

MASTER III 70.2MHz RECEIVER IF ASSY.  
SCHEMATIC: WD-CB101792 Revision: B

221 Jefferson Ridge Parkway  
LYNCHBURG, VIRGINIA 24501

| Item | Qty | Reference                                                                                                                                                                              | Part           | Size  | Part No.        | Approved Mfgr    |
|------|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------|-----------------|------------------|
|      |     |                                                                                                                                                                                        |                |       |                 |                  |
| 1    | 13  | C1,C5,C6,C15,C19,C25,<br>C113,C119,C120,C136,<br>C243,C244,C250                                                                                                                        | 1n             | 0805  | RJC 463 4044/1  |                  |
| 2    | 3   | C2, C13,C14                                                                                                                                                                            | 5.6p           | 0805  | RJC463 9041/56  |                  |
| 3    | 2   | C211,C3                                                                                                                                                                                | 47n            | 0805  | RJC 464 2045/47 |                  |
| 4    | 19  | C4,C20,C27,C117,C123<br>C124,C128,C207,C233<br>C234,C237,C238,C239,C240,<br>C241,C242,C245,C246,C249,                                                                                  | 10n            | 0805  | RJC 464 2045/1  |                  |
| 5    | 4   | C7,C108,C209,C210                                                                                                                                                                      | 4.7n           | 0805  | RJC464 3044/47  |                  |
| 6    | 7   | C8,C102,C110,C201,C206,<br>C216,C219                                                                                                                                                   | 1uF            | 1206  | RJC 464 3067/1  |                  |
| 7    | 6   | C9,C12,C17,C24,C29,C36                                                                                                                                                                 | 3-10p          |       | 19A704350P102   | Murata           |
| 8    | 3   | C10,C248,C252                                                                                                                                                                          | 33p            | 0805  | RJC 463 4042/33 |                  |
| 9    | 4   | C11,C16,C26,C28                                                                                                                                                                        | NO PLACE       |       |                 |                  |
| 10   | 6   | C21,C35,C38,<br>C40,C151,C152                                                                                                                                                          | 15p            | 0805  | RJC 463 6042/15 |                  |
| 11   | 1   | C22                                                                                                                                                                                    | 47p            | 0805  | RJC 463 4042/47 |                  |
| 12   | 1   | C23                                                                                                                                                                                    | 39p            | 0805  | RJC 463 4042/39 |                  |
| 13   | 32  | C37,C104,C106,C109,C112,<br>C115,C116,C122,C125,C126,<br>C130,C131,C132,C133,C134,<br>C135,C137,C138,C140,C141,<br>C142,C143,C144,C147,C154,<br>C155,C157,C203,C205,C213,<br>C214,C223 | 100n           | 0805  | RJC 464 3046/1  |                  |
| 14   | 1   | C42                                                                                                                                                                                    | 10p            | 0805  | RJC 463 4042/1  |                  |
| 15   | 6   | C100,C101,C103,C105,C107,<br>C114                                                                                                                                                      | 22n            | 0805  | RJC 464 3045/22 |                  |
| 16   | 3   | C111,C145,C208                                                                                                                                                                         | 100p           | 0805  | RJC463 4043/1   |                  |
| 17   | 1   | C127                                                                                                                                                                                   | 33uF           | D     | 19A705205P15    |                  |
| 18   | 1   | C129                                                                                                                                                                                   | 27p            | 0805  | RJC 463 4042/27 |                  |
| 19   | 4   | C139,C153,C156,C158                                                                                                                                                                    | 22p            | 0805  | RJC 463 4042/22 |                  |
| 20   | 1   | C146                                                                                                                                                                                   | 6.8uF          | B     | 19A705205P5     |                  |
| 21   | 1   | C148                                                                                                                                                                                   | 120p           | 0805  | RJC 463 4043/12 |                  |
| 22   | 2   | C212,C215                                                                                                                                                                              | 470p           | 0805  | RJC 463 4043/47 |                  |
| 23   | 1   | C200                                                                                                                                                                                   | 47uF           | D     | 19A705205P111   |                  |
| 24   | 4   | C202,C204,C222,C253                                                                                                                                                                    | 1uF POL        | A     | 19A705205P2     |                  |
| 25   | 2   | C235,C236                                                                                                                                                                              | .33uF          | 0805  | RJC 464 3046/33 |                  |
| 26   | 1   | D1                                                                                                                                                                                     | SMS7630-005    |       | RKZ 323 661/5   | Skyworks         |
| 27   | 1   | D2                                                                                                                                                                                     | LED            |       | 19A703595P10    | Agilent Tech.    |
| 28   | 1   | D100                                                                                                                                                                                   | BZX84C8V2/SOT  |       | 19A700083P105   | ON Semicon.      |
| 29   | 1   | D200                                                                                                                                                                                   | BAT18          |       | 19A700155P2     | Philips Semicon. |
| 30   | 1   | FL1,FL2 (2 filters/set)                                                                                                                                                                | 70.2 MHz       | 5x7mm | FL101909V1      | ToyoCom (1)      |
| 31   | 1   | FL3,FL4 (2 filters/set)                                                                                                                                                                | 70.2 MHz       | 5x7mm | FL101909V4      | ToyoCom (1)      |
| 32   | 3   | FL100,FL101,FL102                                                                                                                                                                      | CERAMIC FILTER |       | VECFUM455F      | Murata           |
| 33   | 1   | J1                                                                                                                                                                                     | BNC            |       | 19A115938P24    |                  |

|    |    |                                                     |              |       |                |                  |
|----|----|-----------------------------------------------------|--------------|-------|----------------|------------------|
| 34 | 1  | J2                                                  | 96PIN CONN   |       | 19B801587P7    |                  |
| 35 | 1  | L3                                                  | .82uH        | 1008  | REG704593/82   |                  |
| 36 | 1  | L4                                                  | 6.8uH        | 1008  | REG704594/68   |                  |
| 37 | 4  | L5,L6,L9,L10                                        | .22uH        | 1008  | REG704123/22   |                  |
| 38 | 1  | L7                                                  | .15uH        | 1008  | REG704593/15   |                  |
| 39 | 4  | L100,L103,L201,L202                                 | 10uH         | 1210  | REG 704 14/37  |                  |
| 40 | 1  | L101                                                | 82nH         | 1008  | REG704592/82   |                  |
| 41 | 2  | Q2,Q1                                               | 2SC3356      | SOT23 | 19A704708P2    | CEL (NEC)        |
| 42 | 4  | Q3,Q4,Q100,Q101                                     | MMBT3904/SOT | SOT23 | 19A700076P2    | ON Semicon.      |
| 43 | 6  | R1,R23,R103,R154,R245,<br>R247                      | 51.1         | 0805  | 344A3304P51R1  |                  |
| 46 | 3  | R2,R24,R156                                         | 100          | 0805  | 344A3304P1000  |                  |
| 47 | 9  | R3,R10,R112,R125,R132,<br>R135,R157,R217,R218,      | 10k          | 0805  | 344A3304P1002  |                  |
| 48 | 4  | R4,R114,R117,R202                                   | 3.32k        | 0805  | 344A3304P3321  |                  |
| 49 | 5  | R5,R9,R110,R224                                     | 825          | 0805  | 344A3304P8250  |                  |
| 50 | 3  | R8,R13,R15                                          | 47.5k        | 0805  | 344A3304P4752  |                  |
| 51 | 6  | R14,R7,R106,R152,R153,R160                          | 0 ohm        | 0805  | 19B801251P1    |                  |
| 52 | 5  | R18,R26,R115,R118,R208                              | 6.81k        | 0805  | 344A3304P6811  |                  |
| 53 | 9  | R19,R111,R134,R138,R141,<br>R205,R206,R207,R240,    | 100k         | 0805  | 344A3304P1003  |                  |
| 54 | 3  | R20,R133,R204                                       | 15k          | 0805  | 344A3304P1502  |                  |
| 55 | 3  | R21,R122,R147                                       | 2.21k        | 0805  | 344A3304P2211  |                  |
| 56 | 1  | R22                                                 | 2.67k        | 0805  | 344A3304P2671  |                  |
| 57 | 2  | R30,R25                                             | 5.6          | 0805  | 19B801251P5R6  |                  |
| 58 | 1  | R28                                                 | 392          | 0805  | 344A3304P3920  |                  |
| 59 | 1  | R29                                                 | 10           |       | 344A3304P10R0  |                  |
| 60 | 1  | R100                                                | 1K VAR       |       | REL 316 1114/1 | Bourns           |
| 61 | 10 | R12,R31,R102,R209,R239,R241,<br>R242,R243,R244,R246 | 1k           |       | 344A3304P1001  |                  |
| 62 | 1  | R104                                                | 332          | 0805  | 344A3304P3320  |                  |
| 63 | 3  | R107,R101,R159                                      | 221          | 0805  | 344A3304P2210  |                  |
| 64 | 2  | R108,R215                                           | 150k         | 0805  | 344A3304P1503  |                  |
| 65 | 2  | R109,R142                                           | 1.5k         | 0805  | 334A3304P1501  |                  |
| 66 | 1  | R113                                                | 4.32k        | 0805  | 344A3304P4321  |                  |
| 67 | 1  | R120                                                | 12.1k        | 0805  | 344A3304P1212  |                  |
| 68 | 6  | R121,R123,R144,R148,R149,R155                       | 475          | 0805  | 344A3304P4750  |                  |
| 69 | 2  | R126,R128                                           | 1.21k        | 0805  | 344A3304P1211  |                  |
| 70 | 3  | R11,R16,R127                                        | 3.92k        |       | 344A3304P3921  |                  |
| 71 | 1  | R129                                                | 1.82k        | 0805  | 344A3304P1821  |                  |
| 72 | 2  | R17,R130                                            | 4.75k        | 0805  | 344A3304P4751  |                  |
| 73 | 3  | R213,R131,R214                                      | 8.25k        | 0805  | 344A3304P8251  |                  |
| 74 | 1  | R137                                                | 121k         | 0805  | 344A3304P1213  |                  |
| 75 | 3  | R139,R210,R211                                      | 33.2k        | 0805  | 344A3304P3322  |                  |
| 76 | 1  | R146                                                | 150          | 805   | 344A3304P1500  |                  |
| 77 | 1  | R140                                                | 5k VAR       |       | 19B235029P7    |                  |
| 78 | 1  | R203                                                | 20K VAR      |       | REL 316 1115/2 | Bourns           |
| 79 | 1  | R212                                                | 56.2k        | 0805  | 344A3304P5622  |                  |
| 80 | 1  | R216                                                | 332k         | 0805  | 344A3304P3323  |                  |
| 81 | 2  | R221,R220                                           | 22.1k        | 0805  | 344A3304P2212  |                  |
| 82 | 2  | R222,R136                                           | 68.1k        | 0805  | 344A3304P6812  |                  |
| 83 | 1  | R223                                                | 750          | 0805  | 344A3304P7500  |                  |
| 84 | 4  | TP1,TP2,TP101,TP102                                 | TP           |       | Pads on PCB    |                  |
| 85 | 2  | TP100,TP103                                         | TEST POINT   |       | 344A3367P1     |                  |
| 86 | 1  | TX1                                                 | B5F          |       | REGUA10003/1   | Toko             |
| 87 | 3  | U1,U104,U106                                        | LM239A/SO    |       | GNLM239D       | ON Semicon.      |
| 88 | 1  | U100                                                | UPC3206GR    |       | VEUPC3206GR-E1 | CEL (NEC)        |
| 89 | 1  | U101                                                | SA605        |       | 19A705535P3    | Philips Semicon. |

|    |   |                                  |                 |     |               |                 |
|----|---|----------------------------------|-----------------|-----|---------------|-----------------|
| 90 | 1 | U105                             | LM6172IM        | SO8 | VELM6172IM    | National Semi.  |
| 91 | 1 | U200                             | TLC2274/SO      |     | RYT1016140/2  | TI              |
| 92 | 2 | U201,U204                        | MC78M08C/TO     |     | 19A704971P10  | ON Semicon.     |
| 93 | 2 | U205,U202                        | LM78L05AC/SO    |     | 19A704971P9   | Fairchild Semi. |
| 94 | 1 | U203                             | LM2902/SO       |     | RYT1016002/2C | ON Semicon.     |
| 95 | 1 | Y101                             | DISCRIMINATOR   |     | 19A149976P1   | Murata          |
| 96 | 1 | Y102                             | 69.745 MHz TCXO |     | CY101763V1    | ToyoCom         |
| 97 | 1 | Receiver IF Printed Wiring Board | PWB             |     | PB101793V1    |                 |

Total 292

NOTES: (1) TEW 70.2 MHz filters may be used for FL1-4 if L5, L6, L9, L10 are changed  
to a value of .27 uH (REG704123/27)

FILE: 70r2BOM Rev B.xls

MAINTENANCE

TEST PROCEDURE

The RXFE module has to be tested for Noise Figure, Gain, Third Order Intercept Point, Isolation etc.. With proper current drawing of devices, Bandwidth and Conversion Gain the RXFE module will meet its specifications. The following are test procedures will verify proper Conversion Gain and current drain:

1. Supply 12 Vdc to pin 15A, B, C. (1C is ground.)
2. Inject the desired RF signal into RF IN at a level of -10 dBm.

3. Inject the desired local oscillator signal into LO IN at a level of 0 dBm (LO frequency = RF frequency- 70.2 MHz).
4. Measure the IF OUT power at 70.2 MHz, the ratio of RF IN to IF OUT is -2 dB ±1 dB.
5. Measure the current drawn by the RXFE module. Typical current drain is 260 mA.

TROUBLESHOOTING GUIDE

| SYMPTOM             | AREAS TO CHECK                                                                                                                                | READING (TYP.)                                           |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|
| LOW CONVERSION GAIN | Check Vcc<br>Preselector Loss<br>Preamplifier Gain<br>Image Rej. Filter Loss<br>1st Mixer Conversion Loss<br>1 L.O. Level (@ mixer L.O. port) | 12 V<br>1.5 dB<br>9 dB<br>1.5 dB<br>6.0 dB<br>+17 ±2 dBm |
| LED INDICATOR ON    | Check Vc of Q1<br>Check Vc of Q20 and U20                                                                                                     | 10V<br>10V                                               |
| IF FREQUENCY OFF    | Check L.O. FREQUENCY                                                                                                                          | L.O. frequency = RF frequency - 70.2 MHz                 |
| LOW L.O. POWER*     | Injection Amplifier Gain<br>Injection Filter Loss                                                                                             | 19 ±2 dB<br>2 dB                                         |

\*NOTE: For troubleshooting the gain or loss, the RXFE needs to be under the normal operating condition:

- I2 Vdc supply.

Inject L.O. power at a level of 0 dBm into LO IN (J3), (LO freq. = RF freq. - 70.2 MHz).
- Inject the desired RF signal at a level of -10 dBm into RF IN (J2).

Terminate the IF OUT (J4) with a good 50 ohm impedance.

Use a Spectrum Analyzer and 50 ohm probe (with good RF grounding) to probe at the input and output of each stage to check its gain or loss (see schematic diagram).

RECEIVER FRONT END MODULE  
19D902782G5  
ISSUE 4

| SYMBOL                                  | PART NO.      | DESCRIPTION                                                                  |
|-----------------------------------------|---------------|------------------------------------------------------------------------------|
| 4                                       | 19D902555P1   | Handle.                                                                      |
| 6                                       | 19A702381P506 | Screw, thread forming: TORX No. M3.5-6 x 6.                                  |
| 7                                       | 19A702381P513 | Screw, thread forming: TORX No M3.5-0.6 X.                                   |
| 11                                      | 19A702381P508 | Screw, thread forming: No. 3.5-06 x 8.                                       |
| RECEIVER FRONT END BOARD<br>19D902490G5 |               |                                                                              |
| ----- CAPACITORS -----                  |               |                                                                              |
| C10                                     | 19A702061P12  | Ceramic: 8.2 pF 0.5 pF, 50 VDCW, temp coef 0 ±60 PPM.                        |
| C11                                     | 19A702061P10  | Ceramic: 5.6 pF 0.5 pF, 50 VDCW, temp coef 0 ±60 PPM.                        |
| C12                                     | 19A702061P45  | Ceramic: 47 pF 0.5 pF, 50 VDCW, temp coef 0 ±30 PPM.                         |
| C13                                     | 19A702052P14  | Ceramic; 0.01 µF ±10%, 50 VDCW.                                              |
| C20 and C21                             | 19A702061P45  | Ceramic: 47 pF 0.5 pF, 50 VDCW, temp coef 0 ±30 PPM.                         |
| C22                                     | 19A702061P8   | Ceramic: 3.9 pF 0.5 pF, 50 VDCW, temp coef 0 ±120 PPM.                       |
| C23                                     | 19A702061P12  | Ceramic: 8.2 pF 0.5 pF, 50 VDCW, temp coef 0 ±60 PPM.                        |
| C24                                     | 19A702052P14  | Ceramic; 0.01 µF ±10%, 50 VDCW.                                              |
| C30 and C31                             | 19A702061P49  | Ceramic: 56 pF ±5 %, 50 VDCW.                                                |
| C40 thru C46                            | 19A702052P14  | Ceramic: Ceramic; 0.01 µF ±10%, 50 VDCW.                                     |
| *C47 and *C48                           | 19A705205P26  | Tantalum: 3.3 µF ±20%, 16 VDCW.                                              |
| *C49 and *C50                           | 19A705205P15  | Tantalum: 33 µF ±20%, 16 VDCW                                                |
| ----- DIODES -----                      |               |                                                                              |
| CR1                                     | 344A3062P1    | Diode, Schottky.                                                             |
| CR40                                    | 19A703595P10  | Diode, Optoelectric: Red; sim to HP HLMP-1301-010.                           |
| ----- FILTERS -----                     |               |                                                                              |
| FL10                                    | RTNUA20201/1  | Ceramic Bandpass.                                                            |
| FL11                                    | 19A704888P5   | RF Filter: 806-825 MHz.                                                      |
| FL20                                    | 19A705767P1   | Bandpass.                                                                    |
| ----- JACKS -----                       |               |                                                                              |
| J1                                      | 19B801587P7   | Connector, DIN: 96 male contacts, right angle mounting; sim to AMP 650887-1. |
| J2 thru J4                              | 19A115938P24  | Connector, receptacle.                                                       |
| ----- INDUCTORS -----                   |               |                                                                              |
| L10                                     | 344A4540P100  | Inductor: 10.6 nH.                                                           |
| L11                                     | 19A705470P13  | Coil, Fixed: 0.1 µH.                                                         |
| L12                                     | 344A4540P150  | Inductor: 16.7 nH.                                                           |
| L20                                     | 19A705470P13  | Coil, Fixed: 0.1 µH.                                                         |

| SYMBOL                    | PART NO.      | DESCRIPTION                                         |
|---------------------------|---------------|-----------------------------------------------------|
| L21                       | 19A705470P1   | Coil, Fixed: 10 nH; sim to Toko 380NB-10nM.         |
| L22                       | 19A705470P13  | Coil, Fixed: 0.1 µH ±20%; sim to Toko 380NB-R10M.   |
| L23                       | 19A705470P7   | Coil, Fixed: 33 nH ±20%; sim to Toko 380NB-33nM.    |
| L30 and L31               | 19A705470P13  | Coil, Fixed: 0.1 µH ±20%; sim to Toko 380NB-R10M.   |
| L40                       | 19A705470P16  | Coil, Fixed: 0.18 µH; sim to Toko 380NB-R18M.       |
| *L41                      | 19A70000P122  | Coil, Fixed: 8.2 µH ±10%; sim to Jeffers 22-8.2-10. |
| ----- TRANSISTORS -----   |               |                                                     |
| Q1                        | 344A3058P1    | Silicon, NPN.                                       |
| Q2                        | 19A700059P2   | Silicon, PNP; sim to MMBT3906, low profile.         |
| Q20                       | 344A3058P1    | Silicon, NPN.                                       |
| Q21                       | 19A700059P2   | Silicon, PNP; sim to MMBT3906, low profile.         |
| Q40 and Q41               | 19A700076P2   | Silicon, NPN; sim to MMBT3904, low profile.         |
| ----- RESISTORS -----     |               |                                                     |
| R10                       | 19B800607P183 | Metal Film: 18K ohms ±5%, 1/8w.                     |
| R11                       | 19B800607P102 | Metal Film: 1K ohms ±5%, 1/8w.                      |
| R12                       | 19B800607P331 | Metal Film: 330 ohms ±5%, 1/8w.                     |
| R13                       | 19B800607P560 | Metal Film: 56 ohms ±5%, 1/8w.                      |
| R20                       | 19B800607P680 | Metal Film: 68 ohms ±5%, 1/8w.                      |
| R21                       | 19B800607P332 | Metal Film: 3.3K ohms ±5%, 1/8w.                    |
| R22                       | 19B800607P102 | Metal Film: 1K ohms ±5%, 1/8w.                      |
| R23                       | 19B800607P331 | Metal Film: 330 ohms ±5%, 1/8w.                     |
| R24                       | 19B800607P560 | Metal Film: 56 ohms ±5%, 1/8w.                      |
| R25                       | 19B800607P101 | Metal Film: 100 ohms ±5%, 1/8w.                     |
| R30                       | 19B800607P510 | Metal Film: 51 ohms ±5%, 1/8w.                      |
| R31                       | 19B800607P100 | Metal Film: 10 ohms ±5%, 1/8w.                      |
| R32                       | 19B800607P201 | Metal Film: 200 ohms ±5%, 1/8w.                     |
| R40                       | 19B800607P103 | Metal Film: 10K ohms ±5%, 1/8w.                     |
| R41                       | 19B800607P562 | Metal Film: 5.6K ohms ±5%, 1/8w.                    |
| R42                       | 19B800607P183 | Metal Film: 18K ohms ±5%, 1/8w.                     |
| R43                       | 19B800607P333 | Metal Film: 33K ohms ±5%, 1/8w.                     |
| R44 and R45               | 19B800607P103 | Metal Film: 10K ohms ±5%, 1/8w.                     |
| R46                       | 19B800607P822 | Metal Film: 8.2K ohms ±5%, 1/8w.                    |
| R47 and R48               | 19B800607P333 | Metal Film: 33K ohms ±5%, 1/8w.                     |
| R49                       | 19B800607P104 | Metal Film: 100K ohms ±5%, 1/8w.                    |
| R50                       | 19B800607P273 | Metal Film: 27K ohms ±5%, 1/8w.                     |
| R51                       | 19B800607P102 | Metal Film: 1K ohms ±5%, 1/8w.                      |
| R52                       | 19B800607P103 | Metal Film: 10K ohms ±5%, 1/8w.                     |
| R53                       | 19B800607P682 | Metal Film: 6.8K ohms ±5%, 1/8w.                    |
| R54                       | 19B800607P560 | Metal Film: 56 ohms ±5%, 1/8w.                      |
| R55                       | 19B800607P121 | Metal Film: 120 ohms ±5%, 1/8w.                     |
| R56                       | 19B800607P680 | Metal Film: 68 ohms ±5%, 1/8w.                      |
| R57                       | 19B800607P560 | Metal Film: 56 ohms ±5%, 1/8w.                      |
| -- INTEGRATED CIRCUITS -- |               |                                                     |
| U20                       | 344A3907P1    | MMIC: sim to Avantek MSA-1105.                      |
| U30                       | RYTUA901201/1 | Power Module: MOS FET.                              |
| U40                       | 19A704125P1   | Linear: Quad Comparator; sim to LM339D.             |

