

TAP 2000

Alpha Paging Port Expander

User's Manual

October 1996

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BEFORE YOU BEGIN

The purpose of the TAP 2000 Alpha Paging Port Expander User's Manual is to provide users with the knowledge needed to efficiently operate the TAP 2000 Alpha Paging Port Expander equipment and software. Note, from hereon, the TAP 2000 Alpha Paging Port Expander will be referred to as the TAP 2000.

The TAP 2000 consists of a combination of hardware and software uniquely designed to act as an Alpha Page traffic manager that allows the connection of up to 24 Alpha Page devices, using either built-in modems or direct RS232 connections, to one computer interface port in your paging terminal. The number of Alphanumeric inputs available on your paging terminal are expanded by utilizing the terminal's computer interface ports to handle the Alphanumeric traffic.

HOW TO USE THIS MANUAL

To help you understand and learn how to use the TAP 2000, this manual is organized in a logical sequence that will lead you from the hardware and software installation process through initializing and monitoring the system.

This User's Guide is intended for users of all experience levels. Many general concepts and simple guidelines are discussed in the initial portions of this manual. A familiarity with the basic concepts will ensure that you can use the equipment and software efficiently. Subsequent sections describe particular tasks that will need to be performed and list the procedures to accomplish them.

CONVENTIONS USED IN THIS MANUAL

- The TAP 2000 software is fully menu driven. The functions performed within the application are accomplished using the keyboard.
- Names of keys are shown in small capital letters; for example, TAB, SHIFT, and RETURN.
- Menu functions or options are identified by a number to the left of the function description. Keying the number corresponding to a particular Menu option and pressing the RETURN key will initiate that option.
- Certain actions require the simultaneous use of multiple keystrokes. A plus sign (+) between key names indicates that you must press those keys at the same time. For example, “Press CTRL+P” means that you must hold down the CTRL key while you press the P key.
- The following keys may be used to move the cursor within a displayed TAP 2000 window.

Keys

Function

RETURN

The RETURN key moves the cursor from prompt to prompt on a displayed window. If no data was entered at the current prompt and the RETURN key is pressed, the default data for that prompt will be accepted and you will be moved to the next prompt. If data was entered at the prompt and the RETURN key is pressed, that data is accepted and you are moved to the next prompt.

Escape

Pressing the ESCAPE key while the Main Menu is displayed allows you to exit the Main Menu and display the Status screen. Pressing the ESCAPE key while a window is displayed that was accessed as a result of selecting an option on the Main Menu allows you to exit that window and return to the Main Menu.

FREQUENTLY USED TERMS

This section briefly describes the codes and terms used frequently within this manual when describing the TAP 2000 application. For definitions of terms and fields not referenced within this listing or for more detailed discussions of each listed term, refer to the corresponding section within this manual.

ADA

Stands for *Americans with Disabilities Act*. The built-in TDD feature of the TAP 2000 allows access to your paging terminal without adding separate modems and lines, providing an economical solution to allow companies to comply with the ADA.

Input Device

Terminal or computer at which the alphanumeric page was entered. Any responses from the paging terminal and TAP 2000 are sent back to the input device.

IXO/TAP Protocol

Stands for *Telocator Alphanumeric Paging Protocol*. A seven-bit messaging protocol that allows someone sitting at a terminal or computer to send a message to a pager. An error-detecting link is provided from the sender to the paging service provider. Invalid data and other common errors are reported back to the sender.

Output Device

Device that is receiving the page from the paging terminal.

TDD

Stands for Telecommunications Device for the Deaf. A TDD is defined as a machine that employs graphic communication in the transmission of electronic signals. Most TDD devices are acoustically coupled and use the Baudot method of communications. The built-in TDD feature of the TAP 2000 allows companies to comply with the *Americans with Disabilities Act (ADA)*.

TTY

Stands for teletypewriter. This typewriter style device is used for communicating alphanumeric information over telecom networks. A TTY/TDD is a unique telecommunication device for the deaf that uses TTY principles.

SUPPORT SERVICES

If you have any questions about the TAP 2000, first refer to *TAP 2000 Alpha Paging Port Expander User's Manual*.

If you cannot find the answer, contact technical support at the following numbers. High quality, responsive technical support is available 24 hours a day, 7 days a week, including holidays.

- For technical support between the hours of 8:30 A.M. and 5:30 P.M. Eastern Standard Time, Monday through Friday, excluding holidays, call (843) 764-1560.
- For technical support outside of normal business hours or on holidays, call (843) 764-1560. The voice mail operator will answer your call. This number allows you to leave a message for normal business matters, or initiate a page for immediate technical support. The voice mail attendant will lead you through the appropriate procedures.
 - ◇ For matters that do not require an urgent response, leave a voice message within the general mailbox.
 - ◇ For urgent matters that require that you speak to an on-call technician, the system will prompt you to select the appropriate key identifying the product for which you need technical support. After the technician's greeting, leave a short message with the area code and phone number at which you may be reached. The on-call technician will be paged and will return your call.

1.1 SYSTEM OVERVIEW

The following provides an overview of the components and functionality of the TAP 2000.

- The TAP 2000 Card Cage can accommodate up to 12 dual input cards. Both TAP 200 and TAP 2000 modem cards can be used together in the same card cage. Each card contains either:
 - ◇ Two 14.4K BAUD modems
 - or -
 - ◇ Two RS-232 ports

These modems or RS-232 ports connect to alpha page input devices that use the TAP (Telocator Alphanumeric Paging) protocol.

- The 12 input cards can be installed in any combination of direct connect, modem inputs, or modem on trunk inputs, allowing system flexibility to meet your specific needs.
- The TAP 2000 allows up to 24 phone line connections to the internal modems. Two telephone line inputs are available on each modem-input card; two I/O ports are available on each direct connect card.
- The TAP 2000 contains a high-speed serial port that is connected to the computer interface port of the paging terminal. This port sends the translated input data to the terminal and receives the results of the paging operation (including Page OK messages and any error messages). These results are passed on to the input paging device in real time; the person sending the message receives the results of the operation at the time of the page.
- The TAP 2000 contains a high-speed serial port that may be connected to a billing computer or capture device (for example, a printer). The data output is in DAS-1A, Bell Mode, or Stats Mode format. The data fields contain the seven digit pager number, the input port number on which the page was received, the Julian date, hour, and minute the page was received, and the number of characters in the message sent to the pager. This information is useful for providing port loading data and determining peak paging times.

- A high-speed serial Command/Control port allows the system administrator to access the system configuration parameters and view the paging traffic in real time. Paging traffic may be viewed for a specific input port or the output port.

1.2 OPERATIONAL OVERVIEW

The TAP 2000 inputs are interrupt driven from all sources, thereby preventing the loss of characters. As lines are received, the lines are cued for processing in non-interrupt mode, along with the command port functions. Processing priority is given to the pages. When the system is busy, the command port may appear sluggish. This is normal and should cause no concern. No commands or characters will be lost; the command will only be delayed until the requested operation will not impact a page that is in process.

The following operations are performed by the TAP 2000:

1. Once initialized, the TAP 2000 is ready to receive pages or process commands initiated by the command port.
2. When a character is received on one of the input ports, the character is immediately retrieved and stored in a buffer. If the character is a carriage return (<CR>), the TAP 2000 cues the line to be parsed. This parsing process monitors the protocol, calculates checksums, and provides the proper responses to the input device.
3. When a complete page is received, the TAP 2000 cues the page to the output device.
 - If the page is accepted, the billing record is generated and sent to the billing port.
 - If the input port does not follow the protocol, or data has been corrupted by phone line noise, the TAP 2000 returns the proper codes to the input device to force a retry.

The above process runs concurrently on all ports; the TAP 2000 manages multiple pages from multiple ports. The first port to receive a completed page immediately cues the page to the output port. Any subsequent pages are handled in the order received. The input ports appear to have sole access to the paging port as with other alpha solutions; use of the TAP 2000 as a traffic manager is transparent to the sender and receiver of the page.

1.3 SYSTEM FEATURES AND BENEFITS

The TAP 2000 allows you to expand the number of Alphanumeric inputs by connecting up to 24 paging input ports to a single computer interface port of your paging terminal. System features and benefits include the following:

- The TAP 2000 connects 24 modem inputs to your paging terminal via one high-speed serial port.
- The TAP 2000 consists of 12 input cards with any mix of direct connect cards, modem input cards, and modem on trunk cards.
 - * 14.4 Baud modem card (supports TDD format)
 - * Optional direct connect RS-232 ports for local entry
- Both TAP 200 and TAP 2000 modem cards can be used together in the same card cage.
- Two telephone line inputs are available per modem card.
- Two I/O ports are available per direct connect card.
- A Billing computer data port allows for the connection to a billing computer or data collection device.
- The Command console connection provides for easy system configuration and port monitoring.
- A real time Status screen displays activity on all ports or selected ports. This view shows the data stream flow in both inbound and outbound directions, including the paging terminal and billing output ports.
- Statistics may be viewed for the number of accepted, rejected, and invalid pages within the previous hour, present hour, last 24 hours, and last 30 days.
- An *All Ports Busy Log* displays the number of seconds that all lines are in simultaneous use.

- The Control Port supports ANSI screen codes, allowing the use of virtually all Video Display Terminal (VDT) monitors. The standard WYSE/ADM ASCII interface is also supported.
- The TAP 2000 is TDD compatible for hearing impaired devices without additional lines or modems.
- Provides 19.2k or 9600-Baud throughput.
- You can limit the number of pages delivered on a per call basis.
- Modem boards can be easily grouped and configured using the TAP 2000 command center, providing various grades of service. The following parameters may be set for each group:
 - * Text Greeting
 - * Maximum Bps Connection Rate
 - * Number of rings before answer
 - * Number of pages per call
 - * Number of manual pages per message
 - * Number of characters per message
 - * TDD fallback disable

Each of the above mentioned features for the TAP 2000 are discussed in detail in the following sections of this manual.

1.4 OVERVIEW OF THE TAP 2000 APPLICATION

The following is a brief overview of the process that must be performed to access and monitor the paging traffic using the TAP 2000.

Procedure:

Step 1: Install the Hardware (Section 2)

Actions:

1. Using the diagram and instructions discussed in Section 2 of this manual, configure any RS-232 Paging inputs and connect the paging input devices to the TAP 2000. Connect the phone lines, paging terminal, billing device, and command port to the TAP 2000. Remember; verify that all power is OFF before attempting to connect the equipment.
2. Once all the appropriate connections have been made, turn the power switch located at the back of the TAP 2000 to the ON position.

The system will begin to boot. The TAP 2000 determines the type of VDT connected. The Page Output port is initialized and the TAP 2000 logs onto the computer interface port of the paging terminal. The Status screen and version information is displayed.

3. Press any key to access the Password prompt and log onto the system. Upon successful login, the TAP 2000 Main Menu is displayed.

Step 2: Configure the ports of the TAP 2000 (Section 4)

1. Display the Main Menu.
2. Type a **9** at the *Enter Selection* prompt and press the RETURN key. The Configure Outputs window is displayed.

3. Enter the parameters that apply to each of the ports.

Step 3: Configure the Modem Groups (Section 4)

1. Display the Main Menu.
2. Type an **8** at the *Enter Selection* prompt and press the RETURN key.

The Group Configuration window is displayed.

3. Enter the parameters that apply to each of the modem groups.

Step 4: Assign each modem to a Group (Section 4)

1. Display the Main Menu.
2. Type a **7** at the *Enter Selection* prompt and press the RETURN key.

The Modem Group Select window is displayed.

3. Enter the appropriate Group number (1 through 5) for each modem.

Step 5: If applicable, send a Test Page (Section 4)

1. Display the Main Menu.
2. Type a **4** at the *Enter Selection* prompt and press the RETURN key.

The Enter Page Number window is displayed.

3. Enter the seven-digit page number at the prompt.

The Enter Message window is displayed.

4. Enter the message text and press the RETURN key.

The test page is sent to the output port and a display of the actual transaction is shown on the screen.

Step 6: View individual ports (Section 5)

1. Display the Main Menu.
2. Type a **1** at the *Enter Selection* prompt and press the RETURN key.
3. Enter the port number for which details are to be displayed.

The Port Status window is displayed.

Step 7: View
all ports
(Section 5)

1. Display the Main Menu.
 2. Press the ESCAPE key.
- The Status window is displayed. Note, to return to the Main Menu, you will need to log back onto the system.

SECTION 2

GETTING STARTED

The following is discussed within Section 2:

- System Requirements
- Upgrading from the TAP 200 to TAP 2000
- Installation procedures
- Logging onto the TAP 2000 Application
- Logging off the TAP 2000 Application
- Remote programming access

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2.1 SYSTEM REQUIREMENTS

The following equipment represents the minimum hardware configuration of the TAP 2000.

- Frame with 110 Power Supply
- Capability of interfacing with 14.4 Baud modems
- Four modem line cards, each capable of two inputs, using the TAP protocol
- One CPU card
- One I/O Interface card
- Terminator card

Optional equipment consists of:

- Video Display Terminal
- 48 Volt DC Power Supply
- Direct Connect Serial Interface cards

2.2 UPGRADING FROM THE TAP 200 TO TAP 2000

The original TAP 200 model may be upgraded to the TAP 2000 model. The following hardware upgrades are required for the upgrade from the TAP 200 to the TAP 2000.

