MicroComm DXI

Maintenance

Manual

February, 2002

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Section 1 - Introduction

The "Family" of DXI Manuals

This manual is one of a set of manuals for the MicroComm DXI system:

Manual	Intended Users
Intercom Master Station Operating Instructions	Control Room Operator
MicroComm DXI System Administration Manual	System Administrator/System Installer/Maintenance Staff
MicroComm DXI Maintenance Manual	System Administrator/System Installer/Maintenance Staff
SAC Computer Installation Manuals	System Installer
Intercom System Equipment Installation Bulletins	System Installer
MicroComm DXI Troubleshooting Guide	System Installer/Maintenance Staff

About This Manual

The purpose of this manual is to help you carry out system maintenance functions for the MicroComm DXI system.

It is strongly recommended that you read Sections 2 to 4 of the Intercom Master Station Operating Instructions Manual before you begin to read this manual.

The Manual is divided into eight Sections, each one dealing with a key aspect of the system:

Section One	Introduction
Section Two	Getting Started
Section Three	Using the SAC Computer
Section Four	Procedures for Loading, Saving, Backing up and Restoring Configurations
Section Five	Modifying and Viewing the Hardware Configuration, Setting Alarm Thresholds and PCLTA Operating Characteristics
Section Six	Diagnostics and Maintenance Functions
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The MicroComm DXI

The MicroComm DXI is an intercom system that is designed to help correctional officers communicate with inmates and other staff members. The system handles alarms as well as two-way voice communication between Intercom Stations and Master Stations.

Elements of the System

The DXI consists of:

- *intercom stations*,

- *master stations* to which intercom stations are connected,

- a *SAC computer* (Service, Administration and Control computer), which drives the DXI system and is also used for system administration and maintenance,

- *paging outputs* from *PAB*, *TAB*, and *AOB* channels,

- *audio input/output* from *AIO*, *AIB*, and *AOB* channels,

- *card cage* and *power supplies*,

- *hardware cards* for card cages (*ACB*, *AIB*, *AIO*, *AOB*, *DIO*, *PAB, RDB, RRB*, *SAB*, *TLB*, *TSB*),

- other hardware (*DIO, FDH, FTR, IMS's, ICM's, MAI, RRB, RRR, SPC/SPD, RNS, TIS, VSB*).

All of these elements are linked together on a communications networks. If there is more than one SAC computer they will be linked by an Ethernet Network, while the SAC computer sends control signals to the various cards over a LonWorks network.

You will use the SAC Computer to perform system maintenance functions.

System Maintenance Functions

System maintenance functions include:

- initial set up of the hardware configuration for your DXI installation,

- making changes to the hardware configuration as required,

- swapping hardware components,

- using data logging features to observe or review system activity,

- checking that the system elements are functioning properly, and

- performing system diagnostic tests.

Hardware Configuration

The hardware configuration consists of specifying the physical components used to build your system. It defines the exchanges, cards, master stations, stations, etc. and their physical addresses and ID numbers.

Examples of system hardware parameters include:

- *exchange definitions* - identifying the number of SAC computers you have in your system and giving each one a unique identity,

- *card definitions* - identifying the cards and types of cards and giving each a unique identity and location,

- *master station definitions* - identifying your intercom master stations, and

- *station definitions* - identifying each station and where it is physically connected within the system.

The hardware configuration must be completed before you set up the software configuration. The software configuration consists of giving user defined names to intercom stations, master stations, paging zones, etc. It also sets up the relationships on how the components will work with each other - such as who can call who, setting priority levels, defining default volume levels, etc.

Swapping Components

Some DXI components contain local intelligence and a unique identity so that they perform the functions assigned in the software configuration. These include intercom master stations, discrete I/O modules, audio control boards, and remote receiver and driver units. When the system is initially installed, these units must be given an identity corresponding to that in the hardware configuration. Similarly, if any of these components are removed for service, the replacement unit must be told what its identity is.

The above processes are referred to as returning a card to service and swapping cards.

Data Logging

The DXI logs all system activity at the SAC computer. These log messages may be reviewed through the SAC computer monitor. They may also be printed, so that hard copy is available, and copied to text files for use on other computers.

System activity consists of a series of events such as:

- the beginning of a call,

- the end of a call,

- a time-out alarm, and

- fault reporting.

Each event occurs at a particular point in time. The log is a record of these events and the time at which they occurred. Further details are contained in Section 8 - Data Logging.

Diagnostic Functions

The SAC computer can also be used to perform some system diagnostic functions. These include:

- checking the operating status of the system's networks,

- fixing network communication problems,

- performing self tests on cards,

- performing detailed diagnostic tests on cards, and

- manually activating and deactivating outputs to verify their performance.

Section 2 - Getting Started

In this Section...

We will discuss:

- system maintenance functions

- the Service Administration and Control (SAC) computer

Elements of the DXI system - from the user's point of view - are described in Sections 2 to 4 of the "Intercom Master Station Operating Instructions Manual". You should read and fully understand this material before you begin to perform systems maintenance functions.

System Maintenance Functions

System Maintenance is a key aspect of the successful operation of your DXI system. The role of the system maintainer may involve:

- specifying the initial hardware configuration of the system being installed

- making modifications to the hardware configuration as required, on an on-going basis

- swapping components that need to be removed for service

- verifying the proper operation of the system, and

- monitoring the logged data.

The system maintainer will use the SAC computer to perform these functions.

SAC Computer

The *Service, Administration and Control* (SAC) computer is the brain of the DXI system. It:

- controls the operation of the DXI system, and

- is used for installation, administration and troubleshooting.

The SAC computer is a standard IBM-compatible PC with special operating software and network adapters for communication with other parts of the intercom system.

The SAC computer has the following software installed:

- QNX V4.2X operating system. QNX is a standard commercial operating system, UNIX like but can be used in real time applications.

- DXI MicroComm system software to control the DXI system.

As an option, a redundant SAC computer can be added so that 100% backup is assured. With this option the system can operate on either PC and will switch automatically from one to the other if the need arises.

Configuration Data

There are two major components to the DXI system - the hardware and the software.

The hardware consists of the Exchanges, Cards, Master Stations and Intercom Stations, other types of Stations (e.g. monitor and control points) along with associated wiring. Those items that are hardware-dependent (i.e., that depend on the type or number of components or the actual wiring) are controlled by the *hardware configuration.*

The software makes the system operate. Those items that can be changed without making physical changes to the system (without adding or removing components or rewiring) are controlled by the *software configuration.*

Both the hardware configuration and software configuration must be specified before the system will operate. Configuration data are entered into the SAC computer. The system installer and maintainer specify the hardware configuration. The system administrator specifies the software configuration.

Parameters That Are Specified as Part of the Hardware Configuration

The following hardware items are configured when your system is installed, or when your system is modified. Each of these hardware items has a list of parameters that must be specified for the system to operate properly. A detailed list of the parameters and their purpose is given in Section 5, where screen displays of the various Modify Hardware selections made under the *Edit* function are presented.

- Exchanges
- Cards
- Tones
- Music
- Masters
- Stations
- Doors
- Switch Panels
- CEPTs
- Radios
- Messages
- Globals

Passwords

Access to the DXI system through the SAC computer is password-protected. The System Administrator will set and control passwords. The system uses five passwords:

- one for access to the "Administration" module, which is used to specify and change the software configuration,
- one for access to the "Maintenance" module, which is used for installation, troubleshooting and maintenance functions,

- one to regain access to the system after the screen saver cuts in,

- one for access to the operating system ("system") , and

- one to allow Station names to be changed from the DXI *Shell* by using the *Options* menu selection. In some facilities it is convenient to have the Station name the same as the client located there, and give the authority to make these changes to personnel other than the System Administrator.

Who Needs Passwords

The purpose of passwords is to ensure that only authorized personnel have access to the DXI system through the SAC. Personnel who must know a specific password are:

- personnel who must access the *administration module* will need to know the password for access to the administration module,

- personnel who must access the *maintenance module* will need to know the password for access to the maintenance module,

- all personnel who use the system will need to know the screen saver password, and

- personnel who must access the *operating system* (QNX) will need to know the password for access to the system module.

- personnel who need to change Station names (e.g. the name may correspond to the name of the client at that Station) will need access to the Stnnames password.

Note**:** Only qualified personnel should use passwords.

It is important that all personnel who access the system protect the security of the system.

Guidelines for Managing Passwords

Passwords should only be issued on a "need-to-know" basis.

All personnel who know one or more of the passwords should follow these guidelines.

- Do not disclose passwords to unauthorized persons.

- Do not leave written passwords in places that are not secure. (It is better to commit passwords to memory.)

- When personnel change, new passwords should be established.

- Do not re-use old passwords.

- When your work is finished, exit to the DXI main menu.

Section 3 - Using the SAC Computer

In This Section...

We will discuss:

- the structure of the SAC computer software,

- how you may access the system and modules within the system,

- typical screen layout,

- screen saver, and

- how to access the maintenance module.

Structure of the SAC Computer Software

The DXI SAC computer software is modular in design. At the highest level is the "shell". Once you are in the shell, a main menu is presented with four options - *Administration*, *Maintenance*, *Options* and *System*. When you make your selection, further menus are presented, from which you go further into the system.

You go down the tree by selecting functions - to select a function, press the letter key that is highlighted - until you reach the screen that enables you to perform the desired function.

At any time, you may retrace your path back up the tree by pressing the 'Escape' key.

SAC Startup

When you boot up the SAC computer after a short time the following screen will appear on the monitor.

Normally, you would ignore this message, and after the indicated time has elapsed, Auto-start will commence.

However, if the system will not re-boot (this might happen after you have made changes to the configuration) this gives you an opportunity to revert to a known good configuration. Key in 'x', and the start-up will abort. Now you can select *Options*. (For more information on this procedure, see how to use the *Options* selection in the *Default Configurations* sub-section.)

```
Administration    Maintenance    Options    System            DXI Shell



                    tt seconds until Auto Start.
                         Type 'x' to abort.
```
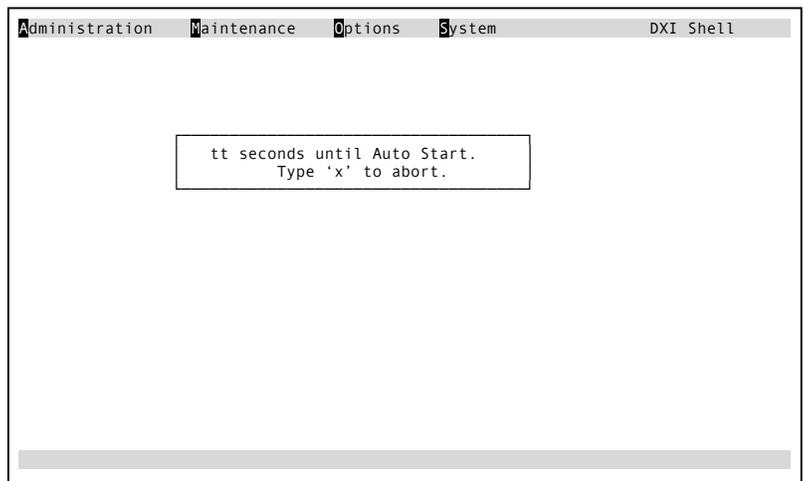
If you do not abort, after the indicated time ("tt") has elapsed, Auto Start begins by first loading the hardware and software configurations. The following screen is displayed:

```
Administration     Maintenance     Options     System          DXI Shell




                    ┌─────────────────────────────────┐
                    │      Configuration loading...    │
                    │      Please wait  tt seconds.    │
                    └─────────────────────────────────┘
```
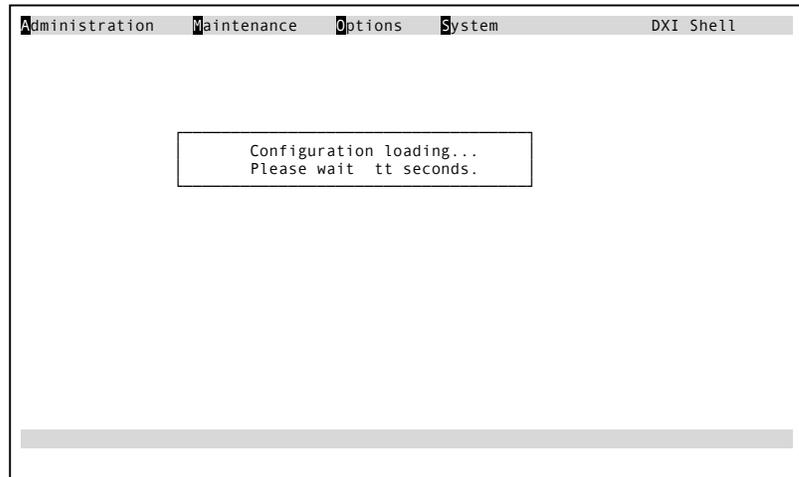
Once the configuration has been loaded the screen displays the following message:

```
Administration     Maintenance     Options     System          DXI Shell




                    ┌─────────────────────────────────┐
                    │      Auto Start Commencing...    │
                    │      Please wait tt seconds      │
                    └─────────────────────────────────┘
```
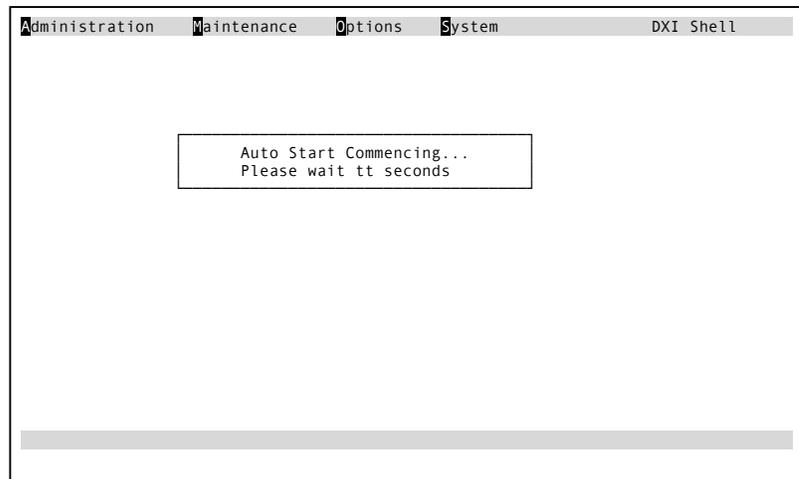
When Auto Start is complete, the DXI shell main menu is displayed:

The main menu presents four selections: *Administration*, *Maintenance*, *Options* and *System*. (Most of the times, when you start to use the SAC computer the DXI *Shell* menu will be displayed.)

```
Administration     Maintenance     Options     System          DXI Shell
```

Default Configurations

The default configuration is the set of hardware and software configurations that the DXI system will use when it is turned on. Therefore, these are usually the current operating configurations. In order to provide automatic recovery after a power failure the DXI will restart using these configurations by default.

If the system will not boot up, the Options menu may be used to revert to a known good configuration (hardware configuration, software configuration or both).

Note**:** It is **extremely** unlikely that the computer will not boot up. This would occur only after you have made changes to the configuration, and the changes cause an unrecoverable error.

When you select *Options*, the following menu appears:

Set Defaults allows you to change the hardware and/or software configuration.

Auto-start takes you back to the boot-up process. You should change the configuration before you return to Auto-start.

```
Administration    Maintenance    Options    System              DXI Shell
                                 Set defaults
                                 Auto-start
                                 Station Names
                                 Language        ▶
                                 Become Alternate      √ English
                                                         Francais
                                                         ESpanol
```
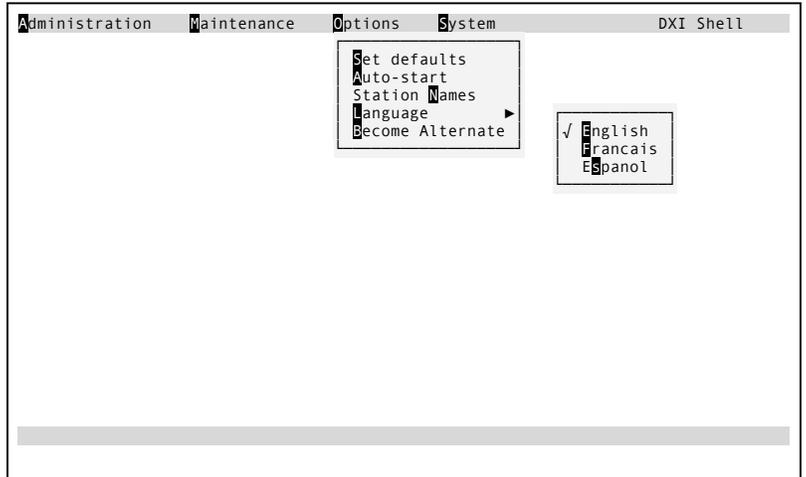
Set Defaults

When you select this option, you will first be prompted for a hardware configuration.

"Hardware cfg file name" is the name of the current hardware configuration. In this example it is hw_demo). The default hardware configuration will be displayed. Key in name of the hardware configuration you want to use and press 'Enter' (The hardware configuration you enter must be on the hard drive). See the next sub-Section for recommended restrictions on file names.

```
Hardware cfg file name: hw_demo
```
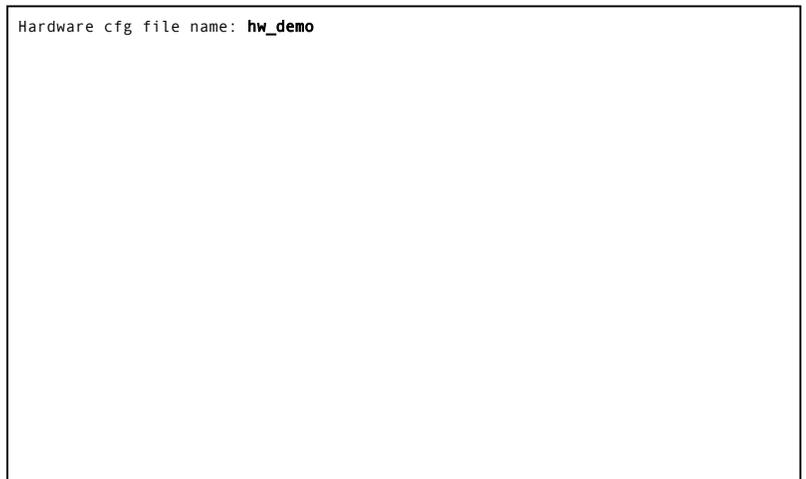
You will now be prompted for a software configuration.

"Software cfg file name" is the name of the current software configuration (In this example it is **sw_demo**). Key in the name of the software configuration you want to use and press 'Enter' (The software configuration you enter must be on the hard drive).

```
Hardware cfg file name: hw_demo
Software cfg file name: sw_demo
```

The following screen will then appear.

"User cfg file name" is the name of the current user configuration (In this case there is no user configuration file). This file unlike the hardware and software configuration files is optional. Key in the name of the user configuration you want to use and press 'Enter' (The user configuration you enter must be on the hard drive). If no user configuration file exists, hit the 'Spacebar' followed by the 'Enter' key to continue.

```
Hardware cfg file name: hw_demo
Software cfg file name: sw_demo
User     cfg file name:
```

The *Options* menu will re-appear, and you can select *Auto-start*.

File names

Since the files used for either a hardware or software configuration can be stored on floppy disks, it is recommended the DOS restrictions be used for file names:

- no spaces,

- file name 8 characters in length (longer is acceptable but it will be truncated if stored on a floppy),

- All alphanumeric characters are acceptable. Alphabetic characters are case sensitive,

- no control characters,

- can use the underscore "_" characters,

- cannot use "*" or "/" characters,

- It is recommended that the character set be restricted to:

  ABCDEFGHIJKLMNOPQRSTUVWXYZ

  abcdefghijklmnopqrstuvwxyz

0123456789_

Become Alternate

The *Become Alternate* selection allows you
to tell the active computer (the one you are
using) to become dormant, causing the
redundant SAC computer to become the
active SAC computer. If you press 'B' in
the Options selection and there is no
redundant computer in the configuration
you will obtain the following screen:

```
No alternative PC configured.
Hit any key to continue...
```
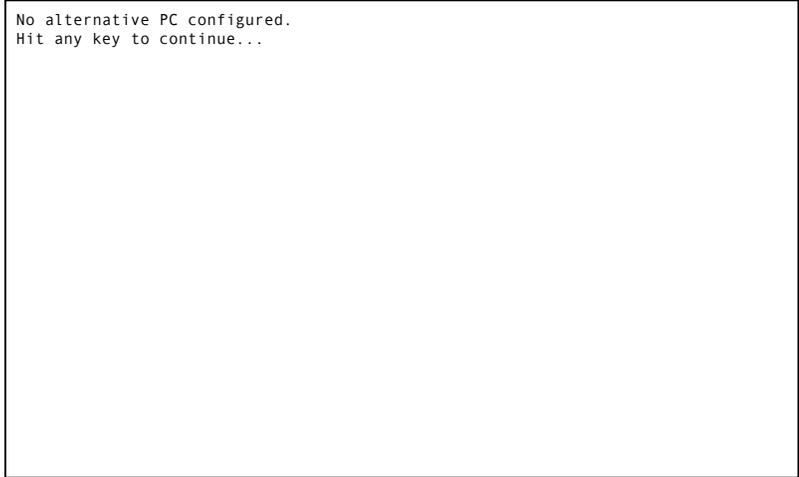
Using the DXI Shell

Now you may select the module that you
wish to access. There are four options. Note that the message at top right of the screen *(DXI Shell)* tells you what
part of the system you are in:

Option	User/Functions
Administration	System Administrator
	To specify or modify software configuration
	Need a password to access
	For more information, see the System Administration Manual
Maintenance	Hardware installer and maintenance personnel
	to specify or modify hardware configuration
	For troubleshooting
	Need a password to access
Options	Allows you to specify different hardware or software configuration.
	Normally, this would be done when the system does not re-boot following changes to the configuration (you have aborted the start-up).
	Review/change station names (need a password to access)
	Lets you choose the language of choice
	For more information, see previous section.
System	Allows you to access the SAC computer operating system (QNX) for DXI system software maintenance.
	Need a password to access

Screen Layout

DXI system menu screens are laid out as follows:

```
Administration    Maintenance    Options    System              DXI Shell




```

- The bar at top of screen displays the main menu for the module that you have selected

- The message at the upper right (on bar) shows where you are in the system, e.g., "DXI *Shell*"

- Messages at bottom of screen are for prompts, errors, etc., e.g., "Enter *DXI Admin* password"

Accessing Modules

To select an option, key in the letter that is highlighted (e.g., for Maintenance, key in 'M'). If you select Administration, Maintenance or System, you will be prompted for a password. (Typing either 'M' or 'm' will select the Maintenance menu, i.e. the selection characters are not case sensitive.)

When you make your selection, the system will prompt you for a password, if one is required.

