MOTOROLA

# MC3000™ Digital Deskset

## L3223

## Operator and Installation Manual


6880309L15-A
21 June 2002

WARNING

This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference to radio communication. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

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6880309L15-O released 15 October 2001
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## COMMERCIAL WARRANTY

## (STANDARD)

Motorola radio communications products are warranted to be free from defects in material and workmanship for a period of ONE (1) YEAR, [except for crystals and channel elements which are warranted for a period of ten (10) years] from the date of shipment. Parts, including crystals and channel elements, will be replaced free of charge for the full warranty period but the labor to replace defective parts will only be provided for ONE (1) Year from the date of shipment. Thereafter purchaser must pay for the labor involved in repairing the product or replacing the parts at the prevailing rates together with any transportation charges to or from the place where warranty service is provided. This express warranty is extended by Motorola Communications and Electronics, Inc., 1301 E. Algonquin Road, Schaumburg, Illinois 60196, to the original purchaser only, and only to those purchasing for purpose of leasing or solely for commercial, industrial, or governmental use.

THIS WARRANTY IS GIVEN IN LIEU OF ALL OTHER WARRANTIES EXPRESS OR IMPLIED WHICH ARE SPECIFICALLY EXCLUDED, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL MOTOROLA BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES TO THE FULL EXTENT SUCH MAY BE DISCLAIMED BY LAW.

In the event of a defect, malfunction or failure to conform to specifications established by seller, or if appropriate, to specifications accepted by Seller in writing, during the period shown, Motorola, at its option, will either repair or replace the product or refund the purchase price thereof, and such action on the part of Motorola shall be the full extent of Motorola's liability hereunder.

This warranty is void if:

a. the product is used in other than its normal and customary manner;

b. the product has been subject to misuse, accident neglect or damage;

c. unauthorized alterations or repairs have been made, or unapproved parts used in the equipment.

This warranty extends only to individual products, batteries are excluded, but carry their own separate limited warranty. Because each radio system is unique, Motorola disclaims liability for range, coverage, or operation of the system as a whole under this warranty except by a separate written agreement signed by an officer of Motorola.

Non-Motorola manufactured products are excluded from this warranty but subject to the warranty provided by their manufacturers, a copy of which will be supplied to you on specific written request.

In order to obtain performance of this warranty, purchaser must contact its Motorola salesperson or Motorola at the address first above shown, attention Quality Assurance Department.

This warranty applies only within the United States.

# Contents

Chapter 1
# Introduction to this Manual

## About this Manual

The purpose of this manual is to help you install and operate the MC3000 Digital Deskset. It is written for operators and for the technicians who are responsible for installing and troubleshooting the MC3000 Digital Deskset and related equipment. It provides reference information for technicians and Motorola field support engineers and technicians.

The MC3000 Digital Deskset (L3223) is operated as an extension of four Motorola radio system types (connected through the Digital Junction Box): ASTRO, MCS2000, iDEN and LTR. As such, the digital radio function buttons will emulate the buttons and display of the radio it is connected to. For detailed instructions on the operation of the radio buttons, refer to the appropriate radio user documentation.

**Note**: The deskset default configuration is for an ASTRO digital radio. Refer to Chapter 2 if you connect the deskset to a different digital radio type.

## MC3000 Deskset Overview

The MC3000 Digital Deskset is a small-footprint radio dispatch console designed to satisfy the needs of digital radio users who require multiple dispatch points with enhanced talk / listen and inter-dispatcher intercom.

The MC3000 is the approximate size and shape of an office telephone set, with a telephone-like handset that includes a PTT switch. The handset microphone and speaker become active when the handset is lifted from the housing base. The housing includes a built-in condenser microphone and an internal speaker. The unit housing and handset are both black in color. An external deskset microphone or footswitch can be connected to the deskset.

Speaker volume can be adjusted using a knob on the front panel. The minimum level does not mute speaker. Receive, transmit, and intercom transmit audio levels can be adjusted using potentiometers inside the deskset housing. The front panel has the following buttons and LEDs:

- Intercom (green LED)
- Speaker (green LED)
- Takeover (green LED)
- Transmit (red TX LED, yellow Busy LED)
- Keypad (1 -9, A - D in green, A - Z in black, * and #)
- Shift button (∧)
- Menu / Home button

- Select button
- Mode Up and Down buttons
- Digital Radio Function buttons

Up to thirty-one MC3000 Desksets can operate in parallel without degradation in performance. A Digital Junction Box L3208 is required to connect one or more desksets to a radio (or L3239 for LTR radio). The maximum aggregate cable length between desksets and the master Digital Junction Box is 5000 ft.

The MC3000 Deskset operates on +12 VDC using an external in-line 120 - 240 $V_{AC}$, 50/60 Hz power supply.

# Model Information

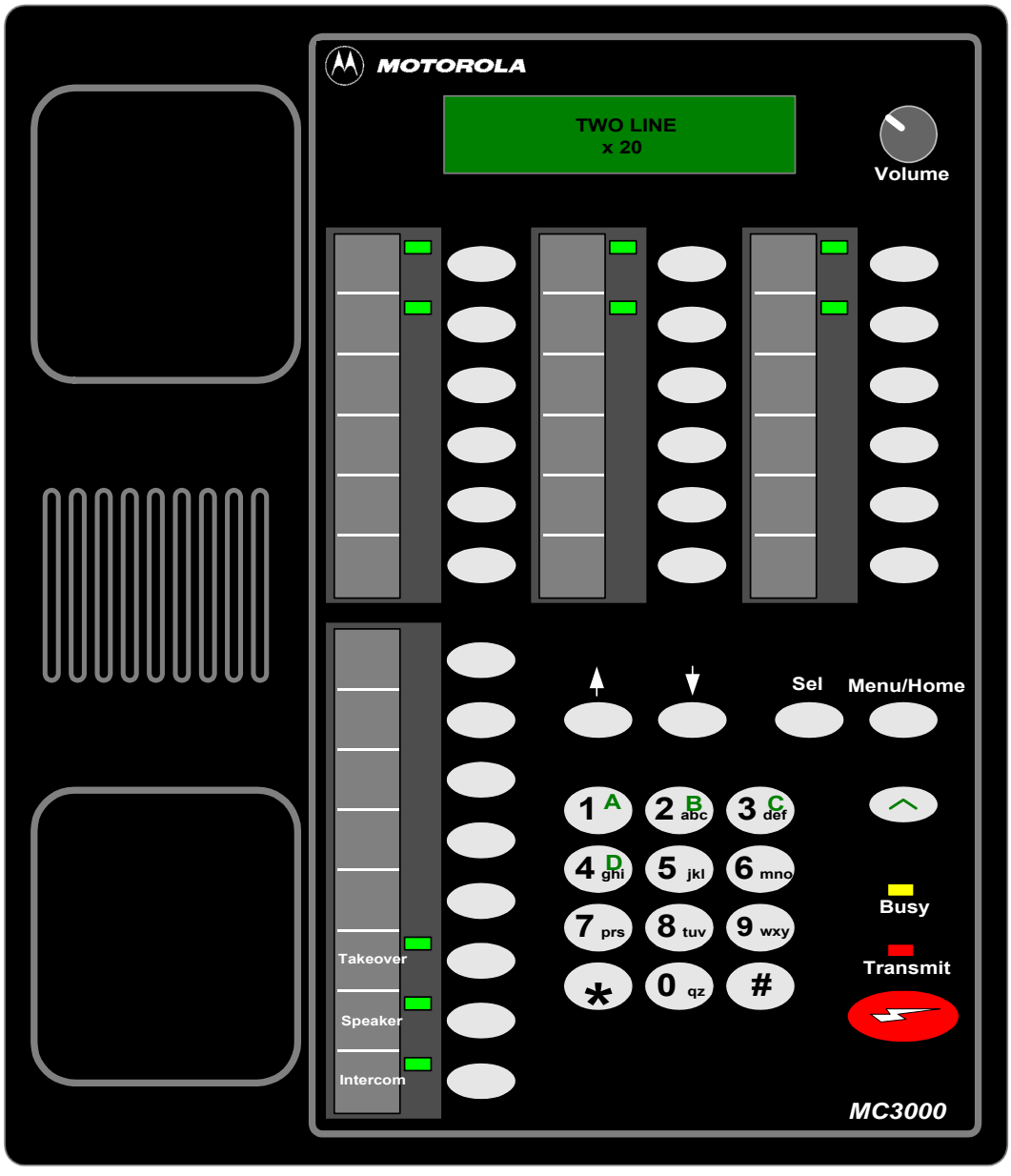



**Figure 1-1: MC3000 Digital Deskset**

# MC3000 Digital Deskset Specifications

| SPECIFICATIONS | |
|---|---|
| **Color** | Black |
| **Dimensions** | W 8·9/16” x L 9 7/8” x H 4 1/2” approx. |
| **Weight** | 3 lb. approx. |
| **Operating Temp Range** | 32° F to 122° F (0° C to 50° C) |
| **Humidity** | 95% at 122° F (50° C) non-condensing |
| **Power Input** | 10.5 – 16 $V_{DC}$ maximum |
| **Frequency Response** | ±3dB from 300-3000 Hz @ 1kHz ref. |
| **Hum and Noise** | Less than -50 dB below rated outputs |
| **Audio Distortion** | Less than 5% THD @ 1000 Hz (full volume) |
| **Audio Output to Speaker** | 0.8 Watt with level in compression range |
| **Line Impedance** | 600Ω nominal or 10KΩ |
| **Receive Audio Input (with autolevel)** | 0.78 $V_{ac}$ or 80mV nominal, auto leveled, - 10 dB to + 6dB nominal |
| **Transmit Audio Output** | 0.78 $V_{ac}$ or 80mV nominal into 600Ω |
| **Max. Number of consoles** | 31 in parallel |

# MC3000 Accessories and Replacement Items

| DESCRIPTION | PART NO. |
|---|---|
| **Digital Junction Box** | L3208, L3239 |
| **MCS2000 Radio Interface Cable** | HKN6123 |
| **Handset with Cord, Black** | DDN6343 |
| **External Deskmic** | HMN3000 |
| **Headset (Supra Monaural)** | CDN6297 |
| **Headset Base Amplifier** | CDN6282 |
| **Headset Jackbox** | BLN7074 |
| **Footswitch** | BLN6732 |
| **LCD Display** | DDN6346 |
| **Power Supply 120 - 240 $V_{AC}$, 50/60 Hz** | DDN6342 |

# Safety Summary

The following general safety precautions must be observed during all phases of operation, service and repair of this product. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture and intended use of the product. Motorola assumes no liability for the customer's failure to comply with these requirements.

## Ground the Equipment

To minimize shock hazard, the MC3000 Deskset must be connected to an electrical ground. The equipment is supplied with a three-conductor AC power cable. This power cable must be plugged into an approved three-contact electrical outlet with the grounding wire (green) firmly connected to an electrical ground at the power outlet. The power cables meet international Electrotechnical Commission (IEC) safety standards.

## Keep Away from Live Circuits

Operating personnel must not open the MC3000 Deskset. Component replacement and internal adjustments required must be made by qualified maintenance personnel. Do not replace components with power cable connected. To avoid injuries, always disconnect power and discharge circuits before removing equipment shelves or making major modifications.

## Do Not Service or Adjust Alone

Do not attempt major component replacement or internal service or adjustment unless another person, capable of rendering first aid and resuscitation, is present.

## Electrostatic Discharge: Sensitive Parts

This product contains CMOS and other circuit components which may be damaged by electrostatic discharge. Proper precaution must be taken when handling circuit modules. As a minimum, grounded wrist straps should be used at all times when handling circuit modules.

See Section 11.9 of the *Motorola R56—Standards and Guidelines for Communications Sites* for more detailed information.

## Do Not Substitute Parts or Modify the Product

Because of the danger of introducing additional hazards, do not install substitute parts or perform any unauthorized modification to the product. Contact an authorized Sales and Service Office for service and repairs to ensure that safety features are maintained.

## Return/Repair Procedure

If trouble is experienced with this equipment, for repairs or warranty information, please contact:

Motorola Inc.
Florida Product Services
(800) 927-2744

If necessary an RMA number will be authorized and you will ship defective units to:

CML Emergency Services Inc.
75 Blvd de la Technolgie,
Hull, Quebec
Canada
J8Z 3G4

Order parts from:

Motorola Accessory and Aftermarket Division
1313 East Algonquin Road
Schaumburg, Illinois 60196
(800) 422-4210

### Dangerous Procedure Warnings

Warnings, such as the example below, precede potentially dangerous procedures throughout this manual. Instructions contained in the warnings must be followed.

**WARNING: THE VOLTAGES EMPLOYED IN THIS EQUIPMENT ARE SUFFICIENTLY HIGH TO ENDANGER HUMAN LIFE. EVERY REASONABLE PRECAUTION HAS BEEN OBSERVED IN DESIGN TO SAFEGUARD THE OPERATING PERSONNEL. OPERATING PERSONNEL SHOULD BE PROHIBITED FROM TAMPERING WITH PROTECTIVE DEVICES SUCH AS DOOR SWITCHES. THE POWER SHOULD BE REMOVED COMPLETELY AND THE HIGH VOLTAGE CAPACITORS IN POWER SUPPLIES DISCHARGED MANUALLY WITH A SHORTING BAR BEFORE MAKING INTERNAL ADJUSTMENTS.**

### Electrical Safety Advisory

Because of the risk of electrical surges, typically lightning transients, which are very destructive to customer terminal equipment connected to AC power sources, we recommend that the customer should install an AC surge arrestor in the AC outlet to which the MC3000 Deskset is connected.

### FCC Interference Warning

RADIO AND TELEVISION INTERFERENCE

**WARNING: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.**

**WARNING: In order to maintain compliance with the FCC regulations, shielded cables must be used with this equipment. Operation with non-approved equipment or unsaddled cables is likely to result in interference to radio and television reception.**

## Related Information

- *Motorola R56—Standards and Guidelines for Communications Sites* (6881089E50); also available on CD-ROM (9882904Y01).
- User documentation for the digital radio types: ASTRO, MCS2000, iDEN and LTR

# Chapter 2
# Installation

## Introduction

The purpose of this chapter is to help you install the MC3000 Digital Deskset. It is written for technicians who are responsible for the installation and troubleshooting of a MC3000 Digital Deskset system. It provides reference information for technicians and Motorola field support engineers and technicians.

This chapter details generic installation techniques to assemble the MC3000 Digital Deskset and troubleshoot rapidly. This manual assumes that you are familiar with the tools, test equipment, the system architecture, and the configuration of the MC3000 Digital Deskset system.

This chapter contains the following sections:

- Preparing for Installation
- Using Digital Junction Box to Connect a Single Deskset
- Using Digital Junction Box to Connect Multiple Desksets
- Opening Deskset
- Connecting Deskset to Alarms
- Setting Jumpers
- Setting DIP Switches
- Back Panel Connector Layout
- Connecting to a Digital Junction Box
- Radio Pinouts
- Connecting to an RCH Junction Box
- Connecting Power Supply
- Connecting an External Deskset Microphone or Footswitch
- Programing Multiple Digital Desksets for Takeover Privileges
- Configuring and Testing Deskset Functions
- Adjusting Potentiometers
- Creating Labels for the Deskset Buttons
- Wall Mounting

# Preparing for Installation

## Equipment

- High impedance audio multi-meter with a range of 80m$V_{RMS}$ to 4 $V_{RMS}$, capable of measuring 1000 Hz
- #1 Phillips screwdriver
- 1/8-inch flat-blade screwdriver
- Optionally, an RF service monitor or tone generator

## Documentation and Software

- MC3000 deskset schematics—in Chapter 4
- MC3000 deskset digital radio function buttons cross-referenced to the four radio types—in Chapter 3
- Deskset/s installation plan—specific to the location
- Labeling software

## Safety Considerations

Cable Installation

- Wiring should conform to Article 800 of the National Electrical Code. Ensure you use listed communication wiring and cabling suitable and specific to the interconnection of other equipment.

Electrostatic Discharge (ESD) Protection

- The deskset has ESD protection circuitry to provide protection from ESD, power and telephone line surges. The circuitry shunts the transient currents to earth ground.

# Using Digital Junction Box to Connect a Single Deskset

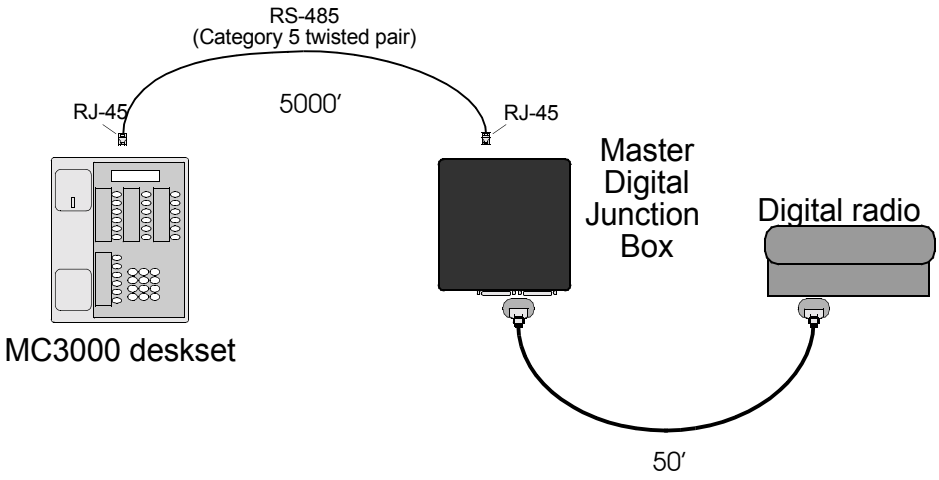



**Figure 2-1: Single Digital Deskset with Digital Junction Box Configuration**

For a single connection, the digital radio and Digital Junction Box must be within 50 feet of each other. Figure 2-1 shows a Digital Junction Box connected to a digital radio. The connection to the radio is made using a radio interface cable (provided with the Digital Junction Box). The connections to the operator desksets and consoles are made over RS-485 links, using RJ45 connectors to connect to the Digital Junction Box. The operator consoles and desksets can be located up to 5000 feet from the Digital Junction Box. If the deskset is connected directly to the radio, the maximum separation is 50 feet. A deskset cannot be connected directly to an LTR radio.

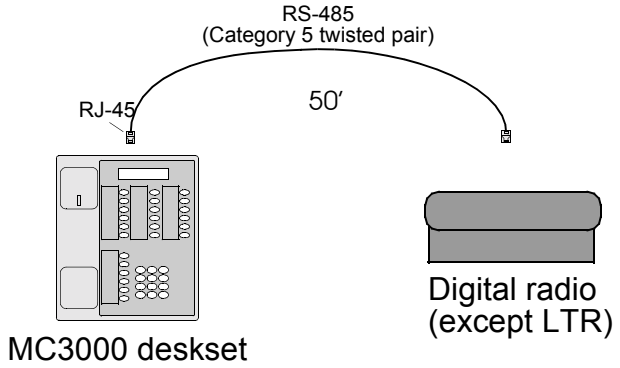



**Figure 2-2: Single Digital Deskset direct to Radio (except LTR) Installation**

# Using Digital Junction Box to Connect Multiple Desksets

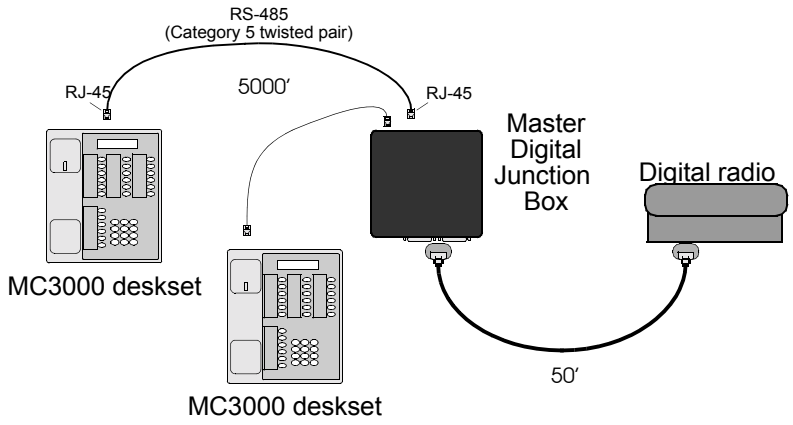



**Figure 2-3: Multiple Digital Desksets with a Digital Junction Box Installation**

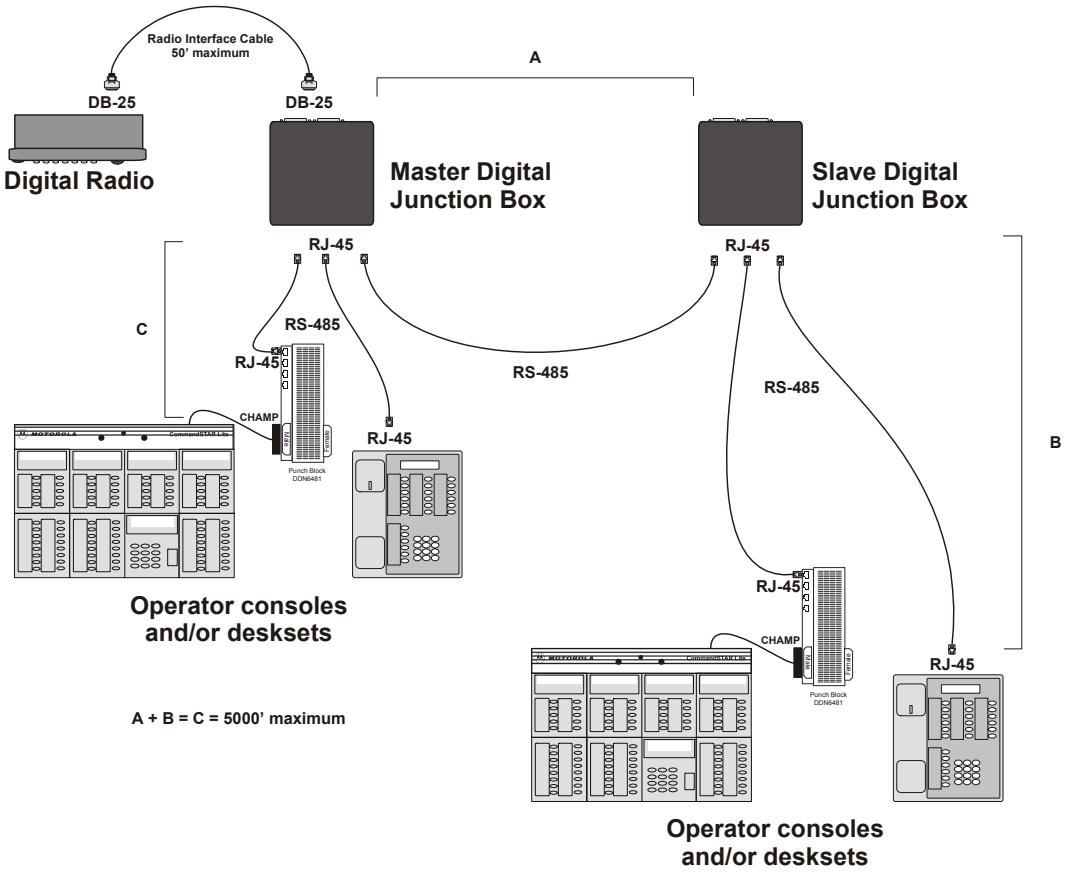



**Figure 2-4: Multiple Digital Deskset and CommandSTAR Lite Console Installation**

Multiple Digital Junction Boxes can share access to a single digital radio. The digital radio is directly connected to one master Digital Junction Box, which is connected to a second slave Digital Junction Box. The second slave Digital Junction Box can be connected in turn to a third slave Digital Junction Box, and so on, for a maximum of 6 Digital Junction Boxes connected to 31 consoles and/or desksets.

