

Chapter 1

INTRODUCTION

This is the third of three books that accompany the Management Analysis Program (MAP) System™ for cable pressurization maintenance. This book, entitled *PressureMAP System Administration*, is intended to help the System Administrator install the required operating system and application software, configure hardware and network connections, and manage user accounts. The other books in this series are:

Book 1 – PressureMAP Operations Manual — describes how to use all of the MAP system programs and access desired information.

Book 2 – PressureMAP Data Entry Manual — describes how to organize office and device information and perform the required data entry for PressureMAP™ offices, dispatch report centers and alarm centers.

This book is designed to be the System Administrator's guide to the PressureMAP system. As custodian of the PressureMAP System, the System Administrator has numerous powers and responsibilities. Those responsibilities include initial installation of the system and occasional updating when new versions become available. The System Administrator is also responsible for keeping system data, such as office names, phone numbers, and priority levels current. Maintenance and security of the system will also be primary duties of the System Administrator.

Included in the manual is a section that describes the minimum hardware requirements for a PressureMAP computer, plus the available communications components, and the various office monitors (CPAMS) that are supported. A chapter on system installation describes how to load the Linux operating system and program applications (PressureMAP and PressureWEB. With the release of PressureMAP Version 28, these procedures have been greatly simplified and automated. Enhancements to the system will be implemented via the Supplemental Update Procedure, which is also described in the installation section.

To assist the System Administrator with system maintenance, this book describes a number of simple maintenance procedures that can be used if problems develop. Utilities such as resetting the multi-port serial card and initializing the asynchronous modems will cure many of the most common problems caused by fluctuating power supplies or user error. In the event of hardware failure, the backup and restore procedures that must be performed before hardware maintenance or replacement are also included here.

The User Management section describes how to ensure system security by designating exactly how much access each user has over the system and ensuring that old passwords are dropped periodically. It will allow the System Administrator to add or delete users, or change their access level.

The Network Administration section details the procedures the System Administrator uses to manage the Ethernet LAN (Local Area Network) connection and the SMTP (Simple Mail Transfer

Protocol) mail server. It covers the procedures used to view the current configuration, perform diagnostics, connect or disconnect the network, set and clear a Gateway IP address, configure the SMTP mail server, start or stop mail delivery, and configure serial resources.

Anyone who knows the System Administration Password has access to the entire MAP System, except for Network Administration and User Management. Because Network Administration is such a powerful utility, a separate password is required to access it.

Document Organization

This System Administration manual consists of the following sections:

1. **Preface**—describes the various MAP Programs, explains the structure of the MAP documentation books, describes the individual sections of the Administration Manual, and provides an overview of all System Administration procedures.
2. **MAP System Overview**—provides a basic description of how the various components of the MAP System function to provide a comprehensive monitoring and analysis program.
3. **Hardware Configuration**—lists hardware requirements and capabilities for MAP System components including the system computer, modems, printers, terminals and printers.
4. **System Installation** — describes how to install the CentOS Linux operating system, PressureMAP application, and PressureWEB. It also explains how to add supplemental updates to the system when needed.
5. **System Administration**—provides step-by-step procedures for MAP computer administrative functions including backing up and recovering data, initializing modems, rebooting the computer, specifying system printers, and stopping and restarting system utilities.
6. **User Management** —gives detailed procedures for controlling user access to the MAP System. Procedures include adding users, listing users, and changing defaults. Utilizing these functions will provide security against unauthorized access.
7. **Network Administration**—provides detailed procedures for managing the Ethernet LAN (Local Area Network) connection and the SMTP (Simple Mail Transfer Protocol) mail server. It covers the procedures used to view the current configuration, perform diagnostics, connect or disconnect the network, set and clear a Gateway IP address, configure the SMTP mail server, start or stop mail delivery, and configure serial resources.
8. **Technical Notes**— contains essays or documents that pertain to the operation and use of the MAP software.
9. **Glossary**—defines important technical terms used throughout MAP documentation.
10. **MAP Engine Maintenance**—offers suggestions for keeping your system running properly.
11. **Appendix 1**—describes the procedures for remotely logging into PressureMAP and accessing various menu options including: Dispatch Priorities, Device Histories, Specific

Device Information (including "realtime" readings), System Indexing, CPAMS Information (which includes the Device Log, Device Log by Location and Device Status Report), and User Support (which contains information regarding the various CPAMS software functions).

