

# PHOTOFACT<sup>®</sup> with

# CIRCUITRACE<sup>®</sup>

For Supplier Address See PHOTOFACT Index

## NOTE

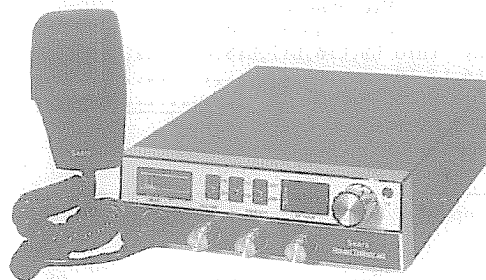
Repair or adjustment of transmitter circuits must be under supervision of a person with first-or second-class radiotelephone license.

(Refer to FCC Rules and Regulations Part 95, Subpart C & D.)

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

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

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



MODEL 663.38070700

## MANUFACTURER'S SPECIFICATIONS

| TRANSMITTER                                                       | UNITS | NOMINAL | LIMIT       |
|-------------------------------------------------------------------|-------|---------|-------------|
| 1. Frequency Tolerance at 25°C<br>(5 minutes after switch on)     | %     | ±0.002  | ±0.005      |
| 2. Carrier Power at No Modulation                                 | W     | 3.7     | 3.4 – 4.0   |
| 3. Spurious Harmonic Emission                                     | dB    | -65     | -60         |
| 4. Battery Drain at No Modulation                                 | mA    | 950     | 1100        |
| 5. Microphone Sensitivity For 50% Mod.                            | mV    | 0.6     | 1.2         |
| 6. AMC Range 50 – 100% Mod.                                       | dB    |         | 50          |
| 7. Battery Drain AM: 80% Mod.                                     | mA    | 1250    | 1500        |
| <b>RECEIVER (ANL &amp; Noise Blanker Switch OFF)</b>              |       |         |             |
| 1. Max Sensitivity                                                | μV    | 0.5     | 1           |
| 2. Sensitivity for 10 dB S/N                                      | μV    | 0.5     | 1           |
| 3. ACC Figure of Merit 50 mV. for<br>10 dB Change in Audio output | dB    | 90      | 75          |
| 4. Overall Audio Fidelity at 6 dB Down                            |       |         |             |
| Upper Frequency                                                   | Hz    | 2500    | 2000 – 3000 |
| Lower Frequency                                                   | Hz    | 450     | 200 – 600   |
| 5. Cross Modulation                                               | dB    | 60      | 50          |
| 6. Adjacent Channel Selectivity (10 KHz)                          | dB    | 70      | 60          |
| 7. Maximum Audio Output Power                                     | W     | 4       | 3           |
| 8. Audio Output Power at 10% THD                                  | W     | 3.5     | 2.5         |
| 9. RF Gain Control Range at Max<br>Sensitivity Level              | dB    | 35      | 26          |
| 10. Hum & Noise Ratio at Input 1 mV                               | dB    | 46      | 40          |
| 11. Squelch Sensitivity at Threshold                              | μV    | 0.5     | 1           |
| 12. Squelch Sensitivity at Tight                                  | μV    | 1,000   | 250 – 4000  |
| 13. S. Meter Sensitivity at "S-9"                                 | μV    | 100     | 50 – 200    |
| 14. Image Rejection Ratio                                         | dB    | 86      | 70          |
| 15. IF Rejection Ratio                                            | dB    | 80      | 70          |
| 16. Oscillator Dropout Voltage                                    | V     | 9       | 11          |
| 17. Battery Drain at No Signal                                    | mA    | 350     | 500         |

Courtesy of the Manufacturer

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

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SEARS MODEL 663.38070700

## ALIGNMENT INSTRUCTIONS

CAUTION: Use isolation transformer or observe polarity when connecting test equipment. Maintain line voltage at 120V AC. Allow a 15-minute warm-up period.  
 Adjustments made with 9-volt DC input.  
 Adjustments made with 12-volt DC input.  
 Adjustments made with 13.8-volt DC input.  
 Connect low sides of test equipment to ground unless specified otherwise.  
 Connect 50-ohm dummy load or antenna before keying transmitter.  
 Connect Microphone.  
 Suggested Alignment Tools: GC Electronics:  
 L1 thru L5, L16, L17, L18, L20, L21, L24.....9440  
 L6, L7, L8.....5000, 5009, 8276, 8278, 8728A  
 L10, L11, L12, L15.....8728, 8728A, 9304

## SYNTHESIZER ALIGNMENT

| TEST EQUIPMENT                     | TRANSCEIVER | ADJUST | REMARKS                                                                                                                                  |
|------------------------------------|-------------|--------|------------------------------------------------------------------------------------------------------------------------------------------|
| Input of oscilloscope to TP1.      | Ch. 19      | L5     | Adjust for maximum RF output.                                                                                                            |
| Input of frequency counter to TP1. | Ch. 19      |        | Check for 10.240MHz.                                                                                                                     |
| Input of DC meter to TP5.          | Ch. 19      | L20    | Adjust for 2.4 volts.                                                                                                                    |
| Input of oscilloscope to TP6.      | Ch. 19      | L21    | Adjust for maximum RF output.                                                                                                            |
| Input of frequency counter to TP6. | Ch. 1       |        | Check for 37.660MHz.<br>Check all channels.<br>(See Truth Chart for correct frequencies.)                                                |
| Input of frequency counter to TP8. | Ch. 19      | L24    | Adjust for 36.570MHz.                                                                                                                    |
| Input of frequency counter to TP4. | Ch. 1       |        | Check for 1.090MHz.<br>Check all channels.<br>(See Truth Chart for correct frequencies.)                                                 |
| Input of oscilloscope to TP3.      | Ch. 19, XMT | L18    | Adjust for maximum RF output.                                                                                                            |
| Input of frequency counter to TP3. | Ch. 1, XMT  |        | Check for 26.965MHz.<br>If necessary readjust L24 for correct frequency.<br>Check all channels.<br>(See page 4 for channel frequencies.) |

## RECEIVER ALIGNMENT

Connect an AC VTVM or AF wattmeter across speaker voice coil.  
 Adjust volume control to obtain a suitable indication.  
 Set generator output low enough to prevent AGC limiting.  
 RF Gain Maximum, Squelch MINIMUM, ANL Switch Off.

| TEST EQUIPMENT                                                                                 | TRANSCEIVER | ADJUST         | REMARKS                                                                        |
|------------------------------------------------------------------------------------------------|-------------|----------------|--------------------------------------------------------------------------------|
| Output of signal generator thru .01uF to TP9 (TR3 base).<br>455kHz, 1000Hz @ 30% modulation.   | Ch. 19      | L8, L7, L6     | Adjust for maximum output.                                                     |
| Output of signal generator thru .01uF to antenna input.<br>27.185MHz, 1000Hz @ 30% modulation. | Ch. 19      | L4, L3, L2, L1 | Adjust for maximum output.<br>If necessary readjust L6, L7 and L8 for maximum. |

## RECEIVER ADJUSTMENTS

Connect an AC VTVM or AF wattmeter across speaker voice coil.  
 Adjust volume control to obtain a suitable indication.  
 RF Gain Maximum, ANL Switch Off.

| TEST EQUIPMENT                                                                                                  | TRANSCEIVER                                 | ADJUST | REMARKS                                              |
|-----------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------|------------------------------------------------------|
| Output of signal generator thru .01uF to antenna input.<br>27.185MHz, 1000Hz @ 30% modulation.<br>Output .9uV.  | Ch. 19<br>Squelch MINIMUM<br>Volume Maximum | VR1    | AGC<br>Adjust for 2.0 volts audio output.            |
| Output of signal generator thru .01uF to antenna input.<br>27.185MHz, 1000Hz @ 30% modulation.<br>Output 500uV. | Ch. 19<br>Squelch Maximum                   | VR203  | SQUELCH RANGE<br>Adjust so that squelch just breaks. |

## RECEIVER ALIGNMENT (Continued)

|                                                                                                                 |                           |       |                                                  |
|-----------------------------------------------------------------------------------------------------------------|---------------------------|-------|--------------------------------------------------|
| Output of signal generator thru .01uF to antenna input.<br>27.185MHz, 1000Hz @ 30% modulation.<br>Output 100uV. | Ch. 19<br>Squelch MINIMUM | VR204 | SIG METER<br>Adjust for 9 on SIG scale of meter. |
|-----------------------------------------------------------------------------------------------------------------|---------------------------|-------|--------------------------------------------------|

## TRANSMITTER ALIGNMENT

Connect an RF wattmeter and 50-ohm, 25-watt dummy load to antenna connector.  
NOTE: Be sure to check transmit frequency and power on all active channels after alignment of transmitter.  
See page 4 for channel frequencies.

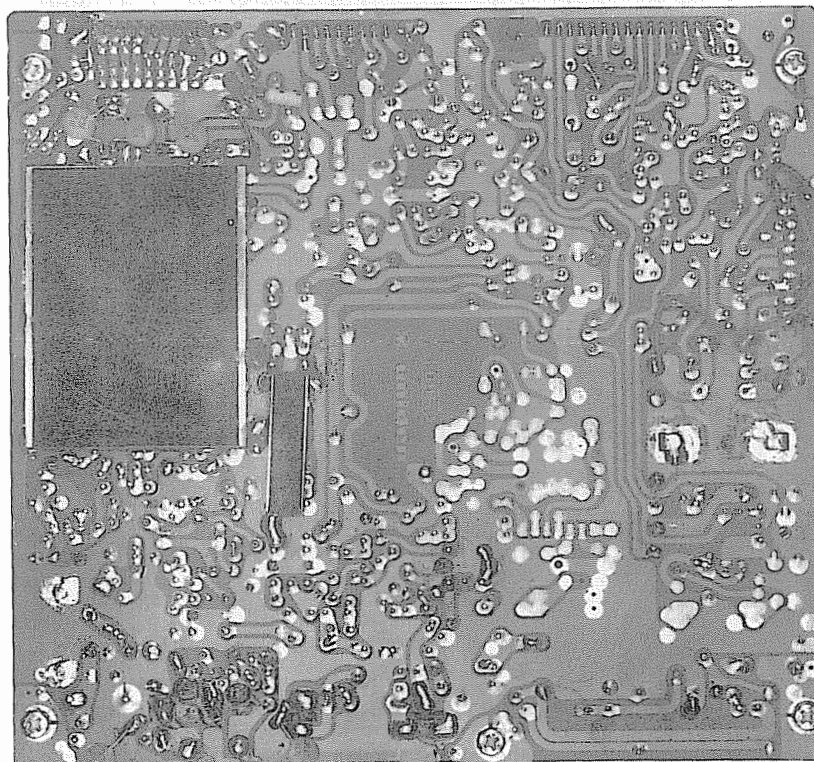
| TEST EQUIPMENT                                                         | TRANSCEIVER | ADJUST        | REMARKS                                     |
|------------------------------------------------------------------------|-------------|---------------|---------------------------------------------|
| Input of RF wattmeter and 50-ohm, 25-watt dummy load to antenna input. | Ch. 19      | L17, L16, L15 | Adjust for maximum RF output.               |
| Input of RF wattmeter and 50-ohm, 25-watt dummy load to antenna input. | Ch. 19      | L12, L11      | Adjust for 4.0 watts RF output maximum.     |
| Input of spectrum analyzer or harmonic meter to antenna input.         | Ch. 19      | L10           | Adjust for MINIMUM at 54MHz (2nd harmonic). |

## TRANSMITTER ADJUSTMENTS

Connect an RF wattmeter and 50-ohm, 25-watt dummy load to antenna connector.  
NOTE: Be sure to check transmit frequency and power on all active channels after adjustment of transmitter.  
See page 4 for channel frequencies.

| TEST EQUIPMENT                                                                                            | TRANSCEIVER | ADJUST | REMARKS                                                       |
|-----------------------------------------------------------------------------------------------------------|-------------|--------|---------------------------------------------------------------|
| Input of oscilloscope or modulation meter to antenna input.<br>Inject a 1000Hz, 10mV signal at MIC input. | Ch. 19      | VR2    | AMC<br>Adjust for 100% modulation maximum.<br>See Figure 1.   |
| Input of RF wattmeter and 50-ohm, 25-watt dummy load to antenna input.                                    | Ch. 19      | VR205  | RF METER<br>Adjust so that RF meter agrees with RF wattmeter. |