Key in the password and press 'Enter'.

```
Administration    Maintenance    Options    System              DXI Shell









Enter DXImaint password:
```
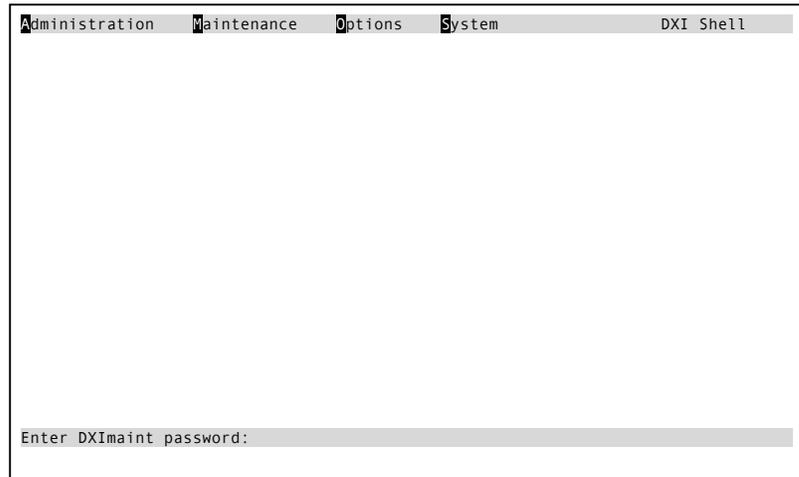
If the password is incorrect, an error message will appear at the bottom of the screen and the PC will give a beep sound.

```
Administration    Maintenance    Options    System              DXI Shell










Password incorrect.
```
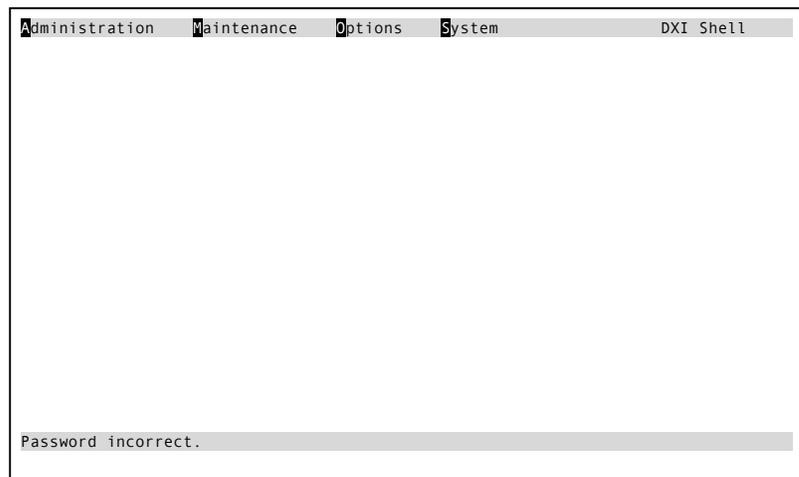
If the password you have entered is correct a message "Password correct" will appear briefly at the bottom of the screen,

```
Administration    Maintenance    Options    System              DXI Shell




















Password correct.
```

followed by the menu screen for the module you have selected (in this case the Maintenance module screen).

```
File      Edit      Maint    View    Log    Exit              DXI Maint

















```
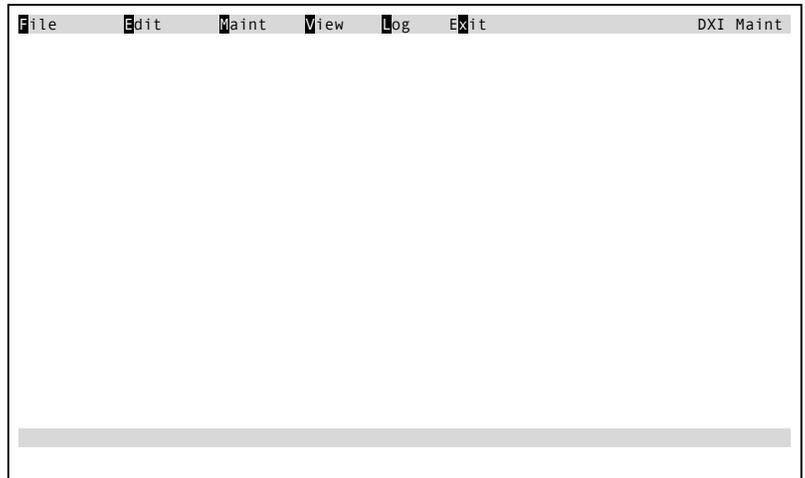
Maintenance Module

The maintenance module is used for configuration file functions; editing the hardware configuration; viewing, saving and/or printing log data; and performing system diagnostic and maintenance functions.

You can now select the function that you want. If you select *Exit*, you will return to the DXI *Shell*.

Select	If you want to
File	Load, save, backup, or restore a hardware configuration
Edit	Specify or modify the hardware configuration
Maint	Perform diagnostic and maintenance functions
View	Check on the network status
Log	View, save, and/or print log data
Exit	Return to the DXI Shell

To select a function, press the highlighted key. A menu will be presented for the function you have selected.

The Default Hardware Configuration

When the system boots up, it loads the "default" hardware configuration, which is stored on the hard drive, into the memory of the SAC computer. This is the configuration that is used to operate the system.

The default configuration is the configuration that was most recently "saved" or "loaded",

- When you modify the hardware configuration (using the *Edit* function), the configuration that is in memory, operating the system (the "current" configuration) is updated immediately, as you enter changes. However, the default configuration is not updated to reflect your changes until the current configuration is "saved". The system will prompt you to save the current configuration as you exit from the *Edit* function.

If you do not save the current configuration, and you have to restart the system, the default configuration will be loaded from the hard drive. The current configuration is lost.

At any time, you may load a configuration from the hard drive into memory. The configuration that you load overwrites the current configuration and becomes the new default configuration.

Screen saver

Normally, when you are working in the DXI system, you should exit as soon as you have completed the functions(s) you intended to perform.

If for some reason, you are in the system and you do not perform any keystrokes within a given time ("screen saver time-out"), the system will revert to "screen saver" mode. The screen will darken, and a message will appear that floats around the screen.
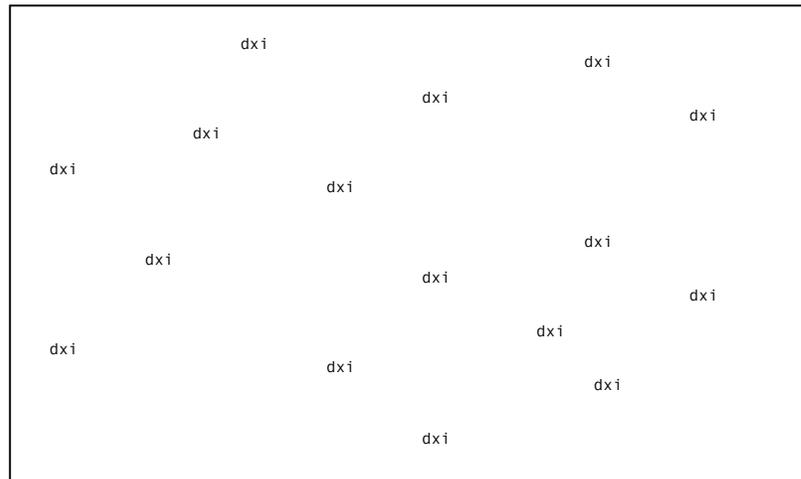
The main purpose of screen saver is to protect the screen on the monitor. It also prevents access to the system by unauthorized people if the SAC computer is left unattended.

Once the system is in screen saver mode, you are locked out. To re-access the system, press any key. You will be prompted for the screen saver password.

Key in the password and press 'Enter'. If

```
Password correct.
```
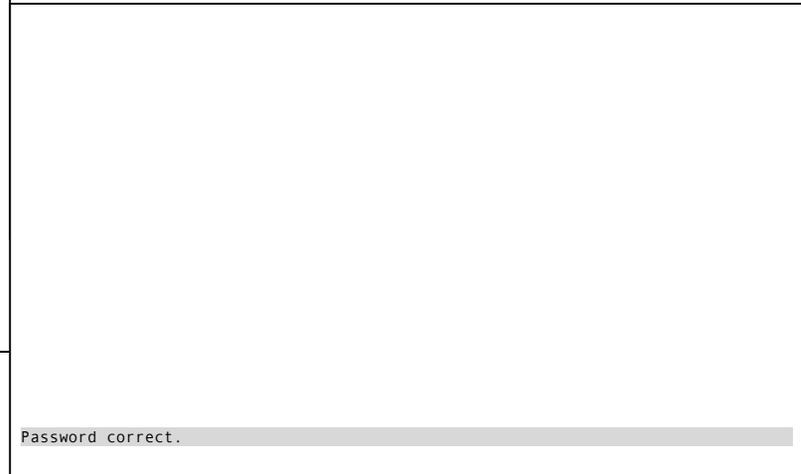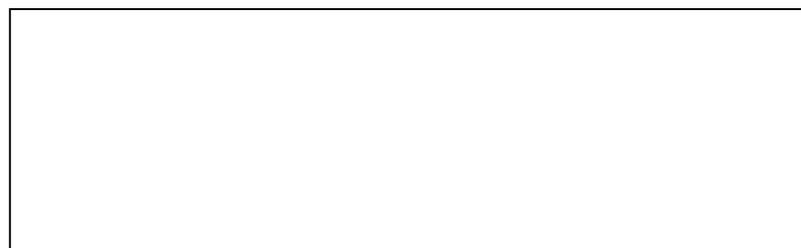
the password is accepted the following message will appear.

After pressing the 'Enter' key you will return to the place where you were working when screen saver was activated.

Screen saver Time-out

This is the elapsed time before the screen saver is activated, if no keys are pressed. The System Administrator sets this parameter.

Section 4 - Procedures for Loading, Saving, Backing up and Restoring the Hardware Configuration

In This Section...

We will:

- examine the entries for *File* selection in the Maintenance module, and

- set out procedures for loading, saving, backing up and restoring a hardware configuration.

Configuration File Functions (FILE)

The DXI allows more than one hardware configuration to be stored on the hard drive. The file function is used to manage hardware configurations. You may:

- *load* a configuration from the hard drive into memory. The configuration that you load becomes the new default configuration

- *save* a configuration. This function saves the current configuration as the new default configuration. The system will prompt you to do this whenever you exit from the Edit function, if you have made changes.

- *back up* a configuration. This will copy the default hardware (and software) configuration(s) to floppy disk.

- *restore* a configuration. You may select a configuration from the floppy disk and store it on the hard drive. The configuration that you restore does not become the default configuration until it is loaded.

When you select the *File* from the main menu of the DXI *Maint* module, these options will be presented;

To select *Load Hardware, Save Hardware, Backup to Disk* or *Restore From Disk*, press the highlighted key.

```
File        Edit       Maint     View     Log     Exit              DXI Maint
 Load Hardware
 Save Hardware
 Backup to Disk
 Restore from Disk
```
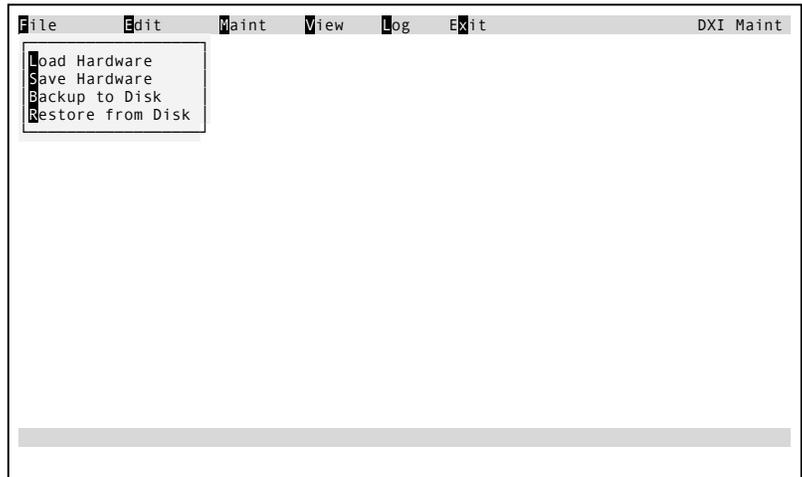
Load Hardware

Remember that when you *load* a hardware configuration, it becomes the default configuration.

```
Hardware cfg file to load: hw_demo
```

When you select *Load Hardware*, the following screen will appear. The default hardware configuration file will be displayed on the screen. You can overwrite this entry if you wish to load a different hardware configuration file.

Press the 'Enter' key and the screen will appear as shown on the right. Now the software configuration file can be typed in to overwrite the default software configuration that is initially displayed.

```
Hardware cfg file to load: hw_demo
Software cfg file to load: sw_demo
```

Once the software configuration is specified press the 'Enter' key and as the hardware configuration is loaded the following screen will be displayed:

```
DXI HW configuration compiler and downloader Version 1.0b1 (95-03-01)
                        (c) 1994 Harding Instrument Co. Ltd.
Hit any key to continue...
```

Press any key to continue and the software configuration will be loaded. Once the software configuration has been loaded a "Sending configuration to the nodes..." message will appear at the bottom of the screen.

The configuration you selected will now be operative. You will return to the Maint menu.

```
DXI HW configuration compiler and downloader Version 1.0b1 (95-03-01)
                              (c) 1994 Harding Instrument Co. Ltd.
Hit any key to continue...
```

```
Sending configuration to nodes...
```

Save Hardware

Remember when you *save* a hardware configuration it becomes the default configuration. Normally you will do this after you have made changes to the hardware configuration.

When you select *Save Hardware*, the following screen will appear:

```
Hardware cfg file to save to: hw_demo
```

Key in the name of the configuration file you want to save to and press 'Enter'.

Remember the name of the previous configuration file since you may need to revert back if the new configuration causes problems.

The current configuration is saved to the specified configuration file. It becomes the new default configuration. After pressing the 'Enter' key you will return to the Maintenance menu.

```
Hardware cfg file to save to: hardware
```

Backup to Disk

The *Backup to Disk* function will save the default hardware (and software) configuration(s) to a floppy disk.

```
Insert formatted DOS floppy in drive A.
Copy config files to floppy? (y/n)  n
```

When you select *Backup to Disk*, the following screen will appear:

Select 'Y' (yes) or 'N' (no) and press 'Enter'.

If you select 'Y', the default configurations are copied to disk, and the following message will appear on the screen:

```
Insert formatted DOS floppy in drive A.
Copy config files to floppy? (y/n)    y

Zipping hw_demo to floppy drive A as hw_demo...
Zipping sw_demo to floppy drive A as sw_demo...
```

You will return to the Maintenance menu.

Restore from Disk

Remember that when you *restore* a software configuration from a floppy disk it is stored on the hard drive. It does not become the default configuration unless it is loaded.

```
Restoring Configuration from:  Floppy Drive
                               Hard Drive

Hit Enter to continue; End to quit.
```

When you select *Restore from Disk*, the following screen will appear:

Use the ↑ or ↓ arrow keys to toggle between the Floppy and Hard Drive. (The selected Drive will be highlighted.)

When you press 'Enter', the files on the disk are displayed.

Select the configuration you want to restore and press 'Enter'.

```
Restoring Configuration from:  Floppy Drive
                               Hard Drive

Hit Enter to continue; End to quit.

List of files on this floppy...
HARDWARE.zip
SOFTWARE.zip
Hw_demo.zip
Sw_demo.zip


Enter name of file to restore (End to quit):
```

When the configuration has been restored, the message is repeated:

This gives you the opportunity to restore more than one configuration. When you have finished, press 'End' and you will return to the Maintenance menu.

```
Restoring Configuration from:  Floppy Drive
                               Hard Drive

Hit Enter to continue; End to quit.

List of files on this floppy…is:
HARDWARE.zip
SOFTWARE.zip
hw_demo.zip
sw_demo

Enter name of file to restore (End to quit): hw_demo.zip

Restoring hw_demo.zip from floppy drive A...
Exploding: /home/dxi/config/hw_demo

Enter name of file to restore: (End to quit):
```

Section 5 - Modifying and Viewing the Hardware Configuration, Setting Alarm Thresholds and PCLTA Operating Characteristics

In this Section...
We will:

- examine the *Edit* selection in the Maintenance module, and

- examine how to specifying or changing the hardware configuration.

- Examine how to set up the alarm (ALA) thresholds

Editing Functions (EDIT)

The editing functions are used to specify and modify the hardware configuration.

When you select the *Edit* function, the following options will be presented:

```
File       Edit      Maint     View    Log    Exit                  DXI Maint
          ┌──────────────────────────┐
          │Modify Hardware           │
          │View Hardware             │
          │Alarm Thresholds          │
          │PCLTA Card Settings       │
          └──────────────────────────┘
```
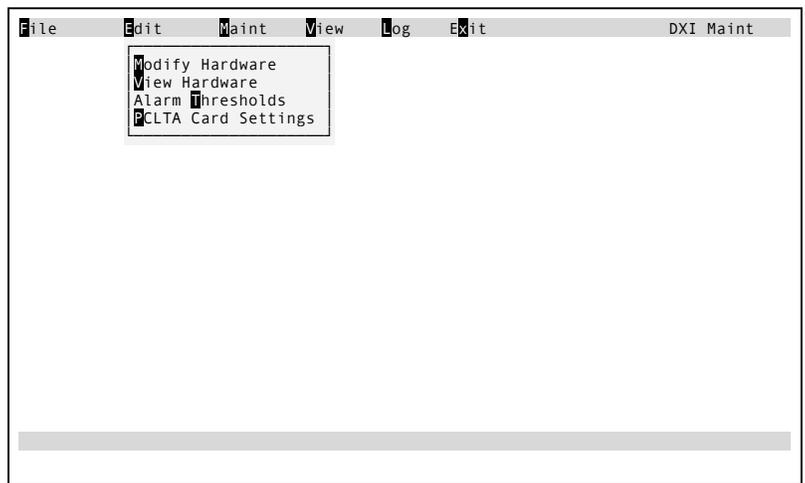
Note: The *View Hardware* function is not described in this manual. The *Modify Hardware* functions and *View Hardware* functions are similar except that no changes can be made when *View Hardware* is selected.

Modify Hardware

You will need to use the modify functions:

- during system setup, and

- whenever the hardware configuration is changed.

When you select Modify Hardware, the "database prompt" screen will appear as shown on the right. Using the Left-arrow and Right-arrow keys you may now select *Exchang*e, *Card*, *Tone*, *Music*, *Master*, *Station*, *Door*, *Switch Panel*, *CEPT*, *Radio Messages*, *Globals* or *Exit*. When you make your selection, the data entry screen for the database you have selected will appear.

```
Database to modify?    Exit                    (←/→ to select)
```
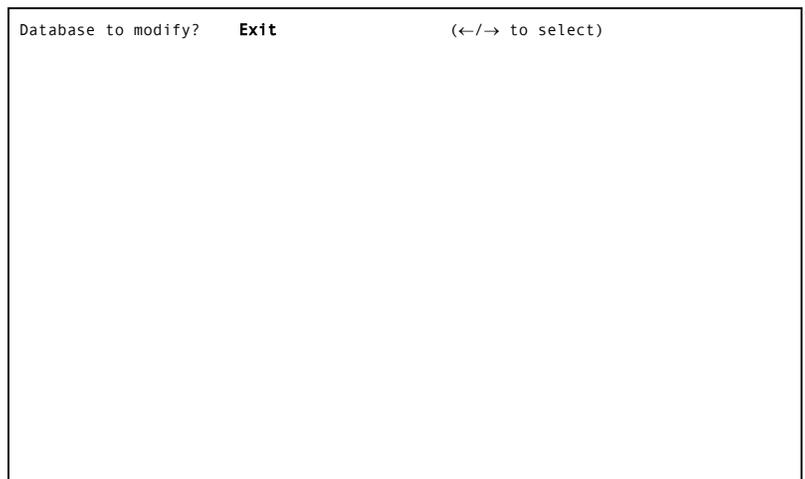
Exchange	allows you to specify or modify the hardware configuration for an exchange.
Card	allows you to specify or modify the hardware configuration for a card.
Tone	allows you to specify or modify the configuration for a signal tone.
Music	allows you to specify or modify the configuration for a music program source.
Master	allows you to specify or modify the hardware configuration for a master station.
Station	allows you to specify or modify the configuration for a station.
Door	allows you to specify or modify the configuration for a door monitor and control station.
Switch Panel	allows you to specify or modify the configuration for a switch panel.
CEPT	allows you to specify the CEPT network.
Radio	allows you to specify or modify a radio.
Message	allows you to specify or modify messages
Globals	sets parameters that are common to all hardware devices

If you are installing the system, you must specify parameters for all of the above (if they apply to your system). If you are modifying the hardware configuration you must specify parameters only for those items that are affected by the change(s).

Function Keys

Once you have selected a hardware device (i.e. exchange, card) a data field for the selected item will appear. The following keys are used on the data entry screens to move from field to field, from record to record and from page to page. The same keys are used to edit all settings.

Down Arrow, Enter	will move you to the next field
Up Arrow	will move you to the previous field
Home	will take you to the next page for that device (if there is more than one page per record)
PgDn	will take you to the next device, same page
PgUp	will take you to the previous device, same page
End	will take you back to the modify menu.
F1	Help - will bring up an on-line help screen for the selected item
F2	search for device by ID number
F3	search for device by name
F8	renumber devices (used for Station configurations only)
F9	to Delete an ID number to a selected database
F10	to Add an ID number to a selected database

To Select a Different Device

If you want to select a different device, use PgDn or PgUp to page through the devices until you find the one you want.

Quick Search for a particular device

The function keys F2 and F3 can help you quickly find a particular device without paging through a long list. The function key F2 does an ID search while function key F3 carries out a name search.

If we press 'F2' the following screen will appear:

You can then type in the ID number of the device you want to select and press 'Enter'. The screen display for the device with that ID number will be immediately displayed.

```
↓ / Enter: Next Field.           ↑: Previous field.          Home: Next Page
   ←/→: Select          PgUp/PgDn: Next/previous entry        End: Quit
                                      F9: Delete  F10: Add      F1: Help
  Master ID:              1                      Page 1 of 2

Exchange:              1
MCB Card ID:           1
Main spkr card ID:     11
Main spkr resource:    16     (for full duplex must be even channel)
VOX:                   0      (0=False 1=True)
Full duplex:           0      (0=Half 1=Full 2=Output only)
MCB audio xfer stn:    0
Ext audio xfer stn:    0
Trouble Lite Stn ID:   0
Display:               4x20 LCD
Hands free card ID:    0
Hands free resource:   0
Hands free pulse:      0      (milliseconds)
Input level:           1      (0=Mic 1=Line)(for AIO)
Output level:          1      (0=Mic 1=Line)(for AIO)
Auto PTT output:       0      (0=Off 1=On)   (for AIO)
PTT input on SW B:     0      (0=SWA 1=SWB)(for SAB-300/400)
Ext buzzer card ID:    0
Ext buzzer resource:   0
Ext buzzer pulse:      0      (milliseconds
```

You can also do a search using the F3 function key. If you press 'F3' the following highlighted box will appear:

You can then type in the name of the device (or part of the name) you want to select and press 'Enter'.

```
↓ / Enter: Next Field.           ↑: Previous field.          Home: Next Page
   ←/→: Select          PgUp/PgDn: Next/previous entry        End: Quit
                                      F9: Delete  F10: Add      F1: Help
  Name English:          _                      Page 1 of 2

Exchange:              1
MCB Card ID:           1
Main spkr card ID:     11
Main spkr resource:    16     (for full duplex must be even channel)
VOX:                   0      (0=False 1=True)
Full duplex:           0      (0=Half 1=Full 2=Output only)
MCB audio xfer stn:    0
Ext audio xfer stn:    0
Trouble Lite Stn ID:   0
Display:               4x20 LCD
Hands free card ID:    0
Hands free resource:   0
Hands free pulse:      0      (milliseconds)
Input level:           1      (0=Mic 1=Line)(for AIO)
Output level:          1      (0=Mic 1=Line)(for AIO)
Auto PTT output:       0      (0=Off 1=On)   (for AIO)
PTT input on SW B:     0      (0=SWA 1=SWB)(for SAB-300/400)
Ext buzzer card ID:    0
Ext buzzer resource:   0
Ext buzzer pulse:      0      (milliseconds
```

On-line Help

The help function key ("F1") allows you to view an on-line help screen. If you are viewing a screen and have moved the cursor to select a particular parameter, pressing the function key 'F1' will bring up a screen describing that parameter. As an example if we were viewing Page 1 of a Master database we would have a screen presentation similar to the following:

```
↓ / Enter: Next Field.           ↑: Previous field.          Home: Next Page
   ←/→: Select          PgUp/PgDn: Next/previous entry        End: Quit
                                      F9: Delete  F10: Add      F1: Help
Master ID:             2                      Page 1 of 2
Is Group:              Master
Exchange:              1
MCB Card ID:           1
Main spkr card ID:     11
Main spkr resource:    16     (for full duplex must be even channel)
VOX:                   0      (0=False 1=True)
Full duplex:           0      (0=Half 1=Full 2=Output only)
MCB audio xfer stn:    0
Ext audio xfer stn:    0
Trouble Lite Stn ID:   0
Display:               4x20 LCD
Hands free card ID:    0
Hands free resource:   0
Hands free pulse:      0      (milliseconds)
Input level:           1      (0=Mic 1=Line)(for AIO)
Output level:          1      (0=Mic 1=Line)(for AIO)
Auto PTT output:       0      (0=Off 1=On)   (for AIO)
PTT input on SW B:     0      (0=SWA 1=SWB)(for SAB-300/400)
Ext buzzer card ID:    0
Ext buzzer resource:   0
Ext buzzer pulse:      0      (milliseconds
```

If the cursor is moved down to the parameter *Display* and you press the key 'F1' the following on-line screen message will appear:

```
┌────────────────────────────────────────────────────────────┐
│ Display                                                     │
│  This describes the type of display for the master (None or 4x20LCD). If │
│  If the master has no display, it should be set to None for optimal     │
│  performance.                                               │
│                                                             │
│                                                             │
│                                                             │
│                                                             │
│                                                             │
│                                                             │
│                                                             │
│                                                             │
│                                                             │
└────────────────────────────────────────────────────────────┘
Any key to continue...
```
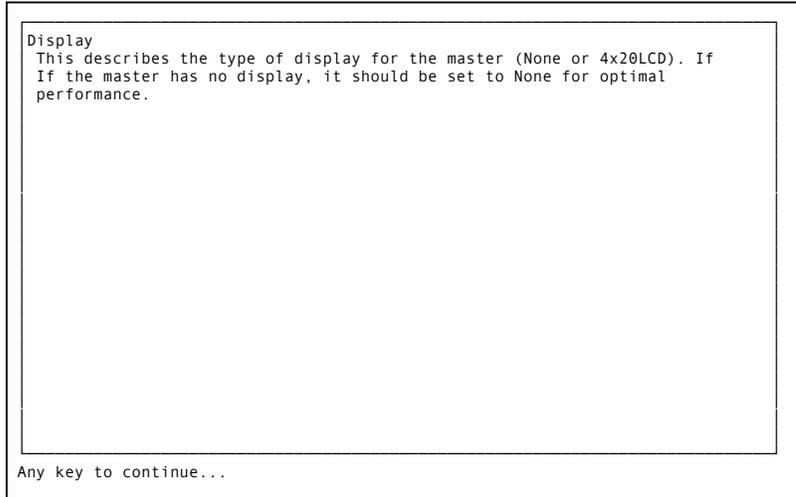
Add, Delete, or Renumber Devices from the Modify Hardware function

Once a particular device has been selected it can be added (copied) or deleted by using the F9 or F10 function keys. If we press 'F9' to delete a device the following screen will appear.

