

INSTALLATION AND SET-UP MANUAL

C3 MAESTRO™ DISPATCH CONSOLE FOR WINDOWS NT®

WITH ENHANCED AUDIO ENCLOSURE

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GENERAL

The purpose of this manual is to guide field installation and maintenance personnel through the installation and set-up of an EDACS® C3 Maestro™ dispatch console for the Windows NT operating system. Installation and set-up of a C3 Maestro console equipped with an Enhanced Audio Enclosure audio system is covered. Figure 1 is a simplified diagram which indicates equipment interconnections in a typical installation of this type. As noted in the figure, some installations may not require all interconnections shown and still others may require additional interconnections to audio accessories or optional equipment not shown in the figure.

This document was developed in accordance with:

- C3 Maestro console primary hardware including PC (with Windows NT) 350A1371P13, monitors 350A1371P14 (14-inch), 350A1371P15 (17-inch), 350A1371P16 (14-inch touch-screen) and 350A1371P33 (17-inch touch-screen), dispatch keyboard 350A1371P17, Enhanced Audio Enclosure 350A1371P4, desk-top speaker kit

350A1371P8, and rack-mount speaker kits 350A1371P11 — P12.

- C3 Maestro console for Windows NT software LZY 213 759 R1A
- Enhanced Audio Enclosure firmware RON 107 781 R2A
- CEC/IMC Digital Audio Switch firmware 5.0x (344A3564G12, 344A3565G12, 344A3567G12 and 344A3568G12)
- CEC/IMC Manager software 5.x (for Windows NT)

NOTE

C3 Maestro for Windows NT software LZY 213 759 R1A requires CEC/IMC Controller and Audio Board firmware 4.x or later, and CEC/IMC Manager software 4.x or later. In addition, CEC/IMC Controller Board firmware 5.x is required in the console's CIM and in the CEC/IMC MOM for some enhanced functions to operate.

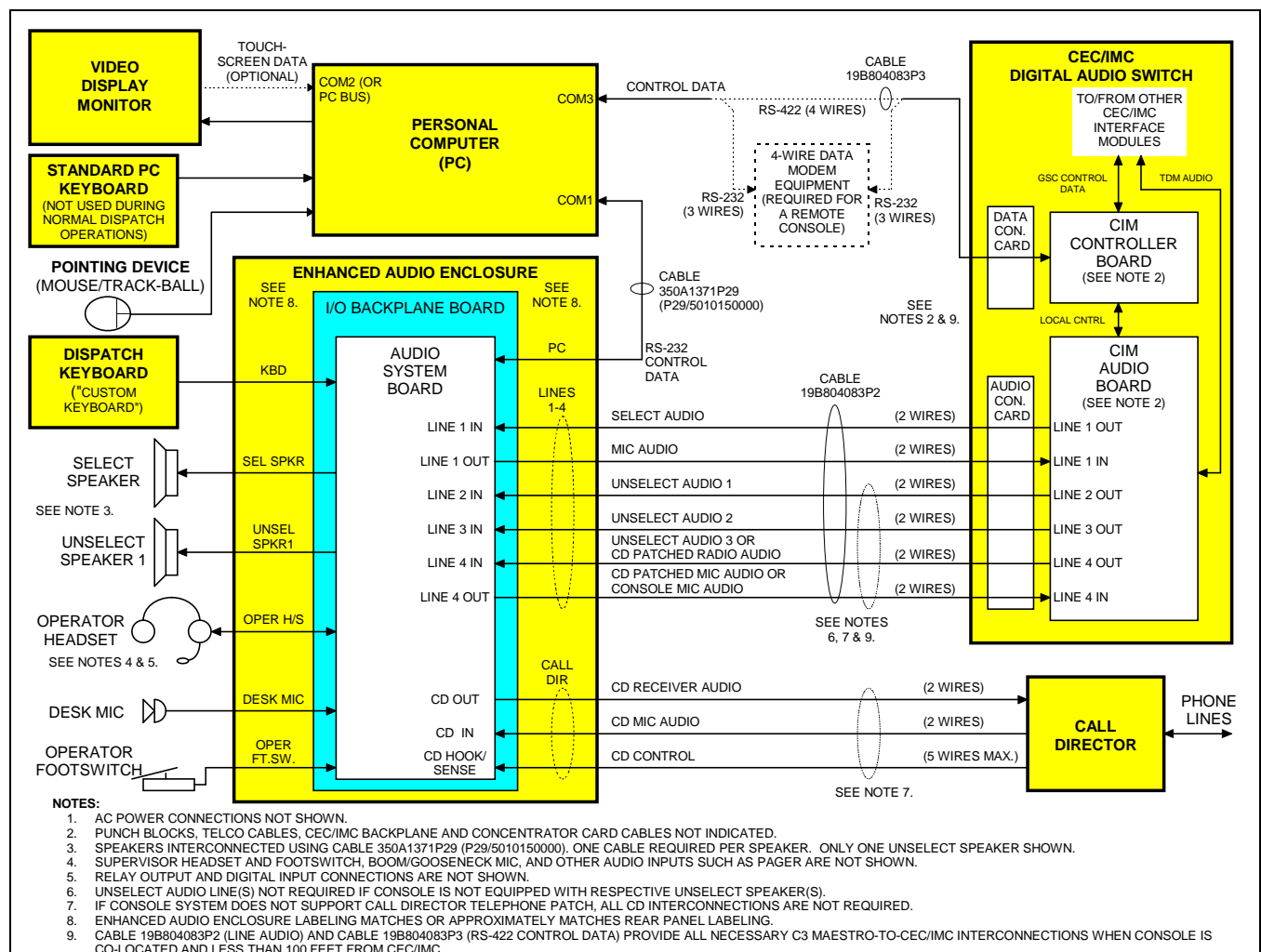


Figure 1 – C3 Maestro With Enhanced Audio Enclosure Equipment Interconnections

PERSONAL COMPUTERS

Hardware

Table 1 lists the PCs approved for use with a C3 Maestro for Windows NT. Use of an unapproved computer will void the console system's warranty and support services. Subsequent to the printing of this manual, additional PCs not listed in the table may be approved.

Table 1 – Approved Personal Computers

MANUFACTURER	MODEL NO. (TYPE)
Hewlett-Packard	Vectra VE Series 2 5/75 (Pentium/75 MHz)
Hewlett-Packard	Vectra VE 5/75 (Pentium/75 MHz)
Hewlett-Packard	Vectra VE2 5/100 (Pentium/100 MHz)

Software

The Personal Computer (PC) used with the C3 Maestro console for Windows NT is delivered with its hard disk drive formatted and Windows NT operating system software installed. In most cases, MS-DOS is also installed and, in this case, the PC is configured with dual-boot capability with Windows NT being the default boot-up operating system. MS-DOS is not required to run the C3 Maestro console for Windows NT.

The C3 Maestro console application software is also installed on the PC's hard disk drive at the factory. The console application software is also included with the console equipment package on 3 1/2-inch floppy disks in the event software re-installation is required.

CAUTION

Always observe proper equipment handling procedures to protect the equipment from ESD damage. Refer to LBI-38737 for complete details.

BOARD SET-UP

ENHANCED AUDIO ENCLOSURE

Normally, the Enhanced Audio Enclosure is configured at the factory for a standard C3 Maestro dispatch console system installation. This configuration includes setting a single 4-position DIP switch and programming all digital pots for nominal audio input and output levels. The DIP switch and digital pots within the Enhanced Audio Enclosure are located on the Audio System Board.

IMPORTANT NOTE

In most cases, changes to the factory DIP switch and digital pot settings **ARE NOT REQUIRED**. The following information lists the normal factory settings and the optional settings which are available. Digital pot setting changes must be accomplished *after* most of the installation procedures presented later in this manual are complete and the console has been powered-up. However, for completeness of this section, a setting procedure is included on page 7.

Audio System Board

Mic Audio ALC Enable/Disable DIP Switch (S1)

DIP switch S1 on the Audio System Board is used to independently enable or disable each microphone's automatic level control (ALC) circuit. The switch has four (4) positions, one for each mic that may be connected to the Enhanced Audio Enclosure.

An Audio System Board ships from the factory with all mic audio ALC circuits enabled. As shown in Figure 2, this is accomplished by setting all four S1 switch positions to "ON" or "CLOSED". Table 2 lists each switch position and its corresponding microphone.

- ☐ Normally, mic audio ALC should not be disabled. However, if required, disable a mic's ALC by setting the corresponding DIP switch position to "OFF" or "OPEN". See manual AE/LZB 119 1892 for Enhanced Audio Enclosure disassembly and Audio System Board access instructions.

Table 2 – Audio System Board Mic Audio ALC Enable/Disable DIP Switch S1

S1 POSITION	MICROPHONE
1	Operator Headset
2	Desk
3	Boom/Gooseneck
4	Supervisor Headset

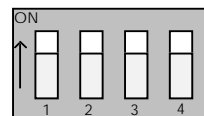


Figure 2 – Audio System Board DIP Switch S1 Factory Setting (ALC Enabled On All Mics)

Digital Potentiometers' Settings

To provide computer-controlled level settings, the Enhanced Audio Enclosure's audio input and output circuits incorporate 256-position digitally-controlled potentiometers. These digital pots, located on the Audio System Board, allow adjustment of the Enhanced Audio Enclosure's audio levels via the PC. Adjustments include dispatcher-adjustable audio levels such as headset sidetone volumes and system-level adjustments such as line input and output levels to and from the CEC/IMC Digital Audio Switch.

With the exception of the dispatcher's headset sidetone volume adjustments, none of the digital pots provide volume adjustments for the speaker or headset earphone audio levels during normal dispatch operations. Speaker and headset volume adjustments are accomplished at the respective speaker or headset via mechanical pots.

NOTE

Communication module volume changes at the C3 Maestro effect CEC/IMC CIM line output levels, not the digital pots within the Enhanced Audio Enclosure.

Fifteen (15) dual digital potentiometer chips (integrated circuits) are located on the Audio System Board for a total of thirty (30) individual pots; there are *no* mechanical potentiometers. *All audio level adjustments are accomplished via software.* See Table 4. A dispatcher may adjust the operator's sidetone digital pot using dedicated keyboard keystrokes <Alt> <Vol ↑> and <Alt> <Vol ↓> at the Dispatch Keyboard or via pointing device (mouse/track-ball/touch-screen) actions upon the console's graphical user interface.

All of the digital pots initially power-up with the wiper in a 50% or centered position. The microcontroller on the Audio System Board then immediately loads each pot in accordance with its respective setting stored in a "working" area of a serial EEPROM chip on the board. The EEPROM also contains an unchangeable "default" digital pot storage area. When shipped from the factory, the working area matches the default area.

Digital pots can be adjusted via the console's Dispatch Manager program. This function changes the settings stored in the EEPROM's working area. This function should only be accomplished by well-trained installation and/or service personnel. To change digital pots' settings, the following procedure may be performed *after the console's installation is complete, it is powered-up, the console application software is executing, and the PC-to-Enhanced Audio Enclosure serial data link is active:*

1. At the standard PC keyboard, use one or more Windows NT <Alt><Tab> keystrokes to switch to the console's Dispatch Manager program.

2. Using the mouse, click Pots on the menu *or* simply press <Alt> P on the PC keyboard. Either action will display the Digital Pots Adjustment dialog box.
3. From the dialog box's drop-down list box, select a digital pot which requires a setting change. See Table 4. The digital pot's existing setting is displayed in the small text box. If a mouse is not available, use the ↑ or ↓ arrow keys on the PC keyboard for digital pot selection.
4. Change the selected digital pot's setting by clicking the four (4) adjustment buttons as necessary. If a mouse is not available, simply <Tab> to the required button and press <Enter>. Repeat as necessary.
Alternately, if restoration to the factory default setting is required click the <Default> button. If a mouse is not available, <Tab> to this button and press the <Enter> key. Either action will cause the pot's EEPROM-stored factory default setting to be copied as EEPROM-stored working setting. Other pots' settings are not altered.
5. Repeat steps 3 and 4 as necessary for any other digital pots which require setting changes.
6. Click the <Done> button to exit the dialog box and save changes. If a mouse is not available, <Tab> to this button and press the <Enter> key. Changes are saved in the EEPROM's working area as they are made.

SPEAKER ASSEMBLY

Normally, a Speaker Assembly used with the Enhanced Audio Enclosure is configured at the factory with its minimum volume feature enabled and its maximum volume output power set to 2 watts. This configuration is accomplished by setting two positions on a 4-position DIP switch located on the Speaker Amp Board within the Speaker Assembly.

NOTE

The following information lists the normal factory settings and the optional settings which are available.

Speaker Amp Board

At each Speaker Assembly, a 4-position DIP switch identified as SW1 is located on the Speaker Amp Board. One position is used to enable or disable the minimum volume level feature. A second position allows setting of the maximum volume level to either 2 or 5 watts of output

power. Factory settings are shown in Figure 3. These switches have no effect on headset earphone output levels. Currently, the other two DIP switch positions on SW1 are not used.

NOTE

SW1 may have a tape seal placed over the switches to prevent changes.

Minimum Volume Level DIP Switch (SW1 Position 1)

When SW1 position 1 is "OFF" or "OPEN", the minimum volume level feature is enabled. This is the factory setting. With this setting, audio from the speaker *cannot* be completely turned off by rotating the volume control on the Speaker Assembly's front panel fully counterclockwise.

Specifically, with the volume control fully counterclockwise and a nominal audio level of 436 millivolts rms at a frequency of 1kHz from the Enhanced Audio Enclosure, the audio output level from the speaker will not drop below approximately 0.38 milliwatts or 55 millivolts rms across the 8-ohm speaker. This wattage figure assumes SW1 position 2 is also "OFF" or "OPEN", selecting the 2-watt maximum volume level. With SW1 position 2 selecting 5-watts, the minimum volume level is approximately 1.25 milliwatts or 100 millivolts across the 8-ohm speaker.

When SW1 position 1 is "ON" or "CLOSED", the minimum volume level feature is disabled and audio from the speaker may be completely turned off by rotating the volume control fully counterclockwise. *This setting should be used with caution since calls, especially calls on unselect audio channels, are more likely to be missed.*

Maximum Volume Level DIP Switch (SW1 Position 2)

SW1 position 2 allows setting of the speaker's maximum volume level to either 2 or 5 watts of output power. Normally, the factory setting is 2 watts. This level is recommended, as it should be adequate in nearly all dispatch environments. The 2-watt setting is selected by setting the switch "OPEN" or "OFF". When the switch is "CLOSED" or "ON", the maximum output power is increased to approximately 5 watts.

Both wattage figures assume the volume control on the Speaker Assembly's front panel is set at maximum (fully clockwise) and a nominal audio signal input level of 436 millivolts rms at a frequency of 1 kHz is applied to the Speaker Assembly.

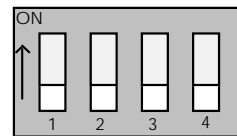


Figure 3 – Speaker Amp Board SW1 Factory Setting

- At this time, configure SW1 as required. Switch position selections are defined in the following table. If the Speaker Assembly is a desktop (with case) style, disassemble it by removing the four (4) screws from the back of the case and then separate the case's front and rear sections.

Table 3 – SW1 Selection Definitions

SW1 POSITION	OPEN (OFF)	CLOSED (ON)
1	minimum volume enabled *	minimum volume disabled
2	2-watt maximum speaker power *	5-watt maximum speaker power
3	(not used) *	(not used)
4	(not used) *	(not used)

* OPEN (OFF) is factory setting for all SW1 positions.

RS-422 BOARD

Most PCs used with the console are factory-equipped with a plug-in RS-422-capable board for serial control data interfacing to the CIM within the CEC/IMC Digital Audio Switch. *In these cases, **no changes to the related factory set-ups** are required assuming the factory-installed RS-422 board is utilized for CIM interfacing.*

If the factory installed RS-422 board is *not* used or not present within the PC, it may be beneficial to review information in this manual in the section entitled "CEC/IMC INTERCONNECTIONS", subsection "Control Data Link" (page 12) at this time. If necessary, also see "SOFTWARE SET-UP PROCEDURE", subsection "PC CMOS SET-UP PROGRAM" (page 37) for serial port enable/disable configuration information.

CAUTION

Always observe proper equipment handling procedures to protect the equipment from ESD damage. Refer to LBI-38737 for complete details.