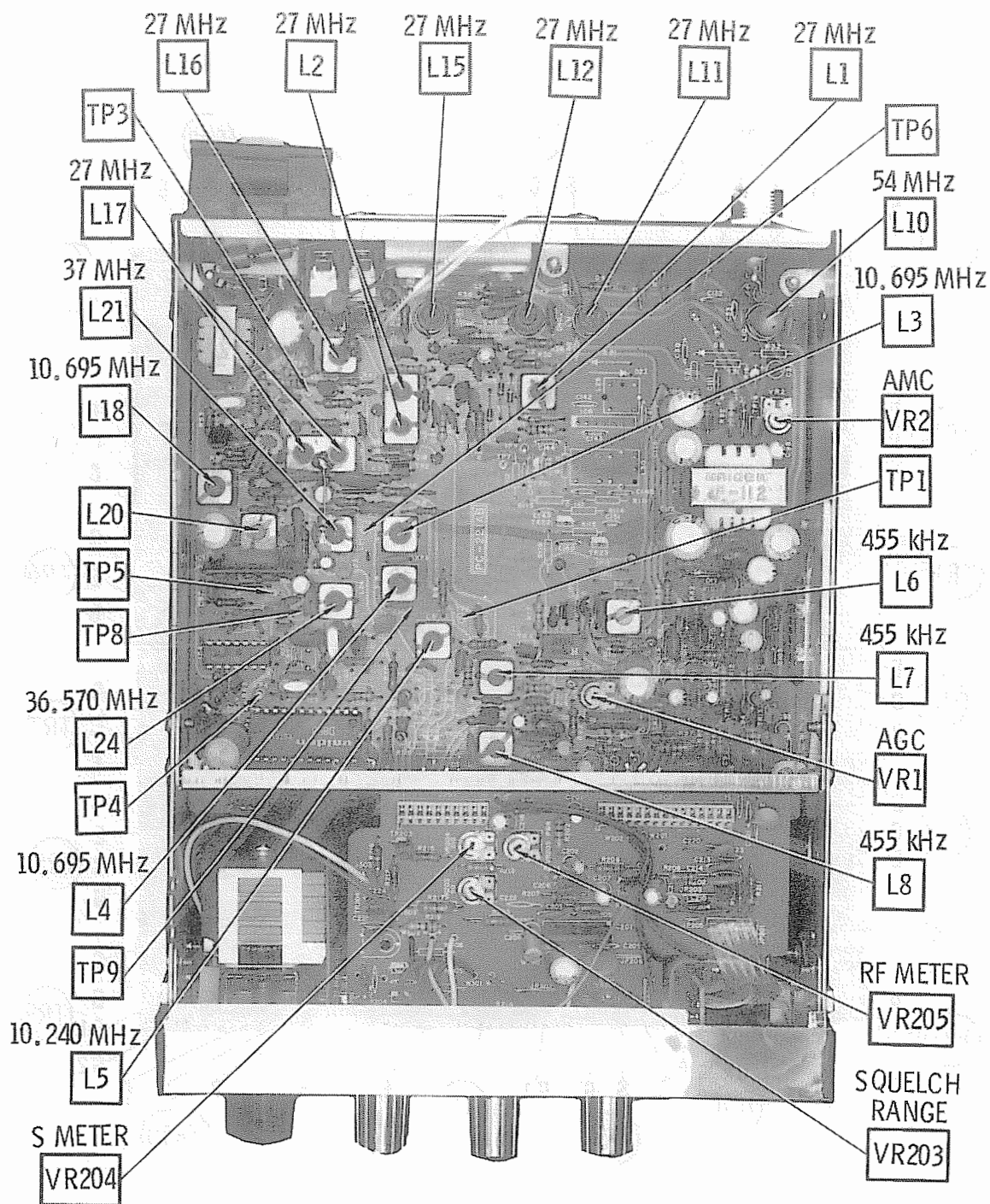
SEARS MODEL 663.38070700



SHIELD LOCATION

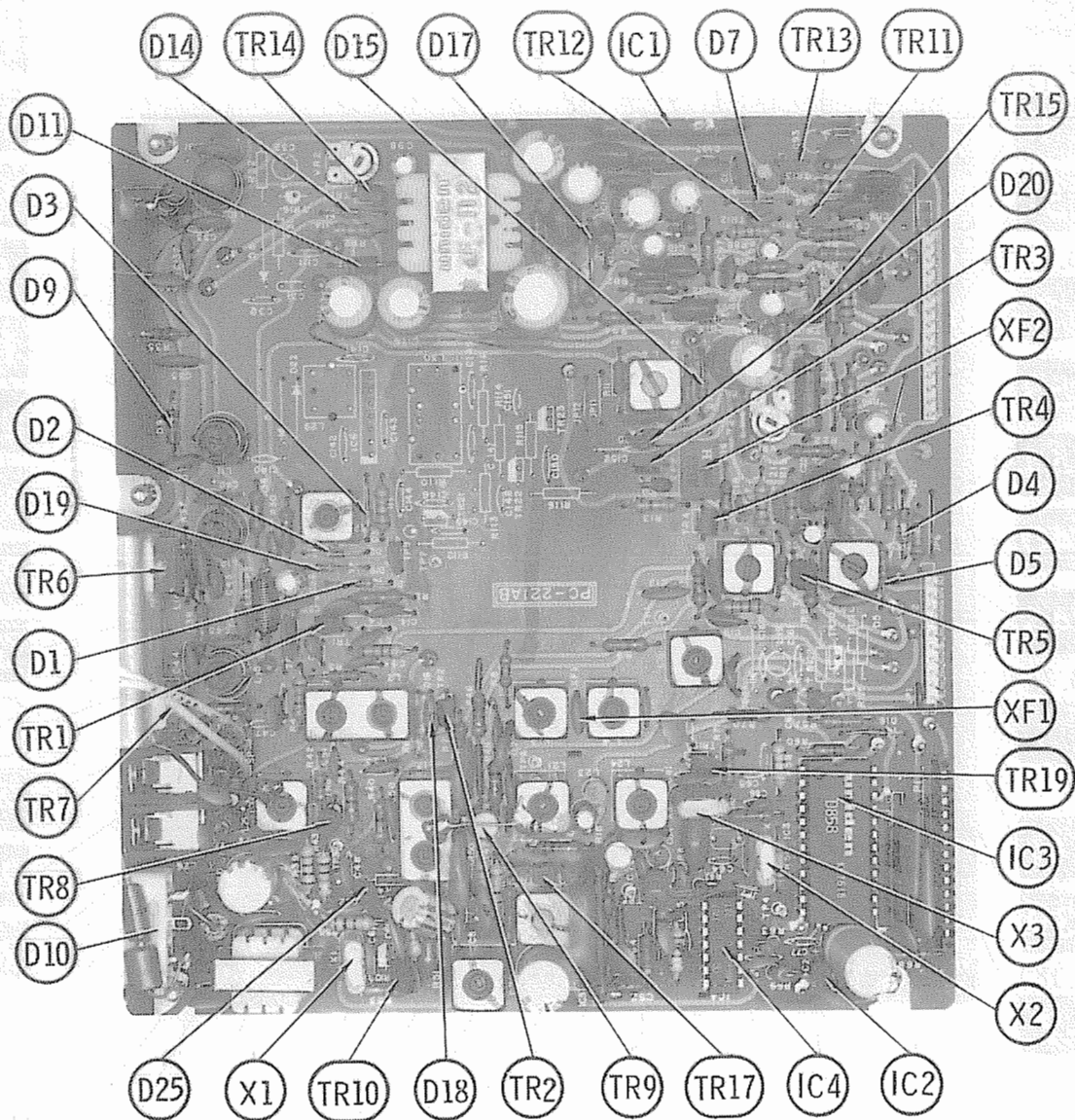
# TRUTH CHART

| C<br>H<br>A<br>N<br>N<br>E<br>L | 1 = 4.80 Volts      0 = 0 Volts |    |    |    |    |    |    | DIVIDER<br>INPUT<br>IN MHz<br>AT TP4 | REC & XMIT<br>SYNTHESIZER<br>OUTPUT<br>IN MHz<br>AT TP6 |        |  |
|---------------------------------|---------------------------------|----|----|----|----|----|----|--------------------------------------|---------------------------------------------------------|--------|--|
|                                 | IC3<br>PROGRAM DIVIDER          |    |    |    |    |    |    |                                      |                                                         |        |  |
|                                 | PINS                            |    |    |    |    |    |    |                                      |                                                         |        |  |
|                                 | 19                              | 18 | 17 | 16 | 15 | 14 | 13 |                                      |                                                         |        |  |
| 1                               | 0                               | 0  | 0  | 1  | 0  | 0  | 1  |                                      | 1.090                                                   | 37.660 |  |
| 2                               | 0                               | 0  | 1  | 0  | 0  | 0  | 0  |                                      | 1.100                                                   | 37.670 |  |
| 3                               | 0                               | 0  | 1  | 0  | 0  | 0  | 1  |                                      | 1.110                                                   | 37.680 |  |
| 4                               | 0                               | 0  | 1  | 0  | 0  | 1  | 1  |                                      | 1.130                                                   | 37.700 |  |
| 5                               | 0                               | 0  | 1  | 0  | 1  | 0  | 0  |                                      | 1.140                                                   | 37.710 |  |
| 6                               | 0                               | 0  | 1  | 0  | 1  | 0  | 1  |                                      | 1.150                                                   | 37.720 |  |
| 7                               | 0                               | 0  | 1  | 0  | 1  | 1  | 0  |                                      | 1.160                                                   | 37.730 |  |
| 8                               | 0                               | 0  | 1  | 1  | 0  | 0  | 0  |                                      | 1.180                                                   | 37.750 |  |
| 9                               | 0                               | 0  | 1  | 1  | 0  | 0  | 1  |                                      | 1.190                                                   | 37.760 |  |
| 10                              | 0                               | 0  | 0  | 0  | 0  | 0  | 0  |                                      | 1.200                                                   | 37.770 |  |
| 11                              | 0                               | 1  | 0  | 0  | 0  | 0  | 1  |                                      | 1.210                                                   | 37.780 |  |
| 12                              | 0                               | 1  | 0  | 0  | 0  | 1  | 1  |                                      | 1.230                                                   | 37.800 |  |
| 13                              | 0                               | 1  | 0  | 0  | 1  | 0  | 0  |                                      | 1.240                                                   | 37.810 |  |
| 14                              | 0                               | 1  | 0  | 0  | 1  | 0  | 1  |                                      | 1.250                                                   | 37.820 |  |
| 15                              | 0                               | 1  | 0  | 0  | 1  | 1  | 0  |                                      | 1.260                                                   | 37.830 |  |
| 16                              | 0                               | 1  | 0  | 1  | 0  | 0  | 0  |                                      | 1.280                                                   | 37.850 |  |
| 17                              | 0                               | 1  | 0  | 1  | 0  | 0  | 1  |                                      | 1.290                                                   | 37.860 |  |
| 18                              | 0                               | 1  | 1  | 0  | 0  | 0  | 0  |                                      | 1.300                                                   | 37.870 |  |
| 19                              | 0                               | 1  | 1  | 0  | 0  | 0  | 1  |                                      | 1.310                                                   | 37.880 |  |
| 20                              | 0                               | 1  | 1  | 0  | 0  | 1  | 1  |                                      | 1.330                                                   | 37.900 |  |
| 21                              | 0                               | 1  | 1  | 0  | 1  | 0  | 0  |                                      | 1.340                                                   | 37.910 |  |
| 22                              | 0                               | 1  | 1  | 0  | 1  | 0  | 1  |                                      | 1.350                                                   | 37.920 |  |
| 23                              | 0                               | 1  | 1  | 1  | 0  | 0  | 0  |                                      | 1.380                                                   | 37.950 |  |
| 24                              | 0                               | 1  | 1  | 0  | 1  | 1  | 0  |                                      | 1.360                                                   | 37.930 |  |
| 25                              | 0                               | 1  | 1  | 0  | 1  | 1  | 1  |                                      | 1.370                                                   | 37.940 |  |
| 26                              | 0                               | 1  | 1  | 1  | 0  | 0  | 1  |                                      | 1.390                                                   | 37.960 |  |
| 27                              | 1                               | 0  | 0  | 0  | 0  | 0  | 0  |                                      | 1.400                                                   | 37.970 |  |
| 28                              | 1                               | 0  | 0  | 0  | 0  | 0  | 1  |                                      | 1.410                                                   | 37.980 |  |
| 29                              | 1                               | 0  | 0  | 0  | 0  | 1  | 0  |                                      | 1.420                                                   | 37.990 |  |
| 30                              | 1                               | 0  | 0  | 0  | 0  | 1  | 1  |                                      | 1.430                                                   | 38.000 |  |
| 31                              | 1                               | 0  | 0  | 0  | 1  | 0  | 0  |                                      | 1.440                                                   | 38.010 |  |
| 32                              | 1                               | 0  | 0  | 0  | 1  | 0  | 1  |                                      | 1.450                                                   | 38.020 |  |
| 33                              | 1                               | 0  | 0  | 0  | 1  | 1  | 0  |                                      | 1.460                                                   | 38.030 |  |
| 34                              | 1                               | 0  | 0  | 0  | 1  | 1  | 1  |                                      | 1.470                                                   | 38.040 |  |
| 35                              | 1                               | 0  | 0  | 1  | 0  | 0  | 0  |                                      | 1.480                                                   | 38.050 |  |
| 36                              | 1                               | 0  | 0  | 1  | 0  | 0  | 1  |                                      | 1.490                                                   | 38.060 |  |
| 37                              | 1                               | 0  | 1  | 0  | 0  | 0  | 0  |                                      | 1.500                                                   | 38.070 |  |
| 38                              | 1                               | 0  | 1  | 0  | 0  | 0  | 1  |                                      | 1.510                                                   | 38.080 |  |
| 39                              | 1                               | 0  | 1  | 0  | 0  | 1  | 0  |                                      | 1.520                                                   | 38.090 |  |
| 40                              | 1                               | 0  | 1  | 0  | 0  | 1  | 1  |                                      | 1.530                                                   | 38.100 |  |