12. **Appendix 2**—describes the procedures used for viewing the MAP Program's Status Display.
13. **Appendix 3**—describes the procedures for administering the PressureMAP Data Export Protocol (PDEP) utility.
14. **Appendix 4**—Security

Emergency Shell Access

The MAP System includes several levels of security to restrict access. Both a "User ID" and a "Password" are required to gain access to the MAP programs. System Administration is further restricted to the highest menu level, System Options, and requires a *System Administration Password*. In the event of a major system failure, an additional login and series of passwords have been created to give the MAP System Administrator, with the help of System Studies' Technical Support, direct access to the operating system shell. To ensure complete system security, the passwords required by this login change both daily and hourly. If the MAP System Administrator needs to invoke this shell access, System Studies Technical Support must give the administrator the correct login and password sequence.

System Administration Functions

System Administration includes twenty-three procedures to help manage PressureMAP. While two of the procedures, User Management and Network Administration, are described in detail in their own sections of this manual (rather than in the System Administration Section), each of the procedures is briefly described here. Also described is the method of remotely accessing the MAP System's View Logs (Alarm Receiver, Scheduler, and System Status).

This introduction also includes an overview of all System Administration procedures and important information on program structure and system operation. Much of this information is crucial to understanding the procedures that are covered in depth in Section 4 of this manual.

PROCEDURES TO BACK UP MAP SYSTEM FILES

The MAP System stores and continually updates seven days of office data and four weeks of weekly averages. This information plus the customized files, such as the dispatch information and user access codes, are backed up nightly. In the case of a system failure, this data may be retrieved from the backup tape (or other media, if the BackupEDGE application is being used). The backup procedures in System Administration allow the operator to manually perform the same functions that occur in the nightly backup. This is useful when the system is going to be updated, or when hardware is going to be replaced. Even when a current nightly backup is available, it is a good idea to make multiple backups on such occasions.

Please note that beginning in PressureMAP Version 26 a third-party backup utility, called BackupEDGE, was certified for use with PressureMAP. This application first needs to be installed onto the MAP Engine or compatible computer, and any desired backup devices, such as the computer's DVD-ROM, must be configured using the BackupEDGE application software.

Separate installation instructions, provided with BackupEDGE, describe these requirements and procedures. The System Administration Menu includes options for selecting BackupEDGE as the default backup resource, if desired, and manually performing backup and restore procedures via the BackupEDGE application. Instructions for these procedures are provided in Section 3 of this manual.

PROCEDURES TO RESTORE MAP SYSTEM FILES

This utility is used to move data from a backup tape or BackupEDGE resource onto the system computer. You would need to do this if hardware problems caused the system to fail, or if a user file was changed or deleted by mistake. This program has six functions:

- reinstall the office and customized files onto the system computer
- transfer the office and customized files to a backup computer
- transfer office files from a backup medium to the system computer
- transfer all office data files from a backup medium to the system computer
- transfer the office list file from a backup medium to the system computer
- transfer any file from a backup medium to the system computer
- migrate office and device data to Linux system from SCO UNIX

All of these operations may be controlled from a remote terminal, but each operation will be performed on the drives of the computer on which the MAP System is running.

PROCEDURES TO REBUILD A SYSTEM

In the case of major damage to the system, such as a hard disk failure, it is necessary to install the entire MAP System from scratch. Three separate installation procedures are required.