- **Optional Upgrade of Modem Boards**

The TAP 2000 modem card allows connections of 300 and 1200 BPS and supports the TDD format.

Both the TAP 200 and TAP 2000 modem cards can be used together in the same card cage. The TAP 200 cards are required to have Version 1.18 modem software to be compatible.

If upgrading ten or more of the TAP 200 modems, the card cage should also be updated.

- **Exchange CPU Card**

Due to the need for higher processing speeds and new features, a more powerful Main CPU card is required. The new modem cards are not compatible with the original TAP 200 Main CPU card. The original TAP 200 modem boards will work with the new TAP 2000 Main CPU card and can be used in an upgraded TAP card cage. The TAP 200 cards are required to have Version 1.18 modem software and a 550 Communications IC to be compatible.

- **Exchange I/O Board**

The I/O boards need to be upgraded to meet the needs of the new Main CPU Card and the increased internal speeds. Only one new I/O board is required to upgrade to the TAP 2000 because the new Main CPU Card contains an on-board Command Port connector. The original TAP 200 I/O boards will not work with the new TAP 2000 CPU.

- **Upgrade of Direct Connect Serial Cards**

If a mixture of modem and direct connect serial cards are being used, all direct connect serial cards must be upgraded with the new Main CPU Card.

2.3 HARDWARE INSTALLATION

The following section briefly describes the procedure to be followed when installing the TAP 2000. Figure 2-1 identifies the location of the cards for a TAP 2000. Figure 2-2 identifies the location of the cards for a TAP 2000 upgrade from a TAP 2000.

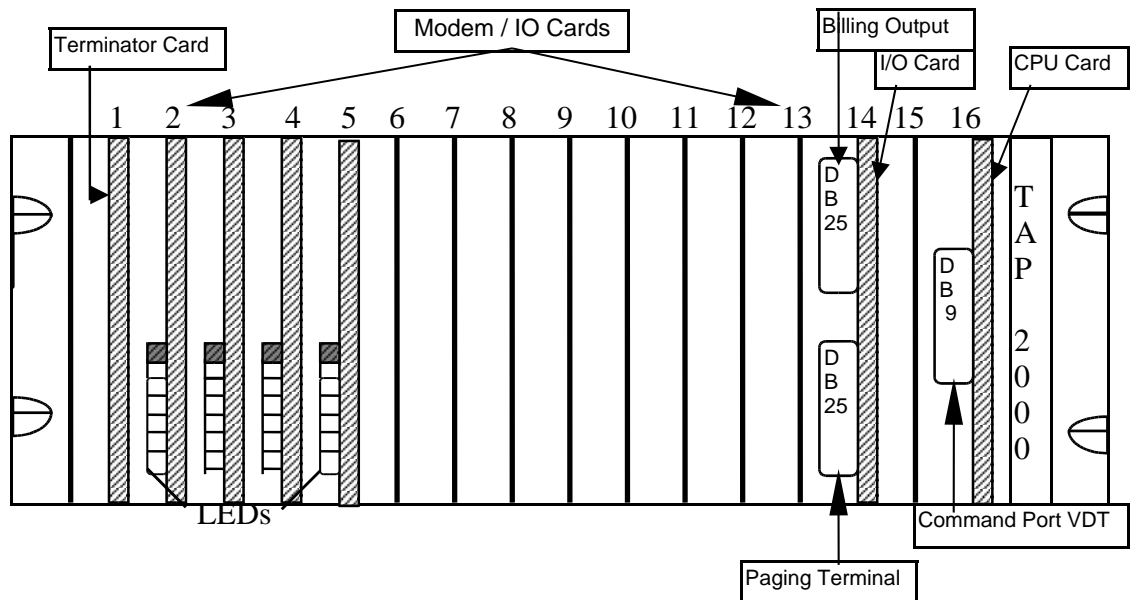


Figure 2-1 Hardware Connections for the TAP 2000

MODEM CARD LINE TYPE

Each modem card in the TAP2000 can be configured for either End-to-End (ringing) lines or for Modem-on-Trunk line types. Use the following table to configure the card for the line type.

	End-to-End	Modem-on-Trunk
W1	out	in
W2	out	in
W3	in	out
W4	in	out
W5	out	in
W6	out	in

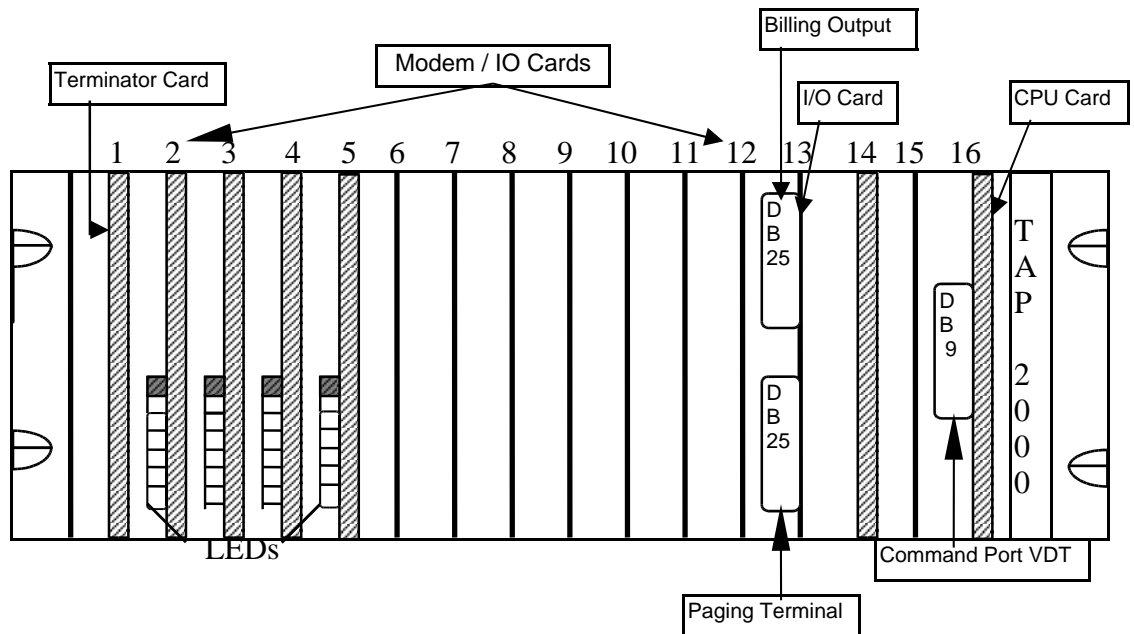


Figure 2-2 Hardware Connections for the TAP 2000 Upgrade

CAUTION:

Make sure the system power is OFF before making any connections between the cards and equipment.

Perform the following to configure and connect the TAP 2000 hardware.

Step 1: Inspect the shipping packages for damage. The TAP 2000 contains CMOS and other Static Sensitive Devices.

Note: Observe proper Electro-static discharge (ESD) precautions when handling the equipment. All handling of circuit boards should be done at a static controlled workstation while being properly grounded with a wrist strap or other device.

Step 2: Carefully unpack the TAP 2000. Inspect for damages incurred during shipping.

Step 3: Configuration of the RS-232 Paging Inputs

If you are using any Dual RS-232 Input Cards in the TAP 2000 for direct connection to page input devices, the fixed baud rate needs to be set for each port. A separate input group must be configured for your serial I/O connections. This group is created using the *Group Configuration* option provided on the TAP 2000 Main Menu. Refer to Section 4.1 for details.

You will need to determine the equipment type and data word format for the paging input device.

Equipment Type:	DCE - Computer DTE - Terminal
Data Word Format	Number of data bits Stop bits Parity

A DCE device is defined as follows:

<u>Pin Definition</u>	<u>Pin Number</u>
Receiving Data (In)	2
Transmitting Data (Out)	3
Request to Send (RTS)	4
Clear to Send (CTS)	5
Ground	7

A DTE device is defined as follows:

<u>Pin Definition</u>	<u>Pin Number</u>
Receiving Data (In)	3
Transmitting Data (Out)	2
Request to Send (RTS)	5
Clear to Send (CTS)	4
Ground	7

- Only DTEs and DCEs can be directly tied together with a straight RS-232 cable (for example, pin 2 to pin 2, pin 3 to pin 3, etc.) The TAP 2000 can be configured to be either a DTE or DCE device. The TAP 2000 configuration is set on the terminal output card using jumpers W1 and W2 for the billing output and W3 and W4 for the terminal output. Refer to the Schematic Drawings in Appendix A of this manual for the location of jumpers W1, W2, W3, and W4.

If connecting the TAP 2000 to a DCE device (for example, AlphaMate), configure the TAP 2000 as a DTE device. If connecting the TAP 2000 to a DTE device, configure the TAP 2000 as a DCE device.

- Wire the paging input device to the input card on the TAP 2000 using a standard RS-232 (straight through) cable that connects pins 2, 3, 4, 5, and 7 of one connector to the same pin number of the second connector. The cable connector pinouts used to connect the paging input device to the input card are described on the prior page.
- If possible, set the paging input device's data word format to match the TAP 2000 default setup of:
 - 7 Data Bits
 - 1 Stop Bit
 - Even Parity

Refer to the paging input device's manual that was distributed with the equipment for instructions on setting these parameters.

- If the above format cannot be set on the paging input device, the TAP 2000 may be configured to match the input device using the **Config. Outputs** option displayed on the TAP 2000 Main Menu. Refer to Section 4.3 for details.

Step 4: Phone Line Connections

Up to 24 phone lines may be connected to the internal modem cards contained within the TAP 2000. These phone lines will be used for the input of paging data. The connection to the phone lines is made using an Amphenol connector on the rear of the TAP 2000 labeled **J1**. A standard 25 pair cable and a DG66 punch block are provided by Hark®.

It is recommended that the phone lines be brought into the punch down block sequentially. In addition, the modem cards should all be loaded from the left of the TAP 2000 card cage. The RS-232 input cards should be loaded from the right side, with any empty slots located in the center of the card cage. This will allow for easy reconfiguration of the system as system requirements change. Refer to Appendix B for the Wiring List/Color Codes chart.

Step 5: Connections to the Paging Terminal

The Paging Output serial port on the TAP 2000 must be connected to the Computer Interface Port on the paging terminal.

- Only DTEs and DCEs can be directly tied together with a straight RS-232 cable (for example, pin 2 to pin 2, pin 3 to pin 3, etc.) The TAP 2000 can be configured to be either a DTE or DCE device. The TAP 2000 configuration is set on the terminal output card using jumpers W1 and W2 for the billing output and W3 and W4 for the terminal output. Refer to the Schematic Drawings in Appendix A of this manual for the location of jumpers W1, W2, W3, and W4.

If connecting the TAP 2000 to a DCE device (for example, AlphaMate), configure the TAP 2000 as a DTE device. If connecting the TAP 2000 to a DTE device, configure the TAP 2000 as a DCE device.

- Wire the paging terminal's computer interface port to the paging output serial port on the TAP 2000 using a RS-232 Null modem cable that connects pins 2, 3, 4, 5, and 7 of one connector to the same pin number of the second connector. The cable connector pinouts used to connect the paging input device to the input card are described in the beginning of this section.
- The recommended BAUD rate is 9600 or 19.2K. The baud rate is set using the *Config. Outputs* option displayed on the TAP 2000 Main Menu. Refer to Section 4.3 for details.
- If possible, set the data word format of the paging terminal's computer interface to match the TAP 2000 default setup of:
 - 7 Data Bits
 - 1 Stop Bit
 - Even Parity

Refer to the paging terminal's manual that was distributed with the equipment for instructions on setting these parameters.

- If the above format cannot be set, the TAP 2000 may be configured to match the paging terminal's computer interface using the *Config. Outputs* option displayed on the TAP 2000 Main Menu. Refer to Section 4.3 for details.

Step 6: Connections to the Billing Device

The TAP 2000 has a Billing Output serial port that can be connected to a Serial Printer or other capture device if billing data is required.

- As previously mentioned in Steps 3 and 4, the TAP 2000 can be configured as either a DTE or DCE device. If the TAP 2000 is connected to a DTE device, configure the TAP 2000 as a DCE device. If connected to a DCE device, configure the TAP 2000 as a DTE device.

- The recommended BAUD rate is 9600. The baud rate is set using the *Config. Outputs* option displayed on the TAP 2000 Main Menu. Refer to Section 4.3 for details.
- Use a standard RS-232 (straight through) cable that connects pins 2, 3, 4, 5, and 7 of one connector to the same pin number of the second connector to connect the Billing Capture device to the Billing Output serial port on the TAP 2000. The billing output port has a DB25F (25-pin female) connector. The cable connector pinouts used to connect the paging input device to the input card are described at the beginning of this section.
- Set the data word format of the Billing data capture device to:
 - 8 Data Bits
 - 1 Stop Bit
 - No Parity

Refer to the billing device's manual that was distributed with the equipment for instructions on setting these parameters.