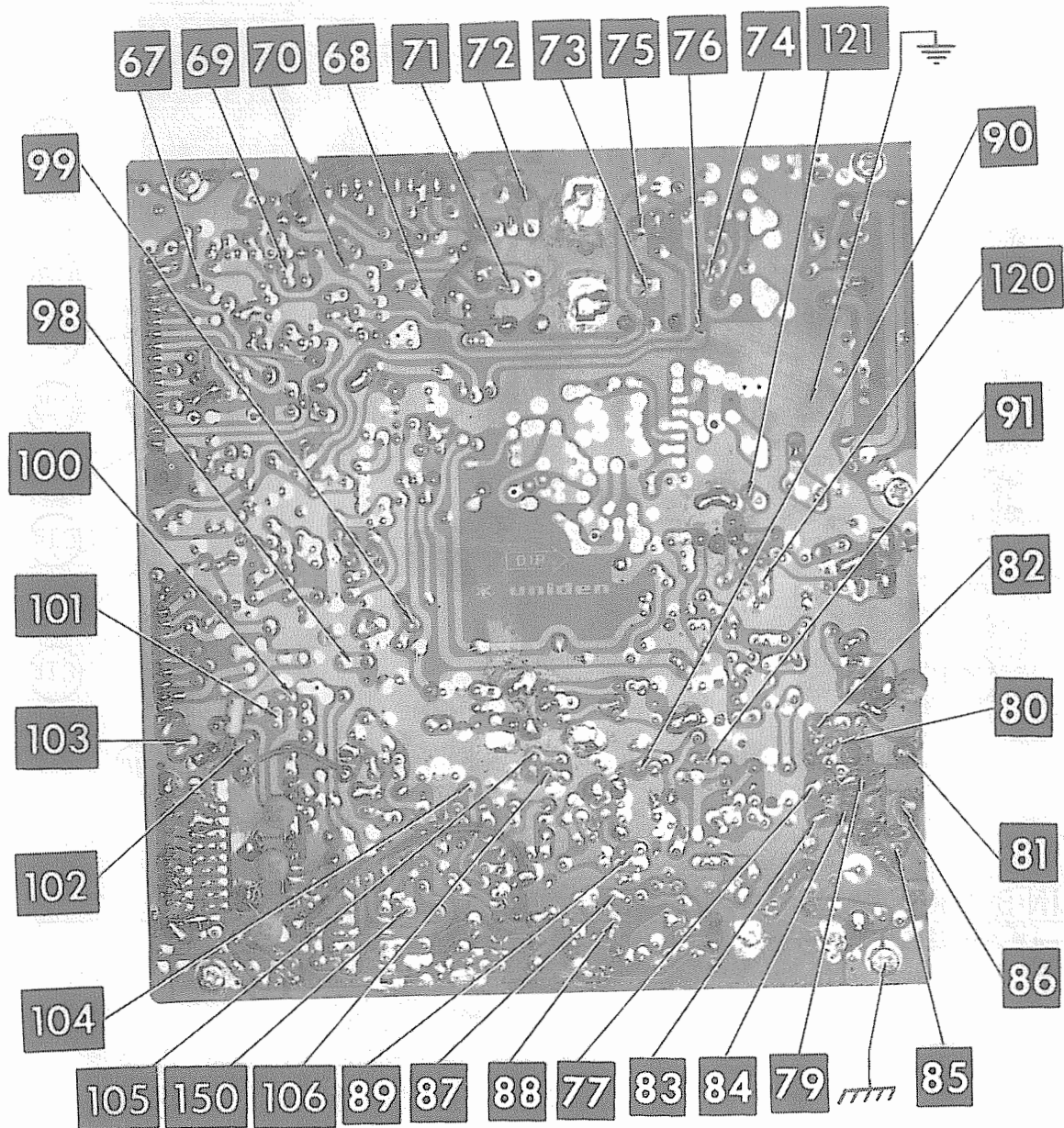
CHASSIS-BOTTOM





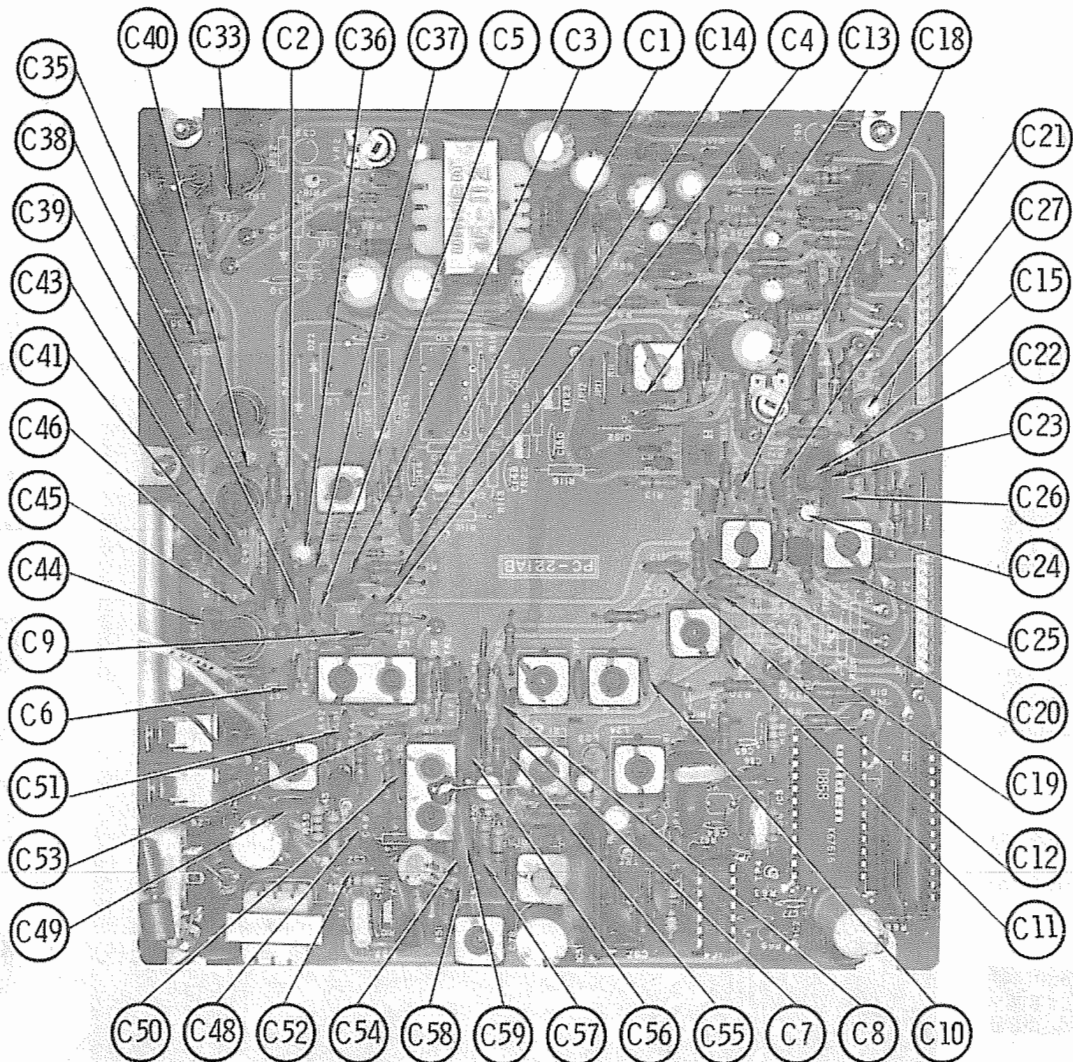
MAIN BOARD





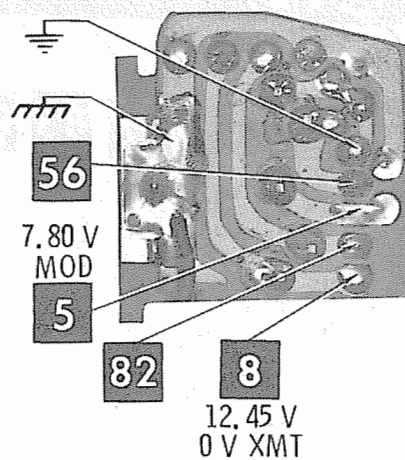
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MAIN BOARD

