LBI-39124

Operations Guide

EDACS®
CEC/IMC MANAGER
(MOM PC) Version 4.0

ERICSSON

PERSONAL COMPUTER PROGRAMMING

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Repairs to this equipment should be made only by an authorized service technician or facility designated by the supplier. Any repairs, alterations or substitution of recommended parts made by the user to this equipment not approved by the manufacturer could void the user's authority to operate the equipment in addition to the manufacturer's warranty.

NOTICE!

TABLE OF CONTENTS

INTRODUCTION

Ericsson welcomes you to the world of mobile communications. We believe there is no equal to Ericsson products and have made a commitment to our customers to ensure that product satisfaction and reliable service is our number one priority.

Quality built and dependable, the CEC/IMC Manager, or Monitor Module (MOM) PC, is a tool designed to monitor and configure the CEC/IMC Digital Audio Switch.

This manual has been written to give you a clear and concise understanding of the CEC/IMC Manager (MOM PC) and will discuss:

- the steps necessary to install the program
- the procedures to set-up and operate the CEC/IMC Manager

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CHAPTER 1
BEFORE YOU BEGIN

ABOUT THIS MANUAL

This document describes the CEC/IMC Manager (MOM PC) user interface and functions. It is intended to aid the user in performing various CEC/IMC Manager functions such as CEC/IMC configuration and viewing interface module status data. The various screens the user may encounter are walked through and explained in full detail. The following sub-sections highlight the major functions of the CEC/IMC Manager.

Configuration

- **MOM Parameters** – Set MOM serial interface baud rates for System Manager and CEC/IMC Manager, enable/disable data logging, enable/disable printer, enable/disable redundant clocks, enable/disable unit logout timers, and set the datalog threshold number.

- **Time and Date** – Set system time and date. This is broadcast throughout the entire CEC/IMC for time synchronization. Also configure the NETCLOCK/2 interface (optional).

- **System Manager Database Uploads** – Transfer unit, group and site databases from the System Manager to the CEC/IMC Manager. Transferred information is automatically distributed to the CEC/IMC interface modules as required.

- **CEC/IMC Manager-Based System Manager Database Uploads** – Distribute System Manager database information stored at the CEC/IMC Manager to CEC/IMC interface modules. An active System Manager link is not required.

- **TDM Buses** – Configure the number of TDM buses to match number of buses supported by the installed CEC/IMC Audio Boards.

- **TDM Bus Time Slots** – Configure the number of TDM bus time slots required by each site-type, console, digital voice, and EDACS Data Gateway (EDG) interface.

- **Trunked and Console Channels** – Adjust audio levels and other related parameters for each site-type, console, and EDACS Data Gateway (EDG) interface.

- **Conventional Channels** – Adjusts audio levels, type of control (tone, dc, etc.), and other related parameters for conventional channel interfaces. Also, set conventional channels for hard patch or hard simulselect operation.

- **Digital Voice Channels** – Configure digital voice channels for either pooled (dynamic) or dedicated call assignment operation.

- **Confirmed Call** – Configure confirmed call options, exempt sites from confirmation process and enable automatic confirmed call database repair.

- **Console User Profiles** – Configure console user-specific parameters. Up to ten (10) different console user profile set-ups (shifts) are available for each console.

- **Console Privilege Lists** – Assign unit, group, conventional channel and phone line privileges to each console.

- **C3 Modular/Desktop Consoles** – Perform special console configurations for C3 Modular/Desktop consoles.

- **Distributed Multisite / StarGate Networks** – Configure Network Interface Module (NIM) and StarGate network options such as NIM baud rates, NIM audio channel parameters, and conventional channel settings.

- **Logging Recorders** – Configure logging recorder channels such as output level and assigned entity (unit, group, etc.).

- **Auxiliary I/O** – Program auxiliary I/O events.

- **Multisite Unit Logout** – Configure multisite unit logout parameters for each unit. Both timer-based and instant command logouts are provided.

- **ProSound** – Configure ProSound site adjacency information for each site. This information is used during wide area scan operations.

Monitoring Functions

- **View Node Statistics** – Used to view error reports on a interface module-by-interface module basis. Also reports Global Serial Channel (GSC) loading.

- **View System Configuration** – Used to view interface module (CAM, CIM, CTIM, DVIM, LRIM, MIM, MOM, NIM, PIM, RIM, VMIM, XLTR) statistics, their assignments, and associated GSC node address.

FEATURES

One of the most important features of the CEC/IMC Manager (MOM PC) is its ability to log data. All data that is placed on the GSC in the CEC/IMC is logged at the MOM Controller Board. The Controller Board then periodically dumps its data log buffer to the CEC/IMC Manager serially. The CEC/IMC Manager writes this data to its hard disk, where it can be extracted and viewed on-line or off-line. The off-line functions are:

CALLS.EXE	Used to extract all calls made within the CEC/IMC.
GSCMON.EXE	Used to extract all messages from the logged data.

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CHAPTER 2
INSTALLATION

UNPACKING

Upon unpacking this package you should verify you have received the following:

- CEC/IMC Manager V4.0 software – located on one 3-1/2 inch diskette (344A3630G11); this software may already be installed on the computer's hard drive
- this manual (LBI-39124)

CEC/IMC MANAGER REQUIREMENTS

The following minimum hardware and software configuration is required to operate the CEC/IMC Manager (MOM PC):

A. IBM PC 386 or any true compatible with MS-DOS version 5.0 (or later) having the following minimum configuration:
   1. two (2) disk drives – a single floppy drive and a fixed disk (hard) drive system
   2. 640K conventional RAM and 1 - 2 megabytes of extended memory
   3. two (2) serial ports
   4. Expanded Memory Manager loaded via CONFIG.SYS

B. EGA video card and monitor (or better – i.e. VGA).

DISKETTE HANDLING

While working with your diskette you may want to consider the following handling procedures:

- Always store your diskette in the envelope.
- Insert diskette into the drive carefully.
- Use only felt tipped pens to write on diskette label.

- Store your diskette at a comfortable room temperature.
- Refrain from touching the recording surface.
- Do not bend the diskette.
- Do not allow any form of liquid to come in contact with the diskette surface.
- Keep diskette away from magnetic fields as found in electronic equipment.

If you follow these simple guidelines you will receive long service from your diskette.

MAKING BACKUPS

This software is provided on a 3-1/2 inch diskette labeled "CEC/IMC Manager V4.0x". This diskette is very sensitive and fragile and therefore, should be handled with care and stored in a secure area.

We recommend that upon receipt of your diskette, you copy the original diskette to another diskette or a fixed disk and store the original in a safe place. This ensures the availability of an accurate program should the copy fail during program applications.

NOTE

It is important to use the DISKCOPY command when making a backup and not the COPY or XCOPY commands. The diskette contains a volume label that is required for the installation process. COPY and XCOPY do not copy volume labels so please refrain from using these commands.

SYSTEM HOOK-UP

Connect all peripheral equipment to your computer prior to configuring the software items described in Chapter 3 of this manual. Refer to the operating manuals of each device for correct installation procedures. Also see the *CEC/IMC Digital Audio Switch Installation, Set-Up and Troubleshooting* maintenance manual (LBI-38938) for interconnection details.

If your system is already established, check to see that you have all the equipment necessary to execute the program. Isolate all cables connecting the equipment to prevent tangling, interference and damage.

LOADING THE SOFTWARE

To install the CEC/IMC Manager software on the computer's fixed disk (hard) drive:

NOTE

In most cases, the CEC/IMC Manager software is pre-installed at the factory (MOMPC directory). If so, skip steps 1 and 2 below.

Step 1 Place the diskette labeled "CEC/IMC Manager V4.0x" in Drive A:

Step 2 Type **A: INSTALL <Enter>**

Once you have completed the installation procedure, the following steps may be taken to run the CEC/IMC Manager (MOM PC) program:

Type: **C: <Enter>**
cd \MOMPC

This step will ensure that the current drive is the CEC/IMC Manager's fixed disk (hard) drive.

Type: **O_MOMPC <Enter>**

The CEC/IMC Manager Software will load into memory and an introductory screen will appear to identify the program.

NOTE

If a WARNING message appears indicating there was no expanded memory found during initialization, do not ignore this warning. This version of CEC/IMC Manager is larger than the 640K conventional memory limitation and it requires expanded memory and an Expanded Memory Manager to run efficiently.

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CHAPTER 3
CONFIGURATION

3.0. CEC/IMC MOM OPTIONS

Type O_MOMPC to execute the CEC/IMC Manager (MOM PC) program. Refer to the section in the previous chapter entitled "LOADING THE SOFTWARE" if this has not been accomplished. You will be prompted for a user name and password before execution of the program will continue. The default user name is "MOMUSER" and the default password is "GUEST". These log-in defaults are provided in the PASSWORD.DAT file that comes with the CEC/IMC Manager (MOM PC) installation disk. This disk should be safeguarded by the system administrator after the installation is complete. It is recommended that you delete the default log-in user name and create some of your own. Multiple functional access levels are supported. See the User Account Maintenance section (3.6.) for additional details.

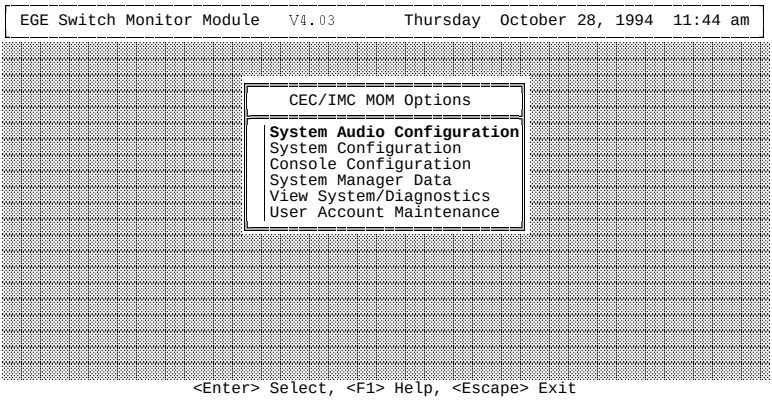

Figure 3.0-1 CEC/IMC Manager Main Menu

After successfully logging in, the CEC/IMC Manager main menu (shown above) displays all the different options available to the user. The user may select any one of the options by simply highlighting the desired option (using the arrow keys) and pressing the **<Enter>** key. Each specific option is discussed in this chapter. A help window/screen for the selected option will appear when the **F1**

function key is pressed. Figure 3.1-1. shows the System Audio Configuration help. Press the **<Esc>** (Escape) key to exit the help screen.

3.1. SYSTEM AUDIO CONFIGURATION

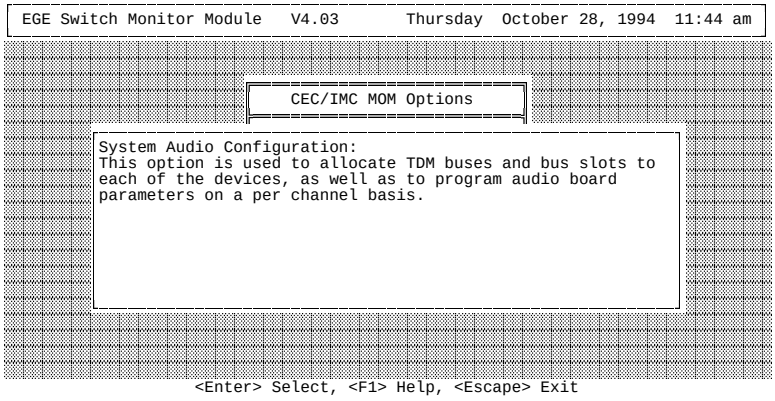

Figure 3.1-1 System Audio Configuration Help Screen

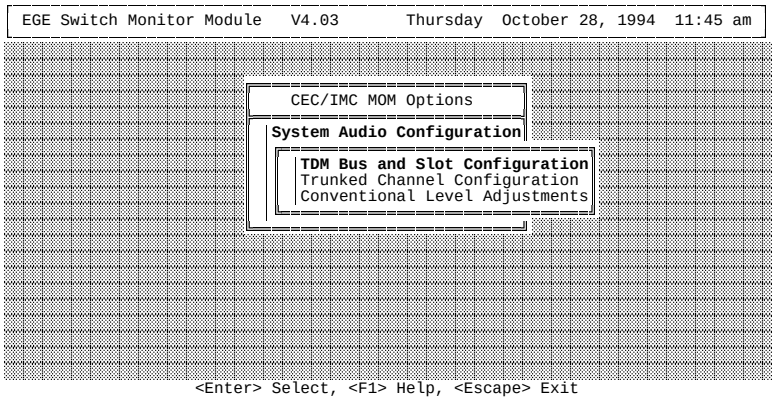

Figure 3.1-2 System Audio Configuration Menu

3.1.1. TDM Bus and Slot Configuration

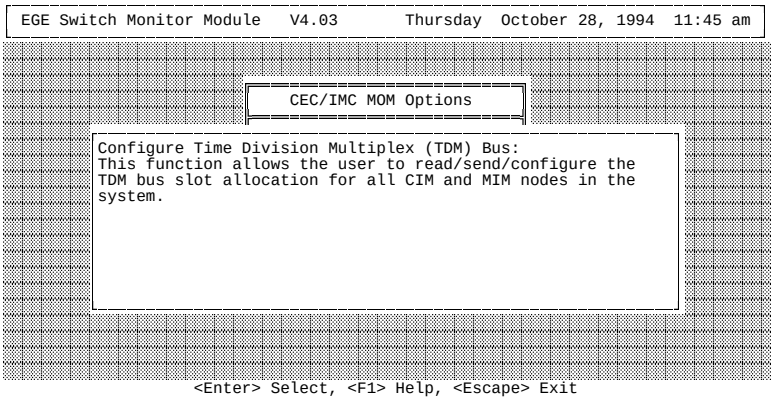

Figure 3.1-3 TDM Bus and Slot Configuration Help Screen

This option may be selected in order to read/configure/send the number of Time Division Multiplex (TDM) buses and the TDM bus slot allocations. Slots and buses may be configured in any order but it is more efficient to configure the buses prior to configuring slot allocations. Pressing the Help key (**F1**) with this option selected displays the helpmessage shown above. The TDM bus slot allocation is the key means for which audio is routed throughout the CEC/IMC. If enough slots are not allocated for each device, audio will not be routed on all calls. The number of slots to allocate depends on the device type and number of channels connected to that device. For instance, a MIM device is connected to a trunked site. If that site has 20 channels then 20 slots need to be allocated for that MIM. Normally, a console needs only one slot since it has only a single microphone that can apply audio to the CEC/IMC. However, a console equipped with a Call Director should be allocated 4 slots. See the *CEC/IMC Digital Audio Switch Installation, Set-Up and Troubleshooting* maintenance manual (LBI-38938) for additional information.

Important Note: The default bus configuration is 8-bus. It is **necessary** for CECs/IMCs with 4-bus Audio Boards to enter this option and set the number of audio TDM buses to 4. If the MOM Controller Board's Non Volatile RAM (NOVRAM) is reset (or not yet initialized), the CEC/IMC will assume an 8-bus system until

instructed otherwise. Again, a CEC/IMC with 4-bus Audio Boards will not route audio correctly if configured as an 8-bus system.

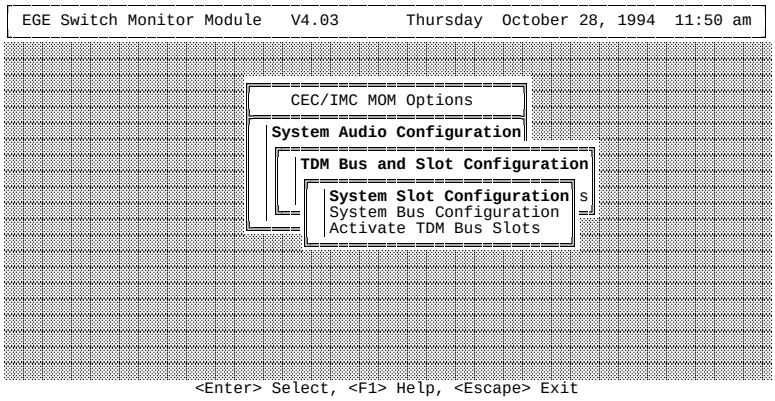

Figure 3.1-4 TDM Bus and Slot Configuration Menu

3.1.1.1. System Slot Configuration

When the CEC/IMC Manager program is executed or when the MOM Controller Board is reset, the MOM Controller Board in the CEC/IMC sends its current NOVRAM-stored bus and slot configurations to the CEC/IMC Manager. This data transfer may take several seconds. If the user attempts to enter a CEC/IMC Manager bus or slot configuration screen before the bus and slot configuration data transfer is complete, the screen shown in Figure 3.1-5 will be displayed. This is a precautionary function to prevent the user from sending all slots set to zero. When this message appears, the user may use the arrow keys and the **<Enter>** key to select one of the following:

- "Continue Bus/Slot Configuration" – Select this option if the CEC/IMC Manager is not connected to an CEC/IMC since it would *never* receive slots.

- "Return to Previous Menu" – Select this option to continue other CEC/IMC Manager functions. Send bus/slot information at a later time (typically 5 to 10 seconds later). This option performs the same function as the **<Esc>** key.

In addition, when this message appears, the user may press the **F1** function key to display a help screen shown in Figure 3.1-6.

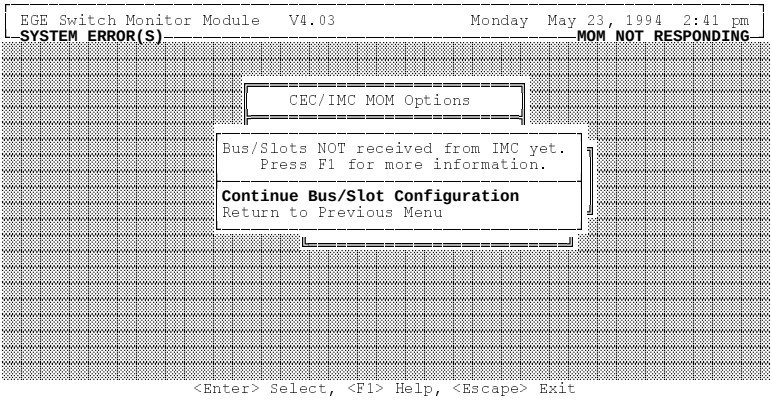

Figure 3.1-5 Bus/Slots Not Received Warning Window

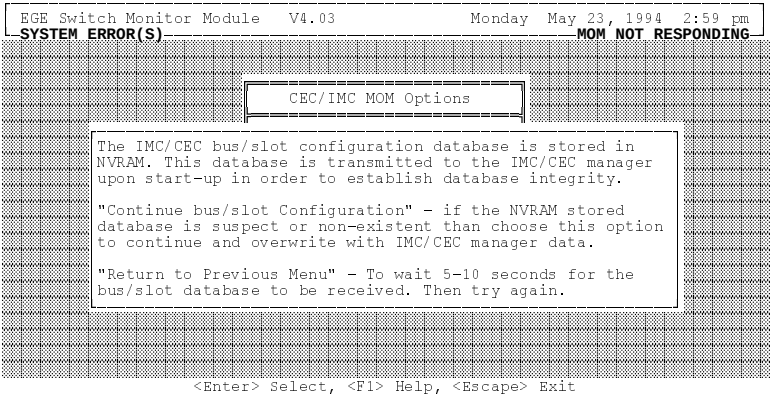

Figure 3.1-6 Bus/Slots Not Received Help Screen

3.1.1.1.1. Read Slots

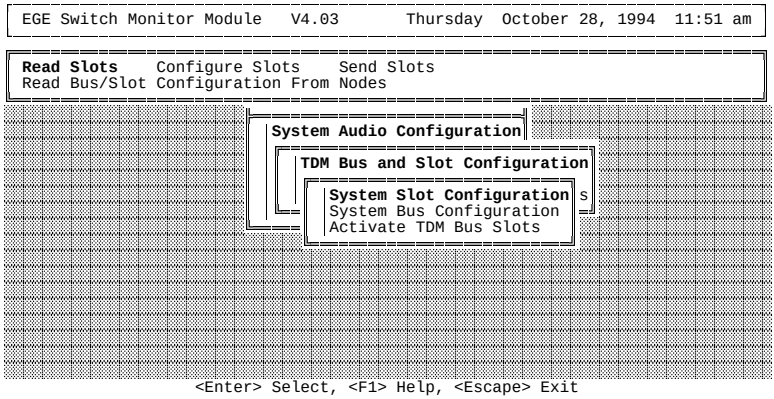

Figure 3.1-7 Read Slots Window

This option is selected if the user wishes to read the current configuration from the MOM Controller Board. The MOM Controller Board stores the configuration in its NOVRAM for power up / reset conditions. **It is important to read the slots before making any changes to the configuration so the *current* CEC/IMC slot configuration is being viewed.**

If the user elects to read slots from the MOM Controller Board the acknowledgment shown in Figure 3.1-8 will be displayed if the read was successful. The user must now press **<Esc>** (Escape) to return to slot configuration.

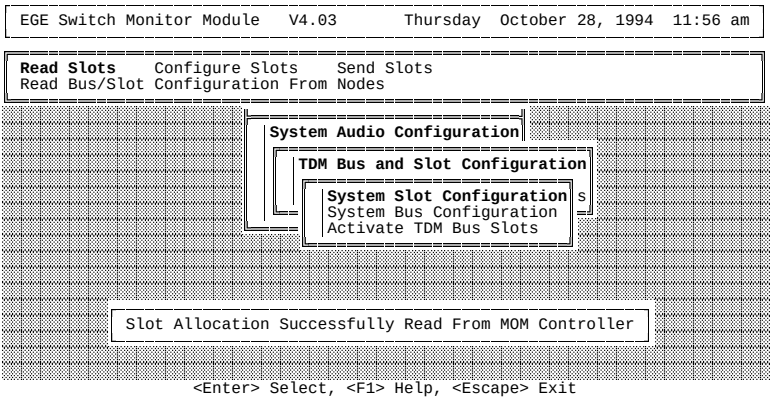

Figure 3.1-8 Read Slots Reply Screen

If the user elects to read slots from the MOM Controller Board and for some reason the MOM Controller Board doesn't respond (not serially connected, MOM Controller Board down, etc...), the following message will appear. The user must now press **<Esc>** (Escape) to return to slot configuration.

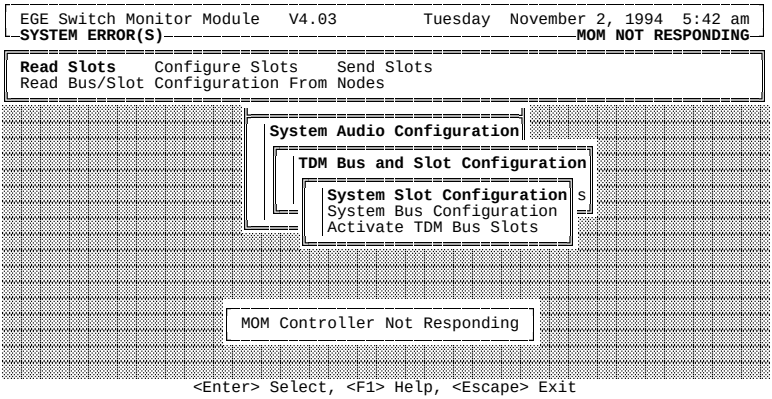

Figure 3.1-9 Read Slots Error Message Screen

3.1.1.1.2. Configure Slots

This option is used to configure the TDM bus slot allocations for each node in the system. When the "Configure Slots" option is selected the following menu will be displayed. The option given to the user is to

configure console slots or site slots. Selecting "Console Slots" allows the user to configure TDM bus slots for each console (or EDG) in the system. Selecting "Digital Voice Slots" allows the user to configure TDM bus slots for each Digital Voice Interface Unit (DVIU). Selecting "Site Slots" allows the user to configure TDM bus slots for each site in the system, trunked or conventional.

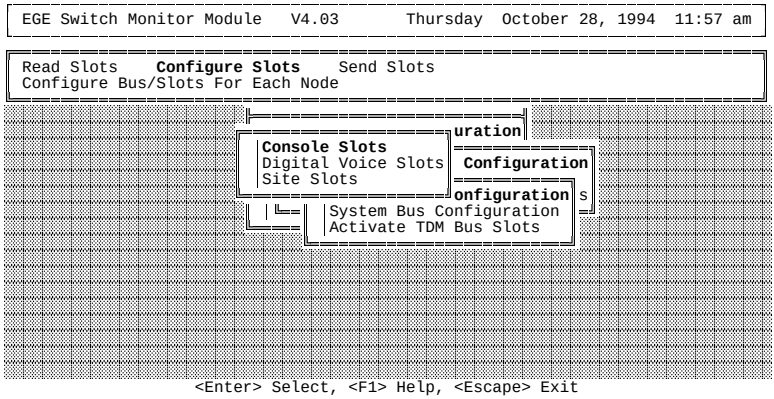

Figure 3.1-10 Configure Slots Window

If the user elects to configure console slots, the following screen will appear. As mentioned earlier, only one slot is normally required for each console since there is only one transmit channel per console. However, four (4) slots are required if the Call Director option will be used with the console. The "Slots Available" field indicates the number of slots left that are available for allocation.

Using the **<Ctrl> <Page Up>** and **<Ctrl> <Page Down>** keys allows the user to page between console groups. Each screen displays 16 consoles. There are a maximum of 32 consoles supported by the CEC/IMC. After completing console configuration, the user must press **<Esc>** to return to the previous menu. The user may then elect to configure site slots or send the new configuration to the MOM Controller Board. Unless the user elects to send the new configuration, the MOM Controller Board will never receive this new data.

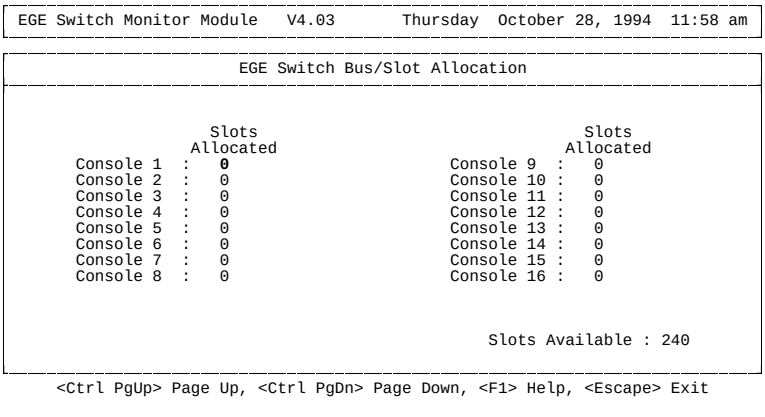

Figure 3.1-11 Console Slots Screen

If the user elects to configure digital voice slots the following screen will appear. The CEC/IMC supports up to four (4) Digital Voice Interface Modules (DVIMs). Each DVIM supports up to thirty-two (32) DVIUs. One TDM bus slot is required for each DVIU. After completion of the digital voice slot allocation, the user must press **<Esc>** to return to the previous menu. After the sites, consoles and digital voice slot allocations are made, the configuration should be sent to the MOM Controller Board via the "Send Slots" option as described in the following section.

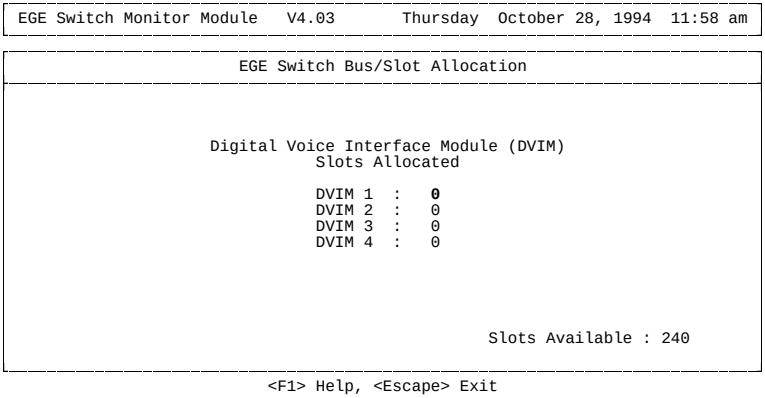

Figure 3.1-12 Digital Voice Slots Screen

If the user elects to configure site slots the following screen will appear. As mentioned earlier, the slot allocation here depends upon the number of channels the site connected to each site-type interface module (MIM, VMIM, NIM, etc.) supports. If the site connected to MIM 3, for instance, supports 20 channels, then 20 slots must be allocated for this MIM. The same holds true for a VMIM. If 15 conventional base stations are supported by VMIM 10, then 15 slots must be allocated for VMIM 10. The "Slots Available" field indicates the number of slots left that are available for allocation.

Using the **<Ctrl> <Page Up>** and **<Ctrl> <Page Down>** keys allows the user to page between site groups. Each screen displays 16 sites. There are a maximum of 32 sites supported by the CEC/IMC. After completion of site configuration, the user must press **<Esc>** to return to the previous menu. The user may then elect to configure console slots or send the new configuration to the MOM Controller Board. Unless the user elects to send the new configuration, the MOM Controller Board will never receive this new data.

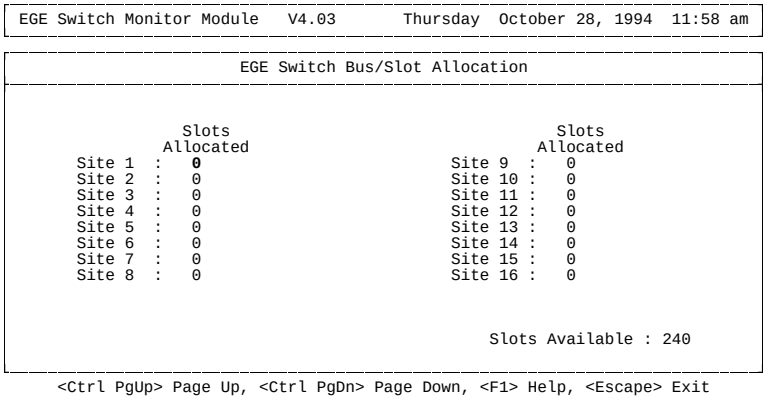

Figure 3.1-13 Site Slots Screen

3.1.1.1.3. Send Slots

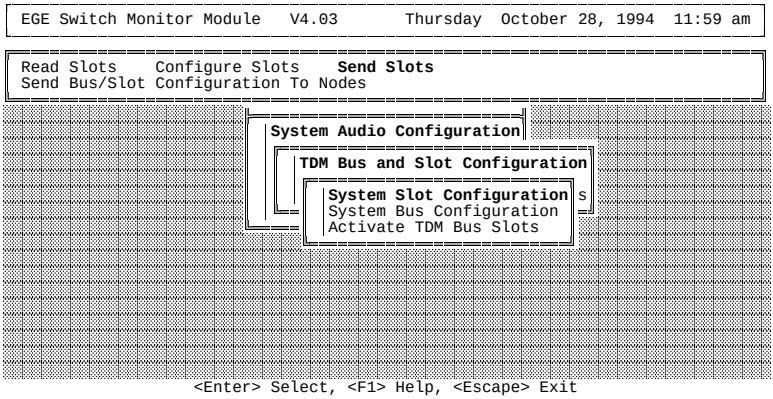

Figure 3.1-14 Send Slots Window

This option is used to send the new TDM bus slot configuration to the MOM Controller Board. The MOM Controller Board will not receive this data unless it is specifically sent using this command.

Important Note: The interface modules (nodes) in the system will not receive the new configuration unless they are reset. Either select the "Activate TDM Bus Slots" option, cycle power on the system or reset each Controller Board individually in order to disperse the new configuration. Selecting the "Activate TDM Bus Slots" option will cause each Controller Board (except the MOM and XLTRs) to reset.

If the user elects to "Send Slots" to the MOM Controller Board and no slots were allocated, the following message will appear. This message is used to prevent clearing the MOM Controller Board's slot allocation database accidentally.

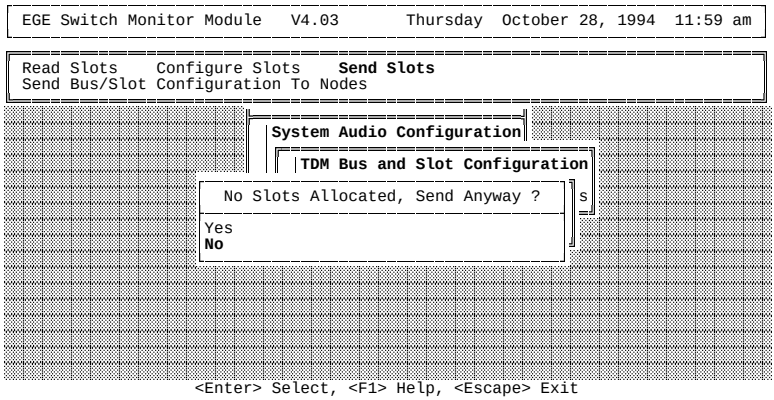

Figure 3.1-15 Send Slots Selection Screen

Upon successful transmission of the TDM bus slot allocation to the MOM Controller Board, the following message will appear. This indicates the MOM Controller Board received the new allocation.

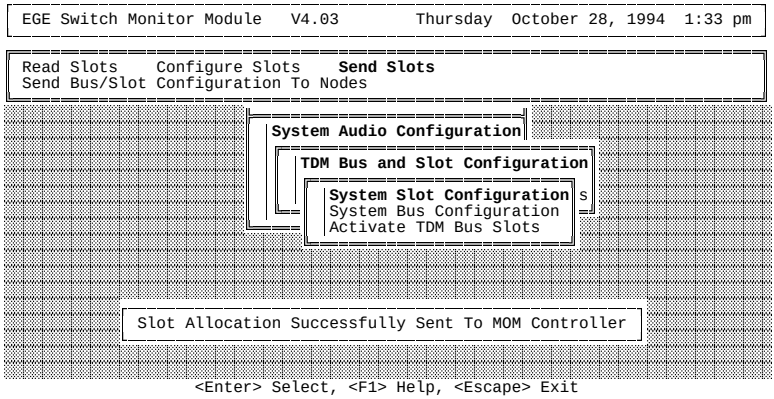

Figure 3.1-16 Send Slots Successful Reply Screen

3.1.1.2. Configure System TDM Bus

3.1.1.2.1. Read Bus Configuration

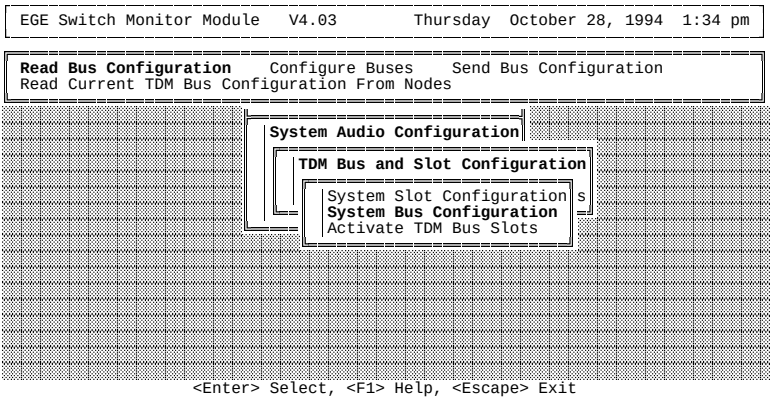

Figure 3.1-17 Read Bus Configuration Screen

This option is selected if the user wishes to read the current bus configuration from the MOM Controller Board. The MOM Controller Board stores the configuration in its NOVRAM for power up / reset conditions. **It is important to read the number of buses before making any changes to the configuration so the *current* CEC/IMC bus configuration is being viewed.**

If the user elects to read the bus configuration from the MOM Controller Board the following acknowledgment will occur if the read was successful. The user must now press **<Esc>** (Escape) to return to bus configuration.

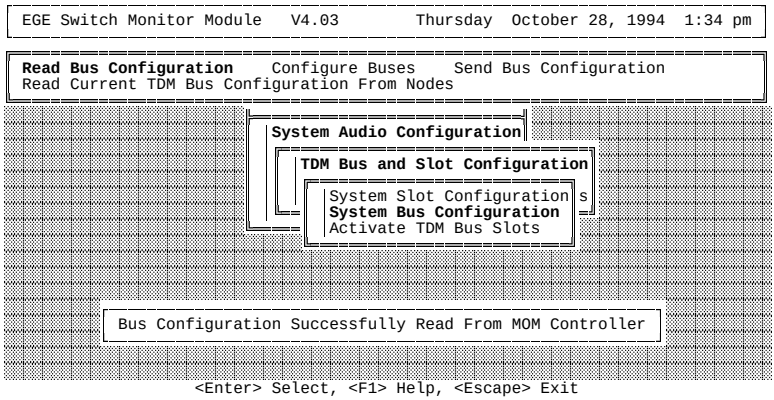

Figure 3.1-18 Bus Configuration Read Successfully Screen

If the user elects to read the bus configuration from the MOM Controller Board and for some reason the MOM Controller Board doesn't respond (not serially connected, MOM Controller Board down, etc...), the following message will appear. The user must now press **<Esc>** (Escape) to return to bus configuration.

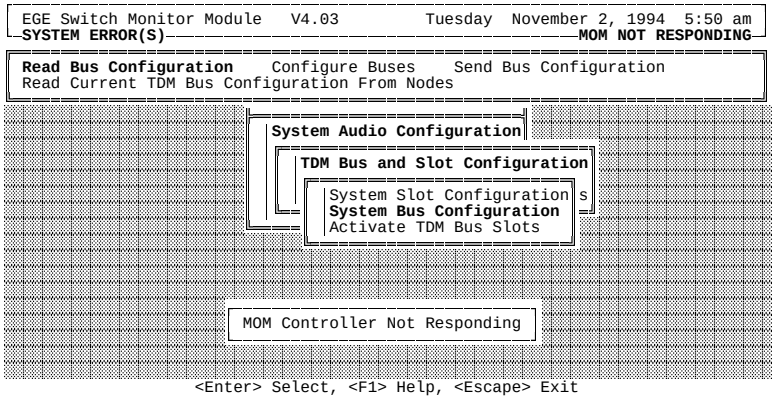

Figure 3.1-19 Unsuccessful Bus Read Screen

3.1.1.2.2. Configure Buses

This option is used to configure the number of TDM buses in the system. The following screen will appear if the "Configure Buses" option is selected. Use the "+" or "-" key to toggle between 4 and 8

buses. The user must know if the Audio Boards in the CEC/IMC are 4 or 8-bus compatible. An 8-bus system may be configured as a 4-bus system, but a 4-bus system will not operate correctly as an 8-bus system.

Important Note: The default bus configuration is 8-bus. It is **necessary** for CECs/IMCs with 4-bus Audio Boards to enter this option and set the number of audio TDM buses to 4. If the MOM Controller Board's Non Volatile RAM (NOVRAM) is reset (or not yet initialized), the CEC/IMC will assume an 8-bus system until instructed otherwise. Again, a CEC/IMC with 4-bus Audio Boards will not route audio correctly if configured as an 8-bus system.

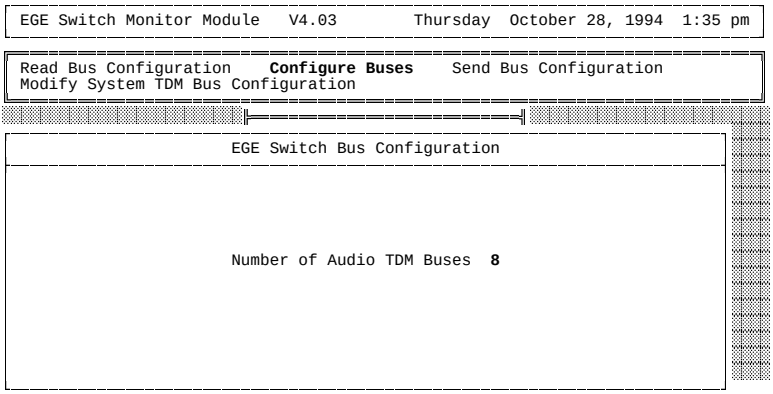

Figure 3.1-20 Configure Buses Screen

3.1.1.2.3. Send Bus Configuration

This option is used to send the new TDM bus count to the MOM Controller Board. The MOM Controller Board will not receive this data unless it is specifically sent using this command. The following screen will appear when the "Send Buses" option is selected and the bus configuration is transmitted to the CEC/IMC.

Important Note: The interface modules (nodes) in the system will not receive the new bus and slot configuration unless they are reset. In order to disperse the new configuration, either cycle power on the system, reset each Controller Board individually, or select the "Active TDM Bus Slots" option which is described in the following sub-

section. This should be done after the bus configuration and the slot configuration have been sent to the MOM Controller Board.

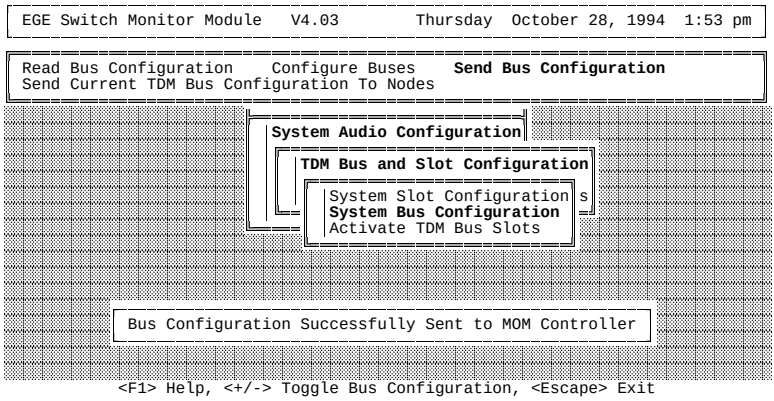

Figure 3.1-21 Bus Configuration Successful Sent Screen

3.1.1.3. Activate TDM Bus Slots

Choose the "Activate TDM Bus Slots" option after the bus and slot assignments have been sent to the MOM Controller Board. This process distributes the configuration throughout the CEC/IMC. When this option is chosen, all Controller Boards (except the MOM and XLTRs) will reset and then receive their new bus and slot assignments from the MOM.

3.1.2. Trunked Channel Configuration

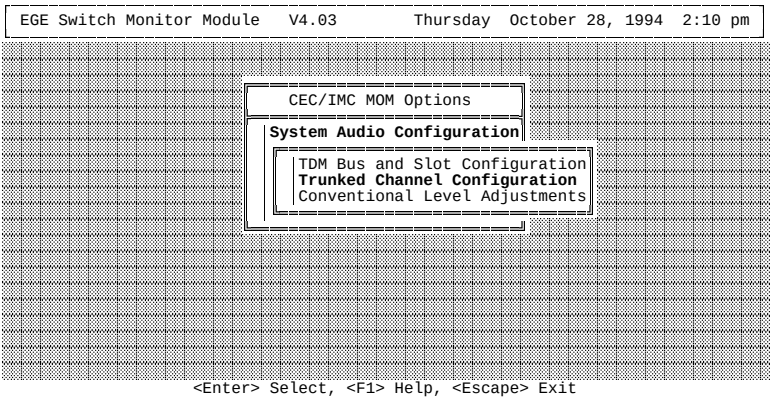

Figure 3.1-22 System Audio Configuration Menu

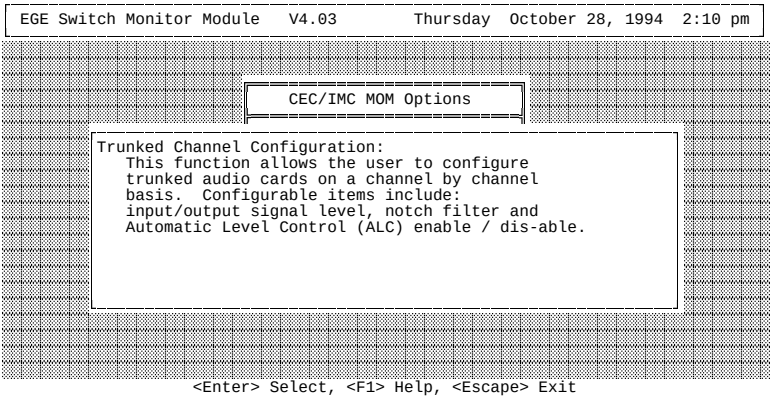

Figure 3.1-23 Trunked Channel Configuration Help

This option allows the user to adjust the audio signal levels for all CEC/IMC trunked channels. The input signal level can be set and the Automatic Level Control (ALC) can be enabled or disabled for console channels. There are more options for site channels. The input signal may be set, the desired output signal may be set, the ALC can be enabled or disabled, and the site signalling mode can be set ("Tone", "M", "Both", or "Off"). If "M", "Tone", or "Both" site signalling method is selected, a screen will appear which allows the 2175 Hz

notch filter to be enabled or disabled, as well as the level for the secure tone to be set (for "Tone" only). The above screen will appear if the user selects Help for "Trunked Channel Configuration".

After the user has selected "Trunked Channel Configuration" and pressed **<Enter>**, the decision must now be made to configure console channels or site channels. The following sub-menu prompts the user for the desired selection.

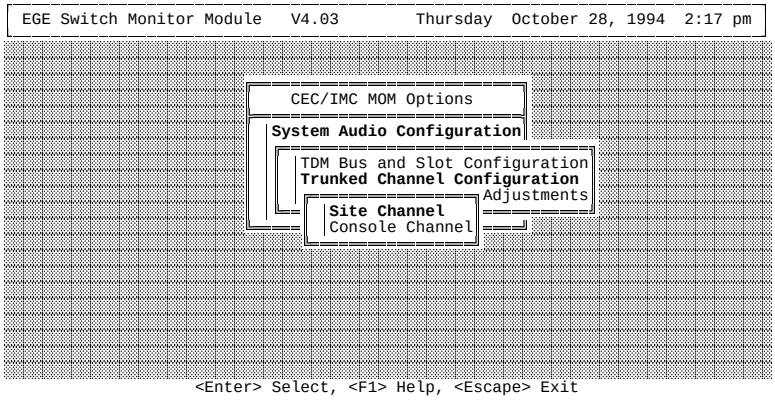

Figure 3.1-24 Trunked Channel Configuration Menu

Upon entering a trunked channel configuration screen, the values stored on the CEC/IMC Manager's hard disk file will be displayed. If there is no file for the specified site or console, the default values will be displayed. These values may or may not reflect the values stored at the site or console interface module (MIM/CIM/etc.). This data can be sent to the interface module by pressing **F7** from the site or console configuration screen. The current configuration can be requested from the interface module by pressing **F10** and pressing **F5** will save the currently displayed data to the hard disk file. Use **F9** to delete the trunked channel configuration file for the selected interface module from the hard disk.

NOTE

Changing the values will have no affect until the data is sent (via the **F7** key) to the respective MIM/CIM/etc. Controller Board.

3.1.2.1. Site Channel Configuration

If the user selects "Site Channel" configuration the following screen will appear. As discussed previously, the user has the option of setting the input signal levels, adjusting the desired output signal levels, choosing the site signalling mode, and enabling / disabling the Automatic Level Control circuitry. This option is used to configure trunked channels for site-type interface modules such as MIMs, NIMs, VMIMs, and CTIMs.

```
EGE Switch Monitor Module   V4.03        Thursday  October 28, 1994  2:17 pm

                          SITE CHANNEL CONFIGURATION

                      Input       Output
                      Signal      Signal      Channel
                      (dBm)       (dBm)     Signalling          ALC
     Channel  1 :       0.0         0.0        Tone              N
     Channel  2 :       0.0         0.0        Tone              N
     Channel  3 :       0.0         0.0        Tone              N
     Channel  4 :       0.0         0.0        Tone              N
     Channel  5 :       0.0         0.0        Tone              N
     Channel  6 :       0.0         0.0        Tone              N
     Channel  7 :       0.0         0.0        Tone              N
     Channel  8 :       0.0         0.0        Tone              N

                                  Site    1

      F1 = Help   F5 = Save   F7 = Send   F9 = Delete    F10 = Read Ctl

<Escape> Exit, <PgDn> Site, <Ctrl PgUp> Page Up, <Ctrl PgDn> Page Down
```

Figure 3.1-25 Site Channel Configuration Screen

Configurable Fields:

Input Signal Level
This is the signal level (in dBm) coming into the CEC/IMC. The input signal level should be measured with a 600-ohm termination (subtract 1.5 dBm if the Automatic Level Control (ALC) is disabled). Valid Range is -25.0 dBm to 12.0 dBm in 0.5 dBm increments.

Output Signal Level (Site Channels Only)
This is the desired signal level (in dBm) from the CEC/IMC to the site. A 600-ohm load output impedance is assumed. The input signal level must be measured and reported correctly on this form to obtain the desired output signal level. Valid range is -25.0 dBm to 13.0 dBm.

Channel Signalling
Use **"+/-"** keys to select the method for signalling and holding a site audio channel. The possible selections are "M", "Off", "Tone", or "Both". If "Tone", "M", or "Both" is chosen and the **<Enter>** key is

pressed, a screen will appear so that the 2175 Hz secure tone level can be adjusted, and the 2175 Hz notch filter can be enabled or disabled See Figure 3.1-27.

NOTE

For a NIM, this field is replaced by "Channel Equipped" – see below for details.

Automatic Level Control (ALC)
Use this field to enable or disable the ALC. Enable the ALC to reduce the variance in the level of an input signal.

WARNING

ALC must NOT be enabled on 19D903302P1 Audio Boards

Channel
Each page of this form contains eight (8) audio channels. Thirty two (32) channels may be cycled through by entering **<Ctrl> <Page Up>** and **<Ctrl> <Page Down>**. It is only possible to configure these channels if they are supported by the site.

Site
Change the site number by using the **<Page Down>** or the arrow keys to position the cursor on the site field. Enter the new site number, and then enter **<Page Up>** If a Network Interface Module (NIM) device is chosen, the following changes to the Site Channel Configuration screen will appear: The "Channel Signalling" field is replaced by the "Channel Equipped" field and the "NIM->" prompt will appear next to the "Site" prompt to indicate this device is a NIM.