The Digital Junction Box connections use RS-485 links with a maximum distance of 5000 feet between the master and the end-slave Digital Junction Boxes. Figure 2-4 shows two Digital Junction Boxes connected in this way, where **distance A+B = 5000'** or less.

# Opening Deskset

Although most connections are made from the back of the deskset, interface connections for alarms and jumper settings are made inside the deskset housing.

*To open the deskset housing:*

1. Gently, lay the deskset face-down and remove the four screws on the outside corners of the back housing.


**Figure 2-5: Bottom of Deskset**

2. Holding the back and front sides of the housing together, turn the deskset face-up.
3. Separate the front housing from the rear housing, starting at the top and opening the console toward you. The two sides have a ribbon cable connecting them at the bottom of the console housing.

**Figure 2-6: Separating Front from Rear Housing**

## Connecting Deskset to Alarms

Alarm connections are made to a terminal strip on the right side of the bottom housing. The pins are numbered in ascending order from left to right (inside to the outside of the bottom housing).

The deskset must be opened for access to this terminal strip.

*To connect the deskset to alarms:*

1. Put the cable through the slot on the bottom rear corner of the housing.
2. Loosen the 4 slotted screws on the each terminal strip and insert the cable wires into the correct positions as shown in the following three tables.
3. Secure and tie-wrap the cable to the bottom housing.

**Note:** After the power supply is connected you can apply power and perform a verification test.

**Table 2-1: P2 Alarm Functions Terminal Strip Table**

| Pin # | Function |
|---|---|
| 1 | Alarm_com (common) |
| 2 | Alarm _NC (normally closed) |
| 3 | Alarm _NO (normally open) |
| 4 | Ground |

## Setting Jumpers

The deskset must be opened for access to the jumpers. You must remove power prior to opening the deskset. If you are connecting a deskmic, all jumpers are in position A. If you are connecting a headset, all jumpers are in position B.

**Table 2-2: Jumper Settings Table**

| Switch | Position | Function *= Default |
|---|---|---|
| S1 | A | *Enable PTT control for Deskmic |
| S1 | B | Enable PTT control for Headset |
| S2 | A | *Enable Monitor for Deskmic |
| S2 | B | Enable Monitor for Headset |
| S4 | A | *Enable Deskmic Sense for Deskmic |
| S4 | B | Enable Headset Sense for Headset |

## Setting DIP Switches

The deskset must be opened for access to the DIP switches. You must remove power prior to opening the deskset. The one DIP switch S46 is reserved for future use.

**Table 2-3: DIP Switch Settings Table**

| Switch | 4 Positions<br>* = Default | Function |
|---|---|---|
| S46 | *OFF, ON | Reserved for future use |
| | *OFF, ON | Reserved for future use |
| | *OFF, ON | Reserved for future use |
| | *OFF, ON | Reserved for future use |

## Back Panel Connector Layout


**Figure 2-7: MC3000 Deskset - Back panel**

# Connecting to a Digital Junction Box

The deskset is connected via an 8-wire CAT-5 cable (4 wires for audio and 4 wires for data) to the Digital Junction Box which is connected to the radio. (See Figure 2-9.)

Desksets are shipped with the line terminations active. When parallel desksets are connected, only the farthest deskset should be terminated.

Connect the cable from the Digital Junction Box to the 8-pin RJ45 connector labeled “Audio/Data” on the back left hand side of the bottom housing. The pins are numbered in ascending order from top to bottom and left to right.

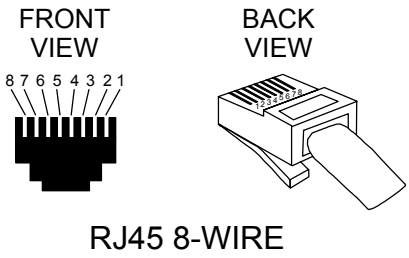



**Figure 2-8: RJ45 Connectors**

**Table 2-4: Audio and Data to Radio RJ45 Pinout**

| Pin # | Function |
|---|---|
| 1 | Ground |
| 2 | Busy |
| 3 | Receive + |
| 4 | Transmit + |
| 5 | Transmit - |
| 6 | Receive - |
| 7 | Data - |
| 8 | Data + |

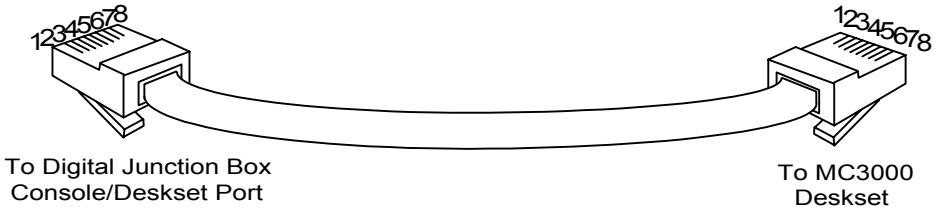



**Figure 2-9: MC3000 Deskset to Digital Junction Box Cable**

# Radio Pinouts

Table 2-5 shows the pinouts for following radios:

- Motorola MCS 2000 (model III)
- iDEN (LM3000)
- Digital Spectra (model W9—ASTRO Consolette).

**Table 2-5: MC3000 RJ45 to ASTRO and MCS 2000/iDEN DB25**

| MC3000 | ASTRO Consolette | | MCS 2000/iDEN Radio | |
|---|---|---|---|---|
| Pin # | Pin # | Function | Pin # | Function |
| 1 | 12 | Digital Ground | 4 | Logic Ground |
| 2 | 6 | Busy | 5 | Busy |
| 3 | 14 | Rx Speaker Audio 1 | 11 | Rx Audio Hi |
| 4 | 3 | Mic Hi | 13 | Mic Audio |
| 5 | 11 | Audio Ground | 10 | Mic Lo (Audio Ground) |
| 6 | 15 | Rx Speaker Audio 2 | 10 | Rx Audio Ground |
| 7 | 19 | Data – | 18 | Data – |
| 8 | 7 | Data + | 6 | Data + |

# Connecting to an RCH Junction Box

The deskset can be connected via an 8-wire CAT-5 cable (4 wires for audio and 4 wires for data) to an RCH Junction Box (CDN1337, CDN6304, CDN6683) which is then connected to the radio. Figure 2-10 shows how the cable must be constructed.

If you are using an RCH Junction Box, you will need to do the following:

1. In the *Configuration and Test* program:
   - set option 9 “Busy Polarity” to **High**
   - set option 12 “RX Impedance and Circuit” to **Differential**
2. Ensure the wiring of the cable is exactly as per Figure 2-10.
3. Connect the cable from the RCH Junction Box (Host port) to the 8-pin RJ45 connector labeled “Audio/Data” on the back left hand side of the MC3000 deskset.

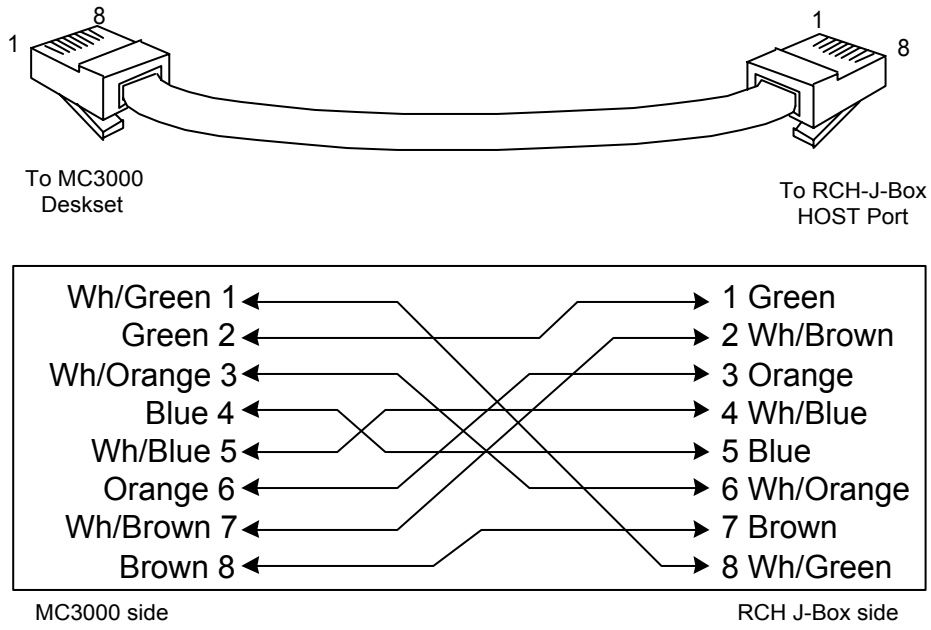



**Figure 2-10: Specially Wired Cable for MC3000 Deskset with RCH Junction Box**

**WARNING: If the settings described above are not properly applied, damage to the equipment may occur. It is recommended that each end of the cable be labeled to reduce the likelihood of incorrect connection.**

# Connecting Power Supply

All power connections are made to the 9-pin mini-DIN connector PWR1 labeled “12V DC” on the back right-hand side of the bottom housing. The power source must supply between 10.5 and 16 volts dc and 0.5 amperes per deskset.

**Table 2-6: PWR 1 Power Supply Mini-DIN Pinout**

| Pin # | Function |
|---|---|
| 1 | Ground |
| 2 | Not used |
| 3 | In_+ 12 V |
| 4 | Ground |
| 5 | In_+ 12 V |
| 6 | In_+ 12 V |
| 7 | Shield 1 |
| 8 | Shield 1 |
| 9 | Shield 1 |

# Connecting an External Deskset Microphone or Footswitch

Connecting an external deskmic or footswitch will disconnect the deskset’s internal microphone.

Connect the desk microphone to two connectors J1and J3 at the back of the deskset. The footswitch is connected to the 3-pin connector J1 labeled “Footswitch”. The headset or deskmic is connected to the 8-pin RJ45 connector J3 labeled “Deskmic Headset” at the back of the deskset. The pins are numbered in ascending order from top to bottom and left to right.

**Table 2-7: J1 Footswitch 3-pin Connector Pinout**

| Pin # | Function |
|---|---|
| 1 | PTT |
| 2 | Ground |
| 3 | Monitor (not used) |

**Table 2-8: J3 Deskmic RJ45 Pinout**

| Pin # | Function |
|---|---|
| 1 | Not used |
| 2 | Not used |
| 3 | PTT |
| 4 | Audio + |
| 5 | Audio - |
| 6 | Monitor (not used) |
| 7 | Ground |
| 8 | Not used |
| **Position A for S1, S2, S4 jumpers** | |

**Table 2-9: J3 Headset RJ45 Pinout**

| Pin # | Function |
|---|---|
| 1 | Mic - |
| 2 | Mic + |
| 3 | PTT |
| 4 | Head_Sensor |
| 5 | Ear - |
| 6 | Ear + |
| 7 | Ground |
| 8 | Not used |
| **Position B for S1, S2, S4 jumpers** | |

## Programing Multiple Digital Desksets for Takeover Privileges

One or more desksets within a group can be configured for the supervisory takeover functionality associated with the **Takeover** button on the deskset. When the **Takeover** button (on a deskset with supervisory takeover priviledges) is pressed once to the ON position, the Busy LED on all other desksets will begin to blink. Effectively, no other deskset (even other supervisors) can communicate on the radio channel until the operator initiating the supervisor takeover, presses the **Takeover** button to the OFF position.

The desksets requiring supervisory takeover priviledges will require the **Takeover** button be programed to the ON (enabled) position. The default position is OFF (disabled).

*To enable/disable the Takeover button on a deskset:*

You will need to set this in the deskset's Configuration and Test program. For instructions on how to access and use the program see "Configurations" on page 2-18. See option 13 'Enable Takeover' of Table 2-10, "Parameters and Parameter Values," on page 2-19 for parameter settings.

# Configuring and Testing Deskset Functions

The power must be connected before you can configure the deskset's parameter values and test the deskset functions. Once in the Configuration and Test program, the LCD display shows two lines; the first line states which of the configurations or tests you are currently performing and the second line states which of the parameters/functions you are setting or testing. The program has 18 menu options where options 1 - 7 are tests and options 8 - 18 are configuration settings.

If the deskset is powered off while modifying the configuration, the changes will not be saved.You must exit the Configuration and Test menu to save the configuration settings.

The Configuration and Test program has a main menu and a sub-menu, except for option # 6 "SW Number".

The Configuration and Test program uses the following buttons on the front console:

- The **Mode Up** button moves up one option in the main menu and sub-menu.
- The **Mode Down** button moves down one option in the menu and sub-menu.
- The **Shift** button works with the **Sel** button to enter the test program.
- The **Menu/Home** button allows you to enter and exit a sub-menu
- The **Sel** button allows you to exit the test program from the main menu.

## Tests

*To enter the Configuration and Test program:*

1. Press and hold the **Shift** button and then press the **Sel** button. When you enter the test program, the first line of the LCD Display will show the "Button Test" and the second line will show "Press Menu".
2. At any time you can press and hold the **Mode Up** or **Down** buttons to move up or down the menu options. Options (1 - 7) on the menu are tests you can run.

*To enter and exit a sub-menu:*

1. When a sub-menu is available from the main menu, press the **Menu/Home** button to enter and exit the sub-menu.
2. At any time you can press and hold the **Mode Up** or **Down** buttons to move up or down the sub-menu items.
3. In the sub-menu, select the desired sub-menu option and press the **Menu/Home** button to exit the sub-menu.

*To exit the Configuration and Test program:*

1. In the main menu, press the **Sel** button to exit the Configuration and Test program.

   **Note**: Once in the Configuration and Test program, the following options (1 - 7) on the menu are tests:

### 1) Buttons

*To test Buttons:*

1. As you enter the Configuration and Test program, the “Button Test” is the first test option. The first line of the LCD Display will show “Button Test” and the second line will show ”Press Menu”.

2. Press the Menu /Home button to enter the sub-menu. The first line of the LCD Display will show “Button Test” and the second line will show “number, letter or name of the button pressed>”.

3. Press each of the **Digital Radio Function, Keypad digits, Shift, Sel, Mode Up, Mode Down, Intercom, Speaker, Takeover and Transmit** buttons. The second line of the LCD Display will display each button number or button name as you test it.

4. Press the **Menu/Home** button to exit the sub-menu. The first line of the LCD Display will show “Button Test” and the second line will show “Press Menu”.

**Note**: The Menu/Home button is the only button NOT tested because when it is pressed you exit the sub-menu.

### 2) LED / LCD Display Test

*To test LEDs and the display:*

1. As you enter the Configuration and Test program, press the **Mode Up** button once to change the test to the “LED/LCD Display Test” is the second test option. The first line of the LCD Display will show “LED/Display” and the second line will show “Press Menu”.

2. Press the **Menu/Home** button to enter the sub-menu. Your sub-menu choices are: LED and Display Tests. The first test is the LED test. The first line of the LCD display will show “LED Test”. The test will run immediately. A positive result of the test is when every LED on the deskset turns on. If any LED is not working it will NOT turn on.

3. Press the **Mode Down** button to move to the next test in the sub-menu. The second test is the Display test. The test will run immediately. A positive result of the test is when every part of the entire LCD display lights up. If any sections of the LCD display are not working they will NOT light up.

4. Press the **Menu/Home** button to exit the sub-menu. The first line of the LCD display will show “LED/Display” and the second line will show “Press Menu”.

### 3) Data Test

*To test that the deskset can send and receive messages successfully with the Digital Junction Box:*

1. After you enter the program, press the **Mode Up** button twice to change the test to the “Data Test” which is the third test option. The first line of the LCD Display will show “Data Test” and the second line of the LCD Display will show ”Press Menu”.

2. Press the **Menu/Home** button to enter the sub-menu. The first line of the LCD Display will show “Test Started” and the second line of the LCD Display will show ”0 Messages”.

   **Note**: The Digital Junction Box sends a message at least every 5 seconds. When the Digital Junction Box is not connected, the deskset will generate a data message signal every 10 seconds. In this case, the second line of the LCD display will show “001 Messages” after 10 seconds, and “002 Messages” after 20 seconds and so on.

3. Plug the cable from the Digital Junction Box into the Deskset's 'Audio/Data' port. The first line of the LCD display will show "Test Started" and the second line will show the "<SW number of the Digital Junction Box>". Then the first line of the LCD display will switch to the bar graph display and the second line will switch to showing the TX Line and Busy Line signals.

   A positive result of the test is when the first line of the LCD display shows a bar graph building from left to right and the second line of the LCD display dynamically shows the number of each incoming message (0 - 255).

   If the link is established the deskset should be reading messages at least every 5 seconds. If the link is not established, the deskset will only read its internal data message signals every 10 seconds. If there is an internal problem with the deskset, there will be no messages.

4. Press the **Menu/Home** button to exit the sub-menu. The first line of the LCD Display will show "Data Test" and the second line will show "Press Menu".

### 4) Busy Test

*To test the Busy Line link to the Digital Junction Box:*

1. After you enter the program, press the **Mode Up** button three times to change the test to the "Busy Test" which is the fourth test option. The first line of the LCD display will show "Busy Test" and the second line of the LCD display will show "Press Menu".

2. Press the **Menu/Home** button to enter the sub-menu. The first line of the LCD display will show "Test Started" and the second line of the LCD display will show "0 Busy".

   **Note**: The Digital Junction Box sends a message at least every 5 seconds. When the Digital Junction Box is not connected, the deskset will generate a Busy Line signal every 10 seconds. In this case, the second line of the LCD display will show "001 Busy" after 10 seconds, and "002 Busy" after 20 seconds and so on.

3. Plug the cable from the Digital Junction Box into the Deskset's 'Audio/Data' port. The first line of the LCD display will show "Test Started" and the second line will show the "<SW number of the Digital Junction Box>". Then the first line of the LCD display will switch to the bar graph display and the second line will switch to reading the Busy Line signals.

   A positive result of the test is when the first line of the LCD display shows a bar graph building from left to right and the second line dynamically shows the number of each busy signal (0 - 255).

   If the link is established, the deskset should be reading messages at least every 5 seconds. If the link is not established, the deskset will only read its internal Busy Line signals every 10 seconds. If there is an internal problem with the deskset, there will be no messages.

4. Press the **Menu/Home** button to exit the sub-menu. The first line of the LCD Display will show "Busy Test" and the second line will show "Press Menu".

### 5) Audio Test

*To test the internal speaker and microphone, the handset mouthpiece and ear piece or optionally an external headset or deskset microphone:*

1. After you enter the program, press the **Mode Up** button four times to change the test to the "Audio Test" which is the fifth test option. The first line of the LCD Display will show "Test Audio". The second line of the LCD Display will show "Press Menu".

2. Press the **Menu/Home** button to enter the sub-menu. Your sub-menu choices are: Handset Mic, Headset Mic, Internal Mic and Deskset Mic. The first test is “Handset mouthpiece to Handset ear piece” test. The first line of the LCD display will show “Testing Audio” and the second line will show “Mic to Handset”.

3. Lift the handset off-hook, speak into the mouthpiece and listen for the transmission on the internal speaker. The VU meter of the LCD display will show the volume level.

4. Adjust the volume of the handset ear piece and the internal speaker with the **Volume** Control. See “Handset Microphone (mouthpiece) to the TX Line” on page 2-21 for additional adjustments.

5. Press the **Mode Up** button to move to the next audio test in the sub-menu. The second test is “Headset mouthpiece to Headset ear piece” test. The first line of the LCD Display will show “Testing Audio” and the second line will show “Mic to Headset”.

6. Optionally, if you have an external headset, press the **Transmit** footswitch pedal, speak into the headset microphone and listen for the transmission on the headset ear piece. The VU meter of the LCD display will show the volume level.

7. Adjust the volume of the headset ear piece and the internal speaker with the **Volume** Control. See “Desk Microphone to the TX Line” on page 2-21 for additional adjustments.

8. Press the **Mode Up** button to move to the next audio test in the sub-menu. The third test is “Internal Microphone to the Internal Speaker” test. The first line of the LCD display will show “Testing Audio” and the second line will show “Internal”.

9. Speak in the direction of the internal microphone and listen for the transmission on the internal speaker. The VU meter of the LCD display will show the volume level.

10. Adjust the volume of the handset ear piece and the internal speaker with the **Volume** Control. See “Internal Condenser Microphone to the TX Line” on page 2-20 for additional adjustments.

11. Press the **Mode Up** button to move to the next audio test in the sub-menu. The fourth test is “Deskmic to Internal Speaker” test.The first line of the LCD display will show “Testing Audio” and the second line will show “Deskmic”.

12. Optionally, if you have an external deskset microphone, press the **Transmit** button of the external deskset microphone and listen for the transmission on the internal speaker. The second line of the LCD display will show ”From: External Mic”.

13. Adjust the volume of the handset ear piece and the internal speaker with the **Volume** Control. See “Desk Microphone to the TX Line” on page 2-21 for additional adjustments.

14. Press the **Menu/Home** button to exit the sub-menu. The first line of the LCD display will show “Test Audio” and the second line will show “Press Menu”.

### 6) SW Number Test

*To check the version number of the software loaded in the deskset:*

After you enter the program, press the **Mode Down** button five times to change the test to the “SW Number Test” which is the sixth test option. The first line of the LCD display will show “Sw Number”. The second line of the LCD display will show ”<actual software version number to maximum of 14 digits>”.

### 7) Headset Sense Test

*To check that the headset is connected to the deskset:*

1. After you enter the program, press the **Mode Up** button six times to change the test to the “Headset Sense Test” which is the seventh test option. The first line of the LCD display will show “Headset Sense”. The second line of the LCD display will show”Press Menu”.

2. Press the **Menu/Home** button to enter the sub-menu. The test will run automatically in real time as you plug and unplug the headset. The second line of the LCD display will show “Connected” or “Disconnected” according to what the deskset senses at the deskset “Headset” connector.

3. Press the **Menu/Home** button to exit the sub-menu. The first line of the LCD display will show “Headset Sense”. The second line of the LCD display will show ”Press Menu”.

## Configurations

The power must be connected before you can program parameters. Once in the Configuration and Test program, the LCD display shows two lines; the first line states which of the parameters you are currently setting. You must then enter the sub-menu to access the parameter values, select the desired value and exit the sub-menu.

*To enter the Configuration and Test program:*

1. Press and hold the **Shift** button and then press the **Sel** button. When you enter the test program, the first line of the LCD display will show the “Button Test” and the second line will show “Button:”.

2. At any time you can press and hold the **Mode Up** or **Down** buttons to move up or down the menu options. Options (8 -18) on the menu are deskset parameters that you can configure.

*To enter a sub-menu:*

1. When you have accessed the desired parameter in the main menu, press the **Menu/Home** button to enter and exit the sub-menu.