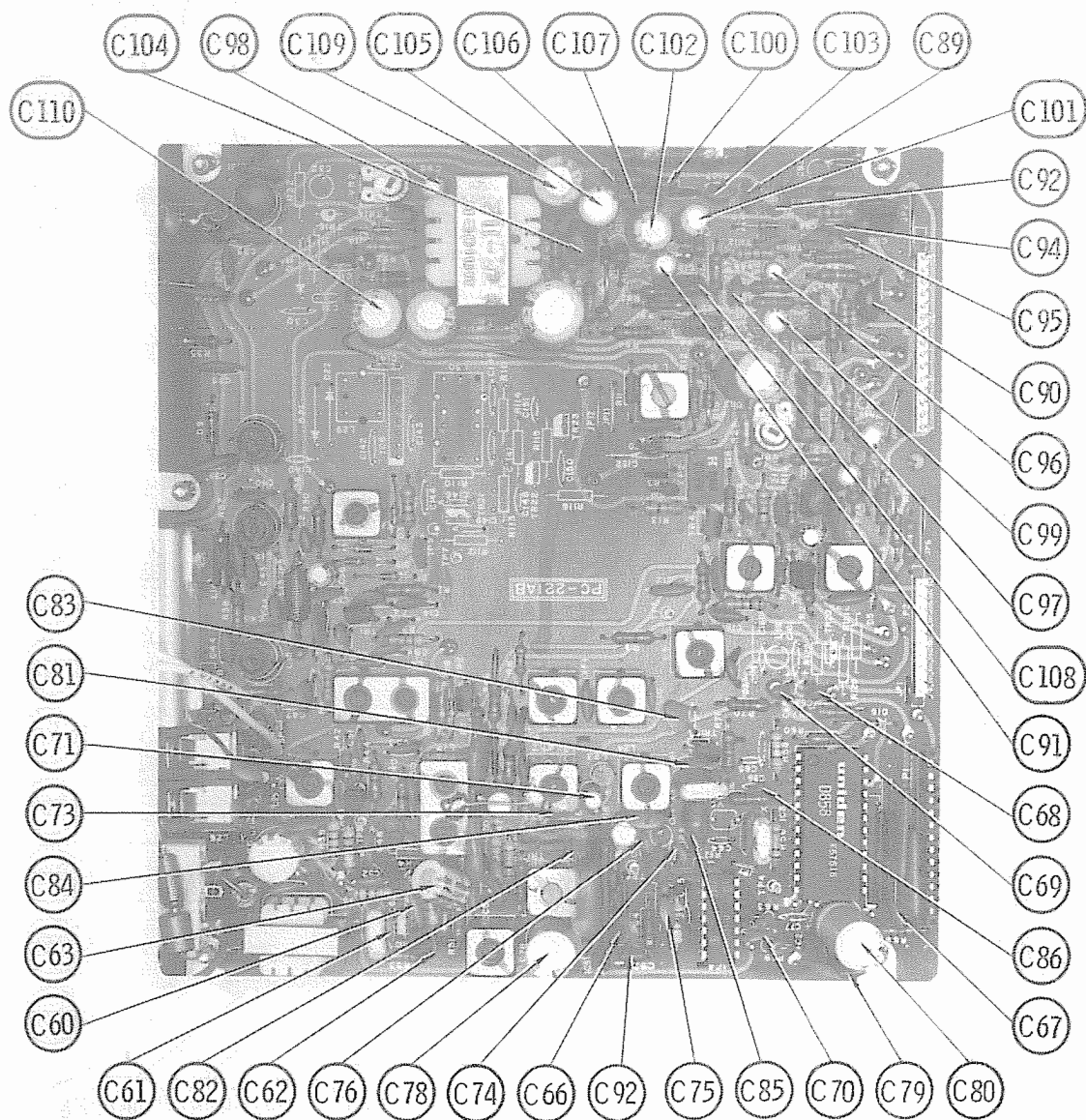


## MAIN BOARD

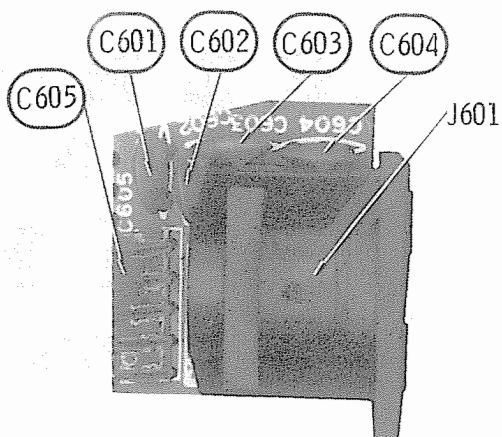
A Howard W. Sams **CIRCUITRACE** Photo



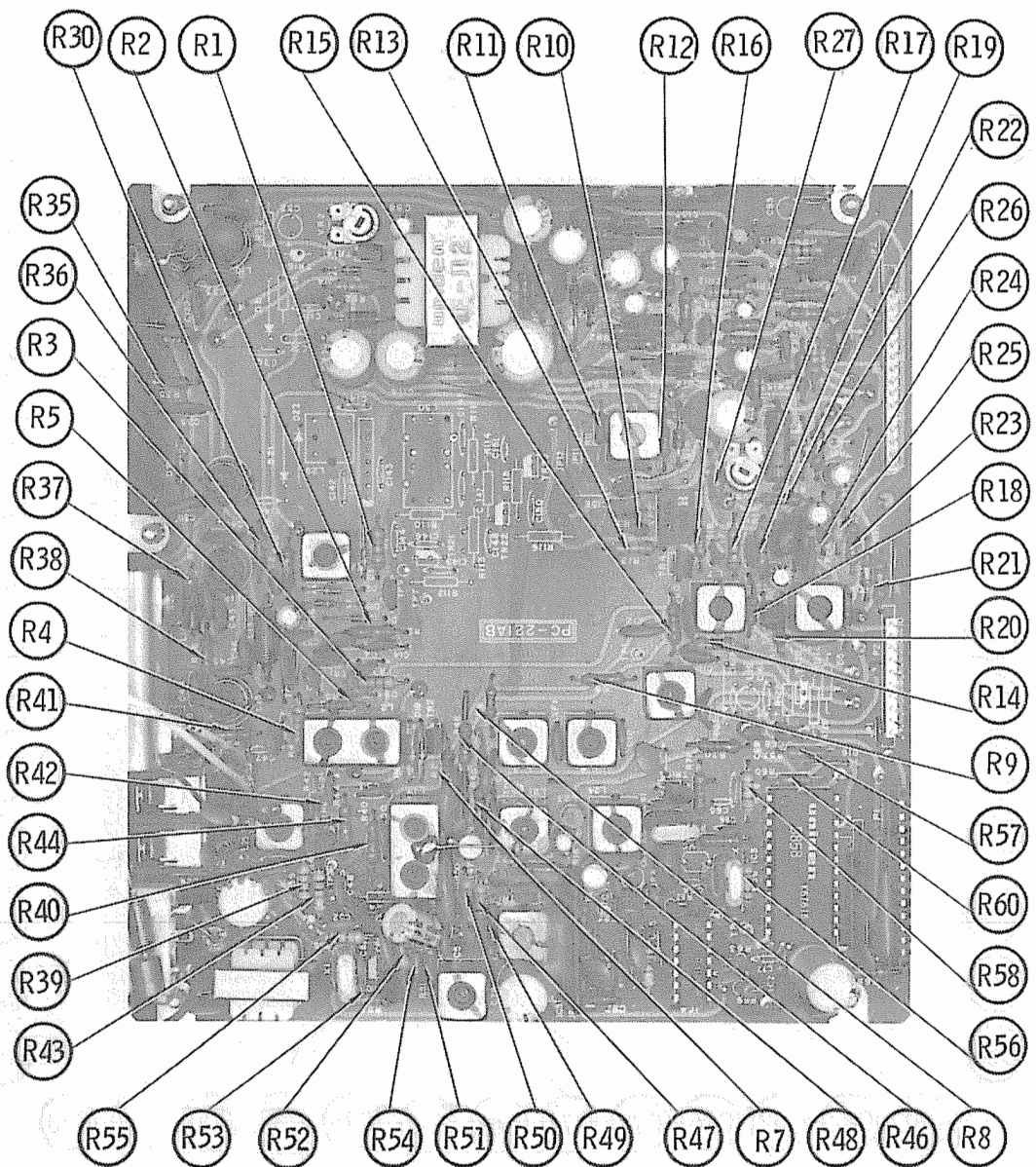
## MIC JACK BOARD



MAIN BOARD

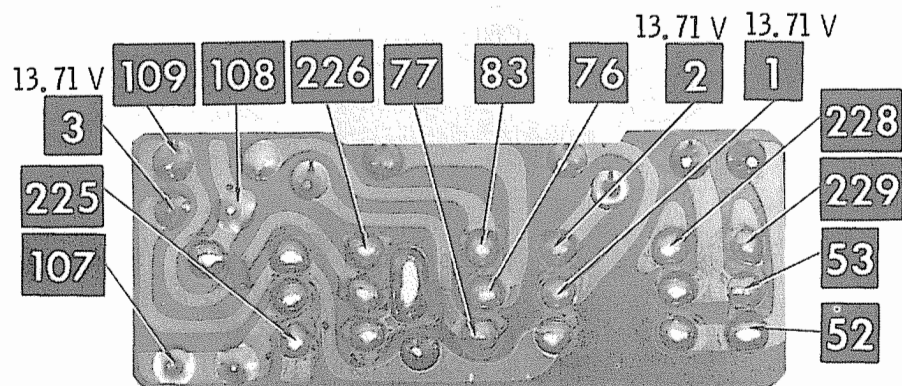


MIC JACK BOARD

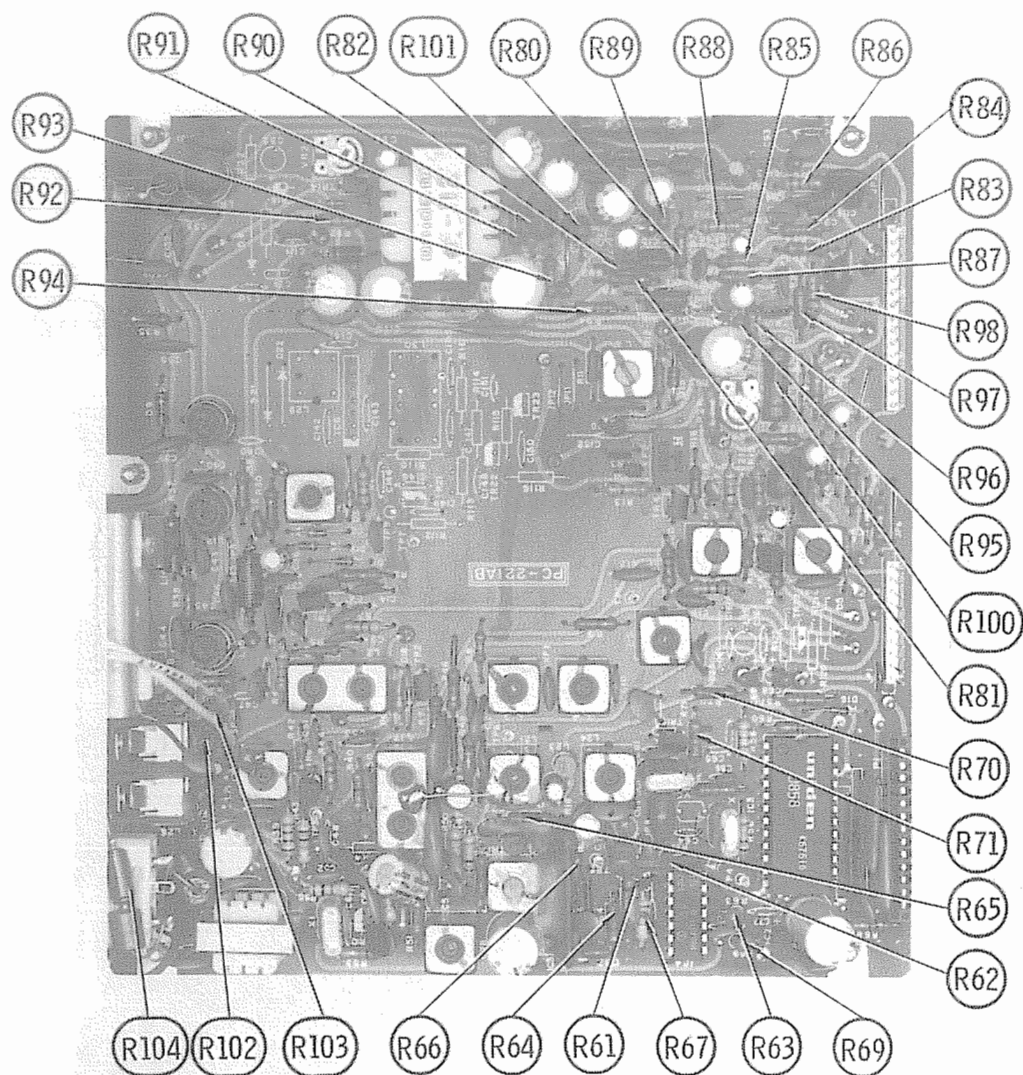


## MAIN BOARD

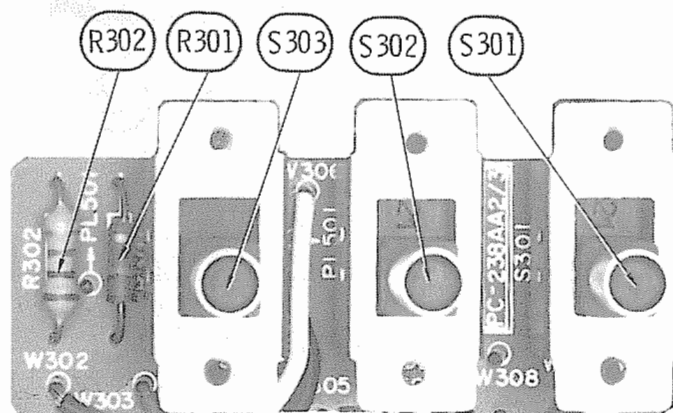
A Howard W. Sams **CIRCUITRACE®** Photo



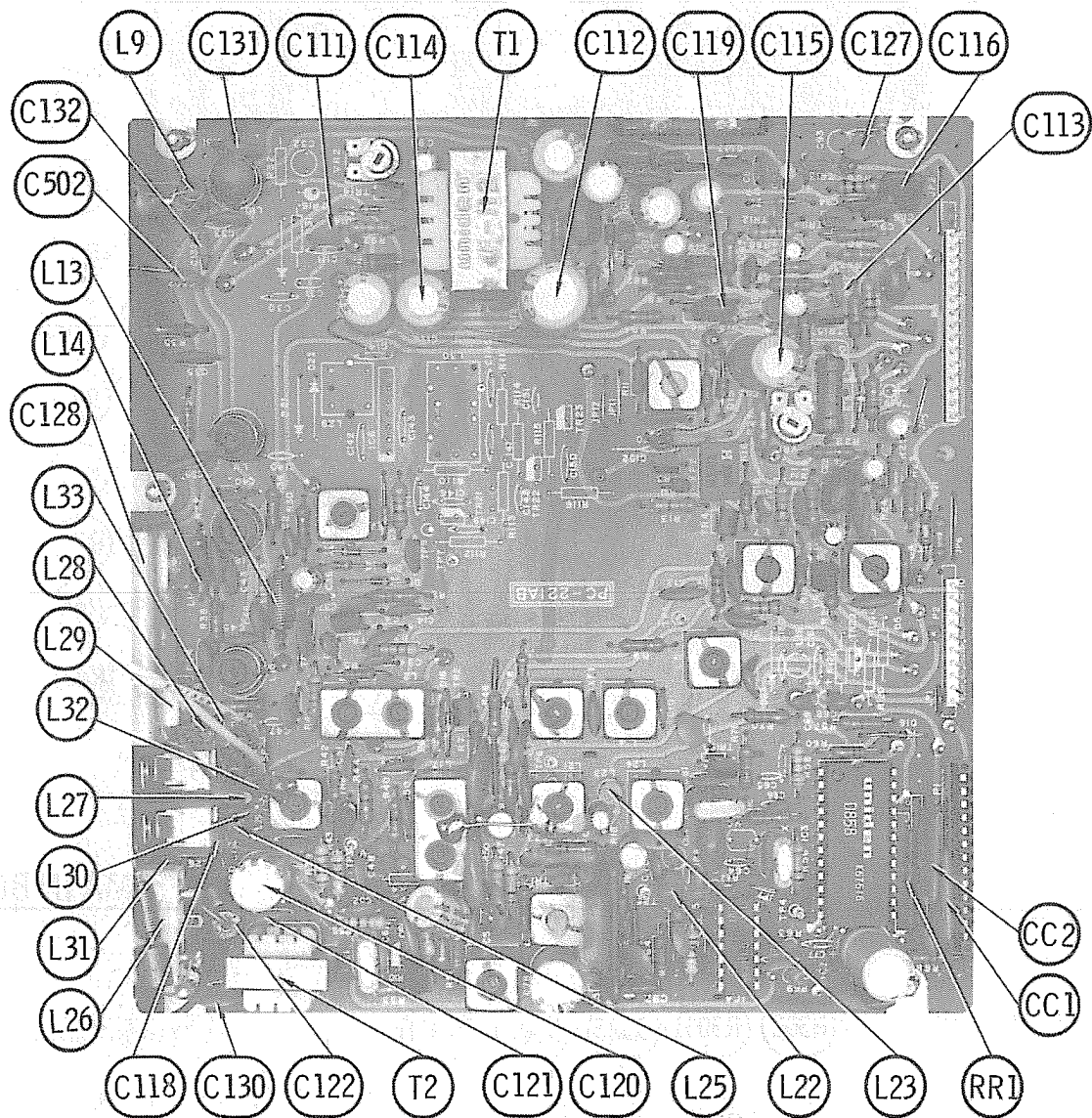
## SWITCH BOARD



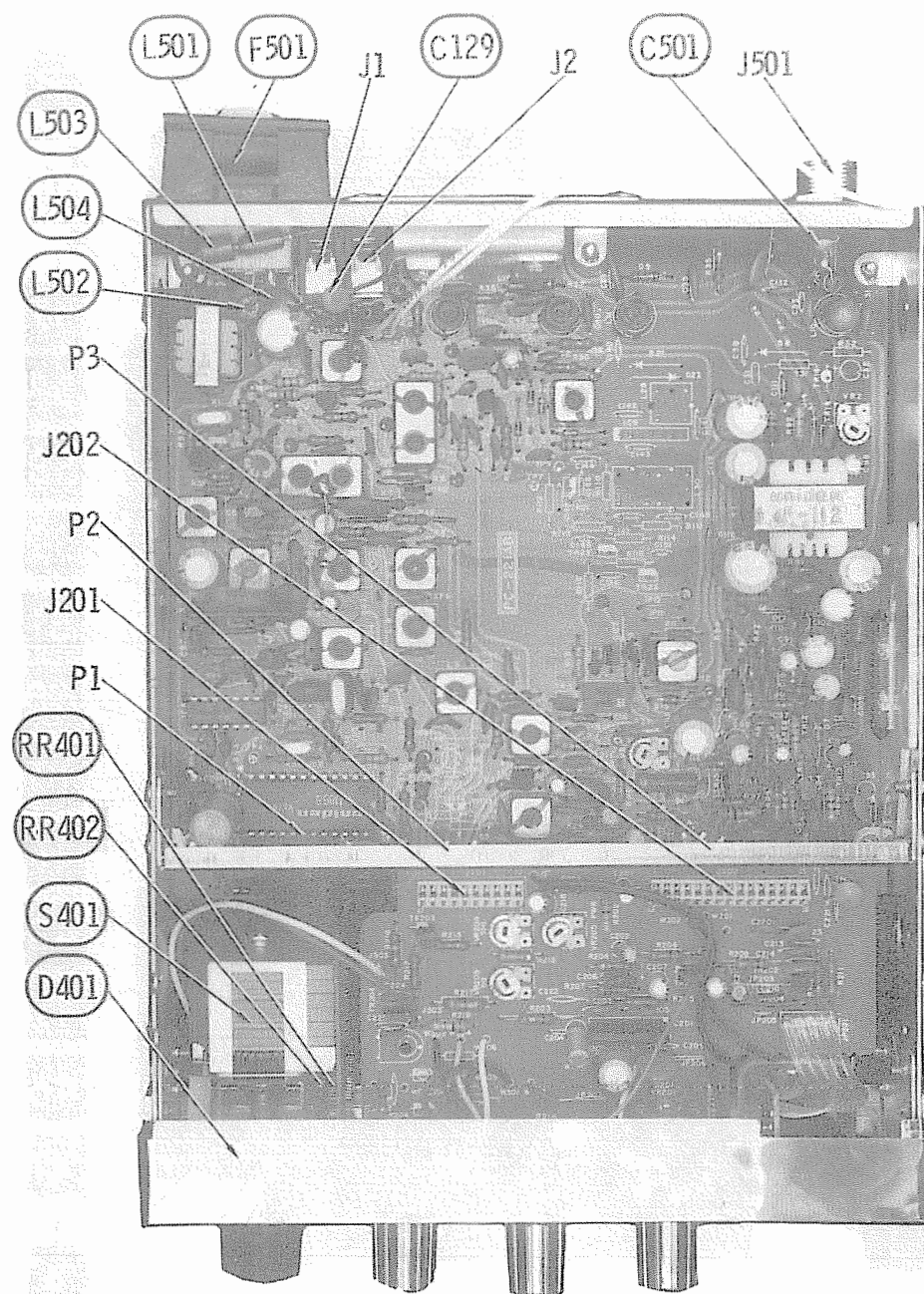
MAIN BOARD



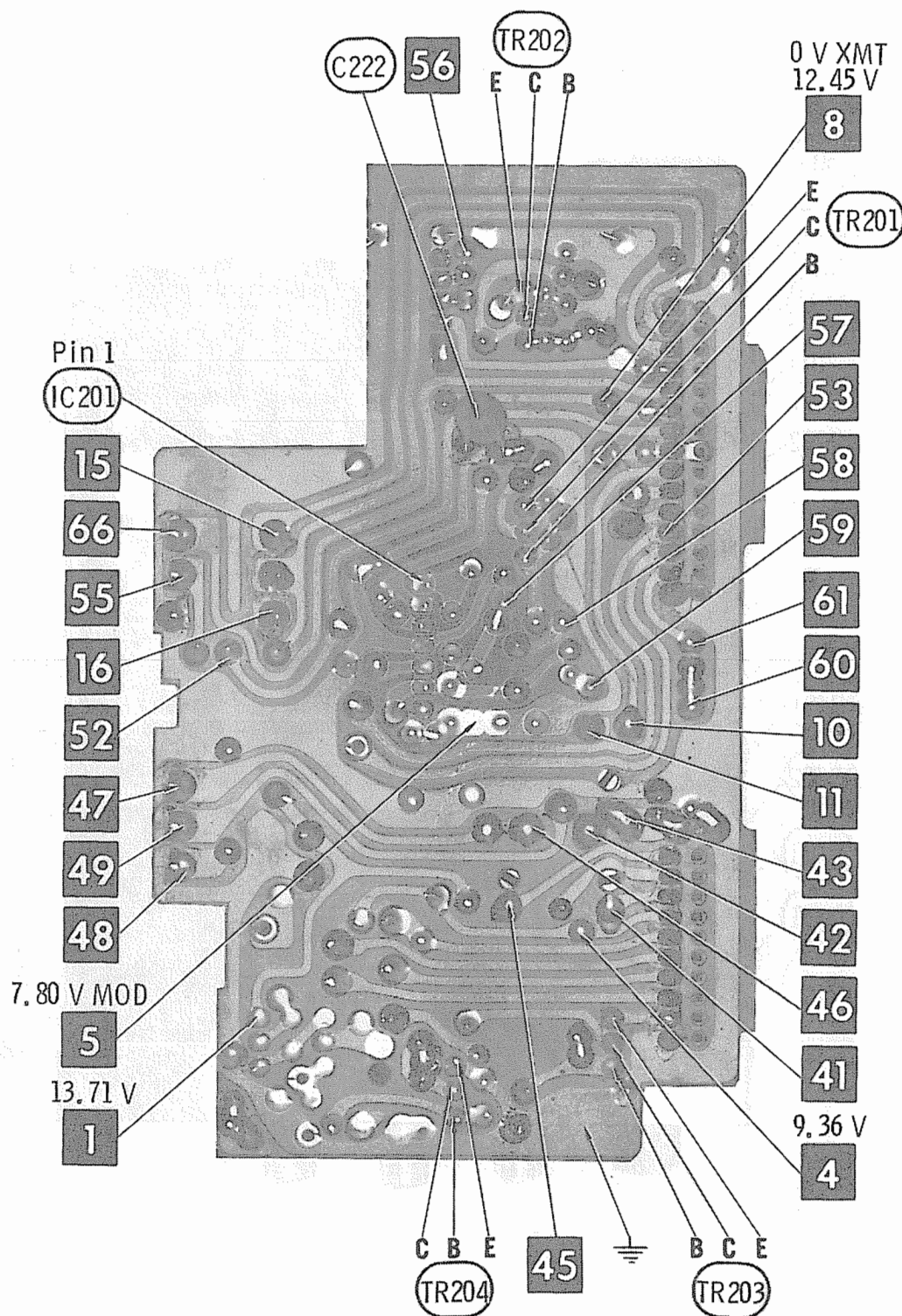
SWITCH BOARD



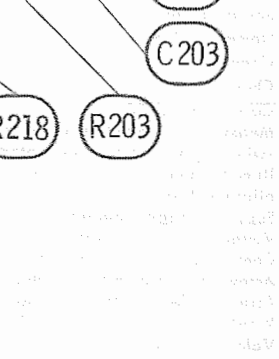
MAIN BOARD



CHASSIS-BOTTOM



PLL BOARD



## Discussion



# PARTS LIST AND DESCRIPTION (CONTINUED)

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

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING   | REPLACEMENT DATA |                           |                  |                  |              |
|----------|----------|------------------|---------------------------|------------------|------------------|--------------|
|          |          | MFR. PART No.    | CORNELL-DUBILIER PART No. | MALLORY PART No. | SPRAGUE PART No. |              |
|          |          |                  |                           |                  | Q-LINE           | GENERAL LINE |
| C15      | 4.7 25V  | CEL2514790       | PC5-50                    | VTT47R850        | QV1-27           | EV-1319      |
| C24      | 10 16V   | CELZ311000       | PC10-25                   | VTT10B25         | QV1-41           | EV-1222      |
| C27      | 1 50V    | CELZ011090       | PC1-50                    | VTT1A50          | QV1-11           | EV-1615      |
| C36      | 10 16V   | CELZ311000       | PC10-25                   | VTT10B25         | QV1-41           | EV-1222      |
| C63      | 33 16V   | CELZ313300       | PC30-25                   | VTT33025         | QV1-63           | EV-1325      |
| C68      | 2.2 16V  | CSEZ312290       |                           | TUC225M035FL     |                  | S035-2R29    |
| C69      | 2.2 16V  | CSEZ312290       |                           | TUC225M035FL     |                  | S035-2R29    |
| C71      | .22 16V  | CAAZ312286       |                           | TUC224M050EL     | Q0T1-10          | S050-R229    |
| C78      | 470 6.3V | CELZ904710       | PC500-16                  | VTT470K16        | QV1-149          | EV-1150      |
| C80      | 220 16V  | CELZ312210       | PC250-25                  | VTT220H16        | QV1-117          | EV-1240      |
| C91      | 10 16V   | CELZ311000       | PC10-25                   | VTT10B25         | QV1-41           | EV-1222      |
| C92      | .1 16V   | CAAZ311086       |                           | TUC104M050EL     | Q0T1-2           | S050-R109    |
| C96      | .22 16V  | CAAZ312286       |                           | TUC224M050EL     | Q0T1-10          | S050-R229    |
| C98      | 2.2 25V  | CELZ512290       | PC2-100                   | VTT2R2A50        | QV1-19           | EV-1517      |
| C99      | .47 50V  | CELZ814780       | PC1-50                    | VTT47A63         | QV1-3            | EV-1610      |
| C101     | 2.2 16V  | CELZ512290       | PC2-100                   | VTT2R2A50        | QV1-19           | EV-1517      |
| C102     | 33 16V   | CELZ313300       | PC30-25                   | VTT33025         | QV1-63           | EV-1325      |
| C105     | 33 16V   | CELZ313300       | PC30-25                   | VTT33025         | QV1-63           | EV-1325      |
| C109     | 220 16V  | CELZ312210       | PC250-25                  | VTT220H16        | QV1-117          | EV-1240      |
| C110     | 220 16V  | CELZ312210       | PC250-25                  | VTT220H16        | QV1-117          | EV-1240      |
| C112     | 470 16V  | CELZ314710       | PC500-16                  | VTT470K16        | QV1-151          | EV-1250      |
| C114     | 220 16V  | CELZ312210       | PC250-25                  | VTT220H16        | QV1-117          | EV-1240      |
| C115     | 220 16V  | CELZ312210       | PC250-25                  | VTT220H16        | QV1-117          | EV-1240      |
| C120     | 100 25V  | CELZ511010       | PC100-25                  | VTT100G25        | QV1-97           | EV-1330      |
| C133     | .1 16V   | CAAZ311086       |                           | TUC104M050EL     | Q0T1-2           | S050-R109    |
| C201     | .1 16V   | CAAZ311086       |                           | TUC104M050EL     | Q0T1-2           | S050-R109    |
| C202     | .1 16V   | CAAZ311086       |                           | TUC104M050EL     | Q0T1-2           | S050-R109    |
| C204     | 10 16V   | CELZ311000       | PC10-25                   | VTT10B25         | QV1-41           | EV-1222      |
| C207     | 10 16V   | CELZ311000       | PC10-25                   | VTT10B25         | QV1-41           | EV-1222      |
| C208     | 33 16V   | CELZ313300       | PC30-25                   | VTT33025         | QV1-63           | EV-1325      |
| C210     | .1 16V   | CAAZ311086       |                           | TUC104M050EL     | Q0T1-2           | S050-R109    |
| C212     | 1 50V    | CELZ811090       | PC1-50                    | VTT1A50          | QV1-11           | EV-1615      |
| C218     | 2.2 25V  | CELZ512290       | PC2-100                   | VTT2R2A50        | QV1-19           | EV-1517      |

## CAPACITORS

| ITEM No. | RATING    | MFR. PART No.            | REPLACEMENT DATA   |                           |                  |                  |              |
|----------|-----------|--------------------------|--------------------|---------------------------|------------------|------------------|--------------|
|          |           |                          | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | SPRAGUE PART No. |              |
|          |           |                          |                    |                           |                  | Q-LINE           | GENERAL LINE |
| C1       | .01 25V   | CCRZ012204               | QC-103             | MGP01                     | TA110            | QC2-141          | TG-S10       |
| C2       | 22 N220   |                          |                    |                           | *                |                  | 10TCR-Q22    |
| C3       | .01 25V   |                          | DC-103             | MGP01                     | TA110            | QC2-141          | TG-S10       |
| C4       | .01 25V   |                          | DC-103             | MGP01                     | TA110            | QC2-141          | TG-S10       |
| C5       | 1.5 NPO   |                          | DTZ-1R5            | NP01P5                    | CN0515           |                  | 10TCC-V15    |
| C6       | .01 25V   |                          | QC-103             | MGP01                     | TA110            | QC2-141          | TG-S10       |
| C7       | .022 25V  |                          | DC-203             | MGP02                     | TA120            | QC2-157          | TG-S20       |
| C8       | .01 25V   |                          | DC-103             | MGP01                     | TA110            | QC2-141          | TG-S10       |
