Meridian 1

Meridian Integrated RAN

Description, Installation, and Operation

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Revision history

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Standard 3.00. This is a global document and is up-issued for X11 Release 25.0x.

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Standard, release 2.00. This release describes the second release of the Meridian Integrated RAN product, MIRAN Release 2.0.

April 1997

Standard, release 1.00. Initial release.

Contents

About this document

This document is a global document. Contact your system supplier or your Nortel Networks representative to verify that the hardware and software described is supported in your area.

This document provides information about the implementation of the Meridian Integrated RAN (MIRAN) in the Meridian 1 system. It describes the MIRAN operation, installation, configuration, administration, applications, and maintenance.

This document focuses on the application and administration of the MIRAN for the Recorded Announcement (RAN) and music-on-hold (MOH) features.

The purpose of this document is to instruct the user how to install, configure, operate, and maintain the Meridian Integrated RAN (MIRAN) as a part of the overall Meridian 1 system.

What's new

This document has been updated to cover information on the upgrade of the MIRAN product to MIRAN Release 2.0. With the introduction of MIRAN Release 2.0, current MIRAN users (those with the NTAG36AA card) can take advantage of the following new features by means of a software upgrade (with a permanently installed PCMCIA disk) and new keycode:

— 366 day calendar

— Multi-user login and channel control

— An enhanced telephone user interface (TUI)

— Royalty-free music

— Disk storage query and expanded recording storage

— Improved C: drive access time

For new MIRAN users, and for existing MIRAN users who upgrade to the MIRAN Release 2.0 card (the NTAG36AC card), the MIRAN Release 2.0 card provides the following additional functionality:

— Text-based user interface accessed via the Ethernet

— An embedded Browser User Interface (BUI) providing web-based OA&M and NTP access via the Ethernet

— FTP download of voice and music files

— Storage capacity for eight minutes of voice and music recordings

— Six minutes of compressed, royalty-free music—You can delete the royalty-free music file to gain 1.5 minutes of storage capacity for other recordings.

— Online access to this NTP (553-3001-112) through the BUI—You can delete the online NTP to gain four minutes of storage capacity for voice and music recordings.

— Time & date synchronization with the Meridian 1 system via the Ethernet

Structure of this document

The following describes the structure of this document:

"Description" on page 15 describes the MIRAN functional and physical characteristics.

"Engineering guidelines" on page 45 describes system hardware and software requirements and MIRAN configuration options.

"Installation and configuration" on page 65 describes how to prepare the Meridian 1 equipment, how to install the MIRAN into the Intelligent Peripheral Equipment (IPE) module or shelf, and how to connect it to the external voice sources and voice delivery devices.

This section also describes the MIRAN configuration, RAN implementation, MIRAN expansion, channel assignment administration, and access security administration.

“RAN Application: Telephone User Interface (TUI)” on page 209 describes different RAN applications based on use of the terminal OA&M access using menus and commands.

“RAN Application: Telephone User Interface (TUI)” on page 209 describes how to use a DTMF telephone to record new announcements and how to place existing announcements in or out of service.

“RAN Application: The Browser User Interface (BUI)” on page 229 describes how to operate and administer the MIRAN card(s) using a web-based server hooked up to the LAN.

“Maintenance” on page 251 describes how to maintain and troubleshoot the MIRAN card and associated equipment.

Appendix A: “Sound recording, codes, and interfaces” on page 261 lists the MIRAN display hexadecimal codes as well as pin assignment and connector types for external connections to the MIRAN. It also contains an example of how to configure the system for telephone set-based administration.

Appendix B: “Product integrity” on page 269 describes reliability, environmental specifications, product integrity, and regulatory standards for the MIRAN.

Description

This chapter describes the NTAG36 Meridian Integrated RAN (MIRAN), both at a system level and at a card level. It describes functions, specifications, applications, and operation of the MIRAN. This chapter contains the following sections:

— Card overview, describing the function of the MIRAN card and its place in the Meridian 1 system

— Features overview, describing the basic features of the MIRAN product, including the new features for MIRAN Release 2.0

— Technical description, describing the structure of the MIRAN card, the faceplate and backplane connections, etc.

Card overview

The MIRAN provides multi-tasking voice processing applications such as recorded announcement (RAN) and music-on-hold (MOH). The MIRAN is an Intelligent Peripheral Equipment (IPE) card compatible with Meridian 1 Options 21E, 51, 51C, 61, 61C, 71, 81, and 81C. It is also compatible with Options 11E and 11C systems and SL-1 systems NT and XT that support IPE cards.

The MIRAN operation requires X11 release 19 or later. The MIRAN application software comes preinstalled in MIRAN.

The MIRAN communicates with X11 system software through trunk signaling announcements over the DS-30X link and emulates the Enhanced Universal Trunk card. The same overlays used to configure the Enhanced Universal Trunk card, trunk routes, and trunk functions are also used to configure the MIRAN routes.

The MIRAN provides up to eight internal one-to-one trunk emulation ports/channels and one or two external multi cross-connect channels to support RAN and MOH applications. Each multi cross-connect channel can connect to up to 16 external trunk ports at the MDF.

The MIRAN card comes in three sizes: small, medium, and large. The largest single MIRAN card provides 8 trunk emulation ports/channels and 2 multi cross-connect channels, for a total of 10 RAN/MOH channels.

Use PCMCIA Flash memory cards to expand the MIRAN announcement storage memory, to install new RAN and MOH applications, and to backup announcements from the MIRAN to the PCMCIA card. The MIRAN provides internally eight to fourteen minutes of announcement storage capacity. If eight to fourteen minutes of announcement storage capacity is sufficient, a Flash memory card is not necessary for this purpose.

You can link a maximum of 16 MIRAN cards in a V-LAN configuration to expand the RAN capacity beyond that of a single MIRAN card. This V-LAN configuration allows one terminal to access any MIRAN in the chain for the purpose of maintaining and configuring individual MIRAN cards and their RAN and MOH applications.

Both the MIRAN card and the MIRAN Release 2.0 card connect to a maintenance terminal (for text-based OA&M) over an RS-232 port or, alternatively, over the CE-MUX using the pass-thru feature on Options 11E and 11C. The MIRAN Release 2.0 card can also connect to the maintenance terminal through a 10BaseT ethernet connection. Through the ethernet connection, you can telnet into the MIRAN Release 2.0 card to perform text-based OA&M. You can also use the internal web server of the MIRAN Release 2.0 card to perform web-based OA&M.

> ***Note:*** The ethernet connection for the MIRAN Release 2.0 card is optional, but necessary for telnet access, web-based OA&M, and FTP downloading of files.

The MIRAN also contains a telephone user interface (TUI). You can use a DTMF telephone to configure the MIRAN, to record new announcements, and to swap existing announcements in and out of service. To use the TUI, one of the eight one-to-one ports/channels (port 7) must be configured as a DID port dedicated to telephone access.

Both cards connect to an external music source over an analog I/O port. This port can also be used to input music or voice to a tape recorder. An additional analog port is available on the backplane.

Figure 1 illustrates the communication bus structure between the MIRAN and the Meridian 1 CPU as well as the Peripheral Controller in the IPE module. This structure works for both the original MIRAN card and the MIRAN Release 2.0 card.

Figure 1
MIRAN interface structure in the Meridian 1 system (Option 1)

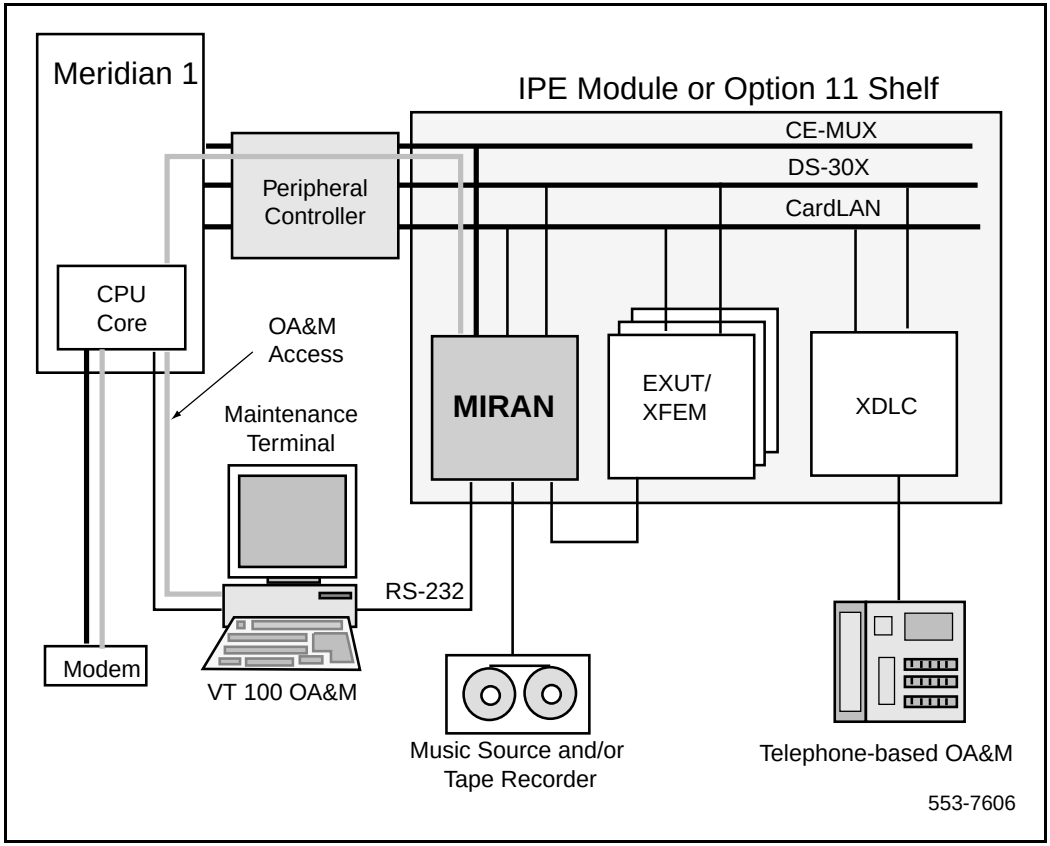
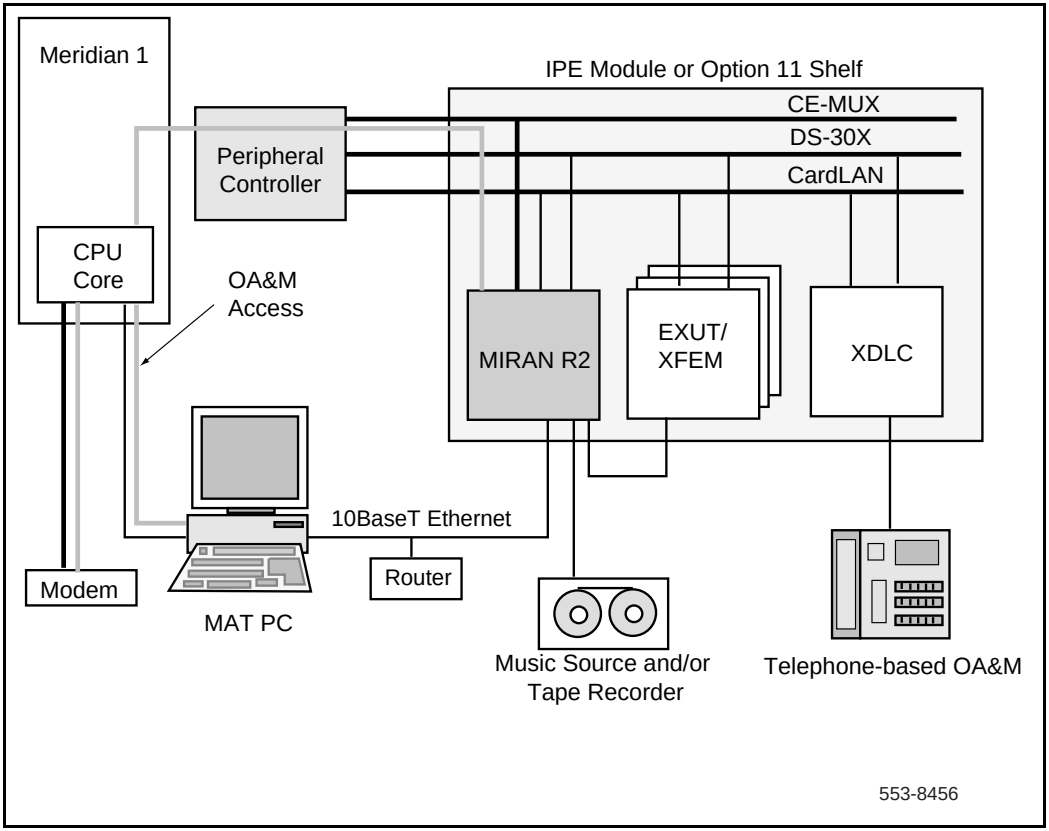


Figure 2 illustrates the communication bus structure between the MIRAN Release 2.0 card, the Meridian 1 CPU, and the Peripheral Controller, making use of an ethernet connection.

Figure 2
MIRAN Release 2.0 interface structure in the Meridian 1 system (Option 2)



The enhanced flexibility of the MIRAN card provides:

— easily expandable, industry-standard architecture (small, medium, and large configuration controlled by keycode)

— a set of both standard and proprietary interfaces

— compatible with all systems that support IPE cards

— embedded real time operating system

— support for CE-MUX and Card-LAN

— simplicity to RAN and MOH applications (no external devices or cables)

— versatile storage capacity features provide for:

- A recording storage capacity of up to eight minutes on the base MIRAN
- Unlimited different announcements per channel per day changeable on a time-of-day and day-of-year basis
- In-system upgradeable MIRAN with plug-in PCMCIA ATA Flash cards to more than five hours of storage
- Up to eight internal one-to-one RAN or MOH port/channels, which support continuous and start/stop RAN mode (seven, if one is used for telephone-based OA&M access)
- Two cross-connect channels, which cross-connect to a maximum of 16 trunk ports each, to provide a total of 32 RAN or MOH channels. These cross-connect channels support only continuous RAN mode.
- Music and voice storage to the limits of the available Flash memory

— a versatile set of recording features that include the following:

- Different announcements programmed to play at different times of day and different days of the year
- FTP downloading of voice and music files via the Ethernet
- Batch files, which enable rapid reconfiguration in case of emergency
- Swapping of “in-service” and “in-reserve” announcements using a DTMF telephone
- Announcement backup and restore capability
- Transfer of existing announcements to the MIRAN
- New announcements recorded over a telephone or from common plug-in audio equipment (e.g., CD players, cassette players, etc.)
- Password-protected RAN recording from any DTMF telephone using a simple voice menu interface
- Connection of up to two external analog (music) sources for recording and playing
- Music recording provided on one faceplate input port

MIRAN design characteristics

The MIRAN card supports voice processing by providing connectivity to the Meridian 1 system, voice storage capacity, and access to an OA&M facility.

The MIRAN card (both NTAG36AA and NTAG36AC):

— is based on an industry standard 486 processor core

— uses standard interface buses (PCI, ISA, and PCMCIA)

— accesses all 32 DS-30X voice/signaling timeslots

— supports CE-MUX and Card-LAN interfaces

— provides two RS-232 serial ports for maintenance access (through the faceplate 8-pin Mini-DIN connector and through the MDF). Port B connects to the terminal, and port A is used together with port B to serially connect multiple MIRAN cards into a V-LAN for a single terminal access.

— provides two cross-connect channels (both input and output) for connecting to analog trunk cards

The MIRAN Release 2.0 card (NTAG36AC) also supports connection to the Ethernet through an Ethernet adapter.

MIRAN channel overview

One-to-one recording ports/channels on the MIRAN emulate the Enhanced Universal Trunk card.

In addition to the eight one-on-one trunk emulation ports/channels, up to two multi cross-connect channels are also available. Thus, ten total ports/channels are available in the largest of the three MIRAN capacity options, as Table 1 shows.

Table 1
MIRAN capacity options

MIRAN capacity option	No. of Multi cross- connect ports/channels	No. of one-to-one ports/channels (North America)	No. of one-to-one ports/channels (International)
Small	1	4*	2*
Medium	2	4*	4*
Large	2	8	8
* Also includes port 7 for the telephone user interface (TUI)			

Note: Each MIRAN capacity option consists of the NTAG36 MIRAN card, the NTDK57 Security Device, and a Keycode.

Each of the two cross-connect channels can be cross-connected with 16 (600 Ohm) trunks or 16 (900 Ohm) trunks to provide a total of up to 32 ports/channels.

For each capacity option in Table 1, port 7 on the MIRAN card can be configured for telephone-based OA&M. Also, note that only one-to-one ports/channels have Enhanced Universal Trunk card emulation; the two multi cross-connect channels do not.

Supported applications

MIRAN supports the following applications:

— 1st RAN

— 2nd RAN

— Intercept treatment

— Music on hold

— Automatic wake-up

Features overview

Text-based user interface

The text-based user interface provides menus and commands so you can perform all of the necessary MIRAN OA&M functions. The software for this interface is part of the MIRAN-specific OA&M tool running under VxWorks; it is independent of Meridian 1 software.

There are two ways to use the text-based user interface to access all commands and options:

— Use the menu system

— Enter commands on the command line

To use the MIRAN text-based user interface, you must access the MIRAN card through a VT-100 type terminal. The MIRAN Release 2.0 card supports a serial connection between the terminal and the card. The MIRAN Release 2.0 card also supports telnet access to the text-based user interface over a E-LAN. The serial interface takes precedence over the telnet interface. If someone has logged in through the serial interface, no one can log in through telnet. Conversely, if someone has logged in through telnet, another user can knock the telnet user off by logging in through the serial interface.

Note: Nortel Networks recommends HyperTerminal for Windows 95/98 for PC-based telnet access.

Refer to “RAN Application: Text-based user interface” on page 127 for more information on the text-based user interface.

Telephone user interface

A telephone user interface (TUI) within the MIRAN application allows you to access the application from *any* Dual Tone Multiple Frequency (DTMF) telephone. (The DTMF telephone can be either internal or external to your PBX system.) The TUI uses a series of simple voice menus and prompts for quick modification of announcements and other simple tasks.

> ***Note:*** You must handle extensive changes through the text-based user interface or the browser user interface (BUI).

The TUI enables you to do the following:

— record new announcements

— play announcements

— assign and unassign announcements to MIRAN ports

— access the MIRAN card security ID

You *cannot* do the following through the TUI:

— set the MIRAN card clock

— assign time-of-day restrictions to announcements

— access system configuration functions

— change passwords

You cannot access the TUI while another uses the text-based user interface.

The TUI allows you to login and issue specific commands through the dialpad of your Meridian Digital Telephone or any standard DTMF telephone. For security, login requires a valid user name and password, which the administrator supplies. The MIRAN card does not identify itself until you enter a valid user name and password.

The TUI reduces the number of MIRAN one-to-one ports available for RAN or music from eight to seven. Because there is no messaging between MIRAN cards, you must reserve port 7 for the TUI on each MIRAN card that requires this interface. If a MIRAN card does not require the TUI, then all eight ports on the card are available for RAN or music.

Refer to "RAN Application: Telephone User Interface (TUI)" on page 209 for more information on the telephone user interface.

Browser user interface

The MIRAN Release 2.0 browser user interface (BUI) is a web server embedded in the MIRAN Release 2.0 card. The BUI allows you to access the MIRAN card through a common web browser to perform OA&M functions. The BUI provides OA&M screens similar to the text-based user interface.

The BUI option available to MIRAN Release 2.0 users who have connected the MIRAN card(s) to their LAN through the necessary Ethernet adapter. For equipment and configuration information regarding the MIRAN BUI, refer to "Ethernet access installation and setup" on page 106.

You do not need the BUI to perform OA&M for the MIRAN Release 2.0 card. You can perform all of the OA&M functions through the text-based user interface. The MIRAN BUI allows you to access the MIRAN Release 2.0 card through your LAN using a common web browser. For the web browser, Nortel Networks recommends you use Netscape 3.0 or later or Internet Explorer 3.0 or later. Any web browser you use must support HTML frames.

Refer to "RAN Application: The Browser User Interface (BUI)" on page 229 for more information on the browser user interface.

User interface multiple-access restrictions

Multiple users can simultaneously access a MIRAN Release 2.0 card. However, there are restrictions under which simultaneous access can occur. shows the various situations in which multiple access can occur.

Table 2
User interface multiple-access restrictions

A user has logged in through the...	Another user can log in simultaneously through the...			
	Text UI?	TUI?	BUI?	FTP?
Text-based User Interface (Text UI)	No	No	Yes	Yes
Telephone User Interface (TUI)	No	No	Yes	Yes
Browser User Interface (BUI)	Yes	Yes	No	Yes
File Transfer Protocol (FTP)	Yes	Yes	Yes	No

Notice that MIRAN Release 2.0 doesn't support simultaneous access through the same interface type. Also, MIRAN Release 2.0 does not support simultaneous access through the text-based user interface and the TUI.

Calendar assignment feature

The MIRAN Release 2.0 software introduces the concept of Calendar assignments for use in scheduling announcements. Assignments are made on a day and month basis, regardless of year, utilizing a 366 day calendar.

Calendar assignments

The Calendar assignment method of assigning files is more powerful and flexible than the "day, time, and filename" method which was employed in the original MIRAN product.

When a Calendar assignment is created, it is assigned a ‘weighting’ based on how specific the assignment is. Assignments are sorted in the Calendar list according to this weighting. The more specific assignments appear at the top of the list while the least specific assignments appear at the end. MIRAN searches the Calendar list when making channel assignments. The first entry in the list that matches the current day, time and channel will be the correct choice. If a match can not be found in the Calendar list, the search will revert to the assignment lists.

All Calendar assignments consist of the following components:

— Channel entry - can be a either single channel, ***6***; a range of channels, ***2-4***; a combination, ***0,2-4,7***; or a wildcard, *******, to denote all channels.

Note: When a wildcard is used, it affects only the channels to which the current user has access. These are the channels that are assigned to the user’s channel group.

— Time entry - can be a single time, ***9:00***; a range of times, ***9:00-10:15***; or a wildcard, *******, to denote the entire day. A wildcard can also be entered instead of the minutes, ***9:****, to indicate the entire hour. Table 3 gives examples of time entries. The entries are sorted in order of most specific to least specific and indicates the order in which the entries would appear in the Calendar list.

Table 3
Time entry examples-sorted from most specific to least specific

Time entry	Comment
9:00-9:30	Range of times (no wildcards allowed) Note: The range ‘10:00-16:30’ is more specific than ‘10:*’ due to the use of the wildcard.
9:*	Entire hour (9:00 to 9:59)
9:00	9:00 until the end of the day (9:00 to 23:59)
*	Entire day (0:00 to 23:59)

— Date entry - can be a single date, ***20/2***; a range of dates, ***20/2-25/2***; a single day, ***MON***; or a range of days, ***MON-WED***. A wildcard, *******, can be used instead of the day or the month; ***25/**** would denote the 25th of each month, and ****/12*** would denote every day in December. A wildcard used alone, *******, denotes every day. Table 4 gives examples of date entries. The entries are sorted in order of most specific to least specific and indicates the order in which the entries would appear in the Calendar list.

Table 4
Date entry examples-most specific to least specific

Date Entry	Comment
20/1	Specific date
20/1-25/1	Range of dates (no wildcards allowed)
1/*	1st day of every month
*/1	Every day in January
MON	Every Monday
MON-WED	Every Monday through Wednesday Note: THUR-MON is also a valid range
*	Every day of the year

Note: You can combine the time and date definitions as part of a "descriptor". Refer to "Calendar descriptors" on page 28.

— Filename or Analog channel - specifies the file to play when the assignment is active, or the analog channel (either ANALOG0 or ANALOG1) to take input from for playthrough.

Calendar descriptors

Calendar descriptors are a user-friendly way to store frequently used times and dates for Calendar assignments. Each date and time pair are assigned a descriptor name which denotes the period. For example, to make assignments for the hour a business is closed for lunch, 13:00 to 14:00 Monday through Friday, instead of making the assignment manually using these times, the user can define a calendar descriptor called ***'lunch'***. The descriptor ***'lunch'*** would have a date entry of ***'MON-FRI'*** and a time entry of either ***'13:*'***, or ***'13:00-14:00'***. Assignments would then be made using the descriptor ***'lunch'***. The advantage to using this method is that, at any time, the user can redefine the ***'lunch'*** descriptor and it will take effect for all assignments using '***lunch'***. By utilizing calendar descriptors, the user avoids having to manually change each assignment, and eliminates the risk that they might miss changing an assignment.

Table 5 shows example Calendar Descriptors that could be used in making assignments. These Descriptors are sorted from most specific to least specific and appear in the same order in which they would appear in the list of Calendar assignments. Note that ***jan_sales_closed*** has the time defines as **'*'**. This means at all times; however, because of the way the entries are sorted, ***jan_sales_open*** will always be found during times when the store is open. When the time is such that the store is closed, the search will 'fall through' to the ***jan_sales_closed*** assignment.

Table 5
Calendar Descriptor examples-most specific to least specific

Descriptor name	Date	Time	Comment
christmas	25/12	*	Christmas Day
jan_sales_open	1/1-20/1	9:00-5:30	January Sales - Store Open
jan_sales_closed	1/1-20/1	*	January Sales - Store Closed
1st_of_month	1/*	*	1st Day of Every Month
weekend	sat-sun	*	Weekends
weekday	mon-fri	*	Weekdays
morning	*	8:00-10:30	Every Morning
opening_time	*	9:00	Store Opening Time
always	*	*	Always

Calendar Files

The Calendar List is stored in a file called _ASSIGNS.CAL, and the Calendar Descriptors are stored in a file called _DESCRIP.CAL. The Calendar Descriptors file is loaded prior to the Calendar file so that the descriptors used in the Calendar file can be validated.

Note: You can create multiple Calendar List files and Descriptor files, where each file contains a group of calendar assignments or descriptors. You can swap these files in and out of service, and transfer them to other MIRAN Release 2.0 cards, depending on your needs. For more information, refer to "The Calendar Operations menu" on page 136 and "The Descriptor Operations menu" on page 144.

System time and date synchronization

MIRAN Release 2.0 introduces a system time and date synchronization feature. This feature requires an Ethernet connection and is therefore not available to initial MIRAN users upgrading to MIRAN Release 2.0 software. The MIRAN Release 2.0 pack downloads the system time and date from the Meridian 1 on boot-up. The MIRAN Release 2.0 pack remotely logs in to the Meridian 1 and starts a terminal session. Once the session has been established, the MIRAN Release 2.0 accesses Overlay 2 and extracts the system time and date by sending the TTAD command. The session is ended and the real-time clock is set accordingly. The IP address of the Meridian 1 is stored in _CONFIG.DAT. The use of this feature will negate the use of the OA&M commands SETDAY, SETTIME, and SETDATE. Refer to "Configuring Ethernet for Time & Date Synchronization" on page 82 and "The Time & Date Configuration menu" on page 178 for instructions on configuring system time and date synchronization.

> ***Note:*** MIRAN Release 2.0 customers have the option of either synchronizing the time and date with the Meridian 1 system or setting the time and date manually.

Music-on-hold option

MIRAN allows you to program music routes and trunks for the card to provide Music-on-hold service to callers. MIRAN Release 2.0 comes with approximately five minutes of royalty-free music on drive C:. This royalty-free music comes pre-assigned to channel 0 and is set to play 'always'. You can change this assignment if it does not meet your needs. You can also delete the royalty-free music file if you do not need the music.

If you do not have X11 Release 23 or later with Music Broadcast, one caller at a time can listen to music on a single channel. With Music Broadcast, up to 64 callers can simultaneously listen to music on a single channel.

External music

In the case of external music, there is a permanent connection between an external music source (e.g. CD player, tape recorder etc.) and the MIRAN over the analog input port. This port is available both at the MDF and also on the MIRAN faceplate. External music is the most suitable implementation in cases where there is a requirement to frequently change the music.

The analog input is obviously not confined to music and can be used in many applications e.g. a “talking timetable”, or perhaps advertisements, which are changed on a regular basis. This type of implementation would generally be found on the larger system options where it is acceptable to have a dedicated piece of audio equipment for this purpose.

Note: MIRAN cannot receive a 600 Ohm or 900 Ohm music source.

Internal music

Internal music is normally used in situations where it is not possible or desirable to have a music source permanently connected to the MIRAN. In this situation, a technician uses an external music source to record the music onto the MIRAN, where it is stored digitally in Flash memory.

RAN password security

There are several levels of access to the MIRAN card for the RAN application. This is to ensure the security of all announcements recorded.

The password protection for telephone set-based OA&M will be transparent to the system in which the MIRAN card is installed. In order to provide security, three levels of passwords are used: distributor, administrator, and user levels.

Distributor level password

The distributor level password can be alphanumeric of up to 16 characters long. The distributor default password is “**distrib0**”. The distributor level is the next level of access above that of the basic user. The distributor is able to access the base code self-test and diagnostic procedures. Also, this password level provides announcement monitoring for Card-LAN, DS-30X, and CE-MUX, 8051 signals.

Administrator level password

MIRAN Release 2.0 introduces a new password level—the administrator password. The administrator default password is “**admin000**”. The Administrator level allows the creation of new Users and assignment of password and channel access permissions, deletion of existing Users, and viewing/editing of User information. Individual Users can alter their own password, but the Administrator can alter any User’s password and channel access permissions.

User password

The user password must be only numeric and up to 16 digits long. The user default password is "**user0000**". The general OA&M password allows a user to login to the MIRAN administration menu. This password level provides unrestricted access to all of the RAN based, and most of the MIRAN card level, administration options. The user password does not provide access to any diagnostic procedures.

Technical description

The NTAG36 MIRAN software and hardware architecture is an effective implementation of RAN and MOH applications for Meridian 1 and systems supporting IPE cards.

The MIRAN provides faceplate and backplane interfaces, which are used to connect external RAN and music sources and maintenance terminals to the MIRAN. The hardware description provides information on the faceplate connectors and indicators as well as the backplane connections to the MDF.

Hardware architecture

The MIRAN is designed with the 486 microprocessor as its core. The microprocessor interfaces directly to the DRAM array and cache memory and to the rest of the system over PCI and SAI buses. Peripheral interfaces such as RS-232 maintenance interface and PCMCIA interface, connect to one or the other of these buses.

Meridian 1 interfaces such as Card-LAN, DS-30X, and CE-MUX connect to a dedicated microcontroller. This microcontroller communicates with the core microprocessor over the dual-ported RAM.

To optimize the installation of the MIRAN and the external connections to the MIRAN, the MIRAN card provides faceplate connections for occasional use of the external devices and the backplane or MDF connections for permanent connection of these external devices.

Figure 3 shows a high level block diagram of the MIRAN card components.

MIRAN hardware list

Table 6 on page 34 lists specific MIRAN hardware components designed to support RAN and MOH applications in the Meridian 1 and SL-1 systems.

Figure 3
MIRAN block diagram

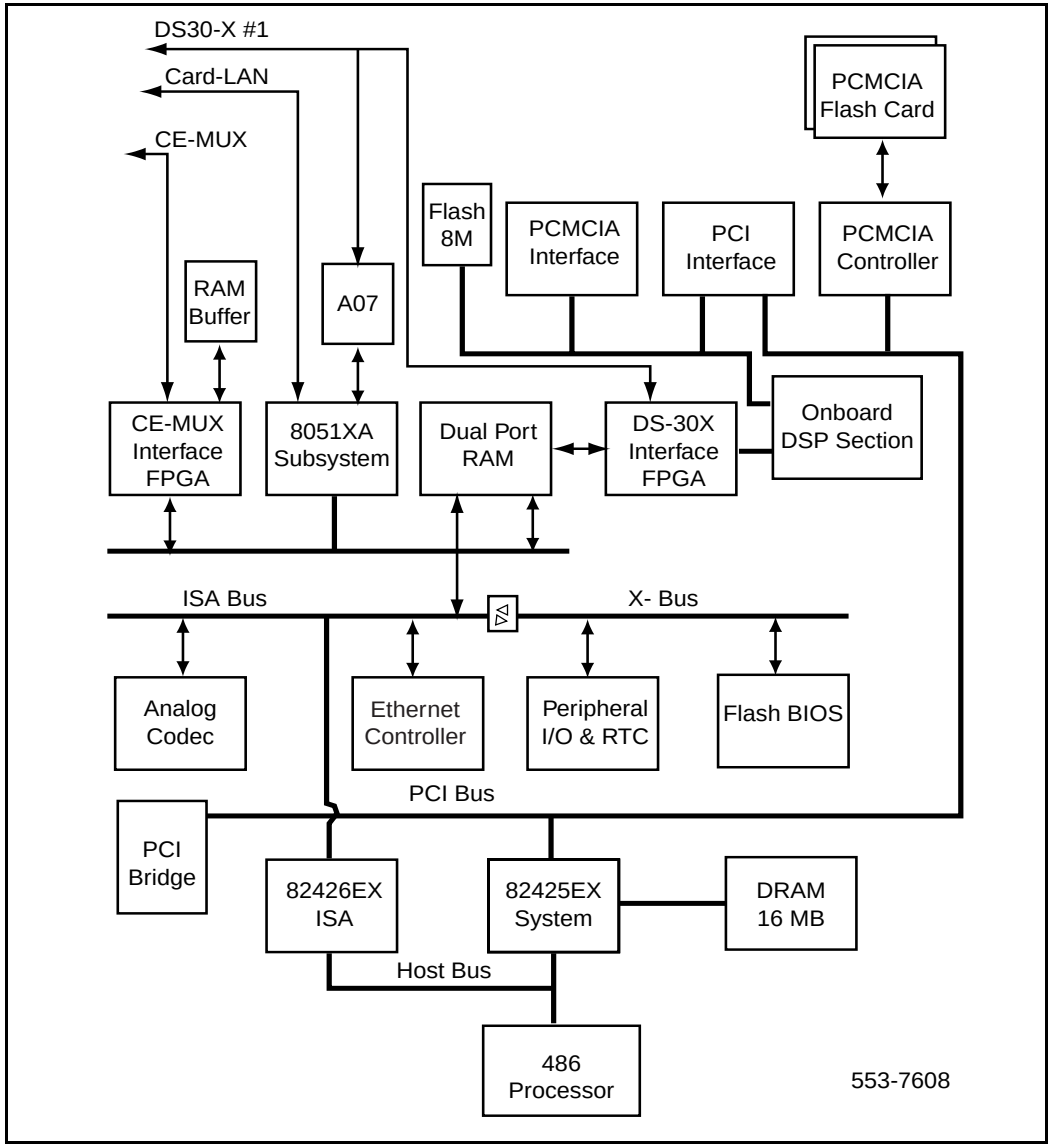


Table 6 does not list external equipment such as terminals, telephones, and recorders, because they are (or can be) non-proprietary products.

Table 6
MIRAN hardware list

Component	Description
NTAG36 Meridian Integrated RAN (MIRAN)	An IPE card that provides RAN and MOH applications over the Meridian 1 system. (NTAG36 plus security device plus keycode= NTAG88)
NTAG81AA Audio Cable	Connects external analog music source or a recording device to the 3.5 mm Audio Jack on the MIRAN faceplate. This is a splitter cable that provides the audio input signal on one connector and the audio output signal on the other connector.
NTAG81BA Maintenance Extender Cable	A 5-meter (16.4 feet) cable that extends the NTAG81CA, NTAG81GA, or the NTAG81DA Cables when connecting a terminal to the MIRAN. Has one DB9 male and one DB9 female connector.
NTAG81CA Maintenance Cable*	A 3-meter (9.8 feet) cable that connects the terminal to the MIRAN 8-pin Mini-DIN maintenance port on the faceplate. It is terminated with an 8-pin Mini-DIN male connector and a DB9 female connector.
NTAG81DA Maintenance Splitter Cable	A 3-meter (9.8 feet) cable that connects the Mini-DIN connector on the MIRAN faceplate to a terminal or to an adjacent MIRAN to form a LAN daisy-chain. It has an 8-pin Mini-DIN connector on the common side and two DB9 connectors, one female (to connect to the maintenance terminal) and one male (to connect to the next MIRAN card in the V-LAN chain) on the split side.
NTBK48AA Terminal Cable	Connects the Option 11E/11C SDI port to the terminal.
NTAG81GA Multi-I/O Adapter Cable	Mounts to the I/O panel on the rear of the IPE module and to the MDF. Contains one RJ-45 connector for connection to the Ethernet, one DB9 female connector for connection to a maintenance terminal (either directly or through a modem), and one 50-pin connector for connection to the MDF.
3MB, 8MB, and 40MB PCMCIA Cards	Use for software upgrades, backups, and/or storage.

Note: You don't need the NTAG81CA maintenance cable if you have the NTAG81GA multi-I/O adapter cable.

Faceplate connectors and indicators

Figure 4 on page 36 shows the NTAG36 MIRAN card faceplate. It shows the connectors, a hex display, a status LED, a reset button, and a PCMCIA card slot.

The MIRAN faceplate provides the following interface connections:

Audio jack

This 3.5 mm audio jack provides access to a single analog input and a single analog output. In addition, it is used to facilitate connection of external analog sources such as a tape recorder or CD player in order to record into MIRAN Flash memory or route it directly through a trunk emulation port into Meridian 1 for MOH. Alternatively, it can be used to back up announcements from the MIRAN or to transfer them onto another MIRAN card.

The audio jack provides an external connection to Port ANALOG0 for a short term connection of an external analog source.

Where a permanent connection to an external music source is required, the external connection should be made at the MDF not at the audio jack. At the MDF, the port signals are duplicated and an additional audio input and output is provided.

Status LED

The MIRAN faceplate provides a single red LED to indicate the enabled/disabled status of the card and to indicate the self-testing result during power up or card insertion into an operational system.

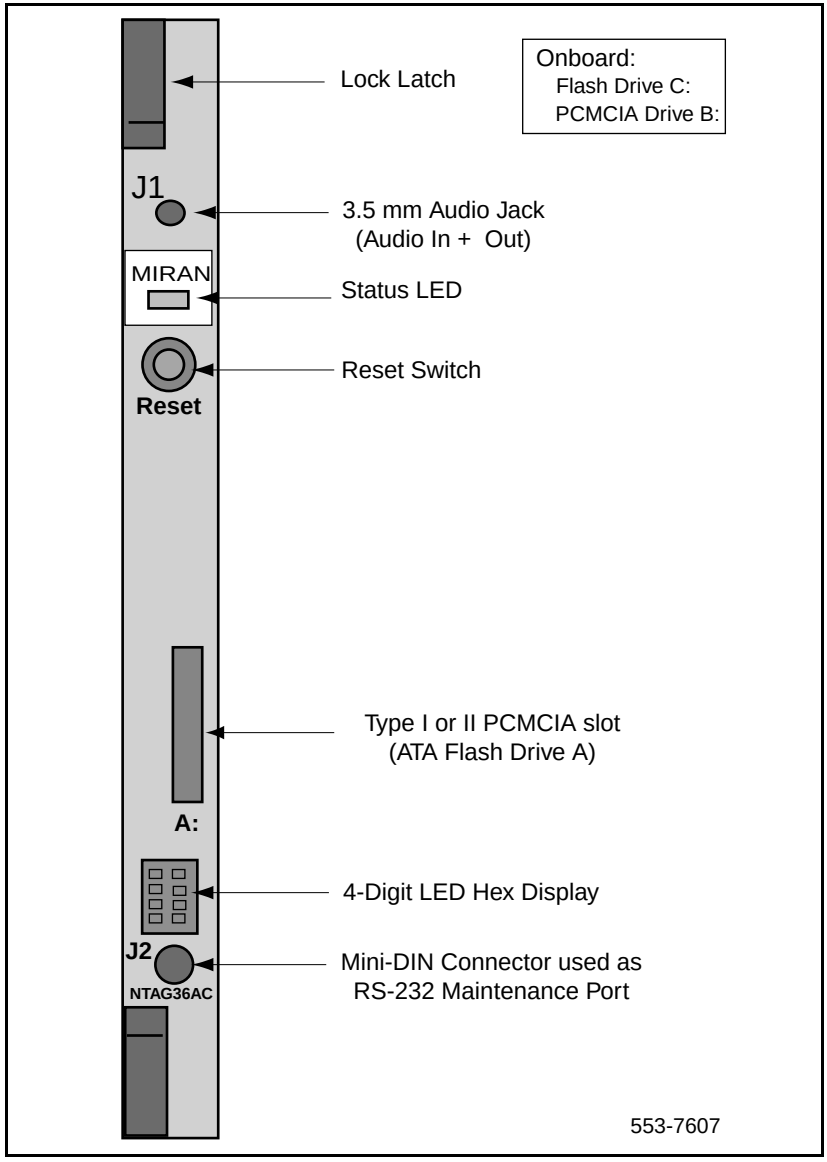
Reset switch

The reset switch on the faceplate allows you to manually reset the MIRAN card.

PCMCIA slot

This slot accepts standard PCMCIA cards including ATA Flash and Type I or II ATA compatible. This slot is used for MIRAN software upgrades, backing up announcements, and additional storage.

Figure 4
The NTAG36 MIRAN faceplate



Maintenance hex display

This is a four-digit LED-based hexadecimal display that provides the status of the MIRAN at all times. In addition, it provides an indication of fault conditions and the progress of PCMCIA-based software upgrades or backups.

It also indicates the progress of the internal self-test in the form of T:xx (refer to *Appendix A, MIRAN hexadecimal codes*). Upon successful completion of the test and the start-up of the RAN application, it will display the code "RAAn", where **n** is the V-LAN card number (in hexadecimal). If cards are not connected in a V-LAN configuration the display will show RAA0.

RS-232 Asynchronous Maintenance Port

An 8-pin mini-DIN socket on the MIRAN faceplate provides access to both RS-232 ports. This faceplate port can provide access to the MIRAN for OA&M purposes. This connector is duplicated on backplane or at the MDF where you can make a permanent terminal connection.

On-board PCMCIA slot

The MIRAN circuit board has a slot that accepts Type I, Type II, and Type III standard PCMCIA Flash cards. This connector is located on the MIRAN printed circuit board, not on the faceplate. This PCMCIA slot is used to increase voice and music memory storage. You also use this slot to upgrade a MIRAN NTAG36AA card to MIRAN Release 2.0 software.

MIRAN I/O panel and MDF connections

In addition to the faceplate connections, the MIRAN Release 2.0 card provides the following connections through the I/O panel: a connection to the MDF cable (which provides two external cross-connect channels, RS-232 ports A and B, and audio ports) or a connection to the multi-I/O adapter cable.

Multi cross-connect channel connection

Multi cross-connect channels are accessible at the MDF. These two external cross-connect channels can be cross-connected with 16 (600 Ohm) trunks or 16 (900 Ohm) trunks each to provide a total of up to 32 trunks cross-connections. (These channels do not emulate a trunk).

MDF ports A and B

A serial port (port B) is provided on the MIRAN card for maintenance functions. Access to this port is at the MDF where you can permanently connect a terminal.

A second serial port (port A) is provided to enable the serial connection of multiple MIRANs. Port B connects to the terminal and port A is used together with port B to serially connect multiple MIRAN cards (up to 16 cards) into a maintenance V-LAN. This configuration enables one, permanently installed maintenance terminal to have access to up to 16 MIRAN cards. You can also telnet to all 16 cards with this configuration. Refer to Figure 18 “Multiple MIRAN card connections over the RS-232 port at the MDF” on page 117.

CE-MUX

The CE-MUX interface provides a standard multiplexed CPU bus to allow the MIRAN to emulate standard equipment circuit cards in order to provide Option 11E and 11C maintenance access.

Analog ports

The MIRAN supports two analog input ports in order to connect external sources for recording announcements and/or music, or, alternatively, to provide two analog channels that can be mapped into up to eight logical RAN units.

The audio jack on the MIRAN faceplate provides access to a single analog input and a single analog output. At the MDF, however, two analog inputs and two analog outputs are available for backing up stored announcements onto audio cassette tape.

The two channels are independent of each other in order to provide two analog ports for recording and playback. Tip and Ring pairs at the MDF provide the ability to permanently connect the external analog sources to both Port ANALOG0 and Port ANALOG1.

Multi-I/O adapter cable

The multi-I/O adapter cable mounts to the I/O panel on the rear of the IPE module and to the MDF. It contains one RJ-45 connector for connection to the Ethernet, one DB9 female connector for connection to a maintenance terminal (either directly or through a modem), and one 50-pin connector for connection to the MDF.

It is very important that the 50-pin connector of the NTAB81GA cable be secured to the I/O connector using the mounting screw provided on the top of the 50-pin connector, as well as the fastener on the bottom.

The NTAB81GA cable provides a shielded RJ-45 coupler at the end of its E-LAN interface. This provides the connection point to the customer's E-LAN equipment. Shielded Cat. 5 cable must be used for connection from this point to the customer's Hub or Router.

> ***Note:*** Ethernet connection is an option available with MIRAN Release 2.0. It is not necessary for basic MIRAN operation.

MIRAN reset and self-test functions

Reset is executed immediately following a power-on or system-level reset. This procedure initializes the processor before proceeding with the power-on self-test. The MIRAN attempts to log the source of each reset condition. This information can later be displayed on the maintenance terminal to find the cause of the problem and time and date when it occurred.

Hard reset

A hard reset is equivalent to a card insertion or loss of power. It results in a total reset of all hardware elements and a full hardware and software initialization. A hard reset is always followed by a power-up sequence. This process may last up to 2 minutes.

A hard reset can be initiated by any of the following activities:

— card-level maintenance over the RS-232 port

— MIRAN sanity reset

— excessive soft resets in a given time period

— by the administrator after upgrading MIRAN software

The excessive soft reset, refers to an attempt at software-level recovery that repeatedly fails. The only other option in that case is to reset the hardware and reload the operating system.

Soft reset

The soft reset re-initializes software elements on the card and corresponds to a reboot of the card. The system checks for the presence of an alternative boot source (e.g., a newly inserted PCMCIA Flash card) during soft resets. This process may last approximately 1 minute. During power up procedure, the system checks first drive A: then drive B: and finally drive C: for configuration information.

A soft reset can be initiated by any of the following:

— card-level maintenance

— excessive sanity non-maskable interrupts in a given time period

The last situation would arise if a number of unsuccessful attempts were made to recover from a software (or hardware) error condition before exceeding a pre-defined threshold.

Executed immediately after a power-on or reset, this procedure:

— performs a minimum-level of hardware testing

— performs a full diagnostic check

— opens a communication path to an external maintenance terminal so that the MIRAN diagnostic status can be displayed during self test

Diagnostic self-test

This tests the installed hardware:

— determines the integrity of the hardware

— establishes MIRAN configuration in terms of its processor, RAM capacity, and Flash memory

The MIRAN displays any unexpected results on the maintenance port and updates the Flash configuration. It may also indicate self-test results on the MIRAN faceplate hex display.

BIOS initialization

This process initializes the base hardware, using configuration information stored in Flash.The BIOS layer provides initialization and device drivers.

The BIOS layer initializes the hardware and boots the operating system, using the low level reset, self-test, and BIOS initialization.

Built-in monitoring functions

The operating system provides some form of low level access over a maintenance port for debugging purposes.

Sanity monitoring

This background task checks the sanity of the system, particularly in relation to other tasks that may be tying up CPU or memory resources. It attempts to restore normal MIRAN operation in cases where the performance has degraded to an unacceptable level. If all else fails, this task restarts the MIRAN in order to return to a functional state.

Responsibility for monitoring the MIRAN sanity is shared between the 486 and the 8051XA processors. The latter monitors the 486 by sending periodic diagnostic polling announcements to which a response is expected within a given time period. Failure of the 486 to respond initiates a recovery procedure, which repeats the announcement at least two more times, followed by generating a soft reset to the 486, and eventually a full board-level reset. Failure to recover at that point results in a permanent error code on the hex display.

Software security

To provide security for the RAN and music applications as well as to prevent unlawful product usage, the MIRAN uses a security device and keycode security approach.

Security overview

A security device and keycode mechanism is necessary to protect against unlawful MIRAN feature usage, because industry-standard PCMCIA cards are used as the software medium on the MIRAN. All upgrades of either channel capacity or application software are restricted to a given MIRAN card and are accurately tracked to allow for satisfactory handling of field repairs and incremental upgrades.

Security is required for the following upgrades:

— port/channel capacity upgrades

— feature enhancements

— new applications

Security is not required for the following upgrades:

— Flash memory capacity expansion

— customer recorded prompts

— backup and restore operations

— application patching/bug fix

Security device

This button-sized device has a unique 12-digit laser-etched code that cannot be overwritten. In addition, it contains 1kbit of PROM to:

— identify the button as part of a Nortel product

— provide an 8-digit security ID

Figure 5 illustrates an example of a security device that contains a unique 12-digit laser etched code and 1kbit of PROM preprogrammed with Nortel specific information. The 'NORTEL'-side of the security device shows the 8-digit security ID. You must install the security device with the 8-digit inscription facing away from the card.

> ***Note:*** If you have properly installed the security device, you can see the Nortel Networks logo with the 8-digit inscription underneath.Figure 6 on page 44 shows the position of the security device on the MIRAN card.

Security ID

The security ID is the number that the customer must query from the MIRAN maintenance port prior to ordering an upgrade. It is read from the security device and it is unique for each MIRAN card.

The security ID number can be found:

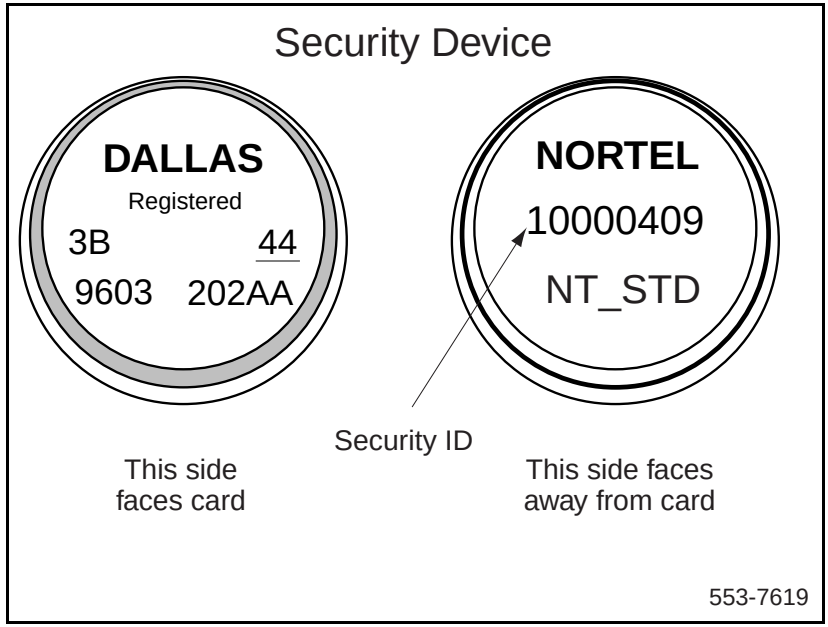
— at the top left-hand corner of the terminal-based OA&M menu or screen

— by using a command on the telephone set-based OA&M access

— on an adhesive label in the box

— on the shipping paperwork

Figure 5
Example of a security device

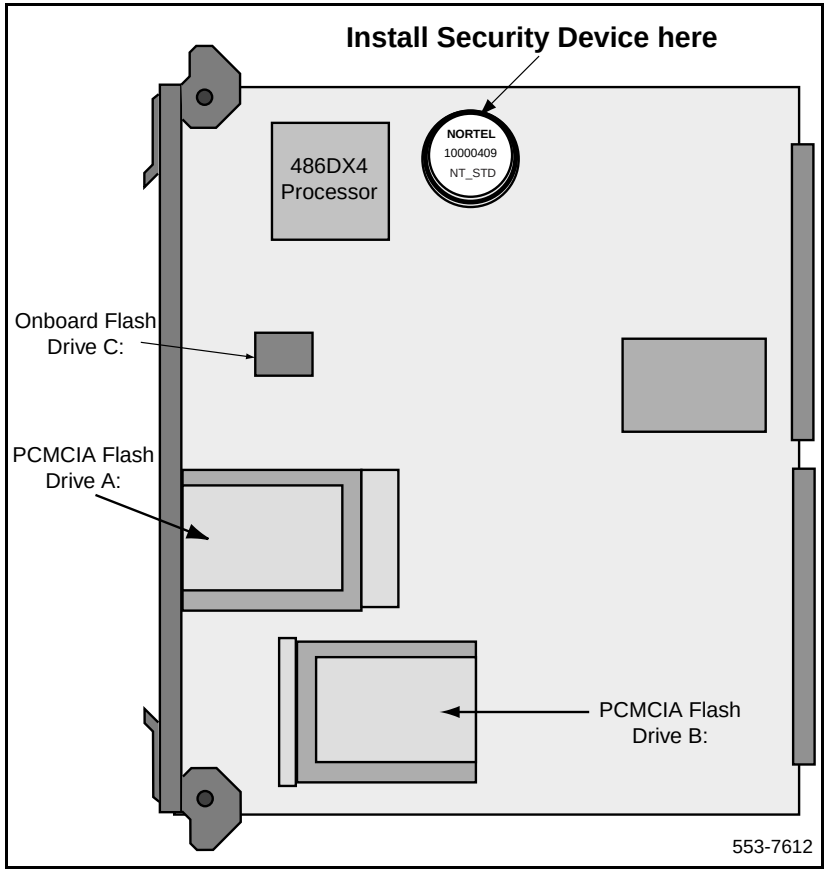


Keycode

Nortel Networks provides the customer with a keycode to enable them to install any desired upgrade. The keycode is entered over a terminal using the local maintenance port on the MIRAN card. The keycode consists of three sets of eight digits and must match the Security ID on the MIRAN card.