- If the above format cannot be set, the TAP 2000 may be configured to match the billing terminal using the *Config. Outputs* option displayed on the TAP 2000 Main Menu. Refer to Section 4.3 for details.

Step 7: Connections to the Command Port

The TAP 2000 has a 19.2-BAUD Command serial port that is connected to a command terminal. This port is used to configure the system, and can also be used to monitor the traffic within the system and send manual test pages.

- The recommended BAUD rate is 19.2K. It is recommended that the BAUD rate is not changed from 19.2K. If baud rate must be changed, it may be set using the *Config. Outputs* option displayed on the TAP 2000 Main Menu. Refer to Section 4.3 for details.

- Use an RS-232 Null modem cable that connects pins 2, 3, 4, 5, and 7 of one connector to the same pin number of the second connector to connect the Command Terminal to the Command serial port on the TAP 2000. The port uses a DB9F (9-pin female) connector. The cable connector pinouts used to connect the paging input device to the input card are described on the prior page.
- The port is configured at the factory with the following data word format; do not change the configuration. The host device must be configured to match these parameters.
 - 8 Data Bits
 - 1 Stop Bit
 - No Parity

Refer to the documentation for the host device for instructions on how to set the device's data word format.

- This port should be used locally (not over a modem) for security and reliability purposes.
- The Command port may be left unconnected with no harmful effect on the operation of the TAP 2000.

Step 8: Once all the above connections have been made, connect the system power and turn the power switch located at the back of the TAP 2000 to the ON position.

- All input ports are initialized as defined in the system configuration. During the initial boot after the TAP 2000 is first installed, the default configuration values set by Hark® will be used.
- The Page Output port is initialized and the TAP 2000 logs onto the Computer Interface port of the paging terminal.

The TAP 2000 Status window shown in Figure 2-3 is displayed. The Status window allows you to view all the modem ports, including the terminal and billing ports. Version information is also displayed. Refer to Section 5 for additional details on the Status window.

- To access the TAP Main Menu, press any key to display the Password prompt. The TAP Main Menu allows you to configure the system parameters, send test pages, and access various other system utilities. Upon entering the appropriate password, the TAP Main Menu is displayed. Refer to Section 2.4 for details on logging onto the TAP 2000 application.

- If logging onto the TAP 2000 application for the first time after installation, enter the default factory password of “HARK” and press the RETURN key. This password allows you to access the Main Menu for the first time after system installation. Once the Main Menu is displayed, you should change the default password to another password using the *Change Password* option displayed on the Main Menu. Refer to Section 6 for details.
- If you have already changed the default factory password of “HARK” to another password, enter the system password at the prompt and press the RETURN key.

NOTE:

The passwords are case-sensitive. Both the default factory password of “HARK” and your individualized system password must be entered in the proper case. For example, the default factory password of “HARK” must be entered in upper case. Also, if the password is a combination of upper and lower cases such as rBw0203, the password must be entered in exactly that combination of upper and lower case characters. If rbw0203 or hark is entered as the password, you will not be logged onto the system. In these examples, HARK or rBw0203 must be entered.

3. The system will verify the entered password. If correct, the TAP Main Menu shown in Figure 2-4 is displayed. The Main Menu provides you with the ability to access all of the TAP 2000 functions and applications.

```

MaTn Menu
1 View Ports
2 Show Port Types
3 Statistics
4 Immediate Page
5 Edit Access Passwords
6 TDD Calibrate
7 Modem Group Select
8 Group Configuration
9 Config Outputs
10 Change Password
11 Change Date/Time
12 Reset Page Counters
13 Load Defaults
14 Reset System

Enter Selection:
TAP-2000      Version: 05.XX   Date: 09-06-1996
Glenayre Output Mode

```

Figure 2-4 Main Menu

4. Select an option displayed on the Main Menu by keying the number or letter displayed to the left of each of the options in the *Enter Selection* field and pressing the RETURN key. For example, to access the **View Ports** option, key a **1** in the *Enter Selection* field and press the RETURN key. To access the Change Password option, key an **A** in the *Enter Selection* field and press the RETURN key. Refer to Section 3 of this manual for details on using the TAP 2000 Main Menu.

2.5 LOGGING OFF THE TAP 2000 APPLICATION

Log off the TAP 2000 application by performing the following:

1. Exit any of the displayed TAP 2000 screens by pressing the ESCAPE key until you access the TAP 2000 Main Menu.
2. You have two options at this time. You may:
 - Press the ESCAPE key to immediately exit the Main Menu and log off the TAP 2000 application. The Status window shown in Figure 2-3 is displayed. To re-access the TAP 2000 application, you will need to log onto the system using the procedures discussed in Section 2.4.
 - Wait approximately 20 seconds without depressing any keys. You will be logged off the TAP 2000 application automatically for security reasons. The Status window shown in Figure 2-3 is displayed.

2.6 SYSTEM REBOOT

If, for any reason, the TAP 2000 program hangs or stops normal processing, you will need to reset the system and call Hark Systems' Service Department immediately.

To reset the system, press the Reset switch located at the bottom of CPU Slot 16 at the front of the TAP 2000 Card Cage.

2.7 REMOTE PROGRAMMING ACCESS

You may remotely access the TAP 2000 by calling one of the modem inputs. System command is rerouted temporarily to that modem port under password control. You may perform all the operations that you would normally perform from the command terminal, including monitoring the traffic on the ports, configuring the system parameters, sending a test page, changing passwords, etc.

Perform the following to remotely access the TAP 2000 application.

1. Call an Alpha Paging telephone number that is connected to the TAP 2000 via a modem.
2. Press the RETURN key until the TAP 2000 responds with the **ID=** prompt.
3. When the **ID=** prompt is displayed:
 - a. Press the ESCAPE key.
 - b. Type the literal **PATCH**.
 - c. Immediately type the current System Password.

The TAP 2000 will respond with the **Input xx Patched** prompt, where **xx** equals the actual port number.

4. Press any key at this time to access the Status screen.

The modem port is now able to perform any operation that you would normally perform from the command port. While in this remote mode, the effective BAUD rate of the command port is the same as the modem port.

NOTE:

Because system throughput is reduced when using the remote mode, the remote mode is not recommended for viewing data at peak traffic times.

5. To exit the remote mode, press the `ESCAPE` key until the Status screen is displayed. The TAP 2000 is now back to the normal operational mode.
6. Perform a modem disconnect.

2.8 WHAT TO DO NEXT...

Now that the system has been installed and you have successfully logged onto the TAP 2000, you should refer to Section 3, *TAP 2000 Main Menu*, to learn about the Main Menu and the various utilities that you will see on the Main Menu.

SECTION 3

TAP 2000 MAIN MENU

The following is discussed within Section 3:

- TAP 2000 Main Menu
- Various options and utilities that you may access from the Main Menu
- Procedure used to select the menu options from the Main Menu

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3.1 DESCRIPTION OF THE MAIN MENU

The TAP 2000 Main Menu shown in Figure 3-1 is displayed automatically as a result of the successful completion of the login process. The Main Menu provides you with the ability to access all of the TAP 2000 utilities and functions.

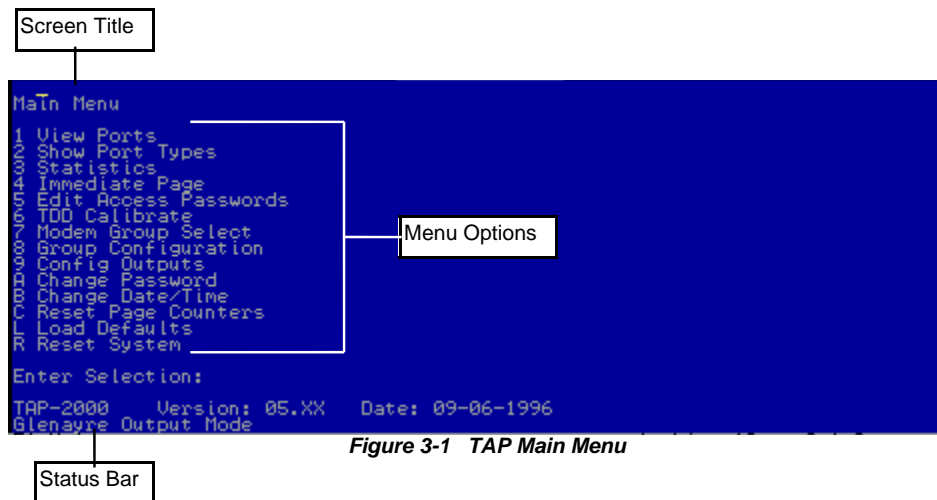


Figure 3-1 TAP Main Menu

The Status Bar identifies the application (TAP 2000), the software version that is currently being used (Version: 05.XX, where XX identifies the actual version) and the current system date (for example, 09-06-1996).

The following menu options are displayed on the Main Menu. Selection of an option initiates the corresponding utility. The appropriate display window or entry prompts are displayed. Each of the following options are discussed in further detail in Sections 4, 5, and 6 of this manual.

View Ports The **View Ports** option allows you to view the traffic for a particular port in real time. Traffic on all the ports, including the terminal and billing ports, may be viewed.

Show Port Types The **Show Port Types** option displays the modem and/or serial interface chip that is in use during the initialization of the system for all ports. The data is displayed in table format.

- Statistics*** The ***Statistics*** option allows you to display the statistical information about the system operation, such as the number of pages received in the current hour, previous hour, last week, last month, and to date, etc.
- Immediate Page*** The ***Immediate Page*** option allows you to send an immediate page from the command console. This function allows you to troubleshoot the link to the paging terminal input by displaying the actual output to the paging terminal.
- Edit Access Passwords*** The ***Edit Access Passwords*** option allows you to identify the individuals that either have access to or no access to the TAP 2000 application.
- TDD Calibrate*** The ***TDD Calibrate*** option allows you to calibrate the TDD or TTY mode of the modems.
- Modem Group Select*** The ***Modem Group Select*** option allows you to assign each modem to a group for programming features. Five groups are available for assignment. The modems must be assigned to a particular group during the initial setup of the system after the TAP 2000 is newly installed.
- Group Configuration*** The ***Group Configuration*** option allows you to configure the modem groups. Each group has a number of parameters that you can set depending upon the type of service being provided by that group. The modem groups must be configured during the initial setup of the system after the TAP 2000 is newly installed.
- Config Outputs*** The ***Config Outputs*** option allows you to configure the output ports of the TAP 2000. The output ports must be configured during the initial setup of the system after the TAP 2000 is newly installed.

- Change Password*** The ***Change Password*** option allows you to change the system password that is required to log onto the TAP 2000 application. This password must be entered to access the Main Menu from the Status window.
- Change Date/Time*** The ***Change Date/Time*** option allows you to change the current system date and time referenced by the TAP 2000 application.
- Reset Page Counters*** The ***Reset Page Counters*** option resets the page counts shown on the Statistics screen and Status screen to zero (0).
- Load Defaults*** The ***Load Defaults*** option resets all the system parameters to the factory default values.
- Reset System*** The ***Reset System*** option resets the entire system as if from an initial power-up.

You may exit the Main Menu and log off the TAP 2000 application by pressing the `ESCAPE` key while the Main Menu is displayed. The Status window shown in Figure 2-3 is displayed. To re-access the Main Menu, you will need to perform the login procedure discussed in Section 2.4.

3.2 SELECTING OPTIONS FROM THE MAIN MENU

Select an option displayed on the Main Menu by performing the following.

1. Key the number or character that is displayed to the left of the Menu Option at the *Enter Selection* prompt.

For example, to access the *View Ports* option, key a **1** at the *Enter Selection* prompt. To access the *Change Password* option, key an **A** at the *Enter Selection* prompt.

2. Press the RETURN key.

The selected option initiates the appropriate utility. The corresponding display window or prompts are displayed. Each of the options and resulting screens are described in detail in Sections 4, 5, and 6 of this manual.

Note: If an invalid entry is keyed at the *Enter Selection* prompt (for example, a **Z** is entered as an option), the option will not be accepted and a beep will be emitted by the command station.

3.3 WHAT TO DO NEXT...

Five modem groups may be configured within the TAP 2000. The parameters that are defined for each of the groups identify the type of service that is being provided by that group. Each modem may then be assigned to one of these groups. You are now ready to configure each of modem groups, assign each of the modems to a particular group, and then configure each of the output ports.

Note: The above process need only be performed during the initial setup of the system. Once configured, the group and port parameters need only be monitored if modifications are required. The configuration process is discussed in detail in Section 4 of this manual.

SECTION 4

SYSTEM CONFIGURATION

The following is discussed within Section 4:

- Configuring the TAP 2000 ports
- Configuring the modem groups
- Assigning each modem to a group
- TDD/TTY calibration of modems
- Sending an Immediate page

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4.1 CONFIGURING THE OUTPUT PORTS

The TAP 2000 Paging terminal, Billing output, and Command ports need to be configured. The parameters that can be set for each of the ports include such items as the output baud rate, port parity, paging terminal login ID, and Paging terminal password.