2. At any time you can press and hold the **Mode Up** or **Down** buttons to move up or down the sub-menu items.

*To exit the Configuration and Test program:*

1. In the main menu, press the **Sel** button to exit the Configuration and Test program.

**Note:** You must exit the Configuration and Test menu to save the configuration settings.

Once in the Configuration and Test program, the following options (8 -18) on the menu are deskset parameters that you can configure:

- 8) Configure Radio Type
- 9) Configure Busy Polarity
- 10) Configure Parallel Unit Mode
- 11) Configure Auto-Level

- 12) Configure RX Impedance
- 13) Enable Supervisor Takeover
- 14) Turn the VU Meter On/Off
- 15) Mute/Unmute the local speaker receive audio (On=Mute, Off=Unmute)
- 16) Configure the Dial Up option
- 17) Configure the Handset Enable/Disable
- 18) Configure the Internal Microphone Enable/Disable.

**Table 2-10: Parameters and Parameter Values**

| Parameter | Parameter Value<br>* = Default |
|---|---|
| 8) Type of Radio | *ASTRO<br>MCS2000<br>iDen<br>LTR |
| 9) Busy Polarity | *Low<br>High[i] |
| 10) Parallel Unit Mode | *On<br>Off |
| 11) Auto-Level | *On<br>Off |
| 12) RX Impedance and Circuit | Differential[iv]<br>*Balanced: 600 ohms<br>Balanced: 10K ohms |

| Parameter | Parameter Value<br>* = Default |
|---|---|
| 13) Enable Takeover | On<br>*Off |
| 14) VU Meter | On<br>*Off |
| 15) Mute Speake | On[ii]<br>*Off |
| 16) Dial Up[iii] | Data<br>Voice<br>Connect<br>Disconnect |
| 17) Handset | *Enable<br>Disable |
| 18) Internal Micro-phone | *Enable<br>Disable |

i. Used when connecting the deskset directly to the radio (except LTR) without the use of a Digital Junction Box.
ii. The Talk Permit Tone is removed from the transmission, when transmitting with the deskmic or internal microphone while the speaker mute function is on.
iii. Option 16 is used by the deskset operators to “Dial Up” and connect to a radio through a modem. For instructions on the “Dial Up” process, see Chapter 3.
iv. Used when connecting the deskset directly to the radio (except LTR) without the use of a Digital Junction Box.

*To program parameter values:*

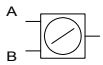
1. After you enter the program, press the **Mode Down** button until you get to the parameter you wish to configure. Look at the LCD Display to find the parameter. The first line states which of the parameters you are currently setting and the second line states the parameter value.
2. Press the **Menu/Home** button to enter the sub-menu.
3. Press the **Mode Up** or **Down** button to navigate to the desired parameter value.

Press the **Menu/Home** button to save the new parameter value and exit the sub-menu.

# Adjusting Potentiometers

The deskset must be opened for access to the potentiometers and trimmers on the main circuit board. All microphones have separate potentiometers that are set to factory default values and do not require adjustment. All outputs are put through a common potentiometer (R75).

The default value for R75 is approximately 3.6 K ohms for 80 $mV_{RMS}$. The value for R75 is approximately 25 K ohms for 0.78 $V_{RMS}$. Use a multi-meter to measure the resistance between point A and B of R75:




## Line (Receive Audio) Input to Handset Ear piece/Internal Speaker

The audio received from the radio can be adjusted using the Volume Control knob.

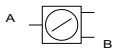
*To adjust the line input from the radio receiver to the handset ear piece and speaker:*

1. To increase the volume of both speakers at the same time, turn the Volume Control knob clockwise.
2. To decrease the volume of both speakers at the same time, turn the Volume Control knob counterclockwise.

## Internal Condenser Microphone to the TX Line

The audio level is factory set, but if the sensitivity of the internal condenser microphone requires adjustment, this can be done using potentiometer R113 on the main board.

*To adjust the Internal Condenser Microphone:*




1. Use a multi-meter to measure the resistance between point A and B of R113:
2. Adjust R113 to increase or decrease the gain as measured by the multi-meter.

   The lower the resistance value, the higher the gain. The default value for R113 is approximately 22.7 K ohms.

## Handset Microphone (mouthpiece) to the TX Line

The audio level is factory set, but if the sensitivity of the handset microphone requires adjustment, this can be done using potentiometer R90 on the main board.

*To adjust the Handset (mouthpiece) Microphone:*


1. Use a multi-meter to measure the resistance between point A and B of R90:
2. Adjust R90 to increase or decrease the gain as measured by the multi-meter.

   The lower the resistance value, the higher the gain. The default value for R90 is approximately 2.85 K ohms.

## Desk Microphone to the TX Line

The audio level is factory set, but the sensitivity of the external deskset microphone requires adjustment, this can be done using potentiometer R57 on the main board.

*To adjust the Desk Microphone:*


1. Use a multi-meter to measure the resistance between point A and B of R57:
2. Adjust R57 to increase or decrease the gain as measured by the multi-meter.

   The lower the resistance value, the higher the gain. The default value for R57 is approximately 10.5 K ohms.

## Headset Microphone to the TX Line

The audio level is factory set, but if the sensitivity of the external headset microphone requires adjustment, this can be done using potentiometer R61 on the main board.

*To adjust the Desk Microphone:*


1. Use a multi-meter to measure the resistance between point A and B of R61:
2. Adjust R61 to increase or decrease the gain as measured by the multi-meter.

   The lower the resistance value, the higher the gain. The default value for R61 is approximately 18.9 K ohms.

## Audio from Parallel Desksets (IC or RCU)

The audio level is factory set at 80 $mV_{RMS}$, but if the received audio from parallel desksets requires adjustment, this can be done using potentiometer R12 on the main board.

*To adjust R12:*


1. Use a multi-meter to measure the resistance between point A and B of R12:
2. Adjust R12 to increase or decrease the gain as measured by the multi-meter.

The lower the resistance value, the higher the gain. The default value for R12 (when connecting the deskset to a Digital Junction Box) is approximately 1.5 K ohms for $80mV_{RMS}$.

**Note:** When connected directly to the radio without other desksets in parallel, no adjustment to R12 is required.

## Creating Labels for the Deskset Buttons

The MC3000 Digital Deskset requires the Labels software program to print labels for the deskset's buttons.

The software installation diskette includes a "Labels Program". The labels program is a Windows application that allows you to produce and print labels for the operator module buttons on the MC3000 Digital Deskset console. For information on how to use the "Labels" program, see Appendix A.

*To install the Labels Program:*

1. Ensure all other software programs, currently open on your computer, are closed. Insert the installation diskette into the diskette drive of your computer.
2. Follow the instructions as they appear on your computer screen and click the **Next** button until you get to the screen where both program titles appear on your computer screen.
3. Check the Label program check box.
4. Click the **Next** button. The installation process will begin. If you wish to cancel the installation, click the **Cancel** button.
5. Follow the instructions as they appear on your computer screen.
6. When you are finished, click on the Labels.exe file in the destination folder (default c:\Program Files\Motorola) to start the program.

## Wall Mounting

*To wall mount:*

1. Open the unit as described in the "Opening Deskset" on page 2-6.
2. After making the required connections, turn the front housing 180 degrees and place it into the back housing so the bulk of the combined housing is at the bottom of the of the wall mounted configuration.

   Note: In the desk mounted housing configuration, the bulk of the combined housing is to the top so the unit is slanted toward the operator for ease of use. The opposite housing configuration is required to hold the handset in the cradle for the wall mounted configuration.
3. Hold the back and front sides of the housing together, turn the deskset face-down.
4. Reattach the four screws in each corner of the back housing.

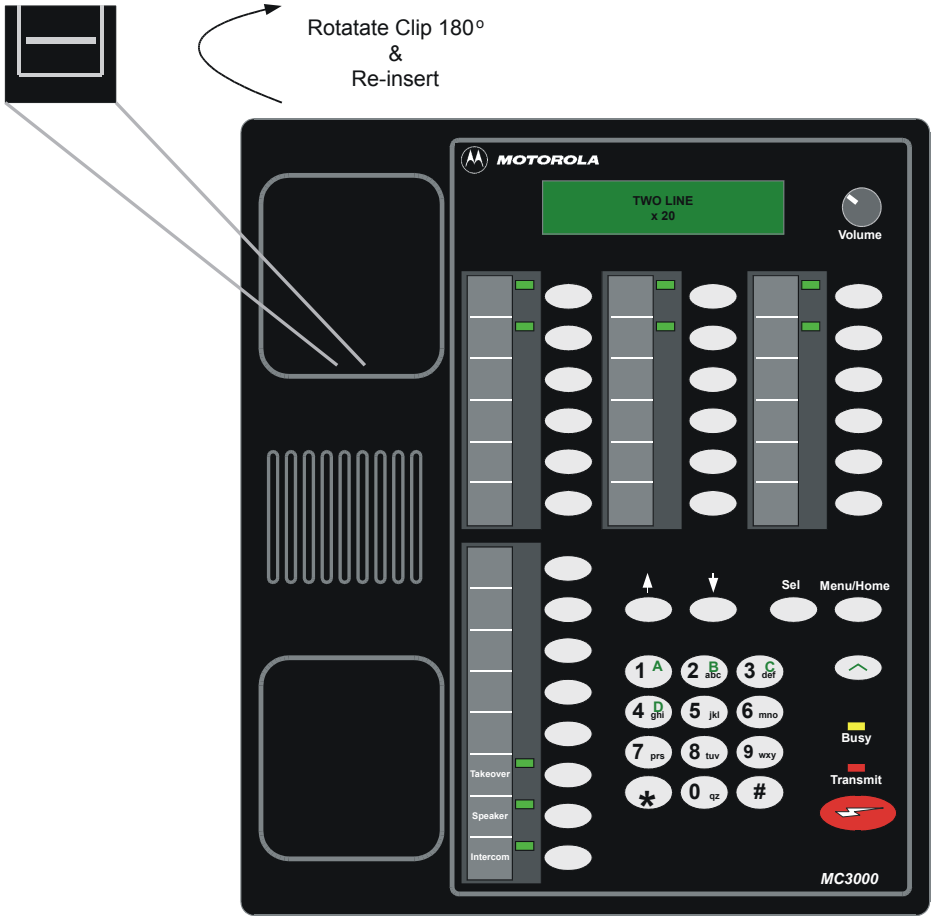



**Figure 2-11: Hanger Clip - hook edge to the bottom**

5. Turn the deskset face-up and pry out the ‘hanger clip’.
6. Rotate and re-insert the ‘hanger clip’ so that the top edge will hook the handset in the cradle when placed on the wall.
7. Place a #8 screw at the appropriate height on the wall leaving the head 1/4 inch from flush to the wall.
8. Slide the deskset wall mount opening located at the top edge of the back housing, over the screw.

Chapter 3
# Operation

## Introduction

The purpose of this chapter is help you use the MC3000 Digital Deskset. It contains information to acquaint you with the deskset and instructions for completing some of the most common tasks using this equipment. It also provides a description of the deskset controls, indicators and displays.

This chapter will discuss functions that the operator will need to perform common to all radio types. Please refer to the specific digital radio type user documentation for specific instructions about all buttons and associated LCD display operations.

This chapter contains the following sections:

- Deskset Overview
- Communication Options
- Takeover Button Operation
- LCD Display
- Keypad Operation
- Monitoring the Radio Channel
- Dial-Up Connection to the Radio
- Digital Remote Control Radio Operation
- Initiating or Answering a Radio Channel Transmission
- Initiating or Answering an Intercom Transmission
- Adjusting the Volume
- Adjusting the LCD Display Contrast

# Deskset Overview

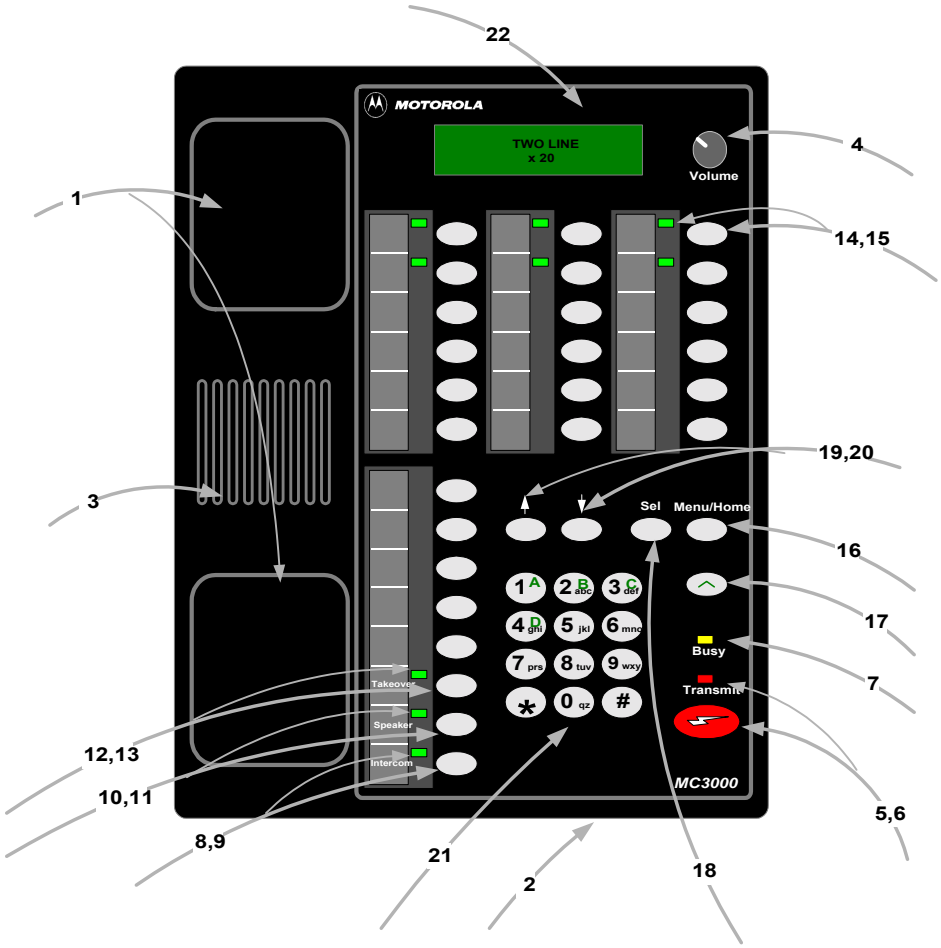



**Figure 3-1: MC3000 Digital Deskset**

1. Handset
2. Internal Microphone
3. Internal Speaker
4. Volume Control
5. Transmit Button
6. Transmit LED
7. Busy LED
8. Intercom Button
9. Intercom LED
10. Speaker Button
11. Speaker LED
12. Takeover Button
13. Takeover LED
14. Digital Radio Function Buttons
15. Digital Radio Function LEDs
16. + 17. Menu/Home and Shift Button
18. Select (Sel) Button
19. + 20. Mode Up and Mode Down Buttons
21. Keypad
22. LCD Display

The MC3000 Digital Deskset shown in Figure 3-1, has the following twenty-two features:

1. **Handset**—for audio transmit and receive with a microphone in the mouthpiece and audio speaker in the ear piece.
2. **Internal Microphone**—for audio transmit without lifting the handset.
3. **Internal Speaker**—for hands-free public audio receive.
4. **Volume Control—**for the handset or internal speaker receive volume adjustment.
5. **Transmit Button**—for transmitting on the radio channel for the handset, headset or internal microphone.
6. **Transmit LED**—for indicating that the deskset is transmitting on the radio channel.
7. **Busy LED—**for indicating that a parallel deskset is using the radio channel.
8. **Intercom Button**—for transmitting to other desksets without transmitting on the radio channel.
9. **Intercom LED**—for indicating that the intercom is being used.
10. **Speaker Button**—for turning the internal speaker on or off when using the handset or headset.
11. **Speaker LED**—for indicating the internal speaker is on or off.
12. **Takeover Button—**for supervisory desksets to takeover communication on the radio channel/s (all other desksets are unable to transmit on the radio).
13. **Takeover LED—**for indicating that a supervisory deskset has takeover communication on the radio channel/s (all other desksets are unable to transmit on the radio).
14. **Digital Radio Function Buttons—**for emulating the functions of the digital radio programable buttons for the radio type to which the deskset is connected.
15. **Digital Radio Function LEDs—**for indicating the programmed function for each digital radio button is in the ON or OFF position. Note: Not all Digital Radio Function Buttons have associated LEDs.
16. **Menu/Home Button**—for entering and exiting the deskset's Configuration and Test sub menu; for exiting the Configuration and Test main menu; for accessing the specific radio's menu of modes, channels or functions that appear on the LCD display.
17. **Shift Button—**when used with a Sel button to access the Configuration and Test menu; or when used with the keypad */# keys to adjust the LCD display contrast.
18. **Select (Sel) Button—**for selecting the radio function in the menu appearing on the LCD display.
19. **Mode Up Button**—for moving up through the deskset or radio's menu of modes, channels or functions that appear on the LCD display.
20. **Mode Down Button**—for moving down through the deskset or radio's menu of modes, channels or functions that appear on the LCD display.
21. **Keypad—**for emulating the keypad of the radio when entering telephone numbers, dial-up numbers, paging CAP codes and mobile PTT ID's for Stat Alert calling.
22. **LCD display—**for displaying: digital radio messages or test and configuration messages, radio icons and VU meter readings.

# Communication Options

## Handset Operation

You use the handset to transmit and receive calls in a high noise environment or when connected to a full duplex trunking radio station. You can transmit and receive at the same time.

### Using the Handset PTT Button

*To transmit:*

1. Lift the handset (off-hook).
2. Press and hold the **PTT** press bar in the middle of the handset. The **Transmit** LED turns on while the button is pushed.
3. Speak into the mouthpiece.
4. Release the **PTT** press bar after you finish transmitting. The **Transmit** LED turns off when the button is released.

Lifting the handset disables the internal microphone, which is the default audio transmit, and allows you to transmit high quality audio in a full duplex mode. Always allow a short delay after pressing the **PTT** button, and before speaking, to allow time for the radio channel to be established. When connected to a trunking radio station, always wait for the grant tone before you begin to speak or your voice message may be clipped.

**Note:** When configuring the deskset, the installation technician has the option of disabling the handset and/or the internal microphone.

*To receive:*

1. Lift the handset (off-hook).
2. Listen for receive audio in the handset ear piece.

Lifting the handset also disables the internal speaker, which is the default audio receiver, and allows you to receive audio privately.

### Enabling the Internal Speaker

You enable the internal speaker while the handset is off-hook to allow the receive audio to be heard publicly while maintaining high quality transmit audio to the caller via the handset mouthpiece.

Although the internal speaker and microphone are normally turned off (default) when the handset is off-hook, you can temporarily turn the internal speaker on while the handset is off-hook.

To turn the internal speaker on with the handset off-hook, press the **Speaker** button once. The **Speaker** LED turns on.

To turn the internal speaker off with the handset off-hook, press the **Speaker** button again. The **Speaker** LED turns off.

**Note**: Returning the handset to the cradle (on-hook) will turn the **Speaker** LED off.

## Internal Speaker and Microphone Operation

You use the internal microphone to transmit calls and the internal speaker to receive calls in a low noise environment, without using the handset. You cannot transmit and receive at the same time.

*To transmit:*

1. Ensure the handset is on-hook (in the cradle).
2. Press and hold the **Transmit** button. The **Transmit** LED turns on while the button is pushed.
3. Speak in the direction of the internal microphone (located slightly to the right of center on the bottom edge of the console).
4. Release the **Transmit** button to listen for a response on the internal speaker. The **Transmit** LED turns off when the button is released.

Always allow a short delay after pressing the **Transmit** button, and before speaking, to allow time for the radio channel to be established. For the best transmit audio quality, maintain a speaking distance of 18 inches from the internal microphone.

*To receive:*

1. Listen for receive audio from the internal speaker.

You can only hear the receive audio if the **Transmit** button has been released.

**Note:** When configuring the deskset, the installation technician has the option of disabling the handset and/or the internal microphone.

## Optional Desk Microphone or Headset/Footswitch Operation

Optionally, you can connect and use an external deskmic or headset/footswitch to transmit calls and the internal speaker to receive calls in a low noise environment, without using the handset. With the deskmic, you cannot transmit and receive at the same time. With the headset/footswitch you can transmit and receive at the same time. You must use the Digital Radio Function button to monitor the radio channel, not the monitor button on the desk microphone or footswitch.

*To transmit:*

1. Ensure the handset is on-hook (in the cradle).
2. Press and hold the **Transmit** button on the deskmic or footswitch. The internal microphone is disconnected and the **Transmit** LED turns on while the button is pushed.
3. Speak in the direction of the desk microphone or headset microphone.
4. Release the **Transmit** button to listen for a response on the internal speaker. The **Transmit** LED turns off when the button is released.

Always allow a short delay after pressing the **Transmit** button, and before speaking, to allow time for the radio channel to be established. For the best transmit audio quality, maintain a speaking distance of 18 inches from the desk microphone.

*To receive:*

1. Listen for receive audio from the internal speaker.

You can only hear the receive audio if the **Transmit** button has been released. However, Trunking Talk Permit Tones can be heard while the Transmit button is pressed.

### Headset

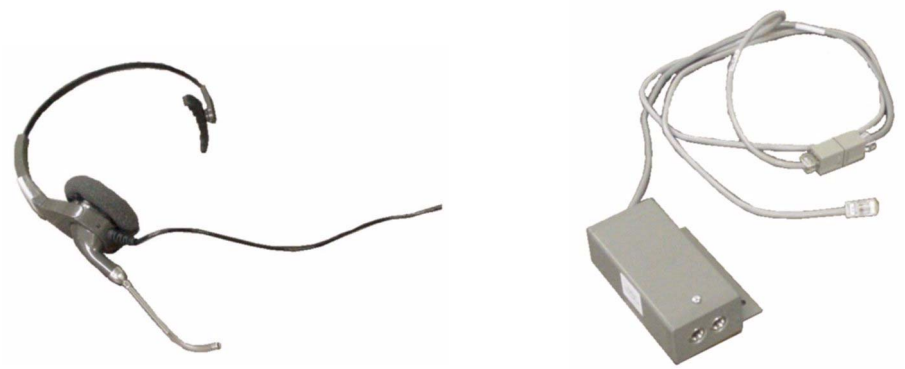


**Figure 3-2: Headset CDN6297 (left) and headset jackbox BLN7074 (right)**

The headset is used to reproduce incoming Select audio, provided the headset is connected to the jackbox. The operator jackbox accommodates a standard dual-jack headset connector.

### Microphones

**Figure 3-3: Desk microphone (HMN3000)**

Each deskset includes an internal condenser microphone, and a jack for an external desk-microphone.

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**Figure 3-4: Dual footswitch (BLN6732)**

The console supports a dual foot-switch that provides hand-free push-to-talk (PTT) radio operation. The right switch is used for PTT and the left is not used.

## Takeover Button Operation

As a supervisor, you use the takeover button to disable all other desksets and prevent them from transmitting over the radio. More than one deskset can be programed with takeover privileges. In takeover mode, only the supervisor deskset that initiated the takeover can make a radio transmission.

*To takeover communication on a radio channel with the supervisor deskset:*

1. Press the **Takeover** button. The **Takeover** LED turns on.
2. Press and release the **PTT** or **Transmit** button as required for supervisor-controlled communication.
3. When supervisor takeover is no longer required, press the **Takeover** button again. The **Takeover** LED turns off and all parallel desksets are again connected to the radio.

## LCD Display

For the digital radio emulated display, the LCD display is divided into four major display lines. The left hand side, both top and bottom lines are fourteen characters in length. The right hand side, both top and bottom lines, are six characters in length. The eight radio icons are: Monitor, Secure, Scan, Talkaround, Low/High Power, Companding and Option Board.