Keycodes can enable additional functionality within an existing application (adding ports, features, etc.) or can be used with a PCMCIA Flash card to provide new software features. The MIRAN comes from the factory equipped with a keycode; however, spare and repaired MIRAN cards are not equipped with a keycode nor with the security device. For the MIRAN to operate correctly, the keycode must be installed.

Figure 6
Security device installation in the MIRAN card



Engineering guidelines

Meridian 1 general system engineering guidelines are described in *System Engineering* (553-3001-151). The following information deals specifically with engineering guidelines for MIRAN planning and implementation. For MIRAN technical characteristics, refer to Appendix B: “Product integrity” on page 269.

X11 software requirements

The MIRAN card emulates the Enhanced Universal Trunk card. The MIRAN card uses the existing Trunk Administration Overlay (LD 14) and Trunk Route Administration Overlay (LD 16) programs to configure the MIRAN trunk parameters and MIRAN trunk routes.

To support the MIRAN functions, the Meridian 1 system must run X11 release 19 or later software. However, the X11 release and the available software options that the user has affect the functionality of the MIRAN card. The following paragraphs detail the differences.

For users with X11 release 22.08 or 21.41 and earlier

Note: This section applies to customers who do not have the MLSS option.

The two MIRAN cross-connect channels can each support up to 16 RAN or MOH listeners. To do this, connect each cross-connect channel to as many as 16 EXUT trunks, with each trunk route programmed to run in continuous RAN mode.

Note: You must program the two EXUT trunk routes associated with the two cross-connect channels to run in continuous mode (RTYP = CON in Overlay 16).

The eight MIRAN one-to-one channels each support only one RAN listener per RAN route.

For users with X11 release 21.45 or 22.16 and later, but without RAN Broadcast

Note: This section applies to customers who have the MLSS option, but do not have RAN Broadcast.

The two MIRAN cross-connect channels can each support up to 16 RAN or MOH listeners. To do this, connect each cross-connect channel to as many as 16 EXUT trunks, with each trunk route programmed to run in continuous RAN mode.

Note: You must program the two EXUT trunk routes associated with the two cross-connect channels to run in continuous mode (RTYP = CON in Overlay 16).

With the MLSS RAN mode, the MIRAN one-to-one channels can each have the same RAN announcement (or music) assignment and the same MLSS RAN trunk route assignment. Therefore, multiple callers can hear the same RAN announcement, although listening on different MIRAN one-to-one channels. One large MIRAN card in MLSS mode supports up to eight callers listening to the same announcement.

Note: Nortel Networks recommends that you reserve port/channel 7 of the MIRAN card exclusively for the Telephone User Interface (TUI); this configuration leaves, therefore, a maximum of seven listeners hearing the same announcement on a single MIRAN card.

For example, if you have one of these X11 software releases and require that ten callers be able to hear the same RAN announcement, you have two options with MIRAN:

— Use ten MIRAN one-to-one ports/channels (two MIRAN cards), placing all of them in the same MLSS RAN route and placing the same recording on all ten channels.

— Use one MIRAN cross-connect channel (one MIRAN card), connecting it to ten EXUT ports (two EXUT cards) and placing each EXUT port in continuous RAN mode.

Note: The MLSS (multi-channel start/stop control) RAN mode allows playing of the same recording independently on multiple channels over the same RAN route.

For users with X11 release 23 or greater and RAN Broadcast

The two MIRAN cross-connect channels can each support up to 16 RAN or MOH listeners. To do this, connect each cross-connect channel to as many as 16 EXUT trunks, with each trunk route programmed to run in continuous RAN mode.

Note: You must program the two EXUT trunk routes associated with the two cross-connect channels to run in continuous mode (RTYP = CON in Overlay 16).

With the RAN Broadcast feature, each internal one-to-one channel can support up to 30 callers simultaneously using a single timeslot. RAN Broadcast also provides other benefits such as the ability to stagger announcements based on time or number of callers in queue and the ability to provide MOH until a RAN is available.

Note: The cross-connect channels do not support RAN Broadcast if you connect them to more than one trunk input. If you connect a cross-connect port to just one trunk input, you can configure that port for RAN Broadcast (RTYP = MCON in Overlay 16).

Option 11C with RAN Broadcast

Option 11C systems come from the factory with 12 pre-installed RAN Broadcast connections. This allows 12 callers to hear the same RAN announcement on a single one-to-one channel. You can purchase additional RAN Broadcast connections for the Option 11C.

Large Meridian 1 systems with RAN Broadcast

Large Meridian 1 systems do not come with pre-installed RAN Broadcast connections. You can purchase RAN Broadcast connections (SW150A) in increments of one.

Example:

A customer with a large Meridian 1 system requires RAN for two incoming trunk routes. Each route requires a first RAN for up to 25 callers and a second RAN for up to 20 callers. The system then requires 90 RAN Broadcast connections and one MIRAN small card.

The MIRAN is supported by:

— Meridian 1 options 21E, 51, 51C, 61, 61C, 71, 81, and 81C

— SL-1 systems NT and XT upgraded to support IPE cards

— Option 11E and 11C (main cabinet for CE-MUX capabilities)

Table 1 lists the Meridian 1 modules and card slots suitable for MIRAN installation.

Table 1
Card slots available for MIRAN installation in different modules

Meridian 1 module	Suitable card slots
NT8D37BA/EC IPE modules, NT8D11BC/ED CE/PE modules	All available IPE card slots
NT8D37AA/DC IPE modules	Slots 0, 4, 8, and 12
NT8D11AC/DC CE/PE modules	Slot 0

MIRAN requirements

The MIRAN equipment can be engineered to meet a specific site and application requirements. You can select the number of ports/channels and the size of the memory required to support current and future requirements. The MIRAN is available in a basic form that provides limited number of ports/channels and minimum memory size. However, the basic MIRAN can be easily upgraded by building on the existing basic platform to increase the number of ports/channels and the memory size.

MIRAN channel capacity options

The MIRAN comes in three port/channel capacity options. These options are listed in Table 2.

Table 2
MIRAN channel capacity options

MIRAN option	No. of Multi cross- connect ports/channels	No. of one-to-one ports/channels (North America)	No. of one-to-one ports/channels (International)
Small	1	4	2
Medium	2	4	4
Large	2	8*	8*
Note: You can use port/channel 7 as a DID port for telephone-based OA&M access; in this case, the large MIRAN option has only seven one-to-one channels available for RAN or MOH.			

For each capacity option, you can configure port 7 as a DID port for telephone-based (TUI) OA&M access. In this case, port 7 of the large MIRAN option is not available for RAN or MOH applications. You can configure port 7 on a large MIRAN for RAN and MOH when you don't need it for telephone-based OA&M access.

The small and medium MIRAN options continue to have all one-to-one ports/channels available for RAN and MOH, because port/channel 7, which is used for telephone-based OA&M access, does not count against the port capacity for these two options.

MIRAN listener capacity options

The size of the MIRAN card (small, medium, or large) affects the number of simultaneous calls that the MIRAN card can support. The RAN Broadcast feature also affects the number of simultaneous calls that the MIRAN card can support.

Without RAN Broadcast, each internal one-to-one port can support a single call at a time. Each external cross-connect port can connect to up to 16 EXUT ports, which enables the MIRAN card to support up to 16 additional simultaneous call per external port.

With RAN Broadcast, each internal one-to-one port can support 30 simultaneous listeners. The external cross-connect ports do not support RAN Broadcast; therefore, each external port still supports 16 simultaneous callers.

Table 3 lists the total call-handling capacity for each MIRAN size, with and without RAN Broadcast.

Table 3
MIRAN call-handling capacities

MIRAN size option	Call capacity without RAN Broadcast	Call capacity with RAN Broadcast
Small	20 (18)[1]	136 (76)
Medium	36 (36)	152 (152)
Large[2]	39 (39)	242 (242)

Note 1: Numbers in parentheses refer to the call capacities for the international MIRAN version.

Note 2: The large configuration assumes you have configured port 7 as a DID route for telephone user interface (TUI) access.

Supported RAN modes

The MIRAN card supports the following RAN modes for the internal and the external channels:

— Internal one-to-one ports/channels support continuous and Level Start (LVL) RAN and MOH modes.

— Internal one-to-one ports/channels support multi-level start/stop (MLSS or MLVL) RAN and MOH modes.

— External cross-connect channels support delay dial (DDL) and immediate (IMM) continuous RAN and MOH modes.

Note: MIRAN supports Auto-Wake-Up.To configure this feature on MIRAN, refer to Automatic Wake Up in *X11 Features and Services* (553-3001-306).

Voice storage capacity

You can expand the MIRAN storage capacity by installing PCMCIA ATA Flash cards into either the faceplate slot (drive A:) or the internal slot (drive B:). Nortel Networks recommends that you use drive B: for voice storage and drive A: for software upgrades (because drive A: is accessible on the faceplate, where a PCMCIA card is easy to remove).

Table 4 lists the memory size and the corresponding announcement recording time.

Table 4
MIRAN voice storage capacity expansion

Memory allocation	Recording time
Base MIRAN card (NTAG36AA) memory	4 minutes
Base MIRAN Release 2.0 (NTAG36AC) card memory	8 minutes*
40 MB PCMCIA Flash memory	80 minutes
A 170 MB PCMCIA card	340 minutes
Each additional 1 MB of Flash memory	2 minutes

*The royalty-free music file **(filename: music.sbc)** occupies approximately 1.5 minutes of the available 8 minutes of recording time. The online version of this document **(filename: miran.pdf)** occupies approximately 4 minutes of available 8 minutes of recording time. You can delete either or both of these files to gain additional voice storage capacity.

External cross-connect channel characteristics

Table 5 displays electrical specifications for the MIRAN RAN cross-connect output channels (A0 and A1).

Table 5
Characteristics of the cross-connect output channels (A0 and A1)

Characteristic	Specification
Terminal impedance	*600/900 Ohms
Supervision type	Continuous, level, or pulse
DC signaling maximum loop length	600/900-Ohm loop
Ground potential difference	±1 V
* Up to 16 trunks with 600 Ohm and 16 trunks with 900 Ohm can be cross-connected.	

Table 6 displays electrical specifications for the MIRAN RAN cross-connect input channels (ANALOG0 and ANALOG1).

Table 6
Characteristics of the cross-connect input channels (ANALOG0 and ANALOG1)

Characteristic	Specification
Terminal impedance	10 kΩ
Line input	1 V rms or 2.83 V peak-to-peak

Power and ground requirements

The IPE module power supply (AC or DC) provides power to the MIRAN.

Note: Power supplied at the IPE module backplane at each card slot exceeds the power requirement for each MIRAN card. Therefore, there is no restriction on the number of MIRAN cards in the IPE module.

Table 7 displays the MIRAN power requirements.

Table 7
MIRAN power requirements

Configuration	+/-15V	5V	Total Power
Basic 8-port/channel	7.0 W	8.0 W	15 W
8-port/channel ± 4MB Flash	7.0 W	8.3 W	15.3 W

The maximum IPE module per-slot power budget is 30 Watts, with an effective limitation of 20 Watts for thermal compensation. A DC/DC converter provides the 3.3 volts required by the 486 processor and the PCMCIA interfaces.

> ***Note:*** Power supplied at the IPE module backplane at each card slot exceeds the power requirement for each MIRAN card. Therefore, there is no restriction on the number of MIRAN cards in the IPE module.

Table 8 shows the maximum current required from each power supply rail.

Table 8
Backplane power available (per card slot)

Supply Rail	Available on backplane	With DC-DC converter	MIRAN
3.3 V	—	2400 mA	8 W
5 V	2000 mA	2000 mA	10 W
+/- 15 V	800 mA	366 mA	10 W

The processor contains three separate grounds: logic, analog, and frame. Logic ground connects to the processor ground. The codec has its own separate analog ground that connects to the logic ground at a single point.

Each MIRAN I/O port routed to the backplane has its own ground to simplify connections.

External equipment requirements

The MIRAN can perform RAN applications without any external connections. However, to perform any of the following operations:

— text-based (or terminal-based) OA&M

— web-based OA&M

— connecting external music sources to the MIRAN

— recording RAN announcements or music

You must connect external devices to the MIRAN faceplate connector or to the MDF.

Maintenance terminal requirements

A VT100 terminal, or a personal computer emulating a terminal, is used to:

— perform RAN and MIRAN administration

— perform maintenance and diagnostics on each MIRAN

— access and configure any MIRAN in a V-LAN configuration

You can serially connect up to 16 MIRANs into a V-LAN connection to provide access to each MIRAN card from a single terminal.

A terminal can use:

— a menu system to perform administrative and maintenance functions, or

— commands that are entered on the command line

The terminal must be connected to the MIRAN RS-232 interface. The connection can be made:

— at the mini-DIN connector on the MIRAN faceplate using the NTAG81CA or NTAG81DA Maintenance Cable for occasional use, or

— at the MDF tip/ring pairs using a terminal cable that must be less than 50 feet long (cable not supplied)

For a Single Terminal Access (STA), MIRAN can be connected to an MSDL port operating in the STA mode. This way, MIRAN and other application cards installed in the system can be accessed from a single terminal.

Terminal interface must be set at 9600 baud, 8 data bits, 1 stop bit, and no parity. The flow control is not supported.

Table 9 lists the terminal-based OA&M access method for different system options over the SDI or MSDL ports.

Table 9
Terminal-based OA&M access for different system options

System option	Access description
Option 11E - remote	Connect a modem to the MIRAN RS232 Port B via the MDF. For multiple cards, use V-LAN and connect the first card in the chain to the modem.
Option 11E - local	Connect a PC or terminal directly to the MIRAN RS232 Port B via the faceplate connector and maintenance cable or via the MDF. For multiple cards, use V-LAN and connect the first card in the chain to the terminal/PC.
Meridian 1 Options 21-81C	Use STA feature on the MSDL card where MIRAN is one of the monitored systems. For multiple cards, use V-LAN and connect the first card in the chain to the MSDL.
Option 11C - CEMUX passthru	Configure MIRAN as an LSSL in OVL 17 and use AX <port no.> command at the system TTY to passthru to MIRAN (no cabling required). Multiple MIRAN cards can be given different port nos. Card must be in the main cabinet.
Option 11C - Cabled passthru	Connect MIRAN to CPU port 1 or 2 via the maintenance cable and 9 to 25 RS232 adapter. Configure port as LSSL. Use AX <1> or <2> to passthru to MIRAN. Can use VLAN for multiple cards. Card may reside in the expansion cabinet.

Telephone for OA&M access

You must use an unrestricted (UNR) DTMF telephone. To perform telephone-based OA&M, you must set one of the internal one-to-one MIRAN ports/channels (port 7) to be a DID trunk in the Meridian 1 system. The DID trunk route makes MIRAN port 7 accessible through a route access code from any unrestricted DTMF telephone. To access a MIRAN, you must enter a valid user name and password. Small and medium size MIRAN options also use port 7 for telephone-based OA&M access.

External analog sources

The MIRAN provides a facility to connect tape recorders or CD players to do the following:

— record onto the Flash memory on the MIRAN

— record announcements from the MIRAN onto a tape for backup

— record backed-up announcements to another MIRAN card

Refer to Figure 12 “Analog device connection at the MDF” on page 105.

You can connect these external analog sources to the following:

— the 3.5 mm Audio Jack on the MIRAN faceplate (one input and one output) by using the NTAG81AA Audio Cable

— at the MDF (cable not supplied)

MIRAN hardware list

Table 10 lists specific MIRAN hardware components designed to support RAN and MOH applications in the Meridian 1 and SL-1 systems.

Table 10 does not list external equipment such as terminals, telephones, and recorders, because they are (or can be) non-proprietary products.

Table 10
MIRAN hardware list

Component	Description
NTAG36 Meridian Integrated RAN (MIRAN)	An IPE card that provides RAN and MOH applications over the Meridian 1 system. (NTAG36 plus security device plus keycode= NTAG88)
NTAG81AA Audio Cable	Connects external analog music source or a recording device to the 3.5 mm Audio Jack on the MIRAN faceplate. This is a splitter cable that provides the audio input signal on one connector and the audio output signal on the other connector.
NTAG81BA Maintenance Extender Cable	A 5-meter (16.4 feet) cable that extends the NTAG81CA, NTAG81GA, or the NTAG81DA Cables when connecting a terminal to the MIRAN. Has one DB9 male and one DB9 female connector.
NTAG81CA Maintenance Cable*	A 3-meter (9.8 feet) cable that connects the terminal to the MIRAN 8-pin Mini-DIN maintenance port on the faceplate. It is terminated with an 8-pin Mini-DIN male connector and a DB9 female connector.
NTAG81DA Maintenance Splitter Cable	A 3-meter (9.8 feet) cable that connects the Mini-DIN connector on the MIRAN faceplate to a terminal or to an adjacent MIRAN to form a LAN daisy-chain. It has an 8-pin Mini-DIN connector on the common side and two DB9 connectors, one female (to connect to the maintenance terminal) and one male (to connect to the next MIRAN card in the V-LAN chain) on the split side.
NTBK48AA Terminal Cable	Connects the Option 11E/11C SDI port to the terminal.
NTAG81GA Multi-I/O Adapter Cable	Mounts to the I/O panel on the rear of the IPE module and to the MDF. Contains one RJ-45 connector for connection to the Ethernet, one DB9 female connector for connection to a maintenance terminal (either directly or through a modem), and one 50-pin connector for connection to the MDF.
3MB, 8MB, and 40MB PCMCIA Cards	Use for software upgrades, backups, and/or storage.

Note: You don't need the NTAG81CA maintenance cable if you have the NTAG81GA multi-I/O adapter cable.

Ethernet/LAN requirements

MIRAN Release 2.0 enables the customer to connect the MIRAN Release 2.0 card (NTAG36AC) to the customer LAN. Through the LAN connection, you can do the following:

— access a browser user interface (BUI), which is embedded on the MIRAN Release 2.0 card, from any PC with a common web browser to perform web-based OA&M

— perform ftp downloads and uploads of announcement and music files from the MIRAN Release 2.0 card

— telnet to the MIRAN text-based user interface through the BUI

— access an online version of this document through the BUI

Note: Connection to the LAN is ***optional***. You can perform all OA&M functions through the text-based user interface.

To access *each* MIRAN Release 2.0 over the LAN, you need the following:

— one NTAG81GA I/O Panel Ethernet and Serial Port Adapter Cable

— a shielded RJ45 mating coupler and shielded RJ45 cable to connect to the customer hub (not supplied)

— an IP address, subnet mask, and Gateway for the card (supplied by your network administrator)

— an ftp client to transfer files remotely to and from the MIRAN (Nortel Networks recommends WS_FTP.)

— a telnet client for remote access to the MIRAN text-based user interface (Nortel Networks recommends HyperTerminal 4.0+.)

— a web browser that supports html frames and JavaScript V1.1 (Nortel Networks recommends Netscape Navigator 3.0+ or Internet Explorer 3.0+.)

Note: European Option 21-81C customers that require ethernet access to the MIRAN must install the MIRAN Release 2.0 card (NTAG36AC) in slot 0, 4, 8, or 12 in the IPE shelf.

LAN hub and router recommendations

The customer hub must support 10BaseT. The hub can be a passive hub, although a switched port hub is suitable if available. Nortel Networks recommends the Bay Networks NETGEAR EN104, EN108, or EN116 hub, depending on the number of ports you require.

For remote access to the system LAN, Nortel Networks recommends the NETGEAR RM356 modem router. This allows dial-in access to the LAN segment containing all of your MIRAN Release 2.0 (and other) networked cards.

Upgrade requirements

Port expansion

The MIRAN product is available in three capacity options: small, medium, and large, as Table 2, "MIRAN channel capacity options," on page 49 shows. There is a maximum of eight internal one-to-one channels and two external cross-connect channels on each MIRAN card.

To upgrade a MIRAN Release 2.0 card to a larger capacity, all that the customer needs is to enter a new keycode.

> ***Note:*** Nortel Networks only supports port expansion upgrades for cards that contain the MIRAN Release 2.0 software. Customers with the original MIRAN NTAG36AA cards must first either upgrade their cards to the MIRAN Release 2.0 software or replace their cards with the MIRAN Release 2.0 card (NTAG36AC) before they can expand port capacity.

Software upgrade to MIRAN Release 2.0

Customers can retain their existing MIRAN NTAG36AA cards and upgrade the software to MIRAN Release 2.0 software. To do this, the customer needs the MIRAN to MIRAN Release 2.0 PCMCIA Upgrade Kit (NTLT82AA). The customer retains the current Security Device. This upgrade kit provides the following:

— an 8MB PCMCIA upgrade card

— a new keycode

— the latest version of this document (553-3001-112)

For instructions on how to perform this upgrade, refer to "Upgrade MIRAN NTAG36AA card to MIRAN Release 2.0 software" on page 122.

> ***Note:*** This upgrade does not provide ethernet capability. For ethernet capability, the customer must upgrade to the new NTAG36AC MIRAN Release 2.0 card. For information on the new functionality that comes with the MIRAN Release 2.0 software, refer to "What's new" on page 11.

Hardware and software upgrade to MIRAN Release 2.0

Customers who use the original MIRAN NTAG36AA card can gain ethernet capability for their MIRANs by upgrading to the new MIRAN Release 2.0 card and software. To perform this upgrade, the customer needs the MIRAN to MIRAN Release 2.0 Card Upgrade Kit. This upgrade kit provides the following:

— a MIRAN Release 2.0 card (NTAG36AC) without a Security Device

— an ethernet and DB9 adapter cable with a 50-pin connector (NTAG81GA)

— a new keycode

— the latest version of this document (553-3001-112)

The customer retains their existing Security Device from the old card and places it in the new one. For information on the new functionality that comes with the MIRAN Release 2.0 card and software, refer to "What's new" on page 11. For instructions on how to perform this upgrade, refer to "Replace MIRAN NTAG36AA card with MIRAN Release 2.0 card and software" on page 123.

Engineering a MIRAN RAN and music application

Based on the options of the MIRAN equipment, external equipment, and your RAN and MOH requirements, you can engineer a MIRAN system to meet your system requirements.

The following six examples illustrate what equipment is required to meet specific site (application) requirements. It also discusses the alternatives available for interconnection of multiple MIRANs and connection of external devices to the MIRAN.

Example 1:

Application requirements:

— Provide two internal RAN channels and one external cross-connect channel to cross-connect 10 trunk ports.

— Provide 1 hour of recording space on the MIRAN card.

— Provide telephone-based OA&M access.

Equipment requirements:

— one small MIRAN

— one 40 MB PCMCIA ATA Flash card

— two Enhanced Universal Trunk cards or three Flexible E&M cards

Example 2:

Application requirements:

— Provide multi-channel level start/stop control RAN mode for four internal RAN channels and two external cross-connect channels to cross-connect 30 trunk ports.

— Provide 4 minutes of recording space on the MIRAN.

— Provide terminal-based OA&M access.

Equipment requirements:

— one medium MIRAN

— four Enhanced Universal Trunk cards or eight Flexible E&M cards

— one NTAG81CA Maintenance Cable (to connect the terminal to the mini-DIN connector on the MIRAN faceplate), or alternatively

— a terminal cabled at the MDF through port A, where total distance from the MDF to the terminal does not exceed 50 feet (17 m)

Note: In this mode, all four ports/channels play the same announcement independently over the same RAN route.

Example 3:

Application requirements:

— Provide seven internal RAN channels and two external cross-connect channels to cross-connect 30 trunk ports.

— Provide 1 hour of recording space on the MIRAN.

— Provide telephone-based OA&M access.

— Provide terminal-based OA&M access.

— Provide web-based OA&M access.

Equipment requirements:

— one large MIRAN

— one 40 MB PCMCIA ATA Flash card

— four Enhanced Universal Trunk cards or eight Flexible E&M cards

— one NTAG81GA Multi-I/O Adapter Cable (The Ethernet port connects to the customer's LAN. The serial port can connect to a maintenance terminal.)

Example 4:

Application requirements:

— Provide 11 internal RAN channels and 3 external cross-connect channels to cross-connect 40 trunk ports.

— Provide 1 hour of recording space on the MIRAN.

— Provide telephone-based OA&M access

— Provide terminal-based OA&M access.

Equipment requirements:

— one large MIRAN with 40 MB PCMCIA ATA Flash memory

— one small MIRAN for the North American market, or

— one medium MIRAN for the international market

— five Enhanced Universal Trunk cards or ten Flexible E&M cards

— two NTAG81DA Maintenance Splitter Cables (to inter-connect the two MIRAN cards to their respective mini-DIN connectors on the MIRAN faceplate and to connect the terminal), or alternatively

— cross-connect ports A and B of the two MIRANs at the MDF and cross-connect the terminal to one MIRAN at the MDF (The distance between the MDF and the terminal must not exceed 50 feet.) See Figure 18 on page 117.

Note: The total number of internal one-to-one ports is 12. Configure port 7 on each card as a DID trunk for telephone-based OA&M access. This reduces the number of available ports for RAN and MOH applications on the large MIRAN to seven ports; but the number of available ports on the small (or medium) MIRAN remains four.

Example 5:

Application requirements:

— Provide 14 internal RAN channels and 4 external cross-connect channels to cross-connect 60 trunk ports.

— Provide 1 hour of recording space.

— Provide two external analog (music) sources.

— Provide telephone-based OA&M access.

— Provide terminal-based OA&M access.

Equipment requirements:

— two large MIRAN with 40 MB PCMCIA ATA Flash memory

— eight Enhanced Universal Trunk cards or fifteen Flexible E&M cards

— two NTAG81AA Audio Cables to connect external analog sources, or instead of using the NTAG81AA cables, you can connect the external analog sources at the MDF

— one NTAG81DA Maintenance Splitter Cable (to inter-connect the two MIRAN cards to their respective mini-DIN connectors on the MIRAN faceplate and to connect the terminal), or alternatively

— cross-connect ports A and B of the two MIRANs at the MDF and cross-connect the terminal to one MIRAN at the MDF (The distance between the MDF and the terminal must not exceed 50 feet.) See Figure 18 on page 117.

Note: The total number of internal one-to-one ports is 16. Configure port 7 on each card as a DID trunk for telephone-based OA&M access. This reduces the number of available ports for RAN and MOH applications on each large MIRAN to seven ports.

Example 6:

Application requirements:

— Provide three recorded announcements for up to 12 total simultaneous callers and MOH for up to 64 simultaneous callers.

— Provide four minutes of recording space on the MIRAN card.

— Provide telephone-based, terminal-based, and web-based OA&M access.

Equipment/system requirements:

— one small (in North America) or medium (international) MIRAN

— X11 release 23 or later system software with RAN and Music Broadcast features

— 12 RAN Broadcast connections

— 64 Music Broadcast connections

Note: Nortel Networks pre-equips each Option 11C with 12 RAN Broadcast connections and 100 Music Broadcast connections. For all other Meridian 1 options (Option 11C-81C), customers can purchase (additional) RAN and Music Broadcast connections in increments of one.

— one NTAG81GA Multi-I/O Adapter Cable (The Ethernet port connects to the customer's LAN. The serial port can connect to a maintenance terminal through a modem.)

Installation and configuration

This chapter describes the installation of the NTAG36 Meridian Integrated RAN (MIRAN). This chapter provides instructions for the following:

— X11 system configuration for the MIRAN

— Basic MIRAN installation, including:

- overview and preparation
- maintenance terminal setup
- card installation
- external audio device setup
- telephone user interface (TUI) setup
- basic MIRAN configuration tasks

— Ethernet installation and setup

— V-LAN installation and setup

— Upgrades and replacements

The following procedure describes the steps required to quickly install and configure the MIRAN product.

MIRAN quick installation procedure

1 Request an IP address, subnet mask, and Gateway from your system administrator. This step is only necessary if you intend to connect the MIRAN to your LAN.

2 Insert the security device onto the MIRAN board. You must install the security device with the Nortel Networks logo and the 8-digit inscription facing away from the board.

Note: You can correctly insert the security device in only one position.

3 Connect the 50-pin female connector of the multi-I/O adapter cable to the I/O panel. Connect the RJ45 connector to your LAN hub; use an RJ45 coupler and additional RJ45 cable, if necessary. Connect the 50-pin male connector to the MDF cable.

4 Connect a VT-100 terminal to the MIRAN using the provided NTAG81GA cable.

Note: You can use the NTAG81CA cable to connect a terminal to the J2 faceplate connector.

5 Configure the terminal in VT-100 mode at 9600 baud, 8 data bits, 1 stop bit, and no parity.

6 Insert the MIRAN card into an *unequipped* IPE slot and watch the terminal screen for boot-up commands. This requires approximately 90 seconds.

Note: Before you install a MIRAN card into an IPE slot, ensure that *no* cross-connect wires from another product remain attached to this slot. Cross-connect wires that carry a ringing voltage can damage the MIRAN card.

7 At the logon screen of the text-based user interface, ensure that the cursor is in the ‘User Name:’ field. Then log on by doing the following:

— Type in the user name (**admin**), and press the ‘down’ arrow.

— Type in the administrator default password (**admin000**), and press the ‘down’ arrow again.

— Press <**CR**> at the ‘Login’ prompt.

Note: If you receive an 'Access denied' response, press the 'Shift' key and tilde (~) to refresh the screen. Then repeat step 7. You can repeat step 7 up to three times. If you receive an 'Access denied' response for a third time, the MIRAN card locks you out for 20 minutes.

8 At the Main menu:

— Select **2**, "Pack Administration"

— Then select **2**, "Keycode Entry"

Note: The keycodes are on a label that accompanies the security device. Pull off this keycode label and attach it to the MIRAN faceplate.

Between the brackets, type in the 24-character keycode with a space between each set of eight characters. Select **Execute** to execute the keycode. Wait for a keycode validation response ('Keycode validated'). Then select **Exit** to return to the Pack Administration menu.

Note: If you do not need ethernet capability for your MIRAN, you can omit step 9 and just log out of the text-based user interface after step 8.

9 At the Pack Administration menu, select **6**, "Ethernet Configuration". At the Ethernet Configuration screen, enter the new IP address, subnet mask, Gateway, and IP method of the MIRAN card, which you received from your network administrator. Select **Set** to set the ethernet configuration parameters. Then select **Exit** to return to the Pack Administration screen. Finally, log out of the text-based user interface by selecting **9** from the menu screen until the Main Menu screen appears.

10 Reboot the MIRAN card by pressing the reset switch on the front of the pack. This causes the keycode to take effect. Wait for the card to reboot and the Login screen to come up on the maintenance terminal. This also requires approximately 90 seconds.

11 Log into the Meridian 1 system. Program a DID route and configure a DID trunk on MIRAN unit 7. Use the TN for the loop, shelf and card slot into which the MIRAN card is plugged. For example, if you installed the MIRAN card in 20 0 0, then provision 20 0 0 7 as the DID unit to allow local telephone access for the recording of RAN announcements.

Note: You can perform this step first.

12 Use a local DTMF telephone to dial the DID access code for MIRAN unit 7.

Note: The local DTMF telephone must have an 'unrestricted' Class of Service; that is, CLS = UNR in Overlay 11.

Enter the number sign (**#**), then the user name (**'user'=8737**) followed by star (*****), then the password (**87370000**) followed by star (*****). Next, press **5** and then press **5** again to begin recording a RAN announcement. When you have finished recording, press **3** to stop the recording and press **1** to save the announcement. Because MIRAN writes the recording to flash memory, it can take 30 seconds or longer for MIRAN to respond that it has saved the announcement. Please be patient.

WARNING

After you press **1** to save the announcement, do not hang-up, but wait for MIRAN to state that it has saved the announcement and tagged the announcement with an announcement identifier (example: 'Announcement has been saved as announcement 1').

13 Program RAN and Music routes and trunks for the remaining channels. For example, program channel 0 as a Music trunk and channel 1 as a RAN trunk.

Note: MIRAN Release 2.0 comes with royalty-free music pre-assigned to channel 0 and set to play 'always'. Therefore, Nortel Networks recommends that you configure channel 0 as a Music route. However, you can remove this assignment and assign any other announcement or music file in its place.

For pre-release 23 Meridian 1 systems see "Multi-channel level start/stop RAN route" on page 74 and "Level start/stop RAN route" on page 76.

If using X11 release 23 or later, refer to the RAN Broadcast feature in *X11 Features and Services* (553-3001-306). For MIRAN with X11 release 23 or later, and configured with RAN Broadcast, use Route Type "MLVL" (RTYP = MLVL in Overlay 16).

14 Log in to the MIRAN using the default user name (**user**) and password (**user0000**). You can log in to the text-based user interface through the maintenance terminal as before. Or, if you have connected the MIRAN to the ethernet, you can access the MIRAN browser user interface (BUI) by pointing your web browser to the IP address of the MIRAN card. To assign a announcement to a MIRAN channel, do the following:

— At the Main Menu select (**1**) “MIRAN Administration...”.

— At the MIRAN Administration menu select (**1**) “Announcement Configuration...”.

— At the Announcement Configuration menu select (**1**) “Calendar Operations...”.

— At the Calendar Operations menu select (**1**) “Calendar Assignment with Descriptor”.

— At the Calendar Assignment with Descriptor screen, enter first the channels (ports) for a particular announcement to play on. For example, if the TN for a RAN trunk is 20 0 0 5, then you can assign a announcement to channel 5.

— At the ‘Filename:’ prompt, enter the filename of the announcement that must play on the channels you selected. You can ‘Browse’ the list of available announcements to select one.

— At the ‘Descriptor’ prompt, enter the descriptor that defines when the selected announcement will play on the selected channels. You can ‘Browse’ the list of available descriptors to select one. (Remember that you can define your own descriptors if the pre-configured descriptors do not meet your needs.)

— Move the cursor to ‘Add to Calendar’ and press <**CR**> to create the calendar assignment with descriptor.

15 To test RAN announcements, dial the trunk access code for the desired RAN route and listen to the announcement that plays.

16 Manually back up RAN announcements and configuration in the event of a power loss or MIRAN re-boot. To complete a back-up, do the following:

— At the Main Menu select (**1**) “MIRAN Administration...”.

— At the MIRAN Administration menu select (**3**) “Backup Configuration”.

— At the ‘Device:’ prompt, enter the drive you want to make a backup to. For example, enter **A:** to back up the MIRAN configuration information to a PCMCIA card in drive A:.

Select from the choices below. The list below does not appear on the menu screen. Perform the backup procedure twice: once on Internal Storage C, and once on device “A” or “B”, if equipped.

- Internal Storage C (old s/w Rls. 1.39 or 1.46 backup s/w to internal storage “C”)
- External ATA A Backup when using a spare PCMCIA
- Internal ATA B When PCMCIA resides on the MIRAN card
- Exit out to the Main Menu

Note: MIRAN provides an automatic save function after you exit the telephone user interface (TUI). If you make changes through the text-based user interface or the browser user interface (BUI), you must back up manually.

X11 system configuration

In the X11 system software, you must configure the following for MIRAN:

— RAN and Music routes

— A DID route

— Trunks for the above routes

To allow synchronization of the time and date between the X11 system and the MIRAN Release 2.0 card, you must also configure the Meridian 1 system for ethernet in Overlay 117 and use Overlay 17 to set up a PTY with a limited access password (LAPW) to access only LD 2. Refer to “Configuring Ethernet for Time & Date Synchronization” on page 82 for this procedure.

You can configure the X11 system software either before or after you install the MIRAN equipment. However, Nortel Networks recommends that you configure the X11 system software first in order to save setup time once the MIRAN pack arrives.

The following sections describe X11 system software configuration for MIRAN.

Configuring RAN routes

The MIRAN card emulates an Enhanced Universal Trunk (EXUT) card in the Meridian 1 system. Therefore, you configure RAN routes and trunks for the MIRAN card in the same way you do for the EXUT card. For detailed information on overlays Trunk Route Administration (LD 16) and Trunk Administration (LD 14), refer to *X11 Administration* (553-3001-311).

To configure the RAN propagation route and the mode of activating the recorded announcement, you must define its parameters using Trunk Route Administration program LD 16. The MIRAN emulates the Enhanced Universal Trunk characteristics and does not require modification of LD 16 to configure the MIRAN functions.

Specifically, the MIRAN and the Enhanced Universal Trunk card support the following modes of operation:

— Delay Dial Continuous RAN (DDL)

— Immediate Start Continuous RAN (IMM)

— Level Start/Stop RAN (LVL, MLSS, or MLVL)

The MIRAN supports all of the above on two, four, or eight independent ports. Thus, you can assign the same RAN announcement to different ports, thereby allowing multiple callers to hear the same announcement at the same time.

> ***Note:*** With X11 release 23 and the availability of RAN Broadcast, up to 30 callers can simultaneously listen to the same RAN announcement on a single RAN port.

Continuous RAN routes (Delay Dial and Immediate Start)

Continuous (immediate or delay) RAN plays an announcement over and over again. Callers “barge in” on a announcement playing on an Immediate Start RAN route. Callers receive a ringback tone for an announcement playing on a Delay Dial RAN route until the announcement begins again. At the end of each announcement, a pulse is issued on the control pulse line that is used by the trunk unit to cut through to the waiting call. External channels barge in at any time during the announcement, internal ports/channels wait until the announcement starts to be connected to a RAN announcement.

Note: Cross-connect channels support only continuous RAN modes.

To configure a continuous RAN route, load Route Data Block program LD 16 using the system TTY and enter the appropriate responses to the prompts as listed in Table 11.

Table 11
Defines a continuous RAN route (LD 16)

Prompt	Response	Description
REQ	NEW/CHG	Define new or change existing configuration
TYPE	RDB	Route data block
CUST	0-99	Customer number
ROUT	0-511	Route number (0-127 for Option 11C)
TKTP	RAN	Trunk type recorded announcement (RAN)
RTYP	CON MCON	Continuous route Continuous Multi-channel (for RAN Broadcast)
- LGTH[1]	4-(60)-7200	Maximum message length in seconds
- GRD[1]	PLAY(IDLE)	Ground signal from RAN indicates MIRAN is playing (idle).
REP	1-15	Number of repetitions of RAN
POST	ATT DIS	Route to attendant after maximum repetitions Disconnect after maximum repetitions
STRT	IMM DDL	Immediately connect call to recorded ann. Delay call connection until start of ann.
BDCT[2]	YES(NO)	Allow (disallow) broadcast capability
ASUP	(NO) YES CO	Do not return answer supervision Return answer supervision Return answer supervision if originator is a CO trunk
ACOD	xxx...x	Trunk route access code

Note 1: These prompts only appear if RTYP = MCON.

Note 2: The 'BDCT' prompt appears only if customer has package 327 (RANBRD).

Multi-channel level start/stop RAN route

In the multi-channel level start/stop control RAN, the leading edge of the start signal initiates announcement playback that continues until either the trailing edge of the start signal occurs or the end of the announcement is reached. An announcement that the trailing edge of a level start signal terminates resets immediately and is again available for playback. The multi-channel level start/stop control RAN mode allows you to play the same announcement over multiple RAN channels completely independently using the same RAN route. For an example, refer to “Example 2:” on page 61.

To configure this RAN route, load Overlay 16 using the system TTY. Then respond to the prompts that Table 12 shows, with the appropriate parameter selection for your application.

Table 12
Defines a multi-channel level start/stop RAN route (LD 16)

Prompt	Response	Description
REQ	NEW/CHG	Define new or change existing configuration
TYPE	RDB	Route data block
CUST	0-99	Customer number
ROUT	0-511	Route number (0-127 for Option 11C)
TKTP	RAN	Trunk type recorded announcement (RAN)
RTYP	MLSS MLVL[1]	Multi-channel level start/stop RAN (for X11 release 21.41 or 22.16 or higher) Level start/stop, multi-channel (for RAN Broadcast)
- LGTH[2]	4-(60)-7200	Maximum message length in seconds
- GRD[2]	PLAY(IDLE)	Ground signal from RAN indicates MIRAN is playing (idle).
REP	1-15	Number of repetitions of RAN
POST	ATT DIS	Route to attendant after maximum repetitions Disconnect after maximum repetitions

Table 12
Defines a multi-channel level start/stop RAN route (LD 16)

Prompt	Response	Description
STRT	IMM	Immediately connect call to recorded announcement
BDCT[3]	YES(NO)	Allow (disallow) broadcast capability
ASUP	NO YES CO	Do not return answer supervision Return answer supervision Return answer supervision for a CO trunk
ACOD	xxx...x	Trunk route access code

Note 1: Set RTYP = MLVL if you have RAN Broadcast, even if you disallow (BDCT = NO) broadcast capability for this route.

Note 2: These prompts appear only if RTYP = MCON.

Note 3: The 'BDCT' prompt appears only if customer has package 327 (RANBRD).

Multi-channel Start/Stop RAN (MLSS or MLVL) allows you to support multiple start/stop RAN channels within the same RAN route.

Level start/stop RAN route

In the immediate (“level”) start RAN, the leading edge of the start signal initiates announcement playback. The playback continues until either the trailing edge of the start signal occurs or the announcement ends. A announcement that the trailing edge of a level start signal terminates resets immediately and is again available for playback.

To configure this RAN route, load Overlay 16 using the system TTY. Then respond to the prompts that Table 13 shows, with the appropriate parameter selection for your application.

Table 13
Defines a level start/stop RAN route (LD 16)

Prompt	Response	Description
REQ	NEW/CHG	Define new or change existing configuration
TYPE	RDB	Route data block
CUST	0-99	Customer number
ROUT	0-511	Route number (0-127 for Option 11C)
TKTP	RAN	Trunk type recorded announcement (RAN)
RTYP	LVL	Level start/stop mode.
REP	1-15	Number of repetitions of RAN
POST	ATT DIS	Route to attendant after maximum repetitions Disconnect after maximum repetitions
STRT	IMM	Immediately connect call to recorded announcement
ASUP	NO YES CO	Do not return answer supervision Return answer supervision Return answer supervision if originator is a CO trunk
ACOD	xxx...x	Trunk route access code

Music-on-hold activation and route configuration

Music-on-hold (MOH) operates in a continuous mode with an immediate connection to the music source. The music source plays continuously. Callers "barge in" on playing music.

To specify the conference loop for the MOH, you must access the Configuration Record program LD 17, as Table 14 shows.

Table 14
Adds or changes conference loop for MOH (LD 17)

Prompt	Response	Description
REQ	CHG	Define change existing configuration
TYPE	CFN	Configuration record
CEQU	Yes (No)	Change common equipment parameters
XCT	0-158	Loop number for NT8D17 Conference/TDS card.
CONF	0-158	Conference loop should be an even number.

To configure the MOH route, load Route Data Block program LD 16 using the system TTY. Then respond to the prompts that Table 15 shows, with the appropriate parameter selection for your application.

Table 15
Defines music-on-hold route (LD 16)

Prompt	Response	Description
REQ	NEW/CHG	Define new or change existing configuration
TYPE	RDB	Route data block
CUST	0-99	Customer number
ROUT	0-511	Route number (0-127 for Option 11C)
TKTP	COT, MUS	Trunk types for MOH
MUS	Yes (No)	Music-on-hold
_MRT	0-511	Music route number
STRT	IMM	Immediately connect call to music-on-hold
ICOG	OGT	For music-on-hold select outgoing trunk only
BDCT[1,2]	YES (NO)	Allow (disallow) broadcast capability.
ASUP	NO YES CO	Do not return answer supervision Return answer supervision Return answer supervision if originator is a CO trunk
ACOD	xxx...x	Trunk route access code

Note 1: The 'BDCT' prompt appears only if customer has package 328 (MUSBRD).

Note 2: If BDCT = YES, no conference loop is necessary; each music trunk has 64 broadcast connections.

Configuring the DID route for the TUI

To configure MIRAN for TUI (telephone-based OA&M) access using internal one-to-one port 7, you must configure the appropriate route and trunk data blocks. Table 16 lists Route Data Block program LD 16 commands to define the DID route data block.

Table 16
Defines a DID route for the TUI (LD 16)

Prompt	Response	Description
REQ	NEW/CHG	Define new or change existing configuration
TYPE	RDB	Route data block
CUST	0-99	Customer number
ROUT	0-511	Route number
TKTP	DID	Trunk type for telephone-based OA&M access
ICOG	IAO	Incoming and outgoing trunk
ACOD	xxx...x	Trunk route access code
CNTL	Yes	Gate opener for control timers
NEDC	ETH	Near end. Both ends have disconnect control.
FEDC	ETH	Far end. Both ends have disconnect control.
ASUP	NO YES CO	Do not return answer supervision Return answer supervision Return answer supervision if originator is a CO trunk

Configuring the MIRAN trunks

After you configure a RAN, Music, or DID route, you can configure the route's corresponding trunk. A trunk data block specifies the parameters for a particular trunk. Because the MIRAN emulates the Enhanced Universal Trunk card, you can define the MIRAN parameters using the Trunk Administration program LD 14 on the system TTY. Respond to the appropriate prompts that Table 17 on page 81 shows to configure the MIRAN data block.

Table 17
Configuring the MIRAN trunk data block for RAN, MOH, and DID (LD 14)

Prompt	Response	Description
REQ	NEW	New MIRAN trunk data block
TYPE	MUS, RAN, DID	Type of trunk: music, RAN, or DID
TN	l s c u	MIRAN loop, shelf, card, and unit.[1, 2]
XTRK	EXUT	Enhanced Universal Trunk Card
CUST	0-99	Customer number defined in LD 15 and prompted when REQ= NEW
RTMB	xxx yyy	Route (0-511) and member (1-254) number
CONN[3]	(4)-48	Maximum number of broadcast connections allowed for this trunk
SIGL	LDR	Signaling for battery or loop outpulsing for telephone-based OA&M over MIRAN port 7
BIMP	600, 900	Balanced trunk impedance for MIRAN
STRI	DDL[4], IMM	Incoming trunk starting arrangement
STRO	DDL[4], IMM	Outgoing trunk starting arrangement
CFLP	0-159	Music conference loop

Note 1: You must configure the DID trunk on unit (port) 7 in order to use the TUI.

Note 2: MIRAN Release 2.0 comes from the factory with six minutes of royalty-free music pre-configured on port 0. Therefore, you can configure unit 0 as a Music trunk to make easy use of the royalty-free music.

Note 3: The 'CONN' prompt only appears if BDCT = YES in LD 16 when configuring a RAN route.

Note 4: Do not program MUS or DID trunks as delayed dial (DDL).

Configuring Ethernet for Time & Date Synchronization

Because synchronization of time and date over the ethernet requires the connection of the Meridian 1 to a LAN environment, X11 release 22 is the minimum software that supports Time & Date Synchronization.

> ***Note:*** Refer to "The Time & Date Configuration menu" on page 178 for instructions on configuring Time & Date Synchronization.

Overlay 117

Use Overlay 117 to configure the Ethernet for the Meridian 1. This allows the MIRAN Release 2.0 card to access a *system* TTY to retrieve the system time and date.

> ***Note:*** Host names and IP addresses that appear in the following steps are examples only.

1 Configure Ethernet at the Meridian 1.

```
>LD 117

>NEW HOST M1SRVR01 41.1.1.10

>CHG ELNK ACTIVE M1SRVR01

>CHG MASK 255.255.255.0
```

If you use a Meridian 1 with a dual CPU, repeat the above steps for the backup (inactive) CPU.

```
>LD 117

>NEW HOST M1SRVR01 41.1.1.11

>CHG ELNK ACTIVE M1SRVR02

>CHG MASK 255.255.255.0
```

2 Define the routing table.

If the network contains a default gateway, define the routing table. The routing table provides the Meridian 1 with the IP address of the gateway server. This process enables the Meridian 1 to send return messages to the gateway, which are then forwarded to the requesting client.

```
>LD 117

>NEW ROUTE 0.0.0.0 47.1.1.250
```

3 Save the configuration.

```
>LD 43

>EDD
```

4 Perform an INIT.

Overlay 17

Use Overlay 17 to configure a PTY for use with MIRAN Release 2.0. Use the same method as MAT to define a LAPW (Limited Access Password) and ID to access *only* Overlay 2. This allows a task running on MIRAN Release 2.0 to remotely log in, access Overlay 2, and extract the system time and date from the Meridian 1.

The following shows an example of the proper Overlay 17 configuration to enable System Time & Date Synchronization:

1 The first section is only required if login names are not configured.

```
>ld 17
CFN000
MEM AVAIL: (U/P): 3352174 USED: 203153 TOT:3555327
DISK RECS AVAIL: 2764
DCH AVAIL: 15 USED: 1 TOT: 16
AML AVAIL: 10 USED: 0 TOT: 10
REQ> chg
TYPE> pwd
PWD2 (your level 2 password)
LNAME_OPTION> yes
MEM AVAIL: (U/P): 3352174 USED: 203153 TOT:3555327
DISK RECS AVAIL: 2764
DCH AVAIL: 15 USED: 1 TOT: 16
AML AVAIL: 10 USED: 0 TOT: 10
DEFAULT LOGIN NAMES SAVED
```

Note: At this point, your old passwords will work with either the newly assigned user IDs or with the default user ID values associated with your old passwords. See the online help for LD17, LNAME_OPTION, for more information. Please alert others of any changes; for example, all technicians with access to the Meridian 1, the distributor, and so on.

2 Continue configuring LAPW.

```
REQ> chg
TYPE> pwd
PWD2 (your level 2 password)
LNAME_OPTION> yes
NPW1
LOGIN_NAME
NPW2
LOGIN_NAME
LAPW> 88 (example)
PWTP
PW88
```

Note: Note: You will be prompted to enter your new password.

```
LOGIN_NAME> johns (example)
OVLA> all
OVLA
CUST> all
CUST
HOST
MAT> yes (not necessary for MIRAN)
MAT_READ_ONLY> no
OPT
LAPW
FLTH
LOCK
AUDT
INIT
MEM AVAIL: (U/P): 3352149 USED: 203178 TOT:3555327
DISK RECS AVAIL: 2764
DCH AVAIL: 15 USED: 1 TOT: 16
AML AVAIL: 10 USED: 0 TOT: 10
REQ> end
```

If you are using Ethernet or PPP connections, configure a PTY for each MAT application that will run over Ethernet or PPP simultaneously. For example, Maintenance Windows and System Terminal each require a PTY if they run at the same time. If you have enough free ports, Nortel Networks recommends that you configure at least two PTYs. You can allocate a maximum of 8 PTYs (maximum of 4 PTYs on an Option 11C).

3 Find an empty TTY slot.

```
>ld 17
```

Note: Choose an empty port number between 0 and 15. Choose a PTY number between 0 and 7. In this example, we find TTY 13 to be free, and assign PTY 0.

```
REQ> chg
TYPE> adan
ADAN> new tty 13
TTY-TYPE> pty
PORT> 0
DES> 13
DES> new pty
FLOW
USER> mtc bug sch
TTYLOG
BANR
```

Basic MIRAN installation

Installation overview

The MIRAN can operate on the following systems:

— Meridian 1 system options 21E, 51, 51C, 61, 61C, 71, 81, and 81C

— Options 11E/11C

— SL-1 systems that supports IPE and Enhanced Universal Trunk cards

The operation of the MIRAN that the Meridian 1 system run on generic software X11 release 19 or higher. Refer to “X11 software requirements” on page 45 for more information.

To complete the installation of a MIRAN, follow the general procedures listed below. These procedures include:

— Preparing the site

— Unpacking, inspecting, and taking inventory of the equipment

— Installing the MIRAN card in the selected IPE card slot, if not already installed

— Installing the cables between the MIRAN faceplate connectors and external devices, if required

— Installing the cables to the I/O panel connector at the rear of the module, if required

— Cross-connecting external devices to the MIRAN card through the MDF (e.g., trunk cards, CD player, cassette player, etc.)

— Cross-connecting multiple MIRAN cards in a serial chain, if required

Installation preparation

The preparation consists of unpacking and inspecting components, taking inventory, and locating the IPE card slots where you will install the MIRAN.

Unpacking and inspection

Unpack and inspect the equipment for damage. When unpacking, follow general precautions recommended by computer and telephone equipment manufacturers:

— Remove items that generate static charge from the installation site.

— Ground yourself before handling any equipment.

— Remove equipment carefully from its packaging.

— Visually inspect the equipment for obvious faults or damage.

Taking inventory

After you have unpacked and visually inspected the equipment, verify that all the equipment is at the site before the installation begins. Check the equipment you received against the shipping documents.

Locating the card slot

You can install a MIRAN card in an appropriate IPE card slot in an IPE module. You cannot use the Peripheral Controller card slot labeled *Cont.* Table 18 lists the Meridian 1 modules and card slots suitable for MIRAN installation.

Table 18
Card slots available for MIRAN installation in different modules

Meridian 1 module	Suitable card slots
NT8D37BA/EC IPE modules, NT8D11BC/ED CE/PE modules	All available IPE card slots
NT8D37AA/DC IPE modules	Slots 0, 4, 8, and 12
NT8D11AC/DC CE/PE modules	Slot 0

Note: European customers who need the MIRAN Release 2.0 ethernet capability must install the card in slot 0, 4, 8, or 12 of the IPE shelf.

In the Options 11E and 11C cabinet, you can install the MIRAN card in any card slot from 1 to 10. Refer to Table 21, “Option 11C CEMUX/pass-thru access configuration,” on page 103.

