

INSTALLATION AND SET-UP MANUAL

C3 MAESTRO™ CONSOLE SYSTEM WITH ENHANCED AUDIO ENCLOSURE

TABLE OF CONTENTS

	<u>Page</u>
GENERAL	5
PERSONAL COMPUTERS	6
Hardware.....	6
Operating System Software.....	6
BOARD SET-UP	6
ENHANCED AUDIO ENCLOSURE	6
Audio System Board	6
Mic Audio ALC Enable/Disable DIP Switch (S1).....	6
Digital Pots Settings	7
SPEAKER ASSEMBLY	7
Speaker Amp Board.....	7
Minimum Volume Level DIP Switch (SW1 Position 1).....	7
Maximum Volume Level DIP Switch (SW1 Position 2)	10
RS-422 BOARD	11
INTERCONNECTING THE EQUIPMENT	11
CEC/IMC INTERCONNECTIONS	11
Control Data Link	12
Overview	12
RS-422 Interfacing (Co-Located Hook-Ups).....	12
RS-232 Interfacing (Remote Console Hook-Ups Via 4-Wire Modems And RS-232 Interconnections)	13
Audio Links	14
PERSONAL COMPUTER	18
PC-To-Enhanced Audio Enclosure Serial Data Interconnect Cable	18
Standard PC Keyboard.....	18
Video Display Monitor	18
ENHANCED AUDIO ENCLOSURE	18
Dispatch Keyboard	18
Desk Mic (if used)	18
Headset Jacks (if used)	18
Boom/Gooseneck Mic (if used)	19
Footswitches (if used)	19
Speakers (if used).....	19
Recorder Outputs (if used).....	20
Paging Input (if used).....	20
Relay Outputs (if used)	21

TABLE OF CONTENTS

	<u>Page</u>
Call Director (if equipped)	21
Console-to-CEC/IMC Audio Interconnections	21
Console-to-Call Director Interconnections	21
EQUIPMENT ROOM GROUNDING	23
AC POWER AND UPS EQUIPMENT	23
AUDIO TOWER REPLACEMENT.....	23
POWER-UP PROCEDURE	25
SOFTWARE INSTALLATION AND SET-UP PROCEDURE	26
PC CMOS SET-UP PROGRAM	26
Hewlett-Packard PCs	26
Other PCs	26
FILE DIRECTORIES AND CONTENTS	26
AUTOEXEC.BAT File Contents	27
CONFIG.SYS File Contents	27
EDITOR PROGRAM.....	27
Serial Ports' Settings.....	27
Set-Up Titles	27
Call Director ID	27
RUNNING THE C3 MAESTRO APPLICATION PROGRAM.....	28
DATABASE INITIALIZATION	28
Console User Profile Configuration	29
System Manager Database Uploads	29
Console Privilege Lists.....	29
Saving Database Information	29
CEC/IMC AUXILIARY I/O	29
SOFTWARE INSTALLATION AND UPGRADES	30
ENHANCED AUDIO ENCLOSURE CONNECTOR PIN-OUTS.....	30
CABLE ASSEMBLY DIAGRAMS	
CONTROL DATA CABLE (100-FOOT) 19B804083P3	36
AUDIO CABLE (100-FOOT) 19B804083P2	37
TABLES	
Table 1 – Approved Personal Computers	6
Table 2 – Audio System Board Mic Audio ALC Enable/Disable DIP Switch S1	6
Table 3 – Digital Pots	8
Table 4 – Cable 19B804083P3 Color Coding	13
Table 5 – C3 Maestro-To-CEC/IMC Audio Line Requirements	15
Table 6 – Boom/Gooseneck Mic Wiring	19
Table 7 – Enhanced Audio Enclosure-To-CEC/IMC Call Director Audio Signal Descriptions	22
Table 8 – Enhanced Audio Enclosure-To-Call Director Control & Audio Signal Descriptions	22
Table 9 – Dispatch Keyboard Cable Color Coding	24
Table 10 – C3 Maestro PC File Directories And Files	26
Table 11 – CEC/IMC Manager (MOM PC) Operations Guide Publication Numbers	28
Table 12 – CEC/IMC Audio Lines (female DB-25 labeled "LINES 1-4")	30
Table 13 – Call Director (female DB-9 labeled "CALL DIR")	32
Table 14 – Boom/Gooseneck Microphone (female DB-9 labeled "B/G MIC")	32
Table 15 – Desk Microphone (female DB-9 labeled "DESK MIC")	32

TABLE OF CONTENTS

	<u>Page</u>
Table 16 – Operator Headset (female DB-9 labeled "OPER H/S")	32
Table 17 – Supervisor Headset (female DB-9 labeled "SUPER H/S")	33
Table 18 – Select Speaker (male DB-9 labeled "SEL SPKR")	33
Table 19 – Unselect Speakers –Three Total (male DB-9 labeled "UNSEL SPKRx")	33
Table 20 – Operator Footswitch (female DB-9 labeled "OPER FT. SW.")	33
Table 21 – Supervisor Footswitch (female DB-9 labeled "SUPER FT. SW.")	34
Table 22 – Optional RS-422 Input/Output (female DB-9 labeled "I/O")	34
Table 23 – Personal Computer RS-232 Input/Output (female DB-9 labeled "PC")	34
Table 24 – Dispatch Keyboard Serial Input/Output (female DB-9 labeled "KBD")	34
Table 25 – Relay Connections (18-position terminal block labeled "RELAYS")	35
Table 26 – Pager Input (4-position terminal block labeled "PAGING")	35
Table 27 – Recorder Outputs (4-position terminal block labeled "RECORDER")	35
Table 28 – Auxiliary Audio Inputs (Not Supported)	35
 FIGURES	
Figure 1 – C3 Maestro With Enhanced Audio Enclosure Equipment Interconnections	5
Figure 2 – Audio System Board DIP Switch S1 Factory Setting (ALC Enabled On All Mics)	6
Figure 3 – Speaker Amp Board SW1 Factory Setting	10
Figure 4 – Plug-In RS-422 Board DB-25 Connector Pin-Out	13
Figure 5 – Audio Line Input And Output Connections At Enhanced Audio Enclosure	15
Figure 6A – CEC/IMC-To-C3 Maestro Interconnections (Co-Located)	16
Figure 6B – CEC/IMC-To-C3 Maestro Interconnections (Remote And/Or RS-232)	17
Figure 7 – Recorder Outputs At Enhanced Audio Enclosure	20
Figure 8 – Pager Inputs At Enhanced Audio Enclosure	20
Figure 9 – Relay Terminal Block At Enhanced Audio Enclosure	21
Figure 10 – Call Director Interface Connector At Enhanced Audio Enclosure	22
Figure 11 – Enhanced Audio Enclosure Rear Panel Connectors	31

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GENERAL

The intent of this manual is to guide field installation and maintenance personnel through the installation and set-up of an EDACS® C3 Maestro™ dispatch console system equipped with an Enhanced Audio Enclosure. Figure 1 is a simplified diagram which indicates equipment interconnections in a typical installation. 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 2-speaker console system hardware P29/7720045009 (350A1371P1) and 4-speaker console system hardware P29/7720045010 (350A1371P2). Each above console system includes an Enhanced Audio Enclosure P29/7720040000 (350A1371P3) or P29/7720040001 (350A1371P4).

- C3 Maestro (PC) application software version 5.0x (344A3922G12)
- Enhanced Audio Enclosure firmware version 1.00 (350A1520G1)
- CEC/IMC Digital Audio Switch firmware version 4.0x (344A3564G11, 344A3565G11, 344A3567G11 and 344A3568G11)
- CEC/IMC Manager (MOM PC) software version 4.0x (344A3630G11)

NOTE

C3 Maestro application software version 5.0x requires CEC/IMC Controller and Audio Board firmware version 4.0x (or later), and CEC/IMC Manager software version 4.0x (or later).

