



# PHOTOFACT® with

# CIRCUITRACE®

For Supplier Address See PHOTOFACT Index

## NOTE

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

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

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

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



MODEL 13-898

## ALIGNMENT INSTRUCTIONS

Suggested Alignment Tools:

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

MIDLAND MODEL 13-898

## SYNTHESIZER

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

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

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## RECEIVER

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

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

## RECEIVER ADJUSTMENTS

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

## TRANSMITTER

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

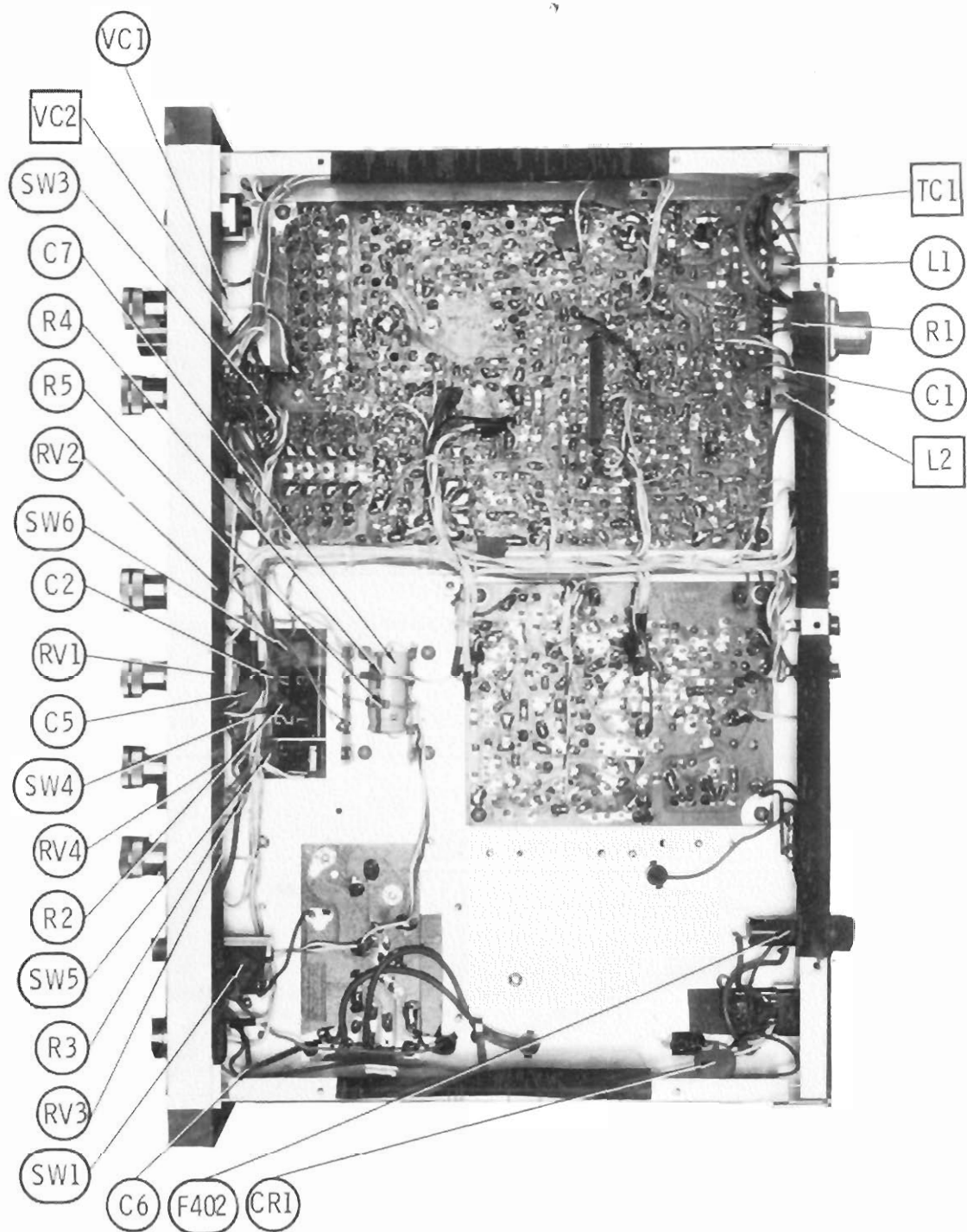
SSB

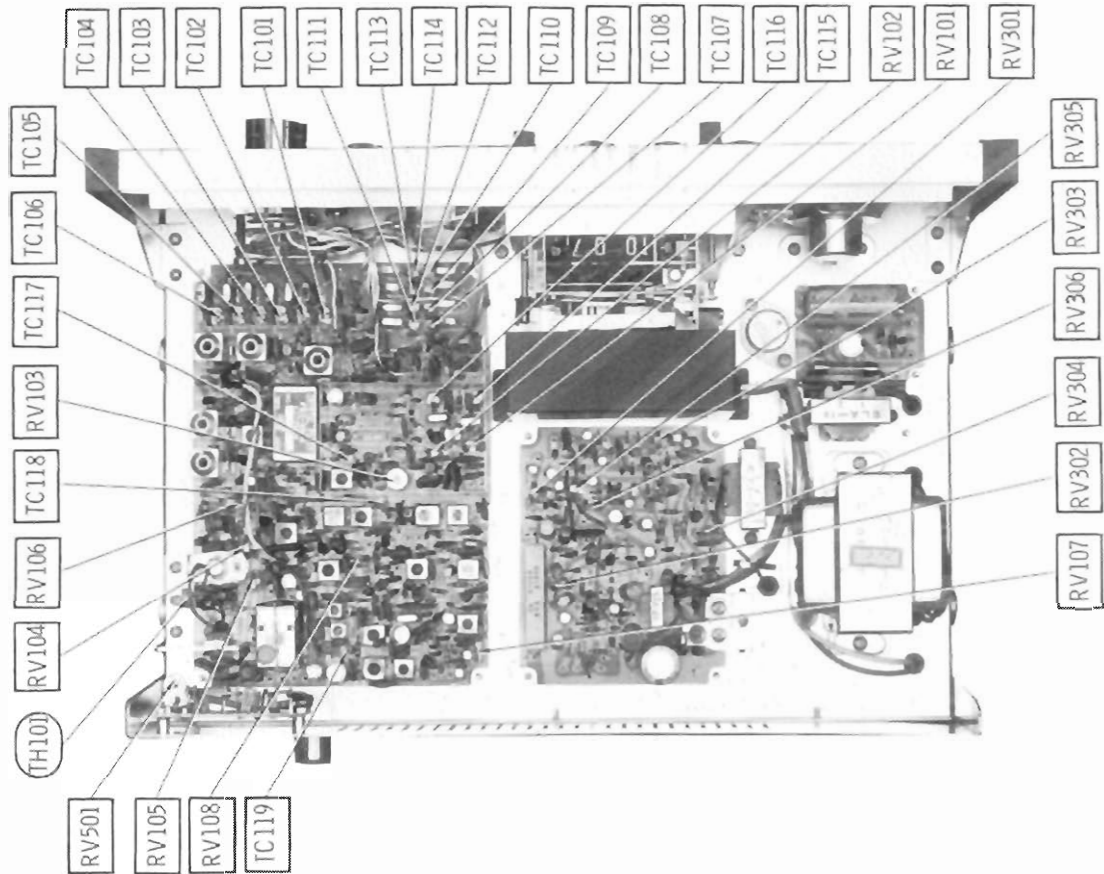
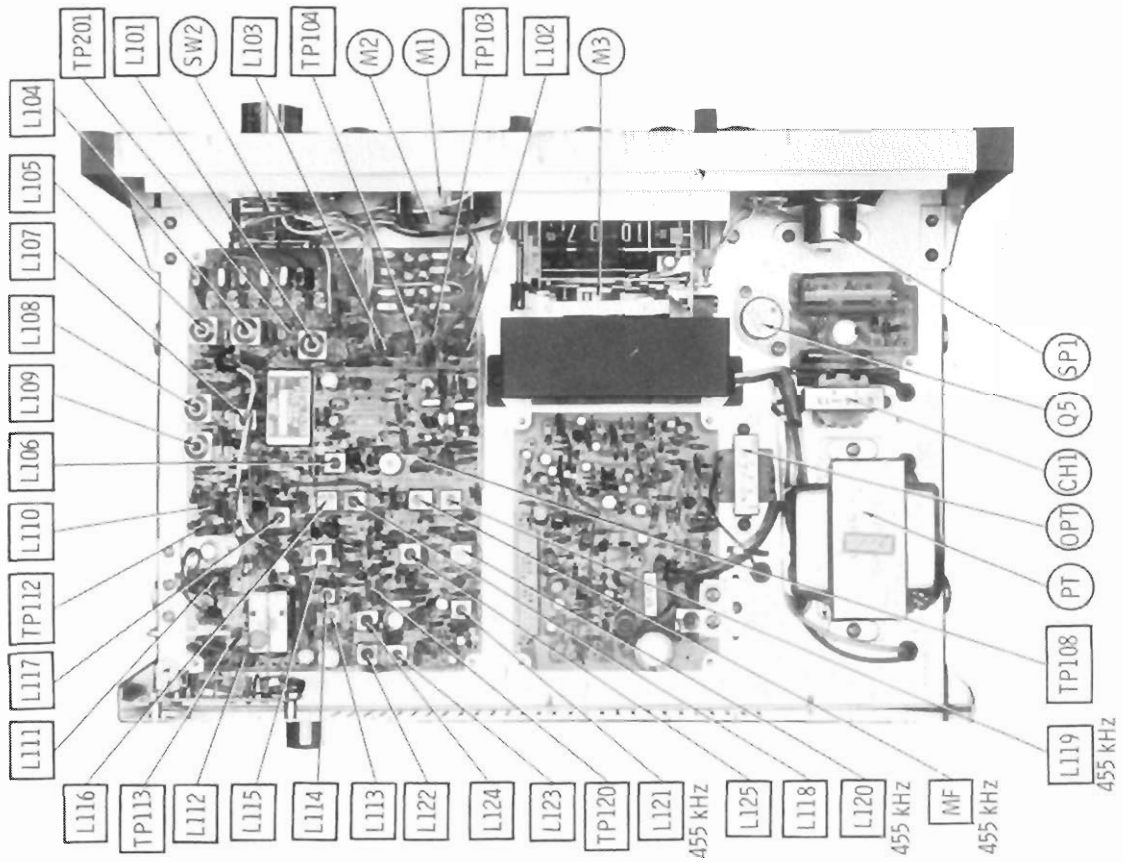
| INDICATOR                                        | ADJUST                                   | REMARKS                                                                                                                                                                          |
|--------------------------------------------------|-------------------------------------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

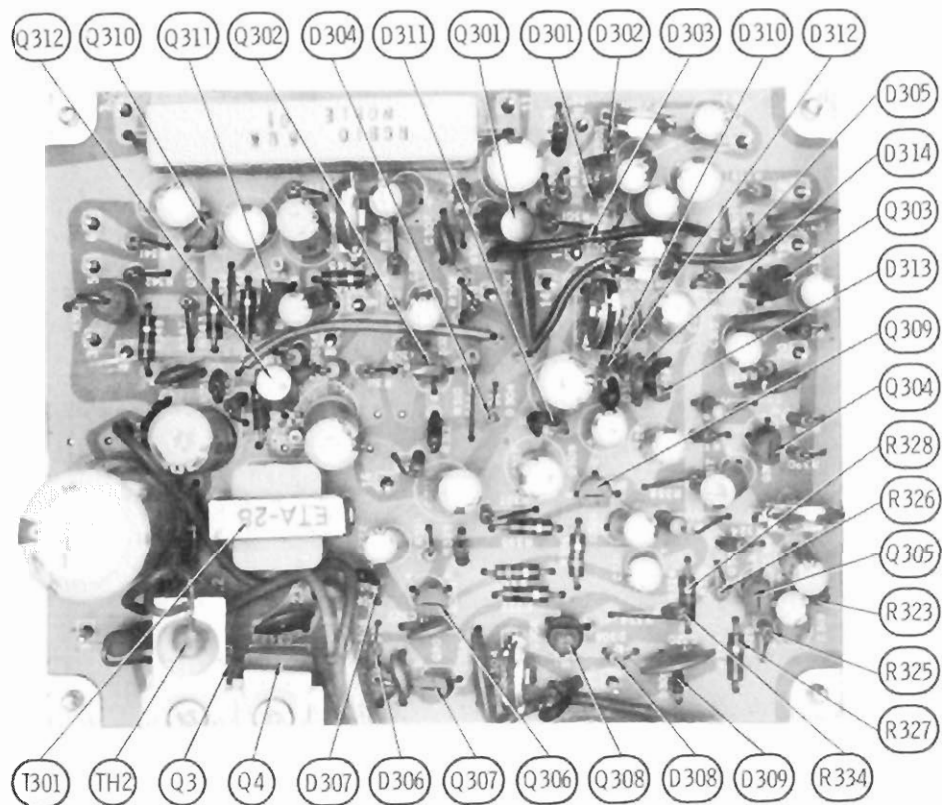
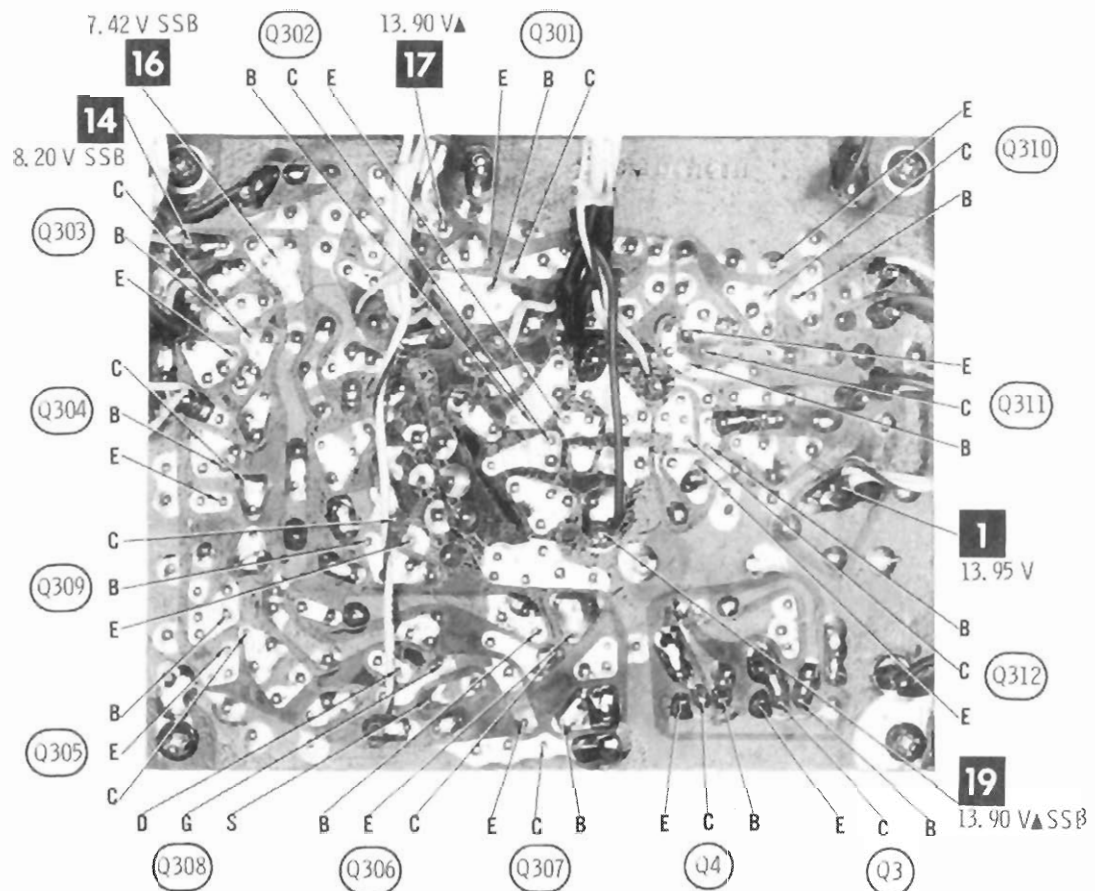
MIDLAND MODEL 13-898