1. Installation of the operating system - refer to Section 2, UNIX Installation, of the MAP System Installation Manual
2. Installation of the MAP System - refer to Section 3, Multi-User MAP Installation, in the MAP Installation manual. To install any Incremental Updates required for the system, refer to the procedures in Section 5 of Installation.
3. Installation of the office and customized files from the backup medium – refer to the section, “Procedure to Rebuild a System,” in this book.

This procedure for rebuilding a system is used to reinstall the office files and the customized files. This process copies the necessary files from the backup medium to the system computer's hard disk. The first two procedures described below offer the options of rebuilding from either a magnetic tape or floppy disks. As mentioned in the section on backing up, the use of magnetic tape is preferable to disks. Note also, that the BackupEDGE utility available beginning with PressureMAP Version 26 can also be used to rebuild a system.

While this rebuilding procedure will make the system completely workable, a timing function will disable many of the program utilities after four days. This function protects System Studies Incorporated from unauthorized duplication of the program. While disabling will deny access to many of the system functions, the system will continue to collect and store data. Office histories will be continuous even for the period during which the system was disabled. To

prevent disabling, or cancel disabling if it has occurred, call System Studies and have a Technical Support Representative re-enable the system.

PROCEDURE TO RESTORE TO A BACKUP COMPUTER

This procedure transfers office files and customized files from backup tapes, DVDs or other backup media to a backup computer. This utility is used when a company has a computer exclusively dedicated to serving as a backup system. The Restore utility differs from the Rebuild utility in that the Rebuild utility requires the target computer to be configured exactly the same as the computer from which the backups were made. The Restore utility allows for a slightly different modem configuration.

Modem configuration refers to a number of variables such as number of modems, baudrate, phone numbers, etc. Like the Rebuild utility, the system resurrected with the Restore utility will be disabled after four days unless enabled by System Studies, but will also continue to save data even after being disabled.

PROCEDURE TO RESTORE AN OFFICE

This procedure transfers all of the files associated with an office from the backup media to the main system computer. It is used when one of the office files is somehow corrupted. This utility offers the option of restoring the files from either a tape or a disk. The utility can be run from a remote terminal, but the backup medium must be loaded into the drives on the system computer.

PROCEDURE TO RESTORE ALL OFFICE DATA

This procedure transfers all of the office data files from a backup source to the MAP computer. It was developed to enable the System Administrator to easily load the office data from a backup tape, DVD, etc. into the MAP computer after updating the earlier Xenix operating system to UNIX. Unlike the other restore options of the System Administration Menu, only office data files are copied from the backup media. The files that are transferred by this option include: all office history, index, dispatch and cable opening files.

PROCEDURES TO UPDATE MAP SYSTEM

This section briefly describes the Update utilities. Although they are part of System Administration, the procedures are documented separately. System Update, Incremental Update, Report Update and Special Data Update are explained in Book 4, MAP System Installation Manual. Special Data Update is used only to update the firmware file in PressureMAP for the 289H/H-M monitor's UAMC board. System Studies Technical Support must then load the updated firmware file to the UAMC.

Office Update is used only for loading office data when System Studies has performed the data analysis and translation for an office. Instructions are included with the prepared data diskettes.

PROCEDURE TO SHUT DOWN THE COMPUTER

This utility implements a controlled shutdown of the system computer. Turning off the power to the computer when the MAP program is running risks losing or damaging files. Using this procedure to exit the MAP program before turning off power to the computer will ensure that no data is lost. This utility is used whenever the computer needs to be turned off, such as for the installation of new hardware, or if the computer is to be moved. It is also useful as a trouble

shooting procedure when modems need to be reinitialized. While this utility can be performed from a remote terminal, running the utility will cut off the remote terminal. Then the remote terminal user will have to wait until someone reboots the program from the system computer.