Verifying MDF wiring

The MIRAN interfaces appear on the IPE module’s backplane. The backplane is cabled to the input/output (I/O) panel at the rear of the IPE module, which is then connected to the Main Distribution Frame (MDF) by the 25-pair cable.

Trunks connect to the two MIRAN external cross-connect channels at the MDF, as shown in Table 19. The two MIRAN external cross-connect channels wiring is shown in Figure 7 on page 91.

CAUTION

Before you install a MIRAN card into an IPE slot, ensure that *no* cross-connect wires from another product remain attached to this slot. Cross-connect wires that carry a ringing voltage can damage the MIRAN card.

CAUTION

Any EXUT or XFEM card that you cross-connect to a MIRAN card *must* reside in the same PBX as the MIRAN card.

Table 19 lists the tip/ring pairs for the MIRAN card installed in the IPE module. It shows the wire color code at the MDF to facilitate cross-connect to the external terminal equipment or trunk tip/ring pairs.

Table 19
NT8D37 IPE Module MIRAN pair termination (I/O panel to MDF cable)

Pair	Pin No	Pair color	MIRAN Assignment
1T/1R	26/1	W-BL/BL-W	RANAT0/RANAR0
2T/2R	27/2	W-O/O-W	CNTRPLS0/GRD
3T/3R	28/3	W-G/G-W	RANAT1/RANAR1
4T/4R	29/4	W-BR/BR-W	CNTRPLS1/GRD
5T/5R	30/5	W-S/S-W	AGRD/AGRD
6T/6R	31/6	R-BL/BL-R	No connection
7T/7R	32/7	R-O/O-R	AIN1/AIN0
8T/8R	33/8	R-G/G-R	Reserved
9T/9R	34/9	R-BR/BR-R	No connection
10T/10R	35/10	R-S/S-R	Reserved
11T/11R	36/11	BK-BL/BL-BK	Reserved
12T/12R	37/12	BK-O/O-BK	Reserved
13T/13R	38/13	BK-G/G-BK	Reserved
14T/14R	39/14	BK-BR/BR-BK	Reserved
15T/15R	40/15	BK-S/S-BK	Reserved
16T/16R	41/16	Y-BL/BL-Y	BDCDA-/Reserved
17T/17R	42/17	Y-O/O-Y	BSOUTA-/BSINA-
18T/18R	43/18	Y-G/G-Y	SGRD/BDTRA-
19T/19R	44/19	Y-BR/BR-Y	BRTSA-/BDSRA-
20T/20R	45/20	Y-S/S-Y	BSINB-/BCTSA-
21T/21R	46/21	V-BL/BL-V	BDCDB-/BSOUTB-
22T/22R	47/22	V-O/O-V	BDSRB-/BDTRB-
23T/23R	48/23	V-G/G-V	R22 RXD+/T22 RXD-
24T/24R	49/24	V-BR/BR-V	R23 TXD+/T23 TXD-
25T/25R	50/25	V-S/S-V	spare

Note: Each of the following I/O panel connectors is cabled as shown above: connectors A, B, C, D, E, F, G, K, L, M, N, R, S, T, and U.

Identifying external cross-connect channels at the MDF

The MIRAN external cross-connect channels are routed from the IPE module backplane to the MDF over the 25-pair tip/ring cable. These two cross-connect channels can be connected up to a maximum of 32 trunks (or to 16 each) at the MDF providing 32 RAN or 32 MOH application channels, or any combination of RAN and MOH totaling 32.

Table 20 lists the NTAG36 MIRAN card pair termination for the two external cross-connect channels that connect to multiple trunks. It lists the pinout and the cable wire color code for the two MIRAN external channels. Each of these two external MIRAN channels can cross-connect to up to 16 trunks for a total of 32 RAN channels.

Table 20
NT8D37 IPE Module: NTAG36 MIRAN external cross-connect channels

MIRAN Assignment	25-pair cable Pin No	Pair color code	MIRAN Port
RANAT0/RANAR0 CNTRPLS0/GRD	26/1 27/2	W-BL/BL-W W-O/O-W	A0
RANAT1/RANAR1 CNTRPLS1/GRD	28/3 29/4	W-G/G-W W-BR/BR-W	A1

Note: The MIRAN has up to 8 internal one-to-one ports/channels (0-7) and two external cross-connect channels (A0 and A1).

Figure 7 illustrates connection of the two MIRAN external cross-connect channels from the IPE module I/O panel to the MDF cross-connect terminals and from the MDF to the multiple trunks for Enhanced Universal Trunk wiring.

Figure 7
MIRAN external cross-connect channels relative to the EXUT wiring

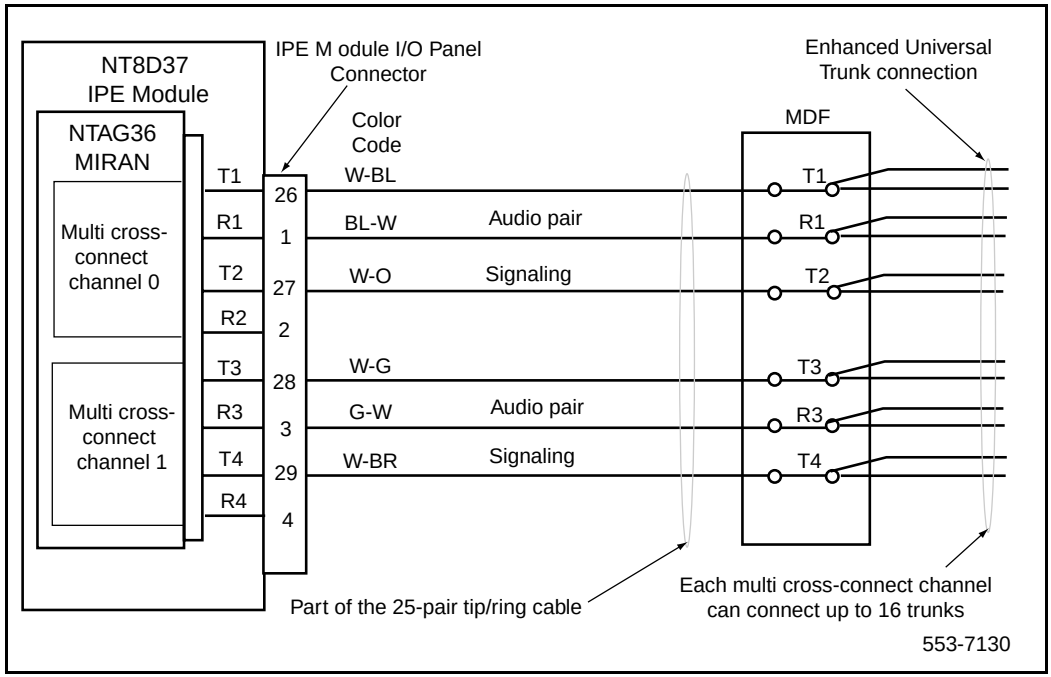
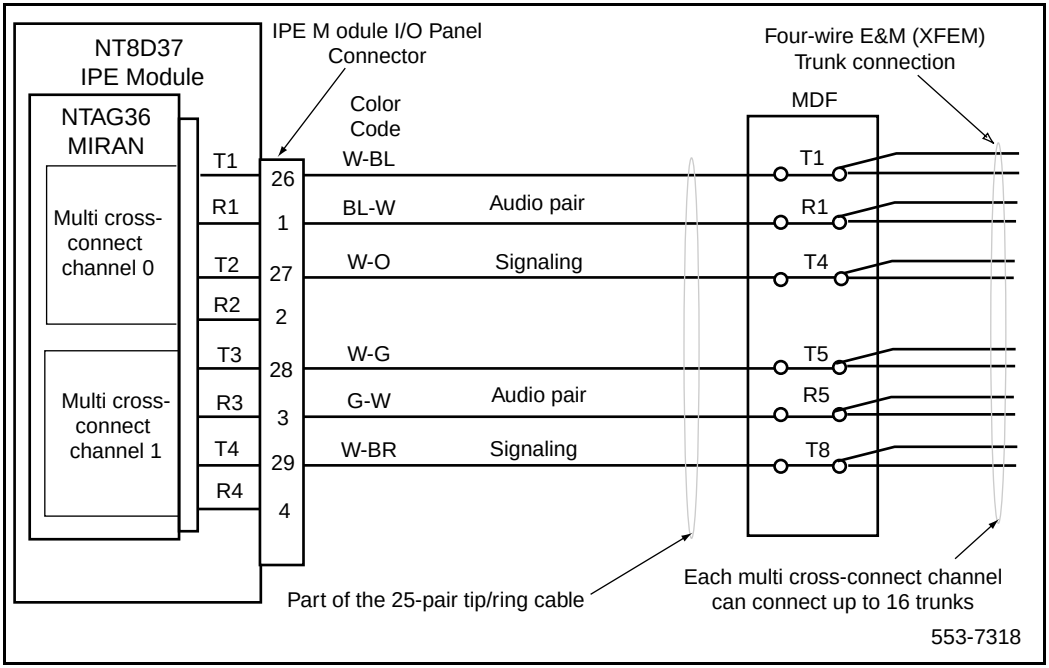


Figure 8 illustrates a connection of the two MIRAN external cross-connect channels from the IPE module I/O panel to the MDF cross-connect terminals and from the MDF to the multiple trunks for 4-Wire E&M trunk wiring.

Figure 8
MIRAN external cross-connect channels relative to the XFEM wiring



MIRAN card installation in an IPE shelf

Before you install the card, inspect the IPE module or cabinet I/O panel for backplane cabling. Refer to Table 18, "Card slots available for MIRAN installation in different modules," on page 87 for a listing of card slots suitable for MIRAN installation.

CAUTION

Before you install a MIRAN card into an IPE slot, ensure that *no* cross-connect wires from another product remain attached to this slot. Cross-connect wires that carry a ringing voltage can damage the MIRAN card.

CAUTION

Any EXUT or XFEM card that you cross-connect to a MIRAN card *must* reside in the same PBX as the MIRAN card.

To install MIRAN cards into an IPE shelf, follow these steps:

1 Identify the IPE card slot(s) selected for MIRAN card(s).

2 Pull the top and bottom extractors away from the MIRAN faceplate.

3 Insert the MIRAN card into the card guides and gently push it until it makes contact with the I/O panel connector.

4 Push the top and the bottom extractors firmly towards the faceplate to insert the MIRAN card into the faceplate connector and to lock it firmly in place.

5 Observe the faceplate hexadecimal display. It indicates the progress of the internal self-test in the form of **T:xx** (refer to "MIRAN hexadecimal codes" on page 262). Upon successful completion of the test and the start-up of the RAN application, the display shows the code "**RAAn**", where **n** is the V-LAN card number (in hexadecimal). If cards are not in a V-LAN configuration, the display shows **RAA0**.

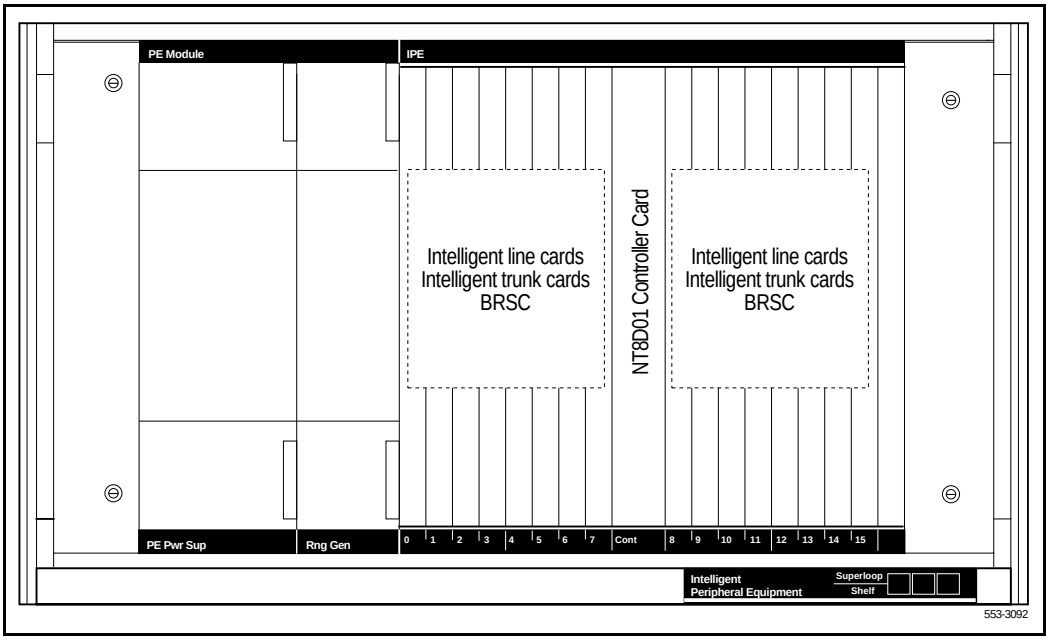
Note: During the MIRAN bootup sequence you can see either an error message or the '**T:xx**' self-test messages on the hex display. To interpret an error message, refer to "MIRAN hexadecimal codes" on page 262.

6 To enable the MIRAN, load the Network and PE Diagnostic program, LD 32, into the system memory using the system TTY. Execute the **ENLC l s c** command, where **l** is the loop, **s** is the module or shelf, and **c** is the card to enable.

7 Repeat steps 1 through 6 for each additional MIRAN.

Figure 9 shows the IPE module and the card slots where the IPE cards reside. You can install a MIRAN card into any IPE card slot except the Peripheral Controller card slot.

Figure 9
The NT8D37 IPE module



Note: European customers who need the MIRAN Release 2.0 ethernet capability must install the card in slot 0, 4, 8, or 12 of the IPE shelf.

Note: If you have either the NT8D37AA/DC IPE or the NT8D11AC/DC CE/PE module *and* you need the port A and B MDF connections, you *cannot* install the MIRAN card in slots 3, 7, 11, or 15 of the IPE shelf. The necessary tip/ring pairs in these slots are not available at the MDF.

MIRAN card installation in Option 11E/11C

Before you install the card, inspect the Option 11E/11C module or cabinet I/O panel for backplane cabling.

CAUTION

Before you install a MIRAN card into a slot, ensure that *no* cross-connect wires from another product remain attached to this slot. Cross-connect wires that carry a ringing voltage can damage the MIRAN card.

CAUTION

Any EXUT or XFEM card that you cross-connect to a MIRAN card *must* reside in the same PBX as the MIRAN card.

To install one or more MIRAN cards into an Option 11E or 11C system, do the following:

1 Identify the card slot(s) selected for the MIRAN card(s). If you are planning to use CE-MUX interface connection for Option 11C, install the MIRAN in a slot from 3 to 9 in the main cabinet.

2 Pull the top and bottom extractors away from the MIRAN faceplate.

3 Insert the MIRAN card into the card guides and gently push it until it makes contact with the backplane connector.

4 Push the top and the bottom extractors firmly towards the faceplate to insert the MIRAN card into the faceplate connector and to lock it firmly in place.

5 Observe the faceplate hexadecimal display. It indicates the progress of the internal self-test in the form of **T:xx** (refer to "MIRAN hexadecimal codes" on page 262). Upon successful completion of the test and the start-up of the RAN application, it displays the code, "**RAAn**", where **n** is the LAN card number (in hexadecimal). If cards are not in a LAN configuration the display shows **RAA0**.

Note: During the MIRAN bootup sequence you can see either an error message or the '**T:xx**' self-test messages on the hex display. To interpret an error message, refer to "MIRAN hexadecimal codes" on page 262.

6 To enable the MIRAN, load the Network and PE Diagnostic program, LD 32, into the system memory using the system TTY. Execute the **ENLC c** command, where **c** is the card to enable.

7 Repeat steps 1 through 6 for each additional MIRAN.

Connecting a VT100-type terminal to the MIRAN

You must connect a VT100-type (maintenance) terminal to the MIRAN to perform the following OA&M functions during installation and setup:

— Entering keycode information

— Entering IP address, subnet mask, and Gateway information for the ethernet configuration

You can also use the VT100-type terminal to perform any of the other OA&M functions. The VT100-type uses MIRAN's text-based user interface to perform OA&M. Refer to "RAN Application: Text-based user interface" on page 127 for more information on the text-based user interface.

This section describes the procedures for connecting a VT100-type terminal to the MIRAN in the following four scenarios:

— Connecting a terminal to the MIRAN in the IPE module (for customers with options 21-81C or any system that uses IPE modules)

— Connecting a terminal to the MIRAN in the Option 11E/11C, basic

— Connecting a terminal to the MIRAN in the Option 11E/11C, pass-thru option

— Connecting a terminal to the MIRAN in the Option 11C, CE-MUX option

For a terminal-based OA&M access, you have to specify the VT-100 type terminal interface characteristics to ensure compatibility with the MIRAN RS-232 interface.

Set the interface parameters as follows:

— Transmission speed; 9600 bps

— Data bits: 8

— Stop bit: 1

— Parity: No

— Flow control: none

To administer RAN applications using the terminal, go to "RAN Application: Terminal-based OA&M" chapter in this manual.

If using a Window™ based terminal emulator, you should disable the CTRL and the arrow keys by Windows™ because these keys are used by the OA&M for traversing the menus.

Connecting a terminal to the MIRAN in the IPE module

To connect a terminal to the MIRAN in the IPE module, you have the following options:

— Connecting directly to the MIRAN faceplate

— Connecting to the MIRAN faceplate through a modem

— Connecting directly at the MDF

— Connecting to the I/O panel connector through a modem

— Connecting to the I/O panel through the multi-I/O adapter cable (see "Installing the multi-I/O adapter cable" on page 106)

The connection of a terminal to the faceplate is simple and preferable for occasional use of the terminal. For a permanent connection, use the MDF to connect the terminal to the MIRAN.

Connecting the terminal directly to the faceplate connector

The MIRAN has an 8-pin mini-DIN connector at the bottom of the faceplate. You can use this connector to connect a terminal as well as interconnect multiple MIRAN cards into a serial chain. One terminal can service all the MIRAN cards in the chain. (Refer to "Connecting multiple MIRAN cards" on page 113 for information on connecting multiple MIRAN cards into a serial chain.)

To connect the terminal or a personal computer emulating a terminal to the 8-pin mini-DIN connector on the MIRAN faceplate, do the following:

1 Place the terminal in the desired location. If the distance to the MIRAN is less than 10 feet (3 m), you do not need an extension cable.

2 Plug the 8-pin mini-DIN male connector of the NTAG81CA Maintenance cable into the MIRAN 8-pin mini-DIN female connector located at the bottom of the faceplate.

3 Plug the NTAG81CA cable DB9 female connector into the terminal. If the terminal requires a different connector, procure an adapter cable or a compact adapter and install it between the terminal and the NTAG81CA cable.

4 If the terminal is more than 10 feet (3 m) from the MIRAN, use the 16-foot NTAG81BA Maintenance Extender Cable. Or, if the terminal requires a different connector, use an adapter cable of the appropriate length.

Connecting a modem to the faceplate connector

To connect a modem to the 8-pin mini-DIN connector on the MIRAN faceplate, do the following:

1 Place the modem in the desired location.

2 Plug the 8-pin mini-DIN male connector of the NTAG81CA Maintenance cable into the MIRAN 8-pin mini-DIN female connector at the bottom of the faceplate.

3 Plug the DB9 female connector of the NTAG81CA cable into theDB9 male connector of the NTAG81DA maintenance splitter cable.

4 Plug the DB-25 male connector of the NTAG81DA maintenance splitter cable into the DB-25 female connector on the modem.

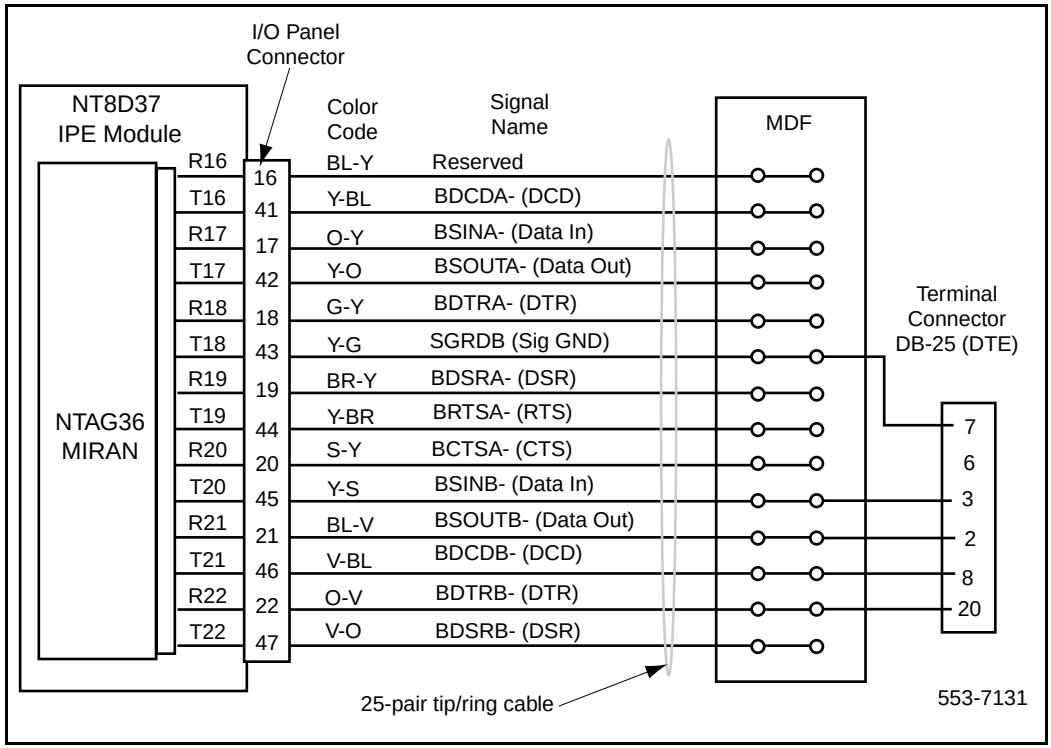
For additional information on how to setup the modem, refer to "MIRAN interface connectors" on page 264.

Connecting the terminal directly to the MDF

For a permanent connection of a terminal to the MIRAN, connect the terminal to the MDF tip/ring pairs that provide ports A and B. The total distance from the MIRAN to the MDF to the terminal must not exceed 50 feet (15 m).

Figure 10 illustrates the terminal wiring, which starts from the IPE module I/O panel through the MDF to the terminal. It shows the I/O panel pinout, the 25-pair tip/ring wire color code, the signal description, the terminal cable, and DB-25 terminal connector.

Figure 10
Terminal connection to the MIRAN at the MDF



To connect the terminal, or a personal computer emulating a terminal, at the MDF using ports A and B, refer to Figure 10 and follow these steps:

1. Place the terminal in the desired location. Place it close to the MDF to minimize the total distance between the MIRAN and the terminal. The total distance must not exceed 50 feet (15 m).
2. Cross-connect the terminal cable at the MDF as Figure 10 shows. Observe the cable connector pinout and the cable wire color code. Terminal cable is not supplied with the MIRAN equipment.
3. Cross-connect the wires of the open end of the terminal cable into the MDF connector block according to the Figure 10 wiring diagram.
4. Plug the connector at the other end of the terminal cable into the terminal RS-232 connector.

Connecting a modem to the MDF

To connect a modem to the MIRAN through the MDF, do the following:

1. Place the modem in the desired location.
2. Plug the 50-pin MDF cable connector into the 50-pin I/O panel connector.
3. Cross-connect the modem cable to the MDF.

For additional information on how to setup the modem, refer to “MIRAN interface connectors” on page 264.

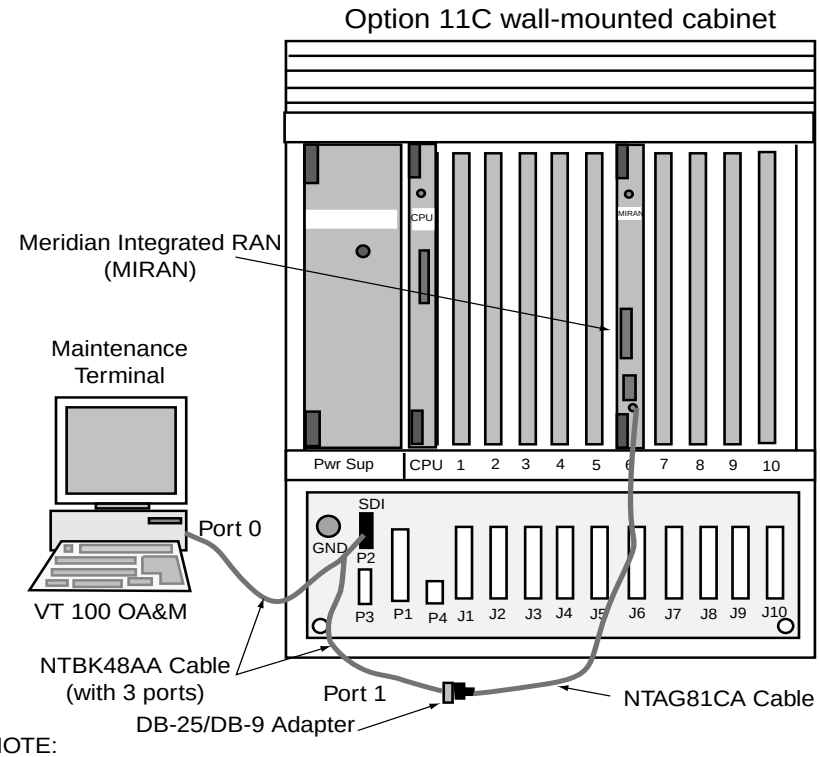
Option 11E/11C MIRAN terminal connection, basic setup

Options 11E and 11C system uses a pass-thru approach to connect the TTY and the terminal used for OA&M access.

Figure 11 shows the terminal connection to the SDI port on the cabinet backplane and to the 8-pin mini-DIN connector on the MIRAN faceplate. This allows you to use the terminal as a TTY and as a terminal-based OA&M.

A terminal connected to the Option 11E or 11C system can be used as a system TTY and the terminal-based OA&M access to the MIRAN card.

Figure 11
Option 11C terminal connection



NOTE:

1. To access the MIRAN maintenace terminal, enter 'AX<space>[port No.].<cr>' twice. (above Port no.=1) To return to Meridian 1 TTY mode, enter 'CTRL]'.
2. Option 11C connects the terminal as shown, Option 11E connects the terminal directly to the faceplate connector or to the backplane.
3. Option 11C uses CE-MUX interface in main cabinet slots 1-9 for passthru.

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To connect the terminal:

1. Position the terminal on a desk near the system.
2. Plug the NTBK48AA cable DB-9 male connector into the SDI connector on the Option 11E or 11C backplane, refer to Figure 11 for detail connection illustration.
3. Connect the NTBK48AA Port 0 to the terminal RS-232 port.
4. Connect the NTBK48AA cable Port 1 DB-25 connector to the DB-25/DB-9 adapter.
5. Plug the NTAG81CA 8-pin mini-DIN connector into the MIRAN faceplate Mini-DIN RS-232 connector.
6. Plug the NTAG81CA cable DB-9 connector into the DB-9 connector on the DB-25/DB-9 adapter.

Configuring the Option 11C for CEMUX/pass-thru access

To be able to use the MIRAN maintenance terminal as a system TTY in Option 11C over the CEMUX/pass-thru, you must configure the terminal parameters using the Configuration Record program LD 17 as shown in Table 21.

Table 21
Option 11C CEMUX/pass-thru access configuration

Prompt	Response	Description
REQ	CHA	Change data
TYPE	CFN	Configuration record
ADAN	NEW TTY 3	Add new TTY
TTY_TYPE	LSL	Low speed AUX link
CAB	0	Main cabinet
CNDO	03	Card slot
PORT	0	MIRAN port
DES	MIRAN	Port or link designation
FLOWTYPE	NONE	Flow control
BPS	9600	TTY speed
BITL	8	Number of bits
STOP	1	Stop bit
PARITY	NONE	Parity bit
ENL		Enable MIRAN

Note: To access the MIRAN, type the prompt 'AX<space>[port number]. Press Enter twice to display the MIRAN OA&M screen on the maintenance terminal.

Note: To return to the system TTY mode, type <CTRL>] and the control will be passed back to the Meridian 1 system.

Connecting an external audio device

You can connect an analog audio source and receiver to the MIRAN for the following purposes:

— recording music or announcements to the Flash memory

— backing up announcements from the MIRAN to a tape or to another MIRAN card

— connecting directly through a trunk emulation port/channel into the Meridian 1 for MOH.

You can connect the analog device to either of the following:

— the 3.5 mm Audio Jack on the MIRAN faceplate

— at the MDF

Analog to internal pass-thru switchover

For Music-on-Hold, both analog ports can be used at the same time, each assigned to different internal channels.

To allow switching from an analog source to an internal channel, the configuration of each channel is polled every 30 seconds to check for an assignment switchover. If the assignment is for a voice file, the playthrough will be stopped and the voice file started immediately, and vice versa. This switchover always occur at the end of the file to avoid hearing truncated announcements.

Connecting audio devices to the MIRAN faceplate

The MIRAN has a 3.5 mm Audio Jack at the top part of the faceplate. This jack provides one audio input and one audio output.

To connect the external audio source to the MIRAN faceplate audio jack:

1 Plug the 3.5 mm jack on the common side of the NTAG81AA Audio Cable into the 3.5 mm Audio Jack on the MIRAN backplane.

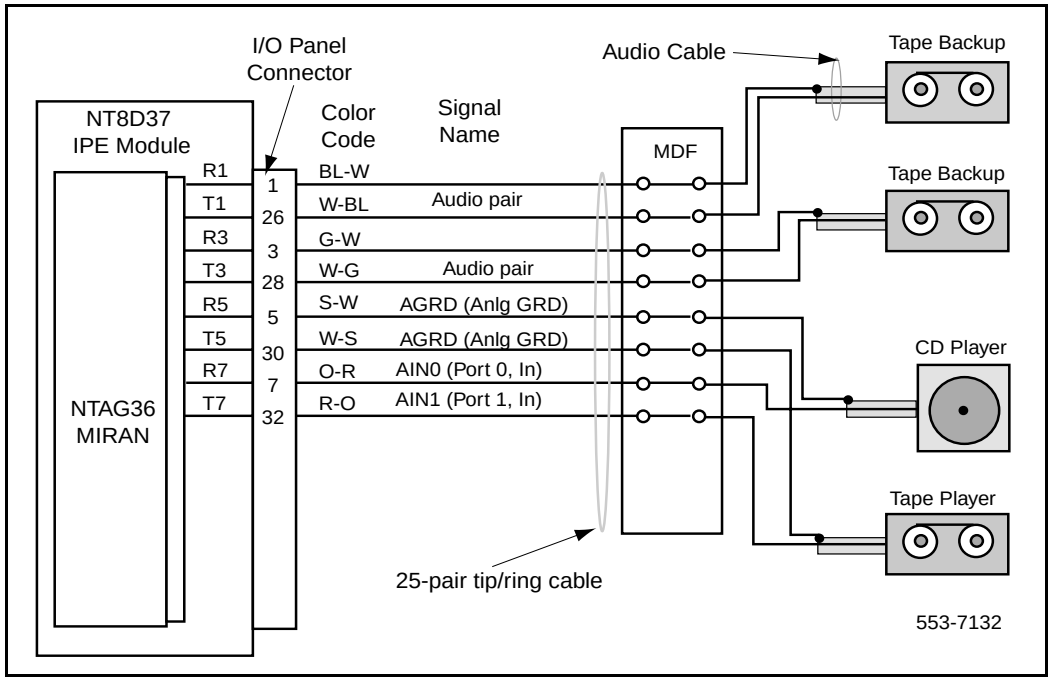
2 Plug the audio input end of the NTAG81AA cable connector into the audio source device. If the source is at a distance from the MIRAN, you may have to use an extension (not supplied).

3 Plug the audio output end of the NTAG81AA cable connector into the audio receiver device (for announcement backup). If the source is at a distance from the MIRAN, you may have to use an extension (not supplied).

Connecting audio devices at the MDF

The MIRAN provides two audio inputs and two audio outputs at the MDF.

Figure 12
Analog device connection at the MDF



To connect the external audio devices at the MDF, refer to Figure 12 and follow these steps:

1 Position the audio devices in a convenient location.

2 Obtain the required audio cables of the appropriate length. The cable should have open wires at one end to connect to the MDF connector block.

3 Connect each audio cable to the appropriate Analog GND and Port terminal on the MDF. Refer to Figure 12 for signal name and color code of the 25-pair tip/ring cable pairs.

4 Plug the other end of each audio cable into the appropriate audio device, as shown in the Figure 12.

Note: The multi-I/O adapter cable connects the I/O panel to the MDF.

Figure 12 illustrates the external audio source and backup device connections at the MDF. It shows two audio inputs that provide external music or announcements to the MIRAN and two audio recorders that provide backup of announcements located in the MIRAN. Analog audio sources have a separate analog ground (AGND), and analog audio backup devices have their own separate (AGND). An audio cable extends from the MDF to the audio device.

Ethernet access installation and setup

Customers that have the MIRAN Release 2.0 card (NTAG36AC) have the capability to connect their card to the ethernet. Ethernet access to the MIRAN Release 2.0 card provides the ability to:

— Access the card through a common web browser to perform OA&M functions

— Perform FTP uploads and downloads of files to and from the card

— Telnet to the card from a remote site

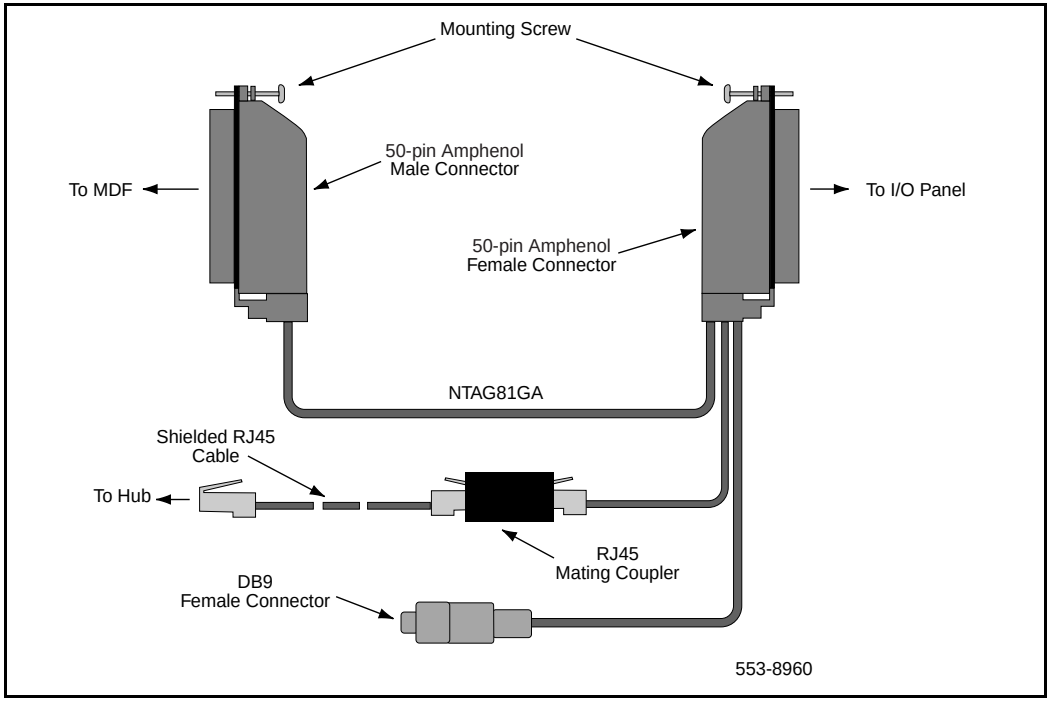
Note: Ethernet access to MIRAN Release 2.0 is *optional*. You do not need ethernet access to perform any of the necessary OA&M functions.

The following sections describe the procedures for setting up and using the MIRAN Release 2.0 ethernet capability.

Installing the multi-I/O adapter cable

To enable the ethernet capabilities of the MIRAN Release 2.0 card, you must install the multi-I/O adapter cable (NTAG81GA). The multi-I/O adapter cable comes with the MIRAN pack. You can install the multi-I/O adapter cable either before or after you install the MIRAN Release 2.0 card. Figure 13 shows a picture of the NTAG81GA multi-I/O adapter cable.

Figure 13
The NTAG81GA multi-I/O adapter cable



To install the multi-I/O adapter cable, do the following:

1 Locate the I/O panel connector that goes with the card slot where you installed (or will install) the MIRAN Release 2.0 card.

2 Disconnect from the I/O panel the 50-pin female connector of the MDF cable.

3 Attach the 50-pin female connector of the multi-I/O adapter cable to the 50-pin male connector on the I/O panel.

4 Attach the 50-pin male connector of the multi-I/O adapter to the 50-pin female connector from the MDF, which you disconnected in step 2.

Note: Use a flathead screwdriver to tighten all 50-pin connectors.

5 Connect the RJ45 connector of the multi-I/O adapter cable to an RJ45 mating coupler.

6 Connect one end of an RJ45 cable to the RJ45 mating coupler and the other end to the E-LAN hub. This connection completes the connection of the MIRAN Release 2.0 card to the ethernet LAN.

Note: You can connect the DB9 female connector of the multi-I/O adapter cable to a maintenance terminal or to a modem. This configuration can provide a permanent connection of the card to a maintenance terminal. If necessary, use the NTAG81BA extender cable to extend the DB9 female connector lead from the multi-I/O adapter cable.

Configuring the IP address, subnet mask, Gateway, and IP method

To enable the ethernet capabilities of the MIRAN Release 2.0 card, you must get an IP address, subnet mask, Gateway, and IP method for the card. Before you can configure the IP address, subnet mask, and Gateway for the MIRAN Release 2.0 card, you must first do the following:

— Obtain the IP address, subnet mask, Gateway, and IP method from your system administrator.

Note: The IP method can be either ‘bootp’ or ‘static’. You can disable the IP connection, but keep MIRAN working, by setting the IP method to ‘disabled’.

— Install the MIRAN Release 2.0 card into the appropriate slot.

— Connect the VT100-type maintenance terminal.

To configure the IP address, subnet mask, Gateway, and IP method for the MIRAN Release 2.0 card, do the following:

1 Log in to the MIRAN Release 2.0 text-based user interface by entering your user name and password and selecting **-Login-** at the login screen. Refer to “The Login screen” on page 130 for further information.

2 At the Main Menu, select **-2-** to access the Pack Administration menu.

3 At the Pack Administration menu, select **-6-** to access the Ethernet Configuration screen.

4 At the Ethernet Configuration screen, enter the 'new' IP address, subnet mask, Gateway, and IP method. This new information writes over any old ethernet configuration information that the card contains.

5 Select **-Set-** to set the new ethernet configuration information. A confirmation notice at the bottom of the Ethernet Configuration screen indicates successful completion of the task. Refer to "The Ethernet Configuration screen" on page 176 for further information.

6 Reboot the MIRAN card to activate the new ethernet configuration.

Accessing the BUI

After you install the multi-I/O adapter cable and configure the IP address, subnet mask, and Gateway for the MIRAN Release 2.0 card, you can access the browser user interface (BUI). To access the BUI, you must have access to a standard web browser that supports html frames. Nortel Networks recommends Netscape 3.0 or later or Internet Explorer 3.0 or later.

To access the MIRAN Release 2.0 BUI, do the following:

1 Enter the IP address of the card in the URL address field on your browser. The login screen of the BUI appears.

2 Select the username; **admin** is the default.

3 Enter the password; **admin000** is the default password for **admin**.

4 Click on the **Login** button. If the login is successful, you receive a confirmation message.

5 Click on **Main Menu**. The main MIRAN Administration page appears.

After you enter the BUI, you can perform most OA&M functions.

Note: You cannot enter the BUI while someone else uses the BUI.

Telneting to the MIRAN Release 2.0 card

The ethernet connection to the MIRAN Release 2.0 card enables you to telnet to the text-based user interface (see page 127) from a remote site. You can then interact with the MIRAN Release 2.0 card just as if you were at the local maintenance terminal. To telnet to the MIRAN Release 2.0 card, do the following:

1. Point your standard web browser to the BUI address for the particular MIRAN Release 2.0 card you must access.
2. Click on the Telnet hyperlink in the left frame of the BUI login page. The login screen of the text-based user interface appears.

   Note: You do not need to log into the BUI to telnet to the text-based user interface.

At the login screen, you can log into the text-based user interface the same way as if you were at the local maintenance terminal.

Note: You cannot access the MIRAN Release 2.0 card while someone else uses the text-based user interface, the BUI, or the TUI.

FTP downloads and uploads

The ethernet connection to the MIRAN Release 2.0 card enables you to ftp files to and from the card. To use the ftp capability, you must have the following:

— A connection of the MIRAN Release 2.0 card to the ethernet LAN through the multi-I/O adapter cable

— A permanent assignment of an IP address to the card

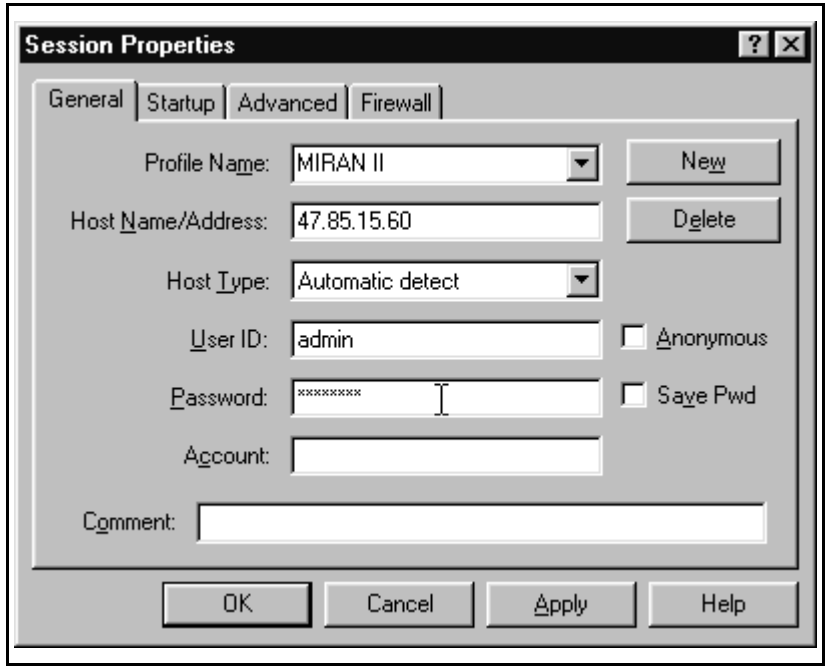
— A valid user name and password with which to access the card

— a standard ftp client application (The figures in this section show the use of the WS_FTP Professional file transfer client.)

To ftp files to and from the MIRAN Release 2.0 card, do the following:

1. Open the ftp client application and select **Connect** to open a dialog box similar to the one that Figure 14 shows.
2. Enter the IP address of the MIRAN Release 2.0 card in the ‘Host Name/Address’ field.

Figure 14
Logging into the MIRAN Release 2.0 card through an ftp client application



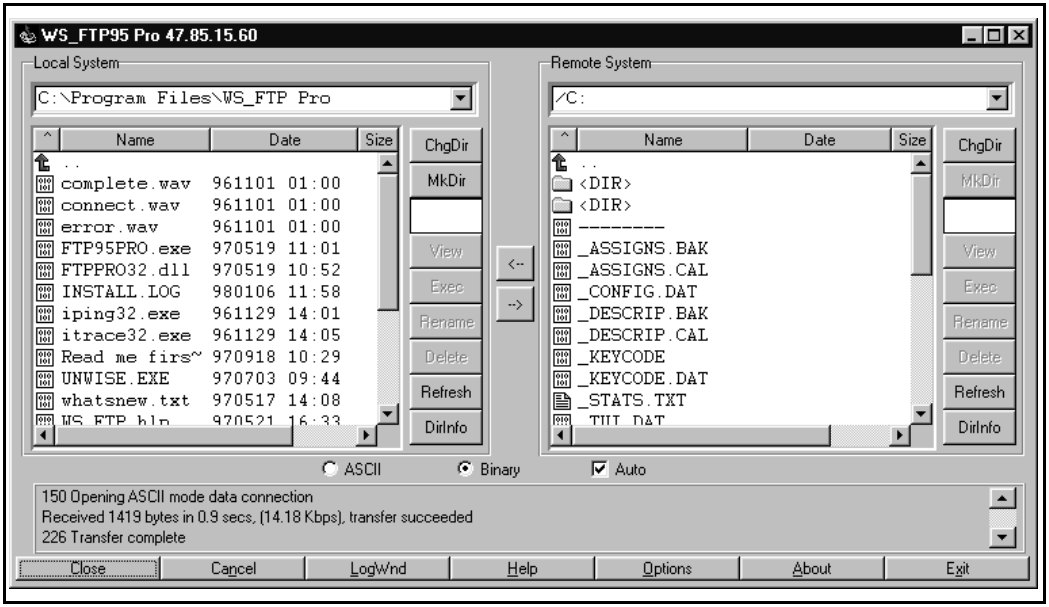
3 Enter the user name and password for the card. This is the same user name and password that you use to log into the text-based user interface.

4 Click **OK** to connect to the MIRAN Release 2.0 card. A dialog box appears, similar to the one that Figure 15 on page 112 shows. From here you can ftp files to and from the MIRAN Release 2.0 card in the same way you ftp files to and from any server.

Note 1: Select 'ASCII' format for the transfer of text files and 'Binary' format for the transfer of all other files.

Note 2: If you copy a .WAV file to the MIRAN card, remember that you must convert the .WAV file to .ALW or .ULW format before you can create an assignment for the file. Refer to "The Convert Announcement File screen" on page 153 for instructions on converting sound files.

Figure 15
Accessing the MIRAN Release 2.0 card through an ftp client application



The ‘Remote System’ lists the files in drive C: of the MIRAN Release 2.0 card. If you must transfer files to or from drive A: or drive B:, select the ‘Change Directory’ option on your ftp client application. Enter ‘/A:’ for drive A: or ‘/B:’ for drive B: as the new directory name.

You can also use the ftp client application to perform file maintenance functions on the MIRAN Release 2.0 card such as:

— Renaming or deleting files

— Creating or deleting sub-directories

Most ftp client applications also allow you to create profiles for addresses that you frequently access. You can use this capability to create a profile for each MIRAN Release 2.0 card in your network. This can save you the time of entering the IP address, the user name, and the password each time you want to access a card.

Connecting multiple MIRAN cards

A maximum of 16 MIRAN cards can be connected in a daisy-chain to form a MIRAN Local Area Network for administration and maintenance purposes.

These MIRAN cards can be inter-connected:

— at the 8-pin mini-DIN connector on the MIRAN faceplate, or

— at the MDF

Connecting multiple MIRAN cards at the faceplate

All of the MIRAN cards in the system are connected in a daisy-chain using the NTAG81DA Maintenance Cable Splitter cable with a mini-DIN connector on the common end and two DB9 connectors on the other ends.

To install the MIRAN cards and connect them in a V-LAN configuration:

1 Install all the MIRAN cards into their card slots in the IPE module or shelf, if not already installed. Refer to Table 18, “Card slots available for MIRAN installation in different modules,” on page 87 for card slots suitable for MIRAN installation.

2 Plug the NTAG81DA cable mini-DIN connector into the mini-DIN connector on the MIRAN faceplate. Do this for every MIRAN installed.

3 Plug the DB9 female connector (labeled P1) of the NTAG81DA cable of the first MIRAN into the terminal, terminal emulating PC, or modem. Use the appropriate adapter cable, if necessary.

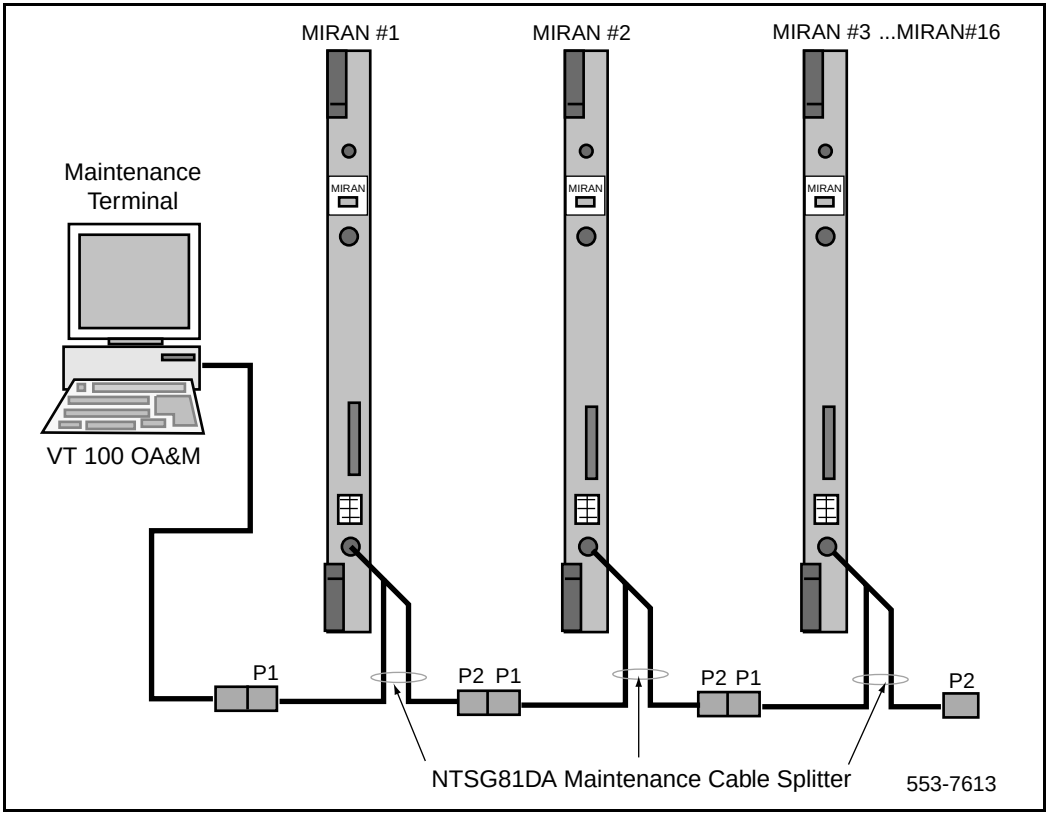
4 Plug the DB9 male connector (labeled P2) of the NTAG81DA cable of the first MIRAN into the DB9 female connector (labeled P1) of the NTAG81DA cable of the second MIRAN. Refer to Figure 16.

5 Repeat steps 3 and 4 for the rest of the MIRAN cards in the V-LAN configuration.

6 If MIRAN cards occupy the same module or shelf, the faceplate cables can be connected directly to each other as shown in Figure 16. For longer runs, the NTAG81BA Maintenance Extender cable may be required to span the distance.

Figure 16 illustrates the multiple MIRAN connections in a V-LAN configuration to enable one terminal to access each MIRAN in the chain. You can connect a maximum of 16 MIRAN cards into a V-LAN configuration.

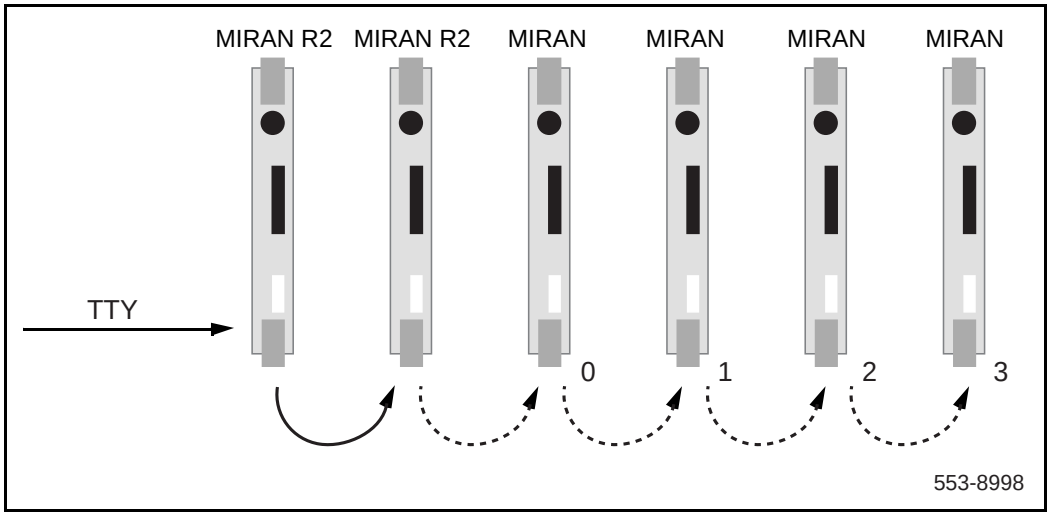
Figure 16
Terminal-based OA&M connection for multiple MIRAN cards



V-LAN Support

MIRAN Release 2.0 supports V-LAN over Ethernet as well as the serial method used in the initial MIRAN product. When connecting both MIRAN and MIRAN Release 2.0 cards, the MIRAN Release 2.0 cards must be the first cards in the V-LAN to be able to telnet to the older cards. Once you telnet to a MIRAN Release 2.0 card in the V-LAN configuration, you can access any MIRAN card (new or old) that follows in the V-LAN configuration, as shown in Figure 17.

Figure 17
V-LAN connection of MIRAN and MIRAN Release 2.0 cards



Note: You can use only the text-based user interface with a V-LAN configuration. Browser-based and ftp access are not available through a V-LAN configuration.

