP082 | CN0482 | | 10TCC-Q82 |
| C104 | .022 25V | | UK25-223 | | | | HY-725 |
| C105 | 20 NPO +.5% | | DTZ-20 | NP020 | CN0420 | | 10TCC-Q20 |
| C106 | 24 50V 10% | | DTZ-25 | NP025 | CN0425 | | 10TCC-Q25 |
| C107 | 47 50V 10% | | DTZ-47 | NP047 | CN0447 | | 10TCC-Q47 |
| C108 | 3 NPO +.5% | | DTZ-3R3 | NP03P3 | CN0533 | | 10TCC-V33 |
| C109 | 5 NPO +.5% | | DTZ-4R7 | NP04P7 | CN0547 | | 10TCC-V47 |
| C110 | .022 25V | | UK25-223 | | | | HY-725 |
| C111 | .022 25V | | UK25-223 | | | | HY-725 |
| C112 | .022 25V | | UK25-223 | | | | HY-725 |
| C113 | .022 25V | | UK25-223 | | | | HY-725 |
| C114 | 5 NPO +.5% | | DTZ-4R7 | NP04P7 | CN0547 | | 10TCC-V47 |
| C115 | .022 50V | | | | M192P2239R8 | | 192P2239R8 |
| C117 | .022 25V | | UK25-223 | | | | HY-725 |
| C118 | 33 NPO +.5% | | DTZ-33 | NP033 | CN0433 | | 10TCC-Q33 |
| C119 | .022 25V | | UK25-223 | | | | HY-725 |
| C120 | 5 NPO +.5% | | DTZ-4R7 | NP04P7 | CN0547 | | 10TCC-V47 |
| C121 | .1 50V | | | WMF05P1 | EWF05010 | | 431P1049R5 |
| C122 | 100 50V 10% | | DTZ-100 | NP0100 | CN0310 | | 10TCC-T10 |
| C123 | .022 25V | | UK25-223 | | | | HY-725 |
| C124 | .001 50V | | | DPMS6D1 | EWF1A210 | QF1-1 | 1PB-D10 |
| C125 | 24 NPO +.5% | | DTZ-25 | NP025 | CN0425 | | 10TCC-Q25 |
| C126 | 10 NPO +.5% | | DTZ-10 | NP010 | CN0410 | | 10TCC-Q10 |
| C127 | .022 25V | | UK25-223 | | | | HY-725 |
| C128 | 100 NPO 5% | | DTZ-100 | NP0100 | CN0310 | | 10TCC-T10 |
| C129 | 330 50V 5% | | | CD15FD331J03 | SX333 | QW1-39 | MWA-331 |
| C130 | .022 25V | | UK25-223 | | | | HY-725 |
| C131 | .022 25V | | UK25-223 | | | | HY-725 |
| C132 | 10 50V | | DTZ-10 | NP010 | CN0410 | | 10TCC-Q10 |
| C133 | 220 50V | | DTZ-220 | | | | 10TCC-T22 |
| C134 | 390 50V | | DD-391 | GP390 | GP339 | | 10TS-T39 |
| C135 | .022 25V | | UK25-223 | | | | HY-725 |
| C136 | .001 50V | | | DPMS6D1 | EWF1A210 | QF1-1 | 1PB-D10 |
| C137 | 18 50V 1% | | | | CN0418 | | 10TCC-Q18 |
| C139 | .022 50V | | | | M192P2239R8 | | 192P2239R8 |
| C140 | .022 25V | | UK25-223 | | | | HY-725 |
| C201 | .01 50V | | UK50-103 | | MAG5011 | | |
| C202 | .01 50V | | UK50-103 | | MAG5011 | | |
| C203 | 1 50V 10% | | | | CN0510 | | 10TCC-V10 |
| C204 | .01 50V | | UK50-103 | | MAG5011 | | |