\*COMPONENTS, ADDED OR DELETED OR CHANGED BY PRODUCTION CHANGES

800 MHz RECEIVER SYNTHESIZER MODULE  
19D902781G5  
ISSUE 2

| SYMBOL                                                    | PART NO.       | DESCRIPTION                                           |
|-----------------------------------------------------------|----------------|-------------------------------------------------------|
| 4                                                         | 19D902555P1    | Handle.                                               |
| 6                                                         | 19A702381P506  | Screw, thread forming: TORX, No. M3.5-.6 x 6.         |
| 7                                                         | 19A702381P513  | Screw, thread forming: TORX, No. M3.5-0.6 x 13.       |
| 9                                                         | 19B802690P1    | Grommet: RF Shielding.                                |
| 11                                                        | 19A702381P508  | Screw, thread forming: No. 3.5-0.6 x 8.               |
| 25                                                        | 19D902508P6    | Chassis.                                              |
| 26                                                        | 19D902509P9    | Cover.                                                |
| 30                                                        | 19A701800P1    | Nut, stamped: sim to Palnut EX80-M-51.                |
| 31                                                        | RTMUA50101/1   | RF Resonator.                                         |
| 32                                                        | RTMUA50101/3   | Spacer.                                               |
| 33                                                        | SBA401040/0250 | Screw, RF: Amide plastic, M4 x 25.                    |
| 34                                                        | 19A702381P1406 | Screw, thread forming TORX M3.                        |
| <b>800 MHz RECEIVER SYNTHESIZER BOARD<br/>19D902664G5</b> |                |                                                       |
| ----- CAPACITORS -----                                    |                |                                                       |
| C1<br>thru<br>C5                                          | 19A705205P2    | Tantalum: 1.0 μF, ±10%, 10 VDCW.                      |
| C6<br>thru<br>C12                                         | 19A702052P3    | Ceramic: 470 pF, ±10%, 50 VDCW.                       |
| C13<br>thru<br>C17                                        | 19A702052P26   | Ceramic: 0.1 μF, ±10%, 50 VDCW.                       |
| C18<br>thru<br>C28                                        | 19A702061P61   | Ceramic: 100pF, 50 VDCW, temp coef 0/30 PPM/°C.       |
| C29                                                       | 19A702236P38   | Ceramic: 33pF, 50 VDCW, temp coef 0/30 PPM/°C.        |
| C30<br>thru<br>C34                                        | 19A702061P99   | Ceramic: 1000 pF, 50 VDCW, temp coef 0/30 PPM/°C.     |
| C35                                                       | 19A705205P6    | Tantalum: 10 μF, ±10%, 10 VDCW.                       |
| C36                                                       | 19A702061P99   | Ceramic: 1000 pF, 50 VDCW, temp coef 0/30 PPM/°C.     |
| C37<br>and<br>C38                                         | 19A705205P6    | Tantalum: 10 μF, ±10%, 10 VDCW.                       |
| C39                                                       | 19A702236P38   | Ceramic: 33pF, 50 VDCW, temp coef 0/30 PPM/°C.        |
| C40<br>and<br>C41                                         | 19A705205P6    | Tantalum: 10 μF, ±10%, 10 VDCW.                       |
| C42                                                       | 19A702052P8    | Ceramic: 3300 pF, ±10%, 50 VDCW.                      |
| C43<br>thru<br>C45                                        | 19A702052P1    | Ceramic: 220 pF, ±10%, 50 VDCW.                       |
| C46<br>thru<br>C50                                        | 19A702052P14   | Ceramic: 0.01 μF, ±10%, 50 VDCW.                      |
| C51                                                       | 19A702061P61   | Ceramic: 100 pF, ±5%, 50 VDCW, temp coef 0/30 PPM/°C. |
| C52<br>thru<br>C54                                        | 19A702052P14   | Ceramic: 0.01pF ±10%, 50 VDCW.                        |
| C55                                                       | 19A702236P38   | Ceramic: 33pF, 50 VDCW, temp coef 0/30 PPM/°C.        |
| C56                                                       | 19A702052P14   | Ceramic: 0.01pF ±10%, 50 VDCW.                        |
| C57                                                       | 19A702236P38   | Ceramic: 33pF, 50 VDCW, temp coef 0/30 PPM/°C.        |

\*COMPONENTS, ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

| SYMBOL                | PART NO.     | DESCRIPTION                                                                  |
|-----------------------|--------------|------------------------------------------------------------------------------|
| C58<br>and<br>C59     | 19A702052P14 | Ceramic: 0.01pF ±10%, 50 VDCW.                                               |
| C60                   | 19A702236P43 | Ceramic: 51 pF, 50 VDCW, temp coef 0/30 PPM/°C.                              |
| C61                   | 19A703902P3  | Metal, Pypro: .047 μF, ±10%, 50 VDCW.                                        |
| C62                   | 19A703684P3  | Metal, Polyester: 2.2 F, ±10%, 50 VDCW.                                      |
| C63                   | 19A702236P13 | Ceramic: 3.3 pF, 50 VDCW, temp coef 0/30 PPM/°C.                             |
| C64                   | 19A702236P23 | Ceramic: 8.2 pF, 50 VDCW, temp coef 0/60 PPM/°C.                             |
| C65<br>thru<br>C75    | 19A702236P38 | Ceramic: 33 pF, 50 VDCW, temp coef 0/30 PPM/°C.                              |
| C76<br>and<br>C77     | 19A702052P26 | Ceramic: 0.1 μF, ±10%, 50 VDCW.                                              |
| C78                   | 19A702236P38 | Ceramic: 33 pF, 50 VDCW, temp coef 0/30 PPM/°C.                              |
| C78<br>and<br>C79     | 19A702052P14 | Ceramic: 0.01 μF, ±10%, 50 VDCW.                                             |
| C80<br>and<br>C81     | 19A705205P2  | Ceramic: 330 pF, ±10%, 50 VDCW.                                              |
| C82<br>and<br>C83     | 19A702052P14 | Ceramic: 0.01 μF, ±10%, 50 VDCW.                                             |
| C84<br>thru<br>C89    | 19A702236P28 | Ceramic: 12 pF, 50 VDCW, temp coef 0/30 PPM/°C.                              |
| C90                   | 19A702236P38 | Ceramic: 33pF, 50 VDCW, temp coef 0/30 PPM/°C.                               |
| C91                   | 19A702061P61 | Ceramic: 100 pF, 50 VDCW, temp coef 0/30 PPM/°C.                             |
| C92<br>thru<br>C95    | 19A702236P38 | Ceramic: 33pF, 50 VDCW, temp coef 0/30 PPM/°C.                               |
| C96                   | 19A702061P99 | Ceramic: 1000pF, 50 VDCW, temp coef 0/30 PPM/°C.                             |
| ----- DIODES -----    |              |                                                                              |
| CR1                   | 19A703595P10 | Diode, Optoelectric: Red; sim to HP HLMP-1301-010.                           |
| D1                    | RKZ323602/1  | Variable: 17.5 to 20 pF.                                                     |
| D2                    | 19A703561P2  | Silicon.                                                                     |
| D3                    | RKZ323602/1  | Variable: 17.5 to 20 pF.                                                     |
| ----- FILTERS -----   |              |                                                                              |
| FL1                   | 19A705767P1  | Bandpass: 732.5 -758.5 MHz.                                                  |
| ----- JACKS -----     |              |                                                                              |
| J1                    | 19B801587P7  | Connector, DIN: 96 male contacts, right angle mounting; sim to AMP 650887-1. |
| J2<br>thru<br>J4      | 19A115938P24 | Connector, receptacle.                                                       |
| ----- INDUCTORS ----- |              |                                                                              |
| L1                    | 19A705470P8  | Coil, fixed: 39 nH; sim to Toko 380NB-39nM.                                  |
| L2                    | 19A705470P24 | Coil, fixed: .082 μH; sim to Toko 380NB-R82M.                                |
| L3                    | 19A705470P8  | Coil, fixed: 39 nH.                                                          |
| L3<br>and<br>L4       | 19A705470P8  | Coil, fixed: 39 nH; sim to Toko 380NB-39nM.                                  |
| L5                    | 19A705470P1  | Coil, fixed: 10 nH; sim to Toko 380NB-10nM.                                  |
| L6<br>thru<br>L8      | 19A705470P8  | Coil Fixed: 39 nH.                                                           |

| SYMBOL                  | PART NO.      | DESCRIPTION                                 |
|-------------------------|---------------|---------------------------------------------|
| ----- TRANSISTORS ----- |               |                                             |
| Q1                      | 19A702524P2   | N-Type, field effect; sim to MMBFU310.      |
| Q2<br>thru<br>Q13       | 19A700076P2   | Silicon, NPN; sim to MMBT3904, low profile. |
| ----- RESISTORS -----   |               |                                             |
| R1<br>and<br>R2         | 19B800607P333 | Metal film: 33K ohms, ±5%, 1/8w.            |
| R3                      | 19B800607P683 | Metal film: 68K ohms, ±5%, 1/8w.            |
| R4                      | 19B800607P333 | Metal film: 33K ohms, ±5%, 1/8w.            |
| R5<br>and<br>R6         | 19A702931P230 | Metal film: 2K ohms                         |
| R7<br>thru<br>R14       | 19B800607P102 | Metal film: 1K ohms, ±5%, 1/8w.             |
| R15                     | 19B800607P104 | Metal film: 100K ohms, ±5%, 1/8w.           |
| R16<br>and<br>R17       | 19B800607P333 | Metal film: 33K ohms, ±5%, 1/8w.            |
| R18<br>thru<br>R20      | 19B800607P103 | Metal film: 10K ohms, ±5%, 1/8w.            |
| R21                     | 19B800607P104 | Metal film: 100K ohms, ±5%, 1/8w.           |
| R22<br>and<br>R23       | 19B800607P103 | Metal film: 10K ohms, ±5%, 1/8w.            |
| R25<br>and<br>R26       | 19B800607P333 | Metal film: 33K ohms, ±5%, 1/8w.            |
| R27<br>thru<br>R29      | 19B800607P473 | Metal film: 47K ohms, ±5%, 1/8w.            |
| R30                     | 19B800607P100 | Metal film: 10K ohms, ±5%, 1/8w.            |
| R31                     | 19B800607P473 | Metal film: 47K ohms, ±5%, 1/8w.            |
| R32                     | 19B800607P221 | Metal film: 220 ohms, ±5%, 1/8w.            |
| R33                     | 19B800607P100 | Metal film: 10K ohms, ±5%, 1/8w.            |
| R35                     | 19B800607P100 | Metal film: 10K ohms,±5%, 1/8w.             |
| *R36                    | 19B800607P151 | Metal film: 150 ohms, ±5%, 1/8w.            |
| R38                     | 19B800607P100 | Metal film: 10K ohms, ±5%, 1/8w.            |
| R39                     | 19B800607P152 | Metal film: 1.5K ohms, ±5%, 1/8w.           |
| R40                     | 19B800607P222 | Metal film: 2.2K ohms, ±5%, 1/8w.           |
| R41<br>and<br>R42       | 19B800607P391 | Metal film: 390 ohms, ±5%, 1/8w.            |
| R43                     | 19B800607P183 | Metal film: 18K ohms, ±5%, 1/8w.            |
| R44                     | 19B800607P104 | Metal film: 100K ohms, ±5%, 1/8w.           |
| R45                     | 19B800607P682 | Metal film: 6.8K ohms, ±5%, 1/8w.           |
| R46<br>and<br>R47       | 19B800607P151 | Metal film: 150 ohms, ±5%, 1/8w.            |
| R48                     | 19B800607P271 | Metal film: 270 ohms, ±5%, 1/8w.            |
| R49                     | 19B800607P331 | Metal film: 330 ohms, ±5%, 1/8w.            |
| R50<br>and<br>R51       | 19B800607P181 | Metal film: 180 ohms, ±5%, 1/8w.            |
| R52                     | 19B800607P390 | Metal film: 39 ohms, ±5%, 1/8w.             |
| R53<br>and<br>R54       | 19B800607P100 | Metal film: 10 ohms, ±5%, 1/8w.             |
| R55                     | 19B800607P270 | Metal film: 27 ohms, ±5%, 1/8w.             |
| R56                     | 19B800607P103 | Metal film: 10K ohms, ±5%, 1/8w.            |
| R57                     | 19B800607P333 | Metal film: 33K ohms, ±5%, 1/8w.            |
| R58                     | 19B800607P105 | Metal film: 1M ohms, ±5%, 1/8w.             |
| R59                     | 19B800607P103 | Metal film: 10K ohms, ±5%, 1/8w.            |
| R60                     | 19B800607P101 | Metal film: 100 ohms, ±5%, 1/8w.            |
| R61                     | 19B800607P151 | Metal film: 150 ohms, ±5%, 1/8w.            |

| SYMBOL                          | PART NO.      | DESCRIPTION                                              |
|---------------------------------|---------------|----------------------------------------------------------|
| R62                             | 19B800607P510 | Metal film: 51 ohms, ±5%, 1/8w.                          |
| R63                             | 19B800607P152 | Metal film: 1.5k ohms, ±5%, 1/8w.                        |
| R64                             | 19B800607P272 | Metal film: 2.7K ohms, ±5%, 1/8w.                        |
| R65                             | 19B800607P103 | Metal film: 10K ohms, ±5%, 1/8w.                         |
| R66                             | 19B800607P272 | Metal film: 2.7K ohms, ±5%, 1/8w.                        |
| R67                             | 19B800607P682 | Metal film: 6.8K ohms, ±5%, 1/8w.                        |
| R68                             | 19B800607P152 | Metal film: 1.5K ohms, ±5%, 1/8w.                        |
| R69                             | 19B800607P272 | Metal film: 2.7K ohms, ±5%, 1/8w.                        |
| R70                             | 19B800607P103 | Metal film: 10K ohms, ±5%, 1/8w.                         |
| R71<br>thru<br>R73              | 19B800607P152 | Metal film: 1.5K ohms, ±5%, 1/8w.                        |
| R74                             | 19B800607P823 | Metal film: 83K ohms, ±5%, 1/8w.                         |
| R75                             | 19B800607P152 | Metal film: 1.5K ohms, ±5%, 1/8w.                        |
| R76<br>and<br>R77               | 19B800607P180 | Metal film: 18 ohms, ±5%, 1/8w.                          |
| R78<br>and<br>R79               | 19B800607P101 | Metal film: 100 ohms, ±5%, 1/8w.                         |
| R80<br>and<br>R81               | 19B800607P270 | Metal film: 27 ohms, ±5%, 1/8w.                          |
| R82                             | 19B800607P510 | Metal film: 51 ohms, ±5%, 1/8w.                          |
| R83<br>and<br>R84               | 19B800607P151 | Metal film: 150 ohms, ±5%, 1/8w.                         |
| R85                             | 19B800607P391 | Metal film: 390 ohms, ±5%, 1/8w.                         |
| R88<br>and<br>R89               | 19B800607P100 | Metal film: 10 ohms, ±5%, 1/8w.                          |
| R90                             | 19B800607P682 | Metal film: 6.8K ohms, ±5%, 1/8w.                        |
| R91                             | 19B800607P332 | Metal film: 3.3K ohms, ±5%, 1/8w.                        |
| R92                             | 19B800607P103 | Metal film: 10K ohms, ±5%, 1/8w.                         |
| R95<br>and<br>R96               | 19B800607P510 | Metal film: 51 ohms, ±5%, 1/8w.                          |
| R98                             | 19B800607P100 | Metal film: 10 ohms, ±5%, 1/8w.                          |
| R100<br>thru<br>R102            | 19B800607P393 | Metal film: 39K ohms, ±5%, 1/8w.                         |
| R103                            | 19B800607P100 | Metal film: 10 ohms, ±5%, 1/8w.                          |
| R104                            | 19B800607P103 | Metal film: 10K ohms, ±5%, 1/8w.                         |
| R105                            | 19B800607P101 | Metal film: 100 ohms, ±5%, 1/8w.                         |
| R106<br>and<br>R107             | 19B800607P100 | Metal film: 10 ohms, ±5%, 1/8w.                          |
| R108                            | 19B800607P103 | Metal Film: 10K Ohms, ±5%, 1/8w.                         |
| ----- INTEGRATED CIRCUITS ----- |               |                                                          |
| U1                              | RYT102217     | Silicon, bipolar, pre-scaler, divide by 2.               |
| U2                              | 19A705927P1   | Silicon, bipolar; sim to Avantek MSA-0611.               |
| U3                              | 19A704971P8   | Voltage regulator: positive; sim to Motorola MC78M05CDT. |
| U4                              | 19A705927P1   | Silicon, bipolar; sim to Avantek MSA-0611.               |
| U5                              | 19A149944P201 | Dual Modulus Prescaler: sim to Motorola MC12022A.        |
| U6                              | 19B800902P7   | Synthesizer, CMOS: Sim to MC145159N1.                    |
| U7<br>and<br>U8                 | 19A705927P1   | Silicon, bipolar; sim to Avantek MSA-0611.               |
| U9                              | 19A702705P4   | Digital: Quad Analog Switch/Multiplexer; sim to 4066BM.  |
| U10                             | 19A703471P120 | Decode/Demux, 3 to 8 line; sim to 74HC138.               |
| U11                             | 19A705927P1   | Silicon, bipolar; sim to Avantek MSA-0611.               |
| U12<br>and<br>U13               | 19A703483P302 | Digital: Quad 2-Input NAND Gate; sim to 74HC00.          |

| SYMBOL | PART NO.     | DESCRIPTION                         |
|--------|--------------|-------------------------------------|
| U14    | 19A705537P2  | MMIC: sim to Avantek MSA-0886.      |
| U15    | 19A702293P3  | Linear: Dual Op Amp; sim to LM358D. |
| U16    | RYT403006/C  | Quad NOR Gate.                      |
| U17    | 19A702293P3  | Linear: Dual Op Amp; sim to LM358D. |
|        |              | ----- CRYSTALS -----                |
| Y1     | 19B801351P14 | Crystal Oscillator: 12.8 MHz.       |

Changes in the equipment to improve performance or to simplify circuits are identified by a "Revision Letter" which is stamped after the model number of the unit. The revision stamped on the unit includes all previous revisions. Refer to the Parts List for the descriptions of parts affected by these revisions.

