

ALTOS

586/986

INTRODUCTION TO XENIX

Change Package to Incorporate the Altos 486 Features into the Introduction to Xenix

**Altos 586/986 Computer Systems
Introduction To XENIX**

ACKNOWLEDGEMENTS

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UNIX is a trademark of Bell Laboratories.

XENIX is a trademark of Microsoft, Incorporated and is a 16-bit microcomputer implementation of the UNIX operating system.

WorkNet is a trademark of Altos Computer Systems.

The File Transfer Program for MP/M is copyrighted by the Balcones Computer Corporation.

How to Use this Manual

INTRODUCTION

This manual describes how to use the Altos implementation of the XENIX operating system and the Altos menu system called the Business Shell. The Business Shell allows you to easily use basic system functions such as creating directories and backing up and restoring files.

This manual is for a person who wants to create, copy, and print files. This manual is also for the person who installs and maintains the system; we call that person the system administrator. The system administrator performs administrative functions such as installing the software, and checking disk space and the file system.

Chapters 1 and 4 are for the system administrator. They describe XENIX installation procedures and system administration utilities, respectively. If you are not the system administrator, you can skip to Chapter 2, which tells you how to log in to the system.

This manual does not describe how to set up your system (see the particular setting up manual or operator's guide for this information) or run the application software that you have purchased with your system.

ORGANIZATION

This manual is organized as follows:

Chapter 1 tells you how to initially install and set up the XENIX operating system, reconfigure ports for your terminals and printers, and set up login user accounts.

Chapter 2 explains how to access the system (log in), set passwords, and exit from the system when you finish (log off).

Chapter 3 describes XENIX functions that you use on a regular basis. These include accessing the system from the Business Shell, working with files, and running programs.

Chapter 4 describes the role of the system administrator.

Chapter 5 explains how to use the XENIX line editor called "ed."

Appendix A describes the utilities furnished with the XENIX Run-Time operating system.

Appendix B explains control character sequences.

Appendix C describes the file transfer programs used to transfer ASCII text or binary data files between Altos systems.

Appendix D details how to upgrade your XENIX operating system.

Appendix E describes how to connect modems.

DOCUMENTATION CONVENTIONS

This section describes documentation conventions used in this manual.

Because this manual is for all Altos systems that use the XENIX run-time operating system, your screens may differ from the screens shown in this manual.

All information you enter is shown in **bold face**. Examples are

Select **k**, System Administration, and then **c**, Port Configuration.

Enter **y** **<CR>**

Any designation inside angle brackets (< >) refers to a key, which, when pressed, does not produce a character on the screen. For example, the symbol **<CR>** means Carriage Return and refers to the Return key. When you see the symbol **<CR>** in bold face, you should press the Return key. For example,

Press **<CR>** Press **<Space Bar>**

When you see the symbol **<Control-D>**, you should press and hold down the Control key while you press the D key (either a lowercase d or an uppercase D). For example,

<Control-D>

When entering commands, do not enter the space after the prompt, this space is provided by the XENIX operating system. For the example,

```
$ who <CR>
```

you would type "who" and then press the Return key.

Variable information (a value that can change) is shown using three lower-case letters: n, a, and x. They mean, respectively, any number, any letter, and any character, either letter or number. For example,

```
#1 of n          Version n.na          Filename xxxxxx
```

ADDITIONAL REFERENCE MATERIAL

XENIX Reference Card

This section lists additional Altos and XENIX publications.

This card briefly explains how to log in and log out, lists basic XENIX commands, and lists the Business Shell menu selections.

Altos Setting Up or Operator's Guide

This manual describes how to connect workstation components, connect peripherals, turn on power, and how to load the diagnostic programs.

Altos Diagnostic Manual

This manual describes diagnostic programs for Altos computer systems.

A User Guide to the UNIX System

This book, by Thomas and Yates, is provided with the XENIX operating system. The book explains UNIX concepts and provides tutorials for getting started with UNIX and for implementing the most common commands.

Altos WorkNet User's Guide

This document provides information on how to install the optional WorkNet network package and how to use it.

Altos XENIX Development System Set

This set, provided only with the XENIX development system, includes reference and tutorial material for programs available in the Altos XENIX development system.