Table 4 – Digital Potentiometers

AUDIO SYSTEM BD. POT NO.	ENHANCED AUDIO ENCLOSURE AUDIO CIRCUIT LOCATED IN / ADJUSTS *	TYPICAL SETTING **
1	Call Director Input — Adjusts level of telephone line audio from Call Director. Affects audio levels to operator/supervisor headsets, select speaker, select recorder and line output to CIM line input (to radio) during Call Director radio patch operations. Also see pot 14.	120
28	Pager Input — Adjusts level of pager input audio from an external pager. Affects tone levels to operator/supervisor headsets, select speaker, select recorder and line output to CIM line input (to radio) during pager activations (PTTs).	130
3	Operator Headset Mic Input — Adjusts level of operator headset mic input audio. <i>Does not</i> affect boom/gooseneck mic or desk mic audio input levels.	75
8	Selected Operator Mic Input — Adjusts currently selected operator mic (either boom/gooseneck, desk or operator headset) audio level. In the circuitry, this adjustment is located <i>after</i> pots 3, 5 and 6. Affects audio level(s) at one or more outputs including line 1, line 4, select recorder and/or sidetone.	140
6	Desk Mic Input — Adjusts level of desk mic input audio. <i>Does not</i> affect boom/gooseneck mic or operator headset mic audio input levels.	85
5	Boom/Gooseneck Mic Input — Adjusts level of boom/gooseneck mic input audio. <i>Does not</i> affect operator headset mic or desk mic audio input levels.	124
4	Supervisor Headset Mic Input — Adjusts level of supervisor headset mic input audio. Also see pot 7.	75
7	Supervisor Headset Mic Input — Post adjustment for supervisor headset mic input audio. <i>Do not change from factory setting.</i> Also see pot 4.	140
9	Supervisor Sidetone — Adjusts sidetone level of supervisor headset mic audio applied to supervisor and operator headset earphones.	31
10	Operator Sidetone — Adjusts sidetone level of operator headset mic audio applied to supervisor and operator headsets earphones.	31
11	Line 1 Input — Adjusts level of line 1 input audio from CIM line 1 output. Affects audio level to select audio output devices such as headset earphones, select speaker and select recorder.	75
12	Line 2 Input — Adjusts level of line 2 input audio from CIM line 2 output. Affects audio level to unselect audio output devices such as unselect speaker 1 and unselect recorder.	75
17	Line 3 Input — Adjusts level of line 3 input audio from CIM line 3 output. Affects audio level to unselect audio output devices such as unselect speaker 2 and unselect recorder.	75
18	Line 4 Input — Adjusts level of line 4 input audio from CIM line 4 output (from radio). Affects audio levels applied to unselect audio output devices such as unselect recorder and, if a third unselect speaker is employed, unselect speaker 3. If a Call Director is employed, adjustment affects audio to Call Director telephone line and unselect recorder. Primary line 4 adjustment. Also see pots 2 and 20.	75

Table 4 – Digital Potentiometers (Continued)

AUDIO SYSTEM BD. POT NO.	ENHANCED AUDIO ENCLOSURE AUDIO CIRCUIT LOCATED IN / ADJUSTS *	TYPICAL SETTING **
20	Auxiliary Input — Adjusts level of line 4 input audio from CIM line 4 output (from radio). Affects audio levels applied to select recorder, and all speakers during Call Director patch operations. Secondary line 4 adjustment used only if console is equipped with a Call Director. Also see pot 18.	114
27	N/A (pot not used)	0
15	Line 1 Output — Adjusts level of line 1 output audio to CIM line 1 input.	23
16	Line 2 Output (adjustment never required)	23
13	Line 3 Output (adjustment never required)	23
14	Line 4 Output — Adjusts level of line 4 output audio to CIM line 4 input. Affects audio level to patched radio during Call Director patch operations. Also see pot 1.	23
21	Select Recorder Output — Adjusts level of audio applied to the select recorder.	175
19	Select Audio Output — Adjusts level of audio at an internal Enhanced Audio Enclosure reference point on Audio System Board. Affects select speaker, select recorder, operator headset earphone and supervisors headset earphone audio levels.	190
29	Select Speaker Output — Adjusts level of audio applied to the select speaker. This pot <i>is not</i> used as a volume control.	128
30	Unselect Speaker 1 Output — Adjusts level of audio applied to the first unselect speaker (unselect speaker 1). This pot <i>is not</i> used as a volume control.	128
23	Unselect Speaker 2 Output — Adjusts level of audio applied to the second unselect speaker (unselect speaker 2). This pot <i>is not</i> used as a volume control.	128
24	Unselect Speaker 3 Output — Adjusts level of audio applied to the third unselect speaker (unselect speaker 3). This pot <i>is not</i> used as a volume control.	128
22	Unselect/Telephone Recorder Output — Adjusts level of audio applied to the unselect recorder. This audio may be from an unselect source or from the Call Director's telephone line.	175
2	Call Director Output — Adjusts level of audio to Call Director's telephone line (from radio). Also see pot 18.	130
25	Supervisor Headset Earphone Output — Adjusts level of audio applied to the supervisor headset earphones. This pot <i>is not</i> used as a volume control.	20
26	Operator Headset Earphone Output — Adjusts level of audio applied to the operator headset earphones. This pot <i>is not</i> used as a volume control.	20

* See the Audio System Board's maintenance manual for specific test points and additional alignment information.

** Numbers represent typical digital pot settings only. Factory settings are subject to change without notice as circuit improvements occur. DO NOT ADJUST any digital pot from factory setting unless a full understanding of the consequences is known.

INTERCONNECTING THE EQUIPMENT

A C3 Maestro dispatch console system equipped with an Enhanced Audio Enclosure requires the following interconnections. See Figure 1:

- **PC-to-CEC/IMC Data Concentrator Card control data link** – Via twisted pairs, phone lines, punch blocks and/or 4-wire modem equipment. A 100-foot (30.5 meters) pre-wired cable is supplied for co-located RS-422 hook-ups.
- **Enhanced Audio Enclosure-to-CEC/IMC Audio Concentrator Card audio link** – Via 600-ohm twisted pairs, phone lines, punch blocks and/or mux equipment. A 100-foot (30.5 meters) pre-wired cable is supplied for co-located audio hook-ups.
- **PC-to-Enhanced Audio Enclosure control data link** – A 9-foot (2.74 meters) pre-wired cable is supplied for this control data link. *(In some very specialized applications, the console does not require an audio system; therefore this interconnection and all audio-related interconnection information within this manual can be ignored. However, since this configuration is very rare, all procedures in this manual assume the console is equipped with an audio system, unless otherwise noted.)*
- **PC-to-Video Display Monitor**
- **PC, Video Display Monitor and Enhanced Audio Enclosure AC Power Connections**

In addition, the following connections are required if the related external devices are used with the console:

- **Enhanced Audio Enclosure-to-Dispatch Keyboard**
- **Enhanced Audio Enclosure-to-Desk Mic**
- **Enhanced Audio Enclosure-to-Supervisor Headset Jack Box**
- **Enhanced Audio Enclosure-to-Operator Headset Jack Box**
- **Enhanced Audio Enclosure-to-Boom/Gooseneck Mic**
- **Enhanced Audio Enclosure-to-Boom/Gooseneck PTT and Monitor Switches**
- **Enhanced Audio Enclosure-to-Footswitches**
- **Enhanced Audio Enclosure-to-Speaker Assemblies**

- **PC-to-Standard PC Keyboard** – The standard PC keyboard is only utilized during console start-up and maintenance operations.

In addition, the following interconnections are required for optional equipment, if employed:

- **Enhanced Audio Enclosure-to-Recorder Equipment**
- **Enhanced Audio Enclosure-to-Pager (Paging Encoder)** — Connections required only if paging operations are necessary but internal Enhanced Audio Enclosure paging circuits are not utilized.
- **Enhanced Audio Enclosure-to-External Equipment Controlled by Relay Form-C Contacts**
- **Enhanced Audio Enclosure-to-Call Director**

NOTE

Unless otherwise noted, all procedures in this manual should be performed in the order presented.

CEC/IMC INTERCONNECTIONS

The C3 Maestro console interfaces to the CEC/IMC via a full-duplex serial control data link and a 4-wire audio connection for the select audio and microphone link. In addition, each unselect speaker at the console requires an additional 2-wire connection from the CEC/IMC. Also, if the console is interfaced to a Call Director for Call Director telephone patch operations, an additional 4-wire audio link between the C3 Maestro and the CEC/IMC is required. See Figures 1 and 7 and Table 7.

As shown in Figure 7, all interconnections at the CEC/IMC are made via Concentrator Cards. These cards are located at the back of the CEC/IMC cabinet. Control data connections are made via Data Concentrator Cards and audio connections are made via Audio Concentrator Cards. Typically, as shown in Figure 7, these connections are extended out of the CEC/IMC cabinet via Telco cables and terminations are actually made at punch blocks located external of the CEC/IMC cabinet.

CEC/IMC Concentrator Card pin-out details are listed on the customer-specific system documentation print-outs. These print-outs are included with the CEC/IMC when it ships from the factory. See the *CEC/IMC Digital Audio Switch Customer-Specific System Documentation* maintenance manual, LBI-38939 for sample print-outs and complete print-out explanations.

Control Data Link

Overview

Either an RS-422 (four-wire) or an RS-232 (three-wire) full-duplex serial control data link may be employed between the console and the CIM within the CEC/IMC. Since RS-422 interfacing is superior to RS-232, PCs used within the C3 Maestro console normally ship from the factory with an RS-422 serial port provided for this purpose. RS-232 has poorer noise performance than RS-422 and therefore, it should never be used for cable runs more than 50 feet (15.2 meters) in length. RS-422 connections may be up to 4000 feet (1219 meters) in length.

If required for a remote console installation, full-duplex 4-wire data modems can be used between the C3 Maestro and the CEC/IMC. Typically, the PC-to-modem and modem-to-CEC/IMC interconnections must be made via RS-232 interconnections since many data modems do not provide RS-422 hook-ups. These RS-232 interconnections should also not exceed 50 feet (15.2 meters) in length. See the following sections for additional remote console wiring and modem configuration details.

At the C3 Maestro, RS-422/RS-232 serial control data connections terminate at one of the PC's serial COM ports. Normally, COM3 is utilized for CEC/IMC CIM interfacing. Typically, this serial port is provided by a plug-in RS-422 board inside the PC as described in the following section. The following table summarizes basic usage of all serial COM ports available at the PC in a standard console equipment package.

**Table 5 - Standard Serial COM Port Utilization
(Factory Default Configurations Unless Noted)**

SERIAL COM PORT	RS-232 or RS-422	SERIAL LINK USED FOR INTERFACING
PC COM1	RS-232	Enhanced Audio Enclosure
PC COM2	RS-232	touch-screen data from touch-screen monitor *
plug-in RS-422 board set as COM3	RS-422 **	CEC/IMC CIM *

* If the console is not equipped with a touch-screen monitor and RS-232 interfacing to a modem via a DB-9 connector at the PC is required, PC serial port COM2 may be utilized for interfacing to the CIM link's modem at the console. Software COM port setting changes from the factory default settings *are* necessary.

**The plug-in RS-422 board may be reconfigured for RS-232 interfacing if RS-232 interfacing to a modem via a DB-25 connector is required. Reconfigurations are accomplished via jumper position changes on the plug-in RS-232 board. Software setting changes from the factory default settings *are not* necessary.

RS-422 Interfacing (Co-Located Hook-Ups)

In most cases, the PC used in the C3 Maestro console system is *not* equipped with a main ("mother") board RS-422 capable serial COM port. Therefore, a plug-in RS-422 capable interface board is installed in one of the PC's internal expansion slots and utilized for CEC/IMC CIM control data interfacing.

Currently approved (factory installed) plug-in RS-422 board is manufactured by B&B Electronics. Its model number is 3PXOCC1A (part number 344A3927P38) and it is an optically-isolated serial board. Subsequent to the writing of this manual, additional boards may be approved.

Factory-installed plug-in RS-422 boards are configured correctly before the PC ships from the factory. This configuration includes setting DIP switches and jumpers on the plug-in board and disabling the PC's main board serial COM port per manufacturer's instructions.

Factory configuration for the 3PXOCC1A board follows. This single-port RS-422 board has one DB-25 connector:

Address Switches (S1) (MSB)1111101(LSB)
= 3E8 Base Hex Address

422/232 Jumpers* JP1A - JP1D "422" positions

RTS/SD Jumper* JP2 (any position)

422/485 Jumpers* JP3TX and JP3RX "422" positions

Interrupt Jumper* JP4 "IRQ11" position

UART Clock Jumper* JP5 "*1" position

* See footnote ¹ below.

Some early C3 Maestro console for Windows NT PCs shipped with a substitute B&B Electronics plug-in RS-422 board, model number 3PXCC2A. RS-422 configuration for this dual-port board with DB-9 connectors is (PORT 1 only):

If COM1: Address Switches (S1) (MSB)1111111(LSB)
= 3F8 Base Hex Address

If COM3: Address Switches (S1) (MSB)1111101(LSB)
= 3E8 Base Hex Address

422/485/232 Jumpers JP1A - JP1C and JP1F "422" positions

RTS/SD Jumper JP1D (any position)

RX Termination Jumper JP1E "Rt OUT" position

If COM1: Interrupt Jumper JP3 "4" position

¹ All jumper numbers correspond to 3PXOCC1A boards shipping mid-1996 (and later). If jumper numbering differs on supplied 3PXOCC1A board, refer to the appropriate B&B Electronics manual for jumper identification information.

If COM3: Interrupt "11" position
Jumper JP3

If any other RS-422 plug-in serial board is used the following board configuration is recommended:

COM Port COM3
Port Address 3E8
Interrupt IRQ11

Normally, a pre-wired 100-foot (30.5 meters) cable is supplied with the console equipment package for RS-422 control data interconnections between the CEC/IMC and a co-located C3 Maestro console. The cable's part number is 19B804083P3. It has a female DB-25 connector on one end for mating to the RS-422 male DB-25 connector at the PC (see the following note). The other end is "pig-tailed" (not terminated) so the cable's 24-gauge solid wires can be punched down to the correct terminals at the required CEC/IMC punch block.

- ❑ If using the supplied control data cable, mate its female DB-25 to the PC's RS-422 male DB-25 connector, route it to the CEC/IMC, shorten the cable as required, and punch the wires to the correct terminals. See Table 6 or the cable's assembly diagram (page 21) for wire color coding. Also see Figure 7A.

NOTE

If cable 19B804083P3 is utilized and the PC is equipped with a 3PXCC2A plug-in RS-422 board (dual ports with DB-9 connectors), a field-fabricated DB-9-to-DB-25 adapter must be constructed and utilized as shown in Figure 7C.

In addition, cable 19B804083P3 is not compatible with earlier plug-in RS-422 boards used with the C3 Maestro console system. These earlier plug-in boards are manufactured by ICS and included model numbers RS422AT-P and RS422I-P. They can be easily identified by the presence of two LED indicators visible on the rear plate.

- ❑ If cable 19B802083P3 is *not used* but RS-422 hook-ups are required, see Figures 4 (or 5) and 7A and/or the manufacturer's documentation for COM port connector pin-out details. Fabricate a cable as required and then use it to interconnect the C3 Maestro's RS-422 control data COM port to the appropriate CEC/IMC Data Concentrator Card as required. Shielded cabling is recommended. Per RS-422 specifications, cable length should be limited to 4000 feet (1219 meters) or less.

Table 6 – Cable 19B804083P3 Color Coding

PC RS-422 PORT DB-25 PIN NO. ***	CONSOLE RS-422 SIGNAL	WIRE COLOR (Also see page 21)	TYPICAL CEC/IMC CONNECTION IDENTIFICATION *
1	cable shield	n/a	none **
2	TX-	white/blue	CRT 01 RX- DATA
14	TX+	blue	CRT 01 RX+ DATA
3	RX-	white/orange	CRT 01 TX- DATA
16	RX+	orange	CRT 01 TX+ DATA
7	ground	white/green	none **

* CEC/IMC Data Concentrator Card identification. See customer-specific system documentation print-outs for specific pin/terminal numbers.

** Wire not terminated at CEC/IMC punch block. Insulate and tie back at punch block.

*** If PC is equipped with plug-in RS-422 board 3PXCC2A, see Figure 5 for DB-9 connector pin numbers.

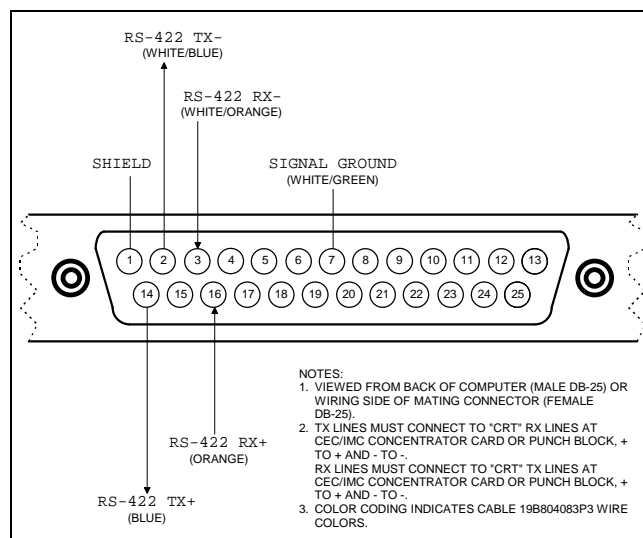


Figure 4 – Plug-In RS-422 Board DB-25 Connector Pin-Out (B&B Electronics 3PXOCC1A Board)

NOTE

Do not over-tighten the screws on the DB-style connectors.

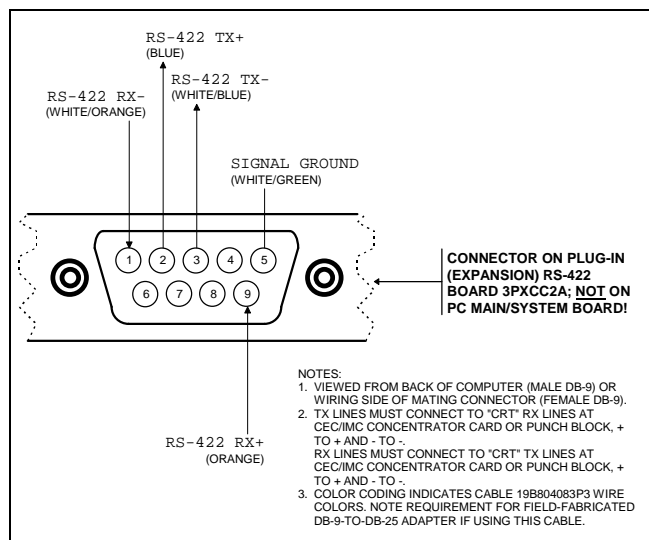


Figure 5 – Plug-In RS-422 Board DB-9 Connector Pin-Out (B&B Electronics 3PXCC2A Board)

RS-232 Interfacing (Remote Console Hook-Ups Via 4-Wire Modems And RS-232 Interconnections)

When the C3 Maestro is installed at a remote location from the CEC/IMC, a serial control data link must be established via RS-232 connections and 4-wire full-duplex 9600 baud data modems. Since the C3 Maestro requires a dedicated or continuous serial link (non-dial-up), a 4-wire leased line (or equivalent) meeting 3002 data grade specifications must be employed between the CEC/IMC and the C3 Maestro in a remote console installation.

Figure 7B shows typical control data interconnections for a remote console installation using RS-232 connections and full-duplex 4-wire modems. At the CEC/IMC Data Concentrator Card, RS-232 connections are made at J13, *not* J12. **Observe all notes listed in the figure if wiring an installation of this type.** Recommended modem settings are listed in the following sections.

If using the factory-supplied 3PXOCC1A board for PC-to-modem link interfacing, the RS-422/232-related jumpers on the board must be reconfigured from the factory default positions to the positions as follows:

422/232 Jumpers* "232" positions
JP1A – JP1D

RTS/SD Jumper* JP2 "RTS" position

* See footnote on page 12.