- REV. A -

**RECEIVER SYNTHESIZER BOARD 19D902664G5**

To improve synthesizer operation. Changed resistor R36 from 82 ohms (19B800607P820) to 150 ohms.
- REV. B -

**RECEIVER SYNTHESIZER BOARD 19D902664G5**

To reduce levels of radiation and meet FCC Requirements. Changed capacitor C29. Capacitor C29 was 100 pF, 19A702061P61. Changed capacitors C55 & C57. Capacitors C 55 & C57 were 0.01 μF, 19A702052P14. Added capacitors C39, C90 and C92 through C95 (33 pF, 19A702236P38). Added capacitor C96 (1000 pF, 19A702061P99). Capacitor C96 is not installed. Added inductors L3, L6 L7 & L8 (19A705470P8). Added resistor R108 (10K Ohms, 19B800607P103). Resistor R108 is not installed. Deleted resistors, R24, R86, R87 & R99 (10 Ohms, 19B800607P100).
- REV. A -

**RECEIVER SYNTHESIZER MODULE 19D902781G5**

To reduce levels of radiation and meet FCC Requirements. In-stalled RF Shielding grommet (item 9) around RF input/output con-nectors.
- REV. B -

**RECEIVER SYNTHESIZER MODULE 19D902781G5**

To change cover to one with a conductive gasket. Changed item 26. Item 26 was 19D902509P7.
- REV. C -

**RECEIVER SYNTHESIZER MODULE 19D902781G5**

**REV. C -****RECEIVER SYNTHESIZER BOARD 19D902664G5**

To accommodate SOG synthesizer IC package U6 (PLCC package discontinued). Modified printed wire board layout (Printed wire board changed from 19D904746P1R4 to 19D904746P1R6). Changed U6. Synthesizer U6 was 19BB00902P5.

To install RC compensation network. Installed resistor R108 (10K, 19B800607P103) and capacitor C96 (1000 pF, 19A702061P99) in 10-volt regulator circuit.

To eliminate spurs from 2nd harmonic of the reference oscillator. Changed capacitor C78. C78 was 33 pF, 19A702236P38.

REV. D -

**RECEIVER SYNTHESIZER MODULE 19D902781G5**

**REV. D -****RECEIVER SYNTHESIZER BOARD 19D902664G5**

To prevent the through hole of capacitor C95 from touching the chassis ground plane. Changed the position of C95 by modifying printed circuit board 19D904746. The print circuit board changed from 19D904746P1R6 to 19D904746P1R7.

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**800 MHz TRANSMITTER SYNTHESIZER MODULE**  
**19D902780G5**  
**Issue 5**

| SYMBOL                                           | PART NUMBER    | DESCRIPTION                                                         |
|--------------------------------------------------|----------------|---------------------------------------------------------------------|
| ----- MISCELLANEOUS -----                        |                |                                                                     |
| 2                                                | 19D902508P4    | Chassis.                                                            |
| 3                                                | 19D902509P2    | Cover.                                                              |
| 4                                                | 19D902555P1    | Handle.                                                             |
| 6                                                | 19A702381P506  | Screw, thread forming: TORX, No. M3.5-.6 x 6.                       |
| 7                                                | 19A702381P513  | Screw, thread forming: TORX, No. M3.5 - 0.6 X 13.                   |
| 8                                                | 19B235310P1    | Nameplate.                                                          |
| 9                                                | 19B802690P1    | RF Shielding Grommet                                                |
| 11                                               | 19A702381P508  | Screw, thd. form: No. 3.5-0.6 x 8.                                  |
| 12                                               | 19D902824P1    | Casting.                                                            |
| 22                                               | 19D902509P6    | Cover.                                                              |
| 23                                               | 19A702381P508  | Screw, thd. form: No. 3.5-0.6 x 8.                                  |
| 24                                               | 19D904877P1    | Cover.                                                              |
| 25                                               | 19C852430P1    | Screw: Tuning.                                                      |
| 26                                               | 19A701800P1    | Stop nut.                                                           |
| 27                                               | RTMUA50101/2   | Screw, tuning.                                                      |
| 28                                               | RTMUA50101/3   | Spacer,                                                             |
| 29                                               | SBA401040/0250 | Screw: Nylon.                                                       |
| 30                                               | 19A702381P1406 | Screw: M2.5 x 6, Thread Forming, Pan Head, Torx Drive, Zinc Plated. |
| <b>TRANSMITTER SYNTHESIZER BOARD 19D902779G5</b> |                |                                                                     |
| ----- CAPACITORS -----                           |                |                                                                     |
| C1                                               | 19A705205P2    | Tantalum: 1 mF, 16 VDCW; sim to Sprague 293D.                       |
| C2                                               |                | Ceramic: 0.01 mF ±10%, 50 VDCW.                                     |
| C3 thru C6                                       | 19A702236P28   | Ceramic: 12 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM.                   |
| C7                                               | 19A702052P14   | Ceramic: 0.01 mF ±10%, 50 VDCW.                                     |
| C8                                               | 19A705205P2    | Tantalum: 1 mF, 16 VDCW; sim to Sprague 293D.                       |
| C9 and C10                                       | 19A702236P28   | Ceramic: 12 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM.                   |
| C201 and C202                                    | 19A702236P38   | Ceramic: 33 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C.                |
| C203                                             | 19A702052P14   | Ceramic: 0.01 mF ±10%, 50 VDCW.                                     |
| C204 thru C206                                   | 19A702236P38   | Ceramic: 33 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C.                |
| C207                                             | 19A702052P14   | Ceramic: 0.01 mF ±10%, 50 VDCW.                                     |
| C211 and C212                                    | 19A702236P38   | Ceramic: 33 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C.                |
| C213                                             | 19A702052P14   | Ceramic: 0.01 mF ±10%, 50 VDCW.                                     |
| C214 and C215                                    | 19A702236P38   | Ceramic: 33 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C.                |
| C216 and C217                                    | 19A702236P12   | Ceramic: 3.0 pF ±0.25 pF, 50 VDCW; temp coef 0 ±30 PPM.             |
| C301                                             | 19A702061P99   | Ceramic: 1000 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C.              |

\* COMPONENTS, ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

## PARTS LIST

| SYMBOL               | PART NUMBER     | DESCRIPTION                                                        |
|----------------------|-----------------|--------------------------------------------------------------------|
| C302                 | 19A702052P14    | Ceramic: 0.01 mF $\pm 10\%$ , 50 VDCW.                             |
| C303<br>and<br>C304  | RJE 599 2167/47 | Electrolytic: 4.7 mF, $\pm 10\%$ & 16VDCW @ 85°C                   |
| C305                 | 19A705205P7     | Tantalum: 10 mF, 25 VDCW; sim to Sprague 293D.                     |
| C306                 | 19A705205P2     | Tantalum: 1 mF, 16 VDCW; sim to Sprague 293D.                      |
| C307                 | 19A705205P6     | Tantalum: 10 mF, 16 VDCW; sim to Sprague 293D.                     |
| C314<br>and<br>C315  | 19A705205P6     | Tantalum: 10 mF, 16 VDCW; sim to Sprague 293D.                     |
| C316                 | 19A702052P14    | Ceramic: 0.01 mF $\pm 10\%$ , 50 VDCW.                             |
| C317                 | 19A702061P99    | Ceramic: 1000pF $\pm 5\%$ , 50 VDCW, temp. 0 $\pm 30$ PPM/°C.      |
| C401                 | 19A702052P14    | Ceramic: 0.01 mF $\pm 10\%$ , 50 VDCW.                             |
| C402                 | 19A702061P99    | Ceramic: 1000 pF $\pm 5\%$ , 50 VDCW, temp coef 0 $\pm 30$ PPM/°C. |
| C403<br>thru<br>C405 | 19A702052P14    | Ceramic: 0.01 mF $\pm 10\%$ , 50 VDCW.                             |
| C406                 | 19A702061P99    | Ceramic: 1000 pF $\pm 5\%$ , 50 VDCW, temp coef 0 $\pm 30$ PPM/°C. |
| C407                 | 19A702052P14    | Ceramic: 0.01 mF $\pm 10\%$ , 50 VDCW.                             |
| C408                 | 19A702061P99    | Ceramic: 1000 pF $\pm 5\%$ , 50 VDCW, temp coef 0 $\pm 30$ PPM/°C. |
| C409                 | 19A705205P6     | Tantalum: 10 mF, 16 VDCW; sim to Sprague 293D.                     |
| C410                 | 19A702052P33    | Ceramic: 0.1 mF $\pm 10\%$ , 50 VDCW.                              |
| C411                 | 19A705205P6     | Tantalum: 10 mF, 16 VDCW; sim to Sprague 293D.                     |
| C412                 | 19A702052P14    | Ceramic: 0.01 mF $\pm 10\%$ , 50 VDCW.                             |
| C413                 | 19A702052P108   | Ceramic: 0.01 mF $\pm 10\%$ , 50 VDCW.                             |
| C414                 | 19A702061P69    | Ceramic: 220 pF $\pm 5\%$ , 50 VDCW, temp coef 0 $\pm 30$ PPM/°C.  |
| C415                 | 19A705205P2     | Tantalum: 1 mF, 16 VDCW; sim to Sprague 293D.                      |
| C502                 | 19A705205P2     | Tantalum: 1 mF, 16 VDCW; sim to Sprague 293D.                      |
| C503                 | 19A702052P33    | Ceramic: 0.1 mF $\pm 10\%$ , 50 VDCW.                              |
| C504                 | 19A702061P99    | Ceramic: 1000 pF $\pm 5\%$ , 50 VDCW, temp coef 0 $\pm 30$ PPM/°C. |
| C505                 | 19A703684P3     | Polyester: 2.2 mF, 50 VDCW.                                        |
| C506                 | 19A702250P113   | Polyester: 0.1 mF $\pm 10\%$ , 50 VDCW.                            |
| C507                 | 19A702052P33    | Ceramic: 0.1 mF $\pm 10\%$ , 50 VDCW.                              |
| C508                 | 19A702250P113   | Polyester: 0.1 mF $\pm 10\%$ , 50 VDCW.                            |
| C602                 | 19A705205P6     | Tantalum: 10 mF, 16 VDCW; sim to Sprague 293D.                     |
| C603                 | 19A702061P99    | Ceramic: 1000 pF $\pm 5\%$ , 50 VDCW, temp coef 0 $\pm 30$ PPM/°C. |
| C604                 | 19A705205P2     | Tantalum: 1 mF, 16 VDCW; sim to Sprague 293D.                      |
| C605                 | 19A703684P3     | Polyester: 2.2 mF, 50 VDCW.                                        |
| C606                 | 19A705205P6     | Tantalum: 10 mF, 16 VDCW; sim to Sprague 293D.                     |
| C701<br>thru<br>C712 | 19A702061P61    | Ceramic: 100 pF $\pm 5\%$ , 50 VDCW, temp coef 0 $\pm 30$ PPM.     |
| C714<br>and<br>C715  | 19A702061P99    | Ceramic: 1000 pF $\pm 5\%$ , 50 VDCW, temp coef 0 $\pm 30$ PPM/°C. |
| C716<br>and<br>C717  | 19A702061P99    | Ceramic: 1000 pF $\pm 5\%$ , 50 VDCW, temp coef 0 $\pm 30$ PPM/°C. |
| C901<br>thru<br>C903 | 19A702236P28    | Ceramic: 12 pF $\pm 5\%$ , 50 VDCW, temp coef 0 $\pm 30$ PPM.      |
| C904                 | 19A702052P14    | Ceramic: 0.01 mF $\pm 10\%$ , 50 VDCW.                             |
| C905                 | 19A702236P28    | Ceramic: 12 pF $\pm 5\%$ , 50 VDCW, temp coef 0 $\pm 30$ PPM.      |

| SYMBOL                  | PART NUMBER   | DESCRIPTION                                                                          |
|-------------------------|---------------|--------------------------------------------------------------------------------------|
| C906                    | 19A702236P38  | Ceramic: 33 pF $\pm 5\%$ , 50 VDCW, temp coef 0 $\pm 30$ PPM/ $^{\circ}$ C.          |
| C907                    | 19A702052P14  | Ceramic: 0.01 mF $\pm 10\%$ , 50 VDCW.                                               |
| C908<br>thru<br>C910    | 19A702236P38  | Ceramic: 33 pF $\pm 5\%$ , 50 VDCW, temp coef 0 $\pm 30$ PPM/ $^{\circ}$ C.          |
| C911                    | 19A702052P14  | Ceramic: 0.01 mF $\pm 10\%$ , 50 VDCW.                                               |
| C912                    | 19A702236P38  | Ceramic: 33 pF $\pm 5\%$ , 50 VDCW, temp coef 0 $\pm 30$ PPM/ $^{\circ}$ C.          |
| ----- DIODES -----      |               |                                                                                      |
| CR701                   | 19A703595P10  | Optoelectric: Red LED; sim to HP HLMP-1301-010.                                      |
| D1<br>and<br>D2         | RKZ320603     | Diode: Variable capacitance.                                                         |
| D401                    | 19A703561P2   | Silicon, fast recovery (2 diodes in series).                                         |
| ----- FILTERS -----     |               |                                                                                      |
| FL201                   | 19A704888P1   | Bandpass Filter, 851-871 MHz: sim to Murata DFC3R861P020BTD ( <i>discontinued</i> ). |
| FL201                   | RNT 202 699/1 | Bandpass Filter, 851-871 MHz.                                                        |
| ----- JACKS -----       |               |                                                                                      |
| J1<br>and<br>J2         | 19A115938P24  | Coaxial Connector.                                                                   |
| J3                      | 19B801587P7   | Connector, DIN: 96 male contacts, right angle mounting; sim to AMP 650887-1.         |
| ----- INDUCTORS -----   |               |                                                                                      |
| L1<br>and<br>L2         | 19A705470P8   | Coil, Fixed: 39 nH; sim to Toko 380NB-39nM.                                          |
| L202                    | 19A705470P5   | Coil, Fixed: 22 nH; sim to Toko 380NB-22nM.                                          |
| L203                    | 344A4540P100  | Inductor, surface mount: 10 nH $\pm 5\%$ .                                           |
| L301                    | 19A705470P8   | Coil, Fixed: 39 nH; sim to Toko 380NB-39nM.                                          |
| L501                    | 19A705470P8   | Coil, Fixed: 39 nH; sim to Toko 380NB-39nM.                                          |
| ----- TRANSISTORS ----- |               |                                                                                      |
| Q301                    | 19A149542P2   | Silicon, PNP: sim to Motorola MJD32C.                                                |
| Q302                    | 19A700076P2   | Silicon, NPN: sim to MMBT3904, low profile.                                          |
| Q401                    | 19A704708P2   | Silicon, NPN: sim to NEC 2SC3356.                                                    |
| Q501                    | 19A700076P2   | Silicon, NPN: sim to MMBT3904, low profile.                                          |
| Q701<br>thru<br>Q705    | 19A700076P2   | Silicon, NPN: sim to MMBT3904, low profile.                                          |
| ----- RESISTORS -----   |               |                                                                                      |
| R1                      | 19B800607P221 | Metal film: 220 ohms $\pm 5\%$ , 1/8 w.                                              |
| R2                      | 19B800607P510 | Metal film: 51 ohms $\pm 5\%$ , 1/8 w.                                               |
| R6                      | 19B800607P100 | Metal film: 10 ohms $\pm 5\%$ , 1/8 w.                                               |
| R201                    | 19B800607P180 | Metal film: 18 ohms $\pm 5\%$ , 1/8 w.                                               |
| R202                    | 19B800607P270 | Metal film: 27 ohms $\pm 5\%$ , 1/8 w.                                               |
| R203                    | 19B800607P100 | Metal film: 10 ohms $\pm 5\%$ , 1/8 w.                                               |
| R204                    | 19B800607P101 | Metal film: 100 ohms $\pm 5\%$ , 1/8 w.                                              |
| R208                    | 19B800607P151 | Metal film: 150 ohms $\pm 5\%$ , 1/8 w.                                              |
| R209                    | 19B801486P820 | Metal film: 82 ohms $\pm 5\%$ , 1/2 w.                                               |
| R213                    | 19B800607P471 | Metal Film: 470 Ohms $\pm 5\%$ , 1/8 w.                                              |
| R214                    | 19B800607P120 | Metal film: 12 ohms $\pm 5\%$ , 1/8 w.                                               |
| R215                    | 19B800607P471 | Metal film: 470 ohms $\pm 5\%$ , 1/8 w.                                              |
| R216                    | 19B800607P270 | Metal film: 27 ohms $\pm 5\%$ , 1/8 w.                                               |
| R217                    | 19B800607P101 | Metal film: 100 ohms $\pm 5\%$ , 1/8 w.                                              |
| R218                    | 19B800607P100 | Metal film: 10 ohms $\pm 5\%$ , 1/8 w.                                               |

## PARTS LIST

| SYMBOL              | PART NUMBER   | DESCRIPTION                                        |
|---------------------|---------------|----------------------------------------------------|
| R219                | 19B800607P121 | Metal film: 120 ohms $\pm 5\%$ , 1/8 w.            |
| R223                | 19B800607P510 | Metal film: 51 ohms $\pm 5\%$ , 1/8 w.             |
| R224                | 19B800607P181 | Metal film: 180 ohms $\pm 5\%$ , 1/8 w.            |
| R225                | 19B800607P271 | Metal film: 270 ohms $\pm 5\%$ , 1/8 w.            |
| R304                | 19B800607P470 | Metal film: 47 ohms $\pm 5\%$ , 1/8 w.             |
| R305                | 19B800607P103 | Metal film: 10K ohms $\pm 5\%$ , 1/8 w.            |
| R306                | 19B800607P152 | Metal film: 1.5K ohms $\pm 5\%$ , 1/8 w.           |
| R307                | 19A702931P230 | Metal film: 2000 ohms $\pm 1\%$ , 200 VDCW, 1/8 w. |
| R308                | 19A702931P230 | Metal film: 2000 ohms $\pm 1\%$ , 200 VDCW, 1/8 w. |
| R313<br>and<br>R314 | 19B800607P100 | Metal film: 10 ohms $\pm 5\%$ , 1/8 w.             |
| R315                | 19B800607P1   | Metal film: 0 ohms $\pm 5\%$ , 1/8 w.              |
| R316                | 19A701250P301 | Metal Film: 10K Ohms $\pm 1\%$ , 1/4 w.            |
| R401                | 19B800607P330 | Metal film: 33 ohms $\pm 5\%$ , 1/8 w.             |
| R402                | 19B800607P102 | Metal film: 1K ohms $\pm 5\%$ , 1/8 w.             |
| R403                | 19B800607P104 | Metal film: 100K ohms $\pm 5\%$ , 1/8 w.           |
| R404                | 19B800607P561 | Metal film: 560 ohms $\pm 5\%$ , 1/8 w.            |
| R405                | 19B800607P510 | Metal film: 51 ohms $\pm 5\%$ , 1/8 w.             |
| R406                | 19B800607P151 | Metal film: 150 ohms $\pm 5\%$ , 1/8 w.            |
| R407                | 19B800607P104 | Metal film: 100K ohms $\pm 5\%$ , 1/8 w.           |
| R408                | 19B800607P100 | Metal film: 10 ohms $\pm 5\%$ , 1/8 w.             |
| R409                | 19B800607P222 | Metal film: 2.2K ohms $\pm 5\%$ , 1/8 w.           |
| R410                | 19B800607P472 | Metal film: 4.7K ohms $\pm 5\%$ , 1/8 w.           |
| R411                | 19B800607P682 | Metal film: 6.8K ohms $\pm 5\%$ , 1/8 w.           |
| R412                | 19B800607P473 | Metal film: 47K ohms $\pm 5\%$ , 1/8 w.            |
| R415                | 19B800607P473 | Metal film: 47K ohms $\pm 5\%$ , 1/8 w.            |
| R416                | 19B800607P150 | Metal film: 15 ohms $\pm 5\%$ , 1/8 w.             |
| R417                | 19B800607P331 | Metal film: 330 ohms $\pm 5\%$ , 1/8 w.            |
| R418                | 19B800607P681 | Metal film: 680 ohms $\pm 5\%$ , 1/8 w.            |
| R419                | 19B800607P103 | Metal film: 10K ohms $\pm 5\%$ , 1/8 w.            |
| R420                | 19B800607P154 | Metal film: 150K ohms $\pm 5\%$ , 1/8 w.           |
| R421                | 19B800607P103 | Metal film: 10K ohms $\pm 5\%$ , 1/8 w.            |
| R502                | 19B800607P103 | Metal film: 10K ohms $\pm 5\%$ , 1/8 w.            |
| R503                | 19B800607P224 | Metal film: 220K ohms $\pm 5\%$ , 1/8 w.           |
| R504                | 19B800607P150 | Metal film: 15 ohms $\pm 5\%$ , 1/8 w.             |
| R505                | 19B800607P104 | Metal film: 100K ohms $\pm 5\%$ , 1/8 w.           |
| R506                | 19B800607P224 | Metal film: 220K ohms $\pm 5\%$ , 1/8 w.           |
| R507                | 19B800607P104 | Metal film: 100K ohms $\pm 5\%$ , 1/8 w.           |
| R509                | 19B800607P473 | Metal film: 47K ohms $\pm 5\%$ , 1/8 w.            |
| R510                | 19B800607P103 | Metal film: 10K ohms $\pm 5\%$ , 1/8 w.            |
| R511                | 19B800607P101 | Metal film: 100 ohms $\pm 5\%$ , 1/8 w.            |
| R512                | 19B800607P473 | Metal film: 47K ohms $\pm 5\%$ , 1/8 w.            |
| R513                | 19B800607P100 | Metal film: 10 ohms $\pm 5\%$ , 1/8 w.             |
| R514                | 19B800607P222 | Metal film: 2.2K ohms $\pm 5\%$ , 1/8 w.           |
| R515                | 19B800607P224 | Metal film: 220K ohms $\pm 5\%$ , 1/8 w.           |
| R516<br>and<br>R517 | 19B800607P102 | Metal film: 1K ohms $\pm 5\%$ , 1/8 w.             |
| R518                | 19B800607P472 | Metal film: 4.7K ohms $\pm 5\%$ , 1/8 w.           |
| R601                | 19A702931P176 | Metal film: 604 ohms $\pm 1\%$ , 200 VDCW, 1/8 w.  |
| R602                | 19B800607P223 | Metal film: 22K ohms $\pm 5\%$ , 1/8 w.            |
| R603                | 19B800607P104 | Metal film: 100K ohms $\pm 5\%$ , 1/8 w.           |
| R604                | 19B800607P470 | Metal film: 47 ohms $\pm 5\%$ , 1/8 w.             |
| R605                | 19B800607P104 | Metal film: 100K ohms $\pm 5\%$ , 1/8 w.           |
| R606                | 19B800607P333 | Metal film: 33K ohms $\pm 5\%$ , 1/8 w.            |