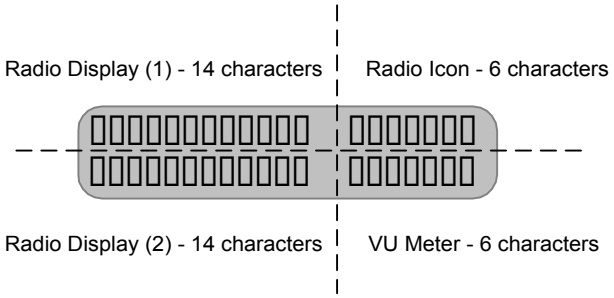



**Figure 3-5: LCD Display Lines**

The LCD display shows:

a) Top left: Radio Display or Deskset Configuration & Test line 1- when in test and configuration mode, this line shows the messages related to the parameters and values being configured or tested. When *not* in test and configuration mode, this line emulates the radio display for the specific radio it is connected to.

b) Bottom left: Radio Display or Deskset Configuration & Test line 2- when in test and configuration mode, this line shows the messages related to the parameters and values being configured or tested. When *not* in test and configuration mode, this line emulates the radio display for the specific radio to which it is connected.

c) Top right: Radio Icon line shows, which of the digital radio functions, are presently being used (from left to right):

E=Emergency, Monitor, Secure, Scan (flashing = Priority 1), Talkaround and L=Low Power or H=High Power.

d) Bottom right: VU Meter shows the transmit level reading when transmitting on the radio channel or on the intercom. The VU meter has the lowest priority and can be overridden by other events such as NPRI, etc. When the digital radio functions C=Companding and O=Option Board are required, they will show in the first and second positions of this line. Therefore, the VU meter is not visible if C or O or both are present.

## Keypad Operation

The keypad acts like the keypad on the digital radio or microphone. Use the keypad keys (0 - 9) and (A - Z in black lettering) to perform the following three functions to:

- enter telephone numbers
- dial up and connect through modems to a radio remotely
- send outbound Stat Alert signals

Please refer to your specific digital radio's user documentation for specific instructions.

## Monitoring the Radio Channel

You monitor a radio channel to verify that your transmission will not interrupt a radio communication between other radio systems sharing the radio channel. This is an FCC and Industry Canada regulated radio procedure.

You will automatically hear any conversation initiated by all deskset consoles and radios on your system without pressing the button corresponding to the **Monitor** button on the digital radio. However, you will not hear conversation initiated by other radio systems that may share the frequency until you press the **Monitor** button.

Note: Both the FCC and Industry Canada may assign numerous companies to share a frequency. In this case, separate tone codes are assigned to radios belonging to each company to offer a degree of privacy. These tone codes encode your radio transmissions so that your receivers only hear radios belonging to your company (similar to party-line telephones).

Pressing the **Monitor** button disables the tone code on your receiver so you may temporarily listen to all conversations from all companies sharing the frequency.

You use the **Mode Up** and **Mode Down** buttons (which emulate the digital radio's Mode/Channel Selector) to select a radio channel and associated TX/RX frequency/ies you wish to monitor or on which to transmit or receive. Only one radio channel can be monitored at a time. This normally applies to conventional radio systems not trunking radio systems.

*Optionally, to select a different radio channel:*

1. Look at the top left hand corner of the **LCD display** and press the **Mode Up** or **Mode Down** keys to find the desired Mode/Channel or Talk Group in a preset list based on the configuration of your system.

*To listen to the radio channel activity:*

1. Press the digital radio function button that corresponds to the **Monitor** button of the radio type the deskset is connected to. The **Monitor** LED turns on. Any radio communication audio on the channel will be heard on the internal speaker. Alternately, if the handset is off-hook, you will hear the audio in the handset ear piece.

   Release the **Monitor** button when you have verified that the radio channel is clear. The **Monitor** LED turns off.

## Dial-Up Connection to the Radio

You use the dial-up function to connect to a digital radio remotely through the telephone lines. Both the Digital Junction Box the deskset is connected to, and the Digital Junction Box the radio is connected to, must have a dial-up modem connection.

The dial-up modem requires two phone lines, one for data communication and one for voice communication (audio). Thus, you must enter two phone numbers to connect the

deskset to a remote radio, for both voice (audio) and data communication. The maximum number of digits allowed in a dialing sequence is fourteen.

**WARNING:** Although the deskset can be connected to four types of radios, it is configured to one type at a time. The deskset will operate properly only when connected to the radio type for which it has been configured. Therefore, if you want to dial up to a different radio type, you must have a technician re-configure the deskset for the new radio type.

*To enter the Configuration and Test menu:*

1. Press and hold the **Shift** button and then press the **Sel** button. When you enter the Configuration and Test program, the first line of the LCD display will read the “Button Test” and the second line will read “Press Menu”.

2. At any time you can press the **Mode Up** or **Down** buttons to move up or down the main or sub menu options. Options (1 - 7) on the main menu are tests you can run. Options (8 -17) on the main menu are deskset parameters that you can configure.

3. Press the **Menu/Home** button to enter and exit the sub menu.

**Note:** To exit the sub menu without connecting or disconnecting, press the **Mode Up** or **Mode Down** buttons until you are in the ‘Voice’ or ‘Data’ sub menu options, before pressing the **Menu/Home** button to exit the sub menu.

*To ‘dial up’ and connect through modems to a radio remotely:*

1. Press and hold the **Shift** button and then press the **Sel** button. When you enter the Configuration and Test program, the first line of the LCD display will read the “Buttons & LEDs Test” and the second line will read “Press Menu”.

2. At any time you can press the **Mode Up** or **Down** buttons to move up or down the menu options. Options (1 - 7) on the menu are tests you can run. Options (8 -17) on the menu are deskset parameters that you can configure.

3. After you enter the program, press the **Mode Down** button until you get to the desired parameter (number 15 ”Dial Up” on the main menu). Look at the LCD display to find the parameter. The first line will state “Dial Up” and the second line will state ”Press Menu”.

4. Press the **Menu/Home** button to enter the sub menu. The first line will state “Dial Up:” and the second line will state ”Voice”.

5. Press the **Mode Up** or **Down** button to navigate to the desired parameter value. You have four choices: Voice, Data, Connect and Disconnect.

6. Enter the site-specific telephone number for the voice (audio) link with the keypad number keys (0 - 9). The numbers you enter will be displayed in the bottom left hand corner of the LCD display. At any time you can press the **Shift** button to move back and erase one character at a time.

7. Press the **Mode Down** button once to access the “Data” option in the sub menu. The first line of the LCD display will state “Dial Up” and the second line will state ”Data”. At any time you can press the **Mode Up** button to go back and change or correct the previous entry.

8. Enter the site-specific telephone number for the voice (audio) link with the keypad number keys (0 - 9). The numbers you enter will be displayed in the bottom left hand

corner of the LCD display. At any time you can press the **Shift** button to move back and erase one character at a time.

9. To initiate the modem dial up, press the **Mode Down** button again to access the “Connect” option in the sub menu. The top left hand side of the LCD display will state “Press Menu to Connect”.

10. To execute the modem connection and exit the sub menu, press the **Menu/Home** button. The first of the LCD display will state “Trying to Connect”. As the deskset attempts to make the connection, the following error messages may appear on the LCD display: Modem: No Dial Tone, Modem: Busy, Modem is Connected.

11. To exit the Configuration and Test program, press the **Menu/Home** button again.

*To disconnect from a ‘dial up’ modem connection to a remote radio:*

1. Press and hold the **Shift** button and then press the **Sel** button. When you enter the test program, the first line of the LCD display will read the “Button Test” and the second line will read “Press Menu”.

2. At any time you can press the **Mode Up** or **Down** buttons to move up or down the menu options. Options (1 - 7) on the menu are tests you can run. Options (8 -17) on the menu are deskset parameters that you can configure.

3. After you enter the program, press the **Mode Down** button until you get to the desired parameter (number 15 ”Dial Up” on the main menu). Look at the LCD display to find the parameter. The first line states which of the parameters you are currently setting and the second line states the parameter value.

4. Press the **Menu/Home** button to enter the sub menu. The sub menu has four choices: Data, Voice, Connect and Disconnect.

5. Press the **Mode Up** or **Down** button three times to navigate to the sub menu option “Disconnect”. The top left hand side of the LCD display will state “Press Menu to Disconnect”.

6. To disconnect the deskset from the radio (through the modem) and exit the sub menu, press the **Menu/Home** button.

7. To exit the Configuration and Test program, press the **Menu/Home** button again.

## Digital Remote Control Radio Operation

The digital deskset emulates one of four types of Motorola digital remote control radios:

- ASTRO Digital Spectra (model W9)
- MCS 2000 (model III)
- iDEN (model M470)
- LTR (models CDM 1550,LS, LS+)

### LCD Display

The LCD display and digital radio function buttons emulate those on the specific model of digital remote control radio controlled by the deskset. The LCD display consists of a single two-row display:

- For the ASTRO Digital Spectra radio, the two rows of the LCD display show the information that appears on the radio display and whether the radio has received a priority mode when the scanning feature is activated:
  - PRI indicates a Priority.
  - NPRI indicates no priority mode.

  Consult your radio's documentation for more information on scanning and priority modes.
- For the MCS 2000 and iDEN radios, the two rows of the LCD display correspond to the two rows of the radio displays.

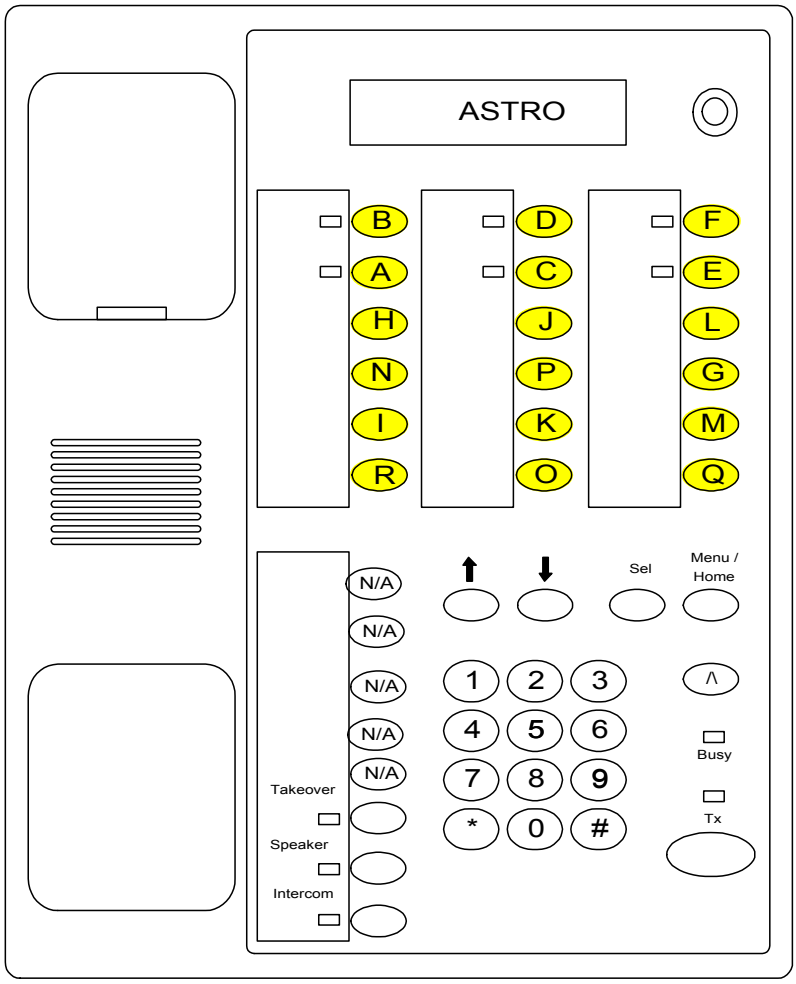
### Buttons

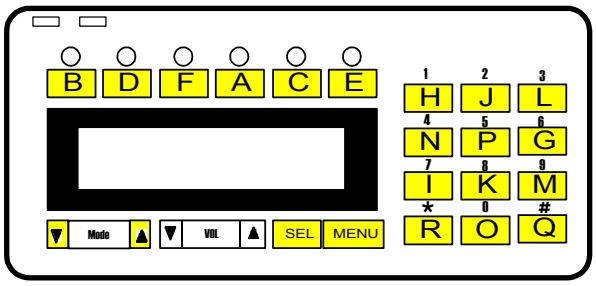
The deskset digital radio function buttons are cross-referenced with each of the four digital radio's set of indicators and buttons by physical location. This means, that whatever function that particular digital radio button has been programmed to perform, the deskset will exactly copy.

This manual will discuss functions that the operator will need to perform common to all radio types. Please refer to the specific digital radio type user documentation for specific instructions about all buttons and associated LCD display operations.

The following figures identify the physical location and cross-reference of the digital radio buttons to the deskset buttons by button number:

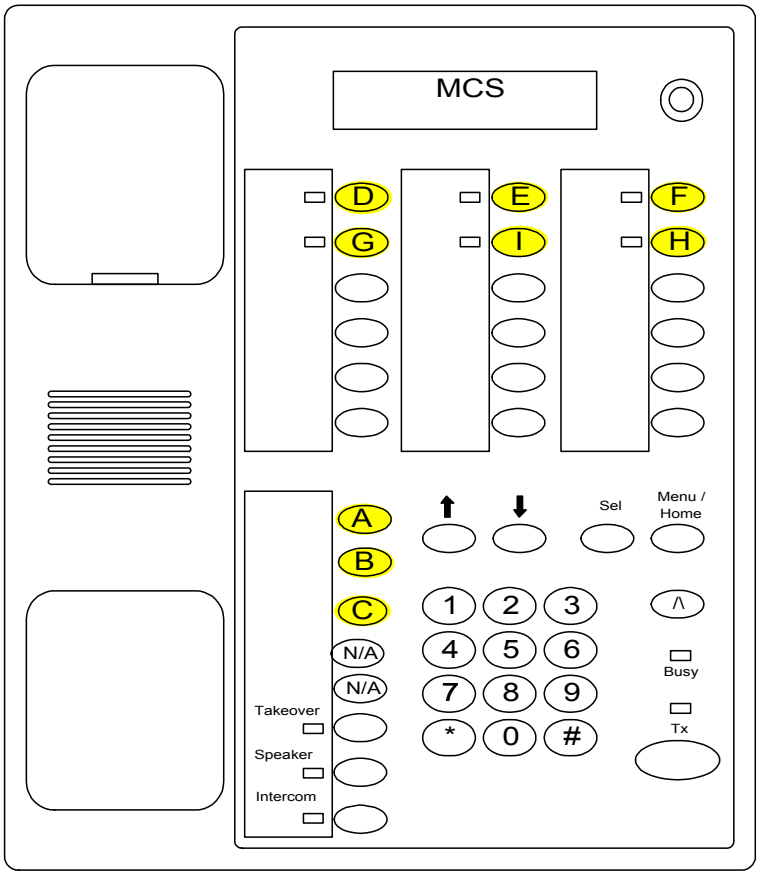
- Figure 3-6, "MC3000 to ASTRO Digital Spectra (model W9)" on page 3-13
- Figure 3-7, "MC3000 to MCS 2000 (model III)" on page 3-14
- Figure 3-8, "MC3000 to iDEN (model M470)" on page 3-15
- Figure 3-9, "MC3000 to LTR (model CDM 1550, LS, LS+)" on page 3-16




The function buttons are shaded.

**Figure 3-6: MC3000 to ASTRO Digital Spectra (model W9)**



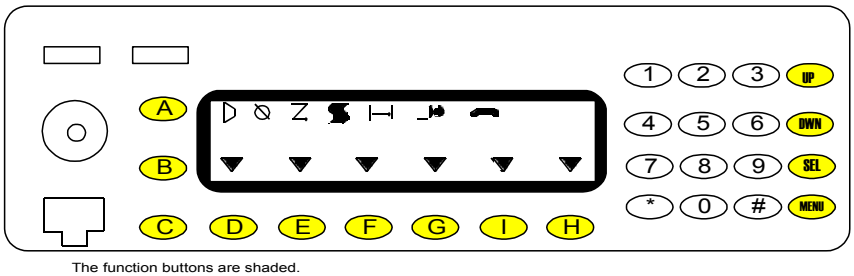
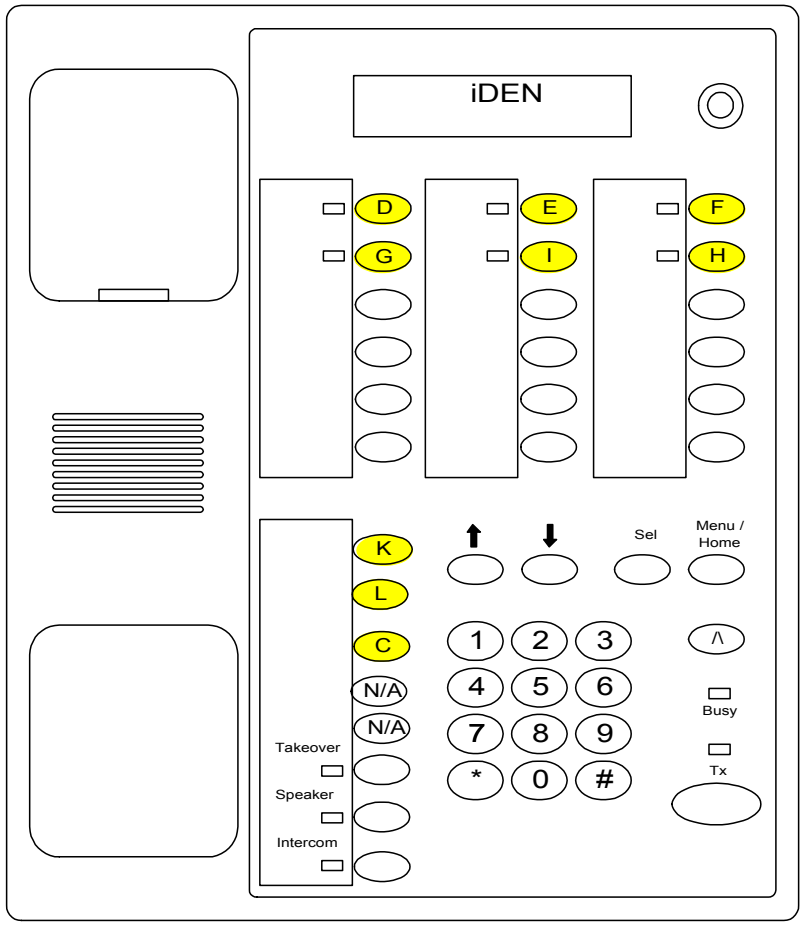




**Figure 3-7: MC3000 to MCS 2000 (model III)**



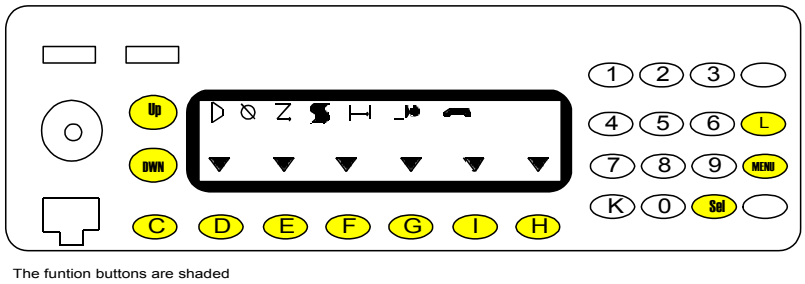




**Figure 3-8: MC3000 to iDEN (model M470)**

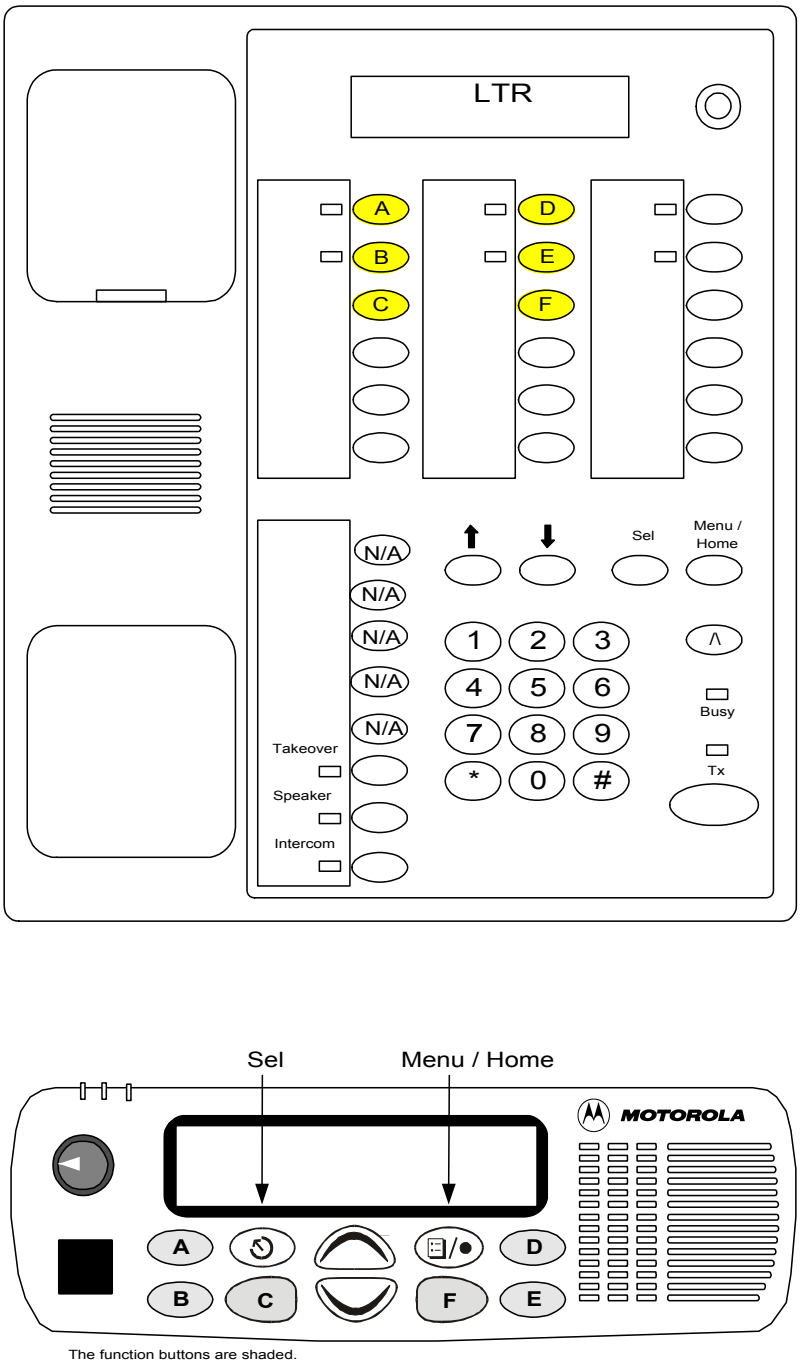



**Figure 3-9: MC3000 to LTR (model CDM 1550, LS, LS+)**

Table 3-1 on page 3-17 gives the names and a brief description of all the possible programmable button functions that the four digital radios can have. The table also provides cross-references for additional information on how to use the functions.