PROCEDURE TO SHUT DOWN AND REBOOT THE COMPUTER

This utility also shuts down the computer, but will immediately reboot it again. It is used during the System Update. It is also used for trouble shooting when a tape drive seems to be hung up or a modem needs reinitializing. While this utility can be performed from a remote terminal, running the utility will cut off the remote terminal. The remote terminal user will have to wait until the system reboots itself and then log on again.

PROCEDURE TO SET THE TIME AND DATE

There are two time keepers in the system computer: one programmed into the computer hardware, and one that is part of the operating system. This utility will change the time and date of these time keepers.

PROCEDURE TO LIST USERS CURRENTLY LOGGED IN

This utility will display a list of all the users who are logged onto the MAP System at the time that the utility is run. It is a good idea to look at this list before the system is shut down. Shutting down the system will cut off all users, which may result in the loss of data that is being input at the time.

PROCEDURE TO RESET FILE PERMISSIONS

This is primarily a maintenance utility. It can be run when you have difficulty accessing a file. It will run that part of the program that establishes what privileges each Menu Level has.

MODEM ADMINISTRATION

This utility allows the System Administrator to reprogram any of the modems attached to the system computer. The reprogramming process is called initializing. Initializing involves setting dozens of parameters so that the modems can communicate with PressureMAP as well as the remote modems. Since the initialization process requires that the modem be disabled, this function also allows the user to disable and enable the modems.

This is primarily a maintenance utility. It is the first thing that you should try if you experience a problem with one of the modems (for example, you cannot dial in).

PROCEDURE TO RESET THE MULTI-PORT SERIAL CARD

This is also primarily a maintenance utility. The multi-port serial card is the piece of hardware that controls the modems attached to the system computer. This utility sets the multitude of variables on the serial card as required by PressureMAP. This utility can be run when you have difficulty accessing a modem. Note that running this utility will cut off any user who is logged onto the system through a modem. To forewarn other users, a message is automatically sent asking them to log off before they are cut off. If they do not log off any data that they have input but not saved may be lost when the utility cuts them off.

PRINTER ADMINISTRATION

The MAP System allows multiple printers to be set up as destinations for printed reports. Using this utility, the System Administrator can add and remove printers, set the system default printer, start and stop receiving print jobs from other systems, and view and manage each

printer queue. Once local and remote printers have been configured in the MAP System, users can specify which printer should receive print jobs from the current login session. The MAP System also has the ability to ensure that the specified printer actually does print every dispatch report. When you detect that a printer designated by the system is not working, you should first try to restart the printer spooler with this utility. When the printer problem is corrected, the spooler will continue feeding the stored reports to the printer. These operations may be performed from a remote terminal, as well as at the console.

PROCEDURE TO USE THE START PROCESSES

The MAP System offers several utilities that can be turned on and off by the operator. The Scheduler, the Alarm Receiver and the Idle Logout utilities are switched on using this procedure. All of these operations can be controlled from a remote terminal.

PROCEDURE TO USE THE STOP PROCESSES

The Scheduler, the Alarm Receiver and the Idle Logout are switched off using this procedure. These operations can be controlled from a remote terminal.

PROCEDURE TO USE THE PAUSE PROCESSES

The Scheduler, the Alarm Receiver and the Idle Logout are paused or disabled for 120 minutes using this procedure. These operations can be controlled from a remote terminal.

USER MANAGEMENT

User Management is a utility that gives a System Administrator the ability to completely control access to the entire MAP System by managing individual User Accounts. The primary benefit of this ability to manage accounts is vastly improved system security.

With User Management, the System Administrator can assign a separate User Account to each MAP System user and customize each account. The accounts can be assigned a unique name, User ID, and password, and the password can be programmed to expire after a fixed period. Most importantly, each User Account specifies a Menu Level, which limits user access to the MAP System and eliminates unauthorized input to the databases. User Management is located in its own User Management Section. The User Management procedures are located in Section 5 of this book rather than in the System Administration section.