## TRANSMITTER ADJUSTMENTS

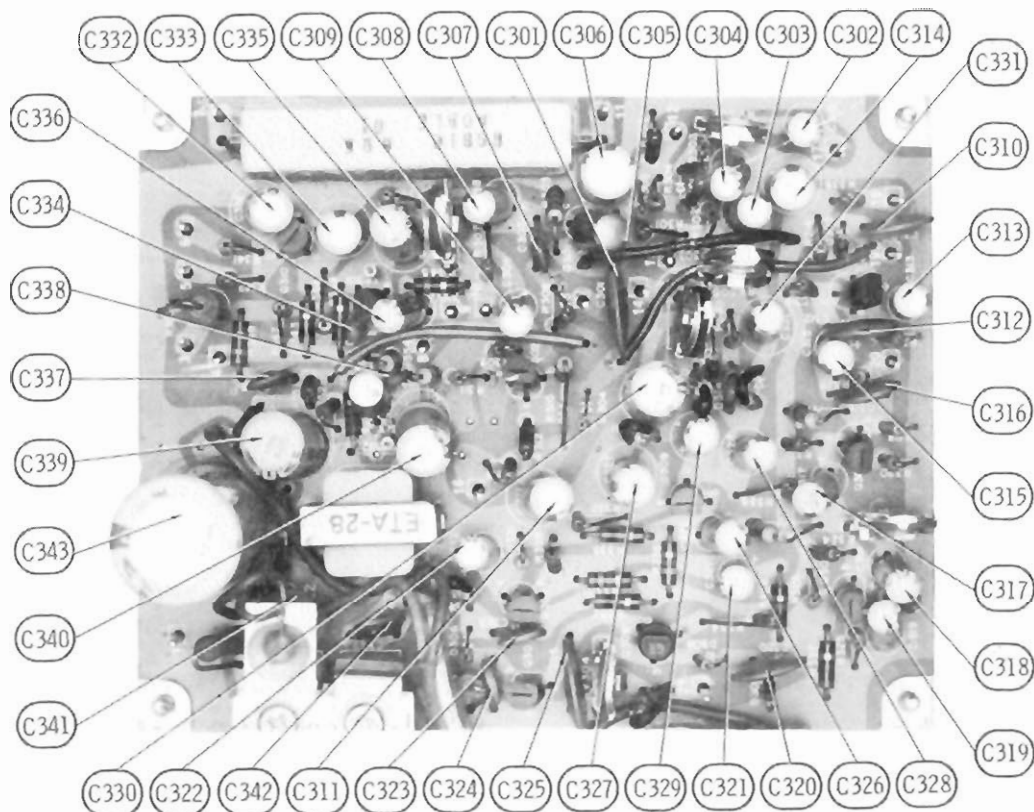
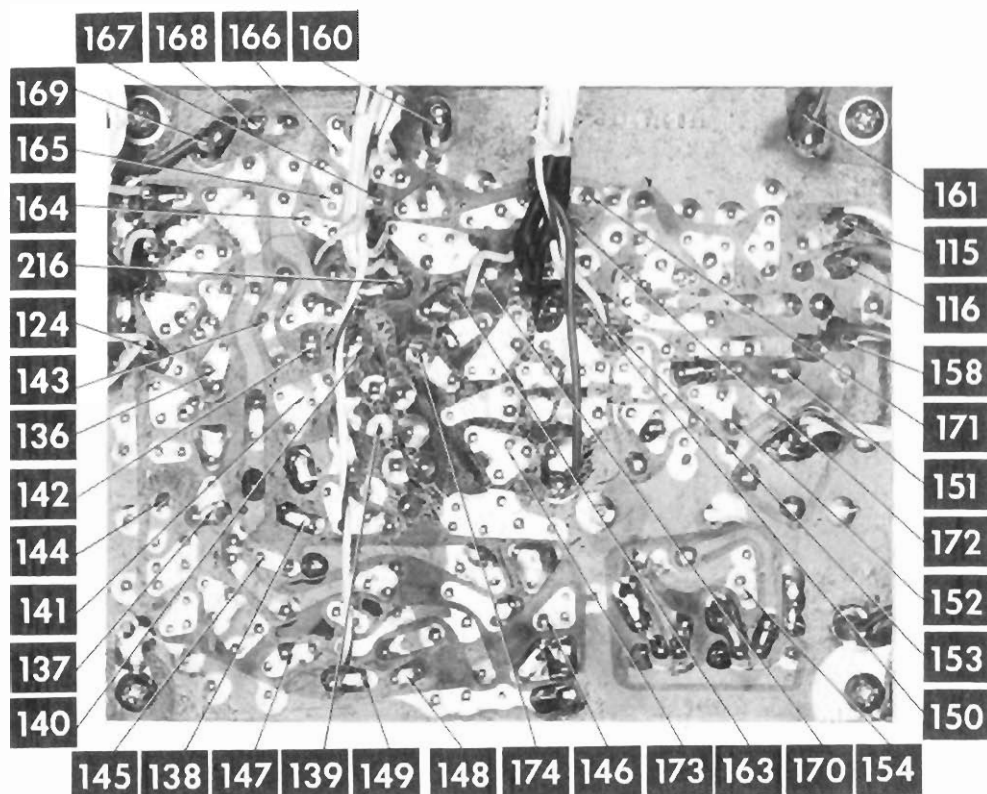
| INDICATOR                           | ADJUST | REMARKS                                                                                                                                                                                                                                                    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





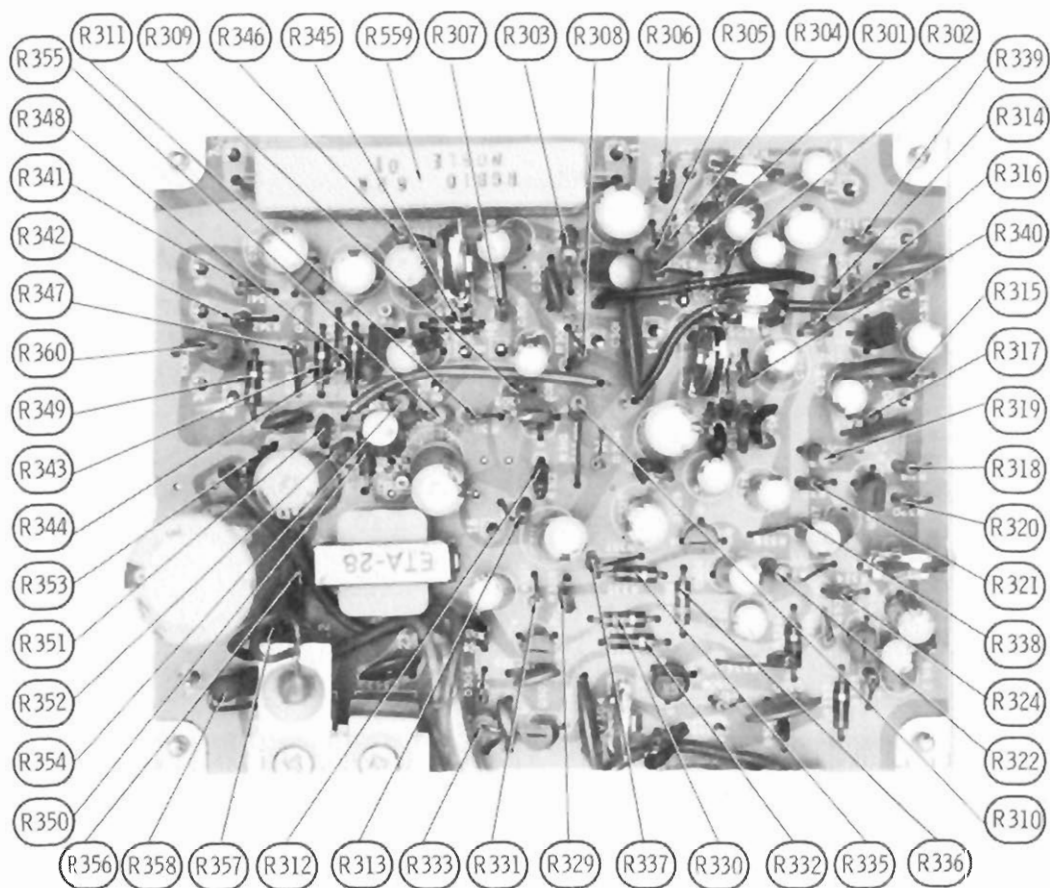


AUDIO-AGC BOARD

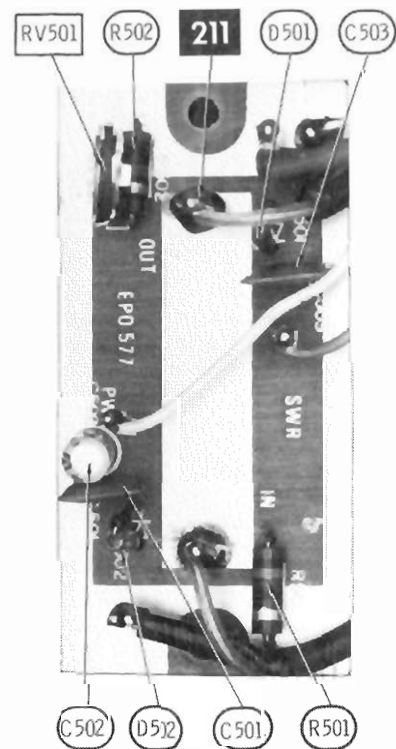
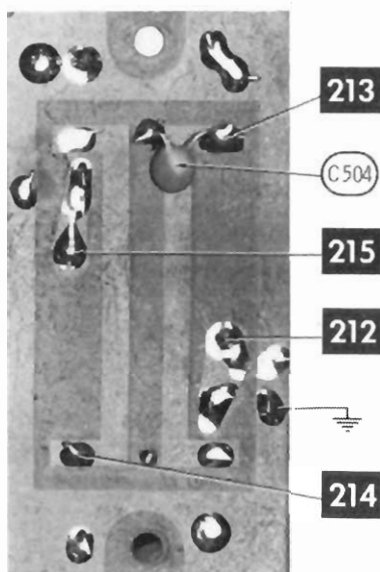