**Table 3-1: Digital Remote Control Radio buttons and indicators**

| Name | Description | Cross-Reference |
|---|---|---|
| **Emergency** (LCD icon indicator) | Informs the operator of an incoming emergency call.<br>* specific to the radio type | ASTRO radio only |
| **Monitor** (LCD icon indicator) | When using a digital radio function button labeled “Monitor”, indicates that the operator is monitoring one of the digital remote control radio channels. (MCS only) | “Monitoring the Radio Channel” on page 3-9 |
| **Secure** (LCD icon indicator) | Indicates that a voice encryption system is enabled on the digital remote control radio. (MCS only) | Consult your radio’s user documentation. |
| **Scan** (LCD icon indicator) | When using a digital radio function button labeled “Scan”, indicates that the digital remote control radio scanning feature is activated. (MCS/iDEN only) | Consult your radio’s user documentation. |
| **Talkaround** (LCD icon indicator) | When selecting the “Talkaround” feature from the menu, indicates that the digital remote control radio is communicating directly with another radio, without using a repeater. (MCS only) | Consult your radio’s user documentation. |
| **Shift** | Used in combination with the SEL button to access the deskset’s Configuration and Test Menu. In the “Dial Up” function is used to erase last digit of the phone number entered. | See Chapter 2, “Configuring and Testing Deskset Functions” |
| **Mode Up** | Used to scroll up through a list of digital remote control radio menu of modes, channels or functions that appear on the LCD display. | Consult your radio’s user documentation. |
| **Mode Down** | Used to scroll down through a list of digital remote control radio menu of modes, channels or functions that appear on the LCD display. | Consult your radio’s user documentation. |

**Table 3-1: Digital Remote Control Radio buttons and indicators(Continued)**

| Name | Description | Cross-Reference |
|---|---|---|
| **Sel** | Used to select a digital remote control radio function appearing on the LCD display. Or used in combination with the SHIFT button to access the deskset's Configuration and Test Menu. | Consult your radio's user documentation. |
| **Menu/Home** | Used to enter and exit from the function selection menu on a digital remote control radio. Or when in the deskset's Configuration and Test Menu used to enter and exit the sub menu or exit the main menu. | Consult your radio's user documentation. |
| **Digit Keys** | Emulate the digit keys on a digital remote control radio Keypad. | Consult your radio's user documentation. |
| **Digital Radio Function Buttons** | Emulate the functions of the programable buttons on the radio, specific to the radio type. | Figure 3-6,Figure 3-7, Figure 3-8, Figure 3-9<br>Consult your radio's user documentation. |

## Initiating or Answering a Radio Channel Transmission

The deskset is always in receive mode unless you press the **PTT**, **Transmit** or **Intercom** buttons. When the handset is on-hook, the deskset mouthpiece continuously routes all radio communication and intercom audio to the internal speaker. Alternately, if you lift the handset (off-hook) the audio is heard via the handset ear piece.

To visually verify that you can initiate or answer a radio channel transmission, look at the **Busy** LED. If the **Busy** LED is on, a parallel deskset is being used and you cannot transmit until the **Busy** LED is off.

The deskset can be connected to a radio configured for a conventional or trunked radio system. A conventional system uses discrete frequencies. A trunked system selects a free radio channel automatically and notifies you with an audible grant tone when a free radio channel is found.

For a conventional system you use the **Mode Up** or **Mode Down** buttons to select a radio channel and its associated TX/RX frequency/ies that you wish to monitor or on which to transmit or receive. Only one radio channel can be selected at a time.

**Note:** The procedure for paging or making a Stat Alert page from a conventional radio versus a trunked radio differ. Please refer to the specific digital radio's user documentation for specific instructions.

**Note:** The procedure for making a telephone call from a conventional radio versus a trunked radio differ. Please refer to the specific digital radio's user documentation for specific instructions.

*Optionally on a conventional system, to select a different radio channel:*

1. Look at the top left hand corner of the **LCD display** and press the **Mode Up** or **Mode Down** keys to find the desired Mode/Channel or Talk Group in a pre-set list based on the configuration of your system.

*To listen to the radio channel activity before transmitting:*

1. Press the digital radio function button that corresponds to the **Monitor** button of the radio type to which the deskset is connected. The **Monitor** LED turns on. Any radio communication audio on the channel will be heard on the internal speaker. Alternately, if the handset is off-hook, you will hear the audio in the handset ear piece.

   Release the **Monitor** button when you have verified that the radio channel is clear. The **Monitor** LED turns off.

When you want to initiate a radio channel transmission or if you hear an incoming call directed to you, there are four ways to respond:

*Method 1—Respond with the handset*

1. Lift the handset (off-hook).
2. Press and hold the **PTT** press bar in the middle of the handset. The **Transmit** LED turns on while the button is pushed.
3. Speak into the mouthpiece.
4. Release the **PTT** press bar after you finish transmitting. The **Transmit** LED turns off when the button is released.

*Method 2—Respond with the handset transmit and the internal speaker receive*

1. Lift the handset (off-hook).
2. To enable the internal speaker with the handset off-hook, press the **Speaker** button once. The **Speaker** LED turns on.
3. Press and hold the **PTT** press bar in the middle of the handset. The **Transmit** LED turns on while the button is pushed.
4. Speak into the mouthpiece.
5. Release the **PTT** press bar after you finish transmitting to allow you to hear the receive audio from the internal speaker. The **Transmit** LED turns off when the button is released.
6. To disable the internal speaker with the handset off-hook, press the **Speaker** button again. The **Speaker** LED turns off.

*Method 3—Respond with handsfree operation*

1. Ensure the handset is on-hook (in the cradle).
2. Press and hold the **Transmit** button. The **Transmit** LED turns on while the button is pushed.
3. Speak in the direction of the internal microphone (located at the bottom center of the console).

4. Release the **Transmit** button to allow you to listen for a response on the internal speaker. The **Transmit** LED turns off when the button is released.

*Method 4—Respond with the desk microphone or footswitch*

1. Ensure the handset is on-hook (in the cradle).
2. Press and hold the **Transmit** button on the desk microphone or footswitch. The internal microphone is disconnected and the **Transmit** LED turns on while the button is pushed.
3. Speak in the direction of the desk microphone.
4. Release the **Transmit** button to listen for a response on the internal speaker. The **Transmit** LED turns off when the button is released.

Always allow a short delay after pressing the **Transmit** button, and before speaking, to allow time for the radio channel to be established. For the best transmit audio quality, maintain a speaking distance of 18 inches from the desk microphone.

## Initiating or Answering an Intercom Transmission

You use the intercom to communicate between desksets without transmitting over the radio channel/s.

To visually verify that you can initiate an intercom transmission, look at the **Busy** LED. If the **Busy** LED is on, a parallel deskset is being used and you cannot transmit until the **Busy** LED is off.

*To transmit:*

1. Press and hold the **Intercom** button. The **Transmit** LED turns on while the button is pushed.
2. Speak in the direction of the internal microphone (located slightly to the right of center on the bottom edge of the console). For the best transmit audio quality, maintain a speaking distance of 18 inches from the internal microphone.
3. Release the **Intercom** button after you finish transmitting to allow you to hear the receive audio from the internal speaker. The **Transmit** LED turns off when the button is released.

*To respond to an intercom call:*

Press and hold the **Intercom** button *only* and speak into the internal microphone. If you use the **PTT** press bar or the **Transmit** button, your response will be heard on the radio channel as well as the intercom. You can only hear the receive audio if the **Intercom** button has been released.

## Adjusting the Volume

There are three speakers that you can adjust the volume on:

- Speaker 1—Handsfree (internal speaker)
- Speaker 2—Handset (ear piece)
- Speaker 3—Headset (ear piece)

To increase the volume of all speakers at the same time, turn the **Volume** control clockwise.

To decrease the volume of all speakers at the same time, turn the **Volume** control counterclockwise.

**Note**: An installation technician can adjust the volume of the mouthpiece or internal microphone.

## Adjusting the LCD Display Contrast

*To decrease or increase the LCD display contrast:*

At any time you can press and hold the **Shift** button and the **Keypad *** (decrease) or **Keypad #** (increase) button to adjust the LCD display contrast.

**Note:** Adjusting the LCD contrast is the same as adjusting the LCD viewing angle.

Chapter 4
# Troubleshooting, Circuit Board and Schematics

## Introduction

This chapter provides suggestions for preliminary verifications on the MC3000 Digital Deskset in the event of operational problems during radio or intercom operations. Circuit Board Layouts and Schematic Diagrams are included for reference.

This chapter contains the following sections:

- Troubleshooting
- Circuit Board Layout
- Schematics

# Troubleshooting

The following table is divided into three columns; a column indicating the potential problem description, an action column detailing the suggested verification or procedure to locate the problem, and a column providing references to additional information, where applicable.

**Table 4-1: Troubleshooting the MC3000 Digital Deskset**

| Problem | Solution | Reference |
|---|---|---|
| The deskset will not key the radio station transmitter | Check the wiring to the radio and the deskset<br>RJ-45 connector.<br>Verify Fuse is OK.<br>Check the local junction wiring.<br>Check that the channel keying configuration matches the requirements. | See Audio and Data to the Radio Table in Chapter 2 |
| The receive audio is low or distorted.<br>There is a continuous hum in the transmit or receive audio | Ensure that the audio being received from the radio station receiver is not distorted and that the radio station receive audio level is between $80mV_{RMS}$ and $0.78V_{RMS}$.<br>Check the equipment grounding and ensure there are no ground loops.<br>Ensure the Tx/Rx audio wiring to the RJ-45 conncector is not damaged or not fastened tightly. | See Line Input Adjustment Chapter 2 |
| No Transmit LED or other LEDs | Check the fuse and replace with a Fast-acting fuse 1A, 5x20mm GMA-1.<br>Do a LED test. | See Testing Deskset Functions Chapter 2 |
| The keypad does not respond | Check the PTT or monitor input on the audio port is not activated. | |

# Circuit Board Layout

The MC3000 deskset has two circuit boards. The top circuit board is attached to the top housing and the bottom circuit board is attached to the bottom housing. The following diagrams show the component side of the top and bottom circuit boards and the key side of the top circuit board.

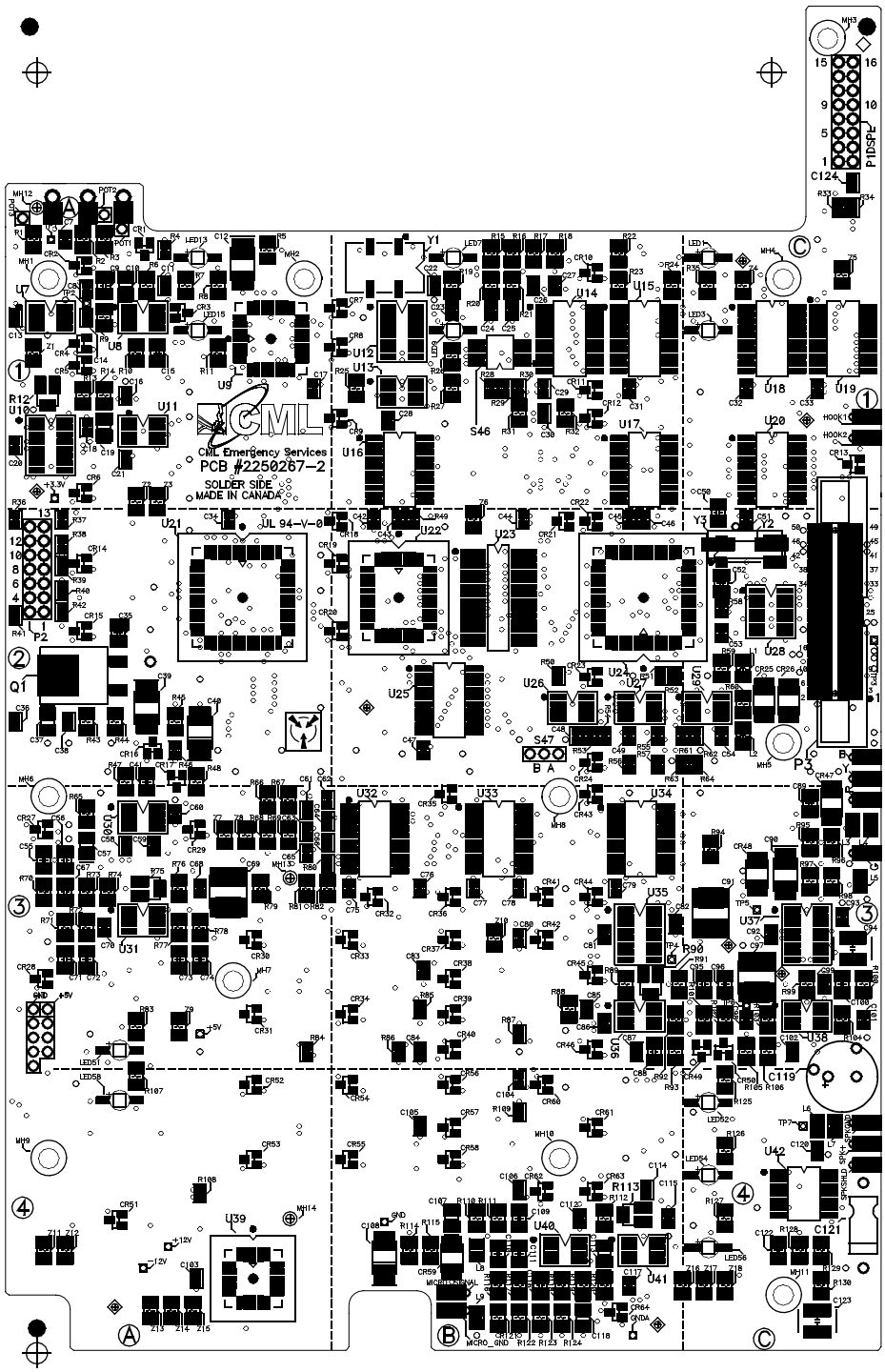



**Figure 4-1: MC3000 Top Circuit Board (component side)**

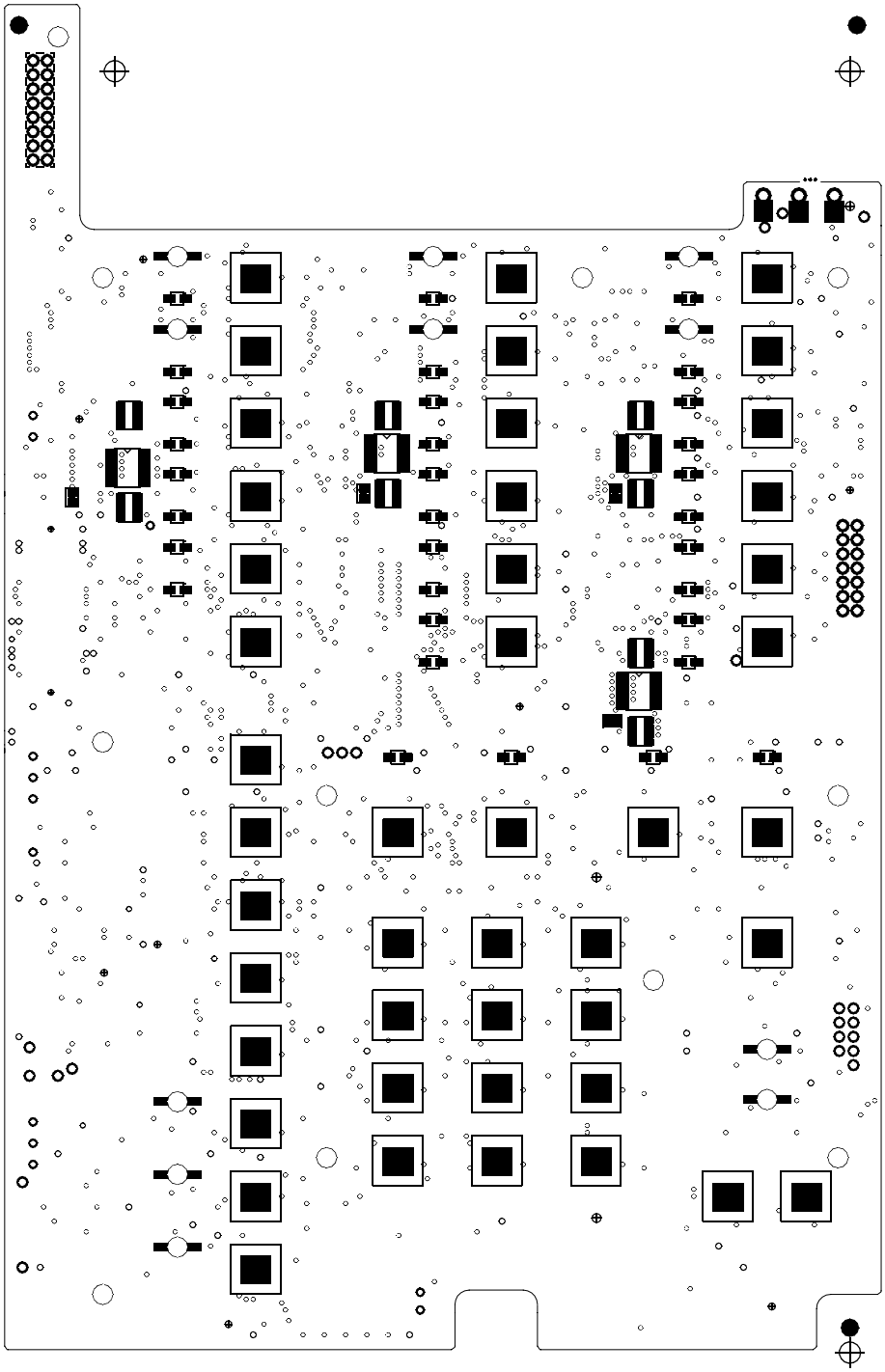


**Figure 4-2: MC3000 Top Circuit Board (key side)**

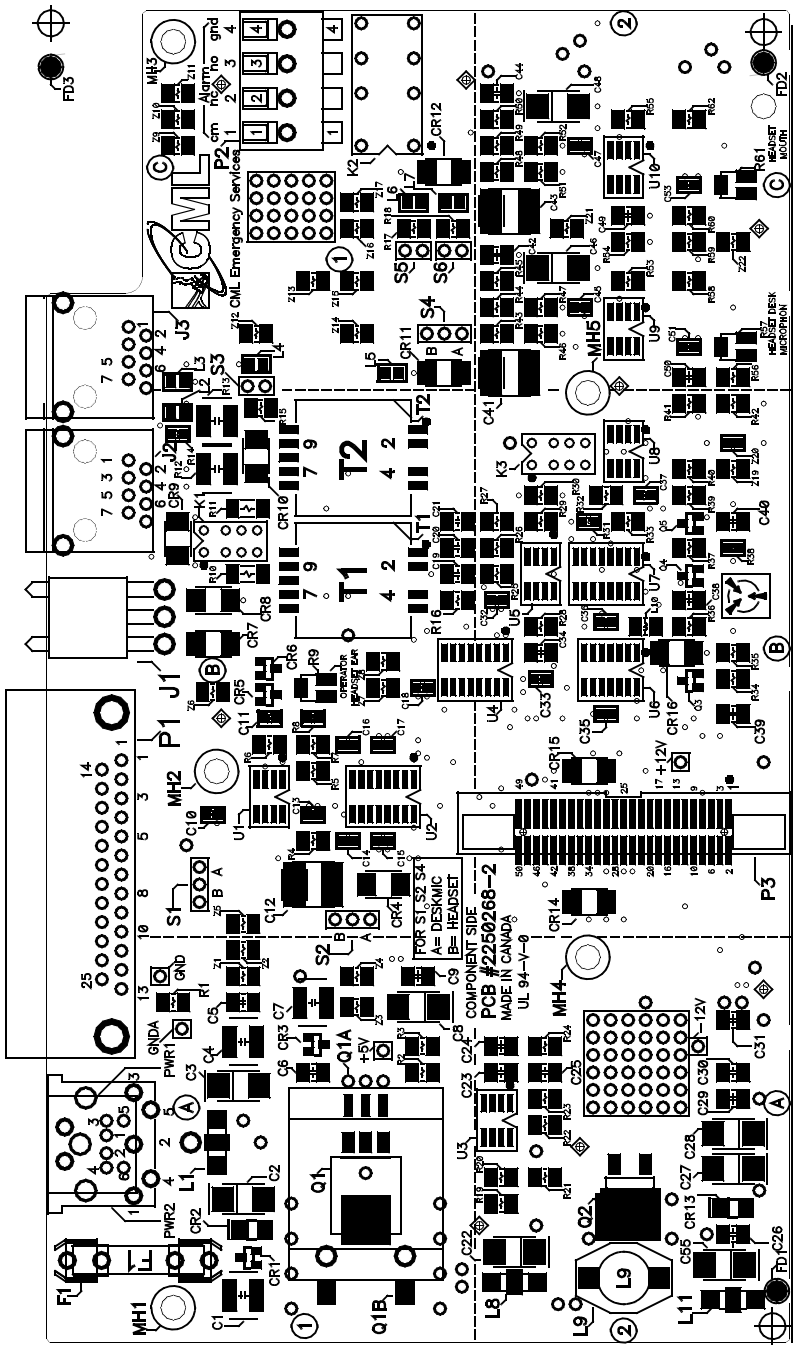
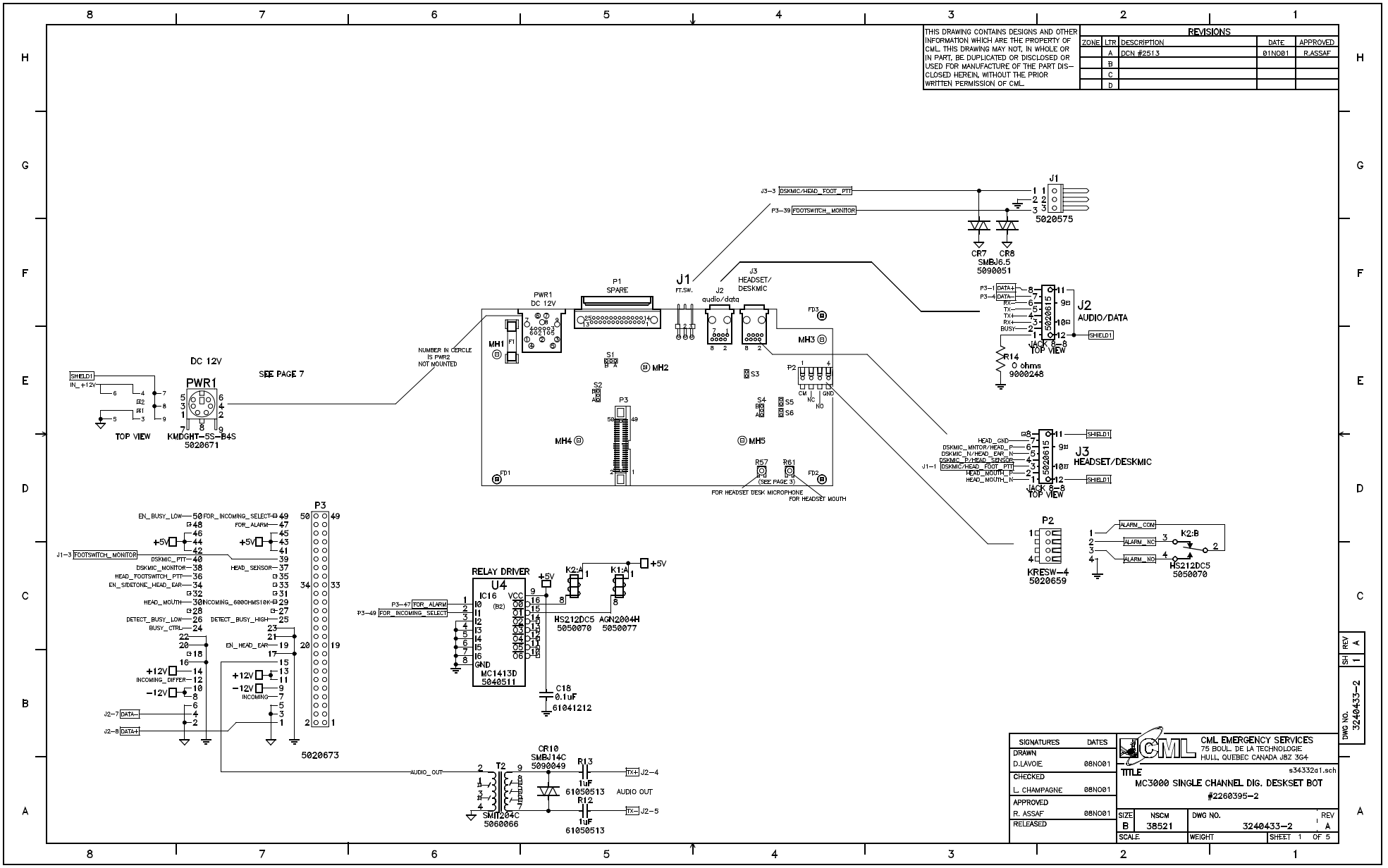
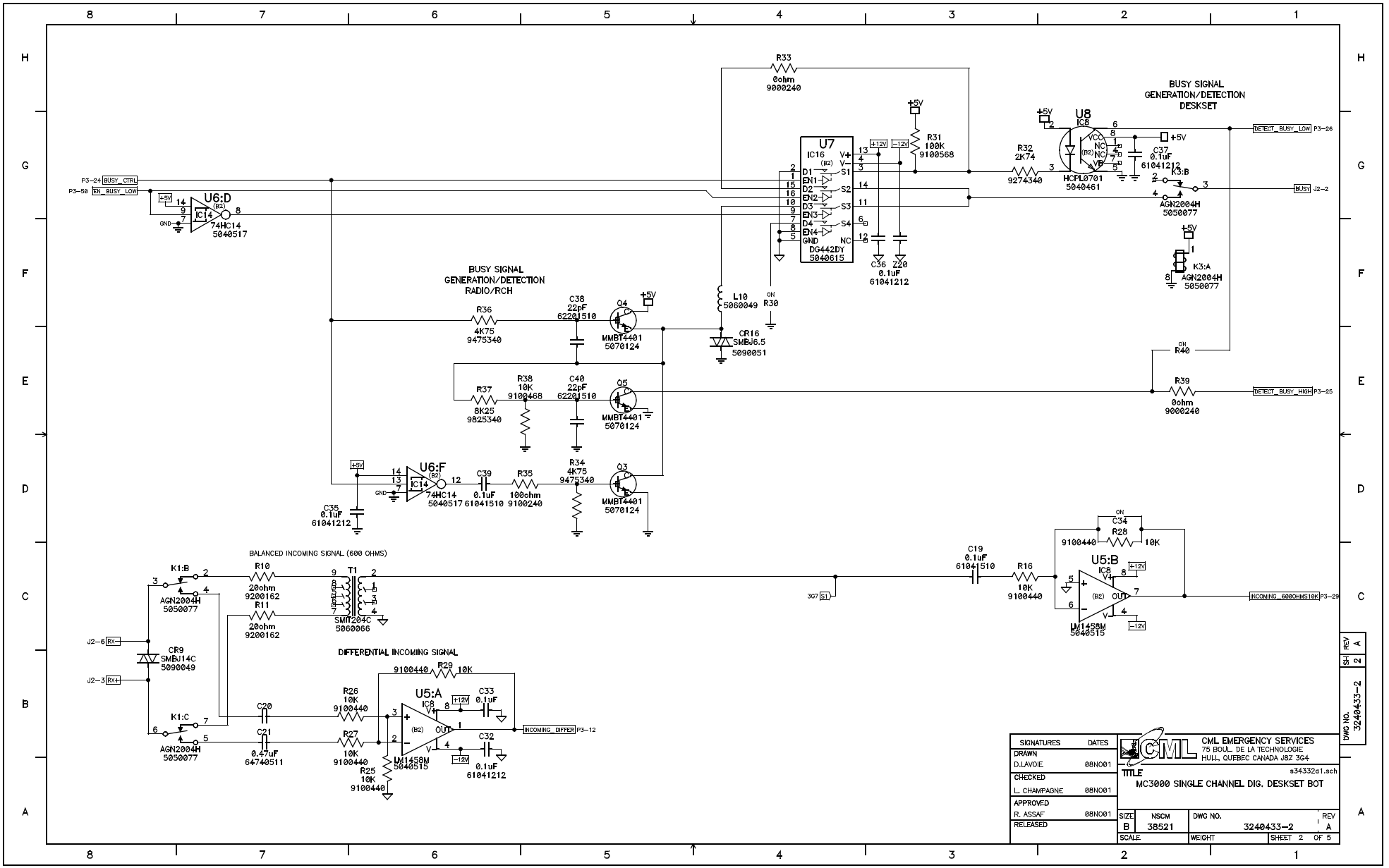



