DIGITAL BOARD (CONT'D)

4.4.6 UART

The UART performs parallel to serial and serial to parallel conversion. The serial format used is a 9-bit format with start and stop bits. The serial transmission speed is 19200 bps. The UART appears as eight registers visible in the I/O space of the DSP starting at every multiple of 0008h from 0000h to 07FFh. U11 performs the address decoding by selecting the UART when both IS* and A15 are low. Crystal Y2 along with the internal oscillator of the UART provides the clock required to generate the correct bit rate on the serial output of the UART.

When the UART receives a new serial word or is ready to accept a new word to send from the DSP, it generates an interrupt on INTRN. This pin is connected to one of the hardware interrupt lines on the DSP. The DSP responds by reading the status register in the UART and by answering accordingly.

4.4.7 ADSIC

The ADSIC is a complex custom IC which performs many analog-to-digital, digital-to-analog, and purely digital functions as previously described. The ADSIC has four internal registers accessible by the DSP. They are selected through the use of address lines A15, A14, A13, A2, A1, A0, IS* (IS* needs to be inverted with U4 to be compatible with the logic level required by the ADSIC), RD*, and WR*. Two of these registers are read-only while the two others are write-only. Therefore, they can be accessed as two locations in the I/O spaces. Due to the decoding performed, those locations appear at the following addresses: Fxx0h, Fxx1h, Fxx8h, Fxx9h, Exx0h, Exx1h, Exx8h, and Exx9h.

Crystal Y1 along with the internal oscillator in the ADSIC provide a 20 MHz clock. This clock signal is used internally by the ADSIC and is also multiplied by two to provide a 40 MHz clock to the DSP. The frequency of the clock can be electronically shifted a small amount by controlling varicap D1 through the OSCW pin (U3-97). This removes interference created on some channels by the clock.

The ADSIC and DSP exchange the sampled receive data and the sampled VCO modulation signal through a serial port. This serial port consists of pins SCKR*, RFS, RxD, TxD, SCKT, and TFS on the ADSIC. U21 and U1 modify the relative phase of TxD and TFS to be compatible with the timing required on the serial port of the DSP.

SDO is the output of the internal speaker DAC. MAI is the input of the internal microphone attenuator and is followed by the microphone ADC.

The ADSIC is configured partially by the DSP through its data and address bus (see preceding). However, most of the configuring is provided through an SPI compatible serial bus. This SPI serial bus consists of pins SEL*, SPD, and SCLK. The other side of this bus is connected to the controller on the Keypad Board.

4.5 KEYPAD BOARD

4.5.1 INTRODUCTION

The Keypad Board contains a microcontroller, LCD Display, Display Driver, Audio circuits, and Power supply. The Keypad Board interfaces with the Digital board via J4, with the Top Control rigid flex circuit via J13, and with the side buttons, PTT switch, and accessory connector through J5.

4.5.2 FUNCTIONAL DESCRIPTION

The microcontroller provides an interface between the hardware and the DSP (on the Digital Board). When the user presses or rotates a control such as the channel selector switch, a side option or PTT switch, or a keypad key, the microcontroller signals the change to the DSP. Conversely, when the DSP needs to change the display or an LED, it signals the microcontroller which then performs the action. The microcontroller also controls peripheral ICs such as the synthesizer, reference oscillator, display, and ADSIC.

The microcontroller uses a serial bus to communicate with the DSP and another RS232 bus to communicate with the side port connector. The side connector bus is used for external communication with a computer running the programming or tuning software. Finally, the microcontroller maintains certain operating parameters in the associated EEPROM which is controlled via a two-wire serial bus.

KEYPAD BOARD (CONT'D)

4.5.3 MICROCONTROLLER

The microcontroller is a Motorola M68HC08XL36 chip. It includes 28K bytes of internal ROM memory and 1K byte of internal SRAM. It does not have an external bus and therefore cannot access any external program memory.

The clock to the microcontroller is provided by Y1 and an internal oscillator. The frequency of the clock can be slightly offset by polarizing the base of Q3 through software control. This prevents RF interference on some channels caused by the clock.

The microcontroller contains an SPI-compatible synchronous serial bus. This bus consists of pins MISO (U1-53), MOSI (U1-52), SPSCK (U1-50), and a chip enable for each device with which it communicates. The devices which communicate with the microcontroller through this bus are as follows:

- Top Display driver chip (Top Display board)
- Front Display driver chip (Digital board)
- ADSIC chip (Digital board)
- Reference Oscillator (RF Board)
- Front-End DAC (RF Board)
- Synthesizer chip (RF Board)
- Optional DES board.

The microcontroller communicates with the DSP chip (Digital board) through a custom serial bus. This serial port includes pins PTA3 (U1-8), PTA4 (U1-9), PTA5 (U1-10), PTA6 (U1-11), and PTA7 (U1-12).

The microcontroller uses its SCI asynchronous serial bus for external communication with a computer running programming or tuning software. The SCI pins RxD (U1-42) and TxD (U1-43) are connected to RS232 driver receiver U5. The other signals of a standard RS232 computer port (DSR, DTR, CTS, RTS) are generated using microcontroller input/outputs.

The RS232 driver U5 converts signals from a logic level of 0 and 5 V to a logic level of –10 and +10V. The chip contains an internal charge pump to generate –10V and +10V from the 5V power supply. The RS232 chip can be put in standby mode by leaving the line K/F-RS232* floating. This line is connected to the side connector which allows it to turn on U5 only when a computer is connected to the radio.

The keypad interfaces with the microcontroller through eight lines (4 rows x 4 columns). The microcontroller regularly polls these lines to detect a key closure.

Serial EEPROM U3 is used to store some important radio parameters. The EEPROM is read to or written from using I/O lines PTC6 and PTC7 of the microcontroller. PTC6 is used for the Data line, and PTC7 is used as a clock line.

Shift register U14 expands the number of I/O lines of the microcontroller. It uses the same data and clock as the EEPROM plus an additional line (U1-45) to control the latch. Other user interface inputs such as the PTT and toggle switches are directly connected to an I/O line of the microcontroller.

4.5.4 LOW VOLTAGE DETECT

Voltage comparator U4 detects a low voltage condition and communicates this information to the microcontroller through the pin PTC5 (U1-30). The microcontroller can also detect through I/O IRQ2* (U1-62) that a battery is connected.

4.5.5 LCD DISPLAYS AND DISPLAY DRIVERS

The radio has two displays which each have eight characters, several icons and a backlight. One display is located on the Keypad Board while the other display is located on the Top Display Board. Each display is driven by its own driver. The drivers are programmed by the microcontroller through the SPI bus. Both display drivers are connected to the common PI bus but are individually addressable so that the displays may show different information at the same time.

4.5.6 AUDIO CIRCUITS

The audio circuits on the Keypad/Display Board consist of four op amps, two audio power amplifiers, and an analog switch.

In receive mode, the analog receive waveform created by the ADSIC (on the Digital Board) is fed to an op amp summing amplifier (U9B). This amplifier sums in the audio tones that are generated by the microcontroller. The output of the summing amplifier

is then fed through the volume control potentiometer to a second op amp buffer.

The buffer output is routed to a pair of audio power amplifiers: one to drive the internal speaker and another to drive the external speaker. Only one of these audio power amplifiers can be active at a time. The active power amplifier is selected by the OPT SEL 1 line (J5-12). The MUTE line turns the active power amplifier on or off by disconnecting the battery voltage from the audio power amplifier IC using the transistor Q4. Transistors Q8 and Q9 and their associated RC networks remove popping sounds from the speaker audio by delaying the unmuting of the audio amp compared to the unMUTE command.

In transmit mode, the audio for transmission can be selected from either an internal or external microphone, depending upon the presence of an external microphone and which PTT is pressed. An analog switch is used to route either the internal or external microphone signal to the microphone amplifier. The external microphone signal is buffered by an op amp. The microphone amplifier has a gain of ten, and is equipped with a pair of clipping diodes to prevent the amplified microphone signal from over-driving the A/D input on the ADSIC.

4.5.7 VOLTAGE REGULATION

The 5-Volt Digital Supply is produced by switching DC-DC converter U12 which operates off the Unswitched B+ Supply. The switching frequency is around 160 kHz. A switching regulator is used to improve efficiency since the 5-Volt Digital Supply power consumption is a large percentage of the total power consumption of the radio. The peak-to-peak residual ripple on the 5-Volt Digital supply is approximately 50 mV.

The DC-DC converter is controlled by a wired AND gate on the Shutdown pin of the device. The two inputs of the wired AND gate are the SW_B+ and the output PTC4 of the microcontroller U1. When either input is high, the DC-DC converter is operating.

The DC-DC converter has a soft-start feature (R98, C136) to prevent chattering of the output regulated voltage due to "bouncing" of the on/off switch. The converter has current limiting that limits output current to 1.5 A. The under voltage protection turns the converter off if the input (Unswitched B+) voltage drops below 5.45 V.

The 5-Volt Analog Supply is produced by a linear regulator running from the Unswitched B+ Supply. The Unswitched B+ input to the regulator is switched on and off by a FET that is turned on by the 5-Volt Digital Supply. The peak-to-peak output ripple of the 5-Volt Analog regulator is less than 10 mV which is appropriate for analog circuits.

4.6 TRANSMIT FREQUENCY DETERMINATION

The operational frequency of the transmitter is determined by the PLL (Phase-Locked-Loop) consisting of synthesizer U204 and VCO circuit Q202/U201. Reference oscillator U203 generates and supplies a reference signal of 16.8 MHz to synthesizer. The synthesizer contains a programmable reference divider, programmable A and B dividers, a programmable prescaler counter (P), and a programmable fractional N divider with two programmable values (N numerator and N denominator).

All of these dividers are programmed through the serial interface which connects the synthesizer to the controller microprocessor. The 16.8 MHz reference oscillator frequency is divided down to a synthesizer reference frequency of 2.1, 2.4, or 2.225 MHz. This signal is fed to the phase detector which generates the steering voltage for the VCO. The output of the VCO circuit is coupled back and divided by AP+B and then divided by the fractional divider and fed into the second input of the phase detector. The VCO buffer has two outputs. One input goes to the input of Rx mixer chip U2, and the other is applied to the input of power amplifier module U105.

4.7 HARMONIC FILTER

The transmitter harmonic filter consists of C148-C151, L126, L127, and L128.With VHF models only, it also consists of C129 and C130. The circuit is essentially a seven-pole low-pass filter. With VHF units only, two additional poles are inserted by C129 and C130 which are series resonant with L126 and L127.

SECTION 5 ALIGNMENT PROCEDURE

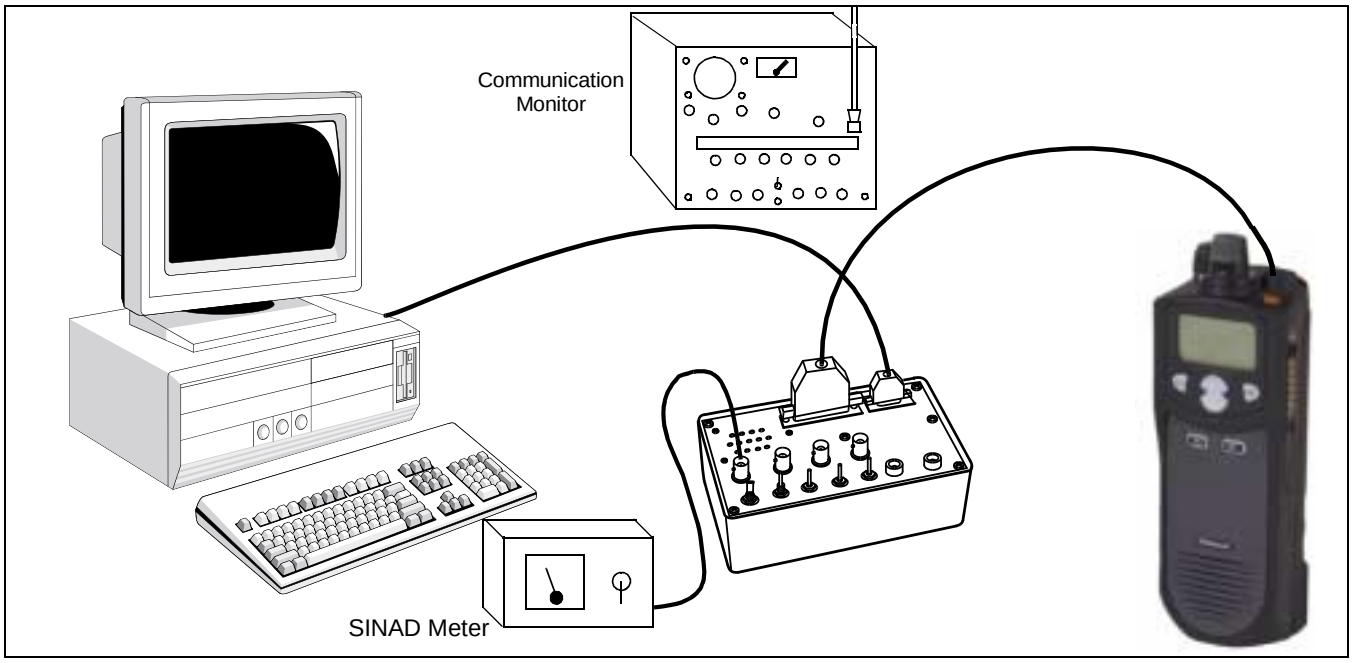


Figure 5-1 Alignment Setup

5.1 GENERAL

5.1.1 INTRODUCTION

The following alignment procedure should be performed if repairs are made that could affect the factory alignment or if adjustments may have changed for some other reason.

To perform transceiver alignment, a PC-compatible computer, the programming interface cable, and PCTune software are required (see Table 1-1). In addition, to adjust the squelch level, the Radio Interface Box (RIB) and radio-to-RIB cable are required. The programming setup is shown in Figure 5-1.

All adjustments are set digitally using the computer. Therefore, there is no need to disassemble the transceiver to access adjustment points. In addition, audio test signals are generated internally, so an audio generator is not required. The required test equipment is shown in Figure 5-1.

5.1.2 TUNE SOFTWARE

General

The PCTune software is a Windows® program. Minimum software and hardware requirements are as follows:

- Windows® 95, 98, or 3.1
- 386SX or faster microprocessor
- 4 megabytes of RAM
- 3 megabytes free space available on hard drive.
- An available serial port

Software Installation

Proceed as follows to install this software:

1. Close all applications that are currently running (other than Windows).

2. Insert the disk containing the PCTune software in drive A: (or B:).

3. From the Windows 95 taskbar, choose RUN and open SETUP.EXE on drive A: (or B:). Alternatively, use File Explorer and double click SETUP.EXE.

   From the Windows 3.1 Program Manager, choose FILE > RUN and select the SETUP.EXE file on drive A: (or B:).

4. Follow the instructions on the screen. The program is automatically loaded on the hard drive and start-up shortcuts or groups are created.

Starting PCTune

From Windows 95 - Select Start in the taskbar, then Programs > PCTune > PCTune x.x.x.

From Windows 3.1 - From the Program Manager, open the PCTune group and then double click the PCTune icon.

Exiting PCTune

Select FILE > EXIT or press ALT + F4.

On-Line Help

On-line help is not available at this time.

5.1.3 PRELIMINARY

1. With transceiver power turned off, connect the female DB9 connector of the programming interface cable to an unused serial port of the computer.

2. Connect the other end of the programming interface cable to the accessory/programming jack on the side of the transceiver.