## CAPACITORS (cor

| ITEM No. | RATING |
|---|---|
| C205 | .01 50V |
| C206 | 15 NPO +.5% |
| C207 | .01 50V |
| C208 | .01 50V |
| C209 | .01 50V |
| C210 | 1 NPO 50V |
| C211 | .022 25V |
| C212 | 15 50V 5% |
| | 10 50V +.5% |
| C213 | .01 50V |
| C214 | .01 50V |
| C215 | 1 50V 10% |
| C216 | .022 50V |
| C218 | .01 50V |
| C219 | .022 50V |
| C221 | .022 25V |
| C222 | .022 50V |
| C223 | 1 50V 10% |
| C224 | .022 25V |
| C225 | .022 25V |
| C227 | .01 50V |
| C228 | .022 25V |
| C230 | .047 50V |
| | .04 |
| C231 | 220 50V |
| C233 | .022 25V |
| C235 | .01 50V |
| C237 | 100 50V 10% |
| C239 | .01 50V |
| C241 | .022 25V |
| C243 | 100 50V 10% |
| C244 | .001 50V |
| C252 | .022 50V |
| C253 | .022 50V |
| C254 | .022 50V |
| C263 | .1 50V |
| C265 | .022 25V |
| C266 | 30 NPO +.5% |
| C267 | 220 50V +5% |
| C268 | .001 50V |
| C270 | .022 25V |
| C271 | 22 NPO +.5% |
| C272 | 33 NPO +.5% |
| C273 | 15 NPO +.5% |
| C274 | 15 NPO +.5% |
| C275 | .01 50V |
| C276 | .01 50V |
| C277 | 3 NPO +.5% |
| C278 | 6 NPO +.5% |
| C279 | 3 NPO +.5% |
| C280 | 220 50V |
| C281 | .01 50V |
| C282 | .022 50V |
| C283 | .01 50V |
| C284 | 470 50V |
| C285 | .022 50V |
| C286 | 200 50V 10% |
| C287 | 100 50V 10% |
| C288 | .022 50V |
| C289 | .001 50V |
| C290 | .01 50V |
| C291 | .022 50V |
| C292 | 250 50V |
| C293 | 300 50V |
| C294 | .022 25V |
| C295 | .022 50V |
| C296 | 150 50V |
| C297 | 10 NPO +.5% |
| C298 | 2 NPO +.5% |
| C299 | .022 50V |
| C300 | .022 50V |
| C301 | .022 50V |
| C302 | .022 50V |
| C303 | .022 50V |
| C304 | .022 50V |
| C305 | .022 50V |
| C306 | .022 50V |
| C310 | 30 50V 10% |
| C401 | .1 50V |
| C403 | 100 50V 10% |
| C405 | .001 50V |
| C501 | .022 25V |
| C502 | .022 25V |
| C503 | .022 25V |
| C601 | .022 25V |
| C602 | .022 25V |
| C604 | .022 25V |
| C605 | .001 |
| C606 | .001 |
| C702 | .022 50V |
| C703 | .0068 50V |

| ART No. |
|---|
| GENERAL LINE |
| TVA-1318.3* |
| EV-1340 |
| EV-1615 |
| EV-1130 |
| EV-1615 |
| EV-1222 |
| EV-1318 |
| EV-1615 |
| EV-1222 |
| 5D50-R109 |
| EV-1615 |
| EV-1222 |
| 5D50-R109 |
| EV-1222 |
| EV-1222 |
| EV-1222 |
| EV-1615 |
| EV-1615 |
| EV-1130 |
| EV-1230 |
| EV-1615 |
| EV-1230 |
| EV-1230 |
| EV-1260 |
| EV-1222 |
| EV-1615 |
| EV-1318 |
| EV-1222 |
| EV-1350 |
| EV-1615 |
| EV-1222 |
| EV-1325 |
| EV-1610 |
| EV-1517 |
| EV-1319 |