AUDIO-AGC BOARD

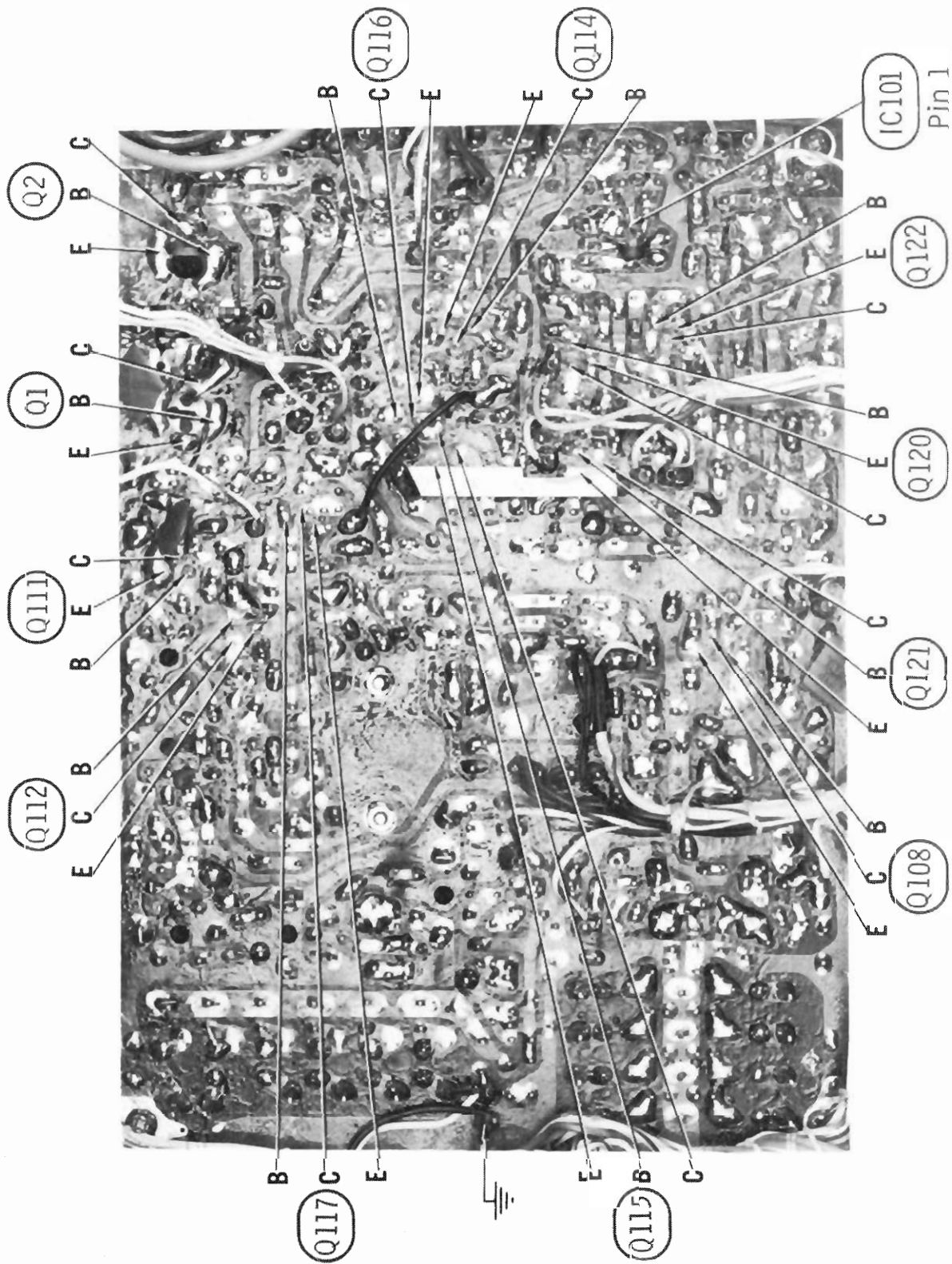
# AUDIO-AGC BOARD

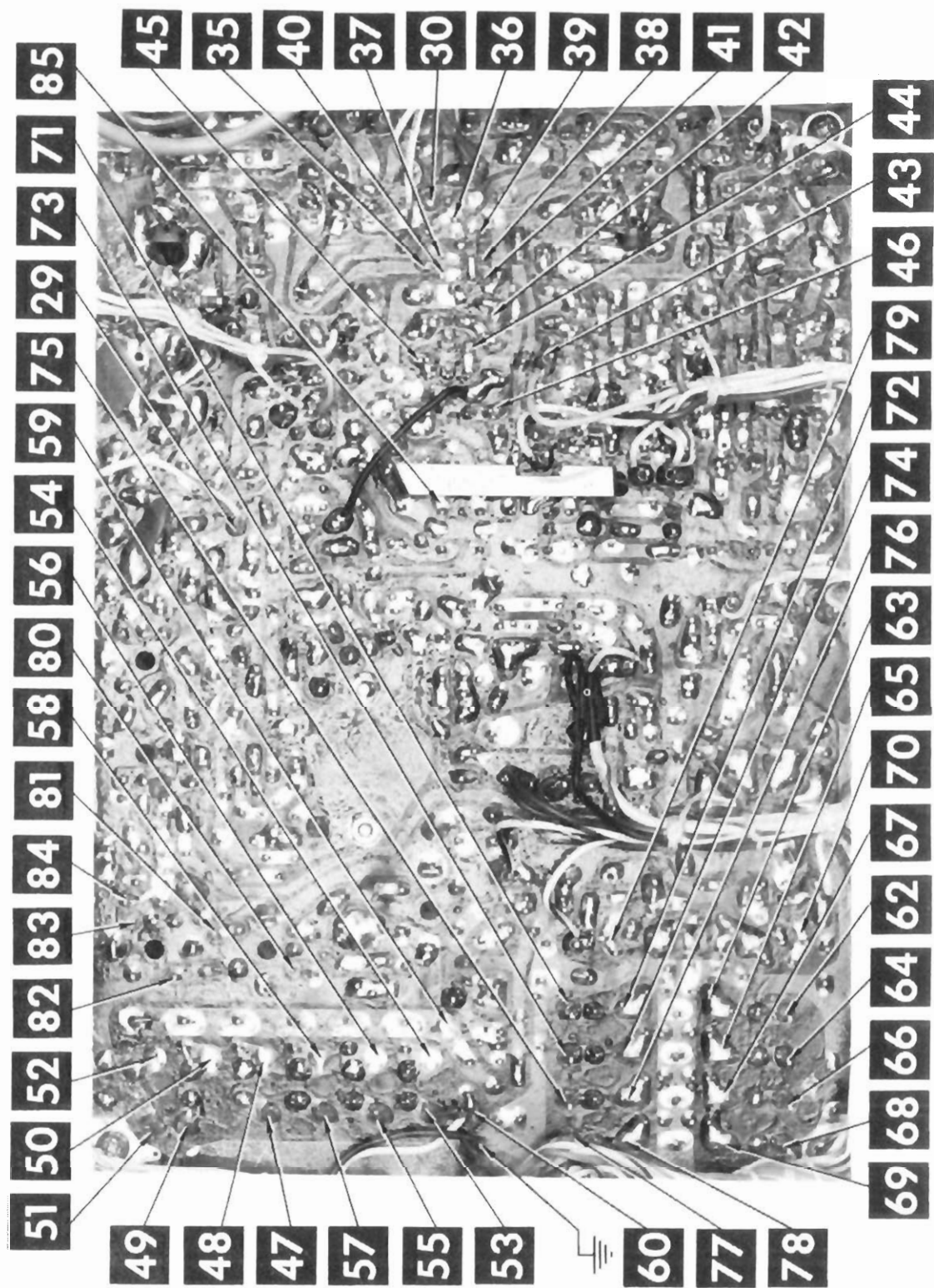


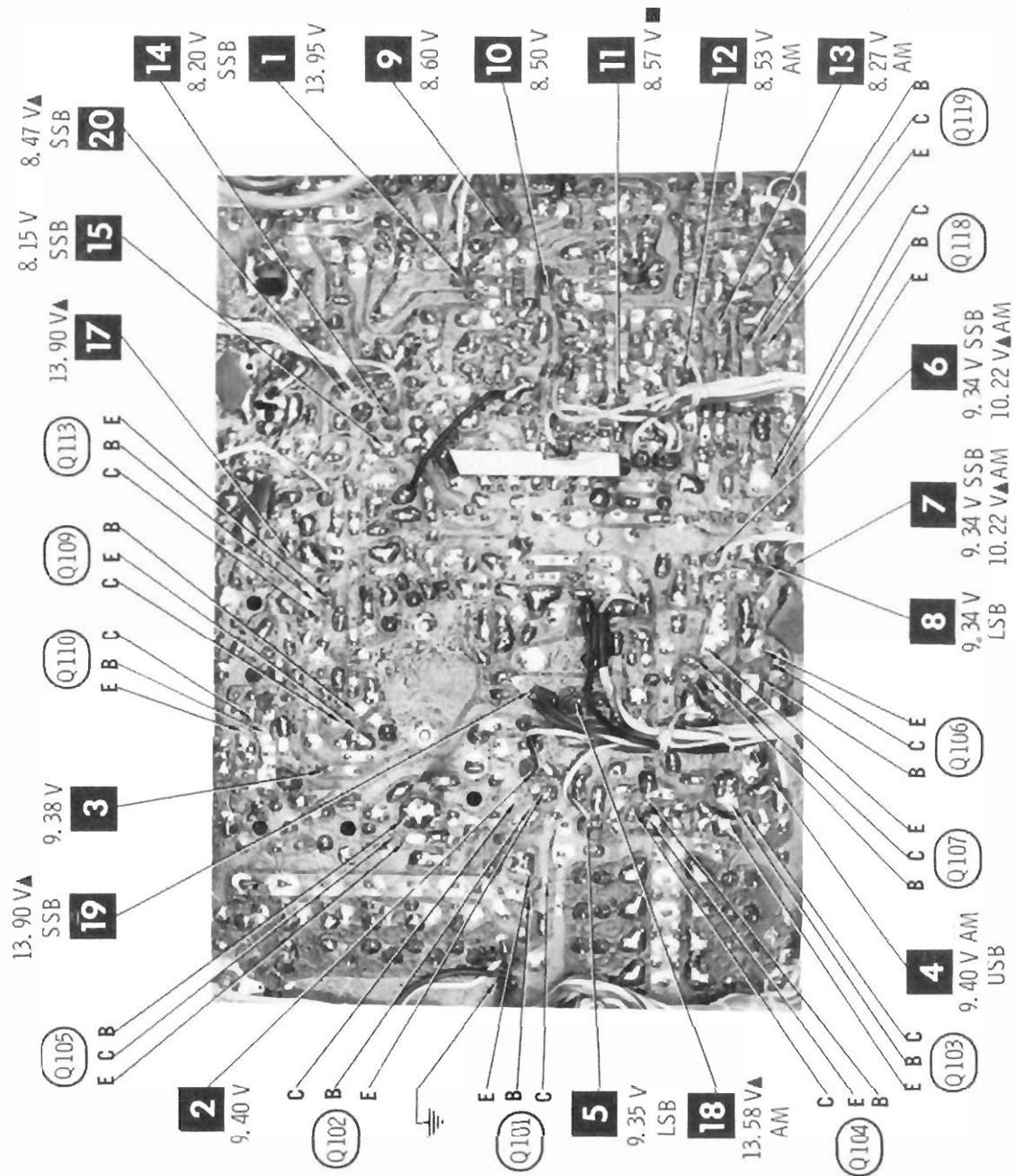
A Howard W. Sams CIRCUITRACE® Photo



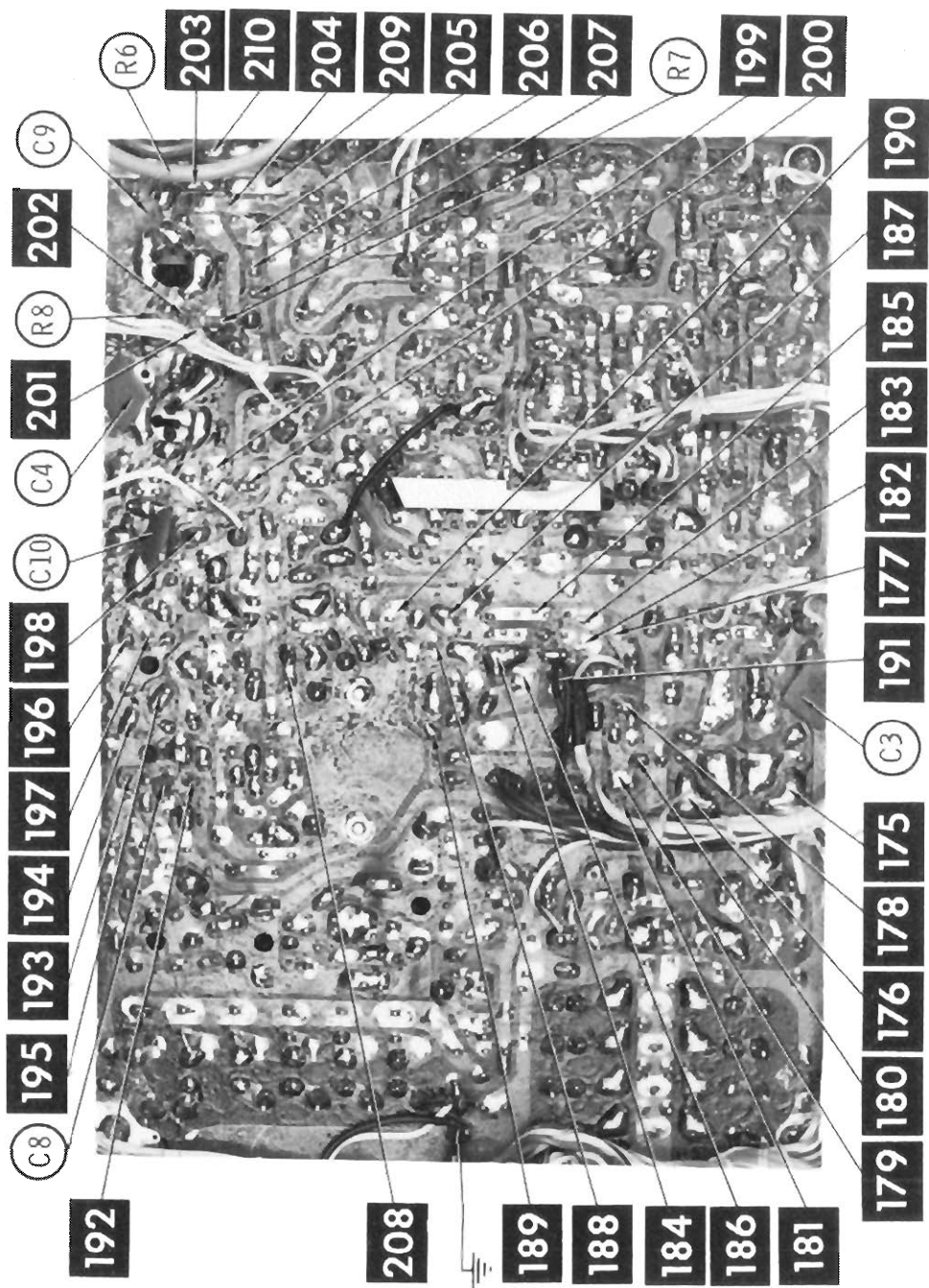
## SWR BOARD





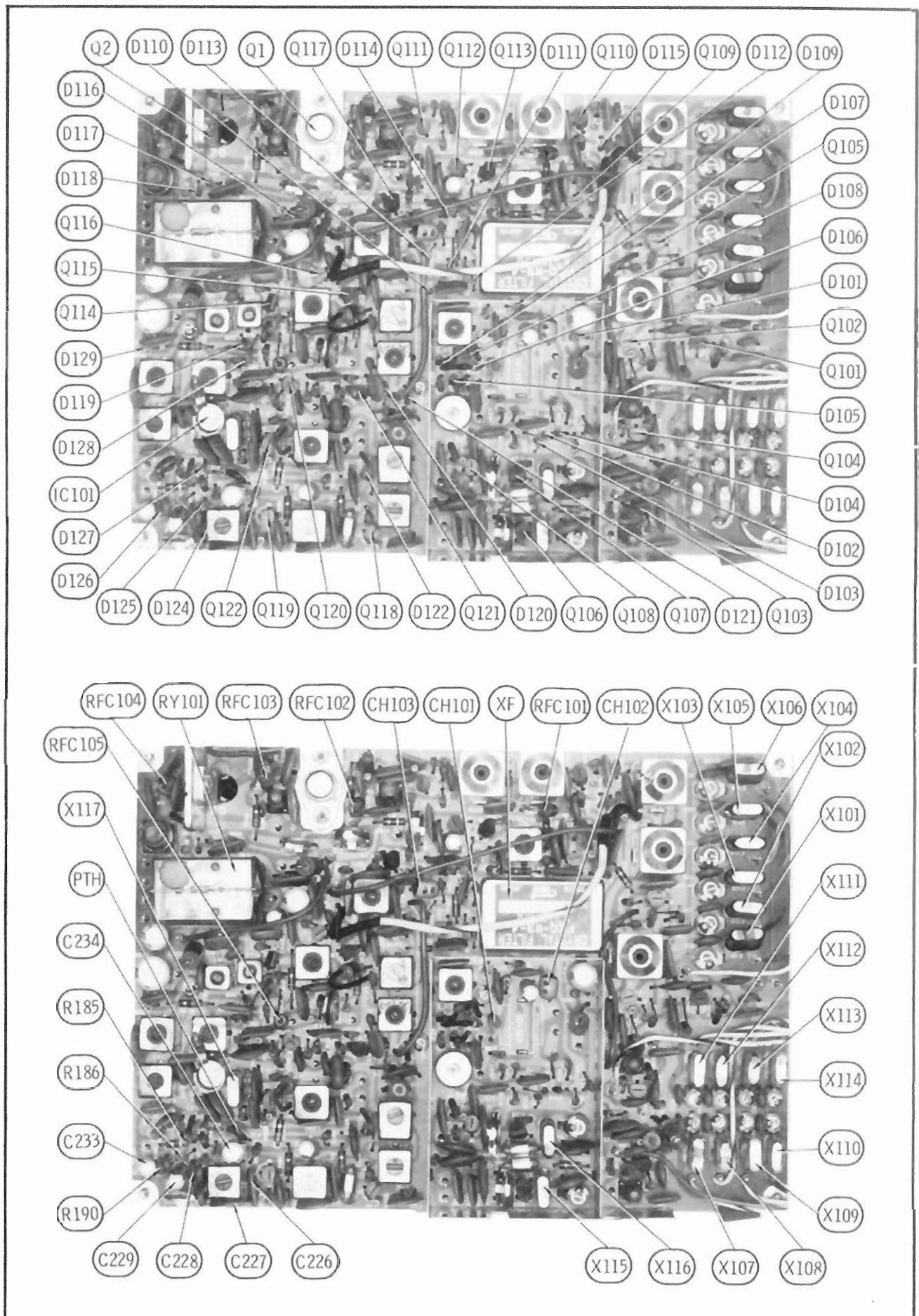


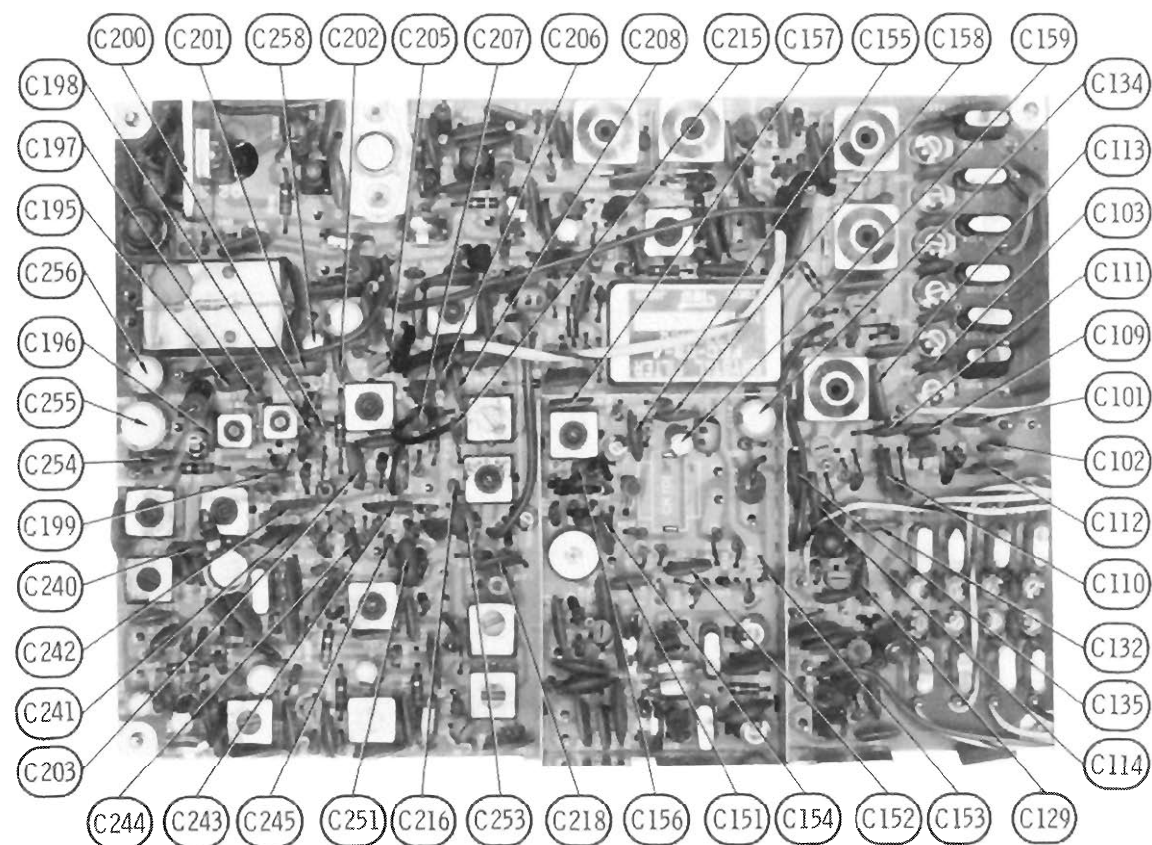
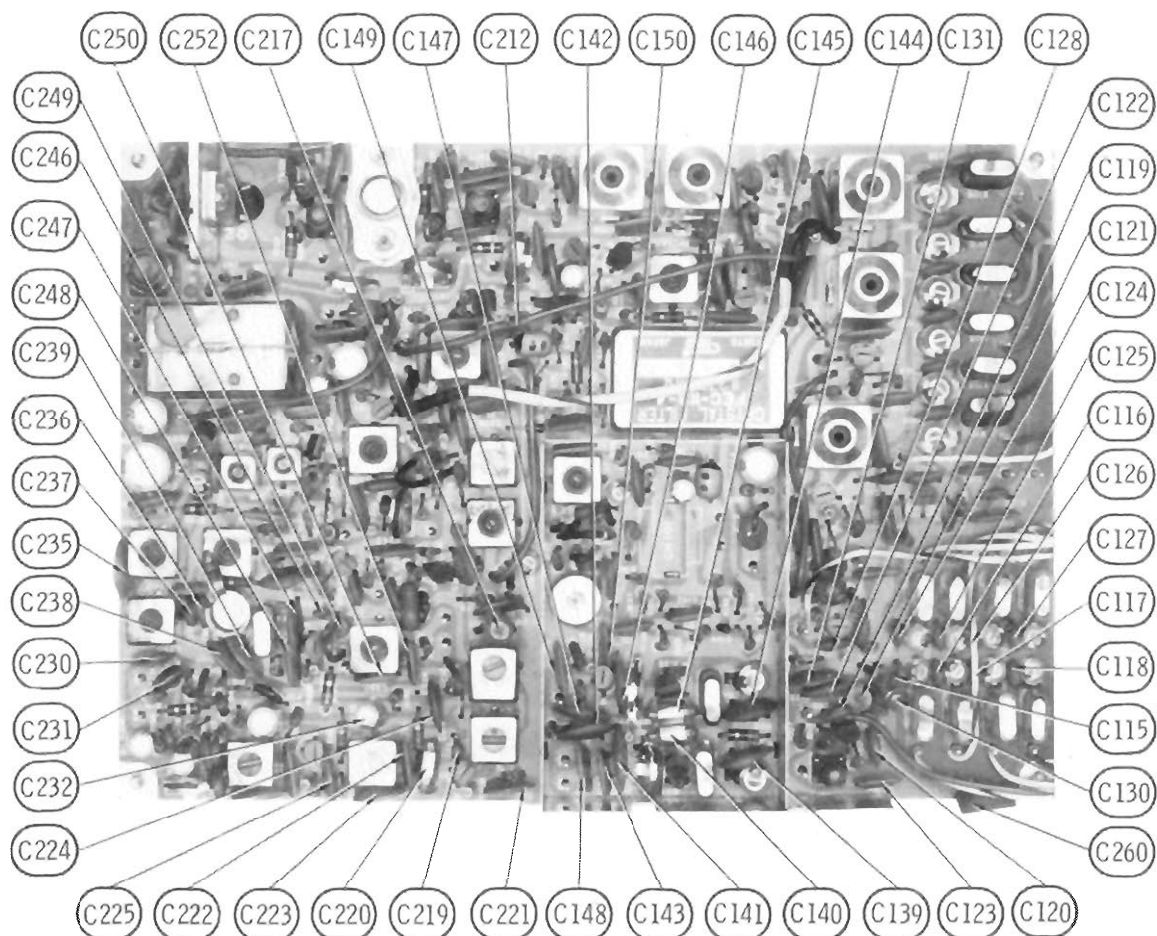