If the PC is equipped with a 3PXCC2A board, the RS-422/232-related jumpers on the board must be reconfigured from the factory default positions to the positions as follows:

422/485/232 Jumpers "232" positions
JP1A and JP1F

ZyXEL Modem Configuration

The following procedure provides basic programming instructions for ZyXEL™ U-1496 series modems when employed in a C3 Maestro console-to-CIM dedicated 4-wire line control data link. These modems are available in desktop and rack-mount versions. ZyXEL modems (and related accessories) are stocked under part numbers 19A149786P6 thru P14. They feature front panel programming via a simple keyboard, an LCD and several LED status indicators; therefore the use of an external terminal or terminal emulation software running on a PC is not required. **Unless otherwise noted in bold print, both modems in a modem pair are programmed identically:**

1. If necessary, using the modem's RESET submenu, reset the modem to the factory default configuration. Refer to ZyXEL modem user's manual for specific instructions.
2. Access the modem's TERMINAL OPTIONS submenu and set each of the following options to the required setting:

OPTION	REQUIRED SETTING
DATA FORMAT	ASYNC
CHARACTER LENGTH	10
COMMAND SET	AT
DTE RATE OPTIONS	FIXED AT DTE RATE
DTR OPTIONS	108.2 + RST
DCD OPTIONS	TRACKS CARRIER
RTS OPTIONS	IGNORED
DSR OPTIONS	DATA SET READY
COMMAND ECHO	DISABLED
RESULT CODE	DISABLED
DTE ASYNC SPEED	9600

3. Access the modem's MODEM OPTIONS submenu and set each of the following options to the required setting:

OPTION	REQUIRED SETTING
LINK OPTIONS	V.32 9600T
QUALITY ACTION	AUTO RETRAIN
DEFAULT DIAL	PH0
DIAL BACKUP	DISABLED
GUARD TONE	NONE

OPTION	REQUIRED SETTING
RDL REQUEST	DENY
LLINE TX POWER	0 DBM (or as required; use -15 DBM if line loss is 0 Dbm)
PHONE JACK	SINGLE RJ11
MAKE/BREAK RATIO	39% / 61%
SECONDARY CHANNEL	DISABLED
PANEL LOCK	UNLOCK (or as required)
SYNC CLOCK	MASTER = CEC/IMC modem; SLAVE = console modem
AUTO HANDSHAKE	ORIGINATE = CEC/ IMC modem; ANSWER = console modem
LINE TYPE	4LL

4. Access the modem's **ERROR CONTROL** submenu and set each of the following options to the required setting:

OPTION	REQUIRED SETTING
CONTROL LEVEL	V.42
FLOW CONTROL	DISABLED
NEGOTIA FALLBACK	STAYS ON-LINE
BREAK HANDLING	DESTRUCTIVE

5. Access the modem's **AUDIO OPTIONS** submenu and set each of the following options to the required setting:

OPTION	REQUIRED SETTING
SPEAKER CONTROL	ON UNTIL CONNECTED
SPEAKER VOLUME	7 (or as required)
RING VOLUME	7 (or as required)

6. Maintain all modem **S** registers per default settings except set **S2 = FF** and set **S35 = 00**.
7. Using the modem's **SAVE TO** submenu, save this modem configuration as **PROFILE 0**. If necessary, refer to ZyXEL modem user's manual for specific instructions.

8. Using the modem's **RESET** submenu, set **RESET = PROFILE 0**. This causes the modem to initialize with the **PROFILE 0** configuration established in the previous steps whenever it is powered-up, or reset via a DTR signal from the PC.

9. Repeat the above configuration for the second modem in the modem pair.

Refer to Figure 7A and 7B as necessary and/or the modem manufacturer's documentation for cable hook-up and wiring information.

Other Modems

• **Modem Options**

DCE Rate = 9600

Originate/Answer = Originate (CEC/IMC modem)

Originate/Answer = Answer (C3 Maestro modem)

V.32 Fast Train = Enabled

Auto Retrain = Enabled

Internal/External Clock = Internal

Dial-Up/Leased Line = Leased

2-Wire/4-Wire = 4 Wire

TX Level = (as required; use -15 dBm if line loss is 0 dB)

Dial Backup = Manual

Loop Back Time = 15 minutes

Dial Line = RJ11

Line Current Disconnect = Long

Long Space Disconnect = Enabled

V.22 Guard Tone = Disabled

• **MNP Options**

MNP Protocol = Enabled

Auto Fallback = Enabled (or Normal)

Flow Control = CTS Only

XON/XOFF Pass Through = Enabled

Data Compression = Disabled

Inactivity Timer = Off

Break Control = 5

• **DTE Options**

Synchronous/Asynchronous Data = Asynchronous

DTE Rate = 9600

Character Length = 8 Bits

Parity = None

Commanded Dialer = Asynchronous

AT Command Set = Disabled

DTR Control = Disabled

DSR = Forced High

DCD = Normal

CTS = Forced High

DTE Fallback = Disabled

Options = Retained At Disconnect

- **Test Options** - All Disabled (or factory defaults)
- **Dial Line Options** - (not applicable; leave at factory defaults)
- **Speaker Options**
 - Volume Control = Low
 - Control = On Until Carrier Detect

Audio Links

Audio Concentrator Cards at the back of the CEC/IMC cabinet provide audio connections at the CEC/IMC. Like the control data connections, audio connections are normally extended out of the CEC/IMC cabinet via Telco cable(s) and line terminations are actually made at punch blocks. See Figure 7A. See the customer-specific system documentation print-outs for Concentrator Card connector pin-out details.

Table 7 shows line requirements between the C3 Maestro and the CEC/IMC for each audio input or output 2-wire 600-ohm twisted pair. Note that two (2) Enhanced Audio Enclosure output pairs, Line 2 out and Line 3 out are never used. These audio output lines are provided for future expansion use.

At the C3 Maestro, audio connections terminate at the DB-25 connector on the Enhanced Audio Enclosure's rear panel. This connector is labeled "LINES 1-4". Its pin-out is shown in Figures 6 and 7A and Table 11. It has female contacts; therefore, the required mating connector is a male DB-25.

Normally, a pre-wired 100-foot (30.5 meters) cable is supplied with the console equipment package for audio interconnections between the Enhanced Audio Enclosure and the CEC/IMC. This 8-pair shielded cable's part number is 19B804083P2. It has a male DB-25 connector on one end for mating to the Enhanced Audio Enclosure's "LINES 1-4" female DB-25 connector. The other end is "pig-tailed" (not terminated) so the cable's 24-gauge solid wires can be punched down to the correct terminals at the required CEC/IMC's punch block.

- ☐ If cable 19B804083P2 is used, mate its DB-25 to the Enhanced Audio Enclosure, route it to the CEC/IMC, shorten it as required, and punch the wires to the correct punch block's terminals. Wire color coding is indicated in Figure 6 and in the cable's assembly diagram (page 22). Refer to the CEC/IMC customer-specific system documentation print-outs for CEC/IMC Audio Concentrator Card pin-outs which map over to the punch blocks via Telco cables.
- ☐ If cable 19B804083P2 *is not used*, fabricate an equivalent cable, less unnecessary pairs, to interconnect the required pairs between the Enhanced Audio Enclosure's "LINES 1-4" DB-25 connector and the appropriate CEC/IMC Audio Concentrator Card's pins or CEC/IMC punch block's terminals. Shielded cabling is recommended. See Figures 6 and 7 and Tables 7 and 11 for details.

NOTE

Do not over-tighten the screws on the DB-style connectors.

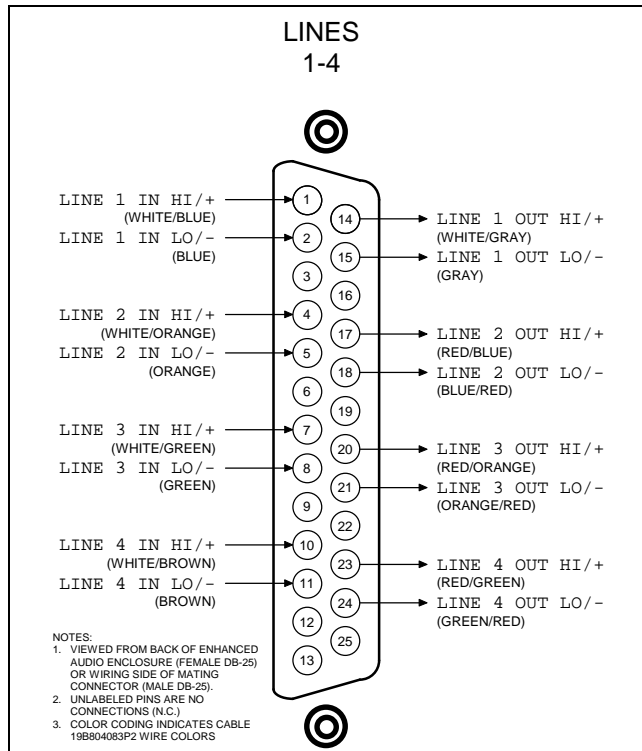


Figure 6 – Audio Line Input And Output Connections At Enhanced Audio Enclosure

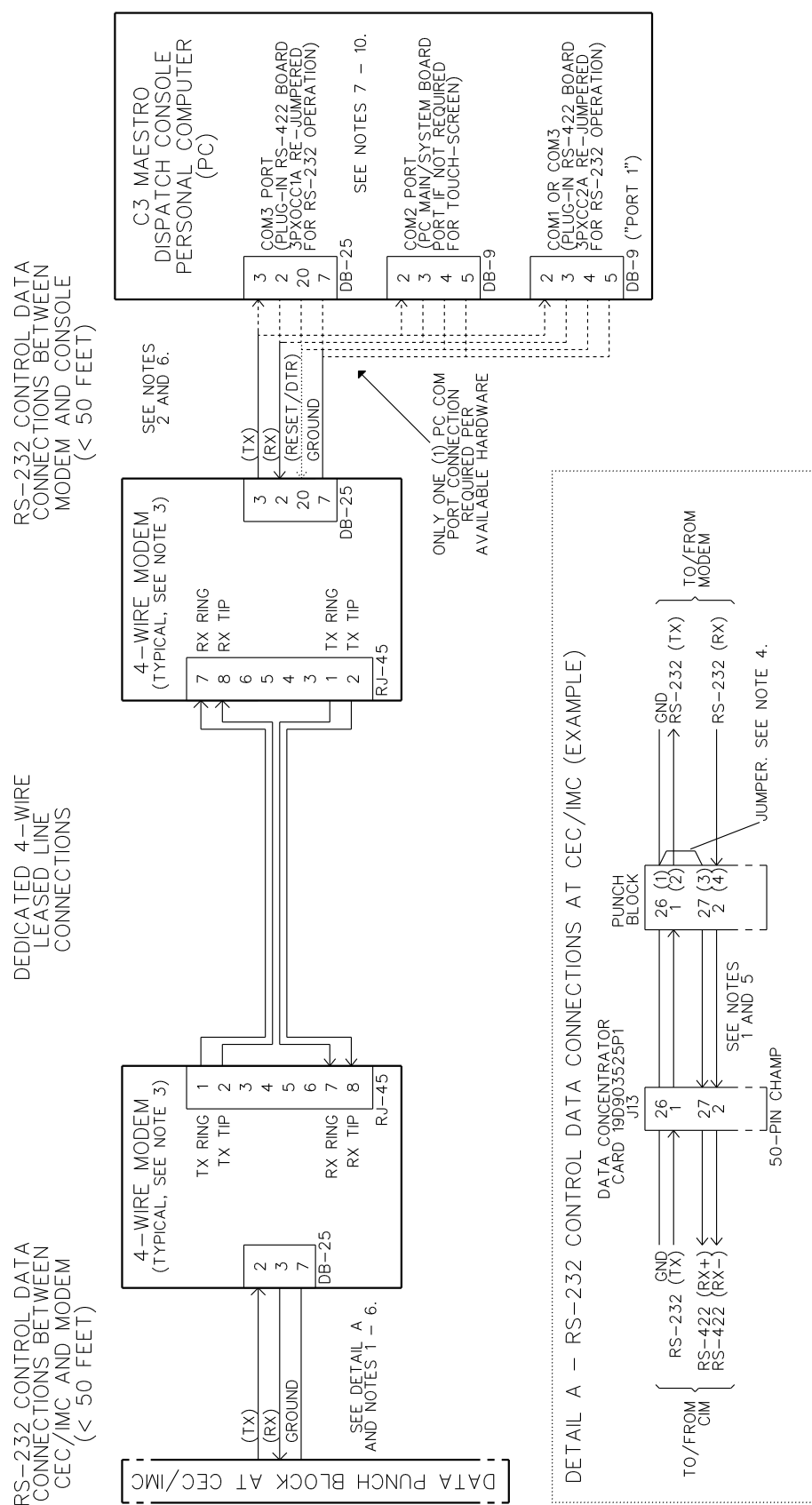
Table 7 – C3 Maestro-To-CEC/IMC Audio Line Requirements

	ENHANCED AUDIO ENCLOSURE AND CEC/IMC IDENTIFICATION (4-Wire)							
	LINE 1		LINE 2		LINE 3		LINE 4	
	IN	OUT	IN	OUT	IN	OUT	IN	OUT
CONSOLE INPUT OR OUTPUT (2-Wire)								
CEC/IMC INPUT OR OUTPUT (2-Wire)	OUT	IN	OUT	IN	OUT	IN	OUT	IN
SELECT SPEAKER/HEADSET	✓							
MICROPHONE		✓						
UNSELECT SPEAKER 1			X					
UNSELECT SPEAKER 2					X			
UNSELECT SPEAKER 3 *							X	
CALL DIRECTOR PATCH *							X	X

✓ = 2-wire connection always required
 X = 2-wire connection required if console is so equipped
 * = Unselect speaker 3 not available if console is interconnected to a Call Director

Figure 7A – CEC/IMC-To-C3 Maestro Interconnections (Co-Located)

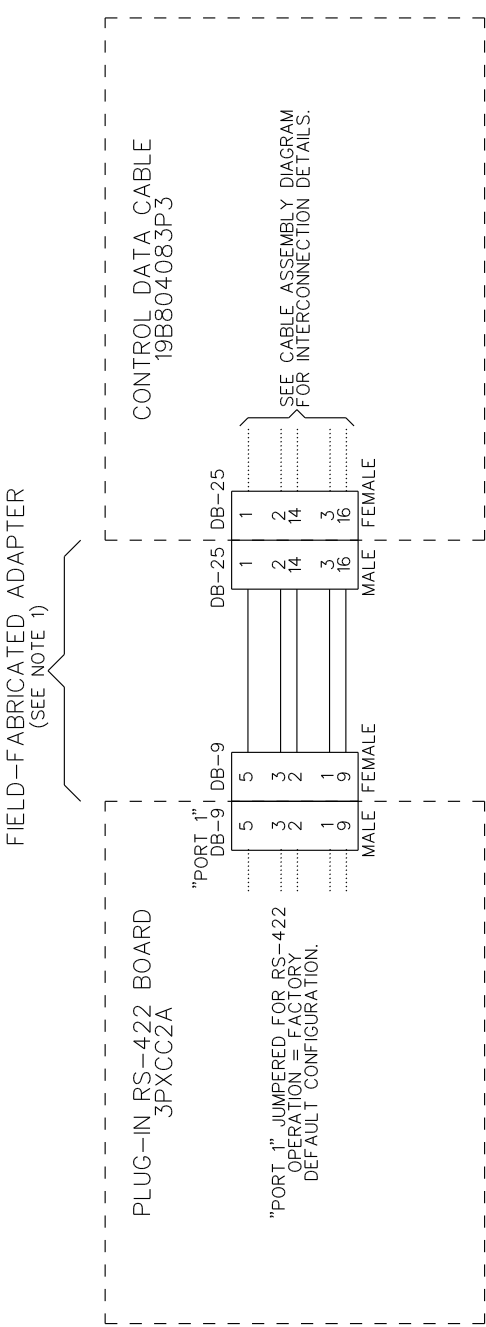
SHEET 2 OF 3.



- NOTES:
1. SEE CUSTOMER-SPECIFIC SYSTEM DOCUMENTATION PRINT-OUTS FOR PUNCH BLOCK CONNECTOR PIN-OUT DETAILS.
 2. SHIELDED CONNECTIONS ARE RECOMMENDED (NOT SHOWN).
 3. SEE MODEM MANUFACTURER'S DOCUMENTATION FOR SPECIFIC REQUIREMENTS FOR PIN-OUTS.
 4. RS-232 CONNECTIONS AT CEC/IMC REQUIRE A JUMPER (SHORT) BETWEEN GND AND RS-422 RX+ TERMINALS. SEE DETAIL A FOR EXAMPLE.
 5. DETAIL A PIN-OUT FIRST CONSOLE ON PUNCH BLOCK ONLY.
 6. AUDIO CONNECTIONS NOT INDICATED.
 7. FACTORY DEFAULT PC COM PORT DESIGNATIONS: COM1=EAE DATA LINK; COM2=TOUCH-SCREEN DATA LINK (OPTIONAL); COM3=CIM DATA LINK.
 8. SEE SHEET 1 FOR ADDITIONAL INFORMATION.
 9. MODEM CABLEING IS NOT FACTORY SUPPLIED.
 10. RESET LINE (DTR) FROM COMx PORT TO MODEM NOT REQUIRED UNLESS THIS FEATURE SUPPORTED VIA CONSOLE APPLICATION SOFTWARE.