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* The appendices listed here are in a separate volume called **Altos 586/986 Computer Systems Introduction to XENIX -- Appendices.**

Preface

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After you connect the components of your Altos computer system and turn on the power, you need to install the operating system programs and utilities.

This chapter describes how to install the XENIX operating system for the first time. This chapter also describes how to set up the ports, create and change user accounts, and set up the system for other users.

CAUTION

The installation procedures described in this chapter erase all information on the hard disk. If you are upgrading your existing XENIX operating system, use the procedures described in Appendix D.

HOW TO START

Before you install XENIX,

1. Connect the terminal you use for the installation procedures to the port marked port 1 or CRT on the back of your Altos computer system (see the Operator's Guide or Setting Up Manual for instructions).
2. Optionally, run the system diagnostic tests. Because the Altos system is tested before shipping, this step is optional. However, you can run the diagnostic tests to detect problems that could occur as a result of shipment (such as loosening of components and connections). The tests take from one to two hours. See the Altos Diagnostic Manual for instructions.
3. Use the diagnostics copy utility to make copies of all XENIX installation diskettes, and hand copy the label information. (The Diagnostics diskette has a copy utility that you can use. See the Altos Diagnostic Manual for information.) Store the originals in a safe place.
4. Assemble the copied set of XENIX installation diskettes. Installation diskettes are labeled as follows:

XENIX Root File System

XENIX Utilities

NOTE

If you have the optional XENIX Development System, you will also receive additional diskettes, such as XENIX Development System Utilities and the C compiler.

If you are not familiar with handling floppy diskettes, see the Altos Operator's Guide or Setting Up Manual for instructions.

INSTALLATION SUMMARY

Installing the XENIX Operating System (for the first time on the hard disk) is summarized here.

Detailed installation procedures follow.

1. Start up (boot) the system from your copy of the XENIX Root File System diskette.
2. Load the utilities from the Utilities diskette.
3. Optionally, reconfigure (set up) the ports.
4. Create or change user login accounts.
5. Optionally, install the XENIX Development System, WorkNet communication network package, or any application software packages. (Refer to particular Altos or vendor manuals for installation instructions.)
6. Set up the system to display "login" on the other terminals so other users can use the system.

INSTALLING XENIX

Allow one-half to one hour to install the XENIX operating system for the first time. If you stop the installation before it is completed, the next time you work with the system a message indicates the system was not shut down properly. In this event, refer to Recovering from Interrupted Installation at the end of this chapter.

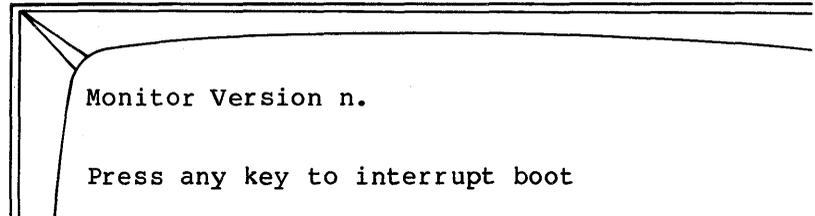
If you encounter problems or error messages not described in this manual (either during or after software installation), run the system diagnostic tests. See the Altos Diagnostic Manual for instructions.

During installation, you can correct typing errors easily. Correct a single character by pressing the Backspace key. Erase a line with the Delete or Rubout key.

Note that the screen on the Altos terminal automatically turns off (blanks) if there is no input from the keyboard or the computer for 15 minutes. You can restore the screen display by pressing any key on the keyboard.

1. Turn on the power switch, or with the power on, turn it off, then back on. You will see a monitor sign-on message; however, your screen may be different from the screen below.

Prepare to press any key when you are prompted.



If you do not get the monitor sign-on message, check that your console is properly set up and attached to the computer system. (Refer to Connecting Additional Terminals and Printers in the Altos Operator's Guide or Setting Up Manual.)

If you press a key in time, you will see a menu (Step 2 shows the first two items of the menu). If not, press the RESET button, and press any key when prompted.