Note: Nortel Networks recommends that you don't interconnect multiple MIRAN Release 2.0 cards that have ethernet connections in a V-LAN configuration. The V-LAN overrides telnet access. To use telnet, you must telnet into the *first* (MIRAN Release 2.0) card in the V-LAN chain to be able to access the other cards in the chain.

Connecting multiple MIRAN cards at the MDF

A maximum of 16 MIRAN cards can be connected in a V-LAN at the MDF. This is a more convenient approach than the connection at the MIRAN faceplate because it allows MIRAN cards to be removed without disconnecting any cables.

> ***Note:*** If you remove a MIRAN card from the daisy-chain, all the remaining cards down-stream from the removed card, cannot be accessed by the administration and maintenance terminal. All the cards that are up-stream, towards the terminal, will continue to be accessed by the terminal. Once the card is re-installed, all cards can be accessed.

To connect MIRAN cards in a V-LAN configuration at the MDF:

1 Install all the MIRAN cards into their card slots in the IPE module or shelf, if not already installed.

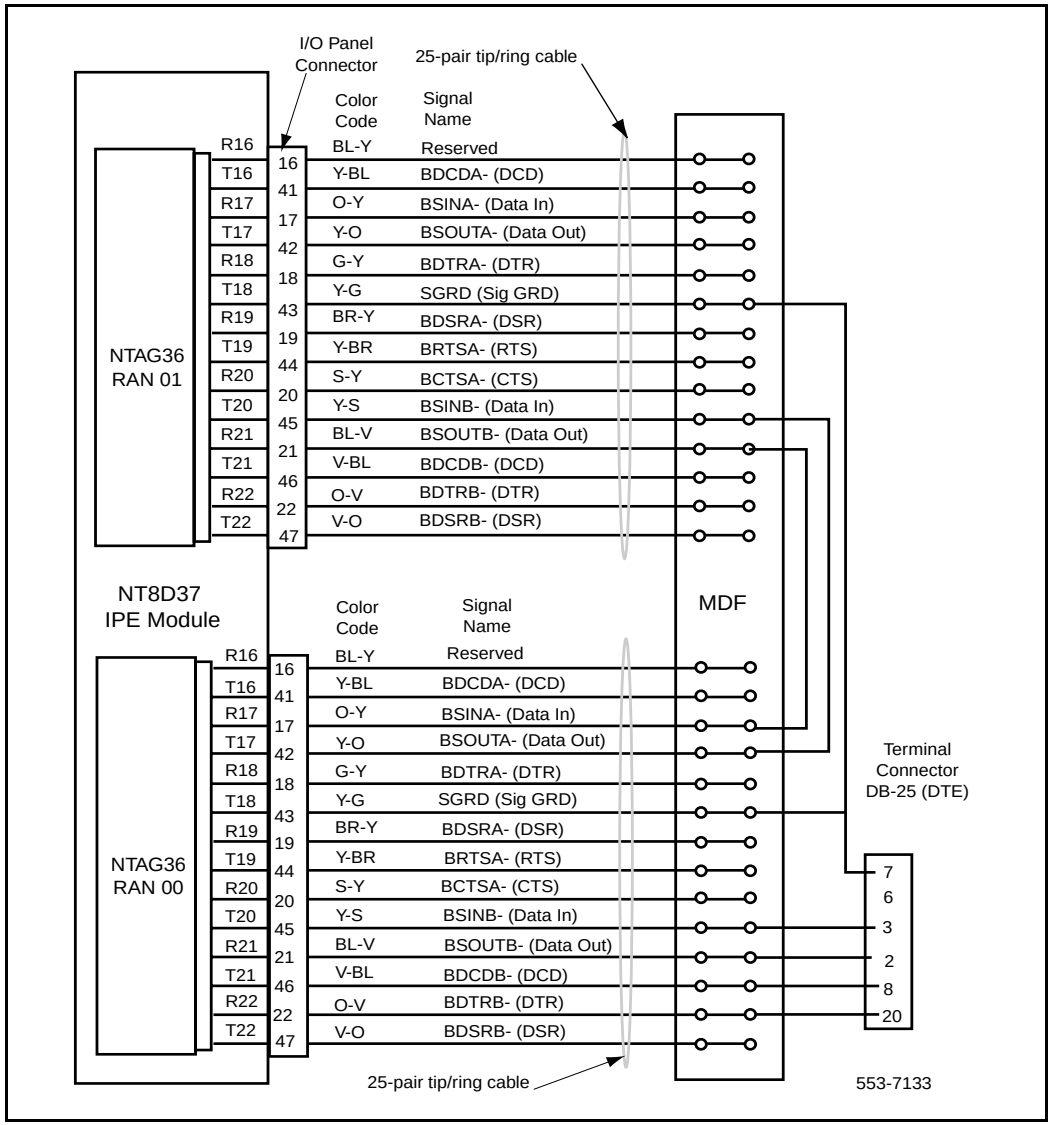
2 Identify each 25-pair tip/ring cable at the MDF that is associated with each MIRAN card. These cables have been installed during system installation or in the pre-installation preparation phase.

3 Cross-connect the wires at the MDF connector block that represent Port A and Port B as shown in Figure 18:

- Connect the terminal to the first MIRAN in the V-LAN as shown in Figure 10 “Terminal connection to the MIRAN at the MDF” on page 99 by plugging the Port B connector of the first MIRAN to the terminal cable.
- Cross-connect Port A of the first MIRAN to Port B of the second MIRAN in the chain, as shown in Figure 18.
- Continue cross-connecting Port A to Port B until the last MIRAN in the daisy-chain.
- Port A on the last MIRAN is not connected.

Figure 18 illustrates the connection of multiple MIRAN cards at the MDF by cross-connecting Port A to Port B of MIRAN cards.

Figure 18
Multiple MIRAN card connections over the RS-232 port at the MDF



Performing upgrades and replacements

As part of the administration tasks, you may have to upgrade RAN applications and perform backups. The upgrades can be:

— storage capacity expansion

— channel capacity expansion

Backups

Backup of recordings is not necessary because the Flash technology used on the MIRAN is very reliable. However, backup is available to a PCMCIA memory card, if needed.

The configuration must be backed up. To back up the configuration, refer to "The Backup Configuration screen" on page 156.

PCMCIA backup

Insert a blank PCMCIA card into drive A: just as if you were increasing the messaging storage capacity. Before beginning to record any additional announcements to this Flash, initiate an OA&M session and select the backup to PCMCIA option or use the **BACKUP** command on the Command line.

The drive A: is checked for the BACKUP.DAT file before checking drive C:. If the BACKUP.DAT file exists on the PCMCIA card in drive A:, the system will retrieve the configuration from this drive rather then the BACKUP.DAT file in drive C:. For details, refer to the *RAN Application: Terminal based OA&M* and *Telephone set-based OA&M* chapters in this document. The new card is now available as a backup medium rather than as a storage medium.

If you attempt to backup to a non-blank card, the existing files will be overwritten.

> ***Note:*** When backing up recordings and configuration, you must define the drive you wish to use for backup.

A backup includes both recorded announcements and configuration. The configuration contains information relating to the RAN/music PCM data stored in Flash that includes:

— voice files

— announcement-to-channel allocation

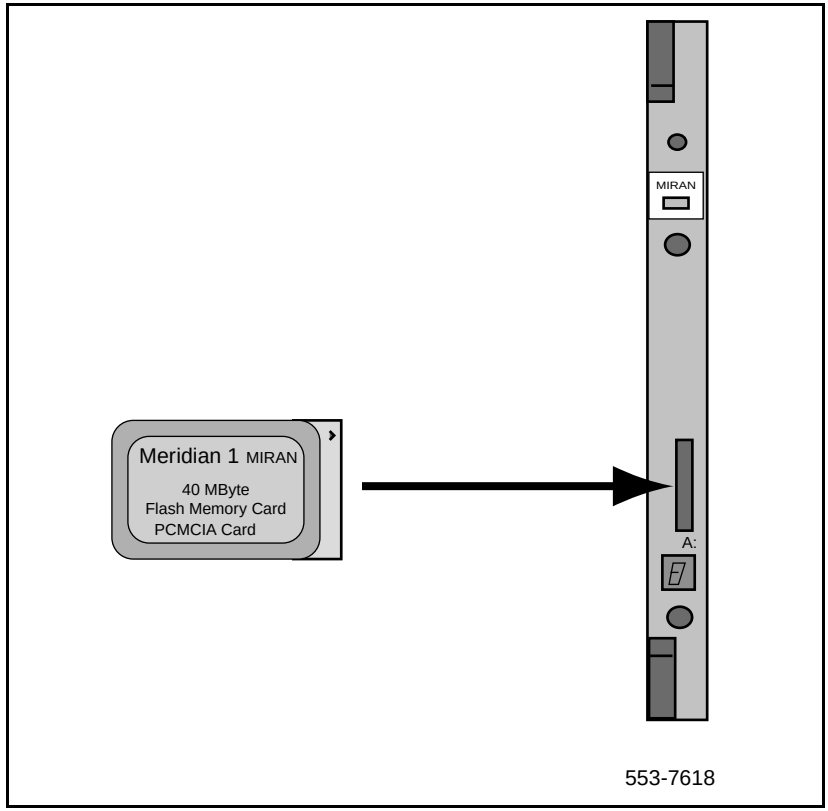
— external/internal music selection

— passwords

— configuration variables

Figure 19 illustrates backing up recordings by using a Flash Memory card.

Figure 19
Backups and upgrades of MIRAN configuration/recordings



Restoring configuration

When you re-boot MIRAN, the MIRAN configuration is restored from the disk using the following sequence: first drive A:, then drive B:, and finally drive C:. This allows a previously stored configuration to be over-written by installing an ATA card in drive A:, which contains a new BACKUP.DAT file that has been saved on a different MIRAN card.

RAN upgrades

Two types of RAN application upgrades are available on the MIRAN card. These are:

— a software upgrade for bug fix and/or addition of new features

— a memory upgrade to increase the voice storage capacity

Local software upgrade

To perform a local software upgrade:

1 Insert the new feature PCMCIA card into the drive A: slot on MIRAN, as shown in Figure 19 on page 119.

Note: The configuration file can be prepared in the distributor's office for each MIRAN customer and then placed on the PCMCIA card along with the application and/or recorded announcements to be upgraded. Then, the PCMCIA card is sent to the customer, who inserts the PCMCIA card into the MIRAN card and performs the upgrade procedure.

2 Initiate the upgrade by using the "The Software Upgrade screen" on page 167. The MIRAN copies across the new application while maintaining all files from the existing ATA Flash memory that are still needed (i.e., existing recorded announcements and configuration).

3 Once the upgrade is complete, remove the old Flash card, unless it is needed to provide additional storage capacity.

4 Enter the new keycode on the MIRAN terminal to activate new features you just installed.

Note 1: If the software upgrade is a maintenance type (bug fix etc.), new keycode is not needed.

Note 2: If the upgrade consists of a new application or enhancement, the administrator must enter a new keycode on the maintenance terminal to enable the upgrade.

5 Perform a cold reboot to activate the new feature(s).

Remote software upgrade

MIRAN Release 2.0 cards can be upgraded remotely from any location on the customer's network using the following procedure.

1. Log into the card using an administrator level password. The access can be either through Telnet or through a modem connection.
2. Download the software upgrade binary over the network using FTP. (Sufficient space must be available on the MIRAN Release 2.0 card to do this.)
3. Enter the software upgrade menu in the text-based user interface (through a serial or a telnet connection) and call up the file you have just downloaded. Complete the upgrade using "The Software Upgrade screen" on page 167.
4. Enter the new keycode on the MIRAN terminal to activate new features you just installed.

   Note 1: If the software upgrade is a maintenance type (bug fix etc.), new keycode is not needed.

   Note 2: If the upgrade consists of a new application or enhancement, the administrator must enter a new keycode on the maintenance terminal to enable the upgrade.
5. Perform a cold reboot to activate the new feature(s).

Increasing voice storage

You can increase voice storage capacity to the maximum amount available on commercially available PCMCIA memory cards (up to 5 hours).

To expand the announcement storage capacity, insert a blank PCMCIA Flash card into the A: slot on the faceplate. The MIRAN software checks the Flash card for formatting information. If none exists, the MIRAN will proceed to format the card in DOS format. When completed, the full capacity of the card will be available for storage. To expand voice storage, use the on-board drive B:.

Upgrade MIRAN NTAG36AA card to MIRAN Release 2.0 software

Note: Ensure that you have the new MIRAN Release 2.0 on hand before you begin. Also, you might want to backup the entire MIRAN configuration to a spare PCMCIA card before you begin the upgrade procedure.

To upgrade an existing MIRAN NTAG36AA card to MIRAN Release 2.0 software, do the following:

1 Backup all announcement files you want to keep to a PCMCIA card.

2 Disable the MIRAN NTAG36AA card in Overlay 32.

3 Remove any faceplate connections.

4 Remove the MIRAN NTAG36AA card from its slot.

5 Insert MIRAN Release 2.0 PCMCIA card in drive B:.

6 Re-install the MIRAN NTAG36AA card in its slot.

7 Restore faceplate connections, if any.

8 Log into the MIRAN card from the TTY and access the Software Upgrade menu. Select the 'Browse' option and select the B: drive. Select the file that has the extension '.MMS' and activate the upgrade.

9 When the upgrade is complete, reboot the pack. When the reboot is complete, the new '*MIRANII*' login screen appears.

10 Log into the MIRAN Release 2.0 text-based user interface (username = **admin** and password = **admin000**).

11 At the Main menu, enter **-2-** to access the Pack Administration menu. At the Pack Administration menu, enter **-2-** to access the Keycode Entry screen.

12 Input the new keycode. Wait for the keycode validation screen and ensure that the configuration is correct before you continue.

13 Insert the PCMCIA card from step 1 into drive A: and upload the announcement files.

14 You can now define users (if desired), calendar assignments, and descriptors.

Replace MIRAN NTAG36AA card with MIRAN Release 2.0 card and software

To replace a MIRAN NTAG36AA card that has an existing configuration with the MIRAN Release 2.0 card and software, do the following:

1 Backup all announcement files you want to keep to a PCMCIA card.

2 Disable the MIRAN NTAG36AA card in Overlay 32.

3 Remove any faceplate connections.

4 Remove the MIRAN NTAG36AA card from its slot.

5 Remove the security device and insert it onto the NTAG36AC MIRAN Release 2.0 card.

6 Install the MIRAN Release 2.0 card.

7 Restore the faceplate connections.

8 Log into the MIRAN Release 2.0 text-based user interface (username = **admin** and password = **admin000**).

9 At the Main menu, enter **-2-** to access the Pack Administration menu. At the Pack Administration menu, enter **-2-** to access the Keycode Entry screen.

10 Input the new keycode. Wait for the keycode validation screen and ensure that the configuration is correct before you continue.

11 Insert the PCMCIA card from step 1 into drive A: and upload the announcement files.

12 You can now define users (if desired), calendar assignments, and descriptors.

13 Set up ethernet connections, if desired.

Recording announcements remotely for use on the MIRAN card

MIRAN Release 2.0 functionality enables a customer to record announcements on a remote PC, and then ftp them to MIRAN Release 2.0 cards that reside in different locations. Through the MIRAN Release 2.0 BUI, the customer can then also assign the announcements on the various MIRAN cards from the same remote PC.

For recording announcement files on a PC, Nortel Networks recommends the shareware, Goldwave. To record an announcement on a PC using Goldwave:

1 At the Goldwave window, go to the "Options" menu on the tool bar and select "File types". In the filename extension, insert "**snd**"; set "Rate (Hz) to "**8000**"; set "Format:" to "**PCM**"; and set "Attributes:" to "**8-bit, mono, unsigned**". Click the OS Associate box and close the window.

2 Click the new icon on the tool bar. Select "voice" under quick settings, select "mono" under channels, and select the length of the announcement you desire. Close the window.

3 Go to tools on the tool bar and select "Device controls". Press the red button to begin recording. Press the red button again to finish the recording.

Note: Use the "Help" menu to select your recording device.

4 Go to "Effects" on the tool bar and select "Resample". Change "Rate (Hz)" to "**8000**". Select "OK".

5 Go to "File" on the tool bar and select "Save as". Input the desired filename; select the file type, either "*.snd" or "*.raw"; and select "µ-law, mono" in the "File Attributes:". Select "Save".

6 Go to Windows Explorer, locate the file, and rename the file extension to ".ulw" (or ".alw" if appropriate).

7 You can now transfer the recording to a PCMCIA card or ftp it to a MIRAN's C: drive. Once the recording is on the MIRAN's C: drive, you can assign it to any available MIRAN channel.

Note: Remember to ftp announcement files as type "Binary".

As an alternative for step 5, you can save the file as type “*.wav” instead of “*.snd” or “*.raw”. Then you skip step 6 and transfer the .wav file to the MIRAN’s C: drive as step 7 describes. However, once the .wav file is on the C: drive, you must convert it to µ-law or a-law format (see “The Convert Announcement File screen” on page 153) before you can assign the announcement to a MIRAN channel.

To replace old announcement files with new files on the PCMCIA:

1 Display existing (old) files by accessing the File Explorer screen from the File Commands menu. (See “The File Commands menu” on page 160.)

2 Delete the files you wish to replace with new files on the PCMCIA card. (See “The Delete File screen” on page 163.)

3 Copy new files from PCMCIA card into the drive where your other announcement files are located. (See “The Copy File screen” on page 162.)

4 Convert files from .WAV to .ULW or .ALW or vice versa, if required. (See “The Convert Announcement File screen” on page 153.)

5 Professionally recorded prompts must be in .WAV, .ALW, or .ULW format. (See “The Record Announcement from External Channel screen” on page 151. See also “Sound recording configuration” on page 261.)

RAN Application: Text-based user interface

This chapter describes the text-based user interface for the MIRAN Release 2.0 (NTAG36AC) card. The text-based user interface provides menus and commands so you can perform all of the necessary MIRAN OA&M functions. The software for this interface is part of the MIRAN-specific OA&M tool running under VxWorks; it is independent of Meridian 1 software.

There are two ways to use the text-based user interface to access all commands and options:

— Use the menu system

— Enter commands on the command line

To use the MIRAN text-based user interface, you must connect a VT-100 type terminal to the MIRAN card. The MIRAN Release 2.0 card supports a serial connection between the terminal and the card. The MIRAN Release 2.0 card also supports telnet access to the text-based user interface over a LAN. Refer to “Connecting a VT100-type terminal to the MIRAN” on page 96 for instructions on how to make a serial connection from the MIRAN card to the VT-100 type terminal. Refer to “Ethernet access installation and setup” on page 106 for instructions on how to connect the MIRAN card to the E-LAN.

The MIRAN Release 2.0 card also supports a browser user interface (BUI). This BUI provides a web-based version of the MIRAN menu system, which the user can access through a standard web browser. This BUI also supports file transfers and online viewing of customer documentation. For more information on the BUI, see “RAN Application: The Browser User Interface (BUI)” on page 229.

General procedure for configuring MIRAN

The following procedure provides a general sequence of steps in configuring MIRAN functions and then using the text-based user interface to configure system RAN and MOH applications:

1 Configure the RAN and MOH trunk route and trunk data block, as "X11 system configuration" on page 70 describes. Complete this step during installation and configuration.

2 Configure the DID trunk for the telephone user interface (TUI) access, if necessary. Refer to "Configuring the DID route for the TUI" on page 79 and "Configuring the MIRAN trunks" on page 80. Complete this step during installation and configuration.

3 Setup the terminal for the text-based user interface access, which "Connecting a VT100-type terminal to the MIRAN" on page 96 describes. Complete this step during installation and configuration.

4 Login to the MIRAN Release 2.0 text-based user interface as either a user or an administrator. You must enter both a user name and a password. The default user login is *User Name:* **user** and *Password:* **user0000**. The default administrator login is *User Name:* **admin** and *Password:* **admin000**. The default distributor login is *User Name:* **distrib** and *Password:* **distrib0**. Refer to "The Login screen" on page 130 for more detail.

5 Enter the keycode, if necessary. Refer to "The Keycode Entry screen" on page 166.

Note: When you order MIRAN as part of a new Meridian 1 (Options 51C through 81C), the factory pre-loads the keycode into the MIRAN. Option 11E/11C and stand-alone orders of the MIRAN require that you enter the keycode.

6 Perform a cold reboot of the MIRAN card and login again. Refer to "Maintenance and Diagnostics" on page 181 for instructions on performing a cold reboot.

7 Record announcements. From the Main Menu, select the MIRAN Administration menu, then the Announcement Configuration menu, then the Record Announcement screen. Refer to "The Record Announcement from External Channel screen" on page 151. From this screen, you can record announcements through port A0 on the faceplate or the MDF.

8 Assign announcements. From the Record Announcement screen, return to the Announcement Configuration menu and select Calendar Operations. From the Calendar Operations menu, you can create assignments, with or without descriptors. You can repeat this step for other files and channels. Refer to “The Calendar Operations menu” on page 136.

9 Back up the original configuration onto drive C:, or a PCMCIA card in drive A: if available.

10 Copy new files (if first installing or upgrading software) from drive A: to drive C:. Remove the PCMCIA from drive A: and store in a safe place for future use. This enables you to restore the configuration into the MIRAN without having to re-configure the system and re-record announcements.

Configuring the VT-100 type terminal

Each MIRAN card has a port A and a port B, which enable direct connection through the MDF to a VT-100 terminal or to a PC running a terminal emulation program.You can use ports A and B at the MDF to inter-connect up to 16 MIRAN cards in a V-LAN configuration. This V-LAN serial connection enables maintenance of all MIRAN cards from a single terminal. The system numbers each card in hexadecimal, starting with 0 for the first card in the serial connection. Connect the terminal to card 0.

Note: Alternatively, you connect each MIRAN card through an Ethernet adapter to the E-LAN. This alternative enables maintenance of all MIRAN cards from any PC that has web or telnet access.

To run the text-based user interface, configure the VT-100 terminal emulation parameters as shown below in Table 7.

Table 7
VT-100 terminal configuration parameters

Parameter	Setting
Transmission rate	9600 baud
Data bits; stop bit	8
Stop bit	1
Parity	No
Flow control	None

Note: If you use Windows™ based terminal emulation, you must disable the CTRL and ARROWS keys. The text-based user interface uses these keys to traverse the menus.

The Login screen

Figure 20 shows the MIRAN Release 2.0 Login screen. This screen appears when you connect the terminal to the MIRAN card and press the Enter key. The screen displays **[VLAN ID n]**, where **n** is the MIRAN card number (in hexadecimal) that you are currently accessing. The maintenance terminal is always connected to the first MIRAN in the V-LAN and is numbered 00 automatically. Select the V-LAN button in the lower-left corner to go to the previous MIRAN card. Select the V-LAN button in the lower-right corner to go to the next MIRAN card.

To log in to the selected MIRAN card, do the following:

1 Enter your user name.

2 Enter your password.

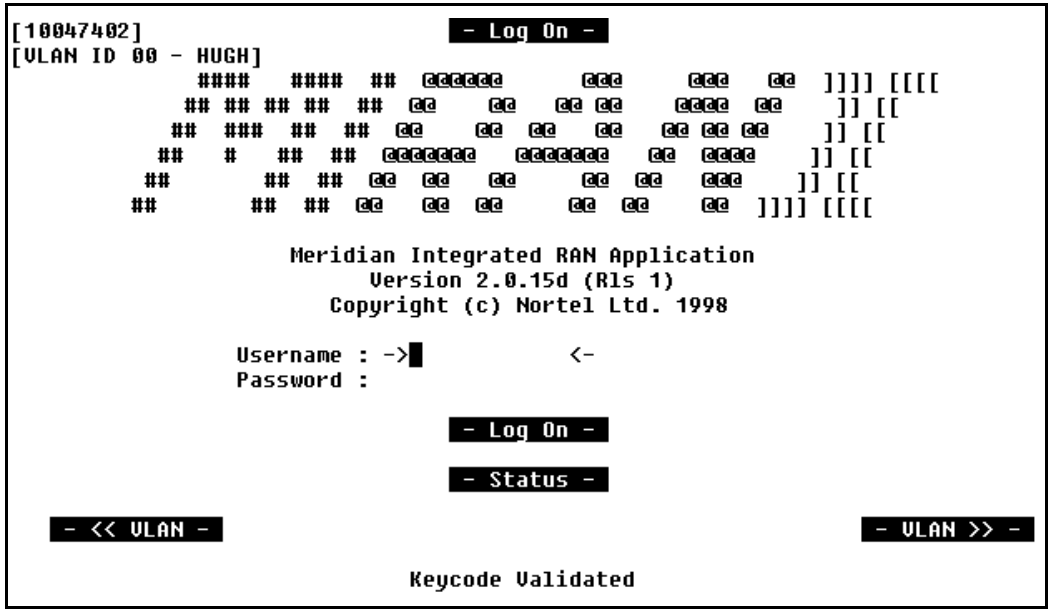
3 Select the Login button.

The defaults for user login are:

— **User Name:** user

— **Password:** user0000

Figure 20
The Login screen



The defaults for administrator login are:

— **User Name:** admin

— **Password:** admin000

The defaults for distributor login are:

— **User Name:** distrib

— **Password:** distrib0

Note: If you receive an ‘Access denied’ response, press the ‘Shift’ key and tilde (~) to refresh the screen. Then attempt to log in again. If you receive an ‘Access denied’ response for a third time, the MIRAN card locks you out for 20 minutes.

Note: All passwords must be at least eight characters in length (up to 12) for MIRAN Release 2.0. It is possible to change the passwords at each user level.

Note: You can restore all default users and passwords by deleting the C:_USERS.DAT file.

The Status screen

You can select the Status button, without logging in, to view the status of the current card. Figure 21 shows the Status screen, which displays the following:

— the current status of the RAN Application version and release

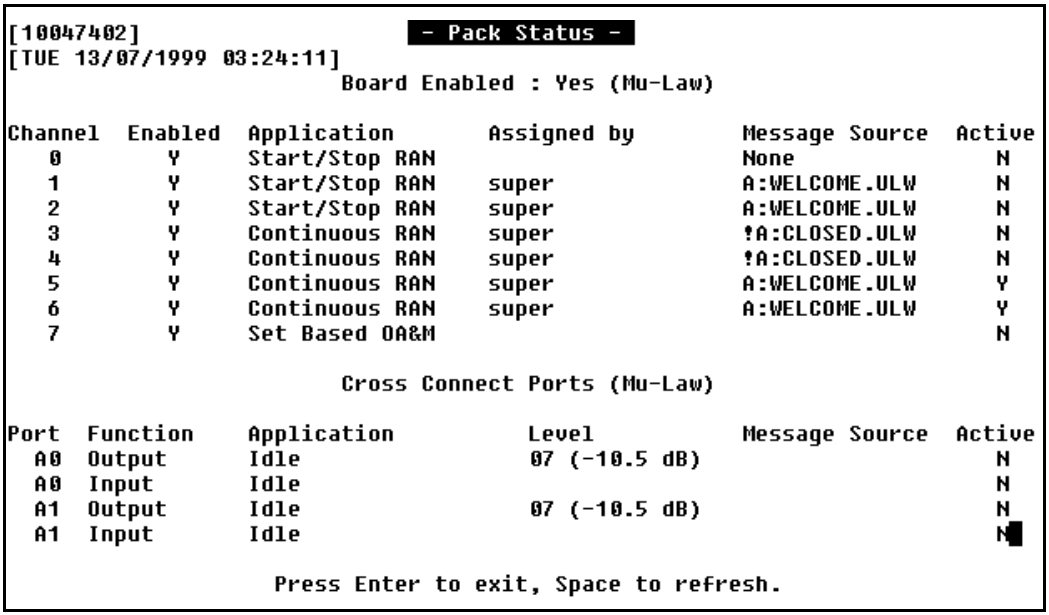
— the board status

— the current time

— the status of the eight one-to-one channels and two cross-connect channels

To display up-to-date channels status, refresh the screen by pressing the spacebar. To exit the Status screen and return to the Login screen, press the Enter key.

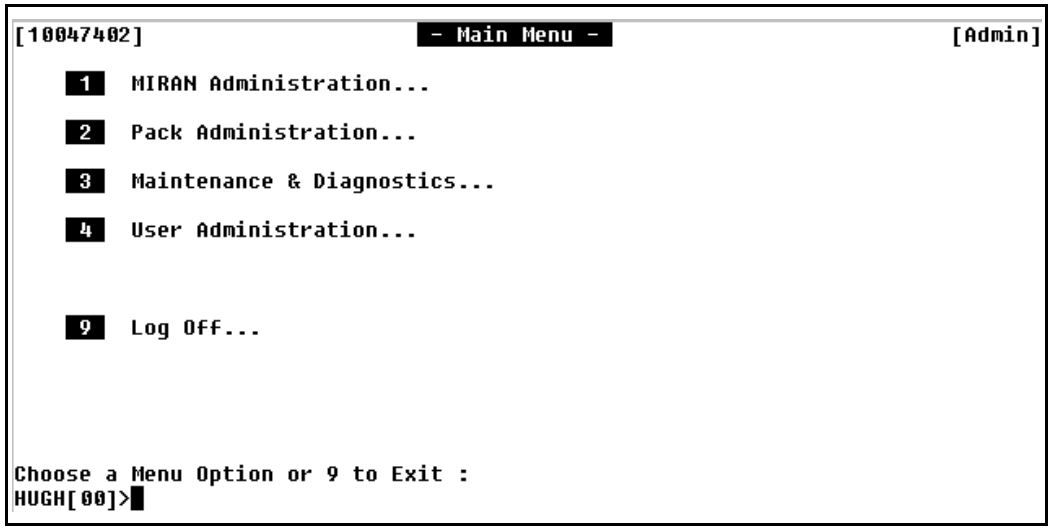
Figure 21
The Status screen



The Main menu

A successful login brings you to the Main menu, which Figure 22 shows.

Figure 22
The Main menu



The Main menu provides five options:

— **MIRAN Administration** - accesses all RAN-specific tasks and menus (e.g., announcement recording and configuration, operational statistics, backup and restore configuration, playback level setting, and batch file running). Refer to “The MIRAN Administration menu” on page 134.

— **Pack Administration** - accesses all MIRAN-specific tasks and menus (e.g. file commands, keycode entry, software upgrade, system information, configuration variables, and ethernet configuration). Refer to “The Pack Administration menu” on page 159.

— **Maintenance and Diagnostics** - provides access to system information, password change, command line access, diagnostics, warm reboot, and cold reboot. The distributor can access all functions, and user can access only system information and password change. Refer to “Maintenance and Diagnostics” on page 181.

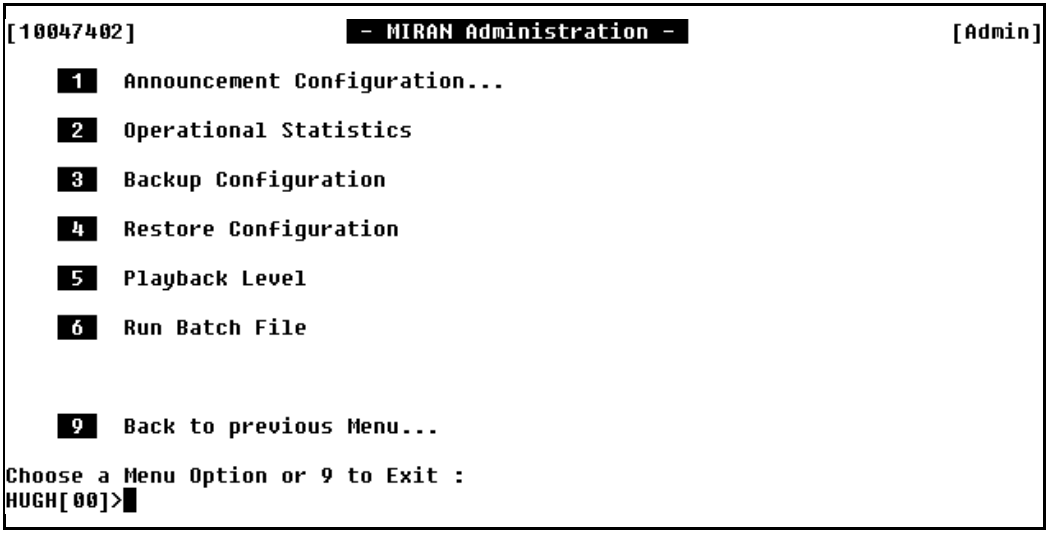
— **User Administration** - provides access to adding, editing, viewing, and deleting users. Refer to “The User Administration menu” on page 182.

— **Logoff** - logs you out of the Main Menu and returns you to the Login screen.

The MIRAN Administration menu

At the Main menu, select **-1-** to access the MIRAN Administration menu, which Figure 23 shows.

Figure 23
The MIRAN Administration menu



At the MIRAN Administration menu, you have seven options:

— **Announcement Configuration...** - displays the Announcement Configuration menu that enables you to create calendar and descriptor announcements, record and play announcements, and convert announcement files. Refer to “The Announcement Configuration menu” on page 135.

— **Operational Statistics** - displays RAN channel usage statistics. Refer to “The Operational Statistics screen” on page 154.

— **Backup Configuration** - saves configuration to a PCMCIA disk. Refer to “The Backup Configuration screen” on page 156. You can also set backups to occur automatically by setting the appropriate configuration variables.

— **Restore Configuration** - restores the configuration from a PCMCIA disk to the MIRAN. Refer to “The Restore Configuration screen” on page 156.

— **Playback Level** - sets the sound volume (loudness) for the external analog channels. Refer to “The Playback Level screen” on page 157.

— **Run Batch File** - executes a batch file containing OA&M commands. It enables multiple channel assignments with a single command in case of emergency. Refer to “The Run Batch File screen” on page 158.

— **Back to previous Menu...** - returns you to the Main menu.

The Announcement Configuration menu

From the MIRAN Administration menu, select **-1-** to access the Announcement Configuration menu, which Figure 24 shows.

Figure 24
The Announcement Configuration menu

```
[10047402]          - Announcement Configuration -          [Admin]

    1  Calendar Operations...

    2  Descriptor Operations...

    3  Record Announcement from External Channel

    4  Play Announcement to External Channel

    5  Convert Announcement File


    9  Back to previous Menu...


Choose a Menu Option or 9 to Exit :
HUGH[00]>
```

At the Announcement Configuration menu, you have six options:

— **Calendar Operations** - enables you to create calendar assignments with or without descriptors, view calendar assignments, and remove calendar assignments. Refer to “The Calendar Operations menu” on page 136.

— **Descriptor Operations** - enables you to add, edit, view, and delete calendar descriptors. Refer to “The Descriptor Operations menu” on page 144.

Note: Before you begin work with Calendar Operations and Descriptor Operations, it is recommended that you read the section, “Calendar assignment feature” on page 25.

— **Record Announcement from External Channel** - enables you to record an announcement and determine its filename and duration. Refer to “The Record Announcement from External Channel screen” on page 151.

— **Play Announcement to External Channel** - enables you to play a selected announcement. Refer to “The Play Announcement to External Channel screen” on page 152.

— **Convert Message File** - enables you to convert an announcement from .WAV format to .ALW or .ULW format (or vice versa). You can also change the filename of the announcement. Refer to “The Convert Announcement File screen” on page 153.

— **Back to previous Menu...** - returns you to the MIRAN Administration menu.

The Calendar Operations menu

At the Announcement Configuration menu, select **-1-** to access the Calendar Operations menu, which Figure 25 shows.

The Calendar Assignment with Descriptor screen Select **-1-** at the Calendar Operations menu to access the Calendar Assignment with Descriptor screen, which Figure 26 shows. Here you can assign an announcement to selected channels and associate with a defined descriptor. Refer to “The Descriptor Operations menu” on page 144 for instructions on how to create a descriptor.

Figure 25
The Calendar Operations menu

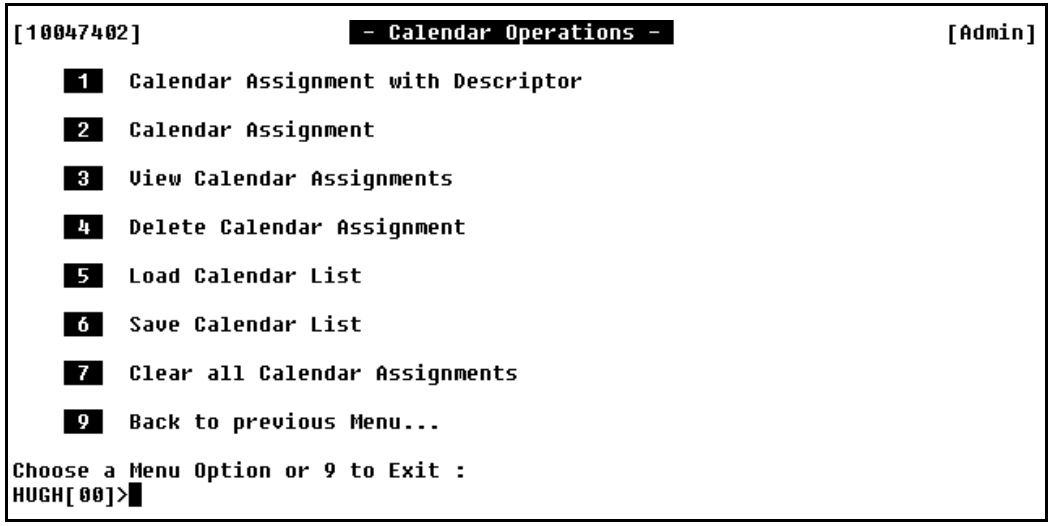
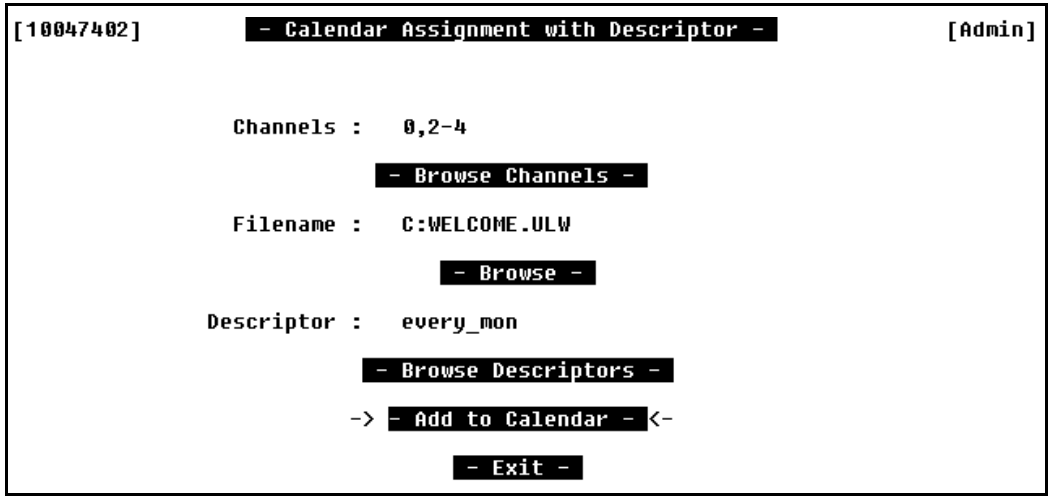


Figure 26
The Calendar Assignment with Descriptor screen

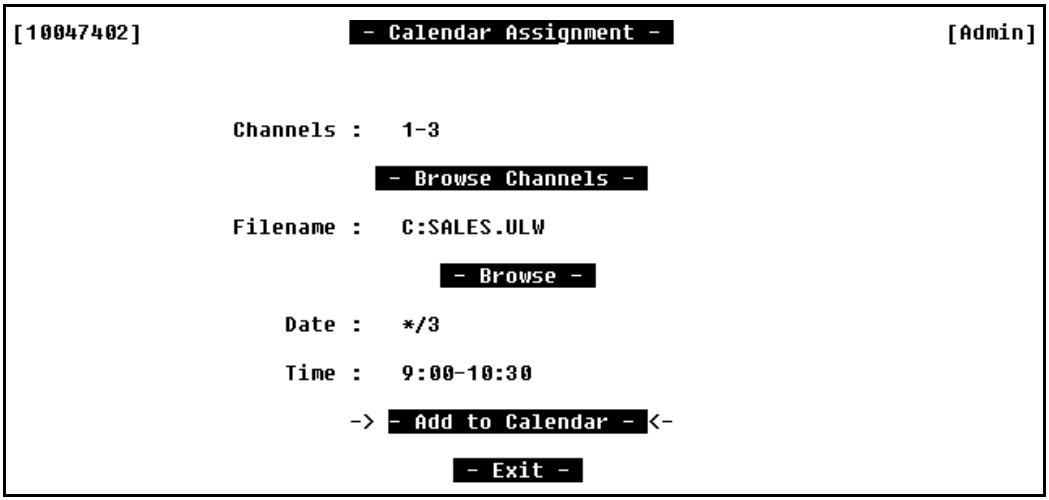


To create a calendar assignment with a descriptor, do the following:

1. Enter the channel(s) you want to assign the announcement to. You can select **Browse** to scan and select from the list of available channels. (Use 's' to toggle the selection of channels.)
2. Enter the filename of the announcement that you are creating the assignment for. You can select **Browse** to scan the list of available announcement files.
3. Enter the name of the descriptor you want to associate with the assignment. You can select **Browse Descriptors** to scan the list of available descriptors.
4. Select **Add to Calendar** to add the assignment with descriptor to the calendar. This updates the calendar immediately.
5. Select **Exit** to return to the Calendar Operations menu.

The Calendar Assignment screen Select **-2-** at the Calendar Operations menu to access the Calendar Assignment screen, which Figure 27 shows. Here you can assign an announcement to selected channels and define directly (as opposed to using a descriptor) when the announcement plays on those channels.

Figure 27
The Calendar Assignment screen

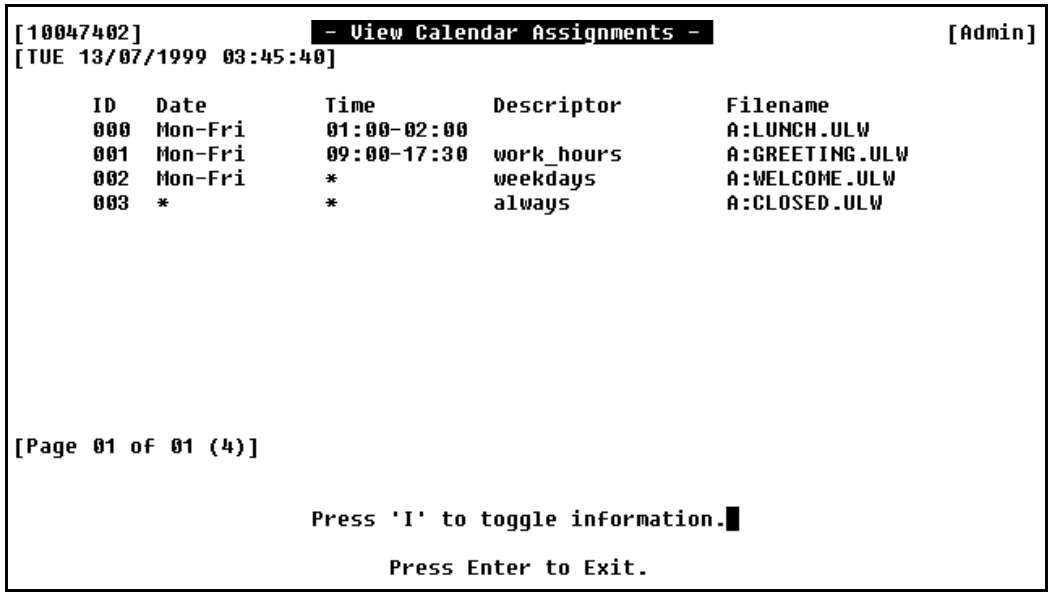


To create a calendar assignment (without descriptor), do the following:

1. Enter the channel(s) you want to assign the announcement to. You can select **Browse** to scan and select from the list of available channels. (Use 's' to toggle the selection of channels.)
2. Enter the filename of the announcement that you are creating the assignment for. You can select **Browse** to scan the list of available announcement files.
3. Enter the time of day you want the announcement to play.
4. Enter the date, dates, or days you want the announcement to play.
5. Select **Add to Calendar** to add the assignment to the calendar. This updates the calendar immediately.
6. Select **Exit** to return to the Calendar Operations menu.

The View Calendar Assignments screen Select **-3-** at the Calendar Operations menu to access the View Calendar Assignments screen, which Figure 28 shows.

Figure 28
The View Calendar Assignments screen



> ***Note:*** The View Calendar Assignments screen shows TUI assignments by setting "TUI" in the date column and the channel assignments in the time column.

The View Calendar Assignments screen lists all Calendar Assignments in order of specificity. The most specific assignments (i.e., those with the most specific time and date) come first. The current day, date, and time appear in the upper-left corner of the screen. The filename for any assignments that match the current date and time appear in bold type.

The right column lists the name of the user who created the assignment. Only the administrator or the user who created an assignment can remove the assignment.

In the example screen that appears in Figure 28, notice that the assignment using the descriptor "every_friday" has a time and date of "?". This indicates that the descriptor "every_friday" has been deleted and the system could not be retrieve the time and date information. The system ignores this assignment until someone re-defines "every_friday".

While in the View Calendar Assignments screen, you can do the following:

— Press **I** to toggle the display for more information. The descriptor column lists the descriptor for each assignment that has one. The channel column lists the channels for each assignment.

— Press **Space bar** to list any more assignments that do not appear on the screen.

— Press **Enter** to exit this screen and return to the Calendar Operations menu.

The Delete Calendar Assignment screen Select **-4-** at the Calendar Operations menu to access the Delete Calendar Assignment screen, which Figure 29 shows.

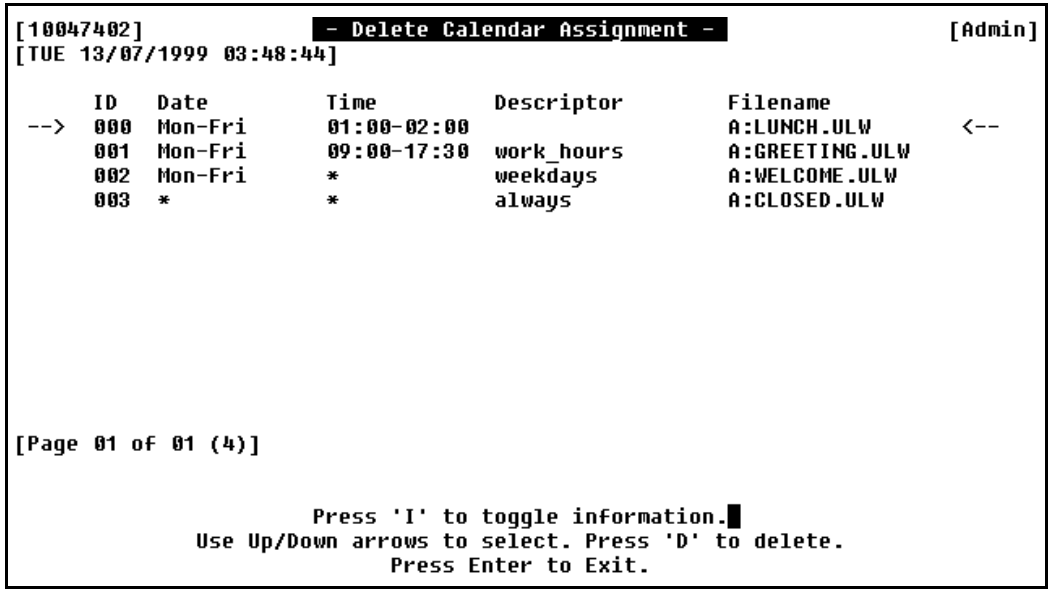
To delete a calendar assignment, do the following:

1 Use the up/down arrows to select the assignment you want to delete.

2 Press **D** to delete the selected assignment.

3 Press **Enter** to exit and return to the Calendar Operations menu.

Figure 29
The Delete Calendar Assignment screen

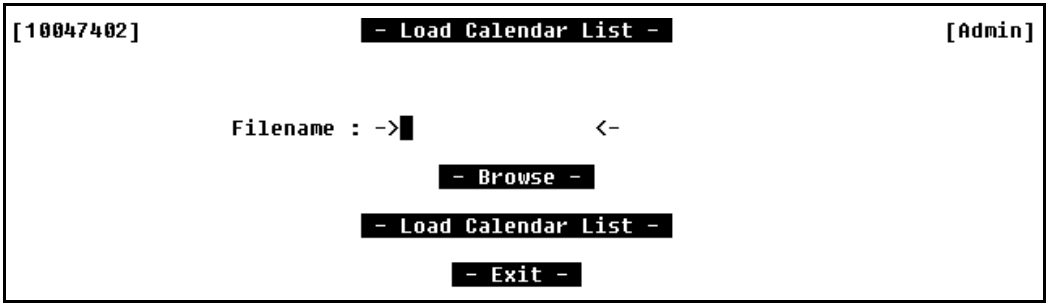


While in the Delete Calendar Assignment screen, you can press the **Space bar** to view more assignments.

The Load Calendar List screen Select **-5-** at the Calendar Operations menu to access the Load Calendar List screen, which Figure 30 shows. A calendar list is a file that contains a collection of calendar assignments, e.g., A:_ASSIGNS.CAL. Use this screen to load a calendar list from any available drive. This screen is valuable as a quick way to activate a calendar configuration (e.g., an emergency configuration) that you had previously saved.

Note: This function only adds assignments to the calendar list. It does not clear (overwrite) existing assignments.

Figure 30
The Load Calendar List screen

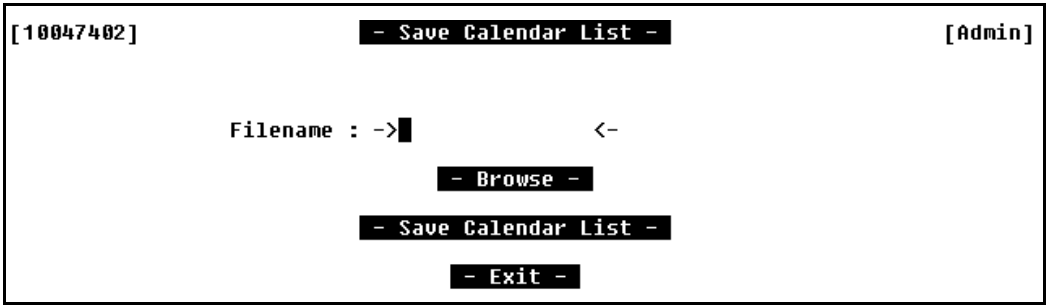


To load a calendar list, do the following:

1. Enter the filename of the calendar list you want to load. You can select **Browse** to scan the list of available calendar lists.
2. Select **Load Calendar List** to load the selected calendar list. You will receive a verification message.
3. Select **Exit** to return to the Calendar Operations menu.

The Save Calendar List screen Select **-6-** at the Calendar Operations menu to access the Save Calendar List screen, which Figure 31 shows. Use this screen to save the current set of calendar assignments in a single file location on any of the available drives. You can transfer the resulting file to another MIRAN card or maintain it for future use.

Figure 31
The Save Calendar List screen



To save a calendar list, do the following:

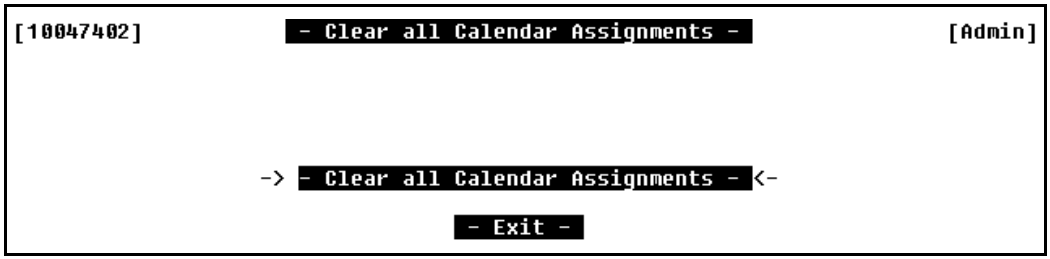
1 Enter the filename of the calendar list you want to save. You can select **Browse** to scan the list of current calendar lists.

2 Select **Save Calendar List** to save the selected calendar list. You will receive a verification message.

3 Select **Exit** to return to the Calendar Operations menu.

The Clear All Calendar Assignments screen Select **-7-** at the Calendar Operations menu to access the Clear All Calendar Assignments screen, which Figure 32 shows. Use this screen to clear all of the current calendar assignments. This screen is useful when you reconfigure a MIRAN for a new customer or when significant changes to the calendar assignments are necessary.

Figure 32
The Clear All Calendar Assignments screen



The ‘Clear all Calendar Assignments’ command clears the current calendar list. If the configuration variable ‘AutoSave’ is TRUE (the default), this command also overwrites the existing calendar file, _ASSIGNS.CAL.

CAUTION
The ‘Clear all Calendar Assignments’ command causes all active announcements to stop playing.