| SYMBOL                          | PART NUMBER   | DESCRIPTION                                                              |
|---------------------------------|---------------|--------------------------------------------------------------------------|
| R607                            | 19B800607P100 | Metal film: 10 ohms $\pm 5\%$ , 1/8 w.                                   |
| R608                            | 19B800607P104 | Metal film: 100K ohms $\pm 5\%$ , 1/8 w.                                 |
| R609                            | 19B800607P472 | Metal film: 4.7K ohms $\pm 5\%$ , 1/8 w.                                 |
| R610                            | 19B800607P105 | Metal film: 1M ohms $\pm 5\%$ , 1/8 w.                                   |
| R611                            | 19B800607P105 | Metal film: 1M ohms $\pm 5\%$ , 1/8 w.                                   |
| R612                            | 19B800607P184 | Metal film: 180K ohms $\pm 5\%$ , 1/8 w.                                 |
| R701                            | 19B800607P102 | Metal film: 1K ohms $\pm 5\%$ , 1/8 w.                                   |
| thru<br>R706                    |               |                                                                          |
| *R707                           | 19B800607P472 | Metal film: 4.7K ohms $\pm 5\%$ , 1/8 w.                                 |
| R708                            | 19B800607P473 | Metal film: 47K ohms $\pm 5\%$ , 1/8 w.                                  |
| and<br>R709                     |               |                                                                          |
| R710                            | 19B800607P103 | Metal film: 10K ohms $\pm 5\%$ , 1/8 w.                                  |
| thru<br>R712                    |               |                                                                          |
| R713                            | 19B800607P102 | Metal film: 1K ohms $\pm 5\%$ , 1/8 w.                                   |
| R714                            | 19B800607P103 | Metal film: 10K ohms $\pm 5\%$ , 1/8 w.                                  |
| R715                            | 19B800607P473 | Metal film: 47K ohms $\pm 5\%$ , 1/8 w.                                  |
| R716                            | 19B800607P103 | Metal film: 10K ohms $\pm 5\%$ , 1/8 w.                                  |
| R722                            | 19B800607P473 | Metal film: 47K ohms $\pm 5\%$ , 1/8 w.                                  |
| R723                            | 19B800607P391 | Metal film: 390 ohms $\pm 5\%$ , 1/8 w.                                  |
| R724                            | 19B800607P102 | Metal film: 1K ohms $\pm 5\%$ , 1/8 w.                                   |
| R725                            | 19B800607P273 | Metal film: 27K ohms $\pm 5\%$ , 1/8 w.                                  |
| thru<br>R727                    |               |                                                                          |
| R901                            | 19B800607P121 | Metal film: 120 ohms $\pm 5\%$ , 1/8 w.                                  |
| R902                            | 19B800607P331 | Metal film: 330 ohms $\pm 5\%$ , 1/8 w.                                  |
| R903                            | 19B800607P150 | Metal film: 15 ohms $\pm 5\%$ , 1/8 w.                                   |
| R904                            | 19B800607P331 | Metal film: 330 ohms $\pm 5\%$ , 1/8 w.                                  |
| R905                            | 19B800607P151 | Metal film: 150 ohms $\pm 5\%$ , 1/8 w.                                  |
| R906                            | 19B800607P181 | Metal film: 180 ohms $\pm 5\%$ , 1/8 w.                                  |
| R907                            | 19B800607P271 | Metal film: 270 ohms $\pm 5\%$ , 1/8 w.                                  |
| ----- INTEGRATED CIRCUITS ----- |               |                                                                          |
| U1                              | 19A705537P2   | Analog: MMIC, sim to AvanteK MSA0886.                                    |
| U201                            | 19A705927P1   | Silicon, bipolar: sim to AvanteK MSA-0611.                               |
| U202                            | 344A3907P1    | Analog: MMIC, sim to AvanteK MSA1105.                                    |
| U203                            | 19A705927P1   | Silicon, bipolar: sim to AvanteK MSA-0611.                               |
| U301                            | 19A704971P8   | Voltage Regulator, Positive: sim to Motorola MC78M05CDT.                 |
| U302                            | 19A116297P7   | Linear: Dual Op Amp; sim to MC4558CD.                                    |
| U401                            | 19A149944P201 | Digital : Prescaler, sim to MC12022A.                                    |
| U402                            | 19B800902P7   | Synthesizer, Custom: CMOS, Serial Input ( <i>Replaced 19B800902P5</i> ). |
| U403                            | 19A702293P3   | Linear: Dual Op Amp; sim to LM358D.                                      |
| U501                            | 19A702293P3   | Linear: Dual Op Amp; sim to LM358D.                                      |
| U502                            | 19A702705P4   | Digital: Quad Analog Switch/Multiplexer; sim to 4066BM.                  |
| U601                            | 19A116297P7   | Linear: Dual Op Amp; sim to MC4558CD.                                    |
| U701                            | 19A703483P302 | Digital: Quad 2-Input NAND Gate; sim to 74HC00.                          |
| U702                            | 19A703471P320 | Digital: 3-Line To 8-Line Decoder; sim to 74HC138.                       |
| U705                            | 19A703483P302 | Digital: Quad 2-Input NAND Gate; sim to 74HC00.                          |
| U901                            | 19A705927P1   | Silicon, bipolar: sim to AvanteK MSA-0611.                               |
| U902                            | RYT102217     | Silicon, bipolar. Prescaler, divide by 2.                                |
| U903                            | 19A705927P1   | Silicon, bipolar: sim to AvanteK MSA-0611.                               |

Continued

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**PARTS LIST**

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Continued

| SYMBOL                | PART NUMBER | DESCRIPTION                                                     |
|-----------------------|-------------|-----------------------------------------------------------------|
| VR601<br>and<br>VR602 | 19B235029P7 | ----- VOLTAGE REGULATORS -----<br>Variable Resistor: 5K, 0.5 W. |

|                          |          |                                                                                                                 |                         |                              |         |              |                   |                      |
|--------------------------|----------|-----------------------------------------------------------------------------------------------------------------|-------------------------|------------------------------|---------|--------------|-------------------|----------------------|
| Drawing Number           |          | PL01-CB101134V1                                                                                                 | Rev A                   |                              |         |              |                   |                      |
|                          |          |                                                                                                                 | Issued Aug 8, 2002      |                              |         |              |                   |                      |
|                          |          |                                                                                                                 | By Seyed Tabrian        |                              |         |              |                   |                      |
| DSP Modem Board          |          |                                                                                                                 |                         |                              |         |              |                   |                      |
| M/A-COM Wireless Systems |          |                                                                                                                 |                         |                              |         |              |                   |                      |
| 3315 Old Forest Rd.      |          |                                                                                                                 |                         |                              |         |              |                   |                      |
| Lynchburg, VA 24501      |          |                                                                                                                 |                         |                              |         |              |                   |                      |
|                          |          |                                                                                                                 |                         |                              |         |              |                   |                      |
|                          |          |                                                                                                                 |                         |                              |         |              |                   |                      |
| Item                     | Quantity | Reference                                                                                                       | Part                    | Description                  | Package | Manufacturer | Order Part Number | 2nd Src. Mfg         |
|                          |          |                                                                                                                 |                         |                              |         |              |                   | 2nd Src, Part Number |
|                          |          |                                                                                                                 |                         |                              |         |              |                   |                      |
|                          |          |                                                                                                                 |                         |                              |         |              |                   |                      |
| 1                        | 2        | C79,C80                                                                                                         | 22uF, AL, 6.3V, LOW E   | CAP, Alum Elect, Low ESR, 6. | 7953    | Panasonic    | ECGC0JB220R       |                      |
| 2                        | 3        | C73,C78,C85                                                                                                     | 22uF, TAN, 25V, 7343    | CAP, Tantalum, 25V +/-20%    | 7343    | AVX          | TAJD226M025R      |                      |
| 3                        | 9        | C18,C21,C25,C27,C35,C38,C44,C51,C53                                                                             | 10uF, TAN, 10V, 3216    | CAP, Tantalum, 10V +/-20%    | 3216    | AVX          | TAJA106M010R      |                      |
| 4                        | 5        | C1,C2,C14,C60,C61                                                                                               | 1.0uF, Y5V, 16V, 0805   | CAP, Ceramic Y5V, 16V, +/-10 | 0805    | AVX          | 0805YG105KAT2A    |                      |
| 5                        | 1        | C55                                                                                                             | 1.0uF, X7R, 16V, 1206   | CAP, Ceramic X7R, 16V, +/-10 | 1206    | AVX          | 1206YC105KAT2A    |                      |
| 6                        | 28       | C16,C17,C22,C23,C26,C28,C29,C30,C31,C34,C39,C41,C42,C43,C45,C50,C52,C56,C57,C58,C68,C69,C71,C72,C75,C77,C82,C84 | 0.1uF, X7R, 25V, 0805   | CAP, Ceramic X7R, 25V, +/-10 | 0805    | AVX          | 08053C104KAT2A    |                      |
| 7                        | 1        | C54                                                                                                             | 0.022uF, X7R, 50V, 0805 | CAP, Ceramic X7R, 50V, +/-10 | 0805    | AVX          | 08055C223KAT2A    |                      |
| 8                        | 1        | C32                                                                                                             | 0.047uF, X7R, 16V, 0603 | CAP, Ceramic X7R, 16V, +/-10 | 0603    | AVX          | 0603YC473KAT2A    |                      |
| 9                        | 26       | C3,C4,C5,C6,C7,C8,C9,C10,C11,C12,C13,C15,C20,C40,C62,C63,C64,C65,C66,C67,C70,C74,C86,C87,C88,C89                | 0.01uF, X7R, 16V, 0603  | CAP, Ceramic X7R, 16V, +/-10 | 0603    | AVX          | 0603YC103KAT2A    |                      |
| 10                       | 4        | C46,C76,C81,C83                                                                                                 | 1000pF, X7R, 50V, 0603  | CAP, Ceramic X7R, 50V, +/-10 | 0603    | AVX          | 06035C102KAT2A    |                      |
| 11                       | 1        | C37                                                                                                             | 220pF, NPO, 50V, 0603   | CAP, Ceramic NPO, 50V +/-10  | 0603    | AVX          | 06035A221KAT2A    |                      |
| 12                       | 1        | C36                                                                                                             | 100pF, NPO, 50V, 0603   | CAP, Ceramic NPO, 50V +/-10  | 0603    | AVX          | 06035A101KAT2A    |                      |
| 13                       | 13       | C19,C24,C33,C47,C48,C49,C59,C90,C91,C92,C93,C94,C95                                                             | 33pF, NPO, 50V, 0603    | CAP, Ceramic NPO, 50V +/-10  | 0603    | AVX          | 06035A330KAT2A    |                      |
| 14                       | 6        | RN1,RN2,RN3,RN4,RN5,RN6                                                                                         | 4.7K, BUS8              | RES NTWK BUS8, 0.063W, 5%    | SM      | CTS          | 745C101472JTR     |                      |
| 15                       | 1        | R27                                                                                                             | 0, 0603                 | RES, 0.063W, 5%              | 0603    | AVX          | CR10-000J-T       |                      |
| 16                       | 1        | R38                                                                                                             | 10, 0603                | RES, 0.063W, 5%              | 0603    | AVX          | CR10-100J-T       |                      |
| 17                       | 21       | R6,R7,R9,R40,R41,R43,R45,R46,R48,R49,R50,R52,R53,R54,R55,R58,R59,R60,R61,R102,R103                              | 30, 0603                | RES, 0.063W, 5%              | 0603    | AVX          | CR10-300J-T       |                      |
| 18                       | 2        | R21,R25                                                                                                         | 49.9, 1%, 0603          | RES, 0.063W, 1%              | 0603    | AVX          | CR10-49R0F-T      |                      |
| 19                       | 18       | R28,R47,R86,R87,R88,R89,R90,R91,R92,R93,R94,R95,R96,R97,R98,R99,R100,R101                                       | 100, 1%, 0603           | RES, 0.063W, 1%              | 0603    | AVX          | CR10-1000F-T      |                      |
| 20                       | 10       | R65,R66,R67,R68,R69,R70,R79,R80,R81,R82                                                                         | 560, 0603               | RES, 0.063W, 5%              | 0603    | AVX          | CR10-271J-T       |                      |
| 21                       | 2        | R22,R26                                                                                                         | 499, 1%, 0603           | RES, 0.063W, 1%              | 0603    | AVX          | CR10-4990F-T      |                      |
| 22                       | 5        | R73,R77,R78,R84,R85                                                                                             | 1.00K, 1%, 0603         | RES, 0.063W, 1%              | 0603    | AVX          | CR10-1001F-T      |                      |
| 23                       | 1        | R44                                                                                                             | 1.47K, 1%, 0603         | RES, 0.063W, 1%              | 0603    | AVX          | CR10-1471F-T      |                      |
| 24                       | 1        | R72                                                                                                             | 1.96K, 1%, 0603         | RES, 0.063W, 1%              | 0603    | AVX          | CR10-1961F-T      |                      |
| 25                       | 2        | R76,R71                                                                                                         | 3.09K, 1%, 0603         | RES, 0.063W, 1%              | 0603    | AVX          | CR10-3091F-T      |                      |
| 26                       | 1        | R39                                                                                                             | 3.32K, 1%, 0603         | RES, 0.063W, 1%              | 0603    | AVX          | CR10-3321F-T      |                      |
| 27                       | 1        | R62                                                                                                             | 3.40K, 1%, 0603         | RES, 0.063W, 1%              | 0603    | AVX          | CR10-3401F-T      |                      |
| 28                       | 25       | R1,R2,R3,R4,R5,R8,R10,R11,R12,R13,R14,R15,R16,R17,R18,R19,R20,R29,R33,R36,R51,R56,R57,R83,R104                  | 4.7K, 0603              | RES, 0.063W, 5%              | 0603    | AVX          | CR10-472J-T       |                      |
| 29                       | 1        | R75                                                                                                             | 5.90K, 1%, 0603         | RES, 0.063W, 1%              | 0603    | AVX          | CR10-5901F-T      |                      |
| 30                       | 9        | R23,R24,R30,R34,R35,R37,R63,R64,R74                                                                             | 10.0K, 1%, 0603         | RES, 0.063W, 1%              | 0603    | AVX          | CR10-1002F-T      |                      |
| 31                       | 1        | R42                                                                                                             | 11.8K, 1%, 0603         | RES, 0.063W, 1%              | 0603    | AVX          | CR10-1182F-T      |                      |
| 32                       | 1        | R32                                                                                                             | 35.7K, 1%, 0603         | RES, 0.063W, 1%              | 0603    | AVX          | CR10-3572F-T      |                      |
| 33                       | 1        | R31                                                                                                             | 66.5K, 1%, 0603         | RES, 0.063W, 1%              | 0603    | AVX          | CR10-6652F-T      |                      |
| 34                       | 1        | L17                                                                                                             | 70ohm, 1206             | FERRITE BEAD, 70 OHM, 300    | 1206    | FAIR-RITE    | 2512067007Y3      | MURATA               |
| 35                       | 2        | L18,L16                                                                                                         | 600ohm, 0805            | FERRITE BEAD, 600 OHM, 20    | 0805    | FAIR-RITE    | 2508056017Y0      | BLM31A601S           |
| 36                       | 26       | L1,L2,L3,L4,L5,L6,L8,L9,L10,L11,L12,L13,L14,L15,L19,L20,L21,L22,L23,L24,L25,L26,L27,L28,L29,L30                 | 600ohm, 0603            | FERRITE BEAD, 600 OHM, 10    | 0603    | FAIR-RITE    | 2506036017Y0      |                      |
| 37                       | 2        | L7,L31                                                                                                          | 39uH, 1008              | INDUCTOR, 39uH, 90mA         | 1008    | PANASONIC    | ELJ-FC390JF       |                      |
| 38                       | 2        | Q5,Q4                                                                                                           | BC856ALT1               | TRANSISTOR, PNP, 65V         | SOT23   | MOTOROLA     | BC856ALT1         | GENERAL SEMI         |
| 39                       | 9        | D3,D4,D5,D6,D7,D13,                                                                                             | MMBD7000LT1             | DIODE. SWITCHING             | SOT23   | MOTOROLA     | MMBD7000LT1       | GENERAL SEMI         |