3.1.2.1.1. NIM Channel Configuration

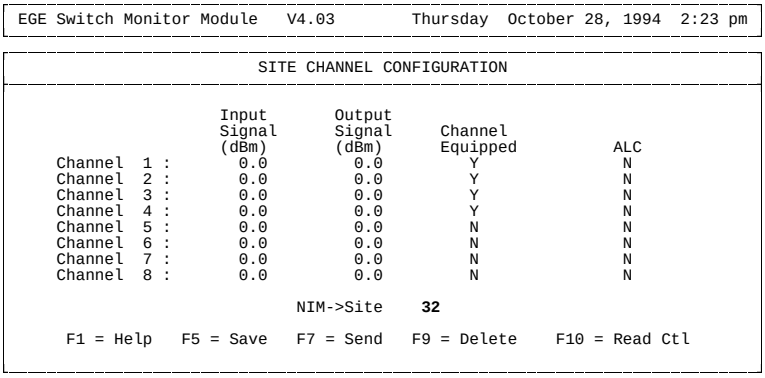

Figure 3.1-26 NIM Channel Configuration Screen

Channel Equipped

This field is unique to NIM devices. This field must be a "Y" for each installed distributed multisite audio channel and a "N" for all other channels.

3.1.2.1.2. Site Channel Signalling

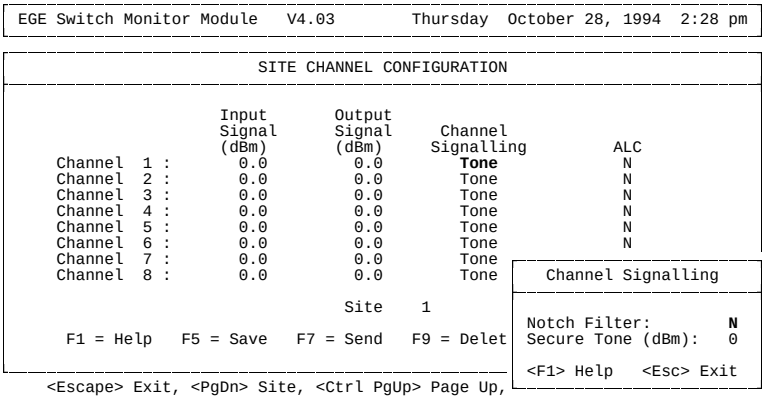

Figure 3.1-27 2175 Hz Tone Adjustment Screen

Configurable Fields on the Channel Signalling Form:

Notch Filter
Use this field to enable or disable the 2175 Hz notch filter. Enable the notch filter to eliminate the "talk down" to a site channel.

WARNING

The notch filter must **NOT** be enabled on 19D903302P1 Audio Boards.

Secure Tone
Enter the signal level in dBm for the 2175 Hz secure tone. Valid range is -10 dBm to 11 dBm. This is only necessary if "Tone" signalling has been selected. The 2175 Hz function tone level will be 10 dBm below the secure tone level. The 2175 Hz hold tone level will be 20 dBm below the function tone.

NOTE

The 2175 Hz secure tone level is set on a per board basis (i.e. setting the secure tone level for channel 1 to 5 dBm affects channels 2, 3 and 4 also).

Press **<Esc>** to return to the site channel configuration screen.

3.1.2.2. Console Channel Configuration

If the user selects "Console Channel" configuration the following screen will appear. As discussed previously, the user has the option of setting the input signal levels, and enabling/disabling the Automatic Level Control circuitry.

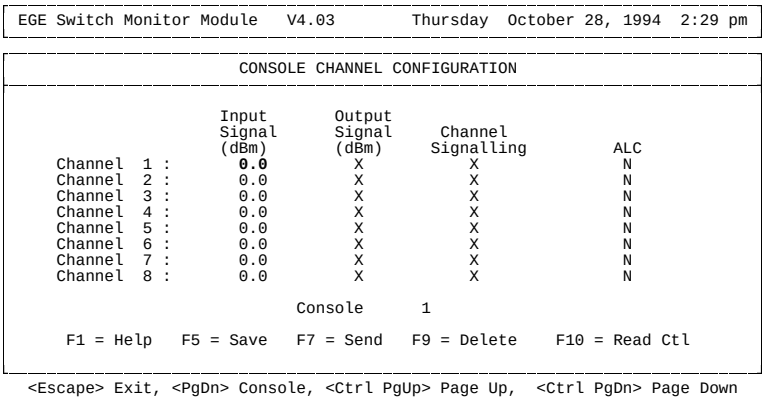

Figure 3.1-28 Console Channel Configuration Screen

Configurable Fields:

Input Signal Level
This is the signal level (in dBm) coming into the CEC/IMC. The input signal level should be measured with a 600-ohm termination (subtract 1.5 dBm if the Automatic Level Control (ALC) is disabled). Valid range is -25.0 dBm to 12.0 dBm in 0.5 dBm increments.

Automatic Level Control (ALC)
Use this field to enable or disable the ALC. Enable the ALC to reduce the variance in the level of an input signal.

Console
Change the console number by using the **<Page Down>** or the arrow keys to position the cursor on the console field. Enter the new console number, and then press **<Page Up>**.

Channel
There are two pages to this form with each page containing eight (8) audio channels. Sixteen (16) channels may be cycled through by entering **<Ctrl>** **<Page Up>** and **<Ctrl>** **<Page Down>**. It is only necessary to configure the channels that are supported by the console.

NOTE

The output signal level for consoles is controlled by the console's module volume bar settings.

3.1.3. Conventional Signal Level Adjustment

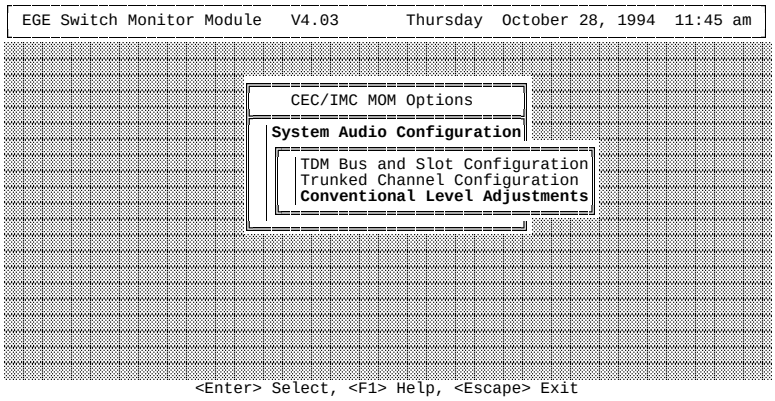

Figure 3.1-29 System Audio Configuration Menu

This function allows the user to adjust the 2175 Hz hold tone and VOX threshold levels for each conventional channel in the system. Up to 64 conventional channels are supported per CEC/IMC. The following help screen is displayed when the **F1** function key is pressed with the "Conventional Level Adjustments" option selected.

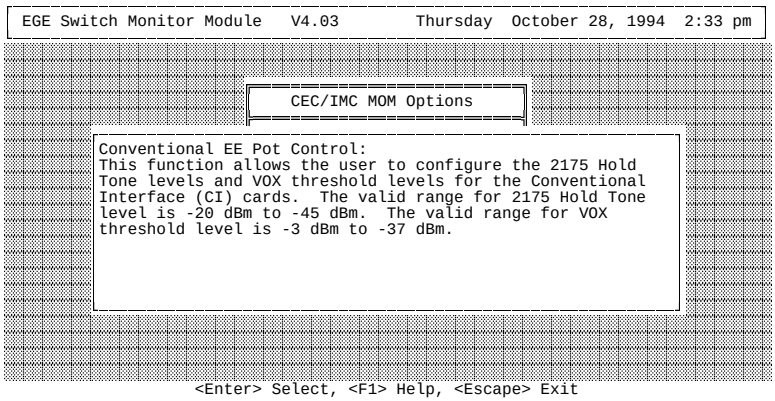

Figure 3.1-30 Conventional Level Adjustments Help

Upon entering the conventional level adjustment screen, the CEC/IMC Manager (MOM PC) will send a request for current configuration data

to the CEC/IMC. If the data fields on the screen are flashing, the current configuration data has not been received by the CEC/IMC Manager from the VMIM.

If the data fields are flashing, one of the following possibilities exists.

- The serial link between the VMIM and the CCI is down
- The serial link from the CEC/IMC Manager to the CEC/IMC is down

To request the data again, exit and re-enter the screen.

NOTES

The SECURE tone level is +30 dB above the HOLD tone. The FUNCTION tone is +20 dB above the HOLD tone.

The VOX threshold is the level in dBm that will cause a VOX trip. The level required to untrip the VOX is approximately 4 dB lower.

Levels may be set to a specific value by simply entering the desired value. If the values are not changing, the link to the CI Board may not be correct. Verify the link.

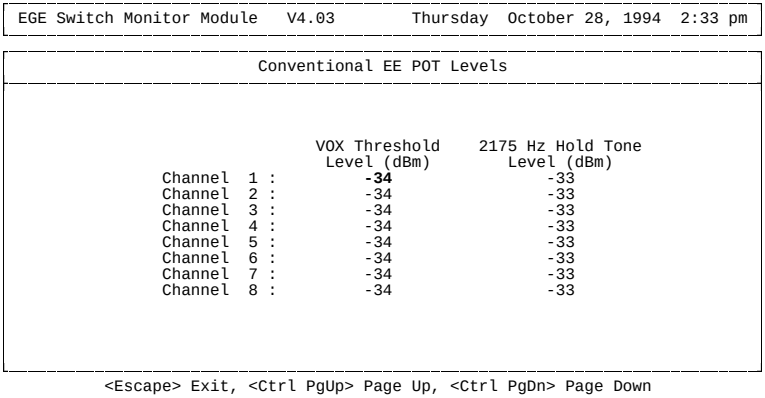

Figure 3.1-31 Conventional EE Pot Control Option

3.2. SYSTEM CONFIGURATION

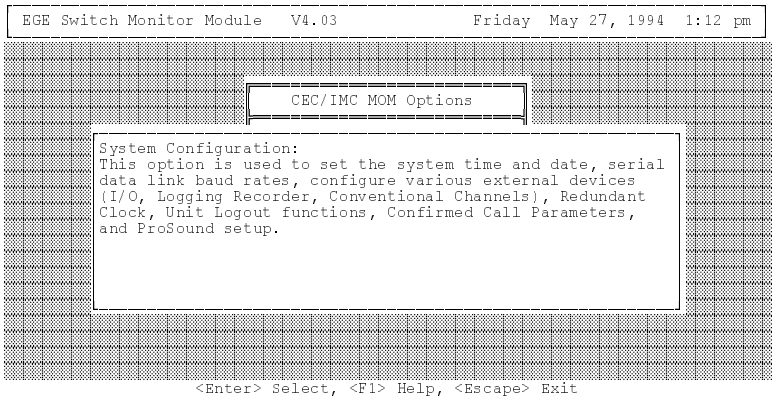

Figure 3.2-1 System Configuration Help Screen

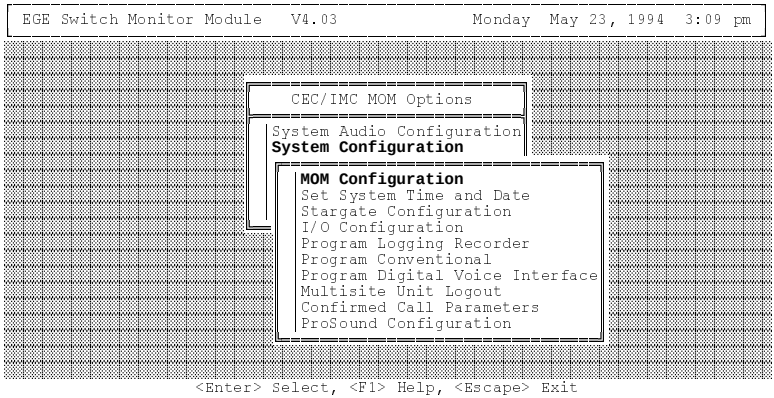

Figure 3.2-2 System Configuration Menu

3.2.1. MOM Configuration

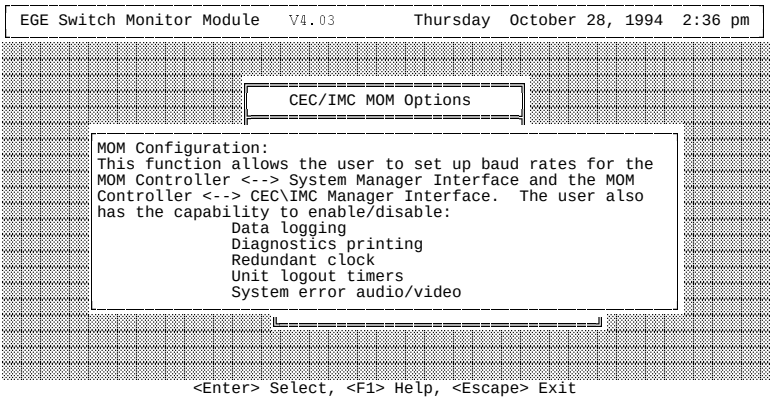

Figure 3.2-3 MOM Configuration Help Screen

The MOM Configuration screen allows the user to configure several MOM-related parameters. These parameters include setting serial port baud rates (9600 or 19.2k), data logging (enable/disable), printer status (enable/disable), redundant clocks (enable/disable), unit logout timers (enable/disable), and setting the datalog threshold number. Pressing **F1** will display the help screen shown in Figure 3.2-3.

The MOM Configuration screen is shown in Figure 3.2-4. Upon entering it, the user can use the up and down arrow keys (↑, ↓) to select the parameter to change.

3.2.1.1. Setting Baud Rates

From the MOM Configuration window, baud rate settings may be adjusted between the CEC/IMC Manager (MOM PC) and MOM Controller Board, and between the MOM Controller Board and the System Manager. Setting the CEC/IMC Manager (MOM PC) ⇔ System Manager baud rate will only configure the CEC/IMC MOM Controller Board. See the System Manager LBI to configure the System Manager's baud rate. Baud rate settings may be adjusted by pressing the "+" or "-" keys with the parameter selected. Currently, the baud rates supported are 19.2k baud and 9600 baud.

3.2.1.2. Enable/Disable Data Logging, Redundant Clocks And Unit Logout Timers

Data logging, the redundant clock feature, and the unit logout timers may be enabled / disabled in the same manner – by pressing the "+" or "-" keys when parameter is selected. If the MOM Controller Board's NOVRAM is ever cleared, the redundant clock feature will return to a disabled setting (default); consequently, if required, the redundant clock feature must be re-enabled from the MOM Configuration window.

WARNING

The redundant clock feature must NOT be enabled if **any** 19D903302P1 Rev. J or earlier Audio Boards are installed in the CEC/IMC.

3.2.1.3. Setting Datalog Threshold Number

Once each day at midnight (12:00 a.m.), the CEC/IMC Manager creates a new datalog file and it names the file in accordance with the day's date. For example, a datalog file created on January 2nd, 1995 will be named `01_02_95.DLG`. This data can be extracted using the CALLS.EXE or GSCMOM.EXE off-line programs as described in Chapter 4 or the on-line functions described in sections 3.5.5.3 thru 3.5.5.5 of this chapter.

The datalog threshold feature automatically deletes old datalog files which are stored on the CEC/IMC Manager's hard disk drive. If, when the CEC/IMC Manager creates a new datalog file, the number of datalog files exceeds the Datalog Threshold number (in days) set at the MOM Configuration screen, the CEC/IMC Manager will automatically delete the oldest datalog file. This prevents hard disk drive "disk full" errors. Datalog files will also be deleted if Datalog Threshold number is reduced via the MOM Configuration screen. For example, if the previous Datalog Threshold number was "8" (8 days) and the user enters the MOM Configuration screen and reduces the number to "5" (5 days), three (3) datalog files will be deleted from the hard disk drive when the user exits the MOM Configuration screen. The valid range for the Datalog threshold number is 1 to 500. Enter "500" to retain all datalog files. The value entered here should be at

least equal to the number of days between back-ups of the datalog files so the datalog files are saved before the CEC\IMC Manager automatically deletes them from the hard disk drive. ERROR.DLG and WARN.DLG files will not be affected by the Datalog Threshold setting.

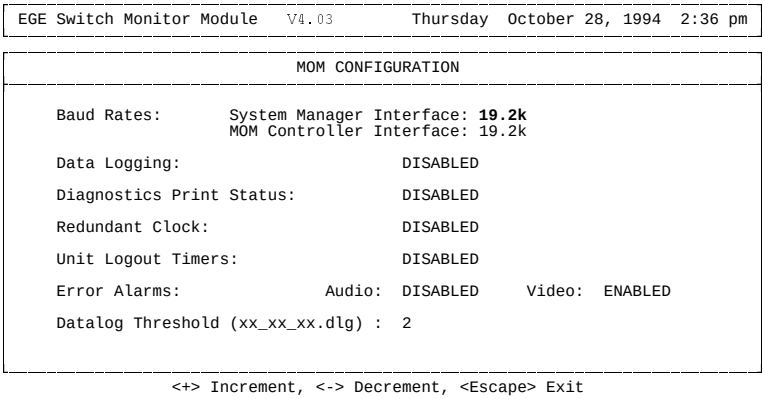

Figure 3.2-4 MOM Configuration Screen

3.2.2. Set System Time and Date

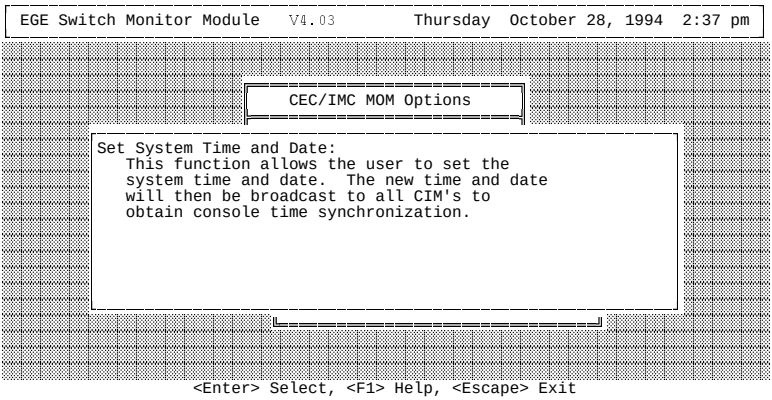

Figure 3.2-5 Set System Time and Date Help Screen

This function is used to alter the system time and date. This time and date is broadcast throughout the entire CEC/IMC for time

synchronization. Pressing **F1** when this option is selected will display the above help screen.

Selecting the "Set System Time and Date" option will bring up the following sub-menu. The user must now select between the time and date options.

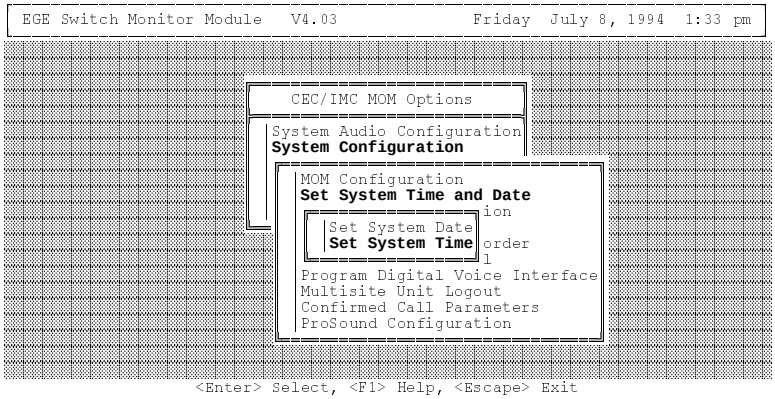

Figure 3.2-6 Set System Time and Date Menu

Enter System Time
If the user selects the "Set System Time", a screen similiar Figure 3.2-7 will appear. The "Enter System Time" field is used to manually set the time. It must be entered in a 24-hour format (i.e. 11:00:00 at night would be entered as 23:00:00). With the NETCLOCK/2 connected, this manual time setting method is only valid until the next NETCLOCK/2 update.

Output MOMPC time to CEC/IMC
This field defaults to "YES" which causes the CEC/IMC Manager's time to update the CEC/IMC time. By selecting "NO" the CEC/IMC is forced to run on it's own internal clock. "YES" should be selected if using the NETCLOCK/2 option.

Source of MOMPC time/date
This field defaults to "INTERNAL". With the default setting, the CEC/IMC Manager (MOM PC) time will be maintained by the PC's internal battery-backed clock. See Figure 3.2-7.

The CEC/IMC can also receive its time from the System Manager. Set this field to "SYSTEM MANAGER" to enable CEC/IMC time updates based on the System Manager's time.

If the NETCLOCK/2 option is installed, press **<Enter>** while this field is highlighted and select "NETCLOCK". The display will update to allow modification of the NETCLOCK/2 configuration options. See Figure 3.2-8 and the following descriptions for details.

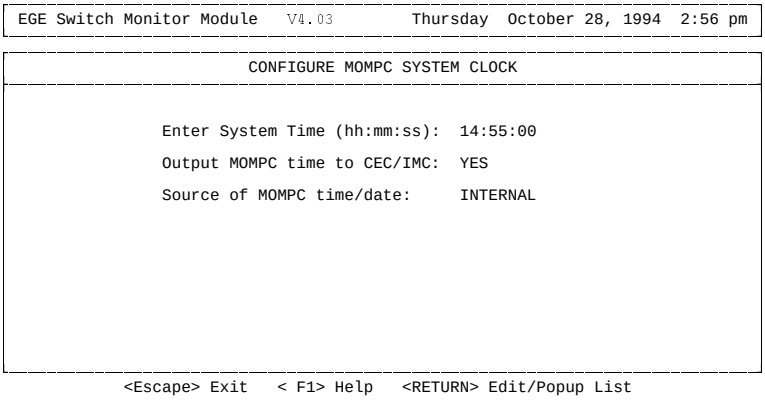

Figure 3.2-7 Set System Time Screen (without NETCLOCK)

Refer to Figure 3.2-8 for the following description of NETCLOCK/2 configuration options. These eight fields are only displayed when "NETCLOCK" is chosen as the source of time for the CEC/IMC Manager (MOM PC). Five may be set as needed (read/write) and three are read-only (not changeable) fields.

Reset MOMPC clock (read/write)
Set from 1 to 30 minutes. Sets the CEC/IMC Manager's internal battery backed clock update/reset period from the received NETCLOCK/2 time. It is recommended that this field be set to a large value (for example – 15 minutes) to avoid unnecessary resetting of the CEC/IMC Manager's battery backed clock.

Netclock port connected (read/write)
This field is used to specify the type of interface between the NETCLOCK/2 and the CEC/IMC Manager. Selections are:

- "Remote Output" – Once per second data from NETCLOCK/2 is sent to the CEC/IMC Manager. However, the CEC/IMC Manager's time is still only reset at intervals specified by the "Reset MOMPC clock" field described above.

- "Serial T-CMD" – Time is received from NETCLOCK/2 when the CEC/IMC Manager requests it.

COM port (read/write)
Select the serial COM port that the CEC/IMC Manager will receive NETCLOCK/2 time. Note that jumper settings on the PC's serial interface board may require changes.

Baud: (read/write)
Enter the baud rate that corresponds to the baud rate set at the NETCLOCK/2 using its baud rate selection switch. See the NETCLOCK/2 manual for additional details on the setting of this switch.

Time Zone Correction (read/write)
This parameter is necessary for FORMAT 2 data ONLY. FORMAT 2 data is received as UTC and must be corrected for local time. Include Daylight Savings Time calculations. Press **F1** for additional help.

NETCLOCK FORMAT (read only)
This field displays the NETCLOCK/2 data format (0, 1, 2 or 99). "99" indicates no valid data is being received from NETCLOCK/2.

- "0" – FORMAT 0; no date setting available

- "1" – FORMAT 1; date setting available

- "2" - FORMAT 2; requires the "Time Zone Correction" field to be entered (data received is UTC). This format is only available when Serial T-CMD port is connected.

SYNCH STATUS (read only)
A "?" indicates NETCLOCK/2 *is not* synchronized to WWVB and an "ok" indicates the NETCLOCK/2 *is* synchronized to WWVB.

QUALITY (read only)
Valid with FORMAT 2 only. If phase lock is lost, this field indicates time since lock was lost.

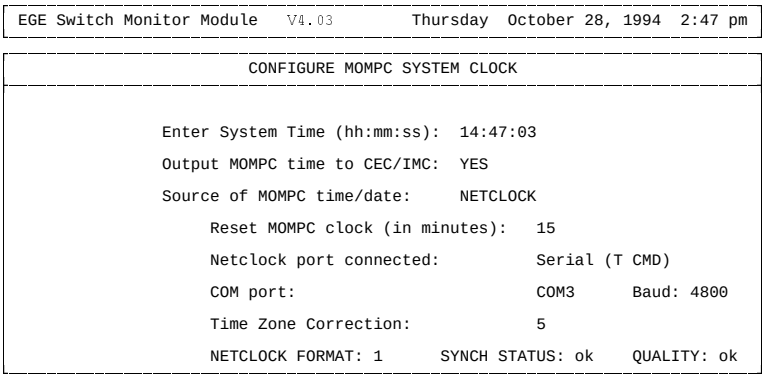

Figure 3.2-8 Set System Time Screen (with NETCLOCK)

If the user selects the "Set System Date" from the "Set System Time and Date" menu, the screen shown in Figure 3.2-9 will appear. The format required for the date is shown in the figure.

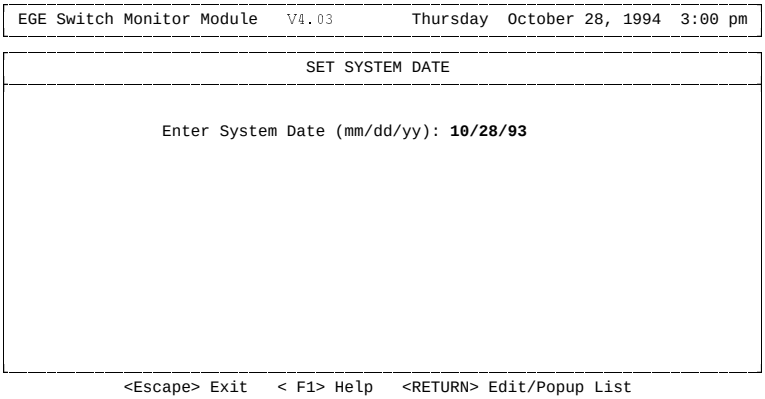

Figure 3.2-9 Set System Date Screen

3.2.3. StarGate Configuration

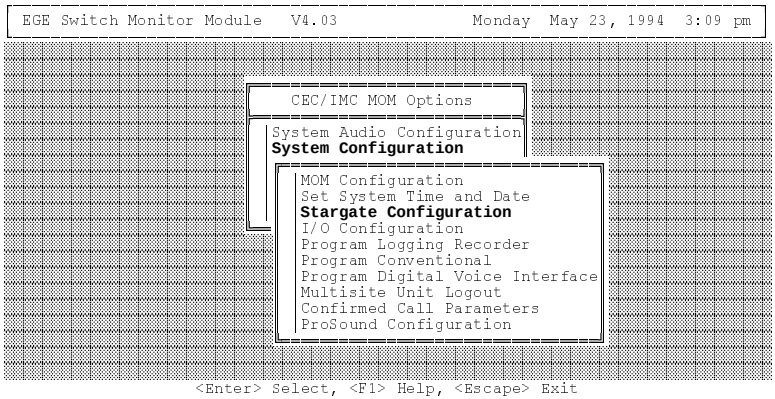

Figure 3.2-10 System Configuration Menu

The StarGate Configuration screen allows the user to enable/disable group call console tracking, enable/disable remote CEC interface operation, and set NIM (Network Interface Module) baud rates. These parameters are all set on a per NIM basis.

If there is more than one NIM in the CEC/IMC, use the **<Ctrl> <Page Up>** and **<Ctrl> <Page Down>** keys to select the appropriate NIM and then use the up and down arrow keys (↑, ↓) for field selection. If no active NIM is found a warning message will appear. Related help screens, accessed by pressing **F1**, are shown in the following three (3) figures and the actual configuration screen is shown in Figure 3.2-14.

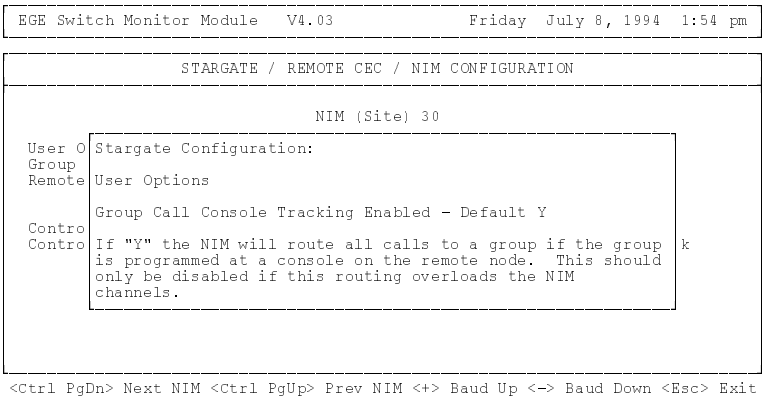

Figure 3.2-11 StarGate Configuration Help Screen (1 of 3)

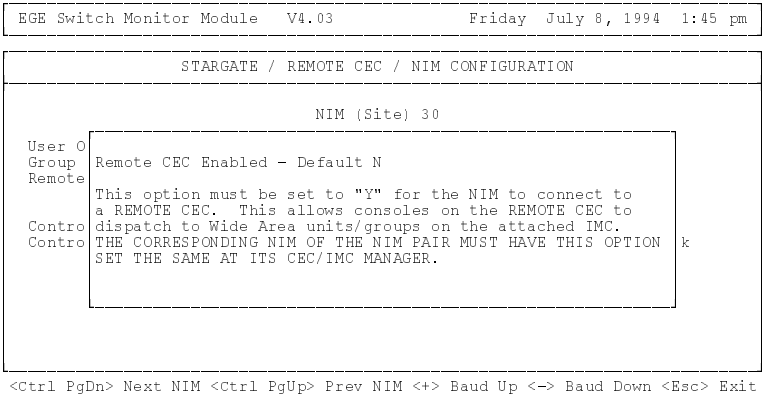

Figure 3.2-12 StarGate Configuration Help Screen (2 of 3)

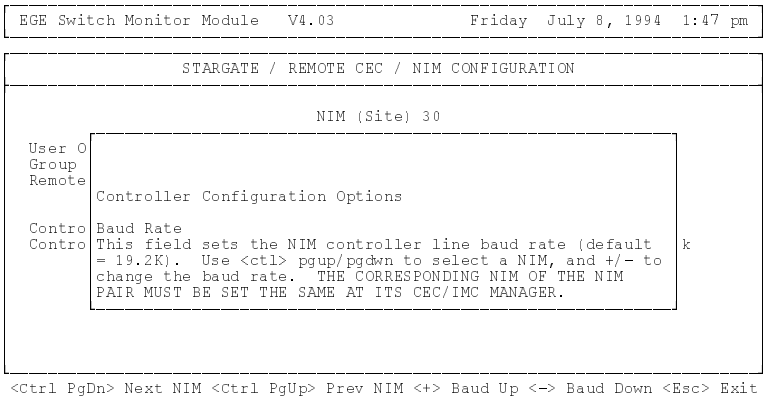

Figure 3.2-13 StarGate Configuration Help Screen (3 of 3)

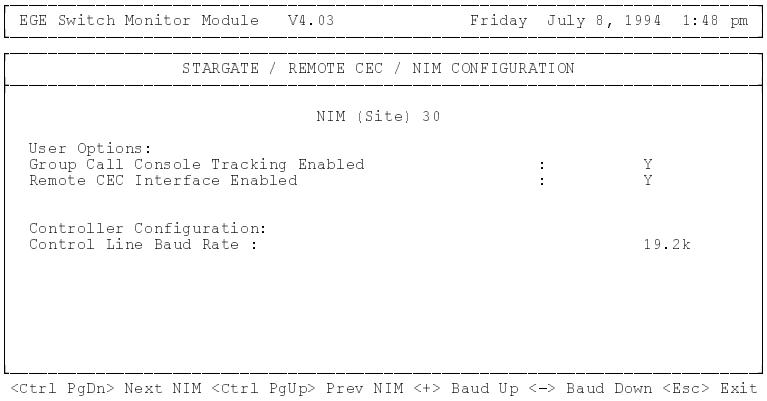

Figure 3.2-14 StarGate Configuration Screen

Group Call Console Tracking Enabled

When this field is set to "Y" (enabled), the selected NIM will send out group calls whenever they are programmed into a communication module at a remote console. The default is "Y". This option should only be set to "N" (disabled) in special circumstances in which routing all calls would cause excessive NIM traffic. In general, StarGate/NIM networks which require large amounts of console dispatch operations will require enabling of this option.

Remote CEC Interface Enabled
This option allows all call traffic being monitored by a console or logging recorder on a remote CEC system to be routed by the NIM link. This option must be set to "Y" at both NIMs in the link. The default is "N" (disabled) and it should only be set to "Y" (enabled) for remote CEC (console only node) links.

Control Line Baud Rate
This field allows setting of a NIM's control data link baud rate. This link is the control data connection between Network Interface Modules (NIM) coupling two CEC/IMC or StarGate Digital Audio Switches together. The NIM on each end of the link must be manually set to equal baud rates via this field. Available baud rates, 9600 and 19.2k, are selected by pressing the "+" or "-" keys.

3.2.4. I/O Configuration

Every Controller Board has eight (8) input lines and eight (8) output lines that can be used for auxiliary I/O interfacing to two-state external devices. Controller Board 19D903299P1 has eight optocoupler inputs (LED with limiting resistor) and eight optocoupler outputs (NPN open-collector). Controller Board 19D903299P3 has eight optocoupler inputs (LED with limiting resistor), four optocoupler outputs (NPN open-collector), and four relay outputs (Form-A / SPST normally-open contacts). These I/O lines interface to the one of the microprocessors on the Controller Board.

Each I/O line can be individually defined at the CEC/IMC Manager (MOM PC) for console I/O use. For example, an output can be used to turn a siren on when a console operator presses a key and an input could be used for alarm monitoring. Up to thirty (30) different I/O "events" can be defined at the CEC/IMC Manager.

```
EGE Switch Monitor Module   V4.03          Friday  October 22, 1994  4:16 pm

                              I/O Configuration

                                 Device
   Event   Type    State   Type Assgn   Bit  Data

H    1:    Output  Low     CIM      6    0   <alt>F1 /ALARM 1[<Unkey>]
H    2:    Input   Low     CIM      6    0   FR5D1 UP
H    3:    Output  Low     CIM      6    1   Select Busy     [       ]
H    4:    Input   Low     CIM      6    1   STA BUSY
H    5:    Output  Low     CIM      6    2   Error   E03-027 [Auto   Clear]
H    6:    Input   Low     CIM      6    2   SITE LNK
H    7:    Output  Low     CIM      6    3   Warning W02-032 [Manual Clear]
H    8:    Input   Low     CIM      6    3   BUS/SLOT
     9:    Input   Low     MIM      1    0
    10:    Input   Low     MIM      1    0
•
c    No Consoles Assigned     <enter> Modify Event       + Activate   Output
m    Modified, Not Sent         F3    Send  To  MOM      - Deactivate Output
H,L  Current State              F4    Read From MOM

<Escape> Exit, <Ctrl PgDn> Page Down, <Ctrl PgUp> Page Up, <Delete> Clear Event
```

Figure 3.2-15 I/O Configuration Main Screen

This screen displays ten (10) I/O event definitions at a time. Each line displays a summary of the I/O event configuration. Pressing **<Enter>** with the cursor positioned on an event's line will bring up the modify event form which displays all modifiable parameters for the event and allows them to be changed. An event must be inactive (not sent to MOM, or deleted) before any parameters can be changed. Pressing **<Ctrl>** **<Page Up>** and **<Ctrl>** **<Page Down>** causes the screen to display the next ten or previous ten event definitions.

All modifiable parameters for an I/O event are displayed/selected from the "Modify I/O Event Data" screen. The fields on this screen change according to the type of event and, for output events, according to the type of output trigger. The screen displays only the parameters required for the current event type/trigger.

3.2.4.1. Common Fields

All I/O events must have a type (input or output), active state (high or low) and a physical location (device type, assignment and bit number). Additionally, all events may be defined to cause an "Auxio Event Warning" log at the CEC/IMC Manager on an event state change. All events except for error/warning triggered outputs are assigned to console positions by use of a console mask.

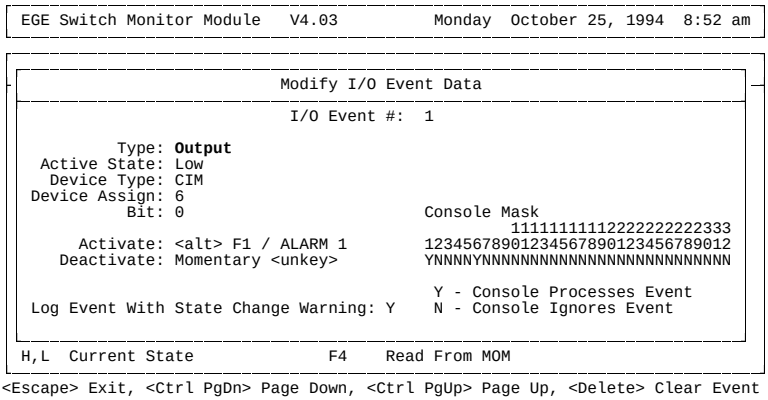

Figure 3.2-16 Modify I/O Event Screen

3.2.4.1.1. Type

Each event must be defined as either an output event or an input event. Output events change the state of the specified output port/bit in response to the specified console trigger condition. Input events display a message (up to eight characters in length) at consoles in response to a change in state on the specified input port/bit. See the *CEC/IMC Digital Audio Switch Installation, Set-Up and Troubleshooting* maintenance manual (LBI-38938) for details on the wiring the I/O ports/bits.

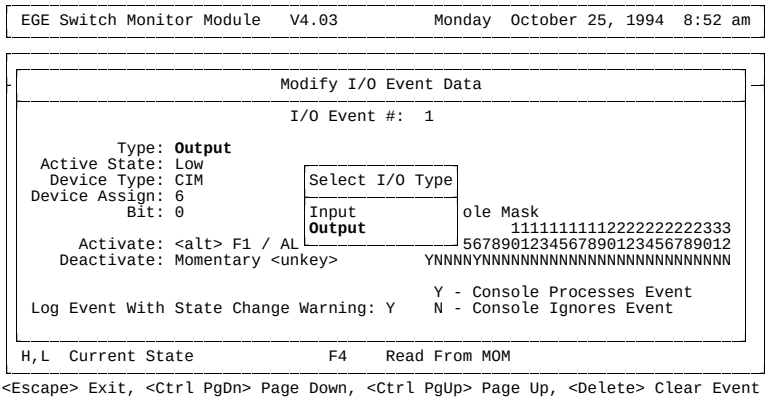

Figure 3.2-17 I/O Event Type Selection Menu

3.2.4.1.2. Active State

Each I/O event must be assigned an active state – "High" or "Low". An output event will be set to its active state whenever its trigger condition is present. An input event will display its message at the console whenever the specified input transitions to its active state. The high or low state of an I/O event is relative to the actual state of the I/O pin as seen by the Controller Board's processor. This may be inverted from the state of the user equipment connected to the Auxiliary I/O Concentrator Card 19C852221P1 (included with option MSDE3U) due to the wiring of the external connections and the buffering circuitry on the Controller Board. See the *CEC/IMC Digital Audio Switch Installation, Set-Up and Troubleshooting* maintenance manual (LBI-38938) for details on the logic characteristics and wiring connections to Controller Board auxiliary I/O ports.

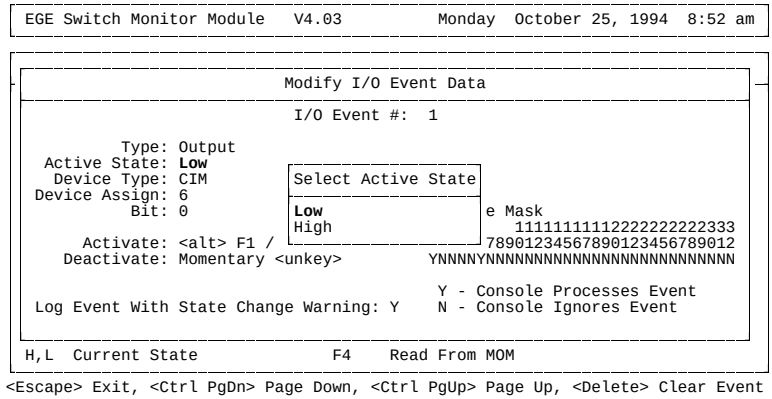

Figure 3.2-18 I/O Active State Selection Menu

3.2.4.1.3. Device Type/Assign

Each Controller Board I/O port is addressed by specifying the board's device type and assignment settings. The device type and assignment fields uniquely identify the Controller Board to which the I/O equipment will be wired.

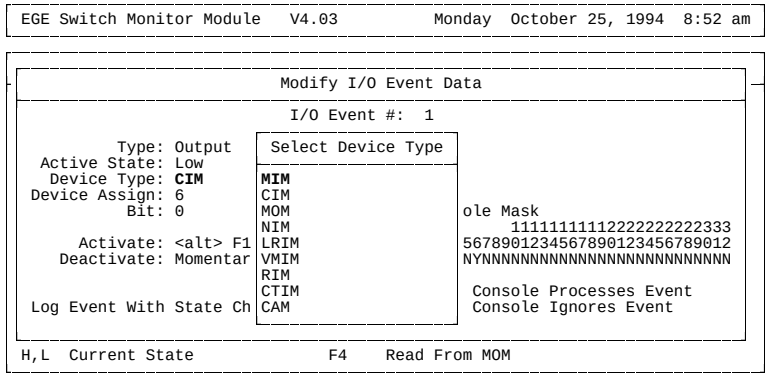

Figure 3.2-19 Device Type Selection Menu

3.2.4.1.4. Bit

The bit field specifies which bit (0 - 7) of the assigned Controller Board's input or output port. There is one 8-bit input port and one 8-bit output port per Controller Board.

3.2.4.1.5. Data

As shown in Figure 3.2-15, each I/O event has a data field. For an input event, this field displays the event's defined text message (8 characters max.) This message is sent to the console(s) when the input becomes active. For an output event, this field displays the defined trigger. As described in section 3.2.4.3, an output event may be triggered via a console keystroke, a console call condition, or an error or warning occurrence. Data field changes for both input and output events are accomplished via the "Modify I/O Event Data" screen.

3.2.4.1.6. Console Mask

Auxiliary I/O events are assigned to consoles by setting the corresponding flag in the console mask to "Y". For an output event

this specifies which consoles may trigger the event. For example, if "<alt> F1" is specified as the event trigger and consoles 1 and 6 have a "Y" in the console mask, then the event can be triggered by pressing **<Alt> F1** at either console 1 or console 6. In the case of a toggled event (changes state with each key press) key presses from different consoles can toggle the current state. For example, console 1 may toggle the event active and console 6 may toggle the event back to the inactive state. An input event's message will be displayed simultaneously at all consoles specified in the console mask whenever the input goes active.

3.2.4.1.7. Log Event Flag

When this flag is set to "Y" (default) the CEC/IMC Manager will log an "Auxiliary I/O - State Change" warning whenever the I/O event changes state. This provides a history of each activation/deactivation of the I/O event. If a defined event is expected to occur frequently, such as "station busy" at a console, the event logging should be disabled to prevent overburdening the CEC/IMC Manager's warning system with auxiliary I/O state change warnings.

An output event state change will be logged with the following warning:

mm/dd/yy hh:mm:ss FF MIM 1 W17-130 Auxiliary I/O - State Change
Output 1 Active [Bit 0 High] Trig: E02-22

The output number, active/inactive state, absolute state (high/low) and trigger description will match the current event's data. The possible "Trig:" descriptions are:

- Console Key Press
- Station Busy
- Select Busy
- Emergency
- Any Error
- Error – Exx-yyy
- Warning – Wxx-yyy

An input event's state change warning is similar except the trigger field is not displayed.

3.2.4.2. Input Event

An input event will display the specified message (8 characters maximum) on any console that has a "Y" in the console mask field. On the C3 Maestro console, the message will be displayed in the bottom left corner of the CRT. On the C3 Modular/Desktop console, the message is displayed in the 8-character alphanumeric LED display. Because these display positions are used for other messages, the I/O event message is displayed only for approximately five (5) seconds and then cleared. For a more permanent record of the input event occurrence, enable the event for logging at the CEC/IMC Manager.

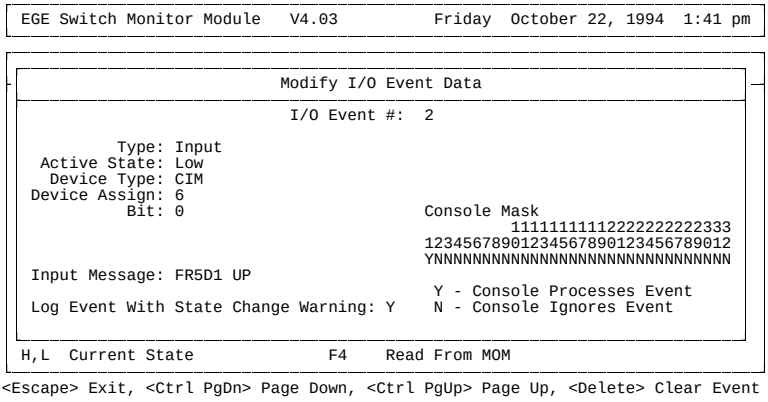

Figure 3.2-20 Modify Input Event Screen

3.2.4.3. Output Event

An output "trigger" must be specified for each output event. The output will be set to its active state on detection of this trigger condition. There are three basic classes of output triggers available:

- Console Key Press – <alt>F1/Alarm1 - <alt>F8/Aux 4
- Console Call – Station Busy, Station Select Busy, Emergency
- CEC/IMC Error/Warning occurrence

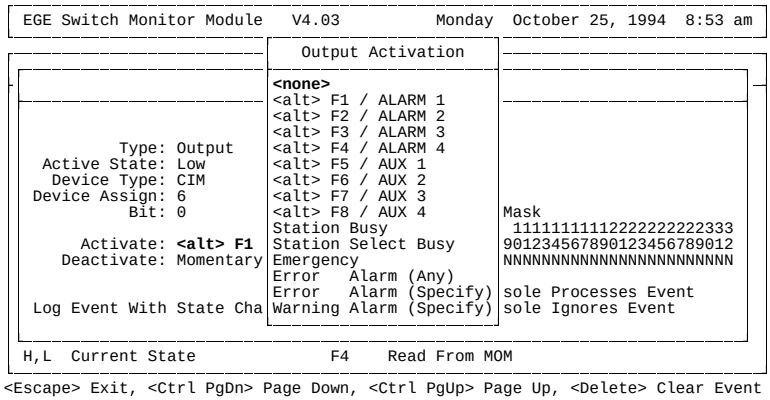

Figure 3.2-21 Output Trigger Selection Menu

3.2.4.3.1. Console Key Trigger

Output events may be set to trigger on a console operator's key press. Eight keys are available at each console for event triggering. The C3 Maestro uses **<Alt>F1** - **<Alt>F8** (press and hold the **<Alt>** key and then press the **F1** - **F8** key). The C3 Modular console uses the **ALARM 1 - 4** and **AUX 1 - 4** keys for the same purpose. Each event can be specified to either deactivate upon release of the key (momentary) or toggle on each subsequent key press (hold). Figure 3.2-16 shows a "Modify I/O Event Data" screen with the output event set to trigger via a console key press with momentary action (**<Alt>F1** keystroke at C3 Maestro console or **ALARM 1** key/button press at a C3 Modular/Desktop console).

3.2.4.3.2. Console Call Trigger

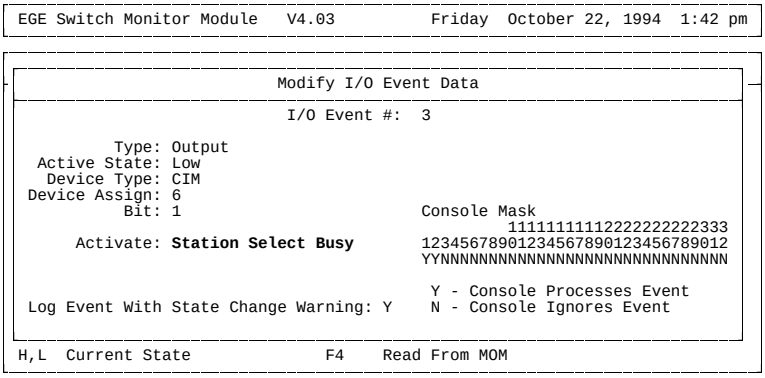

Figure 3.2-22 Console Call Trigger Selection

A console call trigger will activate an output event when the specified condition is detected at the Console Interface Module (CIM). The event deactivates when the condition is no longer present. The three possible settings are:

Station Busy – Active whenever any transmit or receive audio is present at the console.

Station Select Busy – Active whenever any transmit or receive **select** audio is present at the console.

Emergency – Active whenever emergency tone is present at the console. This event will deactivate if the "Alarm Reset" function is used at the console to clear the emergency tone, but leave the emergency active.

3.2.4.3.3. Error/Warning Trigger

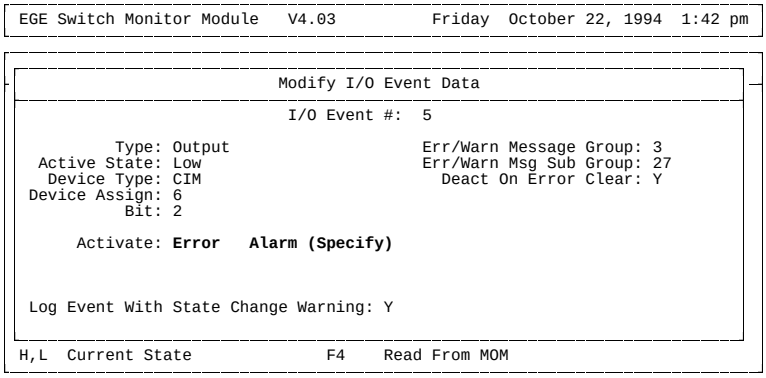

Figure 3.2-23 Error/Warning Trigger Selection

3.2.4.3.3.1 Warning Trigger

A warning trigger will set the output event active on receipt of a warning with the specified group/sub-group at the MOM. Since warnings are never cleared (one-shot event) all warning triggers will require manual deactivation (With the CEC/IMC Manager's I/O configuration screen "-" key). For example if the warning trigger is set to group = 2 (out of range) sub-group = 32 (bus/slot) the output event will be activated by the MOM whenever an out of range bus/slot warning is received. The output will remain active until it is manually reset from the CEC/IMC Manager.