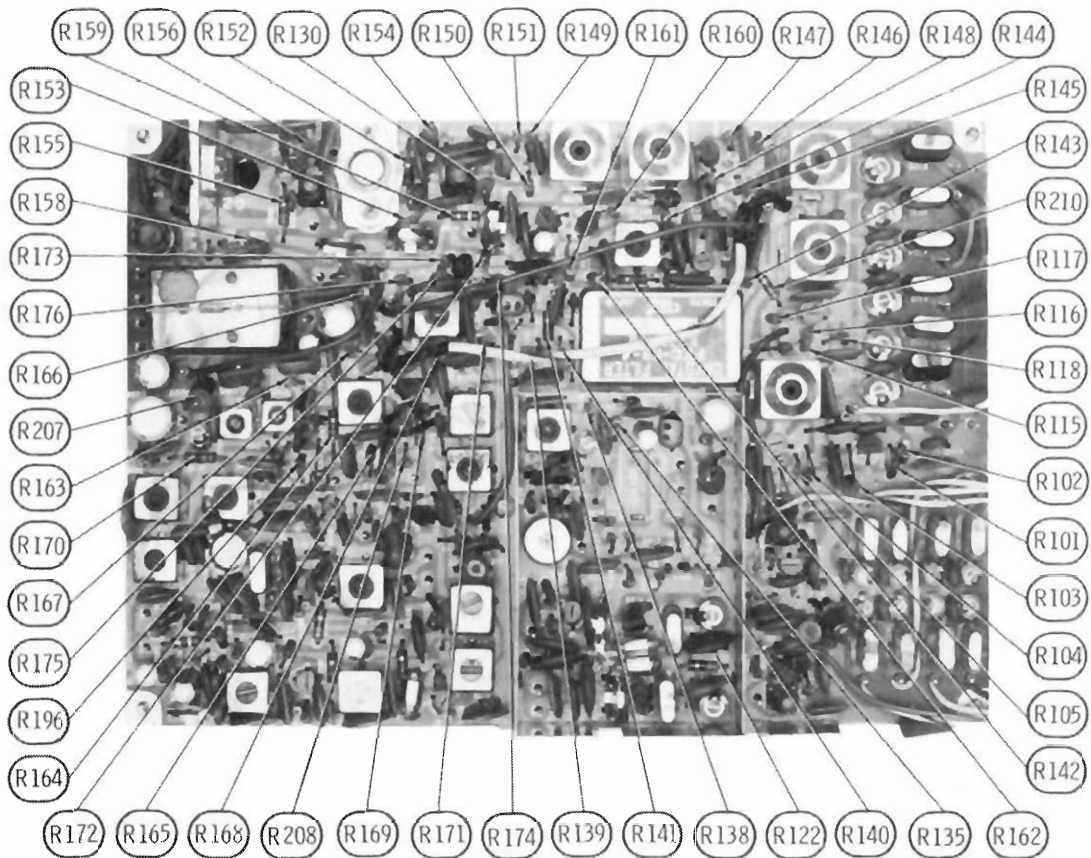
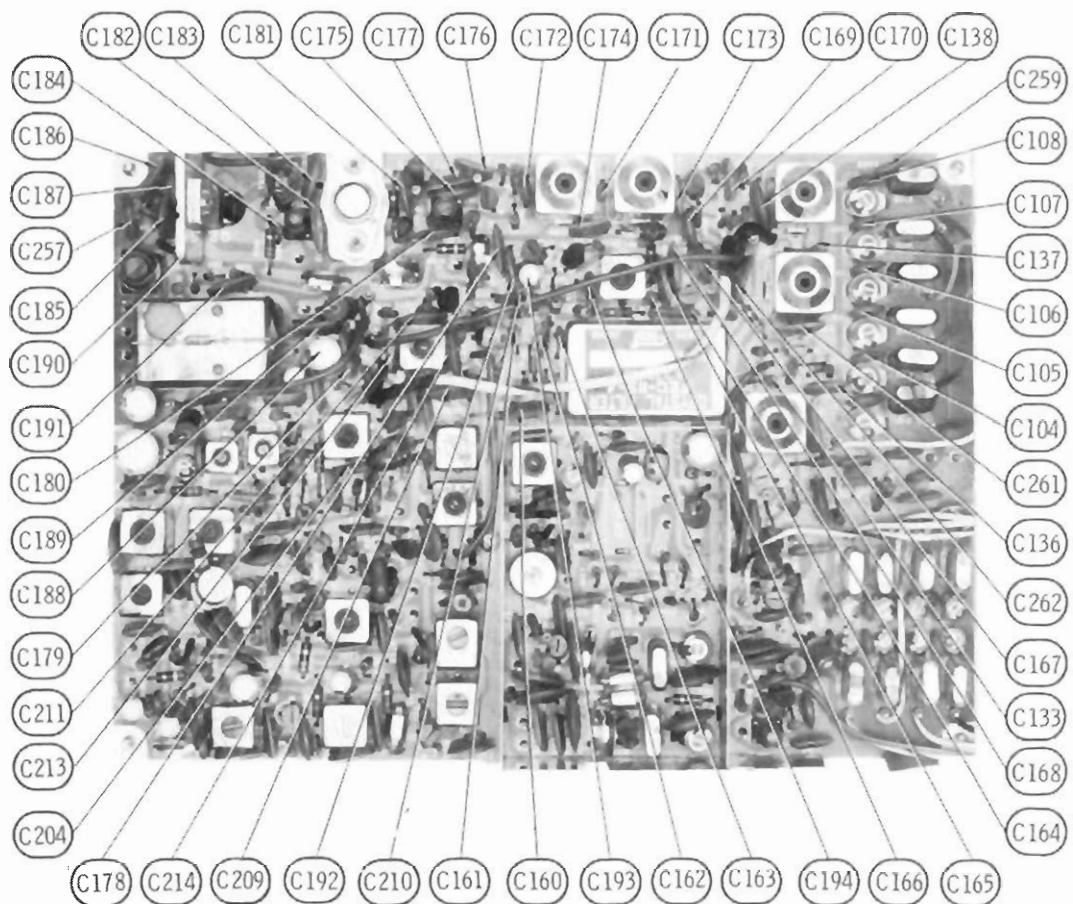


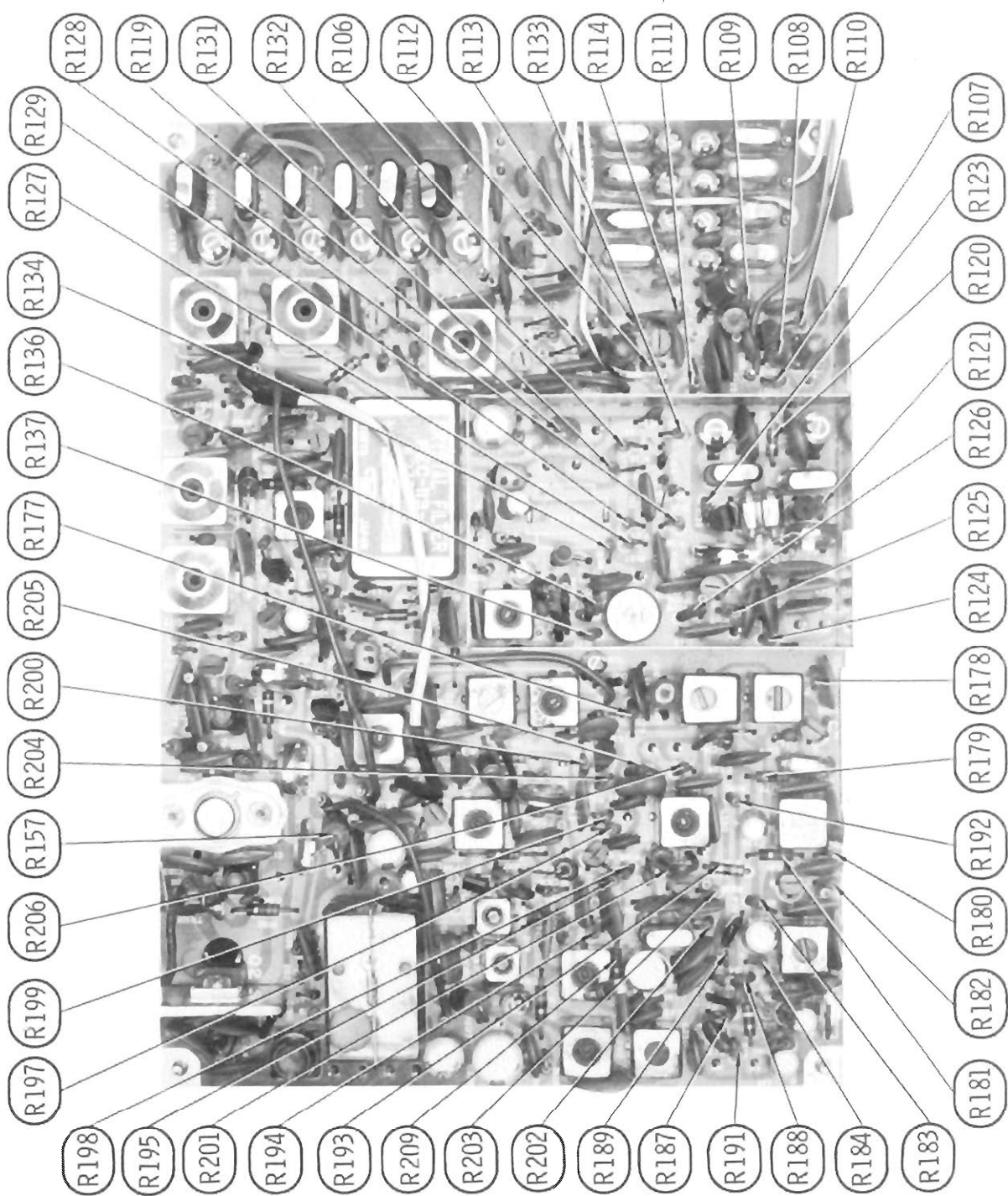
A Howard W. Sams **CIRCUITRACE** Photo

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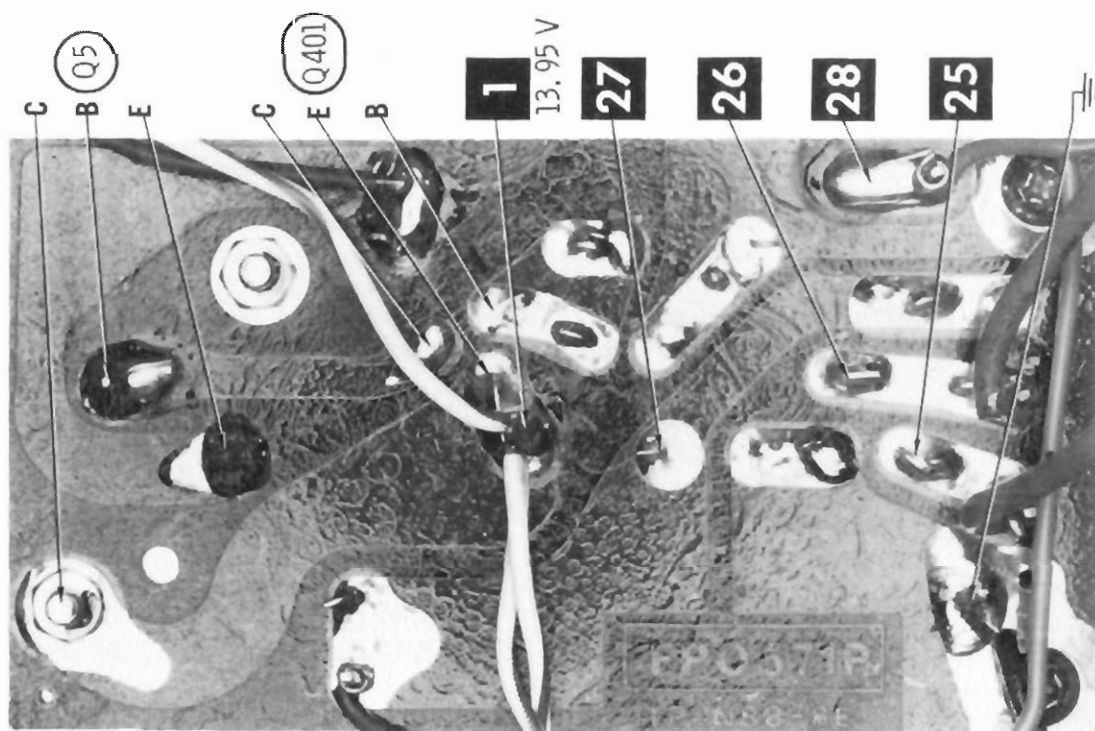
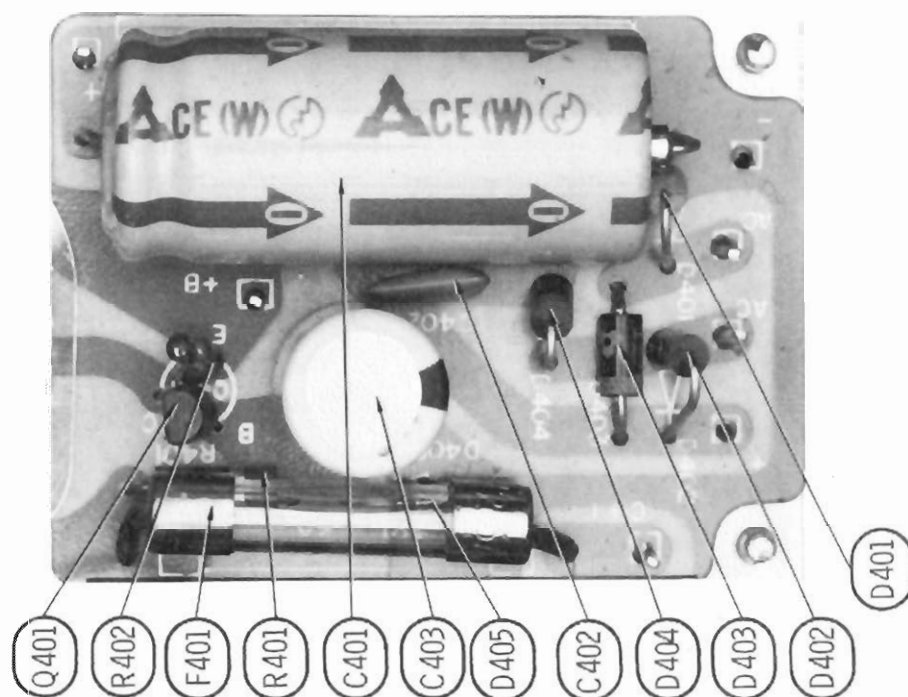