By typing 'Y' the device will be removed from the database.

```
↓ / Enter: Next Field.          ↑: Previous field.          Home: Next Page
   ←/→: Select          PgDn/PgUp: Next/previous entry          End: Quit

┌────────────────────────────────────────────────────────────┐
│ Delete ID number 1?                                         │
│ Hit Y to accept, N to reject_                               │
└────────────────────────────────────────────────────────────┘
Name (Spanish):       ?
QNX ID (PC A):        1
QNX ID (PC B):        0
PC A PCLTA 1 Side A:
PC A PCLTA 1 Side B:
PC A PCLTA 2 Side A:
PC A PCLTA 2 Side B:
PC B PCLTA 1 Side A:
PC B PCLTA 1 Side B:
PC B PCLTA 2 Side A:
PC B PCLTA 2 Side B:
```
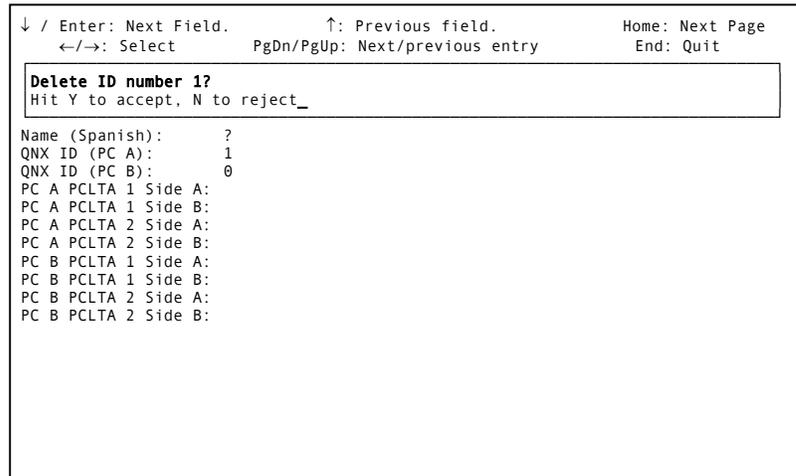
If we press the 'F10' function key for Add the following screen appears:

You can then type in the ID number of the device you wish to add to the database. (In this example we would be adding an Exchange to our system.) The added device is a copy of the currently selected device.

```
↓ / Enter: Next Field.          ↑: Previous field.          Home: Next Page
   ←/→: Select          PgDn/PgUp: Next/previous entry          End: Quit
                                F9: Delete  F10: Add      F1: Help
┌────────────────────────────────────────────────────────────┐
│ Exchange ID           1                                     │
└────────────────────────────────────────────────────────────┘
Name(French):         ?
Name(Spenish):        ?
QNX ID (PC A):        1
QNX ID (PC B):        0
PC A PCLTA 1 Side A:
PC A PCLTA 1 Side B:
PC A PCLTA 2 Side A:
PC A PCLTA 2 Side B:
PC B PCLTA 1 Side A:
PC B PCLTA 1 Side B:
PC B PCLTA 2 Side A:
PC B PCLTA 2 Side B:
```
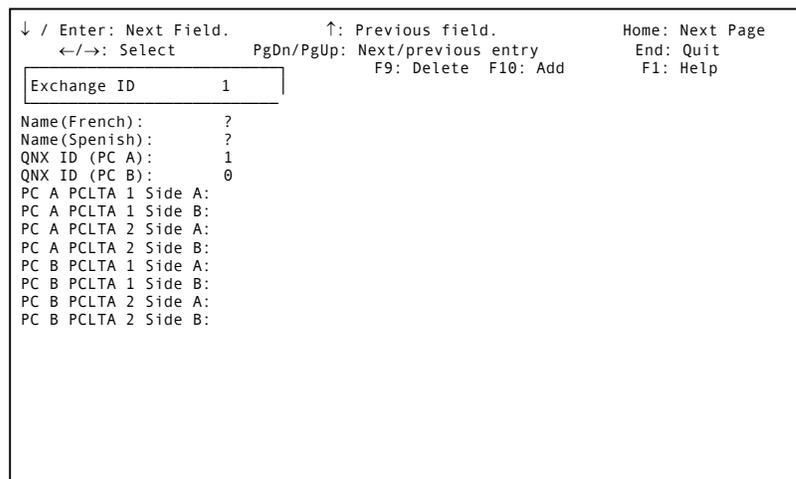
Once the device has been added you will then need to fill in the data field for that device and you will be prompted to do so by the following screen:

```
↓ / Enter: Next Field.           ↑: Previous field.            Home: Next Page
   ←/→: Select         PgDn/PgUp: Next/previous entry          End: Quit
┌────────────────────────────────────────────────────────────────────────────┐
│ Add new record # to database?                                              │
│ Hit Y to accept, N to reject_                                              │
└────────────────────────────────────────────────────────────────────────────┘
Name (Spanish):     ?
QNX ID (PC A):      1
QNX ID (PC B):      0
PC A: PCLTA 1 Side A
PC A: PCLTA 1 Side B
PC A: PCLTA 2 Side A
PC A: PCLTA 2 Side B
PC B: PCLTA 1 Side A
PC B: PCLTA 1 Side B
PC B: PCLTA 2 Side A
PC B: PCLTA 2 Side B
```

To renumber a station, bring up the screen for the station, and then press 'F8'. The screen display will appear as follows:

You can then type in the new station number.

```
↓ / Enter: Next Field.           ↑: Previous field.            Home: Next Page
   ←/→: Select         PgUp/PgDn: Next/previous entry          End: Quit
                             ┌─number   F9: Delete  F10: Add      F1: Help
│ Station ID:        1        │          Page 1 of 2
└─────────────────────────────┘
Audio card ID:      11
Audio resource:     1
Video In Res 1:     0.0                       (Card Resource.Preset)
Video In Res 2:     0.0                       (Card Resource.Preset)
Video In Res 3:     0.0                       (Card Resource.Preset)
Video In Res 4:     0.0                       (Card Resource.Preset)
Video Out card ID:  0
Video Out resource: 0
Output card:        0
Output resource:    0
Exchange:           1
Station has LED:    0        (0=No 1=Yes)
Station camera list:
Stn-camera map:
Alarm FAAS Pt:      0.1.1
Dsbl FAAS pt:       0.0.0
Fault FAAS Pt:      0.1.2
Secondary FAAS pt:  0.0.0
Full duplex:        0        (0=Half 1=Full)
Sidetone:           0        (0=Off 1=On)
```

You will then be prompted to either accept or reject the change in ID numbers. If you type 'Y' to accept the renumbering then the current station is renumbered, but all of the parameters will remain the same.

```
↓ / Enter: Next Field.           ↑: Previous field.            Home: Next Page
   ←/→: Select         PgUp/PgDn: Next/previous entry          End: Quit
┌────────────────────────────────────────────────────────────────────────────┐
│ Renumber ID from 1 to 2 #                                                  │
│ Hit Y to accept, N to reject_                                             │
└────────────────────────────────────────────────────────────────────────────┘
Audio resource:     1
Video In Res 1:     0.0                       (Card Resource.Preset)
Video In Res 2:     0.0                       (Card Resource.Preset)
Video In Res 3:     0.0                       (Card Resource.Preset)
Video In Res 4:     0.0                       (Card Resource.Preset)
Video Out card ID:  0
Video Out resource: 0
Output card:        0
Output resource:    0
Exchange:           1
Station has LED:    0        (0=No 1=Yes)
Station camera list:
Stn-camera map:
Alarm FAAS Pt:      0.1.1
Dsbl FAAS pt:       0.0.0
Fault FAAS Pt:      0.1.2
Secondary FAAS pt:  0.0.0
Full duplex:        0        (0=Half 1=Full)
Sidetone:           0        (0=Off 1=On)
```

When you have finished

As you are making changes to the database for the selected devices the current hardware configuration is updated as you enter changes.

When you have completed specifications of or changes to the device, press 'End' and you will return to the database prompt. You may now access other devices where you want to change the database.

When you have completed the hardware configuration for all hardware devices, select 'Exit', and press 'Enter'. If the changes you have made affect any hardware settings, the message "Sending configuration to nodes" will appear at the bottom of the screen. There will be a slight delay while this takes place.

When the configuration had been sent to nodes, the screen will clear, and you will be prompted to save the new hardware configuration.

Exchange Configuration

Specification of and changes to the
exchange configuration are made from the
"Exchange" database. When you select
Exchange, page one of the hardware
configuration for the first Exchange in the
system (the Exchange with the lowest ID)
will be presented.

Note that there are two pages of parameters
for an Exchange.

```
↓ / Enter: Next Field.          ↑: Previous field.          Home: Next Page
   ←/→: Select        PgUp/PgDn: Next/previous entry          End: Quit
                              F9: Delete  F10: Add        F1: Help
Exchange ID:            1     Page 1 of 2
Name(English):         Exchange 1
Name(French):          ?
Name(Spenish):         ?
QNX ID (PC A):         1
QNX ID (PC B):         0
PC A PCLTA 1 Side A:
PC A PCLTA 1 Side B:
PC A PCLTA 2 Side A:
PC A PCLTA 2 Side B:
PC B PCLTA 1 Side A:
PC B PCLTA 1 Side B:
PC B PCLTA 2 Side A:
PC B PCLTA 2 Side B:
```

*Programming Page 1 of the Exchange
database*

For each Exchange (SAC computer or redundant pair of SAC computers) in your system, you must specify:

Exchange ID	set to a value of 1 to 65535
	A unique number between 1 and 65535 that identifies the Exchange. An Exchange is a DXI system containing Masters, Stations, Doors etc.; all controlled by a single PC or two PCs where one is redundant.
Name	The name of the exchange in English, French, and Spanish that will be used for logging and display.
QNX ID (PC A)	set to a value of 1 to 65535
QNX ID (PC B)	set to a value of 1 to 65535
	Each SAC computer in the system must have a unique QNX node ID. This node ID is assigned during the installation of the QNX operating system and cannot be changed (Contact DXI support for more information). If the system uses only one PC, QNX ID (PC B) will be zero. If the exchange uses two PCs, where one is redundant, then identification numbers for both QNX ID (PC A) and QNX ID (PC B) must be specified.
PC A PCLTA 1 Side A	
PC A PCLTA 1 Side B	
PC A PCLTA 2 Side A	
PC A PCLTA 2 Side B	
PC B PCLTA 1 Side A	
PC B PCLTA 1 Side B	
PC B PCLTA 2 Side A	
PC B PCLTA 2 Side B	
	Each SAC computer in the Exchange may have one or two PCLTA cards, with each PCLTA card having one or two daughter cards. The PCs are referred to as PC A and PC B while the PCLTA cards on each PC are referred to as PCLTA 1 and PCLTA 2. The

modules on each PCLTA card are referred to as Side A (typically the top module) and Side B (typically the bottom module).

If the cursor is moved down to select *PC A PCLTA 1 Side A* for example a message "Hit Enter to edit" will appear on the screen beside the PC A PCLTA 1 Side A text. If you press 'Enter' a set of four additional parameters to be filled in for this database entry will appear at the bottom of the screen. The following screen display will be presented:

```
↓ / Enter: Next Field.          ↑: Previous field.          Home: Next Page
   ←/→: Select       PgUp/PgDn: Next/previous entry          End: Quit
                                F9: Delete  F10: Add         F1: Help
Exchange ID:           1                    Page 1 of 2
Name(English):         Exchange 1
Name(French):          ?
Name(Spenish):         ?
QNX ID (PC A):         1
QNX ID (PC B):         0
PC A PCLTA 1 Side A:
PC A PCLTA 1 Side B:
PC A PCLTA 2 Side A:
PC A PCLTA 2 Side B:
PC B PCLTA 1 Side A:
PC B PCLTA 1 Side B:
PC B PCLTA 2 Side A:
PC B PCLTA 2 Side B:



LonTalk Adapter:       PCLTA
Channel:               Backplane
Address:               340  (Hex: 0 t0 3FF: must match DIP switches on card)
IRQ:                   15   (5/9/10/11/15)
Clock rate;            10hz
```

LonTalk Adapter   Select PCLTA, SLTA, or PCI PCLTA

There are two types of LonTalk Adapters. The first is the PCLTA card (PC LonTalk Adapter), which is an ISA card installed in the computer. The connectors for this are on the back of the computer. The second type is the SLTA (Serial LonTalk Adapter) a standalone box that is connected to one of the PC's serial ports. This must be selected correctly for the LonWorks network to work properly. (If you select SLTA the parameter menu will change from the above menu.)

Channel   select Backplane, No channel, Remote A, or Remote B

This is the type of PCLTA channel used to communicate to an Echelon card. This is set automatically when the card is detected by the system (when the installer presses the service pin on the card to identify it). The channel may be either Backplane for direct connect modules, and Remote A or B for FTT modules. If there is only one FTT module on the PC, use Remote A. If there are two redundant FTT modules on the PC, one module will be remote A and the other Remote B.

Address   set to hex address 0 to 3FF

For PCLTA cards this address is set on the PCLTA card using DIPswitches. The number entered is in hexadecimal.

IRQ   set to 5, 9, 10, 11 or 15

Each PLTA module will use one of the PC's interrupts. Select interrupts that are not used by other hardware on the PC. Valid IRQs are 5, 9, 10, 11 or 15

Clock rate   select 625Khz, 1.25Mhz, 2.5Mhz, 5Mhz or 10Mhz

The serial data rate used for communications on the PCLTA network. Normally set to the maximum 10Mhz. If the line is long then a slower speed may be required.

Caution: You need to know the SAC computer settings before changing Address, IRQ or Clock Rate, otherwise the SAC computer can hang up if set wrong.

Once you have entered the four parameters you will return to the Exchange database display with the cursor moved to the *PC A PCLTA 1 Side B* entr*y*.

If you set the LonTalk Adapter to SLTA the parameter menu will change as follows

```
↓ / Enter: Next Field.          ↑: Previous field.          Home: Next Page
    ←/→: Select          PgUp/PgDn: Next/previous entry          End: Quit
                                    F9: Delete  F10: Add      F1: Help
Exchange ID:            1                   Page 1 of 2
Name(English):          Exchange 1
Name(French):           ?
Name(Spenish):          ?
QNX ID (PC A):          1
QNX ID (PC B):          0
PC A: PCLTA 1 Side A
PC A: PCLTA 1 Side B
PC A: PCLTA 2 Side A
PC A: PCLTA 2 Side B
PC B: PCLTA 1 Side A
PC B: PCLTA 1 Side B
PC B: PCLTA 2 Side A
PC B: PCLTA 2 Side B


LonTalk Adapter:       SLTA
Channel
SLTA Port:
SLTA Baud rate:                             (bits per second)
```

Channel   select Backplane, No channel, Remote A, or Remote B

This is the type of PCLTA channel used to communicate to an Echelon card. This is set automatically when the card is detected by the system (when the installer presses the service pin on the card to identify it). The channel may be either Backplane for direct connect modules, and Remote A or B for FTT modules. If there is only one FTT module on the PC, use Remote A. If there are two redundant FTT modules on the PC, one module will be remote A and the other Remote B.

SLTA Port   this is the serial port that this SLTA (Serial LonTalk Adapter) is connected to. This can be from 1-4. This must not be assigned to any other host or SLTA card.

SLTA Baud rate   this is the baud rate that this SLTA (Serial LonTalk Adapter) runs at. This must match the SLTA card.

Pressing 'Home' will bring up page two of the screen display for the Exchange database, as shown on the right.

```
↓ / Enter: Next Field.          ↑: Previous field.          Home: Next Page
    ←/→: Select          PgUp/PgDn: Next/previous entry          End: Quit
                                    F9: Delete  F10: Add      F1: Help
Exchange ID:        1                   Page 2 of 2
Output A card:      11
Output A resource:  10
Output B card:      0
Output B resource:  0
Side A ID:          1
Side B ID:          0
Master:             1
Pings Xchs every:   1                   (0=off, 1=every second)
```

Programming Page 2 of the Exchange database

Output A card   Card ID (set to a unique value from 1 to 65535)

Output A resource   Channel number

                       Location of the output card and resource (output channel used on output card) where the output signal is sent if PC A is controlling the exchange.

Output B card   Card ID (set to a unique value from 1 to 65535)

Output B resource   Location of the output card and resource where the output signal is sent if PC B is controlling the exchange.

Side A ID

Side B ID   ID numbers set from 1 to 65535

                       This is the output ID number that is sent to an external host. The location of the external host is defined by the card and resource location.

Master   set from 1 to 65535

                       ID number of the Master Station that will receive an alarm if the system detects faulty communications between Exchanges.

Ping Xchs every   set to off ("0") or every second ("1")

                       If set to "0" no pings are sent between exchanges, if set to "1" then a ping is sent every second. This parameter only applies to systems with multiple SAC computers.

Card Configuration

Specification of and changes to the card configuration are made from the "Card" database. When you select *Card*, page one of the hardware configurations for the first Card in the system (the Card with the lowest ID) will be presented:

Note that there are three pages of parameters that may be specified for a card.

```
↓ / Enter: Next Field.         ↑: Previous field.          Home: Next Page
   ←/→: Select        PgUp/PgDn: Next/previous entry         End: Quit
                                      F9: Delete  F10: Add      F1: Help
Card ID:          2                        Page 1 of 3
Name (English):   Master # 2
Name (French):    ?
Name (Spanish):   ?
Exchange:         1
Net A channel:    Remote A
Net B channel:    Remote B
Type:             MCB
Password:         0
Serial Port:      0
Baud Rate:        0                    (bits per second)
Data bits:        0                    (7 or 8)
Stop bits:        0                    (0 to 2)
Parity:           None
Flow Control:     None
Mother Card:      0
Debounce:         25                   (milliseconds)
Master:           0                    (to report faults on)
Host Ack:         0                    (0=Off 1=On)
Set Time:         0                    (0=Off 1=On)
Log Level:        15
```

Programming Page 1 of the Card database

For each card in the system, the following hardware configuration parameters must be defined:

Card ID	set to a value of 1 to 65535
	Each card must have a unique identification number. The numbers can be set in the range from 1 to 65335. Usually cards in each card cage are assigned numbers that correspond to their position in a card cage i.e. card 101 would be the ACB in card cage 1.
Name	the name of the Card in English, French, and Spanish that will be used for logging and display.
Exchange	Exchange ID number (from 1 to 65535)
	Each card is associated with an Exchange. This number corresponds to the ID number associated with this exchange.
Net A channel	select Backplane, No channel, Remote A, or Remote B
	This is the type of PCLTA channel used to communicate to an Echelon card. This is set automatically when the card is detected by the system (when the installer presses the service pin on the card to identify it). The channel may be either Backplane for a Direct Connect module, or Remote A or B for an FTT module. If there is only one FTT module on the PC, use Remote A. If there are two redundant FTT modules on the PC, one module will be remote A and the other Remote B.
Net B channel	select Backplane, No channel, Remote A, or Remote B
Type	select from:
	DIO, MCB, SPC, ACB, RIO, TSB, RNS, TLB, ACB_101, MAB, SAB, AOB, PAB, TAB, AIB, AIO, SAB_300, SAB_400, AOB, PAB_401, SAB_401,SAB_301, PELCO_9750_CTRL, PELCO_DT9760_CTRL, GYYR_DS16C_MUX, MIMS, PCLTA, DXI_HOST, VICON, HDLC_HOST, AMERICAN_DYNAMICS, PANASONIC, ISO-1745, STARCOMM, STARCOMM_HOST, CREATIVE_HOST, MODBUS_HOST, DUMMY_CARD, DXI_TOUCHSCREEN, MARCOMM_TOUCHSCREEN, TCPIP_HOST, SIMPLEX,

	MODBUS_TCPIP_PEER, MAXPRO, FIELDBUS_HOST, MODBUS_TCPIP, OMRON, Unknown
	This entry defines the type of card.
Password	set to 1 to 65535
	Some serial Cards (e.g. Pelco) require a login with a password before communications can proceed. For MCM cards this password will define the password that allows a user to put a disabled master back into service.
Serial Port	This is the PC serial port (1 or 2 on a standard PC with no extra serial ports; a multi-port serial card may be installed in the PC to give the PC additional serial ports) used to communicate to a serial card. Note external serial devices are referred to as Cards by the DXI.
Baud Rate	This is the baud rate used by the PC's serial port for communication with a serial Card. Typical settings are 1200, 2400, 4800, 9600, and 19200 baud.
Data Bits	set to 7 or 8
	this is the number of data bits (7 or 8) used by the PC's serial port for communication with a serial Card.
Stop Bits	set to 0, 1 or 2
	This is the number of stop bits (1 or 2) used by the PC's serial port for communication with a serial Card.
Parity	select from None, Even or Odd
	This is the word parity (None, Odd, or Even) used by the PC's serial port for communication with a serial Card.
Flow Control	select from None, SW, or HW
	This is the type of flow control (None, Software, or Hardware) used by the PC's serial port for communication with a serial card.
Mother Card	Card ID (from 1 to 65535)
	For Echelon slot cards, this is the card ID of the ACB card in the same card cage. For an ACB card whose card cage is connected to another card cage via the external backplane (i.e. both card cages are in the same sub-exchange) this may be the card ID of the ACB card which has a CEPT daughter card (this will be used only if the other card cage has no CEPT daughter card of its own and it requires a connection via CEPT to another sub-exchange or exchange).
Debounce	set to a value of 1 to 65535 milliseconds
	Switch detection on DIO cards can be debounced by setting the debounce time (in milliseconds). A longer time will cause short switch presses or releases to be ignored.
Master	Master Station ID (from 1 to 65535)
	When a card fault occurs (communication between the PC and the card fails), an alarm is sent to this Master Station.
Host Acknowledge	set to Off ("0") or On ("1")
	When an external host sends a request, it is possible to acknowledge the host even if the request was successful (On), or only acknowledge the host when the request fails (Off).

Setting the Host Acknowledge to Off will reduce the number of messages between the PC and the host, but the host may require this acknowledgment.

Set Time   set to Off ("0") or On ("1")

When the time is set, either by the PC or by some Card or Host, other Cards or Hosts may require a time update (True). If they do not, this should be set to Off.

Log Level   Set to 0 to 15

The log level is set to determine how much data is logged to the Maintenance and Administration logs from the external host card (note this only applies to external host cards, all DXI cards log all of their data). A log level of 15 is the most verbose, while a log level of 0 records the least amount of data. Log levels in between these two limits will record varying amounts and types of data. The data logged depends on the type of host.