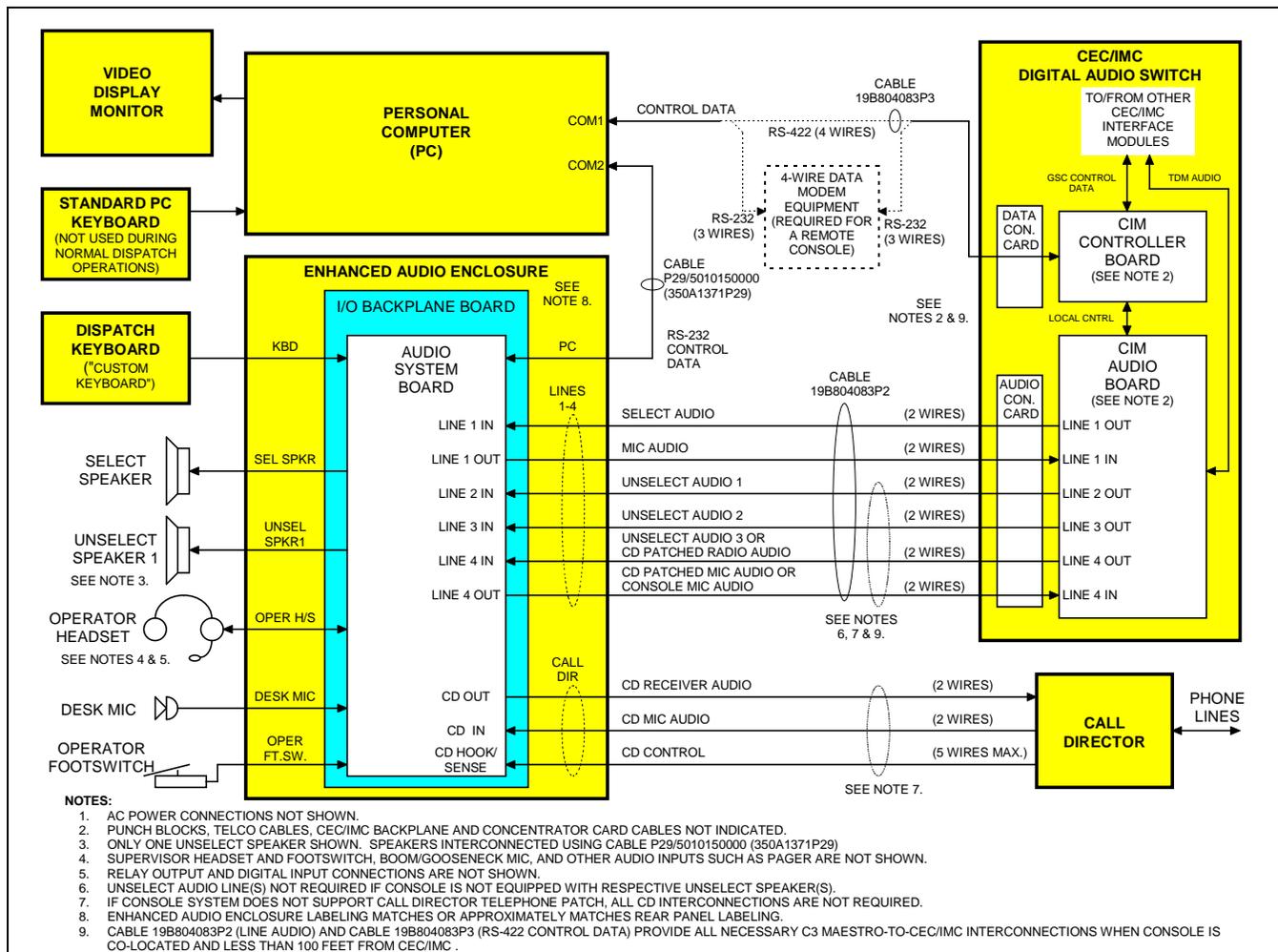


Figure 1 – C3 Maestro With Enhanced Audio Enclosure Equipment Interconnections

PERSONAL COMPUTERS

In most cases, the Personal Computer (PC) used with the C3 Maestro console is delivered with its hard disk drive formatted and MS-DOS® operating system software installed on the hard disk drive. In addition, all C3 Maestro application software is also installed on the drive.

Hardware

Table 1 lists the PCs approved for use with a C3 Maestro console system equipped with an Enhanced Audio Enclosure. 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. OR TYPE
Hewlett-Packard	Vectra VE Series 2 5/75 (Pentium/75 MHz)
Hewlett-Packard	Vectra VE 5/75 (Pentium/75 MHz)
Hewlett-Packard	Vectra VL2 (486/66 MHz)
Hewlett-Packard	Vectra 25N (486/25 MHz)
Hewlett-Packard	486SX/25 (486SX/25 MHz)

Operating System Software

The PC will have MS-DOS version 6.x installed on its hard drive. *Earlier versions of MS-DOS are not approved for use with the C3 Maestro console system equipped with an Enhanced Audio Enclosure.*

NOTE

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

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 LBI-39100 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

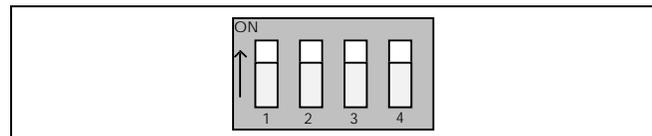


Figure 2 – Audio System Board DIP Switch S1 Factory Setting (ALC Enabled On All Mics)

Digital Pots Settings

To provide computer-controlled level settings, the Enhanced Audio Enclosure's audio input and audio 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. Also see the following note.

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 3. A dispatcher may adjust the operator's sidetone digital pot using dedicated keyboard keystrokes <Alt> <Vol ↑> and <Alt> <Vol ↓> at the Dispatch Keyboard.

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 may be adjusted using the C3 Maestro application program via one of its note cards. This function changes the settings stored in the EEPROM's working area. Normally, this note card function should only be accessed by the installation and/or service personnel. To change a digital pot's setting, the following procedure may be performed *after the console's installation is complete and it has been powered-up*:

1. From the Dispatch Keyboard, simultaneously press the <Alt> (common control function) and the # (on

numeric keypad) keys. "Digital Pot Number: ?" is displayed in the lower left-hand side of the C3 Maestro's display.

2. From the numeric keypad, enter the number of the digital pot to be changed. See Table 3. The digital pot's existing setting is displayed.
3. Press the ↑ (increase) or ↓ (decrease) key to change the current setting. Changes are saved in the EEPROM's working area as they are made.
4. Press <Esc> to exit.

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.

Table 3 – Digital Pots

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

Table 3 – Digital Pots (Continued)

AUDIO SYSTEM BD. POT NO.	ENHANCED AUDIO ENCLOSURE AUDIO CIRCUIT LOCATED IN / ADJUSTS *	TYPICAL SETTING **
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
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 (adjustments 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

Table 3 – Digital Pots (Continued)

AUDIO SYSTEM BD. POT NO.	ENHANCED AUDIO ENCLOSURE AUDIO CIRCUIT LOCATED IN / ADJUSTS *	TYPICAL SETTING **
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 Audio System Board 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.

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.

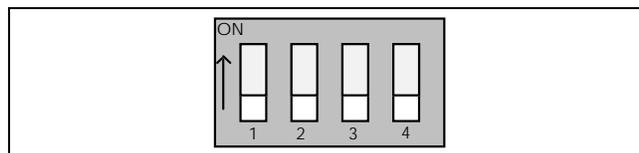


Figure 3 – Speaker Amp Board SW1 Factory Setting

- At this time, configure SW1 as required. 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.

RS-422 BOARD

Most PCs used within the C3 Maestro console application are equipped with a plug-in RS-422 capable board for serial data interfacing to the CIM within the CEC/IMC Digital Audio Switch. *Normally, no changes from the factory set-ups are required on this board or any other related serial COM port hardware within the PC.* However, it may be beneficial to review the information in the section entitled "**CEC/IMC INTERCONNECTIONS**", subsection "**Control Data Link**" (page 12) at this time.