NOTE:

The Paging terminal, Billing output, and Command ports are configured during the initial setup of the system. Once configured, the port parameters only need to be reviewed if modifications are required.

Changes to the port configuration may be performed at any time. Once the changes are entered, the output port is reinitialized automatically using the new configuration.

Perform the following to configure the TAP 2000 output ports.

1. Select the *Config Outputs* option displayed on the Main Menu as follows:
 - a. Key a **9** at the *Enter Selection* prompt.
 - b. Press the RETURN key.

The Port Configuration window shown in Figure 4-1 is displayed. Figure 4-1 displays all the prompts that will appear as a result of entering data onto the Port Configuration window. When using the TAP 2000 application, only those prompts displayed within the upper portion of the Port Configuration window are displayed. The screen display will scroll to display subsequent prompts that are not visible on the initial screen display.

```
5 = 9600
6 = 14400
7 = 19200
8 = 38400
Enter Terminal Baud Rate, or <CR> to accept [19200]:

Enter Terminal parity, or <CR> to accept [E]:

Enter Terminal Login ID, or <CR> to accept []:

Enter Terminal Password, or <CR> to accept []:

1 = None
2 = Standard
3 = Unipage
Enter Timestamp type, or <CR> to accept [2]:

1 = Disabled
2 = DASIA
3 = Bell Mode
4 = Stats Mode
Enter Billing Output mode, or <CR> to accept [3]:

5 = 9600
6 = 14400
7 = 19200
8 = 38400
Enter Billing Baud Rate, or <CR> to accept [19200]:

Enter Billing parity, or <CR> to accept [N]:

1 = 9600
2 = 19200
Enter Command Port Baud Rate, or <CR> to accept [19200]:

Enter Command Port Parity, or <CR> to accept [N]:

TAP-2000      Version: 05.XX      Date: 09-06-1996
Glenayre Output Mode
```

Figure 4-1 Port Configuration Window

2. Upon accessing the Port Configuration window, the cursor is located at the *Enter Terminal Baud Rate* prompt. Either enter the appropriate data and press the RETURN key to move to the next prompt, or accept the displayed default data by pressing the RETURN key without entering any data at the prompt.

Enter data at each of the prompts displayed on the Port Configuration window using the data requirements listed below. Refer to Figure 4-1 for the exact location of each prompt.

Prompt

Data Requirements

The following fields relate to the Paging Terminal port on the TAP 2000. The system defaults that are displayed at the prompts are recommended unless a special case exists that does not allow the paging terminal to be configured. The paging terminal should be configured to match the default data.

Terminal Baud

Rate

Enter the one digit code that corresponds to the baud rate for the paging terminal port. Valid codes include the following:

<u>Code</u>	<u>Baud Rate</u>
5	9600
6	14400
7	19200
8	38400

The system default baud rate for the paging terminal port is equal to 19200.

Terminal

Parity

Enter the one character code identifying the parity for the paging terminal port. Valid codes include:

<u>Code</u>	<u>Parity</u>
E	Even
N	None

The system default for the paging terminal parity is **E**.

Note: Selecting a parity of Even sets the data word format to 7 data bits, 1 stop bit, and even parity. Conversely, selecting a parity of None sets the data word format to 8 data bits, 1 stop bit, and No parity.

Terminal

Login ID

An entry may only be made in this prompt when using BBL or BBL emulating type terminals. If appropriate, enter the paging terminal login ID. The system default is a blank indicating that no login ID is being used.

Terminal
Password An entry may only be made in this prompt when using BBL or BBL emulating type terminals. If appropriate, enter the paging terminal password in this field. The system default is a blank indicating that no terminal password is being used.

Timestamp Type This field allows you to indicate if a timestamp is required for each page, and, if required, the timestamp type. Valid codes include:

<u>Code</u>	<u>Timestamp Type</u>
-------------	-----------------------

1	None
----------	------

2	Standard
----------	----------

3	Unipage
----------	---------

The system default is **2**, indicating that a standard timestamp is required.

The following fields relate to the Billing Output port.

Billing Output
Mode Entry of one of the following one-character codes in this field allows you to specify the billing output mode. Valid codes include:

<u>Code</u>	<u>Billing Output Mode</u>
-------------	----------------------------

1	Disabled
----------	----------

2	DAS1A
----------	-------

3	Bell Mode
----------	-----------

4	Stats Mode
----------	------------

The system default is **1**, indicating that the billing output is disabled.

Billing Baud
Rate Enter the one digit code that corresponds to the baud rate for the billing output port. Valid codes include the following:

<u>Code</u>	<u>Baud Rate</u>
-------------	------------------

5	9600
----------	------

6	14400
----------	-------

7	19200
----------	-------

8	38400
----------	-------

The system default baud rate for the billing output port is equal to 19200.

Billing Parity Enter the one character code identifying the parity for the billing output port. Valid codes include:

<u>Code</u>	<u>Parity</u>
E	Even
N	None

The system default for the billing output port parity is **N**.

The following fields apply to the Command port.

Command Port
Baud Rate Enter the one digit code that corresponds to the baud rate for the command port. Valid codes include the following:

<u>Code</u>	<u>Baud Rate</u>
1	9600
2	19200

The system default baud rate for the command port is equal to 19200.

Command Port
Parity Enter the one character code identifying the parity for the command port. Valid codes include:

<u>Code</u>	<u>Parity</u>
E	Even
N	None

The system default for the command port parity is **N**.

4. Once the above prompts have been displayed and you have entered the appropriate data, the Main Menu is redisplayed automatically.

4.2 CONFIGURING THE MODEM GROUPS

Five modem groups may be configured within the TAP 2000. The parameters that are defined for each of the groups identify the type of service that is being provided by that group. Each modem may then be assigned to one of these groups.

NOTE:

The modem groups need to be configured during the initial setup of the system. Once configured, the group parameters only need to be reviewed if modifications are required.

Changes to the group configuration may be performed at any time. Once the changes are entered, the ports are reinitialized automatically upon the termination of any current call. The configuration changes will be reflected with the next call made to that port.

Perform the following to configure the modem groups.

1. Select the **Group Configuration** option displayed on the Main Menu as follows:
 - a. Key an **8** at the *Enter Selection* prompt.
 - b. Press the RETURN key.

The Group Configuration window shown in Figure 4-2 is displayed.

Note: Figure 4-1 displays all the prompts that will appear as a result of entering data onto the Group Configuration window. When using the TAP 2000 application, only those prompts displayed within the upper portion of the Group Configuration window are displayed. The screen display will scroll to display subsequent prompts that are not visible on the initial screen display.

```
Enter Group 1's Name, or <CR> to accept [Group 1]:
Enter Group 1's Welcome, or <CR> to accept [Hark Tap-2000]:
Enter Group 1's Modem Init String, or <CR> to accept [ATH X4 Y1]:
Enter Group 1's Logon Prompt Delay, or <CR> to accept [8]:
Enter Group 1's Max ID= Count, or <CR> to accept [3]:
Enter <LF><CR> after ID=, or <CR> to accept [Y]:
Enter Send 'Please Wait' prompt, or <CR> to accept [N]:
Enter Group 1's Message Length, or <CR> to accept [240]:
Enter Truncate Messages, or <CR> to accept [Y]:
Enter Group 1's Batch Limit, or <CR> to accept [255]:
Enter Group 1's Manual Limit, or <CR> to accept [10]:
Enter Special Manual Logon, or <CR> to accept [N]:
1200
2400
4800
9600
14400
Enter Max Connect Baud Rate, or <CR> to accept [9600]:
Enter Group 1's Ring Answer Count, or <CR> to accept [1]:
Enter No Tdd fallback, or <CR> to accept [N]:
Enter 'N' for Next or <ESC> to end:
TAP-2000 Version: 05.XX Date: 09-06-1996
Glenayre Output Mode
```

Figure 4-2 Group Configuration Window

2. Upon accessing the Group Configuration window, the cursor is located at the *Enter Group 1's Name* prompt. You will be entering the group configuration data for Group 1. Press the RETURN key to move to the next prompt after entering the appropriate data. Once you have completed entering the parameters for Group 1, the prompt *Enter Group 2's Name* is displayed. You will then be entering the parameters for Group 2. This process is repeated for all 5 groups.

Enter data at each of the prompts displayed on the Group Configuration screen using the data requirements listed below. Move from prompt to prompt by pressing the RETURN key. Default values are displayed within each of the prompts. To accept the displayed default value, press the RETURN key without entering any data at the prompt.

The default will be accepted and you will be moved to the next prompt.

Note: The X displayed in each of the prompt literals shown in the Prompt column below are replaced with the actual group number on the Group Configuration window. Refer to Figure 4-2 for the exact wording and location of each prompt.

Prompt

Data Requirements

Group X's Name Enter the name of the group at this prompt. Up to 8 alphanumeric characters may be entered. The system default name is **Group 1, Group 2, Group 3**, etc., depending upon the group number.

Group X's
Welcome

Enter the Welcome message for the indicated group. The system default is **HARK TAP 2000**. If you enter a Welcome message (either the default or a customized version), the TAP 2000 abides by the TAP 1.6 protocol. If no Welcome message is entered, TAP 2000 abides by the TAP 1.3 protocol.

Group X's Modem

Init String

You may identify the modem initialization string transmitted to the modem on startup. The system default is **ATH X4 V1**.

Group X's Logon

Prompt Delay

Enter the number of seconds before the manual prompt is displayed after logon. A value between 1 through 12 may be entered. The system default is **8** seconds.

Group X's Max

ID=

Enter the maximum number of IDs that may be sent before the system disconnects. A value between 1 and 12 may be entered. The system default is **3**.

- <LF><CR>
After ID= This field allows you to specify if a line feed and carriage return needs to be sent after each ID=. Enter a Y in this field to indicate that a line feed must be sent. Enter an N in this field to indicate that a line feed should not be sent. The system default is **Y**; indicating that a line feed and carriage return will be sent.
- Send 'Please
Wait' Prompt This field allows you to specify if the "Please Wait" prompt should be displayed on the paging input device. Enter a Y in this field to indicate that the prompt will be sent. Enter an N in this field to indicate that the prompt should not be sent. The system default is **N**, indicating that the prompt should not be sent.
- Group X's Mes-
sage Length Enter the maximum number of characters that may be contained within a single message. The maximum value that may be entered at this prompt is 240. The system default for the maximum message length is **240**.
- Truncate Message This field allows you to specify if those characters that exceed the maximum message length specified in the above field should be truncated. Enter a Y in this field to truncate any characters above the maximum message length. For example, if the maximum message length is 240 characters and a page is received with 300 characters, one page will be created for the 240 characters. Once sent, an <ACK> will be returned.
- The system default is **N**, indicating that the message is to be rejected if above the maximum message character count. To accept the default value and move on to the next prompt, press the RETURN key without entering any data at this prompt.

Group 1's

Batch Limit

You may limit the number of pages delivered into the paging system on a per call basis using this field. Enter the maximum number of pages that may be accepted per phone line connection. This prevents unauthorized group calls from gaining access to the paging terminal. The maximum value that may be entered at this prompt is 255. The system default for the maximum batch limit is **255**.

Group 1's

Manual Limit

Enter the number of manual messages that may be sent at one time. A value between 0 and 255 may be entered. The system default for the maximum manual messages is **10**.

Special Manual

Logon

You may specify if you want a special manual logon procedure. Enter a Y if a special manual logon is required. Enter an N if a special manual logon is not required. The system default for the special manual logon is **N**, indicating that no special logon is required.

Max Connect

Baud Rate

Specify the maximum baud rate at which the page may be accepted by this group. Enter the one digit code identifying the baud rate. Valid codes include:

<u>Code</u>	<u>Baud Rate</u>
-------------	------------------

2	1200
---	------

3	2400
---	------

4	4800
---	------

5	9600
---	------

6	14400
---	-------

The system default for the maximum connect baud rate is **9600**.

Group X's Ring

Answer Count Specify the number of rings after which the unit will answer. For example, if a 1 is entered at this prompt, the unit will answer after 1 ring. If a 2 is entered, the unit will answer after 2 rings. A value between 1 and 9 may be entered. The system default for the ring answer count is **1**.

No TDD

Fallback This field allows you to specify if you want to accommodate the Telecommunications Device for the Deaf (TDD) access feature. Enter a Y in this field if you do not want the TDD feature to be activated to the indicated group. Enter an N in this field if you do want the TDD feature to be activated for the indicated group. The system default for the maximum message length is **N**, indicating that you do want the TDD feature to be applicable.

4. Once the above prompts have been displayed and you have entered the appropriate data, the *Enter 'N' for Next or <ESC> to end* prompt is displayed. This prompt is displayed as the last line above the status bar on the Group Configuration window shown in Figure 4-1.
 - Key an **N** at the prompt to indicate that you want to enter the group configuration parameters for the next sequential group. For example, if you were entering the parameters for Group 1, upon entering an **N** at this prompt, the configuration data for Group 1 will be saved and the parameter prompts for Group 2 will be displayed. The prompts are the same, with the exception that the Group number within the prompt will equal 2.
 - Press the `ESCAPE` key to save the entered data and exit the Group Configuration utility. The Main Menu will be displayed.