3.2.4.3.3.2 Error Trigger

An error trigger is similar to a warning trigger except that it may be defined to automatically deactivate when the error condition clears. The MOM will keep track of the number of the specified errors that are active and will deactivate the output when all have cleared, if the "Deact On Error Clear" flag is "Y". Error events may also be defined to require manual deactivation, as for warning alarms. If "Any Error" is specified as the trigger, the output will activate on receipt of any error message at the MOM. The output must be manually deactivated.

3.2.4.3.3.3 Error/Warning Specification

All Error/Warning triggers are specified by the group/sub-group used in the error/warning log. When an error/warning trigger is selected, the message group/sub-group fields are displayed on the "Modify I/O Event Data" screen. When **F1** is pressed when these fields are selected, the applicable help screen will be displayed. Choose the desired message group/sub-group from the list of error/warning conditions.

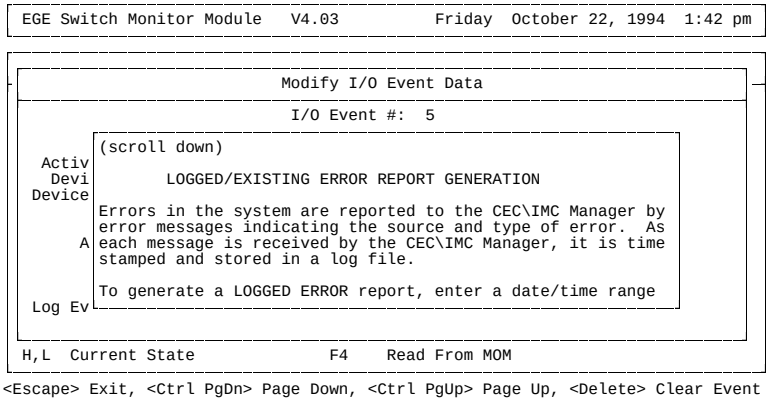

Figure 3.2-24 Error/Warning Trigger Help (partial)

3.2.4.4. Send Event Definitions

Once I/O events are defined at the CEC/IMC Manager the definitions must be sent to the MOM Controller Board. Use **F3** to send the I/O event data. If the I/O event data does not successfully make it to all required devices a "MOM Communication Error" or "Device not active" dialog box will be displayed. The assigned Controller Board (device type and assignment in the I/O definition) must be installed and active for the event definition to operate.

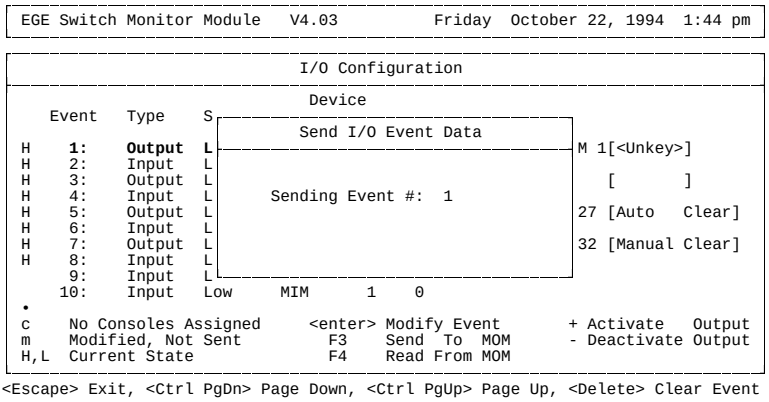

Figure 3.2-25 Send I/O Configuration To MOM Window

Normally, only modified event definitions are sent to the MOM. If F3 is pressed when no event definitions have been modified a dialog box is displayed asking if you wish to resend all definitions. This is useful to refresh all I/O definitions if a Controller Board or console has been replaced or upgraded and has lost its I/O event data.

3.2.4.5. Read Event Definitions

The MOM Controller Board stores all auxiliary I/O event definitions in its non-volatile RAM. Press **F4** to read the current MOM auxiliary I/O data and overwrite all I/O definitions stored at the CEC/IMC Manager. This should only be performed if the I/O data is lost at the CEC/IMC Manager and must be restored to the current CEC/IMC configuration. A confirm dialog box is displayed which will allow the request to be canceled, if necessary.

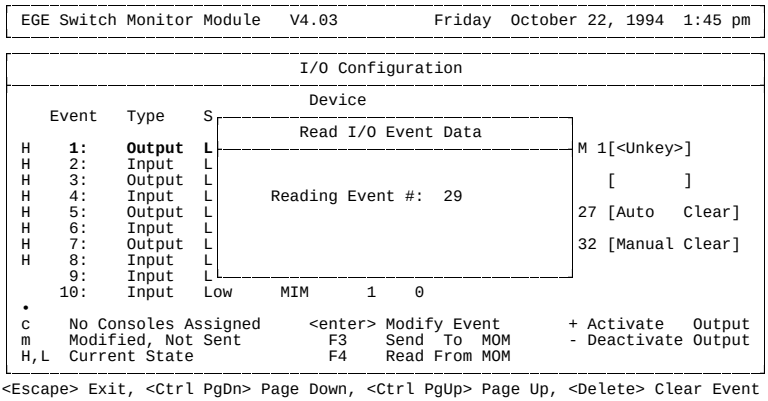

Figure 3.2-26 Read from MOM Controller Window

3.2.5. Logging Recorder

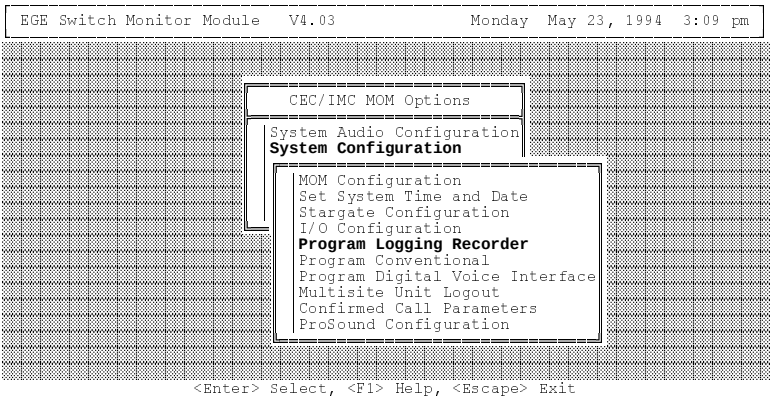

Figure 3.2-27 System Configuration Menu

This option is used to program the Logging Recorder Interface Module (LRIM). The LRIM interface is used for recording audio for selected units, groups and conventional channels. The CEC/IMC supports four (4) LRIM devices, each device supporting up to 64 modules and 32 channels. The following screen is displayed when the **F1** (Help) key is pressed.

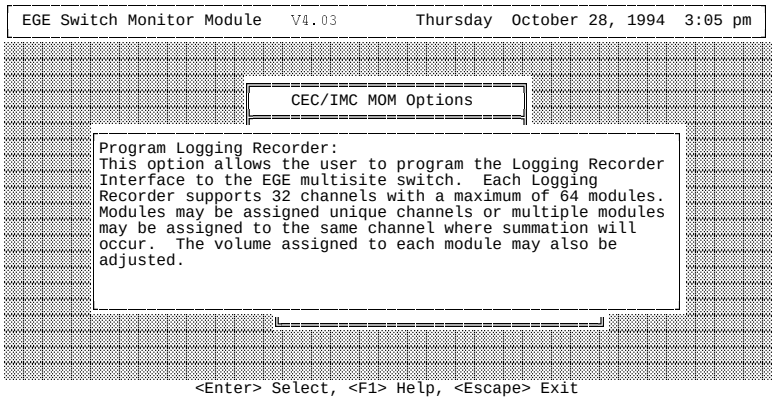

Figure 3.2-28 Logging Recorder Help Screen

The following screen shows the CEC/IMC Manager Logging Recorder Interface. This interface was designed to emulate the console programming interface as closely as possible.

The Logging Recorder currently supports the programming of units, groups, and conventional channels. Phone lines and consoles will be supported in the future.

Summation may be obtained by assigning multiple modules to the same channel. By assigning each module a unique channel number, summation will not occur.

The volume level for each module is also adjustable. Volume levels between 0 and 32 are valid. "0" is minimum volume (-25 dBm) and "32" is maximum volume (+10 dBm). See the following table for additional details.

The PROGRAMMED field is the program status at the Logging Recorder. A "Y" indicates the LRIM has programmed the module. An "N" indicates the module is NOT programmed.

To select the appropriate Logging Recorder, **<Page Down>** to the Logging Recorder prompt and enter a number between 1 and 5. **<Ctrl> <Page Down>** will cycle through the valid modules to program.

The definition of each function key (**F1 - F10**) is defined on the bottom of the form. Function keys **F6** and **F8** are not supported. Function keys **F4** and **F5** will be supported in the future.

TABLE 3.2-1 LRIM MODULE VOLUME LEVELS

VOLUME SETTING	OUTPUT LEVEL (dBm)
0	-25.0
1	-14.0
2	-12.0
3	-10.0
4	-8.0
5	-7.0
6	-6.0
7	-5.5
8	-5.0
9	-4.5
10	-4.0
11	-3.5
12	-3.0
13	-2.5
14	-2.0
15	-1.5
16	-1.0

VOLUME SETTING	OUTPUT LEVEL (dBm)
17	-0.5
18	0
19	0.5
20	1.0
21	1.5
22	2.0
23	2.5
24	3.0
25	3.5
26	4.0
27	5.0
28	6.0
29	7.0
30	8.0
31	9.0
32	10.0

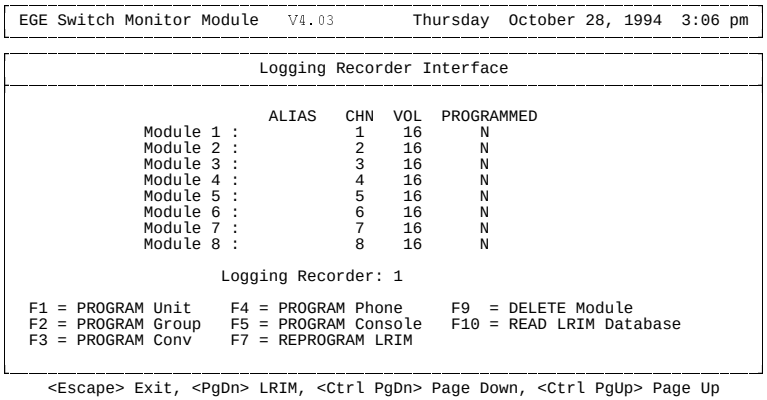

Figure 3.2-29 Logging Recorder Program Screen

To program a module, simply select the module you wish to program and press one of the valid function keys. Entering **F1 (PROGRAM Unit)** will display the following screen. The unit aliases will be displayed in alphabetical order. The first item in the list is the LID (Logical ID) of the currently selected unit. Select the unit you wish to program and press **<Enter>**. This will automatically program the Logging Recorder to the module you previously selected at the volume level displayed for that module. The unit alias should be displayed on the module you just programmed and the PROGRAMMED field should update to "Y". If this does not occur then the interface to the Logging Recorder is not correct and needs to be checked.

Volume levels may be adjusted by selecting the volume for the module you wish to adjust and entering the new volume.

NOTE

Summation will occur if modules are assigned the same channel number. If you do not desire summation, assign each module a unique channel number (between 1 and 32).

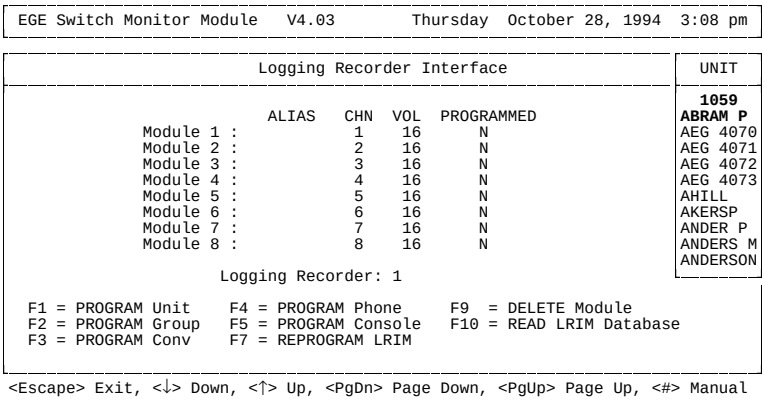

Figure 3.2-30 Logging Recorder Program Unit Screen

Programming groups (**F2**) and conventional channels (**F3**) are performed in the same manner as units. The following forms will appear if these options are selected.

Additional Function Key Support:

F7 Reprograms LRIM with current CEC/IMC Manager database. This function is very important during software upgrades. Part of the upgrade procedure is to clear NOVRAM on all boards in the CEC/IMC. This function allows you to reprogram the LRIM after the NOVRAM has been cleared.

F9 Deletes the currently selected module from the LRIM database.

F10 Read the programming database from the LRIM. This will overwrite the CEC/IMC Manager database with what the LRIM has programmed.

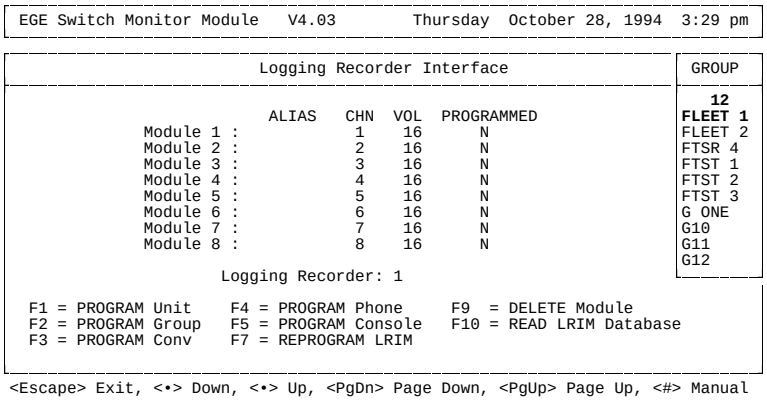

Figure 3.2-31 Logging Recorder Program Group Screen

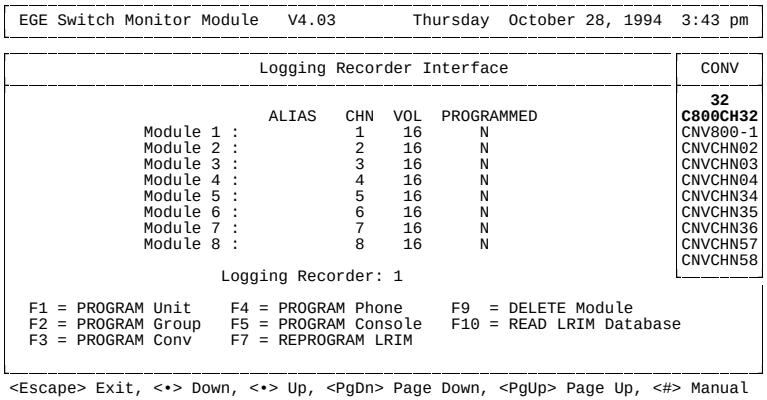

Figure 3.2-32 Logging Recorder Program Conventional Screen

In addition to list programming, the LRIM may be programmed manually with the use of the "**#**" key. This key allows the user to manually enter the id (unit, group, or conventional channel) without having to scroll through the individual lists.

The following screen shows a user manually programming group 273 to the LRIM. To execute this command the user had to PROGRAM Group (**F2**), displaying the GROUP window, enter "**#**", displaying the ID window, and enter 273, to program group 273.

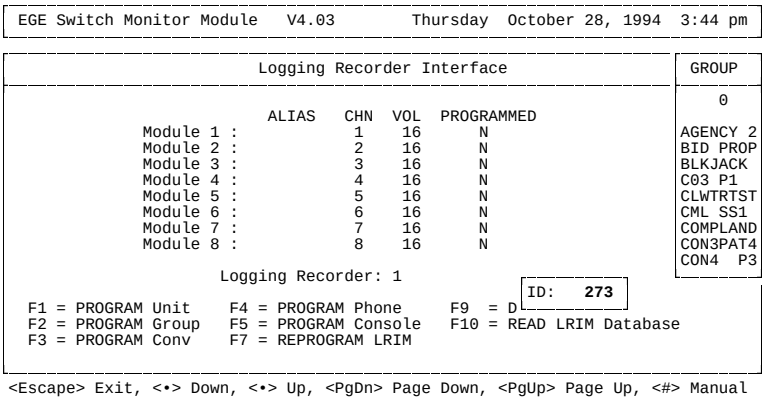

Figure 3.2-33 Logging Recorder Program Group Manually Screen

The following screen shows the Logging Recorder Interface display with five modules programmed. The ALIAS for each programmed module is displayed and the PROGRAMMED field is updated to "Y". Audio for group "FTST 1" will be routed to channel one of the logging recorder. Audio for unit "16 PLUS" will be routed to channel 2 and audio for conventional channel "CNVCHN02" will be routed to channel 3. To demonstrate how summation is accomplished, notice how modules 4 and 5 (groups ENGR 2 and ENGR 3) are assigned the same channel (4). All audio received on these groups will be summed together and routed to channel 4.

The LRIM also handles the patch / simulselect feature of the CEC/IMC. If multiple groups are patched / simulselected together then audio transmitted on the SAID (System Assigned ID) will be routed to each of those groups programmed at the LRIM.

```
EGE Switch Monitor Module   V4.03        Thursday  October 28, 1994  4:00 pm

                          Logging Recorder Interface

                          ALIAS   CHN  VOL  PROGRAMMED
               Module 1 : FTST 1    1    16      Y
               Module 2 : 16 PLUS   2    16      Y
               Module 3 : CNVCHN02  3    16      Y
               Module 4 : ENGR   2  4    16      Y
               Module 5 : ENGR   3  4    16      Y
               Module 6 :           6    16      N
               Module 7 :           7    16      N
               Module 8 :           8    16      N

                        Logging Recorder: 1

  F1 = PROGRAM Unit    F4 = PROGRAM Phone     F9  = DELETE Module
  F2 = PROGRAM Group   F5 = PROGRAM Console   F10 = READ LRIM Database
  F3 = PROGRAM Conv    F7 = REPROGRAM LRIM

     <Escape> Exit, <PgDn> LRIM, <Ctrl PgDn> Page Down, <Ctrl PgUp> Page Up
```

Figure 3.2-34 Logging Recorder Interface Database Screen

3.2.6. Program Conventional

```
EGE Switch Monitor Module   V4.03              Monday  May 23, 1994  3:09 pm

                        CEC/IMC MOM Options

                        System Audio Configuration
                        System Configuration

                          MOM Configuration
                          Set System Time and Date
                          Stargate Configuration
                          I/O Configuration
                          Program Logging Recorder
                          Program Conventional
                          Program Digital Voice Interface
                          Multisite Unit Logout
                          Confirmed Call Parameters
                          ProSound Configuration

                  <Enter> Select, <F1> Help, <Escape> Exit
```

Figure 3.2-35 System Configuration Menu

3.2.6.1. Overview

This option is used to program Conventional Controller Interface (CCI) Controller Board conventional channels. The CCI will in turn program the appropriate Conventional Interface (CI) Boards associated with the channel programmed. The CCI and CI Boards reside in a separate backplane from the CEC/IMC. This set of hardware is referred to as the Conventional Interface Adapter (CIA).

The CCI Controller Board is serially connected to a VMIM Controller Board. Each CCI is capable of controlling up to thirty-two (32) conventional channels – eight (8) CI Boards with four (4) channels per board. A maximum of two (2) CCI Controller Boards may be connected to a CEC/IMC for a maximum of sixty-four (64) conventional channels per CEC/IMC.

With "Program Conventional" on the System Configuration menu selected, the following help screen is displayed when the **F1** (Help) key is pressed.

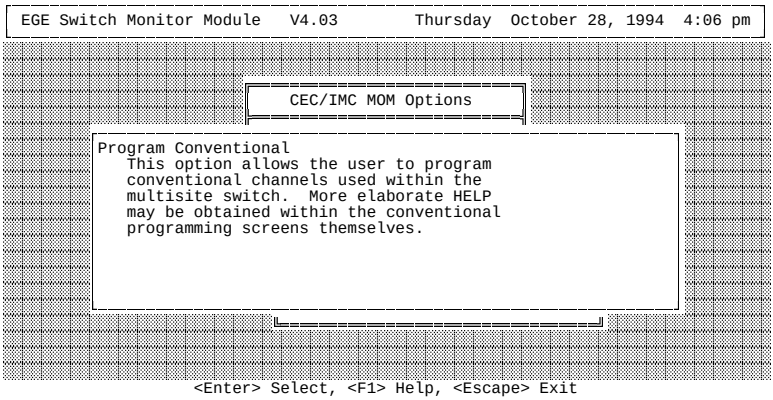

Figure 3.2-36 Program Conventional Help Screen

3.2.6.1.1. StarGate Network Conventional Channels

As previously stated, each CEC/IMC Digital Audio Switch may be equipped with two (2) conventional interfaces, each with thirty-two (32) conventional channels. This results in a maximum of sixty-four (64) conventional channels per CEC/IMC.

A StarGate network supports up to 255 conventional channels. For example, in a StarGate network with each CEC/IMC fully-loaded with conventional channels (64 conventional channels per CEC/IMC less one conventional channel at one CEC/IMC), four (4) CECs/IMCs may contain conventional channels (256 ÷ 64 = 4). The StarGate conventional channel configuration can also be spread over more CECs/IMCs by limiting the maximum number of conventional channels per CEC/IMC. For example, eight (8) CECs/IMCs in a StarGate network may contain up to a maximum of thirty-two (32)

conventional channels each less one conventional channel at one CEC/IMC. In both of the preceding examples, the highest conventional channel in this configuration would actually be 256; however, channel 256 cannot be used due to CEC/IMC call message formats. The maximum number of conventional channels per CEC/IMC must be specified when installing Enhanced StarGate V4.0 software. **In a StarGate network, the *maximum number of conventional channels* at each CEC/IMC must be equal.** For example all 64 or all 32 or all 16, etc. The allocation process is described the following subsection.

3.2.6.1.1.1. Conventional Channel Allocations

Each CEC/IMC in a StarGate network will have fixed conventional channel allocation numbers based on the maximum number of conventional channels allowed per CEC/IMC and the CEC's/IMC's "switch assignment number" (sometimes referred to as "node number" or "node assignment number"). Both of these parameters must be specified when installing the CEC/IMC Manager software. This is accomplished using an off-line program, UF_CONV.EXE, which is included with the CEC/IMC Manager software. If UF_CONV.EXE is not executed, the maximum conventional channels = 64.

NOTE

UF_CONV.EXE must be executed if upgrading CEC/IMC Manager software from V3.0 (or earlier) to V4.0. See Software Release Notes SRN-1000 for details.

When the UF_CONV.EXE program is executed, it prompts the user for the maximum number of conventional channels allowed per CEC/IMC (default = 64) and the CEC's/IMC's switch assignment number (default = 33). It then converts all existing conventional channel allocation numbers (1 – 64) to new numbers based upon the user-entered values. **Again, the maximum number of conventional channels must be equal at all CECs/IMCs in a StarGate network. Also, the CEC/IMC switch assignment number set via UF_CONV.EXE *must match* the switch assignment number set by the DIP switches on the MOM Controller Board.** See the *CEC/IMC Digital Audio Switch Installation, Set-Up And Troubleshooting* maintenance manual (LBI-38938) for MOM Controller Board DIP switch configuration details.

Table 3.2-2 maps the conventional channel allocation numbers in a StarGate network with the maximum number of conventional channels per CEC/IMC equal to sixty-four (64) and Table 3.2-3 shows the mapping for thirty-two (32) maximum channels. As shown in these tables, the conventional channel allocations recycle with higher switch assignment numbers. Therefore, when assigning switch assignment numbers, ensure the conventional channel allocations are unique at each CEC/IMC. For example, conventional channels should *not* be installed at CEC/IMC 33 *and* CEC/IMC 37 if the maximum number of conventional channels per CEC/IMC is equal to sixty-four (64).

TABLE 3.2-2 SWITCH ASSIGNMENT NUMBER-TO-CONVENTIONAL CHANNEL ALLOCATION MAPPING FOR STARGATE NETWORKS
(Example With Max. Conv. Channels Per CEC/IMC = 64)

CEC/IMC SWITCH ASSIGNMENT NUMBERS	CONVENTIONAL CHANNEL ALLOCATIONS
33, 37, 41, 45, 49, 53, 57, 61	1 – 64
34, 38, 42, 46, 50, 54, 58, 62	65 – 128
35, 39, 43, 47, 51, 55, 59, 63	129 – 192
36, 40, 44, 48, 52, 56, 60, 64	193 – 255

NOTE

The CEC/IMC switch assignment number set via UF_CONV.EXE must match switch assignment number set at the CEC's/IMC's MOM Controller Board.

TABLE 3.2-3 SWITCH ASSIGNMENT NUMBER-TO-CONVENTIONAL CHANNEL ALLOCATION MAPPING FOR STARGATE NETWORKS
(Example With Max. Conv. Channels Per CEC/IMC = 32)

CEC/IMC SWITCH ASSIGNMENT NUMBERS	CONVENTIONAL CHANNEL ALLOCATIONS
33, 41, 49, 57	1 – 32
34, 42, 50, 58	33 – 64
35, 43, 51, 59	65 – 96
36, 44, 52, 60	97 – 128
37, 45, 53, 61	129 – 160
38, 46, 54, 62	161 – 192
39, 47, 55, 63	193 – 224
40, 48, 56, 64	225 – 255

3.2.6.1.1.2. Conventional Channel Programming

In a StarGate network, conventional channels for each CEC/IMC must be programmed/configured at the respective CEC/IMC Manager. For example, in Table 3.2-3, channels 1 thru 32 must be programmed at the CEC/IMC Manager for CEC/IMC 33 (or 41, 49, 57) and channels 225 thru 255 must be programmed at the CEC/IMC Manager for CEC/IMC 40 (or 48, 56, 64). In this example conventional channels 1 thru 32 are "local" to CEC/IMC 33 and all other channels are considered "remote" channels to CEC/IMC 33. Similarly, conventional channels 225 thru 255 are "local" to CEC/IMC 40 and all other channels are "remote" channels.

As with a non-StarGate CEC/IMC, conventional channels in a StarGate network are programmed via the CEC/IMC Manager's CONVENTIONAL CHANNEL PROGRAMMING screen. This screen is accessed by selecting "Program Conventional" from the System Configuration menu. See section 3.2.6.2. for in-depth details.

A CEC/IMC Manager can only program/configure its local conventional channels. When local conventional channel

programming is saved at a CEC/IMC Manager, the channel aliases and channel LIDs of the changed channels are sent to all other CECs/IMCs in the StarGate network. This allows remote conventional channel information to be viewed (read-only function) at all other CEC/IMC Managers in the StarGate network. When viewing remote conventional channel information, displayed read-only information includes the remote channel's CEC/IMC switch assignment number (33 – 64), its LID number, its alias, and the range of conventional channels assigned to the remote CEC/IMC. The switch assignment number and the channel range are viewed from the CONVENTIONAL CHANNEL PROGRAMMING screen in a small window identified as "Channel Location". See Figure 3.2-37 for an example. Table 3.2-4 breaks out channel locations for 64 channels maximum per CEC/IMC.

In CEC/IMC software/firmware previous to version 4.0, LIDs 1 – 64 had to be reserved for conventional channels if these channels were going to be patched to trunked groups. In version 4.0, any free LID can be assigned to a conventional channel. This prevents reservations of LIDs 1 – 255 for conventional channels in a StarGate network. To support this enhancement, a "LID" field now appears on the CONVENTIONAL CHANNEL PROGRAMMING screen. This new field allows entry of the conventional channel's LID number per System Manager programming.

It is recommended that a conventional channel's LID stored in the System Manager be given the same alias as the corresponding conventional channel's LID at the CEC/IMC Manager. This will ease conventional channel identification during patch operations. A console communicates with a conventional channel by its channel number, not its LID number.

NOTE

A console never uses a conventional channel's LID. The conventional channel LID is only sent to trunked sites during a conventional channel-to-trunked group patch.

TABLE 3.2-4 CONVENTIONAL CHANNEL LOCATIONS (Example With Max. Conv. Channels Per CEC/IMC = 64) (Non-Inclusive Listing)

CEC/IMC SWITCH ASSIGNMENT NUMBER	CIA RACK NUMBER	CIA RACK CHANNEL NUMBER	NETWORK CONV. CHANNEL NUMBER
33	1	1	1
33	1	32	32
33	2	1	33
33	2	32	64
34	1	1	65
34	1	32	96
34	2	1	97
34	2	32	128
35	1	1	129
35	1	32	160
35	2	1	161
35	2	32	192
36	1	1	193
36	1	32	224
36	2	1	225
36	2	31	255*

* Channel 256 is not available.

3.2.6.1.1.3. Remote Conventional Channel Logged Warnings

As previously stated, when conventional channel programming is saved at a CEC/IMC Manager, conventional channel data is sent to all other CECs/IMCs in the StarGate network. When a CEC/IMC

receives this remote conventional channel data, it logs "warnings". These warnings are part of normal operation and they are logged to provide a record of conventional channel programming activity. All StarGate NIM links and all CEC/IMC Manager (or "StarGate Manager") links must be operational when saving. The following warnings may appear:

W20-136 Conv Chan -Conflict
This warning is logged when a conventional channel definition is received from a remote CEC/IMC that falls within the local CEC/IMC conventional channel range. The data word contains the channel number in conflict. If this error occurs, verify each CEC/IMC in the StarGate network has a unique switch assignment number per the MOM Controller Board DIP switch settings and the UF_CONV.EXE program. StarGate conventional channel operation will not function correctly unless each CEC/IMC has a unique switch assignment number and uniquely allocated conventional channel numbers.

W20-137 Conv Chan -Defined
This warning indicates conventional channel data has changed at a remote CEC/IMC Manager. It is generated as part of normal operation to provide a record at the local CEC/IMC Manager of remote conventional channel configuration changes. The data word contains the defined channel in the lower byte and the respective remote CEC/IMC switch assignment number is contained in the upper byte. On a logged warning screen, this 2-byte data word is displayed in hexadecimal (base 16) in the "Data" column.

W20-138 Conv Chan -Deleted
This warning is logged when a remotely-defined conventional channel is deleted at a remote CEC/IMC Manager. As with the previously described warning, this warning is generated as part of normal operation to provide a record of remote conventional channel configuration changes at the local CEC/IMC. The data word contains the deleted channel number in the lower byte and the respective remote CEC/IMC switch assignment number is contained in the upper byte.

3.2.6.1.1.4. Conventional Privilege List

Local and remote conventional channels appear in the CEC/IMC Manager's conventional privilege list. At this point, there is no difference between local and remote conventional channels to the operator. As conventional channels are defined, they are added to the

console privilege lists. Any conventional channel that should not be available at a console must be removed from that console's privilege list.

3.2.6.1.1.5. CEC/IMC Manager-Based System Manager Uploads

All conventional channel data (local and remote channels) is sent out to the consoles when a CEC/IMC Manager-based System Manager database upload is performed. See section 3.4.2. for details.

3.2.6.1.1.6. Local/Remote Conventional Channel Dispatch

After a console has received the System Manger's conventional channel database information and its privilege list, local and remote conventional channel communications operate almost identically. The console operator can program the channel to a communication module, dispatch to the channel, exercise any available conventional functions (local/remote, main/standby, etc.), or patch/simulselect the channel to other conventional channels or trunked groups.

To a dispatcher, the only operational difference between local and remote conventional channels is a call to a remote conventional channel could be queued at the NIM if all NIM channels are currently busy. In this case, similar to when a trunked group call is queued, a "Queued at NIM Site" call status is displayed at the console.

3.2.6.1.2. Conventional Channel Hard Patch/Simulselect

Conventional channel hard patch/simulselect allows direct patching or simulselecting of a conventional channel to a trunked talk group. A "hard" patch/simulselect exists only in the CCI and VMIM Controller Boards. The CCI and VMIM use the trunked talk group ID (GID) number for hard patch/simulselect communications. All conventional channels within a CEC/IMC Digital Audio Switch (64 maximum) may be hard patched/simulselected. Consoles and trunked sites in the CEC/IMC network know nothing about hard patches or hard simulselects.

In contrast, traditional patches/simulselects (which may be thought of as "soft" patches/simulselects) each use a special group ID number referred to as a System Assigned ID (SAID) number. SAIDs are transferred throughout the CEC/IMC network. SAIDs are *not* used for hard patches/simulselects. "Soft" patches/simulselects are only set-up at the consoles, not the CEC/IMC Manager or System Manager.

"Hard" patch/simulselect advantages over "soft" patch/simulselect include:

- Trunked radios may scan into conventional channel originated calls since the talk group ID (GID) is used.
- Operates in Site Controller mode *and* failsoft mode.
- Reduced audio delay between a conventional PTT and the trunked group's reception of the conventional PTT.
- Consoles may pre-empt hard patches and hard simulselects.
- Patch/simulselect update time is minimized when a trunked radio roams/logs into a new trunked site.
- Eliminates the single-point-of-failure (MOM Controller Board) experienced with "soft" patches/simulselects.
- Frees-up patch/simulselects at consoles which were previously used for "soft" patch/simulselect of these GIDs and conventional channels.

All hard patches and hard simulselects are configured from the CEC/IMC Manager's Conventional Channel Programming screen. As shown in Figure 3.2-37, three (3) fields on this screen configure hard patch/simulselect for the currently displayed conventional channel – "Hard Patch/Simulselect:", "GID:" and "Alias:". See the field descriptions for this figure in section 3.2.6.2 for additional details.

Any field changes must be followed by a "Program" (**F7** function key) before the change(s) will come into effect. This (re)programs the CCI and VMIM Controller Boards. Also, settings should be saved to the CEC/IMC Manager's hard disk drive via the "Save" (**F5** function key) function. Disabling ("tearing down") of a hard patch or a hard simulselect after it has been programmed can only be accomplished from the Conventional Channel Programming screen, not a console.

3.2.6.1.2.1. Hard Patch Operation

Hard patch operation is summarized as follows:

- A conventional call on a hard-patched conventional channel is routed to consoles and trunked sites via the trunked group ID (GID) assigned to the hard patch.

- A trunked site-originated group call is routed to consoles and the hard-patched conventional channel via the trunked group ID (GID) assigned to the hard patch.

- A console-originated group call is routed to trunked sites and the hard-patched conventional channel via the trunked group ID (GID) assigned to the hard patch.

- A console-originated conventional channel call is routed only to the conventional channel. This is due to the fact that consoles know nothing about the hard patch stored in the CCI and VMIM. The logical ID (LID) assigned to the conventional channel handles this call.

3.2.6.1.2.2. Hard Simulselect Operation

Hard simulselect operation is summarized as follows:

- A call on a conventional channel which is hard-simulselected is routed to consoles but not the respective hard-simulselected group. Of course, radios monitoring on the conventional channel also hear the call. This operation is identical to "soft"-simulselected conventional channels.

- A trunked site-originated group call *is not* routed to the respective hard-simulselected conventional channel. It is only routed to the other trunked radios and consoles monitoring the group.

- A console-originated group call via a "common" PTT (selected TX key, mic PTT, or footswitch) at the console is routed to trunked sites and the hard-simulselected conventional channel via the respective trunked group ID (GID).

- A console-originated group call via an "instant" PTT (instant TX key) at the console is routed to trunked sites only, *not* to the simulselected conventional channel.

- A console-originated conventional channel call is routed only to the conventional channel. This is due to the fact that consoles know nothing about the hard simulselect stored in the CCI and VMIM. The logical ID (LID) assigned to the conventional channel handles this call.

3.2.6.2. Configuration

The following screen shows the high-level programming data for the conventional channel. Unless otherwise stated, all information in this section applies to local and remote conventional channels. Field definitions are as follows. See Figure 3.2-37:

NOTE

UF_CONV.EXE must be executed if upgrading CEC/IMC Manager software from V3.0 (or earlier) to V4.0. See Software Release Notes SRN-1000 for details.

Channel
Conventional channel number. Range = 1 – 255.

LID
Conventional channel Logic ID number. Range = 1 – 16383.

Alias
8-character alias associated with channel.

Switch Site
VMIM assignment number. Range = 1 – 32. This field is not displayed if the currently selected channel is a remote conventional channel.

Hard Patch/Simulselect
The "Hard Patch/Simulselect" field is used to set the channel for hard patch operation, hard simulselect operation, or neither by selecting the "Patch", "Simulselect" or "None" options respectively. "None" is the default. Choosing "None" results in no hard patch/simulselect. Choosing "Patch" results in a hard patch to the defined group ID in the GID field (see below) and choosing "Simulselect" results in a hard simulselect to the defined GID.

GID
If the "Hard Patch/Simulselect" field is set to "Hard" or "Simulselect, this field specifies the group ID number for the patch/simulselect. If the "Hard Patch/Simulselect" field is set to "None", this field is not valid.

Alias (Read Only)
This read-only field displays the alias of the group ID number entered into the GID field. This alias is defined at the System Manager.

Type
Control signaling type. This field is not displayed if the currently selected channel is a remote conventional channel. Available selections for this field are:

TONE – Standard tone signaling.

TONE (E&M PTT) – Standard tone signaling except on PTTs. E&M signaling on PTTs.

TONE (TONE/E&M PTT) – Standard tone signaling on all functions. PTTs include both tone and E&M signaling.

DC - Standard DC signaling.

DC (E&M PTT) – Standard DC signaling except on PTTs. E&M signaling on PTTs.

DC (DC/E&M PTT) – Standard DC signaling on all functions. PTTs include both DC and E&M signaling.

Configuration
Various configuration fields. These fields are not displayed if the currently selected channel is a remote conventional channel:

2-wire or **4 wire** – Selects 2-wire or 4-wire interfacing to the conventional station.

Tx/Rx coupled or **Tx/Rx NOT coupled** – Coupled = changing either Tx or Rx causes both Tx and Rx to change. NOT coupled = Tx and Rx frequencies may be changed independently.

VOX Enable or **COR Enable** – VOX enabled = conventional calls trip on presence of audio. COR (Carrier Operated Relay) enabled = calls tripped on relay signalling.

Channel Location
Read-only local/remote information:

Switch Number – In most cases, this field displays the CEC/IMC switch assignment number of the currently displayed conventional channel. See the **bold-face** switch assignment numbers in Tables 3.2-2 and 3.2-3. However, if the switch assignment number is equal to or greater than 256 ÷ max. conventional channels per CEC/IMC + 33, the displayed number *will not* equal the switch assignment number of the currently displayed conventional channel. For example, as shown in Table 3.2-3, if the switch

assignment number of the currently displayed conventional channel is 60, the displayed number will be 36. (Only lower numbers representative of **bold-face** numbers in the tables are displayed for a given max. conventional channels per CEC/IMC.) Range = 33 – 48.

Channel Range – Range of conventional channel numbers that current Switch Number is allocated. Range = 1 – 255; maximum of 64 sequential channels.

Conventional Interface – VMIM number that supports currently displayed conventional channel. Range = 1 or 2. This field is not displayed if the currently selected channel is a remote conventional channel.

CI Channel – Conventional Interface/VMIM channel number of currently displayed conventional channel. Range = 1 - 32. This field is not displayed if the currently selected channel is a remote conventional channel.

Enable/Disable Remote CTRL

When using a Conventional Concentrator Card in a remote controller enable/disable configuration, this field toggles the currently selected channel's remote controller between enabled and disabled. When enabled, the CEC/IMC cannot control or communicate with the conventional base station; the base station is controlled by the remote controller.

Standby Site Enabled/Disabled

When using a Conventional Concentrator Card in a main/standby configuration, this field toggles the currently selected channel between the main conventional base station channel and the standby conventional base station channel. When enabled, the standby channel is active and the main channel is inactive.

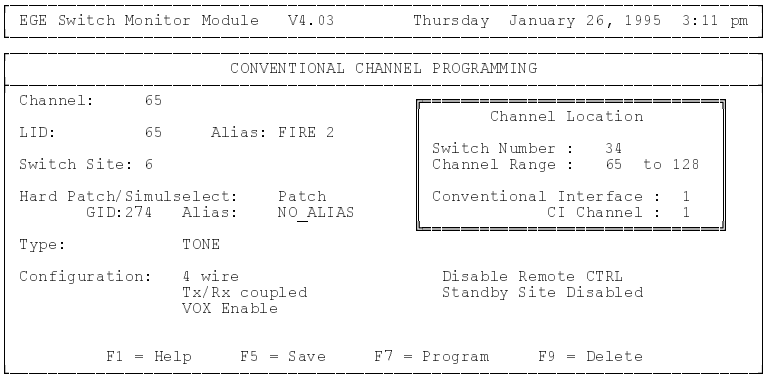

Figure 3.2-37 Program Conventional Configuration Screen (Local Conventional Channel)

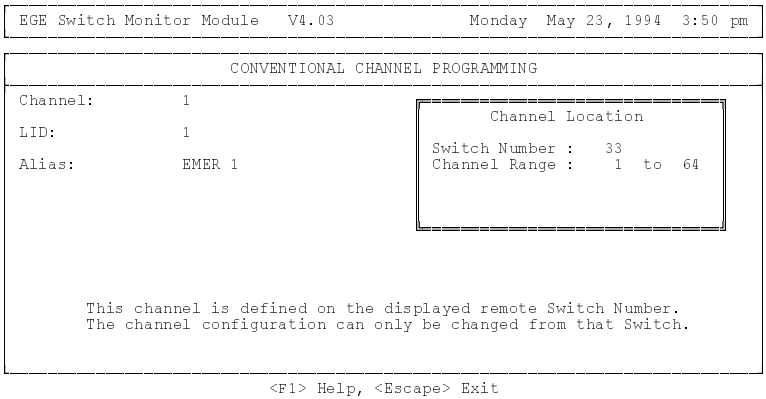

Figure 3.2-38 Program Conventional Configuration Screen (Remote Conventional Channel)

The following figure includes the help text which is displayed for the high-level conventional channel programming screen. Use the **<Page Down>** and **<Page Up>** keys to cycle between Help pages.

```
Conventional Programming Configuration Help:

 This form allows the user to configure conventional channels for the multisite
 switch.  The fields and key input are defined as follows:

 Fields:
      Channel:          Channel number to view / modify. Each CEC/IMC is
                        allowed a specific channel range, within the maximum 1-
                        255 possible channels. Each MSC is usually allocated 64
                        conventional channels. However fewer channels can be
                        specified on installation to allow the 255 maximum
                        channels to be spread over more than four MSC nodes in
                        a Stargate system.
                        On a Stargate system with conventional channels on
                        multiple CEC/IMC nodes, entering a channel number for
                        one of the other nodes will display the defined data
                        for the remote channel. This data is read only and can
                        only be modified from the CEC/IMC Manager on the
                        conventional channel's "home" CEC/IMC node.

      LID:              This is the Logical ID that will be sent to trunked
                        sites when the channel is patched to a trunked group.
                        This will normally be the same as the channel number.
                        If the LID to match the channel number is already
                        assigned, a different LID can be assigned to the
                        conventional channel here. Each channel should have a
                        unique LID.

      Alias:            8 character alias associated with chn. Will be
                        broadcast to all consoles during CEC/IMC Manager based
                        System Manager downloads.

      Switch Site:      VMIM assignment. Range (1 - 32).

      Hard Patch/
      Simulselect:      Select PATCH, SIMULSELECT, or NONE to patch or
                        simulsect a group (GID) to a conventional channel. When
                        HARD PATCH/SIMULSELECT is used, that conventional
                        channel should not be PATCHED/SIMULSELECTED from the
                        console (dispatch). ONLY one channel can be
                        patched/simulselected to a GROUP.

      GID:              Type the Group ID of the group that is required to be
                        patched/simulselected to a conventional channel.
                        Note: The Hard patch/Simulselect field must have PATCH
                        or SIMULSELECT selected for the Group (GID) to be
                        properly patched/simulselected.
                        The VMIM must then be programmed by hitting F7-program
                        to send the information to the VMIM.

      Channel Location: This box contains read only information to display the
                        physical location of the (logical) channel. The
                        physical channel location is specified by the MSC
                        number(33-63)conventional site (CI 1 or CI 2) and
                        physical channel on the CI (always 1-32).

      Type:             Channel configuration type.
                          Tone - Tone signaling.
                          Tone (E&M PTT) -  E&M on PTTs; Tone on all other
                                            functions.
                          Tone (Tone/E&M PTT) -  Tone signaling; Both E&M and
                                                 Tone on PTTs.
                          DC - DC signaling.
                          DC (E&M PTT) - E&M on PTTs; DC on all other
                                         functions.
                          DC (DC/E&M PTT) -  DC signaling; Both E&M and DC on
                                             PTTs.
                        May be altered using "+" key only to cycle through
                        options.

      Configuration:    Various channel configuration options:
                          2 / 4 wire
                          Tx / Rx lines coupled / NOT
                          COR / VOX Enable
                        May be altered using "+" key only to cycle through
                        options.
```

Figure 3.2-39 Program Conventional Configuration Help

```
Key Input:
    Escape          Exit form.
    F1              Display HELP.
    F5              Save Configuration to Disk.
    F7              Program Conventional Channel. This option programs the
                    CCI for this conventional channel. The CCI will in turn
                    program the appropriate CI card for this channel.
    F9              Delete conventional channel database. The database for
                    this conventional will be deleted from the CEC\IMC
                    Manager disk.
```

Figure 3.2-39 Program Conventional Configuration Help (Cont.)

Pressing **<Ctrl> <Page Down>** displays the low-level programming data for the conventional channels. A "Please Wait" window will flash while these forms are being built. The following two screens show an example of tone and DC configured channels. The channel and alias fields cannot be edited here. The user must escape back to the previous form to change these fields. The following commands are supported on both tone and DC configurations:

Command	Definition
SET TX FREQ 1	Transmit on frequency 1.
SET TX FREQ 2	Transmit on frequency 2.
SET TX FREQ 3	Transmit on frequency 3.
SET TX FREQ 4	Transmit on frequency 4.
SET TX FREQ 5	Transmit on frequency 5.
SET TX FREQ 6	Transmit on frequency 6.
SET TX FREQ 7	Transmit on frequency 7.
SET TX FREQ 8	Transmit on frequency 8.
SET RX FREQ 1	Set receive frequency to frequency 1.
SET RX FREQ 2	Set receive frequency to frequency 2.
SET RX FREQ 3	Set receive frequency to frequency 3.
SET RX FREQ 4	Set receive frequency to frequency 4.
SET RX FREQ 5	Set receive frequency to frequency 5.
SET RX FREQ 6	Set receive frequency to frequency 6.
SET RX FREQ 7	Set receive frequency to frequency 7.
SET RX FREQ 8	Set receive frequency to frequency 8.
REPEAT ENABLE	Enable Repeater.
REPEAT DISABLE	Disable Repeater.
CG ENABLE	Enable Channel Guard.
CG DISABLE	Disable Channel Guard.
CG MON ENABLE	Enable Channel Guard Monitor (disabled on PTTs).

CG MON DISABLE	Disable Channel Guard Monitor.
SCAN ENABLE	Scan Enable.
SCAN DISABLE	Scan Disable.
SIM MON ENABLE	Enable simultaneous monitor.
SIM MON DISABLE	Disable simultaneous monitor.