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.
- **Enhanced Audio Enclosure-to-Dispatch Keyboard**
- **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-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**
- **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 6 and Table 5.

As shown in Figures 1 and 6, all CEC/IMC interconnections 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 6, 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 application 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. See the following subsections for additional remote console wiring and modem configuration details.

At the C3 Maestro, RS-422/RS-232 serial control data connections terminate at the PC's serial COM port. Normally, COM1 is utilized for CEC/IMC interfacing. This serial port is normally provided by a plug-in RS-422 board inside the PC as described in the following section.

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 interfacing. If the plug-in RS-422 board's serial port is configured as COM1 (normal factory configuration), the PC's main board COM1 port is disabled to prevent conflicts. Likewise, if the plug-in RS-422 board's serial port is configured as COM2, the PC's main board COM2 port is disabled. Depending upon the type of PC used, disabling of the main board's COM port is done via either a DIP switch, jumper, or a BIOS set-up program. For COM port enable/disable configuration details, refer to the section entitled "**SOFTWARE INSTALLATION AND SET-UP PROCEDURE**", subsection "**PC CMOS SET-UP PROGRAM**" later in this manual (page 26), and the PC manufacturer's documentation.

The currently approved (factory installed) plug-in RS-422 board is manufactured by B&B Electronics. Its

model number is 3PXOCC1A (part number 344A3927P38). 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.

Configuration for the 3PXOCC1A board is:

Address Switches (S1)	(MSB)11111111(LSB)
	= 3F8 Base Hex Address
Interrupt Jumper	IRQ4
Jumpers ¹ JP2 - JP5	Upper Position
Jumpers ² JP6 - JP7	Lower Position

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

COM Port	COM1
Port Address	3F8
Interrupt	IRQ4

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. 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 4 or the cable's assembly diagram near the end of this manual for wire color coding. Also see Figure 6A and the cable's assemble diagram on page 36.

¹ Add ten (10) to jumper numbers for earlier 3PXOCC1A boards (JP2 thru JP5 = JP12 thru JP15).

² Add ten (10) to jumper numbers for earlier 3PXOCC1A boards (JP6 thru JP7 = JP16 thru JP17).

Table 4 – Cable 19B804083P3 Color Coding

PC RS-422 PORT DB-25 PIN NO.	CONSOLE RS-422 SIGNAL	WIRE COLOR (Also see page 36)	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.

NOTE

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. In addition, the cable is also not compatible with earlier C3 Maestro console PCs equipped with main board RS-422 COM ports such as the Dasher PCs manufactured by Data General.

□ If cable 19B802083P3 is not used for RS-422 hook-ups, see Figures 4 and 6A 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.

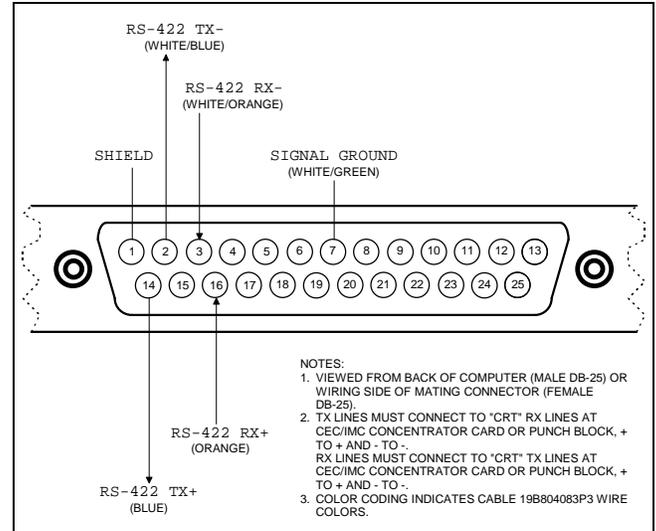


Figure 4 – Plug-In RS-422 Board DB-25 Connector Pin-Out (B&B Electronics 3PXOCC1A Board)

NOTE

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

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 6B 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:

• **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 6A. See the customer-specific system documentation print-outs for Concentrator Card connector pin-out details.

Table 5 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 5 and 6A and Table 12. 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 5 and in the cable's assembly diagram shown at the end of this manual (page 37). 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 5 and 6 and Tables 5 and 12 for details.

NOTE

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

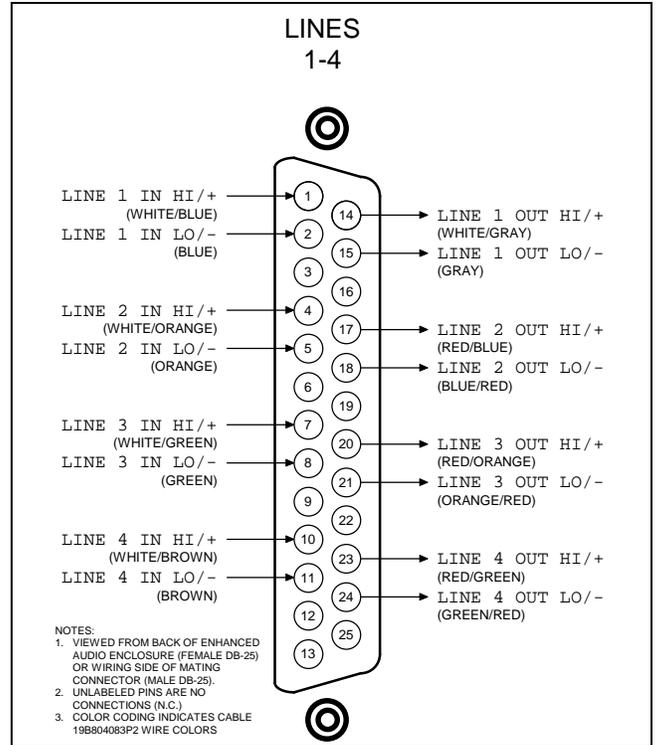


Figure 5 – Audio Line Input And Output Connections At Enhanced Audio Enclosure

Table 5 – 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	
CONSOLE INPUT OR OUTPUT (2-Wire)	IN	OUT	IN	OUT	IN	OUT	IN	OUT
CEC/IMC INPUT OR OUTPUT (2-Wire)	OUT	IN	OUT	IN	OUT	IN	OUT	IN
SELECT SPEAKER/HEADSET	X							
MICROPHONE		X						
UNSELECT SPEAKER 1			XX					
UNSELECT SPEAKER 2					XX			
UNSELECT SPEAKER 3 *							XX	
CALL DIRECTOR PATCH *							XX	XX