In order to access page two and three, press 'Home'. Page 2 of the card configuration database is shown on the right:

```
↓ / Enter: Next Field.           ↑: Previous field.              Home: Next Page
   ←/→: Select        PgUp/PgDn: Next/previous entry         End: Quit
                                 F9: Delete  F10: Add         F1: Help
Card ID:              2                   Page 2 of 3
Memory address:       0                   (Hex: for some PC slot cards)
DXI Mode:             0                   (for PLC host cards)
PLC Mode:             0                   (for PLC host cards)
PLC base reg:         0                   (for PLC host cards)
PLC routing path:                         (for PLC host cards)
IP In port:           10004               (typically 10004)
IP Out port:          11001               (typically 110XX)
Send NOOP every:      0                   (seconds)
Inactivity Timeout:   0                   (seconds)
2ndary ACB card ID:   0                   (for redundant ACB cards)
Nexr ACB in loop:     0                   (for ACB cards in CEPT loop)
CEPT loop number:     1                   (for ACB cards in CEPT loop)
RNS card:             0                   (for redundant card cages)
En/dis host cmds:
Host mode:            0                   (0=Peer 1=Poll 2=Cmmlicity)
```

Programming Page 2 of the Card database

Memory address   Hex memory address

Some PC cards (e.g. Modbus cards) talk to the PC via a specific address in the PC's memory. This address is entered as a hex value.

DXI node   For an Allen-Bradley PLC type host interface card, this is the node ID of the DXI computer.

PLC Mode   Set to 1 to 3

For a Modbus Plus or other PLC type host interface card, this is the node ID of the PLC host.

This is a number from 1 to 32 for a Modbus Plus host interface card.

PLC base reg   specifies the modbus register which all Modbus In/Out registers are referenced with respect to. If this is set to 400001, for example, then register 400001 calls the low-level modbus command requesting register 0. Register 400002 would reference modbus register 1, etc. This is only used for Modbus cards.

PLC routing path	this is the routing path to the PLC from the DXI computer. For a Modbus Plus host type interface card, the PLC node number setting forms the first number in this path, while this setting is the remaining path.
IP In port	Hex address
	Register address where data is read into the PC.
	When this Card is either a Marcomm serial Card or a TCP/IP interface Card, this will be used to determine the TCP/IP or UDP/IP port that the DXI receives input from the host via.
IP Out port	Hex address
	Register address where data is sent from the PC to Modbus controller.
	When this Card is a Marcomm touch screen Card this will be used to determine the UDP/IP port which the DXI sends output to the host via.
Send NOOP every	set from 1 to 65535 seconds
	A NOOP (no operation) command is sent periodically to verify the communications channel is operating.
Inactivity Timeout	set to 1 to 65535 seconds
	This is the amount of time that must elapse for a serial card to generate an inactivity alarm. Every message that the serial Card receives resets this Card's time-out.
2ndary ACB card ID	card ID (from 1 to 65535)
	A single card cage may have one ACB card or two ACB cards where one is redundant. In the case of two redundant ACBs, each ACB should have its secondary ACB Card ID set to the Card ID of the other ACB.
Next ACB in loop	card ID (from 1 to 65535)
	This describes the CEPT trunk line connections between ACB's. The CEPT daughter card on the ACB has two CEPT trunk lines; this setting identify the Card ID of the ACB which is connected to each of this ACB's primary CEPT line (Port 1).
CEPT loop number	CEPT ID
	This is the CEPT loop that is used between the card and the SAC computer. The CEPT loop is defined in the Hardware configuration under CEPT.
RNS card	card ID (from 1 to 65535)
	If a redundant Echelon Backplane communications channel is available this is the Card ID for the redundant network switcher card. This entry must be filled in for every card connected to the backplane.
En/dis host cmds	Used to tell the SAC which commands the host can respond to. This is used to prevent the SAC computer from sending certain commands to the host. When you select this you will be presented with a list of commands that the SAC can send, where you can select 'y' to allow sending the command or 'n' to prevent the SAC from sending that command.

Page three of the card database appears as follows:

```
↓ / Enter: Next Field.          ↑: Previous field.           Home: Next Page
    ←/→: Select        PgUp/PgDn: Next/previous entry        End: Quit
                                 F9: Delete  F10: Add      F1: Help
Card ID:               2                    Page 3 of 3
Comm ALM action:       Unknown
ID 1:                  0
ID 2:                  0
Master:                0
Comm FIX Action:       Unknown
ID 1:                  0
ID 2:                  0
Master:                0
Fault FAAS Pt:         0.1.2
```
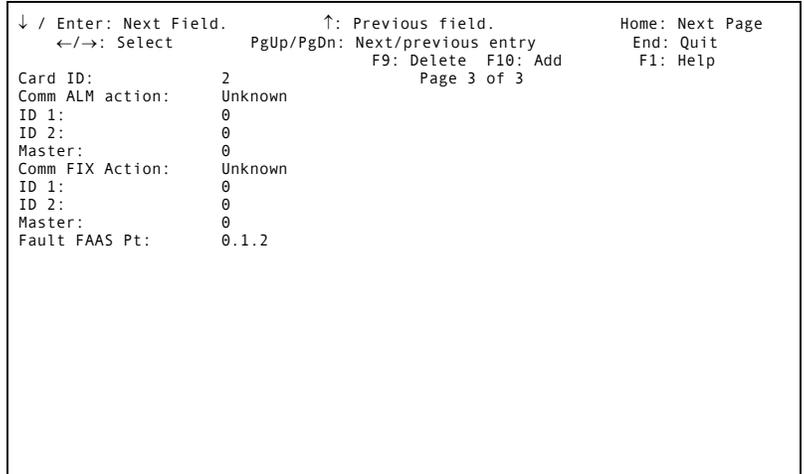
Programming Page 3 of the Card database

Comm ALM Action   selected from:

                     See Appendix 2 for a complete listing of possible Alarm actions.

                     This is the action that will be generated if a communication alarm occurs.

ID 1   set from 1 to 65535

                     An ID number used to identify the communications alarm.

ID 2   set from 1 to 65535

                     An ID number used to identify the communications alarm.

Master   Master ID (from 1 to 65535)

                     The Master Station that will receive the Communication alarm.

Comm FIX Action   selected from:

                     See Appendix 2 for a complete listing of possible Alarm actions.

ID 1   set from 1 to 65535

                     An ID number used to identify the communications alarm that has been fixed.

ID 2   set from 1 to 65535

                     An ID number used to identify the communications alarm that has been fixed.

Master   Master Station ID (from 1 to 65535)

                     The Master Station that will receive the Communication fixed signal.

Tone Configuration

Specification of and changes to the tone configuration are done from "Tone" database. When you select Tone, the hardware configuration for the first tone in the system (the tone with the lowest ID) will be presented.

```
↓ / Enter: Next Field.         ↑: Previous field.          Home: Next Page
   ←/→: Select         PgUp/PgDn: Next/previous entry      End: Quit
                                  F9: Delete  F10: Add      F1: Help
Tone ID:              1
Name (English):       500 Hz
Name (French):        ?
Name (Spanish)::      ?
Volume 1:             2                 (0-7)
Profile 1:            255               See help for description)
Num steps 1:          8
Start Freq 1:         500               (Hertz)
End Freq 1:           0                 (Hertz)
Period 1:             1000              (milliseconds)
Tone DSP:             0
```
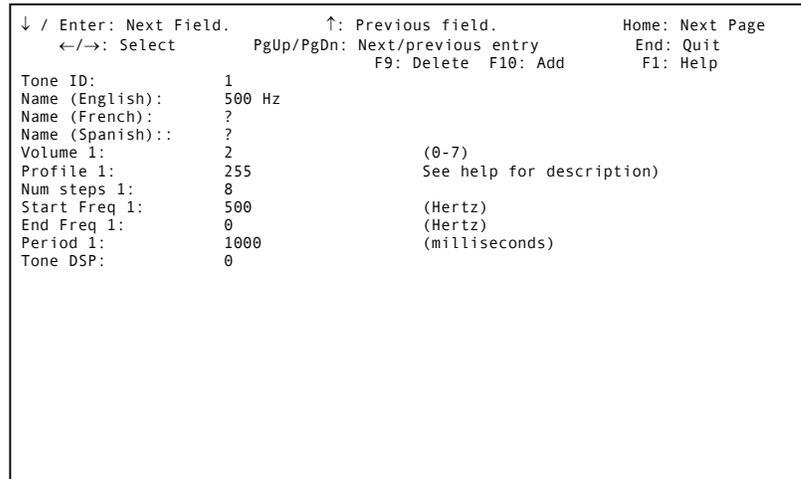
Programming the Tone database

Tone ID	set to 1 to 65535
	A unique number (between 1 and 65535) used to identify the tone source.
Name	A name assigned to the tone
Volume 1	set from 0 to 7
	This setting determines the sound volume of the tone.
Profile 1	A two digit hex word that defines the profile of a periodic tone signal. The hex number is the representation of four two-bit data fields that define the frequency profile of a tone that is divided into four equal sub-intervals. The encoding is as follows:

00   no output

01   frequency increases from initial value to End Freq.

11   frequency is constant at value at the value of the end of the previous sub-interval

10   frequency decreases to Start Freq. value or 0 if next sub-interval is encoded 00

Note: The sequence of the four 2 bit numbers is encoded in reverse order. See Appendix 3 for examples.

Num steps 1	In ramping up in a frequency sweep Num steps is the number of discrete frequency changes used to approximate a continuously changing frequency
Start Freq 1	Specified frequency (usually lowest frequency used in tone).
End Freq 1	Specified frequency (usually highest frequency used in tone).
Period 1	Duration of single period of tone signal.
Tone DSP:	0 (default), or set to 1-5
	Each ACB-100 can have up to 5DSP's. This is the DSP to which the tone is assigned. This can be assigned in one of two places. First, it can be assigned in the card database for an ACB card. This value overrides any setting in the tone database (which is the second place that the Music DSP can be assigned). Note that if you define a tone DSP on a ACB card which does not have the corresponding DSP installed, then the ACB will reset itself whenever it is configured (can't assign something to a DSP that is not present). The values for this field in the card database should be from 1-5 while the

values in the tone database should be from 0-4. A value of 0 in the card database means that the card will use the tone database's value.

For examples of Tone profiles see Appendix 3

Music Configuration

Specification of and changes to the music configuration are made from "Music" database. When you select Music, the hardware configuration for the first music source in the system (the music source with the lowest ID) will be presented.

```
↓ / Enter: Next Field.          ↑: Previous field.          Home: Next Page
   ←/→: Select       PgUp/PgDn: Next/previous entry         End: Quit
                              F9: Delete  F10: Add          F1: Help
Music ID:            1
Name (English):      CD High
Name (French):       ?
Name (Spanish)::     ?
Audio card ID:       1000
Audio resource       1
Volume:              7
Local to Exch:       0               (1=Yes, 0=No)
Input level:         1               (0=Mic 1=Line)(for AIO)
Input sensitivity    3
Music DSP:           0
```

Programming the Music database

Music ID	a unique number (between 1 and 65535) identifying the music source.
Name	a string (0 to 20 characters) for the music source's name. This will be used for logging and display.
Audio Card ID	ID of Audio Card
	The Audio Card ID where the music source is connected in the system. This may be an SAB, AIB or AIO card.
Audio resource	Channel number
	The channel in the Audio Card that the music source is connected to. The card channel number may be 1-16 for an SAB, or 1-8 for an AIB or AIO card.
Volume	set from 0 to 7
	Sets the software volume level for this music source. For music configuration, this is the output volume level (0-7) of this music ID. There can be multiple music ID's assigned to the same music card/resource input with different volume levels (but the line/mic and input sensitivities should be the same for all music ID's that use the same card/resource input)
Local to Exch	set to Yes ("1") or No ("0")
	If set to "No" then the Music source will be available to other Exchanges.
Input Level	Set to Mic ("0") or Line ("1")
	This setting adjusts for the original input source level.
Input Sensitivity	Set from 0 to 7
	Sets the hardware input sensitivity level for all music sources that use this AIB or AIO input.
Music DSP	This is the DSP to which the Music is assigned.
	This is the DSP to which the music is assigned. This can be assigned in one of two places. First, it can be assigned in the card database for an ACB card. This value overrides any setting in the music database (which is the second place that the Music DSP can be assigned). Note that if you define a music DSP on a ACB card which does

not have the corresponding DSP installed, then the ACB will reset itself whenever it is configured (can't assign something to a DSP that is not present). The values for this field in the card database should be from 1-5 while the values in the music database should be from 0-4. A value of 0 in the card database means that the card will use the music database's value.

Master Station Configuration

Specification of and changes to the Master Station configuration are made from "Master" database. When you select *Master*, page one of the software configuration for the first Master Station in the system (the Master Station with the lowest ID) will be presented.

Note that a Master Station has two pages of parameters.

```
↓ / Enter: Next Field.        ↑: Previous field.         Home: Next Page
   ←/→: Select        PgUp/PgDn: Next/previous entry       End: Quit
                                 F9: Delete  F10: Add       F1: Help
Master ID:          2                        Page 1 of 2
Is Group:           Master
Exchange:           1
MCB Card ID:        1
Main spkr card ID:  11
Main spkr resource: 16    (for full duplex must be even channel)
VOX:                0     (0=False 1=True)
Full duplex:        0     (0=Half 1=Full 2=Output only)
MCB audio xfer stn: 0
Ext audio xfer stn: 0
Trouble Lite Stn ID: 0
Display:            4x20 LCD
Hands free card ID: 0
Hands free resource: 0
Hands free pulse:   0     (milliseconds)
Input level:        1     (0=Mic 1=Line)(for AIO)
Output level:       1     (0=Mic 1=Line)(for AIO)
Auto PTT output:    0     (0=Off 1=On)  (for AIO)
PTT input on SW B:  0     (0=SWA 1=SWB)(for SAB-300/400)
Ext buzzer card ID: 0
Ext buzzer resource: 0
Ext buzzer pulse:   0     (milliseconds
```

Master Station Programming Page 1 of Master Station database

Masters may be either individual master stations or groups of master stations.

Master ID	set from 1 to 65535
	A unique number (from 1 and 65535) that identifies the Master Station or Master Group. Note that Master Stations and Master Groups may not have the same ID number.
Is Group	select Master or Group
	Master is a single Master Station while Group is several Master Stations given a single ID number. Call requests, for example, will be displayed at all Master Stations in the Group.
Note:	If a Master is defined as a Group the screen display will change and all the remaining items, except for Exchange, will disappear i.e. the remaining items are specified only for individual Master Stations and have no meaning for a Group.
Exchange	Exchange ID (from 1 to 65535)
	The ID of the exchange to which the master belongs.
MCB Card ID	ID number if MCB Card (from 1 to 65535)
	The ID of the master control board (MCB) card that the master uses for display output and keyboard input. Note that some masters do not have an MCB (e.g. door control system with a manual control panel).
Main spkr card ID	the location of the master speaker / microphone in the system (the resource to which the system will connect master audio). It consists of a card ID (usually an SAB card) and a channel (usually 1 to 16).
Main spkr resource	the channel associated with the main speaker card.
VOX	set to True ("1"), or False ("0")
	When the master audio is in half-duplex mode, setting VOX to True will allow hands-free Push To Talk (PTT) operation. The system will transmit when a certain audio level

of audio is detected, and switch to idle when the audio drops below that level. Setting VOX to False will require the user to press the PTT switch on the master station in order to talk.

Full Duplex   select either Half ("0"), Full ("1"), or Output only ("2")

Set to Full ("1") when a Master Station using an MAI module is connected to this channel. The master will operate in full-duplex mode if the Master Station handset or headset is used (off-hook). Full duplex mode will allow a Master to talk and listen at the same time. When the handset is hung up, the Master audio returns to half-duplex mode (talk or listen). Set the Full-duplex setting to Half ("1") when a half-duplex only Master Station is connected. When set to Output only ("2") the master station can only be used for talking (such as a microphone paging input).

MCB audio xfer stn

Ext audio xfer stn   If the internal MCB or external audio transfer switch is installed, this is set to the ID of the dummy Station to which the transfer switch is connected (usually, the audio will be routed from the Secondary Master Station through a DIO audio channel to the transfer switch, so a dummy Station whose output is set to that DIO channel must be created). This is used for SMM audio only (200 series systems).

Trouble Lite Stn ID   station ID (set from 1 to 65535)

This is set to the ID of a Station whose output LED or buzzer is to flash whenever faults exist on the Master's active alarm queue. The flashing will stop when all faults have been acknowledged or canceled from the active alarm queue. The Card list in the software configuration is the list of Cards that affect this trouble light.

Display   select None, or 4x20 LCD

This describes the type of display for the Master (None or 4x20 LCD). If the Master has no display, it should be set to None for optimal performance.

Hands free card ID   this is the card ID assigned as the hands free output of a Telephone Set Board (TSB), which is used to force a telephone to go into the hands free mode. This should only be configured for telephones that have a connection to the TSB output.

Hands free resource   the channel used in the hands free card.

Hands free pulse   set to 1 to 65,535 milliseconds

This is the number of milliseconds to pulse the hands free output of the TSB to force the telephone into the hands free mode. This value depends on the characteristics of the particular telephone. Typical times are 1 second.

Input level   Set to Mic ("0"), or Line ("1")

The input level will be either for microphone or line level input (for AIB and AIO boards only.

Output level   set to Mic ("0"), or Line ("1")

The output level will be either for microphone or line level input (for AIB and AIO boards only.

Auto PTT output   set to Off ("0"), or On ("1")

When set to On ("1") the relay associated with this output station turns on whenever audio is sent to this channel. The relay turns on whenever the other master connected to this station presses its PTT switch (for AIO and AOB boards only).

PTT input on SW B   set to SWA ("0"), or SWB ("1")

Usually SWA on the master speaker audio channel is used as the Master's PTT switch. In some circumstances, such as handset only Master Stations, the PTT is on SWB. If the setting is SWA ("0"), which is the default setting, the PTT switch is SWA. If the setting is SWB ("1") the PTT switch is SWB. This option is used for SAB-400 boards only. Note that this swaps the switches at the SAB level.

Programming Page 2 of the Master Station database

The second page of the Master Station parameters is shown on the right.

```
↓ / Enter: Next Field.          ↑: Previous field.          Home: Next Page
   ←/→: Select          PgUp/PgDn: Next/previous entry        End: Quit
                                  F9: Delete  F10: Add       F1: Help
Master ID:          2                   Page 2 of 2
Alarm FAAS Pt:      0.1.1
Dsbl FAAS Pt:       0.1.2
Fault FAAS Pt:      0.0.0
Acked FAAS Pt:      0.0.1
Call record card ID: 0
Call record res:    0
Call record level:  0     (0=Mic 1=Line)(for AIO)
Call record gain    0     (0=0-40dB, 1=0-20dB)
In call ID:         0
In call res:        0
Sidetone:           0     (0=Off 1=On
```

Alarm FAAS Pt

Dsbl FAAS Pt.

Fault FAAS Pt.

Acked FAAS Pt.   When there is an alarm, this is the Starcom FAAS point that will be set. The format of this field is "Card.Point.Bit" where the Point is the Starcom point (from 1-1024) and the Bit is the bit to set (1 = SECURITY, 2=TAMPER, (3=FAIL unsupported)). The Card field is set to the FAAS card to which this point applies (0 if there is only one FAAS card or the user doesn't care about checking for duplicates). If the point or bit is 0, this disables this point (i.e., it is not reported to the FAAS). Note that there is currently no check made for duplicate FAAS points therefore the programmer must set these. The default values for the alarm point are as follows:

Master:

Secondary Timeout: Point=Master_ID   Bit=1

Disabled alarms: Point=Master_ID   Bit=2

Faults: Point=0   Bit=0 (not implemented)

Station:

CRQ/COD: Point=Station_ID Bit=1

Fault: Point=Station_ID Bit=2

Disable: Point=0   Bit=0

Card:

Fault: Point=Card_ID   Bit=2

Call record card ID

Call record res   the location of the call recorder output the system (the resource to which the system will
                         connect master call recorder output). It consists of a card ID (usually an AIO/AOB
                         card) and a channel (1 to 8). (For DSM audio only)

Call record level   set to Mic ("0") or Line ("1")

                         the output level will be either microphone or line level outputs. (On AOB and AIO
                         boards only)

Call record gain   the output gain mode selects a different gain range for this channel. On AIO boards,
                         0=0-40 db range, 1=0-20 db range. (On AIO-100 and AOB-100 boards only)

In call card ID

In call res   the card and resource of the call recorder output signal. This is an LED type of output
                         that is turned on when the call recorder is in use (i.e., there is audio over the call
                         recorder output). It is off if the master for this call recorder is not involved in a call.

Sidetone   Set to Off ("0") or On ("1")

                         Will turn on/off the sidetone feature. This feature allows the sound of the users voice
                         (and background noise) to be heard back on the speaker (earpiece) of a telephone. What
                         is spoken in the receiver of a telephone is heard in the speaker of the telephone.

Station Configuration

Specification of and changes to the station configuration are made from the "Station" database. When you select Station, page one of the hardware configuration for the first station in the system (the station with the lowest ID) will be presented.

Note that there are two pages of parameters for the Station database.

```
↓ / Enter: Next Field.          ↑: Previous field.          Home: Next Page
   ←/→: Select          PgUp/PgDn: Next/previous entry          End: Quit
                        F8:Renumber   F9: Delete  F10: Add          F1: Help
Station ID:          2                    Page 1 of 2
Station type:        Camera
Audio card ID:       11
Audio resource:      1
Video In Res 1:      0.0               (Card Resource.Preset)
Video In Res 2:      0.0               (Card Resource.Preset)
Video In Res 3:      0.0               (Card Resource.Preset)
Video In Res 4:      0.0               (Card Resource.Preset)
Video Out card ID:   0
Video Out resource:  0
Output card:         0
Output resource:     0
Exchange:            1
Station has LED:     0      (0=No 1=Yes)
Station camera list:
Stn-camera map:
Alarm FAAS Pt:       0.1.1
Dsbl FAAS pt:        0.0.0
Fault FAAS Pt:       0.1.2
Secondary FAAS pt:   0.0.0
Full duplex:         0      (0=Half 1=Full)
Sidetone:            0      (0=Off 1=On)
```

Programming Page 1 of the Station database

Station ID	set to 1 to 65535
	A unique number (between 1 and 65535) that is used to identify the Station. Note that Stations and Doors may not have the same ID number.
Station Type	select from:
	CRQ&Music, CRQ, CellCall, Page, Alarm, Monitor, Camera, VisBooth, Handset, MonitorGroup, CameraGroup, PageAmp, AudioGroup, Output Group, AlarmAnnunPanel, Host I/O, Unknown,
	• Monitor, Camera, Monitor Group, and Camera Group stations: when connecting monitors to cameras, the system must know which is the camera and which is the monitor.
	• Alarm station: when ending a call to an alarm station, any existing security alarm for this station is cleared, so that automatic monitoring will resume.
	• Page station: when making an audio connection to a page station, its page amp station must be known.
Audio Card ID	card ID from 1 to 65535
	The Station is connected to the audio card with this ID.
Audio Resource	card channel number (from 1 to 16 for SAB Card or 1 to 8 for AOB Card)
	The Station audio speaker and microphone are connected to this channel of the Audio Card. The card is usually an SAB or AOB, and the resource is the card channel (1 to 16 for SAB, 1 to 8 for AOB).
Video In Res 1	
Video In Res 2	
Video In Res 3	
Video In Res 4	card, resource and preset

	This is the video input that the user can assign. Video inputs are camera inputs that are selected when a station is called. Note that up to four cameras can be assigned to a station. These will all be connected to a different monitor (if the master has a monitor group that contains 4 monitors). Typically there is only one camera per station. The format of this parameter is "Card.Resource.Preset". The preset is optional (the user can specify only "Card.Resource" if no preset position is implied). The Card is the Card ID of the video controller and the resource is the resource number on that video recorder.
Video Out card ID	card ID (from 1 to 65535)
	This setting identifies the location of the monitor or video output. The Card may be a video switcher such as a Pelco or GYYR, and the resource will be the monitor number. Consult the video switcher manual for more information.
Video Out resource	channel number
	The monitor number used in the video output Card.
Output Card	card ID (from 1 to 65535)
	The location of the station output (LED, buzzer, relay connection, etc.). The card may be a DIO, SPC, SAB, or AOB, and the resource will be the output channel on that card (1 to 48 for 48-output DIO, 1 to 96 for SPC, 1 to 16 for SAB, 1 to 8 for AOB).
Output resource	channel number
	The output channel used in the output Card
Exchange	Exchange ID (from 1 to 65535)
	The Station is associated with this exchange.
Station has LED	set to No ("0") or Yes ("1")
	This should be set to Yes ("1") when the station has an LED that is controlled by the DXI. Otherwise it should be set No ("0"). This setting controls whether the output is treated as a station LED (output card and resource must be set as well for this to work)
Station Camera list	string of station IDs
	List of stations that this station has cameras for. The list is used for the Station Camera map. The format is the same as the master station call list.
Station Camera map	
	This is a list of station-camera station pairs associated with a monitor. This is normally used only when the DXI system is turning on an output to connect a camera to a monitor (turning on a different output would connect the camera to a different monitor). This is only used for more primitive video switchers that have only one output per monitor-station pair.
	The camera station must be of Type "Camera" or "Camera Group" and have an output (typically assigned to a DIO).
	If it is a camera group then the multiple outputs will be turned on when this station is connected to the master. There must be a monitor assigned to the master (Monitor is on the first page of the master definition), though that will have its output used as part of the connection. This can be a group or single monitor station.