The low-level screens map to a state table located on the CI Board for the selected channel. This state table is what the CI Board uses to control the base station.

```
EGE Switch Monitor Module   V4.03        Thursday  October 28, 1994  4:47 pm

                        CONVENTIONAL CHANNEL PROGRAMMING

         Channel: 1                              Alias: CNV800-1

                                    Function Tone Levels (Hz)
Commands:            1050 1150 1250 1350 1450 1550 1650 1750 1850 1950 2050
SET TX FREQ 1          9    9    9    9    9    9    9    9    9    9    9
SET TX FREQ 2          -    -    -    -    -    -    -    -    -    -    -
SET TX FREQ 3          -    -    -    -    -    -    -    -    -    -    -
SET TX FREQ 4          -    -    -    -    -    -    -    -    -    -    -
SET TX FREQ 5          -    -    -    -    -    -    -    -    -    -    -
SET TX FREQ 6          -    -    -    -    -    -    -    -    -    -    -
SET TX FREQ 7          -    -    -    -    -    -    -    -    -    -    -
SET TX FREQ 8          -    -    -    -    -    -    -    -    -    -    -


                F1 = Help       F5 = Save       F7 = Program

                <Escape> Exit, <Ctrl PgDn> Page Commands
```

Figure 3.2-40 Program Conventional Tone Frequencies Screen

```
EGE Switch Monitor Module   V4.03        Thursday  October 28, 1994  4:51 pm

                        CONVENTIONAL CHANNEL PROGRAMMING

         Channel: 31                             Alias: CNVCHN31

                                    DC Levels (mA)
Commands:            -11   -6   -2.5    0   +2.5   +6    +11
SET TX FREQ 1          -     -     -     -     -     -     -
SET TX FREQ 2          -     -     -     -     -     -     -
SET TX FREQ 3          -     -     -     -     -     -     -
SET TX FREQ 4          -     -     -     -     -     -     -
SET TX FREQ 5          -     -     -     -     -     -     -
SET TX FREQ 6          -     -     -     -     -     -     -
SET TX FREQ 7          -     -     -     -     -     -     -
SET TX FREQ 8          -     -     -     -     -     -     -


                F1 = Help       F5 = Save       F7 = Program

                <Escape> Exit, <Ctrl PgDn> Page Commands
```

Figure 3.2-41 Program Conventional DC Levels Screen

The following figure includes the help text that is displayed for the low-level conventional channel programming screens. Use the **<Page Down>** and **<Page Up>** keys to cycle between Help pages. These screens will aid in correct programming. They provide information about the various keys supported on the programming screens.

```
Conventional Programming Help:


   This form allows the user to program the COMMAND state table for the
   conventional channel selected on the channel  configuration screen. The
   current states (Tone Freq / DC level) are listed across the form and the
   commands to be executed are listed down the form. The editable fields on
   the form indicate the state to transition to.  A "-" indicates the
   command is not supported. A numeric entry indicates the freq / level to
   transition to.

   The numeric entry is an offset to the appropriate freq / level to
   generate.

            DC                                          Tone
      0        -11  mA                          0        1050 Hz
      1        -6   mA                          1        1150 Hz
      5        +6   mA                          9        1950 Hz
      6        +11  mA                         10        2050 Hz

   For example:  (DC channel)

      Command:      -11   -6   -2.5    0   +2.5   +6    +11
                    ---   ---   ---   ---   ---   ---   ---
      CG_ENABLE      1     1     3     3     -     5     6

      If our current state (level output to base station)is -11 mA and our
      command is Channel Guard Enable, then our next state is -6 mA. This is
      obtained by taking the 1 under -11 and offsetting to the a appropriate
      DC level. And similarly, if our current state is -2.5 mA for the same
      command, then our next state is 0 mA (3 -> 0 mA). Tone works in the
      same manner.

   Key Input:

        Escape                Exit form

        F1                    HELP - Display these HELP screens

        F5                    SAVE configuration to disk

        F7                    Program Conventional Channel
                              This will program the CCI for this channel.
                              The CCI will in turn program the appropriate
                              CI card.

        Ctrl Page Down        Page down through commands.

        Ctrl Page Up          Page up through commands.
```

Figure 3.2-42 Conventional Programming Help

Elaborating on the example from this Help screen, we have the following station configuration:

FUNCTION	CONTROL CURRENT IN MILLIAMPS *					
2 FREQ TX	-11	-6	-2.5	0	+6	+11
2 FREQ RX WITH CHANNEL GUARD DISABLE	RX-F2 CG DISABLE	RX-F2 WITH CG	RX-F1 CG DISABLE	RX-F1 WITH CG	TX-F1	TX-F2

* +2.5 mA is not supported in this example.

The DC channel programming data is:

	DC CONTROL CURRENT (mA)						
COMMANDS	-11	-6	-2.5	0	+2.5	+6	+11
SET TX FREQ 1	5	5	5	5	5	5	5
SET TX FREQ 2	6	6	6	6	6	6	6
SET RX FREQ 1	2	3	2	3	-	5	6
SET RX FREQ 2	0	1	0	1	-	5	6
CG ENABLE	1	1	3	3	-	5	6
CG DISABLE	0	0	2	2	-	5	6

DC Level Mapping is:

OFFSET	DC LEVEL
0	-11 mA
1	-6 mA
2	-2.5 mA
3	0 mA

OFFSET	DC LEVEL
4	+2.5 mA
5	+6 mA
6	+11 mA

Explanation of programming (**COMMANDS**):

SET TX FREQ 1 5 on all fields because anytime console dispatcher keys on freq 1, +6 mA needs to be produced, regardless of the current state.

SET TX FREQ 2 6 on all fields because anytime console dispatcher keys on freq 2, +11 mA needs to be produced, regardless of the current state.

	Current State	**Desired State**	**DC Offset Map**
SET RX FREQ 1	RX-F2 CG DISABLE (-11 mA)	RX-F1 CG DISABLE (-2.5 mA)	Offset 2
	RX-F2 WITH CG (-6 mA)	RX-F1 WITH CG (0 mA)	Offset 3
	RX-F1 CG DISABLE (-2.5 mA)	RX-F1 CG DISABLE (-2.5 mA)	Offset 2 (already there)
	RX-F1 WITH CG (0 mA)	RX-F1 WITH CG (0 mA)	Offset 3 (already there)
	TX-F1 (+6 mA)	TX-F1 (+6 mA)	Offset 5 (never override transmissions)
	TX-F2 (+11 mA)	TX-F2 (+11 mA)	Offset 6 (never override transmissions)
SET RX FREQ 2	RX-F2 CG DISABLE (-11 mA)	RX-F2 CG DISABLE (-11 mA)	Offset 0 (already there)

	Current State	Desired State	DC Offset Map
	RX-F2 WITH CG (-6 mA)	RX-F2 WITH CG (-6 mA)	Offset 1 (already there)
	RX-F1 CG DISABLE (-2.5 mA)	RX-F2 CG DISABLE (-11 mA)	Offset 0
	RX-F1 WITH CG (0 mA)	RX-F2 WITH CG (-6 mA)	Offset 1
	TX-F1 (+6 mA)	TX-F1 (+6 mA)	Offset 5 (never override transmissions)
	TX-F2 (+11 mA)	TX-F2 (+11 mA)	Offset 6 (never override transmissions)
CG ENABLE	RX-F2 CG DISABLE (-11 mA)	RX-F2 WITH CG (-6 mA)	Offset 1
	RX-F2 WITH CG (-6 mA)	RX-F2 WITH CG (-6 mA)	Offset 1 (already there)
	RX-F1 CG DISABLE (-2.5 mA)	RX-F1 WITH CG (0 mA)	Offset 3
	RX-F1 WITH CG (0 mA)	RX-F1 WITH CG (0 mA)	Offset 3 (already there)

	Current State	Desired State	DC Offset Map
	TX-F1 (+6 mA)	TX-F1 (+6 mA)	Offset 5 (never override transmissions)
	TX-F2 (+11 mA)	TX-F2 (+11 mA)	Offset 6 (never override transmissions)
CG DISABLE	RX-F2 CG DISABLE (-11 mA)	RX-F2 CG DISABLE (-11 mA)	Offset 0 (already there)
	RX-F2 WITH CG (-6 mA)	RX-F2 CG DISABLE (-11 mA)	Offset 0
	RX-F1 CG DISABLE (-2.5 mA)	RX-F1 CG DISABLE (-2.5 mA)	Offset 2 (already there)
	RX-F1 WITH CG (0 mA)	RX-F1 CG DISABLE (-2.5 mA)	Offset 2
	TX-F1 (+6 mA)	TX-F1 (+6 mA)	Offset 5 (never override transmissions)
	TX-F2 (+11 mA)	TX-F2 (+11 mA)	Offset 6 (never override transmissions)

If we were to program a tone station with the same configuration, the station programming may look like:

FUNCTION	FREQUENCY (Hz)
Tx-Frequency 1	1950
Tx-Frequency 2	1850
Rx-Frequency 1	1750
Rx-Frequency 2	1650
Channel Guard On	1550
Channel Guard Off	1450

The tone channel mapping will be as follows:

	FUNCTION TONE (Hz)										
COMMANDS	1050	1150	1250	1350	1450	1550	1650	1750	1850	1950	2050
SET TX FREQ 1	9	9	9	9	9	9	9	9	9	9	9
SET TX FREQ 2	8	8	8	8	8	8	8	8	8	8	8
SET RX FREQ 1	7	7	7	7	7	7	7	7	7	7	7
SET RX FREQ 2	6	6	6	6	6	6	6	6	6	6	6
CG ENABLE	5	5	5	5	5	5	5	5	5	5	5
CG DISABLE	4	4	4	4	4	4	4	4	4	4	4

Tone Level Mapping:

OFFSET	FREQUENCY
0	1050 Hz
1	1150 Hz
2	1250 Hz
3	1350 Hz
4	1450 Hz
5	1550 Hz

OFFSET	FREQUENCY
6	1650
7	1750
8	1850
9	1950
10	2050

Explanation of programming:

With tone stations, commands are controlled with secure-it, function and hold (PTT only) tones. There is no real definition of current state. Therefore, regardless of the "current state" of the station, the same tone will always be generated for a requested command.

Commands

SET TX FREQ 1 9 on all fields to generate 1950 Hz.
SET TX FREQ 2 8 on all fields to generate 1850 Hz.
SET RX FREQ 1 7 on all fields to generate 1750 Hz.
SET RX FREQ 2 6 on all fields to generate 1650 Hz.
CG ENABLE 5 on all fields to generate 1550 Hz.
CG DISABLE 4 on all fields to generate 1450 Hz.

Anytime a tone offset is entered for a command, the offset is automatically displayed under all function tone levels for that command. This is a safeguard to prevent accidental programming errors.

When programming is complete for a channel you may save this configuration to disk using the **F5** function key. The following screen will be displayed for save verification.

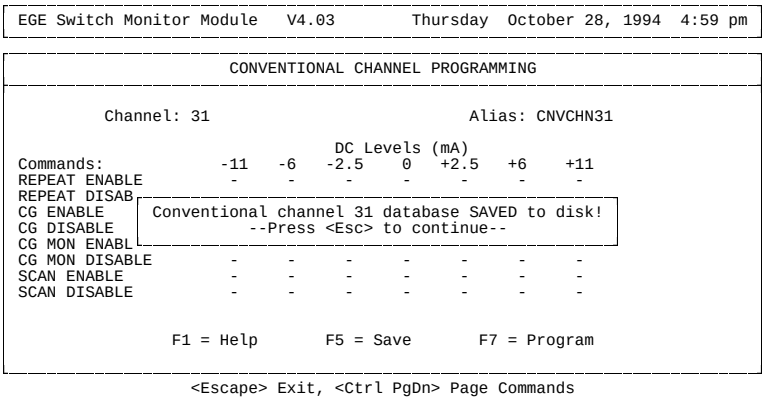

Figure 3.2-43 Save Conventional Channel Verification

Deleting conventional channel databases is performed using the **F9** function key. A delete confirmation window is displayed first to verify desired function, shown below. If you do not wish to delete the database select "No" or simply press the **<Esc>** key. It is recommended to only have those conventional channels actually in use in your system to be in your database. This will minimize conventional database downloads to consoles when requested.

NOTE

This function may only be executed from the high-level programming data screen.

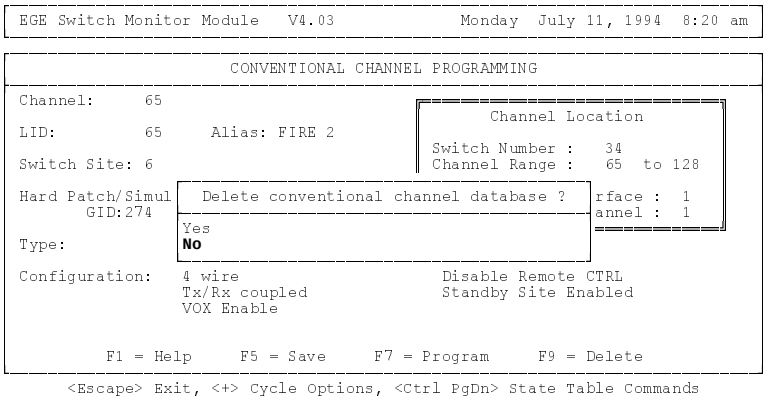

Figure 3.2-44 Delete Conventional Channel

Selecting "Yes" will delete the conventional channel database from the CEC/IMC Manager hard disk. The following window will appear for verification.

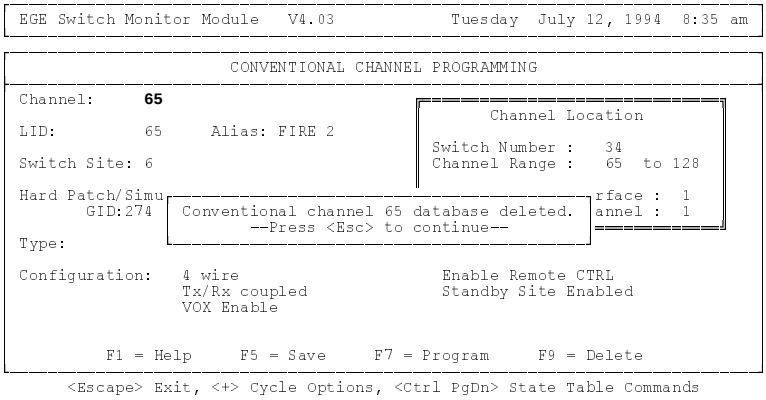

Figure 3.2-45 Delete Conventional Channel Verification

If the user has changed the programming data and attempts to exit without saving, the following window will be displayed to prevent accidental loss of data. If you wish to save the data select "Yes", otherwise select "No". Selecting "Yes" will display the save verification as shown in Figure 3.2-46.

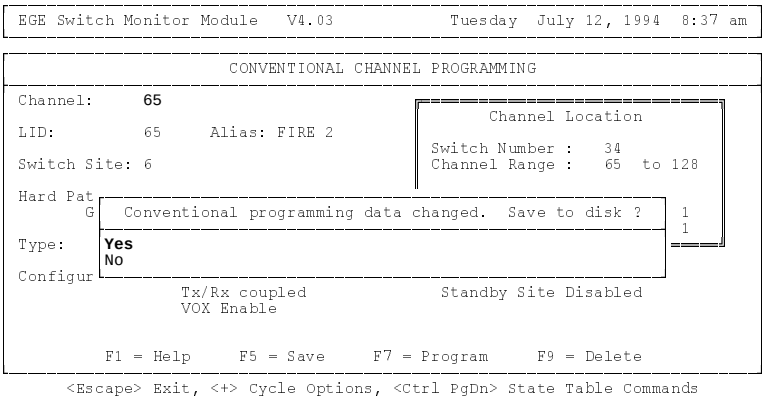

Figure 3.2-46 Conventional Channel Save Verification

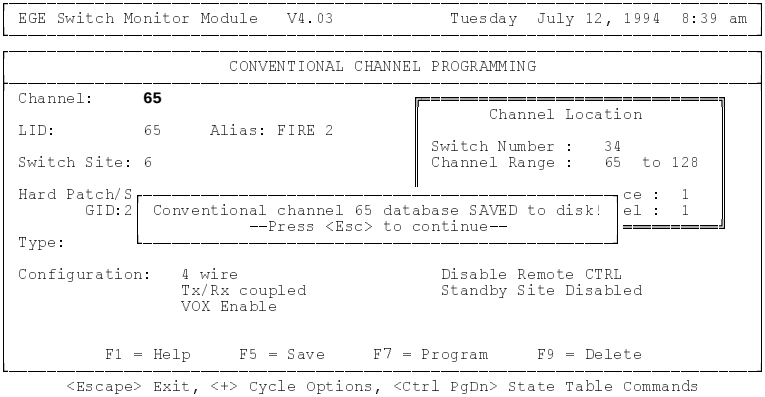

Figure 3.2-47 Conventional Channel Saved

NOTE

TO PREVENT CONFUSION, ALWAYS SAVE THE DATABASE AFTER CONFIGURING.

The CCI Controller Board and associated CI Board may be programmed at any time using the **F7** function key. The boards will be programmed according to the current configuration. If the channel database has been changed and the user exits without saving the new

configuration, the database on the CEC/IMC Manager will differ from the database on the CCI/CI Boards.

The following window will be displayed for programming verification. Absence of this window is an indication of a link failure with the CCI Controller Board. If this window is not displayed after pressing the **F7** function key, check this link and reprogram the channel.

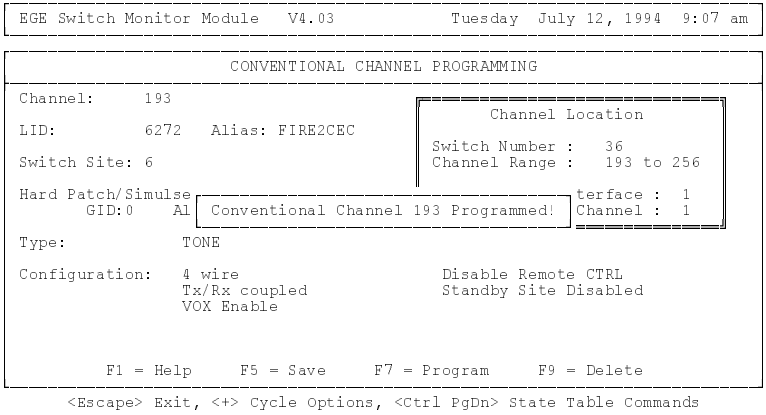

Figure 3.2-48 Conventional Channel Programmed Verification

NOTES

After programming the conventional channels, it is recommended that a CEC/IMC Manager (MOMPC) based System Manager Data upload is executed. This will transmit necessary information to all consoles in the system. See section 3.4.2. for complete details.

It may also be necessary to check the Console Privilege List data for each console to verify programming privileges. See section 3.3.3. for details.

3.2.7. Program Digital Voice Interface

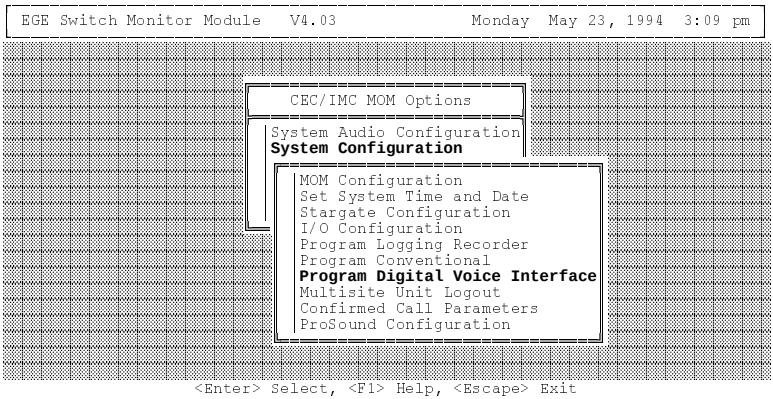

Figure 3.2-49 System Configuration Menu

This option is used to configure the EDACS CEC/IMC for console digital voice dispatch. This will allow the CEC/IMC and associated consoles to process clear voice as well as Aegis digital and Aegis encrypted calls. In order to support digital voice console dispatch, the CEC/IMC must be equipped with at least one Digital Voice Interface Module (DVIM). Each DVIM supports up to thirty-two (32) digital voice channels. There may be as many as four (4) DVIMs in the CEC/IMC. The purpose of this option is to configure the available digital voice channels to suit your system needs. Each utilized digital voice audio channel is connected to a Digital Voice Interface Unit (DVIU). The DVIU operates in either an encryption mode or a decryption mode depending upon the relay control signal received from the DVIM Audio Board.

DVIM Channel Allocation – Each channel supported by the DVIM will require one bus slot. The ideal configuration would be one slot (channel) per Aegis group; however, this is not a requirement. The DVIM will support both dynamic and dedicated channel allocations.

Dynamic Channels – In this mode of operation, the DVIM processes Aegis calls that are not assigned to dedicated channels. The DVIM assigns the call to the first available non-dedicated channel. The only limitation with this mode of operation is all dynamic channels must have the same DVIU key.

Dedicated Channels – Dedicated channels will always process calls assigned to that channel. This allows DVIUs to be dedicated to Aegis groups. Therefore, a system, agency, fleet or group call may be assigned a dedicated DVIM channel, each of which may have a different DVIU cryptographic key. For example, an agency may be assigned to channel 1 of the DVIM and a group within that agency may be assigned to channel 2 of the DVIM. The agency calls will be encrypted/decrypted by the DVIU connected to channel 1 of the DVIM and the group calls will be encrypted/decrypted by the DVIU connected to channel 2. The 2 DVIUs may have different cryptographic keys.

Whenever the **F1** key is pressed while the Program Digital Voice Interface option of the System Configuration menu is highlighted, the following help screen will be displayed.

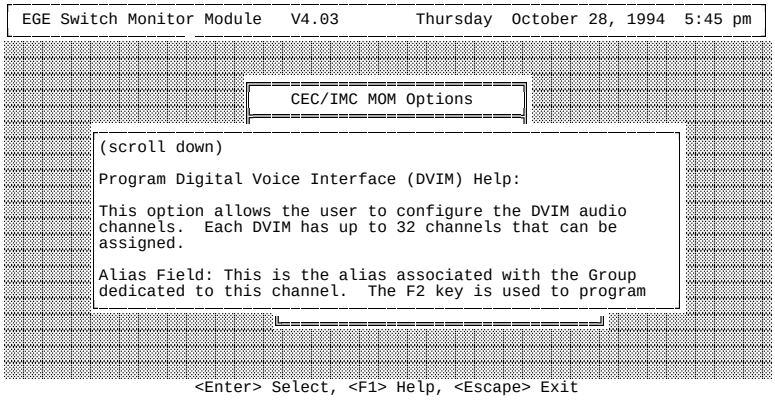

Figure 3.2-50 Program Digital Voice Interface Help Screen 1

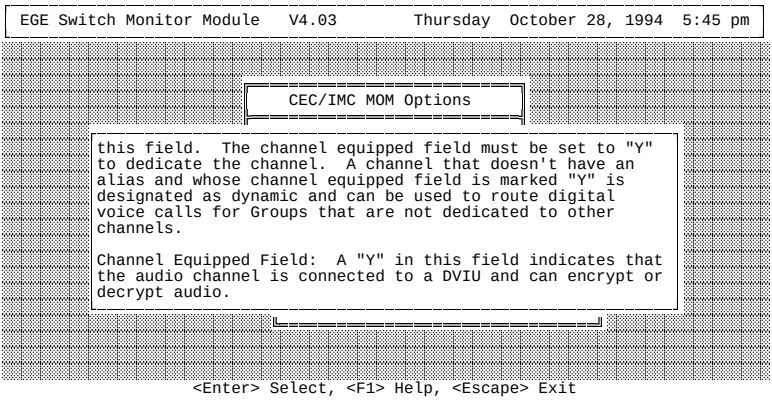

Figure 3.2-51 Program Digital Voice Interface Help Screen 2

To configure a dynamic channel, change the channel equipped field for that channel to a "Y" (this channel must be connected to a DVIU). Leaving the alias field blank when the channel equipped field is set to "Y" indicates it is for dynamic allocation. See the description of dynamic channels above. Press the **F7** key to send the configuration to the DVIMs. Figure 3.2-55 shows the successful upload window.

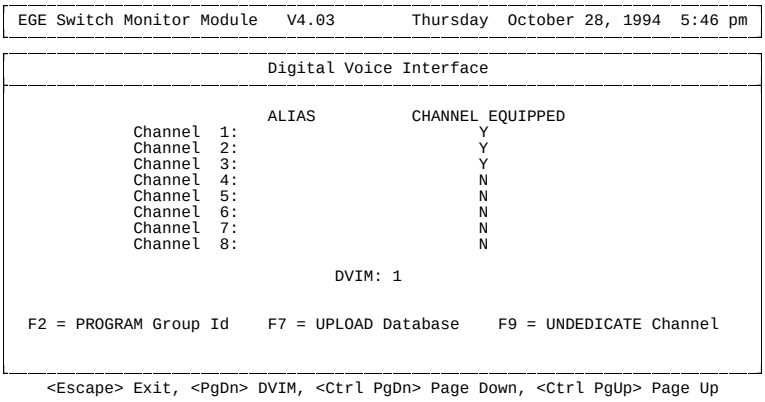

Figure 3.2-52 Digital Voice Configuration Screen

To dedicate a DVIM channel to a specific entity, set the channel equipped field to "Y" and put the entity in the alias field (**F2** for groups). To dedicate a channel to a group for example, press the **F2**

key. A list of the groups in the group database will be displayed as seen in Figure 3.2-53. The group can be dedicated and placed in the alias field by either highlighting the desired group and pressing **<Enter>** or, pressing the "**#**" key followed by the group number and then pressing **<Enter>**. Assuming that the desired group is 387, move the highlight bar down to FTST 3 using the up/down arrow, and press **<Enter>** (see Figure 3.2-53). After pressing **<Enter>**, the alias will be displayed as in Figure 3.2-54. A warning message will be displayed if the entity is already dedicated to a DVIM channel. To undedicate a channel, highlight the field and press the **F9** key. The channel (if previously equipped) will become dynamic and the alias field will become blank.

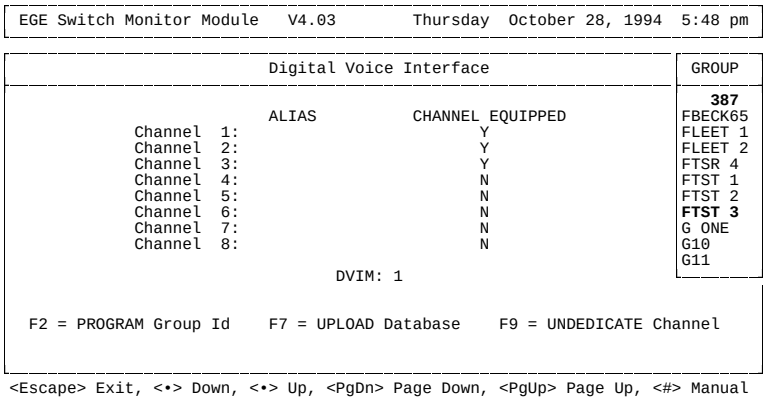

Figure 3.2-53 Dedicate Group

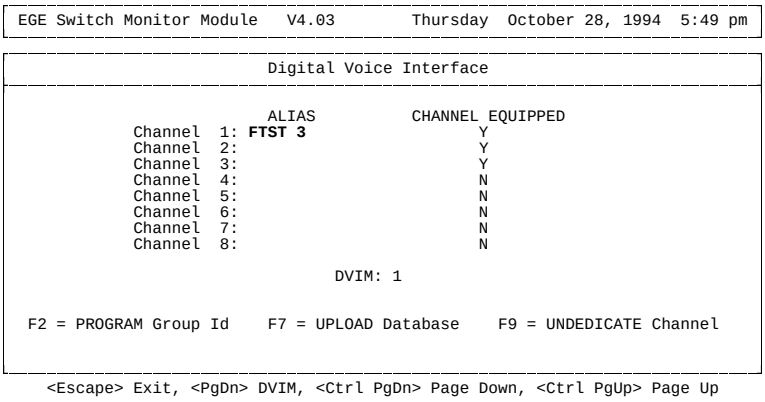

Figure 3.2-54 DVIM 1 Configuration

When the channels are configured, the configuration must be sent to the DVIMs. To do this, press the **F7** key. The following screen will be displayed indicating that the upload to the DVIMs is in progress. When complete, the DVIMs that have successfully received the data will be displayed on the screen as well. Make sure all the DVIMs in the CEC/IMC respond to the upload. Each DVIM stores the database in its Non-Volatile RAM (NOVRAM) so it will remain present after resets. The data does not have to be uploaded again unless the configuration is changed or the NOVRAM is reset on the DVIM.

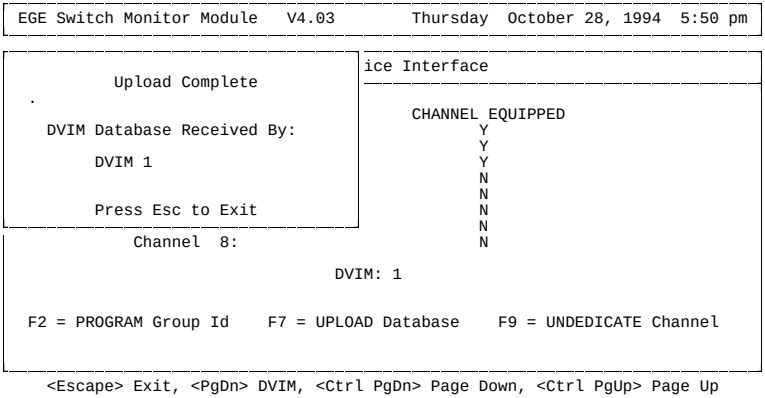

Figure 3.2-55 DVIM Database Upload Window

Upon exiting this function, you will be prompted whether or not to save the database if there have been any changes. Highlight the desired response and press **<Enter>**.

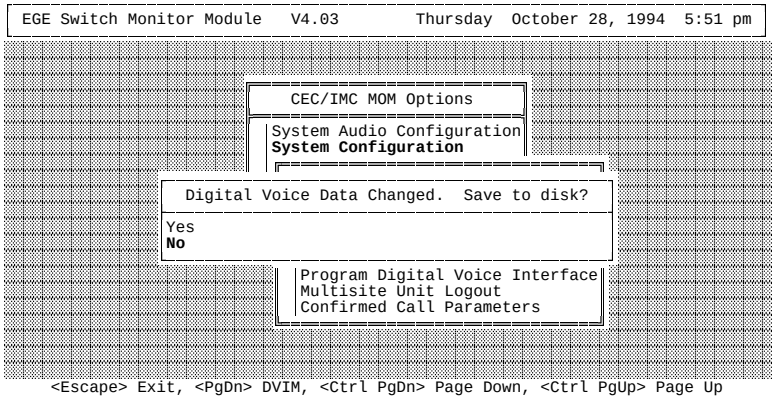

Figure 3.2-56 DVIM Database Save Prompt

3.2.8. Multisite Unit Logout

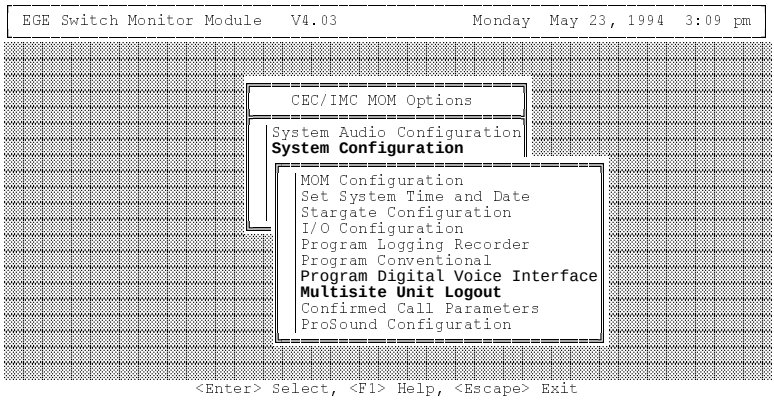

Figure 3.2-57 System Configuration Menu

Multisite Unit Logout is a system feature that improves multisite efficiency and operation by reducing unnecessary call routing. Calls are routed to a site when a unit (subscriber) is logged onto the site and wide area calls are generated to the unit or an entity

(group/fleet/agency) that the unit is a member of. This means calls may be routed to a site unnecessarily when the unit is powered down or is not being monitored. It can be avoided if the CEC/IMC logs the unit off all sites when there is no activity from the unit (timer based unit logout) or when commanded by an operator. The operator commanded logout is required because some units may be monitoring without showing any activity. In this case, it is not desirable to automatically log the unit out at all. Instead, the unit is logged out manually, when commanded by the operator. In order to support this feature, it is also necessary to master disable unit logout and to view unit/group locations.

Multisite Unit Logout has two modes of operation:

1. Timed logout (**F10**) – A Unit Timer is maintained for each unit, and has the following characteristics:
   A) Set at the CEC/IMC Manager and stored in MOM Controller Board NOVRAM.
   B) Set from 0 to 24 hours in 15 minute increments.
   C) Set ALL timers to the same value by selecting **F6**.
   D) SEND timers by selecting **F7**.
   E) Unit Timers set to 0 (zero) never log off. This is used for units that show very little activity.
   F) Unit Timers decrement each minute but reset when a unit shows activity.
   G) ACTIVITY is defined as a PTT or radio login.
   H) ALL unit timers can be suspended from decrementing by toggling "Unit Logout Timers" to DISABLED at the MOM Configuration Screen. See Figure 3.2-4. This does not reset unit timers or change unit timer reset values, so if "Unit Logout Timers" is toggled back to ENABLED the unit timers will again decrement from the previously set values.

2. Command Logout (**F2**) – When it is not desired to have units automatically log off the CEC/IMC, the COMMAND LOGOUT option can be selected to mark and logoff operator selected units.

These two modes are NOT exclusive. If a situation develops where a unit must be COMMAND logged off, this can be done regardless of the Logout Timer status. Figure 3.2-58 shows the Help screen for Multisite Unit Logout.

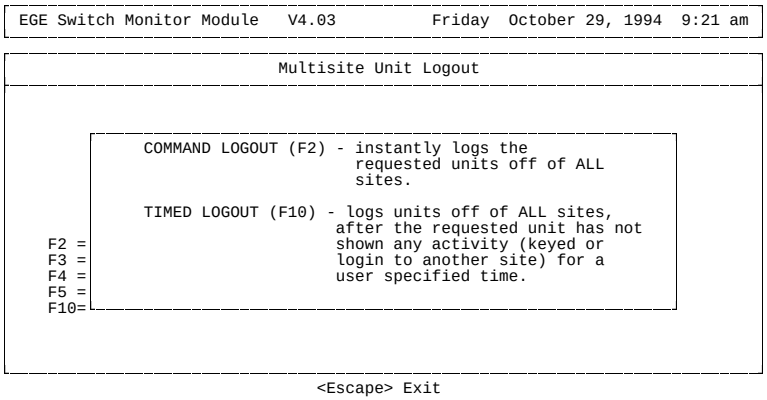

Figure 3.2-58 Multisite Unit Logout Help Screen (partial)

From the Multisite Unit Logout main screen, the operator can select from five (5) options. These options are shown in Figure 3.2-59.

While Multisite Unit Logout is selected, unit location data may be viewed from any of the unit based displays. If the Unit Logout Screens are exited, the group and site data is cleared. This allows the operator to retrieve an updated snapshot of unit locations when necessary.

The following terms are used to describe unit logout functions:

1. Activity	A PTT or Radio Login
2. PTT	Push-To-Talk, keying a radio.
3. Radio Login	Site message generated when units auto login. This can occur when a unit powers up or changes groups/sites and the unit is programmed for auto login capability.
4. Unit locate	Defined by group and site that a unit is logged into.
5. Group locate	Defined by number of units logged onto a group. This "Unit Count" is reported by each site.
6. Unit locate by Site	View of all the individual location responses from selected sites and groups.

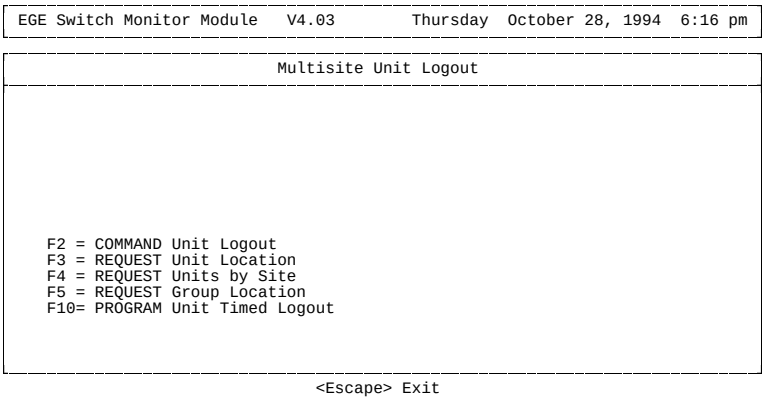

Figure 3.2-59 Multisite Unit Logout Main Screen

3.2.8.1. Timer Based Unit Logout

In the Timer Based Unit Logout screens the (M)anual mode can be selected. This mode allows the user to manually type in a timeout value instead of scrolling through the list of timers. The (M)anual mode can be selected from any unit based screen by typing the letter "M". This allows the operator to immediately jump to a unit that has a known LID or ALIAS by typing the LID or ALIAS instead of scrolling through the list of ALIAS's. See Figure 3.2-60.

F10 = PROGRAM Unit Timed Logout.
Unit logout timers are set at the CEC/IMC Manager by selecting "F10 = PROGRAM Unit Timed Logout". The screen shown in Figure 3.2-61 will be displayed. Upon selection, one of the units will be highlighted (grey background). The operator can select another unit by using the cursor keys or (M)anual mode until the desired unit is highlighted or choose to reset the unit timer for the highlighted unit by pressing **<Enter>**. When **<Enter>** is pressed the highlighted unit will become "selected" and be displayed in yellow letters. Now the timer can be increased or decreased by using the arrow keys. When the desired time-out value is displayed either **<Enter>** or **<Esc>** may be pressed to send the new time-out value to the MOM Controller Board.

F6 = PROGRAM All Unit Timers
If it is necessary to set ALL timers to the same value, the operator can select "F6 = PROGRAM All Unit Timers", after setting one timer to the desired value pressing **F6** will cause ALL timers to be set to this

new default timer setting and transmit the new timers to the MOM Controller Board. The new timer setting becomes the default setting so any new units added to the database will have this default.

F7 = SEND Unit Timers

If all the timers are set to the desired values, but the operator needs to send/start the timers then "F7 = SEND Unit Timers" should be selected. The transmission of the timers to the MOM Controller Board occurs at a rate of 3/second. See Figure 3.2-61

By scrolling through the Unit Logout Timer database, the "Timeout" value that is displayed for the highlighted unit is the MOM Controller Board NOVRAM stored time.

F3 = REQUEST Unit Location

The "F3 = REQUEST Unit Location" is available at any time from this screen. The Unit, Group, and Site ID's displayed in row one are the ID's for the highlighted unit.

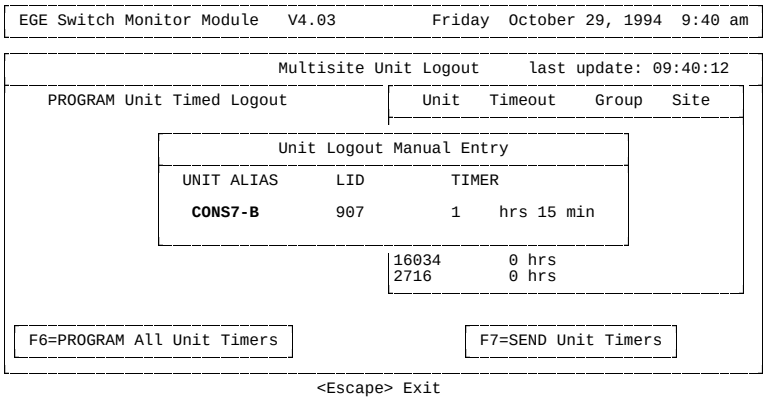

Figure 3.2-60 Unit Logout Manual Entry

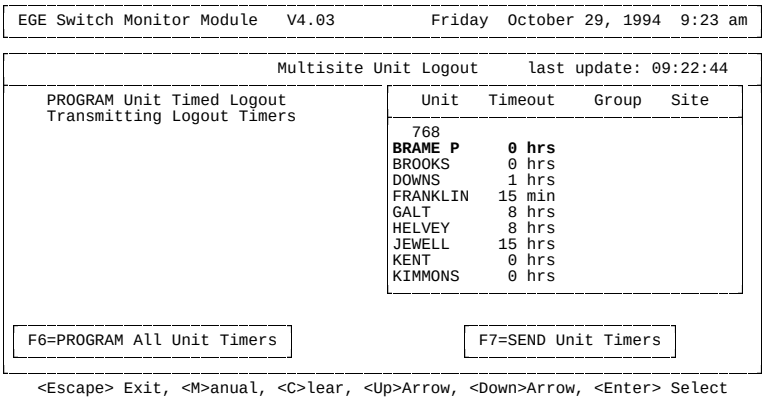

Figure 3.2-61 PROGRAM Unit Timed Logout

3.2.8.2. Command Unit Logout

The (M)anual mode can be selected from the Command Unit Logout screen by typing the letter "M". This allows the operator to QUICKLY jump to a unit that has a known LID or ALIAS by typing the LID or ALIAS instead of scrolling through the list of ALIAS's.

F2 = COMMAND Unit Logout

The command logout function allows the operator to logoff a specified unit instantly, without waiting for inactivity logout. It is selected by pressing "F2 = COMMAND Unit Logout". Once selected, the operator moves the cursor with the arrow keys or uses the (M)anual mode until one of the desired units is highlighted. By pressing **<Enter>** the unit will become "selected" (yellow highlight). While "selected", the unit can be toggled between "**YES**" and "*******". This procedure can be repeated for as many units as necessary until ALL units that need to be logged off are MARKED "YES".

F9 = SEND Logout Command

Once ALL units that need to be logged off are MARKED "YES", the "F9 = SEND Logout Command" button can be pressed at any time while still in the Multisite Unit Logout menu. ALL the MARKED units will be logged off of the Multisite Coordinator and the CEC/IMC Manager will update to show this change in unit location when the **F9** button is pressed.

F3 = REQUEST Unit Location

The "F3 = REQUEST Unit Location" is available at any time from this screen. The unit that is highlighted when **F3** is hit will be updated until any other key is pressed.

The Unit, Group, and Site ID's displayed in row one are the ID's for the highlighted unit.

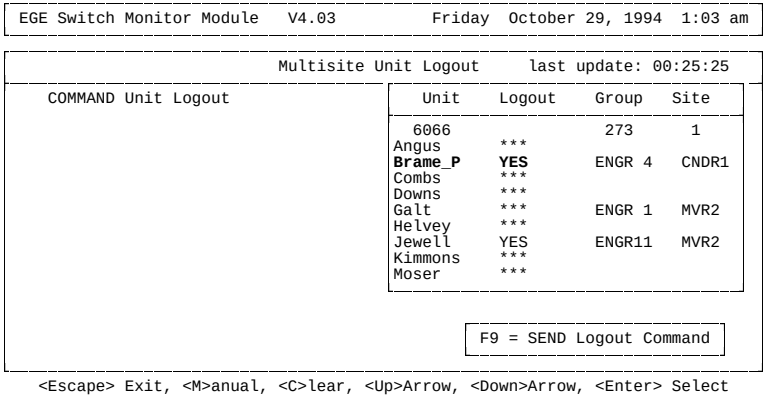

Figure 3.2-62 COMMAND Unit Logout

3.2.8.3. REQUEST Unit Location

The (M)anual mode can be selected from the Request Unit Location screen by typing the letter "M". This allows the operator to QUICKLY jump to a unit that has a known LID or ALIAS by typing the LID or ALIAS instead of scrolling through the list of ALIAS's.

F3 = REQUEST Unit Location

When the Unit ALIAS or ID is known but the SITE and/or GROUP is unknown this option can be selected by the operator to find the location of a particular unit. Location for a unit is defined as the group and site that the unit is currently logged onto. See Figure 3.2-63.

The unit that is highlighted will have a Unit Location Request sent to the MOM Controller Board about once each second. This update will continue until the operator moves the cursor keys to highlight another unit.

Note that the Location response from the MOM Controller Board is also sent to the System Manager.

The group and site data is only updated for the highlighted unit and should be periodically cleared by hitting the (C)lear key on the keyboard.

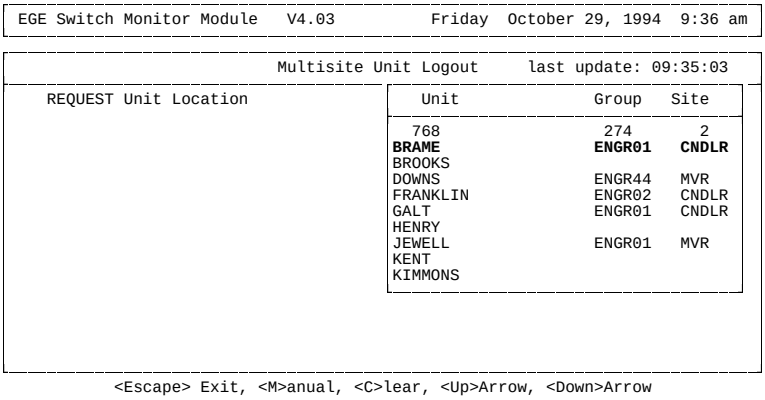

Figure 3.2-63 REQUEST Unit Location

3.2.8.4. REQUEST Unit Location by Site

F4 = REQUEST Units by Site
When the SITE is known and UNIT is unknown this option can be used to obtain a list of all units on a particular site. The list can also be filtered to display only units that are logged onto a particular group or display all units in all groups on the site of interest.

In order to use this function the site and group of interest are selected by the operator from the "site select" and "group select" screens. These screens are activated with the **F6** and **F7** keys respectively.

F8 = SEND Location Request
Once the desired site and group are displayed in the information boxes then the "F8 = SEND Location Request" is pressed and the unit database window will update with the location responses from the MOM Controller Board.

F6 = SITE: CNDLRS800
By pressing **F6**, the site selection screen will be activated and a site can be chosen from the existing CEC/IMC Manager site database. While the screen is active the operator can move the cursor (highlight grey) to the site of interest. When the site of interest is highlighted in

grey the operator presses **<Enter>** or **<Esc>.** This will select that site and the SITE ALIAS (8 characters or less) will be displayed in the information box. See Figure 3.2-64.

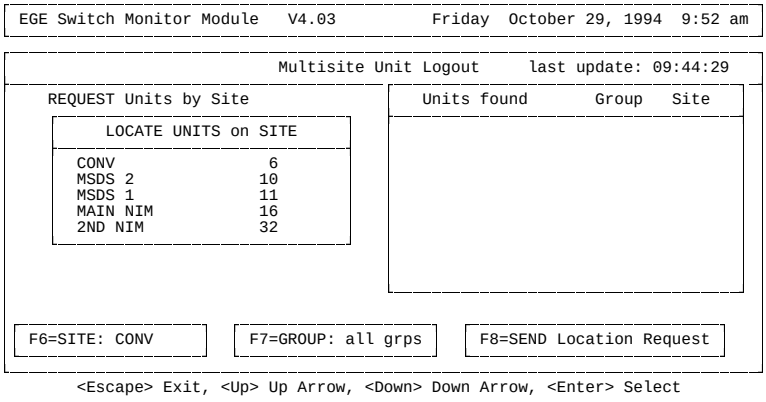

Figure 3.2-64 REQUEST Units by Site (SITE Select)

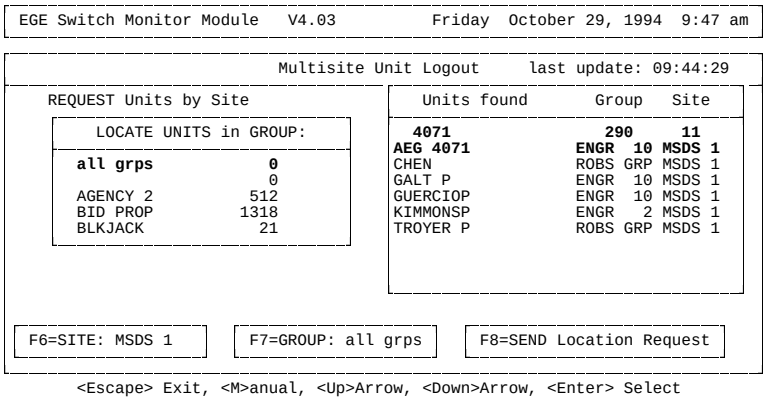

Figure 3.2-65 REQUEST Units by Site (GROUP Select)

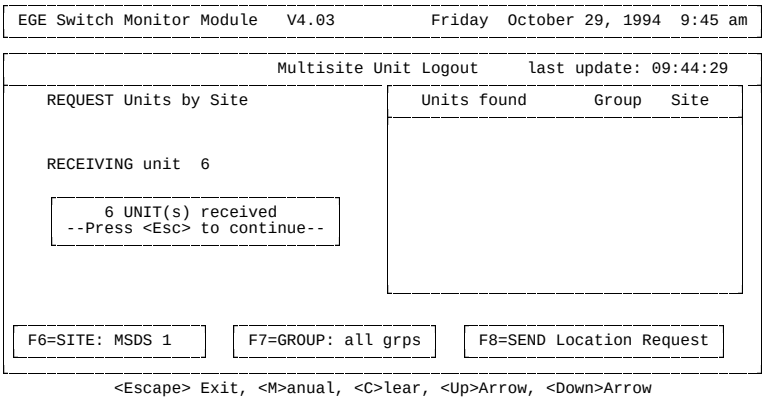

Figure 3.2-66 REQUEST Units by Site

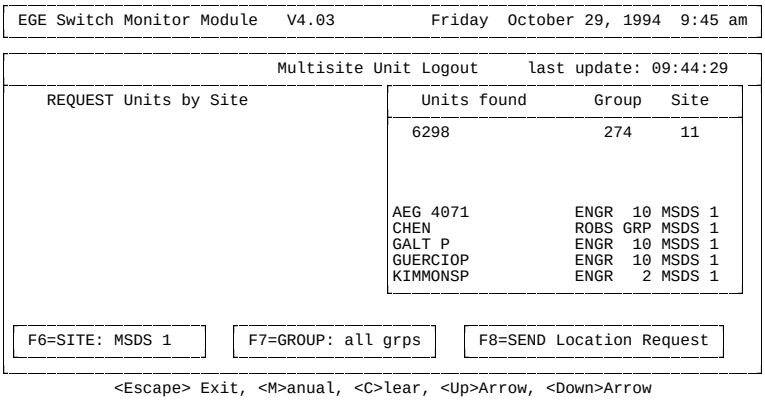

Figure 3.2-67 REQUEST Units by Site

F7 = GROUP: ENGR 1

By pressing **F7**, the group selection screen will be activated and a group can be chosen from the existing CEC/IMC Manager group database. While the screen is active the operator can move the cursor (highlight gray) to the group of interest. When the group of interest is highlighted in gray the operator presses **<Enter>** or **<Esc>**. This will select that group and the GROUP ALIAS (8 characters or less) will be displayed in the information box. See Figure 3.2-65.

F8 = SEND Location Request

Once the desired group and site have been selected **F8** is pressed to send the location request to the MOM Controller Board. The queried site MIM will respond with location responses for each unit logged in.

3.2.8.5. REQUEST Group Location

Group locations are defined as the number of units logged onto the group of interest for each site. Unless this count of units on a group is zero (0), calls will always be routed to a secondary site if the site is wide area enabled.

F5 = REQUEST Group Location

The group location screen is activated by pressing **F5**. Once active, the group of interest can be selected by pressing **<Enter>** so the Group ALIAS and ID are highlighted in yellow. The cursor keys can be used by the operator to scroll through the group database until the group of interest is displayed. When the **<Enter>** key is pressed again the GROUP ALIAS and ID will be highlighted in gray and the group location responses for each site will be displayed in the group location window.