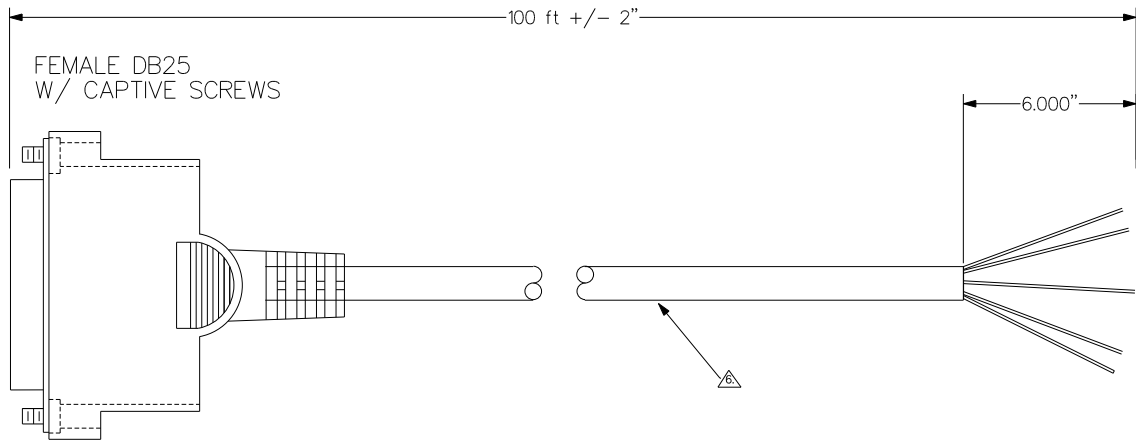
Figure 7B – CEC/IMC-To-C3 Maestro Interconnections (Remote And/Or RS-232)

SHEET 3 OF 3.

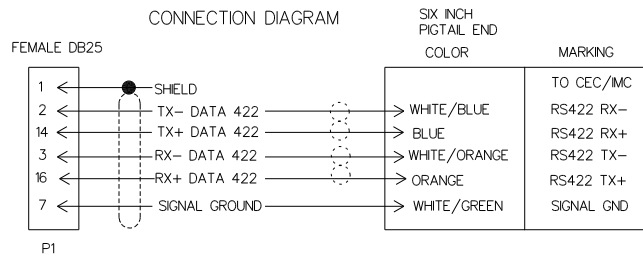
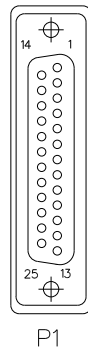


NOTE:
1. THIS ADAPTER REQUIRED ONLY IF CONTROL DATA CABLE 19B804083P3 IS UTILIZED AND PC IS EQUIPPED WITH B&B ELECTRONICS PLUG-IN RS-422 BOARD 3PXCC2A.

Figure 7C – Field-Fabricated Adapter



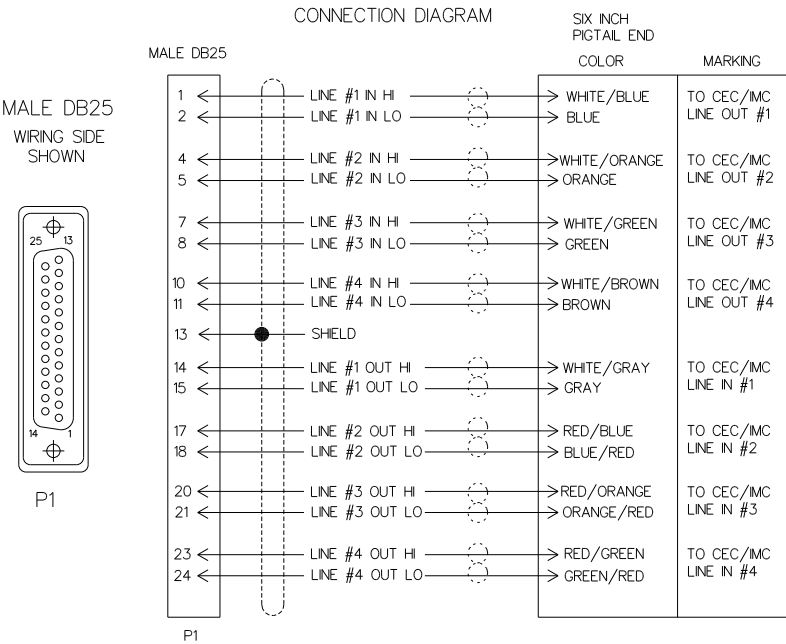
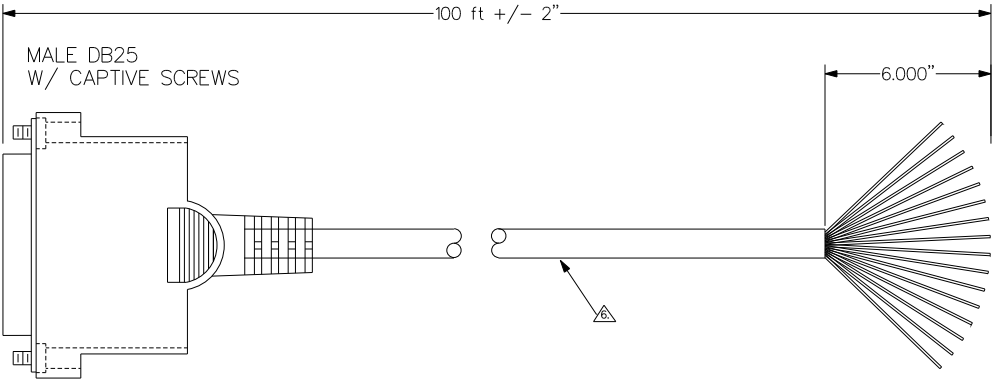
FEMALE DB25
WIRING SIDE
SHOWN



ITEM	PART #	VENDOR PART # OR EQUIV	DESCRIPTION	QTY
P1	19B209727P2	AMP 205207-1	DB25 FEMALE CONN HOUSING	1
	19B209727P20	AMP 1-66505-0	FEMALE CONTACT (28-24 AWG)	6
			PVC MOLDED COVER	1
	19B209727P9	AMP 205980-1	#4-40 CAPTIVE SCREW KIT	1
6		BELDEN 1456A	4 PAIR SHIELDED CABLE, #24 AWG.	100'

CABLE ASSEMBLY DIAGRAM
CONTROL DATA CABLE (100-FOOT)
19B804083P3

(Made from 19B804083 Sh. 4, Rev. 3)



ITEM	PART #	VENDOR PART # OR EQUIV	DESCRIPTION	QTY
P1	19B209727P1	AMP 205208-1	DB25 MALE CONN HOUSING	1
		AMP 66682-8	MALE CONTACT (28-24 AWG)	17
			PVC MOLDED COVER	1
	19B209727P9	AMP 205980-1	#4-40 CAPTIVE SCREW KIT	1
		BELDEN 1572A	8 PAIR SHIELDED CABLE. #24 AWG. 100'	

CABLE ASSEMBLY DIAGRAM

AUDIO CABLE (100-FOOT)
19B804083P2

(Made from 19B804083 Sh. 3, Rev. 3)

PERSONAL COMPUTER

PC-To-Enhanced Audio Enclosure Serial Data Interconnect Cable

The PC-to-Enhanced Audio Enclosure RS-232 serial data link uses cable P29/5010150000 (350A1371P29). This cable has a female DB-9 connector on one end for mating to the PC's male DB-9 serial COM port connector. The cable's other end has a male DB-9 connector for mating to the female DB-9 connector labeled "PC" at the Enhanced Audio Enclosure. The cable is nine (9) feet long. It should not be modified in any way and "extension" cables are not recommended for this 9600 baud serial link. Identical cables are also used between the Enhanced Audio Enclosure and the Speaker Assemblies.

- ☐ Mate the cable's female DB-9 connector to the PC's male DB-9 serial COM port connector used for Enhanced Audio Enclosure interfacing. Normally, the COM1 port is used. Mate the other end of the cable to the Enhanced Audio Enclosure's DB-9 connector labeled "PC". This interconnection is shown in Figure 1 but *not* in Figure 7.

Standard PC Keyboard

During dispatch operations, the standard PC keyboard is not utilized. However during the console set-up process, access to this keyboard will be required:

- for user account name and/or password entry at PC boot-up if Windows NT manual log-on is enabled;
 - for Windows NT administrative-type changes, if required;
 - to configure other Windows NT settings, if required;
 - to configure the console application via the Configuration Editor and/or UDS Configurator programs, if required; and,
 - to start the console's application program if no mouse/track-ball is available and manual console application start-up at Windows NT log-on is the current configuration.
- ☐ Connect the standard PC keyboard to the PC in accordance with the manufacturer's instructions. The plug on the keyboard's cable mates with a connector on the back of the PC.

Mouse (Or Other Pointing Device)

Normally, the C3 Maestro console for Windows NT ships from factory with a standard 2-button mouse. Another

type of pointing device such as a track-ball may be substituted provided it meets compatibility requirements.

- ☐ Connect the pointing device to the PC as recommended by the manufacturer. The mating connector is on the back of the PC.

Video Display Monitor

- ☐ Interconnect the video display monitor's video cable to the Personal Computer in accordance with the PC and/or monitor manufacturer's instructions.
- ☐ If the monitor is a touch-screen unit, there is a second cable between it and the PC which transmits touch information to the PC. In this case, also connect this second cable per the PC's and/or monitor manufacturer's instructions. As shown in Table 5, COM2 at the PC is normally utilized for touch-screen data interfacing. However, some consoles were equipped with PC expansion bus touch-screen interface cards.

ENHANCED AUDIO ENCLOSURE

All Enhanced Audio Enclosure interconnections are made at the rear panel of the enclosure. Secure the cables with cable ties as necessary.

Dispatch Keyboard (if used)

The Dispatch Keyboard interfaces to the console system via the Enhanced Audio Enclosure. This keyboard's part number is P29/7590182003 (350A1371P17). It is sometimes referred to as the "custom keyboard".

- ☐ Connect the Dispatch Keyboard to the Enhanced Audio Enclosure by plugging its male DB-9 connector to the female DB-9 connector on Enhanced Audio Enclosure's rear panel. On the rear panel, this connector is labeled "KBD". Its pin-out is indicated in Table 23.

NOTE

Do not over-tighten the screws on the DB-style connectors.

Desk Mic (if used)

- ☐ Connect the desk microphone (option CRMC3D or equivalent) to the Enhanced Audio Enclosure by mating its male DB-9 connector to the female DB-9 connector labeled "DESK MIC" on the Enhanced Audio Enclosure's rear panel. The desk mic's cable is five (5) feet (1.52 meters) long. The DB-9's pin-out is shown in Table 14. Observe the microphone priority **NOTE** in the following section (page 24); the desk mic has the lowest priority.

Headset Jacks (if used)

- ❑ At the selected location, secure each headset jack box (part of option CRCN1W or equivalent) to the mounting surface using the four (4) #10 thread-forming screws supplied in the installation kit or use alternate hardware if required (not supplied). Before mounting, verify adequate clearance is maintained for the headset's plugs. If using both jack boxes, label them "SUPERVISOR" and "OPERATOR" as required (per cable interconnections accomplished in the following paragraph).
- ❑ Connect each headset jack box to the Enhanced Audio Enclosure using the 6-foot (1.83 meters) cable supplied. This cable (part number 19C337102P1 supplied with CRCN1W) has male DB-9 connectors on both ends. One end mates with the female DB-9 connector at a jack box and the other end mates to the female DB-9 connector at the Enhanced Audio Enclosure's rear panel. The connectors on the rear panel are labeled "SUPER H/S" and "OPER H/S" for the supervisor and operator headsets respectively. Interconnect the cables accordingly. The DB-9 connectors' pin-outs are indicated in Tables 15 and 16.

NOTE

Operator microphone priority is (highest to lowest):

- Operator Headset Mic (highest)
- Boom/Gooseneck Mic ↓
- Desk Mic (lowest) (lowest)

The boom/gooseneck mic has priority over the desk mic when no headset is connected. Desk mic audio and PTTs are ignored if a headset or boom/gooseneck mic is connected.

Boom/Gooseneck Mic (if used)

A boom microphone (option CRMC3E or equivalent) or a gooseneck microphone (option CRMC3F or equivalent) may be connected to the Enhanced Audio Enclosure as follows:

- ❑ Mount the microphone in accordance with the instructions supplied with the mic. With the gooseneck microphone, the supplied male DB-9 connector must be soldered to the cable's wires in accordance with Table 8 *after the mic's cable is routed through the mounting surface*. Connect the boom/gooseneck male DB-9 connector to the female DB-9 connector labeled "B/G MIC" on Enhanced Audio Enclosure's rear panel. Cable length is four (4) feet (1.22 meters). Table 13 indicates the "B/G MIC" connector's pin-out.

CAUTION

DO NOT connect a boom or gooseneck microphone to one of the other female DB-9 microphone connectors at the rear panel of the Enhanced Audio Enclosure. Damage to the mic's magnetic voice coil may occur.

Table 8 – Boom/Gooseneck Mic Wiring*

WIRE COLOR	DB-9 PIN NUMBER
Black	9
White	5
Shield	1

* Also see the following NOTE.

NOTE

All boom and gooseneck mic connectors (male DB-9) must have pins 2 and 3 jumpered together so the sense circuit will be active when the mic is connected to the Enhanced Audio Enclosure.

Footswitches (if used)

Two (2) female DB-9 connectors are located on the rear panel of the Enhanced Audio Enclosure for footswitch interconnections. Footswitches used with the C3 Maestro dispatch console include single-footswitch option CRSU3B and dual-footswitch option CRSU3C. On the dual-footswitch, one switch (PTT) keys the mic and the other switch is a monitor switch. A single-footswitch provides only a PTT function. See Tables 19 and 20 for specific connector pin-out details. Footswitch operation is as follows:

- Depressing the PTT switch on a footswitch connected to the "OPER FT. SW." DB-9 connector will activate the operator's headset mic if the headset is connected. If the headset is not connected, the boom or gooseneck mic will become active when this footswitch PTT switch is depressed and/or the desk microphone is PTTed.
- Depressing the PTT switch on a footswitch connected to the "SUPER FT. SW." DB-9 connector will activate the supervisor's headset mic if the headset is connected.
- If a dual footswitch is connected to either the "OPER FT. SW." or "SUPER FT. SW." DB-9 connectors, depressing its monitor switch will

activate the console's conventional channel monitor function.

- ❑ All footswitch cables terminate with male DB-9 connectors. Mate the appropriate male DB-9 footswitch connector to the respective female DB-9 connector at the Enhanced Audio Enclosure's rear panel. Tables 19 and 20 indicate "OPER FT. SW." and "SUPER FT. SW." connector pin-outs.

Speakers (if used)

Desktop and rack-mount Speaker Assemblies used with the Enhanced Audio Enclosure each basically consist of mechanical hardware, one or more speakers, audio amplification circuitry, and a volume control potentiometer. The mechanical hardware may be of several different varieties providing either desktop speaker operation in the form of a self-contained single-speaker case or a rack-mount version in the form of a standard 19-inch EIA rack mount assembly. The 2-speaker rack-mount versions are generally assembled with one amplified speaker in the far left-hand position (select speaker), one amplified speaker in the far right-hand position (unselect speaker) and blank panels installed in the two center positions. Four-speaker consoles are generally equipped with two separate 2-speaker rack mount assemblies.

- ❑ Install or mount each Speaker Assembly in a suitable location and then interconnect it to the Enhanced Audio Enclosure using cable P29/5010150000 (350A1371P29). This cable is 9 feet (2.74 meters) in length. It is identical to the cable that interconnects the PC's serial COM port to the Enhanced Audio Enclosure. Mate the cable's female DB-9 connector to the appropriate male DB-9 connector on the Enhanced Audio Enclosure's rear panel. These male connectors are labeled "SEL SPKR" (select speaker), "UNSEL SPKR1" (first unselect speaker), "UNSEL SPKR2" (second unselect speaker) and "UNSEL SPKR3" (third unselect speaker). Connect the other end of the cable to the female DB-9 connector at the respective Speaker Assembly. If necessary, see Tables 17 and 18 for DB-9 pin-outs.

NOTE

Load resistors are not required for unused Enhanced Audio Enclosure speaker outputs.

Recorder Outputs (if used)

To provide call-check recorder support, select and unselect audio outputs are available from the Enhanced Audio Enclosure. These unbalanced 600-ohm outputs appear at the removable screw-terminal type terminal block

labeled "RECORDER" on the Enhanced Audio Enclosure's rear panel.

- ❑ Interconnect the outputs to call-check recorders as required. These outputs *are not* isolated from ground through isolation transformers and the two ground terminals are common. See Figure 8 and Table 26 for terminal identification. See the specifications in manual AE/LZB 119 1892 for audio signal output level specifications. If required, audio output levels may be adjusted via menu selection within the console's Dispatch Manager program.

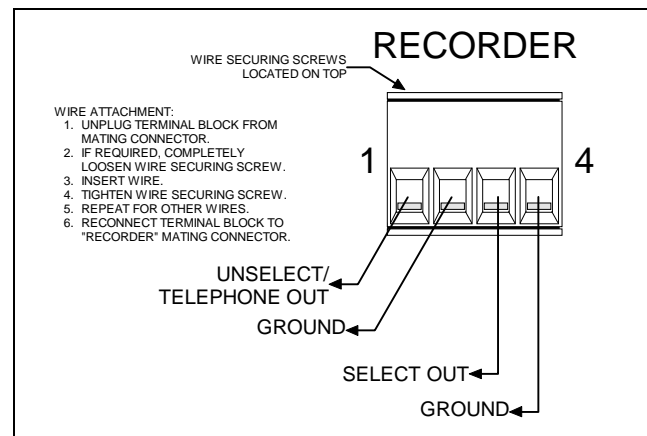


Figure 8 – Recorder Outputs At Enhanced Audio Enclosure

External Paging Encoder Input (if used)

Connections for an external paging tone encoder are located on a second removable screw-terminal terminal block on Enhanced Audio Enclosure's rear panel. A 600-ohm balanced line audio input and a PTT (page enable) input are included. As shown in Figure 9, this terminal block is labeled "PAGING".

Pager balanced audio on terminals 1 and 2 is switched in when the PTT line at terminal 3 becomes active by grounding it to terminal 4. Typically, the PTT action is accomplished by a relay in the pager. During a page, no other audio signals are applied to the Line 1 output. Also, the paging signal is sent to the headsets and speakers approximately 16 dB lower than other audio signal levels.

- ❑ Connect the pager to the terminal block in accordance with the manufacturer's instructions, Figure 9 and Table 25. The audio terminals are isolated from ground. See the specifications page for audio signal input level specifications. If required, audio input level adjustment can be accomplished by changing the respective digital pot's setting using the Dispatch Manager's Digital Pot Adjustment dialog box; see the procedure on page 7 of this manual for additional details.