4.3 ASSIGNING A MODEM TO A GROUP

Once you have configured the modem groups using the process described in Section 4.1, you will need to assign each of the modems to one of the five modem groups. These modem groups identify the type of service that is being provided by that group.

NOTE:

The modems need to be assigned to a particular modem group during the initial setup of the system. Once configured, the modem groups only need to be reviewed if modifications are required.

Changes to the modem groups may be performed at any time. Once the changes are entered, the ports are reinitialized automatically upon the termination of any current call. The configuration changes will be reflected with the next call made to that port.

Perform the following to assign a modem to a particular modem group.

1. Select the ***Modem Group Select*** option displayed on the Main Menu as follows:
 - a. Key a **7** at the *Enter Selection* prompt.
 - b. Press the RETURN key.

The Modem Group Selection window shown in Figure 4-3 is displayed.

Repeat Step 2 until all 24 modems have been assigned to a particular group.

Note: Accept the default values for modem slots that do not contain a card.

```
1 = Group 1
||| Group 3
||| Group 4
||| Group 5
Enter Modem 01's Group Number, or <CR> to accept [Group 1]:

1 = Group 1
||| Group 3
||| Group 4
||| Group 5
Enter Modem 02's Group Number, or <CR> to accept [Group 1]:

1 = Group 1
||| Group 3
||| Group 4
||| Group 5
Enter Modem 03's Group Number, or <CR> to accept [Group 1]:
```

Figure 4-4 Sample Modem Group Selection Window (Modems 1 through 3)

```
1 = Group 1
||| Group 3
||| Group 4
||| Group 5
Enter Modem 22's Group Number, or <CR> to accept [Group 1]:

1 = Group 1
||| Group 3
||| Group 4
||| Group 5
Enter Modem 23's Group Number, or <CR> to accept [Group 1]:

1 = Group 1
||| Group 3
||| Group 4
||| Group 5
Enter Modem 24's Group Number, or <CR> to accept [Group 1]:
```

Figure 4-5 Sample Modem Group Selection Window (Modems 22 through 24)

Note: You can not exit this function by pressing the ESCAPE key. You are required to assign each of the 24 modems to a group.

4.4 SENDING AN IMMEDIATE PAGE

An immediate page may be initiated and sent from the command console. The test page allows you to troubleshoot the link to the paging terminal by allowing you to view the actual output to the paging terminal.

Perform the following to send an immediate page.

1. Select the *Immediate Page* option displayed on the Main Menu as follows:
 - a. Key a **4** at the *Enter Selection* prompt.
 - b. Press the RETURN key.

The Immediate Page window shown in Figure 4-6 is displayed.

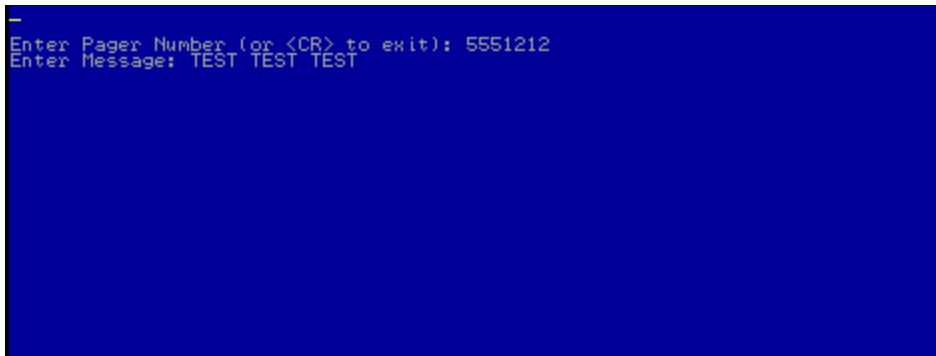


Figure 4-6 Immediate Page Window

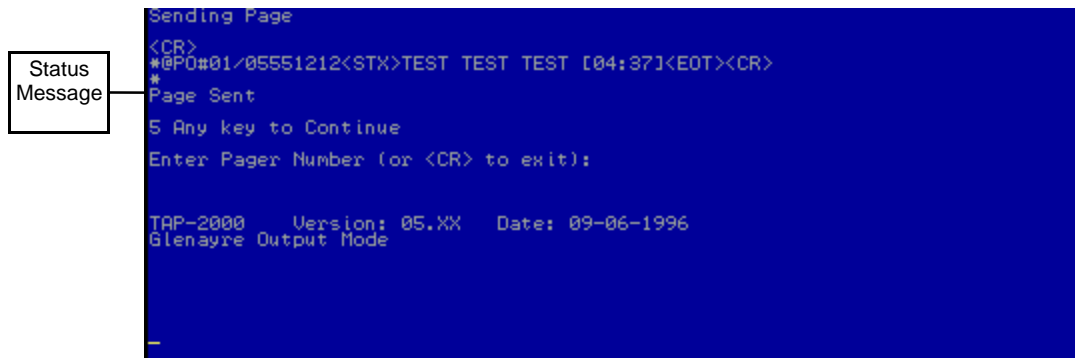
2. Key the seven-digit pager number at the *Enter Pager Number* prompt and press the RETURN key.

NOTE: If you have not entered any data at the prompt, you may press the RETURN key at this time to exit the Immediate Page utility and return to the Main Menu.

The Enter Message prompt is displayed at the bottom of the Immediate Page window. Refer to Figure 4-6 for the location of the prompt.

3. Key the message that you want to send to the paging terminal at the *Enter Message* prompt and press the RETURN key. The maximum number of characters that may be entered is limited by the modem configuration.

The page will be sent at this time. The status of the page will be displayed on the screen (for example, Page Sent). Refer to Figure 4-7 for the location of the Status message.



```
Sending Page
<CR>
*BP0#01/05551212<STX>TEST TEST TEST [04:37]<EOT><CR>
*
Page Sent
5 Any key to Continue
Enter Pager Number (or <CR> to exit):

TAP-2000   Version: 05.XX   Date: 09-06-1996
Glenayre Output Mode
```

A box labeled "Status Message" with a line pointing to the "Page Sent" line in the terminal output.

Figure 4-7 Status Message

4. Press the RETURN key to return to the Main Menu. If you wish to send another page, enter the Page Number at the Enter Pager Number prompt and press the enter key. Then enter the new message as described in Step 3.

4.5 WHAT TO DO NEXT...

If the immediate page transmitted successfully to the paging terminal, you are now ready to monitor the system. The screens that are used to monitor the system in real time are described in detail in Section 5.

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SECTION 5

MONITORING THE SYSTEM

The following section discusses the procedures that must be used to monitor the traffic on all the modem ports, including the terminal and billing ports, in real time.

Three screen displays are provided.

- The Status screen allows you to view the activity on all ports at one time.
- The View Ports screen allows you to view the real-time traffic for a selected output port.
- The Statistics screen allows you to view statistical information about the system operation.
- The Port Types screen allows you to verify the modem and/or serial interface chip in use at the initialization of the system.

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5.1 TAP 2000 STATUS SCREEN

The TAP 2000 Status screen shown in Figure 5-1 is displayed as a result of the successful boot of the TAP 2000 application. The Status screen displays the level of operation of each port in real time.

```

Hark Systems, Inc.      Tap-2000 Version: 05.18      Status Screen
# Rate Lv Page_Num Login Len Rslt # Rate Lv Page_Num Login Len Rslt
0000 9600 00 000000 0000 000 00 002 0000 00 000000 0000 000 00
0000 0000 00 000000 0000 000 00 006 0000 00 000000 0000 000 00
0000 0000 00 000000 0000 000 00 008 0000 00 000000 0000 000 00
0000 0000 00 000000 0000 000 00 010 0000 00 000000 0000 000 00
0000 0000 00 000000 0000 000 00 012 0000 00 000000 0000 000 00
0000 0000 00 000000 0000 000 00 014 0000 00 000000 0000 000 00
0000 0000 00 000000 0000 000 00 016 0000 00 000000 0000 000 00
0000 0000 00 000000 0000 000 00 018 0000 00 000000 0000 000 00
0000 0000 00 000000 0000 000 00 020 0000 00 000000 0000 000 00
0000 0000 00 000000 0000 000 00 022 0000 00 000000 0000 000 00
0000 0000 00 000000 0000 000 00 024 0000 00 000000 0000 000 00
Te 19200 04 5551234 0039 13 Bi 19200 00 5551234 0039 13
[Press any Key for Menu] 0000000310 0000000249 09-27-96 10:06:17
  
```

Figure 5-1 Status Screen

- The Status screen is displayed automatically upon the successful boot of the TAP 2000 application. Pressing any key while the Status screen is displayed will display the Login prompt, allowing you to log onto the TAP 2000 application and display the Main Menu.
- To return to the Status screen from the Main Menu, press the `ESCAPE` key. You will be logged off the TAP 2000 application and the Status screen will be displayed.
- The total number of attempts and the total number of successful connections are displayed at the bottom of the screen to the left of the system date and time.
- The following data is displayed for each of the 24 ports, plus the paging terminal and billing output ports. None of the displayed data may be changed on this screen.

<u>Field</u>	<u>Field Description</u>
--------------	--------------------------

#	The Port Number (01 through 24) is displayed for each of the 24 ports. In addition, the literal <i>Te</i> is displayed for the Paging Terminal port and <i>Bi</i> is displayed for the Billing Output port.
---	---

Rate The Baud rate for each paging connection is listed in this column.

Lv The level of operation for each port is displayed in this column. Level codes and the corresponding function descriptions for a modem port and the terminal port are listed below:

<u>Level</u>	<u>Modem / I/O</u>	<u>Terminal Port</u>
0	Initializing	Not logged in
1	Modem identified	Login sent
2	Wait for OK state	ID sent
3	Idle state	Password sent
4	Ring seen ATA sent	Ready for page
5	Connect XXXXX seen	Page command sent
6	Looking for STX	Response received
7	Looking for message	
8	Looking for checksum	
9	M<CR> seen	
10	Rcvd manual ID	
11	Waiting for more pages	
12	EOT sent	
13	NO CARRIER seen	
14	TDD seen	
15	TDD ID rcvd	
99	Remote Patch In	

Page_Num The seven digit pager number to which the page is being transmitted is displayed in this column.

Login The Login password, if used by the input device, is displayed in this column. TAP protocol provides for a six-digit password.

Len The number of characters contained within the page is displayed in this column.

Rslt The result of the page transmission is displayed in this column. The last level of the paging transaction is displayed for each paging connection.

5.2 VIEW PORTS SCREEN

The *View Ports* option provided on the Main Menu allows you to view the real-time traffic for a selected output port. The data is displayed at the time it is sent to the Paging terminal. Each of the ports (1 through 24), plus the terminal and billing ports may be viewed using this option.

All pages that are sent to the paging terminal, whether the pages were accepted or not, are displayed during this view. If a page is rejected, the calling device is notified of the failure by the TAP 2000. Failed pages are not sent to the Billing device.

Perform the following to access the View Ports screen.

1. Select the *View Ports* option displayed on the Main Menu as follows:
 - a. Key a **1** at the *Enter Selection* prompt.
 - b. Press the RETURN key.

The View Ports window shown in Figure 5-2 is displayed.

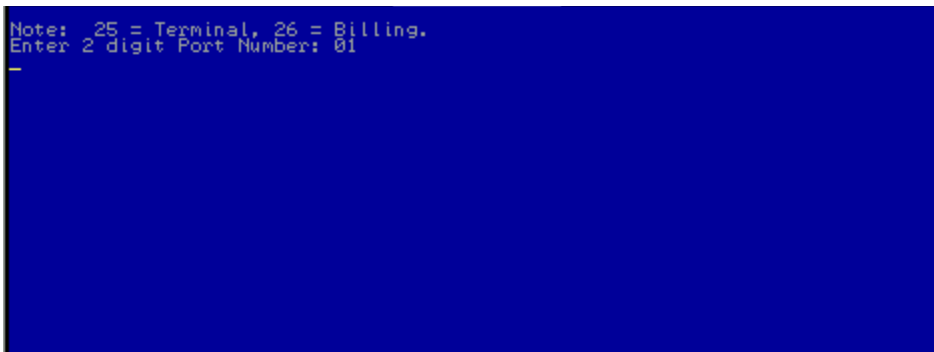


Figure 5-2 View Ports Window

2. Key the two digit port number for which you want to view the traffic. Valid port numbers include 01 to 24 (modem ports), 25 (identifying the Paging Terminal port) and 26 (identifying the Billing port).

The system is now in view mode; you are now watching the activity on the specified port. Various text strings describing the communication are displayed on the screen as a page is sent to the port. A sample of the data that may be displayed on the screen is shown in Figure 5-3.

```
<LF>RING<CR>
<LF>ATA<CR>
<CR>
<LF>CONNECT<CR>
<LF>e<CR>
ID=<LF><CR>
<ESC>P61<CR>
110 1.6<CR>
<ACK><CR>
114 Hark Tap-2000<LF><CR>
<ESC>Lp<CR>
<STX>123<CR>
<STX>123<CR>
HBC<CR>
<CR>
<ACK><CR>
<ETX>17<CR>
<EOT><CR>
115 Please Hangup Now<LF><CR>
<ESC><EOT><CR>
```

Figure 5-3 Sample Data

3. Hold down the CTRL key, then simultaneously press the P key to control the displayed port as though you were controlling the modem from a VDT.