PROCEDURE TO SET THE IDLE LOGOUT TIME

PressureMAP has a function called Idle Logout that will automatically log you out of the system after there has been no input from your keyboard for a set period of time. This function was included because certain files cannot be accessed while someone else is accessing them in a data input mode. Likewise, only one user at a time can work in the System Administration portion of the program. This utility will keep those files and sections from being tied up by a user who has forgotten to log off.

PROCEDURE TO SET THE SYSTEM NAME

This option allows the System Manager to customize the system name that appears during login and when System dispatches are sent.

PROCEDURE TO RESET A LOCKED TAPE DRIVE

This procedure runs a program that checks for and repairs a hung tape process. If for some reason the program is unable to fix the problem, a high priority system dispatch will be immediately posted to the System Dispatch List.

NETWORK ADMINISTRATION

The MAP software provides network users the ability to remotely log into the MAP system via a network connection. This portion of MAP System Administration allows the System Administrator to manage the Ethernet LAN (Local Area Network) connection, the SMTP (Simple Mail Transfer Protocol) mail server, and configure serial port resources. It includes options to view the current configuration, perform diagnostics, connect or disconnect the network, set and clear a Gateway IP address, configure the SMTP mail server, start or stop mail delivery, and install Digi PortServer II or Corollary drivers. A utility for exporting PressureMAP data to external systems is also available, if that capability has been enabled. The Network Administration procedures are located in Section 6 of this book rather than in the System Administration section. The Data Export Protocol procedures are located in Appendix 3 of this book.

BACKUPEDGE OPERATION

This third-party backup utility expands PressureMAP's original tape and floppy disk backup capability to include a variety of more efficient backup capabilities. With BackupEDGE, which is accessible via a System Administration Menu option, users can now use the CD-ROM or DVD-ROM drives supplied on the more recent MAP Engine Computers to perform their automatic and manual backups. BackupEDGE also simplifies the process of backing up files to a remote computer using the local area network (LAN) and file transport protocol (ftp).

RESTART WEB SERVICES

Beginning with PressureMAP Version 26, a web browser user interface for PressureMAP, called PressureWEB, was introduced. This application as well as a system-up checking utility, called System Status Viewer, require an Apache web server to operate. In order to make it possible to restart the web server, if necessary, a toggle option was added to the System Administration Menu.

DISPLAY SYSTEM UPTIME

This procedure provides valuable system usage statistics, including current time, how long the system has been running, the number of users currently logged in, etc.

PROCEDURE TO RENEW SYSTEM REGISTRATION

Beginning with PressureMAP Version 27.00.08, a four star system alarm is generated if any of three events invalidates the PressureMAP system registration file: 1) installation of a new system, 2) initial update to version 27.00.08 or higher, or 3) restoring the system registration from backup media. Once any of these three events triggers an alarm, all PressureMAP capabilities will expire three days from the last change time (time and date of the event). The Renew System Registration option simplifies the process of actively renewing system registration.

PRESSUREMAP DATA EXPORT PROTOCOL (PDEP)

This utility, which is used to export PressureMAP data to external systems, is accessed through the Network Administration Menu when the PDEP capability has been enabled in

PressureMAP. With PDEP, PressureMAP is utilized as a data collector, sending information to an Oracle or similar database via a TCP/IP protocol. The database enables telco managers to create desired customized reports for their cable pressurization systems. The Data Export Protocol procedures are located in Appendix 3 of this book.

FILE MAINTENANCE PROCEDURES

These procedures transfer a TMACS backup file to and from a DOS formatted floppy disk, as well as listing the directory of a DOS disk. When the TMACS monitor is changed to a newer version, the weekly backup file that PressureMAP makes must undergo a conversion process as well. These procedures will copy the file onto a DOS formatted disk for the Harris conversion program, and recopy the converted file back into the MAP database. The utility can be run from a remote terminal, but the backup medium must be loaded into the drives on the system computer.