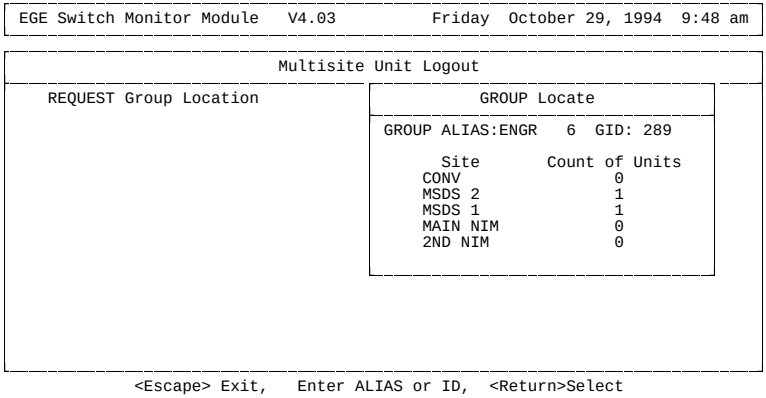

Figure 3.2-68 REQUEST Group Location

3.2.9. Confirmed Call Parameters

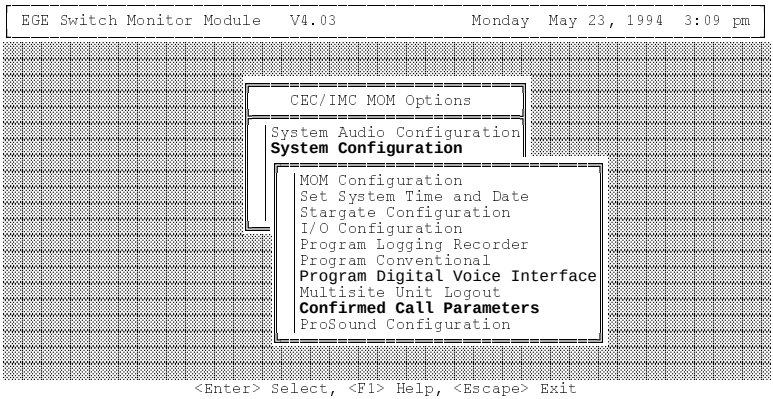

Figure 3.2-69 System Configuration Menu

This option is used to modify the behavior of the CEC/IMC confirmed call tracking database. From this form specific sites may be "Exempted" from the call confirmation process. In addition, the option of removing sites determined to be in FAILSOFT 2 (CEC/IMC to site link not working) or not present in the system (MIM not active) from the confirmed call expected response data may be enabled or disabled.

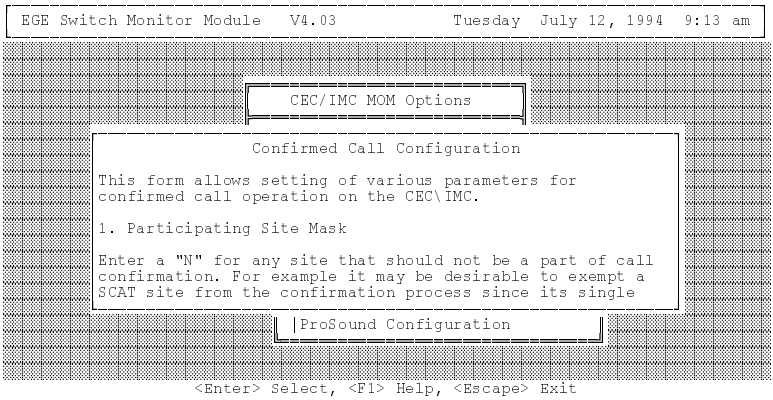

Figure 3.2-70 Confirmed Call Parameters – Online Help (partial)

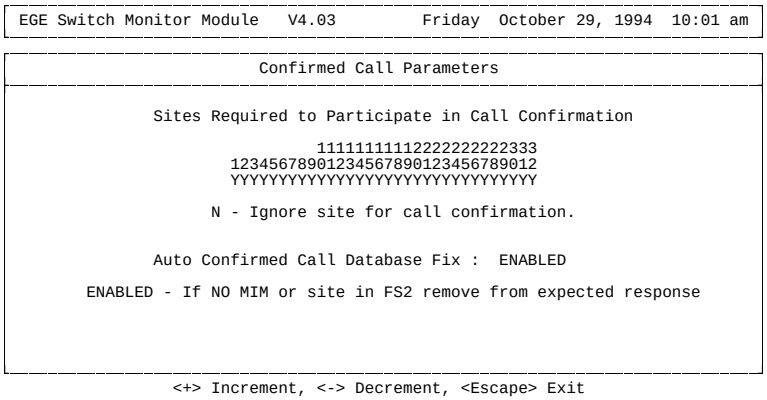

Figure 3.2-71 Confirmed Call Parameters Form

A unit that performs a confirmed call will not be allowed to transmit until all sites that should pick up the call have responded with a working channel assignment. If there are sites that may cause excessive delays (for example a SCAT single channel site), exempting that site from the confirmation process will allow calls to proceed without waiting for the exempted site's channel assignment.

The MOM normally removes sites that are determined to be either in FAILSOFT 2 (CEC/IMC to site link down), or that do not have an active MIM in the system, from the confirmed call expected response database. This causes confirmed calls to fail once for either of these error conditions, and then to proceed successfully. If this option is disabled confirmed calls will continue to fail (10 second delay on every call) until the failed site is restored.

3.2.10. ProSound Configuration

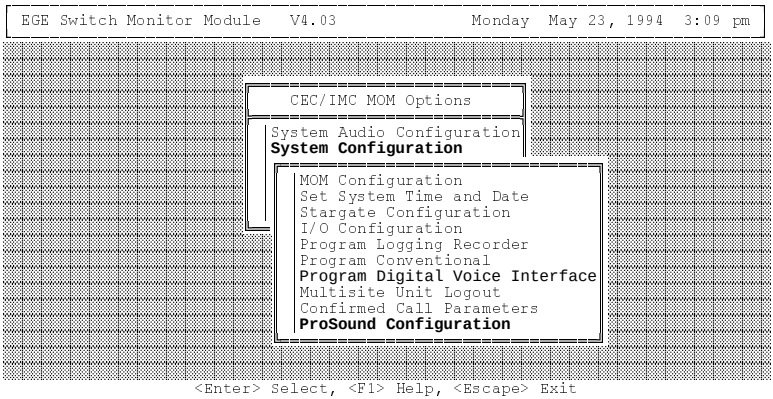

Figure 3.2-72 System Configuration Menu

When roaming on a wide area (multisite) network, ProSound enables a radio to select a new site based upon the bit-error-rate of the "adjacent" sites' control channels. The roaming operation is referred to as "wide area scan" or "wide area system scan". ProSound ensures the newly selected site's working channel(s) will be sufficient to provide quality audio. During wide area scan operations, EDACS allows up to six (6) adjacent sites to be scanned.

Without ProSound, the decision to wide area scan is made base upon the bit-error-rate of the current control channel – three (3) consecutive bad control messages will cause the radio to wide area scan. This method produces an extended coverage range from that of a working channel providing quality receive audio – the radio operator receives lower quality audio during transition. The non-ProSound wide area scan algorithm locks onto the first system it detects and validates; this is not necessarily the best quality signal in the available wide area (multisite) network.

As shown in Figure 3.2-72, the "ProSound Configuration" option is located on the System Configuration menu. Figure 3.2-73 shows the ProSound help screen which is displayed when the **F1** function key is pressed with this option selected.

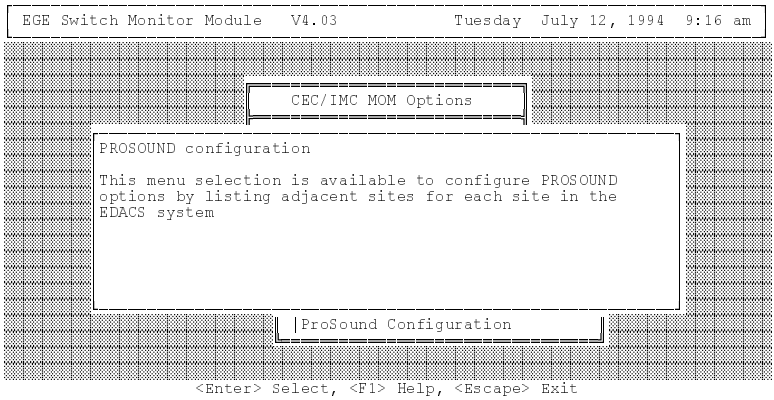

Figure 3.2-73 ProSound Configuration Help Screen

ProSound configuration involves sending each trunked site an updated "adjacency" matrix via the CEC/IMC Manager. This matrix is sent to the radio by the site and the radio uses it to make roaming decisions based on the relative bit-error-rates of the sites in the matrix. The decision also includes one special site, the "priority system". When roaming, the priority system is given an extra bit-error-rate threshold tolerance which favors the priority system during roaming operations. The threshold tolerance is programmed into the radio. The ProSound – Site Adjacency Configuration screen is shown in the following figure.

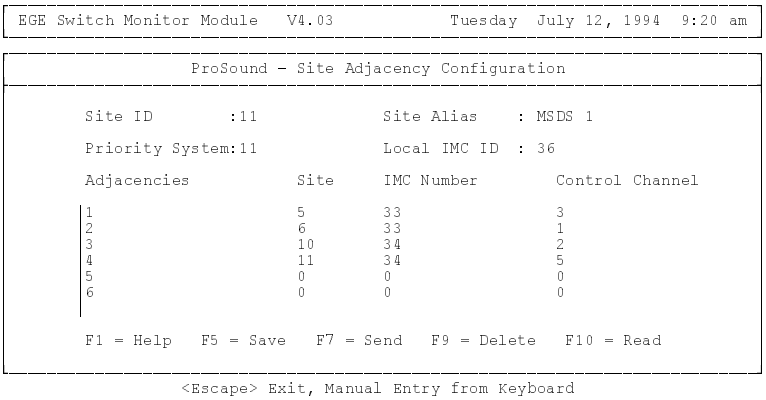

Figure 3.2-74 ProSound Configuration Screen

ProSound configuration fields shown in Figure 3.2-74 are described in the following text. Some are read only fields. The basic ProSound configuration process is as follows: After entering the site's ID number in the "Site ID" field, use the arrow keys to the select the other read/write fields and enter the data as necessary. Next, send this new ProSound configuration data to the site using the **F7** function key and then save database to the CEC/IMC Manager's hard disk drive using the **F5** function key. Repeat the above sequence for all necessary sites.

Site ID (read/write)
Site ID number. Range = 1 – 32. Select the site to be configured for ProSound operation by entering its site ID number in this field and then pressing **<Enter>**. Upon pressing **<Enter>**, all other fields on the screen will update in accordance with the current ProSound database configuration saved on the CEC/IMC Manager's hard disk drive. This number actually matches the MIM site assignment number set by the DIP switches on a MIM Controller Board. *Normally, the site the MIM is connected to should have a matching site ID number.*

Site Alias (read/write)
Alias of currently selected site. This name is originally defined at the System Manager. Alternately, if the "Site ID" number is *not* known (above field) but the site alias is, the alias may be entered in this field. Upon pressing **<Enter>**, all other fields on the screen will update in accordance with the current ProSound database configuration saved on the CEC/IMC Manager's hard disk drive.

Priority System (read/write)
Priority site ID number for the currently selected site. Range = 1 – 32. If a "-1" is displayed, the priority system has not been defined. Enter the priority system's site ID number in this field.

Local IMC ID (read only)
The CEC/IMC switch assignment number that the currently selected site is connected to is displayed in the field. Range = 33 - 64.

Column Configurations:

Adjacencies (read only)
During wide area scan operations, up to six (6) possible adjacent sites can be scanned. This column displays the six adjacency site sequence numbers for the currently selected site.

Site (read/write)
This column defines the site ID numbers of the six possible adjacent sites. For each row, enter the adjacent site's ID number. Leave the field set to "0" (default) if no adjacent site is present or if ProSound operation is not required no this site.

IMC Number (read/write)
This column defines the switch assignment numbers for the six possible adjacent sites. For each row, enter the CEC/IMC switch assignment number ("node ID") for the adjacent site.

Control Channel (read only)
This column displays the control channels currently in use for each of the six possible adjacent sites. A "0" is displayed if the adjacent site has not been configured for ProSound operation.

Function Keys:

F1 = Help
Help for the currently selected field will be displayed when the **F1** function key is pressed.

F5 = Save
Pressing the **F5** function key will save all ProSound adjacency database information to the CEC/IMC Manger's hard disk drive.

F7 = Send
After entering the currently selected site's ProSound configuration, press this function key to send the configuration to the site via the CEC/IMC MIM control data link. A verification message is displayed at the CEC/IMC Manager when the site receives the ProSound configuration.

F9 = Delete
Delete the currently selected site's ProSound database configuration from the CEC/IMC Manager's hard disk drive. This does not delete the CEC's/IMC's ProSound configuration and the site's ProSound configuration for the currently selected site unless the "Send" (**F7** function key) is performed *after* the "Delete" (**F9** function key).

F10 = Read
Press this function key to read the currently selected site's ProSound configuration from the CEC/IMC Manager's hard disk drive.

3.3. CONSOLE CONFIGURATION

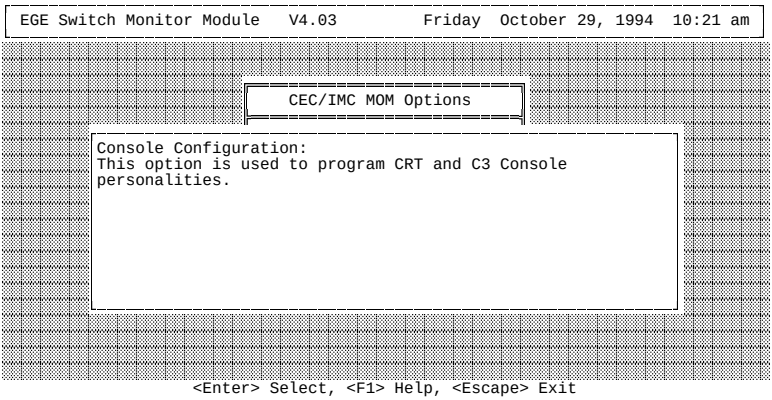

Figure 3.3-1 Console Configuration Help Screen

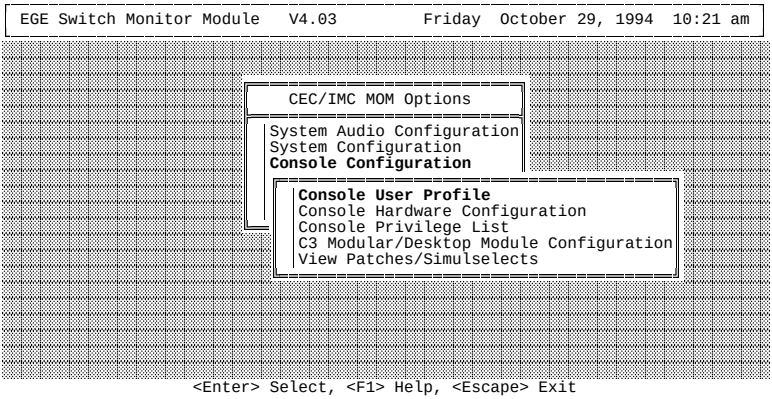

Figure 3.3-2 Console Configuration Menu

3.3.1. Console User Profile

This option is used to configure each console in the system and its associated user profiles. Ten (10) different profile shifts may be set-up for each console, each having a unique personality. The following two screens show the console's user profile configuration and adjustable fields.

```
EGE Switch Monitor Module   V4.03            Tuesday  July 12, 1994  9:23 am

                    CONSOLE USER PROFILE CONFIGURATION

     Console: 6        Unit Id: 806        Name: CONS  06       Setup: 1
                                                 MAESTRO    : v  4.00
  Supervisor                      : N       24 Hour Time               : Y
  Default Unselect Volume         : 16      Unselect Labels            : Y
  Non-Monitored Emergency Volume  : 16      Numeric Labels             : N
  Mute Volume                     : 0       Numeric Volume             : N
  Mute All Delay                  : 30      Auto Alarm Off             : Y
  Label Delay                     : 0       Beep On Error Message      : Y
  Screen Blank Delay (min)        : 0       Display Failsoft Indicator : Y
  Default Speaker                 : 2       Debug Messages / Functions : Y
  Minimum Alarm Level             : 16      Console Labels             : Y
  Alarm Reset Before Emer Clear   : N       Route Unprivileged Emer    : N
  Force Tones to Select Speaker   : N       Confirm Group PTT          : Y
  Monitor ICALL Privilege         : N       Maximum Confirmation Delay : 5
                                            Tone Volume Offset (dBm)   : 5

          F1 = Help     F5 = Save     F7 = Send     F9 = Delete

                    <Escape> Exit   <RETURN> Edit
```

Figure 3.3-3 Console User Profile Configuration Screen (Non-Supervisory)

```
EGE Switch Monitor Module   V4.03            Tuesday  July 12, 1994  9:23 am

                    CONSOLE USER PROFILE CONFIGURATION

     Console: 6        Unit Id: 806        Name: CONS  06       Setup: 2
                                                 MAESTRO    : v  4.00
  Supervisor                      : Y       24 Hour Time               : Y
  Default Unselect Volume         : 16      Unselect Labels            : Y
  Non-Monitored Emergency Volume  : 16      Numeric Labels             : N
  Mute Volume                     : 0       Numeric Volume             : N
  Mute All Delay                  : 30      Auto Alarm Off             : Y
  Label Delay                     : 0       Beep On Error Message      : Y
  Screen Blank Delay (min)        : 0       Display Failsoft Indicator : Y
  Default Speaker                 : 2       Debug Messages / Functions : Y
  Minimum Alarm Level             : 16      Console Labels             : Y
  Alarm Reset Before Emer Clear   : N       Route Unprivileged Emer    : N
  Force Tones to Select Speaker   : N       Confirm Group PTT          : Y
  Monitor ICALL Privilege         : Y       Maximum Confirmation Delay : 5
                                            Tone Volume Offset (dBm)   : 5

          F1 = Help     F5 = Save     F7 = Send     F9 = Delete

                    <Escape> Exit   <RETURN> Edit
```

Figure 3.3-4 Console User Profile Configuration Screen (Supervisory)

Console

This field selects which console is to be configured. Range = 1 - 64.

Unit Id

This field specifies the unit ID or "LID" (Logical ID) number associated with this console. This number must be in the 1 - 16382 range and must not conflict with other unit ID numbers in the System Manager's LID database. 16383 is the default for uninitialized

consoles and indicates to the MOM Controller Board that the console is not configured. All consoles with a unit ID less than 16383 are contained in the console unit ID database and will be uploaded from the CEC/IMC Manager to the MOM Controller Board if so requested from the CEC/IMC Manager option under the System Manager Data main menu option. In a trunked configuration, this LID number should match the console's LID in the System Manager's LID database. In a pure conventional system, there is no System Manager database and therefore this ID number must not conflict with any conventional ID number in the system.

Name
This field allows the user to define an 8-character alias for each console. The default alias is "CONS XX". This alias is also used for display purposes. If a console initiates a call, his alias will be displayed on other consoles who are monitoring the call.

Setup
This field is used to configure shift specific data at each console. Ten (10) different shift set-ups are supported at each console.

Console Type & **Software Version** (read only)
These two fields identify the currently selected console's type and software version number. Console types include C3 Maestro consoles ("MAESTRO") and C3 Modular/Desktop consoles ("MODULAR"). Types are initially defined at the System Manager.

NOTE

All remaining fields on the Console User Profile screen are set-up specific in accordance with the current Setup (shift) number. These fields are described in the following text.

Supervisor
Used to indicate if the user on this shift is a supervisor or not. Certain privileges are allocated to supervisory consoles that are not allocated to non-supervisory consoles. See the "Monitor ICALL Privilege" field for an example.

Default Unselect Volume
Default volume setting on the unselect speaker for incoming calls.

Non-Monitored Emergency Volume
Default volume setting for incoming non-monitored emergency calls.

Mute Volume
Volume used at a muted console module when an incoming call is received. Some dispatchers may want zero volume when they mute a module and others may want just a lower volume than the previous volume.

Mute All Delay
The time, in seconds, the modules are muted after the MUTE ALL button is pressed. After the delay expires, volumes will return to original levels.

Label Delay
Time delay, in seconds, that the CALLER is displayed after the call has dropped. This delay allows the dispatcher to see who made the call for a short time after the call was dropped. There is a built in two (2) second delay for C3 Modular/Desktop consoles. A value in this field will be added to that delay.

Screen Blank Delay
Time delay, in minutes, that the screen waits, without activity, before blanking. This function is designed to extend the life of the console's monitor. A value of zero disables the screen blanker function.

Default Speaker
This is the unselect speaker number for unprogrammed or non-monitored incoming calls. Valid options are speakers 2 through 12. Speaker 1 is for select calls.

Minimum Alarm Level
This is the minimum level at which an emergency tone will be heard. The greater of the module volume or this volume will be used for the emergency tone level.

Alarm Reset Before Emergency Clear
Enabling this field forces the dispatcher to reset the emergency alarm before he may clear the emergency itself.

Force Tones to Select Speaker
Enter "Y" to force confirmation tones and error tones to the select speaker.

Monitor ICALL Privilege
This option is only available if the Supervisor field for the current set-up is enabled and the currently selected console is a C3 Maestro console operating with version 4.0 (or later) software. The field is not displayed for other console types. When enabled by selecting "Y", a

supervisory dispatcher will be able to monitor or "eavesdrop" on Individual Calls to and from any unit which is programmed at the C3 Maestro console. If this field is set to "N" (disabled) or if the Supervisor field is set to "N", the console will only be able to perform standard Individual Call functions. Table 3.3-1 defines the three (3) possible levels of Individual Call functionality each C3 Maestro console may have:

TABLE 3.3-1 – CONSOLE INDIVIDUAL CALL LEVELS

INDIVIDUAL CALL PRIVILEGE	CEC/IMC MANAGER CONFIGURATION	CONSOLE AFFECT
disabled (no Individual Call privileges)	all units must be removed from the console's privilege list (See section 3.3.3.)	a dispatcher cannot make or monitor any Individual Call
partial	desired units are enabled in the console's privilege list and the "Monitor ICALL Privilege" is *disabled* (set to "N")	a dispatcher can make Individual Calls to units on the privilege list *but* cannot monitor any Individual Call
full (Supervisor console set-ups only)	desired units are enabled in the console's privilege list and the "Monitor ICALL Privilege" is *enabled* (set to "Y")	a dispatcher can make Individual Calls to any unit *and* can monitor any Individual Call

24 Hour Time
Used to indicate whether or not the dispatcher wants its time displayed in a 24-hour or a 12-hour format.

Unselect Labels
Used to indicate whether or not the dispatcher wants labels displayed on all incoming calls or just on selected incoming calls.

Numeric Labels
This allows the dispatcher to display labels or logical ids.

Numeric Volume
This allows the dispatcher to select a numeric volume or a volume bar.

Auto Alarm Off
If enabled, the audible portion of the EMERGENCY tone will go away when the EMERGENCY is cleared. If disabled, the tone will remain until cleared by dispatcher.

Beep On Error Message
This enables/disables the error tone. When the console determines an error has occurred this function enables/disables the error tone.

Display Failsoft Indicator
This option is used to enable or disable the trunked operational status indicators and failsoft tones at the console. If enabled, the console will sound a failsoft tone in its default unselect speaker and display one of the following states when a status transition occurs:

"TRNK"– Trunked Operation
"TRFS" – Combined Trunk / Failsoft Operation
"FS2" – Failsoft Operation

Debug Messages / Functions
If enabled, the console will display debug messages and functions.

Console Labels
A "Y" in this field forces alphanumeric alias display for all incoming console originated calls. A "N" forces logical display of console originated calls. This field is only for C3 Modular/Desktop consoles.

Route Unprivileged Emergency
Enter "Y" in this field to route all emergencies to the console regardless of the privilege list entries. Enter "N" in this field to route only emergencies from entities within the console's privilege list to the console. This field is always "N" for non-supervisor consoles. Used on C3 Modular/Desktop consoles only. Determines whether to display labels on console originated calls (incoming from another console).

Confirm Group PTT
Enter "Y" in this field to enable confirmed call on group and digital PTTs. Enter "N" to disable this function.

Maximum Confirmation Delay
This field specifies the maximum time in seconds that a confirmed PTT will hold for confirmation from all called sites. All called sites must confirm a working channel has been assigned before the timer expires; otherwise, the console operator will be given a grant tone when the timer expires signalling the transmission may proceed in a non-confirmed state. The valid time delay range is 0 - 10 seconds.

Tone Volume Offset
Console tone volume levels are determined by subtracting this setting (dBm) from the volume of the current console module associated with the tone. For example, if the field is set to "5", the tones will be 5 dBm

less than the voice audio at the current module. Enter a dBm level between 0 and 40. Setting the offset number to a large value (near 40) will effectively turn off the tones at the console. Headsets equipped with AGC circuits may defeat this feature.

Entering **F1** will display Help for each individual highlighted field.

After the console user profile configuration is complete the **F5** function key should be used to save the profile to disk. Failure to perform this function may result in loss of configuration database for this console. The window shown in Figure 3.3-5 will appear for save verification.

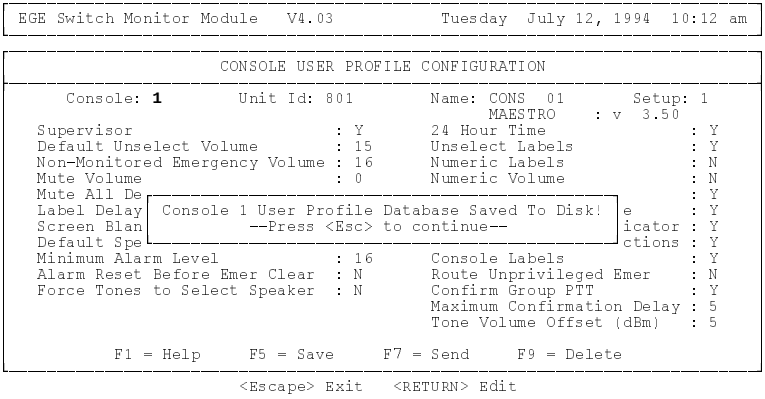

Figure 3.3-5 Console User Profile Save Verification Window

There is a mechanism to prevent accidental loss of data. If the user has changed the configuration and attempts to exit or reconfigure another console without saving the data, the following screen will appear. Selecting "No" on this screen will result in loss of data. Selecting "Yes" will save the data to disk and display the "Saved" window.

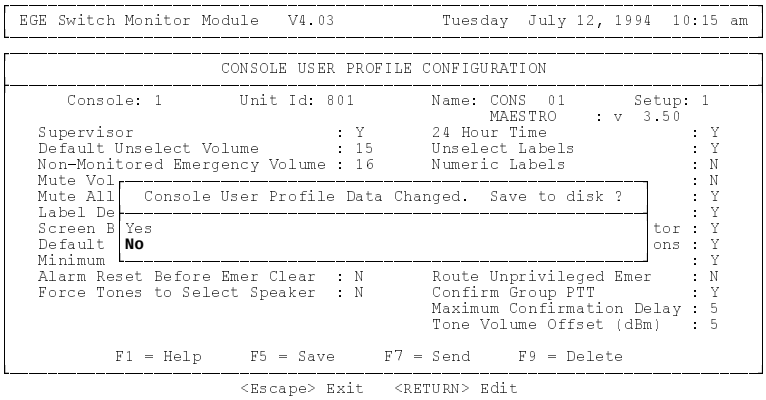

Figure 3.3-6 Console User Profile Data Changed Window

The **F9** key is used to delete the console user profile database from disk. If this console is no longer in use or this console never existed, then the database for this console should be deleted. The following window will be displayed when the **F9** function key is pressed. This window is intended to prevent accidental user profile deletions.

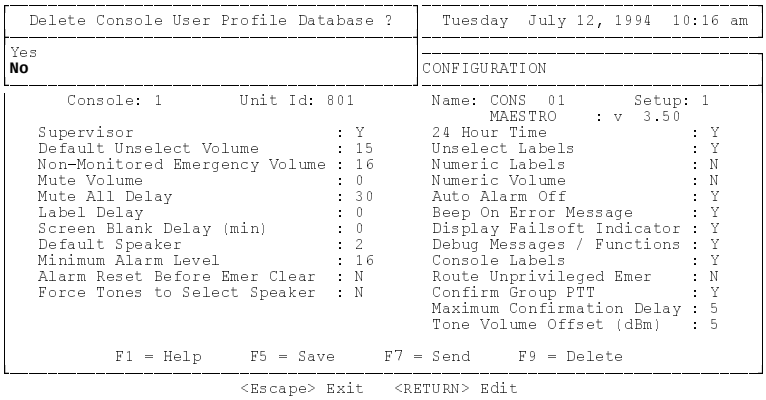

Figure 3.3-7 Console User Profile Delete Window

Selecting "No" will not delete the database. Selecting "Yes" will delete the database and display the following window for delete verification.

NOTE

Deleting the console user profile database also deletes the console privilege list and C3 Modular/Desktop console configuration databases.

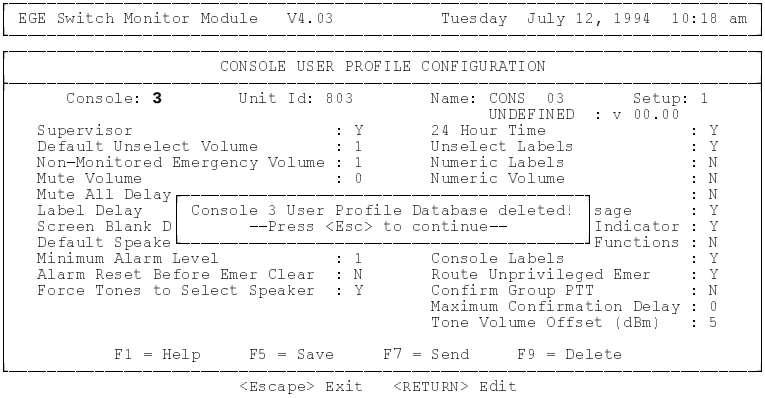

Figure 3.3-8 Console User Profile Delete Verification Window

The user profile configuration database will need to be sent to the console before this configuration will be in effect. The **F7** function key is used for this purpose. The following window will be displayed to verify console receipt of configuration data. If this window does not appear the following conditions may be the cause:

- The link to the console is broken.
- The console itself is off-line.
- The CIM for this console is absent or not operating.

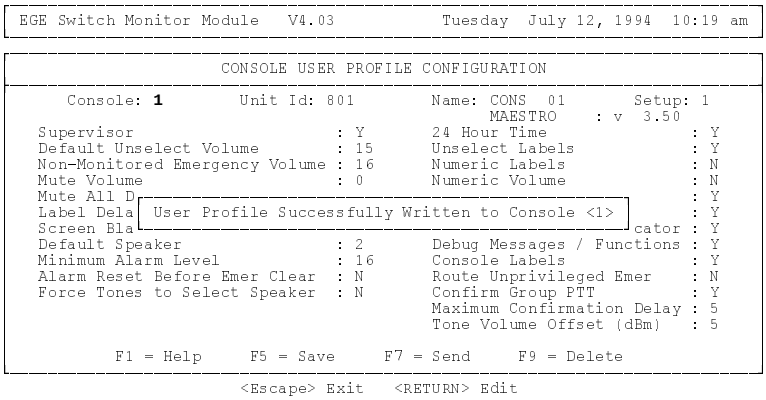

Figure 3.3-9 Console User Profile Database Receipt Window

If an error occurs sending the data to the console the following window will appear. Resend the data.

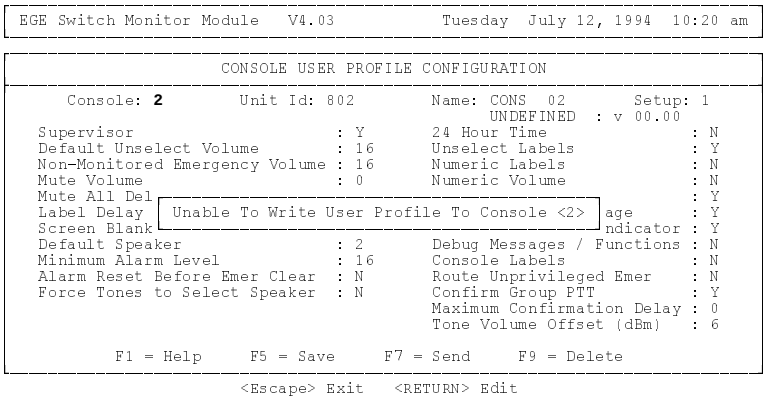

Figure 3.3-10 Console User Profile Database Error Window

3.3.2. Console Hardware Configuration

The Console Hardware Configuration screen is used to modify console parameters which are not shift dependent. The screen is shown in Figure 3.3-11. Help for the selected field is available by pressing **F1**. The fields are described in the follow text.

```
EGE Switch Monitor Module   V4.03          Monday  November 8, 1994  3:17 am

                            CONSOLE CONFIGURATION

           Console: 1        Unit Id: 801        Name: CONS  01


   Speaker Configuration   : 2           Phone Call ICOM Speaker       : NO
   Phone Configuration     : a) CD       Interconnect Hang Time        : 30



   C3 Maestro (ONLY) Options
   -------------------------
   Call Director ID        : 322       Number of PA Boards           : 1




          F1 = Help     F5 = Save     F7 = Send     F9 = Delete

                      <Escape> Exit   <RETURN> Edit
```

Figure 3.3-11 Console Hardware Configuration

Speaker Configuration
Enter the number of speakers that the selected console is equipped with. Most consoles have two (2) speakers, the select speaker and the unselect speaker.

Phone Configuration
With this field selected, a menu will appear when the **<Enter>** key is pressed. If the console is a C3 Maestro console equipped with the Call Director option, select "CD" from this menu; otherwise, leave the field set to "NONE" or blank.

Call Director ID (C3 Maestro Only)
The Logical ID (LID) number of the console's Call Director (if equipped) should entered in this field.

Number of PA Boards (C3 Maestro Only)
If the selected console is a C3 Maestro console, enter the number of Audio PA Boards installed in the console's Audio Tower. Most C3 Maestro consoles will only have one (1) Audio PA Board. However, if the console has three (3) or more speakers, or if it is equipped with the Call Director option, it will a have a second Audio PA Board and a "2" should be entered in this field.

Phone Call ICOM Speaker
This field is not currently supported and it should always be set to "NO", the default value.

Interconnect Hang Time
This field should always be set to "30" seconds, the default value.

3.3.3. Console Privilege Lists

This interface is used to define the units, groups and conventional channels that the console is allowed to program. The console list is currently not supported.

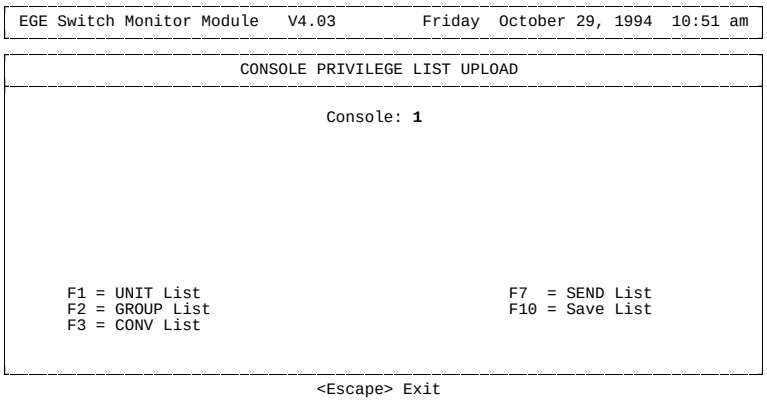

Figure 3.3-12 Console Privilege List Screen

To change the console selection, **<Page Up>** to the console prompt and enter the desired console.

3.3.3.1. Unit Privilege List

To edit the unit privilege list database for the selected console press **F1**. The following screen will appear (Your unit database will not match the one displayed). An asterisk at the far right of the field indicates the unit is enabled for programming. Pressing the **<Enter>** key on the selected field toggles the asterisk on (enabling programming) and off (disabling programming). The entire unit database may be paged through to determine which are programmable and which are not. Different consoles may have different privilege lists. The number in the first row of the Unit window is the unit id of the field highlighted.

To disable all units from being programmed press **F9**. All the asterisks on the right should disappear. This function is handy when only a

limited amount of units will be allowed to be programmed. Now only the few units allowed to be programmed must be modified.

To enable all units to be programmed press **F10**. All the asterisks on the right should be displayed. This allows the dispatcher to program any unit. This function is handy when only a few units will not be allowed to be programmed. Now only those units that need to be disabled need to be modified.

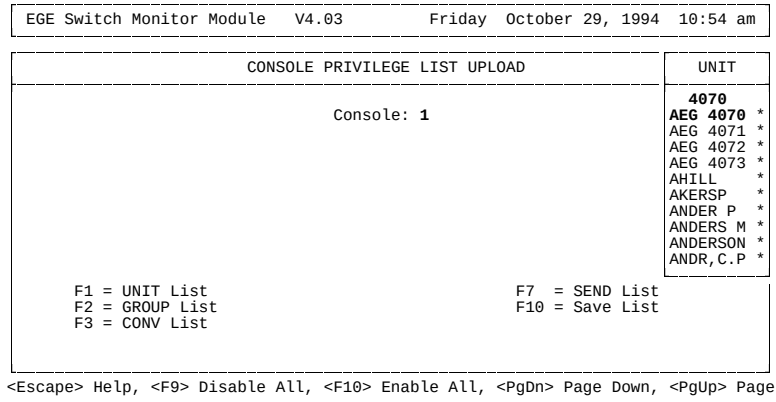

Figure 3.3-13 Console Privilege List Unit Screen

The group, conventional channel and phone line privilege lists are edited in the same manner. The screen for each type is displayed below.

3.3.3.2. Group Privilege List

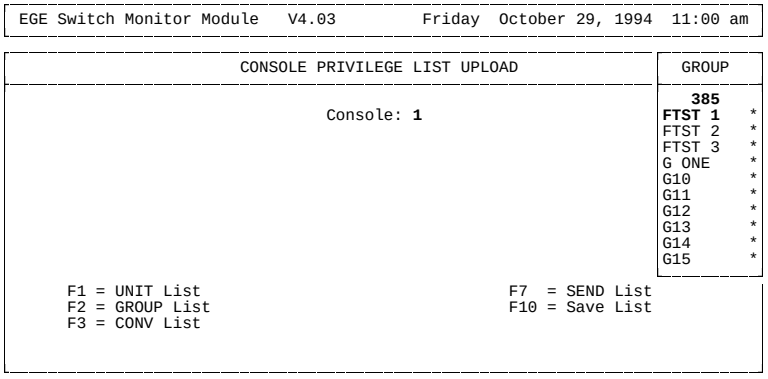

Figure 3.3-14 Console Privilege List Group Screen

3.3.3.3. Conventional Channel Privilege List

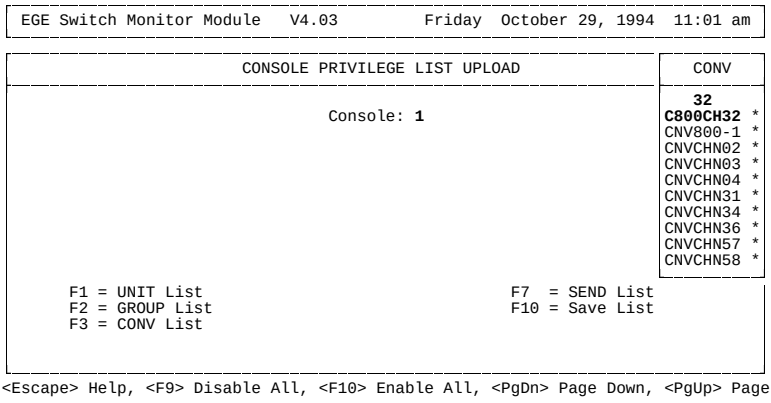

Figure 3.3-15 Console Privilege List Conventional Screen

3.3.3.4. Uploading Console Privilege List Data

To upload the privilege list data to the console press **F7**. The following screen will appear. Each "**.**" is an indication of eight privilege bits. The console will need to be on-line for this function to execute successfully. The entire privilege list will be uploaded to the console.

The user at the console will need to log out and log back in again after this operation (In case a non-valid module is already programmed).

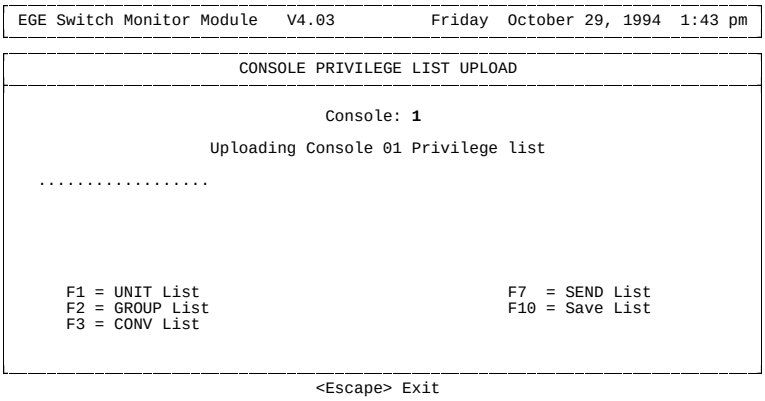

Figure 3.3-16 Console Privilege Uploading Screen

If there is a problem with the CEC/IMC Manager ⇔ MOM Controller Board serial link the following message will be displayed. The upload was not successful and needs to be retransmitted. Before retransmitting, check serial link and baud rates and correct necessary problems.

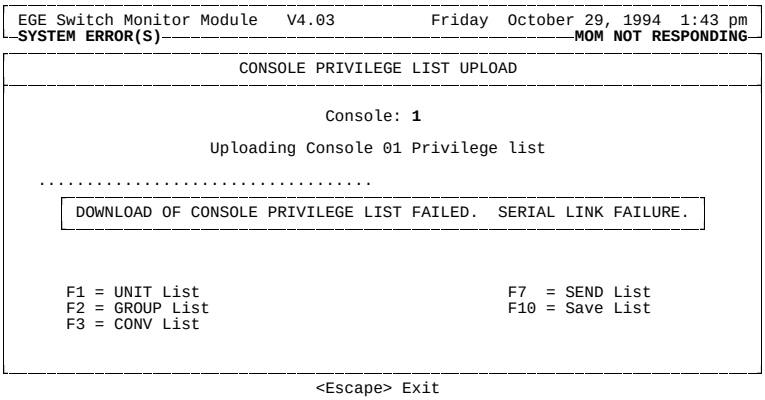

Figure 3.3-17 Console Privilege Upload Failure Screen

When the upload is complete the following message will be displayed:

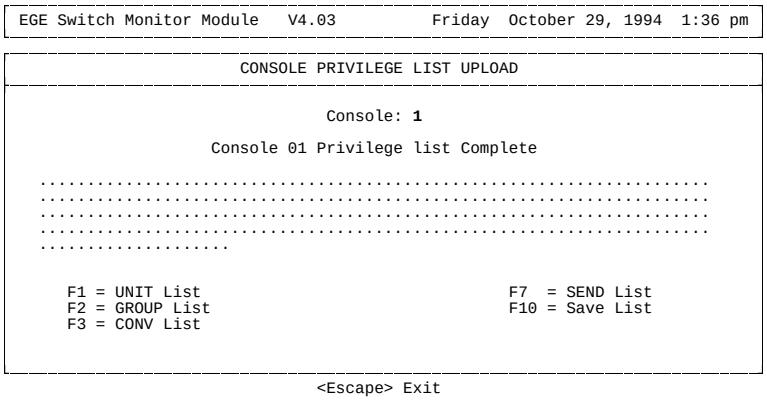

Figure 3.3-18 Console Privilege Upload Complete Screen

After reconfiguring the privilege list the new configuration needs to be saved. Press **F10** to save the data to disk. The following screen will appear for save verification.

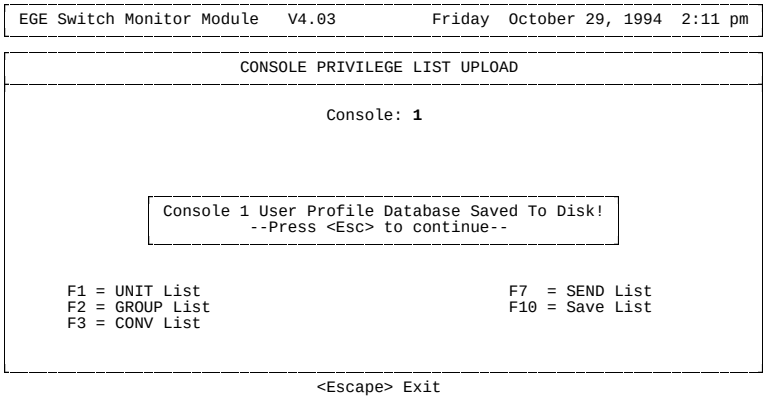

Figure 3.3-19 Console Privilege Data Saved Screen

3.3.4. C3 Modular/Desktop Console Configuration

C3 Modular/Desktop console modules are configured using the following screen. The MODULE TYPE field is one of two types, TRNK or CONV. TRNK indicates a trunked unit or group may be programmed into that module. CONV indicates that a conventional

channel may be programmed into that module. The "+" or "-" keys toggle between the valid states. The DISPLAY TYPE field is also one of two states, ALPHA or FIXED. ALPHA indicates the module has an alphanumeric programmable display. FIXED indicates the module has a fixed display (non-programmable – possible label). These fields are toggled with "+/-" also. The MODULE PRESENT field is used to indicate whether the module actually exits. Each C3 Modular/Desktop console may support up to 64 modules, but the MODULE PRESENT field should only have a "Y" for the modules actually present.

Use the **<Ctrl> <Page Up>** and **<Ctrl> <Page Down>** keys to cycle through the modules.

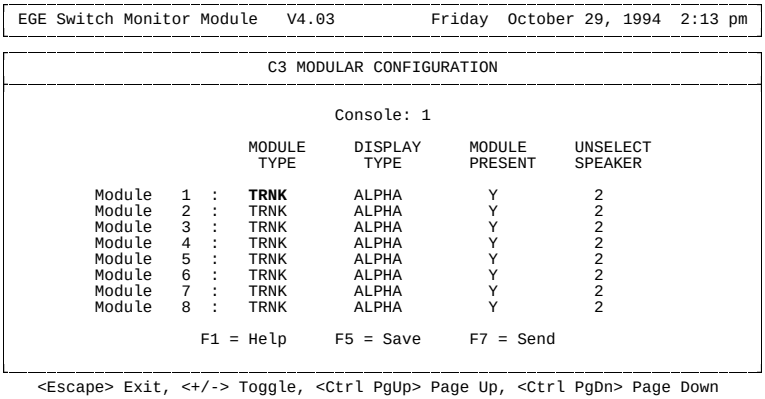

Figure 3.3-20 C3 Modular/Desktop Console Configuration Screen

Use the **F7** key to download the C3 Modular/Desktop console configuration to the console translator. Successful downloads display the following form. Unsuccessful downloads will display the error screen. Successful downloads are an indication of receipt of download by the C3 Modular/Desktop console translator. The translator databases this configuration information in NOVRAM and will not require another download unless the configuration changes.

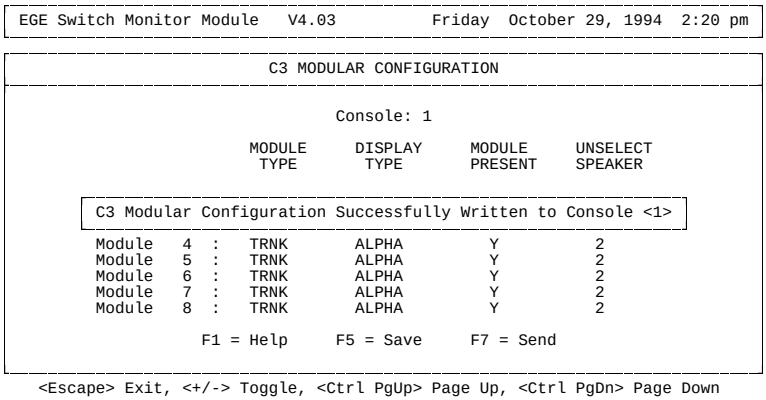

Figure 3.3-21 C3 Modular/Desktop Console Configuration Write Successful Screen

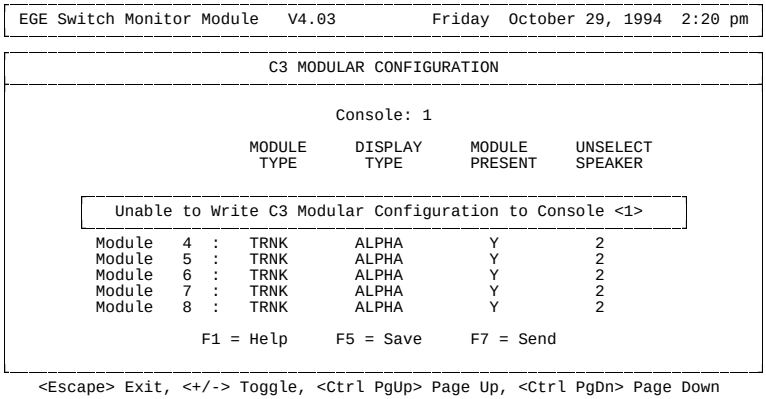

Figure 3.3-22 C3 Modular/Desktop Console Configuration Write Unsuccessful Screen

After reconfiguring the C3 Modular/Desktop console, use the **F5** key to save the new configuration to disk. The following screen will appear for save verification.