To clear all calendar assignments, do the following:

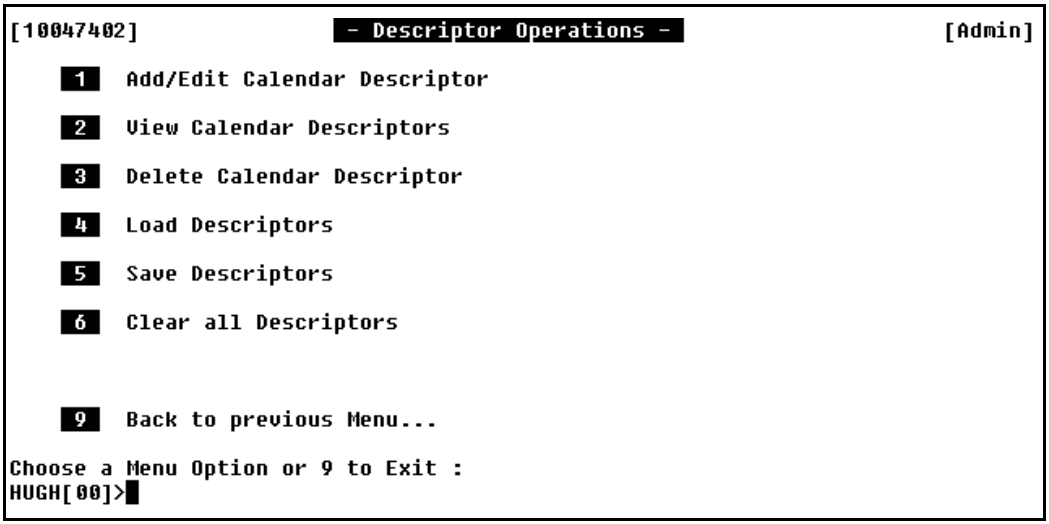
1 Select **Clear all Calendar Assignments** to clear all calendar assignments. You will receive a verification message.

2 Select **Exit** to return to the Calendar Operations menu.

The Descriptor Operations menu

At the Announcement Configuration menu, select **-2-** to access the Descriptor Operations menu, which Figure 33 shows.

Figure 33
The Descriptor Operations menu



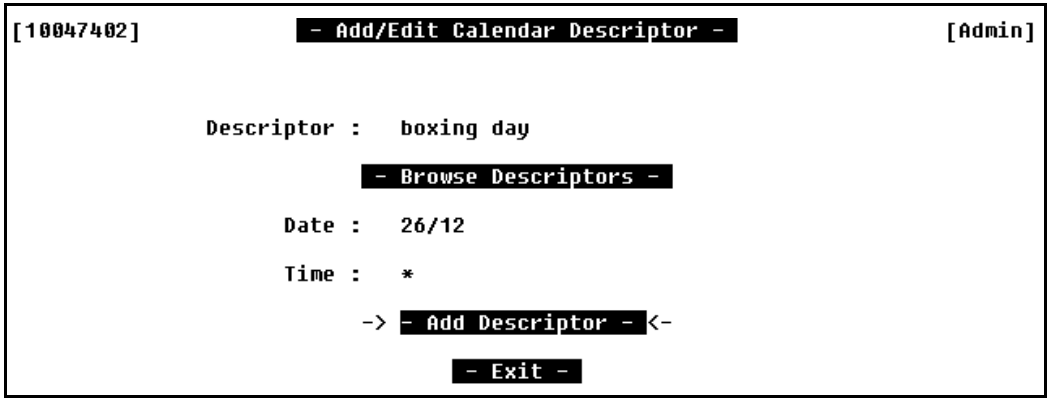
The Add/Edit Calendar Descriptor screen Select **-1-** at the Descriptor Operations menu to access the Add/Edit Calendar Descriptor screen, which Figure 34 shows. Here you can create or edit a calendar descriptor. A calendar descriptor has a time and date associated with it. The time and date definitions determine when an announcement that has a particular descriptor assignment plays. For example, an announcement that uses the descriptor 'opening_hours' from Figure 34 plays from 9:00 a.m. to 5:30 p.m., Monday through Friday.

To add or edit a calendar descriptor, do the following:

1 Enter the name of the descriptor you want to create or edit, up to 16 characters in length. If you want to edit an descriptor, you can select one from the list of existing descriptors by selecting **Browse Descriptors**.

2 Enter the date, dates, or days of the week during which the descriptor must operate.

Figure 34
The Add/Edit Calendar Descriptor screen



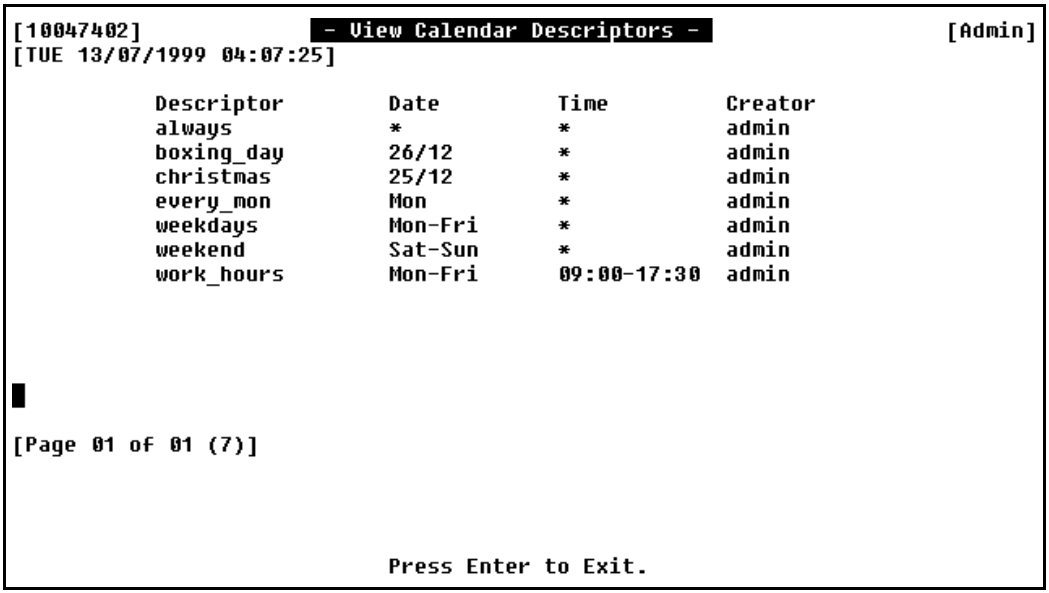
3 Enter the time during which the descriptor must operate.

4 Select **Add Descriptor** to add the descriptor. This immediately affects any assignments that contain this descriptor.

5 Select **Exit** to return to the Descriptor Operations menu.

The View Calendar Descriptors screen Select **-2-** at the Descriptor Operations menu to access the View Calendar Descriptors screen, which Figure 35 shows. The right-hand column of the screen lists the creator of each descriptor. Only the administrator or the user who created a descriptor can delete the descriptor.

Figure 35
The View Calendar Descriptors screen



At the View Calendar Descriptors screen, you can do the following:

— Press the **Space bar** to view more descriptors that don't appear on the initial screen.

— Press **Enter** to exit and return to the Descriptor Operations menu.

The Delete Calendar Descriptor screen Select **-3-** at the Descriptor Operations menu to access the Delete Calendar Descriptor screen, which Figure 36 shows. The right-hand column of the screen lists the creator of each descriptor. Only the administrator or the user who created a descriptor can delete the descriptor.

Figure 36
The Delete Calendar Descriptor screen

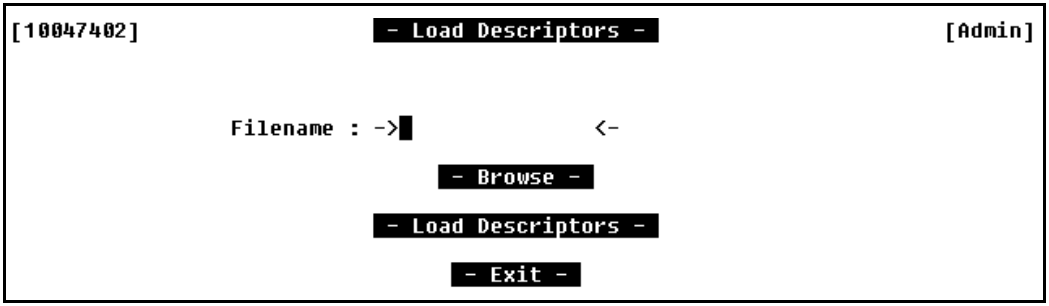
```
[10047402]              - Delete Calendar Descriptor -                [Admin]
[TUE 13/07/1999 04:09:29]

           Descriptor        Date          Time          Creator
           always            *             *             admin
      -->  boxing_day        26/12         *             admin          <--
           christmas         25/12         *             admin
           every_mon         Mon           *             admin
           weekdays          Mon-Fri       *             admin
           weekend           Sat-Sun       *             admin
           work_hours        Mon-Fri       09:00-17:30   admin

[Page 01 of 01 (7)]

            Use Up/Down arrows to select. Press 'D' to delete.
                          Press Enter to Exit.
```

To delete a calendar descriptor, do the following:

1. Use the up/down arrows to select the descriptor you want to delete. You can press the **Space bar** to see more descriptors if there are any.
2. Press **D** to delete the selected descriptor. This immediately affects any assignments that contain this descriptor. Any assignments that use this descriptor immediately become inactive.
3. Press **Enter** to exit and return to the Descriptor Operations menu.

The Load Descriptor List screen Select **-5-** at the Descriptor Operations menu to access the Load Descriptor List screen, which Figure 37 shows. A descriptor list is a file that contains a collection of descriptors, e.g., A:_DESCRIP.CAL. Use this screen to load a descriptor list from any available drive. This screen is valuable as a quick way to load the same descriptor configuration to several MIRAN cards.

Figure 37
The Load Descriptor List screen



Note: This function only adds descriptors to the descriptor list. It does not clear (overwrite) existing descriptors.

To load a descriptor list, do the following:

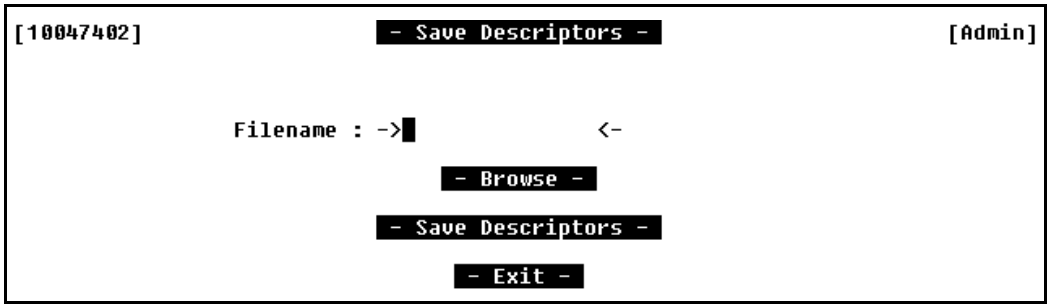
1 Enter the filename of the descriptor list you want to load. You can select **Browse** to scan the list of available descriptor lists.

2 Select **Load Descriptors** to load the selected descriptor list. You will receive a verification message.

3 Select **Exit** to return to the Descriptor Operations menu.

The Save Descriptor List screen Select **-6-** at the Descriptor Operations menu to access the Save Descriptor List screen, which Figure 38 shows. Use this screen to save the current set of descriptors in a single file location on any of the available drives. You can transfer the resulting file to another MIRAN card or maintain it for future use.

Figure 38
The Save Descriptor List screen



To save a descriptor list, do the following:

1. Enter the filename of the descriptor list you want to save. You can select **Browse** to scan the list of available descriptor lists.
2. Select **Save Descriptors** to save the selected descriptor list. You will receive a verification message.
3. Select **Exit** to return to the Descriptor Operations menu.

The Clear All Descriptors screen Select **-7-** at the Descriptor Operations menu to access the Clear All Descriptors screen, which Figure 39 shows. Use this screen to clear all of the current descriptor definitions. This screen is useful when you reconfigure a MIRAN for a new customer or when significant changes to the descriptor definitions are necessary.

Figure 39
The Clear All Descriptors screen

The 'Clear all Descriptors' command clears the current descriptors. If the configuration variable 'AutoSave' is TRUE (the default), this command also overwrites the existing descriptor file, _DESCRIP.CAL.

CAUTION

The 'Clear all Descriptors' command clears all active descriptors. This renders 'inactive' all current calendar assignment that use descriptors. You must define new descriptors or load a new descriptor list to re-activate these calendar assignments.

To clear all descriptors, do the following:

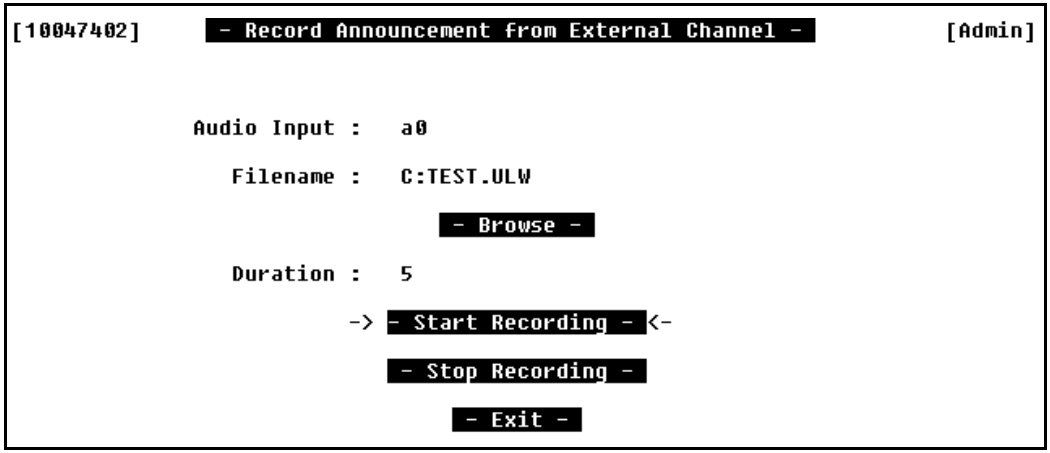
1 Select **Clear all Descriptors** to clear all descriptors. You will receive a verification message.

2 Select **Exit** to return to the Descriptor Operations menu.

The Record Announcement from External Channel screen

At the Announcement Configuration menu, select **-3-** to access the Record Announcement from External Channel screen, which Figure 40 shows. Here you can record an announcement to the MIRAN card.

Figure 40
The Record Announcement from External Channel screen



To record an announcement to the MIRAN card, do the following:

1 At the 'Audio Input' prompt, enter an external channel number, either A0 or A1, from which you want to record. You can only use the external analog channels to record announcements.

2 At the 'Filename' prompt, enter the filename the announcement will have. A proper filename consists of eight alphanumeric characters with the appropriate three-letter extension (.ULW or .ALW). Remember to indicate which drive you want the announcement file to reside on.

Note: You can select **Browse** to ensure that the filename you have chosen does not already exist.

3 At the 'Duration' prompt, enter the length of time, in seconds, the announcement can last.

4 Select **Start Recording** to start recording the announcement.

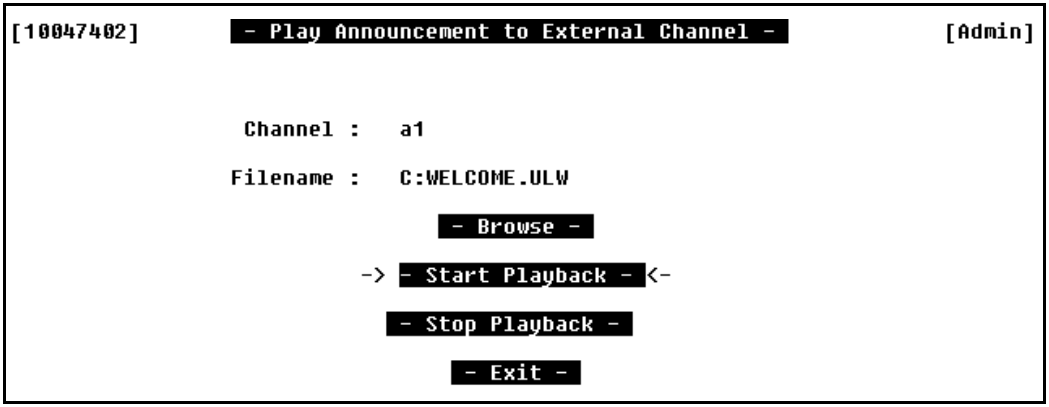
5 Select **Stop Recording** to stop recording. The MIRAN stops recording either when you reach the duration, or when you select **Stop Recording**, or when the file system is full.

6 Select **Exit** to return to the Announcement Configuration menu.

The Play Announcement to External Channel screen

At the Announcement Configuration menu, select **-4-** to access the Play Announcement to External Channel screen, which Figure 41 shows. To verify an announcement, set up a test route to play the announcement. Once you accept the announcement, you can assign it to a regular route.

Figure 41
The Play Announcement to External Channel screen



To play an announcement that resides on the MIRAN card, do the following:

1 At the 'Channel' prompt, enter A0 or A1 to specify the recording channel you want to use. You can only use the external analog channels to play announcements.

2 At the 'Filename' prompt, enter the filename of the announcement you want to play.

Note: You can select **Browse** to scan the list of existing filenames and select the one you want to play.

3 Select **Start Playback** to start playing the announcement.

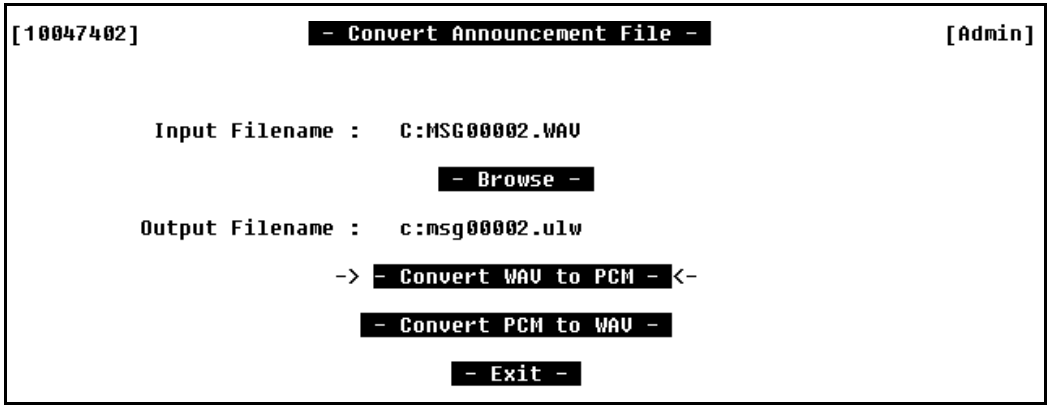
4 Select **Stop Playback** to stop playing the announcement. The MIRAN stops playing the announcement either when you reach the duration or the announcement or when you select **Stop Recording**.

5 Select **Exit** to return to the Announcement Configuration menu.

The Convert Announcement File screen

At the Announcement Configuration menu, select **-5-** to access the Convert Announcement File screen, which Figure 42 shows. Use this screen to convert an announcement file from .WAV format to .ULW or .ALW format, or vice versa.

Figure 42
The Convert Announcement File screen



To convert an announcement file, do the following:

1 At the 'Input Filename:' prompt, enter the filename you want to convert. You can select **Browse** to scan and select from the list of available files.

2 At the 'Output Filename:' prompt, enter the filename you want the converted file to have. If you don't enter the output filename, the file receives the same filename as the input filename with the appropriate new extension.

3 Select **Convert WAV to PCM** to convert the file from .WAV format to .ULW or .ALW format. Select **Convert PCM to WAV** to convert the file from .ULW or .ALW format to .WAV format.

Note: The conversion process makes a duplicate of the input file. Ensure sufficient disk space for the conversion process and delete unnecessary files.

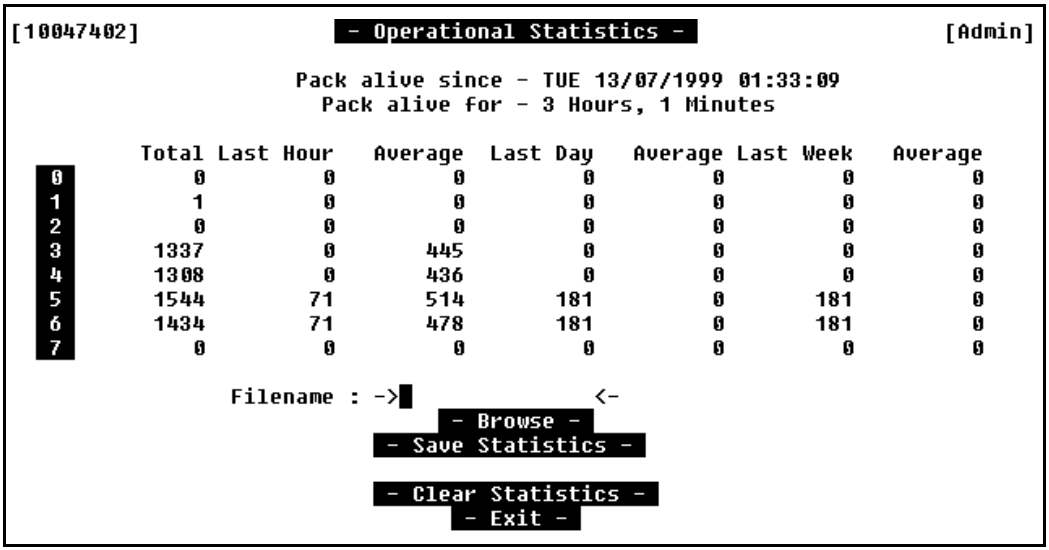
Note: Announcements must be in A-law (.ALW) or μ-law (.ULW) format, depending on your system's configuration, to play on MIRAN.

4 Select **Exit** to return to the Announcement Configuration menu.

The Operational Statistics screen

At the MIRAN Administration menu, select **-2-** to access the Operational Statistics screen, which Figure 43 shows. Use this screen to check the current traffic statistics of all the internal channels. The MIRAN card cannot display the statistics of the external channels, because it cannot monitor the traffic on these channels.

Figure 43
The Operational Statistics screen



Note: MIRAN Release 2.0 updates the operational statistics every minute.

Following is an explanation of each statistical column for each channel:

— **Total** - is the total number of calls received per channel since the last bootup of the MIRAN pack.

— **Last Hour** - is the number of calls received per channel in the last 60 minutes.

— **Last Hour Average** - is the average number of calls received per channel per hour since the last bootup of the MIRAN pack.

— **Last Day** - is the number of calls received per channel in the last 24 hours.

— **Last Day Average** - is the average number of calls received per channel per day since the last bootup of the MIRAN pack.

— **Last Week** - is the number of calls received per channel in the last seven days.

— **Last Week Average** - is the average number of calls received per channel per week since the last bootup of the MIRAN pack.

You can save the current operational statistics to a file by doing the following:

1 Enter the filename you want to save the statistics to. Remember to indicate the drive you want the file to reside on.

Note: You can select **Browse** to choose an existing statistics file to save the statistics to. Or you can ensure that you selected a filename that does not already exist.

2 Select **Save Statistics** to save the statistics to the filename. The MIRAN generates a text file with values separated by commas.

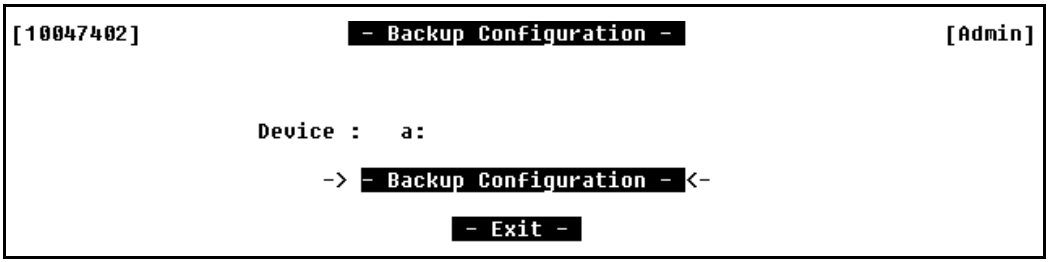
3 Select **Exit** to return to the MIRAN Administration menu.

Note: You can select **Clear Statistics** to reset all statistics on all channels.

The Backup Configuration screen

At the MIRAN Administration menu, select **-3-** to access the Backup Configuration screen, which Figure 44 shows. This screen enables you to back up the calendar, file descriptor, and configuration variable information. You can configure backups to occur automatically by setting the appropriate configuration variables (see “The Configuration Variables menu” on page 170).

Figure 44
The Backup Configuration screen



Note: MIRAN saves user information (user names, passwords, etc.) automatically to drive C: and are not part of this backup process.

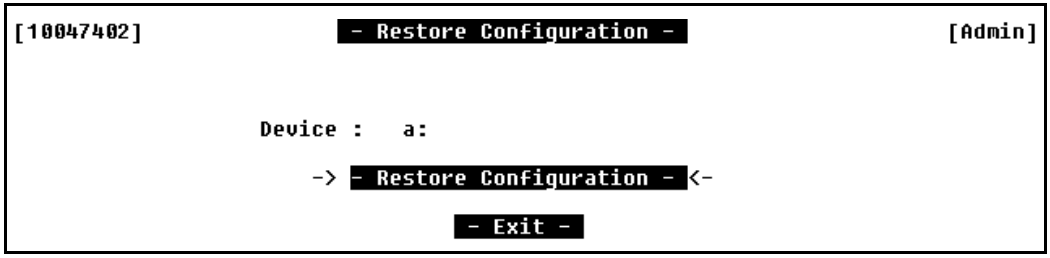
To back up the configuration, do the following:

1. Select the storage device where you will back up the configuration to. This is usually a PCMCIA Flash card in the external drive A:.
2. Select **Backup Configuration** to start the backup process to the specified storage device.
3. When the backup is complete, select **Exit** to return to the MIRAN Administration menu.

The Restore Configuration screen

At the MIRAN Administration menu, select **-4-** to access the Restore Configuration screen, which Figure 45 shows. This screen enables you to restore the calendar, file descriptor, and configuration variable information. The most common use of this screen is to copy the configuration of another MIRAN card in the system by way of a PCMCIA disk.

Figure 45
The Restore Configuration screen



To restore the MIRAN configuration from a backup device to the internal Flash memory of the selected MIRAN card, do the following:

1. Select the storage device where restore the configuration from. This is usually a PCMCIA Flash card in the external drive A:.
2. Select **Restore Configuration** to start the restore process from the specified storage device.
3. When the restoration is complete, select **Exit** to return to the MIRAN Administration menu.

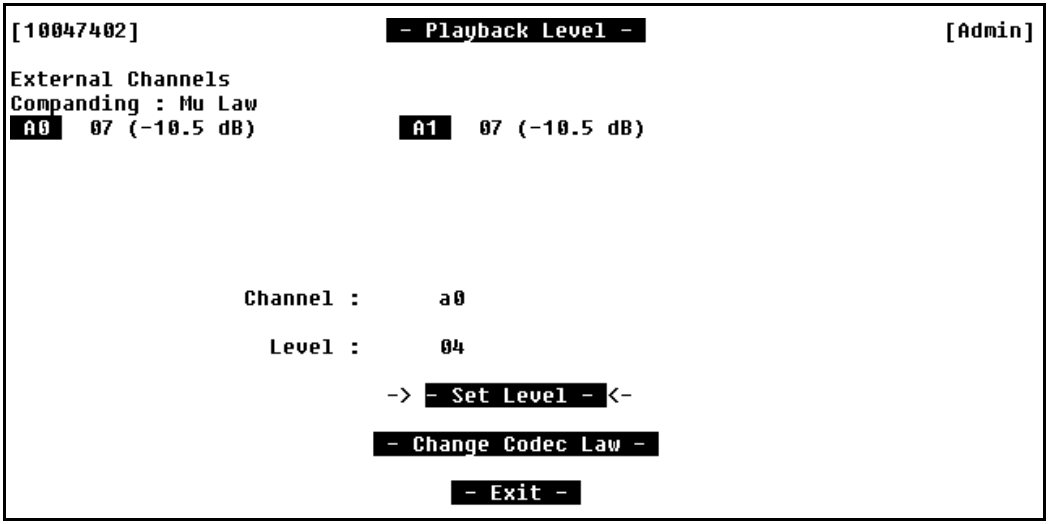
The Playback Level screen

At the MIRAN Administration menu, select **-5-** to access the Playback Level screen, which Figure 46 shows. This screen enables you to separately determine the playback level, or volume, for each external channel. You can also change the companding law for the external channels. The top of the screen displays the current companding law, either A-law or µ-law. It also displays the current playback level for each external channel.

To change the playback level for an external channel, do the following:

1. Enter the channel, A0 or A1, you want to change the playback level for.
2. At the 'Level:' prompt, enter the playback level you want the channel to have. The level can range from 0 to 63. The value represents the attenuation of the signal; so the value 0 provides the loudest playback, while the value 63 provides the softest playback.
3. Select **Set Level** to update the playback level of the selected channel.
4. Select **Exit** to return to the MIRAN Administration menu.

Figure 46
The Playback Level screen

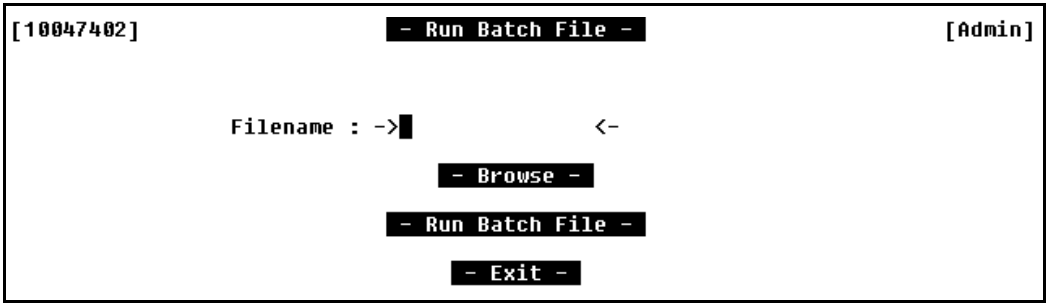


To change the companding law for the external channels, select **Change Codec Law** while at the Playback Level screen.

The Run Batch File screen

At the MIRAN Administration menu, select **-6-** to access the Run Batch File screen, which Figure 47 shows. This screens retrieves the standard file browser and asks you to select which batch file to run. The batch file runs immediately after you select it.

Figure 47
The Run Batch File screen



To run a batch file, do the following:

1 Select a batch file to run by using the up/down arrows on you keyboard.

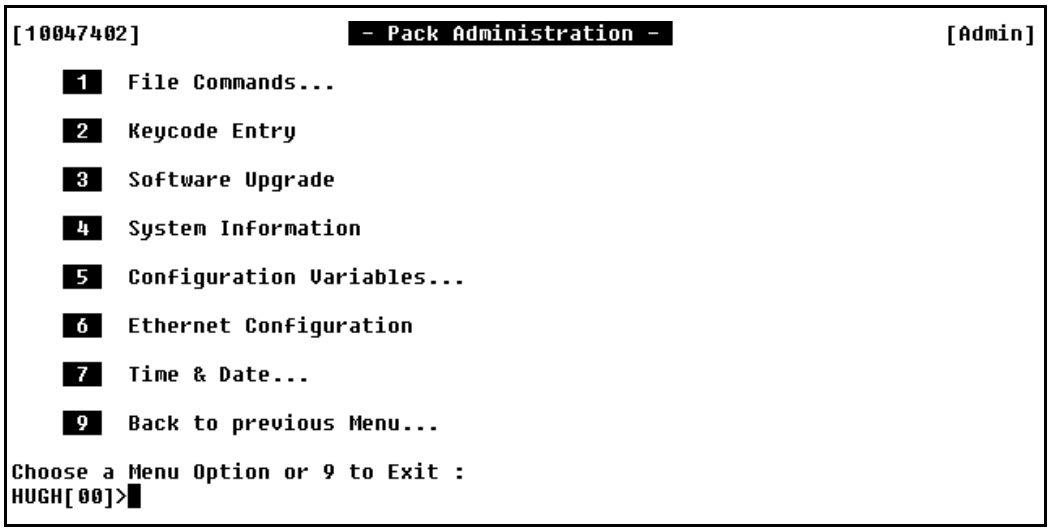
Note: You can press **Space** to list more batch files.

2 Press **Enter** to run the selected batch file. MIRAN will then return you to the MIRAN Administration menu.

The Pack Administration menu

At the Main menu, select **-2-** to access the Pack Administration menu, which Figure 48 shows.

Figure 48
The Pack Administration menu



At the Pack Administration menu, you have eight options:

— **File Commands...** - enables you to explore, copy, delete, rename, and move files. Refer to “The File Commands menu” on page 160.

— **Keycode Entry** - enables you to enter keycodes for new MIRAN packs, port size increases, and software upgrades. Refer to “The Keycode Entry screen” on page 166.

— **Software Upgrade** - enables software upgrades using a PCMCIA card. You need a keycode for software upgrades but not for bug fixes. Refer to "The Software Upgrade screen" on page 167.

— **System Information** - displays the MIRAN hardware platform configuration and software release information. Refer to "The System Information screen" on page 169.

— **Configuration Variables...** - enables you to view, edit, and save configuration variables. Configuration variables control certain aspects or the MIRAN Release 2.0 operation that aren't obvious to the user. Refer to "The Configuration Variables menu" on page 170.

— **Ethernet Configuration** - enables you to set the IP address, the subnet mask, and the Gateway of the MIRAN Release 2.0 card. This is necessary to enable ethernet access to the MIRAN card. Refer to "The Ethernet Configuration screen" on page 176.

— **Time & Date Configuration** - enables you to set the time and date of the MIRAN Release 2.0 card in one of two ways: either manually or retrieving the time and date automatically from the Meridian 1 system. Refer to "The Time & Date Configuration menu" on page 178.

— **Back to previous Menu...** - returns you to the Main menu.

The File Commands menu

At the Pack Administration menu, select **-1-** to access the File Commands menu, which Figure 49 shows.

At the File Commands menu, you have six options:

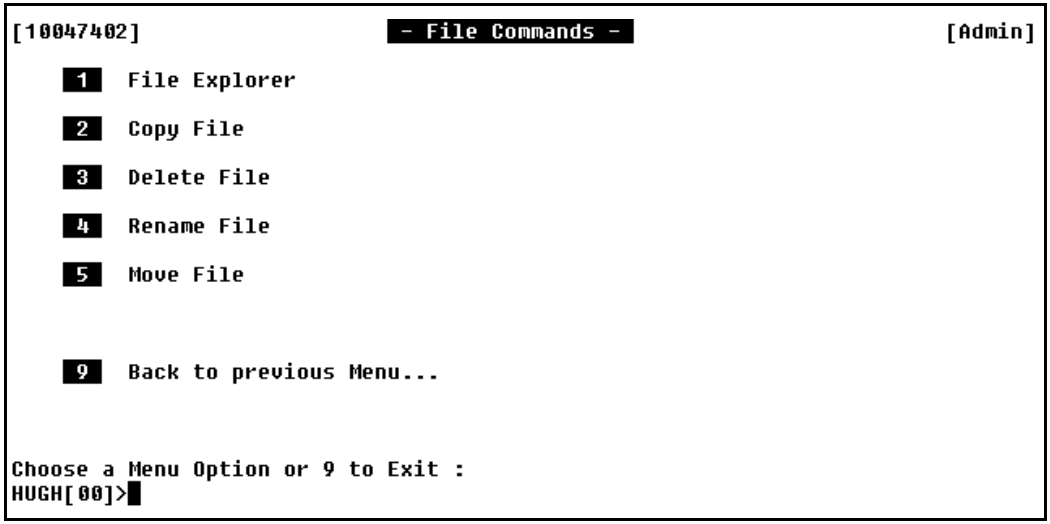
— **File Explorer** - enables you to browse through the directory file listings for the internal drive C: and any PCMCIA-based stored file lists. Refer to "The File Explorer screen" on page 161.

— **Copy File** - enables you to a copy file to a different file on the same drive or another drive. Refer to "The Copy File screen" on page 162.

— **Delete File** - enables you to delete a selected file. Refer to "The Delete File screen" on page 163.

— **Rename File** - enables you to rename any existing file. Refer to "The Rename File screen" on page 164.

Figure 49
The File Commands menu



— **Move File** - enables you to copy a file to a specified location and delete the original source file. Refer to “The Move File screen” on page 165.

— **Exit** - returns you to the Pack Administration menu.

The File Explorer screen

At the File Commands menu, select **-1-** to access the File Explorer screen, which Figure 50 shows.

At the File Explorer screen, you can do the following:

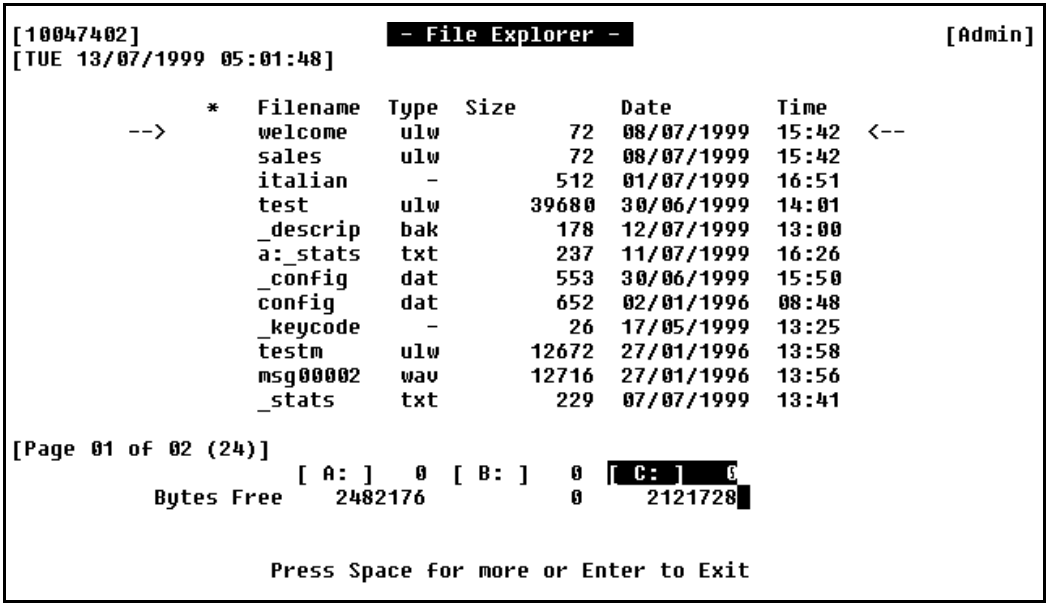
— Select which drive’s contents to explore. Use the right and left arrow keys to do this. The amount of storage space available on each drive appears below each drive letter.

Note: PCMCIA cards must be in place in drives A: and B: before you can check those drives’ contents. Allow approximately ten seconds after inserting a PCMCIA card for the drive to mount.

— Use the up/down arrows to scroll through the list of files.

— Press **Enter** to return to the File Commands screen.

Figure 50
The File Explorer screen



The Copy File screen

At the File Commands screen, select **-2-** to access the Copy File screen, which Figure 51 shows.

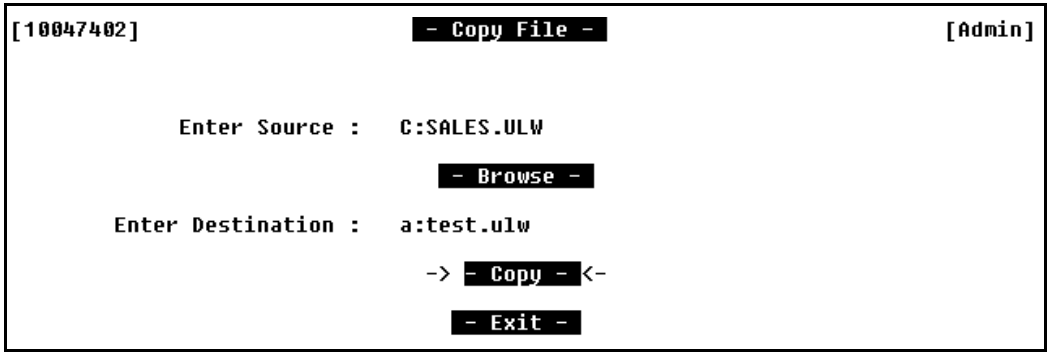
> **CAUTION**
> Disable the MIRAN card before transferring files between drives.

To copy an existing file to a different file, do the following:

1 At the 'Source Filename:' prompt, enter the filename you want to copy. Include the drive where the file resides. You can select **Browse** to scan the list of available files.

2 At the 'Destination Filename:' prompt, enter the filename, including the drive, you want to copy to. Again, you can select **Browse** to scan the list of available files.

Figure 51
The Copy File screen



3 Select **Copy** to copy the selected file from the source filename to the destination filename.

Note: You can repeat steps 1-3 as many times as you want before proceeding on to step 4.

4 Select **Exit** to return to the File Commands screen.

The Delete File screen

At the File Commands screen, select **-3-** to access the Delete File screen, which Figure 52 shows.

CAUTION
Before you delete a file, ensure that the file is *not* currently active.

To delete a file, do the following:

1 At the 'Filename:' prompt, enter the filename you want to delete. Include the drive where the file resides. You can select **Browse** to scan the list of available files.

2 Select **Delete** to delete the selected file.

Note: You can repeat steps 1 and 2 as many times as you want before proceeding on to step 3.

3 Select **Exit** to return to the File Commands screen.

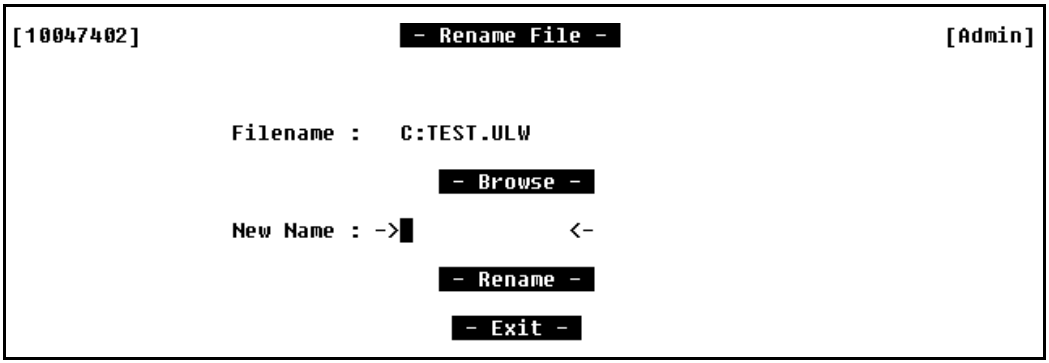
Figure 52
The Delete File screen

The Rename File screen

At the File Commands screen, select **-4-** to access the Rename File screen, which Figure 53 shows.

CAUTION
Before you rename a file, ensure that the file is *not* currently active.

Figure 53
The Rename File screen



To rename a file, do the following:

1. At the 'Filename:' prompt, enter the filename you want to rename. Include the drive where the file resides. You can select **Browse** to scan the list of available files.
2. At the 'New Name:' prompt, enter the new name you want the file to have. Include the drive where the file will reside. Again, you can select **Browse** to scan the list of available files.
3. Select **Rename** to rename the selected file.

   Note: You can repeat steps 1-3 as many times as you want before proceeding on to step 4.

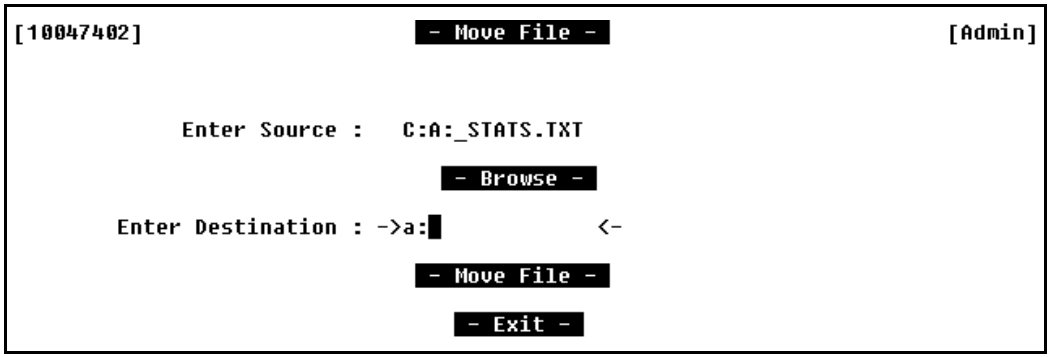
4. Select **Exit** to return to the File Commands screen.

The Move File screen

At the File Commands screen, select **-5-** to access the Move File screen, which Figure 54 shows.

CAUTION
Before you move a file, ensure that the file is *not* currently active.

Figure 54
The Move File screen



To move a file from one location to another, do the following:

1. At the 'Source Filename:' prompt, enter the filename you want to move. Include the drive where the file resides. You can select **Browse** to scan the list of available files.
2. At the 'Destination filename:' prompt, enter the filename, including the drive, where you want to move the file to. Again, you can select **Browse** to scan the list of available files.
3. Select **Move File** to move the selected file. This action deletes the source filename and places the file in the destination filename.

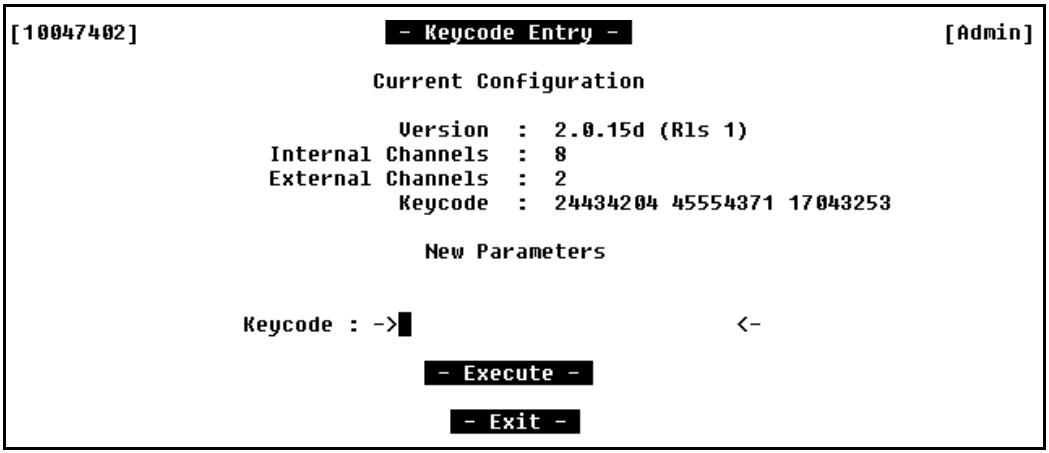
   Note: You can repeat steps 1-3 as many times as you want before proceeding on to step 4.

4. Select **Exit** to return to the File Commands screen.

The Keycode Entry screen

At the Pack Administration menu, select **-2-** to access the Keycode Entry screen, which Figure 55 shows.

Figure 55
The Keycode Entry screen



The Keycode Entry screen shows the current configuration, listing the MIRAN software version, the number of internal and external ports, and the current keycode. To change the keycode, do the following:

1 At the 'Keycode:' prompt, enter the new keycode. Remember to add a space between each group of eight numbers.

Note: For MIRAN Release 2.0, you do not need to enter the number of internal and external ports. The MIRAN extracts this information automatically from the new keycode.

2 Select **Execute** to update the keycode. If the new keycode is valid, a 'Keycode Validated' message appears, and the system updates the current configuration information.

Note: If you are performing an upgrade, step 2 enables the upgrade.

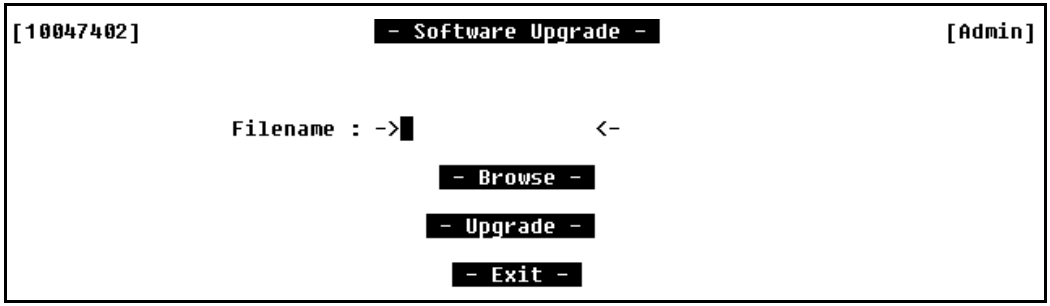
3 Select **Exit** to return to the Pack Administration menu.

Note: If you don't want to update the keycode, you can select **Exit** without selecting **Execute**.

The Software Upgrade screen

At the Pack Administration menu, select **-3-** to access the Software Upgrade screen, which Figure 56 shows.

Figure 56
The Software Upgrade screen



You can use the Software Upgrade screen to upgrade to a new software version or to reload the existing software to fix a bug. If you are upgrading to a new software version, you must also enter a new keycode. If you are simply fixing a bug, you do not need a new keycode.

CAUTION

Do not reboot or power down the MIRAN card during the software upgrade process. When the upgrade is complete, the system acknowledges with an 'OK'. **After 'OK' is displayed, you must COLD REBOOT the card to activate the software upgrade**.

To perform a software upgrade, do the following:

1 At the 'Filename:' prompt, enter the file you want to download from the PCMCIA card to the MIRAN internal Flash memory (drive C:) to upgrade the current software. You can select **Browse** to scan the list of available upgrade files.

2 Select **Upgrade** to place the selected file into the internal Flash memory of the MIRAN card.

Note: The upgrade can take awhile. Wait for the "Upgrade successful" message before you proceed.

3 After the upgrade is complete, select **Exit** to return to the Pack Administration menu.

4 Access the Keycode Entry screen to enter the keycode for the software upgrade (see "The Keycode Entry screen" on page 166).

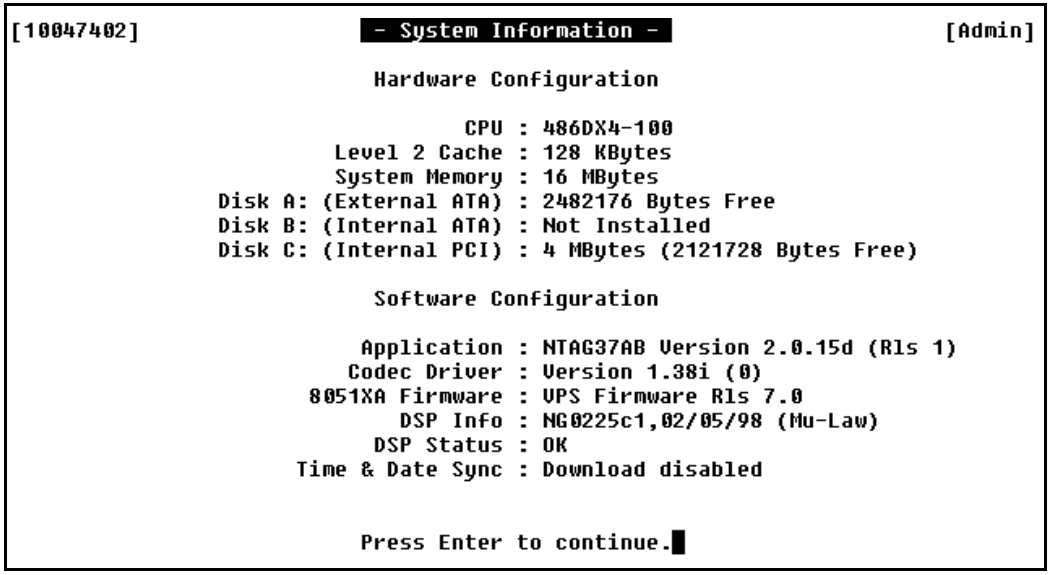
Note: Step 4 is not necessary for a simple bug fix.

5 Go to the Cold Reboot screen to cold reboot the MIRAN card (see "Maintenance and Diagnostics" on page 181). This activates the software upgrade.

The System Information screen

At the Pack Administration screen, select **-4-** to access the System Information screen, which Figure 57 shows.

Figure 57
The System Information screen



The System Information screen displays the following information:

— **Hardware Configuration** - including the CPU, the system memory, and the status of the drives

— **Software Configuration** - including the application and firmware releases

Use this information to help diagnose hardware or software issues that relate to a particular release of the product. When you have finished reviewing the system information, press **Enter** to return to the Pack Administration menu.

The Configuration Variables menu

Configuration variables are variables that control certain aspects of the operation of the MIRAN Release 2.0 pack. These variables aren't immediately visible to the user, and the default settings are usually sufficient. However, an administrator can view and change these variables when non-standard options are necessary. Table 8 lists the configuration variables along with their values and descriptions.

Table 8
MIRAN Release 2.0 configuration variables

Variable	Values/(Default)	Description
AnalogLevel0	0 - 63 / (7)	Loudness level for the Analog0 cross connect channel. (0 = loudest)
AnalogLevel1	0 - 63 / (7)	Loudness level for the Analog1 cross connect channel. (0 = loudest)
AutoSave	True or False / (True)	When True, any change to Descriptors, Calendar Assignments or Configuration Variables are automatically saved. Note that any change to user configurations are always saved automatically regardless of this variable. Changes during a telset session are always saved automatically at the end of the session.
BatchFileLog	True or False / (False)	Batch file log. Enables the logging of the output when running a batch file.
BatchFileRun	Valid filename / (A:AUTORUN.BAT)	If this is a valid filename, then this file will be run on startup.
CalendarFile	Valid filename / (_ASSIGNS.CAL)	Default Calendar file to load on startup.
CodecLaw	A-Law, Mu-Law, Auto / (Auto)	Companding law used for the analog input and output ports. If Auto is selected, the law is taken from the Meridian system. (Should only be set by Administrator).
Com2BootState	Shell, SLIP, or VLAN / (VLAN)	Determines how Com2 is to be initialized on boot-up. (Should only be set by Administrator).

