

# PHOTOFACT<sup>®</sup> with

# CIRCUITRACE<sup>®</sup>

For Supplier Address See PHOTOFACT Index

## NOTE

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

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

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

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



MODEL DIAMOND 60

## ALIGNMENT INSTRUCTIONS

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

## SYNTHESIZER

| INDICATOR                      | CHANNEL | ADJUST           | FREQUENCY  | REMARKS                                                                                                                                                                                                     |
|--------------------------------|---------|------------------|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Frequency Counter              | 1       | C320             | 6.000MHz   | Short between TP301 and TP305.<br>Connect counter between TP303 and TP305.<br>Set mode selector to USB or LSB.                                                                                              |
|                                | 2       | C318             | 6.010MHz   |                                                                                                                                                                                                             |
|                                | 3       | C316             | 6.020MHz   |                                                                                                                                                                                                             |
|                                | 4       | C314             | 6.040MHz   |                                                                                                                                                                                                             |
|                                | 1       | C312             | 15.965MHz  | Disconnect TP301 and TP305.<br>Short TP302 and TP305.<br>Mode switch to LSB or USB.                                                                                                                         |
|                                | 5       | C310             | 16.015MHz  |                                                                                                                                                                                                             |
|                                | 9       | C308             | 16.065MHz  |                                                                                                                                                                                                             |
|                                | 13      | C306             | 16.115MHz  |                                                                                                                                                                                                             |
|                                | 17      | C304             | 16.165MHz  |                                                                                                                                                                                                             |
|                                | 21      | C302             | 16.215MHz  |                                                                                                                                                                                                             |
|                                |         | L301             | 12.8023MHz | Disconnect TP302 and TP305.<br>Disconnect counter from TP303 and TP305.<br>Short TP303 and TP305.<br>Connect counter between TP304 and TP305.<br>Set mode selector to USB.<br>Delta tune maximum clockwise. |
|                                |         | R327             | 12.7977MHz | Mode selector switch to LSB.<br>Delta tune maximum counterclockwise.                                                                                                                                        |
|                                |         | R325             | 12.8007MHz | Mode selector switch to USB.<br>Delta tune maximum counterclockwise.                                                                                                                                        |
|                                |         | R323             | 12.7993MHz | Mode selector switch to LSB.<br>Delta tune maximum clockwise.                                                                                                                                               |
| Oscilloscope (Usable to 30MHz) |         | T301, T302       |            | Remove counter from TP304 and TP305.<br>Remove short between TP303 and TP305.<br>Short between TP306 and TP305.<br>Connect scope between TP304 and TP305.<br>Adjust for maximum.                            |
|                                |         | T303, T304, T305 |            | Disconnect short from TP306 and TP305.<br>Disconnect scope from TP304 and TP305.<br>Connect scope to output of TP"A".<br>Adjust for maximum.                                                                |

TRAM MODEL DIAMOND 60

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

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4CY184

## RECEIVER

| Connect an AC VTVM or AF Wattmeter across speaker voice coil.<br>Adjustments are made with 14 volt DC input.<br>Adjust volume control to obtain suitable reading. |         |                                                          |            |                     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----------------------------------------------------------|------------|---------------------|
| SIGNAL GENERATOR                                                                                                                                                  | CHANNEL | GEN FREQ                                                 | ADJUST     | REMARKS             |
| High side thru a .01uF cap to TP7, low side to TP6.                                                                                                               | Any     | Set to 455kHz, 1000Hz @ 30% Modulation<br>Output 10uV.   | T12, T13   | Adjust for maximum. |
| High side thru a .01uF cap to base of Q10, low side to ground.                                                                                                    | Any     | Set to 7.8MHz, 1000Hz @ 30% Modulation<br>Output 3uV.    | T10, T11   | Adjust for maximum. |
| High side thru a .01uF cap to antenna jack, low side to ground.                                                                                                   | 11      | Set to 27.085Hz, 1000Hz @ 30% Modulation<br>Output .5uV. | T7, T8, T9 | 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.            | 11      | Set to 27.085MHz, 1000Hz @ 30% Modulation<br>Output 10000uV. | No adjustment.* | Set mode switch to AM.<br>Adjust volume control to obtain 0dB. Decrease generator to 10uV. Signal should not drop more than 6db.<br>*If so, check AGC circuits. |
| SQUELCH RANGE<br>High side thru a .01uF capacitor to antenna jack, low side to ground.  | 11      | Set to 27.085MHz, 1000Hz @ 30% Modulation<br>Output 300uV.   | R186            | Set squelch control fully clockwise.<br>Adjust so that squelch just breaks.                                                                                     |
| "S" METER<br>High side thru a .01uF capacitor to antenna connector, low side to ground. |         | Set to 27.085MHz, 1000Hz @ 30% Modulation<br>Output 100uV.   | R72/R159        | Set mode switch to AM/SSB.<br>Adjust for "S9" on panel "S" meter                                                                                                |

## TRANSMITTER

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

### SSB

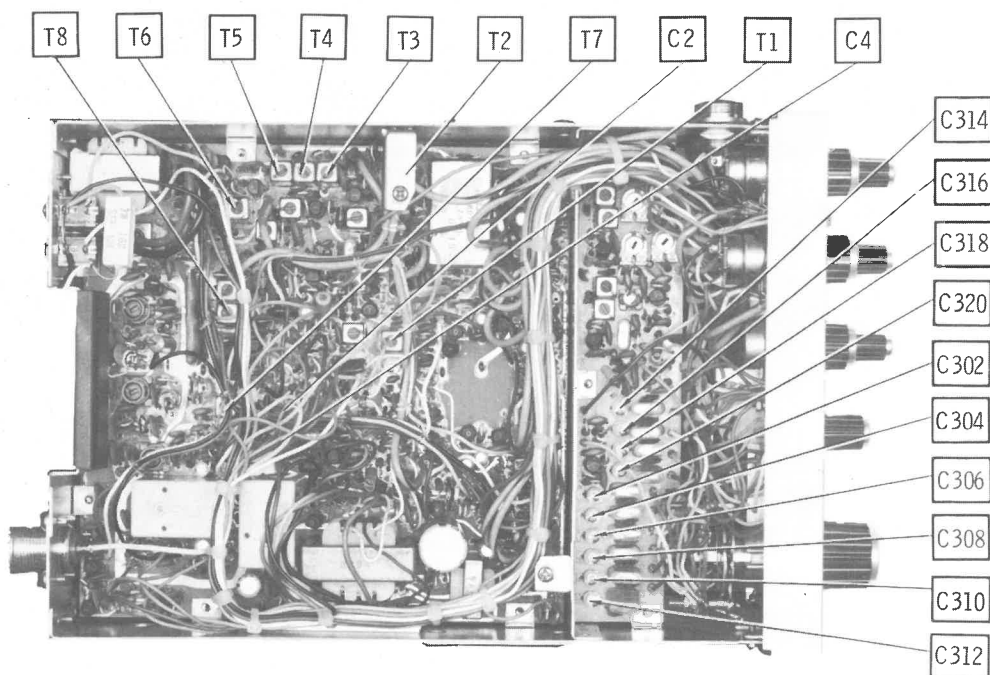
| INDICATOR                              | ADJUST   | REMARKS                                                                                                                                                                          |
|----------------------------------------|----------|------------------------------------------------------------------------------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

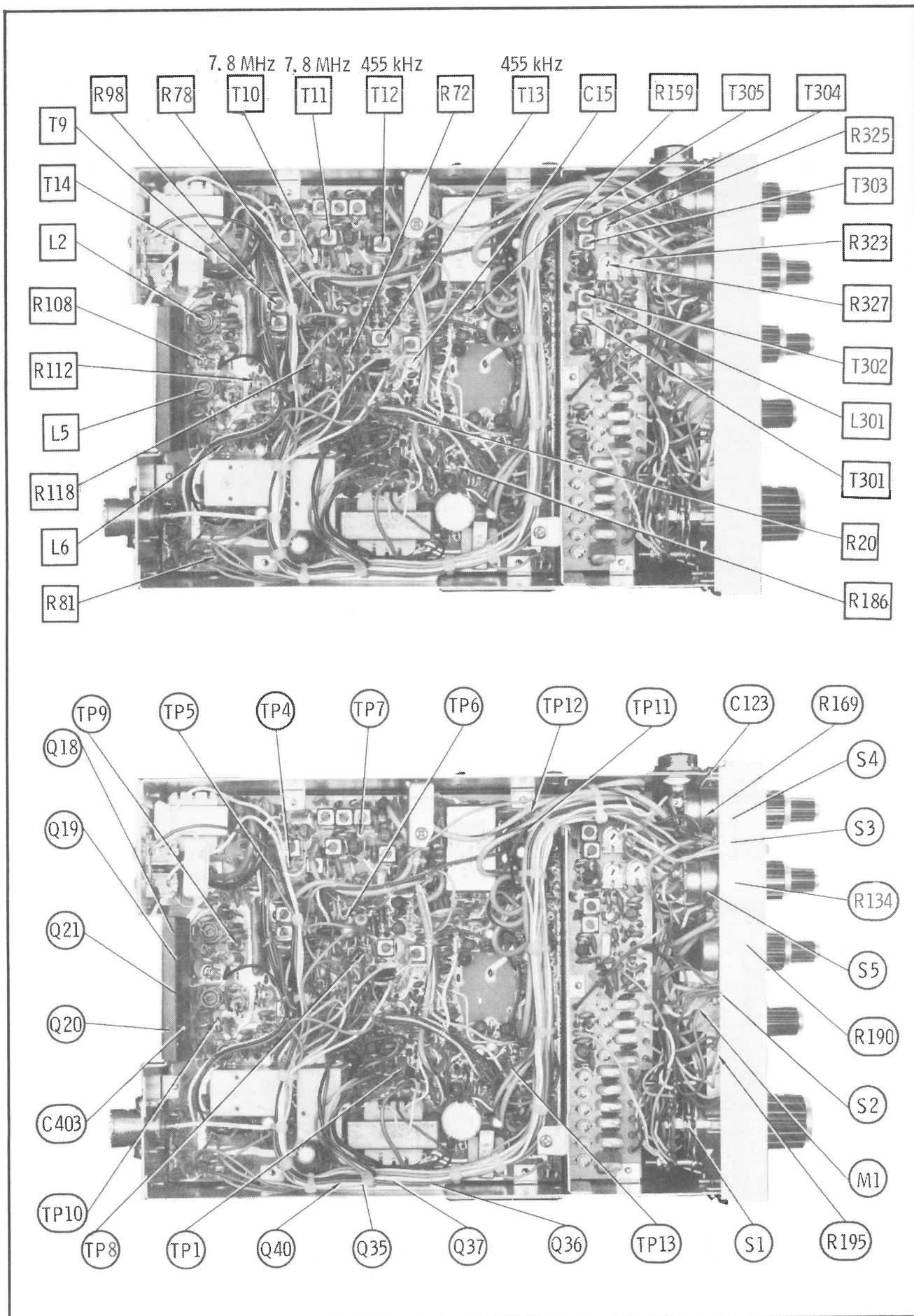
|                                                 |                           |                                                                                                                                                                                                                             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