**Figure 4-3: MC3000 Bottom Circuit Board (component side)**

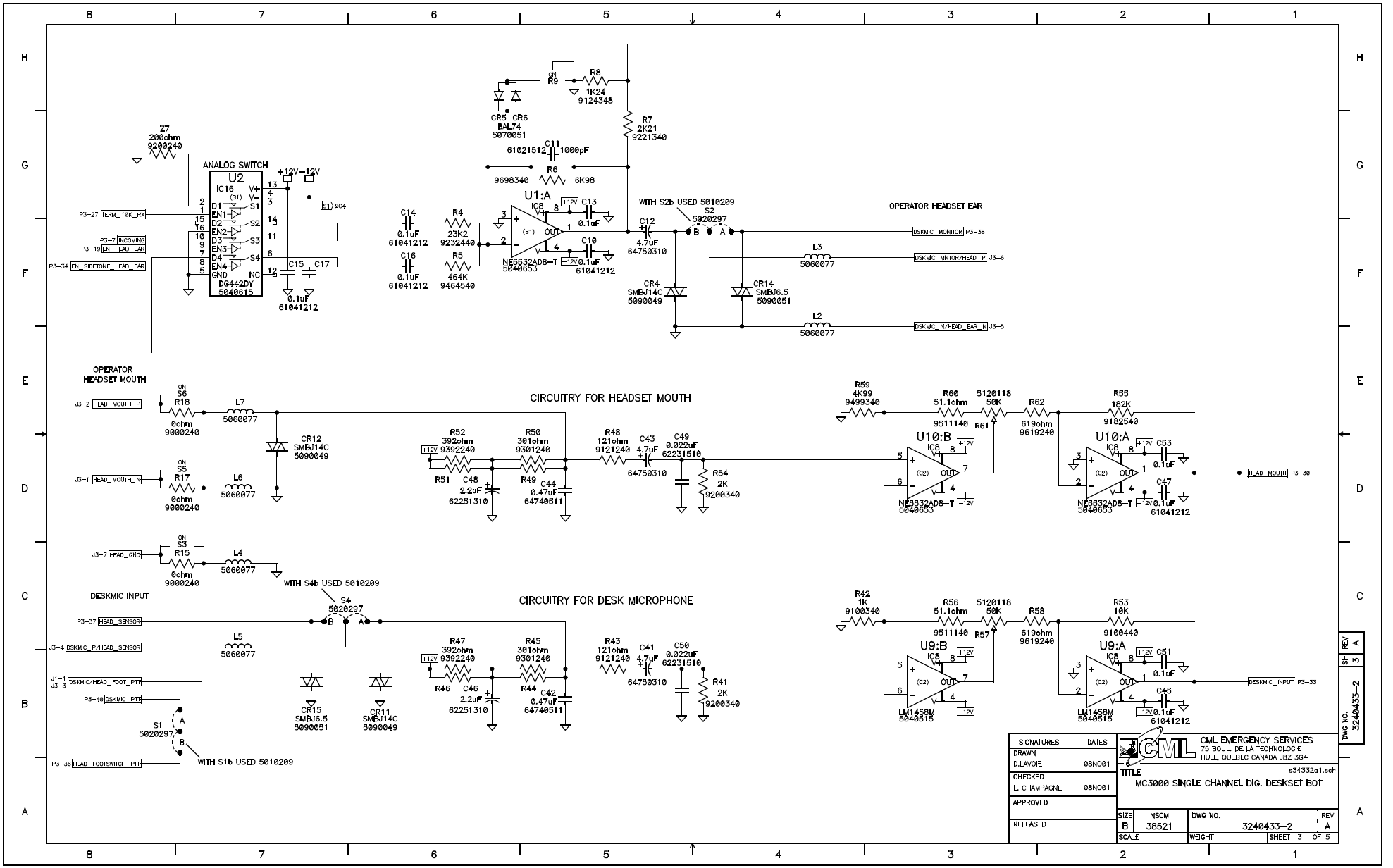
# Schematics — (2260395-1)
# MC3000 Digital Deskset Bottom Board (1 of 4)



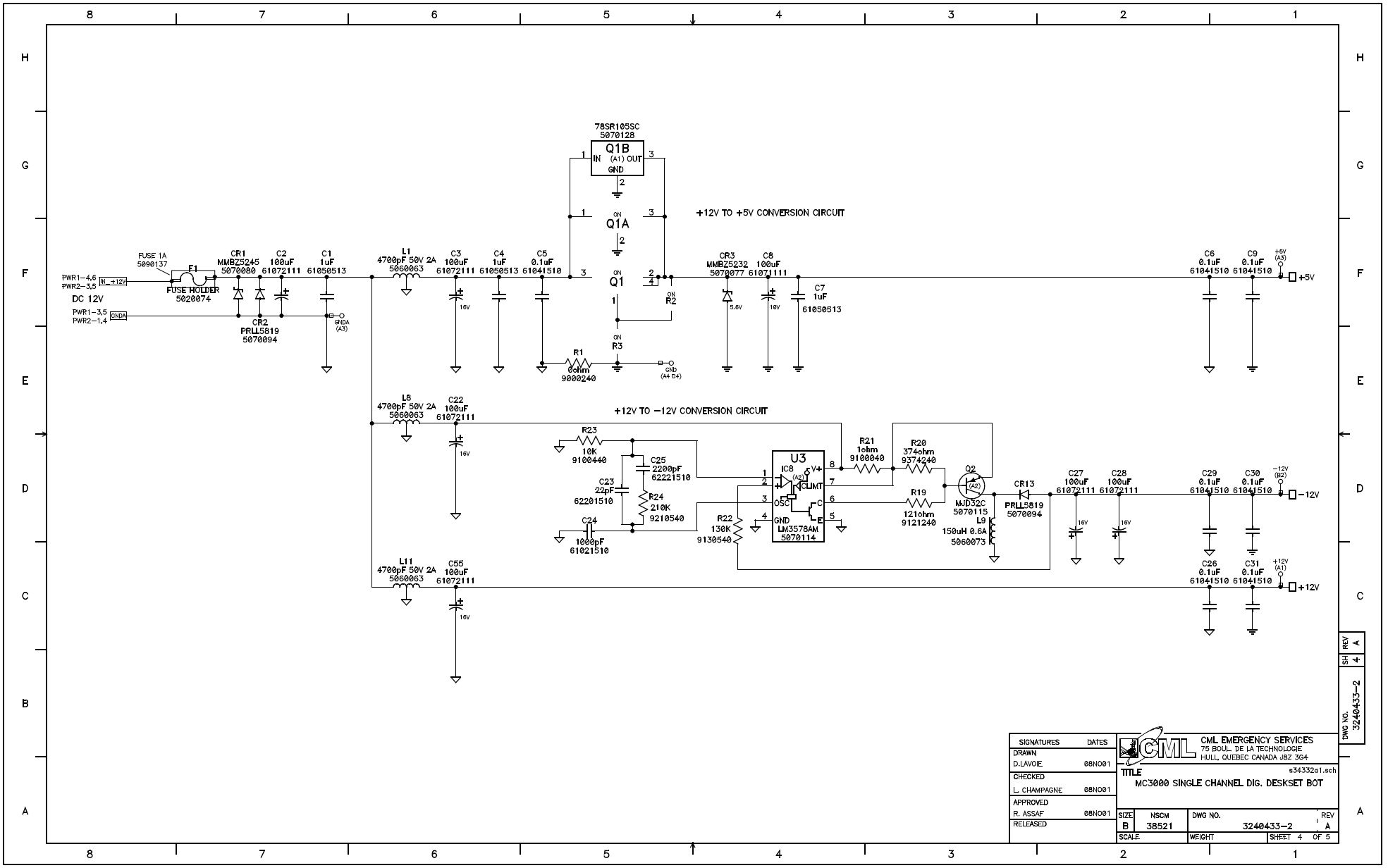
# Schematics — (2260395-1)
# MC3000 Digital Deskset Bottom Board (2 of 4)



# Schematics — (2260395-1)
# MC3000 Digital Deskset Bottom Board (3 of 4)



# Schematics — (2260395-1)
# MC3000 Digital Deskset Bottom Board (4 of 4)




| SIGNATURES | DATES |
|---|---|
| DRAWN | |
| D.LAVOIE | 08NO01 |
| CHECKED | |
| L. CHAMPAGNE | 08NO01 |
| APPROVED | |
| R. ASSAF | 08NO01 |
| RELEASED | |