3. Start the program as described in the preceding section. Select Options > Set Com Port and make sure that the correct serial port is selected (see screen in Figure 5-2).

4. Turn transceiver power on and select Tuning > Complete Tuning to automatically step through a complete alignment or Partial Tuning to adjust only certain settings or randomly select adjustments.

5. The computer then attempts to establish communication with the transceiver. A message is displayed to indicate success or failure. From this point, prompts are displayed for each step of the programming procedure.

5.2 TRANSMIT FREQUENCY TUNING

The transmit frequency is set by transmitting on the indicated frequency and then adjusting the reference oscillator frequency via the tuning software. Proceed as follows:

1. Connect a 50-ohm load to the antenna jack and monitor the transmit signal with a communication monitor.

2. Set the communication monitor to the indicated frequency and click OK to key the transmitter.

3. Adjust the frequency by clicking the + and – keys. The current setting is indicated in the “Current Value” box. When the frequency is correct, click OK again to complete the adjustment and store the setting.

5.3 TRANSMIT MODULATION TUNING

Transmit modulation is set by balancing the modulation produced by 80 Hz and 3 kHz tones and then setting modulation limiting using a 1 kHz tone. All these tones are internally generated by the transceiver, so no external audio generator is required. Proceed as follows:

1. Click OK with “TX Modulation” selected. Set the communication monitor for the displayed frequency.

2. Click OK to transmit a signal modulated with an 80 Hz tone. Enter the resulting deviation (in hertz) in the displayed box and click OK.

3. Continue following the screen instructions to adjust the 3 kHz tone deviation. The + and – buttons are clicked to set the deviation to the indicated level. The 1 kHz tone deviation is then adjusted.

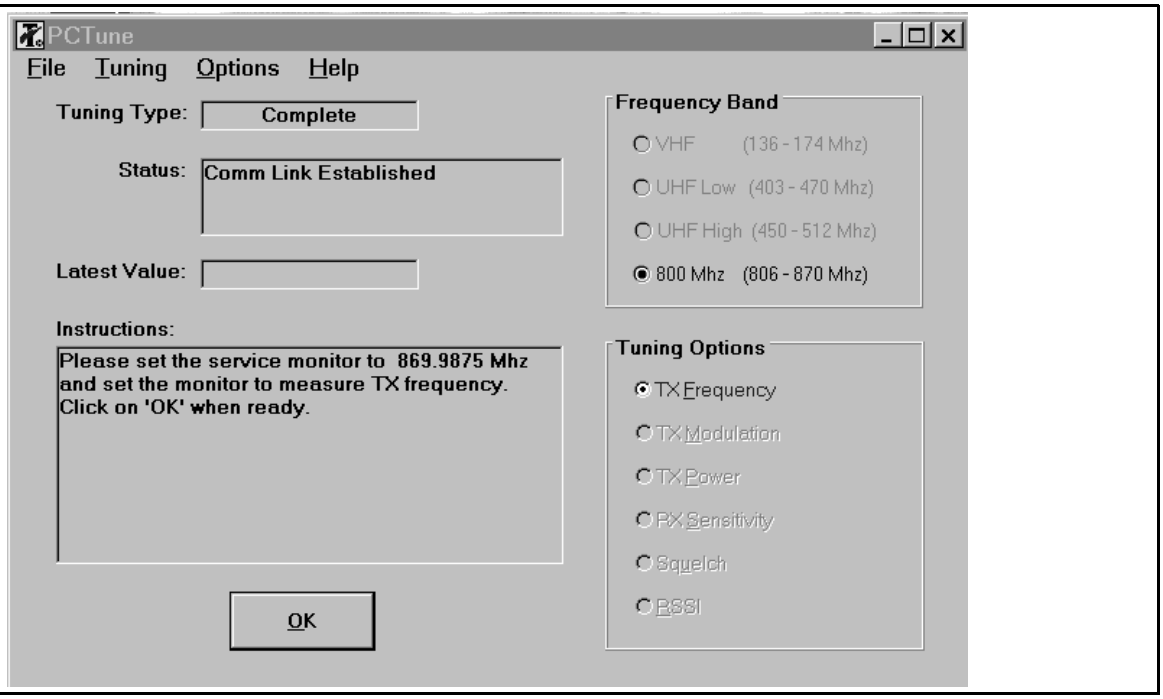


Figure 5-2 Tuning Software Screen (800 MHz Models)

4. The preceding 3 kHz and 1 kHz tone adjustments are then repeated on several other frequencies across the band. After the last adjustment is made, the transmitter unkeys and the settings are stored.

5.4 TRANSMIT POWER ADJUSTMENT

Set transmitter power output as follows:

1. Connect a wattmeter and 50-ohm load to the antenna jack. Click OK with "TX Power" selected.

2. Follow on-screen instructions to adjust for the displayed power output at various frequencies across the band.

3. When the last setting is complete, the transmitter unkeys and the settings are stored.

5.5 RECEIVE SENSITIVITY TUNING

NOTE: This adjustment is not performed with 800 MHz models.

The receiver front end is tuned as follows:

1. Connect an RF signal generator to the antenna jack. Click OK with "RX Sensitivity" selected.

2. Inject the frequencies and signal levels indicated on the computer screen. When tuning is complete, a message is displayed and the settings are saved.

5.6 SQUELCH ADJUSTMENT

NOTE: With some early models, this adjustment cannot be made using the PCTune software so an error message is displayed when it is selected.

Test Setup

This adjustment requires access to the receive audio signal so that SINAD can be measured. It is recommended that this be done using the RIB (Radio Interface Box). This box allows the receive audio signal to be monitored while the computer is connected to the accessory/programming jack.

Adjustment Procedure

1. Connect an RF signal generator to the antenna jack. Click OK with "Squelch" selected.

2. Set the signal generator for the indicated frequency and modulation. Adjust the generator output level for 12 dB SINAD and click OK.

3. When prompted, adjust the output level for 8 dB SINAD and click OK.

4. Proceed as prompted and when this adjustment is complete, a message is displayed and the settings are stored.

5.7 RSSI ADJUSTMENT

NOTE: With some early models, this adjustment cannot be made using the PCTune software so an error message is displayed when it is selected.

This adjustment calibrates the RSSI signal level. Proceed as follows:

1. Connect an RF signal to the antenna jack. Click OK with "RSSI" selected.

2. Set the generator for the indicated frequency and output level and click OK.

3. Select the other output levels as prompted. When this adjustment is complete, a message is displayed the settings are stored.

SECTION 6 PARTS LIST

Ref No.	Description	Part No.
RF BOARD (A450)		
Individual replacement parts not available. Replace entire assembly.		
DIGITAL BOARD (A100) Part No. 023-5005-100/-105		
C 001	.1 µF +80/–20% Z5U 25V cer smd	510-3680-104
C 002	.1 µF +80/–20% Z5U 25V cer smd	510-3680-104
C 003	.1 µF +80/–20% Z5U 25V cer smd	510-3680-104
C 004	.1 µF +80/–20% Z5U 25V cer smd	510-3680-104
C 005	.1 µF +80/–20% Z5U 25V cer smd	510-3680-104
C 006	.1 µF +80/–20% Z5U 25V cer smd	510-3680-104
C 007	.1 µF +80/–20% Z5U 25V cer smd	510-3680-104
C 008	220 pF ±5% NPO 50V cer smd	510-3674-221
C 009	220 pF ±5% NPO 50V cer smd	510-3674-221
C 010	.1 µF +80/–20% Z5U 25V cer smd	510-3680-104
C 011	.1 µF +80/–20% Z5U 25V cer smd	510-3680-104
C 012	.1 µF +80/–20% Z5U 25V cer smd	510-3680-104
C 013	.1 µF +80/–20% Z5U 25V cer smd	510-3680-104
C 014	.1 µF +80/–20% Z5U 25V cer smd	510-3680-104
C 015	.1 µF +80/–20% Z5U 25V cer smd	510-3680-104
C 016	.1 µF +80/–20% Z5U 25V cer smd	510-3680-104
C 017	.1 µF +80/–20% Z5U 25V cer smd	510-3680-104
C 018	.1 µF +80/–20% Z5U 25V cer smd	510-3680-104
C 019	.1 µF +80/–20% Z5U 25V cer smd	510-3680-104
C 020	.1 µF +80/–20% Z5U 25V cer smd	510-3680-104
C 021	.1 µF +80/–20% Z5U 25V cer smd	510-3680-104
C 022	.1 µF +80/–20% Z5U 25V cer smd	510-3680-104
C 023	.1 µF +80/–20% Z5U 25V cer smd	510-3680-104
C 024	.1 µF +80/–20% Z5U 25V cer smd	510-3680-104
C 025	10 pF ±0.1 pF NPO 50V cer smd	510-3673-100
C 026	.1 µF +80/–20% Z5U 25V cer smd	510-3680-104
C 027	10 pF ±0.1 pF NPO 50V cer smd	510-3673-100
C 028	6.2 pF ±0.1 pF NPO 50V cer smd	510-3673-629
C 029	5.1 pF ±0.1pF NPO 50V cer smd	510-3673-519
C 030	470 pF ±5% NPO 50V cer smd	510-3674-471
C 031	470 pF ±5% NPO 50V cer smd	510-3674-471
C 032	.22 µF ±10% Z5U 25V cer smd	510-3686-224
C 033	220 pF ±5% NPO 50V cer smd	510-3674-221
C 034	220 pF ±5% NPO 50V cer smd	510-3674-221
C 035	.1 µF +80/–20% Z5U 25V cer smd	510-3680-104
C 036	.1 µF +80/–20% Z5U 25V cer smd	510-3680-104

Ref No.	Description	Part No.
C 037	220 pF ±5% NPO 50V cer smd	510-3674-221
C 038	220 pF ±5% NPO 50V cer smd	510-3674-221
C 039	220 pF ±5% NPO 50V cer smd	510-3674-221
C 040	220 pF ±5% NPO 50V cer smd	510-3674-221
C 041	470pF ±5% NPO 50V cer smd	510-3674-471
C 042	220 pF ±5% NPO 50V cer smd	510-3674-221
C 043	.1 µF +80/–20% Z5U 25V cer smd	510-3631-104
C 044	220 pF ±5% NPO 50V cer smd	510-3674-221
C 045	.1 µF +80/–20% Z5U 25V cer smd	510-3680-104
C 046	220 pF ±5% NPO 50V cer smd	510-3674-221
C 047	220 pF ±5% NPO 50V cer smd	510-3674-221
C 048	10pF ±0.1 pF NPO 50V cer smd	510-3673-100
C 049	10 pF ±0.1 pF NPO 50V cer smd	510-3673-100
C 050	33 pF ±10% X7R 25V cer smd	510-3675-330
C 051	33 pF ±10% X7R 25V cer smd	510-3675-330
C 052	470 pF ±5% NPO 50V cer smd	510-3674-471
C 053	470 pF ±5% NPO 50V cer smd	510-3674-471
C 054	470 pF ±5% NPO 50V cer smd	510-3674-471
C 055	470 pF ±5% NPO 50V cer smd	510-3674-471
C 056	220 pF ±5% NPO 50V cer smd	510-3674-221
C 057	.1 µF +80/–20% Z5U 25V cer smd	510-3680-104
C 058	470 pF ±5% NPO 50V cer smd	510-3674-471
C 059	470 pF ±5% NPO 50V cer smd	510-3674-471
C 060	.1 µF +80/–20% Z5U 25V cer smd	510-3680-104
C 061	220 pF ±5% NPO 50V cer smd	510-3674-221
C 062	220 pF ±5% NPO 50V cer smd	510-3674-221
C 063	.1 µF +80/–20% Z5U 25V cer smd	510-3680-104
C 064	.1 µF +80/–20% Z5U 25V cer smd	510-3680-104
C 065	220 pF ±5% NPO 50V cer smd	510-3674-221
C 066	.1 µF +80/–20% Z5U 25V cer smd	510-3680-104
C 067	220 pF ±5% NPO 50V cer smd	510-3674-221
C 068	.1 µF +80/–20% Z5U 25V cer smd (-100 boards)	510-3680-104
	220 pF ±5% NPO 50V cer smd (-105 boards)	510-3674-221
C 069	.1 µF +80/–20% Z5U 25V cer smd (-100 boards)	510-3680-104
	220 pF ±5% NPO 50V cer smd (-105 boards)	510-3674-221
C 070	220 pF ±5% NPO 50V cer smd	510-3674-221
C 071	220 pF ±5% NPO 50V cer smd	510-3674-221
C 072	220 pF ±5% NPO 50V cer smd	510-3674-221

DIGITAL BOARD (CONT'D)

Ref No.	Description	Part No.
C 074	220 pF ±5% NPO 50V cer smd	510-3674-221
C 076	.1 µF +80/–20% Z5U 25V cer smd	510-3680-104
C 078	220 pF ±5% NPO 50V cer smd	510-3674-221
C 079	.1 µF +80/–20% Z5U 25V cer smd	510-3680-104
C 080	220 pF ±5% NPO 50V cer smd	510-3674-221
C 081	220 pF ±5% NPO 50V cer smd	510-3674-221
C 082	220 pF ±5% NPO 50V cer smd	510-3674-221
C 091	220 pF ±5% NPO 50V cer smd	510-3674-221
C 092	220 pF ±5% NPO 50V cer smd	510-3674-221
C 093	220 pF ±5% NPO 50V cer smd	510-3674-221
C 094	220 pF ±5% NPO 50V cer smd	510-3674-221
C 095	220 pF ±5% NPO 50V cer smd	510-3674-221
C 096	220 pF ±5% NPO 50V cer smd	510-3674-221
C 097	220 pF ±5% NPO 50V cer smd	510-3674-221
C 098	220 pF ±5% NPO 50V cer smd	510-3674-221
C 157	220 pF ±5% NPO 50V cer smd	510-3674-221
C 158	33 pF ±10% X7R 25V cer smd	510-3675-330
C 159	33 pF ±10% X7R 25V cer smd	510-3675-330
C 160	33 pF ±10% X7R 25V cer smd	510-3675-330
C 161	220 pF ±5% NPO 50V cer smd	510-3674-221
C 162	220 pF ±5% NPO 50V cer smd	510-3674-221
C 163	33 pF ±10% X7R 25V cer smd	510-3675-330
C 164	33 pF ±10% X7R 25V cer smd	510-3675-330
C 165	33 pF ±10% X7R 25V cer smd	510-3675-330
C 166	33 pF ±10% X7R 25V cer smd	510-3675-330
C 167	33 pF ±10% X7R 25V cer smd	510-3675-330
C 168	33 pF ±10% X7R 25V cer smd	510-3675-330
C 169	33 pF ±10% X7R 25V cer smd	510-3675-330
C 170	33 pF ±10% X7R 25V cer smd	510-3675-330
C 171	220 pF ±5% NPO 50V cer smd	510-3674-221
D 001	Diode, 1.5 pF SOT-23	523-1504-029
D 002	Zener diode, 5.6V SOT-23	523-2601-569
EP 101	Contact, power	013-1724-001
EP102	Z ground strip	017-1210-056
EP 103	Contact, battery pogo pin	515-9500-104
J 001	10-pin socket, x 2	515-7113-070
J 002	18-pin flex connector	515-7010-438
J 004	31-pin connector	515-7109-130
L 001	1.8 µH inductor, 350mA	542-9230-027
L 002-L 036	Inductor, ferrite smd (-100 boards)	542-9230-023
	Inductor, ferrite smd (-105 boards)	542-9230-021
MP 101	Shield, pogo	017-1210-053
PC 101	Flex circuit, power	035-1800-180
PC 100	PC board, digital trunking	035-5005-100
	PC board, digital non-trunk	035-5005-105
PC101	Power flex circuit board, pogo pin	035-5005-101
Q 001	NPN general purpose SOT-23	576-0003-658
R 001	4.7k ohm ±5% 1/16W smd	569-0155-472
R 002	4.7k ohm ±5% 1/16W smd	569-0155-472
R 003	10k ohm ±5% 1/16W smd	569-0155-103
R 004	4.7k ohm ±5% 1/16W smd	569-0155-472
R 005	10k ohm ±5% 1/16W smd	569-0155-103
R 006	10k ohm ±5% 1/16W smd	569-0155-103
R 007	390k ohm ±5% 1/16W smd	569-0155-394
R 008	100k ohm ±5% 1/16W smd	569-0155-104
R 009	4.7k ohm ±5% 1/16W smd	569-0155-472
R 010	100k ohm ±5% 1/16W smd	569-0155-104
R 011	10k ohm ±5% 1/16W smd	569-0155-103
R 012	33k ohm ±5% 1/16W smd	569-0155-333
R 013	100k ohm ±5% 1/16W smd	569-0155-104
R 014	10k ohm ±5% 1/16W smd	569-0155-103
R 015	10k ohm ±5% 1/16W smd	569-0155-103
R 016	0 ohm jumper	569-0155-001
R 017	0 ohm jumper	569-0155-001
R 018	10k ohm ±5% 1/16W smd	569-0155-103
R 019	10k ohm ±5% 1/16W smd	569-0155-103
R 020	0 ohm jumper	569-0155-001
R 021	1.0M ohm ±5% 1/16W smd	569-0155-105
R 022	15k ohm ±5% 1/16W smd	569-0155-153
R 023	6.8k ohm ±5% 1/16W smd	569-0155-682
R 024	1k ohm ±5% 1/16W smd	569-0155-102
R 025	0 ohm jumper	569-0155-001
R 026	0 ohm jumper	569-0155-001
R 027	0 ohm jumper (-100 board)	569-0155-001
	47k ohm ±5% 1/16W smd (-105 board)	569-0155-473
R 028	0 ohm jumper (-100 board)	569-0155-001