MIDLAND MODEL 13-898



AC POWER SUPPLY BOARD

## PARTS LIST AND DESCRIPTION

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

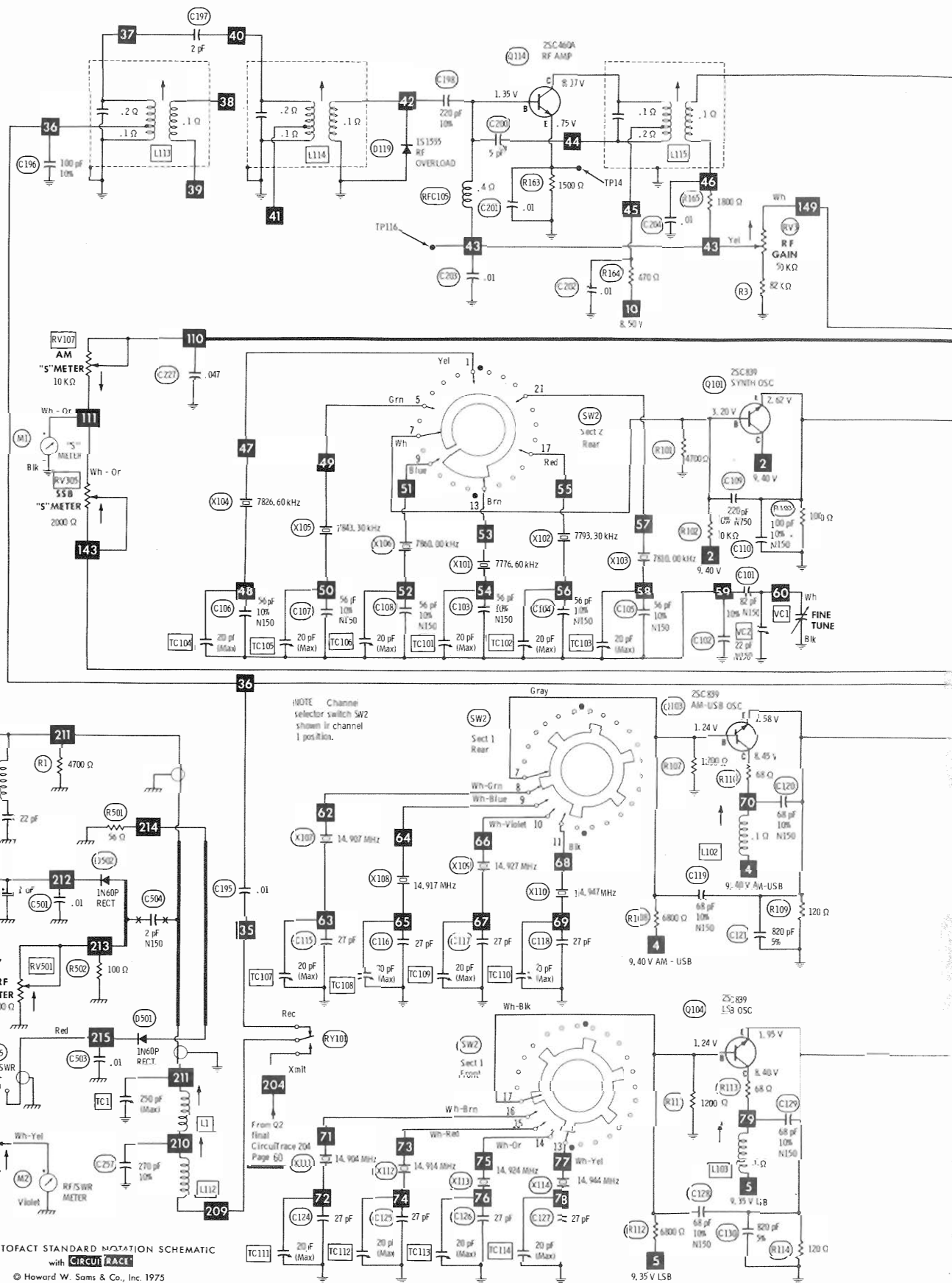
### WIRING DATA

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

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

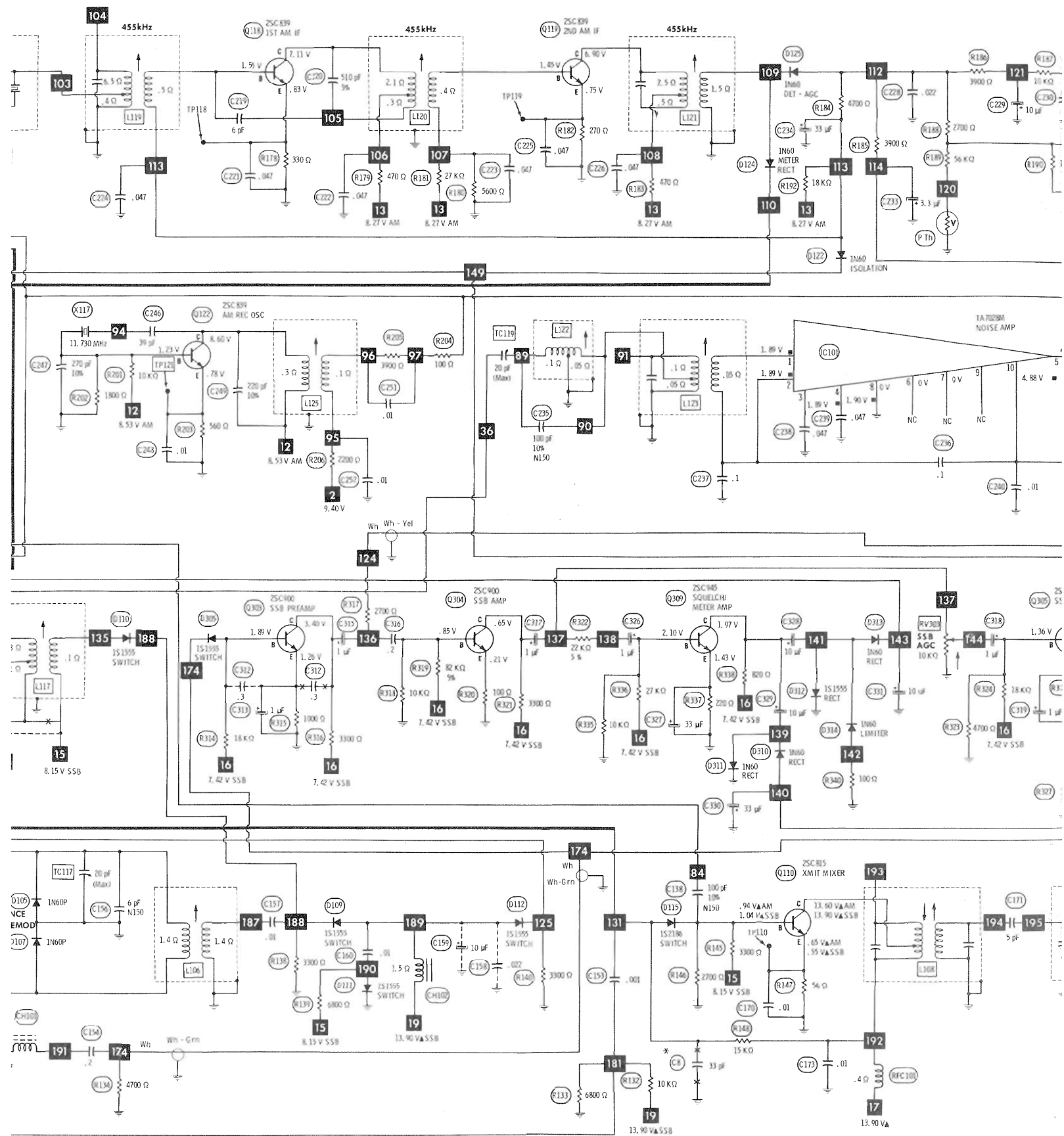
| ITEM No. | TYPE / MFR. No. / PART No.     | REPLACEMENT DATA          |                                  |                  |                   |              |                  |                   |
|----------|--------------------------------|---------------------------|----------------------------------|------------------|-------------------|--------------|------------------|-------------------|
|          |                                | GENERAL ELECTRIC PART No. | INTERNATIONAL RECTIFIER PART No. | MALLORY PART No. | MOTOROLA PART No. | RCA PART No. | SPRAGUE PART No. | SYLVANIA PART No. |
| D101     | BZ-090/09-306180<br>9.1V Zener | GEZD-9.1                  | Z-1210                           | PTC505           | HEPZ0412          | SK3060       | RT240            | ECG 139           |
| D102     | 1S2186/09-306276               | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100       | RT218            | ECG 177           |
| D103     | 1S1555/09-306154               | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100       | RT218            | ECG 177           |
| D104     | 1S2186/09-306276               | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100       | RT218            | ECG 177           |
| D105     | 1N60/09-306019                 | 1N60                      | 1N60                             | PTC206           | HEP135            | SK3088       |                  | ECG 109           |
| D106     | 1N60/09-306019                 | 1N60                      | 1N60                             | PTC206           | HEP135            | SK3088       |                  | ECG 109           |
| D107     | 1N60/09-306019                 | 1N60                      | 1N60                             | PTC206           | HEP135            | SK3088       |                  | ECG 109           |
| D108     | 1N60/09-306019                 | 1N60                      | 1N60                             | PTC206           | HEP135            | SK3088       |                  | ECG 109           |
| D109     | 1S1555/09-306154               | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100       | RT218            | ECG 177           |
| D110     | 1S1555/09-306154               | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100       | RT218            | ECG 177           |
| D111     | 1S1555/09-306154               | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100       | RT218            | ECG 177           |
| D112     | 1S1555/09-306154               | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100       | RT218            | ECG 177           |
| D113     | 1S1555/09-306154               | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100       | RT218            | ECG 177           |
| D114     | 1S1555/09-306154               | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100       | RT218            | ECG 177           |
| D115     | 1S2186/09-306276               | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100       | RT218            | ECG 177           |
| D116     | BZ-081/09-306277<br>8.2V Zener | GE-X11                    | Z-1208                           | ZB8.2            | HEPZ0411          | SK3059       | RT239            | ECG 5072          |
| D117     | 1S1555/09-306154               | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100       | RT218            | ECG 177           |
| D118     | 1S1555/09-306154               | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100       | RT218            | ECG 177           |
| D119     | 1S1555/09-306154               | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100       | RT218            | ECG 177           |
| D120     | 1S1555/09-306154               | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100       | RT218            | ECG 177           |
| D121     | 1S1555/09-306154               | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100       | RT218            | ECG 177           |
| D122     | 1N60/09-306019                 | 1N60                      | 1N60                             | PTC206           | HEP135            | SK3088       |                  | ECG 109           |
| D124     | 1N60/09-306019                 | 1N60                      | 1N60                             | PTC206           | HEP135            | SK3088       |                  | ECG 109           |
| D125     | 1N60/09-306019                 | 1N60                      | 1N60                             | PTC206           | HEP135            | SK3088       |                  | ECG 109           |
| D126     | 1N60/09-306019                 | 1N60                      | 1N60                             | PTC206           | HEP135            | SK3088       |                  | ECG 109           |
| D127     | 1N60/09-306019                 | 1N60                      | 1N60                             | PTC206           | HEP135            | SK3088       |                  | ECG 109           |
| D128     | 1N60/09-306019                 | 1N60                      | 1N60                             | PTC206           | HEP135            | SK3088       |                  | ECG 109           |
| D129     | BZ-081/09-306277               | GE-X11                    | Z-1208                           | ZB8.2            | HEPZ0411          | SK3059       | RT239            | ECG 5072          |
| D301     | 1N60/09-306019                 | 1N60                      | 1N60                             | PTC206           | HEP135            | SK3088       |                  | ECG 109           |
| D302     | 1S1555/09-306154               | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100       | RT218            | ECG 177           |
| D303     | 1S1555/09-306154               | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100       | RT218            | ECG 177           |
| D304     | 1S1555/09-306154               | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100       | RT218            | ECG 177           |
| D305     | 1S1555/09-306154               | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100       | RT218            | ECG 177           |
| D306     | 1S1555/09-306154               | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100       | RT218            | ECG 177           |
| D307     | 1N60/09-306154                 | 1N60                      | 1N60                             | PTC206           | HEP135            | SK3088       |                  | ECG 109           |
| D308     | 1S1555/09-306154               | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100       | RT218            | ECG 177           |
| D309     | 1S1555/09-306154               | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100       | RT218            | ECG 177           |
| D310     | 1N60/09-306019                 | 1N60                      | 1N60                             | PTC206           | HEP135            | SK3088       |                  | ECG 109           |
| D311     | 1N60/09-306019                 | 1N60                      | 1N60                             | PTC206           | HEP135            | SK3088       |                  | ECG 109           |
| D312     | 1S1555/09-306154               | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100       | RT218            | ECG 177           |
| D313     | 1N60/09-306019                 | 1N60                      | 1N60                             | PTC206           | HEP135            | SK3088       |                  | ECG 109           |
| D314     | 1N60/09-306019                 | 1N60                      | 1N60                             | PTC206           | HEP135            | SK3088       |                  | ECG 109           |
| D315     | 1S1555/09-306154(1)            | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100       | RT218            | ECG 177           |
| D401     | SR1K-4/13-102001               |                           |                                  |                  |                   |              |                  |                   |
| D402     | SR1K-4/13-102001               |                           |                                  |                  |                   |              |                  |                   |
| D403     | SR1K-4/13-102001               |                           |                                  |                  |                   |              |                  |                   |
| D404     | SR1K-4/13-102001               |                           |                                  |                  |                   |              |                  |                   |
| D405     | WZ-140/09-306278<br>14V Zener  | GEZD-15                   | Z-1214                           | PTC509           | HEPZ0417          | SK3094       | RT245            | ECG 144           |
| D501     | 1N60/09-306019                 | 1N60                      | 1N60                             | PTC206           | HEP135            | SK3088       |                  | ECG 109           |
| D502     | 1N60/09-306019                 | 1N60                      | 1N60                             | PTC206           | HEP135            | SK3088       |                  | ECG 109           |
| IC101    | TA7028M/09-308039              |                           |                                  |                  |                   |              |                  |                   |
| Q1       | 2SC777/09-302050               |                           | TR-64                            |                  | HEP75             | SK3047       |                  | ECG 224           |
| Q2       |                                | GE-66                     |                                  | PTC110           |                   |              |                  | ECG 236           |
| Q3       | 2SC1096/09-302126              | GE-28                     | TR-55                            | PTC110           | HEPS5003          | SK3054       | RT154            | ECG 186           |
| Q4       | 2SC1096/09-302126              | GE-28                     | TR-55                            | PTC110           | HEPS5003          | SK3054       | RT154            | ECG 186           |
| Q5       | 2SB407 (3)                     | GE-25                     | TR-24                            | PTC105           | HEP232            | SK3009       | RT124            | ECG 121           |
| Q101     | 2SC839/09-302126               | GE-20                     | TR-24                            | PTC121           | HEP54             | SK3122       | RT102            | ECG 123A          |
| Q102     | 2SC839/09-302126               | GE-20                     | TR-24                            | PTC121           | HEP54             | SK3122       | RT102            | ECG 123A          |
| Q103     | 2SC839/09-302126               | GE-20                     | TR-24                            | PTC121           | HEP54             | SK3122       | RT102            | ECG 123A          |
| Q104     | 2SC839/09-302126               | GE-20                     | TR-24                            | PTC121           | HEP54             | SK3122       | RT102            | ECG 123A          |
| Q105     | 2SC815/09-302067               | GE-20                     | TR-21                            | PTC139           | HEP724            | SK3038       | RT102            | ECG 123A          |
| Q106     | 2SC839/09-302126               | GE-20                     | TR-24                            | PTC121           | HEP54             | SK3122       | RT102            | ECG 123A          |
| Q107     | 2SC839/09-302126               | GE-20                     | TR-24                            | PTC121           | HEP54             | SK3122       | RT102            | ECG 123A          |
| Q108     | 2SC839/09-302126               | GE-20                     | TR-24                            | PTC121           | HEP54             | SK3122       | RT102            | ECG 123A          |

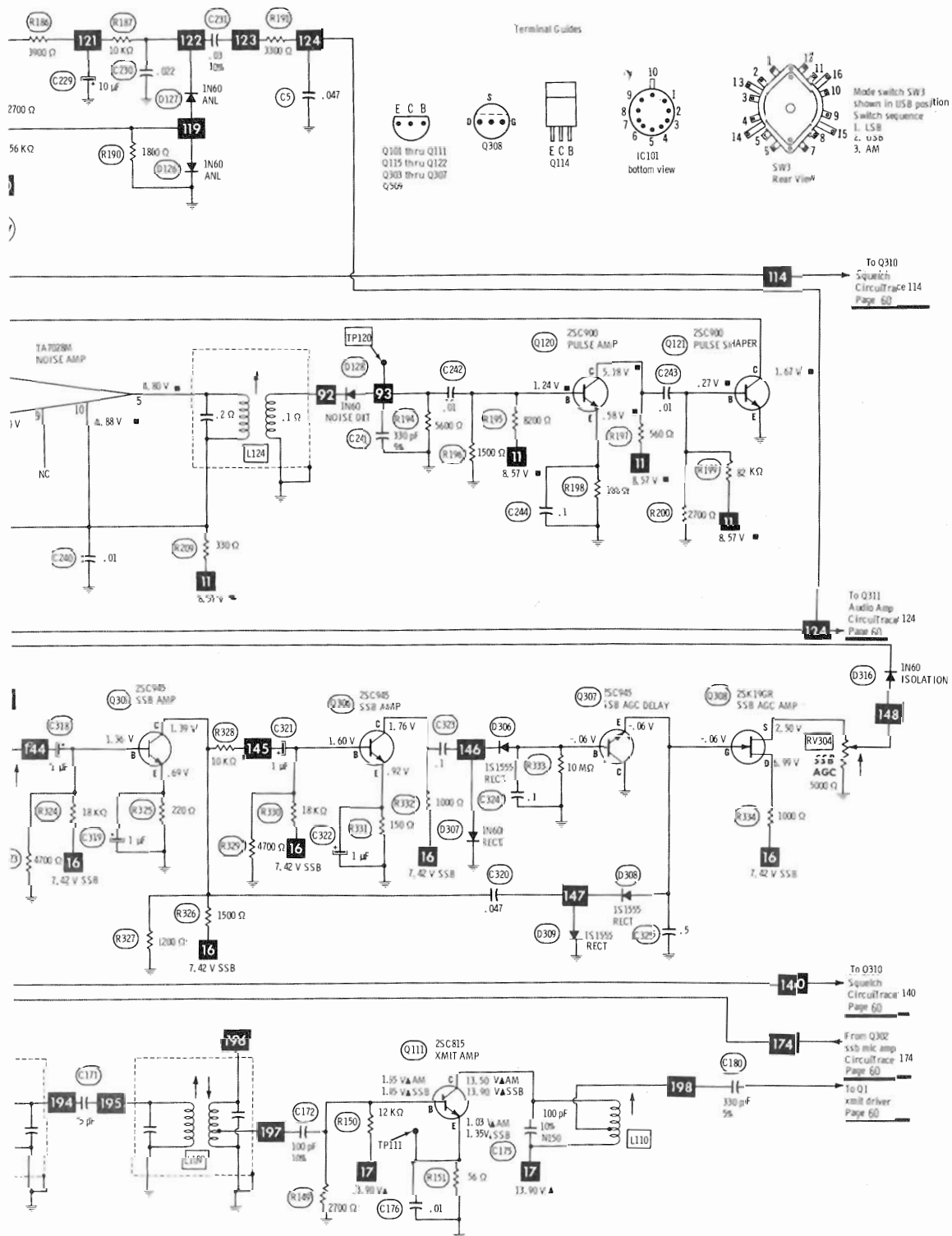
(CONTINUED ON PAGE 63)



SEE NOTES ON PAGE 62

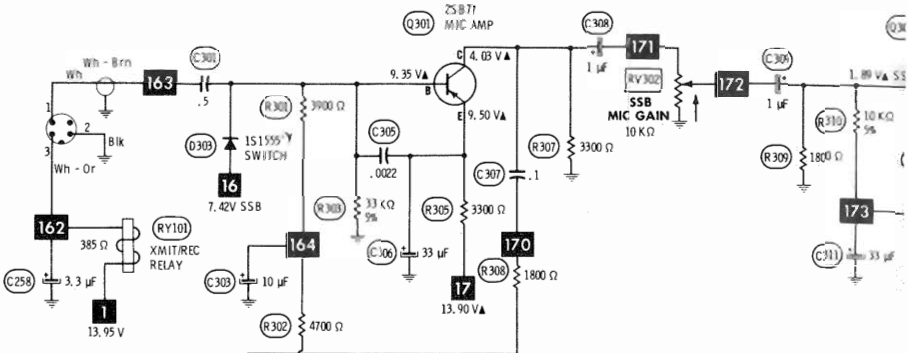
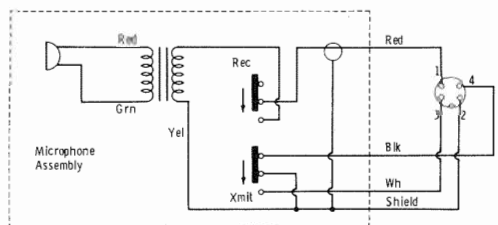