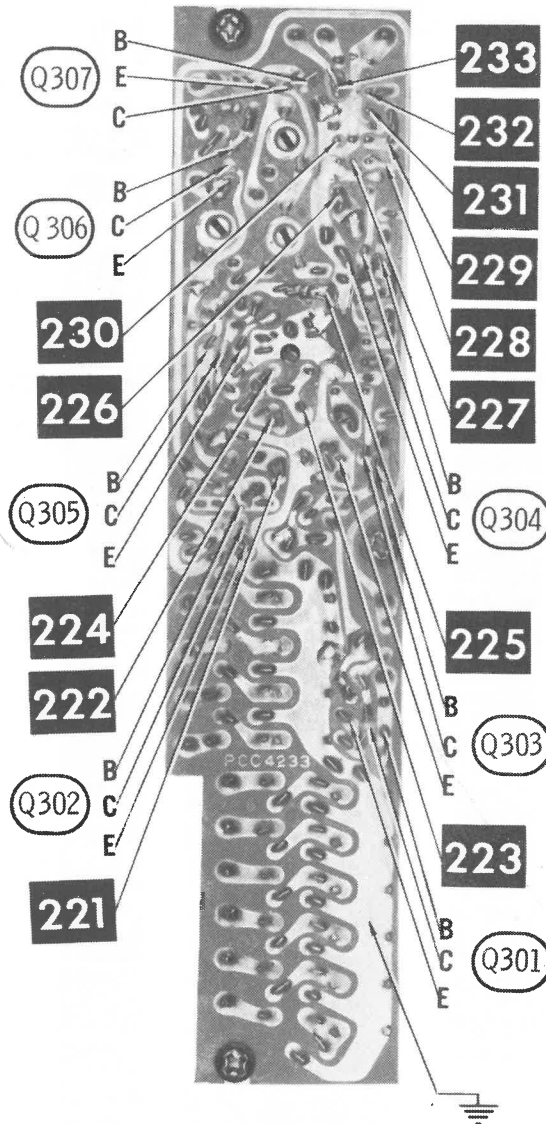
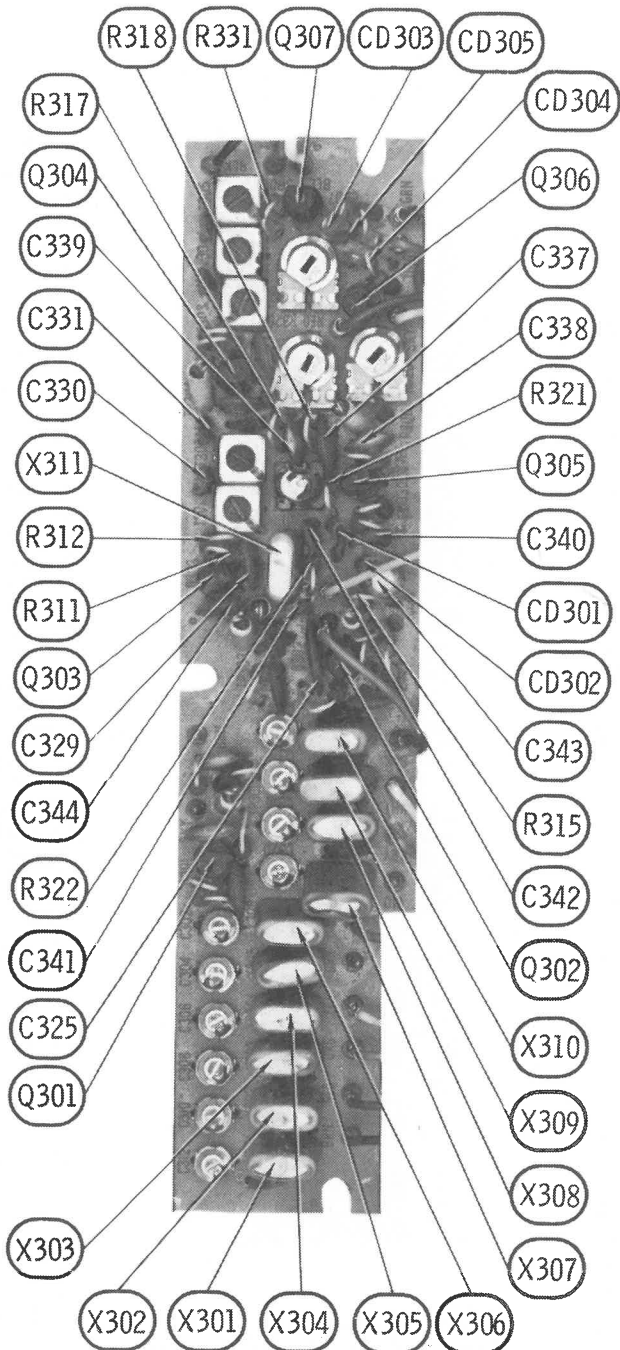
### TRANSMITTER ADJUSTMENTS

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

TRAM MODEL DIAMOND 60

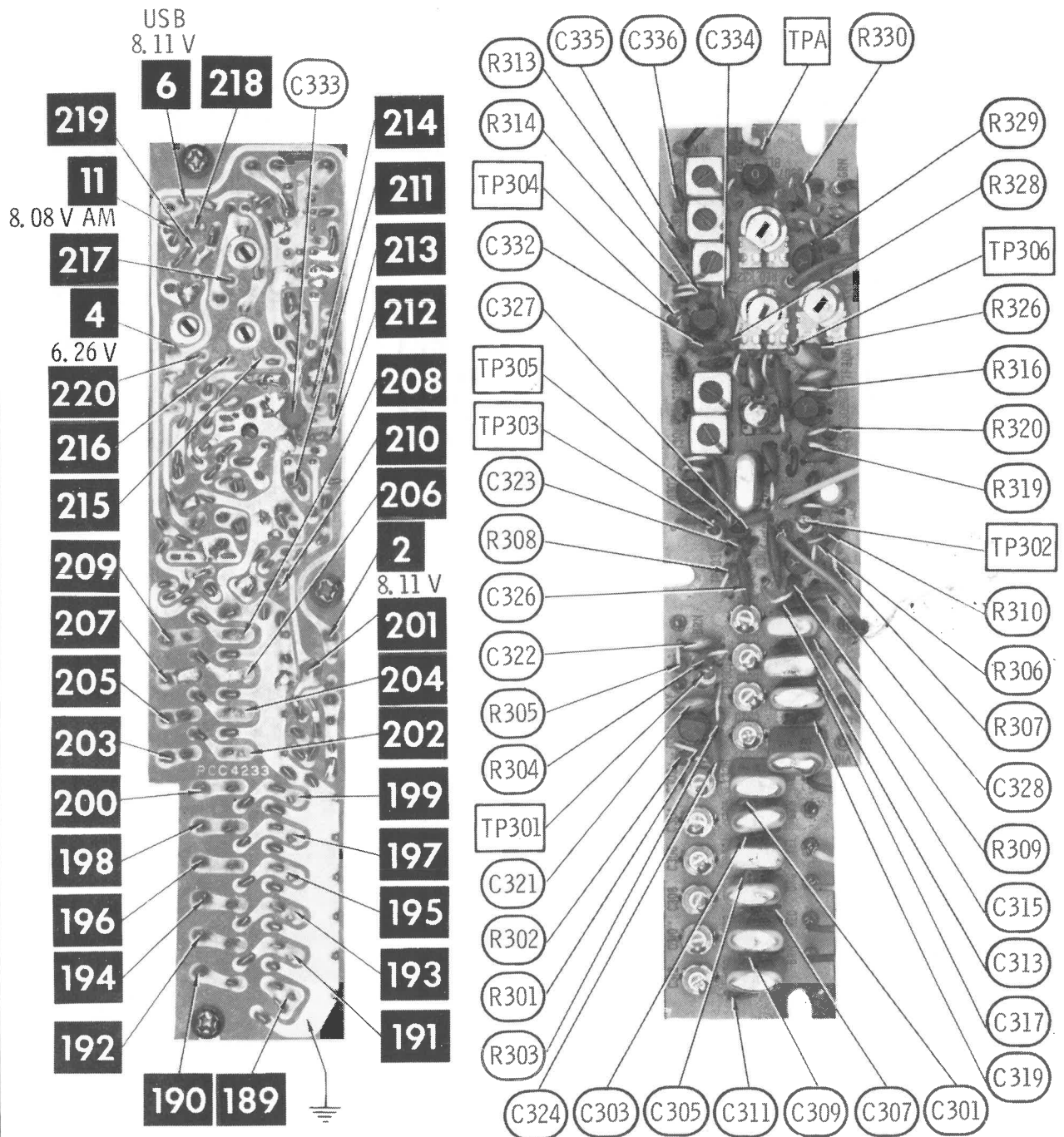




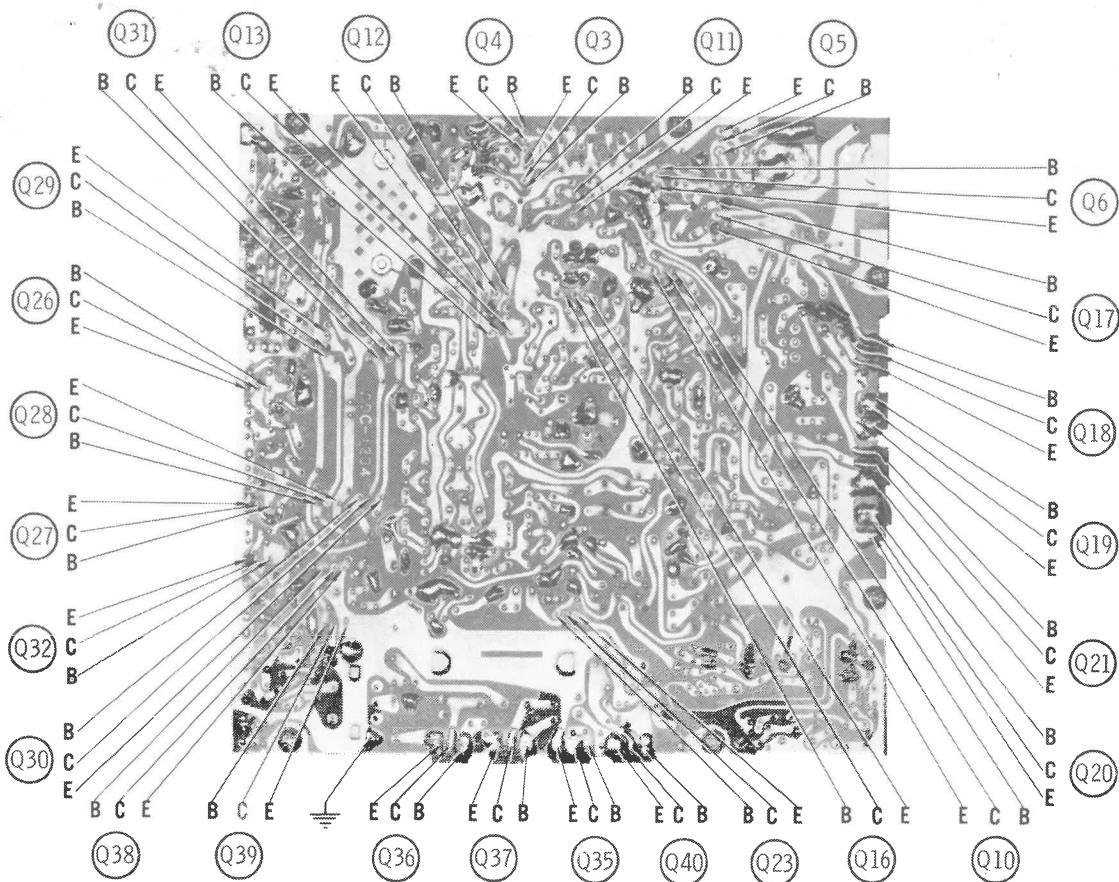


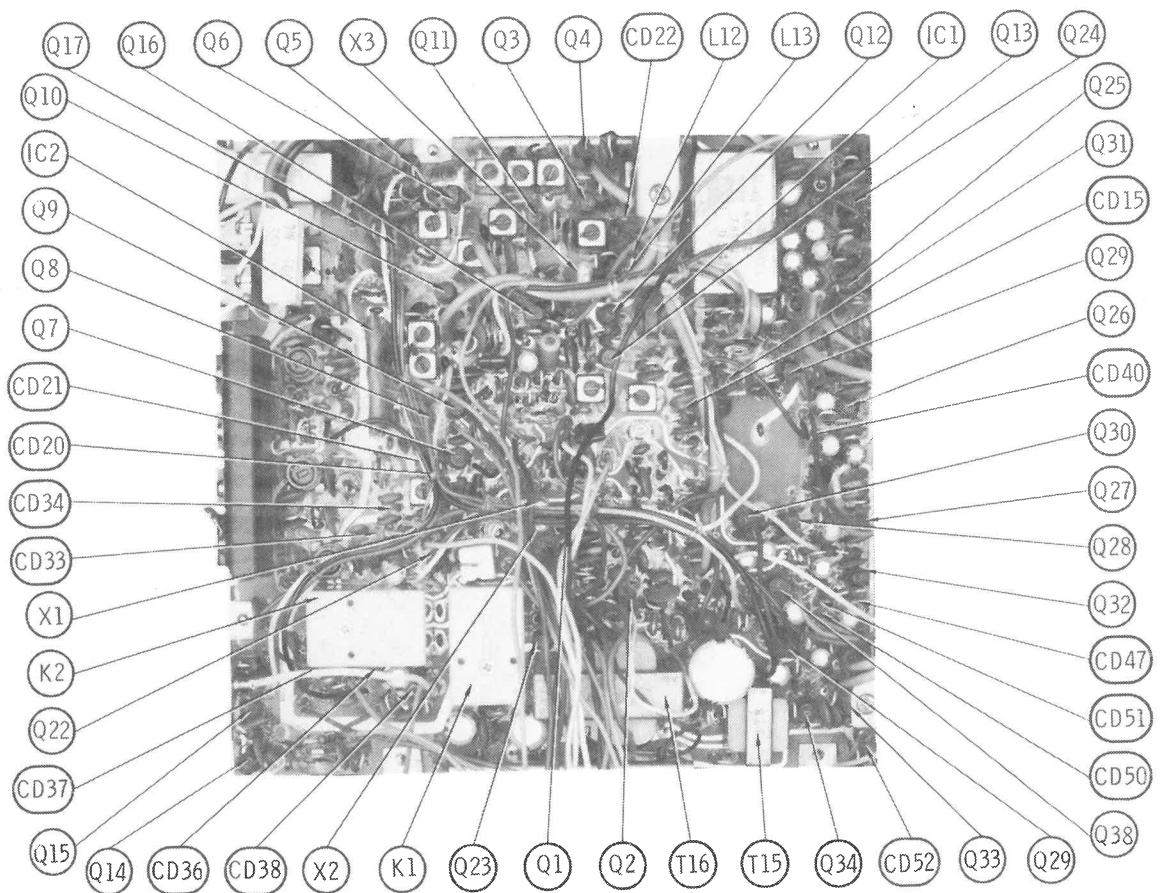
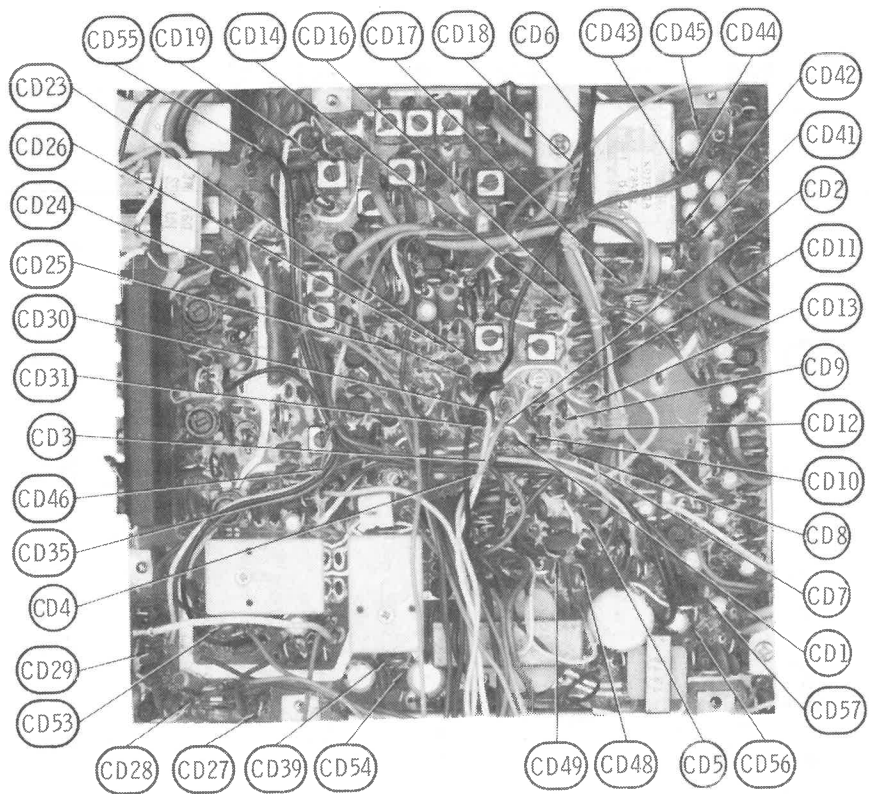
TRAM MODEL DIAMOND 60