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

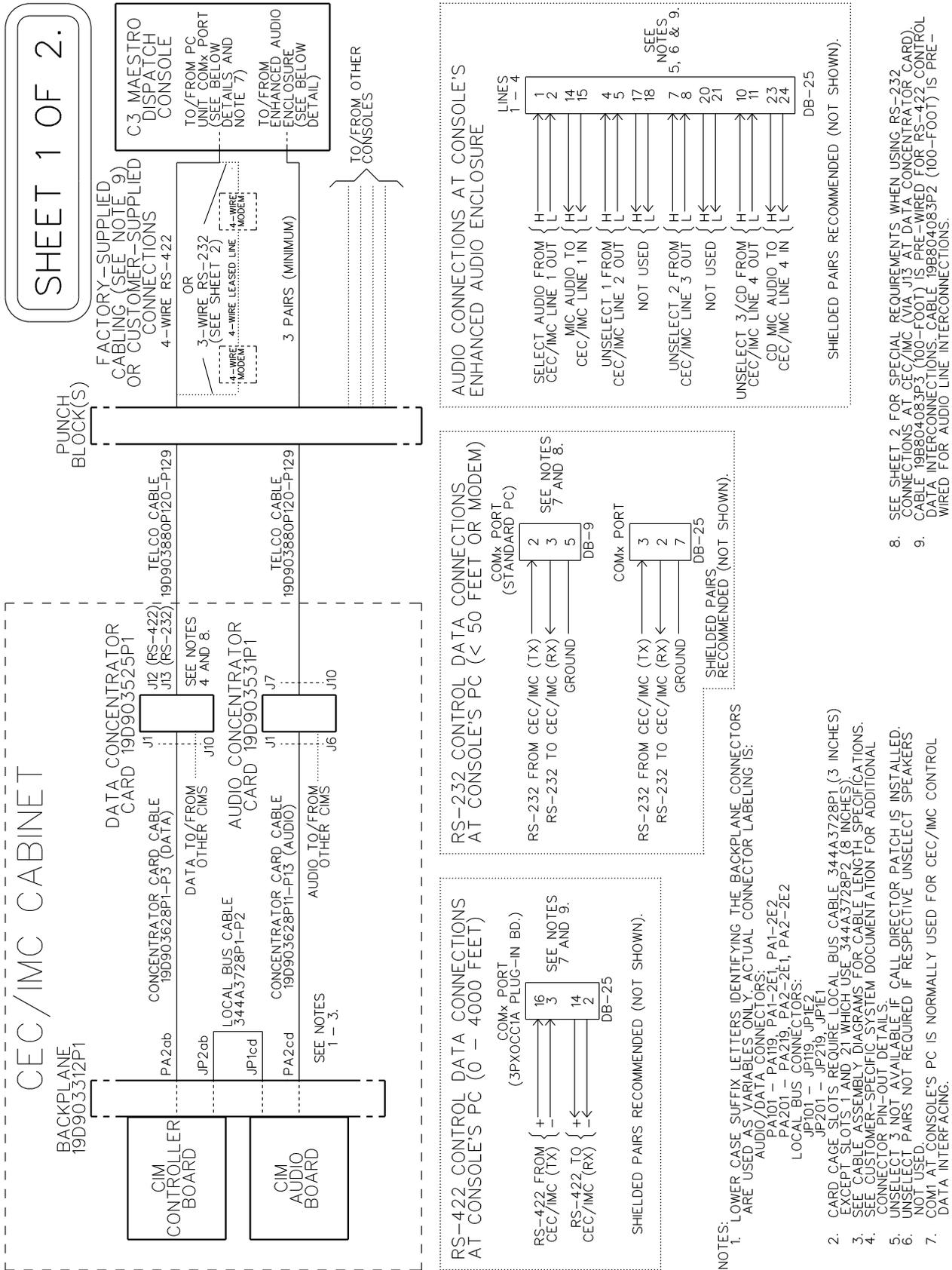


Figure 6A - CEC/IMC-To-C3 Maestro Interconnections (Co-Located)

SHEET 2 OF 2.

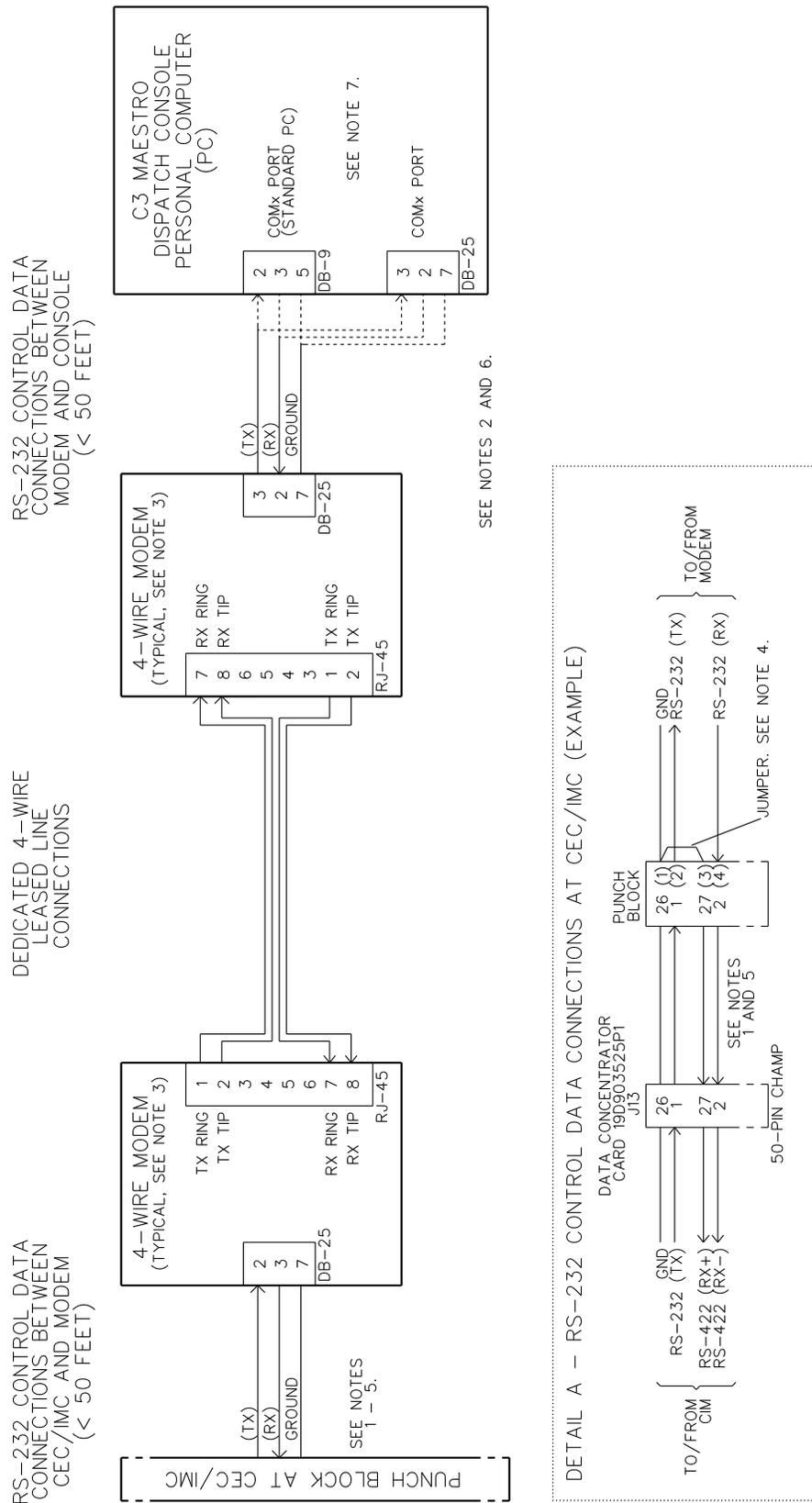


Figure 6B – CEC/IMC-To-C3 Maestro Interconnections (Remote And/Or RS-232)

- NOTES:
1. SEE CUSTOMER-SPECIFIC SYSTEM DOCUMENTATION PRINT-OUTS FOR PUNCH BLOCK CONNECTOR PIN-OUT DETAILS.
 2. SHIELDED PAIRS RECOMMENDED (NOT SHOWN).
 3. SEE MODEM MANUFACTURER'S DOCUMENTATION FOR SPECIFIC CONNECTOR PIN-OUT DETAILS.
 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 PINS OUT FIRST CONSOLE ON PUNCH BLOCK ONLY.
 6. AUDIO CONNECTIONS NOT SHOWN.
 7. COM1 AT CONSOLE'S PC IS NORMALLY USED FOR CEC/IMC CONTROL DATA INTERFACING.

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 19.2k 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 COM2 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 6.

Standard PC Keyboard

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

- for file management (for example - AUTOEXEC.BAT and CONFIG.SYS file changes may be necessary)
 - to configure certain items via the Editor program (see LBI-39056 for details)
 - to start the console's application program
- 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.

Video Display Monitor

- Interconnect the video display monitor's video cable to the Personal Computer in accordance with the manufacturer's instructions.

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

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 24.

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 15. Observe the microphone priority **NOTE** in the following section; 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".
- 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 16 and 17.

NOTE

Microphone priority is (highest to lowest):

- Supervisory Headset Mic (highest)
- Operator Headset Mic ↑
- 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.