Table 8
MIRAN Release 2.0 configuration variables

Variable	Values/(Default)	Description
DefaultDrive	A:, B:, or C: / (C:)	Determines the drive used when files are automatically loaded/saved e.g. Calendar, Descriptors, Operational Statistics.
DescriptorFile	Valid filename / (_DESCRIP.CAL)	Default Calendar Descriptor file to load on startup.
DspReceiveGain	0 - 0xffff / (2052)	DSP DTMF Tone Detection Sensitivity. (Should only be set by Administrator).
FileSortType	Name, Type, Size, Time / (Name)	Sort method used when in File Explorer.
PackName	(MIRANII)	Name of Pack (Appears on Command Line)
Polling	True or False / (True)	XA8051 Polling.
SetBasedAccess	True or False / (True)	Telset User Interface access.
SlipHost	(0.0.0.0)	SLIP Host Address. (Should only be set by Administrator).
SlipRemote	(0.0.0.0)	SLIP Remote Address. (Should only be set by Administrator).
StatsSaveFreq	1 - 7 / (1)	Frequency (in days) at which to save Operational Statistics automatically.
StatusUpdateFreq	0 - 60 / (0)	Frequency (in seconds) at which to update Status Screen for TTY. Enter 0 to disable.
SysDownloadFreq	1 - 7 / (1)	Frequency (in days) at which to automatically download System Time & Date. (Should only be set by Administrator).
SysDownloadTime	00:00 - 23:59 / (00:00)	Time at which to automatically download System Time & Date. (Should only be set by Administrator).
SysIPAddress	(0.0.0.0)	IP Address of Meridian-1. Used to download System Time & Date. (Should only be set by Administrator).

Table 8
MIRAN Release 2.0 configuration variables

Variable	Values/(Default)	Description
SysLoginEnabled	True or False / (True)	System & Date automatic download enabled/disabled. (Should only be set by Administrator).
SysPassword	(MiranII)	Password for System PDT session. (Should only be set by Administrator).
SysTtyPassword	0000	Password for System TTY session. (Should only be set by Administrator).
SysTtyUsername	MiranII	Username for System TTY session. (Should only be set by Administrator).
TuiPromptDir	ENGLISH	Directory to use for TUI voice prompts. (Should only be set by Administrator).
TuiSeizeAck	0 - 127 / (87)	A07 Seize Acknowledge code. (Should only be set by Administrator).
TuiSeizeDelay	0 - 15 / (1)	Delay (in seconds) after which to send TuiSeizeAck. (Should only be set by Administrator).

At the Pack Administration screen, select **-5-** to access the Configuration Variables menu, which Figure 58 shows.

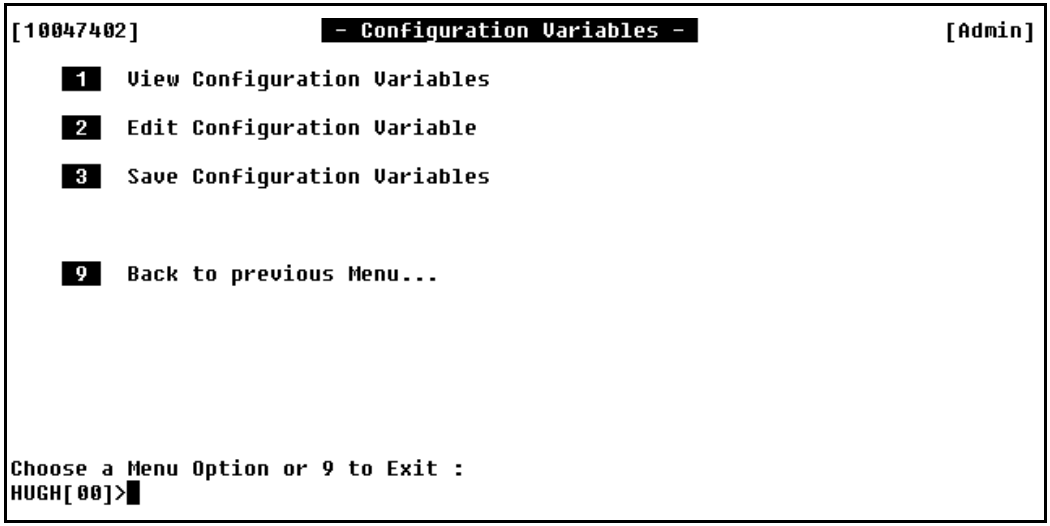
At the Configuration Variables menu, you have the following options:

— **View Configuration Variables** - enables you to view the current values of all the configuration variables. Refer to “The View Configuration Variables screen” on page 174.

— **Edit Configuration Variables** - enables you to edit the current values of the configuration variables. Refer to “The Edit Configuration Variables screen” on page 175.

— **Save Configuration Variables** - enables you to save any changes you made to the configuration variables. The MIRAN saves the current configuration variables as soon as you select this option (option **-3-**). There is no separate screen for this function; you simply receive a confirmation message.

Figure 58
The Configuration Variables menu



Note: This function saves the configuration variables to the default drive with the filename "_CONFIG.DAT".

— **Back to previous Menu...** - returns you to the Pack Administration screen. Be sure to save any changes you made to the configuration variables *before* you exit.

The View Configuration Variables screen

At the Configuration Variables screen, select **-1-** to access the View Configuration Variables screen, which Figure 59 shows.

Figure 59
The View Configuration Variables screen

```
[10047402]          - View Configuration Variables -          [Admin]

                  Variable Name         Value
                  AnalogLevel0          7
                  AnalogLevel1          7
                  AutoSave              True
                  BatchFileLog          False
                  BatchFileRun          A:AUTORUN.BAT
                  CalendarFile          _ASSIGNS.CAL
                  CodecLaw              Auto
                  Com2BootState         Shell
                  DefaultDrive          A:
                  DescriptorFile        _DESCRIP.CAL
                  DspReceiveGain        2052
                  FileSortType          Name

[Page 01 of 03 (29)]


                    Press Space for more or Enter to Exit
```

At the View Configuration Variables screen, you have the following options:

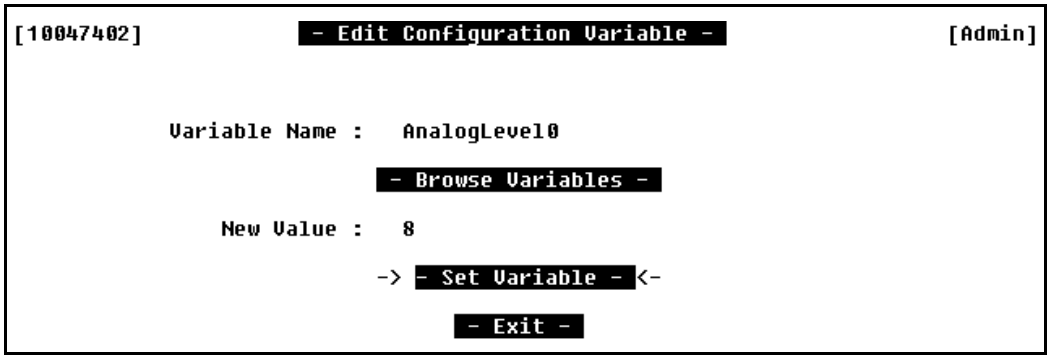
— Press **Space bar** to see more of the configuration variables.

— Press **Enter** to return to the Configuration Variables menu.

The Edit Configuration Variables screen

At the Configuration Variables screen, select **-2-** to access the Edit Configuration Variables screen, which Figure 60 shows.

Figure 60
The Edit Configuration Variables screen



To edit the configuration variables, do the following:

1 At the 'Variable Name:' prompt, enter the name of the variable you want to edit. You can select **Browse Variables** to scan and select from the list of available variables.

2 At the 'New Value:' prompt, enter the new value of the variable you selected in step 1. Make sure that the value falls within the range of acceptable values according to Table 8 on page 170.

3 Select **Set Variable** to set the new value of the variable.

Note: You can repeat steps 1-3 for as many variables as you want to edit.

4 Select **Exit** to return to the Configuration Variables menu.

5 At the Configuration Variables menu, select **-3-** to save the current (new) set of configuration variables.

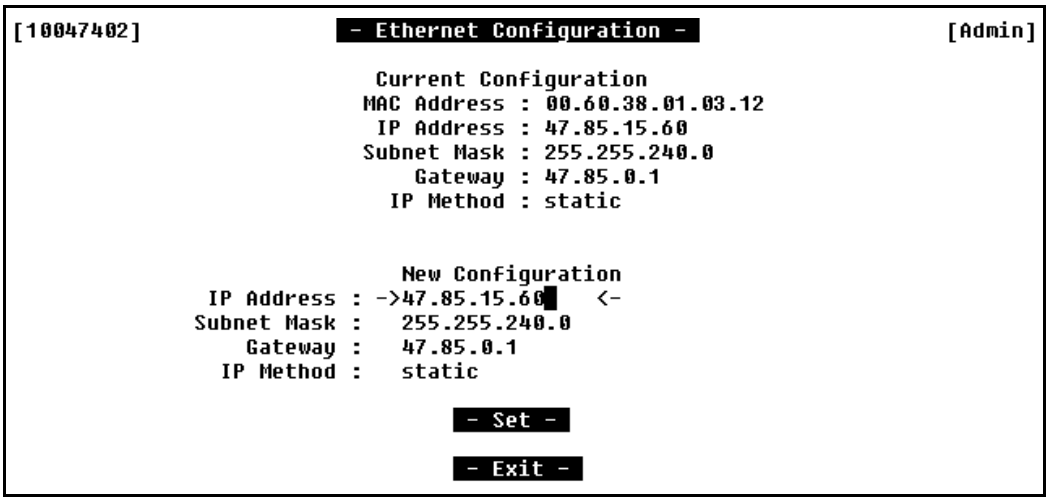
CAUTION

After you edit configuration variables at the Edit Configuration Variables screen, you must select **-3-** (Save Configuration Variables) at the Configuration Variables menu to save the changes. Otherwise the changes won't take effect.

The Ethernet Configuration screen

At the Pack Administration menu, select **-6-** to access the Ethernet Configuration screen, which Figure 61 shows.

Figure 61
The Ethernet Configuration screen



Ethernet access to the MIRAN Release 2.0 card is optional, but it is necessary if you want to do any of the following:

— Use the embedded browser user interface to perform OA&M

— Telnet into the MIRAN Release 2.0 card from a remote site

— Transfer files to and from the MIRAN Release 2.0 card through file transfer protocol (ftp).

You must configure the IP address, the subnet mask, the Gateway, and the IP method for the MIRAN Release 2.0 card correctly to enable ethernet access to the card. The MAC address is unique to each MIRAN Release 2.0 card; you cannot change the MAC address.

CAUTION

Confer with your network administrator before you set the ethernet parameters. Incorrect parameters can cause problems to other users in the network and can even lead to network outages.

To configure the MIRAN Release 2.0 card for ethernet access, do the following:

1 Under 'New Configuration:', enter the IP address at the appropriate prompt.

2 Enter the subnet mask at the appropriate prompt.

3 Enter the Gateway at the appropriate prompt.

Note: The Gateway IP address tells the MIRAN card where the local Gateway router is. This enables access from networks outside of the MIRAN card's subnet. You don't need to enter a Gateway IP address if you are restricting access to a local subnet.

4 Enter the IP method at the appropriate prompt.

Note: '**disabled**' is the default, which makes the card inaccessible from the network even if you have configured the other parameters. Enter '**static**' if you are using a static IP address, corresponding to the IP address you entered on this screen. Enter '**bootp**' to indicate that the card must request its IP address from a bootp server on the network.

5 Select **Set** to register the new IP address, subnet mask, Gateway, and IP method. A valid ethernet configuration receives an 'Ethernet Configuration Set' acknowledgment.

6 Select **Exit** to return to the Pack Administration menu.

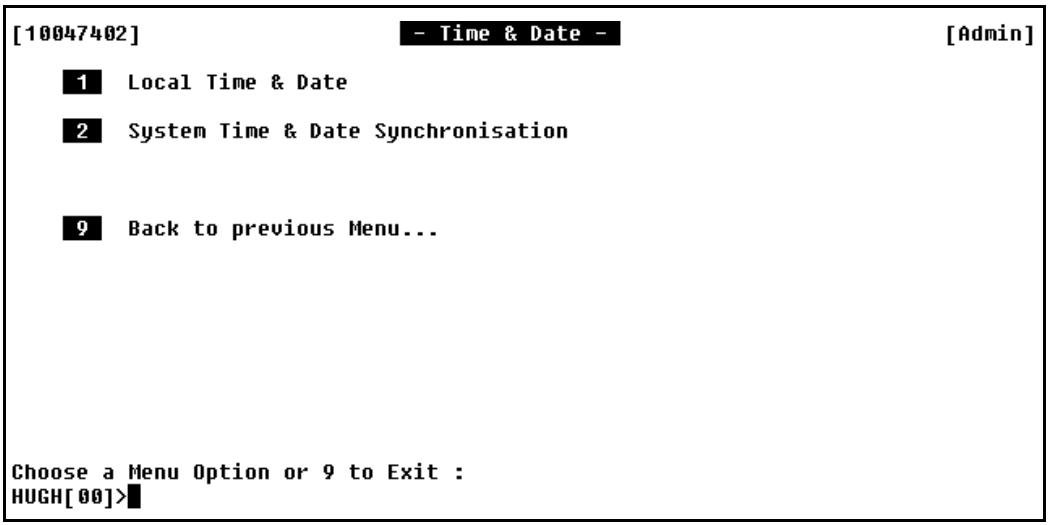
Note: You must reboot the card for the new ethernet configuration parameters to take effect.

The Time & Date Configuration menu

Note: To use the Time & Date Synchronization feature, you must configure Ethernet for the Meridian 1. For instruction on how to configure Ethernet for the Meridian 1, refer to "Configuring Ethernet for Time & Date Synchronization" on page 82.

At the Pack Administration menu, select **-7-** to access the Time & Date Configuration menu, which Figure 62 shows.

Figure 62
The Time & Date Configuration menu



At the Time & Date Configuration menu, you have the following options:

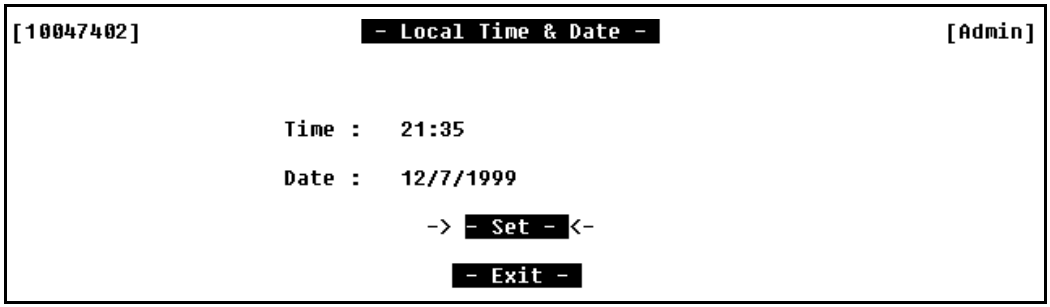
— **Local Time & Date** - enables you to set the time and date on the MIRAN card manually. Refer to "The Local Time & Date screen" on page 179.

— **System Time & Date Synchronization** - enables you to configure the MIRAN Release 2.0 card to retrieve the time and date information automatically from the Meridian 1 system. Refer to "The System Time & Date Synchronization screen" on page 179.

The Local Time & Date screen

At the Time & Date Configuration menu, select **-1-** to access the Local Time & Date screen, which Figure 63 shows.

Figure 63
The Local Time & Date screen



To set the time and date for the MIRAN card manually, do the following:

1 Enter the current time at the 'Time:' prompt.

2 Enter the current date at the 'Date:' prompt.

Note: MIRAN automatically calculates the day of the week.

3 Select **-Set-** to set the time and date.

4 Select **-Exit-** to return to the Time & Date Configuration menu.

Note: This procedure performs the same operation as the SETTIME and SETDATE commands.

The System Time & Date Synchronization screen

At the Time & Date Configuration menu, select **-2-** to access the System Time & Date Synchronization screen, which Figure 63 shows.

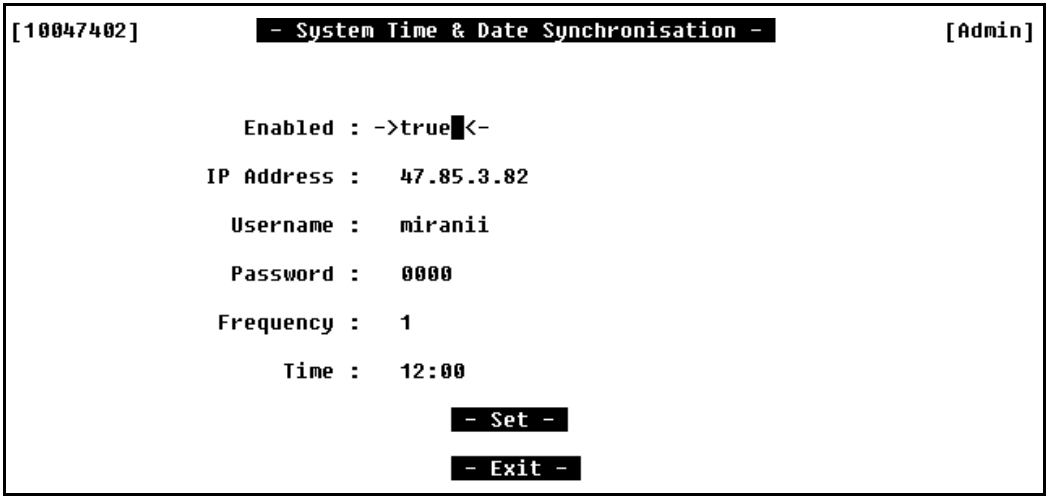
To enable time and date synchronization with the Meridian 1 system, do the following:

1 Set the 'Enabled:' prompt to **true**.

2 Enter the IP address of the Meridian 1 system.

Note: The Meridian 1 system must be on the same subnet as the MIRAN Release 2.0 card.

Figure 64
The System Time & Date Synchronization screen



3 Enter the username that you use to access the Meridian 1 switch through the embedded LAN.

4 Enter the password that you use to access the Meridian 1 switch through the embedded LAN.

Note: You must also set the configuration variable 'SysPassword' to this password.

Note: Confirm what this password is for your given release of Meridian 1 software.

5 At the 'Frequency:' prompt, enter the number of days between each synchronization attempt. (E.g., enter **1** to synchronize every day.)

6 At the 'Time:' prompt, enter the time of day the MIRAN card will attempt to synchronize with the Meridian 1 system.

Note: It is very important to set the time to be during the period of *lowest* technician use (e.g., *not* during midnight routines!).

Note: The MIRAN card makes one attempt to synchronize per scheduled attempt. If synchronization fails, the MIRAN keeps its current time and date configuration and tries to synchronize again at the next scheduled attempt.

7 Select **-Set-** to set the time and date synchronization.

8 Select **-Exit-** to return to the Time & Date Configuration menu.

Note: System Time & Date Synchronization requires the MIRAN card to log into the Meridian 1 system. This can affect other operations on the switch. Therefore, careful staging of the synchronization process is necessary.

Maintenance and Diagnostics

At the Main menu, select **-3-** to access the Maintenance and Diagnostics menu, which Figure 65 shows.

Figure 65
The Maintenance and Diagnostics menu

```
[10047402]          - Maintenance & Diagnostics -          [Admin]

    1  System Information

    2  Warm Reboot

    3  Cold Reboot

    4  Command Line Access (Host)


    9  Back to previous Menu...



Choose a Menu Option or 9 to Exit :
HUGH[00]>
```

At the Maintenance and Diagnostics menu, you can do the following as long as you have the proper level of access:

— Select **-1-** to access the System Information screen. This is the same screen you can access from the Pack Administration menu. Refer to "The System Information screen" on page 169 for details.

— Select **-2-** to perform a warm reboot of the MIRAN card. The 8051XA microcontroller resets the host.

— Select **-3-** to perform a cold reboot of the MIRAN card. This is a full system reboot.

— Select **-4-** to open the Host Command Line Access. Use this CLI to perform PI testing and debugging. This CLI includes a periodic timestamp output, which is useful for such testing.

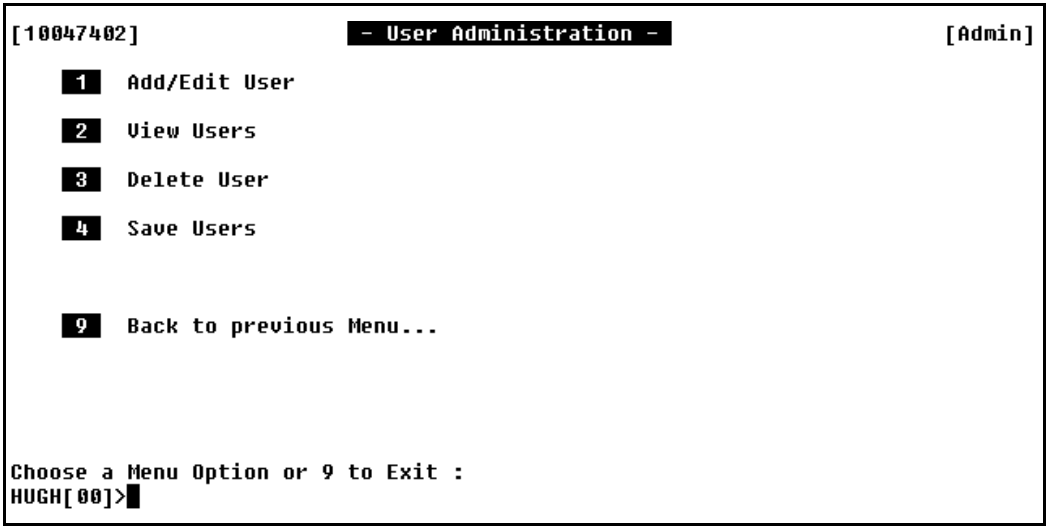
— Select **-5-** to return control of the maintenance port to the 8051XA microcontroller that interfaces with the Meridian 1. This CLI provides its own set of message monitoring facilities.

— Select **-9-** to return to the Main menu.

The User Administration menu

At the Main menu, select **-4-** to access the User Administration menu, which Figure 66 shows. This MIRAN Release 2.0 feature enables the configuration of multiple users for a single MIRAN system. Only users with administrator privileges and above have access to this menu.

Figure 66
The User Administration menu



You have five options at the User Administration menu:

— Select **-1-** to add or edit a user. Refer to “The Add/Edit User screen” on page 183.

— Select **-2-** to view a list of the users and their corresponding channel assignments. Refer to “The View Users screen” on page 185.

— Select **-3-** to delete a user. Refer to “The Delete User screen” on page 186.

— Select **-4-** to save the current configuration of users. You must do this before exiting if you made any changes to the users list that you want to keep.

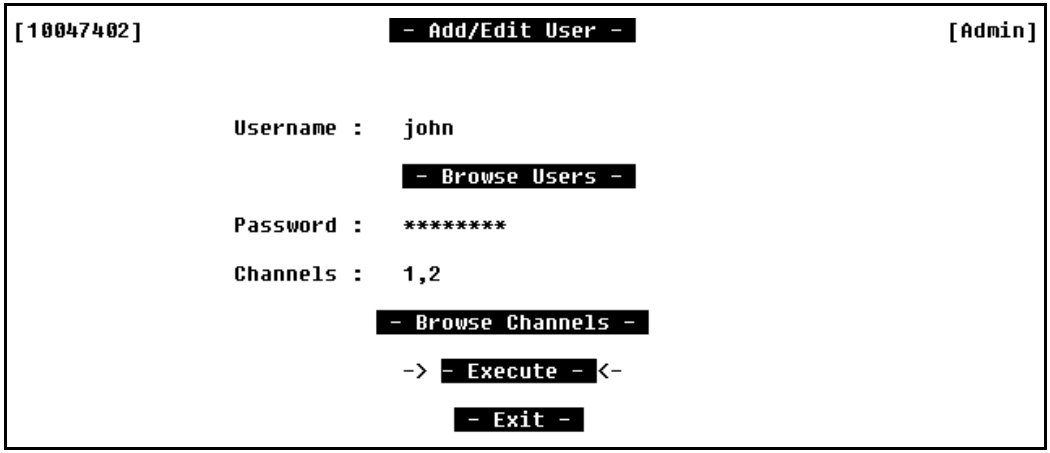
— Select **-9-** to exit and return to the Main menu.

When you define a new user, you give the user a password and a group of channels that the user can access.

The Add/Edit User screen

At the User Administration menu, select **-1-** to access the Add/Edit User screen, which Figure 67 shows.

Figure 67
The Add/Edit User screen



To add or edit a user, do the following:

1 Enter the user name, which can be any combination of alphanumeric characters. If you are adding a new user, you can select **Browse** to ensure that the user name does not already exist. If you are editing an existing user, you can select **Browse** to select a name from the list of users.

2 Enter the new password for the user. The password *must* be at least eight (up to 12) alphanumeric characters.

3 Enter the channels you want the user to have access to. Select **Browse Channels** to view and select from the list of available channels.(Use 's' to toggle the selection of a channel.)

4 Select **Add User** to save the new user information. This step updates the information on drive C: automatically.

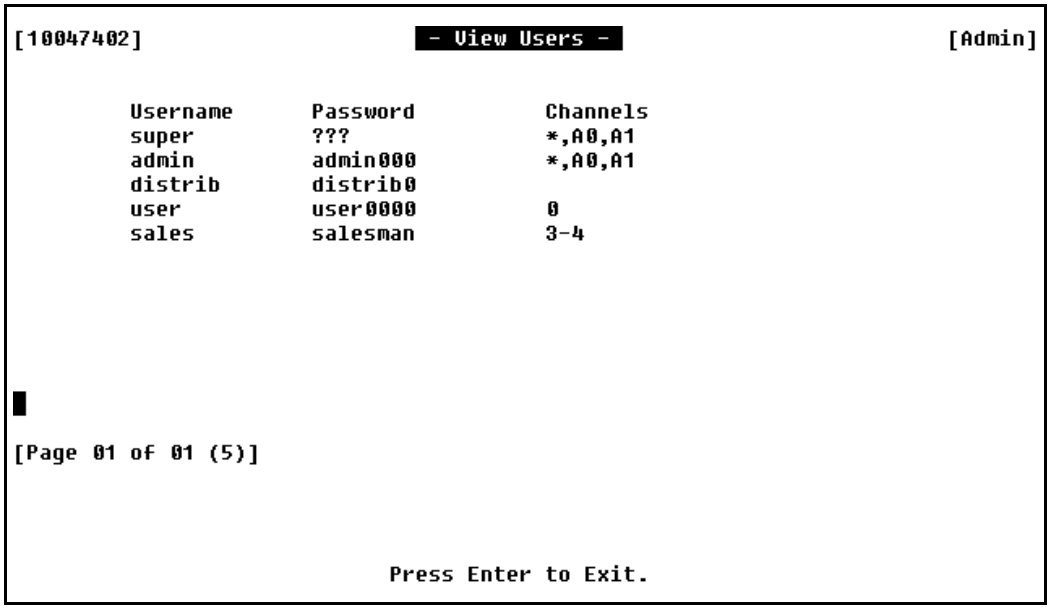
5 Select **Exit** to return to the User Administration menu.

Note: MIRAN saves all user information in a file named "C_USERS.DAT". You can restore all default users and passwords by deleting the C:_USERS.DAT file.

The View Users screen

At the User Administration menu, select **-2-** to access the View Users screen, which Figure 68 shows. This screen lists the users' names and the channels that each one has access to.

Figure 68
The View Users screen



At the View Users screen, you can do the following:

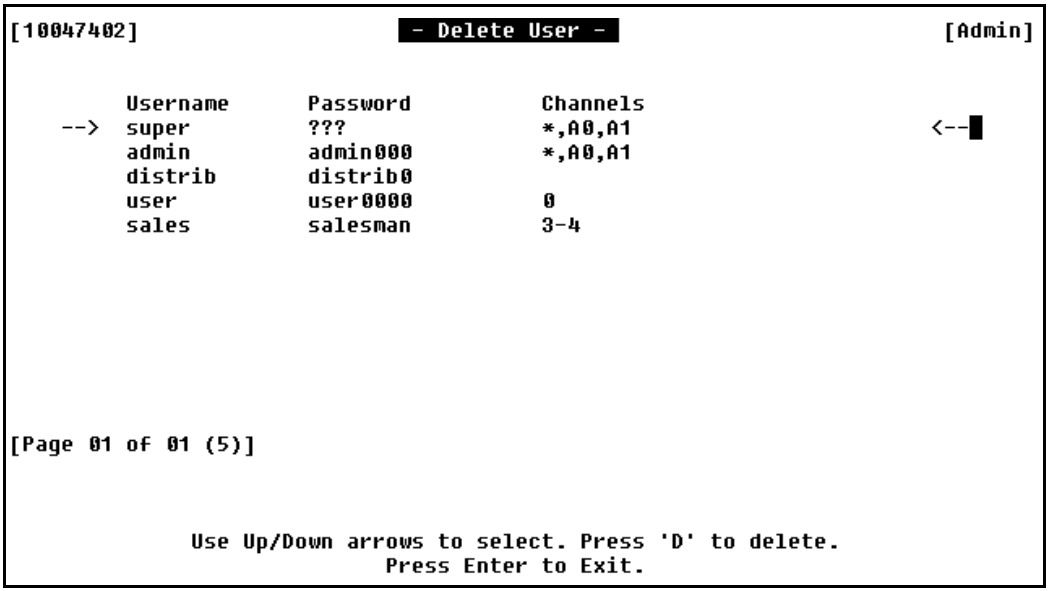
— Press the **Space bar** to view more users if they don't all appear on the initial screen.

— Press **Enter** to exit and return to the User Administration screen.

The Delete User screen

At the User Administration menu, select **-3-** to access the Delete User screen, which Figure 69 shows. This screen lists the users' names and the channels that each one has access to.

Figure 69
The Delete User screen



To delete a user, do the following:

1. Use the up/down arrows to select the user you want to delete. If the user does not appear on the initial screen, you can press the **Space bar** for more users.
2. Press **D** to delete the selected user. This step updates the information on drive C: automatically.
3. Press **Enter** to exit and return to the User Administration menu.

MIRAN OA&M command set

Instead of using the menu structure described in the first half of this chapter, you can enter commands on the command line in the Main Menu. This is advantageous to an experienced user who knows what command to use.

Most of these commands can also be used in batch files to allow complex configurations to be executed in a single command.

Files are specified using DOS convention of an 8-character filename followed by a 3-character extension. The filename is normally preceded by a device descriptor as shown in Table 9.

Table 9
MIRAN disk drives

Drive name	Designation
External PCMCIA Drive	A:
Internal PCMCIA Drive	B:
Internal Flash Drive	C:

The MIRAN channels are named as shown in Table 10:

Table 10
Channel designations

Channels	Designation
Internal	0-7
External (cross-connect)	A0, A1
Analog Inputs	ANALOG0, ANALOG1

These designators are used on the command line when executing MIRAN commands.

OA&M Command summary

OA&M commands are used instead of using different menus to perform system applications configuration. You enter a command on the command line at the bottom of the Main Menu screen (see Figure 22 on page 133). For example:

MIRAN[00]>CON_WAV_PCM PLSWAIT.WAV ANN00005.ULW

Table 11 lists MIRAN OA&M commands along with their descriptions, parameters, and syntax definitions. It also lists terminal-based OA&M access commands that can be entered on the command line on the terminal screen.

Table 11
OA&M command summary (Part 1 of 5)

Command	Parameters	Function
BACKUP	[Device]	Back-up the assignment/configuration information.
CAL_ADD	[Channel list] [Device:Filename.Type] [Descriptor] or [Channel list] [Device:Filename.Type] [Time Entry] [Date Entry]	Add a Calendar assignment.
CAL_CLEAR		Clear all Calendar assignments.
CAL_LOAD	[Device:Filename.Type]	Load Calendar assignments from a file.
CAL_REMOVE	[Calendar Entry Number]	Remove a Calendar assignment.
CAL_SAVE	[Device:Filename.Type]	Save Calendar assignments to a file.
COLD_RESET		Perform a cold reset on the pack.
CONV_PCM_WAV	[Input Device:Filename.ULW] [Output Device:Filename.WAV]	Convert a file from PCM (.ALW or .ULW) to WAV.
CONV_WAV_PCM	[Input Device:Filename.WAV] [Output Device:Filename.ULW]	Convert a file from WAV to PCM (.ALW or .ULW).

Table 11
OA&M command summary (Part 2 of 5)

Command	Parameters	Function
COPY	[Source Device:Filename.Type] [Destination Device:File-name.Type]	Copy a file.
CVREAD	[Configuration Variable]	Show the value of a configuration variable.
CVSAVE		Save Configuration Variables to the drive specified by the variable 'DefaultDrive'.
CVSET	[Configuration Variable] [value]	Set the value of a configuration variable. MIRAN will save values if 'AutoSave' is TRUE.
DELETE	[Device:Filename.Type]	Delete a file.
DESC_ADD	[Descriptor Name] [Time Entry] [Date Entry]	Add/change Calendar Descriptor.
DESC_CLEAR		Clear all Calendar Descriptors.
DESC_LOAD	[Device:Filename.Type]	Load Calendar Descriptors from a file.
DESC_REMOVE	[Descriptor Name]	Remove a Calendar Descriptor.
DESC_SAVE	[Device:Filename.Type]	Save Calendar Descriptors to a file.
ERASE_DIR	[Device:Directory]	Remove a directory and its contents.
IPCONFIG	[IP Address] [Subnet Mask] [Gateway Address] [IP Method]	Configure the IP information on the pack.
KEYCODE	[Keycode]	Capacity upgrade by means of a key-code.
LIST	[Device:Filename.Type]	List files for a given drive.
LOCAL_TIME	[Time hh:mm] [Date dd/mm/yyyy]	Set the time and date on the pack.
LOGOFF		Log off and bring user back to the login screen.

Table 11
OA&M command summary (Part 3 of 5)

Command	Parameters	Function
MKDIR	[Device:Directory name]	Create a directory.
MOVE	[Source Device:Filename.Type] [Destination Device:File-name.Type]	Move a file.
PLAY	[External Channel] [Device:File-name.Type]	Play an announcement on an external channel.
PLAYLEV	[External Channel] [Level]	Set the playback (attenuation) level (0-63) for an external channel.
PLAYSTOP	[External Channel]	Stop playback of a file on an external channel.
POLLING_OFF		Turn 8051XA polling off.
POLLING_ON		Turn 8051XA polling on.
RECORD	[External Channel] [Device:File-name.Type] [Duration]	Record from an external channel to a file for a given duration.
RECORDSTOP	[External Channel]	Stop recording on an external channel.
RENAME	[Device:Old_File_Name.Type] [New_File_Name.Type]	Rename a file.
RESETSTAT		Reset channel statistics.
RESTORE	[Device]	Restore the backed-up assignment/ configuration information.
RMDIR	[Device:Directory]	Removes an empty directory.
RUN	[Device:Filename.BAT]	Run a batch file.
SAVESTATS	[Device:Filename.Type]	Save channel statistics to a file.
SERIAL_PORT		Hands control of the serial port to the 8051XA for debugging purposes.
SETDATE	[dd:mm:yyyy]	Set the date on the pack.

Table 11
OA&M command summary (Part 4 of 5)

Command	Parameters	Function
SETTIME	[hh:mm]	Set the time-of-day on the pack.
SETUP_C	[Device]	Copies MUSIC.SBC and MIRANII.PDF to drive C:
SETUP_PROMPTS	[Device:Directory]	Copy TUI voice prompts to a directory.
SHELL		Enter the vxWorks shell for debugging.
STATS		Show the channel statistics screen.
STATUS		Show the pack status screen.
SWAP_LAW		Swap the companding law of the external channels between A-law and µ-law.
SW_UPGRADE	[Device:Filename.Type]	Upgrade the MIRAN software.
SYSINFO		Show the system information screen.
SYSTEM_TIME	[Enabled] [IP Address] [TTY Username] [TTY Password] [Frequency] [Time]	Set the parameters for System Time & Date Synchronization.
SYSTEM_TIME_SYNC		Initiate the download of the System Time & Date from the M1.
TIME		Show the current day, time, and date
TUI_ASSIGN	[Channel] [Device:Filename.Type]	Make a TUI calendar assignment.
TUI_UNASSIGN	[Channel]	Unassign a TUI assignment.
UPGRADE_ERASE		Erase the current MIRAN software load to force a boot from BIOS.
USER_ADD	[User Name] [Password] [Channel List]	Add a new User.
USER_REMOVE	[User Name]	Remove a User.
USER_SAVE		Save Users.

Table 11
OA&M command summary (Part 5 of 5)

Command	Parameters	Function
VIEW	[Device:Filename.Type]	View a text file.
VNEXT		Move to the next pack in the V-LAN chain.
VPREV		Move to the previous pack in the V-LAN chain.
WARM_RESET		Perform a warm reset of the pack.

OA&M Commands

The command syntax explains in detail each command and its parameters.

Access the next MIRAN card

Use this command to access the next card in the VLAN chain.

Syntax **VNEXT**

Access the previous MIRAN card

Use this command to access the previous card in the VLAN chain.

Syntax **VPREV**

Read configuration variable

Use this command to show the value of a particular configuration variable.

Syntax	**CVREAD** [Configuration Variable]
[Configuration Variable]	The configuration variable you want to read.

Save configuration variables

Use this command to save the configuration variables to the drive specified by the variable ‘DefaultDrive’.

Syntax **CVSAVE**

Set configuration variable

Use this command to set the value of a configuration variable. MIRAN will save the value if the variable 'AutoSave' is 'TRUE'.

Syntax	**CVSET** [Configuration Variable] [Value]
[Configuration Variable]	The configuration variable you want to read.
[Value]	The desired value of the configuration variable.

Keycode entry

Enter a keycode to upgrade/activate software functionality.

Syntax	**KEYCODE** [keycode]
[keycode]	The keycode you received in your upgrade/installation kit.

Operational Statistics

Displays a report of the RAN statistics.

Syntax	**STATS**

System Information

Displays a report of the system hardware configuration.

Syntax	**SYSINFO**

View text file

Use this command to view a text file.

Syntax	**VIEW** [dev:filename.type]
[dev:filename.type]	Device indicates on which drive the file resides. The filename is 8 characters.

Remove MIRAN upgrade software

Use this command to erase the current MIRAN software load to force a boot from BIOS.

Syntax	**UPGRADE_ERASE**

Configure IP information

Use this command to configure the IP information for the MIRAN pack.

Syntax	**IPCONFIG** [IP address] [subnet mask] [gateway address] [IP method]
[IP address]	The IP address for the MIRAN pack.
[subnet mask]	The subnet mask for the MIRAN pack.
[gateway address]	The gateway on which the MIRAN pack resides.
[IP method]	The method the MIRAN pack uses to obtain the IP address. The choices are: bootp—to take an IP address upon bootup static—to have a constant IP address disabled—to disable IP capability

Allow 8051XA debugging

Use this command to hand control of the serial port to the 8051XA for debugging purposes.

Syntax	**SERIAL_PORT**

Allow vxWorks debugging

Use this command to enter the vxWorks shell for debugging purposes.

Syntax	**SHELL**

Synchronize time and date

Use this command to initiate the download of time and date information from the Meridian 1 system.

Syntax	**SYSTEM_TIME_SYNC**

Announcement Commands

The following commands deal with announcements.

Announcement Record

Records an announcement and stores it in a file. Recording starts immediately and terminates after the specified duration.

Syntax:	**RECORD** [source] [device:filename] [duration]
[source]	ANALOG1, ANALOG2, CHANNEL 7 (for set)
[device:filename]	Device indicates on which device the file resides. The file name is a maximum of 8 characters with a 3 character extension.
[duration]	Maximum play duration in seconds.

Stop Recording Announcement

Halts all announcement recording.

Syntax: **RECORDSTOP**

Play Announcement

Plays an announcement file via the specified port.

Syntax:	**PLAY**[destination] [device:filename] [duration]
[destination]	A0 or A1 (.ULW or .ALW files only) channel 7 (OA&M channel))
[device:filename]	Device indicates on which device the file resides. The file name is a maximum of 8 characters with a 3 character extension. If ANALOG0 or ANALOG1 is specified, the analog input ports are used as announcement source.
[duration]	Maximum play duration in seconds. If duration is omitted then all the announcement will be played.

Stop Playback Announcement

Stops playback of an announcement file via the specified port. This can be used to stop playback of a long announcement before making a new assignment.

Syntax	**PLAYSTOP** [channel]
[channel]	0-7, A0, A1

Set Playback Level Announcement

Sets the playback level for given channel.

Syntax:	**PLAYLEV** [channel] [level]
[channel]	0-7 for internal channels A0, A1for external channels.
[level]	Integer in range 0-63. “0” allows the loudest playback, “63” the softest.

Convert Announcement File

Converts audio files from one format to another. Raw PCM (.ULW or .ALW) is the default format used by the MIRAN card. This utility allows conversion between any combination of the following formats:

Windows™ format audio file .WAV

Raw PCM .ULW, .ALW

Syntax and description of announcement files

Syntax:	**CONV_PCM_WAV** [src dev:filename.ULW (or .ALW)] [dest dev:filename.WAV]
[src dev:filename.ext]	Device indicates on which device the file resides. Filename, max 8 characters.
[dest dev:filename.ext]	Device indicates on which device the converted file will be placed.Filename, max 8 characters.

Calendar commands

The following commands deal with the calendar function.

Add a calendar assignment

Create a calendar assignment using either a descriptor or a time & date entry to determine when the announcement plays.

Syntax:	**CAL_ADD** [channel list] [dev:filename.type] [descriptor] or **CAL_ADD** [channel list] [dev:filename.type] [time entry] [date entry]
[channel list]	Specifies on which channels the announcement will play
[dev:filename.type]	Device indicates on which drive the file resides. The filename is 8 characters.
[descriptor]	A previously defined descriptor that describes the times and date the announcement will play.
[time entry]	This is the time of day the announcement will play. Refer to Table 3 on page 26 for available formats.
[date entry]	This is the days or dates the announcement will play. Refer to Table 4 on page 27 for available formats.

Remove a calendar assignment

Delete a calendar assignment from the list of calendar assignments.

Syntax:	**CAL_REMOVE** [calendar entry number]
[calendar entry number]	Specifies which calendar assignment you want to delete from among the list of calendar assignments.

Load calendar assignments from a file

Use this command to load a group of calendar assignments that you previously saved in a file.

Syntax:	**CAL_LOAD** [dev:filename.type]
[dev:filename.type]	Device indicates on which drive the file resides. The filename is 8 characters.

Save a calendar list to a file

Use this command to save the active list of calendar assignments to a file.

Syntax:	**CAL_SAVE** [dev:filename.type]
[dev:filename.type]	Device indicates to which drive you want to save the file. The filename is 8 characters.

Clear current calendar assignments

Use this command to clear the currently active list of calendar assignments.

Syntax:	**CAL_CLEAR**

Assign TUI announcement

Use this command to assign a TUI announcement to a group of channels.

Syntax	**TUI_ASSIGN** [channel] [dev:filename.type]
[channel]	The channel, or channels, you want to make the assignment to. Use '*' for all channels.
[dev:filename.type]	Device indicates on which drive the file resides. The filename is 8 characters.

Unassign TUI announcement

Use this command to unassign a TUI announcement from a group of channels.

Syntax	**TUI_UNASSIGN** [channel]
[channel]	The channel, or channels, you want to remove the assignment from. Use '*' for all channels.

Descriptor commands

The following commands deal with the descriptor function.

Add a descriptor

Use this command to create a descriptor, which you can use for multiple calendar assignments.

Syntax:	**DESC_ADD** [descriptor name] [time entry] [date entry]
[descriptor name]	The name you want the descriptor to have, from one to 16 characters in length.
[time entry]	This is the time of day an announcement with this descriptor will play. Refer to Table 3 on page 26 for available formats.
[date entry]	This is the days or dates an announcement with this descriptor will play. Refer to Table 4 on page 27 for available formats.

Remove a descriptor

Delete a descriptor from the current list of descriptors.

Syntax:	**DESC_REMOVE** [descriptor name]
[descriptor name]	The name of the descriptor you want to remove.

Load descriptors from a file

Use this command to load a group of descriptors that you previously saved in a file.

Syntax:	**DESC_LOAD** [dev:filename.type]
[dev:filename.type]	Device indicates on which drive the file resides. The filename is 8 characters.

Save current descriptors to a file

Use this command to save the active list of descriptors to a file.

Syntax:	**DESC_SAVE** [dev:filename.type]
[dev:filename.type]	Device indicates to which drive you want to save the file. The filename is 8 characters.

Clear current descriptors

Use this command to clear the currently active descriptors.

Syntax: **DESC_CLEAR**

User commands

The following commands deal with the list of users.

Add a user

Use this command to define a user.

Syntax:	**USER_ADD** [user name] [password] [channel list]
[user name]	The name of the user (the login ID).
[password]	The password the user must enter to access the MIRAN Release 2.0 card. The password *must* be eight characters long.
[channel list]	The list of channels you want the user to have access to. For access to all channels, enter '*'.

Note: MIRAN saves all user information in a file named "C_USERS.DAT". You can restore all default users and passwords by deleting the C:_USERS.DAT file.

Remove a user

Delete a user from the current list of users.

Syntax:	**USER_REMOVE** [user name]
[user name]	The name of the user you want to remove.

Save users

Use this command to save all changes to the users list.

Syntax: **USER_SAVE**

File Commands

Control RAN and music files.

List Files

Lists all the files on the specified device or drive:.

Syntax:	**LIST** [device:] [filename] [.extension]
[device:]	Device indicates on which device the file resides.
[filename:]	Filename, max 8 characters or wildcard “*”. If a filename is omitted then all files on the specified device will be listed.
[.extension:]	The extension can be max 3 characters or wildcard “*”. If an extension is omitted then all files with a null extension on the specified device will be listed.

Copy File

Allows you to copy files:

Syntax:	**COPY** [src device:filename.ext] [dest device:filename.ext]
[src dev:filename.ext]	Device indicates on which device the file resides. Filename, max 8 characters and.ext max 3 characters.
[dest dev:filename.ext]	Device indicates on which device the copied file will be placed.Filename, max 8 characters and.ext max 3 characters.

Move File

Allows you to move files from a source to a destination location:

Syntax:	**MOVE** [src device:filename.ext] [dest device:filename.ext].
[src dev:filename.ext]	Device indicates on which device the file resides. Filename, max 8 characters and.ext max 3 characters.
[dest dev:filename.ext]	Device indicates on which device the moved file will be placed.Filename, max 8 characters and .ext max 3 characters.

Delete file

Allows you to delete a file:

Syntax:	**DELETE** [dev:filename.ext]
[dev:filename.ext]	Device indicates on which device the file resides. Filename, max 8 characters and.ext max 3 characters.

Rename File

Allows you to rename a file:

Syntax:	**RENAME** [old dev:filename.ext] [new filename.ext]**.**
[old dev:filename.ext]	Device indicates on which device the original file resides. Filename, max 8 characters and.ext max 3 characters.
[new filename.ext]	New filename, max 8 characters and.ext max 3 characters

Backup configuration

This command copies all active configuration announcement files to the specified destination.:

Syntax:	**BACKUP** [destination]
[destination]	This can be one of the following, device: - logical storage device A:, B: or C:. ANALOG0 - Analogue output port 0 ANALOG1 - Analogue output port 1

Restore configuration

This command restores files that were backed up using the BACKUP command. Only files that were backed up to a logical device can be restored:

Syntax:	**RESTORE** [device:]
[device:]	Device indicates on which device the backed up file resides.

Software upgrade

This command upgrades the MIRAN operating system and application software to the version stored on the specified device:

Syntax:	**SW_UPGRADE** [device:]
[device:]	Device indicates on which device the new software resides.

Run Batch File

Allows you to run batch files:

Syntax:	**RUN** [device:filename.BAT]
[device:filename]	Device indicates on which device the file resides. Filename, max 8 characters. The extension.BAT will be assumed.

Make a directory

Use this command to create a directory on a particular drive.

Syntax	**MKDIR** [device:directory]
[device:	The drive you want to make the directory on, either A:, B:, or C:.
directory]	The name you want the directory to have.

Remove a directory

Use this command to remove a directory from a particular drive.

Syntax	**RMDIR** [device:directory]
[device:	The drive you want to remove the directory from, either A:, B:, or C:.
directory]	The name of the directory you want to remove/

Erase a directory

Use this command to remove a directory *and* its contents from a particular drive.

Syntax	**ERASE_DIR** [device:directory]
[device:	The drive you want to remove the directory from, either A:, B:, or C:.
directory]	The name of the directory you want to erase.

Copy royalty-free music and online NTP to drive C:

Use this command to copy the files, MUSIC.SBC and MIRANII.PDF, from drive A: or drive B: to drive C:.

Syntax	**SETUP_C** [device]
[device]	The drive you want to copy the files from, either A: or B:.

Copy TUI voice prompts to a directory

This command copies the TUI voice prompts to a directory.

Syntax:	**SETUP_PROMPTS** [device:directory]
[device:	The drive you want to copy the prompts to, either A:, B:, or C:.
directory]	The name of the directory you want the prompts in.

Change the companding law

Use this command to change the companding law (A-law or μ-law) of the external channels.

Syntax	**SWAP_LAW**

Comment

This allows you to write comments:

Syntax:	#
	If the first character of a command string is “#” then the string is assumed to be a comment and is ignored.

Miscellaneous Commands

These commands configure and display time and date parameters.

Set Time and Date

This command sets the time *and* date on the MIRAN pack:

Syntax:	**LOCAL_TIME** [Time] [Date]
[Time]	Time of day in hours and minutes (hh:mm).
[Date]	The date (dd/mm/yyyy).

Set Time of Day

This command sets the time of day:

Syntax:	**SETTIME** [HH:MM]
[HH:MM]	Time of day in hours and minutes**.**

Set the date

This command sets the date for the internal calendar:

Syntax:	**SETDATE** [day of month / month / year]

Configure System Time & Date synchronization

This command sets the parameters for System Time & Date synchronization.

Syntax:	**SYSTEM_TIME** [enabled] [IP address] [TTY username] [TTY password] [frequency] [time]
[enabled]	Must be 'true' for System Time & Date synchronization to work.
[IP address]	The IP address of the Meridian 1 system.
[TTY username]	The username that you use to access the Meridian 1 switch through the embedded LAN.
[TTY password]	The password that you use to access the Meridian 1 switch through the embedded LAN.
[frequency]	The number of days between each synchronization attempt, from 1 to 7 days.
[time]	The time of day you want the MIRAN to attempt to synchronize with the Meridian 1 switch. Set the time for the period of *lowest* technician use.

Display Day and Time

Shows the current day-of-week and time.

Syntax: **TIME**

Show Pack Status

Shows the pack status screen.

Syntax: **STATUS**

Show Statistics

Shows the current statistics for channel usage.

Syntax: **STATS**

Save Statistics

Saves the current operational statistics to a file.

Syntax:	**SAVESTATS** [dev:filename.type]
[dev:filename.type]	Device indicates to which drive you want to save the file. The filename is 8 characters.

Clear Statistics

Resets all of the statistics values to zero.

Syntax: **RESETSTAT**

Cold reset

This command activates a cold reset of the MIRAN pack.

Syntax: **COLD_RESET**

Warm reset

This command activates a warm reset of the MIRAN pack.

Syntax: **WARM_RESET**

Turn polling on

This command turns 8051XA polling on.

Syntax: **POLLING_ON**

Turn polling off

This command turns 8051XA polling off.

Syntax: **POLLING_OFF**

Logoff

This command logs you out of the terminal OA&M.

Syntax: **LOGOFF**

MIRAN Batch File Support

The MIRAN batch files are used to execute sequences of frequently used commands. The syntax of these commands is the same as for the command line. Comments are indicated by a "#" character in the left-most column.

Restrictions

The maximum number of lines per batch file (including comments) is limited to 255.

Commands and comments can not be mixed on the same line.

Batch file Example

Batch file INIT.BAT

Initial channel assignments

Copy speech file pls_hold from device A: to internal flash device C:

COPY A:PLS_HOLD.ULW C:

Assign "please hold" announcement to channel 0

ASSIGN MON 0 C:PLS_HOLD.ULW 00:00

Assign music connected to analogue port 0 to channel 1

ASSIGN MON 1 ANALOG0 00:00

Setting up emergency announcements quickly

Unfortunately, situations can arise where you must set up an emergency announcement that must play on all channels and override all other announcements. MIRAN Release 2.0 provides an easy way to do this, using the telephone user interface (TUI).

To set up an emergency announcement on all channels, do the following:

1. Log into the TUI.
2. Record the emergency announcement.
3. Assign the emergency announcement to all channels.

   Note: This assignment through the TUI overrides any previous assignments.

4. Once the crisis has passed, delete the TUI assignment through the browser or text-based user interface screens. This returns the MIRAN to normal operation.

Note: For instructions on using the TUI, refer to “RAN Application: Telephone User Interface (TUI)” on page 209.