| ART No. |
|---|
| GENERAL LINE |
| Y-725 |
| Y-725 |
| Y-725 |
| Y-725 |
| Y-735 |
| Y-735 |
| Y-735 |
| OTCC-T10 |
| Y-725 |
| OTCC-Q82 |
| Y-725 |
| OTCC-Q20 |
| OTCC-Q25 |
| OTCC-Q47 |
| OTCC-V33 |
| OTCC-V47 |
| Y-725 |
| Y-725 |
| Y-725 |
| Y-725 |
| OTCC-V47 |
| 92P2239R8 |
| Y-725 |
| OTCC-Q33 |
| Y-725 |
| OTCC-V47 |
| 31P1049R5 |
| OTCC-T10 |
| Y-725 |
| PB-D10 |
| OTCC-Q25 |
| OTCC-Q10 |
| Y-725 |
| OTCC-T10 |
| WA-331 |
| Y-725 |
| Y-725 |
| OTCC-Q10 |
| OTCC-T22 |
| OTS-T39 |
| Y-725 |
| PB-D10 |
| OTCC-Q18 |
| 92P2239R8 |
| Y-725 |
| OTCC-V10 |



## 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. | |
| | | | | | | Q-LINE | GENERAL LINE |
| C205 | .01 50V | | UK50-103 | | MAG5011 | | |
| C206 | 15 NPO +.5% | | DTZ-15 | NP015 | CN0415 | | 10TCC-Q15 |
| C207 | .01 50V | | UK50-103 | | MAG5011 | | |
| C208 | .01 50V | | UK50-103 | | MAG5011 | | |
| C209 | .01 50V | | UK50-103 | | MAG5011 | | |
| C210 | 1 NPO 50V | | | | CN0510 | | 10TCC-V10 |
| C211 | .022 25V | | UK25-223 | | | | HY-725 |
| C212 | 15 50V 5% | | DTZ-15 | NP015 | CN0415 | | 10TCC-Q15 |
| | 10 50V +.5% | | DTZ-10 | NP010 | CN0410 | | 10TCC-Q10 |
| C213 | .01 50V | | UK50-103 | | MAG5011 | | |
| C214 | .01 50V | | UK50-103 | | MAG5011 | | |
| C215 | 1 50V 10% | | | | CN0510 | | 10TCC-V10 |
| C216 | .022 50V | | | | M192P2239R8 | | 192P2239R8 |
| C218 | .01 50V | | UK50-103 | | MAG5011 | | |
| C219 | .022 50V | | | | M192P2239R8 | | 192P2239R8 |
| C221 | .022 25V | | UK25-223 | | | | HY-725 |
| C222 | .022 50V | | | | M192P2239R8 | | 192P2239R8 |
| C223 | 1 50V 10% | | | | CN0510 | | 10TCC-V10 |
| C224 | .022 25V | | UK25-223 | | | | HY-725 |
| C225 | .022 25V | | UK25-223 | | | | HY-725 |
| C227 | .01 50V | | | WMF1S1 | EWF1A110 | QF1-91 | 1PB-S10 |
| C228 | .022 25V | | UK25-223 | | | | HY-725 |
| C230 | .047 50V | | | DPMS2S47 | EWF1A147 | QF1-171 | 1PB-S47 |
| | .04 | | | DPMS2S47 | EWF1A147 | QF1-171 | 1PB-S47 |
| C231 | 220 50V | | DTZ-220 | | | | 10TCC-T22 |
| C233 | .022 25V | | UK25-223 | | | | HY-725 |
| C235 | .01 50V | | UK50-103 | | MAG5011 | | |
| C237 | 100 50V 10% | | DTZ-100 | NP0100 | CN0310 | | 10TCC-T10 |
| C239 | .01 50V | | UK50-103 | | MAG5011 | | |
| C241 | .022 25V | | UK25-223 | | | | HY-725 |
| C243 | 100 50V 10% | | DTZ-100 | NP0100 | CN0310 | | 10TCC-T10 |
| C244 | .001 50V | | | DPMS6D1 | EWF1A210 | QF1-1 | 1PB-D10 |
| C252 | .022 50V | | | | M192P2239R8 | | 192P2239R8 |
| C253 | .022 50V | | | | M192P2239R8 | | 192P2239R8 |
| C254 | .022 50V | | | | M192P2239R8 | | 192P2239R8 |
| C263 | .1 50V | | | WMF05P1 | EWF05010 | | 431P1049R5 |
| C265 | .022 25V | | UK25-223 | | | | HY-725 |
| C266 | 30 NPO +.5% | | DTZ-33 | NP033 | CN0433 | | 10TCC-Q33 |
| C267 | 220 50V +5% | | | CD15FD221J03 | SX322 | QW1-35 | MWA-221 |
| C268 | .001 50V | | | DPMS6D1 | EWF1A210 | QF1-1 | 1PB-D10 |