| Item | Quantity | Reference                                                                                                                 | Part                 | Description              | Package | Manufacturer    | Order Part Number | 2nd Src. Mfg | 2nd Src, Part Number |
|------|----------|---------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------------|---------|-----------------|-------------------|--------------|----------------------|
|      |          | ,D19,D21,D22                                                                                                              |                      |                          |         |                 |                   |              |                      |
| 40   | 8        | D15,D16,D17,D18,D23,D24,<br>D25,D26                                                                                       | MMBZ5V6ALT1          | DIODE, DUAL ZENER        | SOT23   | MOTOROLA        | MMBZ5V6ALT1       | DIODES INC   | AZ23C5V6             |
| 41   | 1        | Q1                                                                                                                        | IRLML5103            | TRANSISTOR, PFET, 30V    | SOT23   | IR              | IRLML5103         |              |                      |
| 42   | 2        | Q3,Q2                                                                                                                     | IRLML2402            | TRANSISTOR, NFET, 20V    | SOT23   | IR              | IRLML2402         |              |                      |
| 43   | 5        | D8,D9,D10,D11,D12                                                                                                         | LED, GRN             | LED, GREEN, RT-ANGLE SM  | SM      | DIALIGHT        | 591-2301-013      |              |                      |
| 44   | 1        | J6                                                                                                                        | HEADER, 4X1, SM      | CONN, 4X1, 0.1           | SM      | AMP             | 146128-2          |              |                      |
| 45   | 1        | J3                                                                                                                        | HEADER, 6X1, SM      | CONN, 6X1, 0.1           | SM      | AMP             | 146128-4          |              |                      |
| 46   | 1        | J1                                                                                                                        | HEADER, 7X2, SM      | CONN, 7X2, 0.1           | SM      | AMP             | 146130-6          |              |                      |
| 47   | 2        | J9,J8                                                                                                                     | HEADER, 8X2, SM      | CONN, 8X2, 0.1           | SM      | AMP             | 146130-7          |              |                      |
| 48   | 3        | J10,J11,J12                                                                                                               | HEADER, 10X2, SM     | CONN, 10X2, 0.1          | SM      | AMP             | 146130-9          |              |                      |
| 49   | 3        | J2,J4,J5                                                                                                                  | JUMPER2              | JUMPER, 2-PIN            | TH      | AMP             | 103185-2          |              |                      |
| 50   | 1        | J7                                                                                                                        | DIN 96_ABC           | CONN, DIN TYPE-C W/ BRD  | TH      | AMP             | 650913-5          | BRUNDY       | PI96B80P00F00N9      |
| 51   | 1        | U1                                                                                                                        | TMS320VC5421PGE      | IC, DUAL CORE DSP        | PQFP144 | TI              | TMS320VC5421PGE   |              |                      |
| 52   | 1        | U2                                                                                                                        | 74HCT374PW           | IC, OCTAL D-FF'S         | TSOP20  | PHILIPS         | 74HCT374PW        | FAIRCHILD    | MM74HCT374MTC        |
| 53   | 1        | U3                                                                                                                        | AM29LV400BB90EC      | IC, 4M BOOT SECTOR FLASH | TSOP48  | AMD             | AM29LV400BB90EC   |              |                      |
| 54   | 2        | U4,U6                                                                                                                     | 74LVC245APW          | IC, OCTAL XCVR           | TSOP20  | PHILIPS         | 74LVC245APW       | TI           | SN74LVC245APWR       |
| 55   | 1        | U5                                                                                                                        | 74LVC244APW          | IC, OCTAL BUFFER         | TSOP20  | PHILIPS         | 74LVC244APW       | TI           | SN74LVC244APWR       |
| 56   | 2        | U19,U7                                                                                                                    | TLV2451CDBV          | IC, RAIL-TO-RAIL OP AMP  | SOT23   | TI              | TLV2451CDBV       |              |                      |
| 57   | 1        | U8                                                                                                                        | AD9241AS             | IC, A/D CONVERTER        | PQFP44  | ANALOG DEVICES  | AD9241AS          |              |                      |
| 58   | 1        | U9                                                                                                                        | CS4338               | IC, STEREO D/A           | SOIC8   | CIRRUS LOGIC    | CS4338-KS         |              |                      |
| 59   | 2        | U13,U10                                                                                                                   | TLV2461IDBV          | IC, RAIL-TO-RAIL OP AMP  | SOT23   | TI              | TLV2461IDBV       |              |                      |
| 60   | 1        | U11                                                                                                                       | AD73311LARS          | IC, A/D-D/A FRONT END    | SSOIC20 | ANALOG DEVICES  | AD73311LARS       |              |                      |
| 61   | 1        | U12                                                                                                                       | ADG704BRM            | IC, 4-CH MULTIPLEXER     | TSOP10  | ANALOG DEVICES  | ADG704BRM         |              |                      |
| 62   | 1        | U14                                                                                                                       | TLC2932IPWR          | IC, PHASE-LOCKED LOOP    | SOIC14  | TI              | TLC2932IPWR       |              |                      |
| 63   | 4        | U15,U16,U28,U29                                                                                                           | 74AHCT1G125          | IC, SINGLE TS BUFFER     | SOT353  | TI              | SN74AHCT1G125DCKR | PHILIPS      | 74AHCT1G125GW        |
| 64   | 1        | U17                                                                                                                       | XC95144XL-7TQ100     | IC, CPLD                 | TQFP100 | XILINX          | XC95144XL-7TQ100C |              |                      |
| 65   | 1        | U18                                                                                                                       | TLV5636CD            | IC, 12-BIT D/A           | SOIC8   | TI              | TLV5636CD         |              |                      |
| 66   | 1        | U21                                                                                                                       | TL16C550CPFB         | IC, UART                 | PQFP48  | TI              | TL16C550CPFB      |              |                      |
| 67   | 3        | U22,U23,U24                                                                                                               | MC33161D             | IC, VOLT MONITOR         | SOIC8   | MOTOROLA        | MC33161D          |              |                      |
| 68   | 1        | U25                                                                                                                       | REG103-5             | IC, LDO REGULATOR, 5V    | DDPAK-5 | BURR-BROWN      | REG103FA-5        |              |                      |
| 69   | 1        | U26                                                                                                                       | TPS70151PWP          | IC, DUAL LDO REGULATOR,  | TSOP20  | TI              | TPS70151PWP       |              |                      |
| 70   | 1        | U27                                                                                                                       | ADM1232ARN           | IC, uP SUPERVISOR        | SOIC8   | ANALOG DEVICES  | ADM1232ARN        |              |                      |
| 71   | 1        | U20                                                                                                                       | MAX3221ECAE          | IC, RS-232 TRANSCEIVER   | SSOP16  | MAXIM           | MAX3221ECAE       | INTERSIL     | ICL3221CA            |
| 72   | 1        | Y1                                                                                                                        | 2.4576MHz, SG636     | IC, 3.3V, 2.4576Mhz OSC  | SM      | EPSON           | SG-636PCE2.4576MC |              |                      |
| 73   | 1        | S2                                                                                                                        | SW, PB, NO/NC, DIP4  | SWITCH, PB NO/NC, RT-ANG | TH      | GRAYHILL        | 32-01             |              |                      |
| 74   | 1        | S1                                                                                                                        | SOCKET, TSOP, 48-PIN | SOCKET 48-PIN TSOP       | TSOP48  | EMULATION TECH  | S-TSO-SM-048-A    |              |                      |
| 75   | 23       | TP1,TP2,TP3,TP4,TP5,TP6,<br>TP7,TP8,TP9,TP10,TP11,<br>TP12,TP13,TP14,TP15,TP16,<br>TP17,TP18,TP19,TP20,TP28,<br>TP29,TP30 | TESTPT, WHT          | TEST POINT LOOP - WHITE  | TH      | COMPONENTS CORP | TP-105-01-09      |              |                      |
| 76   | 2        | TP21,TP22                                                                                                                 | TESTPT, RED          | TEST POINT LOOP - RED    | TH      | COMPONENTS CORP | TP-105-01-02      |              |                      |
| 77   | 5        | TP23,TP24,TP25,TP26,TP27                                                                                                  | TESTPT, BLK          | TEST POINT LOOP - BLACK  | TH      | COMPONENTS CORP | TP-105-01-00      |              |                      |
| 78   | 6        | FID1,FID2,FID3,FID4,FID5,<br>FID6                                                                                         | FIDUCIAL             | N/A                      | N/A     | N/A             | N/A               |              |                      |
| 79   | 8        | MH1,MH2,MH3,MH4,MH5,MH6,<br>MH7,MH8                                                                                       | MT HOLE 147          | N/A                      | N/A     | N/A             | N/A               |              |                      |
| 80   | 4        | MH9,MH10,MH11,MH12                                                                                                        | MT HOLE 50           |                          |         |                 |                   |              |                      |
| 81   | 1        | Y2                                                                                                                        | 12.288MHZ, VCXO      | IC, 5V, 12.288MHZ VCXO   | SM      | VECTRON         | VCUGLA-12.288MHZ  |              |                      |
| 91   | 1        | PWB                                                                                                                       | PB101133V1R2         |                          |         |                 |                   |              |                      |

STATION POWER SUPPLY  
19A149578P1  
ISSUE 2

| SYMBOL                           | PART NO.     | DESCRIPTION                                                                                 |
|----------------------------------|--------------|---------------------------------------------------------------------------------------------|
| ----- CAPACITORS -----           |              |                                                                                             |
| C1                               | M29/17032400 | Polypropylene: 8 uF, 660Vac. similar to Ronken P61A24805H05.                                |
| ----- FUSES -----                |              |                                                                                             |
| F1                               | M29/09013901 | Non-time delay Glass/Ferrule Fuse: 10 amps, 250V; similar to Bussmann AGC-10.               |
| F2                               | M29/09015200 | Quick blowing Fuse: 40 amps, 250V; similar to Bussmann NON-40.                              |
| F3                               | M29/09016300 | Slow Blow Fuse: 5 amps, 250V; similar to Bussmann MDL-5.                                    |
| ----- FUSE HOLDER & BLOCKS ----- |              |                                                                                             |
|                                  | M29/09014200 | Fuse Holder, screwdriver slot design: similar to Bussmann "MTB-961". (Used with F1 and F3). |
|                                  | M29/09014100 | Fuse Block: 31A to 60 amps, 250V; similar to Bussmann H25060-1C. (Used with F2).            |
| ----- TERMINAL BLOCKS -----      |              |                                                                                             |
| F801B                            | M29/30090900 | Terminal Strip: 45 amps, 250V, 4 position; sim to Bussmann 480304-NL. (REV. 0 and REV. A)   |
| F801B                            | M29/25011000 | Connector: 4 position; sim to AMP 641685-2. (REV. B only)                                   |
| ----- CONNECTOR -----            |              |                                                                                             |
| J801                             | M29/40027400 | Connector: 9 position; sim to Molex 03-09-1091.                                             |
| J802                             | M29/40028400 | Connector: 2 position; sim to AMP 350778-1. (Used in REV. B only)                           |
| P802                             | M29/40028500 | Connector: 2 position; sim to AMP 350777-1. (Used in REV. B only)                           |
| ----- INDUCTOR -----             |              |                                                                                             |
| L1                               | M29/289C3    | Output choke: .8 mH, 33 amps; similar to MagneTek 289C3. Includes W25 and W25.              |
| ----- RESISTORS -----            |              |                                                                                             |
| R1                               | M29/16012301 | Wirewound Resistor: 10 ohms, 50 W; similar to IRC PW-50E-10OHMS-5% (with bracket).          |
| ----- RECEPTACLES -----          |              |                                                                                             |
| RE1 and RE2                      | M29/40027800 | Receptacle: power, 3 wire grounding, 15 amps at 125V; similar to GE 5242-9.                 |
| ----- SWITCHES -----             |              |                                                                                             |
| S1                               | M29/20003300 | SPST: 16 amps, 125V switch; similar to carling RA911VBB0V.                                  |
| ----- TRANSFORMER -----          |              |                                                                                             |
| T1                               | M29/289CV1   | Ferro-Resonant Transformer. (REV. 0 only)                                                   |
| T1                               | M29/289CV5   | Ferro-Resonant Transformer. (REV. A and later)                                              |
| ----- WIRE HARNESS -----         |              |                                                                                             |
| W1 THRU W30                      | M29/289LW1   | WIRING HARNESS. (REV. 0)                                                                    |
| W1 THRU W30                      | M29/289LW1   | WIRING HARNESS. (REV. A)                                                                    |
| W31                              |              | Wire, black: J801 pin 9 to R1. (REV. A)                                                     |
| W1 THRU W34                      | M29/289LW11  | WIRING HARNESS. (REV. B)                                                                    |
| ----- MISCELLANEOUS -----        |              |                                                                                             |
|                                  | M29/07057300 | Front Fuse Cover. (REV. 0 only)                                                             |
|                                  | M29/07063300 | Front Fuse Cover. (REV. A and later)                                                        |

\*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

| SYMBOL                                                                                                                          | PART NO.     | DESCRIPTION                                                                                                                  |
|---------------------------------------------------------------------------------------------------------------------------------|--------------|------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                 | M29/07056600 | Top Cover. (REV. 0 only)                                                                                                     |
|                                                                                                                                 | M29/07062200 | Top Cover. (REV. A and later)                                                                                                |
|                                                                                                                                 | M29/07056700 | Front Panel. (REV. 0 only)                                                                                                   |
|                                                                                                                                 | M29/07062300 | Front Panel. (REV. A and later)                                                                                              |
|                                                                                                                                 | M29/07057400 | Back Cover.                                                                                                                  |
|                                                                                                                                 | M29/22043800 | Machine screw, torx head: 3.5m x 1/2; similar to Camcar/Textron Inc. Secures cover.                                          |
|                                                                                                                                 | M29/22027709 | Machine screw, hex head; No. 6-32 x .625" secures C1 to case.                                                                |
|                                                                                                                                 | M29/22041502 | Hex nut: No. 8-32, secures C1, R1, L1 and ground wire to case.                                                               |
|                                                                                                                                 | M29/05065600 | Bracket for C1; similar to GE K9827065P21.                                                                                   |
|                                                                                                                                 | M29/22041501 | Hex nut: No. 6-32 x .250, secures PCB.                                                                                       |
|                                                                                                                                 | M29/22043200 | Nylon Standoff, to keep PCB from case.                                                                                       |
|                                                                                                                                 | M29/11022000 | Strain relief, black similar to Heyco "1200". To secure W801 to case.                                                        |
|                                                                                                                                 | M29/22008708 | Machine Screw: 10-32 X 5/8", to secure fuse block to front panel and terminal block (F801B to case, REV. 0 and REV. A only). |
|                                                                                                                                 | M29/22041504 | ARCFLT NUT: 1/4-20 x 7/16, secures T1 to case                                                                                |
| HEAT SINK / PCB ASSEMBLY<br>M29/11022900 (REV. 0 only)<br>M29/11024600 (REV. A and later)<br>(Assembly includes the following:) |              |                                                                                                                              |
| ----- CAPACITORS -----                                                                                                          |              |                                                                                                                              |
| C2 thru C4                                                                                                                      |              | Aluminum electrolytic: 27000 uF, 25V; sim to UCC XME25VB273M35X50LL. (REV. 0 only)                                           |
| C2 thru C4                                                                                                                      |              | Aluminum electrolytic: 33000 uF, 25V; sim to UCC XME25VB333M35X50LL. (REV. A and later)                                      |
| C5 thru C7                                                                                                                      |              | Aluminum electrolytic: 27000 uF, 25V; sim to UCC XME25VB273M35X50LL.                                                         |
| ----- RECTIFIERS -----                                                                                                          |              |                                                                                                                              |
| D1 thru D3                                                                                                                      |              | Dual Schottky Rectifier: 30 amps, 60V; similar to G1 MBR3060.                                                                |
| ----- VARISTOR -----                                                                                                            |              |                                                                                                                              |
| VR1                                                                                                                             |              | Varistor: 150V, 80J metal oxide; similar to GE V150LA20A.                                                                    |
| ----- TERMINALS -----                                                                                                           |              |                                                                                                                              |
| TB1 thru TB8                                                                                                                    |              | FASTON tabs; similar to MagneTek "13048100".                                                                                 |
| ----- MISCELLANEOUS -----                                                                                                       |              |                                                                                                                              |
| NU1 thru NU5                                                                                                                    |              | ARCFLT NUT: 1/4-20, secures wire to PCB.                                                                                     |
| SC1 thru SC5                                                                                                                    |              | Screw, Hex head: 1/4-20 x .750 in.                                                                                           |
| W41 thru W45                                                                                                                    |              | Lock Washer: 1/4 internal tooth secures wire to PCB.                                                                         |
|                                                                                                                                 |              | Heatsink: .063" thick aluminum heat sink; similar to MagneTek 11021900.                                                      |
|                                                                                                                                 |              | Hex head screw: No. 4-40 x .5 with washer to secure D1-D3 to heat sink.                                                      |
|                                                                                                                                 |              | ARCFLT 4-40 nut: UNC-2B 1/4 in., used to secure D1-D3 to heat sink.                                                          |
|                                                                                                                                 |              | Heat Transfer Pad: To insure good thermal conductivity between D1-D3 and heat sink.                                          |
|                                                                                                                                 |              | Lock Washer: No. 4; used to secure D1-D3 to heat sink.                                                                       |

## 5.0 PARTS LIST

SYSTEM MODULE<sup>1</sup>

## 19D902590G7 - M III System Module with DSP

(Used in Multiple Receiver Applications)

## 19D902590G6 - M III System Module with DSP

| SYMBOL                                                                                                                                        | PART NUMBER   | DESCRIPTION                                                    |
|-----------------------------------------------------------------------------------------------------------------------------------------------|---------------|----------------------------------------------------------------|
| 2                                                                                                                                             | 19D902485P1   | Chassis                                                        |
| 3                                                                                                                                             | 19D902486P1   | Cover                                                          |
| 4                                                                                                                                             | 19D902555P1   | Handle.                                                        |
| 5                                                                                                                                             | 188D5498G1    | System Board                                                   |
| 6                                                                                                                                             | 19A702381P506 | Screw, thread forming: TORX, No. M3.5-.6 x 6.                  |
| 7                                                                                                                                             | 19A702381P513 | Screw, thread forming: TORX, No. M3.5 - 0.6 X                  |
| 8                                                                                                                                             | 19B232682P20  | Pad.                                                           |
| 9                                                                                                                                             | 19A702381P508 | Screw, thd. form: No. 3.5-0.6 x 8.                             |
| 10                                                                                                                                            | 188D5682G1    | DSP Board                                                      |
| 12                                                                                                                                            | 19A701431P1   | Silicon Compound                                               |
| 21                                                                                                                                            | 19D902485P3   | Casting, System Module Auxiliary Receiver                      |
| <p style="text-align: center;"><b>SYSTEM BOARD</b><br/> <b>188D5498 G1 - G2</b></p> <p style="text-align: center;">----- CAPACITORS -----</p> |               |                                                                |
| C1                                                                                                                                            | 19A702052P5   | Ceramic: 1000 pF + or -10%, 50 VDCW.                           |
| C2                                                                                                                                            | 19A702052P14  | Ceramic: 0.01 uF + or - 10%, 50 VDCW.                          |
| C3                                                                                                                                            | 19A702061P13  | Ceramic: 10 pF + or - 5%, 50 VDCW, temp coef 0 + or - 30 PPM.  |
| C4                                                                                                                                            | 19A702052P5   | Ceramic: 1000 pF + or -10%, 50 VDCW.                           |
| C5                                                                                                                                            | 19A702052P33  | Ceramic: 0.1 uF + or -10%, 50 VDCW.                            |
| C6<br>and<br>C7                                                                                                                               | 19A702052P114 | Ceramic: 0.01 uF + or - 5%, 50 VDCW.                           |
| C8                                                                                                                                            | 19A705205P5   | Tantalum: 6.8 uF, 10 VDCW; sim to Sprague 293D.                |
| C9                                                                                                                                            | 19A702052P28  | Ceramic: 0.022 uF + or -10%, 50 VDCW.                          |
| C10<br>and<br>C11                                                                                                                             | 19A702052P114 | Ceramic: 0.01 uF + or - 5%, 50 VDCW.                           |
| C12                                                                                                                                           | 19A702052P14  | Ceramic: 0.01 uF + or - 10%, 50 VDCW.                          |
| C13                                                                                                                                           | 19A705205P2   | Tantalum: 1 uF, 16 VDCW; sim to Sprague 293D.                  |
| C14                                                                                                                                           | 19A705205P6   | Tantalum: 10 uF, 16 VDCW; sim to Sprague 293D.                 |
| C15                                                                                                                                           | 19A702052P124 | Ceramic: 0.068 uF + or - 5%, 50 VDCW.                          |
| C16                                                                                                                                           | 19A702052P14  | Ceramic: 0.01 uF + or - 10%, 50 VDCW.                          |
| C17                                                                                                                                           | 19A705205P5   | Tantalum: 6.8 uF, 10 VDCW; sim to Sprague 293D.                |
| C18                                                                                                                                           | 19A702052P24  | Ceramic: 0.068 uF + or - 10%, 50 VDCW.                         |
| C19                                                                                                                                           | 19A702052P5   | Ceramic: 1000 pF + or -10%, 50 VDCW.                           |
| C21                                                                                                                                           | 19A702061P77  | Ceramic: 470 pF + or - 5%, 50 VDCW, temp coef 0 + or - 30 PPM. |
| C22                                                                                                                                           | 19A702052P14  | Ceramic: 0.01 uF + or - 10%, 50 VDCW.                          |

<sup>1</sup> COMPONENTS, ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.

| SYMBOL              | PART NUMBER   | DESCRIPTION                                                    |
|---------------------|---------------|----------------------------------------------------------------|
| C27<br>and<br>C28   | 19A705205P111 | Tantalum: 47 + or -10%, 10 VDCW; sim to Sprague                |
| C29<br>thru<br>C36  | 19A702052P5   | Ceramic: 1000 pF + or -10%, 50 VDCW.                           |
| C38                 | 19A702052P14  | Ceramic: 0.01 uF + or - 10%, 50 VDCW.                          |
| C39                 | 19A705205P5   | Tantalum: 6.8 uF, 10 VDCW; sim to Sprague 293D.                |
| C40                 | 19A705205P6   | Tantalum: 10 uF, 16 VDCW; sim to Sprague 293D.                 |
| C42<br>thru<br>C45  | 19A705205P6   | Tantalum: 10 uF, 16 VDCW; sim to Sprague 293D.                 |
| C46                 | 344A3431P1    | Monolithic: 1.0 uF +80/-20%, 16 VDCW.                          |
| C47<br>thru<br>C50  | 19A702052P114 | Ceramic: 0.01 uF + or - 5%, 50 VDCW.                           |
| C51                 | 19A702052P14  | Ceramic: 0.01 uF + or - 10%, 50 VDCW.                          |
| C52                 | 19A702061P37  | Ceramic: 33 pF + or -5%, 50 VDCW, temp coef 0 + or -30 PPM/°C. |
| C53                 | 19A702061P45  | Ceramic: 47 pF + or -5%, 50 VDCW, temp coef 0 + or -30 PPM.    |
| C58                 | 19A702052P14  | Ceramic: 0.01 uF + or - 10%, 50 VDCW.                          |
| C59<br>and<br>C60   | 19A702052P122 | Ceramic: 0.047 uF + or - 5%, 50 VDCW.                          |
| C61                 | 19A702052P26  | Ceramic: 0.1uF + or - 10%, 50 VDCW                             |
| C62<br>thru<br>C67  | 19A149791P1   | Metalized Polypropylene: 0.022 uH + or - 1%, 100 VDCW.         |
| C68<br>thru<br>C71  | 19A702052P14  | Ceramic: 0.01 uF + or - 10%, 50 VDCW.                          |
| C72<br>and<br>C73   | 19A702052P5   | Ceramic: 1000 pF + or -10%, 50 VDCW.                           |
| C74<br>thru<br>C79  | 19A702052P14  | Ceramic: 0.01 uF + or - 10%, 50 VDCW.                          |
| C80<br>thru<br>C84  | 19A702052P5   | Ceramic: 1000 pF + or -10%, 50 VDCW.                           |
| C87<br>thru<br>C95  | 19A702052P5   | Ceramic: 1000 pF + or -10%, 50 VDCW.                           |
| C96<br>and<br>C97   | 19A702052P14  | Ceramic: 0.01 uF + or - 10%, 50 VDCW.                          |
| C98<br>and<br>C99   | 19A702052P5   | Ceramic: 1000 pF + or -10%, 50 VDCW.                           |
| C100<br>and<br>C101 | 19A702052P14  | Ceramic: 0.01 uF + or - 10%, 50 VDCW.                          |
| C102                | 19A702052P5   | Ceramic: 1000 pF + or -10%, 50 VDCW.                           |
| C103                | 19A702052P14  | Ceramic: 0.01 uF + or - 10%, 50 VDCW.                          |
| C104                | 19A705205P111 | Tantalum: 47 + or -10%, 10 VDCW; sim to Sprague 293D.          |