RAN Application: Telephone User Interface (TUI)

This chapter describes the MIRAN telephone user interface (TUI), which you can use to perform certain OA&M functions.

To enable the TUI, you must first do the following:

— load Overlay 16 to build a DID route (See “Configuring the DID route for the TUI” on page 79.)

— load Overlay 14 and configure port/channel 7 of the MIRAN card as a DID trunk (See “Configuring the MIRAN trunks” on page 80.)

— enter the keycode for the MIRAN card (See “The Keycode Entry screen” on page 166.)

— ensure that the configuration variable, ‘SetBasedAccess’, is set to TRUE (See “The Configuration Variables menu” on page 170.)

The TUI reduces the number of MIRAN ports available for RAN or music from eight to seven. Because there is no messaging between MIRAN cards, you must reserve port 7 for the TUI on each MIRAN card that requires this interface.

> ***Note:*** If a MIRAN card does not require the TUI, then all eight ports on the card are available for RAN or music.

Description

A telephone user interface (TUI) within the MIRAN application allows you to access the application from any local Dual Tone Multiple Frequency (DTMF) telephone.

> ***Note:*** The DTMF telephone must have an 'unrestricted' Class of Service' to access the TUI.

The TUI uses a series of simple voice menus and prompts for quick modification of announcements and other simple tasks. You must handle extensive changes through the text-based user interface or the browser user interface (BUI).

The TUI enables you to do the following:

— record new announcements

— play announcements

— assign and unassign announcements to MIRAN ports

— access the MIRAN card security ID

You *cannot* do the following through the TUI:

— set the MIRAN card clock

— assign time-of-day restrictions to announcements

— access system configuration functions

— change passwords

You cannot access the TUI while another uses the text-based user interface.

The TUI allows you to login and issue specific commands through the dialpad of your Meridian Digital Telephone or any standard DTMF telephone. For security, login requires a valid user name and password, which the administrator supplies. The MIRAN card does not identify itself until you enter a valid user name and password. The following pages describe the TUI menus.

Restrictions on TUI access

Toll calls (i.e., dialing 0 or 1 as the first digit) to the TUI channel disconnect automatically if the NATL response in LD 16 is YES. The same thing happens when the NFCR response is YES in LD 15. Set *both* prompts to NO to allow toll calls to the TUI. Also, you must set CLS = UNR in LD 11 to enable a DTMF telephone access to the TUI.

Using the telephone user interface

To perform application tasks over the DTMF telephone, you must use the dialpad. You can press specific digits on the dialpad to login and issue specific commands, which the following paragraphs describe.

Login

To login to your MIRAN card, do the following:

1 Go off-hook.

2 Dial the DID route access code of the MIRAN card.

3 At the voice prompt, enter '**#**', then your user name followed by '*****'. The default user name is "**8737**" (= "user").

4 At the next voice prompt, enter your password followed by '*****'. The default password is "**87370000**" (= "user0000").

If the login is valid, the TUI brings you to the Main menu. If the login is *not* valid after three attempts, the system disables your access for 20 minutes.

There are four conditions that can prevent a user's access to the MIRAN card through the TUI:

— Another person is using the text-based user interface.

— The user has made three invalid login attempts.

— NCOS, TGAR, or the class of service (e.g., CLS = TENA) is restricted.

— The configuration variable 'SetBasedAccess' is set to 'FALSE'.

Navigating the Main menu

When you enter the Main menu, a recorded announcement lists your options for this menu. At the Main Menu, you can do the following:

— Dial 1 to assign the current announcement to a channel.

— Dial 2 to play the current announcement.

Note: When you first login, the current announcement is the same as the first announcement within the available disk volumes.

— Dial 3 to review channel assignments.

— Dial 4 to go to the previous announcement.

— Dial 5 to record an announcement.

— Dial 6 to go to the next announcement.

— Dial 76 to delete the current announcement.

Note: When you dial 76 to delete the current announcement, you also remove all channel assignments that use the announcement.

— Dial 8 to hear the 8-digit MIRAN security ID.

— Dial * to stop an announcement that is playing.

Note: If no announcement is playing, dialing * saves any announcements that you have made and logs you off of the TUI.

— Dial 9 to hear the list of options again.

Recording an announcement

Through the TUI, you can record an announcement, which you can assign to channels either through the TUI, the text-based user interface, or the BUI. To record an announcement, do the following:

1 At the Main menu, dial 5 to enter the Record menu.

2 At the Record menu, dial 5 to begin recording.

3 Dial * to end recording.

Note: If you reach the drive capacity *while* you are recording, the recording stops automatically.

4 Dial 2 to review the announcement, and/or dial 5 to record the announcement again. (This step is optional.)

5 Dial 1 to save the announcement.

When you save the announcement, MIRAN assigns it a filename of the form "ANNxxxxx", where "xxxxx" is the announcement number. MIRAN adds the announcement to the first disk volume with available space of at least 64 kbytes or 8 seconds of recording. The TUI then returns you to the Main menu.

Note: Except while you are recording an announcement, you can dial 9 for help and * to return to the Main menu.

Assigning an announcement

Through the TUI, you can assign an announcement to one or more channels (0 to 7, 90, or 91). It is not recommended that you assign an announcement to channel 7, because the MIRAN card uses channel 7 for the TUI.

> ***Note:*** You can assign an announcement to channel 7, but it won't play unless you reprogram channel 7 as a RAN trunk.

Table 12 lists the internal and cross-connect MIRAN ports/channels.

Table 12
Port/channel number assignments for the telephone user interface

Channel Number	Description
0	Internal one-to-one port/channel
1	Internal one-to-one port/channel
2	Internal one-to-one port/channel
3	Internal one-to-one port/channel
4	Internal one-to-one port/channel
5	Internal one-to-one port/channel
6	Internal one-to-one port/channel
7	Internal one-to-one port/channel (used for TUI access).
90	Cross-connect channel (**A0** for text-based access configuration)
91	Cross-connect channel (**A1** for text-based access configuration)

To assign an announcement to a channel, do the following:

1 At the Main menu, dial 2 to know what the current announcement is. (This step is optional.)

2 At the Main menu, dial 1 to enter the Assignment menu.

3 Enter the list of channels you must assign the announcement to. (Dial * after each channel to separate it from the next channel.)

4 Dial * a second time to end the list.

For example, at the Assignment menu enter

2*3*90**

to assign the current announcement to internal channels 2 and 3 and external channel 90 (A0). If the channel assignment is not valid, the TUI asks you to try again. If the channel assignment is valid, the MIRAN card clears *all* TUI assignments to the selected channels and assigns the current announcement to them. The TUI announces a successful assignment and returns you to the Main menu.

Note: Announcement assignments through the TUI cannot include time and date restrictions. To restrict an announcement on a channel to particular times and days, make the assignment through the text-based user interface or the BUI.

Retrieving channel information

Through the TUI, you can query the MIRAN card for information about its channels. In the Channel Information menu, you can hear the announcements that are assigned to each channel.

Dial 3 at the Main menu to enter the Channel Information menu. At the Channel information menu, you have the following options:

— Dial 4 to go to the previous channel.

— Dial 6 to go to the next channel.

— Dial 76 to unassign any announcement from the current channel.

— Dial 9 for help.

— Dial * to return to the Main menu.

Unlike deleting an announcement in the Main menu, dialing 76 in the Channel Information menu only unassigns the announcement from the current channel. Dialing 76 in the Channel Information menu does not delete the announcement.

Example of using the TUI

Table 13 lists the steps you follow to record and assign an announcement through the TUI.

Table 13
An example of using the TUI

Step	User action	MIRAN response	Comments
1	Go off-hook.	Not Applicable	
2	Dial the access code for the MIRAN card.	Voice prompt for user name	
3	Enter #, followed by the user name and *.	Voice prompt for user password	
4	Enter the password, followed by *.	“Main Menu”	You receive a “Login incorrect” message for wrong input.
5	Dial 5 to access the Record menu.	Voice menu of options available	
6	Dial 5 to record the announcement.	<BEEP>	Records one announcement into a temporary file.
7	Dial * to stop recording.	Menu of available options	Recording stops.
8	Dial 2 to verify the announcement.	Plays announcement from temporary file	If the announcement is acceptable, save it.
9	Dial 1 to save the announcement.	“Announcement saved as announcement *xxxxx*”; “Main Menu”	The announcement is saved to storage and becomes the currently selected announcement.
10	Dial 1 to assign the announcement to MIRAN port(s).	“Assignment menu. Enter a list of channels separated by star. End the list with an extra star.”	
11	Enter list of channels separated by *. (Follow last channel by **)	“Assignments made”; “Main Menu”	The MIRAN assigns the announcement to the selected channels(s).
12	Dial * to exit MIRAN.	“Good-bye”	The TUI disconnects you from the MIRAN.
13	Go on-hook.	Not Applicable	

Voice prompts

Table 14 lists voice prompts and corresponding voice prompt IDs.

Table 14
TUI voice prompts (Part 1 of 3)

Prompt ID	Prompt content
0-31	"Zero" to "thirty one"
32	"Analog ..." as in "**Analog** Zero."
33	"Channel ..." as in "**Channel** 5."
34	<BEEP>
35	"Access is currently disabled."
36	"Please try again later."
37	"Goodbye."
38	"Please enter your user name followed by star."
39	"Please enter your password followed by star."
40	"Three login attempts have failed. Access will be temporarily disabled."
41	"Login incorrect."
42	"Please try again."
43	"Main menu."
44	"Commands you can use are: Assign 1, play 2, record 5, delete 7-6, ID 8."
45	"To go to the next announcement, press 6."
46	"To go to the previous announcement, press 4."
47	"To exit, press star."
48	"There are no announcements available."
49	"Start of list."

Table 14
TUI voice prompts (Part 2 of 3)

Prompt ID	Prompt content
50	"End of list."
51	"Pack ID is ..." as in "**Pack ID is** 1-0-0-0-1-2-3-4."
52	"That option is not available."
53	"For help, press 9."
54	"Assignments saved."
55	"Assignment menu."
56	"Enter a list of channels, separated by star. End the list with an extra star."
57	"Invalid assignment."
58	"You do not have access to the following channels:"
59	"Assignments made."
60	"Record menu."
61	"To begin recording, press 5. To end recording, press star."
62	"Drive capacity exceeded."
63	"Error saving announcement."
64	"Recording stopped."
65	"To save the announcement, press 1. To review it, press 2. To re-record it, press 5."
66	"Announcement saved as announcement..."
67	"Error deleting announcement."
68	"Announcement deleted."
69	"Channel Information Menu."
70	"For Channel Information, press 3."

Table 14
TUI voice prompts (Part 3 of 3)

Prompt ID	Prompt content
71	"To review the current channel, press 2."
72	"To go to the next channel, press 6."
73	"To go to the previous channel, press 4."
74	"To unassign the current channel, press 7-6."
75	“There is no announcement assigned to this channel.”
76	“Assignment cleared.”
77	"Welcome to Miran."
78	"Assignment cleared on channel..."
79	“OK”
80	"... and ..."
81	"... to ..."
82	"You have access to the following channels :"
83	"Invalid channel assignment."
84	"All internal channels."
85	"All external channels."
86	"Channels ..."
87	"Analog Zero."
88	"Analog One."
89	"Assignments cleared on channel ..."
90	“Assignments cleared on...”

TUI flowcharts

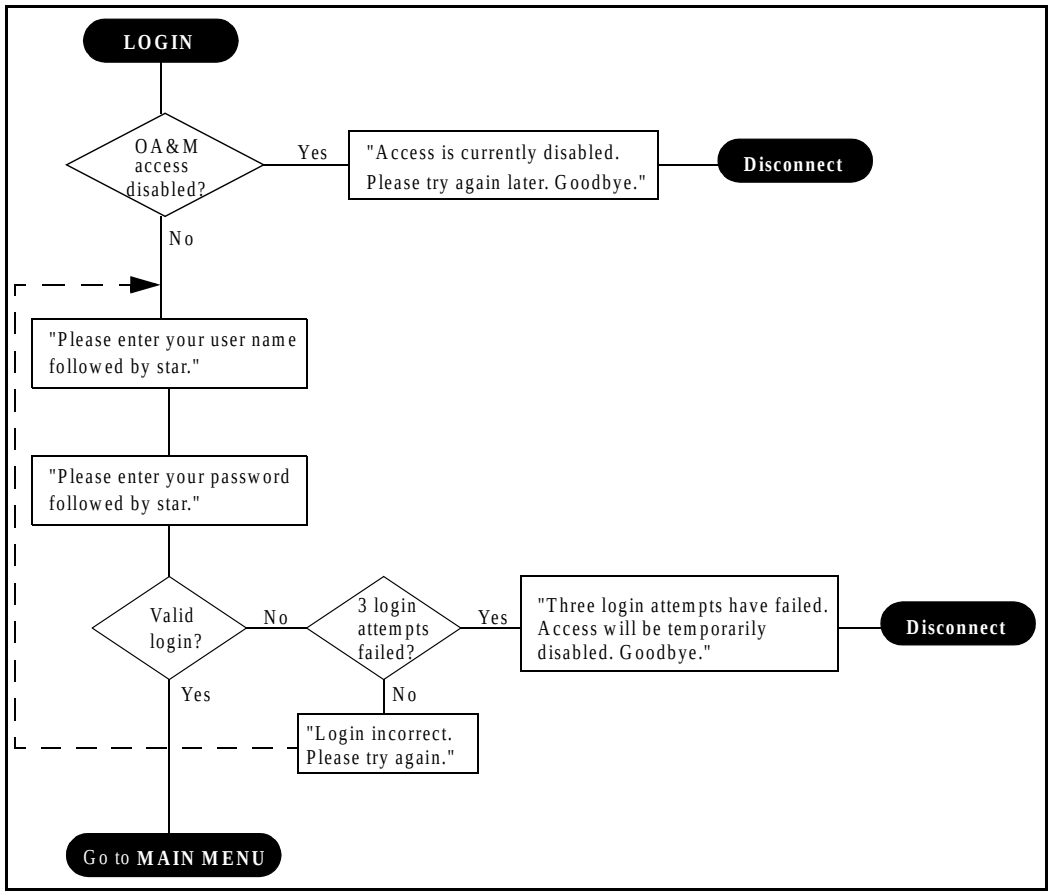
Refer to the TUI flowcharts on the following pages for further information on these TUI functions:

- Login (Figure 70 on page 221)
- Main menu (Figures 71 and 72 on page 222 and page 223)
- Record menu (Figures 73 and 74 on page 224 and page 225)
- Assignment menu (Figure 75 on page 226)
- Channel Information menu (Figure 76 on page 227)
- Delete menu (Figure 77 on page 228)

Login flowchart

Enter your user name and password to access the MIRAN TUI.

Figure 70
TUI Login flowchart



Main menu

Figure 71
TUI Main menu flowchart (Part 1 of 2)

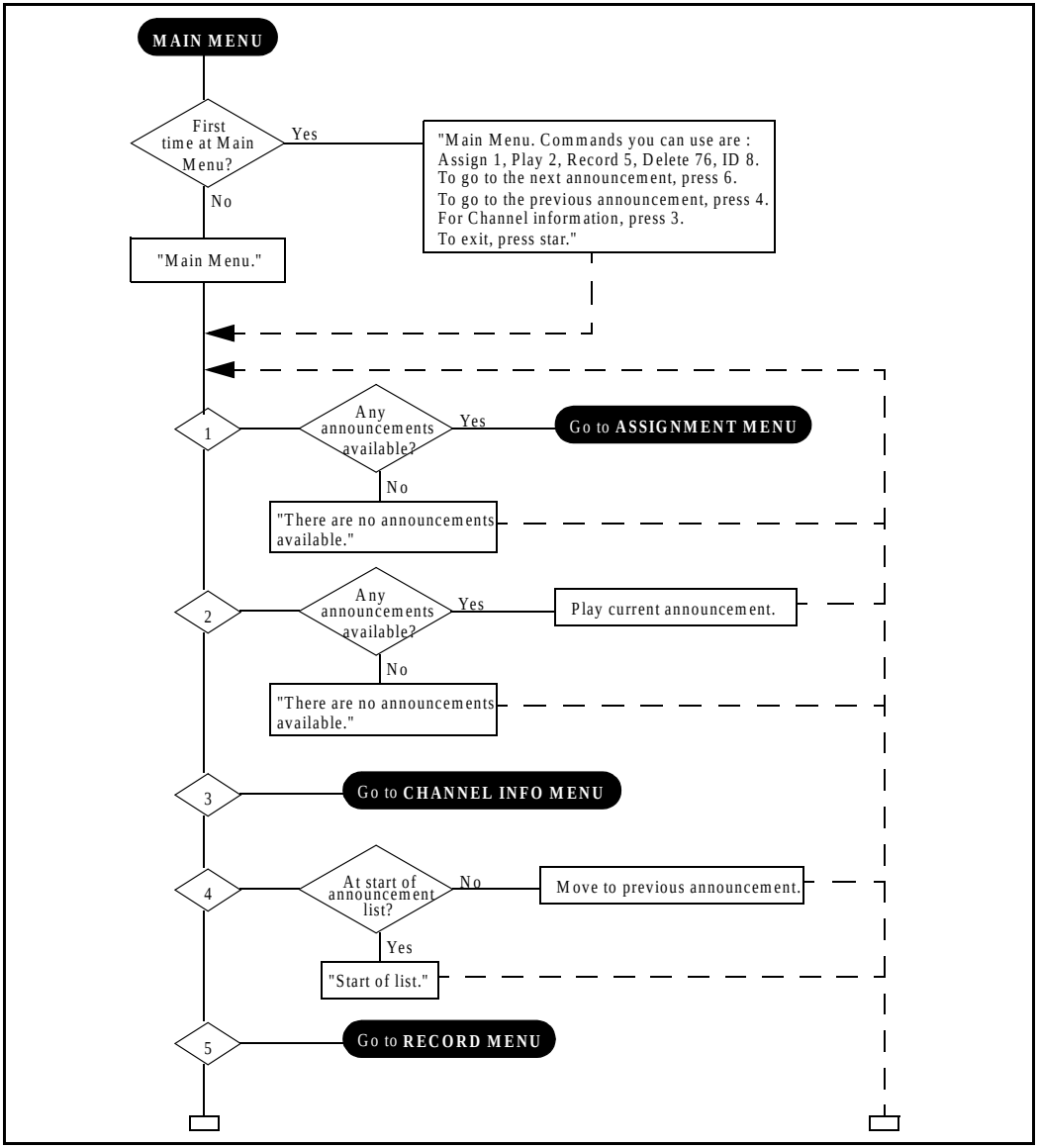
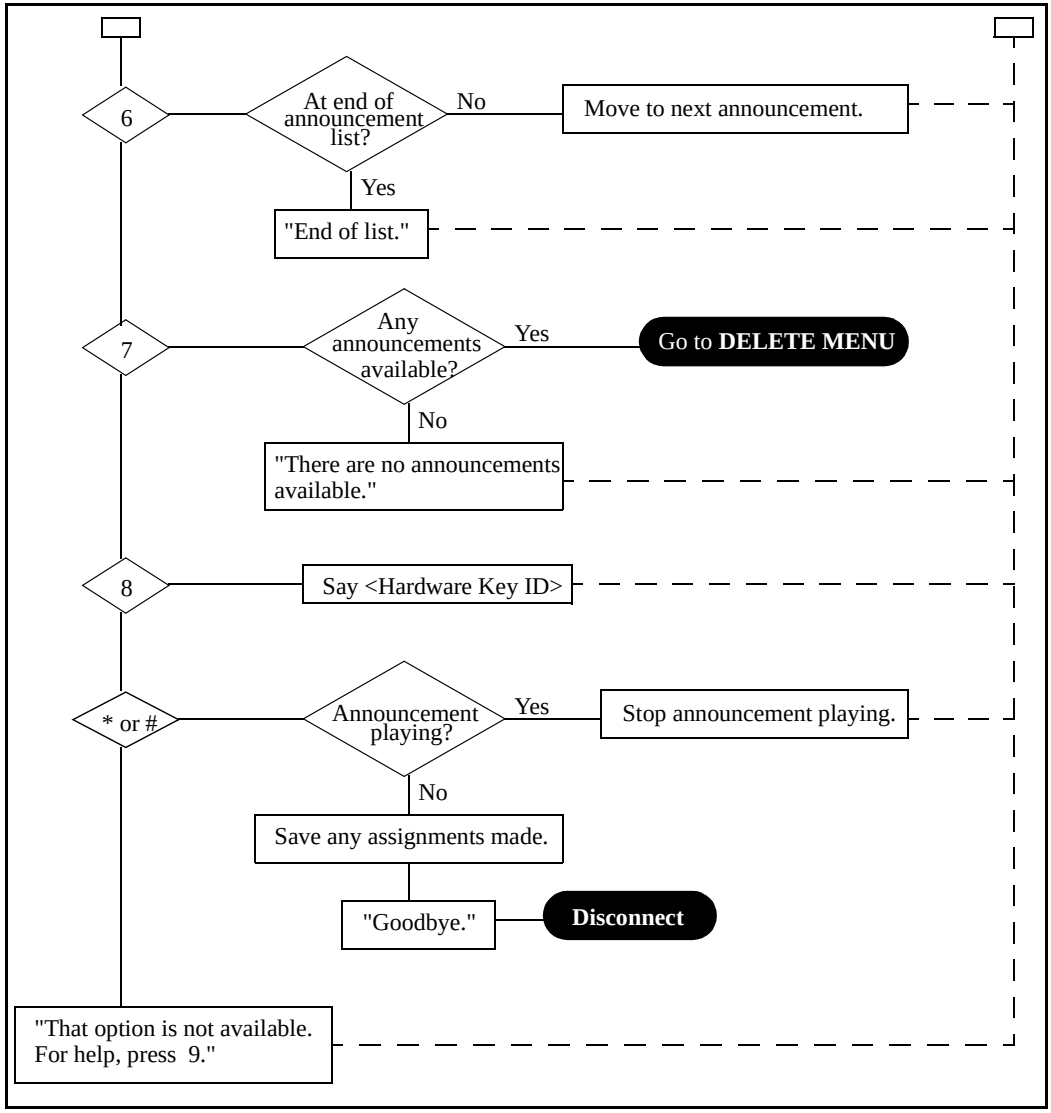


Figure 72
TUI Main menu flowchart (Part 2 of 2)



Record menu

Dial 5 in the Main menu to access the Record menu. This function allows you to record announcements.

Figure 73
TUI Record menu flowchart (Part 1 of 2)

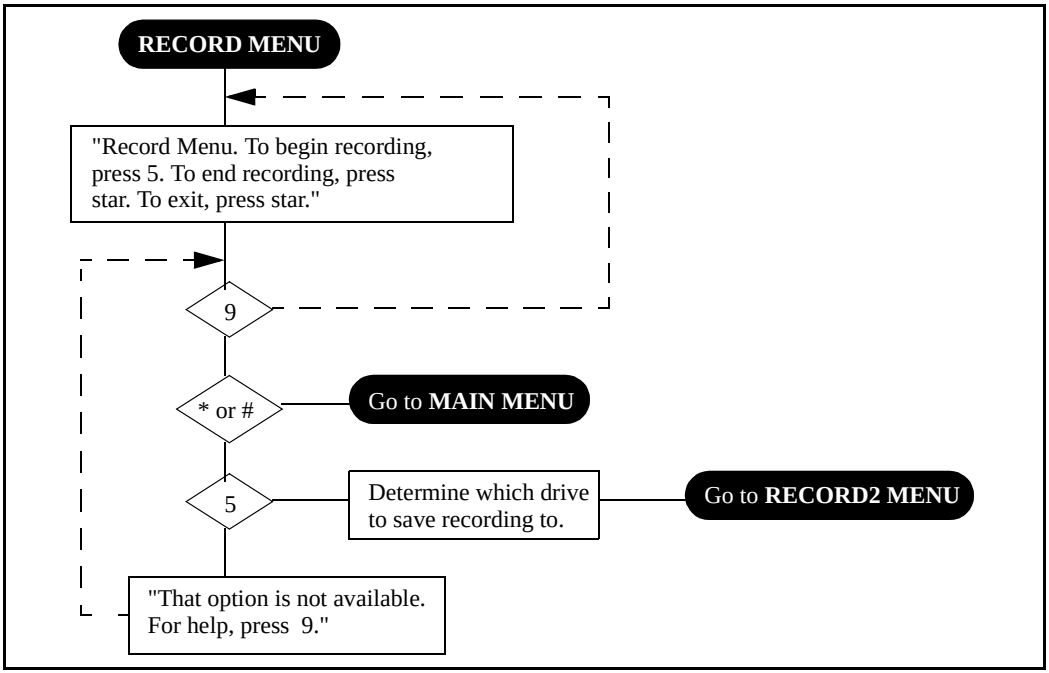
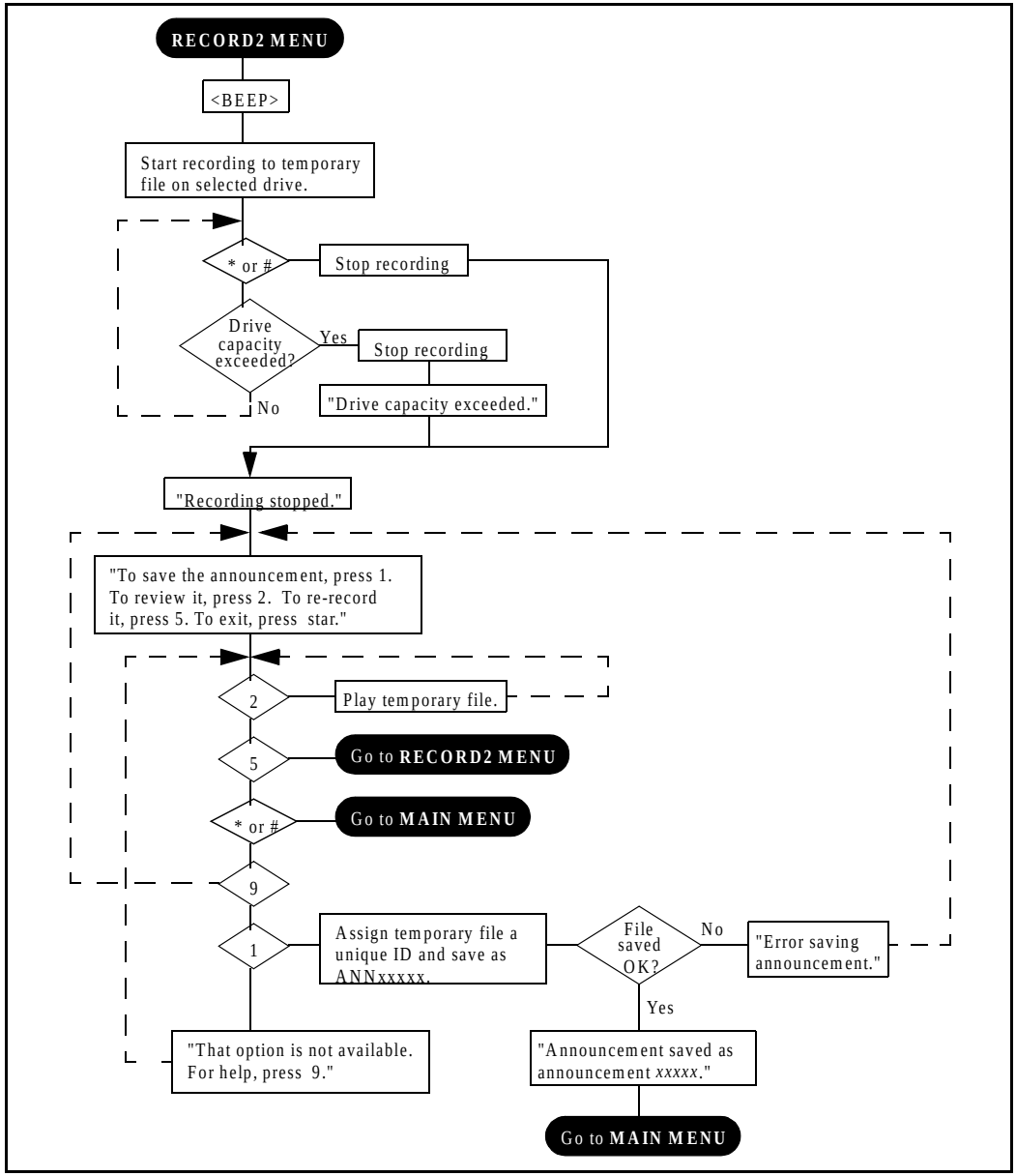


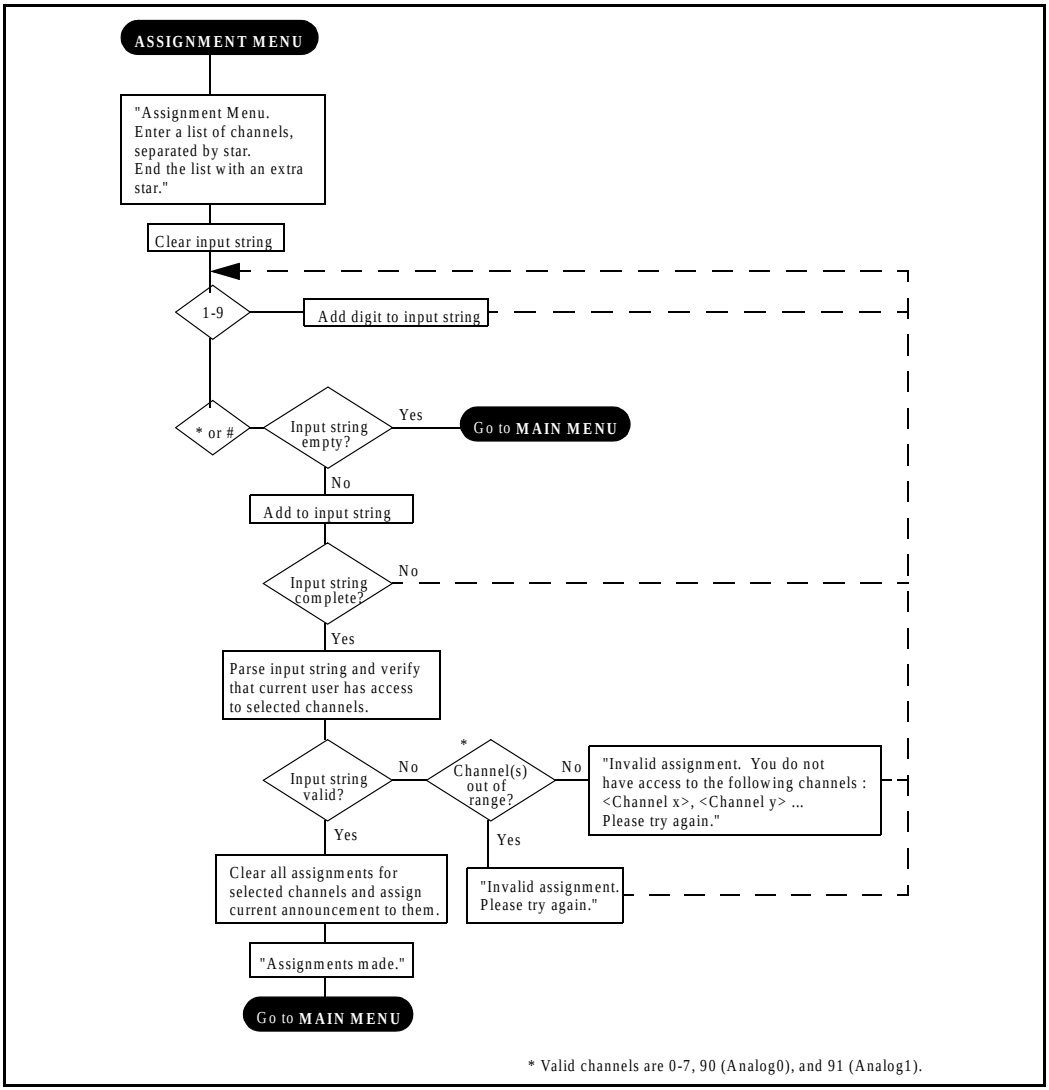
Figure 74
TUI Record menu flowchart (Part 2 of 2)



Assignment Menu

Dial 1 in the Main menu to access the Announcement menu. This function allows you to assign announcement to MIRAN channels.

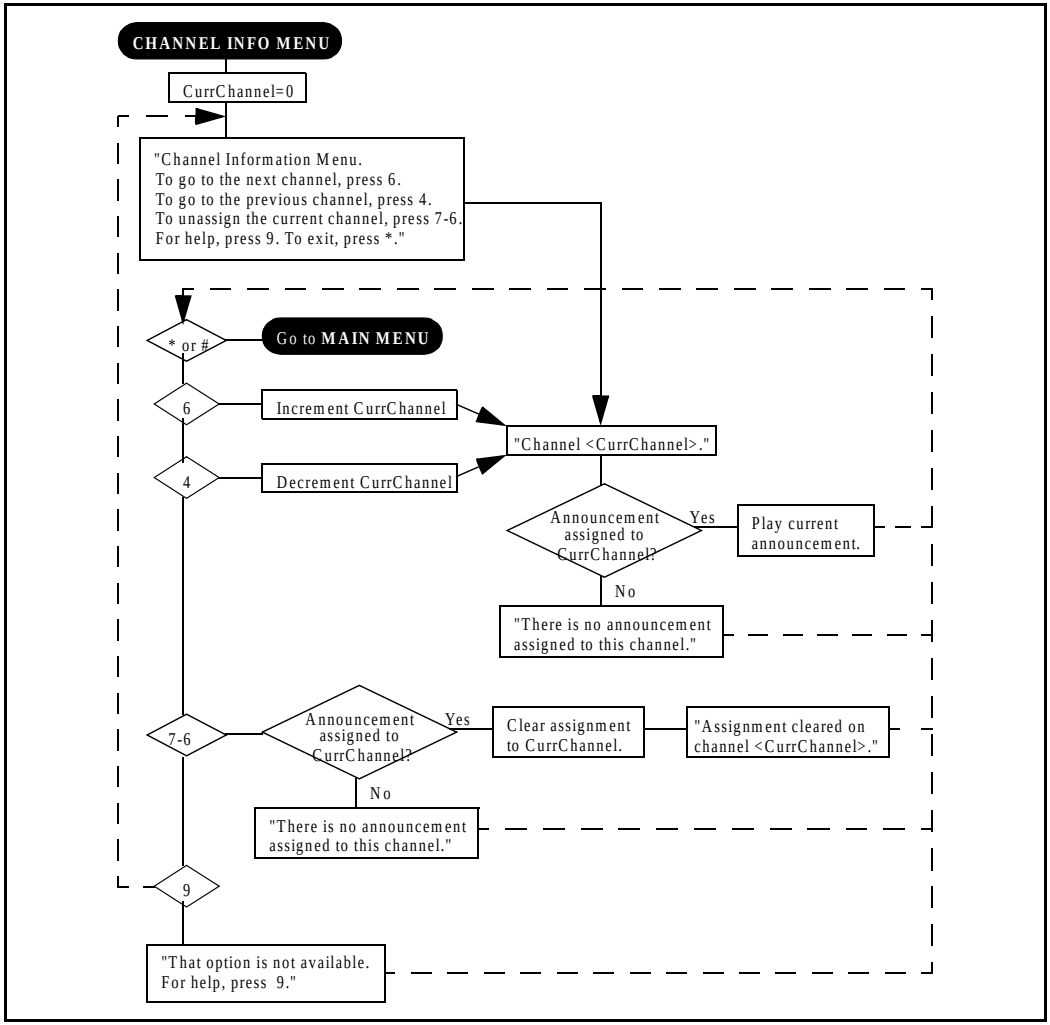
Figure 75
TUI Assignment menu flowchart



Channel Information menu

Dial 3 at the Main menu to access the Channel Information menu. This function allows you to hear the announcement that is assigned to a MIRAN channel. This function also allows you to remove an announcement from a channel.

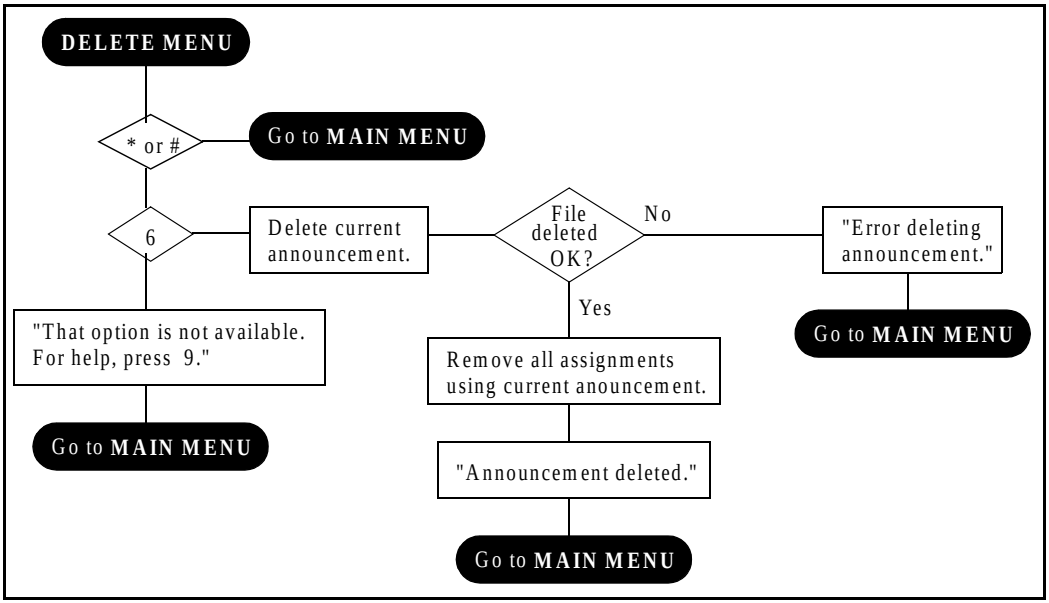
Figure 76
TUI Channel Information menu flowchart



Delete Menu

Dial 7 in the Main menu to access the Delete menu. This function allows you to delete the announcement.

Figure 77
TUI Delete menu flowchart



RAN Application: The Browser User Interface (BUI)

This section describes the browser user interface (BUI) for the MIRAN Release 2.0 card. The BUI is an option available to MIRAN Release 2.0 users who have connected the MIRAN card(s) to their LAN through the necessary Ethernet adapter. For equipment and configuration information regarding the MIRAN BUI, refer to “Ethernet access installation and setup” on page 106.

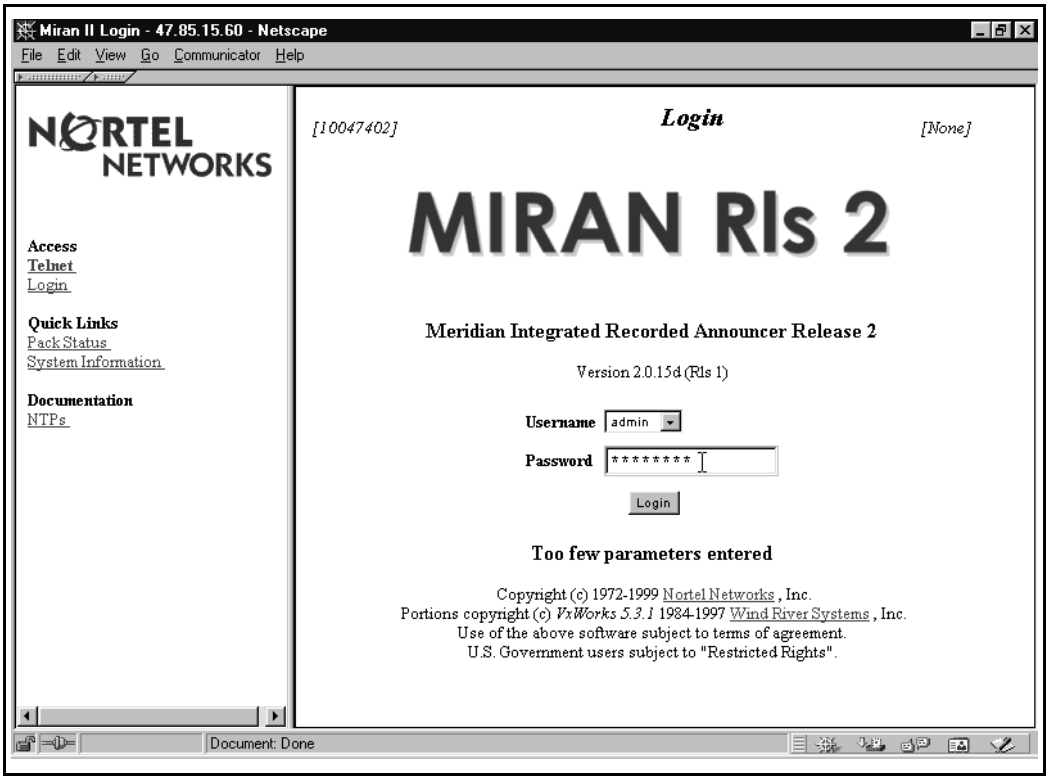
You do not need the BUI to perform OA&M for the MIRAN Release 2.0 card. You can perform all of the OA&M functions through the text-based user interface (see “RAN Application: Text-based user interface” on page 127) and the telephone user interface (see “RAN Application: Telephone User Interface (TUI)” on page 209). The MIRAN BUI allows you to access the MIRAN Release 2.0 card through your LAN using a common web browser. For the web browser, Nortel Networks recommends you use Netscape 3.0 or later or Internet Explorer 3.0 or later.

> ***Note:*** Any web browser you use must support HTML frames and JavaScript V1.1.

Accessing the BUI

To access the MIRAN Release 2.0 card through the web browser, enter the IP address of the card in the URL address field. Figure 78 shows the initial screen that appears when you enter the MIRAN Release 2.0 BUI.

Figure 78
MIRAN Release 2.0 BUI, initial screen



The initial screen consists of two frames. The left frame provides hyperlinks to common features. The right frame is the login screen and is equivalent to the login screen of the text-based user interface.

The hyperlinks in the left frame of the initial screen are as follows:

Telnet launches the browser-based telnet client. This link provides Ethernet access to the text user interface.

Login brings up the Login screen in the right frame if it is not already there.

Pack Status provides information on the current state of the MIRAN card. You do not need to login to access this information.

System Information provides details of the current MIRAN hardware configuration and software version. Refer to "System Information" on page 242 for further information.

NTPs opens the MIRAN Release 2.0 NTP, which is stored on the C: drive. To open the NTP, your browser must contain an Adobe Acrobat reader. Refer to your browser documentation for details on how to open Adobe Acrobat (.pdf) files.

Note: You can delete the NTP (filename = MIRAN.PDF) to open additional storage space on drive C:. Refer to "The Delete File screen" on page 163 for details on how to do this.

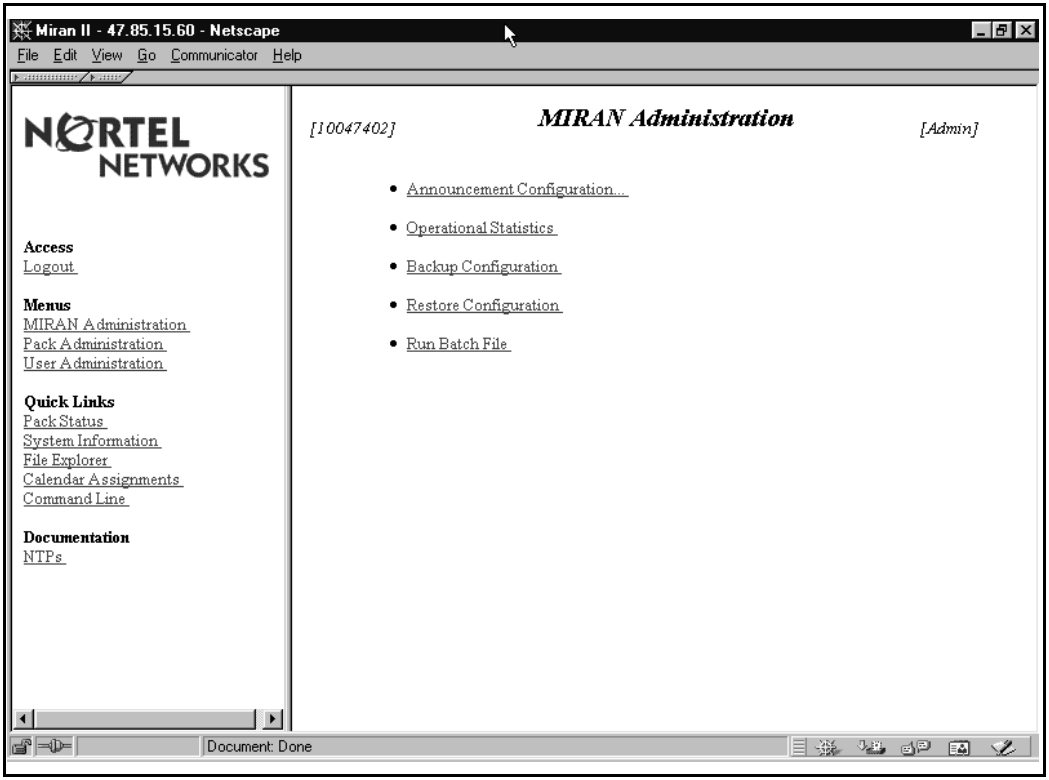
Logging into the BUI

To log into the MIRAN Release 2.0 BUI, do the following:

1. Select the user name from the drop down list.
2. Enter the appropriate password. The initial default user names and passwords are the same as those for the text-based user interface.
3. Click on the **Login** button. If the user name and password are valid, a confirmation message appears.
4. Click on **Main Menu** to access the Main Menu, which Figure 79 on page 232 shows.

Note: If you have three unsuccessful login attempts, the BUI locks you out for 20 minutes.

Figure 79
MIRAN Release 2.0 BUI, MIRAN Administration screen



Navigating the BUI

The main OA&M page consists of two frames. The left frame is always the same and provides links to the MIRAN OA&M functions. Notice that there are more links available once you have logged in than before you logged in. The links in the left frame fall under the following categories:

— **Logout**, brings you to the logout screen.

— **Menus**, which is a collection of links to the main MIRAN OA&M menus. These menus provide further links to OA&M screens. Refer to "The BUI menus" on page 233 for more information.

— **Quick Links**, which is a collection of links to the most common OA&M screens. Refer to "The BUI quick links" on page 246 for more information.

— **Documentation**, which is a link to the online documentation. To open the NTP, your browser must contain an Adobe Acrobat reader. Refer to your browser documentation for details on how to open Adobe Acrobat (.pdf) files.

The right frame of the main OA&M page shows the MIRAN menus and screens where you can perform OA&M functions. You can access these menus and screens by clicking on the appropriate link either in the left frame or in the selected menu. The MIRAN Administration menu appears first when you log in.

The following sections describe the menus and screens in the MIRAN Release 2.0 BUI.

The BUI menus

The Menus links in the left frame of the MIRAN Release 2.0 BUI consist of the following:

— MIRAN Administration

— Pack Administration

— User Administration

— Logout

From any place in the BUI, you can access one of these menus simply by clicking on its link.

MIRAN Administration menu

The MIRAN Administration menu appears first when you log in. Refer to Figure 79 on page 232 for a picture of this menu. The MIRAN Administration menu consists of links to the following:

— Announcement Configuration

— Operational Statistics

— Backup Configuration

— Restore Configuration

— Run Batch File

Announcement Configuration

Figure 80 shows the Announcement Configuration screen.

Figure 80
MIRAN Release 2.0 BUI, Announcement Configuration screen

Calendar Operations menu In the Announcement Configuration screen, click on **Calendar Operations** to access the Calendar Operations screen, which Figure 81 shows.

In the Calendar Operations screen, click on **Calendar Assignment with Descriptor** to access that particular screen, which Figure 82 shows. Use this screen to make descriptor-based assignments to any of the available channels. The operation of this screen is identical to its text-based equivalent. For convenience, however, this screen also provides a drop-down list of all available announcement files.

Figure 81
MIRAN Release 2.0 BUI, Calendar Operations screen

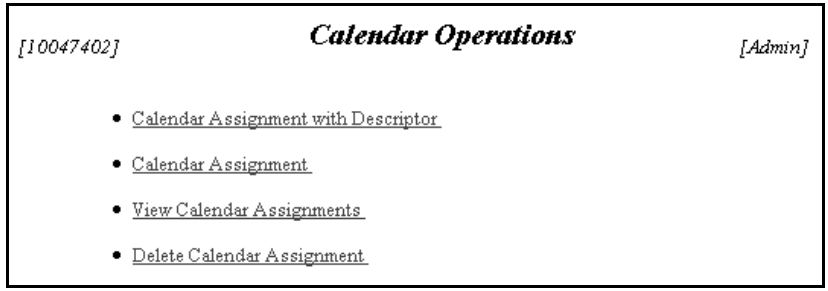
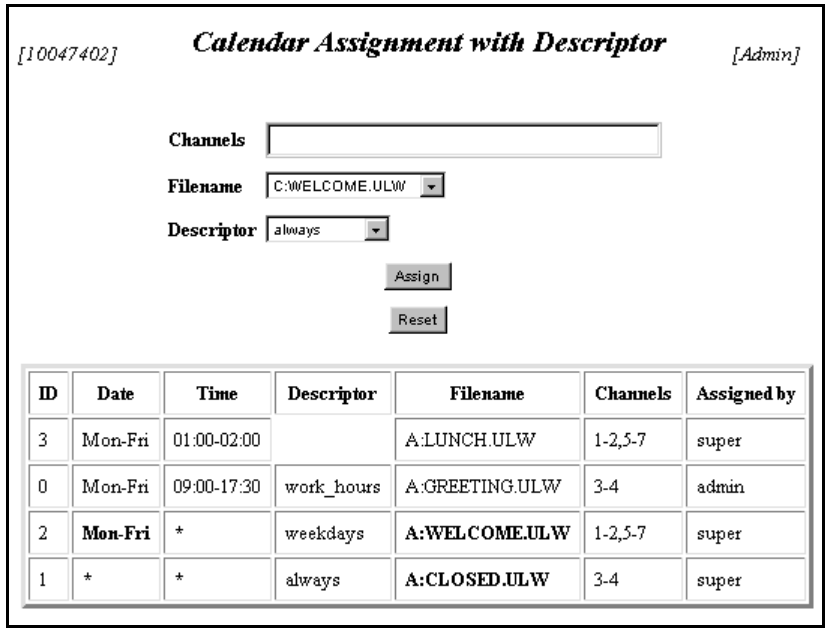
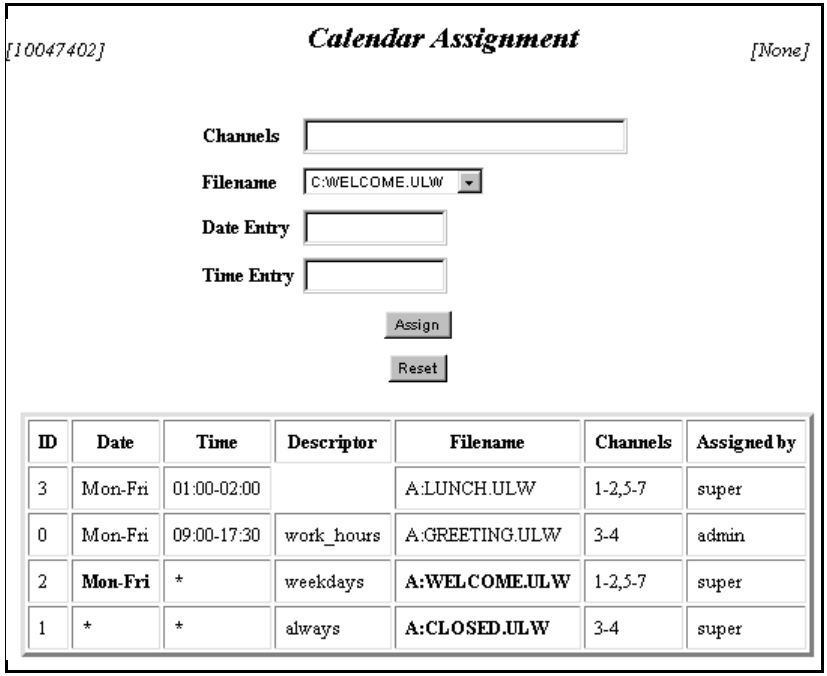


Figure 82
MIRAN Release 2.0 BUI, Calendar Assignment with Descriptor screen



In the Calendar Operations screen, click on **Calendar Assignment** to access that particular screen, which Figure 83 shows. Use this screen to make time and date-based assignments to any of the available channels. The operation of this screen is identical to its text-based equivalent. For convenience, however, this screen also provides a drop-down list of all available announcement files.