| C9       | .01 25V   |                          | QC-103             | MGP01                     | TA110            | QC2-141          | TG-S10       |
| C10      | .01 25V   |                          | DC-103             | MGP01                     | TA110            | QC2-141          | TG-S10       |
| C11      | 5         | CCRZ012091               | DTZ-4R7            | NP04P7                    | CN0547           |                  | 10TCC-V47    |
| C12      | .047 25V  |                          | DC-503             | MGP05                     | TA150            | QC2-207          | TG-S50       |
| C13      | .039 25V  |                          |                    |                           | GP140            |                  | 5GA-S40      |
| C14      | .01 25V   |                          | DC-103             | MGP01                     | TA110            | QC2-141          | TG-S10       |
| C18      | 2 N220    |                          |                    |                           | *                |                  |              |
| C19      | .022      |                          |                    | DPMS2S22                  | EWFA1A122        | QF1-127          | 1PB-S22      |
| C20      | .039 25V  |                          |                    |                           | GP140            |                  | 5GA-S40      |
| C21      | .01 25V   |                          | DC-103             | MGP01                     | TA110            | QC2-141          | TG-S10       |
| C22      | .068      |                          |                    | WMF1S68                   | EWFA1A168        | QF1-195          | 1PB-S68      |
| C23      | .039 25V  |                          |                    |                           | GP140            |                  | 5GA-S40      |
| C25      | .0047 25V | CCRZ015604               | DD-472             | GP4700                    | GP247            |                  | 5GA-D47      |
| C26      | .0047 25V |                          | DD-472             | GP4700                    | GP247            |                  | 5GA-D47      |
| C33      | 56 N220   |                          |                    |                           | *                |                  | 10TCR-Q56    |
| C35      | .039 25V  |                          |                    |                           | GP140            |                  | 5GA-S40      |
| C37      | .01 25V   |                          | DC-103             | MGP01                     | TA110            | QC2-141          | TG-S10       |
| C38      | .039 25V  |                          |                    |                           | GP140            |                  | 5GA-S40      |
| C39      | 180 N220  |                          |                    |                           | *                |                  | 10TCR-T18    |
| C40      | 300       |                          | DD-301             | GP300                     | GP330            |                  | 10TS-T30     |
| C41      | .0047 25V |                          | DD-472             | GP4700                    | GP247            |                  | 5GA-D47      |
| C43      | 100       |                          | DD-101             | GP100                     | GP310            |                  | 10TS-T10     |
| C44      | 180       | CCRZ011814               | DD-181             |                           | GP318            |                  | 10TS-T18     |
| C45      | 180       |                          | DD-181             |                           | GP318            |                  | 10TS-T18     |
| C46      | .022 25V  |                          | QC-203             | MGP02                     | TA120            | QC2-157          | TG-S20       |
| C48      | .01 25V   |                          | DC-103             | MGP01                     | TA110            | QC2-141          | TG-S10       |
| C49      | .039 25V  |                          |                    |                           | GP140            |                  | 5GA-S40      |
| C50      | .01 25V   |                          | QC-103             | MGP01                     | TA110            | QC2-141          | TG-S10       |
| C51      | .002 25V  |                          | DD-202             | GP2000                    | GP220            | QC2-93           | 5GA-020      |
| C52      | .01 25V   |                          | QC-103             | MGP01                     | TA110            | QC2-141          | TG-S10       |
| C53      | .01 25V   |                          | QC-103             | MGP01                     | TA110            | QC2-141          | TG-S10       |
| C54      | .01 25V   |                          | QC-103             | MGP01                     | TA110            | QC2-141          | TG-S10       |
| C55      | .01 25V   | CCRZ013314<br>CCRZ011014 | QC-103             | MGP01                     | TA110            | QC2-141          | TG-S10       |
| C56      | .01 25V   |                          | DC-103             | MGP01                     | TA110            | QC2-141          | TG-S10       |
| C57      | .0047 25V |                          | DD-472             | GP4700                    | GP247            |                  | 5GA-D47      |
| C58      | .01 25V   |                          | DC-103             | MGP01                     | TA110            | QC2-141          | TG-S10       |
| C59      | 330 N220  |                          |                    |                           | *                |                  | 10TCR-T33    |
| C60      | 100 N220  |                          |                    |                           | *                |                  | 10TCR-T10    |
| C61      | .01 25V   |                          | DC-103             | MGP01                     | TA110            | QC2-141          | TG-S10       |
| C62      | .001 25V  |                          | DD-102G            | GP1000                    | GP210            | QC2-81           | 5GA-010      |
| C66      | .01 25V   |                          | QC-103             | MGP01                     | TA110            | QC2-141          | TG-S10       |
| C67      | .01 25V   |                          | QC-103             | MGP01                     | TA110            | QC2-141          | TG-S10       |
| C70      | .01 25V   |                          | QC-103             | MGP01                     | TA110            | QC2-141          | TG-S10       |
| C73      | .01 25V   | CCRZ013314<br>CCRZ011014 | DC-103             | MGP01                     | TA110            | QC2-141          | TG-S10       |
| C74      | 22        |                          | DTZ-22             | NP022                     | CN0422           |                  | 10TCC-Q22    |
| C75      | .001 25V  |                          | DD-102G            | GP1000                    | GP210            | QC2-81           | 5GA-010      |
| C76      | 22        |                          | DTZ-22             | NP022                     | CN0422           |                  | 10TCC-Q22    |
| C79      | .022      |                          |                    | DPMS2S22                  | EWFA1A122        | QF1-127          | 1PB-S22      |