This mode allows you to debug problems that tend to occur when bringing new users or custom remote paging equipment or software on-line. Usually, this mode is not needed during normal operation.

5.3 STATISTICS SCREEN

The Statistics screen is displayed as a result of selecting the *Statistics* option provided on the Main Menu. The Statistics screen displays statistical information about the system operations, including the number of pages received within the current hour, last hour, last week, last month, and year to date. In addition, the number of rejected pages and the time in seconds that the modem groups were in an “All Trunks Busy” statuses are displayed. This information may be used to determine the amount of paging throughput of the system and when more inputs need to be added.

Perform the following to access the Statistics screen.

1. Select the *Statistics* option displayed on the Main Menu as follows:
 - a. Key a **3** at the *Enter Selection* prompt.
 - b. Press the RETURN key.

The Statistics screen shown in Figure 5-4 is displayed. You may press any key while the Statistics screen is displayed to exit the Statistics screen and return to the Main Menu.

Hark Systems, Inc.		Tap-2000 Version: 05.XX			Stats Screen			
Group	Name	Pages	Sent	Rej	Inv	B Secs	LB Secs	
01	Group 1	00000027	00000025	00002	00000	0024.4	0000.0	
02	Group 2	00000000	00000000	00000	00000	0007.1	0000.0	
03	Group 3	00000000	00000000	00000	00000	0000.0	0000.0	
04	Group 4	00000000	00000000	00000	00000	0000.0	0000.0	
05	Group 5	00000003	00000003	00000	00000	0127.4	0000.0	
		C Hr	L Hr	Today	L Day	Month	L Month	Total
Pages:		00026	00004	000030	000000	00000030	00000000	000000030
Sent:		00024	00004	000028	000000	00000028	00000000	000000028
Rej:		00002	00000	000002	000000	00000002	00000000	000000002
Inv:		00000	00000	000000	000000	00000000	00000000	000000000
[Press any Key for Menu]		0000000038	0000000031	09-30-96	09:34:17			

Figure 5-4 Statistics Screen

2. The following data is displayed. None of the displayed data may be changed on this screen.

<u>Field</u>	<u>Field Description</u>
Group	The Group Number for which the data is displayed is listed in this column. Groups 01 through 05 are listed.
Name	The Group name originally assigned to each of the groups using the Group Configuration window discussed in Section 4.1 is displayed in this column.
Pages	The number of attempted pages that were transmitted to each of the groups since the last time the system was reset is displayed in this column. This total is set back to zero (0) each time the page counters are cleared using the <i>Load Defaults</i> and <i>Reset Page Counters</i> options.
Sent	The total number of pages that were successfully sent to each of the groups since the last time the system was reset is displayed in this column. This total is set back to zero (0) each time the page counters are cleared using the <i>Load Defaults</i> and <i>Reset Page Counters</i> options.
Rej	The total number of pages that were rejected within each of the groups since the last time the system was reset is displayed in this column. This total is set back to zero (0) each time the page counters are cleared using the <i>Load Defaults</i> and <i>Reset Page Counters</i> options.
Inv	The total number of pages that were classified as being invalid within each of the groups since the last time the system was reset is displayed in this column. This total is set back to zero (0) each time the page counters are cleared using the <i>Load Defaults</i> and <i>Reset Page Counters</i> options.

B Secs The number of seconds within the current hour that all the trunks were busy within each of the groups is displayed in this column.

LB Secs The number of seconds within the last hour that all the trunks were busy within each of the groups is displayed in this column.

The following totals are displayed for all categories of pages, pages that were sent, pages that were rejected, and pages that were invalid.

C Hr The total number of pages attempted, number of pages sent, rejected pages, and invalid pages that were processed within the current hour are displayed.

L Hr The total number of pages attempted, number of pages sent, rejected pages, and invalid pages that were processed within the last hour are displayed.

Today The total number of pages attempted, number of pages sent, rejected pages, and invalid pages that were processed on the current date are displayed.

L Day The total number of pages attempted, number of pages sent, rejected pages, and invalid pages that were processed yesterday are displayed.

Month The total number of pages attempted, number of pages sent, rejected pages, and invalid pages that were processed within the current month are displayed.

L Month The total number of pages attempted, number of pages sent, rejected pages, and invalid pages that were processed within the last month are displayed.

Total The total number of pages attempted, number of pages sent, rejected pages, and invalid pages that were processed since the last time the page counters were reset are displayed.

3. Press any key while the Statistics screen is displayed to return to the Main Menu.

5.4 PORT TYPES SCREEN

The *Port Types* option provided on the Main Menu allows you to display the modem and/or serial interface chip that is in used at each of the 24 ports, plus the paging terminal port, billing port, and command port, when the system was initialized.

Perform the following to access the Port Types screen.

1. Select the *Show Port Types* option displayed on the Main Menu as follows:
 - a. Key a **2** at the *Enter Selection* prompt.
 - b. Press the RETURN key.

The Port Types screen shown in Figure 5-5 is displayed. You may press any key while the Port Types screen is displayed to exit the Port Types screen and return to the Main Menu.

```
Enter Selection: pp
Port:01 Type:0HARKp Modem:014.4/TDDp Port:02 Type:0HARKp Modem:014.4/TDD
Port:03 Type:0HARKp Modem:014.4/TDDp Port:04 Type:0HARKp Modem:014.4/TDD
Port:05 Type:0HARKp Modem:014.4/TDDp Port:06 Type:0HARKp Modem:014.4/TDD
Port:07 Type:0HARKp Modem:014.4/TDDp Port:08 Type:0HARKp Modem:014.4/TDD
Port:09 Type:0HARKp Modem:014.4/TDDp Port:10 Type:0HARKp Modem:014.4/TDD
Port:11 Type:0HARKp Modem:014.4/TDDp Port:12 Type:0HARKp Modem:014.4/TDD
Port:13 Type:0HARKp Modem:014.4/TDDp Port:14 Type:0HARKp Modem:014.4/TDD
Port:15 Type:0Nonep Modem:0Unknown p Port:16 Type:0Nonep Modem:0Unknown
Port:17 Type:0Nonep Modem:0Unknown p Port:18 Type:0Nonep Modem:0Unknown
Port:19 Type:0Nonep Modem:0Unknown p Port:20 Type:0Nonep Modem:0Unknown
Port:21 Type:0Nonep Modem:0Unknown p Port:22 Type:0Nonep Modem:0Unknown
Port:23 Type:0Nonep Modem:0Unknown p Port:24 Type:0Nonep Modem:0Unknown

Terminal Type:0550 p
Billing Type:0550 p
Command Type:0SCI p

Press any key to exit.
TAP-2000 Version: 05.XX Date: 09-06-1996
```

Figure 5-5 Port Types Screen

2. Press any key while the Port Types screen is displayed to return to the Main Menu.

SECTION 6

MAINTENANCE UTILITIES

Section 6 discusses the following maintenance utilities:

- TDD/TTY calibration of modems
- Changing the access passwords
- Changing the system password
- Changing the system date and time
- Resetting the page counters
- Loading the system defaults
- Resetting the TAP 2000 system

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6.1 TDD/TTY CALIBRATION OF MODEMS

You have the option to calibrate the TDD or TTY mode of the modems. Upon initiating the utility, a process is started that sets the frequency of the TDD encoder/decoder for the specified modem.

Perform the following to calibrate a particular modem port.

1. Select the *TDD Calibrate* option displayed on the Main Menu as follows:
 - a. Key a **6** at the *Enter Selection* prompt.
 - b. Press the RETURN key.

The TDD Calibration window shown in Figure 6-1 is displayed.

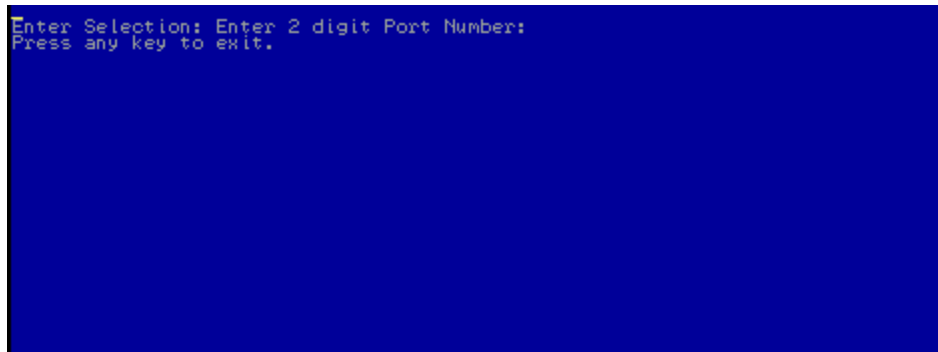


Figure 6-1 TDD Calibration Window

2. Key the number of the modem port that needs calibration at the *Enter 2 digit Port Number* prompt. Note: you must enter two digits. For example, modem port 2 must be entered as 02; modem port 9 must be entered as 09; modem port 11 must be entered as 11.

The TDD Calibration data shown in Figure 6-2 is displayed on the screen.

3. If tuning is required, the proper potentiometer on the modem card can be adjusted. The upper potentiometer is used for the odd numbered modem on the card; the lower potentiometer is used for the even numbered modem card.

6.2 EDIT ACCESS PASSWORDS

The *Edit Access Passwords* option provided on the Main Menu allows you to establish a list of users that may either access the TAP protocol or may not access the TAP protocol. The system will verify the password entered during a login attempt with the passwords contained within the Access List. Depending upon the mode set and whether the user's password is referenced in the Access List, the user is either logged onto the system or returned to the Status screen without accessing the system.

Perform the following to access the *Edit Access Passwords* option.

1. Select the *Edit Access Passwords* option displayed on the Main Menu as follows:
 - a. Key a **5** at the *Enter Selection* prompt.
 - b. Press the RETURN key.

The Edit Access Passwords window shown in Figure 6-3 is displayed.



Figure 6-3 Edit Access Passwords Window

2. The following utilities are provided on Edit Access Passwords window. To select one of the following options, key the number displayed to the left of the option description in the *Enter Selection* field and press the RETURN key.

Positive List Mode

Select this option by typing a **1** in the *Enter Selection* field. Selection of this option indicates that only those passwords that are listed in the Access list may actually log onto and access the TAP 2000 application.

<i>Negative List Mode</i>	Select this option by typing a 2 in the <i>Enter Selection</i> field. Selection of this option indicates that those passwords that are listed in the Access list may NOT log onto and access the TAP 2000 application. Those passwords not listed in the Access list may access the system.
<i>Disable List</i>	Select this option by typing a 3 in the <i>Enter Selection</i> field. Selection of this option disables the Access list. Any user may log onto and access the TAP 2000 application.
<i>Show List</i>	Select this option by typing a 4 in the <i>Enter Selection</i> field. Selection of this option displays the passwords that are referenced within the Access list. Note: this function is used for display purposes only.
<i>Add Name</i>	Select this option by typing a 5 in the <i>Enter Selection</i> field. Selection of this option allows you to add a new password to the Access list.
<i>Remove Name</i>	Select this option by typing a 6 in the <i>Enter Selection</i> field. Selection of this option allows you to delete a particular password from the Access list.
<i>Clear all Names</i>	Select this option by typing a 7 in the <i>Enter Selection</i> field. Selection of this option allows you to delete all individuals from the Access list. At this time, any user may access the system.

6.3 CHANGE PASSWORD

The *Change Password* option provided on the Main Menu allows you to change the system password that must be entered while logging onto the TAP 2000 application. Refer to Section 2.4 for a description of the login procedure.

Perform the following to access the *Change Password* option.

1. Select the *Change Password* option displayed on the Main Menu as follows:
 - a. Key an **A** at the *Enter Selection* prompt.
 - b. Press the RETURN key.

The Change Password window shown in Figure 6-4 is displayed.



Figure 6-4 Change Password Window

2. Key the current system password at the *Enter Current Password* prompt and press the RETURN key.

NOTE:

The passwords are case-sensitive. Both the default factory password of “HARK” and your individualized system password must be entered in the proper case.

If the current system password is entered incorrectly, the user will not be logged onto the system and the Status screen is redisplayed. Press any key to return to the Login prompt.

3. Key the new password at the *Enter New Password* prompt and press the RETURN key.

Up to eight alphanumeric characters may be entered. Note if you are entering the characters in upper or lower case. As mentioned previously, the password is case-sensitive. In order to log onto the system successfully, you will need to know the case of each character contained within the password.

If the current system password is correct and the new password is valid, the system will change the password from the old password to the new password. The next time you log onto the system you will need to enter the new password at the *Enter Password* prompt.

Note: If you forget or misplace your password, contact a service representative at Hark Systems.