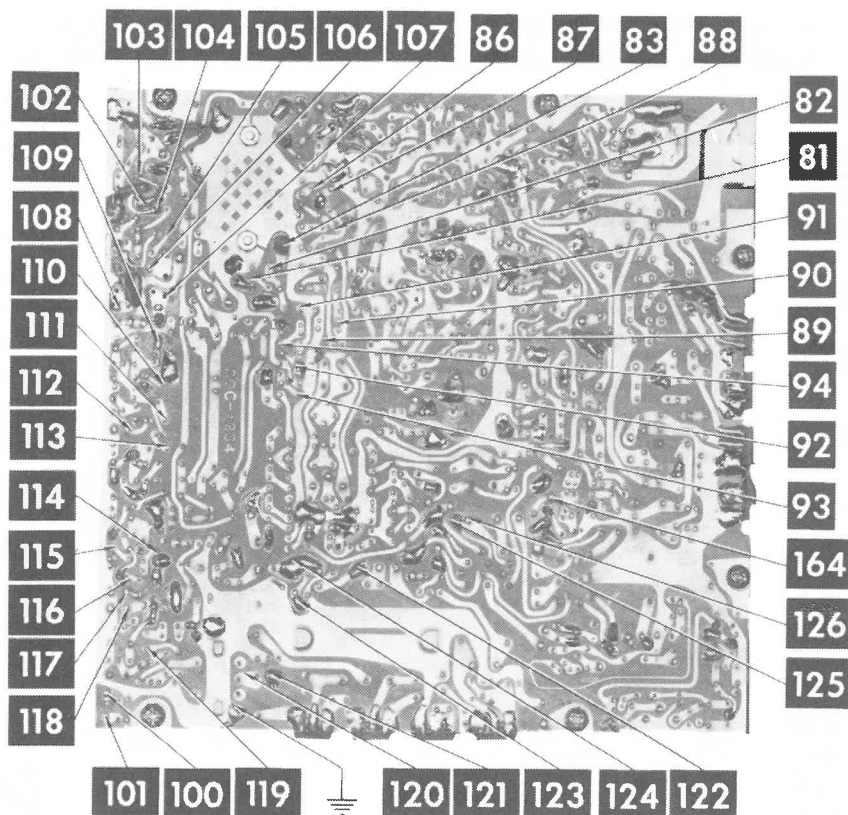
SYNTHESIZER BOARD



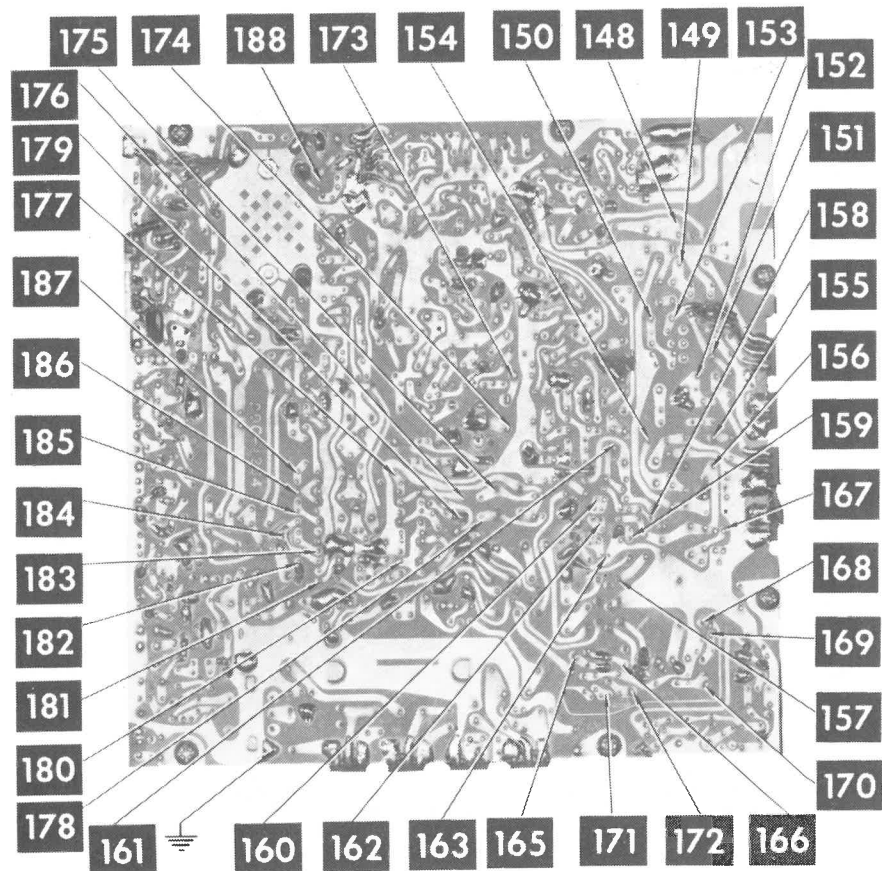
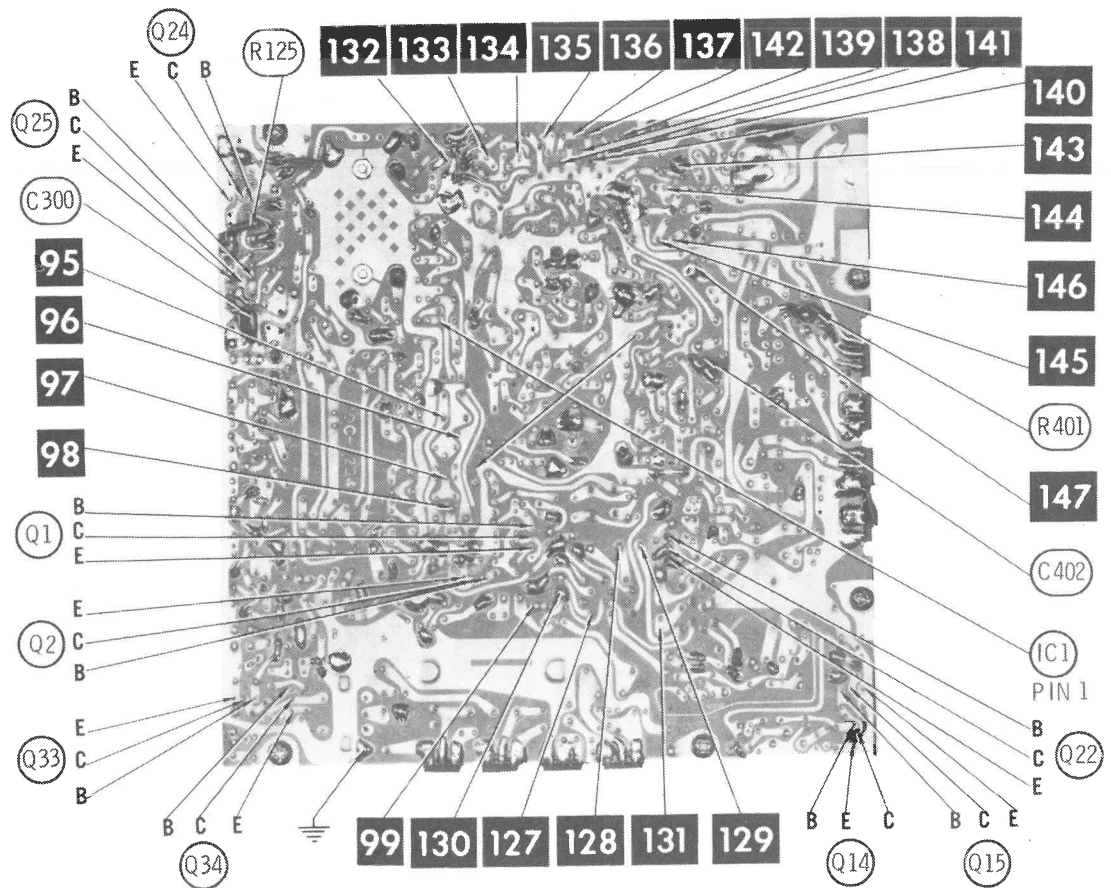
SYNTHESIZER BOARD

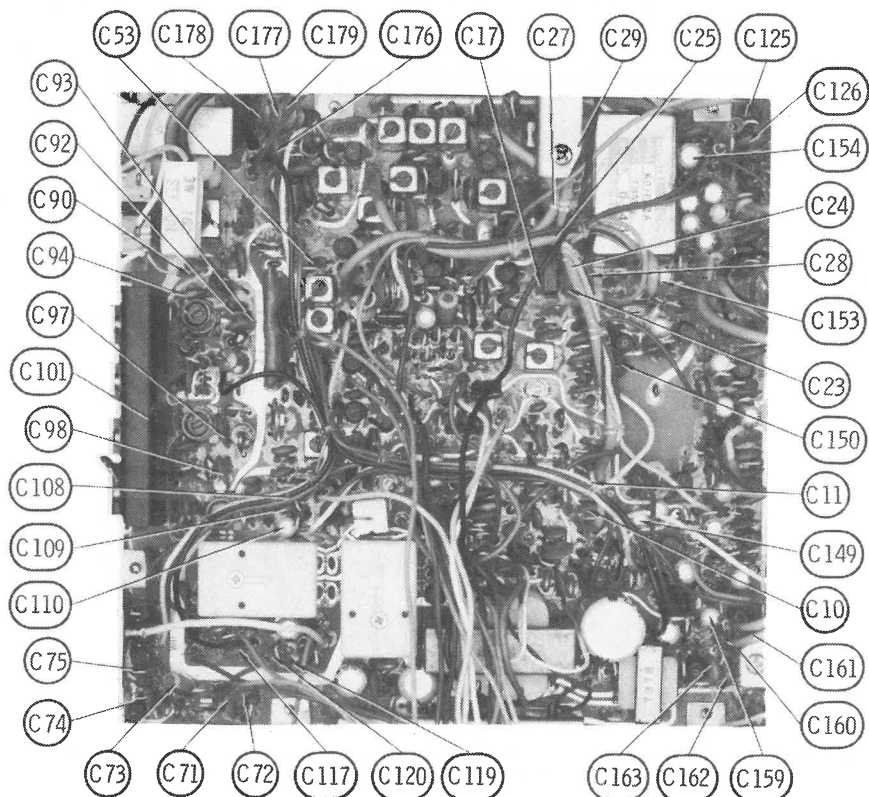
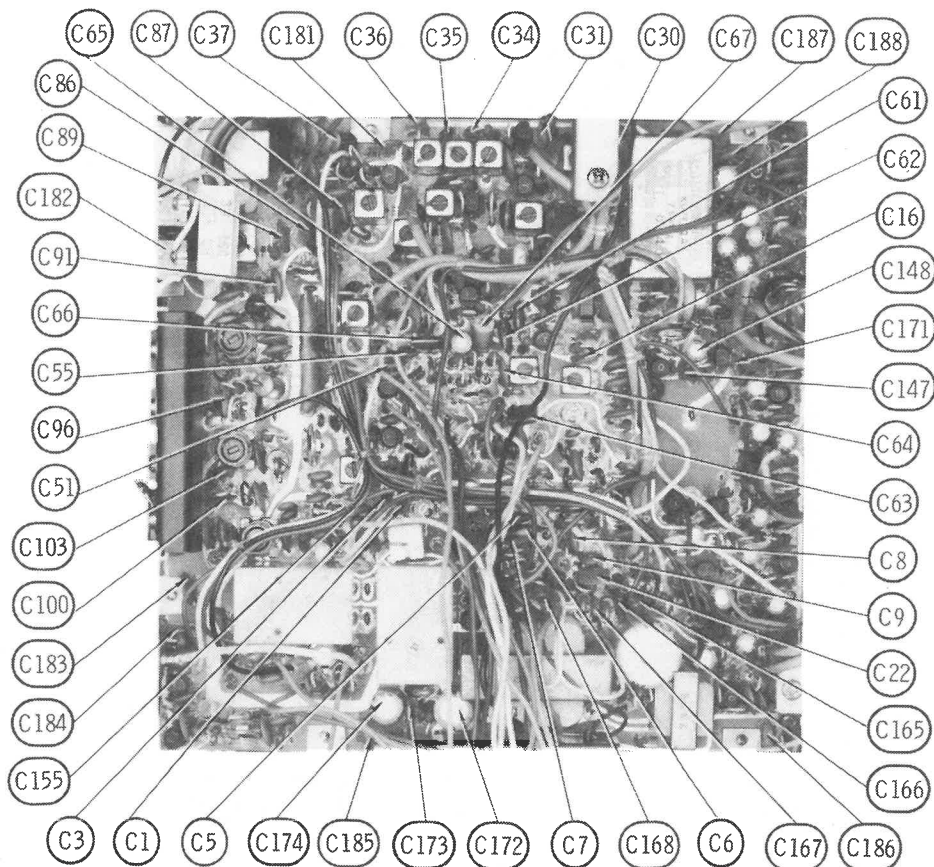