DIGITAL BOARD (CONT'D)

Ref No.	Description	Part No.
	100k ohm ±5% 1/16W smd (-105 board)	569-0155-104
R 029	47k ohm ±5% 1/16W smd	569-0155-473
R 030	1k ohm ±5% 1/16W smd (-100 board)	569-0155-102
	0 ohm jumper (-105 board)	569-0155-001
R 031	10 ohm ±5% 1/16W smd	569-0155-100
R 032	10 ohm ±5% 1/16W smd	569-0155-100
R 033	0 ohm jumper (-100 board)	569-0155-001
	10k ohm ±5% 1/16W smd (-105 board)	569-0155-103
R 034	22k ohm ±5% 1/16W smd	569-0155-223
R 035	22k ohm ±5% 1/16W smd	569-0155-223
R 036	22k ohm ±5% 1/16W smd	569-0155-223
R 037	0 ohm jumper	569-0155-001
R 038	0 ohm jumper	569-0155-001
R 039	10k ohm ±5% 1/16W smd	569-0155-103
R 040	10k ohm ±5% 1/16W smd	569-0155-103
R 041	0 ohm jumper	569-0155-001
R 042	0 ohm jumper	569-0155-001
R 043	0 ohm jumper	569-0155-001
R 044	0 ohm jumper	569-0155-001
R 045	22k ohm ±5% 1/16W smd	569-0155-223
R 046	22k ohm ±5% 1/16W smd	569-0155-223
R 047	22k ohm ±5% 1/16W smd	569-0155-223
R 048	22k ohm ±5% 1/16W smd	569-0155-223
R 049	22k ohm ±5% 1/16W smd	569-0155-223
R 050	22k ohm ±5% 1/16W smd	569-0155-223
R 051	22k ohm ±5% 1/16W smd	569-0155-223
R 052	22k ohm ±5% 1/16W smd	569-0155-223
R 053	22k ohm ±5% 1/16W smd	569-0155-223
R 054	22k ohm ±5% 1/16W smd	569-0155-223
R 055	22k ohm ±5% 1/16W smd	569-0155-223
R 056	22k ohm ±5% 1/16W smd	569-0155-223
R 057	22k ohm ±5% 1/16W smd	569-0155-223
R 058	22k ohm ±5% 1/16W smd	569-0155-223
R 059	22k ohm ±5% 1/16W smd	569-0155-223
R 060	22k ohm ±5% 1/16W smd	569-0155-223
R 061	22k ohm ±5% 1/16W smd	569-0155-223
R 062	22k ohm ±5% 1/16W smd	569-0155-223
R 063	22k ohm ±5% 1/16W smd	569-0155-223
R 064	0 ohm jumper	569-0155-001
R 065	1k ohm ±5% 1/16W smd	569-0155-102

Ref No.	Description	Part No.
R 087	0 ohm jumper	569-0155-001
R 090	10k ohm ±5% 1/16W smd	569-0155-103
R 091	1k ohm ±5% 1/16W smd	569-0155-102
R 092	1k ohm ±5% 1/16W smd	569-0155-102
R 093	1k ohm ±5% 1/16W smd	569-0155-102
R 094	1k ohm ±5% 1/16W smd	569-0155-102
R 095	1k ohm ±5% 1/16W smd	569-0155-102
R 096-R 100	0 ohm jumper	569-0165-001
U 001	Programmable logic (-100 board, revision 2)	544-1015-032
	Microprocessor assembly (-100 board, revision 3)	023-1870-043
	Counter, preset 74HC161 (-105 board)	544-1010-161
U 002	Flash ROM 512k x 16 AT49 (-100 board)	544-1028-192
U 003	ADSIC, DSP supp BGA106 (all except following)	544-1010-015
	ADSIC, DSP supp QFP package (-100 board, rev 3)	544-9100-002
U 004	NAND, 2 Input TC7SHOOFU	544-1010-012
U 005	RAM 128k x 8 CY7C1009 (-100 board)	544-1011-028
	SRAM, 64k x 8,IS61C512 (-105 board)	544-1011-026
U 006	RAM 128k x 8 CY7C1009 (-100 board)	544-1011-028
	SRAM, 64k x 8,IS61C512 (-105 board)	544-1011-026
U 007	Rec/trans SCC2691	544-1012-691
U 008	EEPROM, 32k x 8 AT24C256W (-100 board)	544-1020-256
	PEROM, FLASH AT29C010A (-105 board)	544-1010-010
U 009	NAND, 2-input TC7SH00FU (-100 board)	544-1010-012
	OR, 2-input TC7SH32FU (-105 board)	544-1010-013
U 010	PEROM, FLASH AT29C010A	544-1010-010
U 011	OR, 2-input TC7SH32FU	544-1010-013
U 012	DSP TMS320C50PGEA	544-1010-018
U 021	D-flip flop TC7W74FU	544-1010-014
Y 001	Crystal,20.0000 MHz	521-3060-037
Y 002	Crystal,3.6864 MHz	521-3060-053

KEYPAD BOARD

Ref No.	Description	Part No.
KEYPAD BOARD (A4xx) Part No. 023-5005-4xx		
A 430	DES interface board assembly	023-5005-430
C 001	.1 µF +80/–20% Z5U 25V cer smd	510-3680-104
C 002	.1 µF +80/–20% Z5U 25V cer smd	510-3680-104
C 003	.1 µF +80/–20% Z5U 25V cer smd	510-3680-104
C 004	.1 µF +80/–20% Z5U 25V cer smd	510-3680-104
C 005	330 pF ±10% X7R 25V cer smd	510-3675-331
C 006	220 pF ±5% NPO 25V cer smd	510-3674-221
C 007	.1 µF +80/–20% Z5U 25V cer smd	510-3680-104
C 008	.1 µF +80/–20% Z5U 25V cer smd	510-3680-104
C 009	.1 µF +80/–20% Z5U 25V cer smd	510-3680-104
C 010	22 pF ±5% NPO 25V cer smd	510-3674-220
C 011	2.7 pF ±10% NPO 25V cer smd	510-3674-279
C 012	.1 µF +80/–20% Z5U 25V cer smd	510-3680-104
C 013	22 pF ±5% NPO 25V cer smd	510-3674-220
C 014	4700 pF ±10% X7R 25V cer smd	510-3675-472
C 015	220 pF ±5% NPO 25V cer smd	510-3681-221
C 016	220 pF ±5% NPO 25V cer smd	510-3674-221
C 017	220 pF ±5% NPO 25V cer smd	510-3674-221
C 018	220 pF ±5% NPO 25V cer smd	510-3674-221
C 019	220 pF ±5% NPO 25V cer smd	510-3674-221
C 020	220 pF ±5% NPO 25V cer smd	510-3674-221
C 021	220 pF ±5% NPO 25V cer smd	510-3674-221
C 022	220 pF ±5% NPO 25V cer smd	510-3674-221
C 023	220 pF ±5% NPO 25V cer smd	510-3674-221
C 024	220 pF ±10% X7R 25V cer smd	510-3681-221
C 025	220 pF ±5% NPO 25V cer smd	510-3674-221
C 026	220 pF ±5% NPO 25V cer smd	510-3674-221
C 027	220 pF ±10% X7R 25V cer smd	510-3681-221
C 028	.01 µF ±10% X7R 25V cer smd	510-3675-103
C 029	220 pF ±5% NPO 25V cer smd	510-3674-221
C 030	220 pF ±5% NPO 25V cer smd	510-3674-221
C 031	220 pF ±10% X7R 25V cer smd	510-3681-221
C 032	220 pF ±10% X7R 25V cer smd	510-3681-221
C 033	100 pF ±5% NPO 25V cer smd	510-3674-101
C 034	10 pF ±0.1 pF NP0 50V cer smd	510-3673-100
C 035	220 pF ±5% NPO 25V cer smd	510-3674-221
C 036	220 pF ±5% NPO 25V cer smd	510-3674-221
C 037	220 pF ±5% NPO 25V cer smd	510-3674-221
C 038	33 pF ±5% NPO 50V cer smd	510-3601-330
C 039	100 µF 16V smd tantalum	510-2616-101
C 040	1 µF +80/–20% Z5U 25V cer smd	510-3631-105
C 041	220 pF ±10% X7R 25V cer smd	510-3681-221
C 042	220 pF ±5% NPO 25V cer smd	510-3674-221
C 043	1 µF +80/–20% Z5U 25V cer smd	510-3631-105
C 044	220 pF ±10% X7R 25V cer smd	510-3681-221
C 045	220 pF ±5% NPO 25V cer smd	510-3674-221
C 046	220 pF ±5% NPO 25V cer smd	510-3674-221
C 047	220 pF ±5% NPO 25V cer smd	510-3674-221
C 048	220 pF ±5% NPO 25V cer smd	510-3674-221
C 049	10 pF ±0.1 pF NP0 50V cer smd	510-3673-100
C 050	220 pF ±5% NPO 25V cer smd	510-3674-221
C 051	220 pF ±5% NPO 25V cer smd	510-3674-221
C 052	.1 µF +80/–20% Z5U 25V cer smd	510-3680-104
C 053	.1 µF +80/–20% Z5U 25V cer smd	510-3680-104
C 054	10 pF ±0.1 pF NP0 50V cer smd	510-3673-100
C 055	100 pF ±5% NPO 25V cer smd	510-3674-101
C 056	100 µF 10V smd tantalum	510-2624-100
C 057	.47 µF ±10% Z5U 16V cer smd	510-3605-474
C 058	4.7 µF 10V smd tantalum	510-2624-479
C 059	.1 µF +80/–20% Z5U 25V cer smd	510-3680-104
C 060	.1 µF +80/–20% Z5U 25V cer smd	510-3680-104
C 061	.1 µF +80/–20% Z5U 25V cer smd	510-3680-104
C 062	.47 µF ±10% Z5U 16V cer smd	510-3605-474
C 063	.1 µF +80/–20% Z5U 25V cer smd	510-3680-104
C 064	.47 µF ±10% Z5U 16V cer smd	510-3605-474
C 065	.47 µF ±10% Z5U 16V cer smd	510-3605-474
C 066	.1 µF +80/–20% Z5U 25V cer smd	510-3680-104
C 067	220 pF ±5% NPO 25V cer smd	510-3674-221
C 068	4.7 µF 10V smd tantalum	510-2624-479
C 069	.1 µF +80/–20% Z5U 25V cer smd	510-3680-104
C 070	220 pF ±5% NPO 25V cer smd	510-3674-221
C 071	220 pF ±5% NPO 25V cer smd	510-3674-221
C 072	220 pF ±5% NPO 25V cer smd	510-3674-221
C 073	220 pF ±5% NPO 25V cer smd	510-3674-221
C 074	100 pF ±5% NPO 25V cer smd	510-3674-101
C 075	.1 µF +80/–20% Z5U 25V cer smd	510-3680-104
C 076	220 pF ±5% NPO 25V cer smd	510-3674-221
C 077	.1 µF +80/–20% Z5U 25V cer smd	510-3680-104
C 078	.1 µF +80/–20% Z5U 25V cer smd	510-3680-104
C 079	1 µF +80/–20% Z5U 25V cer smd	510-3631-105
C 080	100 pF ±5% NPO 25V cer smd	510-3674-101
C 081	1 µF +80/–20% Z5U 25V cer smd	510-3631-105
C 082	.001 µF ±10% X7R 25V cer smd	510-3675-102
C 083	1 µF +80/–20% Z5U 25V cer smd	510-3631-105
C 084	220 pF ±10% X7R 50V cer smd	510-3681-221
C 085	220 pF ±5% NPO 25V cer smd	510-3674-221

KEYPAD BOARD (CONT'D)

Ref No.	Description	Part No.
C 086	220 pF ±5% NPO 25V cer smd	510-3674-221
C 087	100 pF ±5% NPO 25V cer smd	510-3674-101
C 088	220 pF ±5% NPO 25V cer smd	510-3674-221
C 089	220 pF ±5% NPO 25V cer smd	510-3674-221
C 090	220 pF ±5% NPO 25V cer smd	510-3674-221
C 091	10 pF ±0.1 pF NP0 50V cer smd	510-3673-100
C 092	1 µF +80/–20% Z5U 25V cer smd	510-3631-105
C 093	100 pF ±5% NPO 25V cer smd	510-3674-101
C 094	100 pF ±5% NPO 25V cer smd	510-3674-101
C 095	220 pF ±5% NPO 25V cer smd	510-3674-221
C 096	220 pF ±5% NPO 25V cer smd	510-3674-221
C 097	220 pF ±5% NPO 25V cer smd	510-3674-221
C 098	220 pF ±5% NPO 25V cer smd	510-3674-221
C 099	220 pF ±5% NPO 25V cer smd	510-3674-221
C 100	220 pF ±5% NPO 25V cer smd	510-3674-221
C 101	220 pF ±5% NPO 25V cer smd	510-3674-221
C 102	220 pF ±5% NPO 25V cer smd	510-3674-221
C 103	220 pF ±5% NPO 25V cer smd	510-3674-221
C 104	220 pF ±5% NPO 25V cer smd	510-3674-221
C 105	220 pF ±5% NPO 25V cer smd	510-3674-221
C 106	220 pF ±5% NPO 25V cer smd	510-3674-221
C 107	220 pF ±5% NPO 25V cer smd	510-3674-221
C 108	220 pF ±5% NPO 25V cer smd	510-3674-221
C 109	220 pF ±5% NPO 25V cer smd	510-3674-221
C 110	220 pF ±5% NPO 25V cer smd	510-3674-221
C 111	220 pF ±5% NPO 25V cer smd	510-3674-221
C 112	220 pF ±5% NPO 25V cer smd	510-3674-221
C 113	220 pF ±5% NPO 25V cer smd	510-3674-221
C 114	220 pF ±5% NPO 25V cer smd	510-3674-221
C 115	220 pF ±5% NPO 25V cer smd	510-3674-221
C 116	220 pF ±5% NPO 25V cer smd	510-3674-221
C 117	220 pF ±5% NPO 25V cer smd	510-3674-221
C 118	220 pF ±5% NPO 25V cer smd	510-3674-221
C 119	220 pF ±5% NPO 25V cer smd	510-3674-221
C 120	220 pF ±5% NPO 25V cer smd	510-3674-221
C 121	220 pF ±5% NPO 25V cer smd	510-3674-221
C 122	220 pF ±5% NPO 25V cer smd	510-3674-221
C 123	220 pF ±5% NPO 25V cer smd	510-3674-221
C 124	220 pF ±5% NPO 25V cer smd	510-3674-221
C 125	220 pF ±5% NPO 25V cer smd	510-3674-221
C 126	220 pF ±5% NPO 25V cer smd	510-3674-221
C 127	220 pF ±5% NPO 25V cer smd	510-3674-221
C 128	220 pF ±5% NPO 25V cer smd	510-3674-221
C 129	68 µF ±10% 16V tantalum	510-3674-221
C 130	220 pF ±5% NPO 25V cer smd	510-3674-221