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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   |                           |                  |                  |              |
|----------|-----------|----------------|--------------------|---------------------------|------------------|------------------|--------------|
|          |           |                | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | SPRAGUE PART No. |              |
|          |           |                |                    |                           |                  | Q-LINE           | GENERAL LINE |
| C81      | 150       | CCRZB14704     | DD-151             |                           | GP315            |                  | 10TS-T15     |
| C82      | 7 NPO     |                | DTZ-6R8            | NP06P8                    | CN0568           |                  | 10TCC-V68    |
| C83      | .01 25V   |                | DC-103             | MGP01                     | TA110            | QC2-141          | TG-S10       |
| C84      | 47 N220   |                |                    |                           | *                |                  | 10TCR-Q47    |
| C85      | .022      |                |                    | OPMS2S22                  | EWFA1A122        | QF1-127          | 1PB-S22      |
| C86      | 10 N150   |                |                    |                           | *                |                  | 10TCP-Q10    |
| C87      | .01 25V   |                | DC-103             | MGP01                     | TA110            | QC2-141          | TG-S10       |
| C88      | .01 25V   |                | DC-103             | MGP01                     | TA110            | QC2-141          | TG-S10       |
| C89      | .01 25V   |                | DC-103             | MGP01                     | TA110            | QC2-141          | TG-S10       |
| C90      | .01       |                |                    | WMF1S1                    | EWFA1A110        | QF1-91           | 1PB-S10      |
| C92      | .022      | CCRZB11004     |                    | OPMS2S22                  | EWFA1A122        | QF1-127          | 1PB-S22      |
| C94      | 100       |                | DD-101             | GP100                     | GP310            |                  | 10TS-T10     |
| C95      | 100       |                | DD-101             | GP100                     | GP310            |                  | 10TS-T10     |
| C97      | .01       |                |                    | WMF1S1                    | EWFA1A110        | QF1-91           | 1PB-S10      |
| C100     | .01       |                |                    | WMF1S1                    | EWFA1A110        | QF1-91           | 1PB-S10      |
| C103     | 68        |                | DD-680             | GP68                      | GP468            |                  | 10TS-Q68     |
| C104     | .068      |                |                    | WMF1S68                   | EWFA1A168        | QF1-195          | 1PB-S68      |
| C106     | .068      |                |                    | WMF1S68                   | EWFA1A168        | QF1-195          | 1PB-S68      |
| C107     | 220       |                | DD-221             |                           | GP322            |                  | 10TS-T22     |
| C108     | .022      |                |                    | OPMS2S22                  | EWFA1A122        | QF1-127          | 1PB-S22      |
| C111     | .01 25V   |                | DC-103             | MGP01                     | TA110            | QC2-141          | TG-S10       |
| C113     | .01 25V   |                | DC-103             | MGP01                     | TA110            | QC2-141          | TG-S10       |
| C116     | .01       |                |                    | WMF1S1                    | EWFA1A110        | QF1-91           | 1PB-S10      |
| C118     | .001 25V  |                | DD-102G            | GP1000                    | GP210            | QC2-81           | 5GA-D10      |
| C119     | .0047     |                |                    | WMF1D47                   | EWFA1A247        | QF1-57           | 1PB-D47      |
| C121     | .01 25V   |                | DC-103             | MGP01                     | TA110            | QC2-141          | TG-S10       |
| C122     | .02       |                | DC-203             | MGP02                     | TA120            | QC2-157          | TG-S20       |
| C127     | .01 25V   |                | DC-103             | MGP01                     | TA110            | QC2-141          | TG-S10       |
| C128     | .01 25V   |                | DC-103             | MGP01                     | TA110            | QC2-141          | TG-S10       |
| C129     | 68        |                | DD-680             | GP68                      | GP468            |                  | 10TS-Q68     |
| C130     | .039 25V  |                |                    |                           | GP140            |                  | 5GA-S40      |
| C131     | .039 25V  |                |                    |                           | GP140            |                  | 5GA-S40      |
| C132     | .01 25V   |                | DC-103             | MGP01                     | TA110            | QC2-141          | TG-S10       |
| C134     | 68        |                | DD-680             | GP68                      | GP468            |                  | 10TS-Q68     |
| C203     | 330       |                | DD-331             | GP330                     | GP333            |                  | 10TS-T33     |
| C205     | 33        |                | DTZ-33             | NP033                     | CN0433           |                  | 10TCC-Q33    |
| C206     | .039      |                |                    | OPMS6S39                  | PVC6139          |                  | 6PS-S39      |
| C209     | .0047 25V |                | DD-472             | GP4700                    | GP247            |                  | 5GA-D47      |
| C211     | .001 25V  |                | DD-102G            | GP1000                    | GP210            | QC2-81           | 5GA-D10      |
| C213     | .01 25V   |                | DC-103             | MGP01                     | TA110            | QC2-141          | TG-S10       |
| C214     | .0047 25V |                | DD-472             | GP4700                    | GP247            |                  | 5GA-D47      |
| C219     | .0047 25V |                | DD-472             | GP4700                    | GP247            |                  | 5GA-D47      |
| C220     | .01 25V   |                | DC-103             | MGP01                     | TA110            | QC2-141          | TG-S10       |
| C221     | .01 25V   |                | DC-103             | MGP01                     | TA110            | QC2-141          | TG-S10       |
| C222     | .01 25V   |                | DC-103             | MGP01                     | TA110            | QC2-141          | TG-S10       |
| C223     | 100       |                | DD-101             | GP100                     | GP310            |                  | 10TS-T10     |
| C224     | .01 25V   |                | DC-103             | MGP01                     | TA110            | QC2-141          | TG-S10       |
| C225     | .01 25V   |                | DC-103             | MGP01                     | TA110            | QC2-141          | TG-S10       |
| C501     | 33        |                | DTZ-33             | NP033                     | CN0433           |                  | 10TCC-Q33    |
| C502     | .047 25V  |                | DC-503             | MGP05                     | TA150            | QC2-207          | TG-S50       |
| C503     | .01 25V   |                | DC-103             | MGP01                     | TA110            | QC2-141          | TG-S10       |
| C504     | .01 25V   |                | DC-103             | MGP01                     | TA110            | QC2-141          | TG-S10       |
| C601     | .01 25V   |                | DC-103             | MGP01                     | TA110            | QC2-141          | TG-S10       |
| C602     | .001 25V  |                | DD-102G            | GP1000                    | GP210            | QC2-81           | 5GA-D10      |
| C603     | .01 25V   |                | DC-103             | MGP01                     | TA110            | QC2-141          | TG-S10       |
| C604     | .01 25V   |                | DC-103             | MGP01                     | TA110            | QC2-141          | TG-S10       |
| C605     | .01 25V   |                | DC-103             | MGP01                     | TA110            | QC2-141          | TG-S10       |
| CC1      |           | HHAY0D3001 (1) |                    |                           |                  |                  |              |
| CC2      |           | HHAY0D3001 (1) |                    |                           |                  |                  |              |

\* Not normally in distributor's stock. Available thru distributor on order to manufacturer.  
(1) Consists of four .01 Capacitors.

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

| ITEM No. | FUNCTION      | RESIST-ANCE | REPLACEMENT DATA |                    |                  |              |
|----------|---------------|-------------|------------------|--------------------|------------------|--------------|
|          |               |             | MFR. PART No.    | CENTRALAB PART No. | MALLORY PART No. | TRW PART No. |
| VR1      | AGC           | 50K         | RRVY133009       |                    |                  | U260R5038    |
| VR2      | AMC           | 5000        | RRVY133005       |                    |                  | U260R5028    |
| VR201    | Volume/Switch | 50K         | RRVY194001       |                    |                  |              |
| VR202    | Squelch       | 20K         | RRVY193001       |                    |                  |              |
| VR203    | Squelch Range | 20K         | RRVY133007       |                    |                  | U260R2538    |
| VR204    | S Meter       | 20K         | RRVY133007       |                    |                  | U260R2538    |
| VR205    | RF Meter      | 20K         | RRVY133007       |                    |                  | U260R2538    |
| VR501    | RF Gain       | 50K         | RRVY241001       |                    |                  |              |

## 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. | MFGR. PART No.                   |          |                  | WORKMAN PART No. | MFGR. PART No. |
| RR1<br>RR401 | Resistor Network<br>Resistor Network |                  | HHAY006001 (1)<br>HHAY008001 (2) | RR402    | Resistor Network |                  | HHAY008001 (2) |

(1) Consists of seven 4700 ohm resistors.

(2) Consists of seven 680 ohm resistors.

### COILS (RF-IF)

| ITEM No. | FUNCTION                   | REPLACEMENT DATA |                      |                 | REMARKS |
|----------|----------------------------|------------------|----------------------|-----------------|---------|
|          |                            | PART No.         | OTHER IDENTIFICATION | MILLER PART No. |         |
| L1       | Rec Antenna (27MHz)        | LLAY029001       | LA-029               | CBS740-T        |         |
| L2       | Rec RF (27MHz)             | LLAY194001       | LA-194               |                 |         |
| L3       | IF (10.695MHz)             | LLAY180001       | LA-180               | CBS715-TC       |         |
| L4       | IF (10.695MHz)             | LLAY181001       | LA-181               |                 |         |
| L5       | Ref Oscillator (10.240MHz) | LLAY182001       | LA-182               |                 |         |
| L6       | IF (455kHz)                | LLAY163001       | LA-163               |                 |         |
| L7       | IF (455kHz)                | LLAY183001       | LA-183               |                 |         |
| L8       | IF (455kHz)                | LLAY184001       | LA-184               |                 |         |
| L9       | RF Choke                   | LLDY073001       | LD-073               |                 |         |
| L10      | TVI Trap (54MHz)           | LLCY018001       | LC-018               | CBS304          |         |
| L11      | PI Filter (27MHz)          | LLCY020001       | LC-020               | CBS306          |         |
| L12      | Final (27MHz)              | LLCY018001       | LC-018               | CBS304          |         |
| L13      | RF Choke                   | LLDY012001       | LD-012               | 4588            |         |
| L15      | XMT Buffer (27MHz)         | LLCY017001       | LC-017               | CBS303          |         |
| L16      | XMT Buffer (27MHz)         | LLAY189001       | LA-189               |                 |         |
| L17      | XMT Mixer (27MHz)          | LLAY185001       | LA-185               |                 |         |
| L18      | XMT Oscillator (10.695MHz) | LLAY193001       | LA-193               |                 |         |
| L20      | VCO                        | LLAY187001       | LA-187               |                 |         |
| L21      | VCO                        | LLAY188001       | LA-188               |                 |         |
| L22      | RF Choke (100uH)           | LLZY001013       | LZ-001               |                 |         |
| L23      | RF Choke (1.5uH)           | LLZY002002       | LZ-002               |                 |         |
| L24      | PLL Oscillator (36.570MHz) | LLAY186001       | LA-186               |                 |         |
| L25      | RF Choke                   | LLDY046001       | LD-046               |                 |         |
| L26      | RF Choke                   | LLDY046001       | LD-046               |                 |         |
| L27      | RF Choke                   | LLDY046001       | LD-046               |                 |         |
| L28      | RF Choke                   | LLDY046001       | LD-046               |                 |         |
| L503     | RF Choke                   | LLDY012001       | LD-012               | 4588            |         |
| L504     | RF Choke                   | LLDY012001       | LD-012               | 4588            |         |

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### FILTER CHOKE

| ITEM No. | RATINGS            |         |                              | REPLACEMENT DATA |                     |                | NOTES               |
|----------|--------------------|---------|------------------------------|------------------|---------------------|----------------|---------------------|
|          | CURRENT (Measured) | DC RES. | INDUCTANCE (0 CURRENT 1000~) | MFGR. PART No.   | THORDARSON PART No. | TRIAD PART No. |                     |
| T2       | 1.2A               | .8      | .86mH                        | TF-083 (1)       | TR516               |                | (1) Number on unit. |

### TRANSFORMER (Driver)

| ITEM No. | TURNS RATIO |        |        | REPLACEMENT DATA |                     |                | NOTES               |
|----------|-------------|--------|--------|------------------|---------------------|----------------|---------------------|
|          | PRI.        | SEC. 1 | SEC. 2 | MFGR. PART No.   | THORDARSON PART No. | TRIAD PART No. |                     |
| T1       | 1           | 1      |        | TF-112 (1)       |                     |                | (1) Number on unit. |

### SPEAKER

| ITEM No. | TYPE         | REPLACEMENT DATA |               | NOTES |
|----------|--------------|------------------|---------------|-------|
|          |              | MFGR. PART No.   | QUAM PART No. |       |
| SP501    | 4" PM 8 Ohms | ASPY003001       | 4A12B         |       |

## PARTS LIST AND DESCRIPTION (CONTINUED)

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

### FUSE DEVICES

| ITEM No. | DESCRIPTION | REPLACEMENT DATA |            |               |        |                     |        |                  |
|----------|-------------|------------------|------------|---------------|--------|---------------------|--------|------------------|
|          |             | PART No.         |            | BUSS PART No. |        | LITTELFUSE PART No. |        | WORKMAN PART No. |
|          |             | DEVICE           | HOLDER     | DEVICE        | HOLDER | DEVICE              | HOLDER | DEVICE           |
| F501     | 2 Amp       | JFSY001005       | ZFHY011001 | AGC2          | H0J    | 312002              | 150145 | FG2-2            |

### MICROPHONE

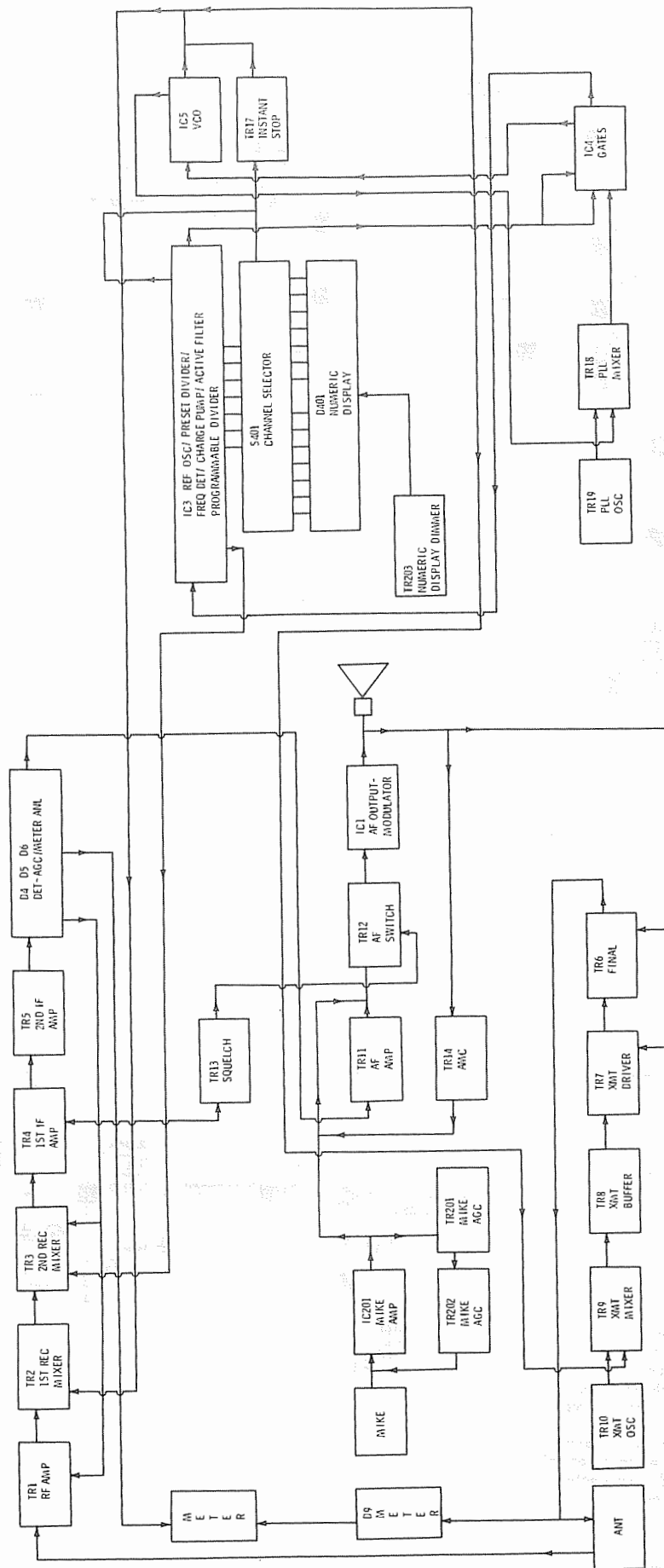
| ITEM No. | REPLACEMENT DATA |             |                 |          | CONNECTION DATA |        |           |           |         |          |          |
|----------|------------------|-------------|-----------------|----------|-----------------|--------|-----------|-----------|---------|----------|----------|
|          | MFGR. PART No.   | GC PART No. | GC NOISE CANCEL | GC POWER | GC CONNECTOR    | GC Red | GC Shield | GC Yellow | GC Blue | GC White | GC Black |
| MIC      | AMKY023001       | 18-032      | 18-034          | 18-010   | 18-105          | 4      | 1         | 3         | 5       | NC       | 1        |