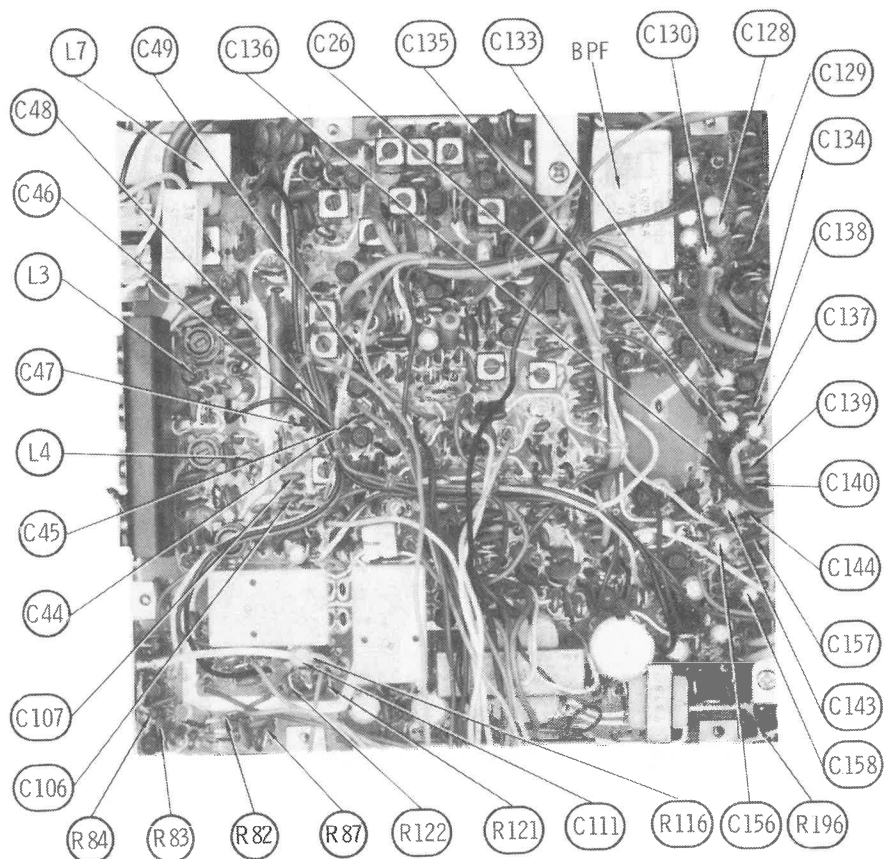
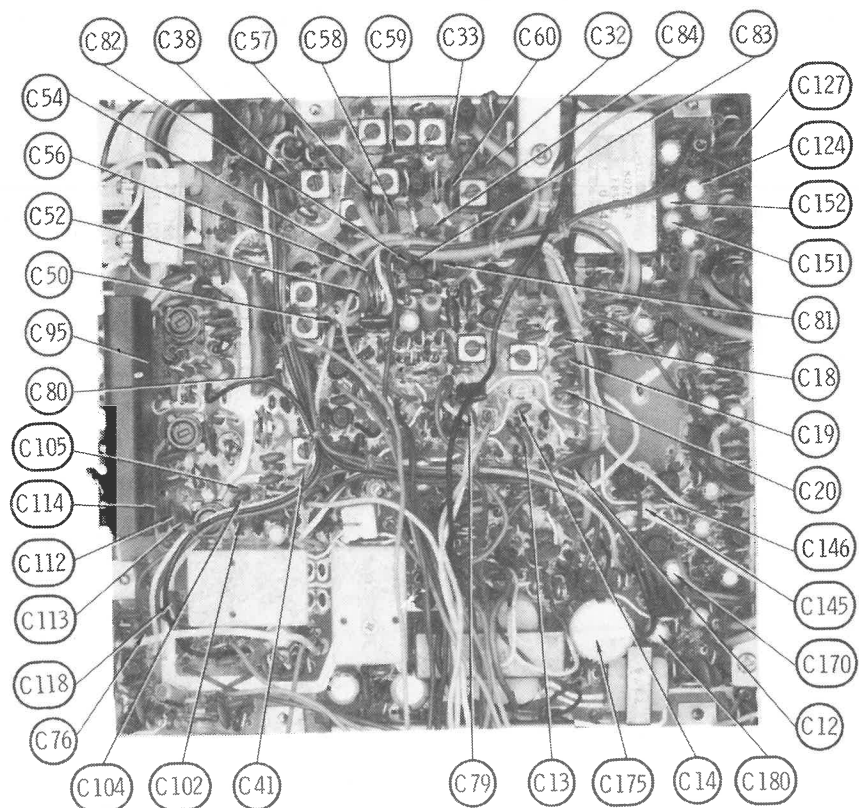


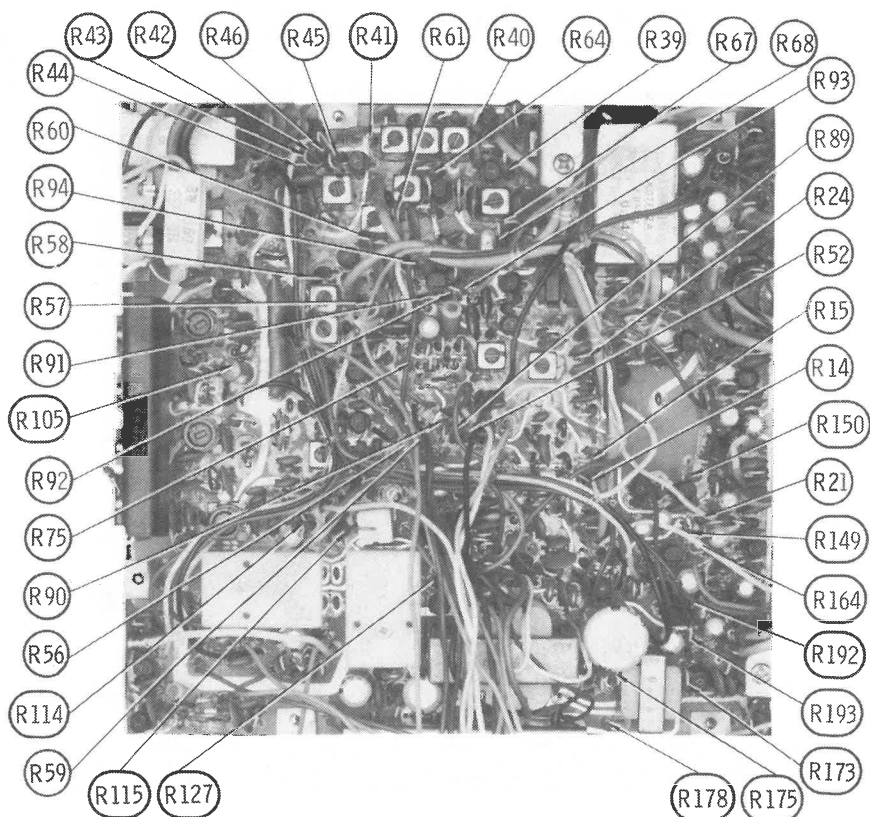
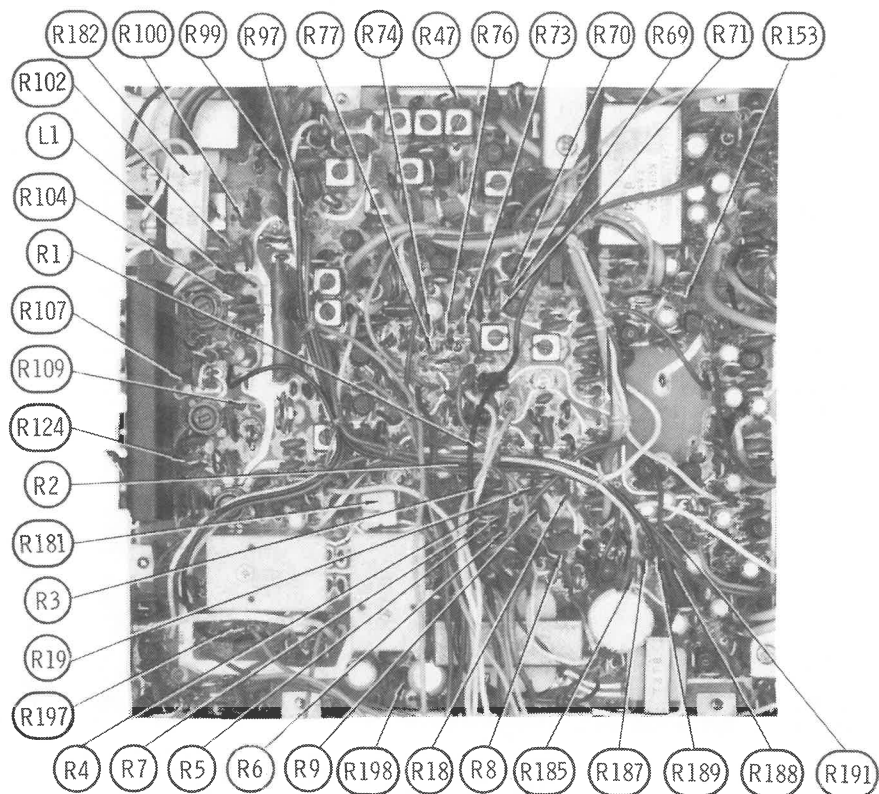


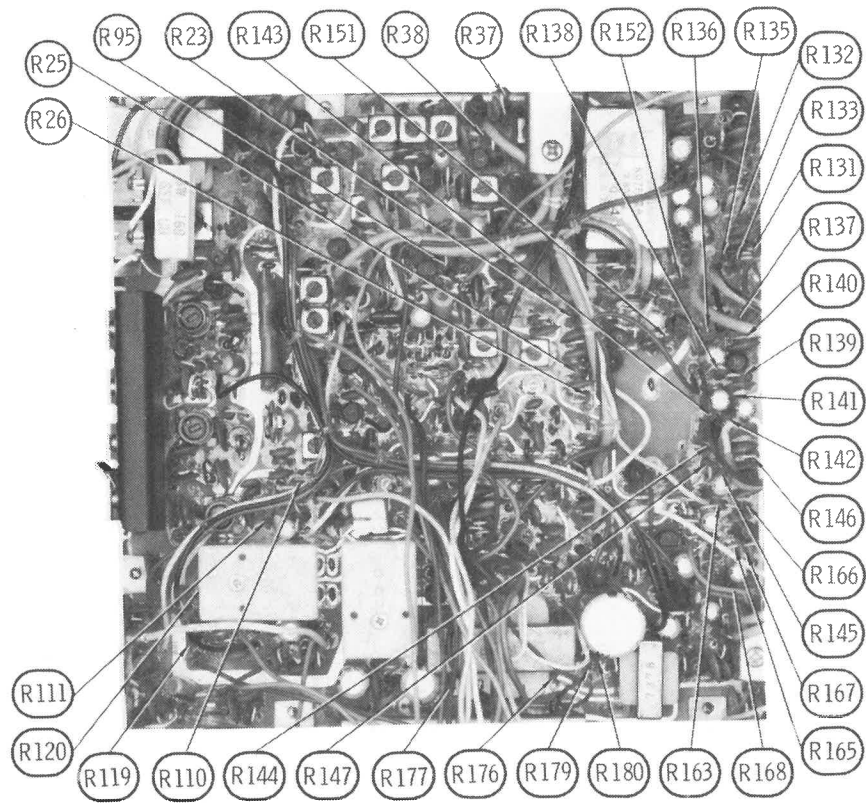
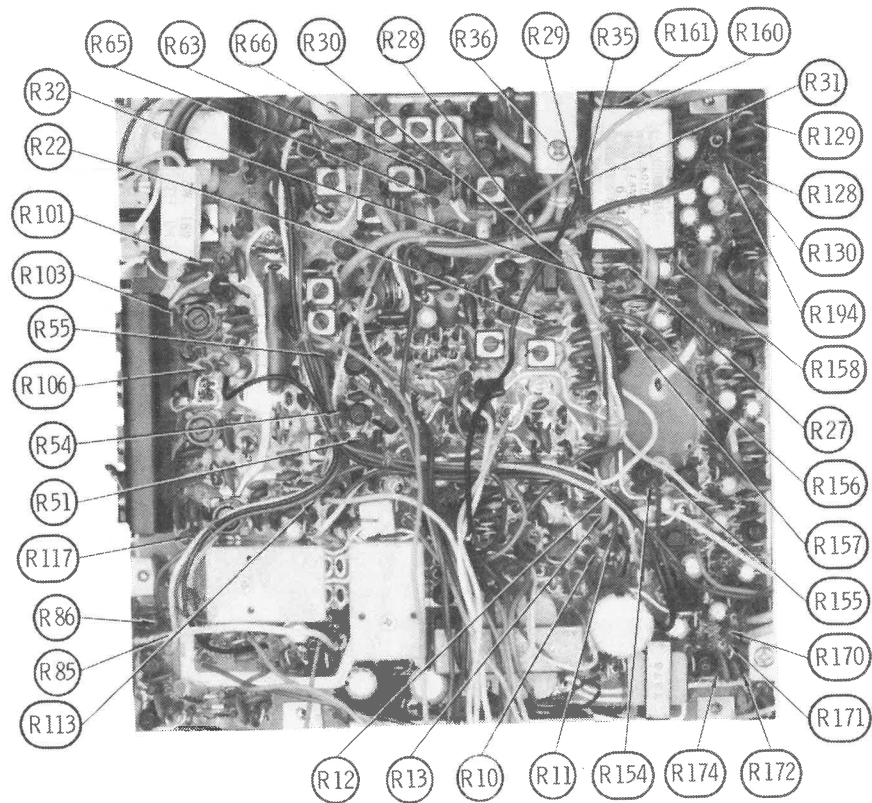
TRAM MODEL DIAMOND 60