Ref No.	Description	Part No.
C 131	220 pF ±10% X7R 25V cer smd	510-3681-221
C 132	47 pF ±5% NPO 25V cer smd	510-3674-470
C 133	47 pF ±5% NPO 25V cer smd	510-3674-470
C 134	47 pF ±5% NPO 25V cer smd	510-3674-470
C 135	1 µF +80/–20% Z5U 25V cer smd	510-3631-105
C 136	.1 µF +80/–20% Z5U 25V cer smd	510-3680-104
C 137	.01 µF ±10% X7R 25V cer smd	510-3675-103
C 138	1 µF +80/–20% Z5U 25V cer smd	510-3631-105
C 139	68 µF ±10% 16V tantalum	510-2625-680
C 140	68 µF ±10% 16V tantalum	510-2625-680
C 141	100 µF 16V smd tantalum	510-2616-101
C 142	4.7 µF 10V smd tantalum	510-2624-479
C 143	4.7 µF 10V smd tantalum	510-2624-479
C 144	68 µF ±10% 16V tantalum	510-3674-221
C 146	220 pF ±10% X7R 25V cer smd	510-3674-221
C 147	3900 pF ±10% X7R 25V cer smd	510-3675-392
C 148	220 pF ±10% X7R 25V cer smd	510-3681-221
C 149	220 pF ±10% X7R 25V cer smd	510-3681-221
C 150	220 pF ±10% X7R 25V cer smd	510-3681-221
C 151	220 pF ±10% X7R 25V cer smd	510-3681-221
C 152	220 pF ±10% X7R 25V cer smd	510-3681-221
C 153	220 pF ±10% X7R 25V cer smd	510-3681-221
C 154	220 pF ±10% X7R 25V cer smd	510-3681-221
C 155	220 pF ±10% X7R 25V cer smd	510-3681-221
C 156	220 pF ±10% X7R 25V cer smd	510-3681-221
C 157	220 pF ±10% X7R 25V cer smd	510-3681-221
C 158	220 pF ±10% X7R 25V cer smd	510-3681-221
C 159	220 pF ±10% X7R 25V cer smd	510-3681-221
C 160	220 pF ±10% X7R 25V cer smd	510-3681-221
C 161	220 pF ±10% X7R 25V cer smd	510-3681-221
C 162	220 pF ±10% X7R 25V cer smd	510-3681-221
C 163	220 pF ±10% X7R 25V cer smd	510-3681-221
C 164	220 pF ±10% X7R 25V cer smd	510-3681-221
C 165	220 pF ±10% X7R 25V cer smd	510-3681-221
C 166	220 pF ±10% X7R 25V cer smd	510-3681-221
C 167	220 pF ±10% X7R 25V cer smd	510-3681-221
C 168	220 pF ±10% X7R 25V cer smd	510-3681-221
C 169	220 pF ±10% X7R 25V cer smd	510-3681-221
CR 400	Front display backlight	585-5000-001
D 001	5.6V zener SOT-23	523-2601-569
D 002	Diode MMBD301LT1	523-1504-040
D 004	5.6V zener SOT-23	523-2601-569
D 005	Schottky diode rectifier	523-0519-034

KEYPAD BOARD (CONT'D)

Ref No.	Description	Part No.
D 007	5.6V zener SOT-23	523-2601-569
D 008	10V zener SOT-23	523-2601-100
D 009	10V zener SOT-23	523-2601-100
D 010	10V zener SOT-23	523-2601-100
D 011	Diode MMBD301LT1	523-1504-040
D 013	Diode MMBD301LT1	523-1504-040
D 014	Diode MMBD301LT1	523-1504-040
D 015	5.6V zener SOT-23	523-2601-569
D 017	LED, green SMD HSMG-C670	549-4101-019
D 019	LED, green SMD HSMG-C670	549-4101-019
D 020	LED, green SMD HSMG-C670	549-4101-019
D 021	LED, green SMD HSMG-C670	549-4101-019
D 022	LED, green SMD HSMG-C670	549-4101-019
D 023	10V zener SOT-23	523-2601-100
D 024	10V zener SOT-23	523-2601-100
D 025	5.1V zener SOT-23	523-2601-519
D 035	LED, green SMD HSMG-C670	549-4101-019
D 036	LED, green SMD HSMG-C670	549-4101-019
D 037	LED, green SMD HSMG-C670	549-4101-019
D 038	LED, green SMD HSMG-C670	549-4101-019
D 039	LED, green SMD HSMG-C670	549-4101-019
D 040	LED, green SMD HSMG-C670	549-4101-019
D 041	LED, green SMD HSMG-C670	549-4101-019
D 042	LED, green SMD HSMG-C670	549-4101-019
D 043	LED, green SMD HSMG-C670	549-4101-019
D 044	LED, green SMD HSMG-C670	549-4101-019
D 045	LED, reen SMD HSMG-C670	549-4101-019
DS 400	LCD glass, radio front	549-5000-002
EP 400	Grounding contact	537-5001-009
J 002	Connector, flex 18-pin	515-7010-438
J 004	Connector, microminiature	515-7113-073
J 005	24-pin socket, ZIF	515-9500-017
J 013	24-pin socket, ZIF	515-9500-017
L 002	1.8 µH 250 mA smd inductor	542-9230-027
L 003	33 µH 1.2A smd inductor	542-9230-025
L 004	Ferrite bead, 600 ohm smd	542-9230-035
L 005	Ferrite bead, 600 ohm smd	542-9230-035
L 006	Ferrite bead, 600 ohm smd	542-9230-035
L 007	Ferrite bead, 600 ohm smd	542-9230-035
L 008	Ferrite bead, 600 ohm smd	542-9230-035
L 009	Ferrite bead, 600 ohm smd	542-9230-035
L 010	Ferrite bead, 600 ohm smd	542-9230-035

Ref No.	Description	Part No.
L 011	Ferrite bead, 600 ohm smd	542-9230-035
L 012	Ferrite bead, 600 ohm smd	542-9230-035
L 013	Ferrite bead, 600 ohm smd	542-9230-035
L 014	Ferrite bead, 600 ohm smd	542-9230-035
L 015	Ferrite bead, 600 ohm smd	542-9230-035
L 016	Ferrite bead, 600 ohm smd	542-9230-035
L 017	Ferrite bead, 600 ohm smd	542-9230-035
L 018	Ferrite bead, 600 ohm smd	542-9230-035
L 019	Ferrite bead, 600 ohm smd	542-9230-035
L 020	Ferrite bead, 600 ohm smd	542-9230-035
L 021	Ferrite bead, 600 ohm smd	542-9230-035
L 022	Ferrite bead, 600 ohm smd	542-9230-035
L 023	Ferrite bead, 600 ohm smd	542-9230-035
L 024	Ferrite bead, 600 ohm smd	542-9230-035
L 025	Ferrite smd inductor	542-9230-023
L 026	Ferrite smd inductor	542-9230-023
L 027	Ferrite smd inductor	542-9230-023
L 028	Ferrite smd inductor	542-9230-023
L 029	Ferrite smd inductor	542-9230-023
L 030	Ferrite smd inductor	542-9230-023
L 031	Ferrite smd inductor	542-9230-023
L 032	Ferrite smd inductor	542-9230-023
L 033	Ferrite bead, 600 ohm smd	542-9230-035
L 034	Ferrite bead, 600 ohm smd	542-9230-035
L 035	Ferrite bead, 600 ohm smd	542-9230-035
L 036	Ferrite bead, 600 ohm smd	542-9230-035
L 037	Ferrite bead, 600 ohm smd	542-9230-035
L 038	Ferrite bead, 600 ohm smd	542-9230-035
L 039	Ferrite bead, 600 ohm smd	542-9230-035
L 040	Ferrite bead, 600 ohm smd	542-9230-035
L 041	Ferrite smd inductor	542-9230-023
L 042	Ferrite smd inductor	542-9230-023
L 043	Ferrite smd inductor	542-9230-023
L 044	Ferrite smd inductor	542-9230-023
L 045	Ferrite smd inductor	542-9230-023
L 046	Ferrite smd inductor	542-9230-023
L 047	Ferrite smd inductor	542-9230-023
L 048	Ferrite smd inductor	542-9230-023
L 049	Ferrite smd inductor	542-9230-023
L 050	Ferrite smd inductor	542-9230-023
L 053	Ferrite smd inductor	542-9230-023
L 054	Ferrite smd inductor	542-9230-023
L 055	Ferrite smd inductor	542-9230-023
L 056	Ferrite smd inductor	542-9230-023
L 057	Ferrite smd inductor	542-9230-023

KEYPAD BOARD (CONT'D)

Ref No.	Description	Part No.
L 058	Ferrite smd inductor	542-9230-023
L 059	Ferrite smd inductor	542-9230-023
L 060	Ferrite smd inductor	542-9230-023
L 061	Ferrite smd inductor	542-9230-023
L 063	Ferrite smd inductor	542-9230-023
L 064	Ferrite smd inductor	542-9230-023
MP 400	Front LCD holder,stamped	014-2229-508
P 400	Elastomeric connector	515-9900-007
P 430	Header, 8-pin	515-9500-018
PC400	PC board, keypad	035-5005-400
PC430	PC board, DES interface	035-5000-030
Q 001	NPN general purpose SOT-23	576-0003-658
Q 002	NPN general purpose SOT-23	576-0003-658
Q 004	P-chan enh mode MOSFET	576-0003-707
Q 005	NPN general purpose SOT-23	576-0003-658
O 006	NPN general purpose SOT-23	576-0003-658
Q 007	NPN general purpose SOT-23	576-0003-658
Q 008	NPN general purpose SOT-23	576-0003-658
Q 009	NPN general purpose SOT-23	576-0003-658
0 010	NPN general purpose SOT-23	576-0003-658
Q 011	P-chan enh mode MOSFET	576-0003-707
Q 012	NPN general purpose SOT-23	576-0003-658
Q 013	NPN general purpose SOT-23	576-0003-658
Q 014	NPN general purpose SOT-23	576-0003-658
Q 015	P-chan enh mode MOSFET	576-0003-707
R 001	100k ohm ±5% 1/16W smd	569-0155-104
R 002	100k ohm ±5% 1/16W smd	569-0155-104
R 003	100k ohm ±5% 1/16W smd	569-0155-104
R 004	100k ohm ±5% 1/16W smd	569-0155-104
R 005	10k ohm ±5% 1/16W smd	569-0155-103
R 006	10k ohm ±5% 1/16W smd	569-0155-103
R 007	100k ohm ±5% 1/16W smd	569-0155-104
R 008	10k ohm ±5% 1/16W smd	569-0155-103
R 009	1k ohm ±5% 1/16W smd	569-0155-102
R 010	10k ohm ±5% 1/16W smd	569-0155-103
R 011	10k ohm ±5% 1/16W smd	569-0155-103
R 012	100k ohm ±5% 1/16W smd	569-0155-104
R 013	10k ohm ±5% 1/16W smd	569-0155-103
R 014	56k ohm ±5% 1/16W smd	569-0155-563
R 015	10k ohm ±5% 1/16W smd	569-0155-103