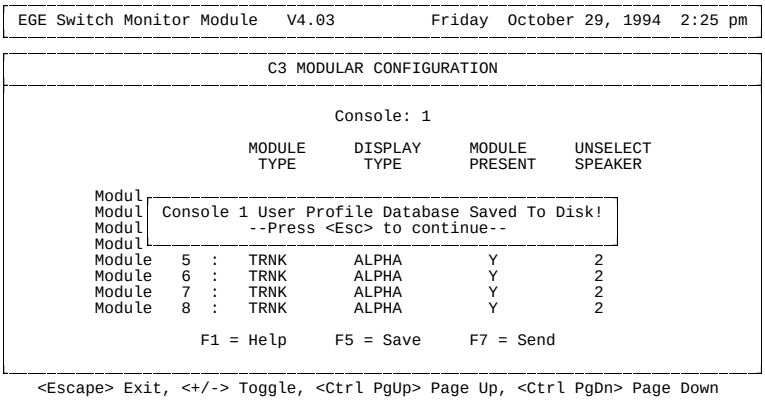

Figure 3.3-23 C3 Modular/Desktop Console Configuration Data Saved Screen

3.3.5. View Patches/Simulselects

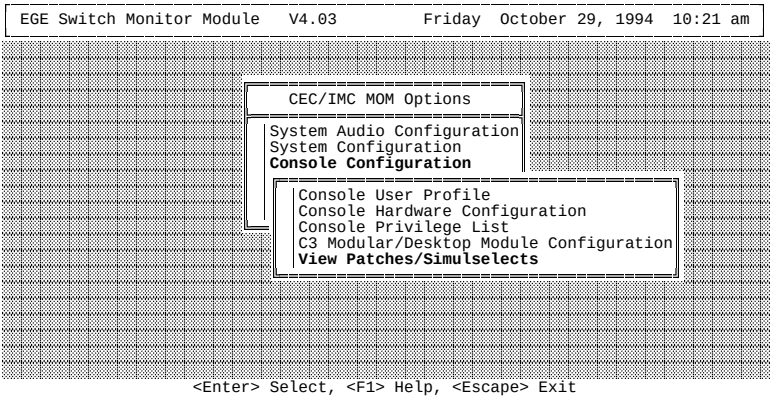

Figure 3.3-24 Console Configuration Menu

The View Patches/Simulselects option can be used to view, deactivate and delete ("soft") patches and simulselects made from consoles. This option reads and changes the ("soft") patch/simulselect data stored in the MOM Controller Board. Selecting "View Patches/Simulselects" from the Console Configuration menu will display a screen similar to the screen shown in Figure 3.3-25. This screen is automatically updated once per second in accordance with the MOM Controller

Board's patch/simulselect data. Refer to the Help associated with this screen for field descriptions. Press the **F1** function key to view the Help. Normally, patches/simulselects should not be deleted or deactivated via this option.

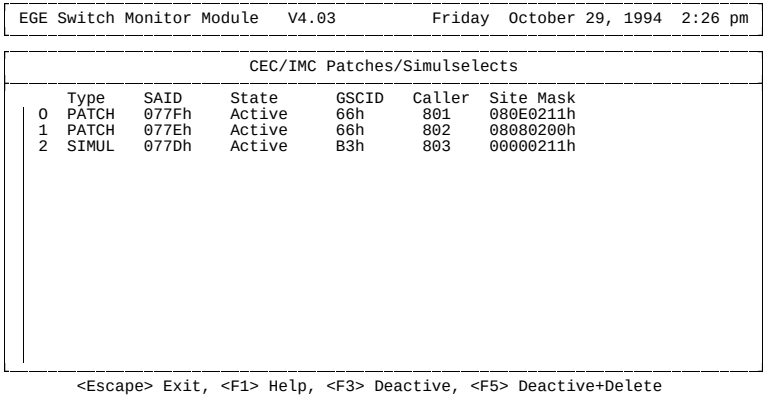

Figure 3.3-25 View ("Soft") Patches/Simulselects Screen

3.4. SYSTEM MANAGER DATA

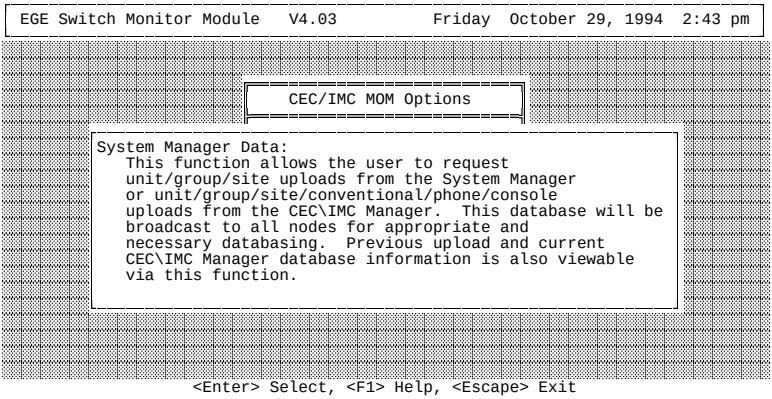

Figure 3.4-1 System Manager Data Help Screen

This function allows the user to upload unit, group, and site data from the System Manager or unit, group, and site data along with

conventional, phone line, and console unit ID databases from the CEC/IMC Manager's hard disk. The upload data is broadcast to all interface modules. If the data is uploaded from the System Manager it is also stored to the CEC/IMC Manager hard disk. The help screen in Figure 3.4-1 will be displayed if the user requests Help (presses the **F1** key).

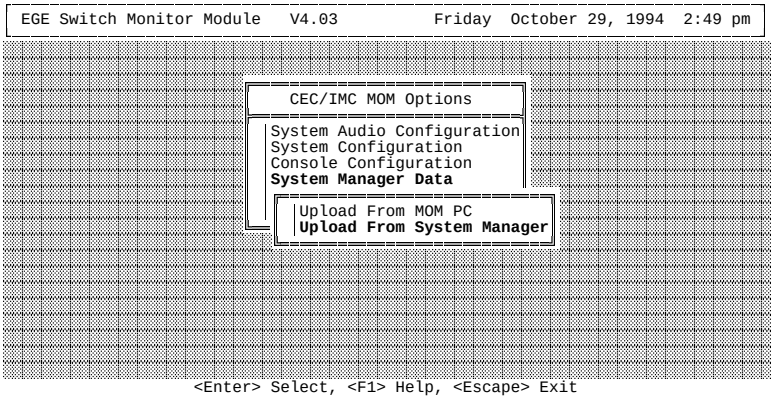

Figure 3.4-2 System Manager Data Select Screen

If the user selects the "System Manager Data" option, the screen in Figure 3.4-2 will appear. The user must now select the source for the upload. If "Upload From System Manager" is selected, all upload data will be requested from the System Manager. If "Upload From MOM PC" is selected, all upload data will originate from the CEC/IMC Manager's hard disk. This is data stored from a previous System Manager upload.

3.4.1. Upload From System Manager

Selecting the "Upload From System Manager" menu option will result in the screen shown in Figure 3.4-3. The user may now select either unit upload **F1**, group upload **F2**, or site upload **F6**.

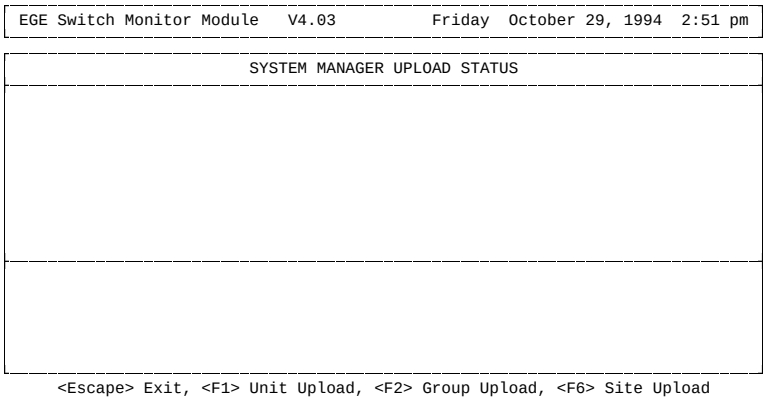

Figure 3.4-3 System Manager Upload Status Screen

If the "Unit Upload" option is chosen, the screen in Figure 3.4-4 will appear. This screen displays unit upload and database status and allows the user to request full and partial unit uploads from the System Manager.

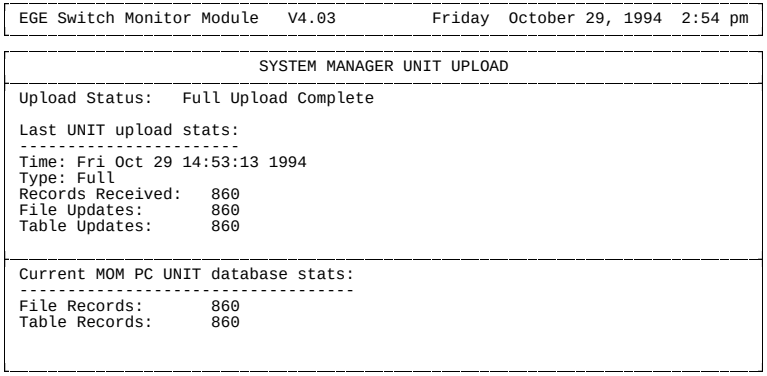

Figure 3.4-4 System Manager Unit Upload Screen

The Upload Status field displays information regarding any current uploads, such as whether a full or partial upload request has been sent, is currently in progress, or has completed.

The fields under Last Upload Stats give information about the last upload received at the CEC/IMC Manager, including the date and

time when the first record in the upload was received, whether it was full or partial, the number of records received, the number of records in the database file that were updated, and the number of records in the table that were updated. This information is written to disk at the end of each upload so that it may be retained for viewing if the CEC/IMC Manager program is exited and restarted. During normal operation, the number of file and table updates should always be equal. For full uploads, these values should also be equal to the records received value. For partial uploads, these values may or may not be equal to the records received value.

The fields under Current Database Stats give information about the number of records currently residing in the database file and table at the CEC/IMC Manager. The database table is a structure which is built upon CEC/IMC Manager startup and updated whenever a System Manager upload is received. It is composed of lists sorted by name and ID, containing additional data not received in an upload, which are used by various functions at the CEC/IMC Manager. During normal operation, the number of file and table records should always be equal.

Function keys **F8** and **F9** are used to request full and partial uploads, respectively, from the System Manager.

Figure 3.4-5 shows the screen that will appear if the "Group Upload" option is chosen. It is similar in appearance and functionality to the unit upload screen.

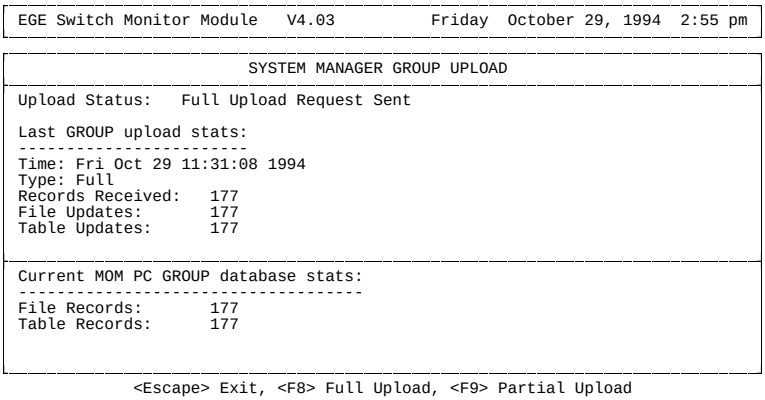

Figure 3.4-5 System Manager Group Upload Screen

In this figure, a partial upload has been received. Note that the file and table updates values do not equal the records received value. This normally only occurs when records marked as deleted are received in a partial upload, but no matching ID field can be found in any of the CEC/IMC Manager's database file and table records.

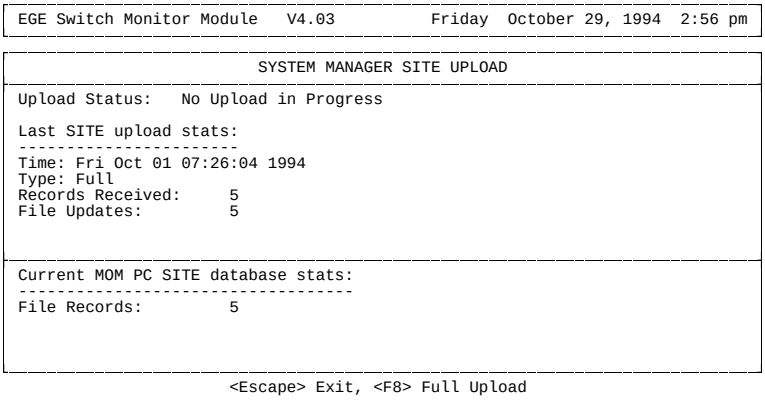

Figure 3.4-6 System Manager Site Upload Screen

If the user selects the "Site Upload" option, the screen shown in Figure 3.4-6 will appear. It is similar in appearance and functionality to the unit and group upload screens with the exceptions that no table is associated with sites, and partial site uploads may not be requested from the System Manager.

NOTES

It is not necessary for the previous upload to complete before requesting a different upload. In other words, you may request a unit upload immediately followed by a group and site upload, or any combination thereof.

It is also not necessary to remain on the screen from which the upload was requested while the databases are being uploaded. You may request the data and then proceed to another screen to perform some other action.

3.4.2. Upload From CEC/IMC Manager (MOM PC)

The "Upload From MOM PC" option works basically the same as the "Upload From System Manager" option except that the uploaded data originates from the CEC/IMC Manager's hard disk. The unit, group, and site databases are stored on the CEC/IMC Manager's hard disk from previous System Manager uploads. Additionally, phone line, conventional, and console unit ID databases can be uploaded from the CEC/IMC Manager. Unlike System Manager uploads which allow partial upload requests for units and groups, only full uploads are supported.

The screen shown in Figure 3.4-7 will appear if the "Upload From MOM PC" option is chosen.

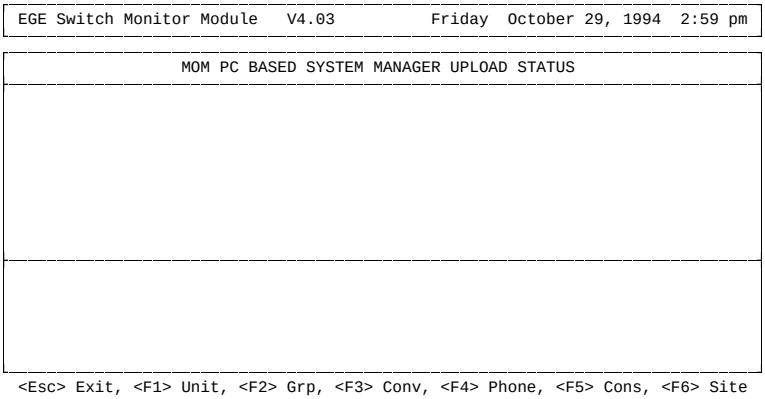

Figure 3.4-7 CEC/IMC Manager Based System Manager Upload Status Screen

From this screen, one of six possible upload options are available. If **F1** Unit is chosen, the screen displayed in Figure 3.4-8 will appear. This screen displays unit upload and database statistics and allows the user to request full unit uploads from the CEC/IMC Manager.

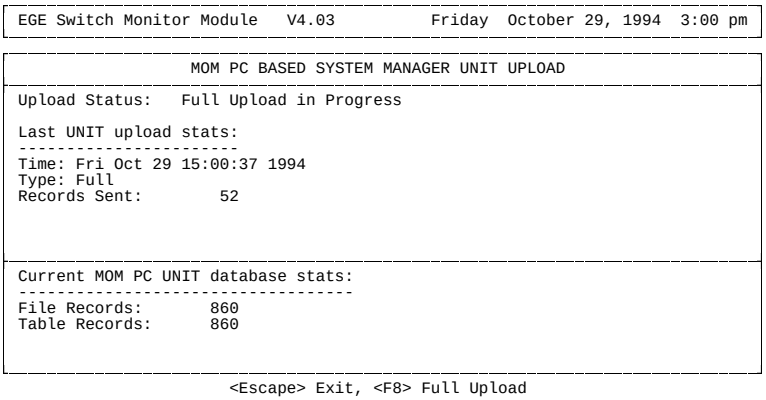

Figure 3.4-8 CEC/IMC Manager Based System Manager Unit Upload Screen

The Upload Status field displays information regarding any current CEC/IMC Manager based uploads, such as whether a full upload request is queued, is currently in progress, has completed, or has been aborted. An upload will be aborted if a full upload from the System Manager begins while the CEC/IMC Manager based upload is in progress, or if a database file read error occurs. If, while a CEC/IMC Manager based upload is in progress, a partial System Manager upload occurs, a CEC/IMC Manager based upload request will be queued, and then restarted from the first record in the database file after the partial upload has completed.

The fields under Last Upload Stats give information about the last upload issued at the CEC/IMC Manager, including the date and time when the first record in the upload was sent, the type of upload, which will always be "Full", and the number of records sent. Unlike the System Manager Upload Stats, this information is not written to disk at the end of each upload. Once the CEC/IMC Manager is exited, this information is lost.

The fields under Current Database Stats give information about the number of records currently residing in the database file and table. Under normal operation, the number of file and table records should always be equal.

Function key **F8** is used to request a full upload from the CEC/IMC Manager.

If **F2** Grp is selected from the CEC/IMC Manager Based System Manager Upload screen, the screen shown in Figure 3.4-9 will be displayed. It is similar in appearance and function to the System Manager Unit Upload screen.

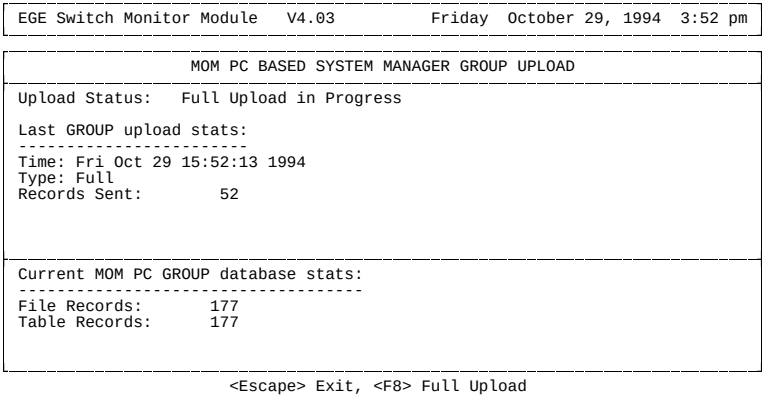

Figure 3.4-9 CEC/IMC Manager Based System Manager Group Upload Screen

Selecting **F3** Conv from the System Manager Upload screen will result in the screen shown in Figure 3.4-10 being displayed. It is similar in appearance and function to the CEC/IMC Manager Based System Manager Unit Upload screen except that no table is associated with the conventional database.

```
EGE Switch Monitor Module   V4.03          Friday  October 29, 1994  3:37 pm

                    MOM PC BASED SYSTEM MANAGER CONV UPLOAD

Upload Status:   Full Upload Complete

Last CONV upload stats:
-----------------------
Time: Fri Oct 29 15:37:41 1994
Type: Full
Records Sent:        17




Current MOM PC CONV database stats:
-----------------------------------
File Records:        17



                        <Escape> Exit, <F8> Full Upload
```

Figure 3.4-10 CEC/IMC Manager Based System Manager Conventional Upload Screen

The conventional database is built using the "Program Conventional" menu option from the "System Configuration" screen.

```
EGE Switch Monitor Module   V4.03        Thursday  November 4, 1994  9:40 am

                    MOM PC BASED SYSTEM MANAGER PHONE UPLOAD

Upload Status:   Full Upload Complete

Last PHONE upload stats:
------------------------
Time: Thu Nov 04 09:40:22 1994
Type: Full
Records Sent:        10




Current MOM PC PHONE database stats:
------------------------------------
File Records:        10



                        <Escape> Exit, <F8> Full Upload
```

Figure 3.4-11 CEC/IMC Manager Based System Manager Phone Upload Screen

The **F4** Phone option on the CEC/IMC Manager Based System Manager Upload screen will invoke the screen shown in Figure 3.4-11. It is similar in appearance and function to the CEC/IMC Manager Based System Manager Unit Upload screen except that no table is associated with the phone line database.

The phone line database is built manually outside of the CEC/IMC Manager program using a text editor.

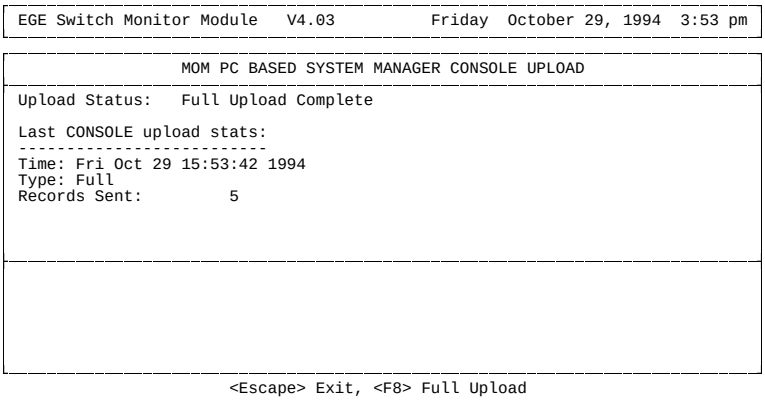

Figure 3.4-12 CEC/IMC Manager Based System Manager Console Upload Screen

If **F5** Console is selected from the CEC/IMC Manager Based System Manager Upload screen, the screen shown in Figure 3.4-12 will be displayed. It is similar in appearance and function to the CEC/IMC Manager Based System Manager Unit Upload screen except that no table is associated with the console database, and no indication is given on the screen of the number of records currently in the database.

The console database is built using the "Console User Profile" menu option from the "Console Configuration" screen.

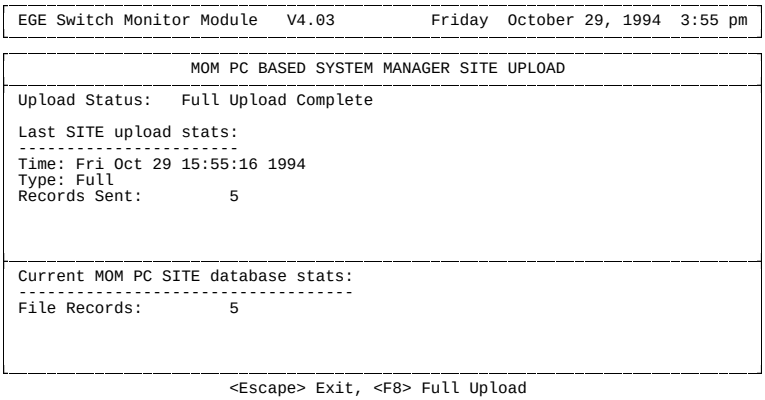

Figure 3.4-13 CEC/IMC Manager Based System Manager Site Upload Screen

Selecting **F6** Site from the CEC/IMC Manager Based System Manager Upload screen will invoke the screen shown in Figure 3.4-13. It is similar in appearance and function to the CEC/IMC Manager Based System Manager Unit Upload screen except that no table is associated with the site database.

As mentioned in the System Manager Upload section, it is not necessary for the previous upload to complete before requesting a different upload. In other words, you may request a unit upload immediately followed by a conventional upload, or any combination of the six options. Each request will be queued, and upload will begin when the previous upload has completed. It is also not necessary to remain on the screen from which the upload was requested while the databases are being uploaded. You may request the data and then proceed to another screen to perform some other action.

There are various messages that may appear on any of the System Manager Data screens. These messages indicate an error condition with a particular database file or table that may affect the proper operation of other functions on the CEC/IMC Manager. Here is a brief description of each of those messages:

"**Invalid Record Received**"- an upload record was received that contained an ID value larger than the defined maximum. This record is not added to the database file or table.

"**Table Full**" – no more upload records may be added to the table.

"**Table Write Error**" – an error was encountered while writing upload record data to the table. On or more table records may contain erroneous data or table may be missing entries.

"**Table Allocation Error**" – RAM/disk space could not be allocated to increase the size of the table to accommodate more upload records.

"**Error Writing to File**" – an error was encountered while writing upload record data to the database file. One or more file records may contain erroneous data or file may be missing entries.

"**Error Reading File**" – an error was encountered while reading data from the database file.

"**Table Corrupted**" – a check on the table encountered an unrecoverable inconsistency. Either exit and restart the CEC/IMC Manager, or request a full upload from the System Manager.

"**Incompatible File Format**" – the database file resident on the hard disk is of a format from a previous version of CEC/IMC Manager that is not compatible with the current version's format. A full upload must be obtained from the System Manager.

3.5. VIEW SYSTEM/DIAGNOSTICS

3.5.1. System Display Screen

Selecting the View System/Diagnostics option from the main menu will invoke the System Display screen, as shown in Figure 3.5-1. This allows the user to view the total Controller Board (device) configuration of the CEC/IMC on a single screen.

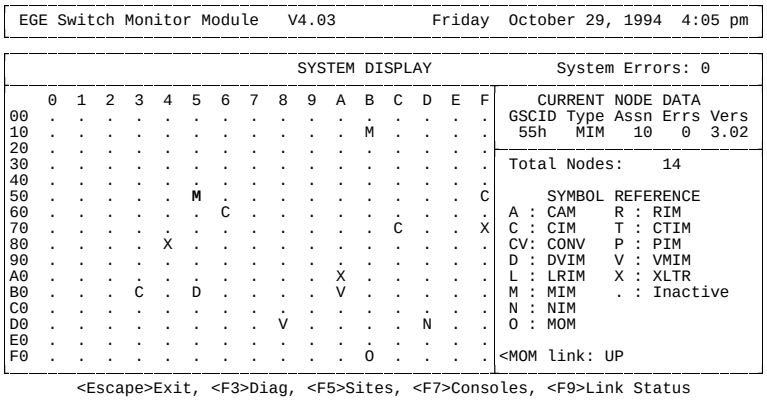

Figure 3.5-1 System Display Screen

The screen is divided into 4 main sections or boxes: Header, Node Matrix, Current Node Data, and Information. Each box is detailed below.

3.5.1.1. Header Box

This box contains a description of the screen currently being displayed and also a count of all current errors in the system. This count is the sum of all errors for each individual interface module (node), plus the number of all global system errors. If this value is greater than 0, then conditions which are detrimental to normal system operation are currently in existence, and should be evaluated and corrected immediately.

3.5.1.2. Node Matrix Box

This box is the main focus of the screen, containing a 16 x 16 matrix of all possible hexadecimal GSC node addresses in the system. The cursor can be moved around within this matrix to get detailed information on a device at a particular GSC node address.

Use the left, right, up, and down arrow keys to move the cursor to any hexadecimal interface module (node) address in the range 00h to EFh, plus FBh, which is the permanent address of the MOM Controller Board. F0h thru FAh, and FCh thru FFh are reserved, and cannot be accessed.

Each element in the matrix will display either a ".", indicating an inactive interface module (node) address (no device responding), or a 1 or 2 character symbol, indicating an active device at that address. A cross reference of symbols to device types is listed in the information box located at the far right of the screen under SYMBOL REFERENCE. In Figure 3.5-1, there are fourteen (14) active nodes: four (4) CIMs at addresses 5Fh, 66h, 7Ch and B3h, one (1) DVIU at address B5h, two (2) MIMs at addresses 1Bh and 55h, one (1) NIM at address DDh, two (2) VMIMs at addresses BAh and D8h, three (3) XLTRs at addresses 7Fh, 84h and AAh and the MOM at its reserved address FBh.

Errors at each interface module (node) are indicated by a flashing symbol. Global system errors, which affect all interface modules (nodes), will cause all active nodes to flash. A global system error will also cause the cursor to flash on any node, active or inactive.

3.5.1.3. Current Node Data Box

This box, located in the upper right portion of the screen, contains data about the interface module (node) where the cursor is currently located in the GSC node matrix. As the cursor is moved, the data changes to reflect the new position of the cursor.

The GSCID field displays the current hexadecimal GSC node address (i.e. cursor position).

The TYPE and ASSN fields display the device type and setting of the device's assignment dip switches, respectively, at the current address, if the interface module (node) is active. If the interface module (node) is inactive, both fields will display "-".

The ERRS field displays the number of errors currently existing that affect the current interface module (node). This count will include errors that affect only the current interface module (node), plus the number of global system errors. In some instances, the sum of all the values displayed in this field for each individual interface module (node) will be greater than the value displayed in the SYSTEM ERRORS field. This will occur whenever a global system error currently exists, since each global system error is counted as a single error in the SYSTEM ERRORS field, but is counted as a single error in each individual interface module (node) error count as well.

The VERS field displays the major and minor version number of the 80C186 software installed in the device at the current interface module

(node). Since the version number was not coded into Controller Board's prior to version 2.00, any previous versions (1.00 through 1.10) of software installed will result in "????" being displayed in this field.

3.5.1.4. Information Box

The lower right box contains a count of the total active interface modules (nodes) in the system, a cross reference of node matrix symbols to device types, as mentioned previously, and a status field, which may display any of the following messages:

MOM NOT RESPONDING – No messages have been received from the MOM via the serial link within the last 8 seconds. This indicates that the MOM Controller Board is inactive or the serial link is not connected or is not working correctly. When this condition happens after communications with the MOM have been previously established, an additional warning message will be displayed, indicating the last time any data was received from the MOM. This is to serve as a reminder that the current configuration displayed in the GSC node matrix was the state of the system at the time indicated, and may or may not be correct now.

UPDATING NODE DATA – The MOM Controller Board is currently sending a dump of its GSC node database. This will occur whenever the CEC/IMC Manager starts up, the MOM Controller Board is reset, a dump request is issued by the user, or when either the MOM or CEC/IMC Manager processes a disruption of serial communications between the two. This is done to ensure the integrity of the CEC/IMC Manager's GSC node database.

MOM RESET – The MOM Controller Board has been reset, or has not received proper response from the CEC/IMC Manager to its polled inquiry. Since this message is immediately followed by the "Updating node data" message, it may only be displayed for a brief instant, or not at all.

INCOMPATIBLE MOM SW – The MOM Controller Board contains 80C186 ROM software version prior to version 2.00. If this is the condition, the CEC/IMC Manager will not be able to get the current system device configuration. Also any diagnostics

information received by the CEC/IMC Manager may not be accurate.

MOM LINK: UP – This is the normal state of operation, indicating no problems with the serial link to the MOM, and no GSC node database dump occurring.

3.5.1.5. Hot Keys

There are various hot keys that may be pressed at any time:

E – If pressed while the cursor is on an active interface module (node), a list of all current **E**rrors for that interface module will be displayed. If pressed while the cursor is on an inactive node, a list of all current errors for the overall system will be displayed.

H – Invokes the **H**DLC channel B statistics screen for the current interface module (node).

I – Invokes the Board **I**dentification Window.

N – Invokes the GSC **N**ode statistics screen for the current interface module (node).

U – Requests an **U**pdate (dump) of the GSC node database from the MOM Controller Board.

V – Issues a request to the current interface module (node) for a copy of its **V**ersion stamp. If the interface module (node) responds, a pop-up window will display the version number of the 80C186 software currently installed at the interface module (node), and a date and time when the executable file was created. Note that any interface module (node) with Controller Board 80C186 source code version prior to 2.00 (indicated by "????" in the VERS field of the Current Node Data box) will not respond to this request.

3.5.1.6. Function Keys

The following function keys may be pressed at any time:

F1 – Invokes the help screen.

F3 – Invokes the diagnostics menu, allowing viewing of errors, warnings, and statistics for the system.

F5 – Toggles between the SYSTEM DISPLAY and SITE DISPLAY screens. The SITE DISPLAY screen changes the format of the GSC node matrix to allow viewing of site numbers of all active MIM-type (MIM, VMIM, CTIM, and NIM) devices on a single screen.

F7 – Toggles between the SYSTEM DISPLAY and CONSOLE DISPLAY screens. The CONSOLE DISPLAY screen changes the format of the GSC node matrix to allow viewing of console numbers of all active CIM devices on a single screen.

F9 – Toggle between the SYSTEM DISPLAY and the LINK STATUS DISPLAY screens. The LINK STATUS DISPLAY screen shows the current control data link status condition for all Controller Boards in the matrix. The status conditions include Link-Up, Link-Down, Trunked, Failsoft 1, Failsoft 2 and state unknown.

<Esc> – Returns to the main menu.

3.5.2. Site Display Screen

The Site Display screen allows the user to view the site numbers of all active MIM-type devices installed in the CEC/IMC system on a single screen, as shown in Figure 3.5-2. Devices that are considered "MIM-type" are MIMs, VMIMs, CTIMs, and NIMs. This screen is invoked by pressing function key **F5** from the System Display or Console Display screens.

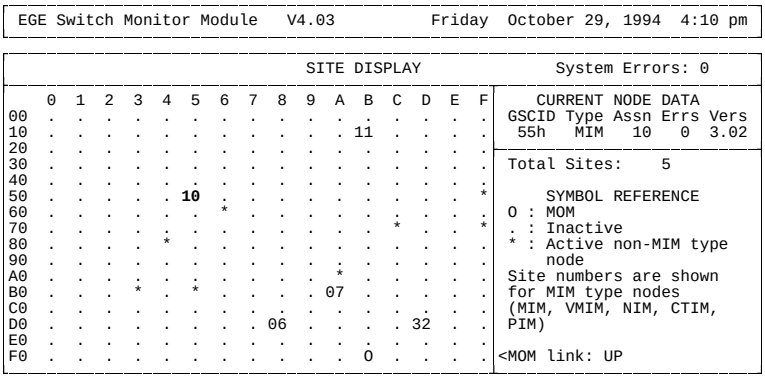

Figure 3.5-2 Site Display Screen

The functionality of this screen is essentially the same as the System Display screen, with the exceptions detailed below. Refer to the System Display section for a description of the basic functionality.

For the site display screen, each element in the matrix will display either a "**.**", indicating an inactive node address (no device responding), a "*****", indicating that the device is active but is not a MIM-type device, or a decimal value, which is the site number of the MIM-type device. The MOM is always shown on the screen as an "**O**". The number of active sites is displayed in the Information Box.

In Figure 3.5-2, there are fourteen (14) active nodes, five (5) of which are MIM-type ("site"-type) devices: two (2) MIMs at addresses 1Bh and 55h, two (2) VMIMs at addresses BAh and D8h, and one (1) NIM at address DDh. The site numbers are 11, 10, 7, 6, and 32 respectively. The non-MIM-type devices, as indicated by the "*" symbols, are located at addresses 5Fh, 66h, 7Ch, B3h, B5h, 7Fh, 84h and AAh. The MOM is shown at its reserved address FBh.

3.5.3. Console Display Screen

The Console Display screen allows the user to view the console numbers of all active CIM devices installed in the CEC/IMC on a single screen, as shown in Figure 3.5-3. This screen is invoked by pressing **F7** from the System Display or Site Display screens.

```
 EGE Switch Monitor Module   V4.03          Friday  October 29, 1994  4:11 pm

                                  CONSOLE DISPLAY                 System Errors: 0

    0  1  2  3  4  5  6  7  8  9  A  B  C  D  E  F     CURRENT NODE DATA
00  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .   GSCID Type Assn Errs Vers
10  .  .  .  .  .  .  .  .  .  .  .  *  .  .  .  .    00h    -    -    0    -
20  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
30  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .   Total Consoles: 4
40  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
50  .  .  .  .  .  *  .  .  .  .  .  .  .  .  . 06       SYMBOL REFERENCE
60  .  .  .  .  .  . 03  .  .  .  .  .  .  .  .  .   O : MOM
70  .  .  .  .  .  .  .  .  .  .  .  . 07  .  .  *   . : Inactive
80  .  .  .  .  *  .  .  .  .  .  .  .  .  .  .  .   * : Active non-CIM node
90  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
A0  .  .  .  .  .  .  .  .  .  .  *  .  .  .  .  .   Console numbers are
B0  .  .  . 01  .  *  .  .  .  .  *  .  .  .  .  .   shown for CIM nodes.
C0  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
D0  .  .  .  .  .  .  .  .  *  .  .  .  .  *  .  .
E0  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
F0  .  .  .  .  .  .  .  .  .  .  O  .  .  .  .  .  <MOM link: UP

        <Escape>Exit, <F3>Diag, <F5>Sites, <F7>System, <F9>Link Status
```

Figure 3.5-3 Console Display Screen

The functionality of this screen is essentially the same as the System Display screen, with the exceptions detailed below. Refer to the System Display section for a description of the basic functionality.

For the console display screen, each element in the matrix will display either a "**.**", indicating an inactive node address (no device responding), a "*****", indicating that the device is active but is not a CIM device, or a decimal value, which is the console number of the CIM device. The MOM is always shown on the screen as an '**O**". The number of active consoles is displayed in the Information Box.

In Figure 3.5-3, fourteen (14) active nodes, four (4) of which are consoles: four (4) CIMs at addresses 5Fh, 66h, 7Ch and B3h. The console numbers are 6, 3, 7, and 1 respectively. The non-CIM devices, as indicated by the "*" symbols, are located at addresses 1Bh, 55h, 7Fh 84h, AAh, BAh, B5h, D8h, and DDh. The MOM is shown at its reserved address FBh.

3.5.4. Link Status Display Screen

As shown in Figure 3.5-4, the current control data link state for each Controller Board can be viewed by pressing the **F9** key from the System Display screen. The current state for each Controller Board is displayed via a two-letter reference in the respective matrix position. The two-letter references are defined in the information box (lower right box) when the Link Status Display is selected. Pressing **F9** again will toggle operation back to the System Display screen.

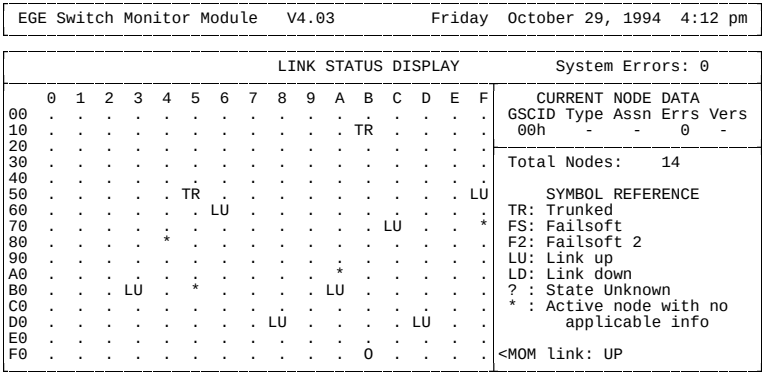

Figure 3.5-4 Link State Screen

3.5.5. Diagnostics Options Menu

The Diagnostics Options menu is invoked by pressing function key **F3** from the System, Site, or Console Display screens.

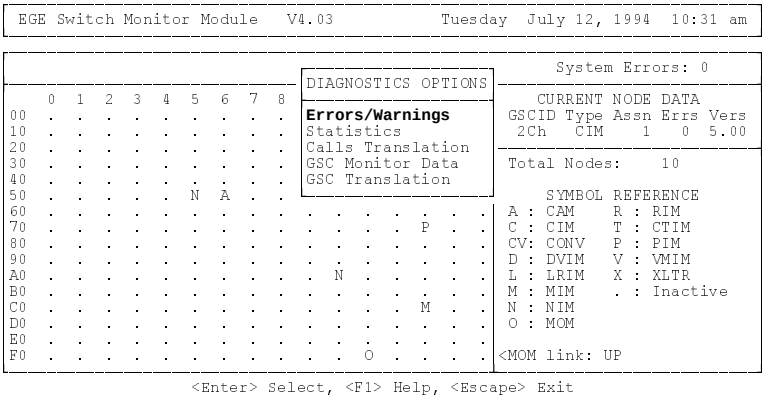

Figure 3.5-5 Diagnostics Options Menu

The Errors/Warnings option allows the user to generate reports about current and past errors and warnings generated in the CEC/IMC. The Statistics option allows viewing, in real time, of quantitative data related to various entities within the CEC/IMC. Either option calls up a sub-menu that lists the available reports and the displays available.

The Calls Translation, GSC Monitor Data, and the GSC Translation options invoke screens which provide detailed call and GSC information which is logged on the CEC/IMC Manager's hard disk drive.

3.5.5.1. Errors/Warnings

The sub-menu displayed when the errors/warnings diagnostics option is chosen is dependent on the screen from which the diagnostics menu was invoked.

There are 3 basic types of error/warning reports available: errors that currently exist, logged errors over a user-specified time interval, and logged warnings over a user-specified time interval. These 3 report types can be generated for a single node, all nodes, all sites, or all consoles, as shown in Figures 3.5-6 thru 3.5-8.

Figure 3.5-6 shows the errors/warnings sub-menu displayed when the diagnostics menu is invoked from the System Display screen. These options allow the user to generate error or warning reports for either the current interface module (node), which is the GSC address displayed in the Current Node Data box, or all GSC nodes.

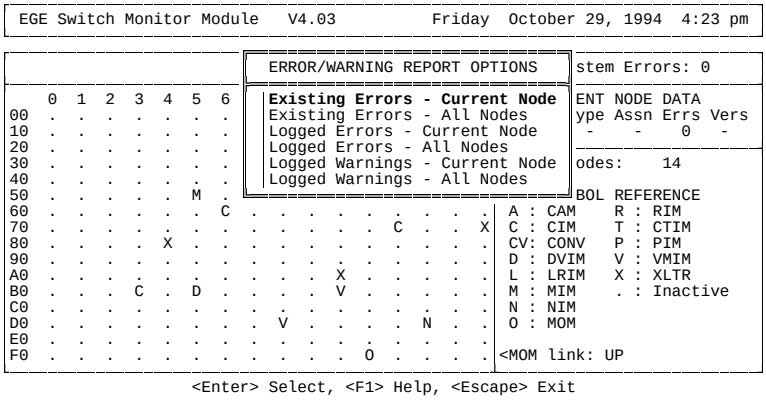

Figure 3.5-6 Errors/Warnings Diagnostics Sub-Menu for System Display Screen

Figure 3.5-7 shows the errors/warnings sub-menu displayed when the diagnostics menu is invoked from the Site Display screen. These options allow the user to generate error or warning reports for either the current interface module (node), which is the GSC address

displayed in the Current Node Data box, or all MIM-type interface modules.

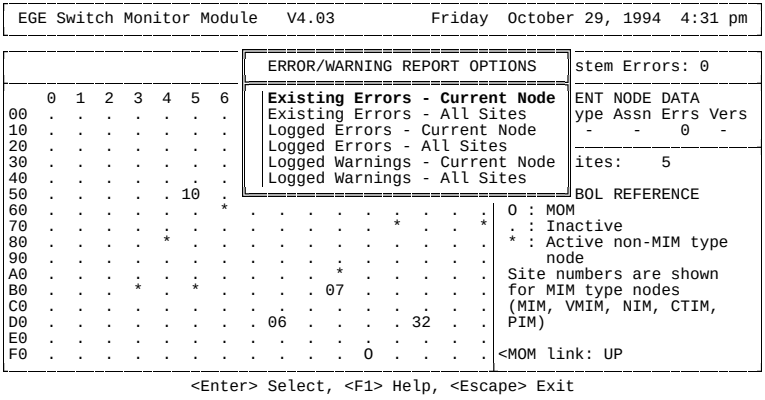

Figure 3.5-7 Errors/Warnings Diagnostics Sub-Menu for Site Display Screen

Figure 3.5-8 shows the errors/warnings sub-menu displayed when the diagnostics menu is invoked from the Console Display screen. These options allow the user to generate error or warning reports for either the current interface module (node), which is the GSC address displayed in the Current Node Data box, or all CIM-type interface modules.

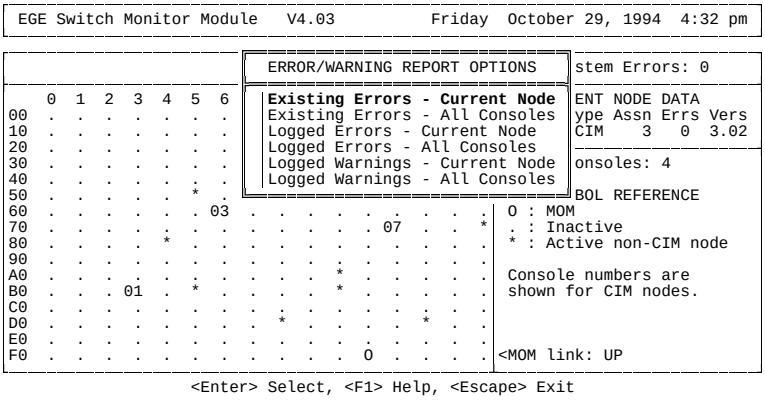

Figure 3.5-8 Errors/Warnings Diagnostics Sub-Menu for Console Display Screen

3.5.5.1.1. Existing Errors Report

Figure 3.5-9 shows an example of the existing errors report screen. The report format is the same for a single node, all nodes, all sites, or all consoles. The example shown in the figure is a report on existing errors for all nodes.

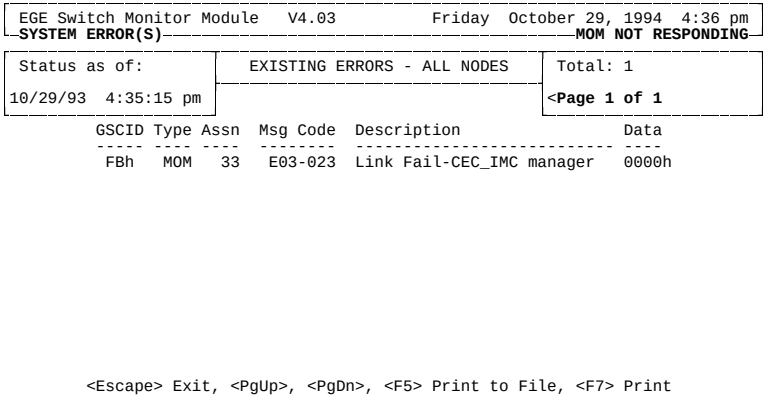

Figure 3.5-9 Existing Errors Report Screen

The header box, at the top center of the screen, indicates which existing error report option was chosen from the sub-menu.

The status box, located in the upper left corner of the screen, displays the system date and time when the errors were calculated. This is usually the time when this screen is invoked, except in the case where communication has been lost with the MOM Controller Board. In this case, the time displayed will be the last time a message was received from the MOM, since the system error status may have changed since communication was lost.

The box in the upper right corner of the screen contains the total number of errors found, and a status line (reverse video text found between the "<" and ">" characters). Usually this will be the current page (screen) number and the total number of pages in the report, as shown here, but sometimes it will display other information of importance to the user.

The remainder of the screen is used to display the errors found. If the number of errors found exceeds the screen capacity, the report will be continued on the next page, or screen. The other pages are accessed by

using the **<Page Up>** and **<Page Down>** keys. To print the entire report directly to the printer, press the **F7** function key. To print the entire report to a file for later viewing or printing, press the **F5** function key.

Each entry in the report details the source of the error, the related message code number, and a short description:

- The GSC address (GSCID), device type (Type), and device assignment (Assn) columns provides the user with an exact location of the source of the error. For the case of a global system error, the text "<GLOBAL SYSTEM>" will be displayed across these 3 columns, since this type of error affects all interfacemodules (nodes). Global system errors are included in all existing error reports, whether it is a single node, all sites, all consoles, or all nodes report (this is not the case for logged error reports).

- The message code number is used as a reference to obtain further information on the error being reported. It consists of a single character followed by 2 decimal values separated by a "-". The character "E" refers to an error message code (there are also message codes for warnings, indicated by a "W" as the first character). The first decimal value specifies a certain class of error, such as a bus failure, or a communications link failure. The second decimal value is the type of entity to which the error refers, such as the GSC bus, or the CEC/IMC Manager. The short description following the message code reflects this format.

- All current possible errors are listed in the screen's help file, indexed by the message code number. The help file is invoked by pressing function key **F1**. In most instances, though, the short description given will provide enough information to indicate the reason for the error.

It is important to note the existing error report screen is not updated if the system error status changes. To generate a new report, this screen must be exited by using the **<Esc>** key, and re-entered.

3.5.5.1.2. Logged Errors/Warnings Report

All warning and error messages generated in the system are sent to the CEC/IMC Manager where they are stored in the warning or error

datalog file, respectively. The errors/warnings report function allows the user to extract entries from either of these files for a specific time range for viewing.

The procedures for creating a logged errors or a logged warnings report are exactly the same. The following will describe how to generate a logged errors report but the same description applies to logged warnings report generation as well. Any differences between the two will be indicated.

There are two (2) screens associated with logged errors/warnings report generation. The first one, which is always displayed first when this report option is invoked, is the time range entry screen, which allows the user to enter the range of times over which to generate report entries. This screen is identified by the "Enter range" text displayed on the status line in the upper right box, as shown in Figure 3.5-11.

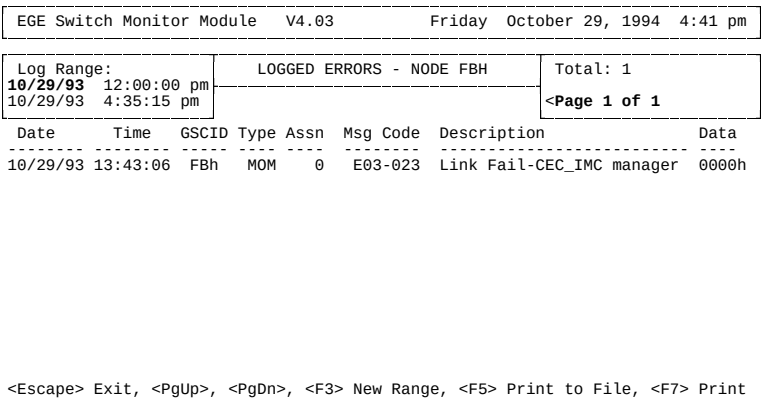

Figure 3.5-10 Time Range Entry Screen for Logged Errors Report

The Log Range Box, located in the upper left corner, is where the dates and times specifying the time range for the report are entered. Times may be entered in 24-hour format or with an "am" or "pm" suffix as shown in the figure. When the range has been entered, press function key **F3** to generate the report.

The amount of time required to generate the report depends on the following factors:

- Time range specified – larger time range requires more processing.
- Size of datalog file – the more entries in the file, the more searching required, although this can be minimized by specifying a narrow time range.
- Serial link activity – large amounts of traffic on MOM ⇔ CEC/IMC Manager serial link will take away processing time from report generation.
- Hard disk/controller throughput – report generation requires a large amount of disk access, both reading and writing. Slow drive or controller will result in longer processing time.