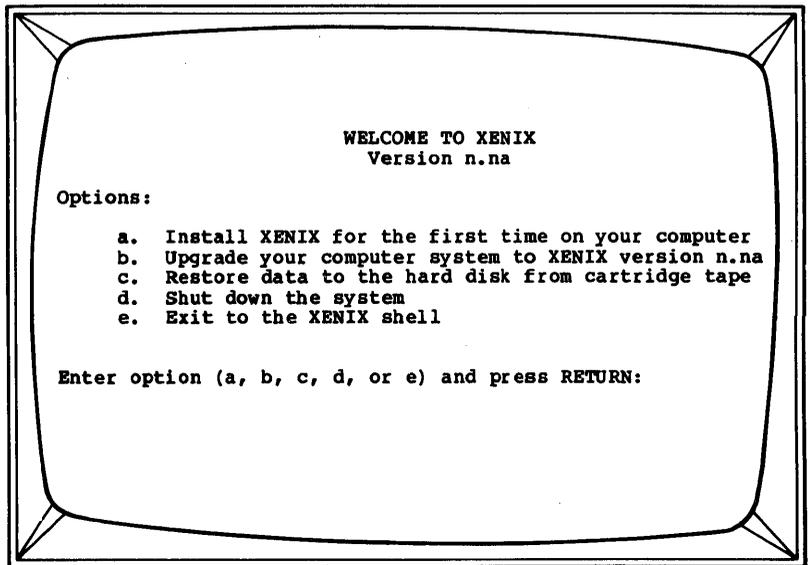
2. When you see the following display, or one similar to it, remove the silver write-protect tab from your copy of the "XENIX Root File System" diskette and insert it into the disk drive.

Enter 2 to boot from the floppy diskette.

```
||| |
||| | Enter [1] to boot from Hard Disk
||| |       [2] to boot from Floppy Disk
||| |
||| | Enter option: 2
||| | Booting from floppy disk . . .
```

After a delay of about 45 seconds, the screen displays messages about your version of XENIX and the size of available memory (in kbytes).

3. The screen then displays the Welcome to XENIX menu.

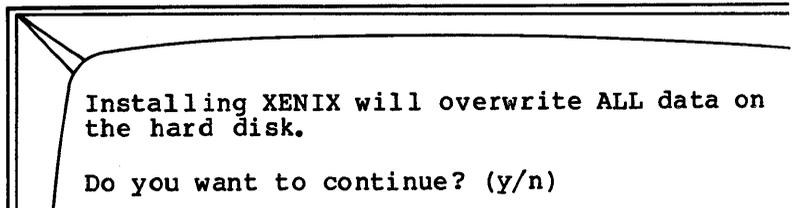


Enter a <CR>

NOTE

The 486 does not have the restore data from tape option, and the screen is adjusted accordingly.

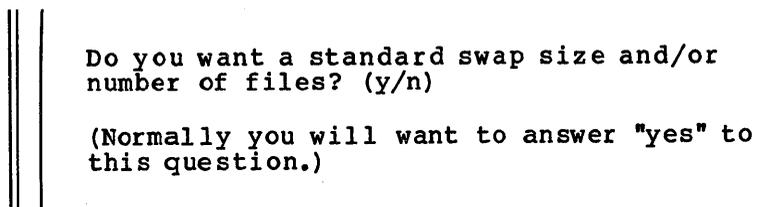
4. The screen displays



Because this is the first time you are installing the XENIX operating system, your hard disk does not have any data on it.

Enter y <CR>

5. The screen displays



This question refers to development systems that run very large application programs on the computer and need a large swap area. Most of the time you want the standard swap size.

Enter y <CR>

If you answer "n" to the above question, the screen displays

```
How many 512-byte blocks do you want in the
swap area? (Default = nnnn)
```

```
How many files (i.e., i-nodes) do you want on
the hard disk? (Default = nnnn)
```

Enter a number and press <CR> in response to each of the above questions.

6. During the next phase of installation, the computer checks the hard disk, makes the file system on the hard disk, and then checks the file system.

The screen displays messages about what the computer is doing. These messages indicate that this phase is going well.

The system may find a disk sector that should not be used. The system flags that sector so that it is not used in the future, and displays information about that sector.