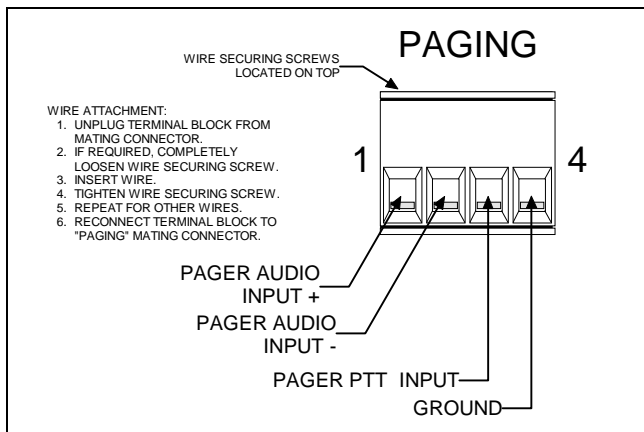


Figure 9 – Pager Inputs At Enhanced Audio Enclosure

Relay Outputs (if used)

Form-C relay contacts (single-pole double-throw) are available from the Enhanced Audio Enclosure for external device control. Contact connections are made at the screw-terminal type terminal block on the rear panel labeled "RELAYS". Even though these relays are also controlled from the console's dispatch keyboard, they are *not* the same as and they should *not* be confused with the relays within the CEC/IMC utilized for auxiliary I/O interfacing.

As shown in Table 24, the first relay (relay 1) is activated when the console is keyed (PTT'd). During the key, the relay's common and normally-open contacts close and its common and normally-closed contacts open. The second relay's (relay 2) common and normally-open contacts close while <Alt><F10> is depressed at the Dispatch Keyboard. Like the first relay, this relay's action is considered "momentarily" as it is only in the active state when the <Alt><F10> keys are depressed. The third relay's (relay 3) contacts toggle open/close at an <Alt><F9> keystroke from the Dispatch Keyboard. The other relays are not supported by software.

- ❑ As required, connect the relay contact outputs to external equipment. See Table 24 and Figure 10. Specified contact rating for all relays is 0.75 amps at 26 Vdc. Open contact isolation is specified to 500 Vrms at 60 Hz. Isolation between any relay terminal and the Enhanced Audio Enclosure's ground is also specified to 500 Vrms at 60 Hz.

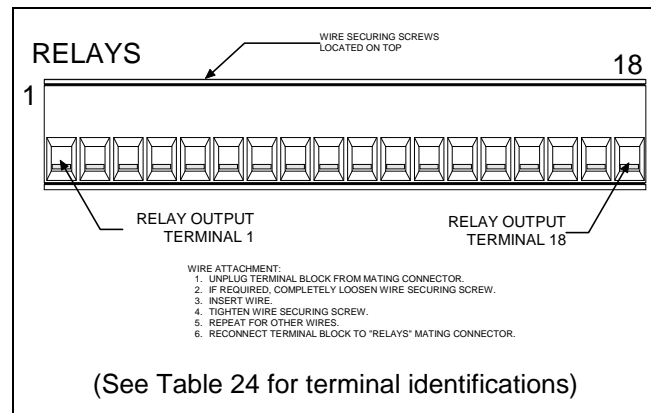


Figure 10 – Relay Terminal Block At Enhanced Audio Enclosure

Call Director (if equipped)

As shown in Figure 1, all C3 Maestro-to-Call Director interconnections at the console are made at the Enhanced Audio Enclosure's connector labeled "CALL DIR". A Call Director telephone patch also requires an additional 4-wire balanced line between the Enhanced Audio Enclosure and the console's CIM Audio Board within the CEC/IMC. At the CEC/IMC, CIM audio channel/line four (4) is used for Call Director interfacing. CD control data interfacing is handled over the existing RS-232/RS-422 serial control data interface between the PC and the CEC/IMC. Therefore, no additional control data link must be added to support Call Director patch equipment. Refer to Figures 1, 6, 7 and 11 for interconnection details and the following discussion on CEC/IMC line audio line requirements.

Console-to-CEC/IMC Audio Interconnections

All CEC/IMC line audio in to and out of a C3 Maestro dispatch console system enters and leaves via the DB-25 connector labeled "LINES 1 - 4" on the Enhanced Audio Enclosure's rear panel. If the console is connected to a Call Director, Line 4 between the Enhanced Audio Enclosure and the CEC/IMC must be established for CD audio routing between the console and the CEC/IMC. In this case, the third unselect speaker audio is not available.

Table 9 describes the audio signals between the Enhanced Audio Enclosure and the CIM within the CEC/IMC. The descriptions are relative to the Enhanced Audio Enclosure. All signals on these 600-ohm pairs have typical levels between -5 dBm to 0 dBm.

Table 9 – Enhanced Audio Enclosure-To-CEC/IMC Call Director Audio Signal Descriptions

TYPE	INPUT / OUTPUT	USE
Patched Radio	Input	Radio audio from CIM TX channel/line 4. During a CD telephone patch, this audio is heard at the telephone.
CD/Operator Mic	Output	Telephone/operator mic audio to CIM RX channel/line 4. This audio is heard at the radio.

Table 10 – Enhanced Audio Enclosure-To-Call Director Control & Audio Signal Descriptions

NAME	INPUT / OUTPUT	USE
ON-HOOK N.O. (pin 1) and ON-HOOK COMMON (pin 6)	Output	Optional – Normally-open relay contact (Form-A). Closure generated when the console disconnects the CD from the CEC/IMC. Used to put CD on-hook, if an input exists. The relay remains energized for approximately 1.2 seconds. This value is fixed in the firmware and cannot be changed. Relay contact rating: 0.75 A @ 26 Vdc, 500 Vrms isolation from ground @ 60 Hz
CD HOOK SENSE IN (pin 2) *	Input	Active low when the CD is placed off-hook. Typically connects to a dry contact (SPST switch, Form-A relay, etc.) from Call Director.
CD JACK SENSE IN (pin 3) *	Input	Optional – Active low when a handset is plugged into the CD. This handset overrides all audio connections to the Enhanced Audio Enclosure. The operator talks directly to the phone via the handset instead of using the console's headset or mic/speaker. Typically connects to a dry contact from Call Director.
GROUND (pin 4) *	n/a	Signal ground for CD HOOK SENSE IN and CD JACK SENSE IN sense inputs.
CD IN (pins 5 and 9)	Input	Audio from the CD (telephone mic). This audio is heard by a radio in patch operation, or by operator headset in normal operation. 600-ohm balanced input: -26 dBm to -14 dBm, typically -20 dBm.
CD OUT (pins 7 and 8)	Output	Radio/operator mic audio to the CD (telephone receiver). This audio is heard by the telephone. 600-ohm balanced output: -11 dBm to +1 dBm, typically -5 dBm.

* GROUND (pin 4) is common for CD HOOK SENSE IN (pin 2) and CD JACK SENSE IN (pin 3)
This ground is *not* isolated from chassis ground.

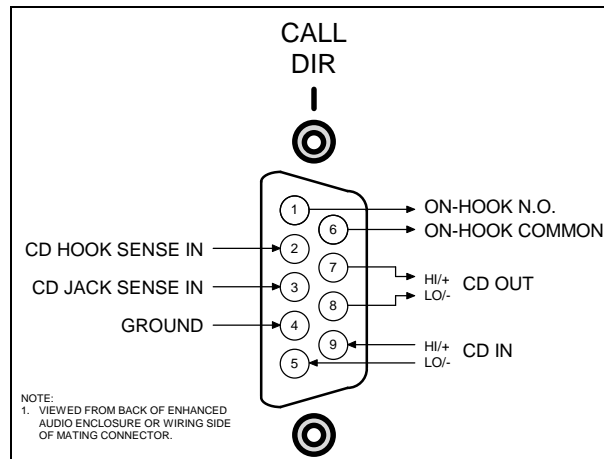


Figure 11 – Call Director Interface Connector At Enhanced Audio Enclosure

- ❑ If *not* accomplished in the previous instructions in this manual, install a 4-wire balanced line (two pairs) between the required CEC/IMC Audio Concentrator Card and Enhanced Audio Enclosure. Refer to the section entitled “**CEC/IMC INTERCONNECTIONS**” (page 11). In most cases, the pre-wired 100-foot audio cable (part number 19B804083P2) is utilized as described in the “**Audio Links**” subsection (page 16).

Console-to-Call Director Interconnections

Table 10 describes the various signals between the Enhanced Audio Enclosure and the Call Director. The descriptions are relative to the Enhanced Audio Enclosure. All Enhanced Audio Enclosure connections are made at the "CALL DIR" female DB-9 connector. Figure 11 and Table 12 indicate the connector's pin-out.

- ❑ Interconnect the Enhanced Audio Enclosure to the Call Director as required per Tables 10 and 12, Figure 11, and the Call Director's documentation.

EQUIPMENT ROOM GROUNDING

Proper grounding techniques should be observed in order to protect the equipment and service personnel from lightning and other sources of electrical surges. All consoles should be connected to properly grounded 3-terminal outlets. If used, lightning arrestors, UPS equipment, and all other console-associated equipment should also be properly grounded. If necessary, refer to LBI-39067 for detailed grounding procedures.

ELECTROSTATIC DISCHARGE (ESD) PROTECTION

Always observe proper equipment handling procedures to protect the equipment from ESD damage. Refer to LBI-38737 for complete details.

AC POWER AND UPS EQUIPMENT

All consoles require 115 or 230 Vac (47 to 63 Hz) power sources. As a minimum, each outlet should be circuit-breaker protected per local building codes.

UPS protection is optional. Maximum required UPS wattage rating for a single console system should be based on the required maximum sums of the Enhanced Audio Enclosure (200 watts max.), the PC's computer (per manufacturer's specifications) and the PC's video display monitor (per manufacturer's specifications).

ENHANCED AUDIO ENCLOSURE PIN-OUTS

Tables 11 thru 27 list the pin-outs of the connectors on the Enhanced Audio Enclosure's rear panel. "NAME" designations in the tables correspond to the labeling used on the I/O Backplane Board schematic diagram. Figure 12 shows the rear panel and serves as a guide to the table(s).

**Table 11 – CEC/IMC Audio Lines
(female DB-25 labeled "LINES 1-4")**

PIN	NAME	USE *
1	LINE_1_IN+	Line 1 balanced input
2	LINE_1_IN-	
3	no connection	
4	LINE_2_IN+	Line 2 balanced input
5	LINE_2_IN-	
6	no connection	
7	LINE_3_IN+	Line 3 balanced input
8	LINE_3_IN-	
9	no connection	
10	LINE_4_IN+	Line 4 balanced input
11	LINE_4_IN-	
12	no connection	
13	no connection	
14	LINE_1_OUT+	Line 1 balanced output
15	LINE_1_OUT-	
16	no connection	
17	LINE_2_OUT+	Line 2 balanced output
18	LINE_2_OUT-	
19	no connection	
20	LINE_3_OUT+	Line 3 balanced output
21	LINE_3_OUT-	
22	no connection	
23	LINE_4_OUT+	Line 4 balanced output
24	LINE_4_OUT-	
25	no connection	

* With respect to the Enhanced Audio Enclosure. For example, pins 1 and 2 are Enhanced Audio Enclosure line inputs; audio signals on these inputs originate from the CEC's/IMC's CIM line outputs. Also see Figure 6.

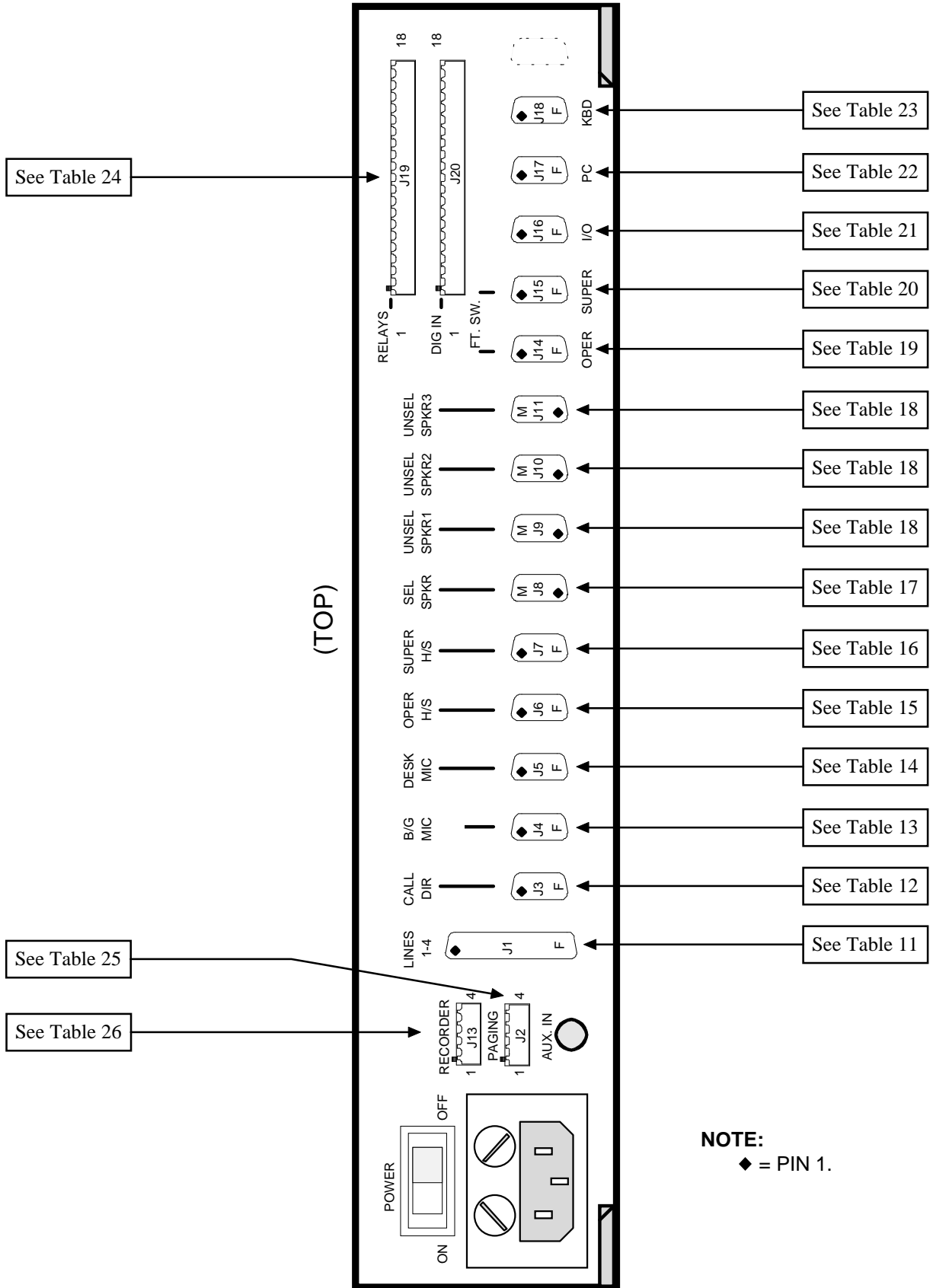


Figure 12 – Enhanced Audio Enclosure Rear Panel Connectors

AE/LZB 119 1894 R1A ENHANCED AUDIO ENCLOSURE PIN-OUTS

Table 12 – Call Director
(female DB-9 labeled "CALL DIR")

PIN	NAME	USE
1	ON_HOOK_NO	normally-open relay output; see pin 6 and Table 10
2	CD_HOOK_SENSE_IN	inputs; see Table 10
3	CD_JACK_SENSE_IN	
4	PS_GND_IN	
5	CALL_DIRECTOR_IN-	½ CD bal. line input
6	ON_HOOK_COMMON	common for pin 1
7	CALL_DIRECTOR_OUT+	CD balanced line output
8	CALL_DIRECTOR_OUT-	
9	CALL_DIRECTOR_IN+	½ CD bal. line input

Table 13 – Boom/Gooseneck Microphone
(female DB-9 labeled "B/G MIC")

PIN	NAME	USE
1	AGND	mic audio shield
2*	PS_GND_IN	ground for pin 3
3*	B/G_MIC_SENSE_IN	mic connected/not connected sense input
4	PS_GND_IN	ground for pin 6
5	B/G_MIC_IN_GND	mic audio ground for pin 9
6	B/G_PTT_IN	PTT input; see pin 4
7	no connection	
8	no connection	
9	B/G_MIC_IN	mic audio input; see pin 5 and Table 8

* Jumper pins 2 and 3 on mating connector.