Note that there are two pages of parameters
that may be specified for a Station. To
access page two, press 'Home'.

```
↓ / Enter:Next Field          ↑ Previous field           Home: Next Page
   ←/→ :Select          PgUp/PgDn: Next/Previous entry       End: Quit
              R8: Renumber    F9: Delete     F10: Add     F1 Help

Station ID:          2      Page 2 of 2
Switch 1 action:    Call request
Switch 1 type:      MNO
Switch 1 card:      11
Switch 1 resource:  1
Switch 1 side:      B      (A-D)
Switch 2 action:    Unknown
Switch 2 type:      Unknown
Switch 2 card:      0
Switch 2 resource:  0
Switch 2 side:      ?      (A-D)
Switch 3 action:    Unknown
Switch 3 type:      Unknown
Switch 3 card:      0
Switch 3 resource:  0
Switch 3 side:      ?      (A-D)
Switch 4 action:    Unknown
Switch 4 type:      Umknown
Switch 4 card:      0
Switch 4 resource:  0
Switch 4 side:      ?      (A-D)
```

Programming Page 2 of the Station database

Switch Action   selected from:

For a complete listing of possible switch actions see Appendix 2

These switches will have actions associated with their press and/or release (e.g. CRQ,
Music change, Camera wipe, I/O alarm, etc.). As well, each switch may have up to 4
additional actions to be performed on press or release; these are set in the software
configuration.

The following switch actions will have an implied action for the release, when
configured as latched:

Camera Wipe will wipe on press and stop wiping on release.

Monitor Hold will hold on press and release on release.

Output High, Flash, Blink, Wink will set output to on, flash, blink, or wink on
press, and off on release.

Bypass On will enable barrier bypass on press, and disable on release.

Battery Low will signal battery low on press, and battery OK on release.

Security Alarm will signal the start of a security alarm on press (this will freeze auto-
monitoring, and queue any other security alarms until this one has been cleared), and
signal end of security alarm on release (auto-stepping resumes, unless other security
alarms exist, in which case the next security alarm is processes, including processing of
any alarm-type additional actions set in the software configuration).

Switch type   select from:

MNO, MNC, Latched, Latched (Active Hi), Unsupervised MNO, Unsupervised MNC,
Unsupervised Latched, Unsup.Latched (OC), Unknown,

A station may have none or up to 4 switch inputs associated with it. The switch may be
of type Supervised (2 switches per circuit—Side A and Side B, monitored for switch
faults; requires a voltage division circuit) or Unsupervised (only Side A switch
available; no fault monitoring). The switch may be Latched (reports both press and
release), Momentary Normally Open (reports release only), or Momentary Normally

	Closed (reports press only). Latched switches are divided into two types. Latched refers to switches which are active when pressed. "Latched (Active Hi)" refers to switches are active when released (i.e., their voltage is high). Unsupervised latched switches can be active when closed or when closed, "Unsup. Latched (OC)". SPC switches must be unsupervised. (up to 4 switches per station)
Switch Card	card ID (from 1 to 65535)
Switch resource	channel number
Switch side	select A, B, C, or D

The location of the switch input. The card may be a DIO, SPC, SAB, AOB, or MIMS, and the resource will the input channel on that card (1 to 48 for 48-input DIO, 1 to 96 for SPC, 1 to 16 for SAB, 1 to 8 for AOB). The side will be Side A or B for a supervised channel with two switches, or Side A for an unsupervised channel, or Side A to D for the MIMS (Side A—inner alarm; Side B—outer alarm; Side C—inner tamper; Side D—outer tamper).

(up to 4 switches per station; each switch may have a different resource)

Door Configuration

Specification of and changes to the door configuration are made from "Door" database. When you select Door, page one of the hardware configuration for the first Door in the system (the Door with the lowest ID) will be presented.

```
↓ / Enter: Next Field.        ↑: Previous field.        Home: Next Page
   ←/→: Select        PgUp/PgDn: Next/previous entry      End: Quit
                                F9: Delete  F10: Add      F1: Help
Door ID:             101   Page 1 of 3
Close sw type:       Unsupervised MNO
Close sw card:       20
Close sw resource:   1
Close sw side:       A    (A-D)
Open sw type:        Unsupervised MNO
Open sw card:        20
Open sw resource:    17
Open sw side:        A    (A-D)
Group sw type:       Unsupervised MNO
Group sw card:       20
Group sw resource:   33
Group sw side:       A    (A-D)
Exchange             1
```

Programming Page 1 of the Door database

Door ID	set to 1 to 65565
	a unique number (between 1 and 65535) identifying the door station. Note that stations and doors may not have the same ID's.
Switch Type	selected from:
	MNO, MNC, Latched, Latched (Active Hi), Unsupervised MNO, Unsupervised MN, Unsupervised Latched, Unsup. Latched (OC), or Unknown
Switch Card	card ID (from 1 to 65535)
	The Card that is connected to the Door switches.
Switch Resource	The channel connected to the door switch
Switch side	set to A, B, C, or D
	The location of the close, open, and group door switches. The card may be a DIO or SPC, and the resource will be the input channel on that card (1 to 48 for 48-input DIO, 1 to 128 for SPC). The side will be Side A or B for a supervised channel with two switches, or Side A for an unsupervised channel.
Exchange	Exchange ID
	The Exchange the switch is associated with.

Note that there are three pages of parameters that may be specified for a door. To access pages two and three press 'Home'.

```
↓ / Enter: Next Field.          ↑: Previous field.          Home: Next Page
   ←/→: Select          PgUp/PgDn: Next/previous entry          End: Quit
                                     F9: Delete  F10: Add      F1: Help


Door ID:              101                 Page 2 of 3
Close Limit SW type: Unsupervised MNO
Close Limit SW card: 20
Close Limit SW res:  1
Close Limit SW side: A                         (A-D)
Open Limit SW type:  Unsupervised MNO
Open Limit SW card:  20
Open Limit SW res:   17
Open Limit SW side:  A                         (A-D)
```

```
↓ / Enter: Next Field.          ↑: Previous field.          Home: Next Page
   ←/→: Select          PgUp/PgDn: Next/previous entry          End: Quit
                                     F9: Delete  F10: Add      F1: Help


Door ID:              101    Page 3 of 3
Close output card:    20
Close output resource:1
Open output card:     20
Open output resource:17
Group motor card:     20
Group motor resource:33
Close motor card:     0
Close motor resource:0
Open motor card:      0
Open motor resource:  0
```

Programming pages 2 and 3 of the Door database

Close Limit switch type   select from:

> MNO, MNC, Latched, Latched (Active Hi), Unsupervised MNO, Unsupervised MN, Unsupervised Latched, Unsup. Latched (OC), or Unknown

> The close and open limit switches are mechanically operated switches used to detect closed and open doors. Switch types may be Supervised or Unsupervised, Latched, MNO, or MNC (usually Unsupervised Latched if using a manual switch).

Close limit switch card

Close limit switch resource

Close limit switch side

Open limit switch type

Open limit switch card

Open limit switch resource

Open limit switch side

The location of the close, open and group door switches. The card may be a DIO or SPC, and the resource will be the input channel on that card (1 to 48 for 48-input DIO, 1 to 128 for SPC). The side will be side A or B for supervised channel with two switches, or side A for an unsupervised channel.

Close output card

Close output resource

Open output card

Open output resource

Group motor card

Group motor resource

The location of the close, open, and group outputs (usually LED's on a manual switch panel). The card may be a DIO or SPC, and the resource will be the output channel on that card (1 to 48 for 48-output DIO, 1-128 for SPC).

Close motor card

Close motor resource

Open motor card

Open motor resource

The location of the close and open motor outputs, used to drive the doors. The card will usually be a DIO, and the resource will be the input channel on that card (1 to 48 for 48-output DIO, 1 to 128 for SPC)

Switch Panel Configuration

Specification of and changes to the switch panel configuration are made from the "Switch Panel" database. When you select Switch Panel, the hardware configuration for the first Switch Panel in the system (the Switch Panel with the lowest ID) will be presented.

```
↓ / Enter: Next Field.          ↑: Previous field.         Home: Next Page
   ←/→: Select        PgUp/PgDn: Next/previous entry        End: Quit
                                 F9: Delete  F10: Add        F1: Help
Switch ID:          1
Master:             12
Switch type:        MNO
Switch card:        400
Switch resource:    1
Switch side:        A      (A-D)
Switch action:      Mas_Vol_up_SW
ID 1:               0
```

- If you are specifying the hardware configuration for the first time, default values will be displayed.

- If you are making changes to an existing configuration, the system will display current values.

Programming the Switch Panel database

Switch ID	set to 1 to 65535
	A unique number (between 1 and 65535) that identifies the Switch Panel. There are no other settings for Switch Panels in the hardware configuration.
Master	Master Station ID (from 1 to 65535)
	The Master Station that will receive switching information from the Switch Panel
Switch type	select from:
	MNO, MNC, Latched, Latched (Active Hi), Unsupervised MNO, Unsupervised MN, Unsupervised Latched, Unsup. Latched (OC), or Unknown
Switch card	card ID (from to 65535)
	The ID of the Card that the Switch Panel is hard wired to.
Switch resource	channel number
	The channel in the Switch Card that the switch is hard wired to.
Switch side	Select A, B, C, or D
Switch action	Select from:
	Mas_Vol_up_SW, Mas_Vol_down_SW, Call_rad_SW, Inv_Call_rad_SW, Stn_CRQ_SW, Call_Mas_SW, Inv_Call_Mas_SW, Test_SW, Timed_Test_SW, Mas_disable_SW, Inv_ Mas_disable_SW , CallDis_Stn_SW, Inv_ CallDis_stn_SW, Mas_StnEnable_SW, Inv_ Mas_StnEnable_SW, Audio_Annun_Off_SW, Cancel_Stn_SW, Cell_Disable_SW, Cell_Ack_SW, Call_Tel_SW, Call_Next_SW, Guard_Tour_SW,Queue_Mas_CRQ_SW, Next_Music_zone_SW, Page_Vol_up_SW Page_Vol_down_SW, Music_To_Zone_SW, Undefined_SW, Page_zone_SW, Call_stn_SW, Inv_Page_zone_SW, Inv_Call_stn_SW, Stn_Vol_up_SW, Stn_Vol_down_SW,
ID 1	set from 1 to 65535
	ID number used to identify the switch action.

Depending on the Switch action that is selected additional parameters may appear on the screen. You can use the help menu 'F1' to obtain information on these parameters.

CEPT

When the menu item CEPT is selected the following screen is displayed:

```
↓ / Enter: Next Field.          ↑: Previous field.            Home: Next Page
   ←/→: Select         PgUp/PgDn: Next/previous entry          End: Quit
                                 F9: Delete  F10: Add        F1: Help
CEPT ID:              1
```

CEPT Programming

If you wish to change the CEPT loop that is used type in the appropriate loop number.

Radio

When the menu item Radio is selected the following screen is displayed:

```
↓ / Enter: Next Field.          ↑: Previous field.          Home: Next Page
   ←/→: Select        PgUp/PgDn: Next/previous entry        End: Quit
                                 F9: Delete  F10: Add        F1: Help
Radio ID:              120
Is Group:              Radio
Audio card ID:         12
Audio resource:        4
Input level:           0                     (0=Mic 1=Line)
Output level           0                     (0=Mic 1=Line)
Output gain mode:      1                     (0=0-40dB 1=0-20dB)
Exchange:              1
Vox:                   1                     (0=False 1=True)
```

Programming the Radio database

Radio ID   set to 1 to 65535

A unique number (between 1 and 65535) that identifies the radio.

Is Group   select Radio or Group

Each individual radio is defined as a Radio with a unique ID number. A group is several Radios (configuration is defined by the System Administrator), typically used for monitoring purposes. Radio outputs of the Group are combined as a single audio signal.

Audio card ID   set to 1 to 65535

ID of the Audio card that transmits/receives the radio signals.

Audio resource   set to the audio channel number used in the Audio card.

Input level   set to Mic ("0") or Line ("1")

Set to either microphone or line audio levels.

Output level   set to Mic ("0") or Line ("1")

Set to either microphone or line audio levels.

Output gain mode   set to 0-20db ("0") or 0-40dB ("1")

Set to give the volume adjustment setting a suitable range.

Leave this setting at "0".

Exchange   set to 1 to 65535

Set to the exchange that controls the Audio card.

VOX   Set to False ("0") or True ("1")

                A radio crosspatch function that is to operate when no squelch input is available. Setting the VOX True ("1") will VOX operation. The system will transmit when a certain level of audio is detected on the radio and switch to idle when the audio drops below that level.

                Setting VOX to False ("0") requires a squelch input to the AIO if a crosspatch function is required.

Message

When the menu item "Message" is selected
the following screen is displayed.

```
↓ / Enter: Next Field.          ↑: Previous field.          Home: Next Page
   ←/→: Select         PgUp/PgDn: Next/previous entry        End: Quit
                                    F9: Delete  F10: Add       F1: Help
Message ID:          12
Name (English):
Name (French):       ?
Name (Spanish):      ?
Audio card ID:       0
Audio resource:      0
Message source:
Volume:              0
Input level:         0                    (0=Mic 1=Line)
Input sensitivity:   0
Message DSP:         0
```
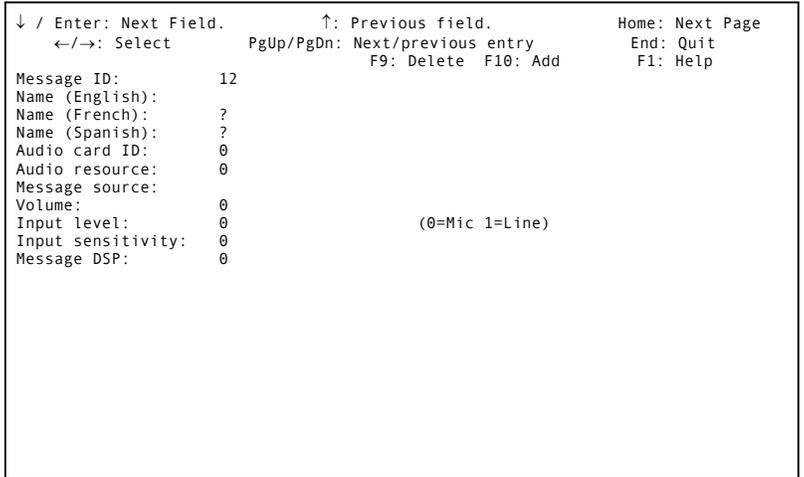
Programming the Message database

| Message ID	set to 1 to 16
	A number (between 1 and 16) that identifies the message.
Name	The name of the card, message in one of 3 languages. Used for logging and display.
Audio Card ID	set to 1 to 65535
	ID of the Audio card that transmits the message
Audio resource	set to the audio channel number used in the Audio card.
Message source	
Volume	Set to 0-7
Input level	set to Mic ("0") or Line ("1")
	The audio source can either be microphone or line level signal.
Input sensitivity	set to 0 to 7
Message DSP	

Globals

The Global parameters applies to all
hardware settings

```
↓ / Enter: Next Field.          ↑: Previous field.        Home: Next Page
   ←/→: Select          PgUp/PgDn: Next/previous entry       End: Quit
                                                              F1: Help
Sidetone level:     0                     (0=Low ... 7=High)
Damping:            3                     (0=Low ... 7=High)
Linearity:          3                     (0=Low ... 7=High)
Equalization:       3                     (0=Low ... 7=High)
Gain                3                     (0=Low ... 7=High)
```

Programming Globals database

Sidetone level   Se to 0 to 7

                        Sets the level at which the user will hear the side tone. The range of settings is from 0 to
                        7 where 0 is the lowest, and 7 is the loudest. The level 3 setting is used as the default.

Damping   Set to 0 to 7

                        The measure of how fast the system is reacting to signals on a communications circuit.
                        The range of settings is from 0 to 7 where 0 is the lowest setting and 7 is the highest
                        setting for damping. Adjusting this level affects the audio quality of the system. (This is
                        a sensitive setting, and should be modified with extreme caution.)[Note: If the setting is
                        to high the system may become unstable, and if the setting is to low the system cannot
                        react quick enough for proper operation.]

Linearity   Set to 0 to 7

                        The measure of gain versus the amount of signal power. The range of settings is from 0
                        to 7 where 0 is the lowest setting, and 7 is the highest setting for linearity. Adjusting
                        this level affects the audio quality. (This is a sensitive setting, and should be modified
                        with extreme caution.)

Equalization   Set to 0 to 7

                        Maintains the system transfer characteristics within specified limits. The range of
                        settings is from 0 to 7 where 0 is the lowest setting, and 7 is the highest setting for
                        equalization. Adjusting this level affects audio quality. (This is a sensitive setting, and
                        should be modified with extreme caution.)

Gain   Set to 0 to 7

The ratio of output power to the input power, expressed in decibels. The range of settings is from 0 to 7 where 0 is the lowest setting, and 7 is the highest setting for gain. Adjusting this level affects audio quality. (This is a sensitive setting, and should be modified with extreme caution.)

To Save Your Hardware configuration

Once you have completed the hardware configuration for all devices, you will return to the database prompt:

To exit change the "Database to modify" selection to "Exit" (as shown above) and press the 'Enter' key.
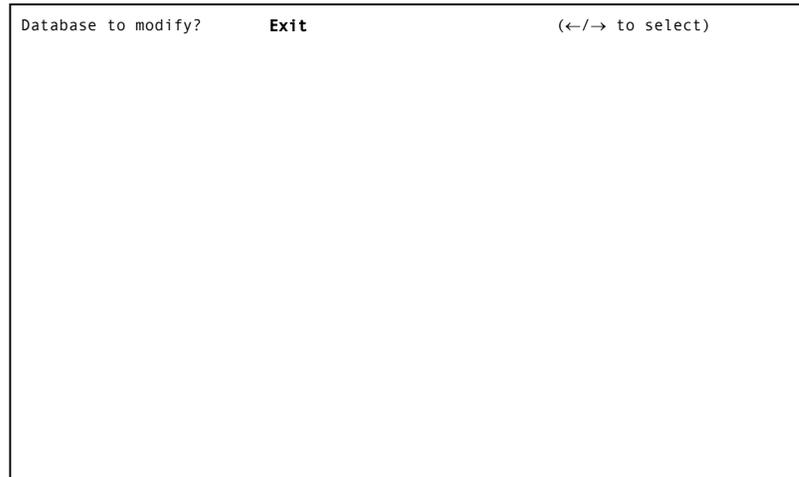
```
Database to modify?        Exit                        (←/→ to select)
```

The message "Sending configuration to nodes" will appear at the bottom of the screen.

```
Database to modify?        Exit                        (←/→ to select)




Sending configuration to nodes                                   …0…
```
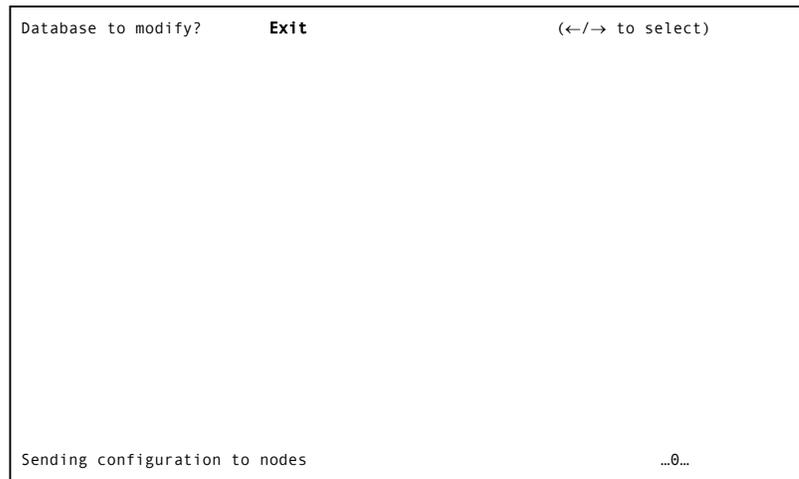
When the configuration has been sent to nodes, the screen will clear, and you will be prompted to save the hardware configuration. The default file name of the currently used hardware configuration will be displayed. If you wish to change the hardware configuration file name, you may change the suggested name and press 'Enter'. If you do not wish to change the hardware configuration file name, press 'Enter'. The following message will appear on the screen.

```
Hardwar cfg file to save to:        hw_demo
```

When the (modified) hardware configuration has been saved, you will return to the Maintenance Menu.
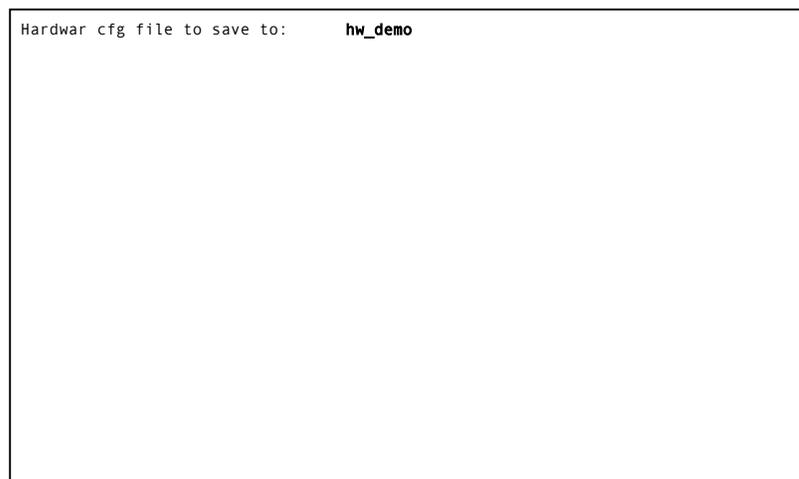
View Hardware

The View Hardware selection operates similar to the Modify Hardware, in that the screen presentations are identical. The only difference is that you are unable to perform editing functions (i.e. change parameters) and when you exit the computer will not go through an automatic save sequence.