When the computer checks the file system, the screen displays

```
/dev/hd0b
** Phase 1 - Check Blocks and Sizes
** Phase 2 - Check Pathnames
** Phase 3 - Check Connectivity
** Phase 4 - Check Reference Counts
** Phase 5 - Check Free List
nn files nnn blocks nnnnn free
```

The file system on the hard disk is correct.

Copying the system files to the hard disk...

Creating the special system files on the hard disk...

If the file system on the hard disk is incorrect, the system will tell you. You should turn your system off, then back on, and try the installation procedure again. If this does not correct the problem, contact your dealer.

If the file system is correct, the screen displays the following messages.

```
** Normal System Shutdown **
```

After the system shuts down, it automatically passes power-up test and displays messages about the system configuration.

The screen then displays

```
|| | PRESS ANY KEY TO INTERRUPT AUTO-BOOT
```

Don't press a key, because you want the system to automatically boot from the hard disk. If you do press a key, enter 1 <CR> to boot from the hard disk.

After booting from the hard disk, screen displays

```
|| | Remove the "XENIX Root File System" diskette  
|| | and store it in a safe place.
```

```
|| | Please insert the diskette labeled "XENIX  
|| | Utilities" and press RETURN.
```

So far, so good. The XENIX Root File System is installed on the hard disk.

7. Remove the XENIX Root File diskette and store it.

If you do not see the XENIX message after shutdown, your hard disk has not been initialized correctly. Try repeating the installation process from the beginning. If this does not work, consult your Altos Dealer.

8. Insert your copy of the diskette labeled "XENIX Utilities" (with a write-protect tab) and press <CR>.

As utilities are copied from diskette to hard disk, you will see messages of the form:

```
x filename, nnnnn bytes, nn tape blocks
```

You will also see messages saying that a file has been linked to another file. These messages are for information only.

CAUTION

Do not remove the diskette until the system tells you to remove it and the red indicator light on the disk drive goes off.

After the last file has been copied to hard disk from the diskette, the display of file names stops. You will see the following message:

```
Remove the "XENIX Utilities" diskette and
store it in a safe place.
```

9. Remove the XENIX Utility diskette and store it.
10. Then the screen displays

```
|| / Configuring the other system files...
```

The system begins this phase of installation by asking

```
Do you want to install a second hard disk on your
system? (y/n)
```

If you do not have a second hard disk, enter n <CR> and skip this step.

If you have a second hard disk connected to your computer system, enter

```
y <CR>
```

NOTE

Press the Delete or Rubout key at any time to abort installation of the second hard disk.

The screen displays

```
Do you want a standard number of files on the
second hard disk? (y/n)
```

(Normally, you will want to answer "yes" to this question.)

This question refers to development systems that run very large application programs and need a different number of files. Most of the time you want the standard number of files.

Enter y <CR>

If you answer "n" to the above question, the screen displays

```
How many 512-byte blocks do you want in the
swap area? (Default = nnnn)
```

```
How many files (i.e., i-nodes) do you want on
the second hard disk? (Default = nnnn)
```

Enter a number and press <CR> in response to each of the above questions.

XENIX then sets up the file system on the second hard disk, and periodically displays messages about what it is doing.

When the system finishes installing the second hard disk, the screen displays

```
||| The file system on the second hard disk is
||| correct.
```

See "Recovering from Interrupted Installation" later in this chapter if the file system check does not occur as described.

During the next phase of installation, the system will ask if you want to do the following tasks:

1. Change the descriptions of the terminal(s) and printer(s) so the system will recognize them.
2. Create accounts for yourself and current users.

In the future, you will only be able to do these tasks from the Business Shell as the system administrator or "super user"; we'll explain more about the super user in Chapter 4.

SETTING UP THE PORTS AND USER ACCOUNTS

Configuring the Ports

The screen displays

Do you want to change the description of the terminal(s) and printer(s)? (y/n)

The ports on your Altos system are already set up for Altos terminals and a printer. Tables 1-1 and 1-2 show the port settings for the 586/986 and 486, respectively.