REMOTE VIEWING OF ALTERNATE CONSOLE OUTPUT

Located in Section 4 of this manual is an explanation of how to remotely view the output of the Alarm Receivers, the Scheduler, and System Status. This output previously could only be viewed at the PressureMAP System console by looking at the Alternate Console TTYs (invoked by hitting the <Alt> key, followed by <F10>, <F11> or <F12>). PressureMAP Version 25 (and above) systems provide for a direct login to a View Logs Menu from which System Administrators and other designated personnel can view the output of the system logs.

Commonly Asked Questions

WHAT HAPPENS IF THE ELECTRICITY GOES OFF?

Although the operating system has built-in safeguards against data loss in the event of a power failure, there remains a small possibility that files could be lost. The following procedures should be followed in the event of power loss to minimize the chances of losing data.

4. If the power fails and your system has a battery backup, immediately run the "Shutdown the Computer" process from System Administration and turn off the computer.
5. When the power is restored, simply turn on the computer and boot the MAP System normally.
6. If your system does not have a battery backup, turn off the computer as soon as the power goes out.
7. After the power is restored, boot the system normally. The program will take a little longer to boot after a power outage because it does a self-analysis to check for any damage. If the program has not sustained any internal damage, it will run normally. A loss of data in an office file will not be detected.

WHAT KIND OF MAGNETIC TAPE SHOULD I USE?

If you plan to back up your system to tape, please contact System Studies' Technical Support Department for information on what type of cartridge to use with your equipment. The recommended backup utility for PressureMAP Version 28 and later versions is BackupEDGE™, which needs to be purchased separately. BackupEDGE extends backup capabilities to include CD ROM, DVD ROM as well as remote computers via file transport protocol (FTP).

Definitions

The various PressureMAP manuals contain a *Glossary* of common terms that pertain to the operation of the program. Listed below are definitions that pertain more directly to System Administrative functions.

ASYNC MODEM

An async modem is asynchronous as opposed to bisynchronous. All user access modems are async modems. The modem used to access the now obsolete WECO E2A monitor is bisynchronous.

CPAMS

Acronym for Cable Pressurization Automatic Monitoring System. Refers to the individual monitor (289H LSS, uM260 Micro Monitor, Sparton, Chatlos, etc.) installed in an office to which monitoring device pairs are connected.

Customized Files

Customized files store information that directs the MAP System communication functions. This information includes the modem call numbers as well as instructions for Dispatcher.

DISPATCH INFORMATION

Dispatch information describes how and where to send the daily dispatches. It includes the phone numbers for the modems at the report centers, the baudrate, and the priority level of calls requested.

DTMF MODEM

DTMF stands for "dual tone multi frequency." Identical to the tones one would hear on a touch tone phone, the DTMF modem makes it possible to converse directly with the System Studies Dial-A-Ducer without additional equipment.

FORMATTING

Formatting refers to a process which establishes a pattern on a computer disk that the operating system will recognize. Each operating system has its own pattern. Formatting is analogous to subdividing the disk into distinct lots and neighborhoods that the computer can then address.

INITIALIZE

In order for different pieces of computer equipment to work together, certain commonalities must be established. The process of setting certain variables on a piece of equipment so that it can communicate with other hardware or software is called initialization. Printers and modems often have to be initialized.

LOGIN

Login, when used as a noun, refers to the combination of terms that a user must type in before s/he can work in the computer program. PressureMAP's login consists of both a User's ID and a password. When "log in" is used as a verb, it describes the process of typing in the series of terms that will allow access into the system.

LOGOUT

Exiting the program through the proper procedures is called logging out. Since exiting the program without following the prescribed steps may result in a loss of data, users should always log out properly. After logging out, the computer is not turned off, but is left on for other users to access.

NIGHTLY BACKUPS

The MAP System automatically makes a backup tape of all data files and all customized program files every night. The backup is made at approximately 11 p.m., so it captures all of the night's data. The same backup can be performed manually using the procedures in System Administration.