Table 14 – Desk Microphone
(female DB-9 labeled "DESK MIC")

PIN	NAME	USE
1	no connection	
2	PS_GND_IN	ground for pin 3
3	MONITOR_PTT_IN	monitor PTT (enable) input
4	PS_GND_IN	ground for pin 6
5	DESK_MIC_IN_GND	mic audio ground for pin 9
6	DESK_MIC_PTT_IN	PTT input; see pin 4
7	no connection	
8	no connection	
9	DESK_MIC_IN	mic audio input; see pin 5

Table 15 – Operator Headset
(female DB-9 labeled "OPER H/S")

PIN	NAME	USE
1	no connection	
2	no connection	
3	OPR_JACK_SENSE_IN	headset connected/not connected sense input
4	PS_GND_IN	ground for pins 3 & 6
5	OPR_HEADSET_MIC_IN_GND	mic audio ground for pin 9
6	OPR_PTT_IN	PTT input; see pin 4
7	OPR_HEADPHONE_OUT	headphone/earphone output; see pin 8
8	OPR_HEADPHONE_OUT_GND	headphone/earphone ground for pin 7
9	OPR_HEADSET_MIC_IN	mic audio input; see pin 5

**Table 16 – Supervisor Headset
(female DB-9 labeled "SUPER H/S")**

PIN	NAME	USE
1	no connection	
2	no connection	
3	SUPR_JACK_SENSE_IN	headset connected/not connected sense input
4	PS_GND_IN	ground for pins 3 & 6
5	SUPR_HEADSET_MIC_IN_GND	mic audio ground for pin 9
6	SUPR_PTT_IN	PTT input; see pin 4
7	SUPR_HEADPHONE_OUT	headphone/earphone output; see pin 8
8	SUPR_HEADPHONE_OUT_GND	headphone/earphone ground for pin 7
9	SUPR_HEADSET_MIC_IN	mic audio input; see pin 5

**Table 17 – Select Speaker
(male DB-9 labeled "SEL SPKR")**

PIN	NAME	USE
1	SELECT_SPEAKER_OUT	high-impedance speaker audio output
2	SELECT_SPKR_OUT_GND	ground for pin 1
3	no connection	
4	+12V	speaker amp 12 Vdc power; see pins 7 & 8
5	+12V	
6	no connection	
7	PS_GND_IN	speaker amp power grounds
8	PS_GND_IN	
9	no connection	

**Table 18 – Unselect Speakers –Three Total
(male DB-9 labeled "UNSEL SPKRx"*)**

PIN	NAME	USE
1	UNSELECT_SPEAKER_x_OUT	high-impedance speaker audio output
2	USEL_SPEAKER_x_OUT_GND	ground for pin 1
3	no connection	
4	+12V	speaker amp 12 Vdc power; see pins 7 & 8
5	+12V	
6	no connection	
7	PS_GND_IN	speaker amp power grounds
8	PS_GND_IN	
9	no connection	

* "x" = unselect speaker number (1, 2 or 3)

**Table 19 – Operator Footswitch
(female DB-9 labeled "OPER FT. SW.")**

PIN	NAME	USE
1	no connection	
2	PS_GND_IN	ground for pins 4 & 6
3	no connection	
4	MONITOR_PTT_IN	monitor PTT (enable) input; see pin 2
5	no connection	
6	B/G_PTT_IN	B/G PTT input; see pin 2
7	no connection	
8	no connection	
9	no connection	

**Table 20 – Supervisor Footswitch
(female DB-9 labeled "SUPER FT. SW.")**

PIN	NAME	USE
1	no connection	
2	PS_GND_IN	ground for pins 4 & 6
3	no connection	
4	MONITOR_PTT_IN	monitor PTT (enable) input; see pin 2
5	no connection	
6	SUPER_PTT_IN	Supervisor PTT input; see pin 2
7	no connection	
8	no connection	
9	no connection	

**Table 21 – Optional RS-422 Input/Output
(female DB-9 labeled "I/O")**

PIN	NAME	USE
1	no connection	
2	no connection	
3	no connection	
4	TX_RS485_DATA_OUT+	½ serial data output
5	RX_RS485_DATA_IN+	½ serial data input
6	no connection	
7	no connection	
8	TX_RS485_DATA_OUT-	½ serial data output
9	RX_RS485_DATA_IN-	½ serial data input

**Table 22 – Personal Computer RS-232 Input/Output
(female DB-9 labeled "PC")**

PIN	NAME	USE
1	no connection	
2	TX_PC_DATA_OUT	serial data output
3	RX_PC_DATA_IN	serial data input
4	no connection	
5	PS_GND_IN	ground for pins 2, 3 & 8
6	no connection	
7	no connection	
8	POWER_STATUS_OUT	power-up status output
9	no connection	

**Table 23 – Dispatch Keyboard Serial Input/Output
(female DB-9 labeled "KBD")**

PIN	NAME	USE
1	+5V_KB_OUT	keyboard dc power output
2	RX_KEYBOARD_DATA_IN	serial data input (data from keyboard)
3	TX_KEYBOARD_DATA_OUT	serial data output (not used)
4	PS_GND_IN	ground for pins 1, 2 & 3
5	no connection	
6	no connection	
7	no connection	
8	no connection	
9	no connection	

* See Table 28 for wire color coding.

Table 24 – Relay Connections
(18-position terminal block labeled "RELAYS")

TERMINAL	NAME*	ACTIVATION METHOD
1	RELAY_1_NO	console PTT (momentary action)
2	RELAY_1_C	
3	RELAY_1_NC	
4	RELAY_2_NO	Dispatch Keyboard <Alt><F10> (momentary action)
5	RELAY_2_C	
6	RELAY_2_NC	
7	RELAY_3_NO	Dispatch Keyboard <Alt><F9> (toggle action)
8	RELAY_3_C	
9	RELAY_3_NC	
10	RELAY_4_NO	(currently not supported by software)
11	RELAY_4_C	
12	RELAY_4_NC	
13	RELAY_5_NO	(currently not supported by software)
14	RELAY_5_C	
15	RELAY_5_NC	
16	RELAY_6_NO	(currently not supported by software)
17	RELAY_6_C	
18	RELAY_6_NC	

* "NO" = normally-open contact; "C" = common contact;
"NC" = normally-closed contact.

Table 25 – Pager Input
(4-position terminal block labeled "PAGING")

TERMINAL	NAME	USE
1	PAGER_IN+	balanced audio input
2	PAGER_IN-	
3	PAGER_PTT_IN	PTT (enable) input
4	PS_GND_IN	ground for pin 3

Table 26 – Recorder Outputs
(4-position terminal block labeled "RECORDER")

TERMINAL	NAME	USE
1	USEL/TELE_ RECORDER_OUT	unselect recorder output
2	AGND	ground for pin 1
3	SELECT_ RECORDER_OUT	select recorder audio output
4	AGND	ground for pin 3

Table 27 – Auxiliary Audio Inputs (Not Supported)
(1/8-inch stereo phone jack labeled "AUX. IN")

TERMINAL	NAME	USE
tip	AUX_LEFT_IN	left chn. input (green)
ring	AUX_RIGHT_IN	right chn. input (red)
sleeve	AUX_IN_GND	grounds T and R (black)

AUDIO TOWER REPLACEMENT

NOTE

If installing a completely new C3 Maestro console system (*new PC and new Enhanced Audio Enclosure equipment*), disregard this section entirely and proceed to the "POWER-UP PROCEDURE" on page 36.

This section lists the steps necessary to replace earlier Audio Tower hardware with Enhanced Audio Enclosure hardware. Instructions are **not** included on replacing Personal Computer (PC) hardware and/or software as it is assumed these items are already Windows NT-ready. To avoid duplication of information, many references are made to other Enhanced Audio Enclosure-related installation and set-up sections within this manual.

1. Power-Down and Cable Disconnections

- ☐ REMOVE AC POWER from the PC system.
- ☐ REMOVE AC POWER from the Audio Tower system.
- ☐ Disconnect the Dispatch Keyboard from the Logic Board installed in the PC. If a new keyboard (with DB-9 connector) is supplied, this old keyboard is no longer needed.

- ☐ Disconnect the large PC-to-Audio Tower interconnect cable connecting the Audio Tower to the Logic Board installed in the PC. This cable is no longer needed.
- ☐ At the Audio Tower, label and then disconnect all cabling between it and external equipment and accessories. Equipment and accessories include items such as the Volume Controller Box, microphones, speakers, headset jack boxes, audio lines to and from the CEC/IMC, pager, recorder(s), Call Director, etc.
- ☐ Remove the Audio Tower, Volume Controller Box, speakers and related cabling. These items are no longer needed.

2. (Console) Logic Board Removal

- ☐ Review the procedures in the documentation included with the PC relating to expansion board installation/removal.
- ☐ Remove the PC's outside cover in accordance with the manufacture's instructions.
- ☐ Identify and remove the Logic Board installed in one of the PC's expansion slots. The large PC-to-Audio Tower interconnect cable (disconnected in step 1) mated with this board's DB-37 connector. The Dispatch Keyboard's small round DIN connector also mated to a connector on this board.
- ☐ Using the screw which held the Logic Board in place, install a blank expansion slot cover (not supplied). Installation of this cover will prevent dust and other foreign matter from entering the PC.
- ☐ Replace the PC's outside cover.
- ☐ Optional: Disabling of the Logic Board's driver is recommended. To do this, power-up the PC, booting-up with Windows NT and then from Windows NT Program Manager, open Control Panel. Next, run the Services option and "stop" the WinStar (Wns27) service. Exit Control Panel, shut-down Windows NT and continue with the following step.

3. PC-To-Enhanced Audio Enclosure Serial Link

- ☐ Connect PC serial port COM1 to the Enhanced Audio Enclosure in accordance with subsection "**PC-To-Enhanced Audio Enclosure Serial Data Interconnect Cable**" in this manual (page 23).

4. Console-To-CIM Serial Control Data Link

- ☐ Normally, no console-to-CIM serial link changes are necessary. However, if upgrading/replacing the plug-in RS-422 board installed in one of the PC's expansion slots (for improved static protection), the DB-25 connector which plugs to this board will, in most cases, require rewiring. Older RS-422 boards have different pin-outs from the newer boards. Refer to the plug-in boards' documentation and/or LBI-39055 for pin-out information. Also see the subsection in this manual entitled "**Control Data Link**" (begins on page 12) and Figure 7 in this manual.

5. Console-To-CIM Audio Link

- ☐ *If using existing modular cabling*, cut the modular plugs off the modular cables. Maintain connections to the CEC/IMC Audio Concentrator Card or punch blocks. Next, wire these audio lines to a male DB-25 connector (not supplied) and mate the connector to the Enhanced Audio Enclosure's "LINES 1-4" female DB-25 connector. See the subsection in this manual entitled "**Audio Links**" (begins on page 16) for additional information.
- ☐ *If using the pre-wired 100-foot audio cable*, remove the existing modular cabling connections from the CEC/IMC Audio Concentrator Cards or punch blocks. Next, wire the 100-foot audio cable to the CEC/IMC Audio Concentrator Card/punch block in accordance with the subsection in this manual entitled "**Audio Links**" (begins on page 16).

6. Dispatch Keyboard

- ☐ The existing (old) Dispatch Keyboard was disconnected in step 1. If a new Dispatch Keyboard (with male DB-9 connector) is not supplied and this keyboard must be utilized, replace its small round DIN connector with a DB-9 connector (not supplied) in accordance with the following table. Also see Table 23:

Table 28 – Dispatch Keyboard Cable Color Coding

MALE DIALOG BOX-9 PIN NUMBER	CABLE WIRE COLOR	USE
1	red	dc power
2	white	keyboard data
4	green	ground
6	(bare)	shield

- ☐ Connect the Dispatch Keyboard to the Enhanced Audio Enclosure in accordance with subsection entitled “**Dispatch Keyboard (if used)**” in this manual (page 23).

7. Microphones & Headsets

- ☐ Connect existing mics and headset jack boxes to the Enhanced Audio Enclosure per section “**INTERCONNECTING THE EQUIPMENT**”, subsection “**ENHANCED AUDIO ENCLOSURE**” in this manual (begins on page 23). No wiring changes are necessary.

8. Footswitches

- ☐ Audio Tower “FOOTSWITCH 1” should now be used as an operator footswitch. Connect it to Enhanced Audio Enclosure’s “OPER FT. SW.” connector. This footswitch keys all non-supervisory mics; see the **NOTE** on page 24 for microphone priority information. Also see the subsection entitled “**Footswitches (if used)**” in this manual (page 24) for additional details.
- ☐ Audio Tower “FOOTSWITCH 2” should now be used as a supervisor footswitch. Connect it to Enhanced Audio Enclosure’s “SUPER FT. SW.” connector. This footswitch keys only the supervisor’s headset.

9. Speakers

Speakers used with the Audio Tower are un-amplified units; therefore, they **cannot** be used with the Enhanced Audio Enclosure. Speakers used with the Enhanced Audio Enclosure are amplified units and each includes a volume control. The Volume Controller Box is not employed in Enhanced Audio Enclosure applications.

- ☐ Existing (old) speakers and the Volume Controller Box were disconnected in step 1. Install and cable the new Speakers Assemblies (desktop or rack-mount) to the Enhanced Audio Enclosure in accordance with the subsection entitled “**Speakers (if used)**” in this manual (page 25).

10. Recorder Outputs

- ☐ If recorder outputs were utilized in the Audio Tower installation, rewire these connections to the Enhanced Audio Enclosure in accordance with the subsection entitled “**Recorder Outputs (if used)**” in this manual (page 25). Audio Tower recorder connections utilized a large removable terminal block; Enhanced Audio Enclosure recorder connections utilize a smaller removable terminal block - the terminal block must be changed. However, note the pin-out sequence is identical. Audio Tower I/O Board J1 terminal 1 (top terminal of “UNSELECT RECORDER” and “SELECT RECORDER” terminal block) corresponds to Enhanced Audio Enclosure “RECORDER” terminal 1. Likewise, Audio Tower I/O Board J1 terminal 4 (bottom terminal) corresponds to Enhanced Audio Enclosure “RECORDER” terminal 4.

11. Paging Inputs

- ☐ If a pager was utilized with the Audio Tower installation, rewire these connections to the Enhanced Audio Enclosure in accordance with the subsection entitled “**External Paging Encoder Input (if used)**” in this manual (page 25). Audio Tower pager connections utilized a large removable terminal block; Enhanced Audio Enclosure pager connections utilize a smaller removable terminal block - the terminal block must be changed. However, note the pin-out sequence is identical. Audio Tower I/O Board J2 terminal 1 (top terminal of “PAGE INPUT” and “PAGE PTT” terminal block) corresponds to Enhanced Audio Enclosure “PAGER” terminal 1. Likewise, Audio Tower I/O Board J2 terminal 4 (bottom terminal) corresponds to Enhanced Audio Enclosure “PAGER” terminal 4.

12. Relay Outputs

- ☐ If any relay outputs were utilized in the Audio Tower installation, rewire these connections to the Enhanced Audio Enclosure in accordance with the subsection entitled “**Relay Outputs (if used)**” in this manual (page 26).

13. Call Director

- ☐ If the Audio Tower was connected to a Call Director, connect the male DB-9 connector on the cable from the Call Director (disconnected in step 1 from Audio Tower’s I/O Board “CALL DIRECTOR” DB-9) to the Enhanced Audio Enclosure’s female DB-9 “CALL DIR” connector. See the subsection entitled “**Call Director (if equipped)**” in this manual (page 26) for additional details. Line coupling transformers utilized between an earlier (“Phase 1”) Audio Tower and the Call Director

are not required and, if present, they should be removed for Enhanced Audio Enclosure applications.

14. Completion

- ☐ Continue with the following power-up procedure.

POWER-UP PROCEDURE

- ☐ The following C3 Maestro power-up procedure is recommended:

1. If the Personal Computer and/or monitor are equipped with a voltage selector switch, verify the switches are positioned correctly. The power supply within the Enhanced Audio Enclosure will operate from any ac voltage from approximately 100 Vac to 240 Vac; no voltage selection switch exists on it.
2. On the these three (3) units, verify each power switch is in the off position.
3. Connect the PC, monitor and the Enhanced Audio Enclosure to a 115 or 230 Vac source. Normally, 1 ½ duplex ac receptacles are required for the three (3) power cords. Refer to the PC and monitor documentation as necessary. Extension cords should *not* be used with the C3 Maestro console system.
4. Verify all equipment is properly grounded.
5. Power-up the Enhanced Audio Enclosure. The on/off power switch lights when ac power is applied and the switch is in the on position.
6. Verify the LED on the Enhanced Audio Enclosure's front panel is illuminated. This signifies the power supply within the unit is operating.
7. Power-up the PC and monitor in accordance with the manufacture's instructions. If a dual-boot text-based menu appears, the system should be booted-up to the Windows NT operating system (non-VGA).
8. Continue with the following software installation and set-up procedures.

SHUT-DOWN PROCEDURE

When necessary, shut-down the C3 Maestro console in accordance with the following recommended shut-down procedure:

1. If the console application is running, exit it via the exit button on the Main Menu command panel. If desired, save any new module programming changes when prompted.
2. If necessary, exit any other application software running under Windows NT.
3. Perform a Windows NT "shutdown" by selecting File > Shutdown... from Program Manager, or by simultaneously depressing <Ctrl><Alt> on the PC keyboard and selecting the <Shutdown...> button.
4. When the "It is now safe to turn off your computer." (or similar) prompt displays, power-down the PC's via its power switch.
5. Power-down the monitor via its power switch.
6. Power-down the Enhanced Audio Enclosure via its power switch.
7. Power-down any other externally-connected equipment such as a Call Director or a paging tone encoder.

SOFTWARE INSTALLATION

CONSOLE APPLICATION

Normally, all required files for the C3 Maestro console for Windows NT application are installed on (copied to) the PC's hard disk drive before the console equipment package ships from the factory. Therefore, no field installation of the console application software is usually required. Upon software installation, this software is properly configured for a standard console set-up. This standard console set-up is considered the factory default configuration.

However, in some rare cases customer installation or re-installation may be required. Refer to the C3 Maestro console for Windows NT *Administrator's Manual* (AE/LZB 119 1897) for an installation/re-installation procedure and additional software-related details including exact file paths and file names. In addition to being installed on the PC's hard disk drive, this software is distributed on two (2) or more 3 ½-inch floppy disks. These disks are included with the console equipment package when the package ships from the factory.

UDS CONFIGURATOR PROGRAM

The User-Definable Screen (UDS) Configurator program is separately sold C3 Maestro console for Windows NT-related software. Therefore, it may not be factory-installed on the PC's hard disk drive. If the UDS

Configurator program is available but not installed, refer to its *User's Manual* (AE/LZB 119 1896) for an installation/re-installation procedure. The software is typically distributed on one (1) 3 1/2-inch floppy disk.

SOFTWARE SET-UP PROCEDURE

NOTE

Unless otherwise noted, all procedures in this manual should be performed in the order presented.

PC CMOS SET-UP PROGRAM

All PCs used with the C3 Maestro console store their start-up configurations in CMOS memory. This information is read by the computer's BIOS (Basic Input-Output System) program and it may be changed by executing a CMOS set-up program during the PC's boot process.

- ☐ Execute the PC's CMOS set-up program **only** if a built-in (main/system board) COM port must be disabled/enabled or if documentation included with the PC deems it necessary for some other reason. Refer to the following subsections for additional details.

NOTE

Normally, the console's time and date are automatically set based on CEC's/IMC's time and date settings; therefore no CMOS time and/or date setting changes are required. Typically, the time and date clock source is the CEC/IMC Manager's (MOM PC's) internal PC clock. However, other clock source options are possible such as the System Manager computer or a NETCLOCK/2™ connected to the CEC/IMC Manager.

Hewlett-Packard PCs

Typically, the HP set-up program is started by pressing the <F2> function key when prompted with "<Setup=F2>" during the boot process. Verify/configure "Serial Port A" (COM1) and "Serial Port B" (COM2) as necessary:

- COM1 is enabled by setting "Serial Port A" to "Serial 1 (3F8h IRQ4)". This is the standard factory configuration. This port is labeled **Serial A** on the back of the PC. Normally, it is used to interface the PC to the Enhanced Audio Enclosure.