As the report is being generated, a "Please Wait" window is displayed. If the number of entries in the report exceeds 1000, the current entry count, in increments of 1000, is then displayed, as shown in Figure 3.5-11. To stop processing, press any key. All entries found so far will then be displayed, and the ending date and time of the log range will be updated to reflect the time of the last entry processed.

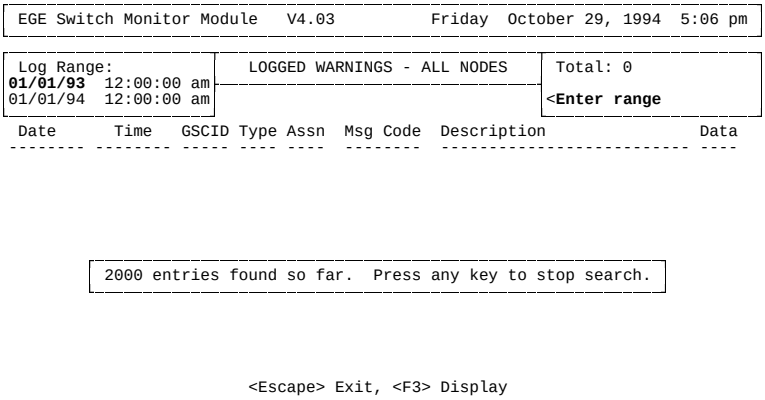

Figure 3.5-11 Entry Display Count During Report Generation

The second type of screen, the report display screen, is shown in Figure 3.5-12. The report format is the same for a single node, all nodes, all sites, or all consoles. The example shown in the figure is a report on logged errors for node FBh (MOM Controller Board).

```
EGE Switch Monitor Module   V4.03          Friday  October 29, 1994  5:01 pm

 Log Range:                    LOGGED ERRORS - NODE FBH          Total: 9
10/28/93  12:00:00 am                                          <Page 1 of 1
01/01/94  12:00:00 am

  Date       Time    GSCID Type Assn  Msg Code  Description                Data
-------- --------- ----- ---- ----  --------  -------------------------- ----
10/28/93 09:32:42  FBh   MOM    0   E03-023  Link Fail-CEC_IMC manager  0000h
10/28/93 09:33:46  FBh   MOM    0   E03-023  Link Fail-CEC_IMC manager  0000h
10/28/93 09:37:32  FBh   MOM    0   E03-023  Link Fail-CEC_IMC manager  0000h
10/28/93 11:34:53  FBh   MOM    0   E03-023  Link Fail-CEC_IMC manager  0000h
10/28/93 14:55:14  FBh   MOM    0   E03-023  Link Fail-CEC_IMC manager  0000h
10/29/93 09:23:29  FBh   MOM    0   E03-023  Link Fail-CEC_IMC manager  0000h
10/29/93 10:36:03  FBh   MOM    0   E03-023  Link Fail-CEC_IMC manager  0000h
10/29/93 13:43:06  FBh   MOM    0   E03-023  Link Fail-CEC_IMC manager  0000h
10/29/93 16:35:24  FBh   MOM    0   E03-023  Link Fail-CEC_IMC manager  0000h



<Escape> Exit, <PgUp>, <PgDn>, <F3> New Range, <F5> Print to File, <F7> Print
```

Figure 3.5-12 Report Display Screen for Logged Errors Report

The log range box, located in the upper left corner of the screen, displays the time range over which the report was generated. As mentioned previously, the ending date and time will be that of the last entry processed if report generation is interrupted by the user, or some condition occurs which prevents completion of the report, such as a disk full condition. Otherwise, the date and time will be the same as that entered.

The box in the upper right corner of the screen contains the total number of entries in the report, and a status line (reverse video text found between the "<" and ">" characters). Usually this will be the current page (screen) number and the total number of pages in the report, as shown here, but sometimes it will display other information of importance to the user.

The remainder of the screen is used to display the entries found. If the number of entries found exceeds the screen capacity, the report will be continued on the next page, or screen. The other pages are accessed by using the **<Page Up>** and **<Page Down>** keys. To print the report directly to the printer, press the **F7** function key. To print the entire report to a file for later viewing or printing, press the **F5** function key. To generate a new report, press **F3** to enter a new time range, or **<Esc>** to return to the menu and select a different report type.

The report format for errors and warnings is where the major difference lies between the two report generations. Each format is discussed separately here.

For error reports, each entry in the report details the time and source of the error, the related message code number, a short description, and a data value. (see Figure 3.5-12):

- The date and time indicates when the error was received by the CEC/IMC Manager, and in most cases will be the time of occurrence. This will not be the case if the message is lost due to a serial link overflow or MOM GSC receive buffer overflow. Since a device will retransmit an error message every 60 seconds until it receives acknowledgment from the CEC/IMC Manager, all error messages will eventually be logged, but in high message traffic conditions, the time stamp may not reflect the actual time of occurrence.

- The GSC address (GSCID), device type (Type), and device assignment (Assn) columns provide the user with an exact location of the source of the error. For the case of a global system error, the text "<GLOBAL SYSTEM>" will be displayed across these 3 columns, since this type of error affects all interfacemodules (nodes). Global system errors are included only in an all nodes report. Reports for a single node, all sites, or all consoles will not contain these types of errors!

- The message code number is used as a reference to obtain further information on the error being reported. It consists of a single character followed by 2 decimal values separated by a "-". The character "E" refers to an error message code (there are also message codes for warnings, indicated by a "W" as the first character). The first decimal value specifies a certain class of error, such as a bus failure, or a communications link failure. The second decimal value is the type of entity to which the error refers, such as the GSC bus, or the CEC/IMC Manager. The short description following the message code reflects this format.

- All current possible errors are listed in the screen's help file, indexed by the message code number. The help file is invoked by pressing function key **F1**. In most instances, though, the short description given will provide enough information to indicate the reason for the error.

- The last field, the data field, may or may not contain relevant information. See the description for the particular message code in the help file for further details.

```
 EGE Switch Monitor Module   V4.03          Friday  October 29, 1994  5:03 pm

 Log Range:                    LOGGED WARNINGS - ALL NODES     Total: 2681
10/01/93  12:00:00 am                                        <Page 1 of 383
01/01/94  12:00:00 am

  Date      Time   GSCID Type Assn  Msg Code  Description                Data
-------- -------- ----- ---- ----  --------  ------------------------- ----
10/18/93 11:37:15  51h   MIM   10   W09-113  Call Routing-Contention
                 Msg Grp 28 Msg Sub Grp  1 U 16383 To G  2047
10/18/93 11:37:17  5Fh   CIM    6   W01-048  Undefined-Callee Type      0000h
                 filename = c_find     linenum = 96
10/18/93 11:37:17  67h   CIM    4   W01-048  Undefined-Callee Type      0000h
                 filename = c_find     linenum = 96
10/18/93 11:37:17  7Ch   CIM    7   W01-048  Undefined-Callee Type      0000h
                 filename = c_find     linenum = 96
10/18/93 11:37:17  B3h   CIM    1   W01-048  Undefined-Callee Type      0000h
                 filename = c_find     linenum = 96
10/18/93 11:37:54  1Bh   MIM   11   W09-113  Call Routing-Contention
                 Msg Grp 21 Msg Sub Grp  1 U 10099 To G  2047
10/18/93 11:37:54  7Ch   CIM    7   W01-048  Undefined-Callee Type      0000h
                 filename = c_find     linenum = 96
<Escape> Exit, <PgUp>, <PgDn>, <F3> New Range, <F5> Print to File, <F7> Print
```

Figure 3.5-13 Report Display Screen for Logged Warnings Report

Figure 3.5-13 shows an example of the warning report screen. Each entry in the report consists of two lines of information detailing the time and source of the warning, the related message code number, a short description, a data value, and the source filename and line number from where the warning was issued:

- The date and time indicates when the warning was received by the CEC/IMC Manager and is the same as the time of occurrence. Unlike errors, warning messages are not acknowledged by the CEC/IMC Manager. If the warning message does not reach the CEC/IMC Manager, it is not retransmitted.

- The GSC address (GSCID), device type (Type), and device assignment (Assn) columns provide the user with an exact location of the source of the warning. Unlike errors, there are no global system warnings.

- The message code number is used as a reference to obtain further information on the warning being reported. It consists of a single character followed by 2 decimal values separated by a "-". The character "W" refers to a warning message code. The first decimal value specifies a certain class of warning,

such as an out-of-range value, or unsupported message group value. The second decimal value is the type of entity to which the warning refers, such as an audio channel, or a message group. The short description following the message code reflects this format.

- All current possible warnings are listed in the screen's help file, indexed by the message code number. The help file is invoked by pressing function key **F1**. In most instances, though, the short description given will provide enough information to indicate the reason for the warning.

- The data field usually contains the value that caused the warning to be issued. See the description for the particular message code in the help file for further details.

- The second line of the entry displays the source code filename and line number where the warning was generated. This is used mainly for debugging potential code data flow problems.

3.5.5.2. Statistics

The sub-menu displayed when the statistics option is chosen from the diagnostics menu is displayed in Figure 3.5-14. There are four (4) types of statistics available for viewing: HDLC channel A, HDLC channel B, GSC node, and NIM. A request is sent to the device at the current GSC node address to begin updating the statistics screen with the appropriate data as soon as the menu option is chosen. If the cursor was positioned on a NIM (Network Interface Module) when the diagnostics sub-menu was opened, the fourth option – "NIM" will be displayed on the statistics display options menu. This screen will display channel usage statistics for the NIM, and is only available on systems that use a NIM.

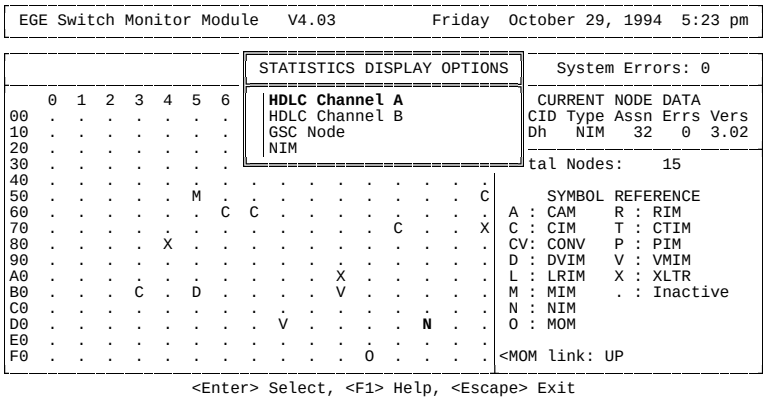

Figure 3.5-14 Statistics Diagnostics Sub-Menu

All statistics screens have the top area of the screen in common, as shown in 3.5-14. The "Last Cleared" box in the top left corner of the screen contains the time when the device's statistics variables were reset to zero. These variables are cleared upon device reset or when commanded by the user by pressing function key **F7** from this screen. The box in the top right corner of the screen displays the source device of the data, and a status line, which communicates any information of interest to the user.

Data updates are sent from the device every two (2) seconds once the initial request has been issued. The status line will display the time the last update was received.

3.5.5.2.1. HDLC Statistics

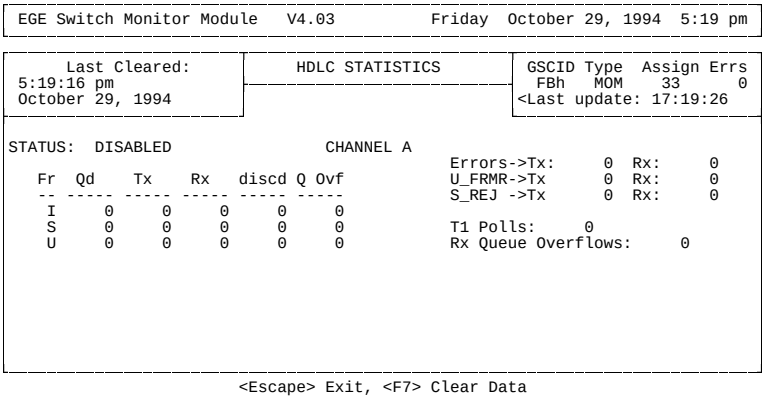

Figure 3.5-15 HDLC Channel A Statistics Screen

The HDLC statistics screen displays data in real-time about either HDLC channel A, which is the high-speed synchronous communications link from the CEC/IMC to an external device such as a CAL computer, or HDLC channel B, which is used for communications between Controller Board and Audio Boards. See Figures 3.5-15 and 3.5-16. The following text describes the fields.

STATUS – This indicates whether the current channel is enabled or disabled. If disabled, no communications are possible on the channel.

Fr – describes HDLC protocol frame type, either I, S, or U

Qd – count of I, S, or U frames placed in the respective transmit queue

Tx – count of I, S, or U frames copied from the respective transmit queue to the HSCX chip transmit FIFO

Rx – count of valid I, S, or U frames received, where a valid frame is defined as one in which the HSCX chip receive status (RSTA) register contains the following bit values:

VFR = 1 (valid frame received)
CRC = 1 (CRC check OK)
RAB = 0 (received frame was not aborted from transmitting station)

discd – count of received I, S, or U frames discarded due to the following:

I-frames – N(R) or N(S) error, address byte indicated a response (I-frames are always commands), or station in a state that doesn't accept I-frames.

S-frames – N(R) error, unrecognized command/response, or station in a state that doesn't accept S-frames.

U-frames – unrecognized command/response, address byte indicated a command for a response, or vice-versa.

Q Ovf – count of I, S, or U frames lost due to transmit queue full condition.

Tx errors – count of all frame types that had to be retransmitted due to an XMR (Transmit Message Repeat) interrupt from the HSCX chip

Rx errors – count of invalid frames received, where an invalid frame is defined as one in which the HSCX chip receive status (RSTA) register contains one or more of the following bit values:

VFR = 0 (invalid frame received)

CRC = 0 (CRC check failed)

RAB = 1 (received frame was aborted from transmitting station)

U_FRMR Tx/Rx – count of U-frame FRMR (frame reject) responses transmitted and received

S_REJ Tx/Rx – count of S-frame REJ commands/responses transmitted and received

T1 Polls – count of polls issued to the remote station due to its failure to acknowledge an I-frame, U-frame command, or polled S-frame command within a given time limit. For channel B, this count also includes the number of polls issued to all remote stations when no messages have been transferred over the link after a given time interval.

Rx Queue Overflows – count of received frames lost due to a full receive queue condition.

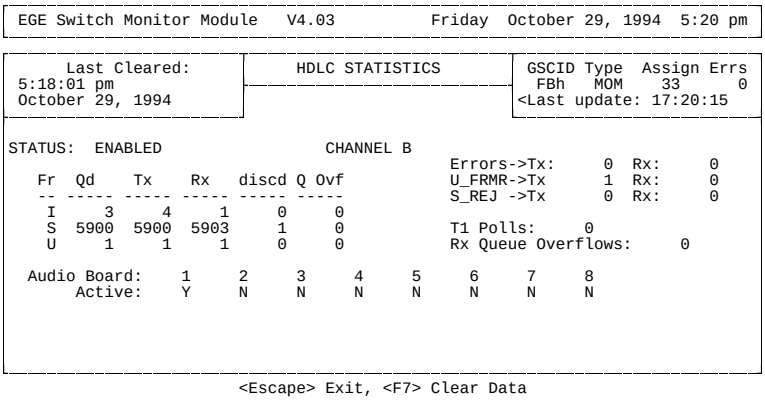

Figure 3.5-16 HDLC Channel B Statistics Screen

In addition to the fields described above, the channel B HDLC statistics screen also contains information on up to eight (8) Audio Boards that may be assigned to the current Controller Board. These fields display "Y" to indicate an active Audio Board (a response is being received via the HDLC link), or "N" to indicate an inactive Audio Board (no response is being received via the HDLC link).

3.5.5.2.2. GSC Node Statistics

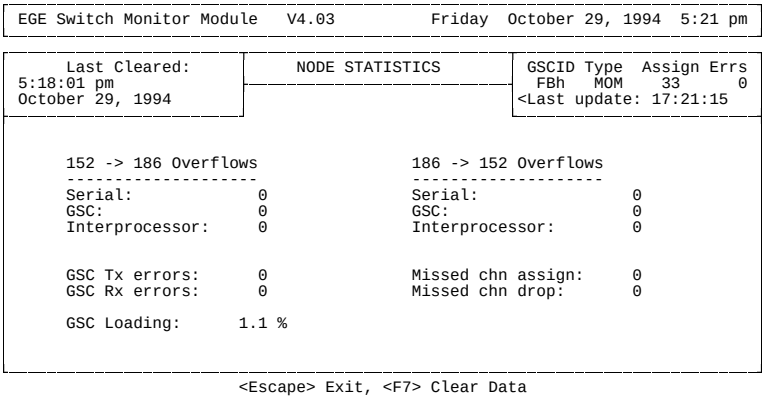

Figure 3.5-17 GSC Node Statistics Screen

The GSC node statistics screen displays various interface module specific data as shown in Figure 3.5-17. Field descriptions are:

- Dual Port Buffer Overflows – number of times dual port buffer is full when attempt is made to place message in buffer. Statistics are shown for overflows for the following messages:

  152 ⇒ 186:

  Serial – data received from 80C152 serial port for 80C186 processing.

  GSC – data received from 80C152 GSC for 80C186 processing.

  Interprocessor – internal 80C152 message for 80C186 processing.

  186 ⇒ 152:

  Serial – data the 80C186 wishes to transmit out the 80C152 serial port.

  GSC – data the 80C186 wishes to transmit onto the 80C152 GSC

  Interprocessor – internal 80C186 message for 80C152 processing.

- Missed channel assignments (MIM-type devices only) – count of channel assignments received by MIM/VMIM/etc. on a channel the MIM/VMIM/etc. currently has marked as active.

- Missed channel drops (MIM-type devices only) – count of channel drops received by the MIM/VMIM/etc. on a channel on which the MIM/VMIM/etc. has no activity.

- GSC transmit errors – count of transmit error interrupts received on the 80C152.

- GSC receive errors – count of receive error interrupts received on the 80C152.

- GSC loading – measurement of loading for the effective bandwidth. Where a 27% loading on the total GSC bandwidth is the maximum, due to excessive collisions, this will be displayed as 100% loading of effective bandwidth.

3.5.5.2.3. NIM Statistics

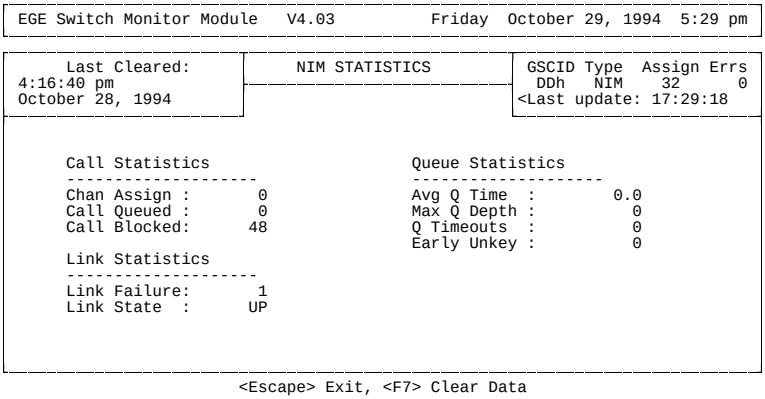

Figure 3.5-18 NIM Statistics

The NIM statistic screen displays the following NIM data. The data is updated continuously (about once per second) while the screen is displayed. The data can be reset with the **F7** key. All counts are since the last reset.

- Chan Assign – Calls routed over NIM interface.
- Call Queued – Call attempts queued due to no channel available.
- Call Blocked – Call attempts blocked, no equipped channels or queue full.
- Avg Q Time – Average waiting time of last four queued calls.
- Max Q Depth – Maximum number of simultaneous queued call attempts.
- Early Unkey – Originator unkeyed while call was still queued.
- Link Failure – Number of control link failures.
- Link State – Current control link state ("UP", or "DOWN").

3.5.5.3. Calls Translation

The Calls Translation option is accessible from the Diagnostics Options menu. This option allows user to display the CEC/IMC Manager's datalog information with a filter so only messages related to call traffic are displayed. In addition, the displayed messages are translated from a hexadecimal format to a more readable format. A typical Calls Translation screen is shown in Figure 3.5-19.

Information displayed by this on-line option is identical to the information displayed by the off-line CALLS.EXE program described in Chapter 4 of this manual. See Chapter 4 or the on-line help screens (accessed via function key **F1**) for message group and sub-group definitions.

Enter date and time ranges using the **F3** function key. Since the datalog file may be quite large, it can take several minutes to finish a translation. The Calls Translation information can be sent to a file or to a printer using the **F5** and **F7** function keys respectively.

```
EGE Switch Monitor Module   V4.03          Tuesday  July 12, 1994  10:49 am

 Log Range:                      CALLS TRANSLATION          Total: 11
07/12/94  8:00:00 am                                      <Page 1 of 1
07/12/94  9:32:49 am

   TIME      BUS SLOT CHN   HOST   GRP    SUB_GRP  VAR   CALLEE     CALLER
09:05:39  03h  17h    1     6   CNF ASS     GCV    80h  GRP 1999  IND 806
09:05:39  03h  0Fh   29    33   CHN UKY      -     01h  GRP 1999  CNV 33
09:05:40  03h  01h    1     6   CHN UKY      -     00h  GRP 1999  CNV 1
09:05:43  03h  01h    1     6   CHN DRP    DROP    00h  GRP 1999  CNV 1
09:05:43  03h  17h    1     6   CHN DRP    DROP    80h  GRP 1999  IND 806
09:05:44  03h  17h    1     6   CNF ASS     GCV    80h  GRP 1999  IND 806
09:05:45  03h  0Fh   29    30   CHN DRP    DROP    00h  GRP 1999  CNV 33
09:05:45  03h  17h    1     6   CHN DRP    DROP    80h  GRP 1999  IND 806
09:05:46  03h  17h    1     6   CNF ASS     GCV    80h  GRP 1999  IND 806
09:05:47  03h  17h    1     6   CHN DRP    DROP    80h  GRP 1999  IND 806
09:05:47  03h  17h    1     6   CNF ASS     GCV    80h  GRP 1999  IND 806


<Escape> Exit, <PgUp>, <PgDn>, <F3> New Range, <F5> Print to File, <F7> Print
```

Figure 3.5-19 Calls Translation Screen

3.5.5.4. GSC Monitor Data

This option is also accessible from the Diagnostics Options menu. It allows user to view the CEC/IMC Manager's datalog information in a raw hexadecimal format. A typical GSC Monitor Data screen is shown in Figure 3.5-20. Once displayed, this information can also be sent to a

file or printed. This on-line option is similar to the off-line GSCMOM.EXE program described in Chapter 4 of this manual.

Enter date and time ranges using the **F3** function key. The Calls Translation information can be sent to a file or to a printer using the **F5** and **F7** function keys respectively.

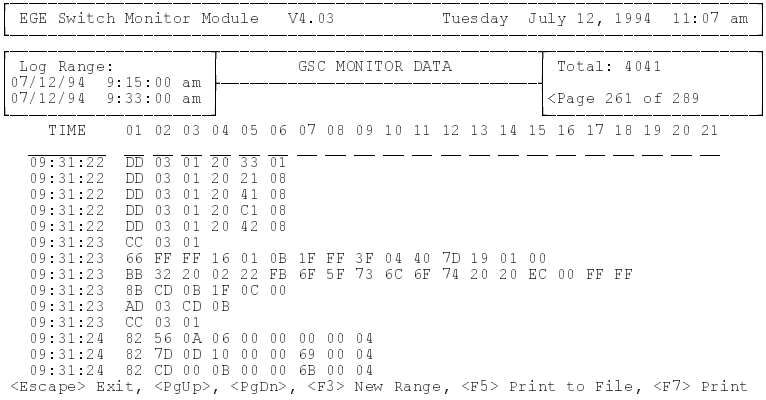

Figure 3.5-20 GSC Monitor Data Screen

3.5.5.5. GSC Translation

This option, also accessible from the Diagnostics Options menu, is similar to the previous option (GSC Monitor Data) except there is an attempt to translate the messages into a more readable format. This is similar to the Call Translation option, except no messages are filtered out. Messages that cannot be translated are left in the raw hex form. A typical screen is shown in Figure 3.5-21. Note the header for this option is identical to the Call Translation header since many messages fall into the same format.

GSC Translation should be used when it is desired to view switch/site status while tracing a problem call if the approximate time is known – for example: Failsoft state at time of call. This is recommended since even a very low traffic CEC/IMC will generate more than 3000 messages in a 15-minute period under these conditions.

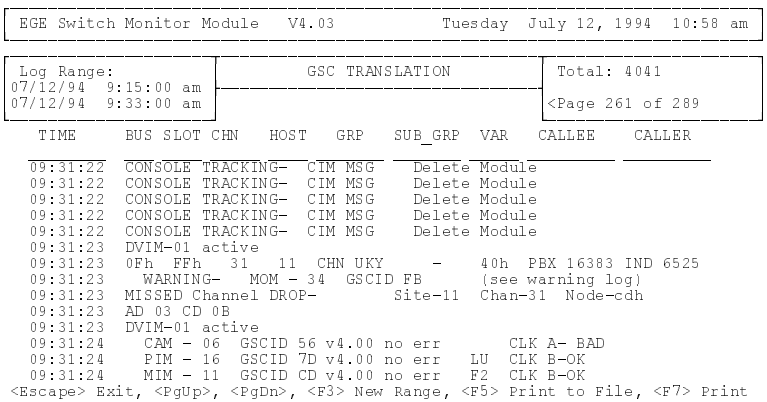

Figure 3.5-21 GSC Translation Screen

3.5.6. Board Identification Window

The hot key "**I**" may be pressed at any time from the System Display Screen. Pressing "**I**" while the cursor is on an active interface module (node) will invoke one of the Board Identification Windows shown in Figures 3.5-22 thru 25.

The cursor keys can be used to maneuver the cursor within the Board Identification Window. To select a board, move the cursor under its corresponding prompt and press "**Y**". For example, pressing "**Y**" under Audio Board 1 will select the first Audio Board.

All selected boards' ID LED will begin to flash immediately upon pressing **<Enter>**. Any board that was unselected will be sent a message clearing its ID LED. Thus if the ID LED was previously flashing it will now turn off.

Pressing **<Esc>** will close the Board Identification Window and clear out all ID LED's on boards associated with that interface module (node). In other words, once the window is closed, all ID LED's will be turned off.

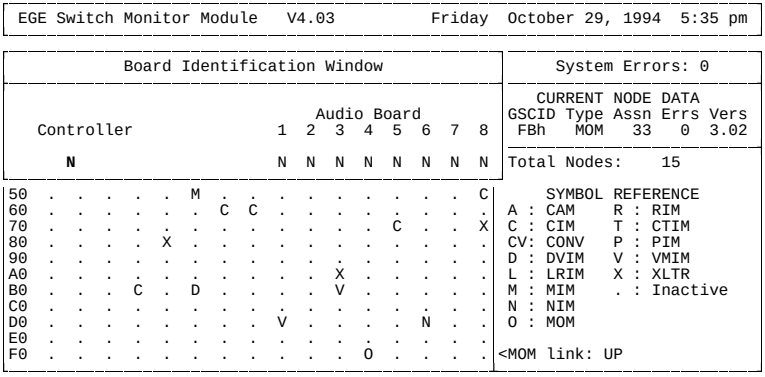

Figure 3.5-22 Board Identification Window for MOM, LRIM, VMIM, CTIM, DVIM, NIM and PIM

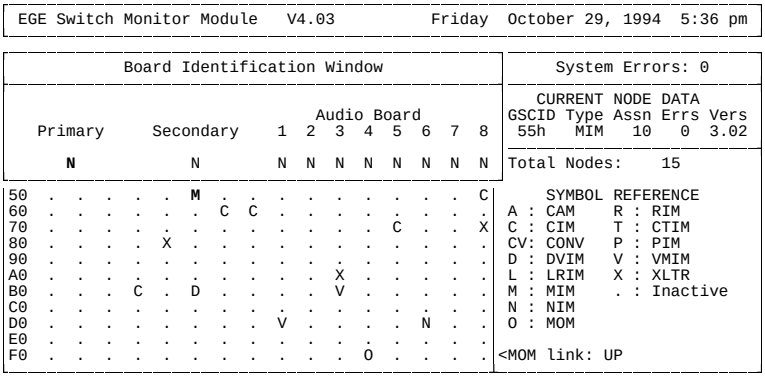

Figure 3.5-23 Board Identification Window for MIM only

```
 EGE Switch Monitor Module   V4.03          Friday  October 29, 1994  5:37 pm

 Board Identification Window  |YSTEM DISPLAY            System Errors: 0
                              |9  A  B  C  D  E  F|    CURRENT NODE DATA
                              |.  .  .  .  .  .  .| GSCID Type Assn Errs Vers
        Controller            |.  .  M  .  .  .  .|  84h  XLTR    1    0  2.13
                              |.  .  .  .  .  .  .|
            N                 |.  .  .  .  .  .  .| Total Nodes:    15
                              |.  .  .  .  .  .  .|
50  .  .  .  .  .  M  .  .  .  .  .  .  .  .  .  C|     SYMBOL REFERENCE
60  .  .  .  .  .  .  C  C  .  .  .  .  .  .  .  .| A : CAM     R : RIM
70  .  .  .  .  .  .  .  .  .  .  .  .  C  .  .  X| C : CIM     T : CTIM
80  .  .  .  .  X  .  .  .  .  .  .  .  .  .  .  .| CV: CONV    P : PIM
90  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .| D : DVIM    V : VMIM
A0  .  .  .  .  .  .  .  .  .  .  X  .  .  .  .  .| L : LRIM    X : XLTR
B0  .  .  .  C  .  D  .  .  .  .  V  .  .  .  .  .| M : MIM     . : Inactive
C0  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .| N : NIM
D0  .  .  .  .  .  .  .  .  V  .  .  .  .  N  .  .| O : MOM
E0  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .|
F0  .  .  .  .  .  .  .  .  .  .  .  O  .  .  .  .|<MOM link: UP
                  <F1> Help, <Escape> Exit, <Enter> Send Request
```

Figure 3.5-24 Board Identification Window for RIM, CAM or XLTR

```
 EGE Switch Monitor Module   V4.03          Friday  October 29, 1994  5:45 pm

                Board Identification Window          |     System Errors: 0
                                                     |    CURRENT NODE DATA
                                  Audio Board        | GSCID Type Assn Errs Vers
   Controller  Translator   1  2  3  4  5  6  7  8   |  66h   CIM    3    0  3.02

       N            N       N  N  N  N  N  N  N  N   | Total Nodes:    15

50  .  .  .  .  .  M  .  .  .  .  .  .  .  .  .  C|     SYMBOL REFERENCE
60  .  .  .  .  .  .  C  C  .  .  .  .  .  .  .  .| A : CAM     R : RIM
70  .  .  .  .  .  .  .  .  .  .  .  .  C  .  .  X| C : CIM     T : CTIM
80  .  .  .  .  X  .  .  .  .  .  .  .  .  .  .  .| CV: CONV    P : PIM
90  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .| D : DVIM    V : VMIM
A0  .  .  .  .  .  .  .  .  .  .  X  .  .  .  .  .| L : LRIM    X : XLTR
B0  .  .  .  C  .  D  .  .  .  .  V  .  .  .  .  .| M : MIM     . : Inactive
C0  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .| N : NIM
D0  .  .  .  .  .  .  .  .  V  .  .  .  .  N  .  .| O : MOM
E0  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .|
F0  .  .  .  .  .  .  .  .  .  .  .  O  .  .  .  .|<MOM link: UP
                  <F1> Help, <Escape> Exit, <Enter> Send Request
```

Figure 3.5-25 Board Identification Window for CIM only

3.6. USER ACCOUNT MAINTENANCE

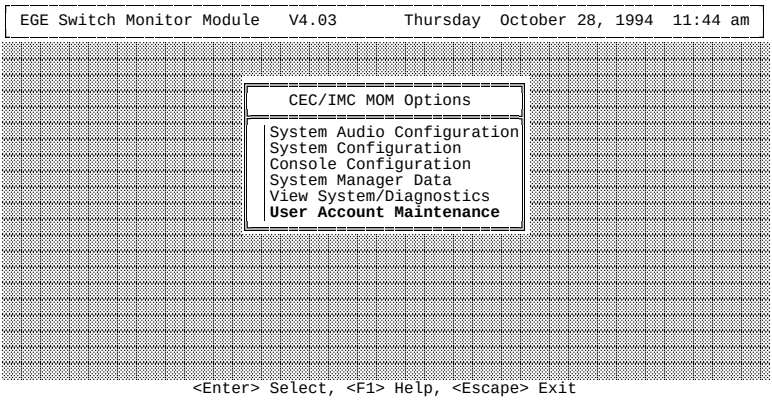

Figure 3.6-1 CEC/IMC Manager Main Menu

The user account maintenance function allows the CEC/IMC Manager to be configured for up to twelve (12) different user accounts with four (4) different access levels. The access levels are "System Administrator", "Console Administrator", "General Maintenance", and "User". Refer to Figure 3.6-3 for a description of the functional access levels.

An access denied message is displayed whenever a menu option is chosen for which the currently logged in user doesn't have the required functional access level. The CEC/IMC Manager installation diskette comes with a PASSWORD.DAT file which has a default user name "MOMUSER" and a default password "GUEST". It is recommended that you delete the default user name and create some of your own. The default PASSWORD.DAT file (on the delivered installation diskette) should be safeguarded by the system administrator. It may be used as a back up in the event that passwords are forgotten or if the installed PASSWORD.DAT file is deleted.

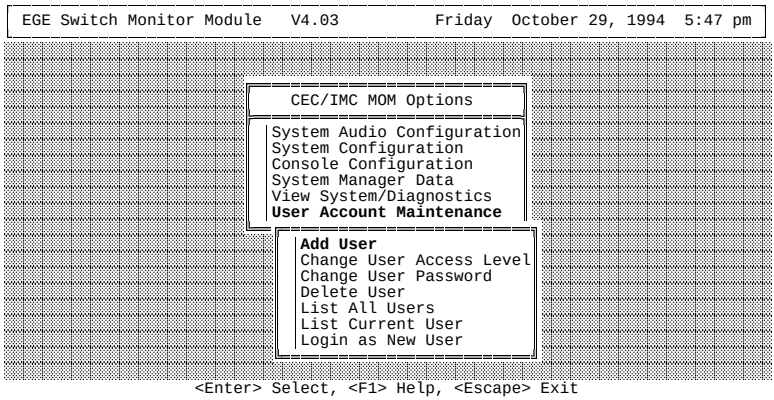

Figure 3.6-2 User Account Maintenance Menu

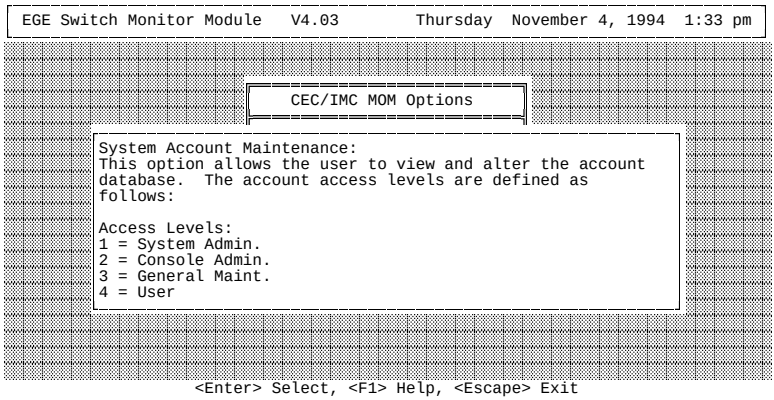

Figure 3.6-3 User Account Maintenance Help Screen (partial)

3.6.1. Add User

This option is used to add a new user account. You will be prompted for a user name, password, and a user access level. Refer to Figure 3.6-3 for functional access level descriptions. This system supports up to twelve (12) user accounts. Only users with system administrator access levels (access level = 1) may access this function.

3.6.2. Change User Access Level

This option is used to change the access level of a given user account. You will be prompted for a user name and a new user access level. Only users with system administrator access levels (access level = 1) may access this function.

3.6.3. Change User Password

Use this option to change the password of an existing account. If you are currently logged in as a user with a system administrator access level, you will be prompted for a user name and a new password. Users that do not have a system administrator access level can only change their own password and will not be prompted for a user name.

3.6.4. Delete User

System administrators can use this option to delete user accounts.

3.6.5. List All Users

System administrators can use this option to list all of the user account names and their access levels. See Figure 3.6-4 for an example listing. Also see the User Account Maintenance Help screen for descriptions of the functional access levels.

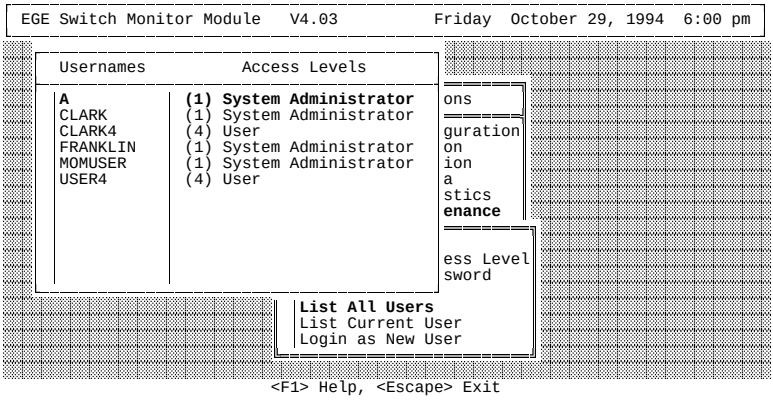

Figure 3.6-4 List All Users

3.6.6. List Current User

Use this option to see the user name and access level of the currently logged in user. See the example in Figure 3.6-5.

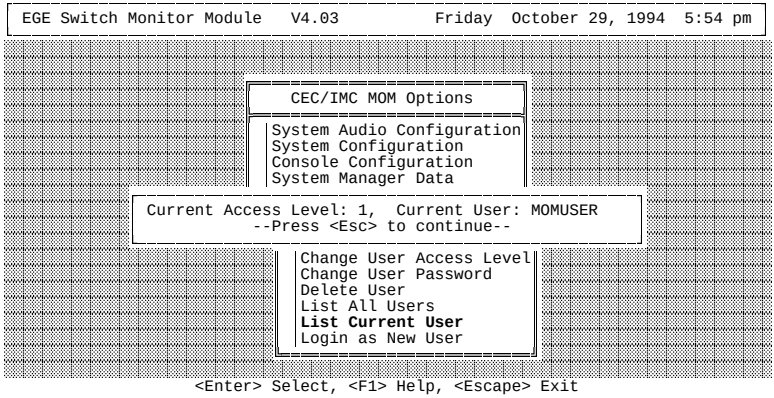

Figure 3.6-5 List Current User

3.6.7. Login As New User

You may log in under a different user name at any time without exiting the CEC/IMC Manager program provided you know the password.

3.7. EXIT CEC/IMC MANAGER

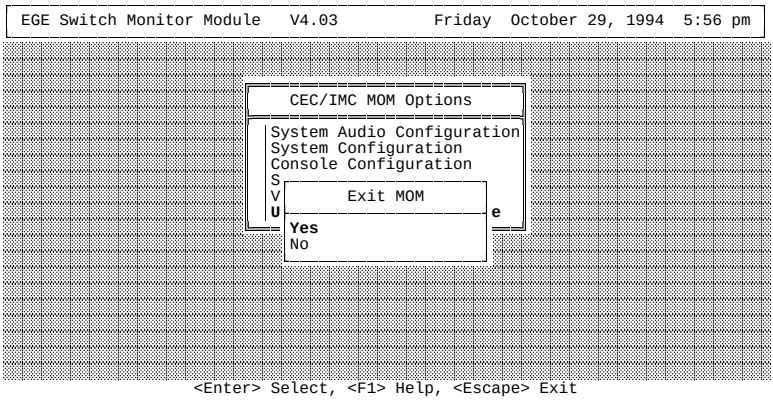

Figure 3.7-1 Exit CEC/IMC Manager Screen

To exit the CEC/IMC Manager software, the user must press the **<Esc>** (Escape) key from the MOM Options window. The above sub-menu will appear prompting the user for verification of exit. To exit select "Yes", if not select "No". Selecting "No" will return to the MOM Options window. Selecting "Yes" will exit the program. This exit may take some time. If data logging is enabled, the software will write the last bit of data to the data log buffer on the hard disk.

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CHAPTER 4
OFF-LINE DIAGNOSTICS

4.0. CEC/IMC MANAGER OFF-LINE FUNCTIONS

The CEC/IMC Manager (MOM PC) has two off-line functions used to extract data from the data log buffer stored on the hard disk.

CALLS.EXE	Used to extract all calls made within the CEC/IMC
GSCMON.EXE	Used to extract all messages from the log

IMPORTANT NOTE

It is recommended that the data log files be backed up to a floppy weekly and removed from the hard disk. This eliminates the hard disk from filling up and disabling data logging.

4.0.1. CALLS.EXE

The **CALLS** function is used to extract channel assignment / drop messages from the data log buffer. It can be a vital tool in tracing calls through the system.

The user may obtain help for the **CALLS** function by using the "**/h**" option on the command line. For example:

calls /h

The following help message will be dumped:

calls - extract channel assignment/drop data from data log buffer
Syntax: calls [<options>]

Options:

/bhh:mm:ss	start time of data extraction
/ehh:mm:ss	stop time of data extraction
/dmm-dd-yy	date of data log file
/s	soft copy output requested
/h	display help file then exit

The output from the **CALLS** function displays the **time** of the assignment / drop, accurate to 480 msec, the TDM **bus** and **slot** the call is / was on, the **channel** the **host** used to process the call, the host (site or console) the call was made to / from, the **message group** and **sub group** of the type of call, a **call variant** field for console originated CEC/IMC originated / radio originated, and the **CALLEE** and **CALLER** involved in the call.

Valid message groups and sub groups are:

CHN ASS	Channel Assignment
GCV	Clear Voice (CV) Group
EGCV	Emergency CV Group CALL
GVG	Voice Guard (VG) Group
EGVG	Emergency VG Group
ICV2	ICall II CV
IVG2	ICALL II VG
IDA	Data ICall
GDA	Data Group
SGCV	Special Call Group CV
SG I	Special Call Group Interconnect
SGVG	Special Call Group VG
SGVGI	Special Call Group VG Inter
SICV	Special Call Individual CV
SI I	Special Call Indiv Inter
SIVG	Special Call Indiv VG
SIVGI	Special Call Indiv VG Inter
ICV	ICall CV
IVG	ICall VG
ACVMT	System All Call CV, msg trunked
ACVTT	System All Call CV, Tx trunked
ACVMTU	System All Call CV Update, msg trunk
ACVTTU	System All Call CV Update, Tx trunked
AVGMT	System All Call VG, msg trunked
AVGTT	System All Call VG, Tx trunked
AVGMTU	System All Call VG Update, msg trunked
AVGTTU	System All Call VG Update, Tx trunked
CTI	Indiv Inter (CTIS)
CTIVG	Indiv Inter (CTIS) VG
CTG	Group Inter (CTIS)
CGGVG	Group Inter (CTIS) VG
ECTG	Emergency Group Inter (CTIS)

ECTGVG	Emergency Group Inter (CTIS) VG
SCTI	Special Inter (CTIS)
SCTIVG	Special Inter (CTIS) VG
EIDA	Emergency Data ICALL
EGDA	Emergency Data Group
GVC	Voice Guard Clear Voice (VGCV) Group
EGVC	Emergency VGCV Group
IVC2	ICall II VGCV
SGVCI	Special Call Group VGCV
SGVCI	Special Call Group VGCV Inter
SIVC	Special Call Indiv VGCV
SIVCI	Special Call Indiv VGCV Inter
IVC	ICall VGCV
AVCMT	System All Call VGCV, Msg trunked
AVCTT	System All Call VGCV, Tx trunked
AVCMTU	System All Call VGCV Update, Msg trunked
AVCTTU	System All Call VGCV Update, Tx trunked
CTIVC	Indiv Inter (CTIS) VGCV
CTGVC	Group Inter (CTIS) VGCV
ECTGVC	Emergency Group Inter (CTIS) VGCV
SCTIVC	Special Inter (CTIS) VGCV

SEC ACK Secondary Acknowledgment
– Used to indicate secondary sites involved

CHN UKY Channel Unkey
– No valid sub group

CHN DRP Channel Drop

DROP Channel Drop

A sample output of the **CALLS** function using the following command line will look like:

calls /d09-12-91 /b14:00:00 /e15:00:00 /s

TIME	BUS	SLOT	CHN	HOST	MSG GROUP	MSG SUB GROUP	CALL VAR	CALLEE	CALLER
14:12:01.44	0	3	1	1	CHN ASS	GCV	80	CNV 1	IND 45
14:12:01.44	0	3	1	1	CHN DRP	DROP	80	CNV 1	IND 45
14:12:01.44	0	3	1	1	CHN ASS	GCV	80	CNV 1	IND 45
14:12:01.44	0	3	1	1	CHN DRP	DROP	80	CNV 1	IND 45
14:20:17.76	3	1	4	10	CHN ASS	GCV	0	GRP 273	IND 1955
14:20:19.68	3	1	4	10	CHN DRP	DROP	0	GRP 273	IND 1955
14:20:20.16	0	1	1	10	CHN ASS	GCV	0	GRP 273	IND 1955
14:20:23.04	0	1	1	10	CHN DRP	DROP	0	GRP 273	IND 1955
14:20:23.04	2	1	3	10	CHN ASS	GCV	0	GRP 273	IND 1955
14:20:24.48	2	1	3	10	CHN DRP	DROP	0	GRP 273	IND 1955
14:20:24.48	3	1	4	10	CHN ASS	GCV	0	GRP 273	IND 1955
14:20:27.84	3	1	4	10	CHN DRP	DROP	0	GRP 273	IND 1955
14:20:28.32	0	1	1	10	CHN ASS	GCV	0	GRP 273	IND 1955
14:20:34.08	0	1	1	10	CHN DRP	DROP	0	GRP 273	IND 1955
14:20:34.56	2	1	3	10	CHN ASS	GCV	0	GRP 273	IND 1955
14:20:35.52	2	1	3	10	CHN DRP	DROP	0	GRP 273	IND 1955
14:36:48.48	1	8	3	1	CHN ASS	GCV	80	GRP 273	IND 45
14:36:48.48	1	8	3	1	CHN DRP	DROP	80	GRP 273	IND 45
14:36:48.96	1	8	4	1	CHN ASS	GCV	80	GRP 273	IND 45
14:36:48.96	1	8	4	1	CHN DRP	DROP	80	GRP 273	IND 45
14:36:48.96	1	8	1	1	CHN ASS	GCV	80	GRP 273	IND 45
14:36:48.96	1	8	1	1	CHN DRP	DROP	80	GRP 273	IND 45
14:36:48.96	1	8	3	1	CHN ASS	GCV	80	GRP 273	IND 45
14:36:49.44	1	8	3	1	CHN DRP	DROP	80	GRP 273	IND 45
14:36:49.44	1	8	4	1	CHN ASS	GCV	80	GRP 273	IND 45
14:36:49.44	1	8	4	1	CHN DRP	DROP	80	GRP 273	IND 45
14:36:55.68	1	8	1	1	CHN ASS	GCV	80	GRP 2047	IND 45
14:36:56.16	1	8	1	1	CHN DRP	DROP	80	GRP 2047	IND 45
14:36:56.16	1	8	3	1	CHN ASS	GCV	80	GRP 2047	IND 45
14:36:56.16	1	8	3	1	CHN DRP	DROP	80	GRP 2047	IND 45
14:36:56.16	1	8	4	1	CHN ASS	GCV	80	GRP 2047	IND 45
14:36:56.64	1	8	4	1	CHN DRP	DROP	80	GRP 2047	IND 45
14:36:56.64	1	8	1	1	CHN ASS	GCV	80	GRP 2047	IND 45
14:36:56.64	1	8	1	1	CHN DRP	DROP	80	GRP 2047	IND 45
14:37:02.40	2	1	3	10	CHN ASS	GCV	0	GRP 2047	IND 16383
14:37:02.40	2	1	3	10	CHN DRP	DROP	0	GRP 2047	IND 16383
14:38:08.64	3	1	4	10	CHN ASS	GCV	0	GRP 2047	IND 16383
14:38:08.64	3	1	4	10	CHN DRP	DROP	0	GRP 2047	IND 16383
14:41:49.92	1	8	1	1	CHN ASS	EGCV	82	GRP 273	IND 45
14:41:49.92	1	8	1	1	CHN UKY	-	80	GRP 273	IND 45

4.0.2. GSCMON.EXE

The **GSCMON** function is used to extract all messages from the data log buffer. It can be a vital tool in tracing calls through the system.