## PARTS LIST AND DESCRIPTION

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

### WIRING DATA

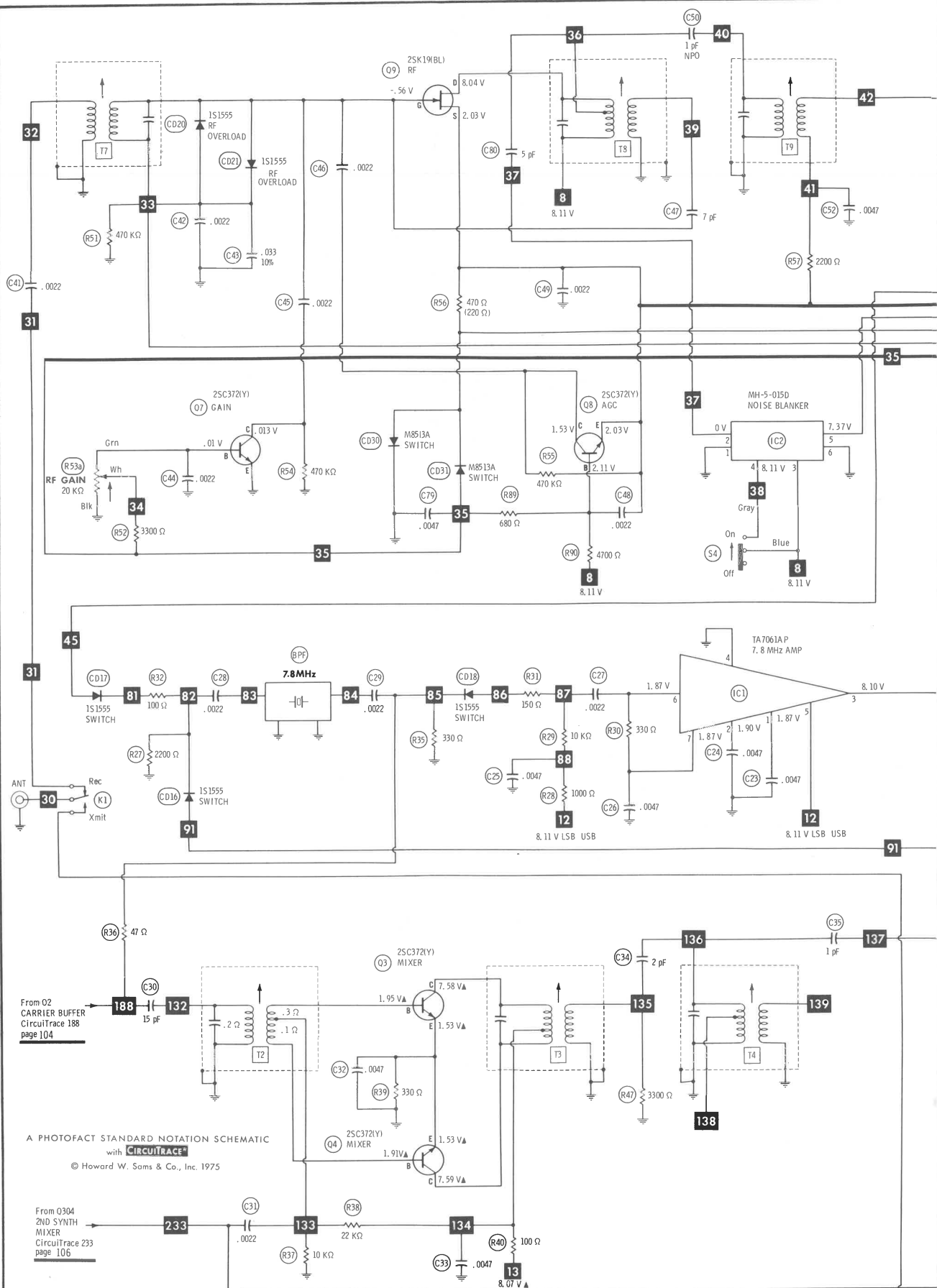
|                                  |                                                                                                                                                     |
|----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| 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)

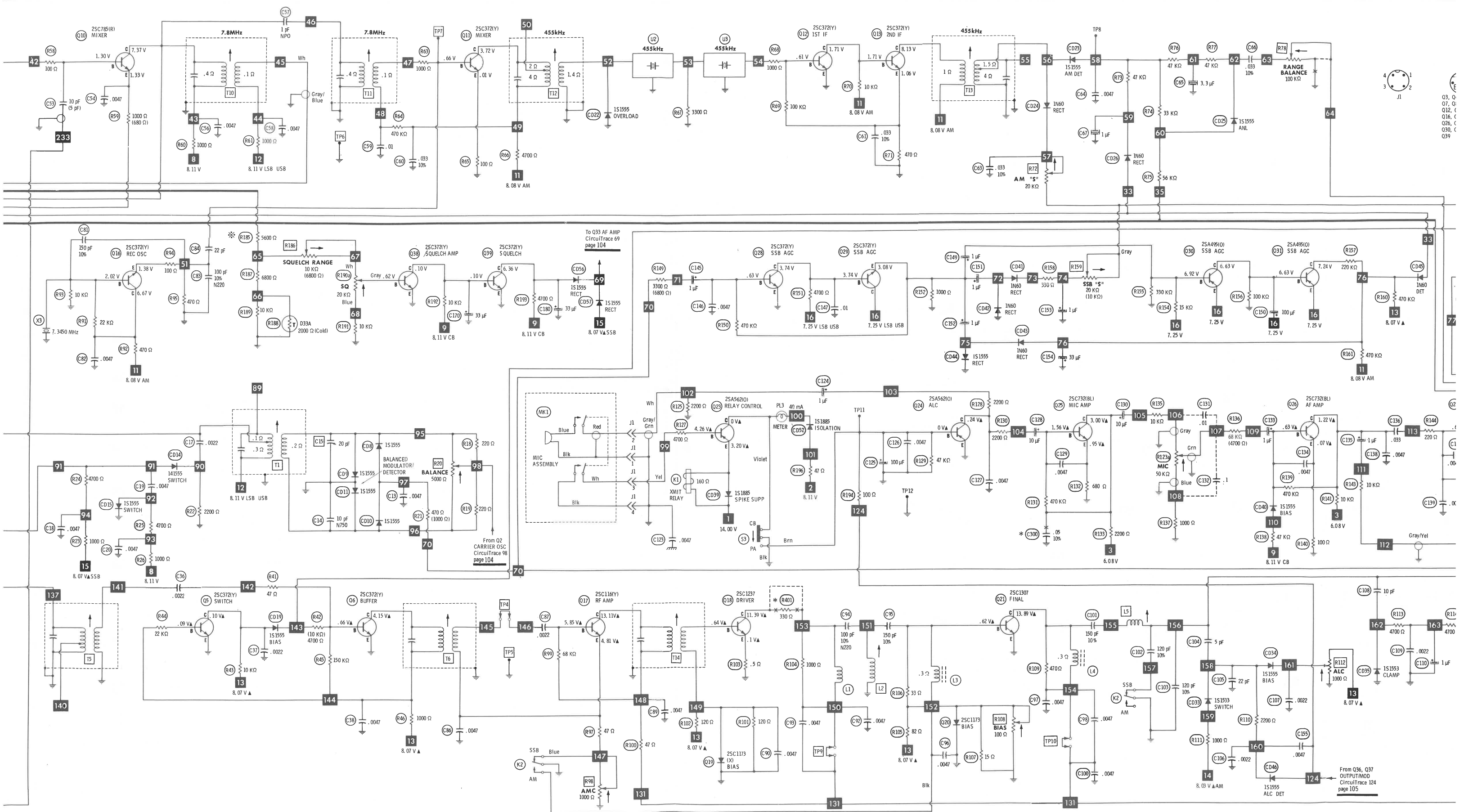
| ITEM No. | TYPE / MFG. No. / PART No.       | REPLACEMENT DATA          |                                  |                  |                   |                  |                  |                    |
|----------|----------------------------------|---------------------------|----------------------------------|------------------|-------------------|------------------|------------------|--------------------|
|          |                                  | GENERAL ELECTRIC PART No. | INTERNATIONAL RECTIFIER PART No. | MALLORY PART No. | MOTOROLA PART No. | RCA PART No.     | SPRAGUE PART No. | SYLVANIA PART No.  |
| CD1      | 1S1555/260-61-067                | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100           | RT218            | ECG 177            |
| CD2      | 1S1555/260-61-067                | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100           | RT218            | ECG 177            |
| CD3      | 1S1555/260-61-067                | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100           | RT218            | ECG 177            |
| CD4      | 1S1555/260-61-067                | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100           | RT218            | ECG 177            |
| CD5      | 1S1555/260-61-067                | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100           | RT218            | ECG 177            |
| CD6      | 1S1555/260-61-067                | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100           | RT218            | ECG 177            |
| CD7      | 1S1555/260-61-067                | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100           | RT218            | ECG 177            |
| CD8      | 1N60P/260-10-048                 | 1N60                      | 1N60                             | PTC206           | HEP135            | SK3088           |                  | ECG 109            |
| CD9      | 1N60P/260-10-048                 | 1N60                      | 1N60                             | PTC206           | HEP135            | SK3088           |                  | ECG 109            |
| CD10     | 1N60P/260-10-048                 | 1N60                      | 1N60                             | PTC206           | HEP135            | SK3088           |                  | ECG 109            |
| CD11     | 1N60P/260-10-048                 | 1N60                      | 1N60                             | PTC206           | HEP135            | SK3088           |                  | ECG 109            |
| CD12     | 1S1553/260-61-067                | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100           | RT218            | ECG 177            |
| CD13     | 1S1553/260-61-067                | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100           | RT218            | ECG 177            |
| CD14     | 1S1553/260-61-067                | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100           | RT218            | ECG 177            |
| CD15     | 1S1553/260-61-067                | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100           | RT218            | ECG 177            |
| CD16     | 1S1553/260-61-067                | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100           | RT218            | ECG 177            |
| CD17     | 1S1553/260-61-067                | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100           | RT218            | ECG 177            |
| CD18     | 1S1553/260-61-067                | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100           | RT218            | ECG 177            |
| CD19     | 1S1553/260-61-067                | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100           | RT218            | ECG 177            |
| CD20     | 1S1553/260-61-067                | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100           | RT218            | ECG 177            |
| CD21     | 1S1553/260-61-067                | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100           | RT218            | ECG 177            |
| CD22     | 1S1553/260-61-067                | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100           | RT218            | ECG 177            |
| CD23     | 1S1553/260-61-067                | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100           | RT218            | ECG 177            |
| CD24     | 1N60/260-10-025                  | 1N60                      | 1N60                             | PTC206           | HEP135            | SK3088           |                  | ECG 109            |
| CD25     | 1S1553/260-61-067                | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100           | RT218            | ECG 177            |
| CD26     | 1N60/260-10-025                  | 1N60                      | 1N60                             | PTC206           | HEP135            | SK3088           |                  | ECG 109            |
| CD27     | 1N60/260-10-025                  | 1N60                      | 1N60                             | PTC206           | HEP135            | SK3088           |                  | ECG 109            |
| CD28     | 1S1555/260-10-011                | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100           | RT218            | ECG 177            |
| CD29     | 1S1555/260-10-011                | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100           | RT218            | ECG 177            |
| CD30     | M8513A/260-10-049                | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100           | RT218            | ECG 177            |
| CD31     | M8513A/260-10-049                | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100           | RT218            | ECG 177            |
| CD32     | 1S1553/260-10-047                | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100           | RT218            | ECG 177            |
| CD33     | 1S1553/260-10-047                | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100           | RT218            | ECG 177            |
| CD34     | 1S1555/260-10-011                | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100           | RT218            | ECG 177            |
| CD35     | 1S1553/260-10-047                | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100           | RT218            | ECG 177            |
| CD36     | 1S1555/260-10-011                | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100           | RT218            | ECG 177            |
| CD37     | 1N60/260-10-025                  | 1N60                      | 1N60                             | PTC206           | HEP135            | SK3088           |                  | ECG 109            |
| CD38     | 1N60/260-10-025                  | 1N60                      | 1N60                             | PTC206           | HEP135            | SK3088           |                  | ECG 109            |
| CD39     | 1S1885/260-10-033                | GE-504A                   | 8D4 or 5A4D                      | PTC201 or PTC202 | HEPR0052          | SK3030 or SK3031 | RT213 or RT214   | ECG 116 or ECG 117 |
| CD40     | 1S1555/260-10-011                | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100           | RT218            | ECG 177            |
| CD41     | 1N60/260-10-025                  | 1N60                      | 1N60                             | PTC206           | HEP135            | SK3088           |                  | ECG 109            |
| CD42     | 1N60/260-10-025                  | 1N60                      | 1N60                             | PTC206           | HEP135            | SK3088           |                  | ECG 109            |
| CD43     | 1N60/260-10-025                  | 1N60                      | 1N60                             | PTC206           | HEP135            | SK3088           |                  | ECG 109            |
| CD44     | 1S1555/260-10-011                | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100           | RT218            | ECG 177            |
| CD45     | 1N60/260-10-025                  | 1N60                      | 1N60                             | PTC206           | HEP135            | SK3088           |                  | ECG 109            |
| CD46     | 1S1555/260-10-011                | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100           | RT218            | ECG 177            |
| CD47     | 1S1555/260-10-011                | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100           | RT218            | ECG 177            |
| CD48     | 1S1885/260-10-033                | GE-504A                   | 8D4 or 5A4D                      | PTC201 or PTC202 | HEPR0052          | SK3030 or SK3031 | RT213 or RT214   | ECG 116 or ECG 117 |
| CD49     | 1S1885/260-10-033                | GE-504A                   | 8D4 or 5A4D                      | PTC201 or PTC202 | HEPR0052          | SK3030 or SK3031 | RT213 or RT214   | ECG 116 or ECG 117 |
| CD50     | 1S1555/260-10-011                | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100           | RT218            | ECG 177            |
| CD51     | 1S1555/260-10-011                | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100           | RT218            | ECG 177            |
| CD52     | 1S1885/260-10-033                | GE-504A                   | 8D4 or 5A4D                      | PTC201 or PTC202 | HEPR0052          | SK3030 or SK3031 | RT213 or RT214   | ECG 116 or ECG 117 |
| CD53     | 1S1885/260-10-033                | GE-504A                   | 8D4 or 5A4D                      | PTC201 or PTC202 | HEPR0052          | SK3030 or SK3031 | RT213 or RT214   | ECG 116 or ECG 117 |
| CD54     | 02Z8.2A/260-10-044<br>8.2V Zener | GE-X11                    | Z-1208                           | ZB8.2            | HEPZ0411          | SK3059           | RT239            | ECG 5072           |
| CD55     | 1S1885/260-10-033                | GE-504A                   | 8D4 or 5A4D                      | PTC201 or PTC202 | HEPR0052          | SK3030 or SK3031 | RT213 or RT214   | ECG 116 or ECG 117 |
| CD56     | 1S1555/260-10-011                | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100           | RT218            | ECG 177            |
| CD57     | 1S1555/260-10-011                | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100           | RT218            | ECG 177            |
| CD301    | 1S1658/260-10-031                | GE-90 (8)                 | D201 (8)                         |                  | HEPR2503(8)       | SK3126 (8)       |                  |                    |
| CD302    | 02Z6.2A/260-10-046               | GEZD-6.2                  | Z-1204                           | PTC503           | HEPZ0408          | SK3058           | RT237            | ECG 137            |
| CD303    | 1S1555/260-10-011                | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100           | RT218            | ECG 177            |
| CD304    | 1S1555/260-10-011                | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100           | RT218            | ECG 177            |
| CD305    | 1S1555/260-10-011                | GE-300                    | D200                             | PTC214           | HEPR0602          | SK3100           | RT218            | ECG 177            |
| IC1      | TA7061(AP)/<br>260-10-036        |                           |                                  |                  |                   |                  |                  | ECG 1100           |
| Q1       | 2SC372(Y)/<br>260-10-020         | GE-20                     | TR-24                            | PTC139           | HEP55             | SK3018           | RT102            | ECG 123A           |
| Q2       | 2SC372(Y)/<br>260-10-020         | GE-20                     | TR-24                            | PTC139           | HEP55             | SK3018           | RT102            | ECG 123A           |
| Q3       | 2SC372(Y)/<br>260-10-020         | GE-20                     | TR-24                            | PTC139           | HEP55             | SK3018           | RT102            | ECG 123A           |