- COM2 is enabled by setting "Serial Port B" to "Serial 2 (2F8h IRQ3)". This is the standard factory configuration. This port is labeled **Serial B** on the back of the PC. Normally, it is used to interface the PC to the (optional) touch-screen monitor.

If any changes are made to the COM1 or COM2 settings, verify they are saved before rebooting/resetting the computer. Typically, a save is accomplished by pressing the <F3> function key.

Other PCs

Refer to the documentation included with the PC for COM port configuration details. If using the plug-in RS-422 board as COM1, verify the PC's main board COM1 port is disabled. Also verify COM2 is enabled.

NOTE

Unless otherwise noted, all procedures in this manual should be performed in the order presented.

STARTING WITH THE FACTORY DEFAULT CONFIGURATION

This section provides general guidelines and information on starting-up the console with the factory default configuration. In some cases, custom changes to this configuration are required prior to console application start-up. Unless otherwise noted, this basic information also applies to consoles with advanced configurations such as custom screen configurations and/or one or more feature licensed options.

Booting-Up The PC With Windows NT

- ☐ Before any C3 Maestro console for Windows NT software may be executed, the PC system must be booted-up with the Windows NT operating system. The following procedure outlines the steps necessary.

1. Power-up the Enhanced Audio Enclosure, monitor and PC in accordance with the power-up procedure outlined on page 36. Actually, powering up of the Enhanced Audio Enclosure is not necessary to boot-up, but it is recommended at this point.
2. If a dual-boot text-based menu appears on the monitor, select Windows NT (non-VGA mode) using the PC keyboard's ↑ (up) or ↓ (down) arrow keys.

3. Press the <Enter> key or, if no arrow key was pressed in the previous step, simply wait for the timer to expire (the timer stops if an arrow key is pressed). The Windows NT boot-up will conclude in a short time.
4. Continue with the following hardware-related settings.

The factory default configuration utilizes automatic user log-on. Therefore, no user name or password entry is required to start-up Windows NT. If manual user log-on is desired, see page 42 for additional information.

Initial Hardware-Related Settings

Via Configuration Editor

☐ Even the most basic console installations may require slight hardware-related configuration changes from the factory default settings prior to console application start-up. Setting changes presented in the following procedure are all accomplished using the Configuration Editor off-line program. Make changes as required:

1. If necessary, from Windows NT Program Manager restore the C3 Maestro console for Windows NT program group from an icon state. This Windows operation may be easily performed with the mouse by double-clicking the icon which is titled similarly and shown below. If it is already in the restored state, simply click once anywhere in the program group to activate (highlight) it. If no mouse is available, use one or more <Ctrl><Tab> keystrokes to select this program group and then, only if the program group is in an icon state, follow with an <Enter> keystroke from the PC's keyboard to restore and activate the program group. The program group's icon is:



2. Execute the Configuration Editor program by double-clicking its icon (shown below) in the program group. If no mouse is available, simply use the PC keyboard's arrow keys to select the icon and then follow with an <Enter> keystroke:



3. Select the Hardware tab by clicking it. If no mouse is available, use one or more <Ctrl><Tab> keystrokes to select it.
4. **Disregard this step if a slower CEC/IMC CIM control data link baud rate is not desired (factory setting = 19.2K baud):** To reduce the CIM link baud rate from the factory setting of 19.2K baud to 9600 baud, click the respective option button. If no mouse is available, sequence to the two baud rate option buttons via one or more <Tab> keystrokes and select the required rate with the PC keyboard's up/down arrow keys. The slower rate is required, for example, when the C3 Maestro is interfaced to the CIM via data modems and these modems require a 9600 baud terminal-side data link rate. NOTE: This setting change will only affect the terminal-side baud rate on the *console's* modem; also change the *CIM's* modem by changing this modem's configuration.
5. **Disregard this step if the console is interfaced to the CIM via the PC's COM3 port (factory setting = COM3 port utilized for CIM link):** If the serial communication port utilized for the CIM link is not COM3, change this port designation from the factory default setting of COM3 to COMx (where x=1 or 2) by clicking the respective option button. If no mouse is available, sequence to the two option buttons via one or more <Tab> keystrokes and select the required COM port with the PC keyboard's up/down arrow keys.
6. **Disregard this step if the dispatch ("custom") keyboard will be utilized during dispatch operations (factory setting = dispatch keyboard enabled):** If the dispatch keyboard will not be utilized during dispatch operations, disable it by unchecking the respective check box using a single mouse click. If no mouse is available, uncheck the box via an <Alt>K keystroke.
7. **Disregard this step if the console is not interconnected to a Call Director (factory setting = Call Director disabled):** If the console is interconnected to a Call Director enable CD operation by checking the respective check box. If no mouse is available, check the box via an <Alt>C keystroke.
8. Exit the Configuration Editor, saving any changes.
9. Continue with the following procedure.

Via Windows NT (Verifying FIFO Is Enabled)

- ☐ Each PC serial communication port which supports console operation has a very important configuration setting—"first-in-first-out" (FIFO)—which, if not enabled, may cause erratic console operation. Some third-party software installation programs may disable FIFO on one or more COM ports. In addition, changes within Control Panel's Ports dialog box may unintentionally disable FIFO. Verify FIFO is enabled for COM1 thru COM3 as follows:

1. From Windows NT Program Manager, if necessary open the Main program group by double-clicking on its icon:



Main

2. Open Control Panel by double-clicking its icon:



Control Panel

3. Execute the Ports program within Control Panel by double-clicking on its icon:



Ports

4. If necessary, from the Ports dialog box select COM1: in the Ports: listing.
5. Select <Settings...> and then <Advanced...>. The Advanced Settings for COMx: dialog box will appear (where x = selected COM port number).
6. Verify the FIFO Enabled check box is checked. **If not, check (enable) it.**
7. Exit (return to the Ports dialog box) via two <OK> command button clicks. Based on past experience, <Cancel> is not recommended here, even if no changes of any sort were required within the Advanced Settings dialog box. If a change is made, a prompt will appear noting that Windows NT must be restarted. Do not restart at this time.
8. From the Ports dialog box, select COM2: in the Ports: listing.
9. Repeat steps 5 thru 7 for COM2.
10. From the Ports dialog box, select COM3: in the Ports: listing.
11. Repeat steps 5 thru 7 for COM3.
12. If a change was made in step 6 (for COM1, COM2 and/or COM3), **restart Windows NT at this time.**

13. Continue with the following start-up procedure.

Since the console application automatically overrides other serial port settings established within the Ports program such as baud rate, number of data bits, etc., no other COM port setting changes are required within the Ports program.

Starting The Console Application

- ☐ Start the console application as follows. Factory default console application start-up settings are assumed:

1. If necessary, from Windows NT Program Manager restore the C3 Maestro console for Windows NT program group from an icon state.
2. Execute C3 Maestro's Dispatch Manager program by double-clicking its icon (shown below). If no mouse/track-ball is available, simply use the PC keyboard's arrow keys to select the icon (if not already) and then follow with an <Enter> keystroke. The Dispatch Manager is the console's main on-line program:

C3 Maestro
Console

Per the factory default configuration, starting the C3 Maestro's Dispatch Manager program will cause it to automatically start two (2) other on-line programs which are required for (normal) console operation. The first is the Communications Interface program; this program handles the serial control data messages to and from the CIM and Enhanced Audio Enclosure. The second program is the GUI—the console's Graphical User Interface.

3. Continue with the database initialization procedures which follow.

In some specialized applications, automatic start-up of the GUI is not desired. See "**Start-Up Options**" on page 44 for additional information.

NOTE

The serial control data link between the PC and the CEC/IMC CIM must be operational before the console's GUI will completely start. If not, the GUI program's "Initializing, please wait..." message box will remain until the link is restored or the program(s) terminates. If this problem occurs, correct the serial control data link problem before continuing with the following database initialization procedures. Although not required at this point, the console application may be terminated by "ending" the Dispatch Manager program using the Windows NT Task List. Open the Task List via a <Ctrl><Esc> keystroke from the PC's keyboard. On the Task List, the Dispatch Manager program is titled "C3 Maestro Dispatch Manager".

NOTE

The following procedures are written in accordance with CEC/IMC Manager version 5.x software (Windows NT-based). If using earlier CEC/IMC Manager software (DOS-based), menu access and dialog box/screen titles will differ from those presented in the following subsections. In this case, if necessary, refer to the manual listed in Table 29 or access the CEC/IMC Manager's on-line help for exact menu selections required to accomplish these console-related configurations.

Database Initialization

When the console initializes from a cold start, the procedures presented in the following subsections should be performed to insure proper operation. All console databases are initialized via commands from the CEC/IMC Manager (MOM PC). If necessary, refer to the appropriate manual listed in Table 29 or access the CEC/IMC Manager's on-line help for complete operating instructions.

**Table 29 – CEC/IMC Manager
Operations Guide Publication Numbers**

SOFTWARE VERSION:	V2.x (for DOS)	V3.x (for DOS)	V4.x (for DOS)	V5.x (for Win- dows NT)
PUBLICATION NUMBER:	LBI-38911	LBI-39024	LBI-39124	LBI-39224

Basically, except for sending console configurations to the console(s), it is assumed all CEC/IMC console-related configurations are complete as described in the *CEC/IMC Digital Audio Switch Installation, Set-Up And Troubleshooting* maintenance manual, LBI-38938. See "STEP 6 - CONSOLE CONFIGURATION" in LBI-38938 for complete details. Consult CEC/IMC administrative/maintenance personnel as required.

Sending Console User Profiles ("Setups")

From the CEC/IMC Manager, user profile data is sent only to a targeted console. When the target console receives this data from the CEC/IMC Manager it will send an acknowledgment to the CEC/IMC Manager. When this procedure is performed, two very important parameters are sent to the console along with the user profiles: the console's logic ID (LID) number and its alias.

□ Send user profile data to the console as follows. At this time it is assumed the console application is running and it is on-line with the CEC/IMC (CIM link is operational):

1. From the CEC/IMC Manager's Configure System main menu, select **Console Configuration**. This action will display the console configuration sub-menu.
2. From this sub-menu, select **User Profile**. The Console User Profile Configuration dialog box displays.
3. Select the console's number via the respective list box (range = 1 to 32). Verify the selected number matches the CIM's console assignment number defined by the respective CIM's Controller Board DIP switches. For example, if the console is interfaced to CIM 3 in the CEC/IMC, select **CONSOLE 03**.
4. From the Unit ID (LID) text box, verify the console's unit ID number does not conflict with any other console or radio ID number in the system.
5. Optional: On a per setup basis (10 total), make any required changes and save changes via the <Save> button. Refer to the applicable CEC/IMC Manager publication listed in Table 29 and/or the CEC/IMC Manager's on-line help for complete details.
6. Send the ten user profiles/setups to the (target) console by clicking the <Send> button.

7. When a good/successful transmit message box displays, acknowledge it and return to the CEC/IMC Manager's main menu by closing the dialog box. If any error message box displays or no good/successful transmit message box appears after ten (10) seconds, the CIM Controller Board may not be properly installed and/or configured; check CIM Controller Board installation and DIP switch settings. Refer to the *CEC/IMC Digital Audio Switch Installation, Set-Up And Troubleshooting* maintenance manual, LBI-38938 as necessary. **A good/successful message box must be displayed before continuing.**
8. Continue with the following Hardware Configuration transfer procedure.

Sending Console Hardware Configuration

Like console user profiles, a console's hardware configuration is sent only to the targeted console from the CEC/IMC Manager. When the target console receives this data from the CEC/IMC Manager it will send an acknowledgment to the CEC/IMC Manager. One important parameter sent to this console when this procedure is performed is the console's Call Director logic ID number.

- ☐ Send the hardware configuration to the console as follows. At this time it is assumed the console application is running and it is on-line with the CEC/IMC (CIM link is operational):
 1. From the CEC/IMC Manager's Configure System main menu, select **Console Configuration**. This action will display the console configuration sub-menu.
 2. From this sub-menu, select **Hardware**. The **C3 Maestro Hardware Configuration** dialog box displays.
 3. Select the console's number via the respective list box (range = 1 to 32). Verify the selected number matches the CIM's console assignment number defined by the respective CIM's Controller Board DIP switches.
 4. From the **Unit ID (LID)** text box, verify the console's unit ID number does not conflict with any other console or radio ID number in the system.
 5. Optional: Make any required changes and save changes via the **<Save>** button. Refer to the applicable CEC/IMC Manager publication listed in Table 29 and/or the CEC/IMC Manager's on-line help for complete details.
 6. Send the hardware configuration to the (target) console by clicking the **<Send>** button.

7. When a good/successful transmit message box displays, acknowledge it and return to the CEC/IMC Manager's main menu by closing the dialog box.
8. Continue with the following System Manager database transfers procedure.

System Manager Database Transfers

System Manager databases contain all system information for all defined entities (units, groups, sites). These databases can be transferred to the console via CEC/IMC Manager operations. Since this data is broadcast to all consoles in the CEC/IMC system, if possible, all consoles should be on-line when this transfer occurs. This avoids having to repeat the process for other consoles at a later time.

- ☐ Transfer the unit, group and site databases to the console(s) as follows:
 1. From the CEC/IMC Manager's Configure System main menu, select **System Options**. This action will display the system options sub-menu.
 2. From this sub-menu, select **File Transfer**. The **System Manager/Network Manager Entity Database** dialog box displays.
 3. Perform a full group database transfer by clicking the respective option buttons and then clicking the **<Request From SysMgr>** button.
 4. Perform a full unit database transfer by clicking the respective option buttons and then clicking the **<Request From SysMgr>** button.
 5. Perform a full site database transfer by clicking the respective option buttons and then clicking the **<Request From SysMgr>** button.
 6. Perform a full conventional channel database transfer by clicking the respective option buttons and then clicking the **<Send to CEC/IMC>** button.
 7. Perform a full console database transfer by clicking the respective option buttons and then clicking the **<Send to CEC/IMC>** button.
 8. Exit this dialog box and continue with the following console privilege list transfers.

NOTE

System Manager database transfers must be accomplished before sending console privilege lists.

Console Privilege Lists

- ☐ Each console must be sent its privilege list from the CEC/IMC Manager as follows:
1. From the CEC/IMC Manager's Configure System main menu, select **Console Configuration**. This action will display the console configuration sub-menu.
 2. From this sub-menu, select **Privilege List**. The Console Privilege List dialog box displays.
 3. Select the console's number via the respective list box (range = 1 to 32).
 4. Optional: Make any required changes to the privilege lists and save changes via the <Save> button. Refer to the applicable CEC/IMC Manager publication listed in Table 29 and/or the CEC/IMC Manager's on-line help for complete details. Hint: The <Select All> button may be utilized to select (privilege the console with) all units, groups, conventional channels and consoles.
 5. Send the privilege list data to the console by clicking the <Send> button.

Saving Database Information

At the console, the following database information is saved automatically to the PC's hard disk drive upon the completion of the respective CEC/IMC Manager database transfer. The data is saved after the last respective database record is received. No user action is required:

- Console User Profiles
- Console Hardware Configurations
- a System Manager database received via a System Manager-based database transfer
- a System Manager database received via a CEC/IMC Manager-based transfer

In most cases, module set-up changes should also be saved after changes are made. Saving eases console initialization procedures after a previous exit or unexpected power cycle. A save is accomplished via a button on the console's Main Menu command panel or the <F10> function key on the dispatch keyboard. This action, a manual operation, saves all module set-up related information including each module's programmed entity if any, the selected module if any, active and inactive patches if any, and the active and inactive simulelects if any. This will save the data to the PC's hard disk. In addition, a save/not save prompt also appears upon exiting the console if any module set-up changes have been made but not saved. Note: Upon exiting the console application, active patches and active

simulelects are deactivated and saved as in an inactive state; therefore, at console re-start, no patches or simulelects are ever active.

If the "module quick save" setting is enabled, a module's newly programmed entity is automatically saved upon completion of the module programming ("module modify") operation. This enable/disable configuration setting is accomplished off-line via the Configuration Editor's Miscellaneous Settings dialog box. If this feature is disabled, module entity programming changes must be saved by manually saving the set-up as previously described.

ADVANCED CONFIGURATIONS AND FEATURE LICENSED OPTIONS

Many advanced configuration changes may be accomplished to customize the console from the factory default configuration. These changes include both Windows NT-related changes and console application-related changes which directly influence how the console operates.

For the feature licensed options, option operation requires both proper configuration and software installation of the respective license(s). A feature option license may be factory-installed or field-installed.

Windows NT-Related Advanced Configuration

The following subsections briefly describe Windows NT operating system-specific configurations applicable to the console. Refer to the *C3 Maestro console for Windows NT Administrator's Manual (AE/LZB 119 1897)* or the other manual(s) indicated for additional information on these topics.

Dual-Boot Capabilities

Typically, the PC is factory-configured with Windows NT as the default operating system at boot-up. In some specialized applications this may not be desired. The *Administrator's Manual* includes general dual-boot information and a procedure which details boot-up configuration changes via the System program in Windows NT Control Panel.

User Accounts

Two (2) Windows NT user accounts are set-up at the factory. No changes to these accounts are necessary if console/computer access security via software is not required.

The first user account — "Administrator" — is used only for Windows NT-related configuration purposes. The factory-set password for this account is "ADMIN" (all upper case; password entry is case sensitive). This account is a member of the "Administrators" group and thus full

Windows NT privileges are granted to it. Factory configuration disables both password expiration and password changes.

NOTE

Computer user account “groups” should **not** be confused with EDACS radio system trunked talk groups.

The second user account — “CONSOLE” — is the factory default account set-up for dispatcher access. This account’s password is “CONSOLE” (all upper case; password entry is case sensitive). During set-up at the factory, this account is granted access to all user account groups including the “Administrators” group. Factory configuration disables password expiration.

If console/computer access security via operating system software configuration is required, refer to the *Administrator’s Manual* and/or the Microsoft Windows NT Workstation *System Guide* manual for user account configuration details.