### MISCELLANEOUS

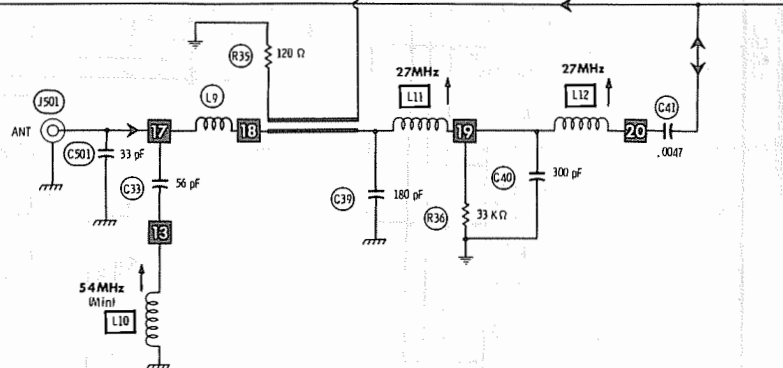
| ITEM No. | PART NAME             | PART No.   | NOTES                          |
|----------|-----------------------|------------|--------------------------------|
| D401     | LED                   | 00AYD78001 | Channel Display (TLQ321)       |
| D501     | LED                   | 0DAY073001 | TX (LR0702R) (1.65V @ 9.5mA)   |
| J1       | Jack                  | JJKY078001 | PA                             |
| J2       | Jack                  | JJKY078001 | External Speaker               |
| J501     | Jack                  | JJKY035001 | Antenna                        |
| J502     | Jack                  | JJKY052001 | Power                          |
| J601     | Jack                  | JJKY083001 | Microphone                     |
| L14      | Ferrite Bead          | LLDY075001 |                                |
| L29      | Ferrite Bead          | LLDY075001 |                                |
| L30      | Ferrite Bead          | LLDY077001 |                                |
| L31      | Ferrite Bead          | LLDY077001 |                                |
| L32      | Ferrite Bead          | LLDY077001 |                                |
| L33      | Ferrite Bead          | LLDY077001 |                                |
| L501     | Ferrite Bead          | ZYY043001  |                                |
| L502     | Ferrite Bead          | ZYY043001  |                                |
| M501     | Meter                 | ZMTY087001 |                                |
| S201     | Switch                |            | S/R                            |
| S301     | Switch                | SSWY094001 | Power (Part of Volume Control) |
| S302     | Switch                | SSWY094001 | ANL                            |
| S303     | Switch                | SSWY094001 | CB/PA                          |
| S401     | Switch                | SSRY155001 | Dim/Brite                      |
| X1       | Crystal               | QQXY078001 | Channel Selector               |
| X2       | Crystal               | QQXY077001 | 10.695MHz                      |
| X3       | Crystal               | QQXY079001 | 10.240MHz                      |
| XF1      | Crystal Filter        | FFLY047001 | 36.570MHz                      |
| XF2      | Crystal Filter        | FFLY053001 | 10.695MHz                      |
|          | Printed Circuit Board | PPCY221012 | 455kHz                         |
|          | Printed Circuit Board | PPCY250011 | Main                           |
|          | Printed Circuit Board | PPCY238011 | Channel Selector               |
|          |                       |            | Control                        |

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

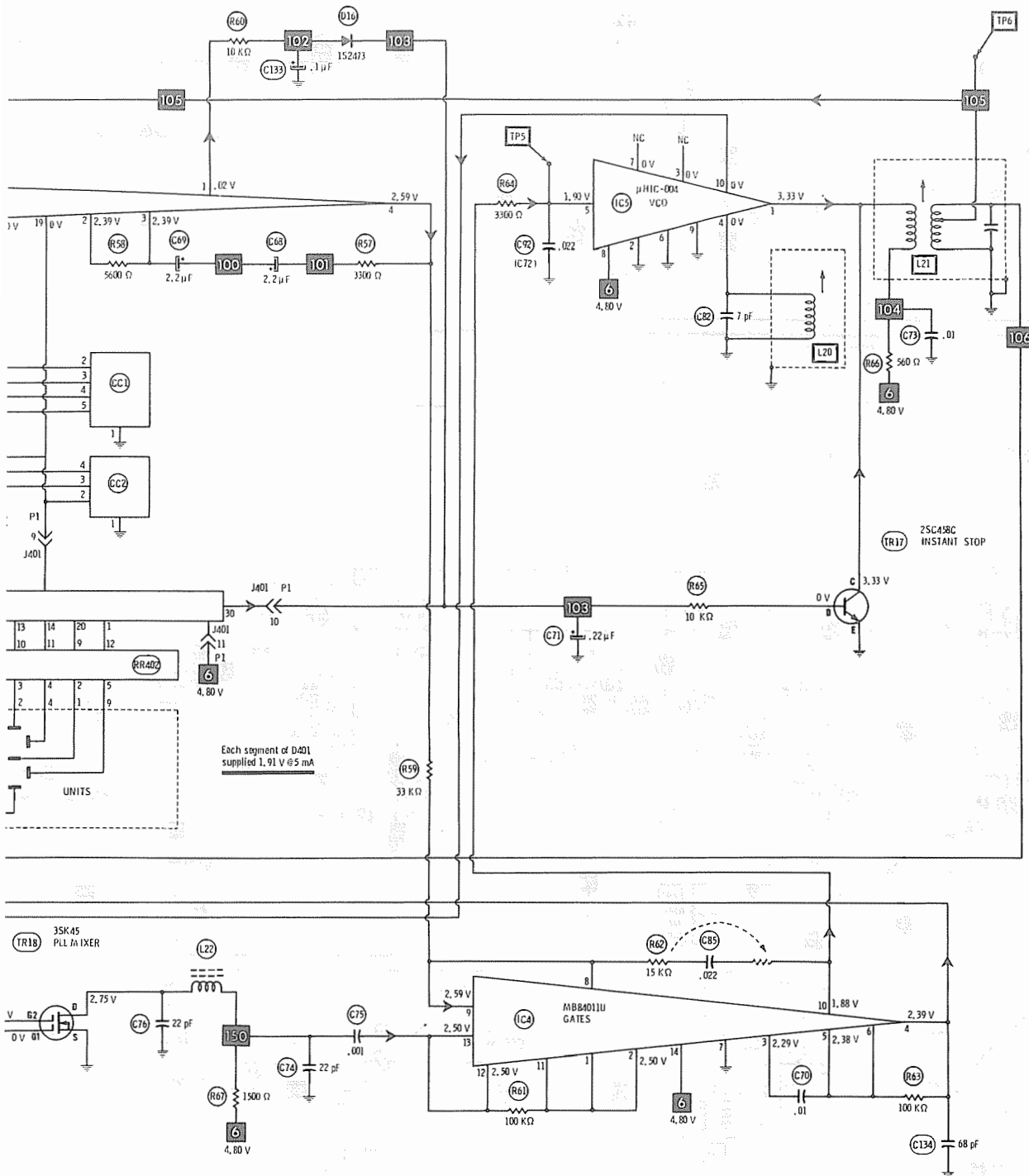
| ITEM              | PART No.   | ITEM             | PART No.   |
|-------------------|------------|------------------|------------|
| Escutcheon        | MONP404489 | Knob, Channel    | MONP404483 |
| Cabinet Top       | MOBP204485 | Knob, Control    | MONP404484 |
| Cabinet Bottom    | MOBP204486 | Mounting Bracket | MONP404535 |
| Microphone Hanger | MOBP402919 |                  |            |



BLOCK DIAGRAM



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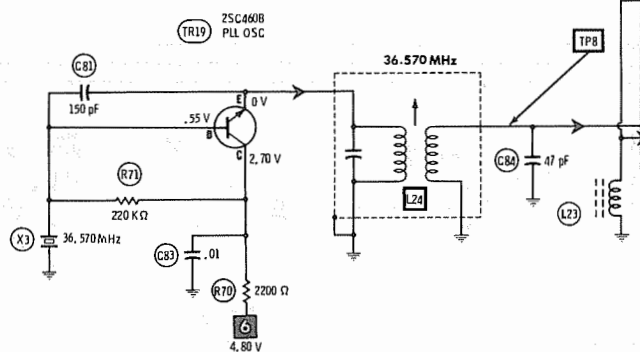
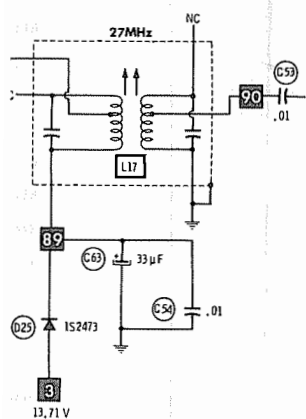


SEARS MODEL 663.38070700

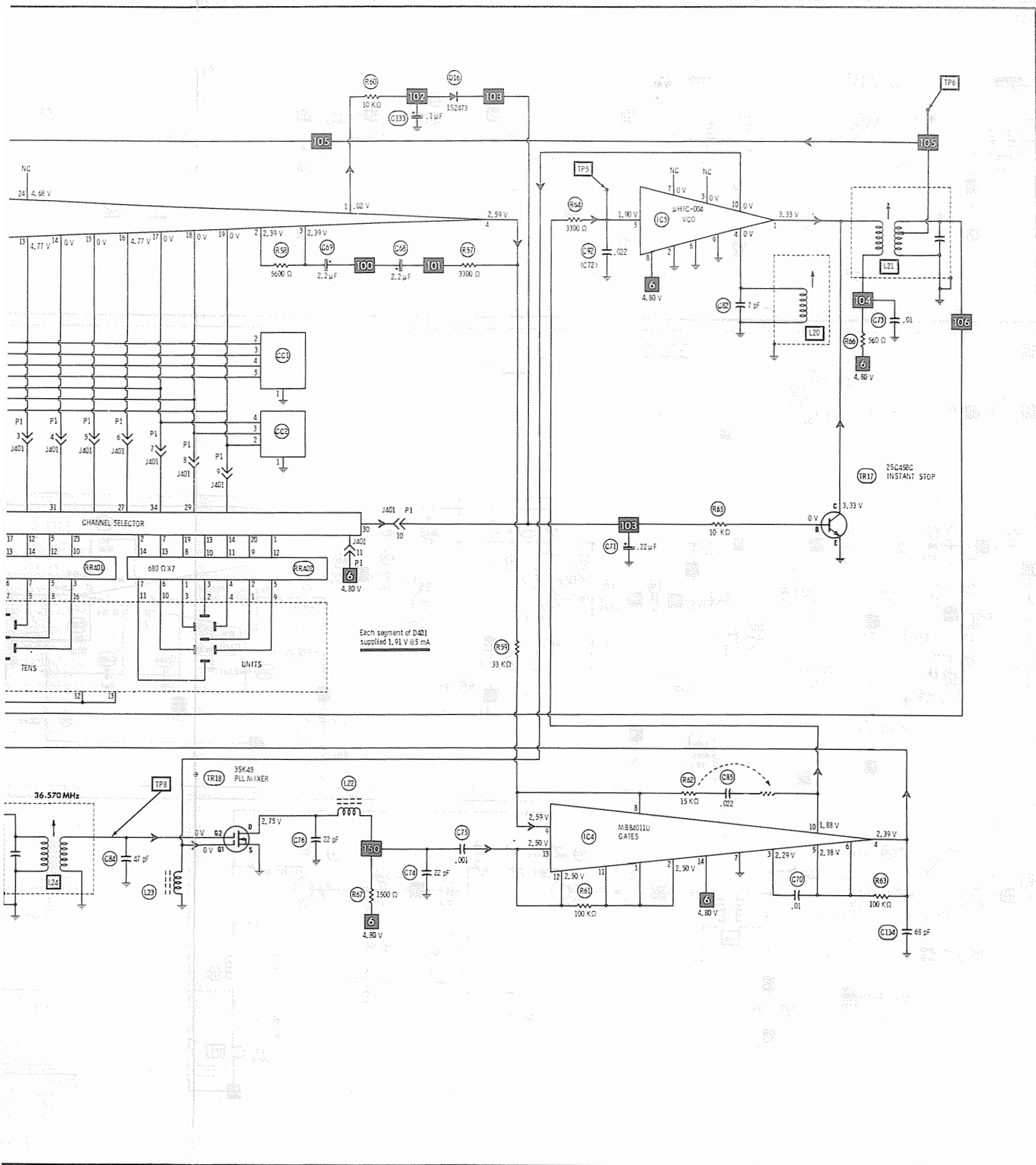
SEM

ITEM  
No.

|       |
|-------|
| D1    |
| D2    |
| D3    |
| D4    |
| D5    |
| D6    |
| D7    |
| D9    |
| D10   |
| D11   |
| D12   |
| D13   |
| D14   |
| D15   |
| D16   |
| D17   |
| D18   |
| D19   |
| D20   |
| D25   |
| IC1   |
| IC2   |
| IC3   |
| IC4   |
| IC5   |
| IC201 |
| TR1   |
| TR2   |
| TR3   |
| TR4   |
| TR5   |
| TR6   |
| TR7   |
| TR8   |
| TR9   |
| TR10  |
| TR11  |
| TR12  |
| TR13  |
| TR14  |
| TR15  |
| TR17  |
| TR18  |
| TR19  |
| TR201 |
| TR202 |
| TR203 |
| TR204 |



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## PARTS LIST AND DESCRIPTION

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

## WIRING DATA

|                                                  |                       |                          |                             |
|--------------------------------------------------|-----------------------|--------------------------|-----------------------------|
| General-use Hook-up Wire (available in 5 colors) | BELDEN No. 8523       | Coiled Microphone Cable  |                             |
| Shielded Hook-up Wire (spiral wrapped)           | BELDEN No. 8421       | 3-conductor (1 shielded) | 23AWG BELDEN No. 9471 (5')  |
| Speaker Cable (available in 4 colors)            | BELDEN No. 8401       |                          | BELDEN No. 8497 (6')        |
| Bonding Strap                                    | BELDEN No. 8782       |                          | BELDEN No. 9472 (7-1/2')    |
| AC Power Cord                                    | BELDEN No. 8672       |                          | BELDEN No. 9465 (6')        |
|                                                  | (6') BELDEN No. 17106 | 4-conductor (unshielded) | 31AWG BELDEN No. 9468 (10') |
|                                                  | (9') BELDEN No. 17109 | 5-conductor (1 shielded) | 23AWG BELDEN No. 8415 (6')  |
|                                                  |                       |                          | BELDEN No. 9467 (6')        |
|                                                  |                       |                          | BELDEN No. 9465 (7-1/2')    |