OFFICE FILES

Office files store transducer data collected from individual offices. These files contain data for the past seven days as well as weekly averages for the past four weeks. The daily data is updated every night and extracted from the files after seven days. It is then used to create a weekly average reading. The weekly averages are saved for four weeks.

PATH NAME

All files stored in a computer are organized in a hierarchy of directories and subdirectories. To find a file you must start at the lowest level which is called a root directory, and follow a path through a series of subdirectories. The path name is simply a listing of all the directories that must be passed through in order to find the file.

PRINTER SPOOLER

All reports are sent as files and routed through a printer buffer and a printer spooler. The buffer stores the files to be printed, and the spooler schedules the movement of the files from the buffer to the printer. The spooler also has the capability to detect problems in the printer. When the spooler detects a problem that may prevent the printing of the reports, it will not send them on to the non-functioning printer where they could be lost.

SYSTEM COMPUTER

The term "system computer" designates the computer on which the PressureMAP System is installed and running. While a remote terminal may also be a computer, only the computer on which the program is actually installed is referred to as the System Computer.

SYSTEM CONSOLE

The system console is the screen and the keyboard on the system computer.

UTILITY

A utility is a part of a computer program that performs a specific function.

Documentation Conventions

Like all software programs, MAP must conform to a number of different computers and keyboards. The following sections on Typographic Conventions and Key Functions will help you understand the procedures and adapt them to your hardware.

TYPOGRAPHIC CONVENTIONS

The following typefaces have special meanings as they appear in the text of the documentation. Their uses are as follows:

Monospace

This typeface represents text as it will appear on screen or in a MAP System report. `Monospace` is used to display what is actually output by the program.

<>

Angle brackets in the text indicate a key on your computer keyboard. For example, the following represents the Return Key: <Return>

Italic Bold

Within the MAP System manuals, Procedures are used to outline the steps that you need to follow in order to accomplish different tasks. The Procedures are outlined in bold and simply show the most basic steps that are required to operate the program. In addition to the Procedures, other important items may appear in bold characters.

C [ontinue]

Brackets are placed around the portion of a word that is not intended to be entered on the keyboard. In the example above, only the C would be entered to continue.

KEY FUNCTIONS

The following keys may be called by different names on some keyboards.

<Return>

The <Return> key (also identified as <Enter>, <CR>, or <Send>) is the "entry" key. <Return> completes an entry made by the user and initiates the program response. Depending on your keyboard setup, <Enter> on the keypad may not work the same as <Return> on the main keyboard.

Make a special note that pressing <Return> after typing an entry not recognized by the program will cause the program to re-display the last prompt. At this point, the user should try to enter a valid response to the prompt issued by the program.

The <Return> key will move the cursor to the next data field on the screen. In addition, <Return> will move you from the last data field on the screen to the option prompt line, thus completing the data entry for that screen.

<Backspace>

The <Backspace> key may also be identified as <BS>, <Rub>, <Rubout>, , or <Ctrl-H>, depending on the machine being used. <Backspace> is used to correct entry errors on the input line BEFORE <Return> has been pressed. To correct an entry, press the <Backspace> key and the cursor will move one space to the left, deleting any existing character in that position. Hit <Backspace> repeatedly until the incorrect entry has been removed. After backspacing has been completed, you may then retype the correct entry.

The <Backspace> key will back the cursor up one space to the left and delete the character which occupied that position. <Backspace> can be used to make minor editing changes, or delete entire fields of data.

<Esc>

An *<Esc>* keystroke will usually exit the current data entry screen, regardless of which data field you are working on at the time. If you use the *<Esc>* key, nothing on the screen will be saved, and no changes will be made to the old file.

<Space Bar><Return>

Hitting the key combination, *<Space Bar><Return>*, when in any data entry screen, will clear the data field that the cursor is located in.