| C270 | .022 25V | | UK25-223 | | | | HY-725 |
| C271 | 22 NPO +.5% | | DTZ-22 | NP022 | CN0422 | | 10TCC-Q22 |
| C272 | 33 NPO +.5% | | DTZ-33 | NP033 | CN0433 | | 10TCC-Q33 |
| C273 | 15 NPO +.5% | | DTZ-15 | NP015 | CN0415 | | 10TCC-Q15 |
| C274 | 15 NPO +.5% | | DTZ-15 | NP015 | CN0415 | | 10TCC-Q15 |
| C275 | .01 50V | | UK50-103 | | MAG5011 | | |
| C276 | .01 50V | | UK50-103 | | MAG5011 | | |
| C277 | 3 NPO +.5% | | DTZ-3R3 | NP03P3 | CN0533 | | 10TCC-V33 |
| C278 | 6 NPO +.5% | CC6P50V.5P | | | | | |
| C279 | 3 NPO +.5% | | DTZ-3R3 | NP03P3 | CN0533 | | 10TCC-V33 |
| C280 | 220 50V | | DTZ-220 | | | | 10TCC-T22 |
| C281 | .01 50V | | UK50-103 | | MAG5011 | | |
| C282 | .022 50V | | | | M192P2239R8 | | 192P2239R8 |
| C283 | .01 50V | | UK50-103 | | MAG5011 | | |
| C284 | 470 50V | | DD-471 | GP470 | GP347 | | 10TS-T47 |
| C285 | .022 50V | | | | M192P2239R8 | | 192P2239R8 |
| C286 | 200 50V 10% | | DTZ-200 | | | | 10TCC-T20 |
| C287 | 100 50V 10% | | DTZ-100 | NP0100 | CN0310 | | 10TCC-T10 |
| C288 | .022 50V | | | | M192P2239R8 | | 192P2239R8 |
| C289 | .001 50V | | | DPMS6D1 | EWF1A210 | QF1-1 | 1PB-D10 |
| C290 | .01 50V | | UK50-103 | | MAG5011 | | |
| C291 | .022 50V | | | | M192P2239R8 | | 192P2239R8 |
| C292 | 250 50V | CG250P50V5 | | | | | |
| C293 | 300 50V | | | CD15FD301J03 | SX330 | QW1-38 | MWA-301 |
| C294 | .022 25V | | UK25-223 | | | | HY-725 |
| C295 | .022 50V | | | | M192P2239R8 | | 192P2239R8 |
| C296 | 150 50V | | | CD15FD151J03 | SX315 | QW1-31 | MWA-151 |
| C297 | 10 NPO +.5% | | DTZ-10 | NP010 | CN0410 | | 10TCC-Q10 |
| C298 | 2 NPO +.5% | | DTZ-2R2 | NP02P2 | CN0522 | | 10TCC-V22 |
| C299 | .022 50V | | | | M192P2239R8 | | 192P2239R8 |
| C300 | .022 50V | | | | M192P2239R8 | | 192P2239R8 |
| C301 | .022 50V | | | | M192P2239R8 | | 192P2239R8 |
| C302 | .022 50V | | | | M192P2239R8 | | 192P2239R8 |
| C303 | .022 50V | | | | M192P2239R8 | | 192P2239R8 |
| C304 | .022 50V | | | | M192P2239R8 | | 192P2239R8 |
| C305 | .022 50V | | | | M192P2239R8 | | 192P2239R8 |
| C306 | .022 50V | | | | M192P2239R8 | | 192P2239R8 |
| C310 | 30 50V 10% | | DTZ-33 | NP033 | CN0433 | | 10TCC-Q33 |
| C401 | .1 50V | | | WMF05P1 | EWF05010 | | 431P1049R5 |
| C403 | 100 50V 10% | | DTZ-100 | NP0100 | CN0310 | | 10TCC-T10 |
| C405 | .001 50V | | | DPMS6D1 | EWF1A210 | QF1-1 | 1PB-D10 |
| C501 | .022 25V | | UK25-223 | | | | HY-725 |
| C502 | .022 25V | | UK25-223 | | | | HY-725 |
| C503 | .022 25V | | UK25-223 | | | | HY-725 |
| C601 | .022 25V | | UK25-223 | | | | HY-725 |
| C602 | .022 25V | | UK25-223 | | | | HY-725 |
| C604 | .022 25V | | UK25-223 | | | | HY-725 |
| C605 | .001 | J311057 | | | | | |
| C606 | .001 | J311057 | | | | | |
| C702 | .022 50V | | | | M192P2239R8 | | 192P2239R8 |
| C703 | .0068 50V | | | WMF1D68 | EWF1A268 | QF1-73 | 1PB-D68 |