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.

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 6 *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 14 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 boom/gooseneck mic's magnetic voice coil may occur.

Table 6 – Boom/Gooseneck Mic Wiring*

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

* Also see the following NOTE.

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 20 and 21 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.
- 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 20 and 21 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 18 and 19 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. The unselect output may, however, be reconfigured via software to output Call Director audio. 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 7 and Table 27 for terminal identification. See the specifications in LBI-39100 for audio signal output level specifications. If required, audio output levels may be adjusted via a C3 Maestro note card.

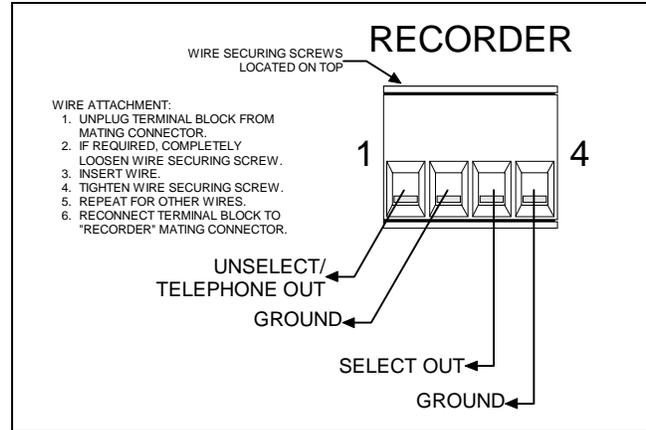


Figure 7 – Recorder Outputs At Enhanced Audio Enclosure

Paging Input (if used)

Paging connections 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 8, 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 8 and Table 26. The audio terminals are isolated from ground. See the specifications page in LBI-39100 for audio signal input level specifications. If required, audio input level adjustment may be accomplished via a C3 Maestro note card.

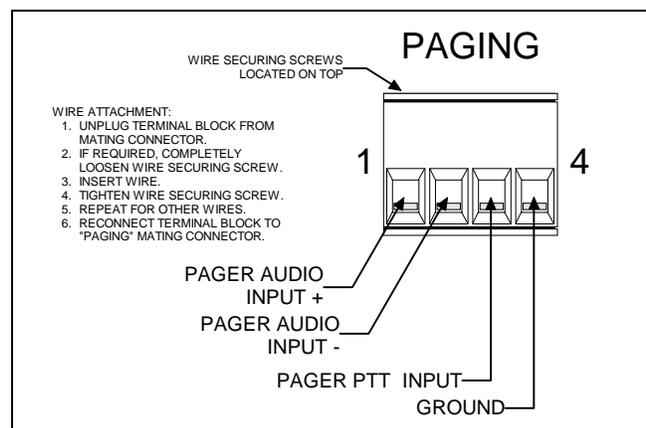


Figure 8 – Pager Inputs At Enhanced Audio Enclosure

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 25, 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 25 and Figure 9. 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.

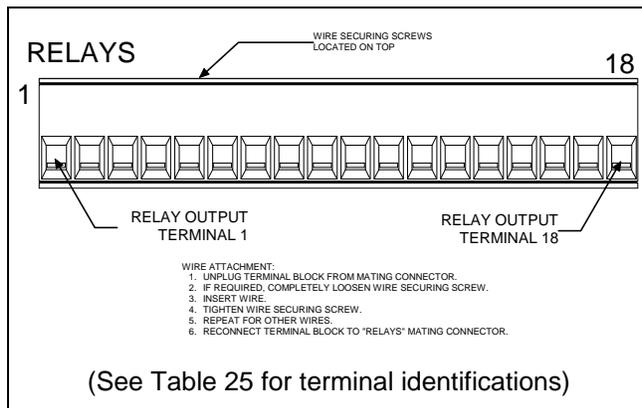


Figure 9 – Relay Terminal Block At Enhanced Audio Enclosure

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 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, 5, 6 and 10 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 7 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.

- 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**" for details (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 14).

Console-to-Call Director Interconnections

Table 8 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 10 and Table 13 indicate the connector's pin-out.

- Interconnect the Enhanced Audio Enclosure to the Call Director as required per Tables 8 and 13, Figure 10, and the Call Director's documentation.

Table 7 – 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 8 – 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.

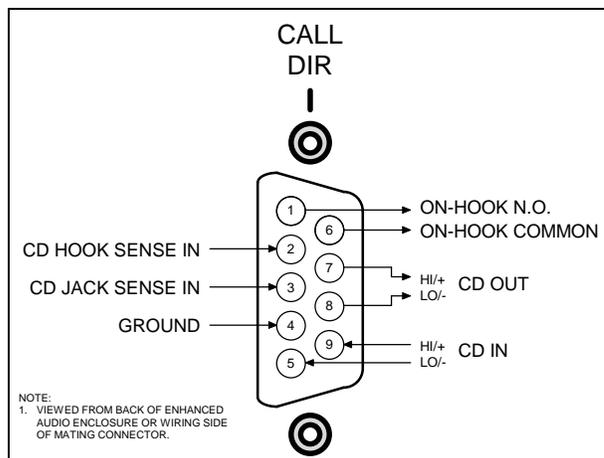


Figure 10 – Call Director Interface Connector At Enhanced Audio Enclosure

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.

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).

AUDIO TOWER REPLACEMENT

This section lists the steps necessary to replace earlier Audio Tower hardware with Enhanced Audio Enclosure hardware. Existing Personal Computer (PC) hardware is not replaced, only the C3 Maestro application software which it executes. To avoid duplication of information, many references are made to other Enhanced Audio Enclosure-related installation and set-up sections within this manual.

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 25.

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 includes 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. 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.
- ### 3. PC-To-Enhanced Audio Enclosure Serial Link
- Using PC's CMOS set-up program, enable the PC's serial port (DB-9 connector) for COM2/address 2F8h and interrupt IRQ3 operation. If the PC is equipped with two serial ports, enable the second port (typically port "B"). The C3 Maestro's application software sets the port's baud rate. Refer to the section entitled "**SOFTWARE INSTALLATION AND SET-UP PROCEDURE**", subsection "**PC CMOS SET-UP PROGRAM**" (page 26) for additional information.
 - Connect this serial port (COM2) to the Enhanced Audio Enclosure in accordance with subsection "**PC-To-Enhanced Audio Enclosure Serial Data Interconnect Cable**" in this manual (page 18).

4. Application Software Installation

- If necessary, obtain C3 Maestro application software V5.0 (or later).
- Install this software on PC's hard disk drive in accordance with the supplied instructions.
- Optional: Delete the old C3 Maestro application software from the PC's hard disk drive.

5. 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 6 in this manual.

6. Console-To-CIM Audio Link

- If using existing modular cabling*, cut the modular plugs off 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 14) 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 14).

7. 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 24:

Table 9 – Dispatch Keyboard Cable Color Coding

MALE DB-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" in this manual (page 18).

8. 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 18). No wiring changes are necessary.

9. 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 subsection entitled "Footswitches (if used)" in this manual (page 19) 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.

10. 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 19).

11. 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 20). 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.

12. 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 "**Paging Input (if used)**" in this manual (page 20). 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.

13. 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 21).

14. 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 21) for additional details. Line coupling transformers utilized between an earlier ("Phase 1") Audio Tower and the Call Director are not required and they should be removed in Enhanced Audio Enclosure applications.

15. 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 three (3) units, verify each power switch is in the off position.
 3. Connect the PC, video display monitor and the Enhanced Audio Enclosure to a 115 or 230 Vac source. Normally, 1½ 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.
 8. Continue with the software installation and set-up procedures that follow.

SOFTWARE INSTALLATION AND SET-UP PROCEDURE

NOTE

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

PC CMOS SET-UP PROGRAM

C3 Maestro software is factory-installed on the PC's hard disk drive and the software is configured properly for standard installations. Therefore, during a typical console configuration, the information in this section may be bypassed.