MIDLAND MODEL 13-898

MIDLAND MODEL 13-898



To balanced mod/mod  
Circuit trace 174  
page 59

From AM det.  
Circuit trace 114  
page 59

From Q309  
SSB Squelch/  
meter amp  
Circuit trace 140  
page 59

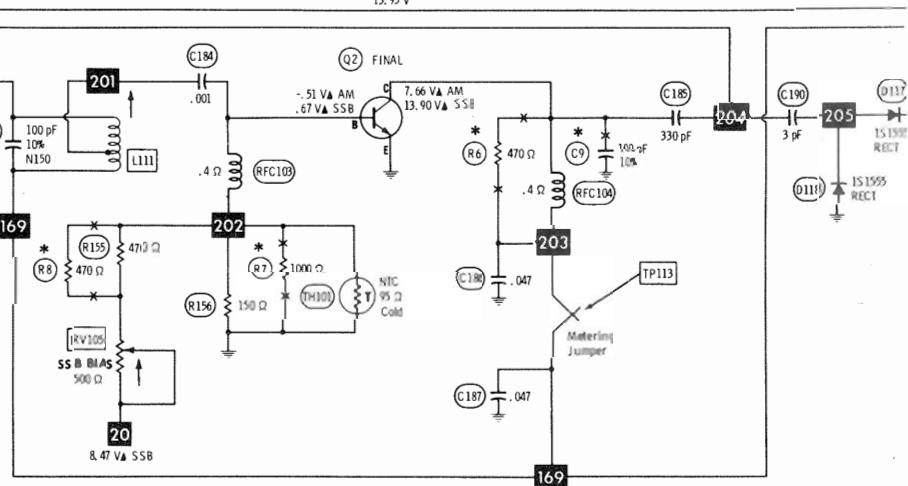
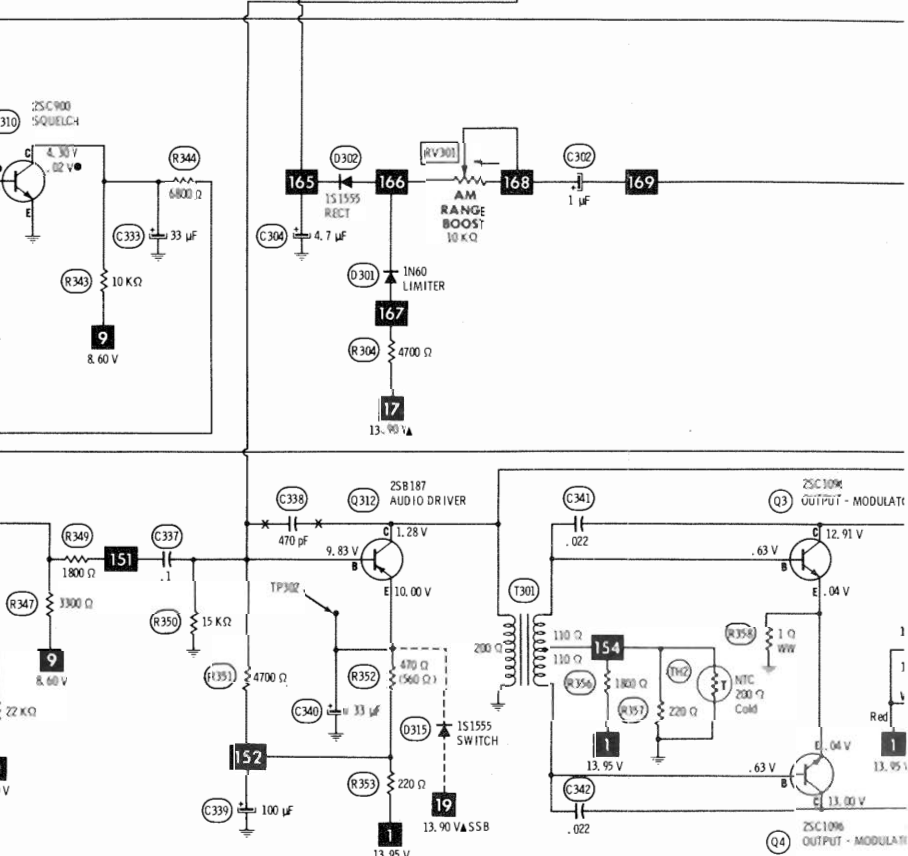
From AM det.  
Q309  
SSB preamp  
Circuit trace 124  
page 59

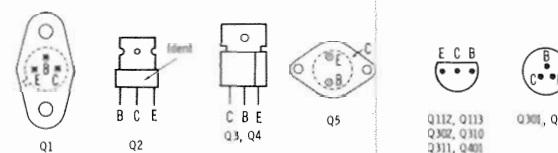
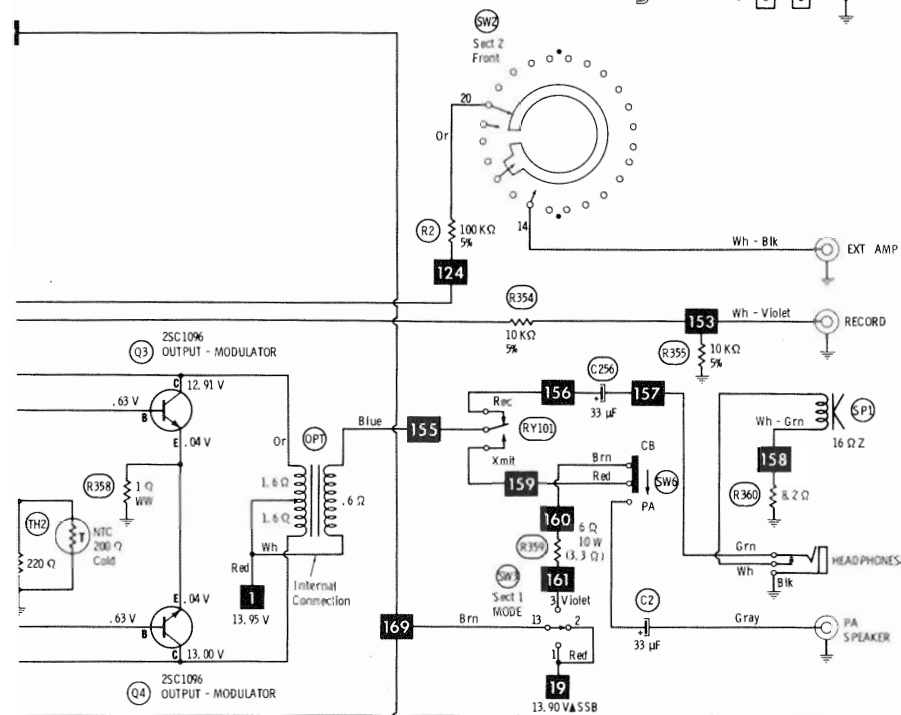
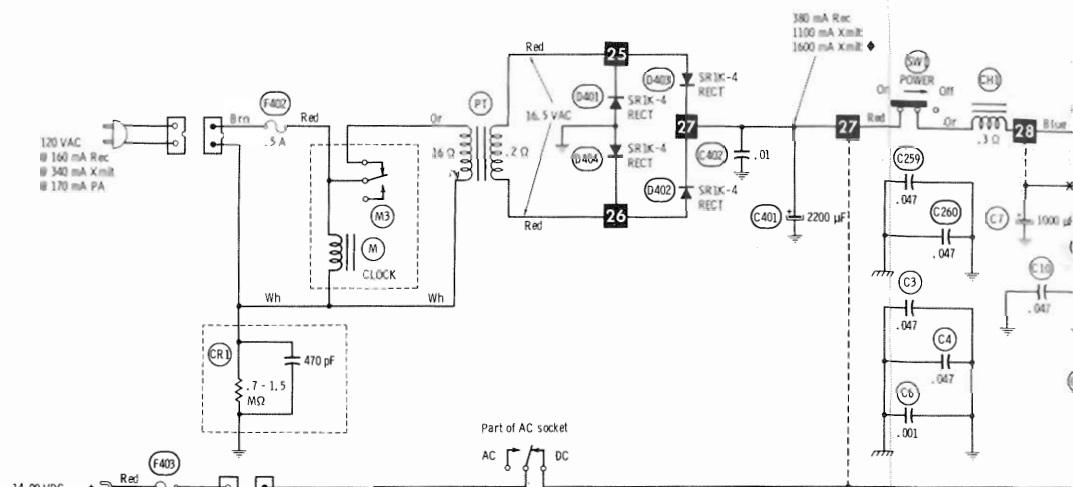
To Q108  
1st SSB IF  
Circuit trace 208  
page 57

To ant.  
Circuit trace 204  
page 56

From Q111  
Xmit amp  
page 59

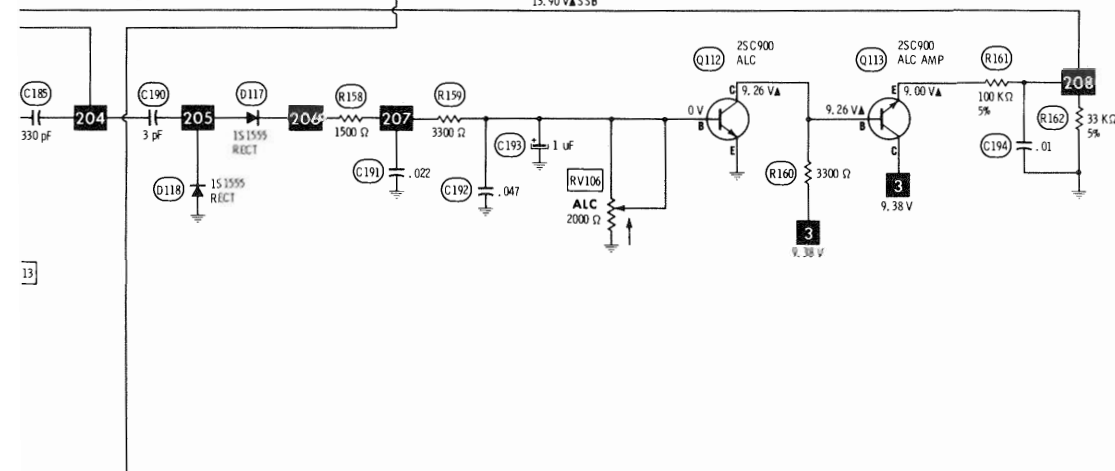
A PHOTOFACT STANDARD NOTATION SCHEMATIC  
with CIRCUITRACE  
© Howard W. Sams & Co., Inc. 1975



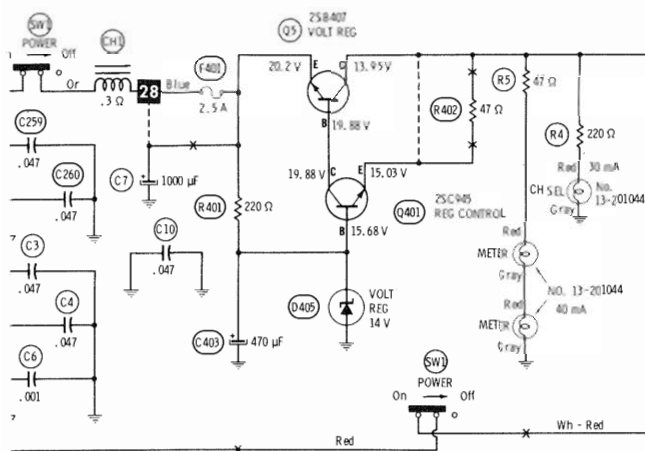


| Chan | Crystal<br>Component | Chan | Crystal<br>Component | Chan | Crystal<br>Component | Chan | Crystal<br>Component |
|------|----------------------|------|----------------------|------|----------------------|------|----------------------|
| 1    | X107, X107, X17      | 7    | X102, X109, X15      | 13   | X104, X107, X15      | 19   | X105, X109, X111     |
| 2    | X107, X108, X18      | 8    | X102, X110, X15      | 14   | X104, X107, X15      | 20   | X105, X110, X111     |
| 3    | X107, X109, X19      | 9    | X103, X107, X15      | 15   | X104, X109, X15      | 21   | X106, X107, X111     |
| 4    | X107, X110, X19      | 10   | X103, X108, X15      | 16   | X104, X110, X19      | 22   | X106, X108, X111     |
| 5    | X102, X107, X19      | 11   | X103, X109, X19      | 17   | X105, X107, X19      | EX   |                      |
| 6    | X102, X108, X19      | 12   | X103, X110, X19      | 18   | X105, X108, X19      | 23   | X106, X110, X111     |

| Chan | Cryp<br>Comple |
|------|----------------|
| 1    | X101, X10      |
| 2    | X101, X10      |
| 3    | X101, X10      |
| 4    | X101, X11      |
| 5    | X102, X10      |
| 6    | X102, X10      |

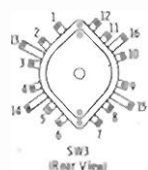


- ◆ 100% Mo  
 $\overline{m}$  Denotes c  
 $\overline{m}$  Denotes c  
 --- Indicates  
 ---X Indicates  
 \* Omitted i  
 ⊖ See parts  
 ⊗ Value var  
 ⊕ Measure  
 ⊙ Measure  
 NC No Conne  
 Measure  
 others  
 Values st  
 Resistors  
 Supply v  
 Voltage ar  
 no sign  
 Arrow on



Q112, Q113  
Q302, Q310  
Q311, Q401

Q301, Q312



Slide switch SW3 shown in USB position.  
Switch sequence -  
1. AM  
2. USB  
3. LSB

LSB

| Chan | Crystal Complement | Chan | Crystal Complement | Chan | Crystal Complement | Chan | Crystal Complement |
|------|--------------------|------|--------------------|------|--------------------|------|--------------------|
| 1    | X102, X107, X116   | 7    | X102, X109, X116   | 13   | X104, X107, X116   | 19   | X105, X109, X116   |
| 2    | X101, X108, X116   | 8    | X102, X110, X116   | 14   | X104, X108, X116   | 20   | X105, X110, X116   |
| 3    | X101, X109, X116   | 9    | X103, X107, X116   | 15   | X104, X109, X116   | 21   | X106, X107, X116   |
| 4    | X101, X110, X116   | 10   | X103, X108, X116   | 16   | X104, X110, X116   | 22   | X106, X108, X116   |
| 5    | X102, X107, X116   | 11   | X103, X109, X116   | 17   | X105, X107, X116   | 23   | X106, X110, X116   |
| 6    | X102, X108, X116   | 12   | X103, X110, X116   | 18   | X105, X108, X116   | 24   | X106, X110, X116   |

♦ 1.00% Modulation

Denotes chassis.

Denotes ground. (Voltage reference unless otherwise indicated)

Indicates connection used in some versions.

Indicates connection not used in some versions.

Denotes omitted in some versions.

See parts list.

Value varies; replace with original value.

Measured in transmit position.

Measured with unit squelched.

No Connection.

Measurements taken with switching in position shown unless otherwise indicated.

Values shown in ( ) are used in some applications.

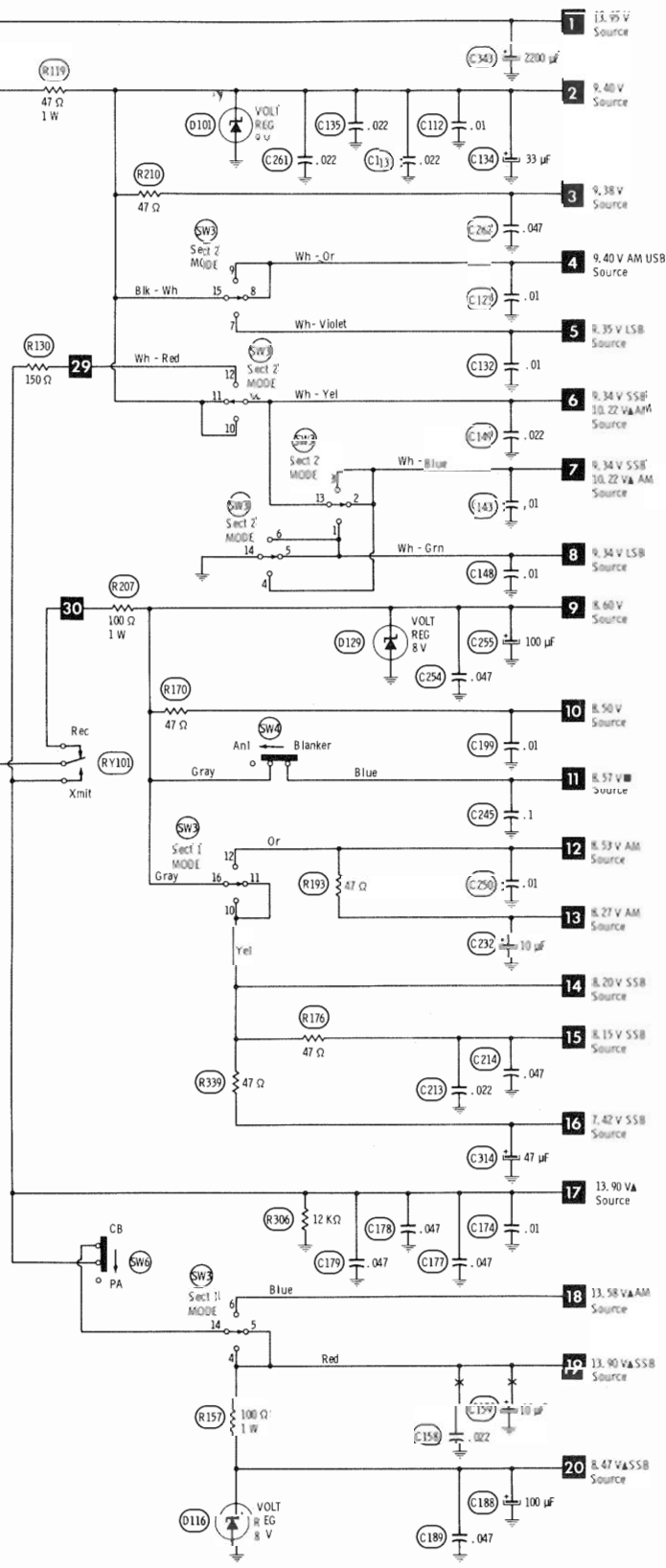
Resistors are 1/2W or less, 5%, unless otherwise indicated.