## 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. | |
| | | | | | | Q-LINE | GENERAL LINE |
| C705 | .01 50V | | | WMF1S1 | EWF1A110 | QF1-91 | 1PB-S10 |
| C706 | .01 50V | | | WMF1S1 | EWF1A110 | QF1-91 | 1PB-S10 |
| C707 | .01 50V | | | WMF1S1 | EWF1A110 | QF1-91 | 1PB-S10 |
| C712 | .1 50V | | | WMF05P1 | EWF05010 | | 431P1049R5 |
| TC101 | | J35471 | | | | | |
| TC102 | | J35471 | | | | | |
| TC201 | | J35471 | | | | | |

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

| ITEM No. | FUNCTION | RESIST-ANCE | REPLACEMENT DATA | | | |
|---|---|---|---|---|---|---|
| | | | MFGR. PART No. | CENTRALAB PART No. | MALLORY PART No. | TRW PART No. |
| VR1 | Voltage | 300 | J25782 | | | |
| VR201 | S Meter | 50K | J25778 | | | U260R503B |
| VR202 | Fine Tune "+" | 10K | J25783 | | | U260R103B |
| VR203 | Fine Tune "-" | 50K | J25778 | U260R503 | | U260R503B |
| VR204 | Squelch Range | 50K | J25778 | | | U260R503B |
| VR205 | RF Meter | 50K | J25778 | | | U260R103B |
| VR206 | AMC | 10K | J25783 | | | BU1(1),CF9, |
| VR207 | RF Gain | 10K | J25780 103221(5) | F1-10K(1), SSK100 | RU13L,SL36,SL3250 | SS1,DC1 |
| VR208 | Volume | 10K | J25731 1032621(5) | F2-10K(1), SSK100 | RU13A,SL36,SL3250 | BU1(1),CF61, SS1,DC1 |
| VR209 | SWR CAL | 5000 | J25781 5023121(5) | F1-5000(1) SSK100 | RU53L,SL36,SL3250 | BU1(1),CF8, SS1,DC1, |
| VR210 | Fine Tuning | 5000 | J25781 5023121(5) | F1-5000(1), SSK100 | RU53L,SL36,SL3250 | BU1(1),CF8, SS1,DC1 |
| VR212 | Squelch | 10K | J25780 1033221(5) | FL-10K(1), SSK100 | RU13L,SL36,SL3250 | BU1(1),CF9, SS1,DC1 |
| VR701 | Alarm | 5000 | J25779 | | | S260R502B |

(1) Enlarge mounting hole.
(5) Number on unit.