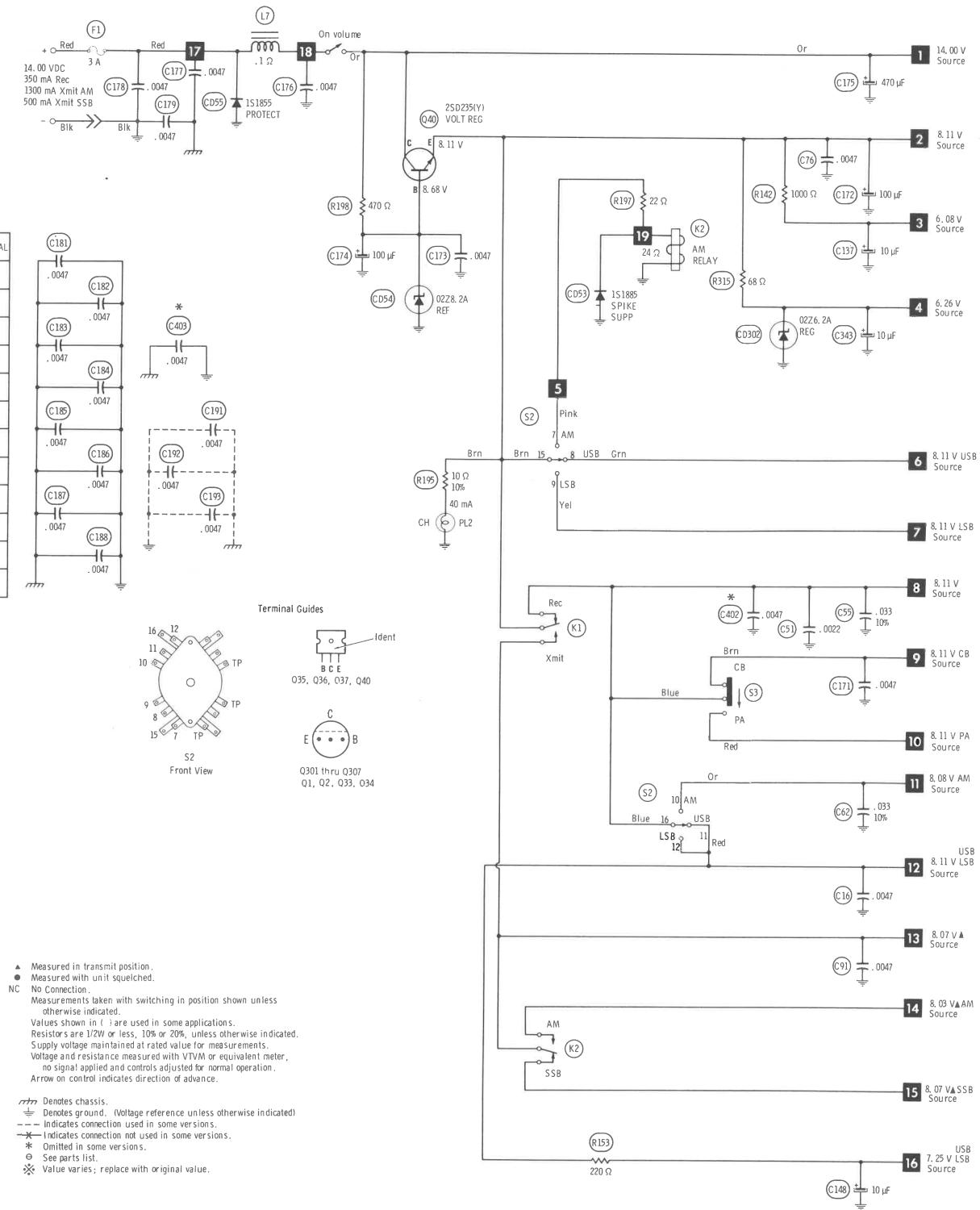
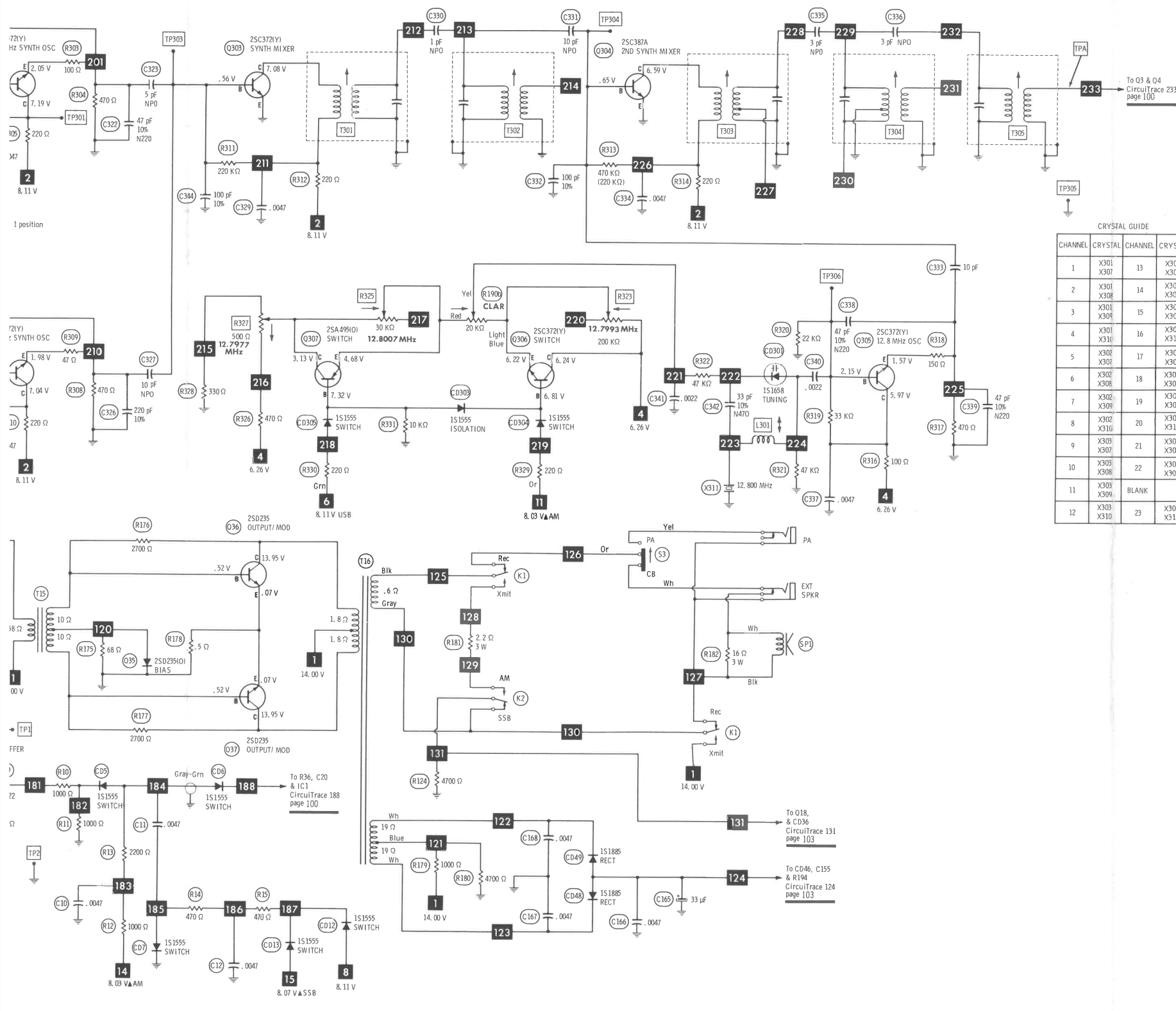
(CONTINUED ON PAGE 107)

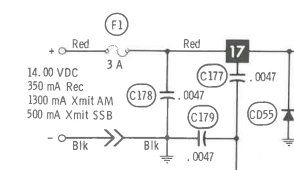
TRAM MODEL DIAMOND 60



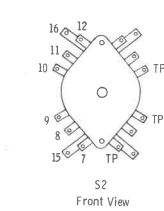
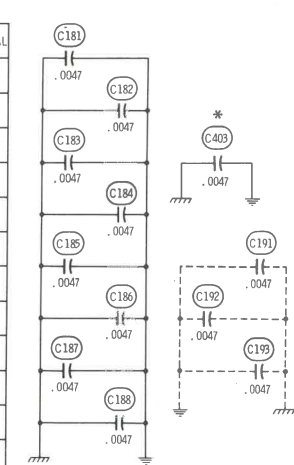
SEE NOTES ON PAGE 106







| CRYSTAL GUIDE |              |         |              |
|---------------|--------------|---------|--------------|
| CHANNEL       | CRYSTAL      | CHANNEL | CRYSTAL      |
| 1             | X301<br>X307 | 13      | X304<br>X307 |
| 2             | X301<br>X308 | 14      | X304<br>X308 |
| 3             | X301<br>X309 | 15      | X304<br>X309 |
| 4             | X301<br>X311 | 16      | X304<br>X310 |
| 5             | X302<br>X307 | 17      | X305<br>X307 |
| 6             | X302<br>X308 | 18      | X305<br>X308 |
| 7             | X302<br>X309 | 19      | X305<br>X309 |
| 8             | X302<br>X310 | 20      | X305<br>X310 |
| 9             | X303<br>X307 | 21      | X306<br>X307 |
| 10            | X303<br>X308 | 22      | X306<br>X308 |
| 11            | X303<br>X309 | BLANK   |              |
| 12            | X303<br>X310 | 23      | X306<br>X310 |



- ▲ Measured in transmit position.
- Measured with unit squelched.
- NC No Connection.