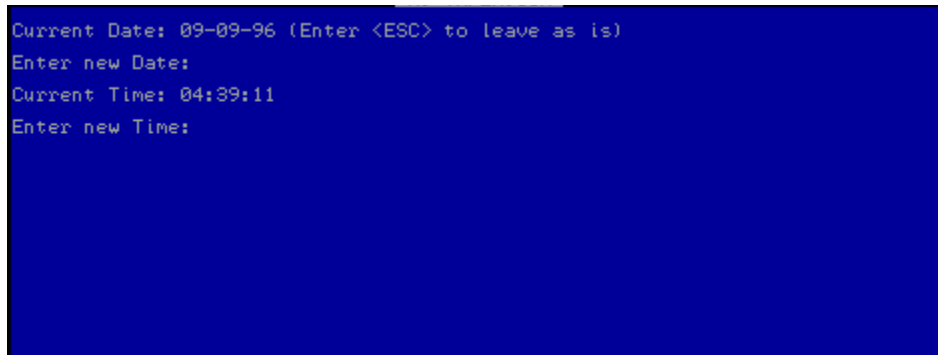
6.4 CHANGE SYSTEM DATE AND TIME

The *Change Date/Time* option provided on the Main Menu allows you to change the current system date and time referenced at the bottom of the Main Menu and Status screen. Refer to Figures 2-3 and 2-4 for the location of the system date and time.

Perform the following to access the *Change Date/Time* option.

1. Select the *Change Date/Time* option displayed on the Main Menu as follows:
 - a. Key a **B** at the *Enter Selection* prompt.
 - b. Press the RETURN key.

The Change Date/Time window shown in Figure 6-5 is displayed.



```
Current Date: 09-09-96 (Enter <ESC> to leave as is)
Enter new Date:
Current Time: 04:39:11
Enter new Time:
```

Figure 6-5 Change Date/Time Window

2. The current system date is displayed at the *Current Date:* literal. The cursor is located at the *Enter new Date:* prompt. You have the option to perform one of the following at this time:

- Press the ESCAPE key if you do not want to change the current date. The displayed system date will not be changed and the cursor will be moved to the *Enter New Time:* prompt.

Note: If you press the RETURN key at this prompt instead of pressing the ESCAPE key, you will not exit this prompt. You MUST press the ESCAPE key to retain the displayed date and move to the next prompt.

- Key the new system date at the *Enter new Date:* prompt and press the RETURN key.

The date must be entered in the format MM-DD-YY, where MM equals the numerical equivalent of the month, DD equals the date and YY equals the last two digits of the year. You also need to enter the dashes (-) between the date segments.

3. The current system time is displayed at the *Current Time:* literal. The cursor is located at the *Enter new Time:* prompt. You have the option to perform one of the following at this time:

- Press the Escape key if you do not want to change the current time. The displayed system time will not be changed.
- Key the new system time at the *Enter new Time:* prompt and press the RETURN key.

The time must be entered in the format HH:MM:SS, where HH equals the hour based on a 24 hour format, MM equals the minute, and SS equals the seconds. You also need to enter the colons (:) between the time segments. For example, 1:30 P.M. must be entered as 13:30:00.

4. The Main Menu is displayed once you have changed the required data.

6.5 RESET PAGE COUNTERS

The *Reset Page Counters* option provided on the Main Menu allows you to reset the page counters displayed on the Statistics screen and Status screen. Refer to Section 5.3 for an explanation of each of the page counters that are displayed on the Statistics screen. Refer to Section 5.1 for an explanation of each of the page counters shown on the Status screen.

NOTE:

Use caution when initiating the *Reset Page Counters* option. Once the page counts are reset to zero (0), the prior counts may not be retrieved.

Perform the following to access the *Reset Page Counters* option.

1. Select the *Reset Page Counters* option displayed on the Main Menu as follows:
 - a. Key a **C** at the *Enter Selection* prompt.
 - b. Press the RETURN key.

The Reset Page Counters Verification window shown in Figure 6-6 is displayed.

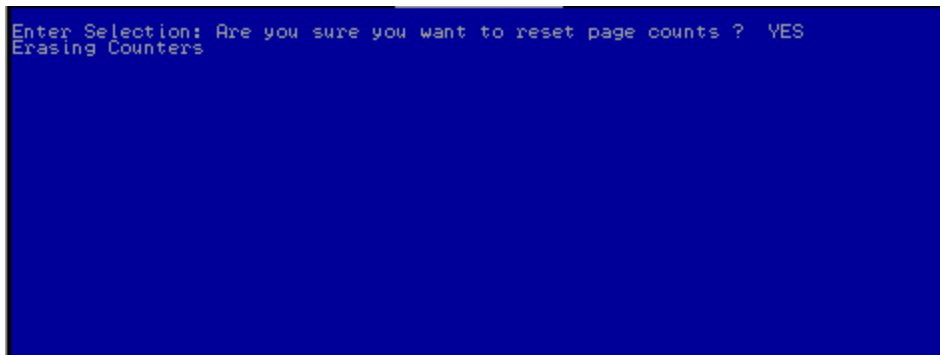


Figure 6-6 Reset Page Counters Verification Window

2. The cursor is located at the *Are you sure you want to reset page counts?* prompt. You have the option to perform one of the following at this time:
 - Key **YES** at the prompt and press the RETURN key if you want to continue with the reset page count process.

Note: You must key **YES** to reset the page counts; the complete word must be typed and the characters must be typed in upper case. Keying a **Y** or **yes** at this prompt will not reset the page counts. The Verification window will be exited and the Main Menu will be redisplayed.
 - Press the ESCAPE key if you want to exit the reset page count process at this time without resetting the page counts.
3. Upon keying **YES** at the prompt, the system will reset all the page counts displayed on the Status and Statistics screens to zero (0).

6.6 LOAD DEFAULTS

The *Load Defaults* option provided on the Main Menu allows you to quickly and easily change all the system defaults set for the modem groups, output ports, and modem assignments back to the original factory default values with which the TAP 2000 was originally shipped. These parameters were established when the system was shipped. In addition, the statistics or page counters shown on the Statistics and Status screens are reset to zero (0). Refer to Section 4.2 for a description of the Modem Group parameters, Section 4.3 for a description of the Modem Assignment parameters, and Section 4.1 for the Output Ports configuration and parameters.

NOTE:

The *Load Defaults* option changes ALL the parameters back to the original, factory default values. You are not given the opportunity to select the parameters that you want changed.

Use caution when performing the *Load Defaults* option. Once the parameters are changed back to the original factory defaults, your customized parameters are deleted and can no longer be retrieved.

Perform the following to access the *Load Defaults* option.

1. Select the *Load Defaults* option displayed on the Main Menu as follows:
 - a. Key an **L** at the *Enter Selection* prompt.
 - b. Press the RETURN key.

The Load Defaults Verification window shown in Figure 6-7 is displayed.

```
Are you sure you want to Reload Parameters? Loading Default Parameters
Current Date: 09-09-96
Enter new Date:
Current Time: 04:39:46
Enter new Time:
```

Figure 6-7 Load Defaults Verification Window

2. The cursor is located at the *Are you sure you want to Reload Parameters?* prompt. You have the option to perform one of the following at this time:
 - Key **Y** at the prompt if you want to continue with the reload factory parameters process.
 - Press the `ESCAPE` key if you want to exit the reload parameters process at this time without reloading the parameters.
3. Upon keying **Y** at the prompt, the system will change all the system parameters to the factory defaults. The literal “Loading Default Parameters” is displayed on the screen while this process is taking place.

The *Current Date* prompt is displayed upon completion of the process.

4. You have the option to perform the following at this time.
 - Key the current system date at the *Current Date* prompt and press the `RETURN` key.

The date must be entered in the format MM-DD-YY, where MM equals the numerical equivalent of the month, DD equals the day and YY equals the last two digits of the year. You must enter the dashes (-) that separate the month, day, and year.
 - Press the `ESCAPE` key to accept the date displayed at the *Current Date* literal and move to the Enter new Time field.

5. The current system time is displayed in the *Current Time* literal. You have the option to perform the following at this time.

- Press the `ESCAPE` key if you do not want to change the current time. The displayed system time will not be changed.
- Key the new system time at the *Enter new Time:* prompt and press the `RETURN` key.

The time must be entered in the format `HH:MM:SS`, where `HH` equals the hour based on a 24 hour format, `MM` equals the minute, and `SS` equals the seconds. You also need to enter the colons (`:`) between the time segments. For example, 1:30 P.M. must be entered as `13:30:00`.

6. The Main Menu is displayed once the above steps are performed.

6.7 RESET SYSTEM

The *Reset System* option provided on the Main Menu allows you to reset the system. This option performs the same function as when you press the Reset button located at the front of the TAP 2000 or when you shut down the entire TAP 2000 system and then restart it.

Perform the following to access the *Reset System* option.

1. Select the *Reset System* option displayed on the Main Menu as follows:
 - a. Key an **R** at the *Enter Selection* prompt.
 - b. Press the RETURN key.

The Reset System Verification window shown in Figure 6-8 is displayed.

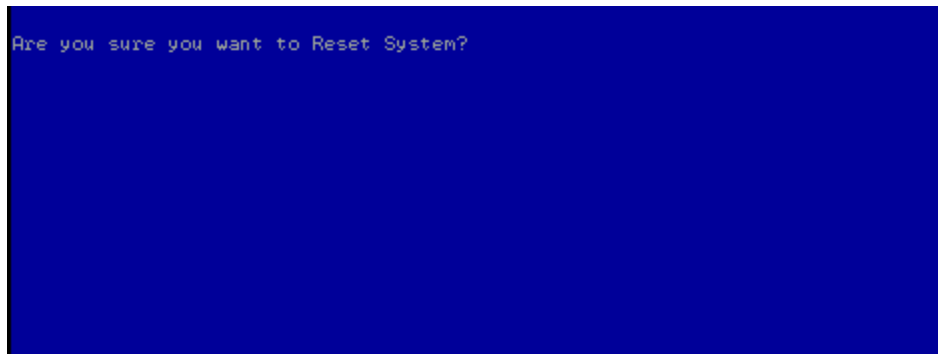


Figure 6-8 Reset System Verification Window

2. The cursor is located at the *Are you sure you want to Reset System?* prompt. You have the option to perform one of the following at this time:
 - Key **Y** at the prompt if you want to continue with the reset process.

The TAP 2000 will begin the boot process at this time. The system will determine the type of VDT that is connected. The Page Output port is initialized and the TAP 2000 logs onto the computer interface port of the paging terminal. When the boot process is complete, the Status screen is displayed. Log onto the system using the login procedures discussed in Section 2.4.

- Press the `ESCAPE` key if you want to exit the reset process at this time without resetting the system.

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SECTION 7

BILLING OUTPUT FORMAT

The Billing Output of the TAP 2000 can be output in one of the following formats:

- DAS1A
- Bell Mode
- Stats Mode

These formats define one text line of ASCII Data per page. The data is arranged in the following format.

Column Number:

```
      1   2   3   4   5   6
123456789012345678901234567890123456789012345678901234
PPPPPPP NN NN DDDHHMM 000000000000 CCC00 CCC00
```

Where:

PPPPPPP = 7 digit pager number
NN = TAP input port number (printed twice)
DDD = Julian date of page
HH = Hour of page (24 hr format)
MM = Minute of page
CCC = Number of text characters in page

message

Each field is separated by 4 spaces. The zeros (00) displayed above are characters defined in the DAS-1A specification that are not applicable to the available billing data. These are constant fill characters and may be ignored by the billing package. The billing data line is terminated with a <CR><LF>.

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SECTION 8

TECHNICAL SPECIFICATIONS

Number of Paging inputs	From 2 to 24 (2 per card) using the TAP (or IXO) protocol.
Telephone Line (MODEM) Inputs	<i>For End to End cards</i> , Loop Start or Grnd Start. Wired for up to 24 lines. (2 lines per modem card) <i>For Modem-on-Trunk cards</i> , only a loop closure is required by the input device. The modem card supplies - 48VDC.
Modem Type	Xecom, 14.4K Baud modems. Hayes AT compatible. Hark TDD modem.
Modem Baud Rates	From 300 to 14.4K. 7 Data Bits. Even parity. 1 Stop Bit or 8 Data Bits, No Parity, 1 Stop Bit.
Direct Connect Inputs	RS-232C with selectable BAUD rates from 300 to 9600 BAUD. Selectable Data Bits, Parity and Stop Bits. Up to 24 inputs allowed (2 per card).
Paging Output Port	RS-232C up to 19.2K BAUD with 7 data bits, Even parity and 1 stop bit.
Billing Output Port	RS-232C up to 19.2K BAUD with 8 data bits, no parity, 1 stop bit.
Billing Output Format	DAS-1A, Bell Mode, Stats Mode
Command Port	RS-232C 19.2K BAUD with 8 data bits, no parity, 1 stop bit.

FCC Registration Number	HWQ2QA-10703-MD-E
Ringer Equivalence	0.4 dB
Operating Environment	-10C to 65C. Up to 95% relative humidity, non-condensing.
Power Requirements for 48VDC option	120 VAC, 1 Amp 48-52 VDC, 2 Amp
Construction	Modular Plug-in Cards. Height: 5.25" Width: 19" Depth: 10.5" Weight: 15 lb. approx.