Automatic Vs. Manual User Log-On

The CONSOLE or any other user account may be configured for either manual or automatic Windows NT log-on. Basically, manual log-on requires password entry and automatic log-on does not. The factory default configuration is automatic log-on with the default log-on user = CONSOLE. Refer to the *Administrator’s Manual* and/or the Microsoft Windows NT Workstation *System Guide* manual for additional information.

The manual method requires the user (for example: the dispatcher), at log-on, to enter his/her user name if he/she was not the last one to log-on and to *always* enter a password. Both entries are accomplished at the standard PC keyboard, not the dispatch (“custom”) keyboard.

A manual log-on method may not be required or desired in certain dispatch environments since the standard PC keyboard may not be easily accessible or, in some cases, it is not available at all. In these cases, automatic user log-on is required/desired.

Automatic user log-on requires no user name or password entry—no standard PC keyboard is required for log-on. Because no password entry is required to start Windows NT, this method provides little security for console/computer access. However, in most dispatch centers, this is not an issue.

During an automatic user log-on sequence, a user may depress the <Shift> key on the standard PC keyboard to revert back to manual log-on. This may be necessary if, for example, CONSOLE is the default log-on user and log-on is

automatic (factory default configuration), and an administrator must make a system change via the Administrator user account. The <Shift> key must be depressed when Windows NT displays its logo. The system will then revert back to manual log-on via the log-on dialog box.

Monitor Video Resolution And Colors

If the console is factory-supplied with a 14-inch monitor the factory default configuration sets video resolution to 640 x 480 pixels. If a 17-inch monitor is supplied the factory-set resolution is 800 x 600 pixels.

To provide the best possible console application screen displays, the console application was designed for required a operating system color setting of 65,536 colors.

Refer to the *Administrator’s Manual* for additional information on monitor resolution and color settings.

Touch-Screen Monitors

Optionally, the console may supplied with a touch-screen monitor which allows the user to control the console/computer by directly touching the monitor’s screen surface with a finger or any small pointer-like object. Basically, a touch is equivalent to a mouse point-and-click action in the same approximate area of the screen. The C3 Maestro console for Windows NT graphical user interface was designed for 100% touch-screen dispatch operability *without* the need of any other user input device such as a mouse or the dispatch keyboard. In addition, since mouse and dispatch keyboard operation is *not* disabled when a touch-screen monitor is added to a console, the addition of the touch-screen monitor adds user input redundancy to the console. Refer to the *Administrator’s Manual* for additional information.

Networking And Computer Naming

If the console will be utilized on a network, refer to the *Administrator’s Manual* for applicable configuration information. User account, computer name, network interface card and other network-related changes may be necessary.

Feature Licensed Options

If the console has one or more feature licensed options, special Windows NT TCP/IP (transmission control protocol/internet protocol) configurations are necessary before the feature licensed option(s) will operate, even if the PC does not have a network interface card installed within it. Refer to the *Administrator’s Manual* for additional information. Also see the section entitled “**Feature Licensed Options**” in this manual (page 46).

Printers

During normal dispatch operations, the C3 Maestro console for Windows NT does not require any printer access. However, printer access may be beneficial during console set-up and/or troubleshooting periods to, for example, print-out a message data log file generated by the Communications Interface's monitor. Also, if another application is utilized on the console's PC, printer access may be required for this application. This access could include a local printer connected to the PC's parallel printer port (for example: LPT1) and/or a remote network printer if the computer is networked.

If printer access is required, refer to the Microsoft Windows NT Workstation *System Guide* manual for configuration information. Within Windows NT, printer configurations are accomplished via Print Manager. Typically, no printers are set-up at the factory — the default printer is "NONE".

Console Application-Related Advanced Configuration

Refer to the C3 Maestro console for Windows NT *Administrator's Manual* (AE/LZB 119 1897), the *UDS Configurator User's Manual* (AE/LZB 119 1896), or the other manuals indicated for detailed configuration information on the following topics:

Start-Up Options

Various console application start-up options are possible based on configurations performed within Windows NT Program Manager and within the Configuration Editor program. If changes from the factory default start-up configuration are desired, refer to the *Administrator's Manual* for specific details. The start-up options are:

- **Manual Dispatch Manager Start-Up with Automatic GUI Start-Up** (factory default)
- **Automatic Dispatch Manager and GUI Start-Up after Windows NT User Log-On**
- **Manual Dispatch Manager Start-Up and Manual GUI Start-Up**
- **Automatic Dispatch Manager Start-Up and No (Local) GUI Start-Up After Windows NT User Log-On**

Changes Via The Configuration Editor Program

The Configuration Editor program is an off-line tool which provides configuration functionality for the following items. In most cases, configuration changes performed with

this program modify the various console application initialization files.

NOTE

For the feature licensed options, configurations performed by the Configuration Editor and the UDS Configurator do not guarantee the configured option(s) will operate; the respective software license must be installed also. Refer to the section entitled "**Feature Licensed Options**" (page 46) for additional details.

- **Hardware Settings** — Serial communication port parameters and audio system-related settings may be changed using the Configuration Editor. For example, if the console interfaces to the CEC/IMC via modems instead of an RS-422 serial data link, a baud rate change to the PC's serial communication port utilized for CIM interfacing may be required.
- **Integrated Paging (feature licensed option)** — With integrated paging, tones are generated by the console's audio system hardware, not an external paging tone encoder connected to it. For integrated paging support, configuration accomplished via the Configuration Editor includes manual and preprogrammed button configuration. Manual paging button configuration involves defining each button's paging code plan type and label text. Preprogrammed paging button configuration involves defining each button's paging code plan type, label text, specific code plan number and the broadcast entity (conventional channel, trunked group, etc.) number.
- **RSM/RTT Status Codes (feature licensed option)** — Using the Configuration Editor, the user can construct and maintain a radio status code database. This database is stored within an initialization file. It is read by the UDS Configurator during RSM and RTT module additions. 128 unique status codes are available for RSM/RTT operations.
- **Miscellaneous Settings** — The Configuration Editor provides configuration functionality for several miscellaneous console settings such as the Dispatch Manager's start-up settings and digital dispatch settings.
- **Entity Database Editor** — The Configuration Editor includes an entity editor which must be utilized for entity database construction and maintenance if the EDACS radio system does not include a System Manager computer.

- **Communications Interface Monitor** — During diagnostic/troubleshooting periods, this monitor can display CIM serial link and audio system link data messages in a hexadecimal (base 16) format. For the monitor, the Configuration Editor provides user-friendly configurability such as its window size and start-up and hex data font colors.

Changes Via The UDS Configurator Program (Optional)

The UDS Configurator program is sold separately from the console application software. *If available*, the following screen-related configuration changes can be accomplished.

- **Standard Communication Module Addition/Deletion & Positioning** — In the console application, each standard communication module is utilized to indicate and control communications to and from its programmed entity (trunked talk group, individual call, conventional channel, or another console). On a per module page basis, the UDS Configurator provides module addition, deletion and positioning configuration functions for a console screen initialization file. For example, one screen configuration could be constructed with fourteen (14) modules on each module page similar to the earlier DOS-based C3 Maestro console while still another screen configuration could be constructed with varying numbers of modules on each module page and these modules could be located in various different positions on the screen.
- **Radio Status Messages Module Addition/Deletion & Positioning (RSM is a feature licensed option)** — In the console application, each RSM module is utilized to indicate one or more EDACS radio units' transmitted status. For example, one RSM module could indicate all radio units which have transmitted an "in route" status and a second RSM module could indicate all radio units which have transmitted an "at scene" status. On a per module page basis, the UDS Configurator provides RSM module addition, deletion and positioning configuration functions for a console screen initialization file. Each RSM module is assigned a unique status code number which corresponds to a radio unit-transmitted status code number utilized throughout the EDACS radio system.
- **Request-To-Talk Module Addition/Deletion & Positioning (RTT is a feature licensed option)** — In the console application, each RTT module is utilized to individually reply to a radio unit requesting-to-talk via its unit-transmitted status. On a per module page basis, the UDS Configurator

provides RTT module addition, deletion and positioning configuration functions for a console screen initialization file. Like an RSM module, each RTT module is assigned a unique status code number which corresponds to a radio unit-transmitted status code number utilized throughout the EDACS radio system.

- **Auxiliary Input/Output (I/O) Module Addition/Deletion & Positioning (auxiliary I/O is a feature licensed option)** — In the console application, auxiliary I/O modules are utilized to monitor and control CEC/IMC auxiliary I/O events. On a per module page basis, the UDS Configurator provides auxiliary I/O module addition, deletion and positioning configuration functions for a console screen initialization file. Each auxiliary I/O module is assigned to a specific CEC/IMC auxiliary I/O event. For example, one module on module page D could be assigned to control auxiliary output event 100 and a second module on this same or a different page could be assigned to monitor auxiliary input event 101.
- **Panel Show/Hide & Positioning** — Panels in the console application include the command panels, message panel, status panel, I-call (individual call) panel, VU meter panel, time (clock) panel, call history panel, page button panel and the general pop-up panels. Using the UDS Configurator, the user may position each panel on the screen as required/desired. Also, if not needed in the console application, the user may "hide" a panel (turn it off) from displaying in the console application. For example, if a screen configuration is constructed which has only one module page the page button panel which provides module page selection is not needed and it could be hidden. In this example, the extra screen area gained by the hiding of the page button panel could be utilized for additional modules.
- **Color Changes** — Using the UDS Configurator, the user may change colors settings of nearly all display items' elements including modules' elements, panels' elements, and the screen's background color. For example, for the standard communication modules both text elements and non-text elements may be changed. Color settings are made and stored on a per screen initialization file basis.
- **Button Label Text Changes** — For certain display items, the UDS Configurator provides text edit functionality for button labels. Examples include RSM and RTT modules' button labels and the page button panel's button labels.

- **Module Page Add/Delete** — The factory default configuration has eight (8) module pages typically identified “Page A” thru “Page H”. With the UDS Configurator, the user may set the number of module pages using the add/delete module page function. The maximum number of module pages per screen initialization file is eight (8).
- **Changing “Setup” Aliases/Names** — During any given dispatch operation session, a C3 Maestro console operates using one (1) of ten (10) available “setups.” These ten setups correspond to CEC/IMC Manager’s ten console user profiles for the respective console. In a typical dispatch center, a setup change is made at each dispatcher shift change. Console user profile data was transferred to the console if/when the “**Sending Console User Profiles (“Setups”)**” procedure on page 40 of this manual was performed.

By using different setups/console user profiles with a given console, user/dispatcher-specific configurations may be easily changed via the console’s Change Setup function. For example, one setup may be a supervisory setup while another setup for the same console may be a non-supervisory setup. Examples of other setup-specific settings include (non-inclusive listing) audio-related settings such as default volume levels and error tone level settings, visual-related settings such as caller ID displayed instead of caller alias/name (enable/disable), and emergency-related settings such as alarm reset required before emergency clear (enable/disable). Each setup has an alias or name per a predefined text string (16 characters maximum). The factory default aliases/names for the ten (10) setups are “Setup #1”, “Setup #2”, etc., thru “Setup #10”. The UDS Configurator provides text edit functionality for the step aliases/names.

- **Indicators Flash Enable/Disable** - Several important text icon-type indicators which appear in the console’s status panel are set to flash (cycle on-off-on) when they appear per the factory default configuration. These indicators include the failsoft, audio system power fail and the download indicators. Using the UDS Configurator, each may be disabled from flashing. This may be desired in certain applications.

- **Full Screen Enable/Disable** - The UDS Configurator includes the ability to enable or disable full screen console application operation. When full screen operation is enabled the console does not *appear* to run in a window as no Windows NT title bar or scroll bars are displayed when the console is the active application; the console’s display area is always in a maximized state as it occupies the “full screen.” When full screen operation is disabled, the console’s display includes a title bar and scroll bars and it may only occupy a portion of the available screen area.
- **Screen Initialization File Selection** — Using the UDS Configurator, the user can set one (1) of the ten (10) available screen initialization files as the “active” screen initialization file. At console start-up, the active screen initialization file determines the console’s screen configuration.

Like the Configuration Editor, the UDS Configurator is an off-line program; it should only be used when the console application is not running. It configures the console’s display/screen attributes by modifying the console’s screen initialization file(s). Refer to the UDS Configurator *User’s Manual* for complete details.

Feature Licensed Options

Currently, the C3 Maestro console for Windows NT has four (4) specific options which each must be individually licensed before utilization at the console is possible. Each license is normally purchased on a per console basis and therefore each option is considered a “product.” Feature licensing provides a customer cost-savings advantage. For example, a customer may wish to obtain a license for only paging and RSM if auxiliary I/O and RTT operation is not required at a particular console; therefore a cost savings achieved.

With the console application running, the options currently licensed (available for use) are viewable from its About C3 Maestro dialog box. This dialog box is accessible via a button on the console’s Main Menu command panel. This information is also available from the Dispatch Manager’s About dialog box, accessible via appropriate menu selection.

At start-up, the console application reads an encrypted licensing file stored on the PC’s hard disk drive. Normally, this file is copied to the hard disk drive at the factory in accordance with the feature licensed options ordered by the customer. This file determines which of the four feature licensed options will operate and which will not. Feature licensed options may also be added in the field at a later date by obtaining a new encrypted license file from the factory and properly copying it to the PC’s hard disk drive. In addition, a uniquely-identifiable written license certificate

for each console is supplied from the factory to the customer. Licensing records are maintained at the factory.

In addition to the required TCP/IP-related network configurations previously mentioned in this manual (page 43) and described in detail in the *Administrator's Manual*, feature licensing also requires third-party software. This software—iFOR/LS from Gradient Technologies—is always installed on the computer's hard disk drive at the factory even if no feature licensed option is ordered with the console equipment package. This allows feature licensed options to be later added to the console by simply updating the encrypted license file.

The set-up and administration of feature licenses is beyond the scope of this manual. Refer to *EDACS Product Licenses for Windows NT* manual AE/LZT 123 1906 and/or the console's *Software Release Notes* for additional for details. Also see the console's *Administrator's Manual*.

CEC/IMC Auxiliary Input/Output (I/O)

A C3 Maestro console may be utilized to monitor and control CEC/IMC 2-state auxiliary I/O (input/output) events. CEC/IMC firmware version 4.x and earlier provides 30 total auxiliary I/O events and version 5.x and later provides 255 total auxiliary I/O events.

On a per event basis, CEC/IMC auxiliary I/O event configurations accomplished at the CEC/IMC Manager include:

- defining the event as one of either a standard input, an acknowledge input, a momentary output *or* a toggle output (event type);
- defining the event's CEC/IMC Controller Board utilized (device type and device assignment number) and the I/O bit number used on this Controller Board;
- including *or* not including each console in the event's "console mask";
- defining the event's active state as either high *or* low; and,
- other event definitions which are not required for/applicable to the C3 Maestro console for Windows NT but are required for other consoles connected to the CEC/IMC.

Refer to the appropriate CEC/IMC Manager manual (numbers listed in Table 29) and/or the CEC/IMC Manager's on-line help for specific CEC/IMC auxiliary I/O configuration information. Also see LBI-38938.

If a C3 Maestro console is granted monitoring/control capability of CEC/IMC auxiliary I/O events via "console mask" definitions, it can monitor input event transitions and

it can control output event transitions. For an auxiliary input event, a state change indication displays at the console in the respective auxiliary input module and in the console's message panel. An auxiliary output event is controlled via one of <Alt><F1> thru <Alt><F8> keystrokes from the console's dispatch keyboard or by mouse/track-ball actions upon the respective auxiliary output module. Like an auxiliary input event state change, an output event's state change indication displays in the respective auxiliary output module and in the console's message panel. These indications provide feedback to the console operator when auxiliary output event state changes occur, even if they are initiated by a different console(s) within the CEC/IMC system.

In addition to the required CEC/IMC auxiliary I/O configurations accomplished via the CEC/IMC Manager, a C3 Maestro console for Windows NT also requires configurations at the console. At the console, auxiliary I/O-related configurations are accomplished by "adding" auxiliary I/O modules to the console's (active) screen initialization file using the UDS Configurator off-line program. Within the UDS Configurator, required configurations include:

- selecting which module page the auxiliary I/O module will be located on;
- positioning the module on the selected module page;
- assigning an auxiliary I/O event (number) to the module;
- specifying the module's/event's type (must match CEC/IMC type event designation);
- defining the module's button label text string;
- defining the module's active label text string which is displayed when the assigned auxiliary I/O event is in the active state; and,
- defining the module's inactive label text string which is displayed when the assigned auxiliary I/O event is in the inactive state.

In addition, many auxiliary I/O module-related color configurations are possible via the UDS Configurator. These configuration changes are performed on a per element basis. For example, a change to the foreground color for momentary output events affects the foreground color of *all* auxiliary output modules programmed for momentary operation.

See the UDS Configurator's *User's Manual* for additional information on auxiliary I/O module configuration.

Integrated Paging

With the integrated paging feature licensed option, the console can generate its own paging tones via internal tone encoder circuits; therefore, an external paging encoder is not required for paging operations. Supported integrated paging tone formats include GE Type 99X, Y and Z, Motorola Quik-Call II™, Custom-Call, Reach, 5/6 and Dual-Tone Multi-Frequency (DTMF).

All integrated paging configurations for the console are performed via the Configuration Editor's **Paging** tab; refer to the *Administrators Manual* for detailed information.

Radio Status Message (RSM) and Request-To-Talk (RTT)

The RSM feature licensed option provides EDACS radio unit transmitted status monitoring at the console. Indications are displayed in one or more of the console's RSM modules. Each RSM module is assigned a status code

number which corresponds to a unique radio unit-transmitted status code utilized throughout the EDACS radio system. 128 status codes are available for RSM and RTT operations.

The RTT feature licensed option is similar to the RSM option except the dispatcher may, as desired, individually reply to a unit requesting communications with dispatch via a radio status transmission. Dispatcher reply is accomplished via an individual call to the unit with the dispatcher being the caller and the requesting-to-talk unit being the callee. The individual call is initiated directly from the respective RTT module holding the queued-up requesting-to-talk unit(s). RTT queue status is indicated by displaying radio units' aliases/names or logical ID (LID) numbers within the particular RTT module.

Additional information on RSM and RTT, including a step-by-step configuration procedure, is included in the *Administrator's Manual*.