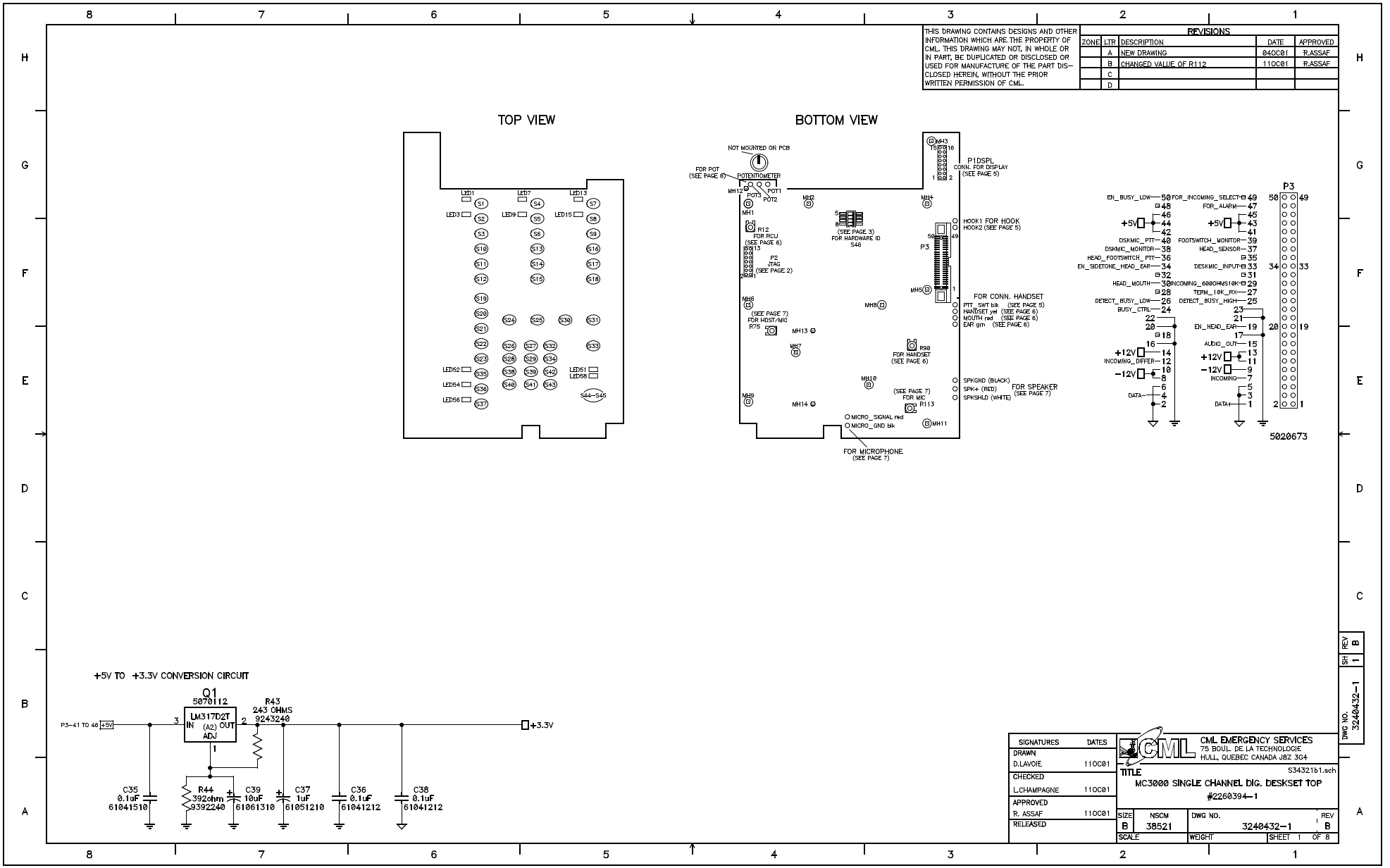
CML EMERGENCY SERVICES
75 BOUL. DE LA TECHNOLOGIE
HULL, QUEBEC CANADA J8Z 3G4

s34332a1.sch

TITLE
MC3000 SINGLE CHANNEL DIG. DESKSET BOT

| SIZE | NSCM | DWG NO. | REV |
|---|---|---|---|
| B | 38521 | 3240433-2 | A |
| SCALE | | WEIGHT | SHEET 4 OF 5 |

DWG NO. 3240433-2
SH 4 REV A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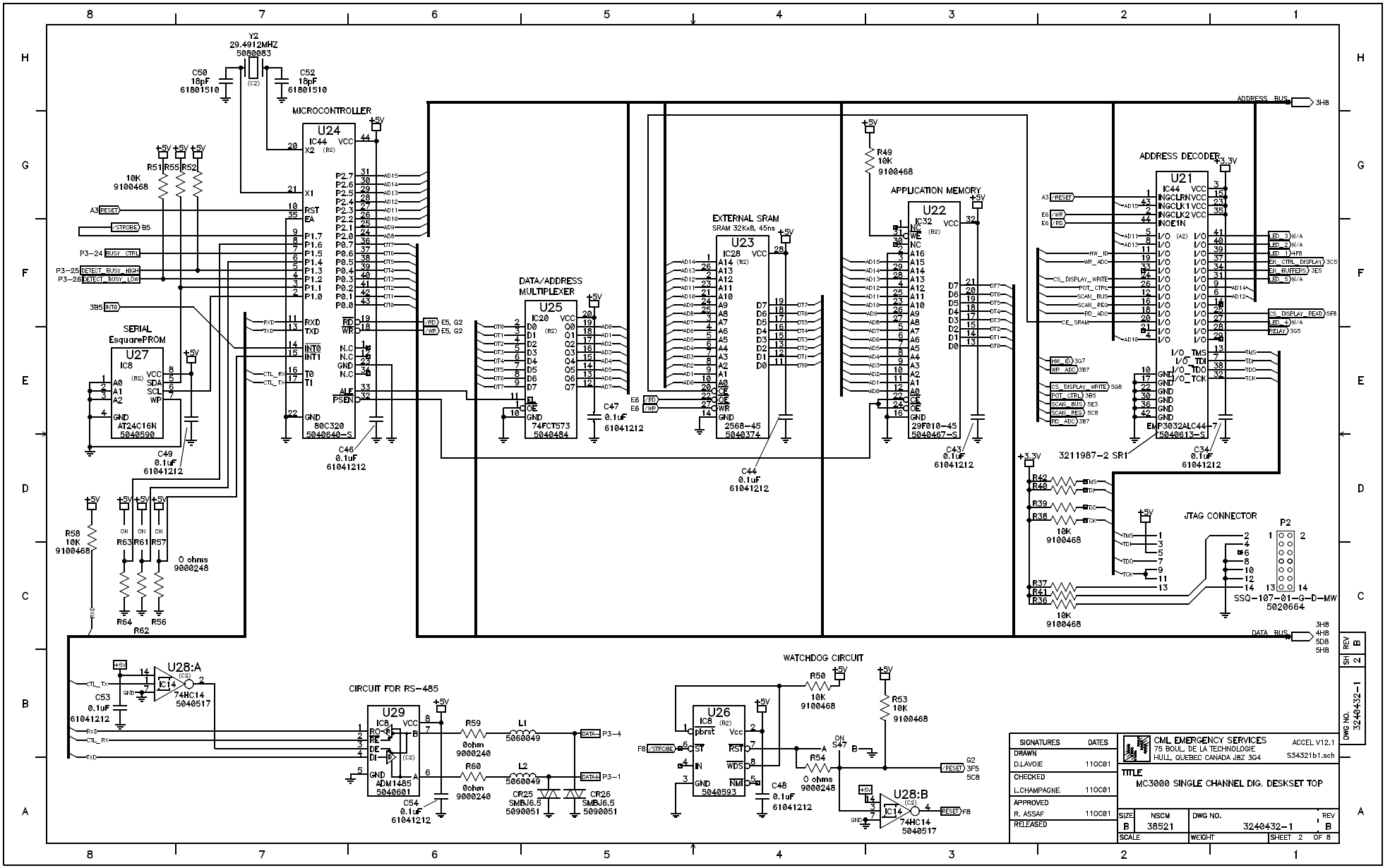
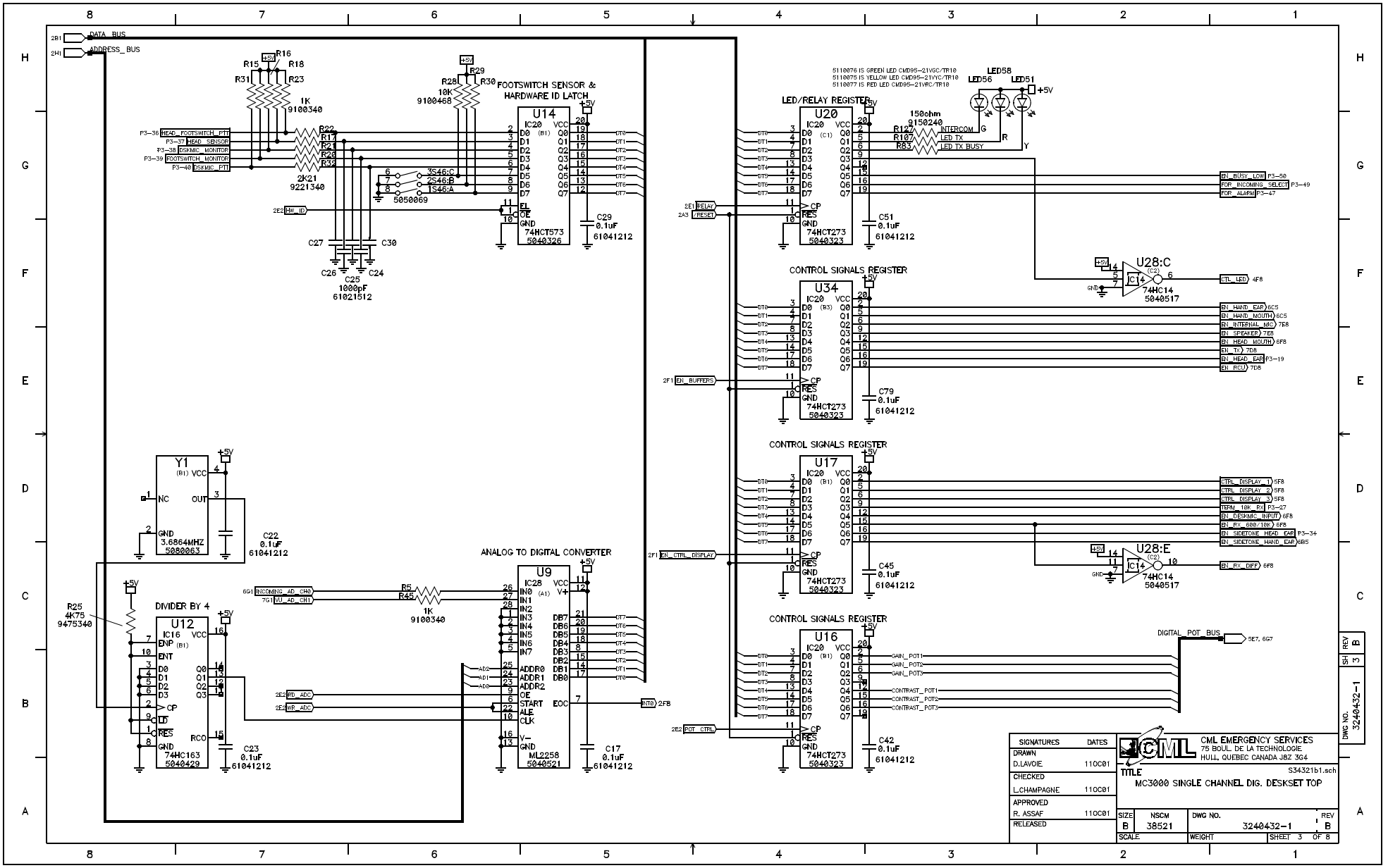
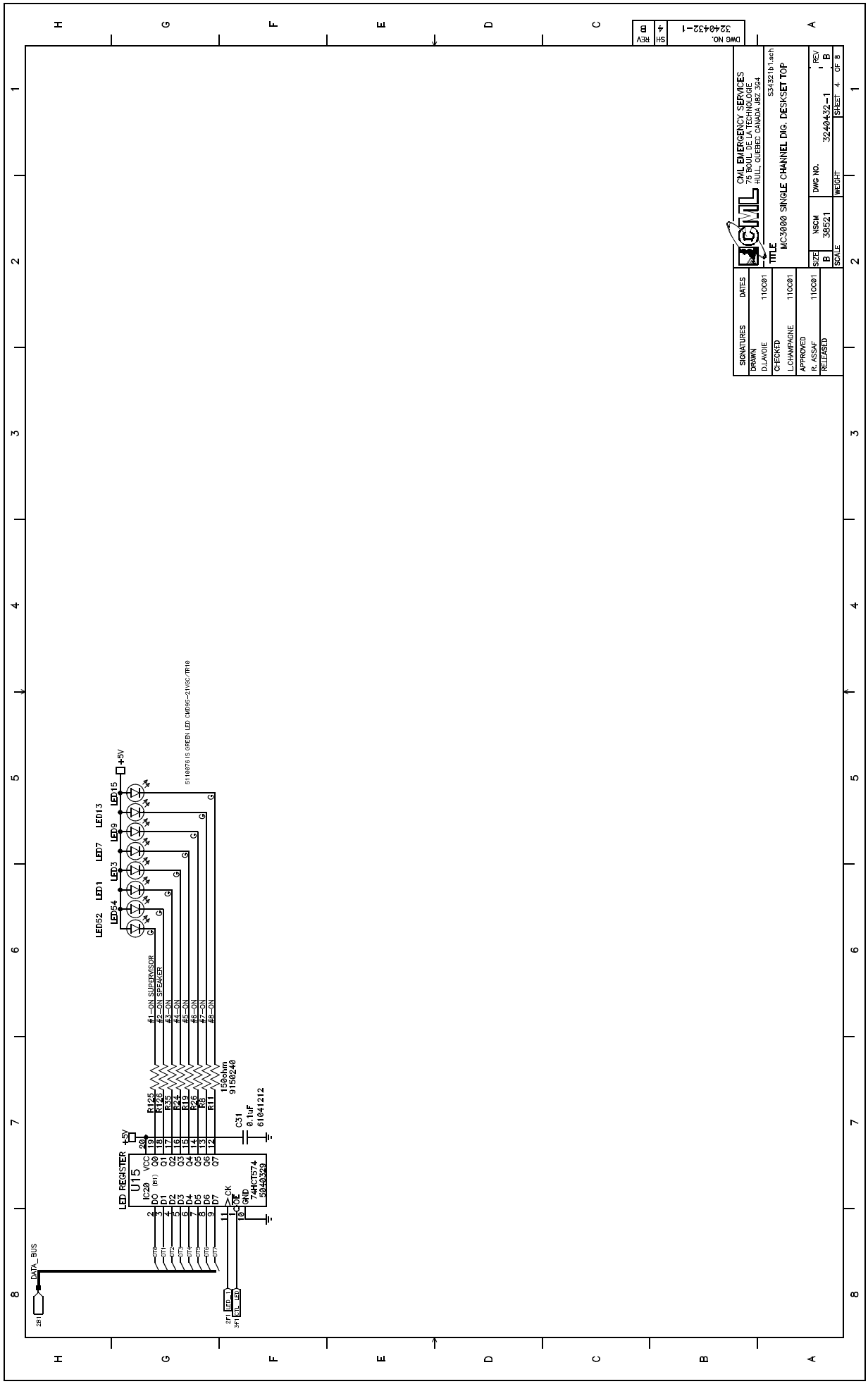
REVISIONS
ZONE LTR DESCRIPTION DATE APPROVED
A NEW DRAWING 040C01 R.ASSAF
B CHANGED VALUE OF R112 110C01 R.ASSAF
C
D
TOP VIEW
BOTTOM VIEW
NOT MOUNTED ON PCB
FOR POT (SEE PAGE 6)
POTENTIOMETER
P1DSPL CONN. FOR DISPLAY (SEE PAGE 5)
HOOK1 FOR HOOK
HOOK2 (SEE PAGE 5)
FOR CONN. HANDSET
PTT_SWT blk (SEE PAGE 5)
HANDSET yel (SEE PAGE 6)
MOUTH red (SEE PAGE 6)
EAR grn (SEE PAGE 6)
FOR HANDSET (SEE PAGE 6)
SPKGND (BLACK)
SPK+ (RED)
SPKSHLD (WHITE)
FOR SPEAKER (SEE PAGE 7)
MICRO_SIGNAL red
MICRO_GND blk
FOR MICROPHONE (SEE PAGE 7)
P3
EN_BUSY_LOW
FOR_INCOMING_SELECT
FOR_ALARM
+5V
DSKMIC_PTT
DSKMIC_MONITOR
FOOTSWITCH_MONITOR
HEAD_FOOTSWITCH_PTT
HEAD_SENSOR
EN_SIDETONE_HEAD_EAR
DESKMIC_INPUT
HEAD_MOUTH
INCOMING_600OHMS10K
TERM_10K_RX
DETECT_BUSY_LOW
DETECT_BUSY_HIGH
BUSY_CTRL
EN_HEAD_EAR
AUDIO_OUT
+12V
INCOMING_DIFFER
-12V
INCOMING
DATA-
DATA+
5020673
+5V TO +3.3V CONVERSION CIRCUIT
Q1
5070112
LM317D2T
IN (A2) OUT
ADJ
R43
243 OHMS
9243240
P3-41 TO 46 +5V
+3.3V
C35 0.1uF 61041510
R44 392ohm 9392240
C39 10uF 61061310
C37 1uF 61051210
C36 0.1uF 61041212
C38 0.1uF 61041212
SIGNATURES DATES
DRAWN D.LAVOIE 110C01
CHECKED L.CHAMPAGNE 110C01
APPROVED R. ASSAF 110C01
RELEASED
CML EMERGENCY SERVICES
75 BOUL. DE LA TECHNOLOGIE
HULL, QUEBEC CANADA J8Z 3G4
S3432lb1.sch
TITLE
MC3000 SINGLE CHANNEL DIG. DESKSET TOP
#2260394-1
SIZE B NSCM 38521
DWG NO. 3240432-1
REV B
SCALE
WEIGHT
SHEET 1 OF 8
SH 1 REV B
DWG NO. 3240432-1

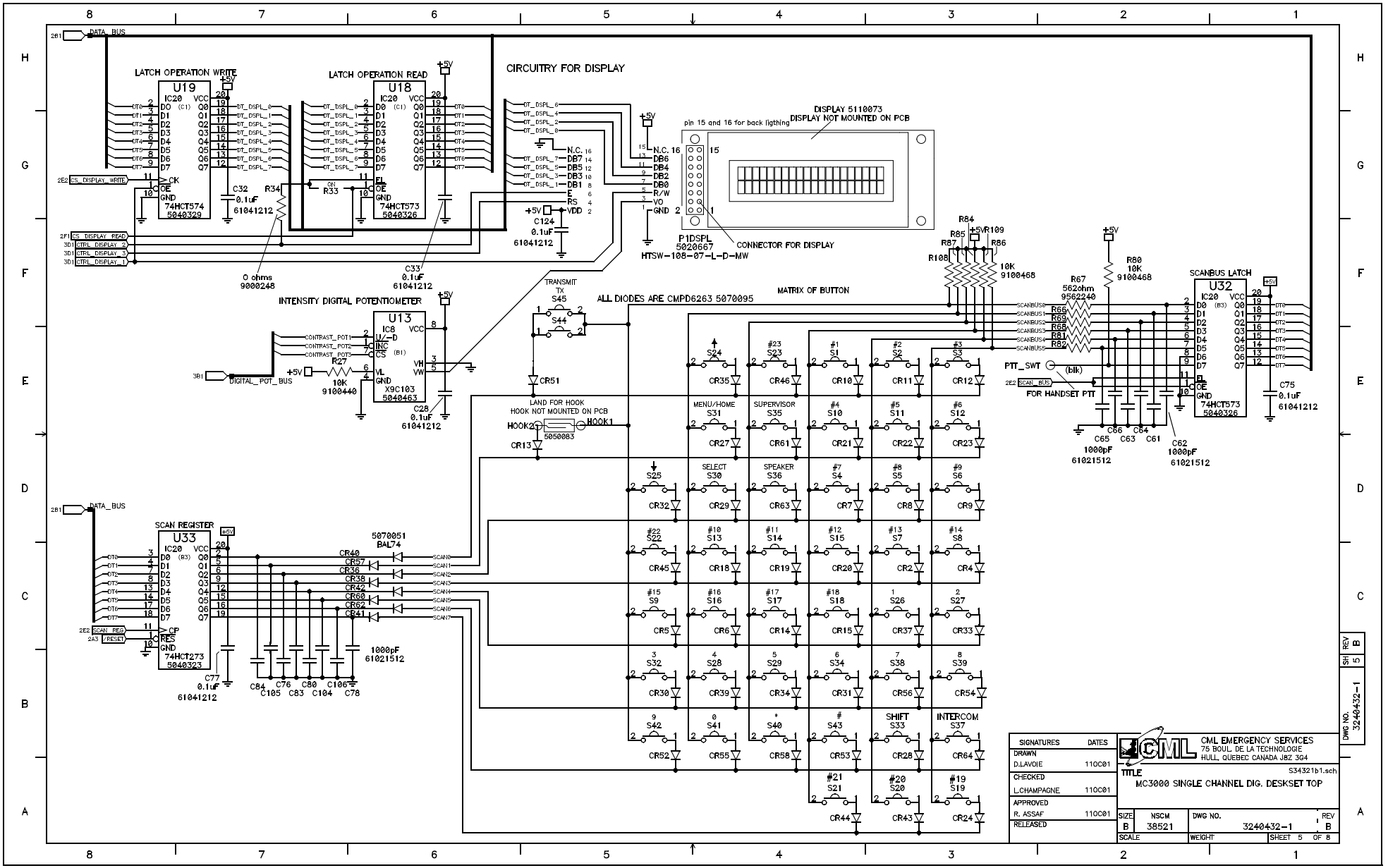

MICROCONTROLLER
U24
IC44
5040640-S
Y2
29.4912MHZ
5080083
C50
18pF
61801510
C52
18pF
61801510
SERIAL
EsquarePROM
U27
IC8
AT24C16N
5040590
DATA/ADDRESS
MULTIPLEXER
U25
IC20
74FCT573
5040454
EXTERNAL SRAM
SRAM 32Kx8, 45ns
U23
IC28
2568-45
5040374
APPLICATION MEMORY
U22
IC32
29F010-45
5040467-S
ADDRESS DECODER
U21
IC44
EMP3032ALC44-7
5040613-S
3211987-2 SR1
JTAG CONNECTOR
P2
SSQ-107-01-G-D-MW
5020664
CIRCUIT FOR RS-485
U29
IC8
ADM1485
5040601
U28:A
U28:B
IC14
74HC14
5040517
WATCHDOG CIRCUIT
U26
IC8
5040593
R49
10K
9100468
R50
10K
9100468
R53
10K
9100468
R54
0 ohms
9000248
R58
10K
9100468
R62
0 ohms
9000248
R42
10K
9100468
L1
5060049
L2
5060049
CR25
SMBJ6.5
5090051
CR26
SMBJ6.5
5090051
C43
0.1uF
61041212
C44
0.1uF
61041212
C46
0.1uF
61041212
C47
0.1uF
61041212
C48
0.1uF
61041212
C49
0.1uF
61041212
C53
0.1uF
61041212
C54
0.1uF
61041212
C34
0.1uF
61041212
ADDRESS BUS
DATA BUS
CML EMERGENCY SERVICES
75 BOUL. DE LA TECHNOLOGIE
HULL, QUÉBEC CANADA J8Z 3G4
ACCEL V12.1
S34321b1.sch
TITLE
MC3000 SINGLE CHANNEL DIG. DESKSET TOP
SIGNATURES
DRAWN D.LAVOIE 11OC01
CHECKED L.CHAMPAGNE 11OC01
APPROVED R. ASSAF 11OC01
RELEASED
SIZE B
NSCM 38521
DWG NO. 3240432-1
REV B
SCALE
WEIGHT
SHEET 2 OF 8
DWG NO. 3240432-1
REV B
SH 2


DATA_BUS
ADDRESS_BUS
FOOTSWITCH SENSOR & HARDWARE ID LATCH
U14
74HCT573
5040326
LED/RELAY REGISTER
U20
74HCT273
5040323
LED58
LED56
LED51
5110076 IS GREEN LED CMD95-21VGC/TR10
5110075 IS YELLOW LED CMD95-21VYC/TR10
5110077 IS RED LED CMD95-21VRC/TR10
CONTROL SIGNALS REGISTER
U34
74HCT273
5040323
U28:C
U28:E
74HC14
5040517
CONTROL SIGNALS REGISTER
U17
74HCT273
5040323
CONTROL SIGNALS REGISTER
U16
74HCT273
5040323
DIGITAL_POT_BUS
ANALOG TO DIGITAL CONVERTER
U9
ML2258
5040521
DIVIDER BY 4
U12
74HC163
5040429
Y1
3.6864MHZ
5080063
CML EMERGENCY SERVICES
75 BOUL. DE LA TECHNOLOGIE
HULL, QUEBEC CANADA J8Z 3G4
TITLE
MC3000 SINGLE CHANNEL DIG. DESKSET TOP
S34321b1.sch
SIZE B
NSCM 38521
DWG NO. 3240432-1
REV B
SCALE
WEIGHT
SHEET 3 OF 8
DWG NO. 3240432-1
REV B
SH 3

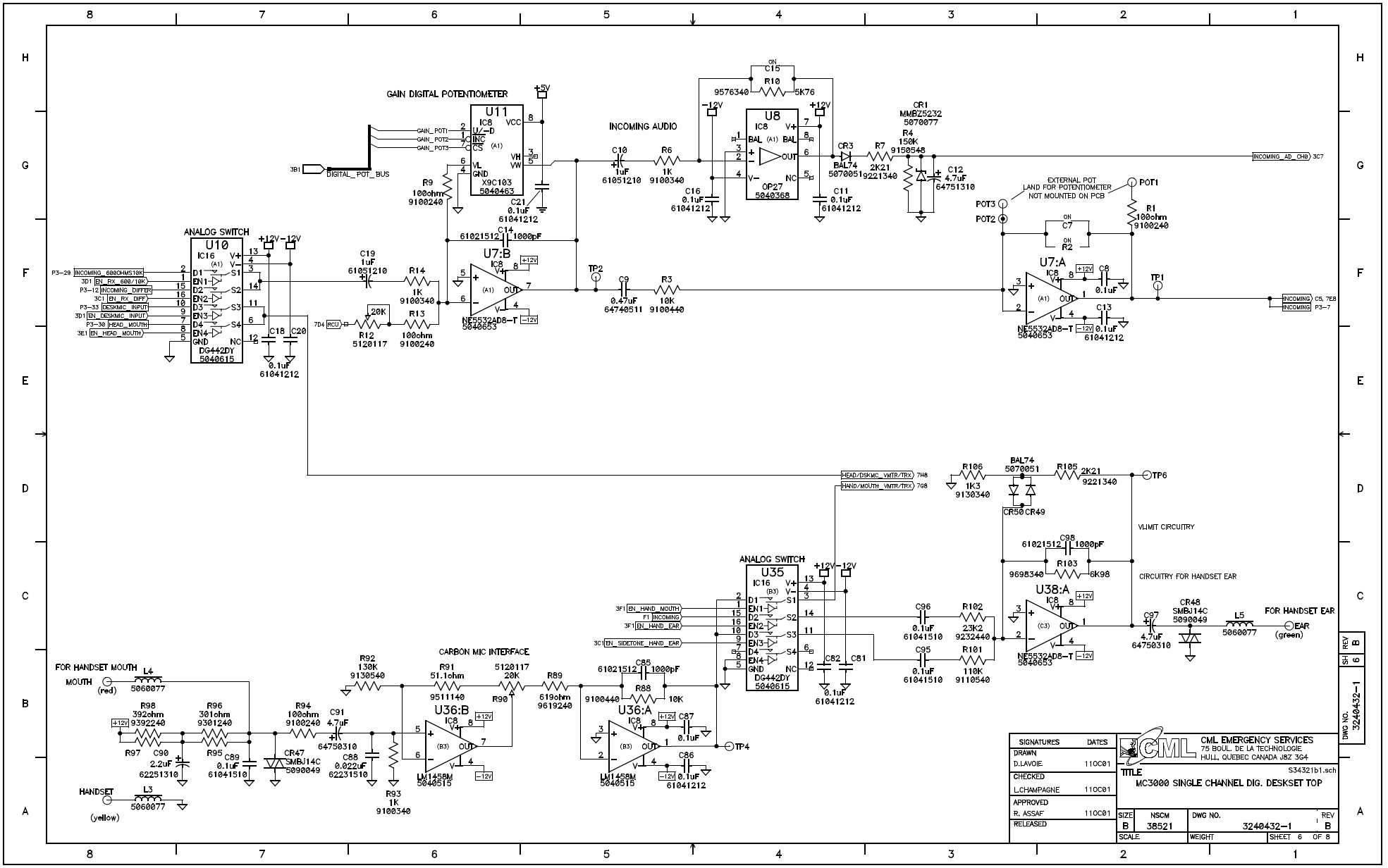
# Schematics — (2260394-1)
# MC3000 Digital Deskset Top Board (4 of 7)

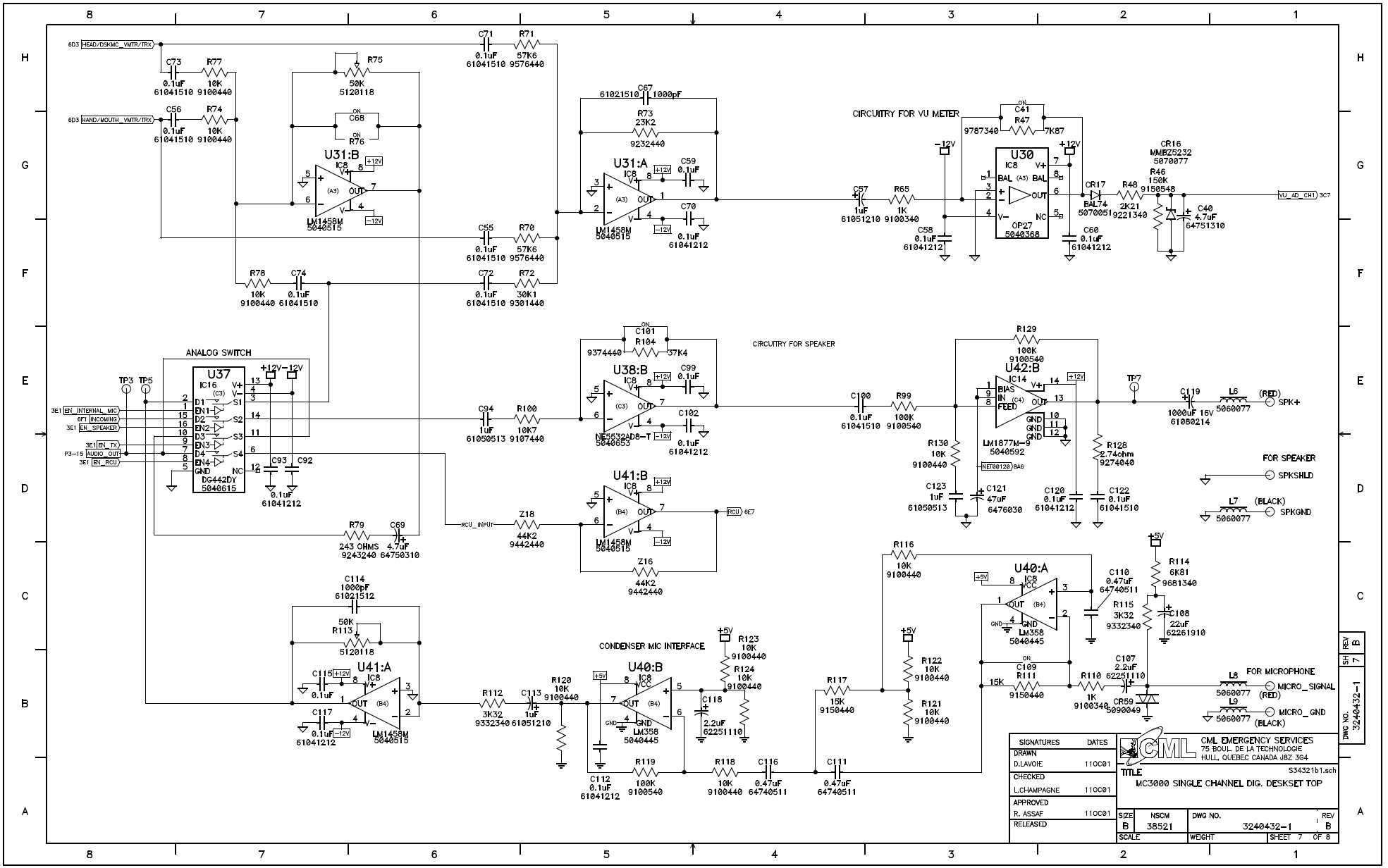


# Schematics — (2260394-1)
# MC3000 Digital Deskset Top Board (5 of 7)



# Schematics — (2260394-1)
# MC3000 Digital Deskset Top Board (6 of 7)




CIRCUITRY FOR VU METER
CIRCUITRY FOR SPEAKER
CONDENSER MIC INTERFACE
ANALOG SWITCH
FOR SPEAKER
FOR MICROPHONE
SPKSHLD
SPK+
SPKGND
MICRO_SIGNAL
MICRO_GND
CML EMERGENCY SERVICES
75 BOUL. DE LA TECHNOLOGIE
HULL, QUEBEC CANADA J8Z 3G4
MC3000 SINGLE CHANNEL DIG. DESKSET TOP
DWG NO. 3240432-1
REV B
SHEET 7 OF 8

Appendix A
# The “Labels” Program

## About the Labels Program

The Labels program is a Windows application that allows you to produce label files and print the labels for the operator module buttons on MC3000 deskset. You can use the Labels program on the installation diskette to create a new label file.