## PARTS LIST

| SYMBOL                         | PART NUMBER   | DESCRIPTION                                                    |
|--------------------------------|---------------|----------------------------------------------------------------|
| C105<br>thru<br>C108           | 19A702052P5   | Ceramic: 1000 pF + or -10%, 50 VDCW.                           |
| C109<br>and<br>C110            | 19A702052P14  | Ceramic: 0.01 uF + or - 10%, 50 VDCW.                          |
| C111                           | 19A702052P114 | Ceramic: 0.01 uF + or - 5%, 50 VDCW.                           |
| C112                           | 19A702061P77  | Ceramic: 470 pF + or - 5%, 50 VDCW, temp coef 0 + or - 30 PPM. |
| C113                           | 19A702052P114 | Ceramic: 0.01 uF + or - 5%, 50 VDCW.                           |
| C114<br>and<br>C115            | 19A702236P17  | Ceramic: 4.7 pF + or -5%, 50 VDCW, temp coef 0 + or -30 PPM.   |
| C116                           | 19A702052P14  | Ceramic: 0.01 uF + or - 10%, 50 VDCW.                          |
| ----- DIODES -----             |               |                                                                |
| D1<br>thru<br>D5               | 19A700053P2   | Silicon: 2 Diodes in Series; sim to BAV99.                     |
| D7                             | 19A700053P2   | Silicon: 2 Diodes in Series; sim to BAV99.                     |
| D8<br>and<br>D9                | 19A702525P2   | Silicon, PIN: sim to MMBV3401.                                 |
| D10                            | 19A705377P4   | Silicon, Hot Carrier: sim to HSMS-2802.                        |
| D11                            | 19A702525P2   | Silicon, PIN: sim to MMBV3401.                                 |
| ----- INDICATING DEVICES ----- |               |                                                                |
| DS1<br>thru<br>DS3             | 19A703595P10  | Optoelectic: Red LED; sim to HP HLMP-1301-010.                 |
| ----- JACKS -----              |               |                                                                |
| J1                             | 19B801587P7   | Connector, DIN: 96 male contacts, right angle to AMP 650887-1. |
| J2<br>and<br>J3                | 19A704852P334 | Connector, printed wire board.                                 |
| ----- INDUCTORS -----          |               |                                                                |
| L1<br>and<br>L2                | 19A705470P53  | Coil, fixed.                                                   |
| ----- TRANSISTORS -----        |               |                                                                |
| Q2                             | 19A700076P2   | Silicon, NPN: sim to MMBT3904, low profile.                    |
| Q4<br>and<br>Q5                | 19A700076P2   | Silicon, NPN: sim to MMBT3904, low profile.                    |
| Q6                             | 344A3855P1    | Silicon, NPN.                                                  |
| Q7                             | 19A700076P2   | Silicon, NPN: sim to MMBT3904, low profile.                    |
| Q8                             | 19A700059P2   | Silicon, PNP: sim to MMBT3906, low profile.                    |
| Q9<br>thru<br>Q13              | 19A700076P2   | Silicon, NPN: sim to MMBT3904, low profile.                    |
| ----- RESISTORS -----          |               |                                                                |
| R1                             | 19B800607P103 | Metal film: 10K ohms + or -5%, 1/8 w.                          |
| R2                             | 19B800607P473 | Metal film: 47K ohms + or -5%, 1/8 w.                          |
| R3                             | 19A702931P301 | Metal film: 10K ohms + or -1%, 200 VDCW, 1/8 w.                |
| R4                             | 19B800607P153 | Metal film: 15K ohms + or -5%, 1/8 w.                          |
| R5                             | 19B800607P332 | Metal film: 3.3K ohms + or -5%, 1/8 w.                         |

| SYMBOL             | PART NUMBER   | DESCRIPTION                                       |
|--------------------|---------------|---------------------------------------------------|
| R6                 | 19A702931P301 | Metal film: 10K ohms + or -1%, 200 VDCW, 1/8 w.   |
| R7                 | 19A702931P249 | Metal film: 3160 ohms + or -1%, 200 VDCW, 1/8 w.  |
| R8                 | 19A702931P313 | Metal film: 13.3K ohms + or -1%, 200 VDCW, 1/8 w. |
| R9                 | 19B800607P103 | Metal film: 10K ohms + or -5%, 1/8 w.             |
| R11                | 19B800607P562 | Metal film: 5.6K ohms + or -5%, 1/8 w.            |
| R12                | 19B800607P103 | Metal film: 10K ohms + or -5%, 1/8 w.             |
| R13                | 19B800607P472 | Metal film: 4.7K ohms + or -5%, 1/8 w.            |
| R14                | 19B800607P272 | Metal film: 2.7K ohms + or -5%, 1/8 w.            |
| R15                | 19B800607P103 | Metal film: 10K ohms + or -5%, 1/8 w.             |
| R16                | 19B800607P1   | Metal film: Jumper.                               |
| R17                | 19A702931P369 | Metal film: 51.1K ohms + or -1%, 200 VDCW, 1/8 w. |
| R18                | 19B800607P103 | Metal film: 10K ohms + or -5%, 1/8 w.             |
| R19                | 19B800607P102 | Metal film: 1K ohms + or -5%, 1/8 w.              |
| R20                | 19B800607P103 | Metal film: 10K ohms + or -5%, 1/8 w.             |
| R21                | 19B800607P223 | Metal film: 22K ohms + or -5%, 1/8 w.             |
| R22                | 19B800607P102 | Metal film: 1K ohms + or -5%, 1/8 w.              |
| R23                | 19B800607P103 | Metal film: 10K ohms + or -5%, 1/8 w.             |
| R24                | 19B800607P122 | Metal film: 1.2K ohms + or -5%, 1/8 w.            |
| R25                | 19B800607P103 | Metal film: 10K ohms + or -5%, 1/8 w.             |
| R26                | 19A702931P384 | Metal film: 73.2K ohms + or -1%, 200 VDCW, 1/8 w. |
| R27                | 19A702931P388 | Metal film: 80.6K ohms + or -1%, 200 VDCW, 1/8 w. |
| R28                | 19A702931P358 | Metal film: 39.2K ohms + or -1%, 200 VDCW, 1/8 w. |
| R29                | 19A702931P383 | Metal film: 71.5K ohms + or -1%, 200 VDCW, 1/8 w. |
| R30                | 19A702931P384 | Metal film: 73.2K ohms + or -1%, 200 VDCW, 1/8 w. |
| R31                | 19B800607P103 | Metal film: 10K ohms + or -5%, 1/8 w.             |
| R32                | 19A702931P369 | Metal film: 51.1K ohms + or -1%, 200 VDCW, 1/8 w. |
| R33                | 19A702931P325 | Metal film: 17.8K ohms + or -1%, 200 VDCW, 1/8 w. |
| R34                | 19A702931P350 | Metal film: 32.4K ohms + or -1%, 200 VDCW, 1/8 w. |
| R35                | 19A702931P383 | Metal film: 71.5K ohms + or -1%, 200 VDCW, 1/8 w. |
| R36                | 19A702931P382 | Metal film: 69.8K ohms + or -1%, 200 VDCW, 1/8 w. |
| R37                | 19A702931P383 | Metal film: 71.5K ohms + or -1%, 200 VDCW, 1/8 w. |
| R39                | 19A702931P401 | Metal film: 100K ohms + or -1%, 1/8 w.            |
| R40                | 19B800607P103 | Metal film: 10K ohms + or -5%, 1/8 w.             |
| R41                | 19B800607P104 | Metal film: 100K ohms + or -5%, 1/8 w.            |
| R42                | 19B800607P103 | Metal film: 10K ohms + or -5%, 1/8 w.             |
| R43                | 19B800607P684 | Metal film: 680K ohms + or -5%, 1/8 w.            |
| R44                | 19B800607P473 | Metal film: 47K ohms + or -5%, 1/8 w.             |
| R45                | 19B800607P683 | Metal film: 68K ohms + or -5%, 1/8 w.             |
| R46                | 19B800607P103 | Metal film: 10K ohms + or -5%, 1/8 w.             |
| R47<br>and<br>R48  | 19B800607P681 | Metal film: 680 ohms + or -5%, 1/8 w.             |
| R49                | 19A702931P301 | Metal film: 10K ohms + or -1%, 200 VDCW, 1/8 w.   |
| R50                | 19A702931P388 | Metal film: 80.6K ohms + or -1%, 200 VDCW, 1/8 w. |
| R51<br>thru<br>R53 | 19B800607P472 | Metal film: 4.7K ohms + or -5%, 1/8 w.            |

## PARTS LIST

| SYMBOL              | PART NUMBER   | DESCRIPTION                                       |
|---------------------|---------------|---------------------------------------------------|
| R55<br>and<br>R56   | 19B800607P472 | Metal film: 4.7K ohms + or -5%, 1/8 w.            |
| R57<br>and<br>R58   | 19B800607P1   | Metal film: Jumper.                               |
| R59                 | 19B800607P102 | Metal film: 1K ohms + or -5%, 1/8 w.              |
| R60                 | 19B800607P471 | Metal film: 470 ohms + or -5%, 1/8 w.             |
| R61                 | 19A702931P413 | Metal film: 133K ohms + or -1%, 200 VDCW, 1/8 w.  |
| R62                 | 19A702931P327 | Metal film: 18.7K ohms + or -1%, 200 VDCW, 1/8 w. |
| R63                 | 19B800607P103 | Metal film: 10K ohms + or -5%, 1/8 w.             |
| R64                 | 19A702931P177 | Metal film: 619 ohms + or -1%, 200 VDCW, 1/8 w.   |
| R65                 | 19B800607P682 | Metal film: 6.8K ohms + or -5%, 1/8 w.            |
| R66                 | 19A702931P243 | Metal film: 2740 ohms + or -1%, 200 VDCW, 1/8 w.  |
| R67                 | 19B800607P103 | Metal film: 10K ohms + or -5%, 1/8 w.             |
| R68                 | 19B800607P153 | Metal film: 15K ohms + or -5%, 1/8 w.             |
| R69                 | 19B800607P103 | Metal film: 10K ohms + or -5%, 1/8 w.             |
| R70                 | 19B800607P104 | Metal film: 100K ohms + or -5%, 1/8 w.            |
| R78                 | 19A702931P222 | Metal film: 1650 ohms + or -1%, 200 VDCW, 1/8 w.  |
| R80<br>and<br>R81   | 19B800607P103 | Metal film: 10K ohms + or -5%, 1/8 w.             |
| R82                 | 19B800607P562 | Metal film: 5.6K ohms + or -5%, 1/8 w.            |
| R83                 | 19B800607P103 | Metal film: 10K ohms + or -5%, 1/8 w.             |
| R84                 | 19A702931P389 | Metal film: 82.5K ohms + or -1%, 200 VDCW, 1/8 w. |
| R85                 | 19A702931P434 | Metal film: 221K ohms + or -1%, 200 VDCW, 1/8 w.  |
| R86                 | 19A702931P383 | Metal film: 71.5K ohms + or -1%, 200 VDCW, 1/8 w. |
| R87                 | 19B800607P105 | Metal film: 1M ohms + or -5%, 1/8 w.              |
| R88                 | 19A702931P305 | Metal film: 11K ohms + or -1%, 200 VDCW, 1/8 w.   |
| R89                 | 19A702931P384 | Metal film: 73.2K ohms + or -1%, 200 VDCW, 1/8 w. |
| R90                 | 19A702931P358 | Metal film: 39.2K ohms + or -1%, 200 VDCW, 1/8 w. |
| R91                 | 19A702931P383 | Metal film: 71.5K ohms + or -1%, 200 VDCW, 1/8 w. |
| R92                 | 19A702931P384 | Metal film: 73.2K ohms + or -1%, 200 VDCW, 1/8 w. |
| R93                 | 19A702931P383 | Metal film: 71.5K ohms + or -1%, 200 VDCW, 1/8 w. |
| R94                 | 19A702931P388 | Metal film: 80.6K ohms + or -1%, 200 VDCW, 1/8 w. |
| R95                 | 19A702931P325 | Metal film: 17.8K ohms + or -1%, 200 VDCW, 1/8 w. |
| R96                 | 19A702931P383 | Metal film: 71.5K ohms + or -1%, 200 VDCW, 1/8 w. |
| R97                 | 19A702931P382 | Metal film: 69.8K ohms + or -1%, 200 VDCW, 1/8 w. |
| R98                 | 19A702931P383 | Metal film: 71.5K ohms + or -1%, 200 VDCW, 1/8 w. |
| R99                 | 19A702931P350 | Metal film: 32.4K ohms + or -1%, 200 VDCW, 1/8 w. |
| R100                | 19B800607P471 | Metal film: 470 ohms + or -5%, 1/8 w.             |
| R101                | 19B800607P102 | Metal film: 1K ohms + or -5%, 1/8 w.              |
| R102                | 19B800607P563 | Metal film: 56K ohms + or -5%, 1/8 w.             |
| R103                | 19B800607P123 | Metal film: 12K ohms + or -5%, 1/8 w.             |
| R104<br>and<br>R105 | 19B800607P472 | Metal film: 4.7K ohms + or -5%, 1/8 w.            |
| R106                | 19A702931P355 | Metal film: 36.5K ohms + or -1%, 200 VDCW, 1/8 w. |
| R107                | 19A702931P285 | Metal film: 7500 ohms + or -1%, 1/8 w.            |
| R108                | 19A702931P177 | Metal film: 619 ohms + or -1%, 200 VDCW, 1/8 w.   |

| SYMBOL              | PART NUMBER    | DESCRIPTION                                       |
|---------------------|----------------|---------------------------------------------------|
| R109                | 19B800607P102  | Metal film: 1K ohms + or -5%, 1/8 w.              |
| R110                | 19B800607P105  | Metal film: 1M ohms + or -5%, 1/8 w.              |
| R111                | 19B800607P102  | Metal film: 1K ohms + or -5%, 1/8 w.              |
| R112<br>and<br>R113 | 19A702931P401  | Metal film: 100K ohms + or -1%, 1/8 w.            |
| R114                | 19A702931P383  | Metal film: 71.5K ohms + or -1%, 200 VDCW, 1/8 w. |
| R115<br>and<br>R116 | 19B800607P391  | Metal film: 390 ohms + or -5%, 1/8 w.             |
| R117                | 19A702931P385  | Metal film: 75K ohms + or -1%, 200 VDCW, 1/8 w.   |
| R120                | 19B800607P103  | Metal film: 10K ohms + or -5%, 1/8 w.             |
| R121                | 19A702931P342  | Metal film: 26.7K ohms + or -1%, 200 VDCW, 1/8 w. |
| R122                | 19B800607P102  | Metal film: 1K ohms + or -5%, 1/8 w.              |
| R124                | 19A702931P325  | Metal film: 17.8K ohms + or -1%, 200 VDCW, 1/8 w. |
| R125                | 19B800607P103  | Metal film: 10K ohms + or -5%, 1/8 w.             |
| R126                | 19B800607P472  | Metal film: 4.7K ohms + or -5%, 1/8 w.            |
| R127                | 19B800607P104  | Metal film: 100K ohms + or -5%, 1/8 w.            |
| R128<br>and<br>R129 | 19A702931P222  | Metal film: 1650 ohms + or -1%, 200 VDCW, 1/8 w.  |
| R130                | 19A702931P422  | Metal film: 165K ohms + or -1%, 200 VDCW, 1/8 w.  |
| R132                | 19B800607P332  | Metal film: 3.3K ohms + or -5%, 1/8 w.            |
| R133<br>and<br>R134 | 19B800607P103  | Metal film: 10K ohms + or -5%, 1/8 w.             |
| R135                | 19A702931P313  | Metal film: 13.3K ohms + or -1%, 200 VDCW, 1/8 w. |
| R136<br>and<br>R137 | 19B800607P103  | Metal film: 10K ohms + or -5%, 1/8 w.             |
| R138                | 19A702931P285  | Metal film: 7500 ohms + or -1%, 1/8 w.            |
| R139                | 19A702931P389  | Metal film: 82.5K ohms + or -1%, 200 VDCW, 1/8 w. |
| R140                | REP 64 5626/22 | Metal film: 220K ohms + or -1%, 1/8 w.            |
| R141                | 19A702931P269  | Metal film: 5110 ohms + or -1%, 1/8 w.            |
| R142                | REP 64 5626/47 | Metal film: 470K ohms + or -1%, 1/8 w.            |
| R143                | 19A702931P436  | Metal film: 232K ohms + or -1%, 200 VDCW, 1/8 w.  |
| R144                | 19A702931P243  | Metal film: 2740 ohms + or -1%, 200 VDCW, 1/8 w.  |
| R145                | REP 64 5626/22 | Metal film: 220K ohms + or -1%, 1/8 w.            |
| R146                | REP 64 5626/47 | Metal film: 470K ohms + or -1%, 1/8 w.            |
| R147                | 19B800607P103  | Metal film: 10K ohms + or -5%, 1/8 w.             |
| R148                | 19B800607P153  | Metal film: 15K ohms + or -5%, 1/8 w.             |
| R149<br>thru<br>151 | 19B800607P103  | Metal film: 10K ohms + or -5%, 1/8 w.             |
| R152                | 19B800607P102  | Metal film: 1K ohms + or -5%, 1/8 w.              |
| R153                | 19B800607P103  | Metal film: 10K ohms + or -5%, 1/8 w.             |
| R155                | 19A702931P434  | Metal film: 221K ohms + or -1%, 200 VDCW, 1/8 w.  |
| R156                | 19A702931P406  | Metal film: 113K ohms + or -1%, 200 VDCW, 1/8 w.  |
| R157                | 19B800607P472  | Metal film: 4.7K ohms + or -5%, 1/8 w.            |
| R158                | 19A702931P383  | Metal film: 71.5K ohms + or -1%, 200 VDCW, 1/8 w. |
| R159                | 19B800607P472  | Metal film: 4.7K ohms + or -5%, 1/8 w.            |