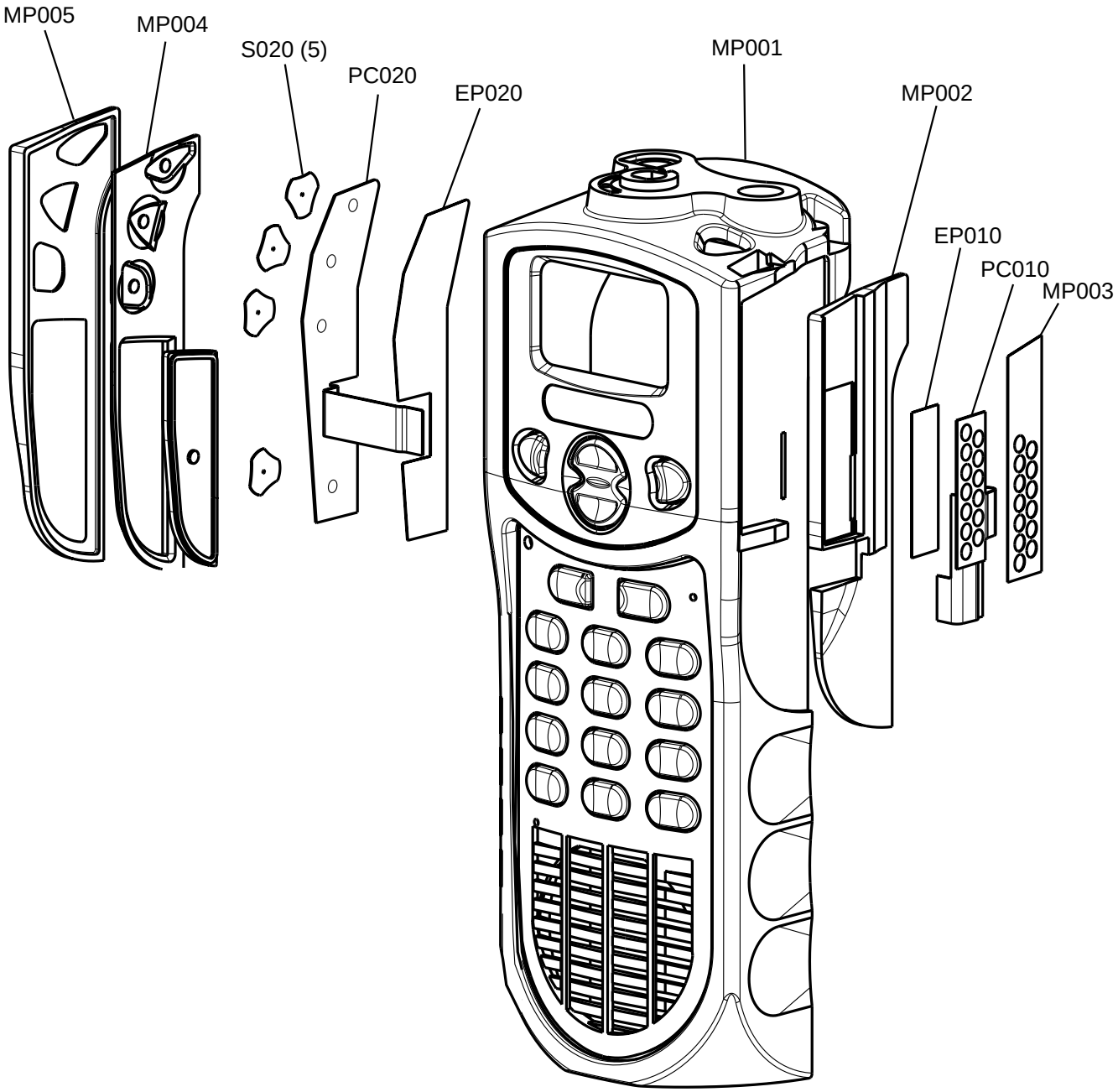
Ref No.	Description	Part No.
R 016	0 ohm jumper	569-0155-001
R 017	1.0M ohm ±5% 1/16W smd	569-0155-105
R 018	100k ohm ±5% 1/16W smd	569-0155-104
R 019	10k ohm ±5% 1/16W smd	569-0155-103
R 020	100k ohm ±5% 1/16W smd	569-0155-104
R 021	100k ohm ±5% 1/16W smd	569-0155-104
R 022	100k ohm ±5% 1/16W smd	569-0155-104
R 023	1k ohm ±5% 1/16W smd	569-0155-102
R 024	220 ohm ±5% 1/16W smd	569-0155-221
R 025	220 ohm ±5% 1/16W smd	569-0155-221
R 026	0 ohm jumper	569-0155-001
R 027	47k ohm ±5% 1/16W smd	569-0155-473
R 028	4.75k ohm ±1% 1/16W smd	569-0156-903
R 029	10k ohm ±5% 1/16W smd	569-0155-103
R 030	6.19k, ±1% 1/16W smd	569-0156-904
R 031	10k ohm ±5% 1/16W smd	569-0155-103
R 032	10k ohm ±5% 1/16W smd	569-0155-103
R 033	100k ohm ±5% 1/16W smd	569-0155-104
R 034	220 ohm ±5% 1/16W smd	569-0155-221
R 035	0 ohm jumper	569-0155-001
R 036	100k ohm ±5% 1/16W smd	569-0155-104
R 037	27k ohm ±5% 1/16W smd	569-0155-273
R 038	10k ohm ±5% 1/16W smd	569-0155-103
R 039	2k ohm ±5% 1/16W smd	569-0155-202
R 040	100k ohm ±5% 1/16W smd	569-0155-104
R 041	100k ohm ±5% 1/16W smd	569-0155-104
R 042	100k ohm ±5% 1/16W smd	569-0155-104
R 043	100k ohm ±5% 1/16W smd	569-0155-104
R 044	4.7k ohm ±5% 1/16W smd	569-0155-472
R 045	47k ohm ±5% 1/16W smd	569-0155-473
R 046	390 ohm ±5% 1/16W smd	569-0155-391
R 047	4.7k ohm ±5% 1/16W smd	569-0155-473
R 048	22k ohm ±5% 1/16W smd	569-0155-223
R 049	10k ohm ±5% 1/16W smd	569-0155-103
R 050	390 ohm ±5% 1/16W smd	569-0155-391
R 051	4.7k ohm ±5% 1/16W smd	569-0155-472
R 052	10k ohm ±5% 1/16W smd	569-0155-103
R 053	10k ohm ±5% 1/16W smd	569-0155-103
R 054	100k ohm ±5% 1/16W smd	569-0155-104
R 055	100k ohm ±5% 1/16W smd	569-0155-104
R 056	47k ohm ±5% 1/16W smd	569-0155-473
R 057	360k ohm ±5% 1/16W smd	569-0155-364
R 058	130k ohm ±5% 1/16W smd	569-0155-134
R 059	180k ohm ±5% 1/16W smd	569-0155-184
R 060	220 ohm ±5% 1/16W smd	569-0155-221

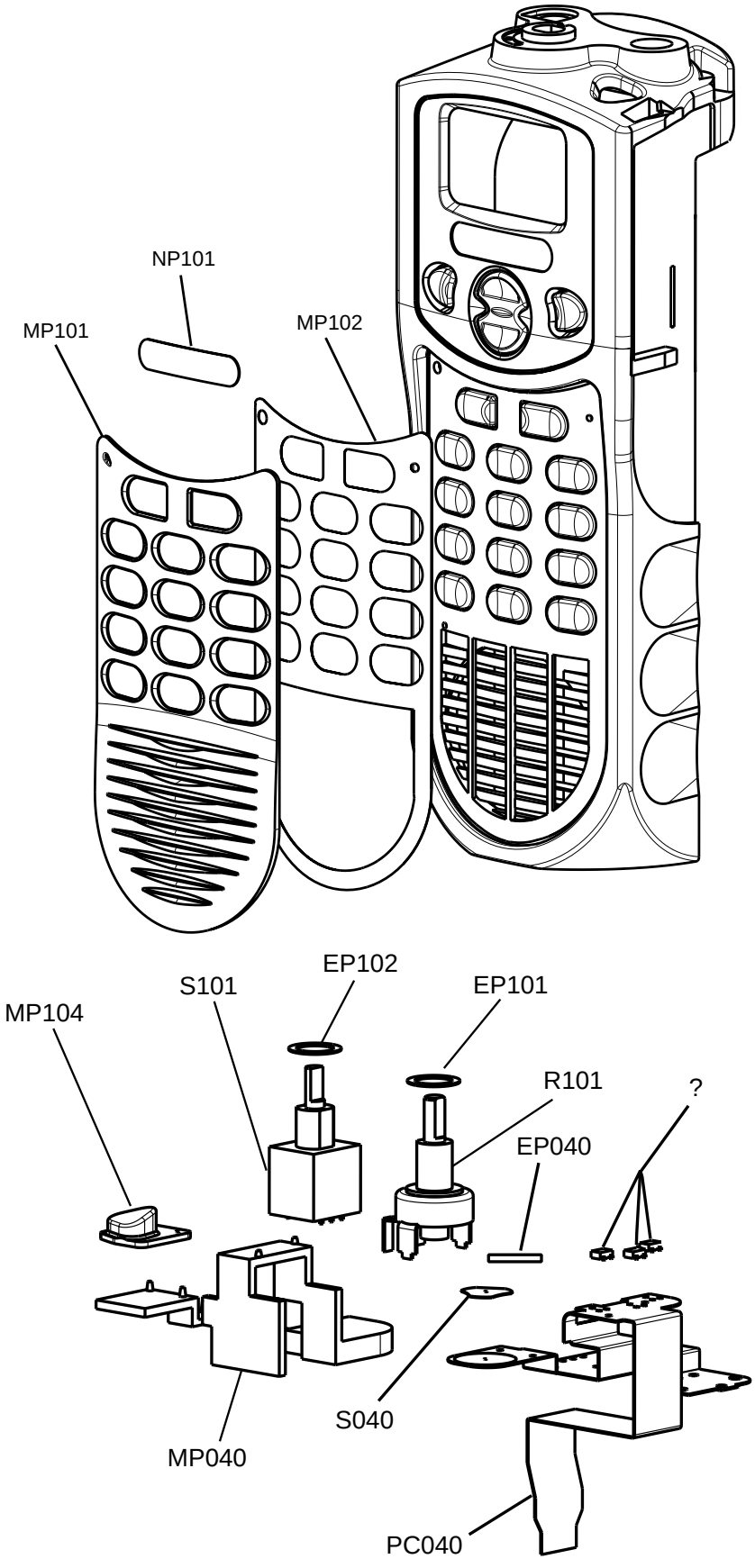
KEYPAD BOARD (CONT'D)

Ref No.	Description	Part No.
R 061	150 ohm ±5% 1/8W smd	569-0115-151
R 062	1k ohm ±5% 1/16W smd	569-0155-102
R 063	100k ohm ±5% 1/16W smd	569-0156-104
R 064	27k ohm ±5% 1/16W smd	569-0155-273
R 065	22k ohm ±5% 1/16W smd	569-0155-223
R 066	10k ohm ±5% 1/16W smd	569-0155-103
R 067	100k ohm ±5% 1/16W smd	569-0155-104
R 068	2.2k ohm ±5% 1/16W smd	569-0155-222
R 069	220 ohm ±5% 1/16W smd	569-0155-221
R 070	220 ohm ±5% 1/16W smd	569-0155-221
R 071	220 ohm ±5% 1/16W smd	569-0155-221
R 072	47k ohm ±5% 1/16W smd	569-0155-473
R 073	220 ohm ±5% 1/16W smd	569-0155-221
R 074	220 ohm ±5% 1/16W smd	569-0155-221
R 075	220 ohm ±5% 1/16W smd	569-0155-221
R 076	220 ohm ±5% 1/16W smd	569-0155-221
R 077	220 Ohm ±5% 1/16W smd	569-0155-221
R 078	0 ohm jumper	569-0155-001
R 079	100k ohm ±5% 1/16W smd	569-0155-104
R 080	100k ohm ±5% 1/16W smd	569-0155-104
R 081	200k ohm ±5% 1/16W smd	569-0155-204
R 082	100k ohm ±5% 1/16W smd	569-0155-104
R 083	100k ohm ±5% 1/16W smd	569-0155-104
R 084	100k ohm ±5% 1/16W smd	569-0155-104
R 085	100k ohm ±5% 1/16W smd	569-0155-104
R 086	1k ohm ±5% 1/16W smd	569-0155-102
R 087	150k ohm ±5% 1/16W smd	569-0155-154
R 088	2.2k ohm ±5% 1/16W smd	569-0155-222
R 089	220 ohm ±5% 1/16W smd	569-0155-221
R 090	220 ohm ±5% 1/16W smd	569-0155-221
R 091	10k ohm thermistor	569-3004-041
R 092	2k ohm ±5% 1/16W smd	569-0155-202
R 093	0 ohm jumper	569-0155-001
R 094	0 ohm jumper	569-0155-001
R 095	150 ohm ±5% 1/8W smd	569-0115-151
R 096	220 ohm ±5% 1/16W smd	569-0155-221

Ref No.	Description	Part No.
R 097	220 ohm ±5% 1/16W smd	569-0155-221
R 098	510k ohm ±5% 1/16W smd	569-0155-514
R 099	150k ohm ±5% 1/16W smd	569-0155-154
R 100	27k ohm ±5% 1/16W smd	569-0155-273
R 101	100k ohm ±5% 1/16W smd	569-0155-104
R 102	100k ohm ±5% 1/16W smd	569-0155-104
R 103	0 ohm jumper	569-0155-001
R 104	0 ohm jumper	569-0155-001
R 108	1k ohm ±5% 1/16W smd	569-0155-102
R 109	220k ohm ±5% 1/16W smd	569-0155-224
R 110	0 ohm jumper	569-0155-001
R 111	100k ohm ±5% 1/16W smd	569-0155-104
R 112	150 ohm ±5% 1/16W smd	569-0115-151
R 113	150 ohm ±5% 1/16W smd	569-0115-151
R 114	100k ohm ±5% 1/16W smd	569-0155-104
R 116	Zero ohm jumper	569-0165-001
R 117	Zero ohm jumper	569-0165-001
R 118	Zero ohm jumper	569-0165-001
R 119	Zero ohm jumper	569-0115-001
U 001	Microprcsr, MC68HC708 (unrev bd)	023-1870-045
	Microprcsr, MC68HC908 (rev bd)	544-9100-003
U 002	Analog MUX TC4W53FU	544-1010-011
U 003	EEPROM, 1K 2.5V 24LC02B	544-1012-402
U 004	Voltage detector, micropower	544-1027-665
U 005	RS-232 driver LTC13381G	544-1015-706
U 006	Audio amp, 0.5W w/vol control	544-2006-026
U 007	Audio amp, 0.5W w/vol control	544-2006-026
U 008	Analog MUX TC4W53FU	544-1010-011
U 009	Op amp, SO-8 MC33182D	544-1010-030
U 010	Op amp, SO-8 MC33182D	544-1010-030
U 011	LCD driver MC14LC5003	544-1010-017
U 012	DC-DC converter 5V MAX744AE	544-1010-744
U 013	Regulator, 5V LT11211ST-5	544-1011-121
U 014	Shift register, 8-bit 4094	544-3016-094
W 101	Wire, black 30 gauge solid	592-0080-069
Y 001	Crystal,4.9152 MHz	521-3060-023