Supply voltage maintained at rated value for measurements.

Voltage and resistance measured with VTVM or equivalent meter.

no signal applied and controls adjusted for normal operation.

Arrow on control indicates direction of advance.



## PARTS LIST AND DESCRIPTION (CONTINUED)

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

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

| ITEM No. | TYPE / MFR. No. / PART No. | REPLACEMENT DATA          |                                  |                  |                   |              |                  |                   |
|----------|----------------------------|---------------------------|----------------------------------|------------------|-------------------|--------------|------------------|-------------------|
|          |                            | GENERAL ELECTRIC PART No. | INTERNATIONAL RECTIFIER PART No. | MALLORY PART No. | MOTOROLA PART No. | RCA PART No. | SPRAGUE PART No. | SYLVANIA PART No. |
| Q109     | 2SC839/09-302124           | GE-20                     | TR-24                            | PTC121           | HEP54             | SK3122       | RT102            | ECG 123A          |
| Q110     | 2SC815/09-302062           | GE-20                     | TR-21                            | PTC139           | HEP724            | SK3038       | RT102            | ECG 123A          |
| Q111     | 2SC815/09-302062           | GE-20                     | TR-21                            | PTC139           | HEP724            | SK3038       | RT102            | ECG 123A          |
| Q112     | 2SC900/09-302093           | GE-62                     | TR-21                            | PTC139           | HEP725            | SK3124       | RT102            | ECG 199           |
| Q113     | 2SC900/09-302093           | GE-62                     | TR-21                            | PTC139           | HEP725            | SK3124       | RT102            | ECG 199           |
| Q114     | 2SC450(A)/09-302004        | GE-17                     | TR-24                            | PTC101           | HEP720            | SK3039       | RT107            | ECG 108           |
| Q115     | 2SC839/09-302124           | GE-20                     | TR-24                            | PTC121           | HEP54             | SK3122       | RT102            | ECG 123A          |
| Q116     | 2SC900/09-302093           | GE-62                     | TR-21                            | PTC139           | HEP725            | SK3124       | RT102            | ECG 199           |
| Q117     | 2SC839/09-302124           | GE-20                     | TR-24                            | PTC121           | HEP54             | SK3122       | RT102            | ECG 123A          |
| Q118     | 2SC839/09-302124           | GE-20                     | TR-24                            | PTC121           | HEP54             | SK3122       | RT102            | ECG 123A          |
| Q119     | 2SC839/09-302124           | GE-20                     | TR-24                            | PTC121           | HEP54             | SK3122       | RT102            | ECG 123A          |
| Q120     | 2SC900/09-302093           | GE-62                     | TR-21                            | PTC139           | HEP729            | SK3124       | RT102            | ECG 199           |
| Q121     | 2SC900/09-302093           | GE-62                     | TR-21                            | PTC139           | HEP729            | SK3124       | RT102            | ECG 199           |
| Q122     | 2SC839/09-302124           | GE-20                     | TR-24                            | PTC121           | HEP54             | SK3122       | RT102            | ECG 123A          |
| Q301     | 2SB77(B)/09-301048         | GE-2                      | TR-85                            | PTC109           | HEP254            | SK3004       | RT121            | ECG 102A          |
| Q302     | 2SC900/09-302093           | GE-62                     | TR-21                            | PTC139           | HEP729            | SK3124       | RT102            | ECG 199           |
| Q303     | 2SC900/09-302093           | GE-62                     | TR-21                            | PTC139           | HEP729            | SK3124       | RT102            | ECG 199           |
| Q304     | 2SC900/09-302093           | GE-62                     | TR-21                            | PTC139           | HEP729            | SK3124       | RT102            | ECG 199           |
| Q305     | 2SC945/09-302125           | GE-20                     | (1R)2SC945                       | PTC136           | HEP728            | SK3124       | RT102            | ECG 123A          |
| Q306     | 2SC945/09-302125           | GE-20                     | (1R)2SC945                       | PTC136           | HEP728            | SK3124       | RT102            | ECG 123A          |
| Q307     | 2SC945/09-302125           | GE-20                     | (1R)2SC945                       | PTC136           | HEP728            | SK3124       | RT102            | ECG 123A          |
| Q308     | 2SK19(GR)/09-305014        | GE-FET-2                  | FE-100                           | PTC152           | HEP70021          | SK3116       | RT175            | ECG 132           |
| Q309     | 2SC945/09-302125           | GE-20                     | (1R)2SC945                       | PTC136           | HEP728            | SK3124       | RT102            | ECG 123A          |
| Q310     | 2SC900/09-302093           | GE-62                     | TR-21                            | PTC139           | HEP729            | SK3124       | RT102            | ECG 199           |
| Q311     | 2SC900/09-302093           | GE-62                     | TR-21                            | PTC139           | HEP729            | SK3124       | RT102            | ECG 199           |
| Q312     | 2SB187(C)                  | GE-53                     | TR-17                            | PTC135           | HEP632            | SK3004       | RT121            | ECG 102A          |
| Q401     | 2SC945/09-302125           | GE-20                     | (1R)2SC945                       | PTC136           | HEP728            | SK3124       | RT102            | ECG 123A          |

(1) Used in some versions.

(2) Rating 10 Watts @ 2 Amps.

(3) Rating 30 Watts @ 7 Amps.

### ELECTROLYTIC CAPACITORS

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

# PARTS LIST AND DESCRIPTION (CONTINUED)

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

## CAPACITORS

| ITEM No. | RATING       | MFR. PART No. | REPLACEMENT DATA      |                    |                           |                  |                  |
|----------|--------------|---------------|-----------------------|--------------------|---------------------------|------------------|------------------|
|          |              |               | ARCO/ELMENCO PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | SPRAGUE PART No. |
| C1       | 22           |               | CCT0-220              | DTZ-22             | NP022                     | CN0422           | 10TCC-Q22        |
| C3       | .047         |               | CCD-403               |                    |                           | GP140            | 5GA-S40          |
| C4       | .047         |               | CCD-403               |                    |                           | GP140            | 5GA-S40          |
| C5       | .047         |               | CCD-403               |                    |                           | GP140            | 5GA-S40          |
| C6       | .001         |               | CCD-102               | DD-102             | GP1000                    | GP210            | 2SS-D10          |
| C8       | 13           |               |                       |                    |                           | CN0412           | 10TCC-Q12        |
| C9       | 100          |               |                       | DTZ-100            | NP0100                    | CN0310           | 10TCC-T10        |
| C10      | .047         |               | CCD-403               |                    |                           | GP140            | 5GA-S40          |
| C101     | 82 10% N150  |               | *                     |                    |                           | *                | 10TCP-Q82        |
| C102     | 22 N150      |               | *                     |                    |                           | *                | 10TCP-Q22        |
| C103     | 56 10% N150  |               | *                     |                    |                           | *                | 10TCP-Q56        |
| C104     | 56 10% N150  |               | *                     |                    |                           | *                | 10TCP-Q56        |
| C105     | 56 10% N150  |               | *                     |                    |                           | *                | 10TCP-Q56        |
| C106     | 56 10% N150  |               | *                     |                    |                           | *                | 10TCP-Q56        |
| C107     | 56 10% N150  |               | *                     |                    |                           | *                | 10TCP-Q56        |
| C108     | 56 10% N150  |               | *                     |                    |                           | *                | 10TCP-Q56        |
| C109     | 220 10% N750 |               | CCTN-221              | DTN-220            | N220                      | CN7322           | 10TCU-T22        |
| C110     | 100 10% N150 |               | *                     |                    |                           | *                | 10TCP-T10        |
| C111     | 220 10% N750 |               | CCTN-221              | DTN-220            | N220                      | CN7322           | 10TCU-T22        |
| C112     | .01          |               | CCD-103               | DC-103             | GP10000                   | MAG5011          | 2SS-S10          |
| C113     | .022         |               | CCD-203               | DC-203             |                           | MAG5012          | 2SS-S20          |
| C114     | .01          |               | CCD-103               | DC-103             | GP10000                   | MAG5011          | 2SS-S10          |
| C115     | 27           |               |                       |                    |                           | CN0427           | 10TCC-Q27        |
| C116     | 27           |               |                       |                    |                           | CN0427           | 10TCC-Q27        |
| C117     | 27           |               |                       |                    |                           | CN0427           | 10TCC-Q27        |
| C118     | 27           |               |                       |                    |                           | CN0427           | 10TCC-Q27        |
| C119     | 68 10% N150  |               | *                     |                    |                           | *                | 10TCP-Q68        |
| C120     | 68 10% N150  |               | *                     |                    |                           | *                | 10TCP-Q68        |
| C121     | 82 5%        |               | DM10-820J             | CPR-82J            | CD10ED820J03              | SX482            | 424MC820J501     |
| C122     | 100 10% N150 |               | *                     |                    |                           | *                | 10TCP-T10        |
| C123     | .01          |               | CCD-103               | DC-103             | GP10000                   | MAG5011          | 2SS-S10          |
| C124     | 27           |               |                       |                    |                           | CN0427           | 10TCC-Q27        |
| C125     | 27           |               |                       |                    |                           | CN0427           | 10TCC-Q27        |
| C126     | 27           |               |                       |                    |                           | CN0427           | 10TCC-Q27        |
| C127     | 27           |               |                       |                    |                           | CN0427           | 10TCC-Q27        |
| C128     | 68 10% N150  |               | *                     |                    |                           | *                | 10TCP-Q68        |
| C129     | 68 10% N150  |               | *                     |                    |                           | *                | 10TCP-Q68        |
| C130     | 820 5%       |               | DM19-821J             | CPR-820J           | CD19FD821J03              | SX382            | 424MC820J501     |
| C131     | 100 10% N150 |               | *                     |                    |                           | *                | 10TCP-T10        |
| C132     | .01          |               | CCD-103               | DC-103             | GP10000                   | MAG5011          | 2SS-S10          |
| C133     | 15           |               |                       | DTZ-15             | NP015                     | CN0415           | 10TCC-Q15        |
| C135     | .022         |               | CCD-203               | DC-203             |                           | MAG5012          | 2SS-S20          |
| C136     | .01          |               | CCD-103               | DC-103             | GP10000                   | MAG5011          | 2SS-S10          |
| C137     | 5            |               | CCT0-050              |                    |                           | *                | 10TCC-V50        |
| C138     | 100 10% N150 |               | *                     |                    |                           | *                | 10TCP-T10        |
| C139     | 150 10% N150 |               | *                     |                    |                           | *                | 10TCP-T15        |
| C140     | 510 5%       |               | DM15-511J             | CPR-510J           | CD15FD511J03              | SX351            | 424MC510J501     |
| C141     | 220 10% N150 |               | *                     |                    |                           | *                | 10TCP-T22        |
| C142     | 150 10% N150 |               | *                     |                    |                           | *                | 10TCP-T15        |
| C143     | .01          |               | CCD-103               | DC-103             | GP10000                   | MAG5011          | 2SS-S10          |
| C144     | 150 10% N150 |               | *                     |                    |                           | *                | 10TCP-T15        |
| C145     | 150 5%       |               | DM10-151J             | CPR-150J           | CD7FD151J03               | SX315            | 424MC150J501     |
| C146     | 220 10% N150 |               | *                     |                    |                           | *                | 10TCP-T15        |
| C147     | 150 10% N150 |               | *                     |                    |                           | *                | 10TCP-T15        |
| C148     | .01          |               | CCD-103               | DC-103             | GP10000                   | MAG5011          | 2SS-S10          |
| C149     | .022         |               | CCD-203               | DC-203             |                           | MAG5012          | 2SS-S20          |
| C150     | .01          |               | CCD-103               | DC-103             | GP10000                   | MAG5011          | 2SS-S10          |
| C151     | .01          |               | CCD-103               | DC-103             | GP10000                   | MAG5011          | 2SS-S10          |
| C152     | .01          |               | CCD-103               | DC-103             | GP10000                   | MAG5011          | 2SS-S10          |
| C153     | .001         |               | CCD-102               | DD-102             |                           | GP210            | 10TS-D10         |
| C154     | .2           |               |                       |                    |                           |                  |                  |
| C155     | .047         |               | CCD-503               | DC-503             | MGP05                     | MAG5015          | TGL-S50          |
| C156     | 6 N150       |               | *                     |                    |                           | *                | 10TCP-V56        |
| C157     | .01          |               | CCD-103               | DC-103             | GP10000                   | MAG5011          | 2SS-S10          |
| C160     | .01          |               | CCD-103               | DC-103             | GP10000                   | MAG5011          | 2SS-S10          |
| C161     | .001         |               | CCD-102               | DD-102             |                           | GP210            | 10TS-D10         |
| C162     | .01          |               | CCD-103               | DC-103             | GP10000                   | MAG5011          | 2SS-S10          |
| C163     | 39           |               | CCT0-390              |                    |                           | CN0439           | 10TCC-Q39        |
| C164     | .01          |               | *                     |                    |                           | *                | 10TCP-T10        |
| C165     | 100 10% N150 |               | CCT0-3R3              | DTZ-3R3            | NP03P3                    | CN0533           | 10TCC-V33        |
| C166     | 4            |               | CCD-203               | DC-203             |                           | MAG5012          | 2SS-S20          |
| C167     | .022         |               | CCD-203               | DC-203             |                           | MAG5012          | 2SS-S20          |
| C168     | .022         |               | *                     |                    |                           | *                | 10TCP-Q39        |
| C169     | 47 10% N150  |               | CCD-103               | DC-103             | GP10000                   | MAG5011          | 2SS-S10          |
| C170     | .01          |               | CCT0-050              |                    |                           |                  | 10TCC-V50        |
| C171     | 5            |               | CCT0-101              | DTZ-100            | NP0100                    | CN0310           | 10TCC-T10        |
| C172     | 100 10%      |               | CCD-103               | DC-103             | GP10000                   | MAG5011          | 2SS-S10          |
| C173     | .01          |               | CCD-103               | DC-103             | GP10000                   | MAG5011          | 2SS-S10          |
| C174     | .01          |               | *                     |                    |                           | *                | 10TCP-T10        |
| C175     | 100 10% N150 |               | CCD-103               | DC-103             | GP10000                   | MAG5011          | 2SS-S10          |
| C176     | .01          |               | CCD-503               | DC-503             | MGP05                     | MAG5015          | TGL-S50          |
| C177     | .047         |               | CCD-503               | DC-503             | MGP05                     | MAG5015          | TGL-S50          |
| C178     | .047         |               | CCD-503               | DC-503             | MGP05                     | MAG5015          | TGL-S50          |
| C179     | .047         |               | CCD-503               | DC-503             | MGP05                     | MAG5015          | TGL-S50          |
| C180     | 330 5%       |               | DTN-330               |                    | N330                      | CN7333           | 10TCU-T33        |
| C181     | .047         |               | CCD-503               | DC-503             | MGP05                     | MAG5015          | TGL-S50          |
| C182     | 100 10% N150 |               | *                     |                    |                           | *                | 10TCP-T10        |
| C183     | .047         |               | CCD-503               | DC-503             | MGP05                     | MAG5015          | TGL-S50          |
| C184     | .001         |               | CCD-102               | DD-102             | GP1000                    | GP210            | 2SS-D10          |
| C185     | 330          |               | CCD-331               | DD-331             | GP330                     | GP333            | 10TS-T33         |
| C186     | .047         |               | CCD-503               | DC-503             | MGP05                     | MAG5015          | TGL-S50          |
| C187     | .047         |               | CCD-503               | DC-503             | MGP05                     | MAG5015          | TGL-S50          |
| C189     | .047         |               | CCD-503               | DC-503             | MGP05                     | MAG5015          | TGL-S50          |