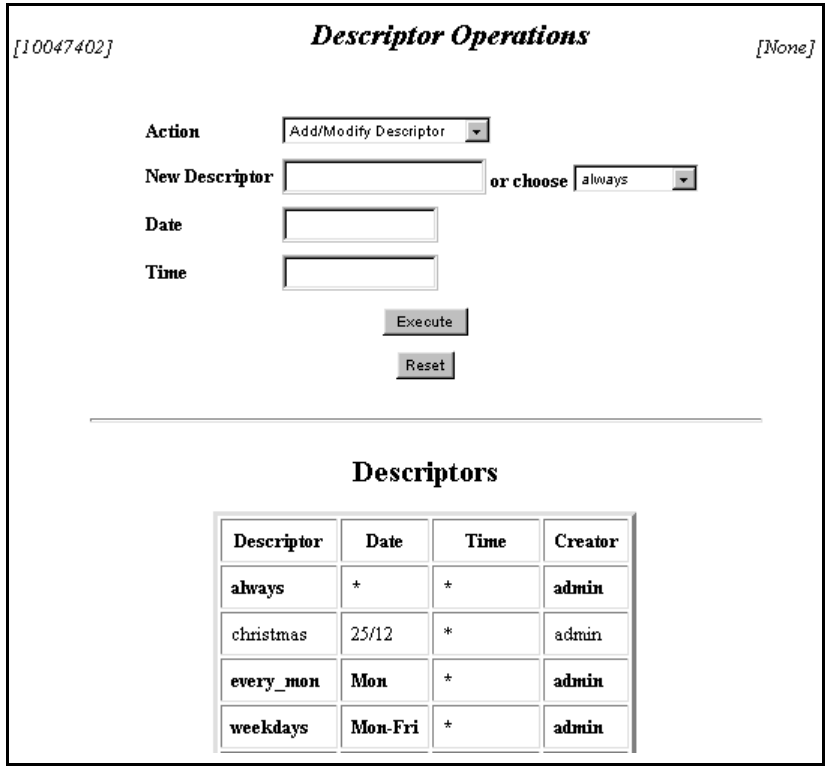
Figure 83
MIRAN Release 2.0 BUI, Calendar Assignment screen



In the Calendar Operations screen, click on **View Calendar Assignments** to view the current calendar assignments. Click on **Delete Calendar Assignment** to delete a particular calendar assignment. The operation of these functions is similar to their text-based equivalents.

Descriptor Operations screen In the Announcement Configuration screen, click on **Descriptor Operations** to access the Descriptor Operations screen, which Figure 84 shows. Use this screen to add, modify, or delete calendar descriptors. The same restrictions apply as for the text-based version of this screen.

Figure 84
MIRAN Release 2.0 BUI, Descriptor Operations screen



Convert Announcement screen In the Announcement Configuration screen, click on **Convert Announcement File** to access that particular screen, which Figure 85 on page 238 shows. The operation of this screen is identical to its text-based equivalent.

Operational Statistics

In the MIRAN Administration menu, click on **Operational Statistics** to access that particular screen, which Figure 86 on page 238 shows. The operation of this screen is identical to its text-based equivalent.

Figure 85
MIRAN Release 2.0 BUI, Convert Announcement screen

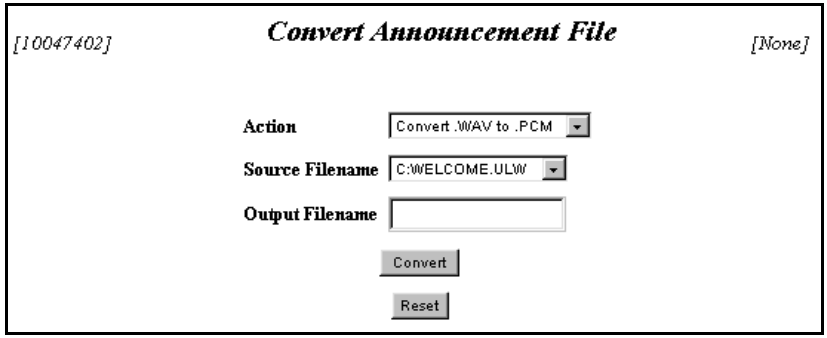


Figure 86
MIRAN Release 2.0 BUI, Operational Statistics screen

[10047402] **Operational Statistics** [None]

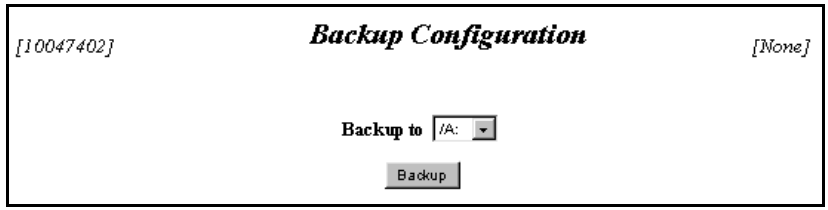
Channel	Total	Last Hour	Average	Last Day	Average	Last Week	Average
0	0	0	0	0	0	0	0
1	2	0	0	1	0	1	0
2	1	0	0	1	0	1	0
3	1337	0	133	0	0	0	0
4	1308	0	130	0	0	0	0
5	2014	71	201	650	0	650	0
6	1904	71	190	650	0	650	0
7	0	0	0	0	0	0	0

Action Save Statistics to File
Filename
Execute

Backup Configuration

In the MIRAN Administration menu, click on **Backup Configuration** to access that particular screen, which Figure 87 shows. The operation of this screen is identical to its text-based equivalent. Remember to select the appropriate destination drive from the drop-down box before you click on the **Backup** button.

Figure 87
MIRAN Release 2.0 BUI, Backup Configuration screen



Restore Configuration

In the MIRAN Administration menu, click on **Restore Configuration** to access that particular screen, which Figure 88 shows. The operation of this screen is identical to its text-based equivalent. Remember to select the appropriate destination drive from the drop-down box before you click on the **Restore** button.

Figure 88
MIRAN Release 2.0 BUI, Restore Configuration screen

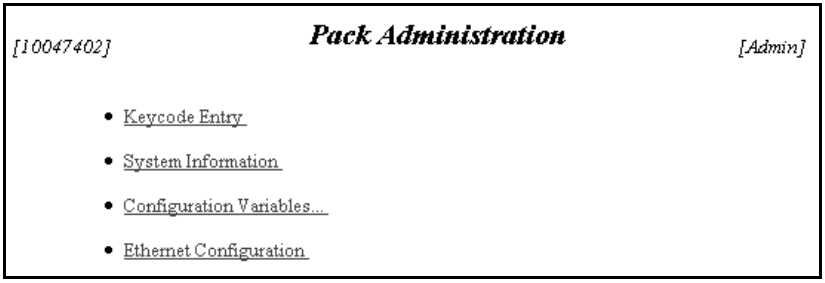
Run Batch File

In the MIRAN Administration menu, click on **Run Batch File** to run a batch file. The operation of this function is identical to its text-based equivalent.

Pack Administration menu

Click on **Pack Administration** in the left frame to access the Pack Administration menu, which Figure 89 shows.

Figure 89
MIRAN Release 2.0 BUI, Pack Administration menu



The Pack Administration menu consists of links to the following:

— Keycode Entry

— System Information

— Configuration Variables

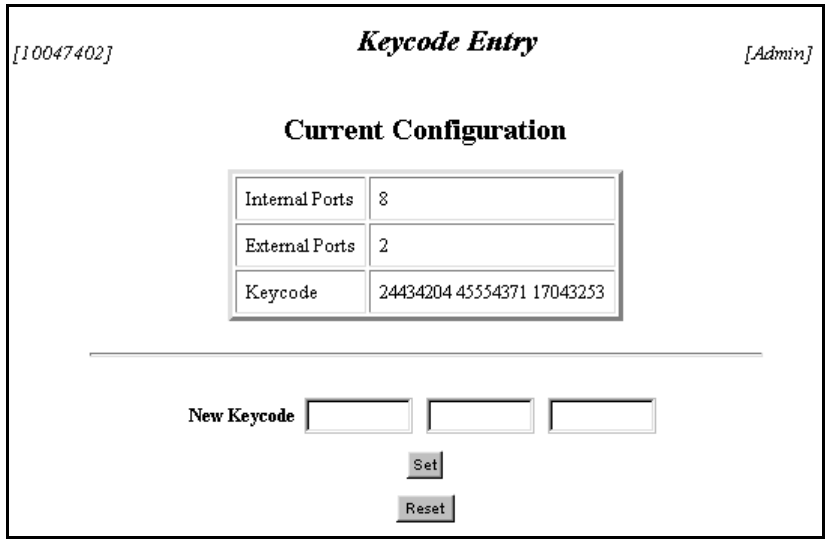
— Ethernet Configuration

Note: To avoid potential problems, the BUI does not support the Software Upgrade function. To perform a software upgrade, you must access the text-based user interface. You can do this remotely through a telnet session.

Keycode Entry

In the Pack Administration menu, click on **Keycode Entry** to access that particular screen, which Figure 90 shows.

Figure 90
MIRAN Release 2.0 BUI, Keycode Entry screen



To register a new keycode, enter the keycode in the **New Keycode** field and click on the **Set** button. A successful registration automatically updates the **Current Configuration** fields with the appropriate settings for internal and external ports.

System Information

In the Pack Administration menu (or in the left frame), click on **System Information** to see details of the current hardware configuration and software version. An example appears in Figure 91.

Figure 91
MIRAN Release 2.0 BUI, System Information screen

[10047402] ***System Information*** *[Admin]*

Hardware	Info
CPU	486DX4-100
Level 2 Cache	128 KBytes
System Memory	16 MBytes
Disk A: (External ATA)	2482176 Bytes Free
Disk B: (External ATA)	Not Installed
Disk C: (Internal PCI)	2121728 Bytes Free

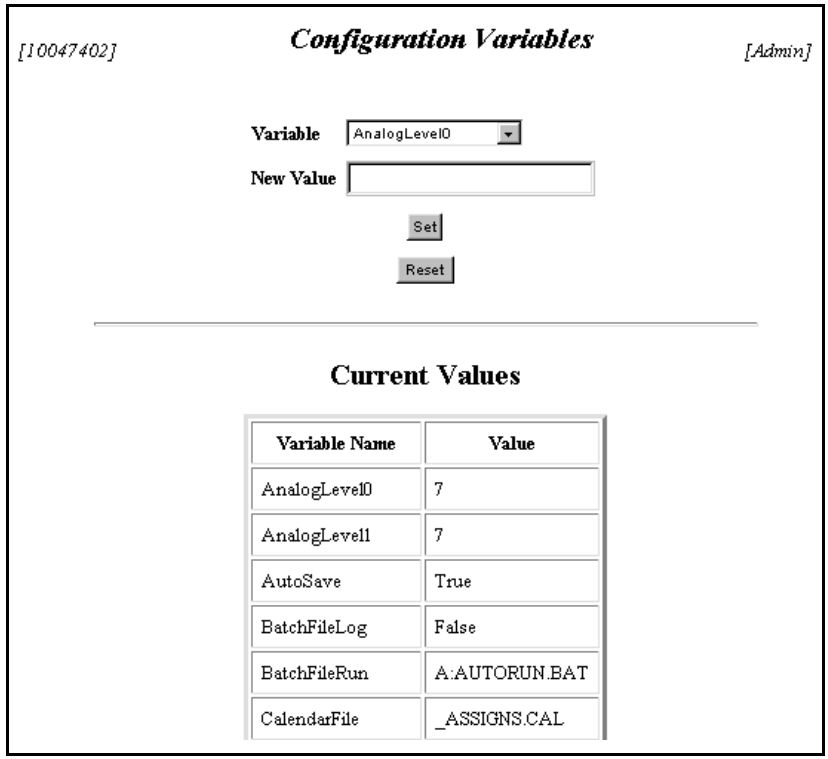
Software	Info
Application	NTAG37AB Version 2.0.15d (Rls 1)
Codec	1.38i (0)
XA8051 Firmware	VPS Firmware Rls 7.0
DSP Load	NG0225c1,02/05/98 **(Mu-Law)**
DSP Status	OK
Time & Date Sync	Download disabled

Note: You do not need to log in to access the System Information screen.

Configuration Variables

In the Pack Administration menu, click on **Configuration Variables** to access that particular screen, which Figure 92 shows.

Figure 92
MIRAN Release 2.0 BUI, Configuration Variables



To change a configuration variable, do the following:

1 Enter the variable you must change.

2 Enter the new value of the variable.

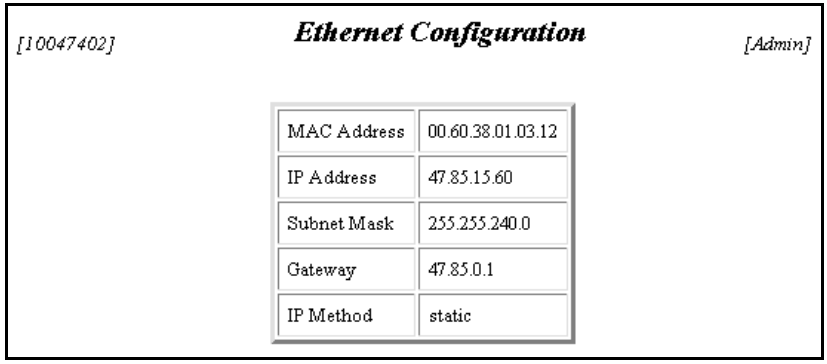
3 Click on the **Set** button.

If the new value is valid, it appears automatically in the Current Values table. For a description of each of the configuration variables, refer to “The Configuration Variables menu” on page 170.

Ethernet configuration

In the Pack Administration menu, click on **Ethernet Configuration** to view the current Ethernet parameters. Figure 93 shows the Ethernet Configuration screen.

Figure 93
MIRAN Release 2.0 BUI, Ethernet Configuration screen



The Ethernet Configuration screen only *displays* the Ethernet parameters. To *change* these parameters, you must use the text-based user interface.

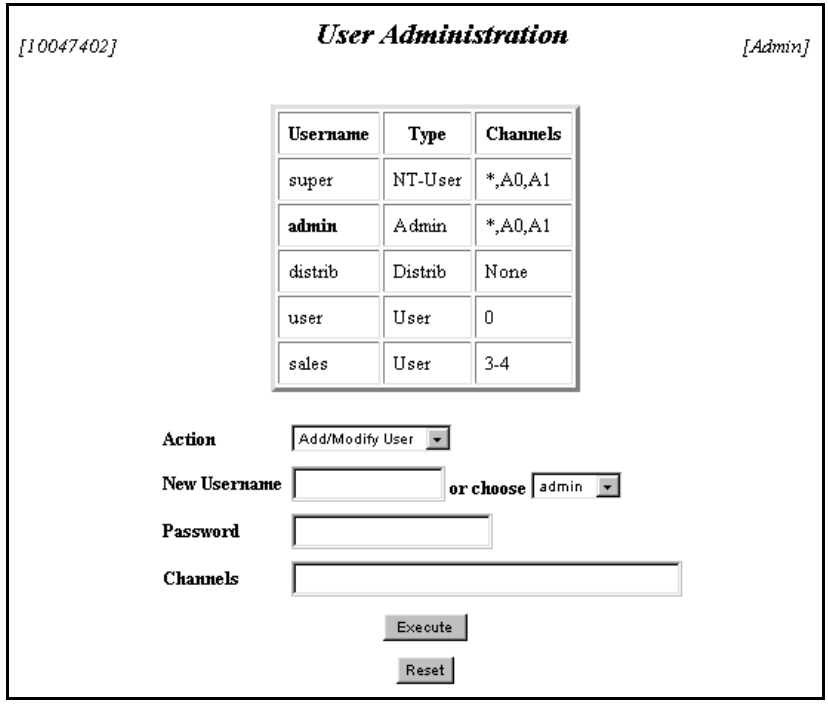
User Administration

Normally, the first OA&M function you perform on the MIRAN card is to configure users. Click on **User Administration** in the left frame to access that particular screen, which Figure 94 shows.

Use the User Administration screen to add, modify, or delete users. The current user information appears in a table on this screen. To add, modify, or delete a user, do the following:

1. Select the appropriate action from the drop-down menu.
2. Enter a new username or select an existing username.
3. Enter the password of the user.
4. Enter the MIRAN channels that the user has (or must have) access to.
5. Click on the **Execute** button.

Figure 94
MIRAN Release 2.0 BUI, User Administration screen



If the command is successful, the MIRAN card automatically updates the user information on its C: drive. The new information appears in the user table on this screen.

Note: For security reasons, the user table on the User Administration screen does not display the user passwords. If necessary, you can view the user passwords from the text user interface.

Logout

To log out of the BUI, click on **Logout** in the left frame. Figure 95 shows the screen that appears.

Figure 95
MIRAN Release 2.0 BUI, MIRAN Logout screen

Click the **Logout** button to confirm your desire to log out. Otherwise, click on the **Back** button on your browser to return to the previous screen.

After you log out, a confirmation screen appears. You can then click on your browser's **Reload** button to log in again. Or you can select another MIRAN Release 2.0 card to log into.

The BUI quick links

The Quick Links in the left frame of the MIRAN Release 2.0 BUI consist of the following:

— Pack Status

— System Information

— File Explorer

— Calendar Assignments

— Command Line

From any place in the BUI, you can access one of these screens simply by clicking on its link.

Pack Status

Click on **Pack Status** for information on the current state of the MIRAN card. You do not need to login to access this information.

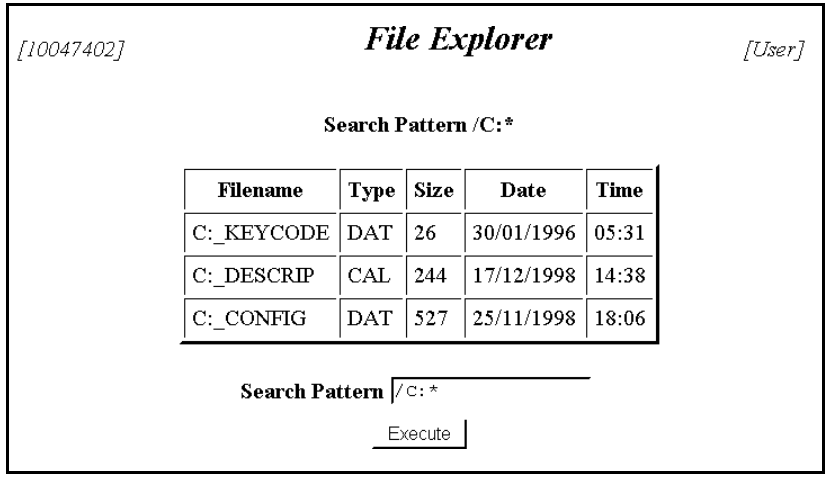
System Information

Click on **System Information** for details of the current MIRAN hardware configuration and software version. Refer to “System Information” on page 242 for further information. You do not need to login to access this information.

File Explorer

Click on **File Explorer** to access the File Explorer screen, which Figure 96 shows. You can also access the File Explorer screen by clicking on **Pack Administration**, then **File Commands**, then **File Explorer**.

Figure 96
MIRAN Release 2.0 BUI, File Explorer screen



In the File Explorer screen, you can list the files that conform to a particular search pattern. To do this, enter the search pattern in the available space and click on the **Execute** button.

Calendar Assignments

Click on **Calendar Assignments** to access the Calendar Assignments screen. Refer to Figure 83 for a picture of this screen.

> ***Note:*** You can also access this screen by clicking on **MIRAN Administration**, then **Announcement Configuration**, then **Calendar Operations**, then **Calendar Assignment**.

Use this screen to make time and date-based assignments to any of the available channels. The operation of this screen is identical to its text-based equivalent. For convenience, however, this screen also provides a drop-down list of all available announcement files.

Command Line

Click on **Command Line** to access the Command Line Interface (CLI). The CLI that you can access through the BUI is equivalent to the CLI that you can access through the text-based user interface. The CLI provides a higher level of control of the MIRAN card than is available through the BUI or the text-based user interface. However, Nortel Networks does not recommend using the CLI if you are a new user who is unfamiliar with the card. For more information on the CLI, refer to “MIRAN OA&M command set” on page 187.

Figure 97 shows the Command Line screen.

You can view a list of all available commands by scrolling through the Command Information table at the bottom of the screen. To execute a command, do the following:

1. Select a command from the drop-down menu by the **Command** prompt.
2. Enter the appropriate parameters for the selected command in the parameters line.
3. Click on the **Execute** button.

Once you click on the **Execute** button, the results of the command appear in a framed box below the data entry area. Click on the **Reset** button to clear the command and parameter lines.

Figure 97
MIRAN Release 2.0 BUI, Command Line screen

Command	Parameters	User	Access
BACKUP	[Device]	User	TTY,Web
CAL_ADD	[Channels] [[Device:Filename.Type]/[External Channel]] [[Descriptor]/[Date] [Time]]	User	TTY,Web,Batch
CAL_CLEAR		Admin	TTY,Web
CAL_LOAD	[Device:Filename.Type]	User	TTY,Web,Batch
CAL_REMOVE	[Calendar Entry ID]	User	TTY,Web
CAL_SAVE	[Device:Filename.Type]	User	TTY,Web
CONV_PCM_WAV	[Device:Filename.Type] [Device:Filename.WAV]	User	TTY,Web

Maintenance

This chapter describes Meridian Integrated RAN (MIRAN) maintenance tools and procedures to guide you in identifying the MIRAN faults, locating defective equipment, correcting problems by fixing or replacing defective equipment, and verifying the operation of the MIRAN after corrections or replacements have been made.

Maintenance overview

The problem identification should be approached systematically. A problem may have more than one cause. To isolate the cause, a knowledge of MIRAN operation is required. Once the cause is identified, the problem can be corrected by replacing the defective card, connecting accidentally disconnected cables, or correcting the software security problem.

The system and the MIRAN provide built-in self-diagnostic indicators and software and hardware tools. These diagnostic facilities simplify system troubleshooting and reduce mean-time-to-repair (MTTR).

This document focuses on the maintenance of the MIRAN equipment. It requires that system operates correctly before you start diagnosing the MIRAN problems.

The system installation and maintenance guide documents: *General Maintenance Information* (553-3001-500), *Fault Clearing* (553-3001-510), and *Hardware Replacement* (553-3001-520) describe how to maintain the entire system. This chapter describes how to maintain the MIRAN as an integral part of the system.

Diagnostic tools

Diagnostic tools are used to troubleshoot problems in the system including problems with the MIRAN. When diagnosing MIRAN problems, you may have to use more than one of these tools.

System diagnostic tools consist of:

— LED indicators

— display codes

— card self-tests

— sanity monitoring

— overlay commands

LED indicators

System cards are equipped with red LED indicators and module power supplies are equipped with green LED indicators. These indicators show the status of each card or power supply.

MIRAN maintenance LED indicator

The MIRAN has a card LED indicator at the top of the faceplate. The card LED is a red LED that indicates the status of the card. If the LED is ON, the card may be faulty or disabled. The LED turns OFF when the card is software enabled.

Display codes

The MIRAN is equipped with a 4-digit alphanumeric hexadecimal display on the faceplate.

The hexadecimal display indicates the progress of the internal self-test in the form of T:xx (refer to *Appendix A, MIRAN hexadecimal codes*). Upon successful completion of the test and the start-up of the RAN application, it will display the code "**RAAn**", where **n** is the LAN card number (in hexadecimal). If cards are not connected in a LAN configuration the display will show RAA0.

The maintenance display on the MIRAN faceplate provides detailed maintenance information. The display includes the following types of information:

— self-test results on power-up

— maintenance routine results

— upgrade and backup information

— Reading and writing to and from Drives A:, B:, or C:

Self-test

A self-test is automatically performed by each MIRAN card when you insert it into an operating system module, when you enable the card, or when you power up or reset the system. You can also perform a self-test on a card using software commands or menus.

The self-test checks general MIRAN functions and determines if they are operating correctly. It is very useful when you first install the cards because, upon insertion, the card automatically starts the self-test and gives you an immediate indication of its operating status.

Self-test performs a detail test and analysis of the installed hardware both to determine the integrity of the hardware and to establish the configuration of MIRAN card (refer to Table 22). If the detected configuration is different from that stored in the Flash memory, the difference is logged on the maintenance terminal and the Flash configuration information is updated. Results of the self-test may also be displayed on the hex display on the MIRAN faceplate.

Table 22
MIRAN self-test sequence

Item tested	Description of action
Processor/Coprocessor	Read and store processor ID. Run processor self-test.
Onboard Flash memory	Check the amount of Flash installed. Perform checksum testing of diagnostics, application, configuration areas, BIOS, and OS.
DRAM	Check the amount of DRAM installed. Perform R/W test.
PCI Chipset	Perform R/W test on selected registers.
System I/O Controller	Perform R/W test on selected registers.
PCMCIA Controller	Perform R/W test on selected registers.
DS-30X Interface	Test shared memory and perform loopback test over SD-30 LCA.
CE-MUX Interface	Test shared memory and perform loopback test over CE-MUX LCA
PCMCIA DSP card(s)	Check the presence of DSP cards and initiate diagnostic tests on DSP cards, if present.
PCMCIA Flash card(s)	Check the presence of Flash memory and the MIRAN check configuration information.

Sanity monitoring

Sanity monitoring is a background routine that checks the operation of system resources such as CPU activity memory allocation etc. This background routine attempts to restore normal system operation if the system performance has degraded to an unacceptable level. If all else fails, this routine will restart the system to try to restore it to normal operation. If the soft reset is not effective, a full board level reset is initiated. If reset is not successful, the permanent error code is displayed on the MIRAN hex display.

Overlay commands

Diagnostics are performed for every card as part of the daily routines, or may be invoked from a maintenance TTY or the SMP (when equipped). See the NTP titled *Meridian 1 system maintenance* (553-3001-520).

The MIRAN card appears as an Enhanced Universal Trunk card to a system in which it is installed. All relevant system maintenance commands for a Enhanced Universal Trunk card can therefore be used with MIRAN. Enabling and disabling of RAN channels is done in Network and Peripheral Equipment Diagnostics program LD 32. To test the music and RAN device, use the Trunk Diagnostics program LD 36.

Table 23 lists some of the commands used to control the MIRAN status and functions.

Table 23
Commands to enable/disable and test MIRAN channels

Overlay	Command	Operation performed
LD 32	DISC / ENLC	Disable / Enable specified card
LD 32	DISU / ENLU	Disable / Enable specified channel
LD 36	MUS	Test music device for specified customer and route
LD 36	RAN	Test RAN device for specified customer and route
LD 32	STAT	Get status of specified card /channel

All the above commands are handled by the MIRAN card exactly as they are by the Enhanced Universal Trunk card, transparently to the system.

MIRAN fault isolation and correction

Fault clearing procedures for the MIRAN are the same as for other IPE cards; refer to *Fault Clearing* (553-3001-510) for more information.

Table 24 deals specifically with MIRAN service problems. To diagnose these problems, the table refers you to the test procedures in this manual that will most likely be able to resolve these problems based on the symptoms these problems are exhibiting.

Table 24
MIRAN equipment problems

Symptoms	Diagnosis	Solution
Red card LED on the MIRAN is permanently on.	Card is disabled or faulty.	Go to *Procedure 1,* in this chapter to check the card status and perform self-test.
Display on the MIRAN card shows fault codes.	Card faulty, failed self-test or problem communicating with peripheral equipment.	Go to *Procedures 1* and *2* to check self-test and self-test on reset. Also refer to *Hex codes in Appendix A* for a list of error codes. Based on the maintenance display codes description, take the appropriate action and resolve the problem.
Error messages printed on the terminal or the Meridian 1 TTY.	Hardware or software problems with the MIRAN.	Note various error messages. Refer to *X11 Administration* (553-3001-311) for a list of these messages and their description. Based on the code's description, take the appropriate action to resolve the problem.

If you cannot resolve the problem after exhausting all available diagnostic tools and test procedures, make a list of all the symptoms you observed and contact your field service representative. Refer to Appendix A "Sound recording, codes, and interfaces" on page 261 to identify the HEX codes that indicate possible problems with the MIRAN.

Procedure 1
MIRAN self-test steps

1 The card will self-test.

2 Card LAN will poll the card.

3 If self-test passed, the card will send back “powered-up occurred” message.

4 Card LAN will request configuration data.

5 The card will return configuration data (card type, A07 signaling type, and TN mapping type 2).

6 Card LAN will enable the DS-30X signaling channel.

7 The MIRAN card will wait until it receives configuration data (trunk type, signaling type, balance impedance, etc.)via the DX-30X, but it will then discard this data.

8 The card will go into its main program loop.

Procedure 2
Reset MIRAN card command

1 Software will send a reset message to the card if no channels are busy.

2 The card will set all appropriate resources to disabled state and turn on the faceplate LED.

3 The MIRAN card will reset and self-test. Self-test results will be stored in case a later query is performed by the Meridian 1. Refer to hex codes in Appendix A.

4 Card LAN will poll the card.

5 If self-test passes, the card will send back a message: “power-up occurred”.

6 Card LAN will request configuration data.

7 The card will return configuration data (card type, A07 signaling type, and TN mapping type 2) and enable DS-30X link.

8 Card LAN will enable the DS-30X signaling channel

9 The card will wait until it receives download configuration data (trunk type, signaling type, balance impedance, etc.)via the DS-30X, but it will then discard this data.

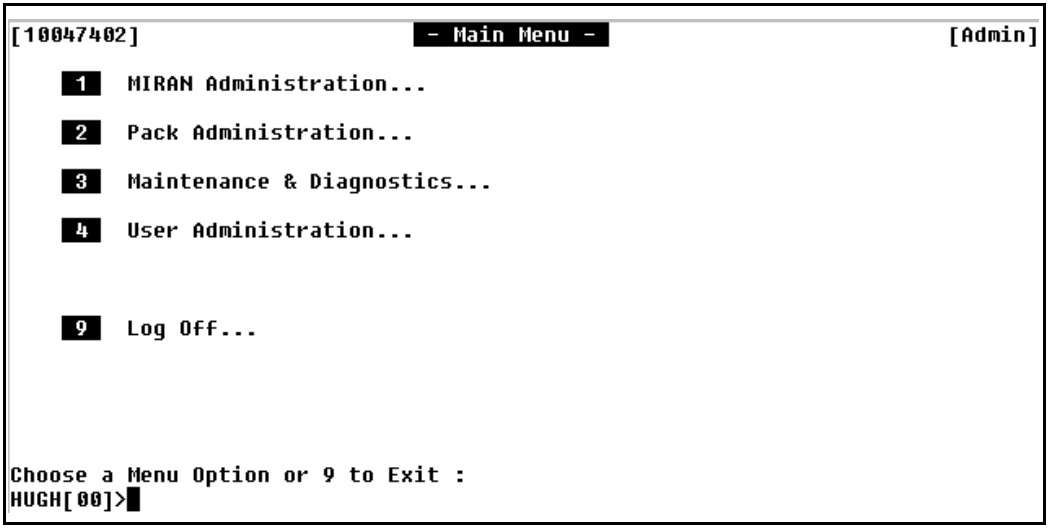
10 The card will go to its main program loop.

MIRAN fault isolation using the menu system

Refer to “RAN Application: Text-based user interface” on page 127 for details on using the menu system. You will see the Main Menu when you access the text-based OA&M. Each option listed on the Main Menu leads to another task screen or submenu.

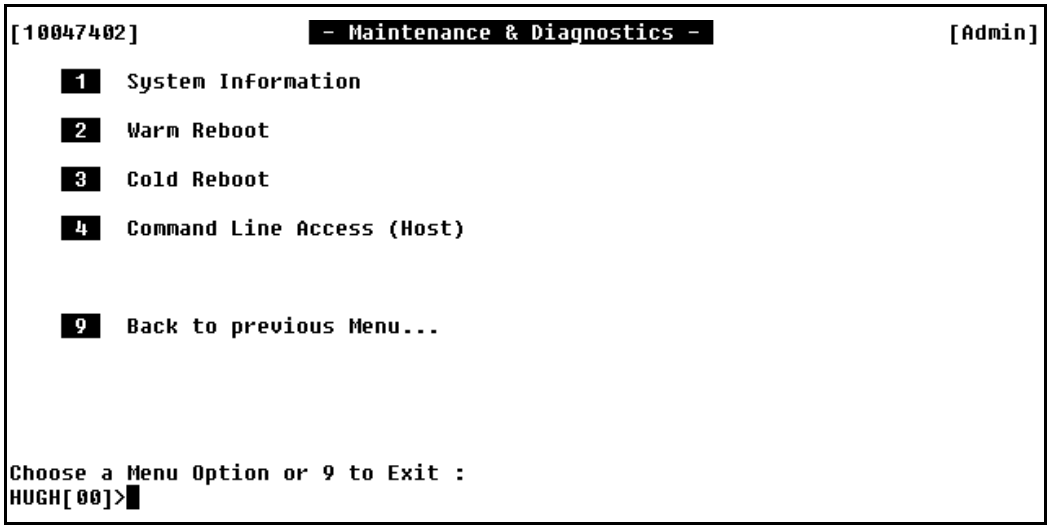
Main menu

Log into the text-based user interface to access the Main Menu. This OA&M screen presents the highest level of end-user maintenance access and provides all functions needed to configure, maintain, and upgrade the MIRAN card.



Maintenance & Diagnostics menu

To troubleshoot the MIRAN using the menu system, select **3** in the Main Menu and press the Enter key to display the Maintenance and Diagnostics sub-menu.



Card replacement

The MIRAN is based on Flash EPROM technology. This allows you to remove the MIRAN from the IPE shelf indefinitely without loosing the configuration data.

To replace the MIRAN card:

1. Disable the MIRAN card by loading the LD 32 overlay and executing the **DISC l s c** command, where **l**= loop, **s**= shelf or module, **c**= card in the module.
2. Remove the card from its card slot in the IPE module.
3. Remove all PCMCIA cards from the faulty MIRAN card (i. e. the internal PCMCIA card and the PCMCIA cards installed into the MIRAN faceplate slots.
4. Transfer the Security Device from the faulty MIRAN to the replacement.
5. Transfer all PCMCIA cards to the new MIRAN card.

   Note: This procedure moves all software, configuration, and records to the replacement MIRAN card.
6. Install the new MIRAN card into the IPE module card slot.
7. Enter the same keycode to enable the new MIRAN card.
8. Enable the new card by executing the **ENLC l s c** command.
9. Configure the newly installed MIRAN card.
10. Package the faulty MIRAN card and ship it to the repair center.

Appendix A: Sound recording, codes, and interfaces

This appendix describes a typical sound recording configuration, lists the Meridian Integrated RAN (MIRAN) hexadecimal codes that are displayed on the four-digit display on the MIRAN faceplate, and describes the external connectors and their pin assignments. The hex codes provides the status of the card during power-up and on the operational status when in service.

Sound recording configuration

The following is an example of a PC-based digital sound recording. Alternate configurations can be used that produce the 8kHz A-law or U-law PCM format output files required by the MIRAN either in .ULW or .WAV format.

Minimum PC requirements:

— 100MHz Pentium processor

— 32Mbytes of RAM

— 1Gbyte hard drive

— x4 CD ROM

— Windows 95

— Speakers

Recommended sound card:

— Creative Labs AWE 32 Plug and Play audio card Model CT3601 (comes with the microphone)

PCMCIA drive:

— DATABOOK ThinCard Drive Model TMB-240

Software:

— GOLDWAVE sound editor.

Note: When recording announcements, use the following recommendations. To remove sharp transitions at the boundaries of an announcement, add fade-in (from 0) at the start of the announcement and fade-out (to 0) at the end of announcement. Also, one second of silence must be added to the beginning and to the end of each announcement.

When the internal RAM test, ALU test, address mode test, boot ROM test, timer test, or external RAM test fails, the MIRAN will go into a maintenance loop and no further processing will be possible. A failure message is displayed to indicate which test failed. The message changes to **F:xx** Example; if the timer test fails, F:05 is displayed.

MIRAN hexadecimal codes

T:00	Initialization
T:01	Testing Internal RAM
T:02	Testing ALU
T:03	Testing address modes
T:04	Testing Boot ROM
T:05	Testing timers
T:06	Testing watchdog timer
T:07	Testing external RAM
T:08	Testing Host DPRAM
T:09	Testing DS30 DPRAM
T:10	Testing security device

T:11	Testing Flash memory
T:12	Programming PCIFPGA
T:13	Programming DS30 FPGA
T:14	Programming CEMUX FPGA
T:15	Programming DSP FPGA
T16	Testing CEMUX interface
T:17	Testing EEPROM
T:18	Booting 486, waiting for response with self-test information
T:19	Waiting for application start-up message from 486
T:20	CardLan enabled, waiting for Request Config. Message
T:21	CardLan operational, A07 enabled under host control
T:22-99	Reserved for future diagnostic tests
RAAn	RAN application active and enabled for terminal OA&M (n = MIRAN V-LAN card number 0-F).
RA-S	RAN application active with Set Based OA&M running. (Terminal is locked out until this clears)

When any other test fails including the EEPROM test, a message will be displayed for three seconds after the T:17 message to indicate the problem. If more than one test fails, the message displayed indicates the first fault.

MIRAN interface connectors

The interface connectors connect the MIRAN to the external equipment at the faceplate and the backplane or MDF connectors.

Port A and port B pinout

Two serial ports are provided on the MIRAN board for maintenance functions. Access to both ports is over tip/ring pairs on the MDF. A permanently connected terminal should be connected at the MDF. Both ports are also accessible through the MIRAN faceplate 8-pin mini-DIN connector for occasional OA&M purposes. Port B connects the terminal and port A connects to port B in a V-LAN configuration.

Table 15 displays pinouts for the MIRAN faceplate 8-pin mini-DIN connector.

Table 15
Faceplate 8-pin mini-DIN connector signals

Pin No.	Signal	Description
1	BDTRB-	Port B Data Terminal Ready
2	BSOUTB-	Port B Serial Data Out
3	BSINA-	Port B Serial Data In
4	SGRD	Signal Ground
5	BSINA-	Port A Serial Data In
6	BCTSA-	Port A Clear To Send
7	BSOUTA-	Port A Serial Data Out
8	BDTRA-	Port A Data Terminal Ready

Table 16 lists the port A and port B connections at the I/O panel 50-pin connector. It lists the pins signal assignments, wire color code, and the description of the signals. Total distance from the MIRAN to the MDF and from the MDF to the terminal must not exceed 50 feet.

Table 16
Port A and port B pinout and wire color code on the 50-pin connector

I/0 Panel 50-pin connector pin assignment and wire color code	MIRAN signal name	MIRAN signal description
16 (BL-Y)	Reserved	Future use
41 (Y-BL)	BDCDA-	Port A Data Carrier Detect
17 (O-Y)	BSINA-	Port A Serial Data In
42 (Y-O)	BSOUTA-	Port A Serial Data Out
18 (G-Y)	BDTRA-	Port A Data Terminal Ready
43 (Y-G)	SGRD	Signal Ground
19 (BR-Y)	BDSRA-	Port A Data Set Ready
44 (Y-BR)	BRTSA-	Port A Request to Send
20 (s-y)	BCTSA-	Port A Clear to Send
45 (Y-S)	BSINB-	Port B Serial Data In
21 (BL-V)	BSOUTB-	Port B Serial Data Out
46 (V-BL)	BDCDB-	Port B Data Carrier Detect
22 (O-V)	BDTRB-	Port B Data Terminal Ready
47 (V-O)	BDSRB-	Port B Data Set Ready

Analog ports and pinouts

The MIRAN supports two analog input ports in order to connect external sources for recording announcements and/or music, or, alternatively, to provide two analog channels that can be mapped into up to eight logical RAN units.

The 3.5 mm Audio jack provides access to a single analog input and a single analog output. On the backplane, however, two analog inputs and two cross-connect analog outputs are available for backing up stored announcements onto audio cassette tape or, alternatively, for connecting to an external paging amplifier.

Table 17 lists the 50-pin I/O panel connector pins and their signal assignment for the analog ports.

Table 17
Analog port backplane signals

I/0 Panel 50-pin connector pin assignment and wire color code	MIRAN signal name	MIRAN signal description
5 (S-W)	AGND	Analog Ground
30 (W-S)	AGND	Analog Ground
7 (O-R)	AIN0	Analog In, Port 0
32 (R-O)	AIN1	Analog In, Port 1
9 (BR-R)	AGND	Analog Ground
34 (R-BR)	AGND	Analog Ground

Note: Cross-connect audio pairs can be used to connect to external recording devices for the purpose of backing up announcements to a tape.

MIRAN cross-connect channels

The MIRAN supports two cross-connect channels to provide connection to callers on multiple incoming lines.

Table 18 lists the 50-pin I/O panel connector pin assignments for the MIRAN cross-connect channels.

Table 18
MIRAN cross-connect port MDF signals

25-pair pinout and color code	Signal	Description
1 (BL-W)	RANAR0	Port 0 Audio RING
26 (W-BL)	RANAT0	Port 0 Audio TIP
2 (O-W)	RANB0	Port 0 Signaling RING to Port 0 busy (GRD)
3 (G-W)	RANAR1	Port 1 Audio RING
28 (W-G)	RANAT1	Port 1 Audio TIP
4 (BR-W)	RANB1	Port 1 Signaling RING to Port 1 busy (GRD)

MIRAN faceplate to modem cabling

Table 19 shows the modem cable RS-232 connector pin assignments.

Table 19
NTAG81CA/DA modem cable RS-232 pinouts

Signal name	9-pin male (MIRAN side) Pin No.	25-pin male (Modem side) Pin No.
TX	2	2
RX	3	3
DTR	4	20
GRN	5	7

I/O panel to modem cable

Table 20 shows the I/O panel to modem cable pin assignments.

Table 20
I/O panel connector to modem cable pinouts

Signal name	50-pin I/O panel parallel connector Pin No.	25-pin male (RS-232) (Modem side) Pin No.
TX	21	2
RX	45	3
DTR	22	20
GRN	43	7

Modem setup

To setup the modem, use a terminal connected to the modem. Set up the terminal for 9600 bps, 8 bits, 1 start, 1 stop, and no parity.

1 Setting the modem to auto answer

- — Connect the terminal to the modem
- — Type “AT” for a Hayes compatible modem. If the modem is connected properly, it will reply “OK”.
- — Type “ATS0=1”
- — Type “AT&W0” to save the settings.

2 Disable result codes.

- — Type “AT” for a Hayes compatible modem. If the modem is connected properly, it will reply “OK”.
- — Type “ATQ1”
- — Type “AT&W0” to save the settings.

3 Connect the modem to MIRAN using one of the cable configuration tabulated above.

Appendix B: Product integrity

This chapter presents information about MIRAN reliability, environmental specifications, and electrical regulatory standards.

Reliability

Reliability is measured by the Failure Rate (in FITS), Mean Time Between Failures (MTBF), and the Return Rate.

— **Failure Rate (FITS) -** predicted failure rate per billion hours of operation is 1168.

— **Mean Time Between Failures (MTBF) -** expected mean hours of operation between failures is 98 years.

— **Return Rate (% per year)** - expected return rate per year for the first 2 years is 1% per year.

Environmental specifications

This describes the operating and storage temperature ranges and humidity for MIRAN. The ideal operating temperature is obtained when the environmental temperature is regulated using air-conditioning, however MIRAN is design to operate in the standard telephony equipment accepted temperature and humidity ranges.

Table 21 displays acceptable temperature and humidity ranges for the MIRAN card.

Table 21
Temperature-related specifications

Specification	Minimum	Maximum
Normal Operation		
Recommended	15° C	30° C
Relative humidity	20%	30% (non-condensing)
Absolute	10 ° C	45° C
Relative humidity	20% to	80% (non-condensing)
Rate of change	Less than 1° C per 3 minutes	
Storage		
Long Term	–20° C	60° C
Relative Humidity	5%	95% (non-condensing
	-40° C to 70° C, non-condensing	
Short Term (less than 72 hr)	–40° C	70° C
Temperature Shock		
In 3 minutes	-40° C	25° C
In 3 minutes	70° C	25° C
	-40° to 70° C, non-condensing	

Electrical regulatory standards

The following three tables list the safety and electro-magnetic compatibility regulatory standards for the MIRAN, listed by geographic region. Specifications for the MIRAN meet or exceed the standards listed in these regulations.

Safety

Table 22 provides a list of safety regulations met by the MIRAN, along with the type of regulation and the country/region covered by each regulation.

Table 22
Safety regulations

Regulation Identifier	Regulatory Agency
UL 1459	Safety, United States, CALA
CSA 22.2 225	Safety, Canada
EN 41003	Safety, International Telecom
EN 70950/IEC 950	Safety, International
BAKOM SR 784.103.12/4.1/1	EMC/Safety (Switzerland)
AS3260, TS001 - TS004, TS006	Safety/Network (Australia)
JATE	Safety/Network (Japan)

Electro-magnetic compatibility (EMC)

Table 23 lists electro-magnetic emissions regulations met by the MIRAN, along with the country's standard that lists each regulation.

Table 23
Electro-Magnetic Emissions

Regulation Identifier	Regulatory Agency
FCC part 15 Class A	United States Radiated Emissions
CSA C108.8	Canada Radiated Emissions
EN50081-1	European Community Generic Emission Standard
EN55022/CISPR 22 CLASS B	Radiated Emissions (Basic Std.)
BAKOM SR 784.103.12/4.1/1	EMC/Safety (Switzerland)
SS-447-20-22	Sweden EMC standard
AS/NZS 3548	EMC (Australia/New Zealand)
NFC 98020	France EMC standard

Table 24 lists electro-magnetic immunity regulations met by the MIRAN, along with the country's standard that lists each regulation.

Table 24
Electro-Magnetic Immunity

Regulation Identifier	Regulatory Agency
CISPR 22 Sec. 20 Class B	I/O conducted noise
IEC 801-2 (level 4)	ESD (Basic Standard)
IEC 801-3 (level 2)	Radiated Immunity (Basic Standard)
IEC 801-4 (level 3)	Fast transient/Burst Immunity (Basic Standard)
IEC 801-5 (level 4, preliminary)	Surge Immunity (Basic Standard)
IEC 801-6 (preliminary)	Conducted Disturbances (Basic Standard)
BAKOM SR 784.103.12/4.1/1	EMC/Safety (Switzerland)
SS-447-20-22	Sweden EMC standard
AS/NZS 3548l	EMC (Australia/New Zealand)
NFC 98020	France EMC standard

List of Terms

ALU

Arithmetic Logic Unit.

API

Application Programming Interface. High level language software used as components in the development of an application. Also, graphics routines that perform basic graphics tasks or other functions when called by high-level application programs.

ASIC

Application-Specific Integrated Circuit. A microprocessor chip designed to do specific tasks; providing graphics capability is one such task.

ATA

AT Attachment interface. Normally used to refer to the PCMCIA version of the IDE disk drive interface found in a PC. For MIRAN, standard ATA based cards are required instead of the simpler memory based cards. The later are lower cost but require custom driver software both at the PC and MIRAN.

AUI

Autonomous/Attachment User Interface. Refers to the 15-pin, D-type connector and cables used to connect single- and multiple-channel equipment in an Ethernet transceiver.

BIOS

Basic Input/Output System. A set of permanently stored program outlines in buffers that allow software to interact with hardware components (e.g., keyboard) in a device-independent manner.

bootp

An IP protocol that allows the automatic assignment of an IP address to a client device upon bootup.

Boundary scan

Test methodology for integrated circuits that provides visibility and control of on-chip logic.

BUI

Browser User Interface. The interface a user can use to interact with the MIRAN Release 2.0 card through the web.

Card option

Low-end Meridian Mail platform that is packaged in the same cabinet with the Meridian 1/Option 11 switch.

CD-ROM

Compact Disk Read-Only Memory.

CE-MUX

Common Equipment bus with MUltipleXed address and data.

CPE

Customer Premise Equipment. Equipment that resides on a customer's premises and is controlled by the customer as opposed to the Central Office

CPU

Central Processing Unit. A chip that performs logic, control, and arithmetic functions. The part of the switch that performs these functions and any others needed to carry out call processing.

DIN

A German Standardization Organization.

DS-30X

Parallel serial transmission from a superloop (XNET) card to a Controller Card in an IPE shelf.

DRAM

Dynamic Random Access Memory. A type of semi-conductor memory that is characterized by its high density (smaller packages for a given amount of memory). It typically has slower access time as compared with SRAM and requires external memory refresh circuitry.

DSP

Digital Signal Processing. A specialized computer chip that performs speedy and complex operations on digitized waveforms. Useful in processing sound and video.

DTMF

Dual Tone Multi-Frequency. A term describing push-button or touch-tone dialing.

EIDE

Enhanced IDE (*see* IDE). This feature provides a significant improvement in performance over the standard IDE; it is comparable to standard SCSI in terms of throughput.

EMC

Electro-Magnetic Compatibility. Refers to equipment units that are collectively performing each of their functions without causing or suffering unacceptable degradation due to electromagnetic interference from other equipment/systems in the same environment.

EMI

(ElectroMagnetic Interference) - Unwanted electromagnetic coupling, such as a ham radio heard on an electric organ or church music heard in hearing aids. Also known as “static”.

EPLD

Erasable Programmable Logic Device. An electronic device for performing logical operations that can easily be erased and reprogrammed.

ESS

Environmental Stress Screening

EST

Environmental Stress Testing.

EXUT

Enhanced Universal Trunk card. See *XUT*.

Field programmable

A program to which changes can be made while it is installed.

Firmware

Hardwired logic, software, data, and programming instructions such as that stored by threading wires through ferrite cores. May also refer to software programmed in the factory or burnt in the field, and is semipermanently stored within ROM.

Flash memory

Electrically erasable memory that is non-volatile (not affected by power disruptions).

FPGA

Field Programmable Gate Array.

FTP

File Transfer Protocol. This is an industry standard protocol for transferring files between a server and a client on a TCP/IP network.

Gate array

A circuit consisting of an array of logic gates (network nodes) aligned on a substrate (piece of silicon) in a regular pattern.

IDE

Integrated Drive Electronics. A low-cost hard disk drive interface.

IP

Internet Protocol.

IPE

Intelligent Peripheral Equipment - A range of cards that contain micro-processors that provide off-loading of the CPU function and the flexibility to make changes to the system's parameters without revising the hardware.

ISA

Industry Standard Architecture. A particular type of bus architecture on an IBM-DOS motherboard.

IVR

Interactive Voice Response. An application that allows telephone callers to interact with a host computer via pre-recorded announcements and prompts.

Kernel

That part of a computer's operating system that performs basic functions like switching between tasks.

LCA

Logic Cell Array) - A Xilinx product that is a form of Field Programmable Gate Array. See *FPGA.*

Loader

A device that moves a program or data from a floppy or hard disk and stores it into a computer's RAM memory.

MAT

Meridian Administration Tool. A Nortel Networks Windows™ application that is available for configuring the Meridian 1 PBX.

MAU

Media Access Unit. A device used to allow connection of the Ethernet AUI signals on MIRAN to an external LAN.

MDS

Modular Documentation System

MIRAN

Meridian Integrated Recorded Announcer.

MINT

Message INTerrupt. This occurs when a message being transmitted receives an interrupt signal from an outside device, which must process a task of its own. Then the transmission of the original message can resume, or be resent.

M1

Meridian 1 PBX.

Mmail

Meridian Mail. Nortel's proprietary voice processing platform.

MOH

Music On Hold. Refers to telephony equipment, supplied by a Nortel switch via one or more trunk cards, to provide recorded music or radio to each caller on hold until the called party becomes available.

MTBF

Mean Time Between Failure. A measure of reliability: the time that a user may reasonably expect a device or system to work before an incapacitating fault occurs. Also, the average number of hours between one random failure and the next under stated conditions.

MTTR

Mean Time To Repair. The average time required for corrective maintenance.

NTP

Nortel Networks Publications; customer documentation. Each NTP is identified by a unique ten-digit publication number.

OA&M

Operations, Administration, and Maintenance.

OEM

Original Equipment Manufacturers.

PAS

Product Administration System.

PBX

Private Branch eXchange. A telephony switch that is privately owned.

PCB

Printed Circuit Board.

PCI

Peripheral Component Interconnect. An Intel device that enables high performance in an interface between a CPU bus and a peripheral device. A high-speed PC local expansion bus, capable of interconnecting ICs and plug-in boards to the hose processor.

PCM

Pulse Code Modulation. A method for encoding an analog voice signal into a digital bit stream.

PCMCIA

Personal Computer Memory Card International Association. This organization has defined a credit card sized plug-in board for use in PCs. These cards are the only way to get to a laptop bus without using a docking station. In addition, application software can be stored on the card into system address space so that the software can run directly from the car, resulting in a faster start and less memory required from the host computer.

PDF

Portable Document Format.

RAN

Recorded ANnouncement trunks - A trunk that provides a link between the PBX and a recorded announcement device, used to provided recorded information to callers.

RTC

Real Time Clock. System clocking influenced/determined by connection to a time process external to processing by the system.

SBC

Sub-Band Coding. Algorithm used by Meridian Mail for compressing speech data down to just over a quarter of its original size.

Scalable architecture

A way of designing a system that allows it to be resized with relative ease; the cost required to increase its size in proportion to the new size.

SDI

Serial Data Interface. For some Meridian switches, provides ports between the CPU and external devices like a teletype or maintenance telephone. More generally, an SDI is a mechanism for changing the parallel arrangement of data within computers to the serial form used on transmission lines, and vice versa.

SL-1

Generic term given to Nortel digital switches. Meridian 1 refers specifically to the current series of Nortel PBX's.

STA

Single Terminal Access.

Telnet

An IP-based protocol for accessing a host computer over a network. You can use telnet to access the MIRAN text-based user interface over an ethernet LAN.

TUI

Telephone User Interface. The interface a user can use to record, play, and assign and unassign announcements over a DTMF telephone.

VxWorks

Wind River RTOS (Real Time Operating System). See RTOS.

.WAV

File format used for storing voice files created under Microsoft Windows.

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Meridian 1

Meridian Integrated RAN

Description, Installation, and Operation

Information is subject to change without notice. Nortel Networks reserves the right to make changes in design or components as progress in engineering and manufacturing may warrant. This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC rules, and the radio interference regulations of Industry Canada. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their own expense.
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