EXPLODED VIEWS

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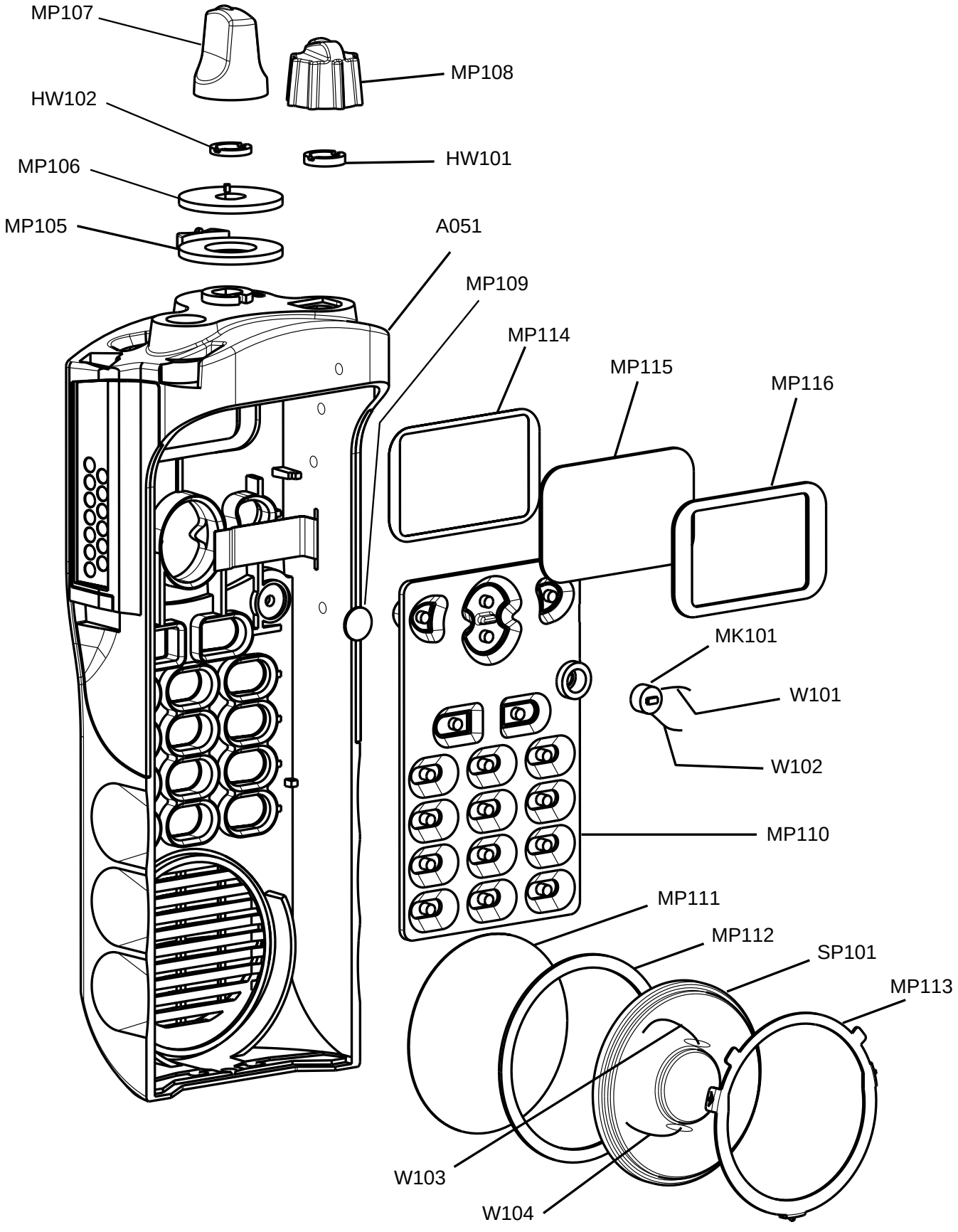
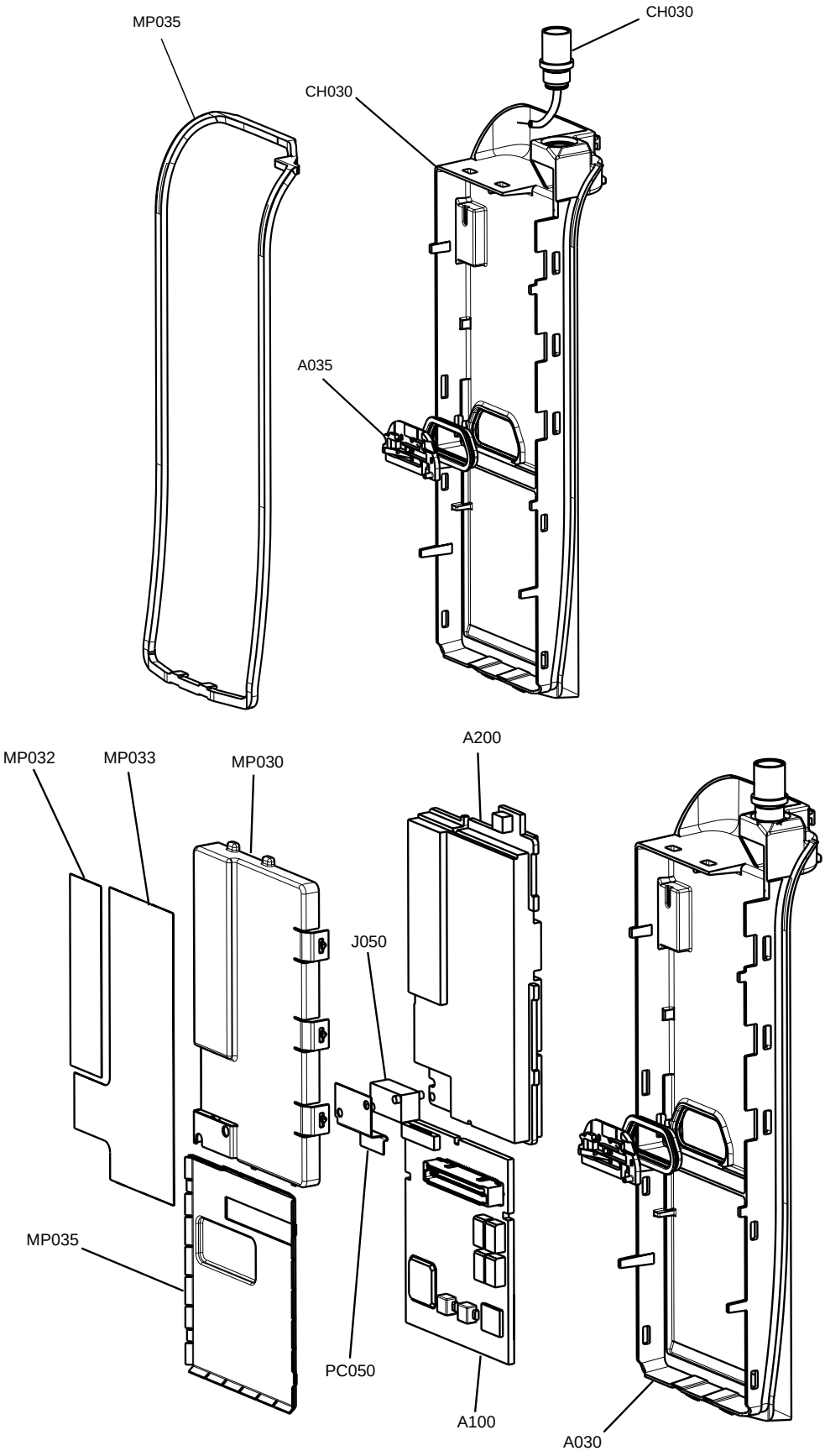
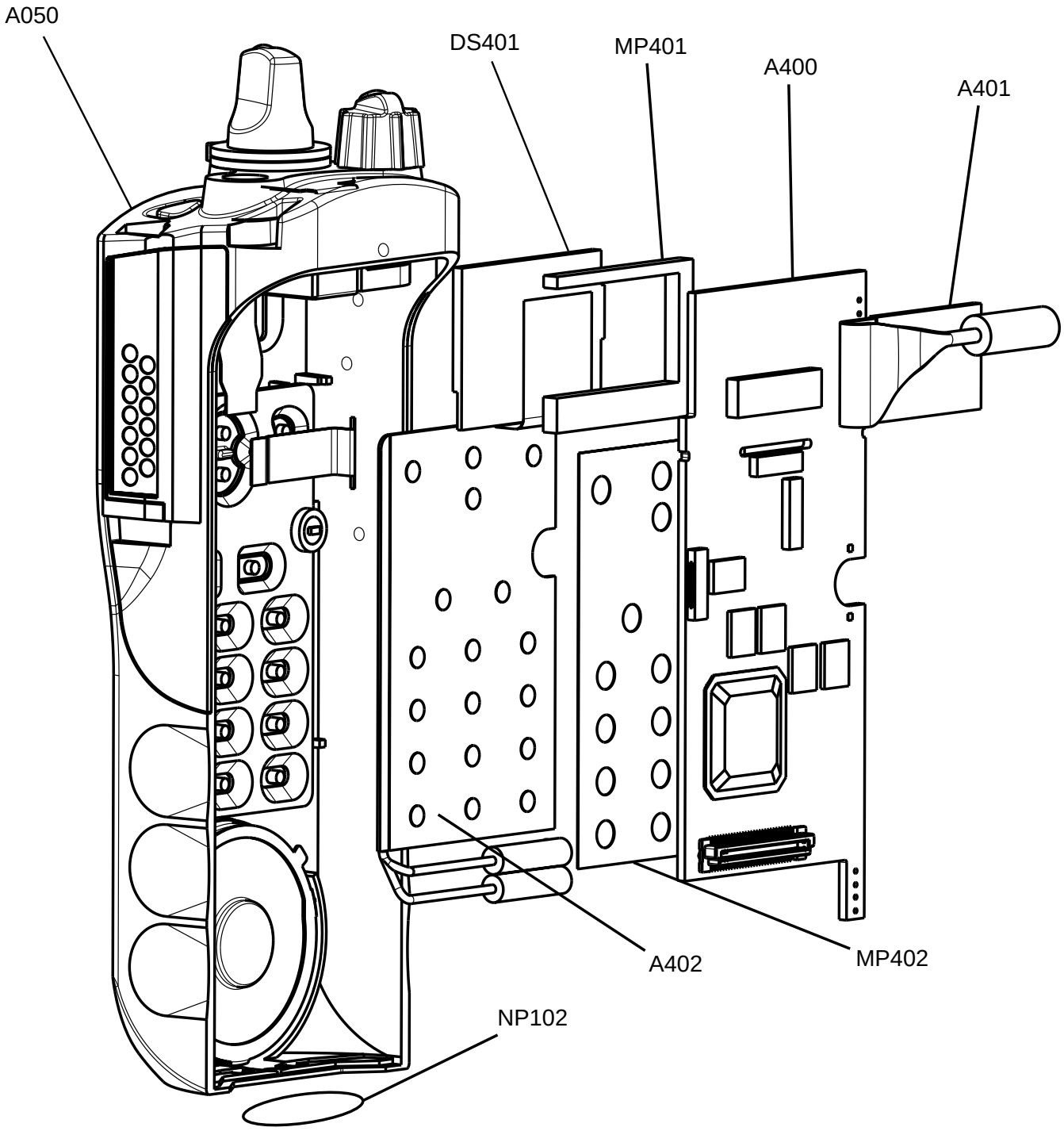
MP101
MP102
EP102
S101
EP101
MP104
R101
?
EP040
S040
MP040
PC040

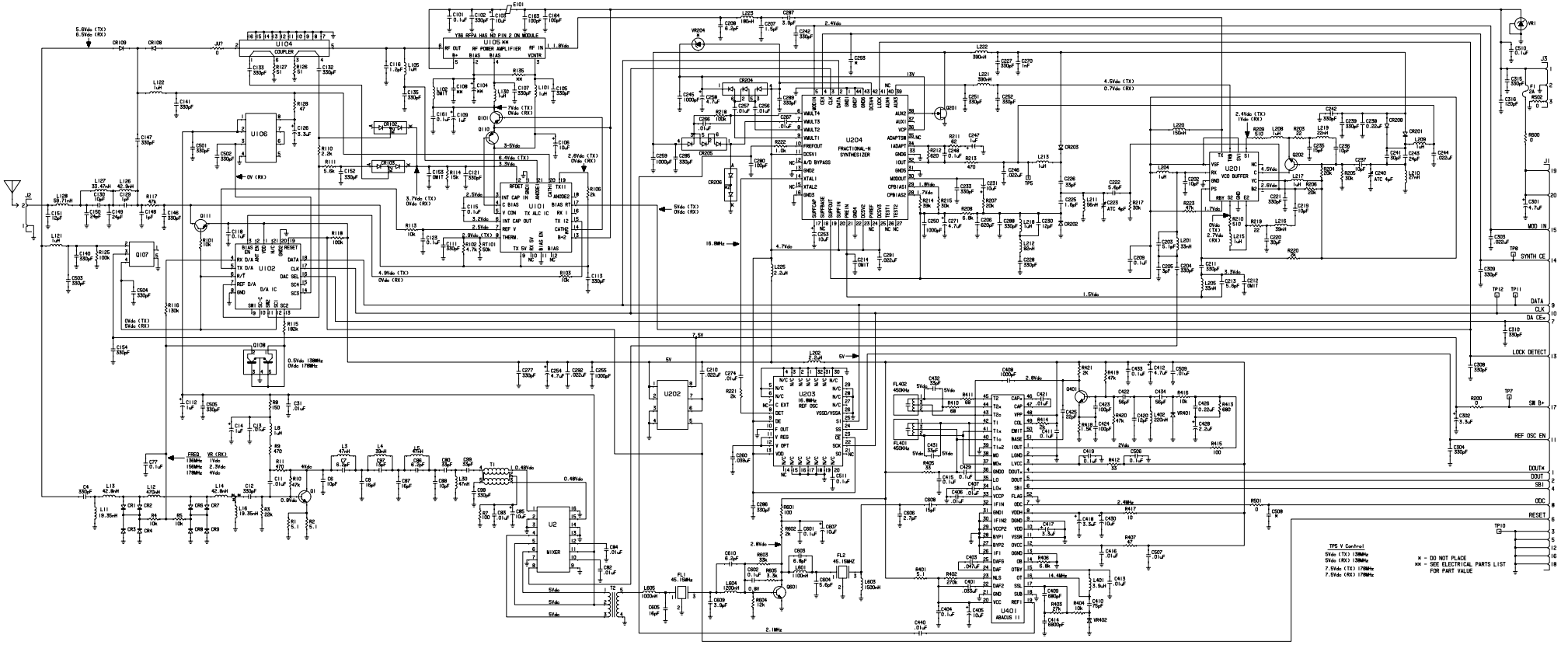


Revised October 2000
Part No. 001-5005-002


MP035
CH030
CH030
A035
MP032
MP033
MP030
A200
J050
MP035
PC050
A100
A030


A050
DS401
MP401
A400
A401
A402
MP402
NP102

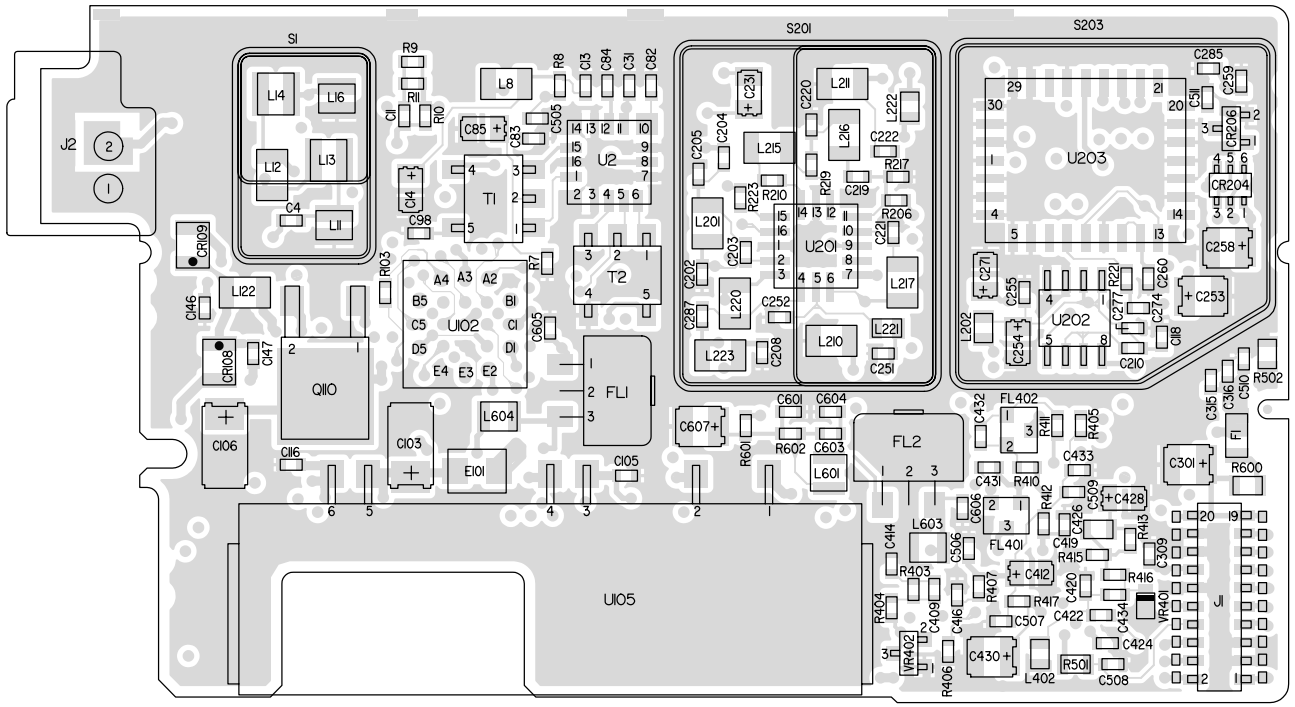
SECTION 8 SCHEMATIC DIAGRAMS AND COMPONENT LAYOUTS



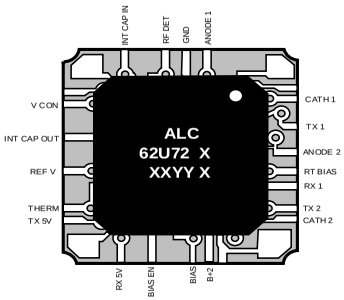
NOTE: Individual replacement parts are not available for the RF board, so the entire board must be replaced if it is defective.