## PARTS LIST

| SYMBOL                          | PART NUMBER    | DESCRIPTION                                                  |
|---------------------------------|----------------|--------------------------------------------------------------|
| R160                            | 19A702931P177  | Metal film: 619 ohms + or -1%, 200 VDCW, 1/8 w.              |
| R161                            | 19B800607P103  | Metal film: 10K ohms + or -5%, 1/8 w.                        |
| R162                            | 19B800607P474  | Metal film: 470K ohms + or -5%, 1/8 w.                       |
| R163                            | 19B800607P102  | Metal film: 1K ohms + or -5%, 1/8 w.                         |
| R164                            | 19B800607P472  | Metal film: 4.7K ohms + or -5%, 1/8 w.                       |
| R165                            | 19B800607P682  | Metal film: 6.8K ohms + or -5%, 1/8 w.                       |
| R166                            | 19A702931P355  | Metal film: 36.5K ohms + or -1%, 200 VDCW, 1/8 w.            |
| R167                            | 19A702931P325  | Metal film: 17.8K ohms + or -1%, 200 VDCW, 1/8 w.            |
| R168                            | 19A702931P305  | Metal film: 11K ohms + or -1%, 200 VDCW, 1/8 w.              |
| R169                            | 19A702931P393  | Metal film: 90.9K ohms + or -1%, 200 VDCW, 1/8 w.            |
| R170<br>and<br>R171             | 19B800607P472  | Metal film: 4.7K ohms + or -5%, 1/8 w.                       |
| R172<br>and<br>R173             | 19B800607P474  | Metal film: 470K ohms + or -5%, 1/8 w.                       |
| R174                            | 19A702931P313  | Metal film: 13.3K ohms + or -1%, 200 VDCW, 1/8 w.            |
| R175                            | 19B800607P333  | Metal film: 33K ohms + or -5%, 1/8 w.                        |
| R176                            | 19A702931P222  | Metal film: 1650 ohms + or -1%, 200 VDCW, 1/8 w.             |
| R177                            | 19A702931P269  | Metal film: 5110 ohms + or -1%, 1/8 w.                       |
| R178                            | 19B800607P474  | Metal film: 470K ohms + or -5%, 1/8 w.                       |
| R179                            | 19A702931P385  | Metal film: 75K ohms + or -1%, 200 VDCW, 1/8 w.              |
| R180                            | 19A702931P413  | Metal film: 133K ohms + or -1%, 200 VDCW, 1/8 w.             |
| R181                            | 19A702931P130  | Metal film: 200 ohms + or -1%, 200 VDCW, 1/8 w.              |
| R183                            | 19B800607P183  | Metal film: 18K ohms + or -5%, 1/8 w.                        |
| R185                            | REP 64 5625/47 | Metal film: 47K ohms + or -1%, 1/8 w.                        |
| R186                            | 19B800607P472  | Metal film: 4.7K ohms + or -5%, 1/8 w.                       |
| R187                            | 19B800607P473  | Metal film: 47K ohms + or -5%, 1/8 w.                        |
| R188                            | 19B800607P104  | Metal film: 100K ohms + or -5%, 1/8 w.                       |
| R189                            | 19B800607P1    | Metal film: 0 ohms + or -5%, 1/8 w.                          |
| R190                            | 19B800607P103  | Metal film: 10K ohms + or -5%, 1/8 w.                        |
| R193                            | 19B800607P561  | Metal film: 560K ohms + or -5%, 1/8 w.                       |
| ----- SWITCHES -----            |                |                                                              |
| S2<br>thru<br>S4                | 19A705959P3    | Toggle, SPDT: right-angle mount; sim to C&K T101-M-H9-A-B-E. |
| ----- INTEGRATED CIRCUITS ----- |                |                                                              |
| U1                              | RYT 123 6089/C | Microcomputer: 8-bit extended I/O; sim to Kawasaki KS152.    |
| U2                              | 19A703471P302  | Digital: Octal Data Latch; sim to 74HC373.                   |
| U3                              | 19A703471P320  | Digital: 3-Line To 8-Line Decoder; sim to 74HC138.           |
| U4                              | 344A3307G17    | EPROM KIT.                                                   |
| U5                              | 19A705603P6    | Digital: 8K X8 bit Static CMOS SRAM; sim to K M6264AL-10.    |
| U6                              | RYT 118 029/2C | EEPROM: 2K X 8, 5 Volts, programmable; sim to XICOR 28HC64.  |
| U7                              | 19A704380P319  | Digital: CMOS Octal Data Flip-Flop; sim to 74HC377.          |
| U8                              | 19A702705P5    | Digital: Triple 2-Channel Analog Multiplexer; sim to 4053BM. |
| U9                              | 344A3070P3     | Digital: JFET, Input quad Op Amp; sim to TL074.              |
| U10                             | 19A704883P2    | Digital: Quad Op Amp; sim to MC3303D.                        |
| U11                             | 19A116297P7    | Linear: Dual Op Amp; sim to MC4558CD.                        |
| U12                             | 19A702705P5    | Digital: Triple 2-Channel Analog Multiplexer; sim to 4053BM. |

| SYMBOL             | PART NUMBER   | DESCRIPTION                                                             |
|--------------------|---------------|-------------------------------------------------------------------------|
| U13                | 19A704883P2   | Digital: Quad Op Amp; sim to MC3303D.                                   |
| U14                | 19A702705P3   | Digital: 8-Channel Analog Multiplexer; sim to 4051BM.                   |
| U15                | 344A3856P101  | Analog: 8-Channel Single Ended Multiplexer; sim to SILICONIX DG408/409. |
| U16<br>and<br>U17  | 19A704883P2   | Digital: Quad Op Amp; sim to MC3303D.                                   |
| U18                | 19A704380P302 | Digital: CMOS Dual Data Flip-Flop; sim to 74HC74.                       |
| U19                | 19A149895P1   | Digital: Microprocessor Supervisory; sim to MAX 691C.                   |
| U20                | 19A116180P575 | Digital: Hex Open Collector Inverter; sim to 7406.                      |
| U21                | 19A703995P3   | Digital: High speed logic, hex inverter, unbuffered; sim to 74HCU0-4.   |
| U22                | 344A3039P201  | Digital: Driver/receiver, EIA-232D/V.28; sim to MC145406.               |
| U24                | 19A705980P101 | Tranxceiver, differential Bus; sim to SN751768.                         |
| U25                | 19A703471P316 | Digital: Driver/receiver, octal 3-state noninverting buffer; sim        |
| U26                | 19A116180P575 | Digital: Hex Open Collector Inverter; sim to 7406.                      |
| U27                | 19A705979P101 | Digital: CMOS A/D; sim to TL549CP.                                      |
| U28                | 19A704380P302 | Digital: CMOS Dual Data Flip-Flop; sim to 74HC74.                       |
| U29                | 19A149466P301 | Digital: CMOS, Programmable Timer; sim to Intel 82C54.                  |
| U30                | 19A704883P2   | Digital: Quad Op Amp; sim to MC3303D.                                   |
| U31                | 344A3070P3    | Digital: JFET, Input quad Op Amp; sim to TL074.                         |
| U32<br>and<br>U33  | 19A702705P3   | Digital: 8-Channel Analog Multiplexer; sim to 4051BM.                   |
| U34                | 19A705991P101 | Digital: Programmable interface; sim to Harris C82C55A.                 |
| U35<br>and<br>U36  | 344A3041P201  | Digital: dual in-line potentiometers, ceramic, to DS1267S-10.           |
| U37                | 19A704883P2   | Digital: Quad Op Amp; sim to MC3303D.                                   |
| U40                | 19A116180P575 | Digital: Hex Open Collector Inverter; sim to 7406.                      |
| U41                | 19A700176P101 | Digital: Hex Inverting Buffer/Converter; sim to 4049UBD.                |
|                    |               | ----- SOCKETS -----                                                     |
| XU4                | 19A705840P2   | Socket: sim to Amp 643646-3.                                            |
|                    |               | ----- CRYSTALS -----                                                    |
| Y1                 | 19A702511G37  | Crystal, 14.7456 MHz.                                                   |
|                    |               | <b>DSP BOARD</b><br><b>188D5682 G1</b>                                  |
|                    |               | ----- CAPACITORS -----                                                  |
| C2<br>thru<br>C4   | 19A702052P26  | Ceramic: 0.1uF + or - 10%, 50 VDCW                                      |
| C6<br>thru<br>C15  | 19A702052P26  | Ceramic: 0.1uF + or - 10%, 50 VDCW                                      |
| C16<br>and<br>C17  | 19A702061P29  | Ceramic: 22 pF + or - 5%, 50 VDCW, temp coef 0 + or - 30 PPM.           |
| C18<br>thru<br>C22 | 19A705205P6   | Tantalum: 10 uF, 16 VDCW; sim to Sprague 293D.                          |
| C24                | 19A702052P107 | Ceramic: 2200 pF + or - 5%, 50 VDCW.                                    |
| C25                | 19A702061P53  | Ceramic: 68 pF + or - 5%, 50 VDCW, temp coef 0 + or - 30 PPM.           |
| C26                | 19A702052P120 | Ceramic: 0.033 uF + or - 5%, 50 VDCW.                                   |

## PARTS LIST

| SYMBOL                | PART NUMBER   | DESCRIPTION                                                 |
|-----------------------|---------------|-------------------------------------------------------------|
| C27<br>and<br>C28     | 19A705205P19  | Tantalum: 2.2 uF, 10 VDCW; sim to Spargue 293D.             |
| C29                   | 19A702052P134 | Ceramic: 0.1 uF + or - 5%, 25 VDCW.                         |
| C30                   | 19A702052P112 | Ceramic: 6800 pF + or - 5%, 50 VDCW.                        |
| C31                   | 19A702052P105 | Ceramic: 1000 pF + or - 5%, 50 VDCW.                        |
| C32                   | 19A702052P142 | Ceramic: 0.082 uF + or - 5%, 16 VDCW.                       |
| C33<br>and<br>C34     | 19A702052P112 | Ceramic: 6800 pF + or - 5%, 50 VDCW.                        |
| C35                   | 19A702052P105 | Ceramic: 1000 pF + or - 5%, 50 VDCW.                        |
| C38                   | 19A702061P45  | Ceramic: 47 pF + or -5%, 50 VDCW, temp coef 0 + or -30 PPM. |
| ----- DIODES -----    |               |                                                             |
| D1                    | 19A700053P2   | Silicon: 2 Diodes in Series; sim to BAV99.                  |
| D2                    | 19A705377P4   | Silicon, Hot Carrier: sim to HSMS-2802.                     |
| ----- PLUGS -----     |               |                                                             |
| P2<br>and<br>P3       | 19A704779P14  | Connector, 15 pin.                                          |
| ----- RESISTORS ----- |               |                                                             |
| R2                    | 19B800607P1   | Metal film: Jumper.                                         |
| R4                    | 19B800607P1   | Metal film: Jumper.                                         |
| R5<br>and<br>R6       | REP645625/47  | Metal film: 47K ohms + or -5%, 1/8 w.                       |
| R7                    | 19B800607P1   | Metal film: Jumper.                                         |
| R10                   | 19B800607P1   | Metal film: Jumper.                                         |
| R12<br>and<br>R13     | 19B800607P1   | Metal film: Jumper.                                         |
| R14<br>and<br>R15     | 19A702931P355 | Metal film: 36.5K ohms + or -1%, 200 VDCW, 1/8 w.           |
| R16                   | 19A702931P318 | Metal film: 15K ohms + or -1%, 200 VDCW, 1/8 w.             |
| R17                   | 19A702931P401 | Metal film: 100K ohms + or -1%, 1/8 w.                      |
| R18                   | REP645623/56  | Metal film: 560 ohms + or -5%, 1/8 w.                       |
| R20                   | REP645624/33  | Metal film: 3.3K ohms + or -5%, 1/8 w.                      |
| R21                   | 19B800607P103 | Metal film: 10K ohms + or -5%, 1/8 w.                       |
| R23<br>thru<br>R27    | 19B800607P103 | Metal film: 10K ohms + or -5%, 1/8 w.                       |
| R28<br>and<br>R29     | 19B800607P102 | Metal film: 1K ohms + or -5%, 1/8 w.                        |
| R30                   | 19A702931P418 | Metal film: 150K ohms + or -1%, 200 VDCW, 1/8 w.            |
| R31                   | 19A702931P318 | Metal film: 15K ohms + or -1%, 200 VDCW, 1/8 w.             |
| R32                   | 19A702931P209 | Metal film: 1210 ohms + or -1%, 200 VDCW, 1/8 w.            |
| R33                   | 19A702931P369 | Metal film: 51.1K ohms + or -1%, 200 VDCW, 1/8 w.           |
| R34                   | 19A702931P331 | Metal film: 20.5K ohms + or -1%, 200 VDCW, 1/8 w.           |
| R35                   | 19A702931P201 | Metal film: 1000 ohms + or -1%, 200 VDCW, 1/8 w.            |
| R36                   | 19A702931P317 | Metal film: 14.7K ohms + or -1%, 200 VDCW, 1/8 w.           |
| R37                   | 19A702931P331 | Metal film: 20.5K ohms + or -1%, 200 VDCW, 1/8 w.           |

| SYMBOL             | PART NUMBER   | DESCRIPTION                                                   |
|--------------------|---------------|---------------------------------------------------------------|
| R38                | 19A702931P377 | Metal film: 61.9K ohms + or -1%, 200 VDCW, 1/8 w.             |
| R39                | 19A702931P307 | Metal film: 11.5K ohms + or -1%, 200 VDCW, 1/8 w.             |
| R40                | 19A702931P347 | Metal film: 30.1K ohms + or -1%, 200 VDCW, 1/8 w.             |
| R41<br>and<br>R42  | 19A702931P157 | Metal film: 383 ohms + or -1%, 200 VDCW, 1/8 w.               |
| R43                | 19A702931P339 | Metal film: 24.9K ohms + or -1%, 200 VDCW, 1/8 w.             |
| R44                | 19A702931P347 | Metal film: 30.1K ohms + or -1%, 200 VDCW, 1/8 w.             |
| R45                | 19A702931P307 | Metal film: 11.5K ohms + or -1%, 200 VDCW, 1/8 w.             |
| R46                | 19A702931P294 | Metal film: 9310 ohms + or -1%, 200 VDCW, 1/8 w.              |
| R47                | 19A702931P265 | Metal film: 4640 ohms + or -1%, 200 VDCW, 1/8 w.              |
| R48                | REP645625/18  | Metal film: 18 ohms + or -1%, 200 VDCW, 1/8 w.                |
| R49<br>thru<br>R51 | 19A702931P201 | Metal film: 1000 ohms + or -1%, 200 VDCW, 1/8 w.              |
| R55                | 19A702931P301 | Metal film: 10K ohms + or -1%, 200 VDCW, 1/8 w.               |
| R56                | 19A702931P339 | Metal film: 24.9K ohms + or -1%, 200 VDCW, 1/8 w.             |
| R57                | 19A702931P301 | Metal film: 10K ohms + or -1%, 200 VDCW, 1/8 w.               |
|                    |               | ----- INTEGRATED CIRCUITS -----                               |
| U1                 | 344A3038P101  | Digital: DSP microcomputer, oper freq. 40.96 ADSP210KX-40.    |
| U4<br>and<br>U5    | 19A705827P1   | Encoder/Decoder: sim to Texas Instruments TCM29C23.           |
| U6                 | 344A3309G5    | EPROM KIT                                                     |
| U7                 | 344A3064P203  | Digital: Octal Data Flip-Flop; sim to 74HCT377.               |
| U8                 | 344A3064P201  | Digital: 3-To-8 Line Decoder/Demultiplexer; sim to 74HCT138.  |
| U9                 | 344A3064P204  | Digital: Octal Buffer/Line Driver; sim to 74HCT541.           |
| U10                | 19A702705P5   | Digital: Triple 2-Channel Analog Multiplexer; sim to 4053BM.  |
| U11                | 19A704883P2   | Digital: Quad Op Amp; sim to MC3303D.                         |
| U12                | 344A3040P201  | Digital: SRAM, 1K X 8 Dual port; sim to IDT7130SA100.         |
| U13                | 344A3064P202  | Digital: Octal Transparent Latch; sim to 74HCT373.            |
| U15                | 344A3041P201  | Digital: dual in-line potentiometers, ceramic, to DS1267S-10. |
| U16                | 344A3070P3    | Digital: JFET, Input quad Op Amp; sim to TL074.               |
| U17                | 19A702705P5   | Digital: Triple 2-Channel Analog Multiplexer; sim to 4053BM.  |
| U18                | 344A3070P3    | Digital: JFET, Input quad Op Amp; sim to TL074.               |
|                    |               | ----- SOCKETS -----                                           |
| XU6                | 19A705840P2   | Socket: sim to Amp 643646-3.                                  |
|                    |               | ----- CRYSTALS -----                                          |
| Y1                 | 19A702511G30  | Crystal, quartz: 8.192 MHz.                                   |

UHF stations: - Cont.

Front End: Cont.

The preferred method of tuning for the RX Front End is using the MASTR III module test fixture and associated procedures. This is required to sweep tune stations for more than one RX frequency. However, when using one frequency, one can peak tune the RX Front End as follows (reference alignment procedure in LBI-38673):

1) Place the RX FE on an extender card and connect the LO out of the RX Synthesizer and the IF out of the Front End to the IF module with 50Ω coax.

2) Preset the Front End tuning slugs per the appropriate RX FE LBI.

3) Using an RF signal generator, put in an "on channel" RF signal into the RF In on the Front End module.

4) While monitoring the RSSI metering function, adjust the RF level of the generator to the responsive range of the meter.

5) Tune the Front End tuning slugs for a peak on the RSSI meter, reduce the input signal level as necessary to keep the meter in the responsive reading range.

The IF requires no tuning.

VHF stations:

Synthesizers:

TX Synthesizer: Tuning is not required for the TX Synthesizer but the Dip switches must be set as follows:

| Freq. Range (MHz) | SW1A   | SW1B   | SW1C   | SW1D   |
|-------------------|--------|--------|--------|--------|
| 160-174           | OPEN   | OPEN   | OPEN   | OPEN   |
| 150-162           | CLOSED | OPEN   | CLOSED | OPEN   |
| 142-152           | OPEN   | CLOSED | OPEN   | CLOSED |
| 136-144           | CLOSED | CLOSED | CLOSED | CLOSED |

RX Synthesizer: Same as 800 MHz for the RX Synthesizer. Programmable bandwidth is ± 1 MHz.

Front End:

Same as UHF.

| MASTR III STATION T/R SHELF<br>19D902839G1 |               |                                                                                       |
|--------------------------------------------|---------------|---------------------------------------------------------------------------------------|
| SYMBOL                                     | PART NO.      | DESCRIPTION                                                                           |
| A1                                         |               | ----- ASSEMBLIES -----<br><b>BACKPLANE BOARD<br/>19D902947G1</b><br>----- JACKS ----- |
| J1 thru J9                                 | 19B801587P8   | Connector, DIN: 96-position; sim to AMP 650963-4.                                     |
| J10                                        | 19B801587P11  | Connector, DIN: 96-position, right angle mounting; sim to AMP 650895-4.               |
| P1                                         | 19A704852P135 | ----- PLUGS -----<br>Printed Wiring Board Connector.                                  |
| P2                                         | 19A704852P146 | Connector, printed wire, two part: 16 contacts; sim to Dupont Berg 22-12-2164.        |
| P3                                         | 19A704852P148 | Connector, printed wire, two part: 16 contacts; sim to Dupont Berg 22-12-2164.        |
| P4                                         | 19A704852P136 | Printed Wiring Board Connector.                                                       |
| P5                                         | 19A704852P155 | Printed Wiring Board Connector.                                                       |
| A2                                         |               | <b>INTERFACE BOARD<br/>19D902975G1</b><br>----- CAPACITORS -----                      |
| C101 and C102                              | 7486445P5     | Electrolytic, non polarized: 4 µF -10 + 100%, 150 VDCW.                               |
| C103                                       | 19A700121P106 | Ceramic: 0.1 µF ±20%, 50 VDCW.                                                        |
| C104                                       | 19A701225P3   | Electrolytic: 220 µF, -10+50%, 25 VDCW.                                               |
| C105                                       | 19A700121P106 | Ceramic: 0.1 µF ±20%, 50 VDCW.                                                        |
| C106                                       | 19A701534P5   | Tantalum: 2.2 µF, ±20%, 35 VDCW.                                                      |
| C107                                       | 19A701225P3   | Electrolytic: 220 µF, -10+50%, 25 VDCW.                                               |
| C108                                       | 19A701534P7   | Tantalum: 10 µF ±20%, 16 VDCW.                                                        |
| C109                                       | 162B3688P422K | Ceramic: 0.22 µF ±20%, 50 VDCW.                                                       |
| C112 and C113                              | 19A701534P5   | Tantalum: 2.2 µF, ±20%, 35 VDCW.                                                      |
| C114                                       | 19A701534P8   | Tantalum: 22 µF ±20%, 16 VDCW.                                                        |
| C115 thru C119                             | 19A700121P106 | Ceramic: 0.1 µF ±20%, 50 VDCW.                                                        |
| C121                                       | 19A701534P6   | Tantalum: 4.7 µF ±20%, 35 VDCW.                                                       |
| C124                                       | 19A701534P5   | Tantalum: 2.2 µF, ±20%, 35 VDCW.                                                      |
| C125                                       | 19A701225P3   | Electrolytic: 220 µF -10 +50%, 25 VDCW.                                               |
| C126                                       | T644ACP310K   | Polyester: 0.01 µF, 50 VDCW.                                                          |
| D101 thru D103                             | 19A700028P1   | ----- DIODES -----<br>Silicon: 75 mA, 75 PIV; sim to 1N4148.                          |
| D104                                       | 19A703595P10  | Optoelectronic LED: Red; sim to HP HLMP-1301-010.                                     |
| D105 thru D108                             | 344A3799P9    | Zener: 6.8 volts; sim to 1N4736A.                                                     |
| D109 thru D112                             | T324ADP1041   | Silicon: Rectifier; sim to 1N4004.                                                    |
| D113                                       | 19A700025P8   | Silicon, zener: 400 mW max; sim to BZX55-C6V8.                                        |
| D114                                       | 19A700025P11  | Silicon, zener: 400 mW max; sim to BZX55-C12.                                         |
| D115 and D116                              | T324ADP1041   | Silicon: Rectifier; sim to 1N4004.                                                    |
| D117 and D118                              | 19A700025P9   | Silicon, zener: 400 mW max; sim to BZX55-C8V2.                                        |
| D119                                       | 19A115250P1   | Silicon, fast recovery, 225 mA, 50 PIV.                                               |
| D121                                       | 19A115250P1   | Silicon, fast recovery, 225 mA, 50 PIV.                                               |
| D123                                       | 19A115250P1   | Silicon, fast recovery, 225 mA, 50 PIV.                                               |
| D125                                       | 19A700025P4   | Silicon, Zener: 400 mA max; sim to BZX55-C3V9.                                        |