Measurements taken with switching in position show otherwise indicated.

Values shown in ( ) are used in some applications.

Resistors are 1/2W or less, 10% or 20%, unless otherwise noted.

Supply voltage maintained at rated value for measure.

Voltage and resistance measured with VTVM or equivalent.

no signal applied and controls adjusted for normal operation.

Arrow on control indicates direction of advance.

~ Denotes chassis.

~ Denotes ground. (Voltage reference unless otherwise noted.)

-- Indicates connection used in some versions.

- - - Indicates connection not used in some versions.

○ Omitted in some versions.

See parts list.

Value varies; replace with original value.



# PARTS LIST AND DESCRIPTION (CONTINUED)

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

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

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

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

(2) Rating 25 watt @ 3 amp.

(8) Varactor.

TRAM MODEL DIAMOND 60

## PARTS LIST AND DESCRIPTION (CONTINUED)

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

### ELECTROLYTIC CAPACITORS

| ITEM No. | RATING     | REPLACEMENT DATA |               |                    |                           |                  |                  |
|----------|------------|------------------|---------------|--------------------|---------------------------|------------------|------------------|
|          |            | MFGR. PART No.   | ARCO PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | SPRAGUE PART No. |
| C65      | 3.3 NP 16V | 260-43-023       |               |                    |                           | TCN503A          | TVAN-1302-1      |
| C67      | 1 NP 6V    | 260-43-024       |               |                    |                           | TCN501A          | TVAN-1200        |
| C73      | 4.7 35V    | 260-43-044       |               |                    |                           | VT74R7A50        | EV-1519          |
| C110     | 1 50V      | 260-43-027       | RME-B-H-005   | EN50-105           | WNP1-50                   | MTV1CB50         | EV-1615          |
| C111     | 33 16V     | 260-43-040       | RME-A-J-001   | EP50-5             | PC5-50                    | MTV30CB25        | EV-1325          |
| C124     | 1 50V      | 260-43-027       | ME-3-E-035    | EP15-25            | PC30-25                   | MTV1CB50         | EV-1615          |
| C125     | 100 3V     | 260-43-027       | RME-A-J-001   | EP50-1             | PC1-50                    | MTV1CB50         | SD10-1009        |
| C128     | 10 16V     | 260-40-002       |               |                    |                           | TDC107M010GL     | EV-1222          |
| C130     | 10 16V     | 260-43-030       | RME-B-E-010   | EP15-10            | PC10-25                   | VT710A25         | EV-1222          |
| C133     | 1 50V      | 260-43-030       | RME-B-E-010   | EP15-10            | PC10-25                   | VT710A25         | EV-1222          |
| C135     | 1 50V      | 260-43-027       | RME-A-J-001   | EP50-1             | PC1-50                    | MTV1CB50         | EV-1615          |
| C137     | 10 16V     | 260-43-027       | RME-A-J-001   | EP50-1             | PC1-50                    | MTV1CB50         | EV-1615          |
| C143     | 1 50V      | 260-43-030       | RME-B-E-010   | EP15-10            | PC10-25                   | VT710A25         | EV-1222          |
| C145     | 1 50V      | 260-43-027       | RME-A-J-001   | EP50-1             | PC1-50                    | MTV1CB50         | EV-1615          |
| C148     | 10 16V     | 260-43-027       | RME-A-J-001   | EP50-1             | PC1-50                    | MTV1CB50         | EV-1615          |
| C149     | 1 50V      | 260-43-030       | RME-B-E-010   | EP15-10            | PC10-25                   | VT710A25         | EV-1222          |
| C150     | 100 3V     | 260-43-027       | RME-B-E-010   | EP15-10            | PC10-25                   | VT710A25         | EV-1222          |
| C151     | 1 50V      | 260-40-002       |               |                    |                           | TDC107M010GL     | SD10-1009        |
| C152     | 1 50V      | 260-43-027       | RME-A-J-001   | EP50-1             | PC1-50                    | MTV1CB50         | EV-1615          |
| C153     | 1 50V      | 260-43-027       | RME-A-J-001   | EP50-1             | PC1-50                    | MTV1CB50         | EV-1615          |
| C154     | 33 16V     | 260-43-027       | ME-3-E-035    | EP15-25            | PC30-25                   | MTV30CB25        | EV-1325          |
| C156     | 1 50V      | 260-43-027       | RME-A-J-001   | EP50-1             | PC1-50                    | MTV1CB50         | EV-1615          |
| C158     | 1 50V      | 260-43-027       | RME-A-J-001   | EP50-1             | PC1-50                    | MTV1CB50         | EV-1615          |
| C159     | 1 50V      | 260-43-027       | RME-A-J-001   | EP50-1             | PC1-50                    | MTV1CB50         | EV-1615          |
| C161     | 1 50V      | 260-43-027       | RME-A-J-001   | EP50-1             | PC1-50                    | MTV1CB50         | EV-1615          |
| C165     | 33 10V     | 260-40-001       |               |                    |                           | TDC336M010FL     | SD10-339         |
| C170     | 33 16V     | 260-43-040       | ME-3-E-035    | EP15-25            | PC30-25                   | MTV30CB25        | EV-1325          |
| C172     | 100 16V    | 260-43-035       | RME-E-E-100   | EP15-100           | PC100-16                  | MTV100CD15       | EV-1230          |
| C174     | 100 10V    | 260-43-036       | RME-E-D-100   | EP15-100           | PC100-10                  | MTV100CB10       | EV-1130          |
| C175     | 470 25V    | 260-43-043       | RME-N-G-500   | EP30-500           | WBR500-25                 | MTA500G25        | EV-1350          |
| C180     | 33 16V     | 260-43-040       | ME-3-E-035    | EP15-25            | PC30-25                   | MTV30CB25        | EV-1325          |
| C343     | 10 16V     | 260-43-030       | RME-B-E-010   | EP15-10            | PC10-25                   | VT710A25         | EV-1222          |

### CAPACITORS (cont)

| ITEM No. | RATING       | MFGR. PART No. | REPLACEMENT DATA      |                    |                           |                  |                  |
|----------|--------------|----------------|-----------------------|--------------------|---------------------------|------------------|------------------|
|          |              |                | ARCO/ELMENDO PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | SPRAGUE PART No. |
| C1       | 33 NPO 10%   |                | CCT0-330              | DTZ-33             | NP033                     | CN0433           | 10TCC-Q33        |
| C2       | 20           |                | CCT0-330              | DTZ-33             | NP033                     | CN0433           | 10TCC-Q33        |
| C3       | 33 NPO 10%   |                |                       |                    |                           |                  |                  |
| C4       | 20           |                |                       |                    |                           |                  |                  |
| C5       | 150 10%      |                | CCD-151               | DD-151             | GP150                     | GP315            | 10TS-T15         |
| C6       | 100 N220 10% |                | *                     |                    |                           | *                | 10TCR-T10        |
| C7       | .0047        |                | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C8       | .0022        |                | CCD-222               | DD-222             | GP2200                    | GP222            | 10TS-D22         |
| C9       | .0022        |                | CCD-222               | DD-222             | GP2200                    | GP222            | 10TS-D22         |
| C10      | .0047        |                | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C11      | .0047        |                | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C12      | .0047        |                | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C13      | .0047        |                | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C14      | 10 N750      |                | CCTN-100              | DTN-10             | N10                       | CN7410           | 10TCUQ10         |
| C15      | 20           |                | CCT0-200              | DTZ-20             | NP020                     | CN0420           | 10TCC-Q20        |
| C16      | .0047        |                | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C17      | .0022        |                | CCD-222               | DD-222             | GP2200                    | GP222            | 10TS-D22         |
| C18      | .0047        |                | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C19      | .0047        |                | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C20      | .0047        |                | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C22      | .0047        |                | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C23      | .0047        |                | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C24      | .0047        |                | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C25      | .0047        |                | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C26      | .0047        |                | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C27      | .0022        |                | CCD-222               | DD-222             | GP2200                    | GP222            | 10TS-D22         |
| C28      | .0022        |                | CCD-222               | DD-222             | GP2200                    | GP222            | 10TS-D22         |
| C29      | .0022        |                | CCD-222               | DD-222             | GP2200                    | GP222            | 10TS-D22         |
| C30      | 15           |                | CCT0-150              | DTZ-15             | NP015                     | CN0415           | 10TCC-Q15        |
| C31      | .0022        |                | CCD-222               | DD-222             | GP2200                    | GP222            | 10TS-D22         |
| C32      | .0047        |                | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C33      | .0047        |                | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C34      | 2            |                |                       | DTZ-2R2            | NP02P2                    | CN0522           | 10TCC-V22        |
| C35      | 1            |                |                       |                    | CN0510                    |                  | 10TCC-V10        |
| C36      | .0022        |                | CCD-222               | DD-222             | GP2200                    | GP222            | 10TS-D22         |
| C37      | .0022        |                | CCD-222               | DD-222             | GP2200                    | GP222            | 10TS-D22         |
| C38      | .0047        |                | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C41      | .0022        |                | CCD-222               | DD-222             | GP2200                    | GP222            | 10TS-D22         |
| C42      | .0022        |                | CCD-222               | DD-222             | GP2200                    | GP222            | 10TS-D22         |
| C43      | .033 10%     |                | 4DP-2-333             |                    | DPMS6533                  | EMF4133          | 4PS-S33          |
| C44      | .0022        |                | CCD-222               | DD-222             | GP2200                    | GP222            | 10TS-D22         |
| C45      | .0022        |                | CCD-222               | DD-222             | GP2200                    | GP222            | 10TS-D22         |
| C46      | .0022        |                | CCD-222               | DD-222             | GP2200                    | GP222            | 10TS-D22         |
| C47      | 7 NPO        |                |                       | DTZ-6R8            | NP06P8                    | CN0568           | 10TCC-V68        |
| C48      | .0022        |                | CCD-222               | DD-222             | GP2200                    | GP222            | 10TS-D22         |
| C49      | .0022        |                | CCD-222               | DD-222             | GP2200                    | GP222            | 10TS-D22         |