## SEMICONDUCTORS (Select replacement transistor for best results)

| ITEM No. | TYPE No.  | MFR. PART No.  | REPLACEMENT DATA          |                  |                   |                   |              |                  |                   |                     |                  |                 |
|----------|-----------|----------------|---------------------------|------------------|-------------------|-------------------|--------------|------------------|-------------------|---------------------|------------------|-----------------|
|          |           |                | GENERAL ELECTRIC PART No. | MALLORY PART No. | MOTOROLA PART No. | RAYTHEON PART No. | RCA PART No. | SPRAGUE PART No. | SYLVANIA PART No. | THORDARSON PART No. | WORKMAN PART No. | ZENITH PART No. |
| D1       | 152473    | DDAY048012     | GE-514                    | PTC214           | HEPRO602          | REN 177           | SK3100       | RT-218           | ECG519            | 1N4148              | WEP925           |                 |
| D2       | 152473    | DDAY048012     | GE-514                    | PTC214           | HEPRO602          | REN 177           | SK3100       | RT-218           | ECG519            | 1N4148              | WEP925           |                 |
| D3       | 152473    | DDAY048012     | GE-514                    | PTC214           | HEPRO602          | REN 177           | SK3100       | RT-218           | ECG519            | 1N4148              | WEP925           |                 |
| D4       | 1N60AM    | DDAY001010     | 1N60                      | PTC206           | HEPR9135          | REN 109           | SK3088       | RT-263           | ECG109            | 1N60                | WEP134           | ZEN-430         |
| D5       | 1N60AM    | DDAY001010     | 1N60                      | PTC206           | HEPR9135          | REN 109           | SK3088       | RT-263           | ECG109            | 1N60                | WEP134           | ZEN-430         |
| D6       | 152473K   | DDAY048012     | GE-300                    | PTC214           | HEPRO602          | REN 177           | SK3100       | RT-218           | ECG177            | 1N4148              | WEP1062          |                 |
| D7       | 152473    | DDAY048012     | GE-514                    | PTC214           | HEPRO602          | REN 177           | SK3100       | RT-218           | ECG519            | 1N4148              | WEP925           |                 |
| D9       | 1N60AM    | DDAY001010     | 1N60                      | PTC206           | HEPR9135          | REN 109           | SK3088       | RT-263           | ECG109            | 1N60                | WEP134           | ZEN-430         |
| D10      | SR1K1     | DDAY002001     | GE-504A                   | PTC201           | HEPR0052          | REN 116           | SK3030       | RT-213           | ECG116            | 1N4004              | WEP156           | 212-76-02       |
| D11      | SR1K1     | DDAY002001     | GE-504A                   | PTC201           | HEPR0052          | REN 116           | SK3030       | RT-213           | ECG116            | 1N4004              | WEP156           | 212-76-02       |
| D12      | 152473K   | DDAY048012     | GE-300                    | PTC214           | HEPRO602          | REN 177           | SK3100       | RT-218           | ECG177            | 1N4148              | WEP1062          |                 |
| D13      | 152473K   | DDAY048012     | GE-300                    | PTC214           | HEPRO602          | REN 177           | SK3100       | RT-218           | ECG177            | 1N4148              | WEP1062          |                 |
| D14      | 152473    | DDAY048012     | GE-514                    | PTC214           | HEPRO602          | REN 177           | SK3100       | RT-218           | ECG519            | 1N4148              | WEP925           |                 |
| D15      | CZ092     | DDAY010006     | GEZD-9.1                  | HEZD9.1A         | HEZD0412          | REN 139           | SK3060       | RT-240           | ECG139            | 1N4739A             | WEP1109          | 103-272         |
| D16      | 152473    | DDAY048012     | GE-514                    | PTC214           | HEPRO602          | REN 177           | SK3100       | RT-218           | ECG519            | 1N4148              | WEP925           |                 |
| D17      | CZ092     | DDAY010006     | GEZD-9.1                  | HEZD9.1A         | HEZD0412          | REN 139           | SK3060       | RT-240           | ECG139            | 1N4739A             | WEP1109          | 103-272         |
| D18      | 152473    | DDAY048012     | GE-514                    | PTC214           | HEPRO602          | REN 177           | SK3100       | RT-218           | ECG519            | 1N4148              | WEP925           |                 |
| D19      | 152473    | DDAY048012     | GE-514                    | PTC214           | HEPRO602          | REN 177           | SK3100       | RT-218           | ECG519            | 1N4148              | WEP925           |                 |
| D20      | 152473    | DDAY048012     | GE-514                    | PTC214           | HEPRO602          | REN 177           | SK3100       | RT-218           | ECG519            | 1N4148              | WEP925           |                 |
| D25      | 152473    | DDAY048012     | GE-514                    | PTC214           | HEPRO602          | REN 177           | SK3100       | RT-218           | ECG519            | 1N4148              | WEP925           |                 |
| IC1      | UPC1156H  | DDEY091001     |                           |                  |                   |                   |              |                  | ECG1194           |                     |                  |                 |
| IC2      | 78L05A    |                |                           |                  |                   | REN 977           | SK3462       |                  | ECG977            |                     |                  |                 |
|          | 78L05A    |                |                           |                  |                   | REN 977           | SK3462       |                  | ECG977            |                     |                  |                 |
|          | NJM78L05A | DDEY088001     |                           |                  |                   | REN 977           | SK3462       |                  | ECG977            |                     |                  |                 |
| IC3      | D858      |                |                           |                  |                   |                   |              |                  | ECG1198           |                     |                  |                 |
|          | UPD858C   |                |                           |                  |                   |                   |              |                  | ECG1198           |                     |                  |                 |
|          | UPC858C   | DDEY055001     |                           |                  |                   |                   |              |                  | ECG1198           |                     |                  |                 |
| IC4      | MB84011U  |                |                           |                  |                   |                   |              |                  | ECG4011B          |                     |                  |                 |
|          | MB84011V  | DDEY089001     |                           |                  |                   |                   |              |                  | ECG4011B          |                     |                  |                 |
|          | 84011U    |                |                           |                  |                   |                   |              |                  | ECG4011B          |                     |                  |                 |
| IC5      | UHC-004   | DDEY087001     |                           |                  |                   |                   |              |                  | ECG1203           |                     |                  |                 |
| IC201    | UPC942H2  | DDEY097001     |                           |                  |                   |                   |              |                  | ECG1195           |                     |                  |                 |
| TR1      | 25C1342B  | DDBY287001     | GE-61*                    | PTC132           | HEPS0014*         | REN 229*          | SK3018*      | RT-108A*         | ECG229*           |                     | WEP956*          | ZEN-127         |
|          | 25C1342   |                | GE-61*                    | PTC132           | HEPS0014*         | REN 229*          | SK3018*      | RT-108A*         | ECG229*           |                     | WEP956*          | ZEN-127         |
| TR2      | 25K55D    | DDCY006001     | GE-FET-2                  | PTC161           | HEPF0021          | REN 132           | SK3448       | RT-175           | ECG312            |                     |                  | ZEN-123         |
|          | 25K55     |                | GE-FET-2                  | PTC161           | HEPF0021          | REN 132           | SK3448       | RT-175           | ECG312            |                     |                  | ZEN-123         |
| TR3      | 25C460B   | DDBY277002     | GE-61*                    | PTC136*          | HEPS0014*         | REN 107           | SK3122       | RT-134           | ECG107            | 25C460              | WEP460           | 121-722         |
|          | 25C460    |                | GE-61*                    | PTC136*          | HEPS0014*         | REN 107           | SK3122       | RT-134           | ECG107            | 25C460              | WEP460           | 121-722         |
| TR4      | 25C460B   | DDBY277002     | GE-61*                    | PTC136*          | HEPS0014*         | REN 107           | SK3122       | RT-134           | ECG107            | 25C460              | WEP460           | 121-722         |
|          | 25C460    |                | GE-61*                    | PTC136*          | HEPS0014*         | REN 107           | SK3122       | RT-134           | ECG107            | 25C460              | WEP460           | 121-722         |
| TR5      | 25C460B   | DDBY277002     | GE-61*                    | PTC136*          | HEPS0014*         | REN 107           | SK3122       | RT-134           | ECG107            | 25C460              | WEP460           | 121-722         |
|          | 25C460    |                | GE-61*                    | PTC136*          | HEPS0014*         | REN 107           | SK3122       | RT-134           | ECG107            | 25C460              | WEP460           | 121-722         |
| TR6      | 25C2092   | DDBY289001(14) | GE-337                    | PTC166           |                   | REN 235           | SK3197       | RT-146           | ECG235            | 25C1306             | WEP785           | 121-722         |
| TR7      | 25C2091   | DDBY288001(15) | GE-270                    | PTC180           |                   | REN 295           |              |                  | ECG295            |                     | WEP913           |                 |
| TR8      | 25C2076C  |                | GE-210*                   | PTC121*          | HEPS0015*         | REN 123A*         | SK3122       | RT-308           | ECG295            |                     | WEP736           | 121-722         |
|          | 25C2076   |                | GE-210*                   | PTC121*          | HEPS0015*         | REN 123A*         | SK3122       | RT-308           | ECG295            |                     | WEP736           | 121-722         |
|          | 25C2076CB | DDBY270001     | GE-210*                   | PTC121*          | HEPS0015*         | REN 123A*         | SK3122       | RT-308           | ECG295            |                     | WEP736           | 121-722         |
| TR9      | 35K45B    | DDCY104001     | GE-FET-4                  | PTC182           | HEPF2007          | REN 222           | SK3065       | RT-181           | ECG222            |                     | WEP905           | 121-826         |
|          | 35K45     |                | GE-FET-4                  | PTC182           | HEPF2007          | REN 222           | SK3065       | RT-181           | ECG222            |                     | WEP905           | 121-826         |
| TR10     | 25C460B   | DDBY277002     | GE-61*                    | PTC136*          | HEPS0014*         | REN 107           | SK3122       | RT-134           | ECG107            | 25C460              | WEP460           | 121-722         |
|          | 25C460    |                | GE-61*                    | PTC136*          | HEPS0014*         | REN 107           | SK3122       | RT-134           | ECG107            | 25C460              | WEP460           | 121-722         |
| TR11     | 25C458C   | DDBY273001     | GE-210*                   | PTC121*          | HEPS0009*         | REN 123A*         | SK3124       | RT-187           | ECG289            | 25C458              | WEP458           | 121-29000*      |
|          | 25C458    |                | GE-210*                   | PTC121*          | HEPS0009*         | REN 123A*         | SK3124       | RT-187           | ECG289            | 25C458              | WEP458           | 121-29000*      |
| TR12     | JF10336   |                | GE-FET-2                  | PTC161           | HEPF0021          | REN 132           | SK3448       | RT-175           | ECG312            |                     |                  | ZEN-123         |
|          | JF1033    | DDCY202002     | GE-FET-2                  | PTC161           | HEPF0021          | REN 132           | SK3448       | RT-175           | ECG312            |                     |                  | ZEN-123         |
| TR13     | 25C458C   | DDBY273001     | GE-210*                   | PTC121*          | HEPS0009*         | REN 123A*         | SK3124       | RT-187           | ECG289            | 25C458              | WEP458           | 121-29000*      |
|          | 25C458    |                | GE-210*                   | PTC121*          | HEPS0009*         | REN 123A*         | SK3124       | RT-187           | ECG289            | 25C458              | WEP458           | 121-29000*      |
| TR14     | 25C458C   | DDBY273001     | GE-210*                   | PTC121*          | HEPS0009*         | REN 123A*         | SK3124       | RT-187           | ECG289            | 25C458              | WEP458           | 121-29000*      |
|          | 25C458    |                | GE-210*                   | PTC121*          | HEPS0009*         | REN 123A*         | SK3124       | RT-187           | ECG289            | 25C458              | WEP458           | 121-29000*      |
| TR15     | 25A673C   | DDBY007002     | GE-269                    | PTC103*          | HEPS0026*         | REN 290           | SK3114       | RT-115*          | ECG290            | 25A661              | WEP911           | 121-774         |
|          | 25A673    |                | GE-269                    | PTC103*          | HEPS0026*         | REN 290           | SK3114       | RT-115*          | ECG290            | 25A661              | WEP911           | 121-774         |
| TR17     | 25C458C   | DDBY273001     | GE-210*                   | PTC121*          | HEPS0009*         | REN 123A*         | SK3124       | RT-187           | ECG289            | 25C458              | WEP458           | 121-29000*      |
|          | 25C458    |                | GE-210*                   | PTC121*          | HEPS0009*         | REN 123A*         | SK3124       | RT-187           | ECG289            | 25C458              | WEP458           | 121-29000*      |
| TR18     | 35K45     |                | GE-FET-4                  | PTC182           | HEPF2007          | REN 222           | SK3065       | RT-181           | ECG222            |                     | WEP905           | 121-826         |
|          | 35K45B09  | DDCY104003     | GE-FET-4                  | PTC182           | HEPF2007          | REN 222           | SK3065       | RT-181           | ECG222            |                     | WEP905           | 121-826         |
| TR19     | 25C460B   | DDBY277002     | GE-61*                    | PTC136*          | HEPS0014*         | REN 107           | SK3122       | RT-134           | ECG107            | 25C460              | WEP460           | 121-722         |
|          | 25C460    |                | GE-61*                    | PTC136*          | HEPS0014*         | REN 107           | SK3122       | RT-134           | ECG107            | 25C460              | WEP460           | 121-722         |
| TR201    | 25A844C   | DDBY008001     | GE-244*                   | PTC103*          | HEPS0019*         | REN 129*          | SK3114       | RT-126A*         | ECG129*           |                     | WEP60*           |                 |
|          | 25A844    |                | GE-244*                   | PTC103*          | HEPS0019*         | REN 129*          | SK3114       | RT-126A*         | ECG129*           |                     | WEP60*           |                 |
| TR202    | 25C458C   | DDBY273001     | GE-210*                   | PTC121*          | HEPS0009*         | REN 123A*         | SK3124       | RT-187           | ECG289            | 25C458              | WEP458           | 121-29000*      |
|          | 25C458    |                | GE-210*                   | PTC121*          | HEPS0009*         | REN 123A*         | SK3124       | RT-187           | ECG289            | 25C458              | WEP458           | 121-29000*      |
| TR203    | 25D467B   | DDBY410001     | GE-243*                   | PTC178           | HEPS3001*         | REN 128           | SK3024*      | RT-114*          | ECG128*           |                     | WEP59*           | 121-1014        |
|          | 25D467    |                | GE-243*                   | PTC178           | HEPS3001*         | REN 128           | SK3024*      | RT-114*          | ECG128*           |                     | WEP59*           | 121-1014        |
| TR204    | 25C458C   | DDBY273001     | GE-210*                   | PTC121*          | HEPS0009*         | REN 123A*         | SK3124       | RT-187           | ECG289            | 25C458              | WEP458           | 121-29000*      |
|          | 25C458    |                | GE-210*                   | PTC121*          | HEPS0009*         | REN 123A*         | SK3124       | RT-187           | ECG289            | 25C458              | WEP458           | 121-29000*      |