See Chapter 2 “Creating Labels for the Deskset Buttons” for instructions on installing the Labeling program from the diskette. The label file used by the label printing program has the file extension “.LBL”.

## Starting the Labels Program

Click on the Labels.exe file in the destination folder (default c:/Program Files/Motorola) to start the program. The “Labels” program window appears.

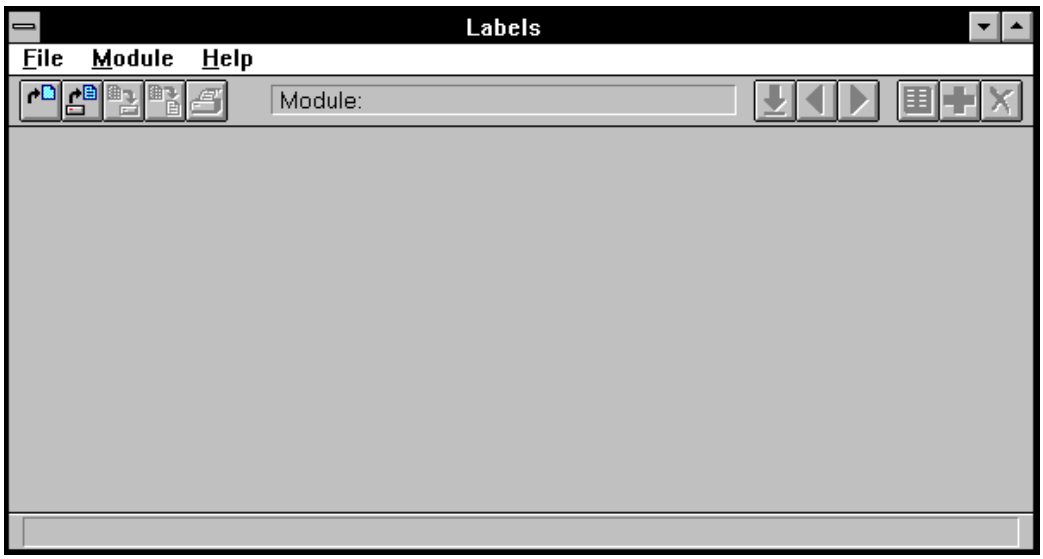


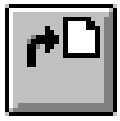
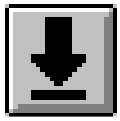
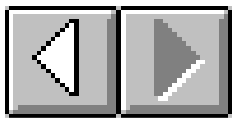

**Figure A-1: Labels Program Window**

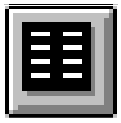
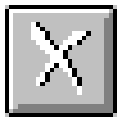
## Help Feature

For information on how to use the Labels program, use the “Help” feature.

To start the “Help” feature, select the **Contents** command from the Help menu.

## Toolbar

| | |
|---|---|
|  | This button allows you to create a new label file. |
|  | This button allows you to open an existing label file. |
|  | This button allows you to save the current file. |
|  | This button allows you to save the current file under a new name. |
|  | This button allows you to print the labels. |
|  | This button allows you to select a module from a list. |
|  | These buttons allow to select the previous and next module in the list. |

| | |
|---|---|
|  | This button allows you to edit the labels of the selected module. |
|  | This button allows you to add a new module to the list. |
|  | This button allows you to delete the selected module. |

## Creating a New Label File

**To create a new label file using the labels program:**

1. Select  , or the **New label file** command from the File menu. The "Labels System Information" dialog box appears.

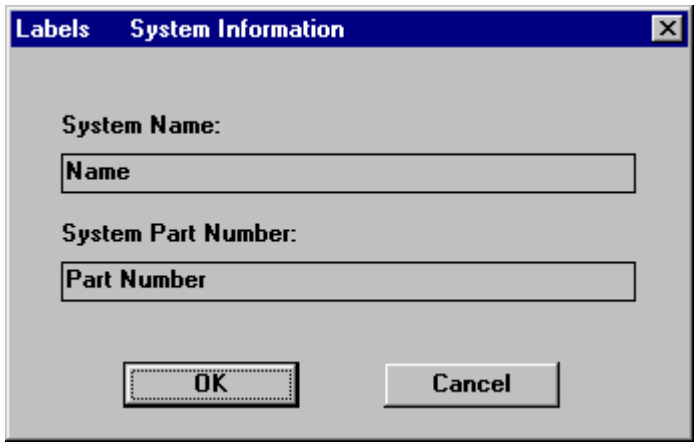



**Figure A-2: System Information Dialog Box**

2. Add the system name and system part number.
3. Press the **OK** button.

 ,  , and  become active.

4. Select  , or the **Add** command from the Module menu, to add a module. The "Labels Add Module" dialog box appears.

.

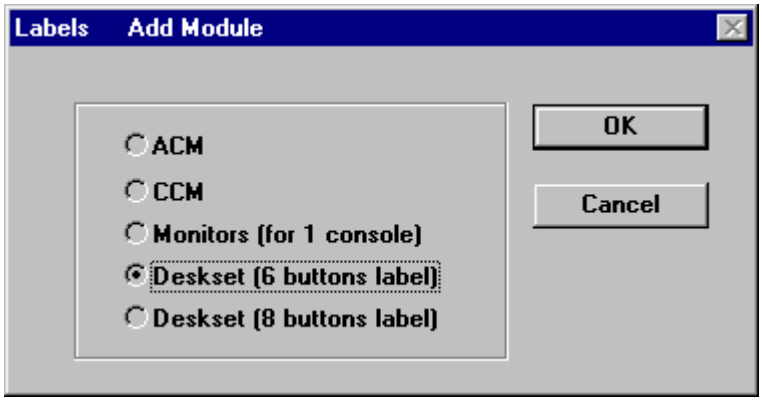



**Figure A-3: Labels Add Module (6 button option) Dialog Box**

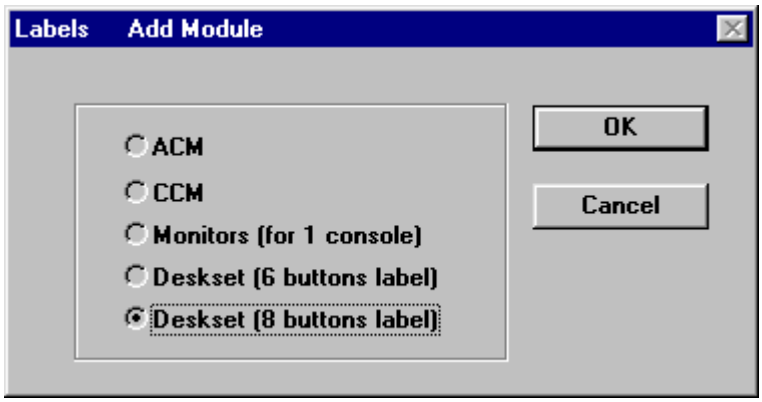



**Figure A-4: Labels Add Module (8 button option) Dialog Box**

5. Select the "Deskset (6 buttons label)" and "Deskset (8 buttons label)" option buttons to create labels for each button row on the Digital Deskset.

   **Note:** The Labels program is used for many types of desksets. The option you select in this dialog box determines which "Module Label" dialog box will open.

6. Press the **OK** button. The selected "Deskset (6 buttons)" or "Deskset (8 buttons)" module label dialog box will appear. See "Deskset Label (6 buttons) Dialog Box" on page A-6 or the "Default Deskset Label (8 buttons) Dialog Box" on page A-7for screen captures.

7. Type the desired labels in the fields. The eight button module dialog box has default labels that you need to change for the Digital Deskset. For the Digital Deskset, the top five buttons should be blank and the bottom three should be Takeover, Speaker and Intercom.

8. Press the **OK** button. You can now add more module labels or modify, print or delete existing labels. The Digital Deskset has three rows of six digital radio function buttons and one row of eight buttons. Each row will need a separate module label. If you are using all the rows on the deskset you will need four module labels.

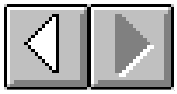
9. Select the **Save** command from the File menu to save the module label file that includes all module labels created. The "Save As" dialog box appears.

10. Indicate the file name and the directory you desire the file to be stored under.

11. Press the **OK** button.

## Adding and/or Editing Label Text

**To add and/or edit the label text:**

1. Select the desired module label file by using  or the **View Next** or **View Previous** commands from the Module menu.

2. Select  or the **Edit** command from the Module menu. The selected "Module Label" dialog box appears.

   **Note:** The Labels program is used for many types of desksets. The option you selected in the "Labels Add Module" dialog box, when first creating the desired file,

determines which “Module Label” dialog box will open. For Digital Deskset labels files, the “Deskset (6 buttons)” or “Deskset (8 buttons)” dialog box should appear.

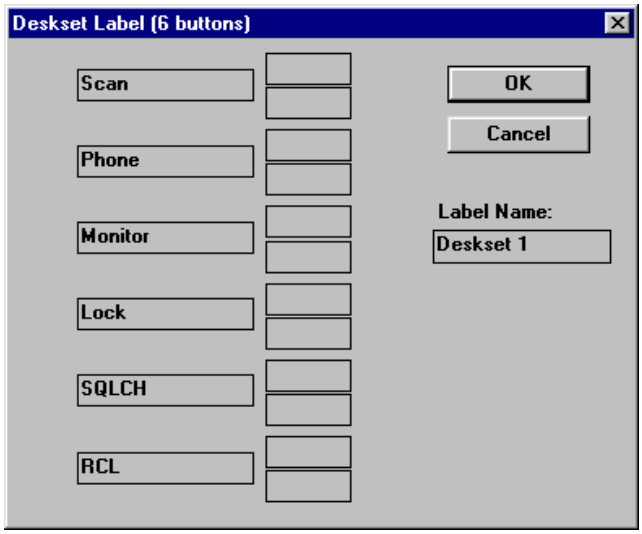



**Figure A-5: Deskset Label (6 buttons) Dialog Box**

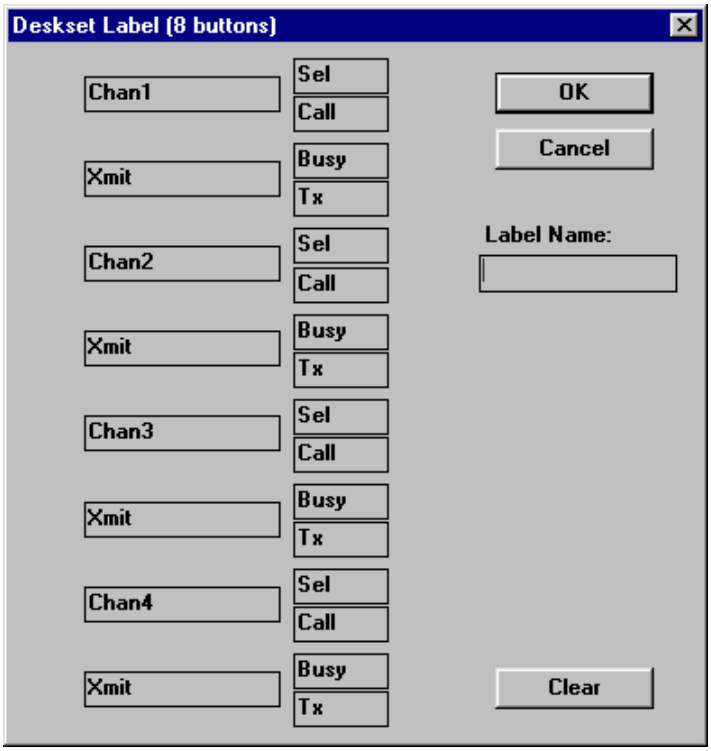



**Figure A-6: Deskset Label (8 buttons) Dialog Box - Default**

Select and edit the field(s) you wish to modify. The eight button module dialog box has default labels that you need to change for the Digital Deskset. .

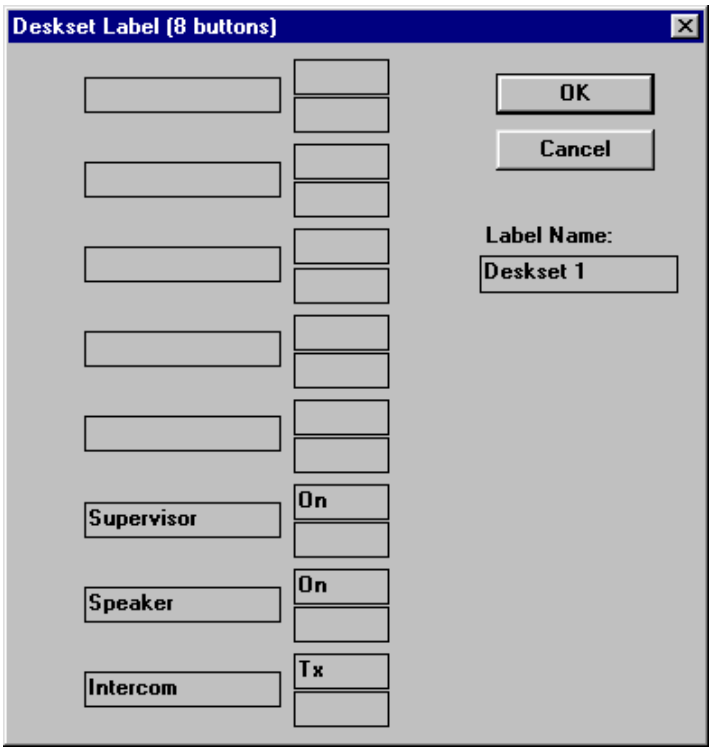



**Figure A-7: Default Deskset Label (8 buttons) Dialog Box**

3. Click the **Clear** button to clear the defaults in all fields. For the Digital Deskset, the top five buttons should be blank and the bottom three should be Supervisor or Takeover, Speaker and Intercom.

The "Label Name" field allows you to add or modify the name of the module's label. The label name will be printed with the labels.

4. Press the **OK** button. The "Labels" screen appears. The screen will display a print preview of the module label.

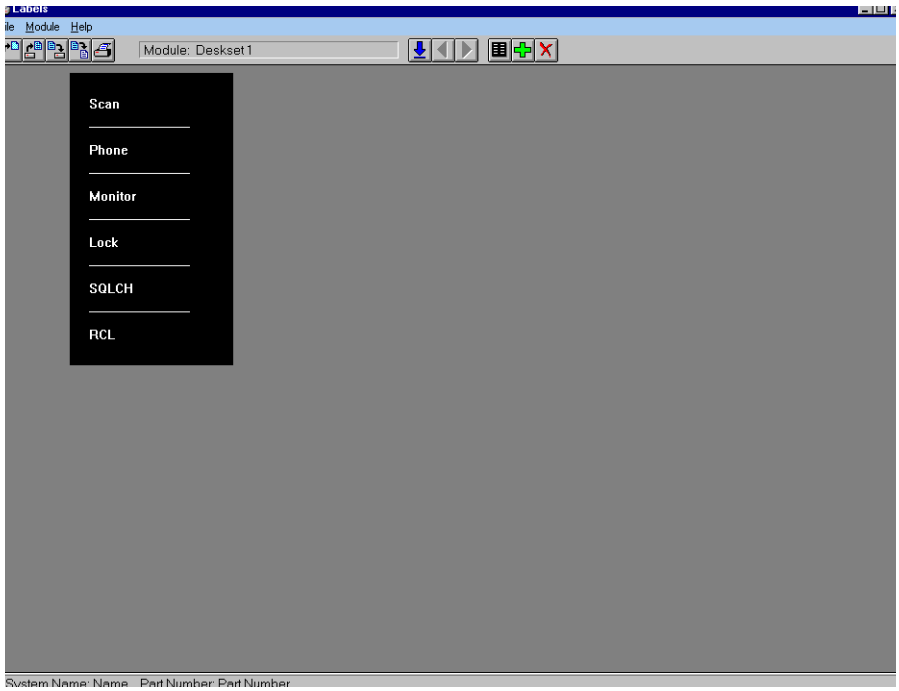



**Figure A-8: Label (6 buttons) Dialog Box**

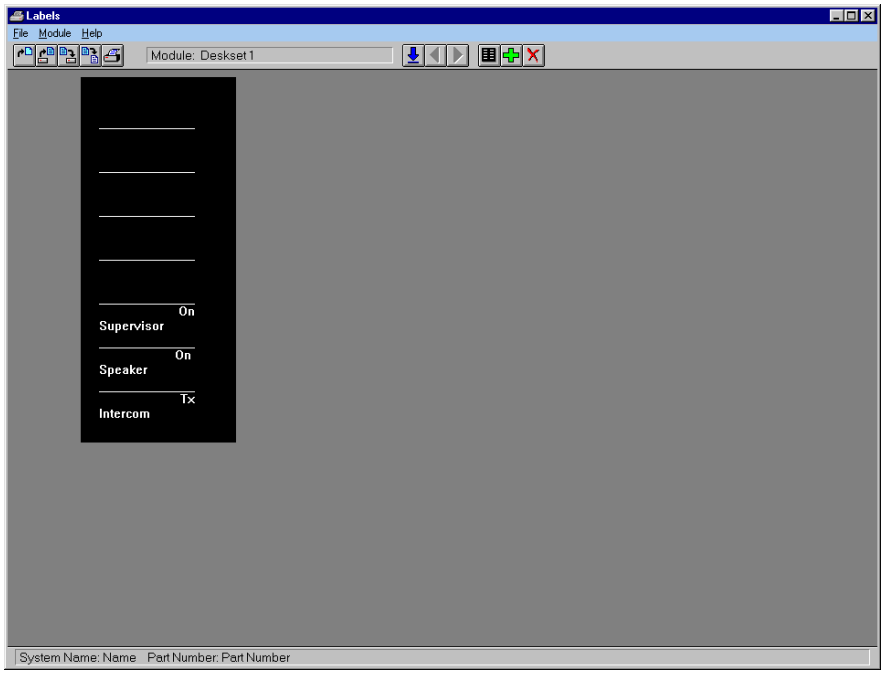



**Figure A-9: Label (8 buttons) Dialog Box**

5. Select the **Save** command from the File menu to save the module label file. The "Save As" dialog box appears.
6. Indicate the file name and the directoryunder which you desire the file to be stored.
7. Press the **OK** button.

## Producing Labels

**To produce labels:**

1. Select  , or the **Print** command from the File menu.

The "Print the Labels" dialog box appears.

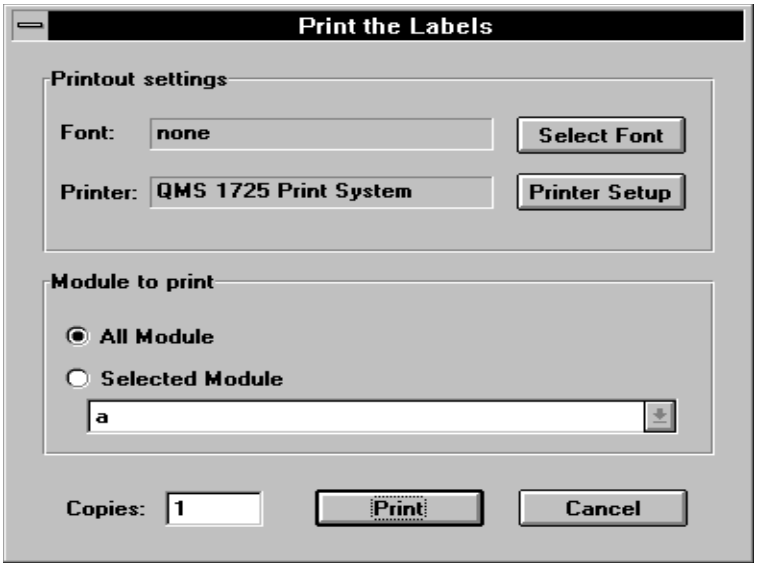



**Figure A-10: Print the Labels Dialog Box**

Use the "Select font" button to select the font for the labels.

Use the "Printer Setup" button to select the printer.

Select the "All Module" button to print the labels for all the modules.

Select the "Selected Module" button to print the module currently selected on the combo list box (directly below the "Selected Module" button).

2. Press the **Print** button.

The Labels print (see Figure A-6).

3. Use scissors to cut out the labels.
4. Insert the labels into the slots provided on the deskset.

# Glossary

| | |
|---|---|
| **AC** | alternating current |
| **ACK** | acknowledge |
| **ALT** | alert |
| **C** | celsius |
| **CD** | compact disk |
| **cm** | centimeters, a metric unit of measurement of size |
| **COR** | carrier operated relay |
| **DC** | direct current |
| **dB** | decibel, a logrithmic ratio measurement of the amplitude or power of two signals |
| **dBm** | a logarithmic ratio measurement of the power of a signal relative to one milliwatt and referenced to 600 ohms |
| **DTMF** | dual tone multi-frequency |
| **Emerg** | emergency |
| **ESD** | electrostatic discharge |
| **GND** | electrical ground |
| **Hz** | Hertz, a unit of frequency; one hertz is equal to one cycle per second. |
| **IEC** | International Electrotechnical Commission |
| **I/O** | input/output |
| **K** | Kilo |
| **kg** | Kilograms; a metric unit of measurement of weight, that is, one thousand grams |
| **KHz** | Kilohertz; that is, one thousand Hertz (thousand cycles per second) |
| **lb** | pounds, an imperial unit of measurement of weight |
| **LBL** | label |

| | |
|---|---|
| **LCD** | liquid crystal display |
| **LED** | light emitting diode; used on the deskset consoles for status lights |
| **Lobl** | line operated busy light |
| **M** | Mega or Megabits |
| **mA** | milli-Amperes, a unit of measurement of electrical current |
| **MIC** | microphone |
| **ms** | millisecond, a unit of measurement of time |
| **Multi-Sel** | multiple selection |
| **NC** | normally closed |
| **NO** | normally open |
| **POT/Pot** | potentiometer |
| **PTT** | push (or press) to talk |
| **PWR** | power |
| **RAC** | Repeater Access Code |
| **RCU** | remote control unit; same as parallel unit |
| **RF** | radio frequency |
| **RMA** | return material authorization |
| **RSS** | radio service software |
| **RX, Rx** | receive /received /receiving |
| **THD** | total harmonic distortion |
| **TR** | trimmer |
| **TX, Tx** | transmit/transmitted/transmitting |
| **$V_{AC}$** | volts, alternating current |
| **$V_{DC}$** | volts, direct current |
| **VOL** | volume |
| **$V_{RMS}$** | volts, root mean square |
| **VU** | visual volume display unit |