Table 1-1. 586/986 Port Configuration

Hardware Name	Software Name	Device Type	Terminal Type	Printer Number	Baud Rate	Parity	Word Len	Modem?
Port 1	console	terminal	altos2		9600			
Port 2	tty2	terminal	altos2		9600			
Port 3	tty3	terminal	altos2		9600			
Port 4	tty4	terminal	altos2		9600			
Port 5	tty5	terminal	altos2		9600			
Port 6	tty6	printer		default	9600	none	8 bits	
Port 7	tty7	terminal	altos2		9600			
Port 8	tty8	terminal			9600			
Port 9	tty9	terminal			9600			
Port 10	tty10	terminal			9600			

NOTE

The 586 has 6 ports (1-6) and the 986 has 10 ports (1-10).

Table 1-2. 486 Port Configuration

Hardware Name	Software Name	Device Type	Terminal Type	Printer Number	Baud Rate	Parity	Word Len	Modem?
Port 1	console	terminal	altos2		9600			
Port 2	tty2	terminal	altos2		9600			
Port 3	tty3	terminal	altos2		9600			
Port 4	tty4	terminal	altos2		9600			
Port 5	tty5	printer		default	9600	none	8 bits	

When you first install XENIX, you may need to reconfigure a port to tell the system what kind of terminal and/or printer is attached to the port. After the initial installation, use the Port Configuration program described in Chapter 4 to make future changes.

If you need to change a port's setting, enter

y <CR>

The Port Configuration program display appears. See Chapter 4, Configuring the Ports, for instructions. Ignore the first two steps, which tell you how to access this program from the Business Shell.

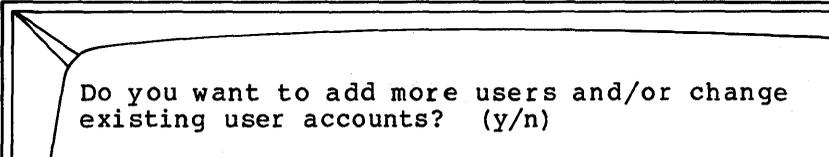
When you are finished with port configuration, return to the next section.

If you do not need to change port settings, enter

n <CR>

and continue with the next section.

Next, the screen displays



```
Do you want to add more users and/or change
existing user accounts? (y/n)
```

You should create a user account login name for each person using the system when you first install XENIX. In the future, when you want to add or change user accounts, you can access this program from the Business Shell.

Enter y <CR>

The User Administration screen appears (see Figure 4-2).

See Chapter 4, User Administration for instructions. Ignore the first three steps, which tell you how to access this program from the Business Shell. When you finish, return to the next paragraph to continue installation.

After you set up user accounts using the User Administration program, the installation proceeds and your screen displays the following:

Creating and Changing User Accounts

Checking the file system on the hard disk...

/dev/hd0b

** Phase 1 - Check Blocks and Sizes
** Phase 2 - Check Pathnames
** Phase 3 - Check Connectivity
** Phase 4 - Check Reference Counts
** Phase 5 - Check Free List

nn files nnn blocks nnn free

XENIX Version n.nn is correctly installed on your
computer

If XENIX is not correctly installed, the system will tell you. You should turn your system off, then back on, and try the installation procedure again. If this does not correct the problem, contact your dealer.

Next, the XENIX Options menu appears on the screen.

USING THE XENIX OPTIONS MENU

You can install additional software (such as the XENIX Development System or Worknet), set up the system so other users can log in, or shut down the system by using the XENIX options menu.

```
Select one of the following options:  
a. Display the "login" prompt on all terminals in the system  
b. Continue with only one user and install other software packages  
c. Shut down the system  
Enter option (a, b, or c) and press RETURN:
```

**Installing
Other
Software**

If you purchased the XENIX Development System, WorkNet communication package, or other application software, enter

b <CR>

and install them now. Refer to the appropriate manual for instructions.