### COILS (RF-IF)

| ITEM No. | FUNCTION | REPLACEMENT DATA | | | REMARKS |
|---|---|---|---|---|---|
| | | PART No. | OTHER IDENTIFICATION | MILLER PART No. | |
| L101 | Buffer (37.660MHz) | J611272 | 513300513 | | |
| L102 | VCO | J611218 | 593301013 | | |
| L103 | Synth Out (37.660MHz) | J611272 | 593300513 | | |
| L104 | Synth Out (37.660MHz) | J611272 | 593300513 | | |
| L105 | Local Oscillator (10.240MHz) | J611274 | 593300713 | | |
| L106 | Mixer | J611275 | 593300813 | | |
| L201 | RF (27MHz) | J611268 | 593300113 | | |
| L202 | RF Amp (27MHz) | J611269 | 593300213 | | |
| L203 | Bandpass Filter | J611270 | 593300313 | | |
| L204 | Bandpass Filter | J611271 | 593300413 | | |
| L205 | Bandpass Filter | J611270 | 593300313 | | |
| L206 | Bandpass Filter | J611271 | 593300413 | | |
| L207 | XMT Buffer | J611271 | 593300413 | | |
| L208 | XMT Driver | J611267 | 59430205 | | |
| L209 | Loading Final | J611265 | 5943-0185 | | |
| L210 | Pi Filter (27MHz) | J611285 | 5943-0215 | | |
| L211 | Pi Filter (27MHz) | J611286 | 5943-0225 | | |
| L212 | TVI Trap (54MHz) | J611307 | 5943-0235 | | |
| L213 | Antenna Matching | J611068 | 5991-0495 | | |
| RFC201 | RF Choke | J611283 | 5995-0106 | | |
| RFC202 | RF Choke | J611260 | 5995-00511 | | |
| RFC203 | RF Choke (2.7uH) | J611262 | 5995-2R7225 | | |
| RFC204 | RF Choke (5.6uH) | J611263 | 5995-5R6225 | | |
| RFC205 | Final | J611261 | 5993-0045 | | |
| RFC601 | RF Choke | J611283 | 5995-0106 | | |
| RFC602 | RF Choke | J611283 | 5995-0106 | | |
| RFC603 | RF Choke (2.7uH) | J611262 | 5995-2R7225 | | |
| T101 | Local Oscillator (10.240MHz) | J62853 | 5563-0047 | | |
| T201 | Mixer (10.695MHz) | J62853 | 5563-0047 | | |
| T202 | Mixer (10.695MHz) | J62854 | 5563-0097 | | |

## 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. | |
| T203 | IF (455kHz) | J62852 | 5553-0047 | | |
| T204 | IF (455kHz) | 62MW564 | 5553-0187 | 2071 | |
| T205 | IF (455kHz) | J62570 | 55530107 | 2068 | |

### 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. | |
| AFC 201 | 1.35A | .125 | 1.12mH | J62885<br>83-0018(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. | |
| T1 | 120V AC @ 440mA AC | 15.60V AC 1.35A DC | J11479<br>5584-001175(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. | |
| T206 | 1 | 1 | | J11474<br>81-00319(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. | |
| T207 | 32 | 1<br>19 | 2<br>10 | J11477<br>85-0015(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 | J10175<br>C0920218(1) | 3C3Z8U | (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 |
| FU1 | 3A Quick Acting | J18544 | J64178 | AGC-3 | HTA | 312003 | 342058AL | FG3-2 |

# 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 | | 18-032 | 18-034 | 18-010 | 18-092 | 1 | 2 | 4 | NC | NC | 2 |