All PCs used with the C3 Maestro store start-up configurations in CMOS memory. This information is read by the computer's BIOS and it may be changed by executing a set-up program during the PC's boot process. Execute the PC's set-up program only if a built-in (main board) COM port must be disabled/enabled or if documentation included with the PC deems it necessary for some other reason.

NOTE

Time and date will be correctly set by the CEC/IMC Manager (MOM PC) when the console is on-line with the CEC/IMC.

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:

- COM2 is enabled by setting "Serial Port B" to "Serial 2F8h IRQ3". This is the standard factory configuration. Normally, this serial port is used to interface the PC to the Enhanced Audio Enclosure.

- COM1 is disabled by setting "Serial Port A" to "Off". This disables the computer's main board COM1 serial port so the plug-in RS-422 board used for CEC/IMC control data interfacing can be set to COM1 without conflicting. This is the standard factory configuration. If the plug-in RS-422 board is not being used and the main board COM1 port is used for CEC/IMC control data interfacing, set "Serial Port A" to "Serial 3F8h IRQ4".

If any necessary 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.

FILE DIRECTORIES AND CONTENTS

Table 10 specifies PC file directories and files directly applicable to the C3 Maestro console. The MS-DOS file directory and its files are not shown. Also, other utility files are not listed in the table may exist in a utility directory which are not essential to the operation of the C3 Maestro application program.

Table 10 – C3 Maestro PC File Directories And Files

ROOT DIRECTORY (C:\)	CONSOLE DIRECTORY (C:\CONSOLE)
AUTOEXEC.BAT CONFIG.SYS COMMAND.COM* IO.SYS* MSDOS.SYS*	AUXIO.DAT CONFIG.DAT CONKEY.COM CONSOLE.EXE EDITOR.EXE ENGLISH.DAT ENTITY.DAT FONT33.DAT SETUPS.DAT

* MS-DOS 6.0 or later. IO.SYS and MSDOS.SYS are hidden files.

AUTOEXEC.BAT File Contents

Contents of the AUTOEXEC.BAT file located in the root directory (C:\) are as follows. Changes are not recommended:

```
@ECHO OFF
PATH=C:\DOS;C:\UTIL
PROMPT $P$G
CD\CONSOLE
CONKEY
CONSOLE
```

CONFIG.SYS File Contents

Contents of the CONFIG.SYS file located in the root directory (C:\) are as follows. Changes are not recommended:

```
FILES=20
BUFFERS=40
DEVICE=C:\DOS\ANSI.SYS
```

EDITOR PROGRAM

If necessary, the Editor program (EDITOR.EXE) can be used to change one or more of the following console-related parameters (non-inclusive list):

- Serial Ports' Settings (baud rates and serial/parallel interface; PC-to-Enhanced Audio Enclosure interface is always serial)
- Set-Up Titles
- Call Director ID
- headset sidetone volume levels

With the exception of the Call Director ID parameter, these console-related parameters cannot be changed via the CEC/IMC Manager (MOM PC).

Most console-related configuration parameters should be changed at the CEC/IMC Manager and sent to the console. Users of the Editor program must understand the CEC/IMC Manager should be the central point of databasing and configuration for all C3 Maestro consoles connected to the CEC/IMC Digital Audio Switch. Changes made locally via the Editor program will override settings previously made via the CEC/IMC Manager. Correspondingly, changes made via the CEC/IMC Manager will override settings previously made via the Editor program.

At the PC's standard keyboard, execute the Editor program by typing EDITOR followed by an <Enter> from an MS-DOS prompt. The current directory must be C:\CONSOLE. See the LBI-39056 for additional details on the use of the Editor program.

Serial Ports' Settings

Normally, the PC's COM1 serial port is utilized for CEC/IMC control data interfacing. The baud rate of this port may be set to operate at 19,200 or 9600. The 19,200 setting is recommended for all co-located console hook-ups. The 9600 baud setting is normally required when a data modem is employed between the console and the CEC/IMC in a remote console installation.

- If necessary, use the Editor program to change the COM1 baud rate. Save the change to the hard disk drive. 19,200 baud is the factory (default) setting. See LBI-39056 for additional details. The CEC's/IMC's CIM has auto-baud sensing; therefore, no CIM changes are required when a baud rate change is made here.

Normally, the PC's COM2 serial port is utilized for Enhanced Audio Enclosure control data interfacing. In this case the port operates at 9600 baud. This setting is fixed in the PC's software and in the Enhanced Audio Enclosure's firmware. It cannot be changed.

Editor program version 5.0 (and later) includes a setting to select Enhanced Audio Enclosure (serial) *or* Logic Board (parallel) interfacing. When using an Enhanced Audio Enclosure, enable/verify serial operation as follows:

- From the Editor program's "CONFIGURATION DATA" screen, verify the "Serial Audio System" parameter is "Y" (enabled). This is the factory default setting for Editor program version 5.0 (and later).

Set-Up Titles

From the Editor program's "USER PROFILE DATA" screen, enter the titles as required. These titles are displayed on the C3 Maestro's "Change Setup" note cards. Ten (10) titles, each with thirty-one (31) alphanumeric characters, are available. See LBI-39056 for additional details.

Call Director ID

Call Director ID is a secondary console ID number that is only used for Call Director telephone patch operations. The default value for this ID is zero (0) – no Call Director. Valid Call Director ID range is 1 - 16382. The zero setting should not be changed unless a Call Director is attached to the console and the console will be used for Call Director patch operations. The ID resides in the unit/console ID space and it should therefore be a unique (unused) ID number. *Console ID and Call Director ID should **never** be identical.*

- ❑ If using CEC/IMC firmware version 2.x (and earlier), set the Call Director ID number from the Editor program's "CONFIGURATION DATA" form. Save changes to the hard disk drive. See LBI-39056 for complete details.
- ❑ If using CEC/IMC firmware version 3.x (and later) the Call Director ID setting should be made via the CEC/IMC Manager's "Console Hardware Configuration" option and then sent to the console.

RUNNING THE C3 MAESTRO APPLICATION PROGRAM

The C3 Maestro application program will automatically start when the PC is powered up via the CONSOLE(.EXE) statement in the AUTOEXEC.BAT file. After exiting the program, restart it again from the PC's standard keyboard by typing CONSOLE followed by an <Enter> at the MS-DOS prompt. The current directory must be C:\CONSOLE.

The CONKEY.COM program is also run via the AUTOEXEC.BAT file at boot-up. This program allows the C3 application program to be quickly restarted by simply pressing function key <F10> on the PC's standard keyboard.

In a new console installation, after starting the C3 Maestro application program, databases must be initialized as described in the following section. This must be accomplished before dispatch operations can be performed.

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). See the appropriate manual listed in Table 11 for CEC/IMC Manager operating details.

**Table 11 – CEC/IMC Manager (MOM PC)
Operations Guide Publication Numbers**

SOFTWARE VERSION	V2.1x	V3.0x	V4.0x	V5.x
PUBLICATION NUMBER	LBI-38911	LBI-39024	LBI-39124	LBI-39224

Basically, except for sending console configurations, all procedures presented assume all CEC/IMC console 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 details.

NOTE

If using CEC/IMC Manager version 5.x (or later) software (any CEC/IMC Manager for Windows NT version), menu titles and menu selections will differ from those presented in the following subsections. In this case, refer to LBI-39244 (or later) or the CEC/IMC Manager's on-line help for exact menu selections required to accomplish these console-related configurations.