The user may obtain help for the **GSCMON** function by using the "**/h**" option on the command line. For example:

gscmon /h

The following help message will be dumped:

GSC Monitor - extract all GSC activity
Syntax: gscmon [<options>]
Options:

/bhh:mm:ss	start time of data extraction
/ehh:mm:ss	stop time of data extraction
/dmm-dd-yy	date of data log file
/s	soft copy output requested
/n	suppress node active messages
/h	display help file then exit

The output from the **GSCMON** function displays the **time** of the message and the message contents. The interface module (node) ids seen at the hardware GSC monitor are not output. The expected input filename is **mm_dd_yy.dlg**. The output filename is **mm_dd_yy.mon**.

gscmon /d12-30-92 /b09:10:00 /e09:10:08

TIME	DATA
09:10:00.00	82 2C 01 0E 00 00 40 09
09:10:00.00	82 12 01 07 00 00 40 09
09:10:00.00	82 1F 04 01 00 00 50 09
09:10:00.00	82 0B 01 06 00 00 60 09
09:10:00.00	82 14 01 0C 00 00 40 09
09:10:01.44	66 01 02 17 01 01 0E 31 03 02 00 3A 06 01 00
09:10:01.92	82 50 01 01 00 00 40 09
09:10:01.92	82 1F 04 01 00 00 50 09
09:10:01.92	82 47 05 02 00 00 69 09
09:10:01.92	82 6D 01 09 00 00 40 09
09:10:01.92	82 3B 00 01 00 00 49 09
09:10:01.92	82 57 01 0B 00 00 40 09
09:10:03.36	66 05 00 15 01 01 02 31 03 02 00 1E 06 01 00
09:10:03.84	82 1F 04 01 00 00 50 09
09:10:03.84	82 7D 01 02 00 00 40 09
09:10:03.84	82 7A 01 05 00 00 40 09
09:10:03.84	82 91 01 0D 00 00 40 09
09:10:03.84	82 89 01 08 00 00 40 09
09:10:03.84	82 A5 01 04 00 00 40 09
09:10:04.80	66 05 00 17 01 01 02 31 03 02 00 1E 06 01 00
09:10:05.76	82 DF 01 03 00 00 40 09
09:10:05.76	82 BB 01 0A 00 00 40 09
09:10:05.76	82 1F 04 01 00 00 50 09
09:10:07.20	10 02 FB 00 04 00 00 09
09:10:07.68	82 2C 01 0E 00 00 40 09
09:10:07.68	82 14 01 0C 00 00 40 09
09:10:07.68	82 1F 04 01 00 00 50 09
09:10:07.68	82 0B 01 06 00 00 60 09
09:10:07.68	82 12 01 07 00 00 40 09

gscmon /d12-30-92 /b09:10:00 /e09:11:00 /n

TIME	DATA
09:10:01.44	66 01 02 17 01 01 0E 31 03 02 00 3A 06 01 00
09:10:03.36	66 05 00 15 01 01 02 31 03 02 00 1E 06 01 00
09:10:04.80	66 05 00 17 01 01 02 31 03 02 00 1E 06 01 00
09:10:07.20	10 02 FB 00 04 00 00 09
09:10:08.64	66 06 00 15 01 01 03 31 03 02 00 1E 06 01 00
09:10:11.04	66 06 00 17 01 01 03 31 03 02 00 1E 06 01 00
09:10:11.04	66 07 00 15 01 01 04 31 03 02 00 3A 06 01 00
09:10:14.40	66 07 02 15 01 02 06 A4 07 02 00 06 00 03 00
09:10:15.36	66 07 02 17 01 02 06 A4 07 02 00 06 00 03 00
09:10:23.52	10 02 FB 00 04 00 00 09
09:10:32.16	66 07 00 17 01 01 04 31 03 02 00 3A 06 01 00
09:10:32.64	66 01 01 15 01 01 06 31 03 02 00 1E 06 01 00
09:10:35.04	66 01 01 17 01 01 06 31 03 02 00 1E 06 01 00
09:10:39.84	10 02 FB 00 04 00 00 09
09:10:53.76	66 01 03 15 01 02 08 08 00 03 00 08 00 03 00
09:10:55.20	66 07 02 15 01 02 06 A4 07 02 00 06 00 03 00
09:10:55.68	66 07 02 17 01 02 06 A4 07 02 00 06 00 03 00
09:10:55.68	66 07 02 15 01 02 06 A4 07 02 00 06 00 03 00
09:10:55.68	10 02 FB 00 04 00 00 09
09:10:56.16	66 01 03 17 01 02 08 08 00 03 00 08 00 03 00
09:10:56.64	66 07 02 17 01 02 06 A4 07 02 00 06 00 03 00
09:10:58.08	66 07 02 15 01 02 06 A4 07 02 00 06 00 03 00
09:10:58.56	66 05 01 15 01 01 0A 31 03 02 00 3A 06 01 00
09:10:59.04	66 07 02 17 01 02 06 A4 07 02 00 06 00 03 00

CHAPTER 5
NETCLOCK/2™ INTERFACE OPTION

5.0. OVERVIEW

A Coordinated Universal Time (UTC) standard option is available that allows the CEC/IMC to be synchronized to WWVB located in Fort Collins, Colorado. WWVB operates on a frequency of 60 kHz. This option uses Spectracom® Corporation's NETCLOCK/2™ WWVB receiver which interfaces to the CEC/IMC via an RS-232 serial port at the CEC/IMC Manager (usually COM2). With this option installed, the CIMs and consoles are synchronized to the UTC signals broadcast by WWVB.

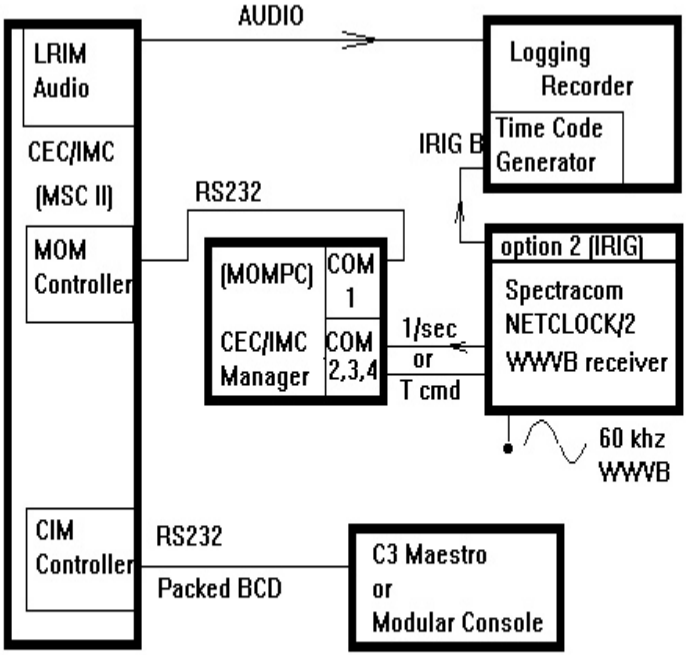

Figure 5.0-1 NETCLOCK/2 Configuration

Using the RS-232 serial connection, the CEC/IMC Manager (MOMPC) reads the 26-character ASCII time/date data from the receiver and updates the MOM Controller Board. The MOM then provides synchronized time and date messages to the CIMs and consoles.

NOTE

NETCLOCK/2 functions are integrated into CEC/IMC Manager (MOM PC) software program V4.0. The option was a Terminate Stay Resident (TSR) program in software versions prior to V3.0 (V2.12 and earlier).

5.1. NETCLOCK INSTALLATION

The following procedures must be performed in order to implement NETCLOCK/2 time synchronization option:

1. Verfiy a COMM port on the CEC/IMC Manager is available (COM2, COM3 or COM4).
2. Configure the NETCLOCK/2 interface from within the CEC/IMC Manager software per section 3.2.2 of this manual.
3. Install and configure the NETCLOCK/2 in accordance with the manufacture's instructions.
4. Connect the NETCLOCK/2 to the correct CEC/IMC Manager COMM port. It should be connected to the same port that the CEC/IMC Manager configuration specifies. See the cable wiring diagrams that follow.

If a CEC/IMC Manager is being upgraded from software V2.12 (or earlier) to software V4.0, the following additional items must be performed:

1. Remove the C:\NETCLOCK\O_NETCLK.COM statement from the CEC/IMC Manager AUTOEXEC.BAT file. This TSR program is not compatible with CEC/IMC Manager software V4.0.
2. Verify CEC/IMC Manager V4.0 software is installed on the CEC/IMC Manager.

The NETCLOCK/2 has two RS-232 serial ports. One is an output that transmits the 26-character ASCII time/date data once each second in Format 0 or Format 1. This is called the 1/sec interface or the "REMOTE OUTPUT".

The other port responds to commands from the CEC/IMC Manager by transmitting a 26-character ASCII time/date data in Format 0, Format 1, or Format 2. This port transmits the data on the next even second after receiving an ASCII "T" from the CEC/IMC Manager. This is the T-CMD or "SERIAL COMM" port. Refer to section 3.4.2 of the NETCLOCK/2 instruction manual for details on the NETCLOCK/2 data formats.

5.1.1. Hardware Installation Notes

TIME DATA FORMAT – Select the required data format:

- FORMAT 0 – No date setting.
- FORMAT 1 – Date setting available.
- FORMAT 2 – Only available when using the T-CMD interface. Must use the Time Zone Correction setting at the CEC/IMC Manager. No date setting capability.

BAUD Rate Selection – Verify the Baud Rate selection switch on the NETCLOCK/2 matches the Baud Rate set in the CEC/IMC Manager's "Set System Time" screens. When choosing a baud rate, note that higher baud rates will provide less delay errors.

5.1.1.1. T-CMD Interconnections

The T-CMD interface (RS-232) requires a 9-pin male connector at the NETCLOCK/2. The CEC/IMC Manager end may be either 9-pin female or 25-pin female, depending on the specific configuration of the PC. See Figures 5.1-1 and 5.1-2.

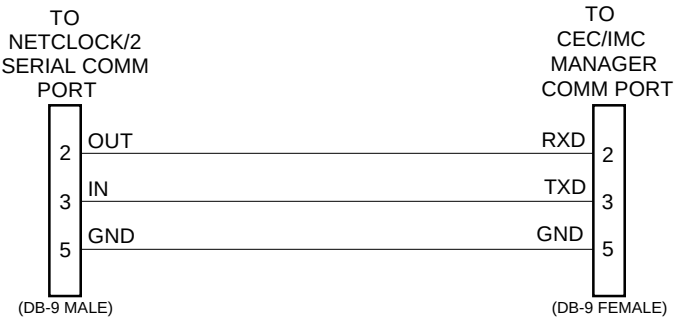

Figure 5.1-1 T-CMD Interconnections (9-Pin CEC/IMC Manager COMM Port – Cable 19B801348P2)

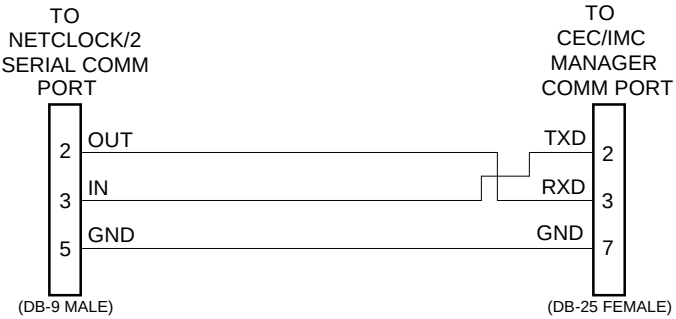

Figure 5.1-2 T-CMD Interconnections (25-Pin CEC/IMC Manager COMM Port)

NOTE

A character consists of 1 start, 8 data, and 2 stop bits.

5.1.1.2. 1/sec (REMOTE OUTPUT) Interconnections

The 1/sec (REMOTE OUTPUT) requires a 9-pin male connector at the NETCLOCK/2. The CEC/IMC Manager end will be either 9-pin female or 25-pin female, depending on the specific configuration of the PC. See Figures 5.1-3 and 5.1-4.

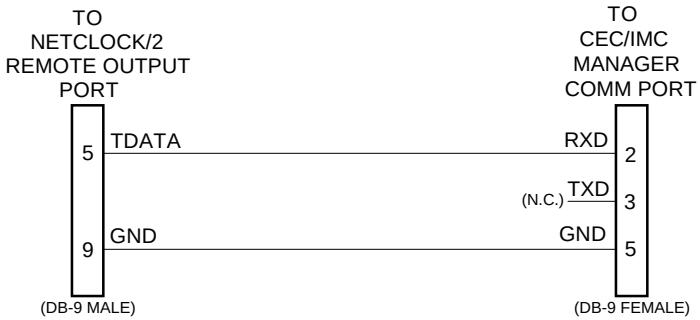

Figure 5.1-3 REMOTE OUTPUT (9-Pin CEC/IMC Manager COMM Port)

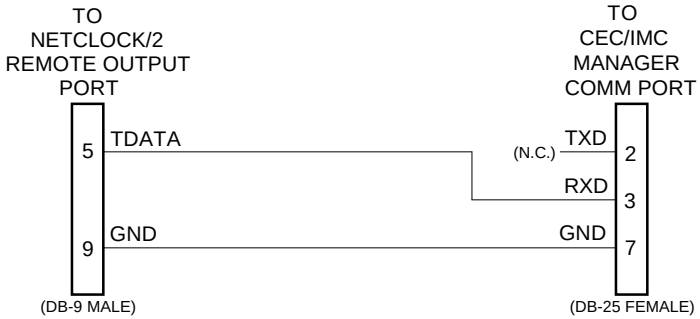

Figure 5.1-4 REMOTE OUTPUT (25-Pin CEC/IMC Manager COMM Port)

NOTE

A character consists of 1 start, 8 data, and 2 stop bits.

5.1.2. Software Installation Notes

The NETCLOCK/2 interface is integrated into CEC/IMC Manager (MOMPC) software V4.0. However, if the software is being upgraded from an earlier version (V2.12 or eariler), the NETCLOCK/2 TSR program used with the earlier software (O_NETCLK.COM) must be removed from the CEC/IMC Manager's AUTOEXEC.BAT file.

O_NETCLK.COM SHOULD NOT BE EXECUTED; this TSR is not compatible with CEC/IMC Manager software V4.0.

5.1.3. Additional Considerations

The following topics in the NETCLOCK/2 Instruction Manual are very important and should be reviewed closely prior to connecting the NETCLOCK/2 to the CEC/IMC Manager.

	Topic	NETCLOCK/2 Instruction Manual
1.	Time Data Format	page 3-15
2.	Propagation Path Delay	page 2-3
3.	Path Delay Switches	page 3-10
4.	Time Zone Switches	page 3-10
5.	Baud Rate Switches	page 3-10
6.	Antenna Installation	page 4-17

5.2. INSTALLATION VERIFICATION

Before connecting the NETCLOCK/2 to the CEC/IMC Manager, the operator should verify the status of the three (3) LED indicators on the front panel. All three should be illuminated green. A red "ANTENNA" LED indicates there has been a loss of antenna continuity. A red "SIGNAL" LED means the received signal is weak and carrier lock is lost. This LED can be expected to flash red occasionally; this is only a problem if it stays red more than seven (7) hours. When time synchronization is lost the "TIME SYNC" LED will light red. Valid time messages will not be sent to the CEC/IMC Manager if the "TIME SYNC" LED is lit. During this condition, the CEC/IMC Manager will ignore the invalid data.

Within thirty (30) minutes of executing O_MOMPC.EXE, the system time should update to match the NETCLOCK/2 time.

Ericsson Inc.
Private Radio Systems
Mountain View Road
Lynchburg, Virginia 24502
1-800-528-7711 (Outside U.S.A., 804-528-7711) Printed in U.S.A.

APPENDIX A
GLOSSARY

Aegis™ — **Aegis™** is Ericsson's digital voice audio system that employs advanced Digital Signal Processing (DSP) circuitry. Aegis has two primary modes – "Aegis digital" and "Aegis private". Aegis digital mode offers improved weak signal performance and impedance to unauthorized monitoring when compared to standard analog voice transmissions. Aegis digital transmissions are not encrypted. Aegis private mode also offers improved weak signal performance. In addition, since Aegis private transmissions are encrypted, Aegis private mode provides very secure communications against unauthorized monitoring.

Audio Board — The **Audio Board** routes audio, mobile data and Aegis data between EDACS radio systems, dispatch consoles, logging recorders, etc. The board digitizes analog signals applied to its audio inputs and applies the digitized signals to the TDM bus. It also performs the reverse process for its audio outputs.

C3 Maestro — The **C3 Maestro** is the CRT-type console that is designed to take advantage of the advanced features of EDACS. It consists of a specialized audio unit and an IBM PC compatible computer running custom software developed by Ericsson.

CAM — **C**entralized **A**ctivity **M**odule – The CAM is a CEC/IMC interface module that provides call activity information to the **C**entralized **A**ctivity **L**ogger (**CAL**) computer. Usage and billing information can be generated with the CAL through the CAM link.

CCI Board — **C**onventional **C**ontrol **I**nterface **Board** – This is a CEC/IMC Controller Board configured for use in the CIA rack. It provides master CI Board control. The control data port that connects the CIA rack to the VMIM is also located on the CCI Board. (Also see **CI Board.**)

CEC — **C**onsole **E**lectronics **C**ontroller – The CEC is an advanced radio communications controller incorporating time division multiplex digital audio switching technology. The CEC connects dispatch consoles to EDACS and CNI systems.

CEC/IMC Manager — The **CEC/IMC Manager** (formerly referred to as the "MOM PC") provides CEC/IMC monitoring and configuration functions. This IBM PC compatible computer running custom software developed by Ericsson is the window into the CEC/IMC for the system administrator and service technicians.

CIA rack — **C**onventional **I**nterface **A**dapter **rack** – The CIA rack allows conventional tone and dc controlled base stations and voting systems to be connected to the CEC/IMC. It is considered a "secondary interface" since it does not have direct TDM and GSC bus connections to the primary CEC/IMC interface modules.

CI Board — **C**onventional **I**nterface **Board** – This board is located in the CIA secondary interface rack. It contains circuitry used to connect conventional tone and dc controlled base stations and voting systems to the CEC/IMC switch.

CIM — **C**onsole **I**nterface **M**odule – The CIM is a CEC/IMC interface module used to connect C3 Maestro (CRT-type) and C3 Modular/Desktop consoles to the CEC/IMC. A CIM consists of a Controller Board and an Audio Board. A C3 Modular/Desktop console also requires a C3 Console Translator interface module. (See **XLTR.)**

CNI — **C**onventional **N**etwork **I**nterface – A conventional base station can be connected to the CEC/IMC via a CNI. The CNI is formed by a GETC shelf located at the conventional station that makes the conventional station appear to a MIM as an EDACS trunked site. In the CNI system, different Channel Guard tones are assigned to different talk groups.

confirmed call — The **confirmed call** function ensures all EDACS radio systems being called have working channels available before the caller is given a channel access (talk permit) tone. This function can be disabled on a per system/group basis.

control data — **Control data** includes any data used by the switch for system control.

Controller Board — The **Controller Board** processes control data, holds databases, and controls the Audio Board(s) within its respective interface module.

CTIM — **C**entralized **T**elephone **I**nterconnect **M**odule – The CTIM is a CEC/IMC interface module used to connect **C**entralized **T**elephone **I**nterconnect **S**ystem (**CTIS**) equipment to the CEC/IMC so radio users and dispatchers can access land-line telephone systems.

cursor keys — The **cursor keys**, normally on the right hand side of the keyboard, are marked with arrows (←, ↑, ↓, →). They are used to control the direction of the cursor during field and character selections.

default value — The software provides predetermined or **default values** in a majority of the data entry fields within the program. The default values assume that the program will be used without optional features. Before changing default values, familiarity with the operational implications should be understood.

distributed multisite — Two or more IMC networks can be linked together for **distributed multisite** communication. Audio and control data is transferred between the different IMC networks via a NIM at each IMC. (Also see **StarGate Controller**.)

DPRAM — **D**ual **P**ort **R**andom **A**ccess **M**emory – These specialized memory chips have two separate data buses that allow two microprocessor chips to quickly and efficiently transfer data between each other.

DVIM — **D**igital **V**oice **I**nterface **M**odule – The DVIM is a CEC/IMC interface module that connects **D**igital **V**oice **I**nterface **U**nits (**DVIU**) to the CEC/IMC to provide Aegis digital and Aegis private voice operation for dispatch consoles, Jessica PBX, and CTIS equipment. (Also see **Aegis**, **Jessica PBX Gateway** and **CTIM**.)

EDACS radio system **E**nhanced **D**igital **A**ccess **C**ommunication **S**ystem **radio system** – The term "EDACS radio system" refers to RF equipment that may be interfaced to the EDACS CEC/IMC Digital Audio Switch. The RF equipment may be located at a single location, such as an EDACS trunked site or it may be located at several locations, such as in a voting system. Other examples of EDACS radio systems include simulcast, CNI, and SCAT systems.

EDG interface module **E**DACS **D**ata **G**ateway **interface module** – Mobile data is forwarded to the CEC/IMC Digital Audio Switch from the EDG computer equipment via the **EDG interface module**. This interface module's Controller Board is typically labeled "**DATA**".

failsoft **Failsoft** refers to the mode of operation of the trunked system when the Site Controller is not operational.

field **Field** refers to the area of the screen which allows data entry for a particular parameter. This area is readily identifiable by a reverse video bar when moving the cursor across the screen.

function keys **Function keys** are the keys often found on the upper portion of the PC's keyboard that begin with the letter "F", followed by a number. Function keys are used in the CEC/IMC Manager (MOM PC) software to execute particular commands. The particular command executed for a particular key is dependent upon the currently displayed screen and possibly, other conditions.

hard patch/simulselect The "**hard**" **patch** feature allows a conventional channel to be patched directly to a trunked talk group via the trunked group's Group ID (GID) number. The "**hard**" **simulselect** feature allows a conventional channel to be simulselected to a trunked talk group via the trunked talk group's Group ID (GID) number. All conventional channels in a CEC/IMC can be hard patched/simulselected. These patches/simulselects are set-up and deactivated at the CEC/IMC Manager, not consoles. Consoles and trunked sites in the CEC/IMC network know nothing about hard patches or hard simulselects. (Also see **patch ("soft"/console)** and **simulselect ("soft"/console)**.)

GETC — Ericsson **G**eneral **E**lectric **T**runking **C**ard – The GETC is a microprocessor-controlled shelf that can be configured to perform many different signal processing tasks for EDACS radio communications equipment. In CEC/IMC applications, each GETC is equipped with a 9600 baud modem that provides serial control data communications between different radio systems.

GSC bus — **G**lobal **S**erial **C**hannel **bus** – The GSC bus is a high-speed serial bus which provides packetized control data transfers between Controller Boards in the CEC/IMC Digital Audio Switch.

IMC — **I**ntegrated **M**ultisite and **C**onsole **C**ontroller – The IMC is a Digital Audio Switch that routes audio/mobile data/Aegis data between EDACS radio systems and dispatch consoles. It is a second generation multisite controller plus a console controller for the C3 series consoles.

interface module — The term "CEC/IMC **interface module**" is used to refer to a subset of hardware components within the CEC/IMC that permits it to be connected or linked to an external device such as a dispatch console or an EDACS radio system. Each interface module is formed by a Controller Board and usually one or more Audio Boards. This term replaces the term "subsystem" and it may sometimes be referred to as a "node". Examples of CEC/IMC interface modules include: MIM, CIM, LRIM, VMIM and RIM.

Jessica PBX Gateway — **Jessica P**rivate **B**ranch e**X**change **Gateway –** This advanced telephone interconnect system is used with CEC/IMC equipment to provide the EDACS radio systems' users access to local public switched telephone networks (PSTN). Jessica incorporates the Ericsson MD110 PBX. It is interfaced to the CEC/IMC via a PIM. (Also see **PIM**.)

LRIM — **L**ogging **R**ecorder **I**nterface **M**odule – This CEC/IMC interface module provides audio outputs for logging recorders. Each output channel can be programmed to supply audio based on groups or individual units within the CEC/IMC network.

MIM — **M**ASTR II/III **I**nterface **M**odule – The MIM connects an EDACS radio system to the CEC/IMC switch. EDACS radio systems include EDACS sites, simulcast systems, voted systems, CNI and SCAT systems.

MOM — **MO**nitor **M**odule – The MOM is a CEC/IMC interface module that provides serial data connections for the CEC/IMC Manager (MOM PC) and the System Manager computers. It also provides many important functions for the CEC/IMC and it stores certain data bases for the CEC/IMC such as the current ("soft" or console) patch/simulselect settings made from consoles.

MOM PC — (see **CEC/IMC Manager**)

multisite — A **multisite** is a network of multiple EDACS radio systems and possibly conventional radio systems all linked together for wide-area communication. In a multisite network, adjacent systems do not use the same radio frequencies.

NIM — **N**etwork **I**nterface **M**odule – Two or more IMC networks can be linked together for distributed multisite communications using a NIM at each IMC Digital Audio Switch.

patch ("soft"/console) — A **patch** ("soft" or console) is when two or more talk groups are connected together by a dispatcher at a console. This allows the patched groups to communicate as a single group. "Soft" or console patches utilize a special group ID number referred to as a SAID. (Also see **hard patch/simulselect**.)

PCM — **P**ulse **C**ode **M**odulation – An audio processing technique used to encode and decode analog signals so they can be transferred digitally.

PIM — **P**rivate Branch eXchange (PBX) **I**nterface **M**odule – This CEC/IMC interface module supports Jessica PBX Gateway equipment. It provides the audio and control data links in to and out of the CEC/IMC to and from Jessica. (Also see **Jessica PBX Gateway**.)

ProSound When roaming on a wide area (multisite) network, **ProSound** enables a radio to select a new site based upon the bit-error-rate of the "adjacent" sites' control channels. The roaming operation is referred to as "wide area scan" or "wide area system scan". ProSound ensures the newly selected site's working channel(s) will be sufficient to provide quality audio. During wide area scan operations, EDACS allows up to six (6) adjacent sites to be scanned.

RIM **R**equest Status Monitor **I**nterface **M**odule – The RIM interface module enables the RSM computer to request status information from radios within the network.

RSM **R**equest **S**tatus **M**onitor – The RSM is an IBM PC compatible computer running custom software developed by Ericsson. It allows the system administrator and/or the dispatchers to view status of EDACS units within the CEC/IMC network. Status information is typically initiated (transmitted) by the radio operator to identify the current condition (in route, at scene, etc.) of the unit.

screen **Screen** refers to a major or parent data entry process and is used to show position within the program. Each screen is divided into three distinct areas: (1) screen title, (2) screen windows, and (3) active function keys. The title indicates the current position in the program's hierarchy. The screen windows are provided for input of data to the screen. The active function keys provide access to the commands (or actions) available within that screen. The function key commands are labeled along the bottom of the screen. Only the function keys with labels are enabled in a given screen.

secondary interface The term "**secondary interface**" refers to the CIA rack. This rack is considered to be secondary because it is not connected to the primary TDM and GSC buses within the CEC/IMC.

simulselect ("soft"/console) A console operator can simultaneously communicate with two or more talk groups by selecting the groups for "**simulselect**" communication. Simulselect communication uses only a single radio channel at each active radio system. These "soft" or console simulselects utilize a special group ID number referred to as a SAID. (Also see **hard patch/simulselect**.)

site This term normally refers to radio equipment at a single specific location.

StarGate Controller A **StarGate Controller** is an IMC switch specifically configured for distributed multisite operation. It is the central point or "hub" for all distributed multisite communications. A StarGate Controller is formed by NIM interface modules and a MOM interface module.

System Manager The **System Manager** is a DEC multitasking computer which performs features such as configuring EDACS unit (Logic ID or LID) and trunked group (Group ID or GID) databases, monitoring system operation, generating management reports, individual unit enable/disable and dynamic regrouping.

TDM bus **T**ime **D**ivision **M**ultiplexed **bus** – The TDM bus in the CEC/IMC Digital Audio Switch is a digitally multiplexed bus system used to transfer audio/mobile data/Aegis data throughout the CEC/IMC. Each signal coming into the CEC/IMC is assigned a TDM time slot and receiving devices extract the digitized signals from the appropriate time slot.

tracking In a multisite network, all active radios log into their particular system. This login information is databased to allow the CEC/IMC to track individual radio units as they move from system-to-system. The CEC/IMC can then route wide area calls based on this database.

VMIM Con**V**entional **M**ASTR II/III **I**nterface **M**odule – The VMIM couples the CIA secondary interface rack to the primary CEC/IMC interface modules. The VMIM - CIA set allows conventional base stations and conventional satellite receiver voting systems to be connected to the CEC/IMC.

XLTR C3 Modular/Desktop Console **Translator** – Using data protocol conversion techniques, this interface module allows the CEC/IMC to communicate with a C3 Modular/Desktop console. The XLTR is placed in the control data path between the C3 console and its respective CIM. It is a Controller Board with unique firmware and DIP switch settings.

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APPENDIX B
LOGGED ERROR DEFINITIONS

LOGGED ERROR MESSAGE	LOGGED ERROR DATA	CAUSE/ CORRECTIVE ACTION
E00-xxx: UNKNOWN ERROR		An error has been generated within the CEC/IMC, but the CEC/IMC Manager (MOM PC) cannot determine what it is. This is usually a result of a Controller Board residing in the system with firmware prior to version 2.00 or with a firmware version more recent than the CEC/IMC Manager's software version. **Corrective Action:** Ensure all Controller Boards in system are equipped with firmware version 2.00 or greater and the CEC/IMC Manager contains a software version greater than or equal to the most recent Controller Board firmware being used.
E01-020: HW FAIL - CLOCK BANK	Lower byte is the clock which failed: 00h = A clock. 01h = B clock.	An Audio Board has detected a failed clock circuit. If three (3) of these errors are generated by three (3) different GSC nodes, a global system Clock Board failure will be issued. **Corrective Action:** If less than three (3) GSC nodes declare this error, the problem is with one or more of the Audio Boards at the interface module declaring the error. Observe the clock LEDs on the Audio Boards at the interface module generating the error. If they are all lit, the problem is likely in the clock failure detection circuit. If any of the LEDs are not lit, the problem is with the corresponding clock circuit on the Audio Board.

LOGGED ERROR MESSAGE	LOGGED ERROR DATA	CAUSE/ CORRECTIVE ACTION
E01-037: HW-FAIL CLOCK BOARD	Lower byte is the clock which failed: 00h = A clock. 01h = B clock. Upper byte is reserved.	The redundant clock feature is enabled, and at least three (3) interface modules have declared a clock bank failure. **Corrective Action:** Provided the redundant clock is working, the CEC/IMC will switch to the redundant clock and the error will be cleared. The failed clock circuit should be repaired.
E02-022: HW-FAIL - GSC BUS	Lower byte contains the bus number that failed, either 0 or 1 (in hex). The upper byte of the data word is reserved.	No poll response is being received, via the GSC bus, from a Controller Board set up to be an end node. Both the MOM and one other Controller Board must be set, via the DIP switches, to be end nodes in the system. This other Controller Board should be placed at the opposite end of the GSC bus relative to the MOM, preferably in the slot nearest to the Terminator Board. No other Controller Boards should have the end node dip switch bit set. When the error occurs, all devices in the CEC/IMC are commanded to switch to the alternate GSC bus. If an end node responds on the new GSC bus, the error will be cleared. If not, a switch is made back to the previous GSC bus. No further switching will occur until communications can be established with an end node. **Corrective Action:** Ensure the Controller Board furthest for the MOM Controller Board on the primary backplane structure has the end node DIP switch bit set. If the error remains, the probable cause is a physical break in the GSC bus.
E03-017: LINK FAIL - MULTINODE		Control data link failure between two interconnected NIMs.
E03-023: LINK FAIL - CEC/IMC Manager		Control data link failure between MOM Controller Board and CEC/IMC Manager (MOM PC).
E03-027: LINK FAIL - SITE		Control data link failure between MIM and Site Controller.

LOGGED ERROR MESSAGE	LOGGED ERROR DATA	CAUSE/ CORRECTIVE ACTION
E03-028: LINK FAIL - CONSOLE	0000h = CIM control data link failure. 0001h = Attached console is "Logged Out" or "Disabled". For a C3 Desktop/ Modular console, 0001h indicates the Translator-to-console control data link has failed.	Control data link failure between CIM and console.
E03-029: LINK FAIL - RECORDER (Reserved for future use.)		Control data link failure between LRIM and logging recorder.
E03-030: LINK FAIL - RSM MONITOR		Control data link failure between RIM and RSM equipment.
E03-031: LINK FAIL - CTIS		Control data link failure between PIM/CTIM and Jessica/CTIS equipment.
E03-035: LINK FAIL - HDLC CHAN A	No information is contained in the data word.	The idle flag sequence cannot be detected on HDLC channel A. **Corrective Action:** To clear the error, proper connection to HDLC channel A, via the backplane connector, must be made to a remote station that continuously transmits idle flag sequences at the correct bit rate.
E03-036: LINK FAIL - HDLC CHAN B	Lower byte of the data word contains 01h, indicating channel B. The upper byte of the data word contains the number of the Audio Board that stopped responding.	An Audio Board at a secondary address on HDLC channel B that was previously responding to polls has stopped responding. **Corrective Action:** To clear the error, an Audio Board set to the same number that caused the error must be placed In the system, or the Controller Board that originated the error must be reset.
E05-021: INCOMPATIBLE - AUDIO BUS		
E05-023: INCOMPATIBLE - IMC\CEC Manager		

LOGGED ERROR MESSAGE	LOGGED ERROR DATA	CAUSE/ CORRECTIVE ACTION
E06-116: INVALID VALUE - ASSIGNMENT	No information contained in the data word.	A Controller Board was installed that conflicted with an existing Controller Board. For example a MIM 6 and a VMIM 6, or two CIM 1's. **Corrective Action:** Both interface modules that are conflicting will have this error active. Change the device type/assignment setting of the board in error. All boards that conflicted must be reset to clear the error.
E07-119: INVALID REDUNDANCY - MULT END NODES	Lower byte of the data word contains the node ID of the existing end node. Upper byte of the data word is reserved.	This Controller Board is set up to be an end node, but an end node already exists in the system. This message replaces warning W06-119 beginning with MOM Controller Board firmware version 3.00. **Corrective Action:** To clear the error, only one (1) Controller Board should have its end node DIP switch set to the ON position.
E08-18: Device Conflict - Cntrl Board	No information in the data word.	A Controller Board device type/assignment setting is conflicting with another boards setting. For example a VMIM 5 and a MIM 5 will conflict with each other. The main information is the device type/assignment in the error heading. With the correct hardware revision, the ID LED will also be flashing on the offending board. Also, sometimes this error only applies to one board. (Example CCI, or second MOM mistakenly installed in main CEC/IMC rack). **Corrective Action:** The offending board must be removed and its type/assignment setting must be changed to not conflict with another device. The other device should also be displaying this error and it should also be reset.

APPENDIX C
LOGGED WARNING DEFINITIONS

LOGGED WARNING MESSAGE	LOGGED WARNING DATA	CAUSE/ CORRECTIVE ACTION
W00-xxx: UNKNOWN WARNING	(none)	A warning has been generated within the CEC/IMC, but the CEC/IMC Manager cannot determine what it is. This is usually a result of a Controller Board residing in the system with firmware prior to version 2.00 or with a firmware version more recent than the CEC/IMC Manager's software version. **Corrective Action:** Ensure all Controller Boards in system are equipped with firmware version 2.00 or greater and the CEC/IMC Manager contains a software version greater than or equal to the most recent Controller Board firmware being used.
W01-048: UNDEFINED CALLEE TYPE	The callee type value that generated the warning.	Unknown callee type was found.
W01-049: UNDEFINED CALLER TYPE	The caller type value that generated the warning.	Unknown caller type was found.
W02-028: CONSOLE NUMBER OUT OF RANGE	Console number that generated the warning.	Console number found that was not in the 1 – 32 range of allowed consoles.
W02-032: BUS_SLOT OUT OF RANGE	Low byte contains bus number. High byte contains slot number.	Bus or slot number found that was greater than the maximum number allowed.
W02-033: AUDIO CHANNEL OUT OF RANGE	Audio channel number that generated the warning.	Audio channel number found that was not in range 1 – maximum allowed channels.
W02-050: AUDIO SUM COUNT OUT OF RANGE	Value of sum count when the attempt was made to add another channel.	Current summed audio list has the maximum number of channels allowed and an attempt was made to add an additional channel.
W02-051: CONSOLE LOG COUNT OUT OF RANGE	Value of console log count that generated the warning.	Current number of console originated calls greater than maximum number of consoles allowed.

LOGGED WARNING MESSAGE	LOGGED WARNING DATA	CAUSE/ CORRECTIVE ACTION
W02-052: MODULE COUNT OUT OF RANGE	Value of console module count when the attempt was made to add another module.	Console module count currently at maximum and an attempt was made to add another module.
W02-115: PATCH/SIMULSELECT OUT OF RANGE	Value of entry count when the attempt was made to add another entry.	Number of entries in patch/simulselect table is at maximum and an attempt was made to add another entry.
W02-121: UNIT ID OUT OF RANGE	Unit ID that generated the warning.	Unit ID found that was greater than maximum allowed.
W02-122: GROUP ID OUT OF RANGE	Group ID that generated the warning.	Group ID found that was greater than maximum allowed.
W02-131 & W02-132: DEVICE TYPE/ ASSIGNMENT	Bad device or assignment (usually FFH).	A Controller Board has an invalid device type or assignment DIP switch setting. **Corrective action:** Check the board's DIP switches.
W03-064: UNSUPPORTED CONSOLE_ICOM_REQ ID	Message ID value that generated the warning.	Unsupported message ID from a CIM.
W03-065: UNSUPPORTED MODULE_PROGRAM_REQUEST ID	Message ID value that generated the warning.	Unsupported message ID from a CIM or LRIM.
W03-066: UNSUPPORTED PATCH_SIMUL_MSG ID	Message ID value that generated the warning.	Unsupported message ID from a CIM, MIM, NIM, LRIM or MOM.
W03-067: UNSUPPORTED SYSTEM_MANAGER_REC ID	Message ID value that generated the warning.	During a System Manager database upload, an unsupported CIM or MIM message ID will cause this warning to be logged.
W04-080: UNSUPPORTED CALL_STATUS MSG_GRP	Message group value that generated the warning.	Unsupported message group from CIM or NIM.
W04-081: UNSUPPORTED CHAN_PRIM MSG_GRP	Message group value that generated the warning.	Unsupported message group from a MIM (site-type) interface module (MIM, NIM, VMIM, CTIM, PIM, etc.).
W04-082: UNSUPPORTED CONSOLE_TRANSMIT_REQUEST MSG_GRP	Message group value that generated the warning.	Unsupported message group from a CIM or a MIM-type (site-type) interface module (MIM, NIM, VMIM, CTIM, PIM, etc.).

LOGGED WARNING MESSAGE	LOGGED WARNING DATA	CAUSE/ CORRECTIVE ACTION
W04-083: UNSUPPORTED SLOT_ASSGN MSG_GRP	Message group value that generated the warning.	Unsupported message group from a CIM or a MIM-type (site-type) interface module (MIM, NIM, VMIM, CTIM, PIM, etc.).
W04-084: UNSUPPORTED INTER_CONSOLE_MSG MSG_GRP	Message group value that generated the warning.	Unsupported message group from a CIM.
W05-096: UNSUPPORTED AUDIO_CHAN_CONFIG_MSG MSG_SUB_GRP	Message subgroup value that generated the warning.	Unsupported message sub group from a CIM.
W05-097: UNSUPPORTED CHAN_ASSGN MSG_SUB_GRP	Message subgroup value that generated the warning.	Unsupported message group from a MIM-type (site-type) interface module (MIM, NIM, VMIM, CTIM, PIM, etc.).
W05-098: UNSUPPORTED STATUS MSG_SUB_GRP	Message subgroup value that generated the warning.	Unsupported message group from a MIM-type (site-type) interface module (MIM, NIM, VMIM, CTIM, PIM, etc.).
W06-033: MISMATCH - AUDIO CHANNEL	Logical ID (LID) of the unit that experienced the missed channel drop.	The CEC/IMC has received a channel assignment for a unit that is marked active on another channel. This is a missed channel drop condition – the CEC/IMC will drop the existing channel before routing the new channel assignment.
W06-116: MISMATCH - ASSIGNMENT	Site number reported in the Site ID record from the site.	The MIM's assignment from the DIP switches does not match the site number reported from the site. This warning will only be issued once by the MIM when detected.
W06-119: MULTIPLE END NODES MISMATCH	(none)	A second Controller Board has responded that is set up to be an end node. This message is not generated by MOM Controller Board firmware version 3.00 (or later); it is replaced by error message E07-119.

LOGGED WARNING MESSAGE	LOGGED WARNING DATA	CAUSE/ CORRECTIVE ACTION
WO6-134: BACKUP_ID MISMATCH	New backup node ID	MOM has received a new backup node ID for a redundant MIM pair and has overwritten the old backup ID. This warning may occur when changing/resetting the primary/ secondary MIMs, and is not a problem in this case. However if this warning occurs at any other time it indicates the MOM may be confused about the prim/backup IDs; backup operation should be verified (reset primary/secondary nodes). This situation is most likely to occur if a third MIM with the same assignment is mistakenly installed in the CEC/IMC.
W07-115: PATCH/SIMULSELECT TABLE FULL	The maximum number of simultaneous patches and simulselects allowed on this switch.	An attempt was made to create a patch/simulselect, but the MOM Controller Board's patch/simulselect table already contains the maximum number of entries.
W07-120: MOM ERROR MSG ARRAY FULL	(none)	The MOM error status array is full on receipt of a new error message. The status of the new error will not be stored.
W08-112: Call Blocked-No Circuit Available	DVIM device/assignment	The DVIM did not have digital decryption channel available for a radio-originated encrypted call. Wide area (multisite) radio-to-radio calls are routed.
W09-113: Call Routing-Contention	The message group, subgroup, caller and callee of the call that was routed only to dispatch consoles due to contention with an already active call.	Multiple units attempted to transmit to the same callee at the same time. The CEC/IMC will only allow one active transmitter on a talk group. The "rejected" call will be routed to all dispatch consoles but will not be routed to other sites. This leaves the sites all hearing the same (original) transmitter, but the consoles hearing all transmissions.

LOGGED WARNING MESSAGE	LOGGED WARNING DATA	CAUSE/ CORRECTIVE ACTION
W09-125: Call Routing-Confirm Fail	(see below)	Confirmed Call related warnings. This warning is generated from multiple causes:
	The caller and callee of the failed confirmed call. The failure reason, as well as a bit mask of all required sites that did not successfully respond is also included. Each bit corresponds to a site number (1-32): 00000001H = Site 1, 80000000H = Site 32	Radio PTT causes: A confirmed group call did not receive working channel assignments from all required sites for the confirmed group. The call will time out and transmit in any event after 6-10 seconds.
	"Time Out"	No response received from expected site(s).
	"Queued"	Call was queued at secondary site(s).
	"Sys Busy"	Call received System Busy at secondary site.
	"Denied"	Call was denied at secondary site.
	"Inv Chan"	Call received an invalid channel assignment.
	"FS2"	Expected site was in FAILSOFT 2.
	"No MIM"	Expected site MIM was not active in system.
	"Rcv Call"	Call lost contention to call from other site.
		Encrypted Jessica/CTIS causes
	"DVIM Decrypt" and caller and callee of the failed confirmed call.	The DVIM did not decrypt the radio-to-landline call.
	"CTIM Sec Ack" warning and the caller and callee of the failed confirmed call.	A scondary acknowledgment was not received from the PIM/CTIM for the radio originated encrypted Jessica/CTIS call.
	"DVIM Sys Busy" warning and the caller and callee of the failed confirmed call.	There are no DVIU resources available to perform the encryption / decryption of the encrypted Jessica/CTIS call.
	"CIC Queued" warning and the caller and callee of the failed confirmed call.	The encrypted Jessica/CTIS call was queued at the landline interface.

LOGGED WARNING MESSAGE	LOGGED WARNING DATA	CAUSE/ CORRECTIVE ACTION
	"CIC Sys Busy" warning and the caller and callee of the failed confirmed call.	The encrypted Jessica/CTIS call received a "system busy" at the landline interface.
	"CIC Denied" warning and the caller and callee of the failed confirmed call.	The encrypted Jessica/CTIS call was denied at the landline interface.
	"CTIM Duplex" warning and the caller and callee of the failed confirmed call.	A "call back" was not received from the landline interface for the encrypted Jessica/CTIS call. This "call back" is required for the full duplex operation as well as ringing tone connections.
	"DVIM Encrypt" warning and the caller and callee of the failed confirmed call.	The DVIM did not encrypt the landline-to-radio call.
	"MIM Sec Ack" warning and the caller and callee of the failed confirmed call.	A Secondary Acknowledgment was not received from the MIM for the landline originated encrypted Jessica/CTIS call.
	"Site Queued" warning and the caller and callee of the failed confirmed call.	The landline originated encrypted Jessica/CTIS call was queued at the site.
	"Site Sys Busy" warning and the caller and callee of the failed confirmed call.	The landline originated encrypted Jessica/CTIS call received a "System Busy" from the site.
	"Site Denied" warning and the caller and callee of the failed confirmed call.	The landline originated encrypted Jessica/CTIS call was denied at the site.
W10-018: Timeout-Controller Board	No data, the Node ID device assignment and device type fields of the warning identify the board.	A Controller Board in the CEC/IMC did not respond to a poll from the MOM Controller Board. The board will be marked as inactive at the CEC/IMC Manager. This warning will occur when a Controller Board is removed from the CEC/IMC. Other times indicate a problem with the reported Controller Board.

LOGGED WARNING MESSAGE	LOGGED WARNING DATA	CAUSE/ CORRECTIVE ACTION
W10-114: Timeout-Channel Safety Timer	Channel number that was cleared.	The NIM (StarGate systems) has received no activity on an active channel for approximately ten (10) minutes. The NIM will clear the channel at this point and issue this warning.
W11-118: Redundancy-Primary/Secondary switch	The GSC address of the secondary node that switched.	Secondary MIM Controller Board has switched to become a primary MIM Controller Board.
W12-036: LINK FAIL - HDLC CHANNEL B	The Audio Board number that failed to respond.	An Audio Board with slots allocated to it has failed to respond to S-Frame polls from the Controller Board. This warning could indicate the high speed serial link (HDLC Protocol) between the Controller Board and one of its Audio Boards is not functioning. This warning will also be generated if slots are allocated but the board is not installed in the switch.
W13-99: CALLEE NOT FOUND - CIM MODULE TABLE	Callee ID that could not be found.	The given callee ID could not be found in the CIM Module Table.
W13-100: CALLEE NOT FOUND - CIM CHANNEL DATABASE	Callee ID that could not be found.	The given callee ID could not be found in the CIM Channel Database.
W14-101: EDG DATA - ATTEMPT TO SUM DATA	Channel number.	An attempt was made to sum data on the same audio channel.
W15-129: NO SAID VALUE AVAILABLE	Number of SAIDs allocated to this switch.	All SAIDs (System Assigned Group IDs) allocated to this switch are currently in use by other patches/simulselects.
W16-017: VALUE IN USE - MULTINODE	Switch ID that is duplicated.	A NIM received a call from another CEC/IMC with the same switch ID as this CEC/IMC. (Set by the MOM Controller Board assignment DIP switch). For proper call arbitration on a StarGate network, each CEC/IMC must have a unique switch ID.

LOGGED WARNING MESSAGE	LOGGED WARNING DATA	CAUSE/ CORRECTIVE ACTION
W16-129: VALUE IN USE - SAID	The SAID value.	An attempt was made to create a patch/simulselect with a SAID (System Assigned Group ID) that was already being used by another patch/simulselect.
W17-120: Auxiliary I/O- MOM error message array	(none)	The MOM auxiliary I/O error/warning alarm list is full. This should not normally occur. The list has an entry for each possible event. **Corrective Action:** Reset the MOM and resend the auxiliary I/O definitions from the CEC/IMC Manager.
W17-130: Auxiliary I/O- State Change	This warning uses specially formatted data to identify the event and the current state.	A defined auxiliary I/O event has changed states – active to inactive or inactive to active. This warning provides a record of aux. I/O activity and, at the CEC/IMC Manager, it may be suppressed for any aux. I/O event.
Notes for W18-xxx warnings: Controller Boards with firmware versions prior to 2.12 do not log these warnings. For Controller Boards with firmware versions 2.12 or greater but less than 3.00, W18-132 will be logged for changes in device type, version number, and date/time stamp. For these versions also note the following: 1) the node ID of the source node will always be FFh. 2) the upper byte of the data word will contain the new device type value and the lower byte will either be the previous device type value if the device type has changed, or the value FFh, otherwise. For CCI Controller Board, version 2.12 and greater, the source node ID will always be FFh.		
W18-131: NOVRAM CLEARED - NEW DEVICE ASSIGNMENT	Previous assignment value in upper byte, current assignment value in lower byte.	Non-volatile RAM cleared on Controller Board due to a change in device assignment DIP switches. This only occurs on certain device personalities.
W18-132: NOVRAM CLEARED - NEW DEVICE TYPE	Previous type value in upper byte, current type value in lower byte.	Non-volatile RAM cleared on Controller Board due to a change in device type DIP switches.
W18-133: NOVRAM CLEARED - INVALID CHECKSUM	Either the computed checksum, or the value 0055h	Non-volatile RAM cleared on Controller Board due to one of the following: (1) computed checksum did not match the stored checksum (2) a key value stored in NOVRAM did not match the value in the 80C186 ROMs (e.g. version number, date/time stamp. etc.)

LOGGED WARNING MESSAGE	LOGGED WARNING DATA	CAUSE/ CORRECTIVE ACTION
W19-115: DENIED - PATCH/SIMUL	The SAID value assigned to the patch/simulselect.	A site has denied the activation of a patch or simulselect. If multiple sites deny it, only the first denial received is logged.
Note for W20-xxx warnings: These warnings are applicable only for StarGate systems that have conventional channels installed on more than one CEC/IMC in the StarGate network.		
W20-136: CONV CHAN - CONFLICT	Channel number in conflict.	A conventional channel definition has been received from a remote CEC/IMC that falls within the local CEC/IMC conventional channel range. Each CEC/IMC has a unique conventional channel range assigned of sixty-four (64) channels or less. **Corrective Action:** Verify each CEC/IMC has a unique switch assignment number (node ID) assigned via the MOM Controller Board DIP switches. StarGate conventional operation will not function correctly unless each CEC/IMC switch assignment number is unique.
W20-137: CONV CHAN - DEFINED	Channel that has been defined in lower byte. Source CEC/IMC switch assignment number in upper byte.	A conventional channel has been defined on a remote CEC/IMC Manager, and the definition has been received by this CEC/IMC Manager. This warning is for information purposes only. It is generated as part of normal operation to provide a record of remote conventional channel configuration changes on this CEC/IMC.
W20-138: CONV CHAN - DELETED	Channel that has been deleted in lower byte. Source CEC/IMC node ID in upper byte.	A remotely defined conventional channel has been deleted at the remote CEC/IMC Manager. This warning is for informational purposes only and is a result of normal operation.

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