# PARTS LIST AND DESCRIPTION (CONTINUED)

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

## CAPACITORS (cont)

| ITEM No. | RATING       | MFR. PART No. | REPLACEMENT DATA      |                    |                           |                  |                  |
|----------|--------------|---------------|-----------------------|--------------------|---------------------------|------------------|------------------|
|          |              |               | ARCO/ELMENCO PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | SPRAGUE PART No. |
| C190     | 3            |               | CCTO-3R3              | DTZ-3R3            | NP03P3                    | CN0533           | 10TCC-V33        |
| C191     | .022         |               | CCD-203               |                    |                           | GP120            | 5GA-S20          |
| C192     | .047         |               | CCD-503               | DC-503             | MGP05                     | MAG5015          | TGL-S50          |
| C194     | .01          |               | CCD-103               | DC-103             | GP10000                   | MAG5011          | 2SS-S10          |
| C195     | .01          |               | CCD-103               | DC-103             | GP10000                   | MAG5011          | 2SS-S10          |
| C196     | 100 10%      |               | CCTO-101              | DTZ-100            | NP0100                    | CN0310           | 10TCC-T10        |
| C197     | 2            |               | CCTO-2R2              | DTZ-2R2            | NP02P2                    | CN0522           | 10TCC-V22        |
| C198     | 220 10%      |               | CCTN-221              | DTN-220            | N220                      | CN7322           | 10TCU-T22        |
| C199     | .01          |               | CCD-103               | DC-103             | GP10000                   | MAG5011          | 2SS-S10          |
| C200     | 5            |               | CCTO-050              |                    |                           |                  | 10TCC-V50        |
| C201     | .01          |               | CCD-103               | DC-103             | GP10000                   | MAG5011          | 2SS-S10          |
| C202     | .01          |               | CCD-103               | DC-103             | GP10000                   | MAG5011          | 2SS-S10          |
| C203     | .01          |               | CCD-103               | DC-103             | GP10000                   | MAG5011          | 2SS-S10          |
| C204     | .01          |               | CCD-103               | DC-103             | GP10000                   | MAG5011          | 2SS-S10          |
| C205     | 27           |               |                       |                    |                           | CN0427           | 10TCC-Q27        |
| C206     | .01          |               | CCD-103               | DC-103             | GP10000                   | MAG5011          | 2SS-S10          |
| C207     | 220 10%      |               | CCTN-221              | DTN-220            | N220                      | CN7322           | 10TCU-T22        |
| C208     | .01          |               | CCD-103               | DC-103             | GP10000                   | MAG5011          | 2SS-S10          |
| C209     | .01          |               | CCD-103               | DC-103             | GP10000                   | MAG5011          | 2SS-S10          |
| C210     | .01          |               | CCD-103               | DC-103             | GP10000                   | MAG5011          | 2SS-S10          |
| C211     | 150 10% N150 |               | *                     |                    |                           | *                | 10TCP-T15        |
| C212     | .022         |               | CCD-203               | DC-203             |                           | MAG5012          | 2SS-S20          |
| C213     | .022         |               | CCD-203               |                    |                           | GP120            | 5GA-S20          |
| C214     | .047         |               | CCD-503               | DC-503             | MGP05                     | MAG5015          | TGL-S50          |
| C215     | 5            |               | CCTO-050              |                    |                           |                  | 10TCC-V50        |
| C216     | 15           |               | CCTO-150              | DTZ-15             | NP015                     | CN0415           | 10TCC-Q15        |
| C217     | .001 10%     |               | DM19-102J             | CPR-1000J          | CD19FD102J03              | SX210            | 424ME100J501     |
| C218     | .047         |               | CCD-503               | DC-503             | MGP05                     | MAG5015          | TGL-S50          |
| C219     | 6            |               | CCTO-6R8              | DTZ-6R8            | NP06P8                    | CN0568           | 10TCC-V68        |
| C220     | 510 5%       |               | DM15-511J             | CPR-510J           | CD15FD511J03              | SX351            | 424ME510J501     |
| C221     | .047         |               | CCD-503               | DC-503             | MGP05                     | MAG5015          | TGL-S50          |
| C222     | .047         |               | CCD-503               | DC-503             | MGP05                     | MAG5015          | TGL-S50          |
| C223     | .047         |               | CCD-503               | DC-503             | MGP05                     | MAG5015          | TGL-S50          |
| C224     | .047         |               | CCD-503               | DC-503             | MGP05                     | MAG5015          | TGL-S50          |
| C225     | .047         |               | CCD-503               | DC-503             | MGP05                     | MAG5015          | TGL-S50          |
| C226     | .047         |               | CCD-503               | DC-503             | MGP05                     | MAG5015          | TGL-S50          |
| C227     | .047         |               | CCD-503               | DC-503             | MGP05                     | MAG5015          | TGL-S50          |
| C228     | .022         |               | CCD-203               |                    |                           | GP120            | 5GA-S20          |
| C230     | .022         |               | CCD-203               |                    |                           | GP120            | 5GA-S20          |
| C231     | .03 10%      |               | 6DP-3-333             |                    | DPMS6S33                  | EW6133           | 6PS-S33          |
| C235     | 100 10% N150 |               | *                     |                    |                           | *                | 10TCP-T10        |
| C236     | .1           |               |                       | DC-104             | MGP1                      | MAG5001          | TG-P10           |
| C237     | .1           |               |                       | DC-104             | MGP1                      | MAG5001          | TG-P10           |
| C238     | .047         |               | CCD-503               | DC-503             | MGP05                     | MAG5015          | TGL-S50          |
| C239     | .047         |               | CCD-503               | DC-503             | MGP05                     | MAG5015          | TGL-S50          |
| C240     | .01          |               | CCD-103               | DC-103             | GP10000                   | MAG5011          | 2SS-S10          |
| C241     | 330 5%       |               | DM15-331J             | CPR-330J           | CD15FD331J03              | SX333            | 424ME330J501     |
| C242     | .01          |               | CCD-103               | DC-103             | GP10000                   | MAG5011          | 2SS-S10          |
| C243     | .01          |               | CCD-103               | DC-103             | GP10000                   | MAG5011          | 2SS-S10          |
| C244     | .1           |               |                       | DC-104             | MGP1                      | MAG5001          | TG-P10           |
| C245     | .1           |               |                       | DC-104             | MGP1                      | MAG5001          | TG-P10           |
| C246     | 39           |               | CCTO-390              |                    |                           | CN0439           | 10TCC-Q39        |
| C247     | 270 10%      |               | DM15-271J             | CPR-270J           | CD15FD271J03              | SX327            | 424ME270J501     |
| C248     | .01          |               | CCD-103               | DC-103             | GP10000                   | MAG5011          | 2SS-S10          |
| C249     | 220 10%      |               | DM10-221J             | CPR-220J           | CD10FD221J03              | SX322            | 424ME220J501     |
| C250     | .01          |               | CCD-103               | DC-103             | GP10000                   | MAG5011          | 2SS-S10          |
| C251     | .01          |               | CCD-103               | DC-103             | GP10000                   | MAG5011          | 2SS-S10          |
| C252     | .01          |               | CCD-103               | DC-103             | GP10000                   | MAG5011          | 2SS-S10          |
| C253     | 180 10%      |               | CCD-181               | DC-181             |                           | GP318            | 10TS-T18         |
| C254     | .047         |               | CCD-503               | DC-503             | MGP05                     | MAG5015          | TGL-S50          |
| C257     | 270 10%      |               | CCD-271               | DD-271             | GP270                     | GP327            | 10TS-T27         |
| C259     | .047         |               | CCD-503               | DC-503             | MGP05                     | MAG5015          | TGL-S50          |
| C260     | .047         |               | CCD-503               | DC-503             | MGP05                     | MAG5015          | TGL-S50          |
| C261     | .022         |               | CCD-203               |                    |                           | GP120            | 5GA-S20          |
| C262     | .047         |               | CCD-503               | DC-503             | MGP05                     | MAG5015          | TGL-S50          |
| C301     | .5           |               |                       |                    |                           |                  |                  |
| C305     | .0022        |               | CCD-222               |                    |                           | GP222            | 10TS-D22         |
| C307     | .1           |               |                       | DC-104             | MGP1                      | MAG5001          | TG-P10           |
| C310     | .047         |               | CCD-503               | DC-503             | MGP05                     | MAG5015          | TGL-S50          |
| C312     | .3           |               |                       |                    |                           |                  |                  |
| C316     | .2           |               |                       |                    |                           |                  |                  |
| C320     | .047         |               | CCD-503               | DC-503             | MGP05                     | MAG5015          | TGL-S50          |
| C323     | .1           |               |                       | DC-104             | MGP1                      | MAG5001          | TG-P10           |
| C324     | .1           |               |                       | DC-104             | MGP1                      | MAG5001          | TG-P10           |
| C325     | .5           |               |                       |                    |                           |                  |                  |
| C334     | .0022        |               | CCD-222               |                    |                           | GP222            | 10TS-D22         |
| C337     | .1           |               |                       | DC-104             | MGP1                      | MAG5001          | TG-P10           |
| C338     | 470          |               | CCD-471               | DD-471             | GP470                     | GP347            | 10TS-T47         |
| C341     | .022         |               | CCD-203               |                    |                           | GP120            | 5GA-S20          |
| C342     | .022         |               | CCD-203               |                    |                           | GP120            | 5GA-S20          |
| C402     | .01          |               | CCD-103               | DC-103             | GP10000                   | MAG5011          | 2SS-S10          |
| C501     | .01          |               | CCD-103               | DC-103             | GP10000                   | MAG5011          | 2SS-S10          |
| C503     | .01          |               | CCD-103               | DC-103             | GP10000                   | MAG5011          | 2SS-S10          |
| C504     | 2 N150       |               | *                     |                    |                           | *                | 10TCP-V22        |

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

MIDLAND MODEL 13-898

## PARTS LIST AND DESCRIPTION (CONTINUED)

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

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

| ITEM No. | FUNCTION          | RESISTANCE | REPLACEMENT DATA |                              |                                                    |                     |                                                            |
|----------|-------------------|------------|------------------|------------------------------|----------------------------------------------------|---------------------|------------------------------------------------------------|
|          |                   |            | MFR. PART No.    | CENTRALAB PART No.           | CLAROSTAT PART No.                                 | CTS-IRC PART No.    | MALLORY PART No.                                           |
| RV1      | Volume            | 10K        | 13-160089        | F2-10K (1), SSK012           | A47-10K-Z (1), KSS-3 or [NP-10K-Z (1), UP-C-400]   | BU1 (1), CF61, SS6A | RU14A, SL36 (1), SL1500 or [UA14A (1), SK750] or [U18 (1)] |
| RV2      | Squelch           | 10K        | 13-166041        | F5-10K (1), SSK012           | A47-10K-V (1), KSS-3 or [NP-10K-V (1), UP-C-400]   | BU1 (1), CF35, SS6A | RU14R, SL36 (1), SL1500 or [UA14R (1), SK750] or [U19 (1)] |
| RV3      | RF Gain           | 50K        | 13-166042        | F1-50K (1), SSK012           | A47-50K-S (1), KSS-3 or [NP-50K-S (1), UP-C-400]   | BU1 (1), CF12, SS6A | RU54L, SL36 (1), SL1500 or [UA54L (1), SK750] or [U35 (1)] |
| RV4      | "SWR" Calibrate   | 5000       | 13-166043        | F1-5000 (1), SSK012          | A47-5000-S (1), KSS-3 or [NP-5000-S (1), UP-C-400] | BU1 (1), CF8, SS6A  | RU53L, SL36 (1), SL1500 or [UA53L (1), SK750] or [U14 (1)] |
| RV101    | USB Osc Level     | 1000       | 13-164083        | TSV-1K (2) or T-1000 (2)     | C-102 (2)                                          | X201R102B (2)       | MTC13L1 (2)                                                |
| RV102    | LSB Osc Level     | 1000       | 13-164083        | TSV-1K (2) or T-1000 (2)     | C-102 (2)                                          | X201R102B (2)       | MTC13L1 (2)                                                |
| RV103    | Carrier Balance   | 300        | 13-164084        | TSV-1K (2) or T-1000 (2)     | C-102 (2)                                          | X201R102B (2)       | MTC13L1 (2)                                                |
| RV104    | SSB Bias          | 1000       | 13-164083        | TSV-500 (2) or T-500 (2)     | C-501 (2)                                          | X201R501B (2)       | MTC52L1 (2)                                                |
| RV105    | SSB Bias          | 500        | 13-164085        | TSV-2.5K (2) or [T-2500 (2)] | C-252 (2)                                          | X201R252B (2)       | MTC23L1 (2)                                                |
| RV106    | ALC               | 2000       | 13-164086        | TSV-10K (2) or T-10K (2)     | C-103 (2)                                          | X201R103B (2)       | MTC14L1 (2)                                                |
| RV107    | AM "S" Meter      | 10K        | 13-164087        | TSV-10K (2) or T-10K (2)     | C-103 (2)                                          | X201R103B (2)       | MTC14L1 (2)                                                |
| RV108    | Squelch Range     | 10K        | 13-164087        | TSV-10K (2) or T-10K (2)     | C-103 (2)                                          | X201R103B (2)       | MTC14L1 (2)                                                |
| RV301    | AM Range Boost    | 10K        | 13-164087        | TSV-10K (2) or T-10K (2)     | C-103 (2)                                          | X201R103B (2)       | MTC14L1 (2)                                                |
| RV302    | SSB Mic Gain      | 10K        | 13-164088        | TSV-10K or T-10K             | C-103                                              | X201R103B           | MTC14L1                                                    |
| RV303    | SSB AGC           | 10K        | 13-164088        | TSV-10K or T-10K             | C-103                                              | X201R103B           | MTC14L1                                                    |
| RV304    | SSB AGC           | 5000       | 13-164089        | TV-5K or T-5000              | C-502                                              | X201R502B           | MTC53L1                                                    |
| RV305    | SSB "S" Meter     | 2000       | 13-164090        | TSV-2.5K (2) or [T-2500 (2)] | C-252 (2)                                          | X201R252B (2)       | MTC23L1 (2)                                                |
| RV306    | SSB Squelch Range | 5000       | 13-164091        | TSV-5K (2) or T-5000 (2)     | C-502 (2)                                          | X201R502B (2)       | MTC53L1 (2)                                                |
| RV501    | RF Meter          | 500        | 13-164085        | TSV-500 (2) or T-500 (2)     | C-501 (2)                                          | X201R501B (2)       | MTC52L1 (2)                                                |

(1) Enlarge mounting hole.

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

### RESISTORS (Power and Special)

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

### COILS (RF-IF)

| ITEM No. | FUNCTION              | REPLACEMENT DATA |                      |                 | REMARKS |
|----------|-----------------------|------------------|----------------------|-----------------|---------|
|          |                       | PART No.         | OTHER IDENTIFICATION | MILLER PART No. |         |
| CH101    | AF Choke (1mH)        | 13-178134        |                      |                 |         |
| CH102    | RF Choke              | 13-178135        |                      |                 |         |
| CH103    | RF Choke              | 13-178135        |                      |                 |         |
| L1       | Pi Network (27MHz)    | 13-176385        |                      |                 |         |
| L2       | TVI (54MHz)           | 13-176386        |                      |                 |         |
| L101     | Synth. Buffer (23MHz) | 13-094010        | ETR-216-531          |                 |         |
| L102     | USB Osc. (15MHz)      | 13-170188        |                      |                 |         |
| L103     | LSB Osc. (15MHz)      | 13-170188        |                      |                 |         |
| L104     | Synth. Mixer (38MHz)  | 13-094011        | ETR-217-531          |                 |         |
| L105     | Synth. Mixer (38MHz)  | 13-094011        | ETR-217-531          |                 |         |
| L106     | Bal. Mod. (11MHz)     | 13-094012        |                      |                 |         |
| L107     | 1st SSB IF (11MHz)    | 13-090260        | ETI-65-361Y          |                 |         |
| L108     | Xmit. Mixer (27MHz)   | 13-094013        | ETR-218-43           |                 |         |
| L109     | Xmit. Mixer (27MHz)   | 13-094013        | ETR-218-43           |                 |         |
| L110     | Xmit. Amp (27MHz)     | 13-094014        |                      |                 |         |
| L111     | Xmit. Driver (27MHz)  | 13-094014        |                      |                 |         |
| L112     | Final (27MHz)         | 13-094015        |                      |                 |         |
| L113     | Rec. Ant (27MHz)      | 13-094016        | R-12-3530            |                 |         |
| L114     | Rec. Ant (27MHz)      | 13-094016        | R-12-3530            |                 |         |
| L115     | Rec. RF (27MHz)       | 13-094017        | R-27-361Y            |                 |         |
| L116     | Rec. Mixer (11MHz)    | 13-090260        | ETI-66-361S          |                 |         |
| L117     | 2nd SSB IF (27MHz)    | 13-090261        | ETI-65-361Y          |                 |         |
| L118     | Rec. Mixer (455kHz)   | 13-090262        | I-32-361Y            |                 |         |
| L119     | Rec. IF (455kHz)      | 13-090263        | I-33-3525            |                 |         |
| L120     | AM Input IF (455kHz)  | 13-090264        | I-41-3535            |                 |         |
| L121     | AM Output IF (455kHz) | 13-090265        | I-23-3535            |                 |         |
| L122     | Noise Amp (455kHz)    |                  | R-42-361Y            |                 |         |

## PARTS LIST AND DESCRIPTION (CONTINUED)

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

### COILS (RF-IF) (cont)

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

### FILTER CHOKE

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

### TRANSFORMER (Power)

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

### TRANSFORMER (Driver)

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

### TRANSFORMER (Audio Output)

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

### SPEAKER

| ITEM No. | TYPE           | REPLACEMENT DATA |               | NOTES |
|----------|----------------|------------------|---------------|-------|
|          |                | MFGR. PART No.   | QUAM PART No. |       |
| SP1      | 3" PM, 16 Ohms | 13-060084        | 30A05RZ16     |       |

MIDLAND MODEL 13-898

## PARTS LIST AND DESCRIPTION (CONTINUED)

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

### FUSE DEVICES

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

### MISCELLANEOUS

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

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

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

### ACCESSORIES

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