Optional Features or Equipment

Video Display Terminal
48 VDC Power Supply

Installation

Note: *Features and specifications subject to change without notice.*

SECTION 9

TROUBLESHOOTING

The following section describes common questions and situations that are encountered during TAP 2000 processing. The purpose of this section is to help you solve any problems that you may encounter during the processing of the TAP 2000 application. This section will be continuously updated as new questions arise.

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I am entering the correct password; however, the TAP 2000 application is not allowing me to access the system.

First, verify that you are entering the password in the correct case. For example, the system default password of HARK must be entered in all upper-case characters. You will not be logged onto the system if you are entering HaRK, hARK, or any characters in lower case.

If the password is being entered correctly, have your System Technician verify the Access list and Access List mode. If the Access List mode equals Positive mode, only those users referenced in the Access list can log onto the system successfully. If the Access List mode equals Negative mode, those users referenced in the Access list may NOT log onto the system. Refer to Section 6.2 for details.

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APPENDIX A

SCHEMATIC DRAWINGS

Appendix A contains the schematic drawings for the TAP 2000 cards.

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APPENDIX B

WIRING LIST/COLOR CODES

J2	Wire Color	Signal		Backplane Conn.	
<u>Pin</u>	<u>Basic/Marker</u>	<u>Description</u>		<u>Card</u>	<u>Chan</u>
26	White/Blue	Input LINE #1	Tip	1	1
1	Blue/White		Ring		
27	White/Orange	Input LINE #2	Tip	1	2
2	Orange/White		Ring		
28	White/Green	Input LINE #3	Tip	2	1
3	Green/White		Ring		
29	White/Brown	Input LINE #4	Tip	2	2
4	Brown/White		Ring		
30	White/Slate	Input LINE #5	Tip	3	1
5	Slate/White		Ring		
31	Red/Blue	Input LINE #6	Tip	3	2
6	Blue/Red		Ring		
32	Red/Orange	Input LINE #7	Tip	4	1
7	Orange/Red		Ring		
33	Red/Green	Input LINE #8	Tip	4	2
8	Green/Red		Ring		
34	Red/Brown	Input LINE #9	Tip	5	1
9	Brown/Red		Ring		
35	Red/Slate	Input LINE #10	Tip	5	2
10	Slate/Red		Ring		
36	Black/Blue	Input LINE #11	Tip	6	1
11	Blue/Black		Ring		
37	Black/Orange	Input LINE #12	Tip	6	2
12	Orange/Black		Ring		
38	Black/Green	Input LINE #13	Tip	7	1
13	Green/Black		Ring		
39	Black/Brown	Input LINE #14	Tip	7	2
14	Brown/Black		Ring		
40	Black/Slate	Input LINE #15	Tip	8	1
15	Slate/Black		Ring		
41	Yellow/Blue	Input LINE #16	Tip	8	2
16	Blue/Yellow		Ring		
42	Yellow/Orange	Input LINE #17	Tip	9	1
17	Orange/Yellow		Ring		

J2	Wire Color	Signal		Backplane Conn.	
<u>Pin</u>	<u>Basic/Marker</u>	<u>Description</u>		<u>Card</u>	<u>- Chan</u>
43	Yellow/Green	Input LINE #18	Tip	9	2
18	Green/Yellow		Ring		
44	Yellow/Brown	Input LINE #19	Tip	10	1
19	Brown/Yellow		Ring		
45	Yellow/Slate	Input LINE #20	Tip	10	2
20	Slate/Yellow		Ring		
46	Violet/Blue	Input LINE #21	Tip	11	1
21	Blue/Violet		Ring		
47	Violet/Orange	Input LINE #22	Tip	11	2
22	Orange/Violet		Ring		
48	Violet/Green	Input LINE #23	Tip	12	1
23	Green/Violet		Ring		
49	Violet/Brown	Input LINE #24	Tip	12	2
24	Brown/Violet		Ring		
50	Violet/Slate	Unused			
25	Slate/Violet				

APPENDIX C

WARRANTIES

For a period not to exceed two years from the date of purchase, Hark Systems, Inc., guarantees that the electronic equipment sold will be fit for the ordinary purposes for which they are supplied, and will conform to the property description and statements of fact contained within any applicable brochure and labels provided with the product. However, upon the cessation of the two year warranty, Hark makes no warranty, expressed or implied, that the equipment is merchantable and/or fit for any particular purposes.

The Seller warrants that the goods covered by this agreement shall be free from defects in material and workmanship for two years when used under normal conditions and for the purpose for which they are sold. However, the warranty period for expendable parts, such as bulbs and fuses shall be limited to thirty days. This warranty does not extend to damage incurred by natural causes such as lightning, fire, floods, or other catastrophes, damages caused by environmental extremes such as power surges and/or transients or willful, malicious, reckless, negligent acts or misuse by the purchaser or third parties.

All warranty work must be performed at Hark Systems, Inc. No credit will be given for unauthorized repair work attempted by the customer or other unauthorized repair facilities. In/warranty merchandise must be shipped freight prepaid to the nearest Hark Systems facility.

A Return Materials Authorization (RMA) Number must be obtained from Hark Systems customer service department prior to returning any equipment, in/warranty, or otherwise to Hark Systems for repair. Equipment received without the proper RMA number will be returned to the shipper.

All goods and materials are carefully tested and inspected before leaving the point of manufacture; however, as it is impossible to always detect imperfections, the only guarantee that is given by us, or for which we are in any way liable, is to repair or replace such goods as prove defective, when used for the purposes for which manufactured. All replaced goods are to be returned to us transportation prepaid. Under no circumstances are we responsible for any other damages, incidental, consequential, or otherwise, nor in any case shall we be responsible for any damages beyond the price of the goods. No damages or charges of any kind for labor, expenses, or otherwise suffered or incurred by the customer in replacing or repairing defective goods or otherwise occasioned by the customer will be allowed.

Written notice must be promptly given to the Seller of any perceived failure of the equipment sold, in order to fulfill the warranty, and in no event shall notice be given more than ten days after the discovery of the product defect. The notice shall state in what parts and wherein the warranty has failed and reasonable time shall be given to the Seller to remedy the difficulty. Failure to provide adequate notice within the required time frame shall be conclusive evidence of due fulfillment of the warranty on the part of the Seller, and that the product is satisfactory to the Purchaser, and that the Seller shall be released from all liability under the warranty.

DISCLAIMER OF WARRANTIES

THE WARRANTY PRINTED ABOVE IS THE ONLY WARRANTY APPLICABLE TO THIS PURCHASE. ALL OTHER WARRANTIES EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED.

IT IS UNDERSTOOD AND AGREED THAT UNDER NO CIRCUMSTANCES SHALL THE SELLER BE LIABLE FOR ANY SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES, WHETHER THE THEORY OF LIABILITY IS BASED IN CONTRACT, TORT, UNDER ANY WARRANTY, OR IN NEGLIGENCE. THE PRICE AS STATED FOR THE WARRANTY IS A CONSIDERATION FOR LIMITING SELLERS WARRANTY. FURTHER, NO ACTION, REGARDLESS OF FORM, ARISING OUT OF THE TRANSACTIONS UNDER THIS AGREEMENT MAY BE BROUGHT BY THE PURCHASER MORE THAN ONE YEAR AFTER THE CAUSE OF ACTION HAS ACCRUED.

BREACH OF AGREEMENT

In the event that the terms or conditions of this Agreement are breached, then Hark is entitled to have the customer pay all reasonable court costs, attorney fees and expenses that shall be made or incurred by Hark in enforcing this Agreement; and the parties agree that the terms and conditions of this Agreement shall be binding on, apply and inure to their respective heirs, executors, administrators, successors and assigns.

This invoice shall be construed and governed by the laws of the State of South Carolina *AND VENUE IN ANY LITIGATION PURSUANT TO THIS INVOICE SHALL BE IN CHARLESTON COUNTY, SOUTH CAROLINA.*

ALTERATIONS AND CHANGES

Any alterations for deviations from the above specifications that involve extra material, costs or additional or more costly labor will require extra charges. These extra charges will be billed over and above the proposal amount.

PROPOSAL GOOD FOR THIRTY (30) DAYS

The price given in the proposal for material and labor is an offer that shall bind Hark for 30 days. If the proposal is not accepted within 30 days, then Hark has the option of revoking its proposal.

AGREEMENT SUBJECT TO APPROVAL BY MANAGEMENT

This offer is subject to management's approval. If terms of payment are cash on completion, or if this is a credit sale, this offer is also subject to approval by Hark's credit manager.

ACTS BEYOND HARK'S CONTROL

Hark is not responsible for delays in delivery, or for delays in delivery or installation due to weather, fire, strikes, governmental regulations, or other causes unforeseen or beyond it's control.

SECURITY AGREEMENT

Hark may require as a condition to this Agreement that the customer execute a security agreement to safeguard its position as a creditor in extending payment terms to the customer. In the event that Hark requires collateral, the customer agrees to provide a promissory note and a security agreement (and UCC-1) in the manner acceptable to Hark.

BAD CHECKS & C.O.D.

A service charge of \$25.00 will be applied to each returned check. Accounts 60 days old will be placed on C.O.D. and technical service shall be withheld. Legal action will be taken after the account is 90 days old.

RETURNS

No returned goods will be accepted without a Returned Merchandise Authorization Number.

HANDLING/RESTOCKING CHARGE

A restocking charge of 20% will be made on all goods returned unless due to error caused by Supplier.

TITLE

Title to and all goods or material hereafter purchased shall remain with Supplier until full purchase price has been paid.

ENTIRE AGREEMENT

This Agreement constitutes the entire agreement between the parties hereto; and this Agreement shall not be modified, amended, altered, or changed except by a written agreement signed by the party sought to be charged. However, change orders may be made by an oral agreement as enumerated in the "Alterations and Changes" section above.

PACKING INSTRUCTIONS

Equipment to be returned to Hark Systems for repair must be packed in the original packing supplied by the factory. If the original packing material is not available, Hark Systems will provide it to you for a nominal fee. Customer packing materials can be used, providing that precautions are taken to provide adequate static protection for the equipment.

DO NOT PACK HARK EQUIPMENT IN STYROFOAM PEANUTS ONLY

Repairs necessitated due to improper packing will be billed at the standard factory repair rate. Hark Systems, Inc. will repair or replace equipment and return to customer, freight prepaid, within the continental United States. Equipment found not to be defective will be returned at purchaser's expense and will include cost of handling, testing and returning of equipment.

Out-of-warranty repairs will be billed at the established factory flat rate per hour, plus components needed for replacement.

CANCELLATION

Buyer may by written notice to Seller within fifteen (15) days of the merchandise received date cancel any contract or agreement arising here under, for other than the default of the Seller and at its convenience, in which event Buyer shall pay Seller twenty percent (20%) of the above total price for all products and accessories returned as a restocking charge.

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APPENDIX D

USER INFORMATION

INFORMATION SUPPLIED TO USERS

NOTIFICATION TO TELEPHONE COMPANY

Before connecting the device, the customer shall notify the Telephone Company of the particular line to which the connection will be made. It is required that the telephone company be provided with the FCC registration number and the ringer equivalence of the registered protective circuitry. The customer shall also notify the Telephone Company upon final disconnect of the device from the particular line(s).

MALFUNCTION OF THE EQUIPMENT

In the event that the device should fail to operate properly, the customer shall disconnect the equipment from the telephone line to determine if it is the customer's equipment, which is not working properly, or if the problem is with the telephone company network. If the problem is with the device, the customer shall discontinue use until it is repaired. Customer should locate an authorized Hark Systems Service Center. If there is not one in your area contact Hark Systems, Inc., 2675 Lake Park Drive, N. Charleston, SC. 29406.

TELEPHONE CONNECTION REQUIREMENTS

Except for telephone company-provided ringers, all connections to the telephone network shall be made through standard plugs and standard telephone company-provided jacks, or equivalent, in such a manner as to allow for easy and immediate disconnection of the terminal equipment. Standard jacks shall be so arranged that, if the plug connected thereto is withdrawn, no interference to the operation of the equipment at the customer's premises which remains connected to the telephone network shall occur by reason of such withdrawal.

INCIDENCE OF HARM

Should terminal equipment or protective circuitry cause harm to the telephone network, the telephone company shall, where practicable, notify the customer that temporary discontinuance of service may be required; however, where prior notice is not practicable, the telephone company may temporarily discontinue service, if such action is deemed reasonable in the circumstances. In the case of such temporary discontinuance, the Telephone Company shall promptly notify the customer and will be given the opportunity to correct the situation. The customer also has the right to bring a complaint to the FCC if it is felt the disconnection is not warranted.

CHANGES IN TELEPHONE COMPANY EQUIPMENT OR FACILITIES

The Telephone Company may make temporary changes in its communication facilities, equipment, operations or procedures, where such action is reasonably required and proper in its business. Should any such changes render the customer's terminal equipment incompatible with the telephone company facilities, the customer shall be given adequate notice to make modifications to maintain uninterrupted service.

GENERAL

The FCC prohibits customer-provided terminal equipment to be connected to party lines.

INSTALLATION

The device is equipped with an USOC RJ21X standard 50 pin miniature jack.

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