# PARTS LIST AND DESCRIPTION (CONTINUED)

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

## CAPACITORS (cont)

| ITEM No. | RATING       | MFR. PART No. | REPLACEMENT DATA      |                    |                           |                  |                  |
|----------|--------------|---------------|-----------------------|--------------------|---------------------------|------------------|------------------|
|          |              |               | ARCO/ELMENCO PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | SPRAGUE PART No. |
| C50      | 1 NPO        |               |                       |                    | CN0510                    |                  | 10TCC-V10        |
| C51      | .0022        |               | CCD-222               | DD-222             | GP2200                    | GP222            | 10TS-D22         |
| C52      | .0047        |               | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C53      | 10 NPO       |               | CCT0-100              | DTZ-10             | NP010                     | CN0410           | 10TCC-Q10        |
| C54      | .0047        |               | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C55      | .033 10%     |               | 4DP-2-333             |                    | DPMS6S33                  | EW4133           | 4PS-S33          |
| C56      | .0047        |               | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C57      | .1 NPO       |               |                       |                    |                           |                  |                  |
| C58      | .0047        |               |                       |                    |                           |                  |                  |
| C59      | .01          |               | CCD-203               | CK-203             | MGP02                     | TA120            | TG-S20           |
| C60      | .033 10%     |               | IDP-1-103             | CPR-10000J         | DPMS6S1                   | EW41A110         | 225P10391WD3     |
| C61      | .033 10%     |               | 4DP-2-333             |                    | DPMS6S33                  | EW4133           | 4PS-S33          |
| C62      | .033 10%     |               | 4DP-2-333             |                    | DPMS6S33                  | EW4133           | 4PS-S33          |
| C63      | .033 10%     |               | 4DP-2-333             |                    | DPMS6S33                  | EW4133           | 4PS-S33          |
| C64      | .0047        |               | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C66      | .033 10%     |               | 4DP-2-333             |                    | DPMS6S33                  | EW4133           | 4PS-S33          |
| C71      | .0047        |               | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C72      | .0022        |               | CCD-222               | DD-222             | GP2200                    | GP222            | 10TS-D22         |
| C74      | .0047        |               | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C75      | .0047        |               | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C76      | .0047        |               | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C79      | .0047        |               | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C80      | 5            |               |                       |                    | NP05                      |                  | 10TCC-V50        |
| C81      | 150 10%      |               | CCD-151               | DD-151             | GP150                     | GP315            | 10TS-T15         |
| C82      | .0047        |               | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C83      | 100 N220 10% |               | *                     |                    |                           | *                | 10TCR-T100       |
| C84      | 22           |               | CCT0-200              | DTZ-20             | NP020                     | CN0420           | 10TCC-Q20        |
| C86      | .0047        |               | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C87      | .0022        |               | CCD-222               | DD-222             | GP2200                    | GP222            | 10TS-D22         |
| C89      | .0047        |               | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C90      | .0047        |               | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C91      | .0047        |               | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C92      | .0047        |               | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C93      | .0047        |               | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C94      | 100 N220 10% |               | *                     |                    |                           | *                | 10TCR-T10        |
| C95      | 150 10%      |               | CCD-151               | DD-151             | GP150                     | GP315            | 10TS-T15         |
| C96      | .0047        |               | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C97      | .0047        |               | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C98      | .0047        |               | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C100     | .0047        |               | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C101     | 150 10%      |               | CCD-151               | DD-151             | GP150                     | GP315            | 10TS-T15         |
| C102     | 120 10%      |               | CCT0-121              | DTZ-120            |                           | CN0312           | 10TCC-T15        |
| C103     | 120 10%      |               | CCT0-121              | DTZ-120            |                           | CN0312           | 10TCC-T15        |
| C104     | 5            |               |                       |                    | NP05                      |                  | 10TCC-V50        |
| C105     | 22           |               | CCT0-200              | DTZ-20             | NP020                     | CN0420           | 10TCC-Q20        |
| C106     | .0022        |               | CCD-222               | DD-222             | GP2200                    | GP222            | 10TS-D22         |
| C107     | .0022        |               | CCD-222               | DD-222             | GP2200                    | GP222            | 10TS-D22         |
| C108     | 10           |               | CCT0-100              | DTZ-10             | NP010                     | CN0410           | 10TCC-Q10        |
| C109     | .0022        |               | CCD-222               | DD-222             | GP2200                    | GP222            | 10TS-D22         |
| C112     | 150 10%      |               | CCD-151               | DD-151             | GP150                     | GP315            | 10TS-T15         |
| C113     | 68 N220 10%  |               | *                     |                    |                           | *                | 10TCR-Q68        |
| C114     | 150 10%      |               | CCD-151               | DD-151             | GP150                     | GP315            | 10TS-T15         |
| C117     | .0022        |               | CCD-222               | DD-222             | GP2200                    | GP222            | 10TS-D22         |
| C118     | .0022        |               | CCD-222               | DD-222             | GP2200                    | GP222            | 10TS-D22         |
| C119     | 50 5%        |               | CCT0-510              | DTZ-50             | NP050                     | CN0450           | 10TCC-Q50        |
| C120     | .0022        |               | CCD-222               | DD-222             | GP2200                    | GP222            | 10TS-D22         |
| C123     | .0047        |               | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C126     | .0047        |               | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C127     | .0047        |               | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C129     | .0047        |               | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C134     | .0047        |               | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C136     | .033         |               | 4DP-2-333             |                    | DPMS6S33                  | EW4133           | 4PS-S33          |
| C138     | .0047        |               | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C139     | .0047        |               | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C140     | .0047        |               | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C144     | .0047        |               | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C146     | .0047        |               | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C147     | .01          |               | IDP-1-103             | CPR-10000J         | DPMS6S1                   | EW41A110         | 225P10391WD3     |
| C155     | .0047        |               | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C157     | .0047        |               | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C160     | .0047        |               | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C162     | .001         |               | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C163     | .0047        |               | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C166     | .0047        |               | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C167     | .0047        |               | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C168     | .0047        |               | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C171     | .0047        |               | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C173     | .0047        |               | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C176     | .0047        |               | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C177     | .0047        |               | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C178     | .0047        |               | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C179     | .0047        |               | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C181     | .0047        |               | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C182     | .0047        |               | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C183     | .0047        |               | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C184     | .0047        |               | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C185     | .0047        |               | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C186     | .0047        |               | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C187     | .0047        |               | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C188     | .0047        |               | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C301     | 33 NPO 10%   |               | CCT0-330              | DTZ-33             | NP033                     | CN0433           | 10TCC-Q33        |
| C302     | 2            |               |                       | DTZ-2R2            | NP02P2                    | CN0522           | 10TCC-V22        |
| C303     | 33 NPO       |               | CCT0-330              | DTZ-33             | NP033                     | CN0433           | 10TCC-Q33        |
| C304     | 2            |               |                       | DTZ-2R2            | NP02P2                    | CN0522           | 10TCC-V22        |

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## PARTS LIST AND DESCRIPTION (CONTINUED)

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

### CAPACITORS (cont)

| ITEM No. | RATING  | MFR. PART No. | REPLACEMENT DATA      |                    |                           |                  |                  |
|----------|---------|---------------|-----------------------|--------------------|---------------------------|------------------|------------------|
|          |         |               | ARCO/ELMENCO PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | SPRAGUE PART No. |
| C305     | 33 NPO  |               | CCTO-330              | DTZ-33             | NP033                     | CN0433           | 10TCC-Q33        |
| C306     | 20      |               |                       |                    |                           |                  |                  |
| C307     | 33 NPO  |               | CCTO-330              | DTZ-33             | NP033                     | CN0433           | 10TCC-Q33        |
| C308     | 20      |               |                       |                    |                           |                  |                  |
| C309     | 33 NPO  |               | CCTO-330              | DTZ-33             | NP033                     | CN0433           | 10TCC-Q33        |
| C310     | 20      |               |                       |                    |                           |                  |                  |
| C311     | 33 NPO  |               | CCTO-330              | DTZ-33             | NP033                     | CN0433           | 10TCC-Q33        |
| C312     | 2       |               |                       |                    |                           |                  |                  |
| C313     | 33 NPO  |               | CCTO-330              | DTZ-33             | NP033                     | CN0433           | 10TCC-Q33        |
| C314     | 20      |               |                       |                    |                           |                  |                  |
| C315     | 33 NPO  |               | CCTO-330              | DTZ-33             | NP033                     | CN0433           | 10TCC-Q33        |
| C316     | 20      |               |                       |                    |                           |                  |                  |
| C317     | 33 NPO  |               | CCTO-330              | DTZ-33             | NP033                     | CN0433           | 10TCC-Q33        |
| C318     | 20      |               |                       |                    |                           |                  |                  |
| C319     | 33 NPO  |               | CCTO-330              | DTZ-33             | NP033                     | CN0433           | 10TCC-Q33        |
| C320     | 20      |               |                       |                    |                           |                  |                  |
| C321     | 68 N220 |               | *                     |                    |                           | *                | 10TCR-Q68        |
| C322     | 47 N220 |               | *                     |                    |                           | *                | 10TCR-Q47        |
| C323     | 5 NPO   |               |                       |                    |                           |                  | 10TCC-V50        |
| C324     | .0047   |               | CCD-472               | DD-472G            | NP05                      |                  |                  |
| C325     | 330 10% |               | CCD-331               | DD-331             | GP4700                    | JF247            | 10TS-D47         |
| C326     | 220 10% |               | CCD-221               | DD-221             | GP330                     | GP333            | 10TS-T33         |
| C327     | 10 NPO  |               | CCTO-100              | DTZ-10             | GP220                     | GP322            | 10TS-T22         |
| C328     | .0047   |               | CCD-472               | DD-472G            | NP010                     | CN0410           | 10TCC-Q10        |
| C329     | .0047   |               | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TS-D47         |
| C330     | 1 NPO   |               |                       |                    | GP4700                    | JF247            | 10TS-D47         |
| C331     | 10 NPO  |               | CCTO-100              | DTZ-10             | CN0510                    |                  | 10TCC-V10        |
| C332     | 100 10% |               | CCTO-101              | DTZ-100            | NP010                     | CN0410           | 10TCC-Q10        |
| C333     | 10      |               | CCTO-100              | DTZ-10             | NP0100                    | CN0310           | 10TCC-T10        |
| C334     | .0047   |               | CCD-472               | DD-472G            | NP010                     | CN0410           | 10TCC-Q10        |
| C335     | 3 NPO   |               |                       |                    | GP4700                    | JF247            | 10TS-D47         |
| C336     | 3 NPO   |               |                       |                    |                           |                  | 10TCC-V30        |
| C337     | .0047   |               | CCD-472               | DD-472G            | GP4700                    | JF247            | 10TCC-V30        |
| C338     | 47 N220 |               | *                     |                    |                           | *                | 10TS-D47         |
| C339     | 47 N220 |               | *                     |                    |                           | *                | 10TCR-Q47        |
| C340     | .0022   |               | CCD-222               | DD-222             | GP2200                    | GP222            | 10TCR-Q47        |
| C341     | .0022   |               | CCD-222               | DD-222             | GP2200                    | GP222            | 10TS-D22         |
| C342     | 33 N470 |               | *                     |                    |                           | *                | 10TS-D22         |
| C344     | 100 10% |               | CCTO-101              | DTZ-100            | NP0100                    | CN0310           | 10TCT-Q33        |

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

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

| ITEM No. | FUNCTION             | RESIST-ANCE | REPLACEMENT DATA |                               |                    |                  |                  |
|----------|----------------------|-------------|------------------|-------------------------------|--------------------|------------------|------------------|
|          |                      |             | MFR. PART No.    | CENTRALAB PART No.            | CLAROSTAT PART No. | CTS-IRC PART No. | MALLORY PART No. |
| R20      | Balance              | 5000        | 260-61-064       | TSV-5K or T-5000              | C-502              | X201R502B        | MTC53L1          |
| R53a     | RF Gain              | 20K         | 260-61-044       |                               |                    |                  |                  |
| R72      | Volume/Switch AM "S" | 50K         |                  |                               |                    |                  |                  |
| R78      | Range Balance        | 20K         | 260-61-079       | T-20K (2) or TSV-25K (2)      | C-253 (2)          | X201R253B (2)    | MTC24L1 (2)      |
| R81      | "SWR"                | 100K        | 260-61-066       | TSV-100K (2) or T-100K (2)    | C-104 (2)          | X201R104B (2)    | MTC15L1 (2)      |
| R98      | "AMC"                | 1000        | 260-61-068       | TSV-1K or T-1000              | C-102              | X201R102B        | MTC13L1          |
| R108     | Bias                 | 1000        | 260-61-067       | TSV-1K (2) or T-1000 (2)      | C-102 (2)          | X201R102B (2)    | MTC13L1 (2)      |
| R112     | ALC                  | 100         | 260-61-063       | TSV-100K (20) or [T-100 (20)] |                    | X201R101B (20)   | MTC12L1 (20)     |
| R118     | RF                   | 1000        | 260-61-068       | TSV-1K or T-1000              | C-102              | X201R102B        | MTC13L1          |
| R123a    | Mic Gain             | 20K         | 260-61-079       | T-20K (2) or TSV-25K (2)      | C-253 (2)          | X201R253B (2)    | MTC24L1 (2)      |
| R159     | SWR/Switch SSB "S"   | 100K        | 260-61-075       |                               |                    |                  |                  |
| R186     | Squelch Range        | 20K         | 260-61-079       | T-20K (2) or TSV-25K (2)      | C-253 (2)          | X201R253B (2)    | MTC24L1 (2)      |
| R190a    | Squelch              | 10K         | 260-61-071       | TSV-10K (2) or T-10K (2)      | C-103 (2)          | X201R103B (2)    | MTC14L1 (2)      |
| R323     | Clarifier            | 20K         | 260-61-043       |                               |                    |                  |                  |
| R325     | 17.7993MHz Adjust    | 20K         |                  |                               |                    |                  |                  |
| R327     | 17.8007MHz Adjust    | 200K        | 260-61-074       |                               |                    |                  |                  |
|          | 12.7977MHz Adjust    | 30K         | 260-61-072       |                               |                    |                  |                  |
|          |                      | 500         | 260-61-073       |                               |                    |                  |                  |

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

## PARTS LIST AND DESCRIPTION (CONTINUED)

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

### RESISTORS (Power and Special)

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

### COILS (RF-IF)

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

TRAM MODEL DIAMOND 60

### FILTER CHOKE

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

### TRANSFORMER (Driver)

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

### TRANSFORMER (Audio Output)

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

## PARTS LIST AND DESCRIPTION (CONTINUED)

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

### SPEAKER

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

### FUSE DEVICES

| ITEM No. | DESCRIPTION     | REPLACEMENT DATA |            |               |        |                     |        |                  |
|----------|-----------------|------------------|------------|---------------|--------|---------------------|--------|------------------|
|          |                 | PART No.         |            | BUSS PART No. |        | LITTELFUSE PART No. |        | WORKMAN PART No. |
|          |                 | DEVICE           | HOLDER     | DEVICE        | HOLDER | DEVICE              | HOLDER | DEVICE           |
| F1       | 3A Quick-Acting | 260-14-045       | 260-16-027 | AGC3          | HDJ    | 312003              | 150145 | FG3-2            |

### MISCELLANEOUS

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

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

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

### ACCESSORIES

| ITEM       | MFGR. PART No. | REMARKS |
|------------|----------------|---------|
| Microphone | 260-15-229     |         |