Alarm Thresholds

Selecting *Alarm Thresholds* will bring up a menu that allows you to set a boundary for the frequency characteristics of an audio signal that will automatically trigger an alarm. If detected sounds meet or exceed these preset limits then an alarm will be generated. The screen appears as shown on the right.
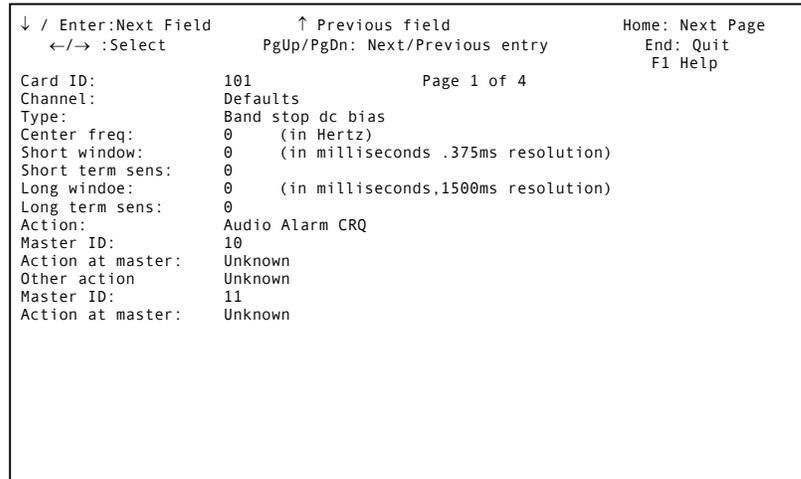
Note that there are four pages in the database for each Alarm Threshold. The additional pages of alarm settings allow an operator to select and arm different alarm thresholds for different conditions, i.e. daytime, night, holidays.

```
↓ / Enter:Next Field              ↑ Previous field              Home: Next Page
   ←/→ :Select            PgUp/PgDn: Next/Previous entry        End: Quit
                                                                F1 Help
Card ID:            101                      Page 1 of 4
Channel:            Defaults
Type:               Band stop dc bias
Center freq:        0      (in Hertz)
Short window:       0      (in milliseconds .375ms resolution)
Short term sens:    0
Long windoe:        0      (in milliseconds,1500ms resolution)
Long term sens:     0
Action:             Audio Alarm CRQ
Master ID:          10
Action at master:   Unknown
Other action        Unknown
Master ID:          11
Action at master:   Unknown
```

Block Diagram of ALA

The above block diagram gives an overview of the filter operation that provides the ALA function. Input parameters determine the type of filter, bandwidth and center frequency. The output samples from the filter are squared to provide a power measure of the signal strength. A moving sum of these values is continuously calculated. If the moving sum exceeds the threshold value an alarm condition is generated. The filter is arranged so that both a long term moving average and a short term moving average can be calculated. Either one of the moving averages can generate an alarm condition.

The sampling rate for the incoming audio signals is the telephone standard 8 kHz. This sampling frequency can be used to transmit clear voice quality audio providing the incoming audio is limit to signals below 4 kHz. Analog filters are used to limit the frequency content of the incoming audio to less than 4 kHz. This filtering means that the ALA function can be used set threshold conditions for audio signals whose frequency spectrum falls within the 350 to 3500 Hertz range.

Programming Page 1 of the Alarm Threshold database

Card ID   set to 1 to 65535

                             The ID of the ACB card where the Station audio is available for monitoring.

Channel   the channel number that is assigned to the station being monitored.

Type   Select from:

                             Band stop dc bias, Band stop all pass, Band stop 2KHz, Band stop 1KHz, Band stop
                             500 Hz, Band pass dc bias, Band pass all pass, Band pass 2KHz, Band pass 1KHz,
                             Band pass 500 Hz.

                             This selection sets the type and bandwidth (BW) of the filter.

Center freq   set from 500 to 3500 Hertz

                             This setting specifies the center frequency of a band stop or band pass filter.

Short window   set from 0 to 95625 milliseconds.

                             The length of the short window used to calculate the moving sum of rms filtered
                             samples is given by 0 to 255*375 milliseconds.

Short term sens   set from 0 to 255

                             An 8-bit number used to set the threshold value for the short window. If the moving
                             sum of the rms values for the filtered samples exceeds this threshold an alarm is
                             generated.

Long window   set from 0 to 382500 milliseconds

                             The length of the long window used to calculate the moving sum of rms filtered
                             samples is given by 0 to 255*1500 milliseconds.

Long term sens   set from 0 to 255

                             An 8-bit number used to set the threshold value of the moving sum of rms filtered
                             samples for the long window. If the moving sum exceeds this threshold value an alarm
                             is generated.

Action   select from:

                             See Appendix 2 for a complete list of possible switch actions.
                             The action to trigger when the audio alarm is actuated.

Master ID   set to 1 to 65535
                             The master station that will be notified if an alarm is generated.

Action at master   set to Queue ("0") or Call ("1")
                             If set to Queue ("0") this queues the event at the master to be answered when it is
                             acknowledged. If set to Call ("1") this automatically places the call to the master.

Other action   select from:
                             See Appendix 2 for a complete list of possible switch actions.
                             This is the second action to be triggered when the audio alarm is actuated.

Master ID   set from 1 to 65535

	A second master that will be notified if an alarm is generated. Note that the type of alarm can be different.
Action at master	set to Queue ("0") or Call ("1")
	If set to Queue ("0") this queues the event at the master to be answered when it is acknowledged. If set to Call ("1") this automatically places the call to the master.

Pages 2 to 4 are identical to Page 1. They provide additional flexibility in that they can be programmed to respond to different sound threshold characteristics. When arming the automatic ALA feature the operator only selects one of the four pages. This allows different ALA characteristics to be selected for different times of the day.

PCLTA Card Settings

From the Edit sub-menu if you select
PCLTA Card Settings you will be presented
with the following screen:

```
↓ / Enter: Next Field.           ↑: Previous field.          Home: Next Page
   ←/→: Select        PgUp/PgDn: Next/previous entry          End: Quit
                                 F9: Delete  F10: Add       F1: Help
CardID              PCLTA
Number of Retries    3
Transmit Time (msec):128
Receive Time (msec): 768
Timeout (sec):       2.00000
No. Repeaters(2/3)   2
```

The PCLTA setting are used to set operating characteristics for the LonWorks network. Normally these settings
are set when the system is initially installed and should not be changed.

Programming PCLTA Settings

Card ID

Number of Retries

Transmit Time (msec)

Receive Time (msec)

Timeout (sec)

No.Repeaters (2/3)

Section 6 - Diagnostics and Maintenance Functions

In This Section...

We will discuss:

- examine the Maint selection in the Maintenance module,

- using the self test feature to test cards while in service,

- using the test feature to achieve a functional test on cards, and

- procedures for removing, swapping or returning cards to service.

Using Maintenance Functions

These functions include a number of procedures that allow maintenance personnel to run diagnostic tests on the network and cards and to remove, install, and swap cards. The specific functions include:

|	
Selftest Card	this function will run a series of internal diagnostics on an intelligent card to see if it is operating properly. The MCB, DIO, RDB, RRB, and SPC cards can be self tested.
Test Card	this function allows an operator or maintenance personnel to conduct a functional test of a MCB, DIO, RDB, RRB, or SPC card.
Remove Card	this function is used to remove a card from the system
Swap Card	this function is used to remove a card and immediately replace it with another card (in one operation)
Return Card	this function is used to put a new card in the system to replace a card that was removed at an earlier time
Manual	this function is used to test a single output or make a connection between two stations or a master and a station.

When you select the maintenance function, these options will be presented:
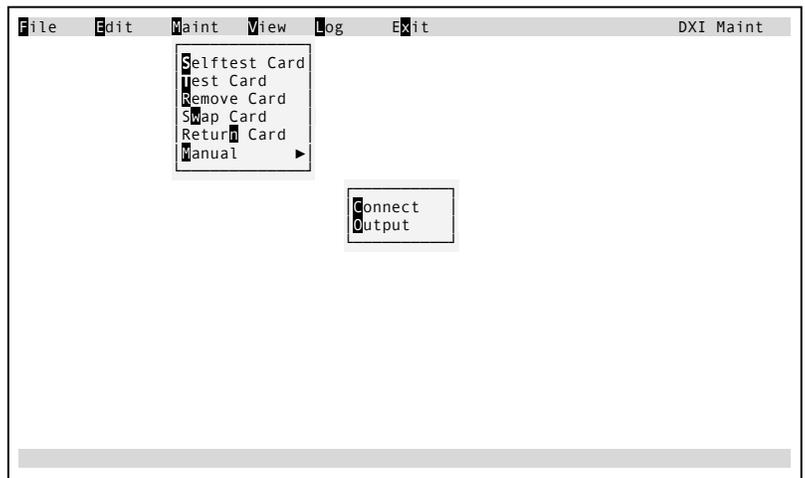
Selftest Card

This function can be used to check whether a Master Station, DIO card or SPC card is operating properly. It might be used when you are checking out the complete system and want to see if a particular card is talking properly on the network and operating correctly. A number of quick tests, which are not extensive or exhaustive, are run.

- the *master self test* performs a test on the CPU, network, LCD display RAM, and keyboard. It does not test the audio circuits, keyboard keys, beeper or backlighting (to test these features, you would conduct a functional test, using the test card function), external inputs, or relay outputs.

- the *DIO self test* performs tests on the CPU, network, and digital inputs to ensure that multiplexers and voltage references are operating properly. It does not test the actual inputs or outputs (to test these features, you would conduct a functional test, using the test card function)

- the *SPC self test* performs tests on the CPU, network, and the SPC card to verify that the card is communicating properly with the SAC computer. It does not test the actual inputs or outputs (to test these features, you would conduct a functional test, using the test card function)

- The RDB and RRB self test performs tests on the CPU, memory, and CEPT controller. It does not test the CEPT cabling or driver circuitry. To test these features you would conduct a functional test using the test card function.

These are diagnostic tests. A card that does not pass a self-test should be replaced.

When you select *self test card*, the following screen will appear.

Key in the ID of the card you want to run the self test on and press 'Enter'.

```
Card ID to test?        0          (0=Exit)
```
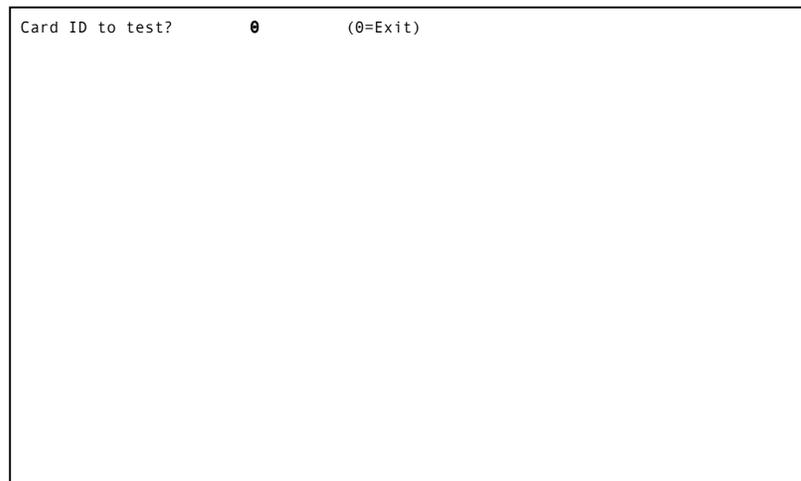
The following screen will appear. If you select "y" followed by pressing 'Enter' the selftest will be carried out.

```
Y/Y: Test card       End: Exit without testing

Card ID:              101
Name (English):       ACB
Name (French):        ?
Name (Spanish):       ?
Type:                 ACB
Self Test (y/n):      n
```
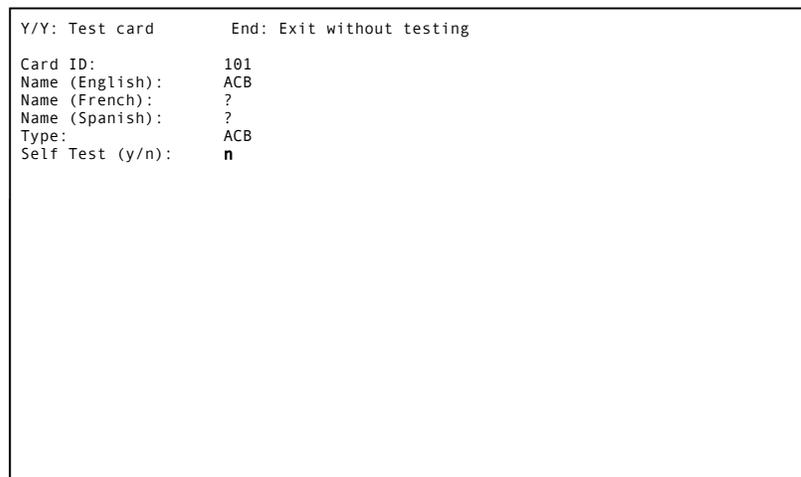
A message will appear on the bottom line "Please wait up to 30 seconds for result.   ."

```
Please wait up to 30 seconds for result  ……………………………………………………………………….
```
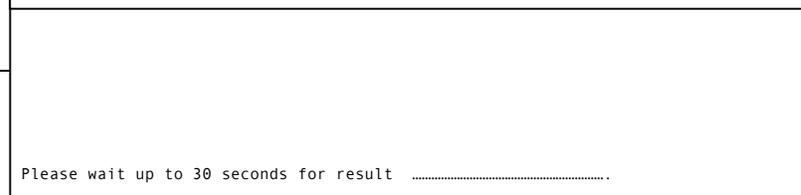
When the self test is complete, the self test result ("Pass", "Fail" or "No Response") will appear on the screen. The possible messages are:

"Self test result: PASS!"

"Self test result: Fail!" or

"Self test result: No response"

Press 'Enter' and you will return to the screen that prompts you to key in the ID of the card that you want to test.

```
Y/Y: Test card      End: Exit without testing.

Card ID:            !)!
Name (English):     ACB
Name (French):      ?
Name Spanish:       ?
Type:               ACB
Selftest? (y/n      n














Self test result: No response.
```

Test Card

This function can be used to conduct functional tests of a Master Station, DIO, RDB, RRB, or SPC card. It tests the card without relying on the network connections. When you activate test card, the system puts the card you have selected into a special test state. An operator who is present at the card location then conducts the functional test.

These tests are used when you know, or suspect, there's a problem with a card and you want to isolate it.

To activate the test

When you select *test card*, the following screen will appear:

```
Card ID to test?        0              (0=Exit)
```

Key in the ID of the card you want to run the test on and press 'Enter'. The following screen will appear: If you press 'y' followed by 'Enter' and the card cannot be tested a message "Card test unavailable" will appear at the bottom of the screen.

```
Y/Y: Test card   End: Exit without testing.

Card ID:            103
Name (English):     SAB 1
Name (French):      ?
Name Spanish:       ?
Type:               SAB-410
Selftest? (y/n)     n   (Warning: Card will require Manual Reset after test)
```

If the card can be tested the message "Card may now be tested" will appear at the bottom of the screen.

Press 'Enter' and you will return to the screen that prompts you to key in the ID of the card you want to test.

Note: While the card is in functional test mode, it is off the network. It will return to the network, when it is reset, at the conclusion of the functional test.

```
Y/Y: Test card      End: Exit without testing.

Card ID:
Name (English):
Name (French):
Name Spanish:
Type:
Selftest? (y/n    n        (Warning: Card will rquire Manual Reset after test)




Card may now be tested…
```

Master station functional test

This function tests the LCD display, the keyboard keys, beeper and backlighting. The test steps through the functions as follows:

1. The LCD display displays the alphabet "A" - "Z", one letter at a time.

2. A keypad test screen is displayed. The operator presses each key on the keypad. Pressing a key on the keyboard will display the key code on the LCD display.

3. After testing the keypad, you must press the key labeled 'END' on the menu or the 'D' key twice within 1 second.

4. The next test is the buzzer test. The operator is given a menu with four options:

*   Pressing menu 'BUZ1' starts a 30 second test of the beeper. During the beeper test use the Up-arrow and Down-arrow keys to adjust the volume of the beeper.

*   Pressing the menu 'EXT1' or 'EXT2' activates the external relay contacts on the DB25 connector.

DB25 Pin Names	External Relay #1	External Relay #2
NC	22	8
Common	9	20
NO	21	7

*   Pressing the menu 'END' move to the next test.

5. The watchdog reset test causes the unit to reset. It then starts up as it normally would if the power had just been turned on.

DIO functional test

This tests the inputs and outputs of the DIO card. Pressing and holding a switch connected to input channel number one will activate output channel number one; pressing the switch on channel number two will activate output channel number two; and so on.

When the switch is released the output is turned OFF. This allows you to test the operation of a station switch and LED.

The audio channels on 200 series DIOs (i.e. DIO 2xx) are tested by pressing a switch connected to an input channel. The first switch press will connect the master audio to channel number one; the second switch press will connect the master audio to channel number two; the third to channel three and so on. When channel 48 is reached, the next switch press will wrap the connection back to channel one.

Note: The operations of the audio channels will be changed in the next version of the software to match that of the digital outputs.

SPC functional test

This tests inputs and outputs of the SPC card. The card can be tested functionally using the installed switches and indicator lights. A special test board is available to test the switch inputs and logic level outputs to be tested at the SPC card.

RDB and RRB functional test

This tests the CPU, memory, and the complete CEPT link. You need a loopback cable to perform this test. For more information on this functional test see the Troubleshooting Guide.

Remove Card

If you wish to take a card out of service you can use the *remove card* selection. When you select *remove card*, the following screen will appear:

```
Card ID to remove?        0             (o=Exit)
```
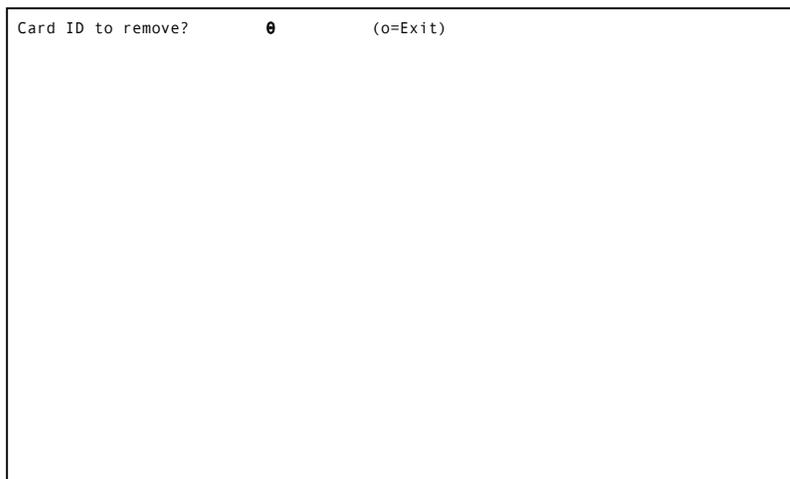
Key in the ID of the card you want to remove and press 'Enter'. The following screen will appear:

```
y/Y: Remove card       End: Exit without testing.

Card ID:              101
Name (English):       ACB101
Name (French):        ?
Name Spanish:         ?

Remove? (y/n)         n
```

Now press 'y' and the message "Card may now be removed" will appear at the bottom of the screen.

The card is now out of service.

Press 'Enter' and you will return to the screen that prompts you to key in the ID of the card you want to remove, you can now type in additional cards IDs that you may want to remove. Otherwise press 'End' and you will be asked to save the new hardware configuration.

```
y/Y: Remove card       End: Exit without testing.

Card ID:              101
Name (English):       ACB101
Name (French):        ?
Name Spanish:         ?
Type:                 ACB

Remove? (y/n)         n




Card may now be removed.
```

Swap Card

When you select *swap card*, the following screen will appear:

```
Card ID to replace?       0         (0=Exit)
```

```
y/Y: Replace card      End: Exit without testing.

Card ID:              101
Name (English):       ACB101
Name (French):        ?
Name Spanish:         ?
Type:                 ACB

Remove? (y/n)         n
```

Key in the ID of the card you want to replace and press 'Enter'. The following screen will appear:

If you are swapping an audio card (i.e. an SAB card) the ACB card must be running with its status LED #1 blinking.

Now press 'y' and the message "Take old card out of service" will appear.

```
y/Y: Replae card      End: Exit without testing.

Card ID:
Name (English):
Name (French):
Name Spanish:
Type:

Remove? (y/n)          y












Take old card out of service…
```

Press 'Enter' and the message "Insert new card; hit service pin on card to identify it" appears.

Insert the new card, hit the service pin and press 'Enter'. You will return to the screen that prompts you to key in the ID of the card that you want to swap. If you are not swapping any additional cards press 'End' and you will be prompted to save the new configuration.

```
y/Y: Replacee card      End: Exit without testing.

Card ID:
Name (English):
Name (French):
Name Spanish:
Type:

Remove? (y/n)          y


Insert new card: hit service pin on card to identify it.
To exit, hit any key
```

```
Card ID to return?        0          (0=Exit)
```

Return Card

If you want to return a card to service when you select *return card*, the following screen will appear:

Key in the ID of the card you want to return to service and press 'Enter'. The following screen will appear:

If you are adding an audio card (i.e. an SAB card), the ACB card in the card cage must be running with it Status LED #1 blinking.

Now press 'Y' and the message "Insert new card; hit service pin on card to identify it" will appear:

Insert the new card, hit the pin and press 'Enter'. A new message will appear at the bottom of the screen, "Service pin message received. Card type OK."

```
y/Y: Return card to service.      End: Exit without testing.

Card ID:
Name (English):
Name (French):
Name Spanish:
Type:

Return? (y/n)         n




Insert new card: hit service pin on card to identify it.
To exit, hit any key.




Waiting for service pin message (hit any key to exit).
```

You will return to the screen that prompts you to key in the ID of the card that you want to return. Type in 'End' and you will be prompted to save the new configuration.

Manual

The purpose of the manual entry is to test a single output or to make a connection between two stations or a master and a station.

Connect option

When you select *Manual* there are two options *Connect* or *Output* that can be selected. If you select the *Connect* option the following screen will be displayed:

```
SAP control of DXI now ON.
Enter the connection type:
Then enter the Ids of the masters and/or stations to connect/disconnect.


Function:                    Exit                          (←/→ to select)
```

There are three choices that can be selected; *Connect*, *Disconnect* or *Exit* If we select *Connect* and press the 'Enter' key a new screen will be displayed:

Connect

By using the left or right arrow keys you can now make a selection of:

```
SAP control of DXI now ON.
Enter the connection type:
Then enter the Ids of the masters and/or stations to connect/disconnect.

Function:                    Connect                       (←/→ to select)
Connection type:             Exit                          (←/→ to select)
```

- Two stations

- Two masters

- Master to Station

- Master to ToneMaster to Music

- Station to Tone

- Station to Music

Once you have made a choice you will be prompted for the Station (or Master) ID:

Once this information is typed in the two devices will be connected together.

```
SAP control of DXI now ON.
Enter the connection type:
Then enter the Ids of the masters and/or stations to connect/disconnect.

Function:                    Connect                       (←/→ to select)
Connection type:             Exit                          (←/→ to select)
Connect Station ID:          0                             (0=Exit)
```

Output

If you select Manual and then Output you will be presented with the following screen:

You may now select; *Station*, *Card* or *Exit*.

```
SAP control of DXI now ON.
Outputs may be set bystation ID or card ID.


Output by:              Exit                        (←/→ to select)
```
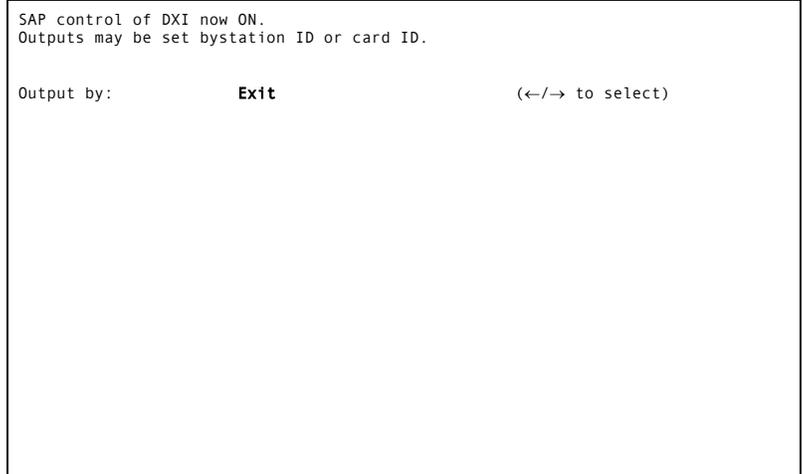
If for example you select *Station* then press 'Enter' the following screen will appear:

Once you type in a station ID number and press 'Enter' you will then be prompted for the output level:

After you select the output level and press 'Enter' you will then be prompted for the station's master ID number.

```
SAP control of DXI now ON.
Outputs may be set by station ID or card ID.
Enter the station ID, the output level, and the station master ID.


Output by:              Station                     (←/→ to select)0
Station ID:             0                           (0=Exit)
```
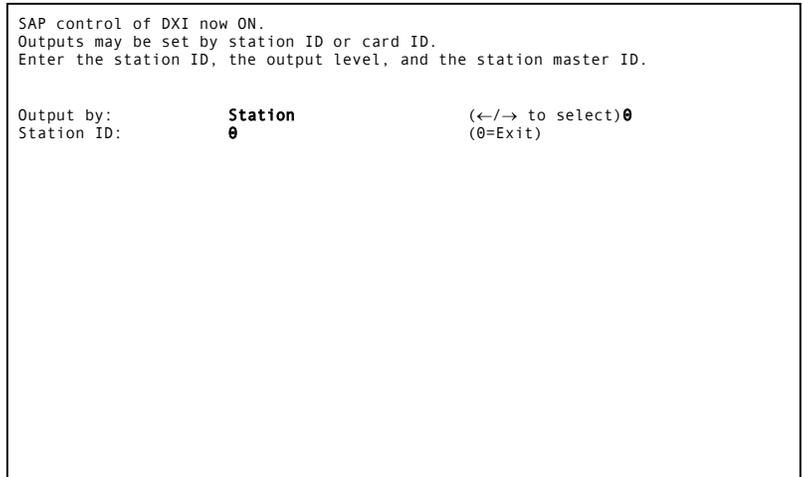
Section 7 - Examining the Network

In this Section...