VHF RF BOARD SCHEMATIC

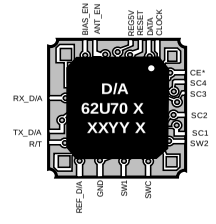
September 2001
Part No. 001-5100-001



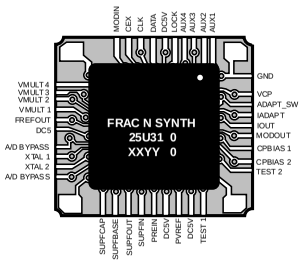
TOP VIEW



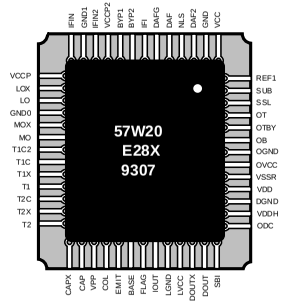
U101



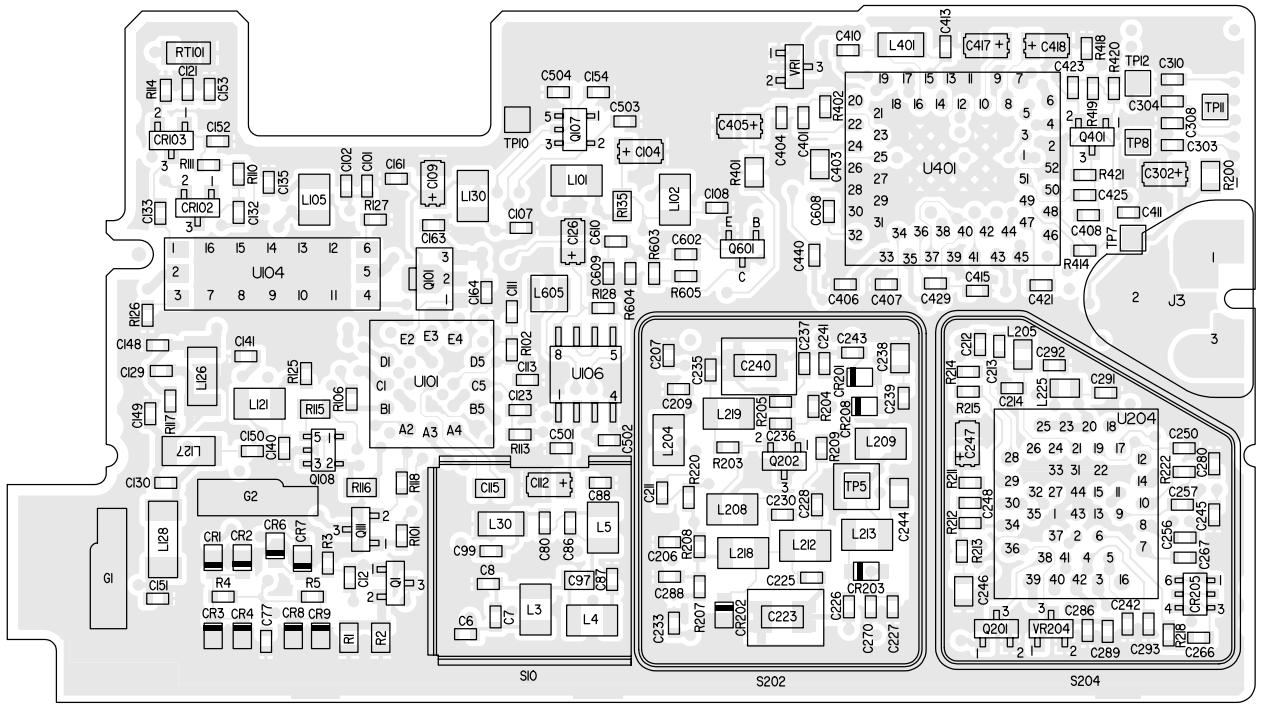
U102



U204



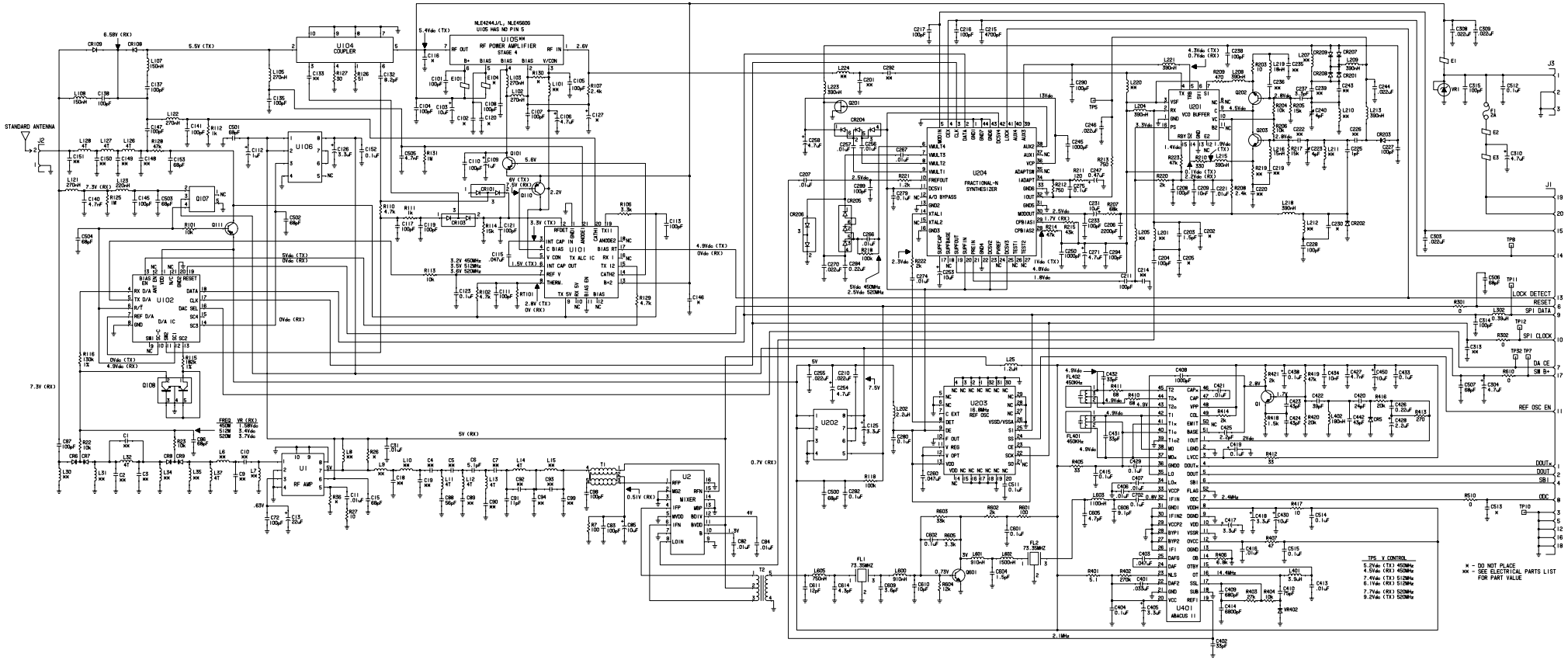
U401



BOTTOM VIEW

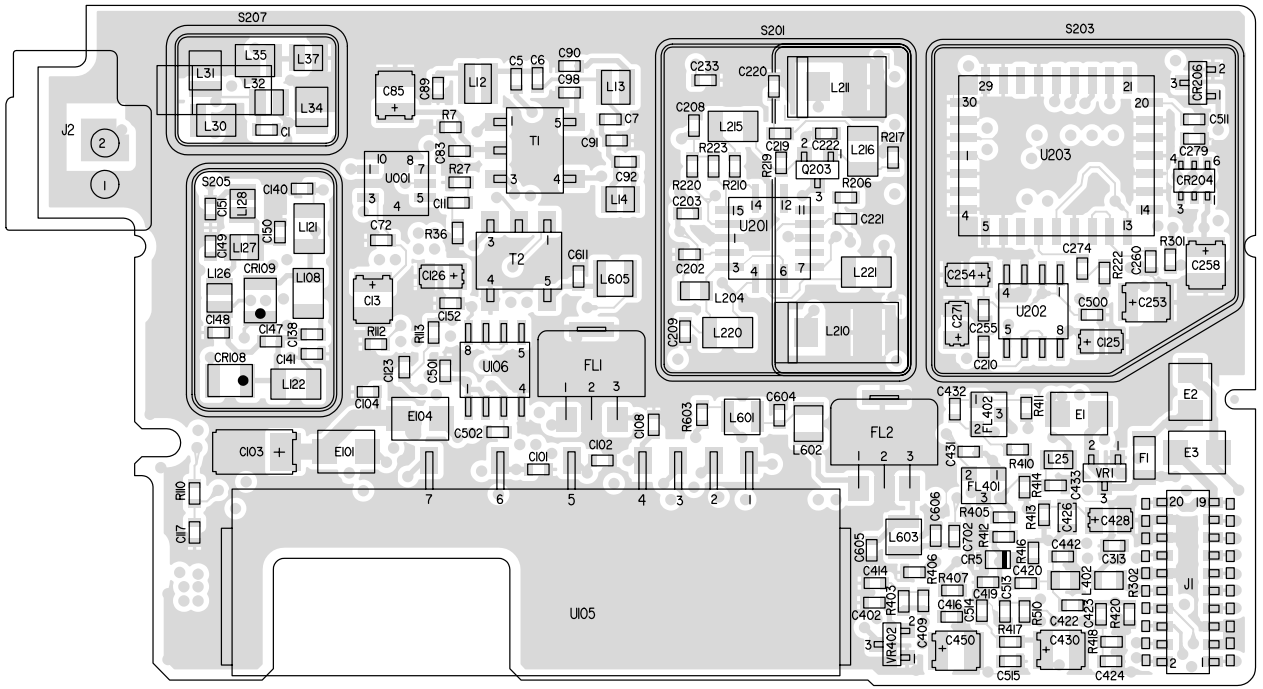
VHF RF BOARD LAYOUT

September 2001
Part No. 001-5100-001

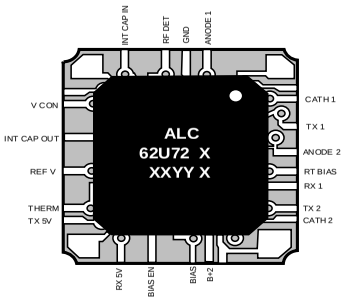


NOTE: Individual replacement parts are not available for the RF board, so the entire board must be replaced if it is defective.

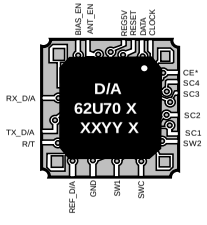
UHF RF BOARD SCHEMATIC



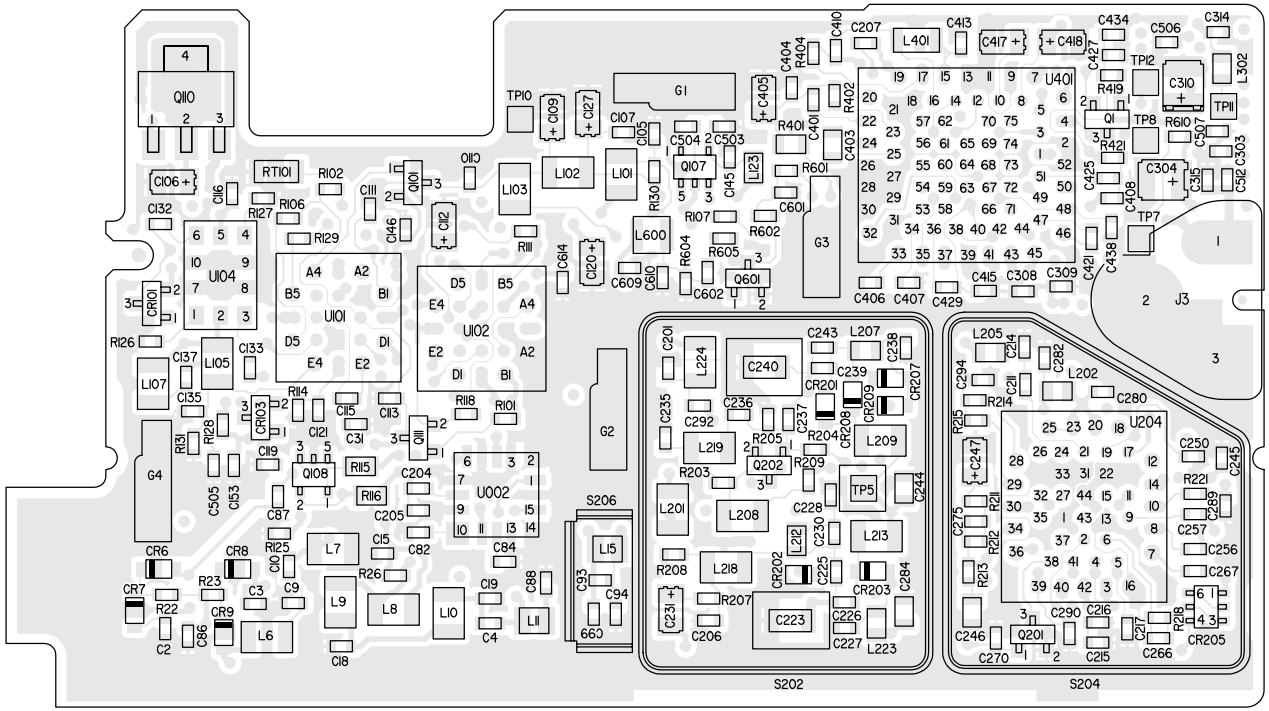
TOP VIEW

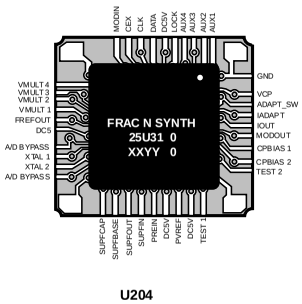


U101



U102





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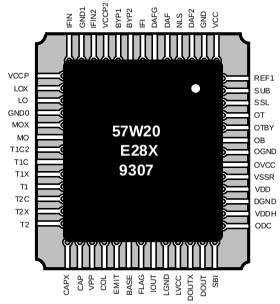
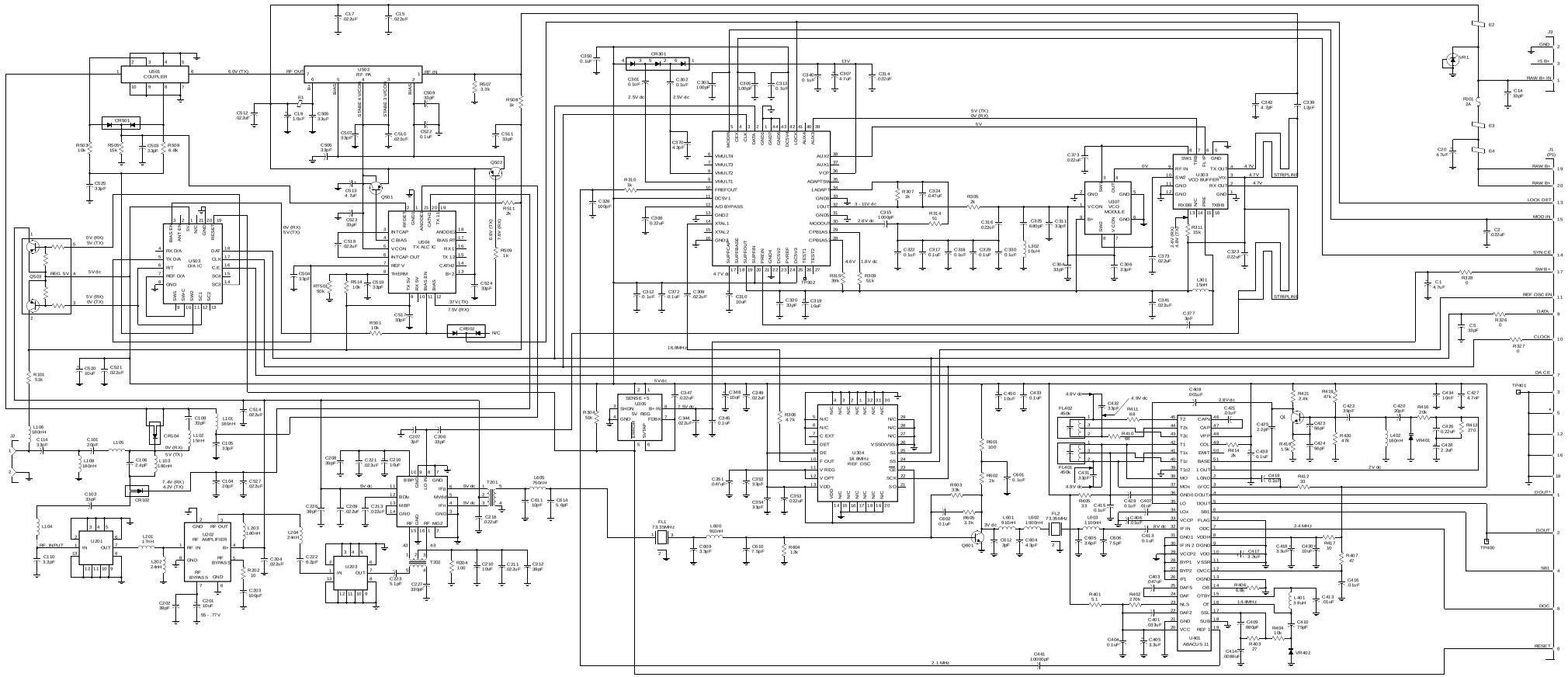