NOTE: COMPONENTS ARE ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.

| SYMBOL         | PART NO.      | DESCRIPTION                                                                           |
|----------------|---------------|---------------------------------------------------------------------------------------|
| D126 and D127  | 19A700028P1   | Silicon, 75 mA, 75 PIV; sim to 1N4148.                                                |
| F101 thru F106 | 19A702169P3   | ----- FUSES -----<br>Enclosed link, .375 Amps @ 125 volts; sim to Littlefuse 255.375. |
| J101           | 344A3288P1    | ----- JACKS -----<br>Modular jack: 6-position; sim to AMP 520425-3.                   |
| J102           | 19J706197P3   | Connector: 8 contacts; sim to AMP Type 520251-4.                                      |
| J103           | 19B209727P43  | Connector: Plug.                                                                      |
| J104 and J105  | 19A702104P2   | Connector: Shorting Jumper, Gold Plated. (Housing Color: White).                      |
| J107           | 19B209727P17  | Connector: 25 contacts; sim to AMP 205738-2.                                          |
| J108           | 19B209727P43  | Connector: Plug.                                                                      |
| J109           | 344A3288P3    | Telephone: 6 positions, 6 contacts, right angle.                                      |
| P101           | 19B801587P6   | ----- PLUGS -----<br>Connector, DIN: 96 male contacts; sim to AMP 531796-1.           |
| P102           | 19A705822P1   | Power connector, 4 positions; sim to Amp Cat. #641737-1.                              |
| P103           | 19A704852P32  | Printed wire, two part: 6 contacts, sim to Molex 22-29-2061.                          |
| P104 and P105  | 19A704852P2   | Connector: 3 Pin Male Header.                                                         |
| P106           | 19A700072P28  | Printed wire: 2 contacts rated @ 2.5 amps; sim to Molex 22-27-2021.                   |
| P107           | 19A704852P29  | Connector; sim to: Molex 22-29-2031.                                                  |
| P108           | 19A705512P1   | Connector, RF SMB Series: sim to AMP No. 221111-1.                                    |
| P109           | 19A700072P28  | Printed wire: 2 contacts rated @ 2.5 amps; sim to Molex 22-27-2021.                   |
| P110           | 19A704852P132 | Connector: 2 circuits; sim to Molex 22-12-2024.                                       |
| P111           | 19A700072P28  | Printed wire: 2 contacts rated @ 2.5 amps; sim to Molex 22-27-2021.                   |
| Q101 and Q102  | 19A705953P1   | ----- TRANSISTORS -----<br>Silicon, NPN: sim to MPSA43.                               |
| Q103 and Q104  | 19A700023P2   | Silicon, NPN: sim to 2N3904.                                                          |
| Q108           | 19A700023P2   | Silicon, NPN: sim to 2N3904.                                                          |
| Q109           | 19A700054P1   | Silicon, NPN, 60 w; sim to BD-201.                                                    |
| Q110 thru Q113 | 19A700023P2   | Silicon, NPN: sim to 2N3904.                                                          |
| R101           | 19B235632P1   | ----- RESISTORS -----<br>Variable, conductive plastic: 1000 ohms.                     |
| R102           | 19B235632P2   | Variable, conductive plastic: 10K ohms.                                               |
| R103 and R104  | H212CRP022C   | Deposited carbon: 22 ohms ±5%, 1/4 w.                                                 |
| R105 and R106  | H212CRP910C   | Deposited carbon: 1 ohm ±5%, 1/4 w.                                                   |
| R107 thru R110 | 19A700113P74  | Composition: 3.0K ohms ±5%, 1/2 w.                                                    |
| R111           | H212CRP410C   | Deposited carbon: 100K ohms ±5%, 1/4 w.                                               |
| R112           | H212CRP510C   | Deposited carbon: 1M ohms ±5%, 1/4 w.                                                 |
| R113 and R114  | H212CRP315C   | Deposited carbon: 15K ohms ±5%, 1/4 w.                                                |
| R115 thru R118 | 19A700113P74  | Composition: 3.0K ohms ±5%, 1/2 w.                                                    |
| R119           | H212CRP310C   | Deposited carbon: 10K ohms ±5%, 1/4 w.                                                |
| R120           | H212CRP510C   | Deposited carbon: 1M ohms ±5%, 1/4 w.                                                 |
| R121           | H212CRP310C   | Deposited carbon: 10K ohms ±5%, 1/4 w.                                                |
| R122           | H212CRP510C   | Deposited carbon: 1M ohms ±5%, 1/4 w.                                                 |

| SYMBOL         | PART NO.      | DESCRIPTION                                |
|----------------|---------------|--------------------------------------------|
| R124           | H212CRP247C   | Deposited carbon: 4.7K ohms ±5%, 1/4 w.    |
| R125           | H212CRP356C   | Deposited carbon: 56K ohms ±5%, 1/4 w.     |
| R126           | H212CRP118C   | Deposited carbon: 180 ohms ±5%, 1/4 w.     |
| R127           | H212CRP015C   | Deposited carbon: 15 ohms ±5%, 1/4 w.      |
| R128           | H212CRP910C   | Deposited carbon: 1 ohm ±5%, 1/4 w.        |
| R129           | 19A700113P162 | Composition: 1.0 ohms ±5%, 1/2 w.          |
| R130           | H212CRP410C   | Deposited carbon: 100K ohms ±5%, 1/4 w.    |
| R131           | H212CRP310C   | Deposited carbon: 10K ohms ±5%, 1/4 w.     |
| R132           | H212CRP315C   | Deposited carbon: 15K ohms ±5%, 1/4 w.     |
| R133           | H212CRP510C   | Deposited carbon: 1M ohms ±5%, 1/4 w.      |
| R134           | H212CRP220C   | Deposited carbon: 2.0K ohms ±5%, 1/4 watt. |
| R135           | H212CRP310C   | Deposited carbon: 10K ohms ±5%, 1/4 w.     |
| R136           | H212CRP322C   | Deposited carbon: 22K ohms ±5%, 1/4 w.     |
| R137           | H212CRP127C   | Deposited carbon: 270 ohms ±5%, 1/4 w.     |
| R138           | H212CRP247C   | Deposited carbon: 4.7K ohms ±5%, 1/4 w.    |
| R139           | H212CRP210C   | Deposited carbon: 1K ohms ±5%, 1/4 w.      |
| R144 thru R150 | H212CRP210C   | Deposited carbon: 1K ohms ±5%, 1/4 w.      |
| R151           | H212CRP191C   | Deposited carbon: 910 ohms ±5%, 1/4 w.     |
| R152           | H212CRP110C   | Deposited carbon: 100 ohms ±5%, 1/4 w.     |
| R153           | H212CRP191C   | Deposited carbon: 910 ohms ±5%, 1/4 w.     |
| R154           | H212CRP251C   | Deposited carbon: 5.1K ohms ±5%, 1/4 w.    |
| R155           | H212CRP239C   | Deposited carbon: 3.9K ohms ±5%, 1/4 w.    |
| R156           | H212CRP310C   | Deposited carbon: 10K ohms ±5%, 1/4 w.     |
| R157           | H212CRP282C   | Deposited carbon: 8.2K ohms ±5%, 1/4 w.    |
| R158           | H212CRP147C   | Deposited carbon: 470 ohms ±5%, 1/4 w.     |
| R162           | 19A700113P73  | Deposited carbon: 2.7k ohms ±5%, 1/4 W.    |
| R163           | H212CRP315C   | Deposited carbon: 15K ohms ±5%, 1/4 w.     |
| R164           | H212CRP412C   | Deposited carbon: 0.12M ohms ±5%, 1/4 w.   |
| R165           | H212CRP312C   | Deposited carbon: 12K ohms ±5%, 1/4 w.     |
| R166           | 19A700050P11  | Wirewound: 0.68 ohms ±10%, 2 w.            |
| R167           | H212CRP220C   | Deposited carbon: 2.0K ohms ±5%, 1/4 watt. |
| R168           | H212CRP420C   | Deposited carbon: 200K ohms ±5%, 1/4 w.    |
| R175 thru R178 | H212CRP210C   | Deposited carbon: 1K ohms ±5%, 1/4 w.      |
| R179 thru R182 | H212CRP147C   | Deposited carbon: 470 ohms ±5%, 1/4 w.     |
| R183           | H212CRP247C   | Deposited carbon: 4.7K ohms ±5%, 1/4 w.    |
| R184           | H212CRP312C   | Deposited carbon: 12K ohms ±5%, 1/4 w.     |
| R185           | H212CRP147C   | Deposited carbon: 470 ohms ±5%, 1/4 w.     |
| R186           | H212CRP210C   | Deposited carbon: 1K ohms ±5%, 1/4 w.      |
| R187           | H212CRP247C   | Deposited carbon: 4.7K ohms ±5%, 1/4 w.    |
| R188           | H212CRP210C   | Deposited carbon: 1K ohms ±5%, 1/4 w.      |
| R189 and R190  | H212CRP356C   | Deposited carbon: 56K ohms ±5%, 1/4 w.     |
| R191           | H212CRP247C   | Deposited carbon: 4.7K ohms ±5%, 1/4 w.    |
| R192           | H212CRP356C   | Deposited carbon: 56K ohms ±5%, 1/4 w.     |
| R193           | H212CRP247C   | Deposited carbon: 4.7K ohms ±5%, 1/4 w.    |
| R194           | H212CRP356C   | Deposited carbon: 56K ohms ±5%, 1/4 w.     |
| R195           | H212CRP510C   | Deposited carbon: 1M ohms ±5%, 1/4 w.      |
| R196           | H212CRP156C   | Deposited carbon: 560 ohms ±5%, 1/4 w.     |
| R197           | H212CRP247C   | Deposited carbon: 4.7K ohms ±5%, 1/4 w.    |
| R198           | H212CRP322C   | Deposited carbon: 22K ohms ±5%, 1/4 w.     |
| R199           | H212CRP324C   | Ceramic film: 24K ohms, .2 w.              |
| R200           | H212CRP510C   | Deposited carbon: 1M ohms ±5%, 1/4 w.      |
| R201           | H212CRP356C   | Deposited carbon: 56K ohms ±5%, 1/4 w.     |
| R202           | H212CRP247C   | Deposited carbon: 4.7K ohms ±5%, 1/4 w.    |

| SYMBOL           | PART NO.      | DESCRIPTION                                                               |
|------------------|---------------|---------------------------------------------------------------------------|
| R203 thru R205   | H212CRP051C   | Ceramic film: 51 ohms, .2 w.                                              |
| R206             | H212CRP147C   | Deposited carbon: 470 ohms ±5%, 1/4 w.                                    |
| R207             | H212CRP310C   | Deposited carbon: 10K ohms ±5%, 1/4 w.                                    |
| R208             | H212CRP322C   | Deposited carbon: 22K ohms ±5%, 1/4 w.                                    |
|                  |               | ----- VARSITORS -----                                                     |
| SG101 thru SG106 | 19A701783P3   | Arrester, electrical surge (MOV): sim to V150La20A.                       |
|                  |               | ----- TRANSFORMERS -----                                                  |
| T101 and T102    | 19A705947P2   | Audio: 600 ohm impedance.                                                 |
|                  |               | ----- TERMINAL BOARDS -----                                               |
| TB101            | 19A705820P5   | Terminal Block.                                                           |
|                  |               | ----- TEST POINTS -----                                                   |
| TP1 thru TP3     | 344A3367P1    | Test point.                                                               |
|                  |               | ----- INTEGRATED CIRCUITS -----                                           |
| U101 thru U103   | 19A705952P1   | Optoisolator; sim to 4N38.                                                |
| U104             | 19A701830P1   | Linear: Audio AMPLIFIER; sim to TDA2003.                                  |
| U105             | 19A703987P21  | Digital: CMOS Shift resistor with parallel I/O; sim to 74HC299.           |
| U106             | 19A703987P24  | Digital: CMOS 8-Bit shift register with tri-state outputs; sim to 74HC595 |
| U107             | 19A704445P1   | Digital: CMOS 1-of-8 Decoder/Demulti- plexer; sim to 74HC138.             |
| U108             | 19A705180P2   | Digitally Controlled Potentiometer: 40 - 10K ohms; sim to X9103P.         |
| U109             | 19A703483P11  | Digital: CMOS Quad 2-Input OR Gate; sim to 74HC32.                        |
| U110             | 19A701789P1   | Linear: Quad Op Amp; sim to LM324.                                        |
| U111             | 19A703483P11  | Digital: CMOS Quad 2-Input OR Gate; sim to 74HC32.                        |
| U112             | 19A705180P2   | Digitally Controlled Potentiometer: 40 - 10K ohms; sim to X9103P.         |
| U113             | 19A701789P1   | Linear: Quad Op Amp; sim to LM324.                                        |
| U114             | 19A700029P38  | Digital: CMOS Triple 2 Channel Multiplexer.                               |
|                  |               | ----- SOCKETS -----                                                       |
| XK1 and XK2      | 19A700156P9   | Socket, IC: 16 Pins, Tin Plated.                                          |
| XK3A             | 19A700156P7   | Socket, IC: 14 Pins, Tin Plated.                                          |
| XK3B             | 19A700156P7   | Socket, IC: 14 Pins, Tin Plated.                                          |
|                  |               | ----- MISCELLANEOUS -----                                                 |
| 5                | 19A702917P7   | Heat Sink, Transistor: Sim to Thermalloy Cat 6030B-TT.                    |
| 6                | 19A702364P308 | Machine screw, TORX Drive: No. M3-0.5 x 8.                                |
| 7                | 19A700032P5   | Lockwasher, internal tooth: No. 3MM.                                      |
| 8                | 19A700034P4   | Nut, hex: No. M3 x 0.5MM.                                                 |
| 9                | 19A705469P1   | Insulator Plate, TO-220.                                                  |
|                  |               | ----- JACKS -----                                                         |
| J1 and J2        | 19A115938P13  | Connector, receptacle.                                                    |
|                  |               | ----- LOUDSPEAKERS -----                                                  |
| LS1              | 344A3136P1    | Speaker, permanent magnet.                                                |
|                  |               | ----- MISCELLANEOUS -----                                                 |
| 2                | 19D902721P1   | Chassis.                                                                  |
| 3                | 19B801732P1   | Speaker cloth.                                                            |
| 4                | 19B801706P1   | Knob.                                                                     |
| 5                | 19A700032P5   | Lockwasher, internal tooth: No. 3MM.                                      |
| 6                | 19A123224P10  | Button plug.                                                              |
| 7                | 19A702381P506 | Screw, threaded.                                                          |
| 8                | 19A700034P4   | Nut, hex: No. M3 x 0.5MM.                                                 |

PRODUCTION CHANGES

Changes in the equipment to improve performance or to simplify circuits are identified by a "Revision Letter" which is stamped after the model number of the unit. The revision stamped on the unit includes all previous revisions. Refer to the Parts List for the descriptions of parts affected by these revisions.

REV. A - INTERFACE BOARD 19D902975G1

To add new features to board including SOR and DSP. New board is backward compatible.  
Added C125, D119-D127, R132-R134 and R186-R205, Q110-Q113 and I111-U114.  
Changed C103, C105, C109, C115-C119, D105-D108, R111, R158, R179-R182 and R185.  
C103, C105, C109 and C115-C119 were: Tantalum: 0.1 µF ±20%, 35 VDCW.  
D105-D108 were: 19J706030P2.  
R111 was: H212CRP310C - 10K ohms ±5%, 1/4 w.  
R158 was: H212CRP247C - 4.7K ohms ±5%, 1/4 w.  
R179-R182 were: H212CRP247C - 4.7K ohms ±5%, 1/4 w.  
R185 was: H212CRP247C - 10K ohms ±5%, 1/4 w.

REV. B - INTERFACE BOARD 19D902975G1

To make RX\_1\_MUTE Logic Level compatible with GETC level requirement. Added R206 and buffer U111 between RX\_1\_MUTE and the base of Q110.

REV. A - BACKPLANE BOARD 19D902947G1

To support GETC and 2nd receiver applications, the printed wire board was changed. Also connectors P1, P3 and P6 changed.

REV. B - BACKPLANE BOARD 19D902947G1

To correct errors on printed wire board, the board was changed. Connections to J6, J7, J8 and J9, pin 7 were renamed.

REV. C - INTERFACE BOARD 19D902975G1

Adds alarm capabilities for EDACS configuration. Permits alarm capabilities of Power Monitor Unit functions. Added J108, J109, P110, P111 and R207.

REV. C - BACKPLANE BOARD 19D902947G1

Add alarm capability in EDACS configuration. New PWB.

REV. D - INTERFACE BOARD 19D902975G1

To eliminate high frequency oscillation.  
C109 was 0.1µF (19A700121P106)  
C126 added - 0.01µF (T644ACP310K)  
R208 added - 22K ohms (H212CRP322C).

REV. E - INTERFACE BOARD 19D902975G1

To improve operation of the manual squelch control.  
Changed resistor R162.

Resistor R162 was H212CRP247C, 4.7k Ohms.

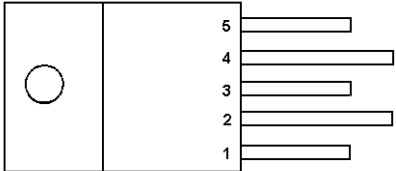
REV. F - INTERFACE BOARD 19D902975G1

To reverse the insertion position of capacitor C124 and to relay-out the board to have several components automatically inserted.

Relayed-out the board to auto insert capacitors C105 and C106 and resistor R127.

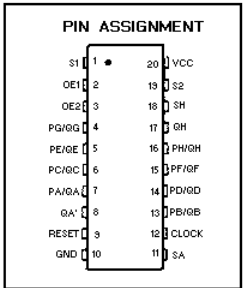
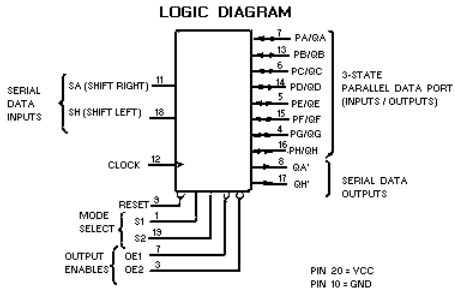
Connected capacitor C124 with the positive end on U110, Pin 14 and the negative end on U110, Pin 13.

U104  
Audio Amplifier  
19A701830P1

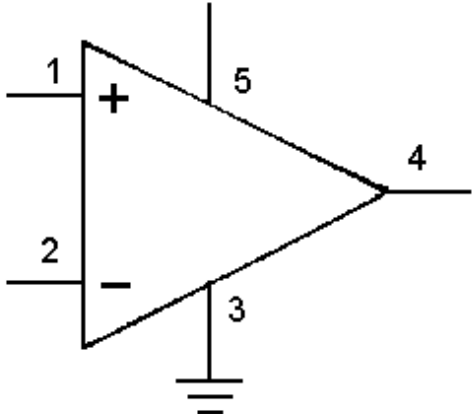


PIN IDENTIFICATION

U105  
Shift Register  
Parallel Output  
19A703987P21



U110 & U113  
Quad OP Amp  
19A701789P1



| INPUTS        |       |             |    |    |     |     |       |    |    | RESPONSE                                               |       |       |       |       |       |       |       |         |    |
|---------------|-------|-------------|----|----|-----|-----|-------|----|----|--------------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|---------|----|
| Mode          | Reset | Mode Select | S2 | S1 | OE1 | OE2 | Clock | DA | DH | PA/QA                                                  | PB/QB | PC/QC | PD/QD | PE/QE | PF/QF | PG/OG | PH/QH | QA' QH' |    |
| Reset         | L     | X           | L  | L  | L   | L   | X     | X  | X  | L                                                      | L     | L     | L     | L     | L     | L     | L     | L       | L  |
| Shift Right   | H     | L           | H  | H  | X   | H   | X     | X  | X  | Shift Right: QA through QH = Z; DA - FA; FA - FB; etc. |       |       |       |       |       |       |       | D       | QG |
| Shift Left    | H     | L           | H  | H  | L   | L   | X     | X  | X  | Shift Left: QA through QH = Z; DA - FA; FA - FB; etc.  |       |       |       |       |       |       |       | D       | QG |
| Parallel Load | H     | H           | H  | X  | X   | X   | X     | X  | X  | Parallel Load: FN - FN                                 |       |       |       |       |       |       |       | PA      | PH |
| Hold          | H     | L           | L  | L  | H   | X   | X     | X  | X  | Hold: QA through QH = Z; FN = FN                       |       |       |       |       |       |       |       | PA      | PH |

Z = high impedance  
D = data on serial input  
F = flip-flop (see Logic Diagram)  
t/when one or both output controls are high the eight input/output terminals are disabled to the high-impedance state; however, sequential operation or clearing of the register is not affected.