We will:

- examine the *View* menu selection in the Maintenance module, and

- examine the *Status*, *Networks* and *Faults* entry in the under the *View* menu.

View Functions (VIEW)

You may view Networks or Status; Activity is reserved for future use and is not described in this manual

```
File     Edit     Maint     View     Log     Exit                      DXI Maint
                            Networks
                            Activity
                            Status
                            Faults
```
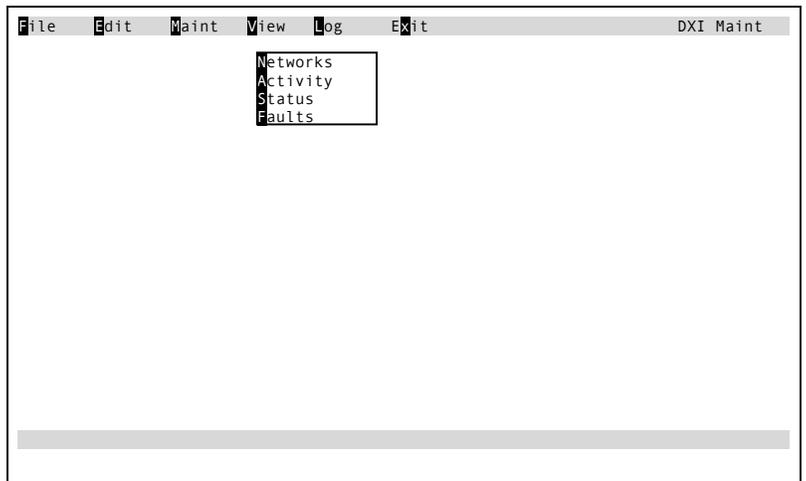
Status

When you select *Status*, the following screen will appear:

This screen display provides troubleshooting information about the Ethernet network between the SAC computer, and tells you which of the SAC computers is currently driving the system.

Further information on the use of the *View Status* is detailed in Troubleshooting Guide Section 9 – Using the SAC Computer for Troubleshooting.

```
System status by node ID:

Status of node #1:
    Primary node for this exchange.
    Node: 1 Up  TCPIP address:192.168.0.0


Hit any key to continue…
```
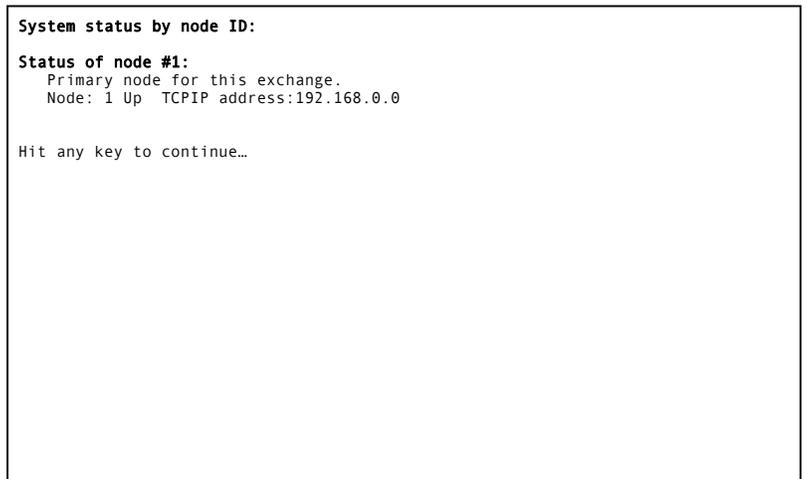
Networks

View Networks provides troubleshooting information about the LonWorks network.

When you select *Networks*, the following screen will appear.

You may page through each card in the network and review its status. The following information is provided: Card ID, Name, Type, Current Echelon Channel, Number of Active Channel and Card Status (In Service, Not in Service).

Further information on the use of the *View Networks* is detailed in Troubleshooting Guide Section 9 – Using the SAC Computer for Troubleshooting.

```
PgDn: Next card       PgDn: Previous card       End: Exit

Card ID:            1
Name (English):     Master 1
Name (French):      ?
Name (Spanish):     ?
Type:               ACB
Current channel:    Remote A
# of active chans   0 (0,1, or 2 channels)
Card status:        In service














F2,F3: Search   F7: Test   F8: Heal   F9: Net Status   F10: Clear Status
```

Function Keys

The function keys at the bottom of the screen perform the following functions:

F2	ID search
F3	Name search
F7	tests redundant LonWorks network connections
F8	attempts to connect on non functioning network in redundant LonWorks network system
F9	displays current status of LonWorks nodes
F10	clear error codes and counts on LonWorks nodes

Faults

View Faults provides troubleshooting information about many aspects of the DXI system, including LonWorks errors, CEPT faults, and station wiring faults.

If the *Faults* entry is selected a screen will be displayed that list all of the current faults on the system. An example of the type of display that will be generated is shown on the right. See the Troubleshooting Guide Section 9 – Using the SAC Computer for Troubleshooting for more details on the type of information that is contained in the Faults List.

```
Hit END key to quit. Any key to refresh this page            Page #1
Card 3 (Master #3)
Card 10 (ACB)
Card 10 (ACB) CEPT 30 faaulted
Card 10 (ACB) CEPT 31 faaulted
Card 11 (SAB 1)
Card 12 (SAB 2)
Card 15 (AOB)
Card 17 (TAB Card)
Card 20 (SPC)
Card #10 (ACB) slot 3.1.B            Stn #1 (UNIT 5 CELL 3) Switch #1
Card #10 (ACB) slot 3.2.B  Syn #1 (Station 2) Switch #1
```

Section 8 - Data Logging

In This Section...

We will discuss:

- the type of events that are logged by the system, and the log message content,

- log functions,

- options for continuous printing of log messages,

- how to view log messages, and

- how to print or save selected log messages.

Data Logging

The Service, Administration and Control (SAC) computer logs all significant events, including intercom activities and alarms.

For each event, the following information is recorded:

- the time at which the event occurred,

- exchange number, and

- a message that describes the event.

A typical log message looks like this:

Time   Message

09:51:07   Call Request from Station #5006 [intercom station name] sent to Master #5 [master station name]

Note: The exchange number is used for large systems with multiple exchanges.

The time appears at the bottom of the screen for the message line that the cursor is on.

For logging purposes, an "event" is an activity that occurs at a point in time. A call request would generate the following events:

When the call request is initiated, the first event is logged:

Call Request from Station [ID/name] sent to Master [ID/name]

When the call request is acknowledged i.e. a call is made, three more events are logged:

Connected Master [ID/name] to Station [ID/name]

Call Request from Station [ID/name] removed from Master [ID/name] Active queue

Call Request from Station [ID/name] added to Master [ID/name] Acknowledged queue

When the call request is canceled i.e. the call is ended, and two additional events are logged:

Disconnected Master [ID/name] from Station [ID/name]

Call Request from Station [ID/name] removed from Master [ID/name] Acknowledged queue

These logged messages form a historical record of all activities, which can be printed or reviewed at a later time.

Log Message File

The system's log message file has sufficient capacity to save approximately one month's messages, under normal conditions of operation. When the file's capacity is reached, the system will begin to overwrite messages. The oldest message is the first to be overwritten, so that the file always contains the most recent messages. The log file is a circular buffer that can be set to store up to a maximum of 99,9999,99 entries (for both the Admin and Maint log entries). The maximum size of the circular buffer will depend on the capacity of the hard drive. In older systems, with small capacity hard drives, the number of log messages in the circular buffer was set to 200,000.

Note that the user can access the log message files either from the Maintenance or the Administration menus. The screens shown for access to the log message files in this manual are from the Administration menu.

Log Functions

The Log Functions that are available - *Exchange*, *Log Level*, *Open Viewer*, *Multi Viewer* and *No. Log Records*

Exchange	for systems that have more than one exchange (computer) each exchange will have its own log file. You can select which exchange log file or files to view with the Multi Viewer selection
Log Level	allows you to select user information, debug information or both.
Open Viewer	allows you to view the log message file for the computer you are at. If you choose Open Viewer without first selecting log level the system will assume that you want user information only.
Multi Viewer	In systems with more than one exchange, each creating its own log file, the log files selected under Exchange can be viewed.
No. Log Records	The user can set the number of log records that will be maintained. Both the number of Maint and Admin records can be set. The maximum number of records that can be set is 99,9999,999.

Log Level

When you select *Log Level*, a second menu appears on the screen beside the log menu.

You may select user information and/or debug information. For operations purposes, you should select user information. Only the system manufacturer, system installer, or maintenance staff should require debug information for problem solving.

```
File      Edit      Maint     View     Log     Exit              DXI Maint

                                        Exchange        ►
                                        Log Level       ►
                                        Open Viewer
                                        MultiViewer
                                        No. Log Records►
```
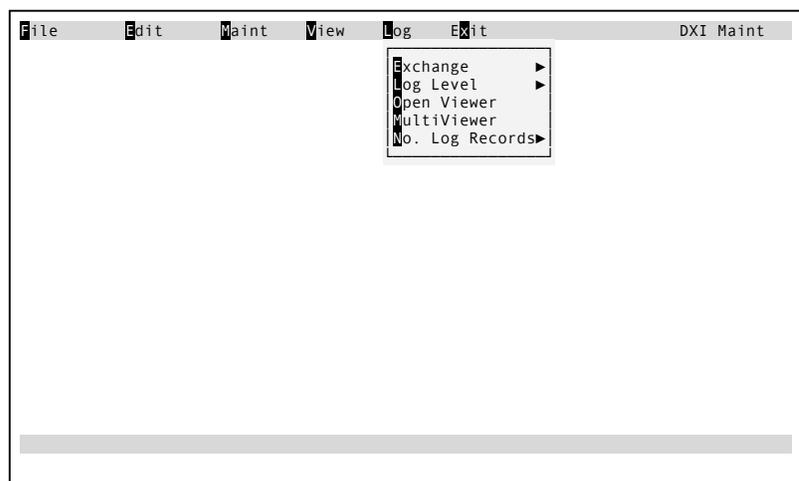
Open Viewer

You must select *Open Viewer* to view the log message file stored at the computer you are accessing the log data from. If you have not selected a log level the system will assume that you want to view User information. To open the viewer press 'o' for *Open Viewer*. A screen message "Viewing activity on this exchange." Will appear on the bottom of the screen, followed by the message "Using User log levels."

```
 File       Edit       Maint      View      Log      Exit                DXI Maint












 Viewing activity on this exchange.
```

Log message data will be displayed on the screen. An example of the log screen is shown on the right.

```
  Time        Message           Exchange 1                   Aug 15,2001 14:43:00
 14:34:00  Hardware compiler compiled and loaded config file /home/dxi/config/h
 14:34:00  Software compiler compiled and loaded config file /home/dxi/config/s
 13:34:01  User compiler compiled and loaded config file /home/dxi/config/user_
 14:34:05  User Request from Station 4 (Cell#1) sent to Master 1 (Control Room)
 14:34:20  Connected Master 1 (Control Room) to Station 4 (Cell #1)
 14:34:21  Call Request from Station 4 (Cell #1) removed from Master 1 (Control
 14:34:21  Call Request from Station 4 (Cell #1) added to Master 1 (Control Roo
 14:34:55  Connected Master 4 (Guard Tower) to Station 5 (Cell #2)
 14:34:55  Call  Request from Station 5 (Cell #2) removed from Master 4 (Guard
 14:34:59  Disconnected Master 1 (Control Room) fro, Station 4 (Cell #1)
 14:35:00  Call Request from Station 4 (Cell #1) removed from Master 1 (Control
 14:35:15  Disconnected Master 4(Guard Tower) from Station 5 (Cell #2)
 14:35:16  Call Request from Station 5 (Cell #2) removed from Master 5 (Guard T
 14:40:46  Performed network Fix on Card #1 (DIO 1)
 14:40:57  Performed network Fix on Card #2 (Master 1)
 14:41:08  Performed network Fix on Card #3 (DIO 2)
 14:41:19  Performed network Fix on Card #4 (Master 2)
 14:42:20  User Request from Station 6 (Cell#3) sent to Master 1 (Control Room)
 14:42:21  Call Request from Station 6 (Cell #3) added to Master 1 (Control Roo
 14:42:26  Connected Master 1 (Control Room) to Station 6 (Cell #3)
 14:42:26  Call Request from Station 6 (Cell #3) removed from Master 1 (Control
 Col 0     End of logs        Log date:Aug 15,2001          Scanning logs
 Block(single block)     Clear all blocks Print    →←↓↑PgUp/PgDn moves cursor
 Multiple Blocks         Exit Viewer      Save     F1 More help on cursor movement
```

Multi Viewer

The operation of *Multi Viewer* is similar to *Open Viewer* except that a column is displayed which indicates which Exchange (or node) logs are being viewed.

```
  Time    Node              Message                    Aug 15,2001 14:43:00
 14:34:00   3    Hardware compiler compiled and loaded config file /home/dxi/confi
 14:34:00   3    Software compiler compiled and loaded config file /home/dxi/confi
 13:34:01   3    User compiler compiled and loaded config file /home/dxi/config/us
 14:34:05   3    User Request from Station 4 (Cell#1) sent to Master 1 (Control Ro
 14:34:20   3    Connected Master 1 (Control Room) to Station 4 (Cell #1)
 14:34:21   3    Call Request from Station 4 (Cell #1) removed from Master 1 (Con
 14:34:21   3    Call Request from Station 4 (Cell #1) added to Master 1 (Control
 14:34:55   3    Connected Master 4 (Guard Tower) to Station 5 (Cell #2)
 14:34:55   3    Call  Request from Station 5 (Cell #2) removed from Master 4 (Gua
 14:34:59   3    Disconnected Master 1 (Control Room) fro, Station 4 (Cell #1)
 14:35:00   3    Call Request from Station 4 (Cell #1) removed from Master 1 (Cont
 14:35:15   3    Disconnected Master 4(Guard Tower) from Station 5 (Cell #2)
 14:35:16   3    Call Request from Station 5 (Cell #2) removed from Master 5 (Guar
 14:40:46   3    Performed network Fix on Card #1 (DIO 1)
 14:40:57   3    Performed network Fix on Card #2 (Master 1)
 14:41:08   3    Performed network Fix on Card #3 (DIO 2)
 14:41:19   3    Performed network Fix on Card #4 (Master 2)
 14:42:20   3    User Request from Station 6 (Cell#3) sent to Master 1 (Control Ro
 14:42:21   3    Call Request from Station 6 (Cell #3) added to Master 1 (Control
 14:42:26   3    Connected Master 1 (Control Room) to Station 6 (Cell #3)
 14:42:26   3    Call Request from Station 6 (Cell #3) removed from Master 1 (Cont
 Col 0    End of logs       Log date:Aug 15,2001
 Block(single block)     Clear all blocks Print    →←↓↑PgUp/PgDn moves cursor
 Multiple Blocks         Exit Viewer      Save     F1 More help on cursor movement
```

Log Data

You may view, print or save log data to a floppy disk.

When you select Open Viewer, log message data will appear on the screen in the shaded area of the following screen display. At present 21 log messages can be displayed at one time. Each page of log messages contains 21 messages; if we page back the top message will become the last message on the next screen.

A typical log record was shown previously.

The system will take you to the end of the

```
 Time      Message            Exchange 1              Aug 15,2001 14:43:00




















Col 0        End of logs     Log date:Aug 15,2001      Scanning logs
Block(single block)      Clear all blocks Print   →←↓↑PgUp/PgDn moves cursor
Multiple Blocks          Exit Viewer      Save     F1 More help on cursor movement
```

log message file (the most recent log messages will be displayed). If you page back then the "End of logs" message will be replaced by the numbers indicating the count of the logs included on the displayed page (i.e. 40100 - 40121).
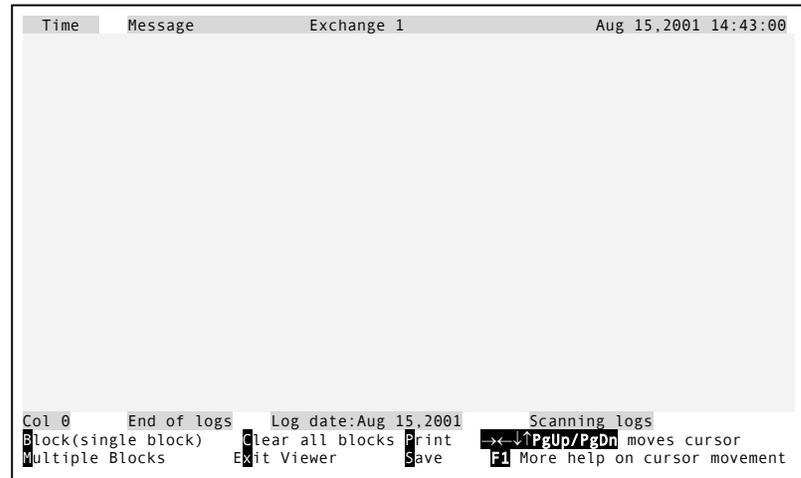
Function Keys

You may use the following function keys to view and select log data to save or print.

Right Arrow	Scroll right, will move the text to the left (if the message is longer than the width of the screen). The Col # will tell you how many columns are off screen to the left.
Left Arrow	Scroll left, will move the text to the right. (You cannot move the text Col # less than 1)
Down Arrow	Will move you to the next log line (towards newer entries).
Up Arrow	Will move you to the previous log line (towards older entries).
PgDn	Will move you to the next page of logs (towards newer entries).
PgUp	Will move you to previous page of logs (toward older entries).
+	Allows you to type in the number of pages to jump down, then will move you that number of pages down in the logs (toward newer entries).
-	Allows you to type in the number of pages to jump up, and then will move you that number of pages up in the logs (toward older entries).
Home	Jumps to the first log line (the oldest entry).
End	Jumps to the last log line (the newest entry).
/ (search down)	Allows you to type in a search string, then looks down in the logs (towards newer entries) until the string is found or until the newest entry is reached.
? (search up)	Allows you to type in a search string, and then looks up in the logs (towards older entries) until the string is found or until the oldest entry is reached.

N (search next)	Continues the previous search (started with / or ?) in the same direction, looking for the next occurrence of the search string.
X (Exit)	you will exit viewer
B (Block)	To select a block of log messages for saving or printing
M (Multiple blocks)	To select multiple blocks of log messages for saving or printing
C (Clear all blocks)	To de-select blocks that you have selected
P (Print)	To print selected blocks
S (Save)	To save selected blocks
F1	help on cursor movement

Viewing Log Data

If the log message you are looking for is not displayed on the screen, you may scroll up or down, using Up-arrow and Down-arrow keys or PgUp and PgDn keys. Arrow keys will move the cursor one line at a time. Page keys will move the cursor one page at a time.

If the log message extends beyond the border of your screen, you may scroll across, using the Right-arrow and Left-arrow keys. The Col # will tell you how many columns you have scrolled off the screen to the left.

Printing or Saving Log Data

First you must select log data that you want to print or save.

The keys at the bottom of the screen will help you to select blocks for printing. A block is a set of log messages that are contiguous (listed one after the other).

```
   Time      Message          Exchange 1              Nov 15,2001 14:43:00
12:41:21   Desktop sent Remove_Secondary_Alarm (#4) to to Secondary Master #1.
12:41:24   Master #2 (Desktop) acked Alaarm #4 (LED Top).
12:41:24   Desktop sent Remove_Secondary_Alarm (#4) to to Secondary Master #1.
12:42:36   Master #2 (Desktop) connected to Master #1 (Panel Master).
12:42:50   Disconnected Master #2 (Desktop) from Master #1 (Panel Master).
12:47:50   Master #2 disabled.
12:47:50   Desktop sent Remove_Secondary_Alarm (#5) to to Secondary Master #1.
12:47:50   HW Alarm on Station #5 (LED Btm).
12:47:50   HW Alarm on Station #5 (LED Btm).
12:47:50   Desktop sent Remove_Secondary_Alarm (#1) to to Secondary Master #1.
14:47:50   Echelon Remote Ch A Alarm on Card #1 (Master #1).
14:47:50   Echelon Remote Ch A Alarm on Card #1 (Master #1).
12:47:51   Desktop sent Remove_Secondary_Alarm (#4) to to Secondary Master #1.
12:47:51   Desktop sent Remove_Secondary_Alarm (#3) to to Secondary Master #1.
12:47:51   Desktop sent Remove_Secondary_Alarm (#105) to to Secondary Master #1.
12:47:51   Desktop sent Remove_Secondary_Alarm (#205) to to Secondary Master #1.
12:47:51   Desktop sent Remove_Secondary_Alarm (#21) to to Secondary Master #1.
12:47:51   Call Request from Master #2 (Desktop) sent to Master #1 (Panel Master
12:48:03   Master #2 (Desktop) password incorrect (attempt #1).
00:00:02   HW config saved to file "home/dxi/config/hw_demo_ala.Tuesday".
00:00:02   SW config saved to file "home/dxi/config/sw_demo_ala.Tuesday".
Col 0                      Log date:Nov 14,2001
Block(single block)       Clear all blocks Print   →←↓↑PgUp/PgDn moves cursor
Multiple Blocks           EXit Viewer      Save     F1 More help on cursor movement
```

To select a single block of log messages for printing or saving.

Move the cursor to the log message you want and press 'B' (Block). The line you have selected will be highlighted. Now move the cursor up or down (using arrow keys or page keys) to select additional messages. Each time you move the cursor additional messages are highlighted. When you reach the end of the block press 'B'.

### To select multiple blocks of log messages for printing or saving

Sometimes the log messages you want to print or save are not altogether. In this case, you must Press 'M' (multiple blocks) at the beginning and end of each block that you want. This allows you to select more than one block without losing the ones you have already selected.

Now you can press 'P' (to print the block) or 'S' (to save the block to a floppy disk or to the hard drive).

Printing

When you press 'P', you will be prompted to print.