## MISCELLANEOUS

| ITEM No. | PART NAME | PART No. | NOTES |
|---|---|---|---|
| CF201 | Filter | J302 | 455kHz |
| DET1 | LED | J1369 | Vacuum Display Tube (Clock Display) |
| E01 | Jack | J26828 | Microphone (4 Pin) |
| J1 | Jack | 63MW297 | External Speaker |
| J2 | Jack | 63MW297 | PA Speaker |
| J3 | Jack | J63353 | Headphone |
| J4 | Jack | J26858 | DC Supply, Terminal |
| J5 | Jack | J63356 | Tape Out |
| LED401 | LED | GL52AR | XMT (1.57V @ 7.5mA) |
| LED402 | LED | GL52PG | Rec (1.96V @ 1.45mA) |
| LED403 | LED | GL52AR | PA (1.60V @ 12mA) |
| LED404 | LED | LKA4022 | Channel Display |
| LP1 | Terminal | J26392 | Speaker Connection |
| LP2 | Terminal | J26392 | Speaker Connection |
| LP3 | Connector | J26158 | AC Line Cord Connection |
| LP4 | Connector | J26158 | AC Line Cord Connection |
| ME1 | Meter | J1370 | S/RF/SWR/CAL |
| P1 | Cord | E8928 | AC Line Cord (Brown) |
| PL1 | Lamp | J18552 | Meter (13.74V @ 86mA) |
| RL1 | Relay | J12591 | XMT/Rec 160 Ohm |
| RL2 | Relay | J12612 | Alarm On/Off |
| S1 | Switch | | Record/XMT (Part of Relay RL1) |
| S2 | Switch | | Alarm On/Off (Part of Relay RL2) |
| | Plug | J26828 | Microphone |
| SO2 | Plug | J26856 | Antenna |
| SW1 | Switch | J12608 | ANL |
| SW2 | Switch | | Microphone |
| SW3 | Switch | J12608 | PA |
| SW4 | Switch | J12608 | Tone |
| SW5 | Switch | J12625 | AC/DC |
| SW6 | Switch | J12610 | Time Adjust Fast |
| SW7 | Switch | J12610 | Time Adjust Slow |
| SW8 | Switch | J12610 | Time Set |
| SW9 | Switch | J12611 | PWR On |
| SW10 | Switch | J12611 | PWR Off |
| SW11 | Switch | J12611 | Auto |
| SW12 | Switch | J12611 | Alarm |
| SW13 | Switch | J12609 | S/RF/SWR/CAL |
| SW14 | Switch | J12602 | Rotary, Channel Selector |
| X101 | Crystal | J241284 | 10.240MHz |
| X102 | Crystal | J241283 | 36.190MHz |
| X201 | Crystal | J241285 | 10.695MHz |
| | Microphone | J63349 | Dynamic (Includes: Col) |
| | Printed Circuit Board | J56488 | Channel Display |
| | Printed Circuit Board | J56484 | Digital Clock |
| | Printed Circuit Board | J56485 | Main |
| | Printed Circuit Board | J56487 | PA, Tone, ANL, Meter Switch |
| | Printed Circuit Board | J56489 | PA, RX, TX, LED Indicator |
| | Printed Circuit Board | J56462 | PLL Synthesizer |
| | Printed Circuit Board | J56486 | Power Supply |
| | Printed Circuit Board | J56483 | SWR Rectifier |
| | Printed Circuit Board | J56517 | Tape Out Amp |

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

| ITEM | PART No. |
|---|---|
| Cabinet Assembly | J98860 |
| Front Panel Assembly | J70723 |
| Knob Assembly, Channel Selector | J501107 |

| ITEM | PART No. |
|---|---|
| Knob Assembly, SWR CAL/Vol./SQL./RF Gain/ Fine Tune, | J501108 |
| Pushbutton, On,Off/Auto/Alarm/Time Adjust/ Time Set | J501093 |

## WIRING DATA

General-use Hook-up Wire (available in 5 colors) BELDEN No. 8523
Shielded Hook-up Wire (spiral wrapped) . . . . . BELDEN No. 8421
(braided) . . . . . BELDEN No. 8401
Speaker Cable (available in 4 colors) . . . . . BELDEN No. 8782
Bonding Strap . . . . . BELDEN No. 8672
AC Power Cord . . . . . (6') BELDEN No. 17106
(9') BELDEN No. 17109

Coiled Microphone Cable
3-conductor (1 shielded) 23AWG BELDEN No. 9471 (5')
BELDEN No. 8497 (6')
BELDEN No. 9472 (7-1/2')
28AWG BELDEN No. 9466 (6')
31AWG BELDEN No. 9468 (10')
4-conductor (unshielded) 23AWG BELDEN No. 8415 (6')
5-conductor (1 shielded) 28AWG BELDEN No. 9467 (6')
BELDEN No. 9465 (7-1/2')