Console User Profile Configuration

From the CEC/IMC Manager, user profile data is sent only to the targeted console. When a target console receives user profile data from the CEC/IMC Manager it will send an acknowledgment to the CEC/IMC Manager. Send user profile data to the console as follows:

1. From the CEC/IMC Manager's "CEC/IMC MOM Options" main menu, select the "Console Configuration" option. This will display the console configuration menu.
2. From this menu, select the "Console User Profile" option. This will display the "CONSOLE USER PROFILE CONFIGURATION" screen.
3. Verify the "Console" number matches the CIM's console assignment number defined by the CIM's Controller Board DIP switches.
4. Verify the "Unit ID" number does not conflict with any other console or radio ID number (LID) in the system.
5. Select the correct "Setup" and then make any required modification(s) to the configuration. Save the new configuration. Refer to LBI-38938 and the applicable CEC/IMC Manager publication listed in Table 11 for complete details.
6. Press the <F7> function key to send the Console User Profile configuration to the console.
7. When the "User Profile Successfully Written..." message is displayed, return to the CEC/IMC Manager's main menu. If an "Unable to Write User Profile..." message appears or no message appears after ten (10) seconds, the CIM may not be properly installed and/or configured. Check Controller Board installation and DIP switch settings. Refer to the *CEC/IMC Digital Audio Switch Installation,*

Set-Up And Troubleshooting maintenance manual, LBI-38938. A "User Profile Successfully Written..." message must be received before continuing.

System Manager Database Uploads

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

1. From the CEC/IMC Manager's "CEC/IMC MOM Options" main menu, select the "System Manager Data" option. This will display the System Manager data menu.
2. Select "Upload From System Manager".
3. From the "SYSTEM MANAGER UPLOAD STATUS" screen, select <F1> then <F8> for a full unit upload. After the upload is complete, exit the unit upload screen by pressing <Esc>.
4. From the "SYSTEM MANAGER UPLOAD STATUS" screen, select <F2> then <F8> for a full group upload. After the upload is complete, exit the group upload screen by pressing <Esc>.
5. From the "SYSTEM MANAGER UPLOAD STATUS" screen, select <F6> then <F8> for a full site upload. After the upload is complete, exit the site upload screen by pressing <Esc>.
6. From the "System Manager Data" menu, select the "Upload From MOM PC" option.
7. From the "MOM PC BASED SYSTEM MANAGER UPLOAD STATUS" screen, select <F3> then <F8> for a full conventional channel upload. After the upload is complete, exit the conventional upload screen by pressing <Esc>.
8. From the "MOM PC BASED SYSTEM MANAGER UPLOAD STATUS" screen, select <F5> then <F8> for a full console upload. After the upload is complete, exit the console upload screen by pressing <Esc>.

NOTE

System Manager database uploads 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 "CEC/IMC MOM Options" main menu, select the "Console Configuration" option. This will display the console configuration menu.
2. From this menu, select the "Console Privilege List" option.
3. From the "CONSOLE PRIVILEGE LIST UPLOAD" screen, enter the number of the console (1 - 32).
4. Select <F7> to send the privilege list data to the console.

Saving Database Information

At the C3 Maestro console, the following database information is saved automatically to the PC's hard disk drive after the last record is received. No user action is required:

- User Profiles
- Hardware Configurations

The following data is not saved automatically, but on demand or by prompt:

- System Manager Upload Data
- CEC/IMC Manager Upload Data
- Module Set-Ups

Upload data should be saved after it is transferred to the console's PC. Modules set-ups should also be saved after changes are made to the modules. Saving prevents configuration problems if the PC's power is cycled or if it is rebooted. To save upload data and module set-ups, press <F10> on either keyboard. This will save the data to the PC's hard disk.

CEC/IMC AUXILIARY I/O

A C3 Maestro console may be utilized to monitor and control CEC/IMC auxiliary I/O (input/output) events. CEC/IMC firmware/software 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.

At the console, no auxiliary I/O-related configurations are necessary; all auxiliary I/O configurations are accomplished at the CEC/IMC Manager. Basically, these configurations include, on a per auxiliary I/O event basis (non-inclusive listing):

- defining the event for input *or* output operation (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
- for an input event, defining a text message which is sent to the console(s) when the event is triggered (when it transitions to the active state)
- for an output event, defining if it will operate with momentary *or* toggle action, and defining which console keystroke or other trigger signal controls the event

Refer to the appropriate manual listed in Table 11 and/or the CEC/IMC Manager's on-line help for configuration details. Also see LBI-38938.

If a C3 Maestro console is granted monitoring/control capability of auxiliary I/O events via "console mask" definitions, it can monitor input event transitions and it can control output event transitions. For auxiliary input events, text messages display in the bottom left corner of the console's display. Auxiliary output events are controlled via <Alt><F1> thru <Alt><F8> keystrokes from the console's dispatch keyboard.

SOFTWARE INSTALLATION AND UPGRADES

As previously stated, all C3 Maestro application software is installed on the PC's hard disk drive at the factory. Refer to publication SRN-1000-xx which is included with a software upgrade package if a re-installation or an upgrade is necessary.

ENHANCED AUDIO ENCLOSURE CONNECTOR PIN-OUTS

Tables 12 thru 28 that follow 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 11 shows the rear panel and serves as a guide to the desired table(s).

**Table 12 – 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 5.

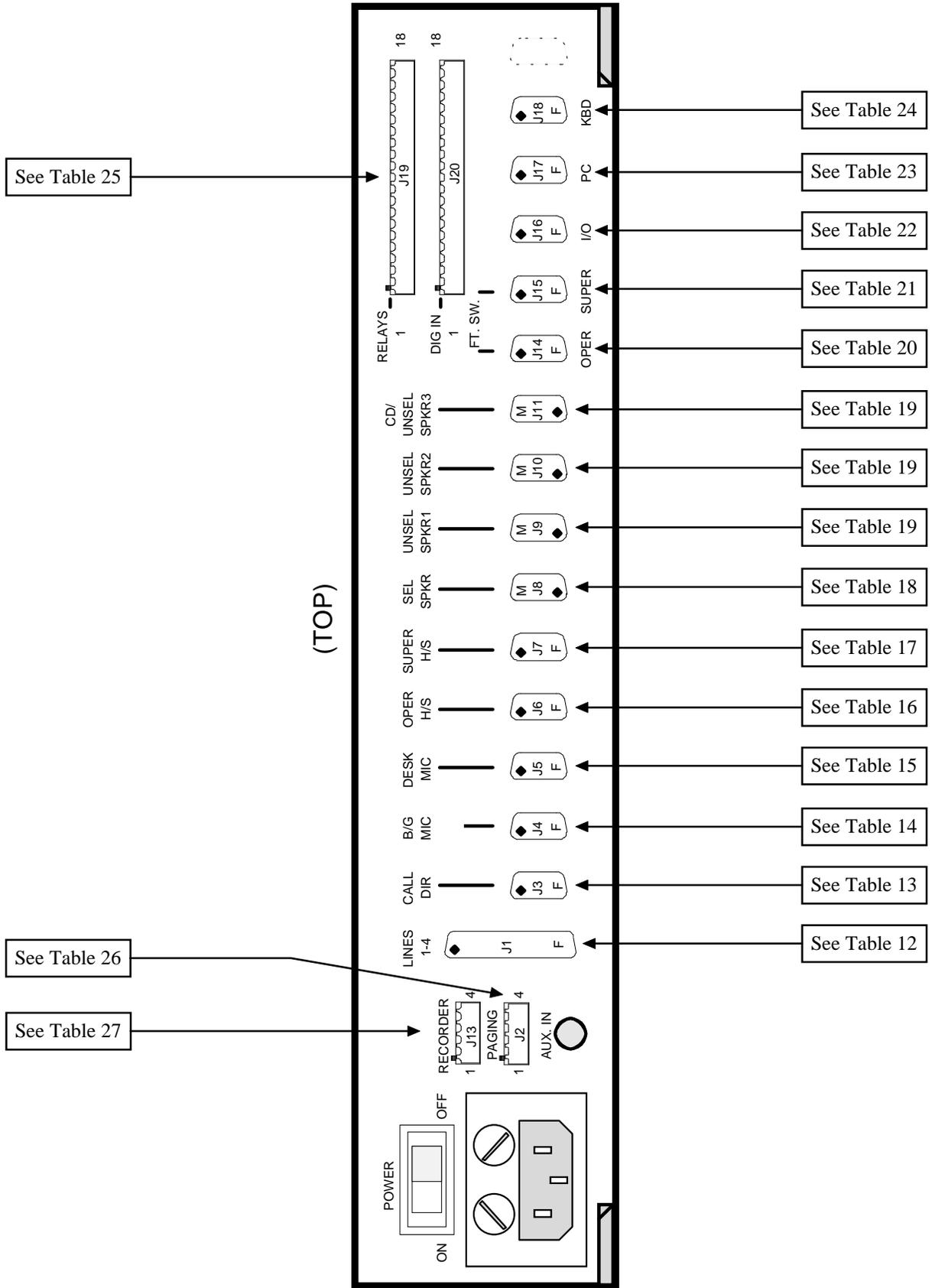


Figure 11 – Enhanced Audio Enclosure Rear Panel Connectors

Table 13 – Call Director
(female DB-9 labeled "CALL DIR")

PIN	NAME	USE
1	ON_HOOK_NO	output; see pin 6 and Table 8
2	CD_HOOK_SENSE_IN	inputs; see Table 8
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 14 – 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 6

* Jumper pins 2 and 3 on mating connector.