If you type 'y' the block(s) you have elected will be printed at the log printer.

```
  Time      Message            Exchange 1              Nov 15,2001 14:43:00
12:41:21   Desktop sent Remove_Secondary_Alarm (#4) to to Secondary Master #1.
12:41:24   Master #2 (Desktop) acked Alaarm #4 (LED Top).
12:41:24   Desktop                                              ary Master #1.
12:42:36   Master #    Print highlighted sections? (y/n)
12:42:50   Disconne                                          Master).
12:47:50   Master #
12:47:50   Desktop                                              ary Master #1.
12:47:50   HW Alarm on Station #5 (LED Btm).
12:47:50   HW Alarm on Station #5 (LED Btm).
12:47:50   Desktop sent Remove_Secondary_Alarm (#1) to to Secondary Master #1.
14:47:50   Echelon Remote Ch A Alarm on Card #1 (Master #1).
14:47:50   Echelon Remote Ch A Alarm on Card #1 (Master #1).
12:47:51   Desktop sent Remove_Secondary_Alarm (#4) to to Secondary Master #1.
12:47:51   Desktop sent Remove_Secondary_Alarm (#3) to to Secondary Master #1.
12:47:51   Desktop sent Remove_Secondary_Alarm (#105) to to Secondary Master #1.
12:47:51   Desktop sent Remove_Secondary_Alarm (#205) to to Secondary Master #1.
12:47:51   Desktop sent Remove_Secondary_Alarm (#21) to to Secondary Master #1.
12:47:51   Call Request from Master #2 (Desktop) sent to Master #1 (Panel Master
12:48:03   Master #2 (Desktop) password incorrect (attempt #1).
00:00:02   HW config saved to file "home/dxi/config/hw_demo_ala.Tuesday".
00:00:02   SW config saved to file "home/dxi/config/sw_demo_ala.Tuesday".
Col 0                    Log date:Nov 14,2001
Block(single block)      Clear all blocks Print   →←↓↑PgUp/PgDn moves cursor
Multiple Blocks          Exit Viewer      Save     F1 More help on cursor movement
```

Saving

When you press 'S' (save), a series of messages will appear that enable you to save the log messages you have selected to a file on a floppy disk or to the hard drive.

```
  Time      Message            Exchange 1              Nov 15,2001 14:43:00
12:41:21   Desktop sent Remove_Secondary_Alarm (#4) to to Secondary Master #1.
12:41:24   Master #2 (Desktop) acked Alaarm #4 (LED Top).
12:41:24   Desktop                                              ary Master #1.
12:42:36   Master #    Save highlighted logs ? (y/n)
12:42:50   Disconne                                          Master).
12:47:50   Master #
12:47:50   Desktop                                              ary Master #1.
12:47:50   HW Alarm on Station #5 (LED Btm).
12:47:50   HW Alarm on Station #5 (LED Btm).
12:47:50   Desktop sent Remove_Secondary_Alarm (#1) to to Secondary Master #1.
14:47:50   Echelon Remote Ch A Alarm on Card #1 (Master #1).
14:47:50   Echelon Remote Ch A Alarm on Card #1 (Master #1).
12:47:51   Desktop sent Remove_Secondary_Alarm (#4) to to Secondary Master #1.
12:47:51   Desktop sent Remove_Secondary_Alarm (#3) to to Secondary Master #1.
12:47:51   Desktop sent Remove_Secondary_Alarm (#105) to to Secondary Master #1.
12:47:51   Desktop sent Remove_Secondary_Alarm (#205) to to Secondary Master #1.
12:47:51   Desktop sent Remove_Secondary_Alarm (#21) to to Secondary Master #1.
12:47:51   Call Request from Master #2 (Desktop) sent to Master #1 (Panel Master
12:48:03   Master #2 (Desktop) password incorrect (attempt #1).
00:00:02   HW config saved to file "home/dxi/config/hw_demo_ala.Tuesday".
00:00:02   SW config saved to file "home/dxi/config/sw_demo_ala.Tuesday".
Col 0                    Log date:Nov 14,2001
Block(single block)      Clear all blocks Print   →←↓↑PgUp/PgDn moves cursor
Multiple Blocks          Exit Viewer      Save     F1 More help on cursor movement
```

The first message is: "Save to floppy or to hard drive?"

```
 Time       Message          Exchange 1              Nov 15,2001 14:43:00
12:41:21   Desktop sent Remove_Secondary_Alarm (#4) to to Secondary Master #1.
12:41:24   Master #2 (Desktop) acked Alaarm #4 (LED Top).
12:41:24   Desktop                                          condary Master #1.
12:42:36   Master #  Options:
12:42:50   Disconne   F: save to floppy diskette            Master).
12:47:50   Master #   H: save to hard drive
12:47:50   Desktop    Enter your choice.  _
12:47:50   HW Alarm
12:47:50   HW Alarm
12:47:50   Desktop                                          condary Master #1.
14:47:50   Echelon Remote Ch A Alarm on Card #1 (Master #1).
14:47:50   Echelon Remote Ch A Alarm on Card #1 (Master #1).
12:47:51   Desktop sent Remove_Secondary_Alarm (#4) to to Secondary Master #1.
12:47:51   Desktop sent Remove_Secondary_Alarm (#3) to to Secondary Master #1.
12:47:51   Desktop sent Remove_Secondary_Alarm (#105) to to Secondary Master #1.
12:47:51   Desktop sent Remove_Secondary_Alarm (#205) to to Secondary Master #1.
12:47:51   Desktop sent Remove_Secondary_Alarm (#21) to to Secondary Master #1.
12:47:51   Call Request from Master #2 (Desktop) sent to Master #1 (Panel Master
12:48:03   Master #2 (Desktop) password incorrect (attempt #1).
00:00:02   HW config saved to file "home/dxi/config/hw_demo_ala.Tuesday".
00:00:02   SW config saved to file "home/dxi/config/sw_demo_ala.Tuesday".
Col 0                     Log date:Nov 14,2001
Block(single block)       Clear all blocks Print   →←↓↑PgUp/PgDn moves cursor
Multiple Blocks           Exit Viewer      Save    F1 More help on cursor movement
```

If you select "floppy", you will be prompted to put a floppy disk in the indicated drive.

```
 Time       Message          Exchange 1              Nov 15,2001 14:43:00
12:41:21   Desktop sent Remove_Secondary_Alarm (#4) to to Secondary Master #1.
12:41:24   Master #2 (Desktop) acked Alaarm #4 (LED Top).
12:41:24   Des                                              Master #1.
12:42:36   Mas   Insert DOS formatted floppy and press Enter    er
12:42:50   Dis   or press ESC to quit.                        Master).
12:47:50   Mas
12:47:50   Des                                              Master #1
12:47:50   HW
12:47:50   HW Alarm on Station #5 (LED Btm).
12:47:50   Desktop sent Remove_Secondary_Alarm (#1) to to Secondary Master #1.
14:47:50   Echelon Remote Ch A Alarm on Card #1 (Master #1).
14:47:50   Echelon Remote Ch A Alarm on Card #1 (Master #1).
12:47:51   Desktop sent Remove_Secondary_Alarm (#4) to to Secondary Master #1.
12:47:51   Desktop sent Remove_Secondary_Alarm (#3) to to Secondary Master #1.
12:47:51   Desktop sent Remove_Secondary_Alarm (#105) to to Secondary Master #1.
12:47:51   Desktop sent Remove_Secondary_Alarm (#205) to to Secondary Master #1.
12:47:51   Desktop sent Remove_Secondary_Alarm (#21) to to Secondary Master #1.
12:47:51   Call Request from Master #2 (Desktop) sent to Master #1 (Panel Master
12:48:03   Master #2 (Desktop) password incorrect (attempt #1).
00:00:02   HW config saved to file "home/dxi/config/hw_demo_ala.Tuesday".
00:00:02   SW config saved to file "home/dxi/config/sw_demo_ala.Tuesday".
Col 0                     Log date:Nov 14,2001
Block(single block)       Clear all blocks Print   →←↓↑PgUp/PgDn moves cursor
Multiple Blocks           Exit Viewer      Save    F1 More help on cursor movement
```

Once you have made your choice, the message "Enter File Name" will appear. Type in the file name and press 'Enter'.

```
 Time       Message          Exchange 1              Nov 15,2001 14:43:00
12:41:21   Desktop sent Remove_Secondary_Alarm (#4) to to Secondary Master #1.
12:41:24   Master #2 (Desktop) acked Alaarm #4 (LED Top).
12:41:24                                                    r #1.
12:42:36      Enter file name to save logs under or hit Esc to abort.
12:42:50      An extension ".log" will be added to the file name        er).
12:47:50
12:47:50   ███████████                                       r #1
12:47:50
12:47:50   HW Alarm on Station #5 (LED Btm).
12:47:50   Desktop sent Remove_Secondary_Alarm (#1) to to Secondary Master #1.
14:47:50   Echelon Remote Ch A Alarm on Card #1 (Master #1).
14:47:50   Echelon Remote Ch A Alarm on Card #1 (Master #1).
12:47:51   Desktop sent Remove_Secondary_Alarm (#4) to to Secondary Master #1.
12:47:51   Desktop sent Remove_Secondary_Alarm (#3) to to Secondary Master #1.
12:47:51   Desktop sent Remove_Secondary_Alarm (#105) to to Secondary Master #1.
12:47:51   Desktop sent Remove_Secondary_Alarm (#205) to to Secondary Master #1.
12:47:51   Desktop sent Remove_Secondary_Alarm (#21) to to Secondary Master #1.
12:47:51   Call Request from Master #2 (Desktop) sent to Master #1 (Panel Master
12:48:03   Master #2 (Desktop) password incorrect (attempt #1).
00:00:02   HW config saved to file "home/dxi/config/hw_demo_ala.Tuesday".
00:00:02   SW config saved to file "home/dxi/config/sw_demo_ala.Tuesday".
Col 0                     Log date:Nov 14,2001
Block(single block)       Clear all blocks Print   →←↓↑PgUp/PgDn moves cursor
Multiple Blocks           Exit Viewer      Save    F1 More help on cursor movement
```

If the file you have specified exists, you will be asked if you want to overwrite the existing file.

```
   Time       Message            Exchange 1                  Nov 15  14:43:00
12:41:21    Desktop sent Remove_Secondary_Alarm (#4) to to Secondary Master #1.
12:41:24    Master #2 (Desktop) acked Alaarm #4 (LED Top).
12:41:24    Desktop s┌─────────────────────────────────────┐ndary Master #1.
12:42:36    Master #2 │   Overwrite existing file? (y/n)    │l Master
12:42:50    Disconnen │                                     │Panel Master).
12:47:50    Master #2 └─────────────────────────────────────┘
12:47:50    Desktop s                                       ndary Master #1.
12:47:50    HW Alarm on Station #5 (LED Btm).
12:47:50    HW Alarm on Station #5 (LED Btm).
12:47:50    Desktop sent Remove_Secondary_Alarm (#1) to to Secondary Master #1.
14:47:50    Echelon Remote Ch A Alarm on Card #1 (Master #1).
14:47:50    Echelon Remote Ch A Alarm on Card #1 (Master #1).
12:47:51    Desktop sent Remove_Secondary_Alarm (#4) to to Secondary Master #1.
12:47:51    Desktop sent Remove_Secondary_Alarm (#3) to to Secondary Master #1.
12:47:51    Desktop sent Remove_Secondary_Alarm (#105) to to Secondary Master #1.
12:47:51    Desktop sent Remove_Secondary_Alarm (#205) to to Secondary Master #1.
12:47:51    Desktop sent Remove_Secondary_Alarm (#21) to to Secondary Master #1.
12:47:51    Call Request from Master #2 (Desktop) sent to Master #1 (Panel Master
12:48:03    Master #2 (Desktop) password incorrect (attempt #1).
00:00:02    HW config saved to file "home/dxi/config/hw_demo_ala.Tuesday".
00:00:02    SW config saved to file "home/dxi/config/sw_demo_ala.Tuesday".
Col 0                       Log date:Nov 14,2001
Block(single block)        Clear all blocks Print  →←↑↓PgUp/PgDn moves cursor
Multiple Blocks            EXit Viewer      Save   F1 More help on cursor movement
```

Now hit 'Enter' and your selected log messages will be saved.

```
   Time       Message            Exchange 1                  Nov 15  14:43:00
12:41:21    Desktop sent Remove_Secondary_Alarm (#4) to to Secondary Master #1.
12:41:24    Master #2 (Desktop) acked Alaarm #4 (LED Top).
12:41:24    Desk┌──────────────────────────────────────────┐Master #1.
12:42:36    Mast│ File saved to disk.   IMPORTANT: Wait for disk │er)
12:42:50    Disc│ disk drive light to go out before removing disk!│Master).
12:47:50    Mast│ (This may take from several seconds to a   │
12:47:50    Desk│ few minutes, depending on how many logs you│Master #1.
12:47:50    HW A│ are saving)                                │
12:47:50    HW A│                                            │
12:47:50    Desk│ Press <enter> to continue_                 │
14:47:50    Eche└──────────────────────────────────────────┘Master #1).
14:47:50    Echelon Remote Ch A Alarm on Card #1 (Master #1).
12:47:51    Desktop sent Remove_Secondary_Alarm (#4) to to Secondary Master #1.
12:47:51    Desktop sent Remove_Secondary_Alarm (#3) to to Secondary Master #1.
12:47:51    Desktop sent Remove_Secondary_Alarm (#105) to to Secondary Master #1.
12:47:51    Desktop sent Remove_Secondary_Alarm (#205) to to Secondary Master #1.
12:47:51    Desktop sent Remove_Secondary_Alarm (#21) to to Secondary Master #1.
12:47:51    Call Request from Master #2 (Desktop) sent to Master #1 (Panel Master
12:48:03    Master #2 (Desktop) password incorrect (attempt #1).
00:00:02    HW config saved to file "home/dxi/config/hw_demo_ala.Tuesday".
00:00:02    SW config saved to file "home/dxi/config/sw_demo_ala.Tuesday".
Col 0                       Log date:Nov 14,2001
Block(single block)        Clear all blocks Print  →←↑↓PgUp/PgDn moves cursor
Multiple Blocks            EXit Viewer      Save   F1 More help on cursor movement
```

Searching for Particular Log Messages

You can search for a particular log message using the /, ?, or n keys. The / key searches down (toward newer log messages), the ? key searches up (toward older log entries), and the n key searches in the current direction looking for the next occurrence of the current search string. The next (n) search function can only be started after you have specified a direction and string with the / or ? search keys

When you type in a '/' or '?' you will see the following display:

```
   Time       Message            Exchange 1                  Nov 15  14:43:00
12:41:21    Desktop sent Remove_Secondary_Alarm (#4) to to Secondary Master #1.
12:41:24    Master #2 (Desktop) acked Alaarm #4 (LED Top).
12:41:24    Desktop sent R┌──────────────────────────────────────┐
12:42:36    Master #2 (Des│  Search string: ███████████████████   │
12:42:50    Disconnected M│                                        │
12:47:50    Master #2 (Des└──────────────────────────────────────┘
12:47:50    Desktop sent R
12:47:50    HW Alarm on Station #5 (LED Btm).
12:47:50    HW Alarm on Station #5 (LED Btm).
12:47:50    Desktop sent Remove_Secondary_Alarm (#1) to to Secondary Master #1.
14:47:50    Echelon Remote Ch A Alarm on Card #1 (Master #1).
14:47:50    Echelon Remote Ch A Alarm on Card #1 (Master #1).
12:47:51    Desktop sent Remove_Secondary_Alarm (#4) to to Secondary Master #1.
12:47:51    Desktop sent Remove_Secondary_Alarm (#3) to to Secondary Master #1.
12:47:51    Desktop sent Remove_Secondary_Alarm (#105) to to Secondary Master #1.
12:47:51    Desktop sent Remove_Secondary_Alarm (#205) to to Secondary Master #1.
12:47:51    Desktop sent Remove_Secondary_Alarm (#21) to to Secondary Master #1.
12:47:51    Call Request from Master #2 (Desktop) sent to Master #1 (Panel Master
12:48:03    Master #2 (Desktop) password incorrect (attempt #1).
00:00:02    HW config saved to file "home/dxi/config/hw_demo_ala.Tuesday".
00:00:02    SW config saved to file "home/dxi/config/sw_demo_ala.Tuesday".
CCol 0                      Log date:Nov 14,2001
Block(single block)        Clear all blocks Print  →←↑↓PgUp/PgDn moves cursor
Multiple Blocks            EXit Viewer      Save   F1 More help on cursor movement
```

Type in the string you are looking for (this is case sensitive so only the exact case will be searched for), and then press 'Enter'.

The log viewer will then scroll through the logs n the specified direction, and will stop when the search string is found anywhere in a log line, or until the top or bottom of the logs is reached.

When you have finished

Press 'x' (for *Exit*) and you will return to
the Maintenance menu. You will be
prompted to verify that you want to exit.

```
  Time       Message          Exchange 1                    Nov 15  14:43:00
12:41:21   Desktop sent Remove_Secondary_Alarm (#4) to to Secondary Master #1.
12:41:24   Master #2 (Desktop) acked Alaarm #4 (LED Top).
12:41:24   Deskto┌─────────────────────────────────────────┐ ry Master #1.
12:42:36   Master│  Are you sure you want to exit? (y/n)     │ aster).
12:42:50   Discon│                                           │ nel Master).
12:47:50   Master│                                           │
12:47:50   Deskto└─────────────────────────────────────────┘ ry Master #1.
12:47:50   HW Alarm on Station #5 (LED Btm).
12:47:50   HW Alarm on Station #5 (LED Btm).
12:47:50   Desktop sent Remove_Secondary_Alarm (#1) to to Secondary Master #1.
14:47:50   Echelon Remote Ch A Alarm on Card #1 (Master #1).
14:47:50   Echelon Remote Ch A Alarm on Card #1 (Master #1).
12:47:51   Desktop sent Remove_Secondary_Alarm (#4) to to Secondary Master #1.
12:47:51   Desktop sent Remove_Secondary_Alarm (#3) to to Secondary Master #1.
12:47:51   Desktop sent Remove_Secondary_Alarm (#105) to to Secondary Master #1.
12:47:51   Desktop sent Remove_Secondary_Alarm (#205) to to Secondary Master #1.
12:47:51   Desktop sent Remove_Secondary_Alarm (#21) to to Secondary Master #1.
12:47:51   Call Request from Master #2 (Desktop) sent to Master #1 (Panel Master
12:48:03   Master #2 (Desktop) password incorrect (attempt #1).
00:00:02   HW config saved to file "home/dxi/config/hw_demo_ala.Tuesday".
00:00:02   SW config saved to file "home/dxi/config/sw_demo_ala.Tuesday".
Col 0                    Log date:Nov 14,2001
Block(single block)      Clear all blocks Print   →←↓↑PgUp/PgDn moves cursor
Multiple Blocks          EXit Viewer       Save    F1 More help on cursor movement
```

Continuous Printing of Log Messages

Continuous printing of log messages occurs at the log printer. It has no effect on log message file maintenance. As
log messages occur, the log message file is update. Simultaneously, the log messages are sent to the log printer.

Printing of log messages that you have selected will also occur at the log printer.

- If you have selected the FAAS printer, printing of log messages that you have selected will be embedded
  in the continuous printing. A full line of asterisks will appear before and after the block of messages you
  selected.

- If you have selected another printer, log messages that you select for printing will start on a new page.
  When the printer finishes printing your selected message(s), it will skip to a new page to resume
  continuous printing.

Appendix 1 - Acronyms

Hardware Components

ACB	Audio Control Board
AIB	Audio Input Board
AIO	Audio Input/Output Board
AOB	Audio Output Board
DIO	Discrete Input/Output Board
DSM	Desktop Speaker Microphone
FDH	Full Duplex Handset
FTR	Free Topology Repeater
ICM	Intercom Station
IMS	Intercom Master Station
IOC	Input/Output Card Cage
MAI	Master Audio Interface
PAB	Paging Amplifier Board
PSU	Power Supply Unit
RDB	Remote Driver Board
RIO	Remote Input/Output
RNS	Redundant Network Switch
RRB	Remote Receiver Board
RRR	Remote Receiver Rack (describes an RDB or RRB)
SAB	Station Audio Board
SAC	Service, Administration and Control
SPC	Switch Panel Controller
SPD	Switch Panel Driver
TAB	Talk back Amplifier Board
TIS	Tower Intercom Station
TLB	Telephone Line Board
TSB	Telephone Set Board
VBS	Visitor Booth Station

Appendix 2 - List of Possible Switch Actions

When selecting possible switch actions the following choices are available:

Side Effects Only, Call request, Call Request Cancel, Emerg Call Request, Music Button, Telephone CRQ, Cell Alarm, Cell Alarm Cancel, Panic Alarm, Door Alarm, Security Alarm, Audio Alarm, Wiring Alarm, Comm Alarm, IO Alarm, Serial Alarm, Wipe Request, Wipe End, Monitor Up, Monitor Down, Monitor Hold, Monitor Resume, Connect Stations, Connect Master & Stn, Connect Masters, Disc Stations, Disc Master & Stn, Disc Masters, Alarm: Connect Stn, Alarm: Connect Mstr-Stn, Alarm: Connect Mstrs, Alarm: Disc Stations, Alarm: Disc Mstr-Stn, Alarm: Disc Masters, Output On, Output Wink, Output Slow Flash, Output Flash, Output Blink, Output Off, Group Output On, Group Output Off, Alarm: Output On, Alarm: Output Wink, Alarm: Output Slow Flash, Alarm: Output Flash, Alarm: Output Blink, Alarm: Output Off, Door Partial Open, Cell Group Switch, Group Door Open, Group Door Close, Bypass Activate, Bypass Deactivate, Door Stop, Barrier Stop, Door Open Limit On, Door Open Limit Off, Door Close Limit On, Door Close Limit Off, Door Open, Door Close, Door Group, Battery Low, Connect to Conf, Disconnect from Conf, Master Call Request, Disable Master, Enable Master, Unman Master, Man Master, Send Tone CON, Send Tone DIS, Host Door OPN, Host Door CLS, Host Door STP, Host Set Output, Card ALA State, Stn ALA State, Connect Master & Rad, Disc Master & Stn, Connect Radios, Disc Radios, Audio Alarm CRQ, Audio Alarm MRQ, Host Cont CALL, Nurse Emerg Blue, Nurse Emerg LGreen, Nurse Emerg Yellow, Nurse Emerg Red, Nurse Emerg Ack, Nurse Emerg Can, Call Request Ack, Stn Ack Tone, Report to Host, Call Request Disable, Call Request Enable, Cell EnDis, Cell ACK, Unknown

Appendix 3 - Tone Generation

The format for tone generation is based on dividing the period into four equal time slots. Two binary bits encode each time slot. The encoding is as follows:

|	
00	No output.
01	Frequency sweeps from Start Freq. to End Freq. (or initial frequency to End Freq.).
11	Frequency is constant at the value just before the 1/4 time interval time slot begins. If the previous time slot had a value of 00 then the constant output frequency is Start Freq.
10	Frequency sweeps from End Freq. to Start Freq. (or 0 if next time slot is encoded 00)

This information is encoded into a two digit hex number. Dividing the 1/4 period time slot into equal sub-intervals, defined by the Num Steps and changing the frequency by an equal amount in each sub-interval accomplish the "sweep" in frequency. The format pattern is encoded in reverse order of the pattern that is desired i.e. if a frequency pattern of 00 01 11 10 is required it should be entered as 10 11 01 00

Example 1

For a tone encoded with the following set of parameters:

Volume	4	(default volume)
Profile	B4	(corresponding to the pattern 00 01 11 10 entered in reverse order i.e. as 10 11 01 00)
Num Steps	4	
Start Freq	0	(0 Hz)
End Freq	2000	(2000 Hz)
Period	2	(2 seconds)

The generated waveform would be as follows:
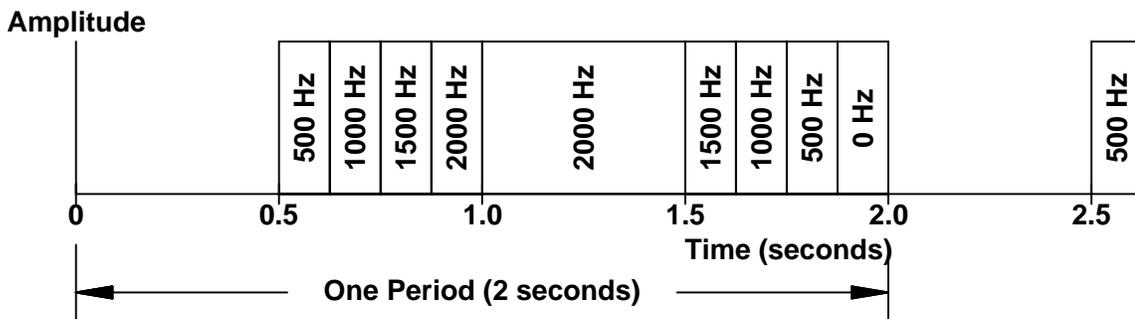
By increasing the Num Steps the frequency sweep will sound closer to a continuously changing frequency, rather than sounding as though there are abrupt changes in frequency.

Example 2

Volume   4   (default volume)

Profile   B7   (corresponding to the binary pattern 11 01 11 10 entered in reverse order
                                           i.e. as 10 11 01 11)

Num Steps   4

Start Freq   1000   (1000 Hz)

End Freq   2000   (2500 Hz)

Period   2   (2 seconds)

Will generate the following periodic waveform:

Amplitude

| 1000 Hz | 1250 Hz | 1500 Hz | 1750 Hz | 2000 Hz | 2000 Hz | 1750 Hz | 1500 Hz | 1250 Hz | 1000 Hz | 1000 Hz | 1250 Hz |

0   0.5   1.0   1.5   2.0   2.5

Time (seconds)

← **One Period (2 seconds)** →