U401

BOTTOM VIEW

UHF RF BOARD LAYOUT

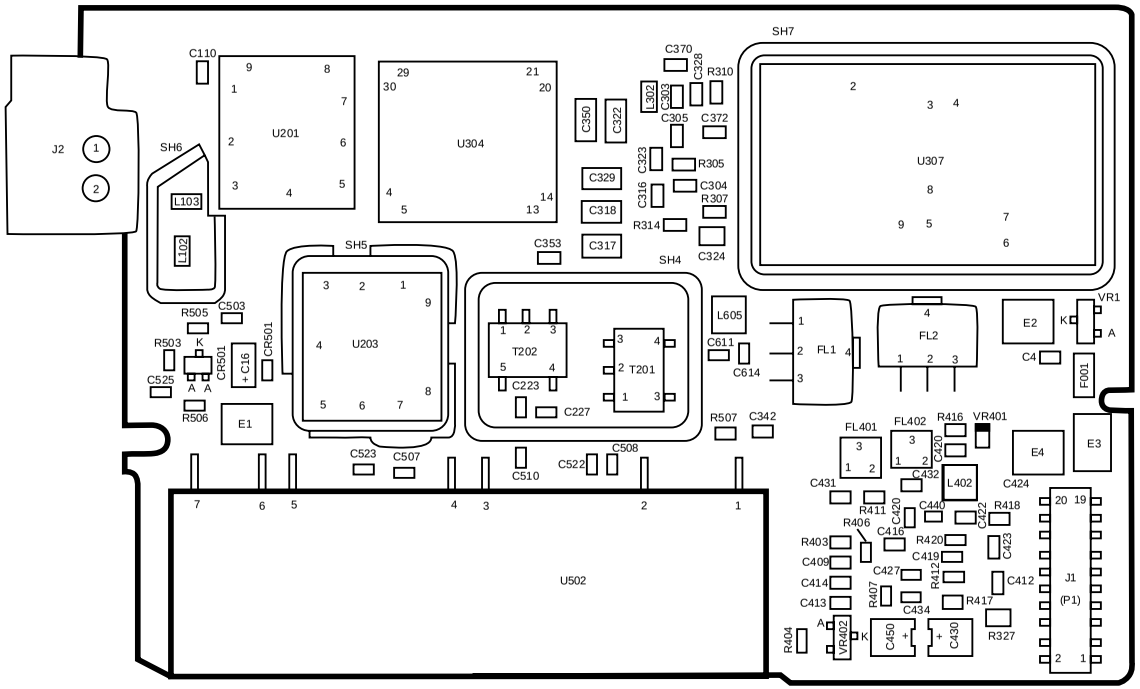
September 2001
Part No. 001-5100-001



NOTE: Individual replacement parts are not available for the RF board, so the entire board must be replaced if it is defective.

800 MHZ RF BOARD SCHEMATIC

September 2001
Part No. 001-5100-001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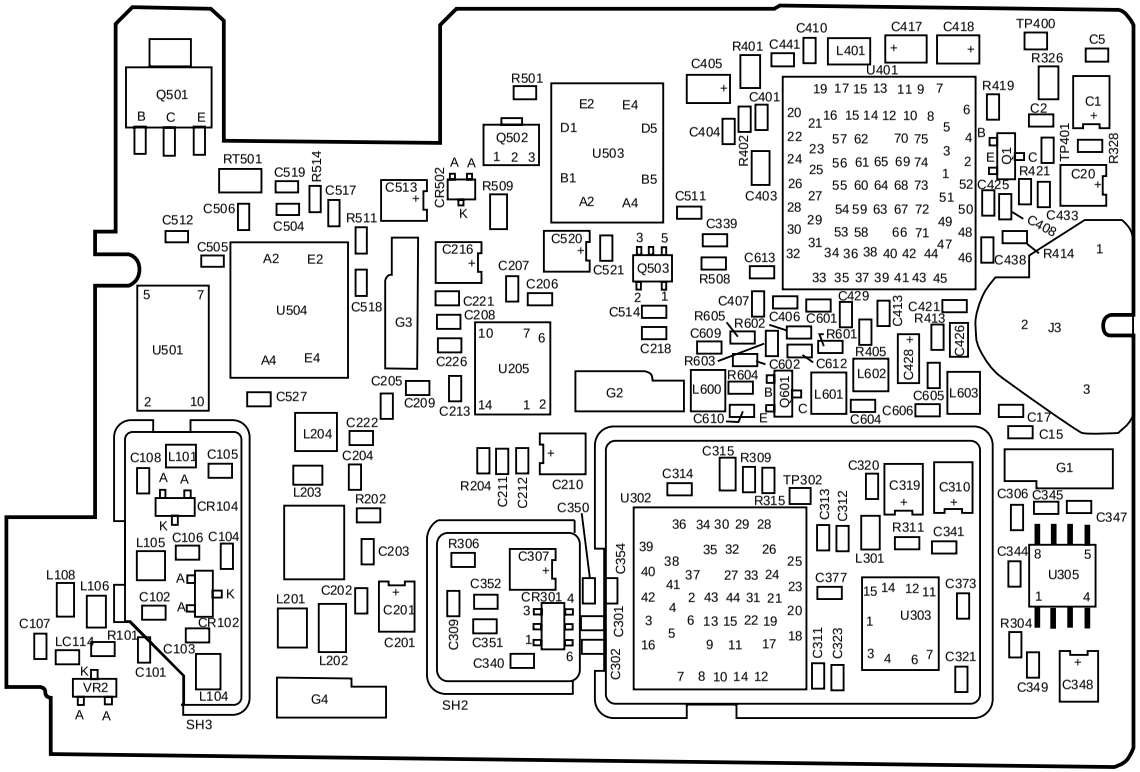
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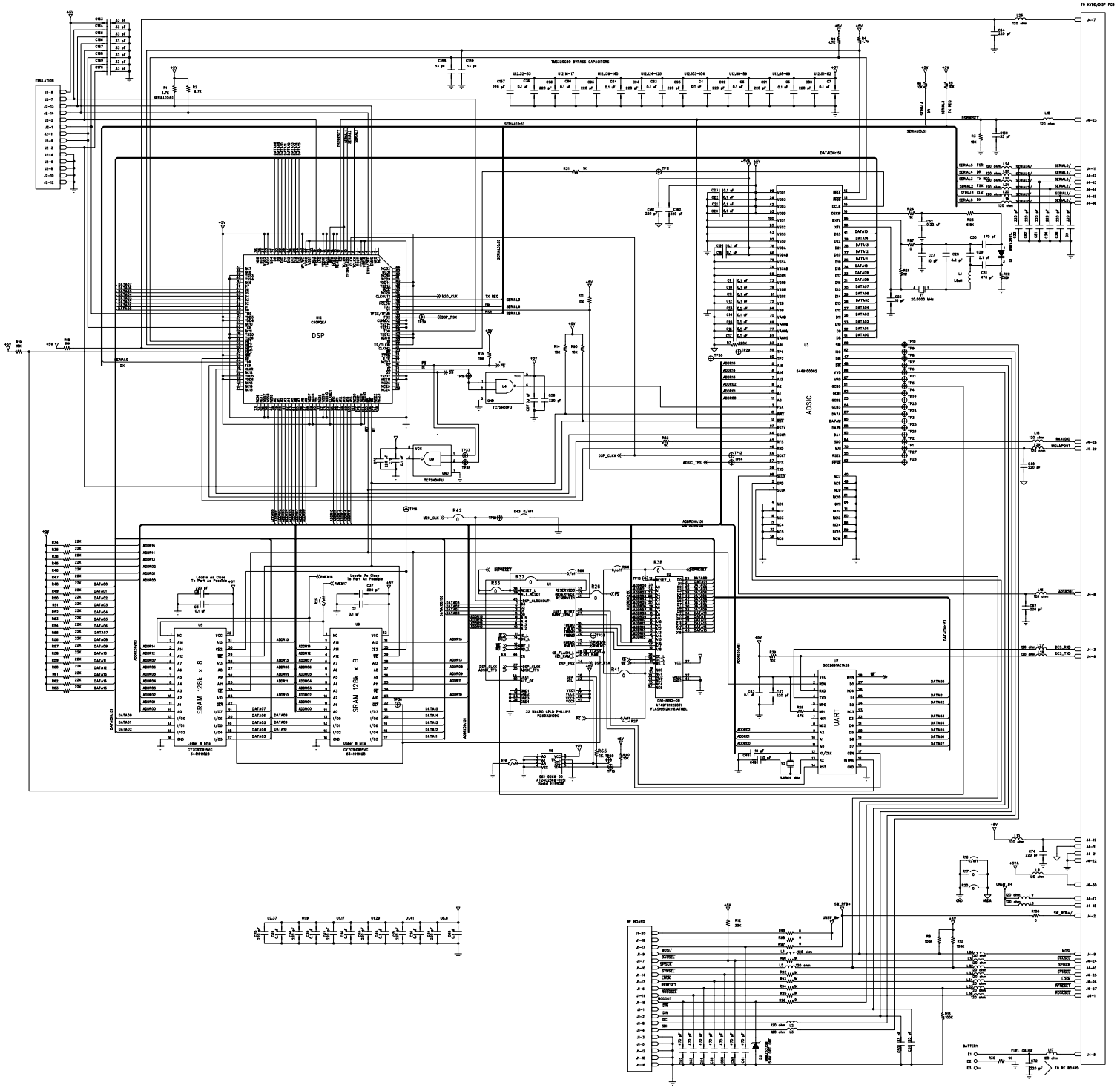
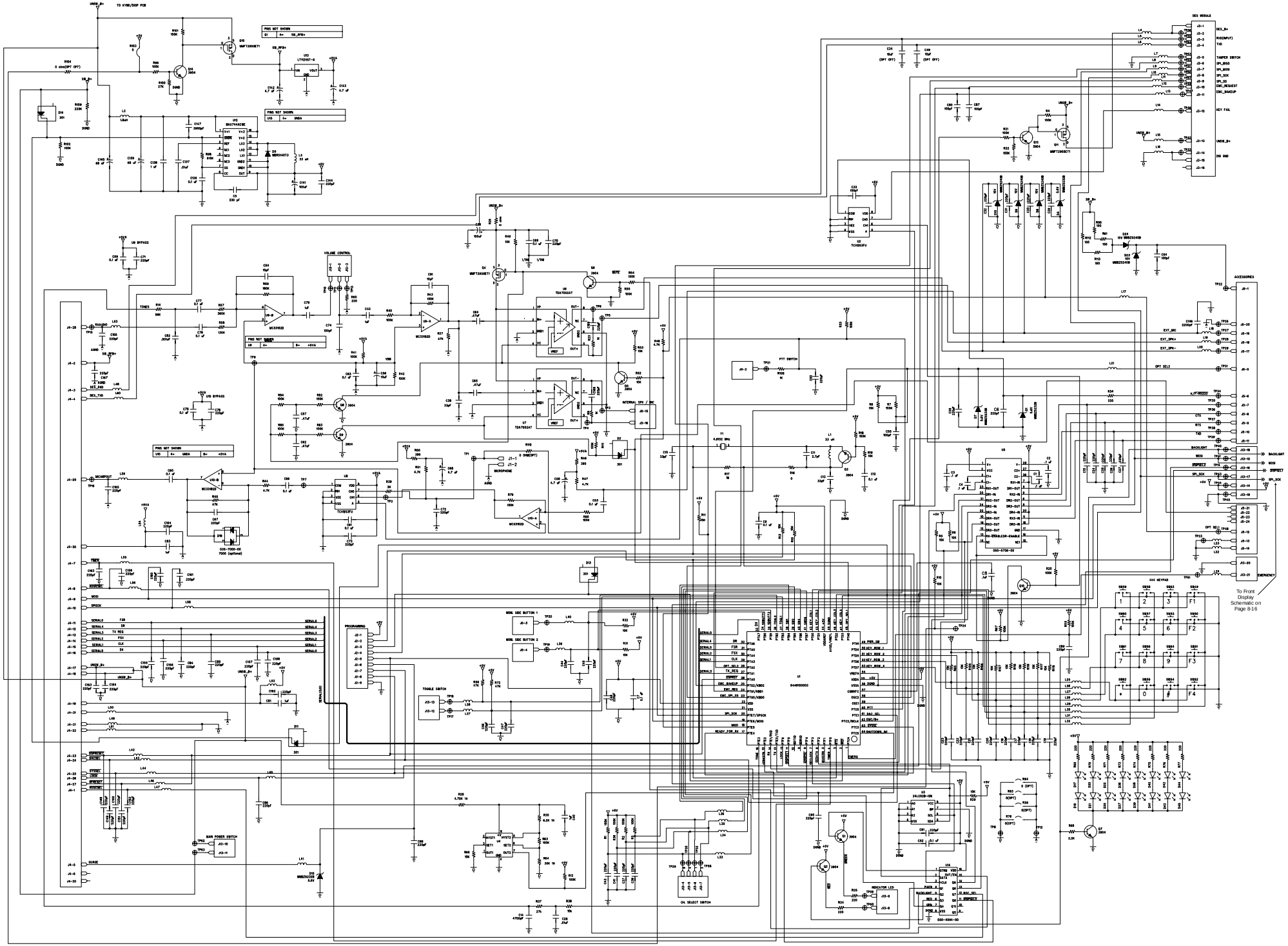


LOGIC BOARD (REV. 3) SCHEMATIC



REVISED KEYPAD BOARD SCHEMATIC