Table 15 – 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 16 – 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 17 – 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 18 – 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 19 – 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 20 – 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 21 – 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 22 – 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 23 – 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 24 – 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 9 for wire color coding.

**Table 25 – 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 26 – Pager Input
(4-position terminal block labeled "PAGING")**

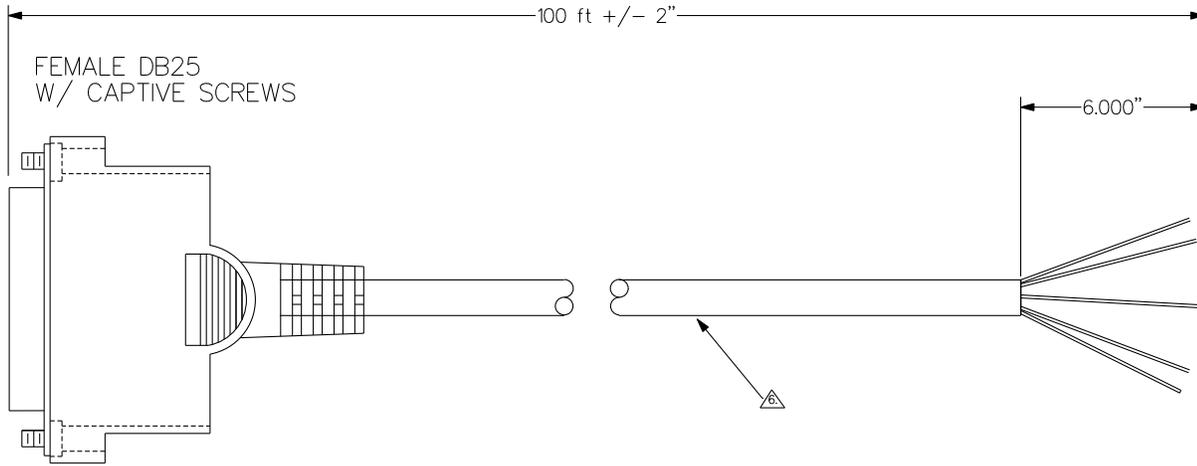
TERMINAL	NAME	USE
1	PAGER_IN+	balanced audio input
2	PAGER_IN-	
3	PAGER_PTT_IN	PTT (enable) input
4	PS_GND_IN	ground for pin 3

**Table 27 – Recorder Outputs
(4-position terminal block labeled "RECORDER")**

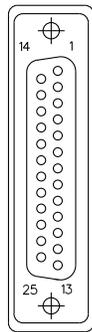
TERMINAL	NAME	USE
1	USEL/TELE_RECORDER_OUT	unselect/telephone recorder output
2	AGND	ground for pin 1
3	SELECT_RECORDER_OUT	select recorder audio output
4	AGND	ground for pin 3

**Table 28 – Auxiliary Audio Inputs (Not Supported)
(1/8-inch stereo phone jack labeled "AUX. IN")**

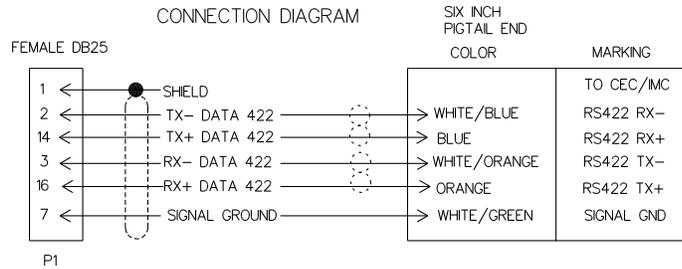
TERMINAL	NAME	USE
tip	AUX_LEFT_IN	left chn. input (green)
ring	AUX_RIGHT_IN	right chn. input (red)
sleeve	AUX_IN_GND	grounds T and R (black)



FEMALE DB25
WIRING SIDE
SHOWN



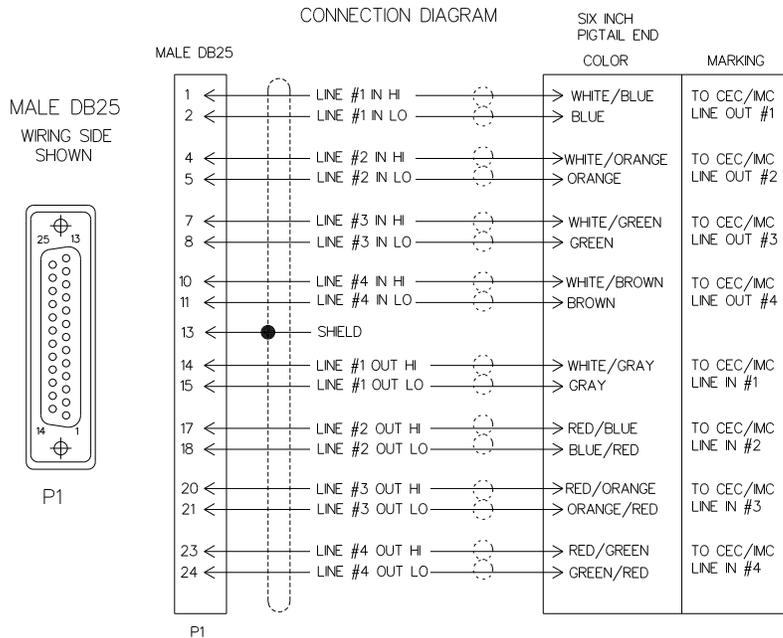
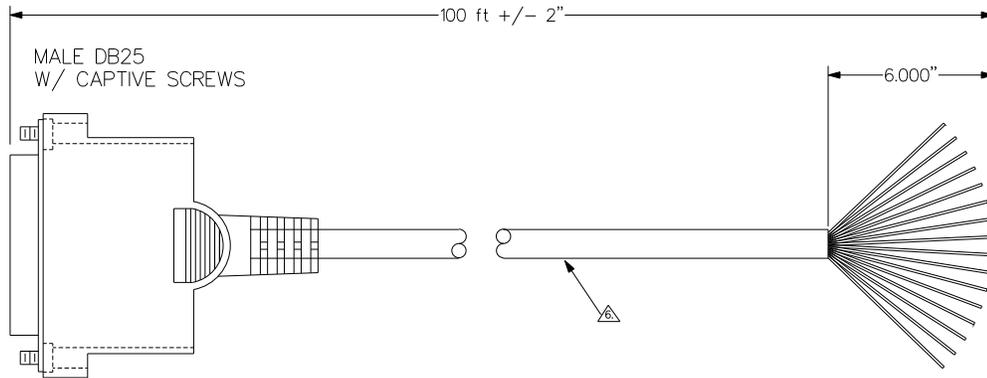
P1



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
△		BELDEN 1456A	4 PAIR SHIELDED CABLE, #24 AWG, 100'	

**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'

**AUDIO CABLE (100-FOOT)
19B804083P2**

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

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Printed in U.S.A.