**Displaying
"login:" on
Other
Terminals**

To display the "login" prompt on other terminals in the system (so other users can log in and use the system), enter

a <CR>

Then the screen displays the date and time. For example,

```
I think it's Thu Sep 27 18:38:10 1984
Enter date (yymmdd) or press RETURN if ok:
Enter time (hhmm) or press RETURN if ok:
```

To change the date and time, use the following format:

```
yy = current year
mm = current month
dd = current day of month
hh = hour (24-hour clock)
mm = minutes
```

For example, enter May 1, 1984 as

840501 <CR>

and enter 4:30 pm as

1630 <CR>

The screen displays the date and time as you set them, and the "login" prompt then appears.

```
|| | Altosnnn login:
```

Now the system is set up for other users.

**Shutting
Down the
System**

If you want to turn the power off, first you should shut down the system; enter

c <CR>

**Returning to
the Options
Menu**

To return to the Options menu after you are finished with an option, if needed, log in as root, and enter

options <CR>

In the future, if you need to access the Options menu you must be logged in as the super user. From the System Administration menu of the Business Shell, type **p**, Go to System Maintenance Mode. At the XENIX prompt (**#**), enter

options <CR>

**RECOVERING
FROM
INTERRUPTED
INSTALLATION**

If installation is interrupted, you may receive the following message after you press the RESET button.

```
The system was not shut down properly.
The root file system will be cleaned.
(Type "no" only if you want to avoid cleaning.)
```

This process begins automatically after about 5 seconds. XENIX validates the consistency of the disk file system, which may have been damaged, and automatically repairs it. If there is no damage, you will see the following:

```
/dev/root
** Phase 1 - Check Blocks and Sizes
** Phase 2 - Check Pathnames
** Phase 3 - Check Connectivity
** Phase 4 - Check Reference Counts
** Phase 5 - Check Free List

nn files nnn blocks nnnnn free
```

If the file system was damaged, XENIX repairs it automatically and displays a log of the corrections that have been made.

After the "*** Rebooting ***" message appears, the system may ask you to insert the Utilities diskette and press the Return key.

If nothing appears on the screen after the message "Booting from Hard Disk," the installation procedure has failed. Start the installation procedure again by booting from the diskette labeled "XENIX Root File System."

Installing and Setting Up Xenix 1

CONTENTS

- 1-2 HOW TO START
- 1-3 INSTALLATION SUMMARY
- 1-3 INSTALLING XENIX
 - 1-4 Installation
- 1-8 INSTALLING A SECOND HARD DISK
- 1-10 CONFIGURING THE PORTS
- 1-11 CREATING AND CHANGING USER ACCOUNTS
- 1-13 USING THE XENIX OPTIONS MENU
 - 1-13 Installing Other Software
 - 1-13 Displaying "login:" on Other Terminals
 - 1-14 Shutting Down the System
 - 1-14 Returning to the Options Menu
- 1-15 RECOVERING FROM INTERRUPTED INSTALLATION

After you connect the components of your Altos computer system and turn on the power, you need to install the operating system programs and utilities.

This chapter describes how to install the XENIX operating system for the first time. This chapter also describes how to set up the ports, create and change user accounts, and set up the system for other users.

CAUTION

The installation procedures described in this chapter erase all information on the hard disk. If you are upgrading your existing XENIX operating system, use the procedures described in Appendix D.

HOW TO START

Before you install XENIX,

1. Connect the terminal you use for the installation procedures to port 1 on the back of your Altos 586/986 system (see the Altos 586 and 986 Computer Systems Operator's Guide for instructions).
2. Optionally, run the system diagnostic tests. Because the Altos system is tested before shipping, this step is optional. However, you can run the diagnostic tests to detect problems that could occur as a result of shipment (such as loosening of components and connections). The tests take from one to two hours. See the Altos 586 Computer System Diagnostic Manual for instructions.
3. Use the diagnostics copy utility to make copies of all XENIX installation diskettes, and hand copy the label information. (The Diagnostics diskette has a copy utility that you can use. See the Altos 586 Computer System Diagnostic Manual for information.) Store the originals in a safe place.
4. Assemble the copied set of XENIX installation diskettes. Installation diskettes are labeled as follows:

XENIX Root File System

XENIX Utilities

NOTE

If you have the optional XENIX Development System, you will also receive additional diskettes, such as XENIX Development System Utilities and the C compiler. See the XENIX Development System Operations Guide for more information.

If you are not familiar with handling floppy diskettes, see the Altos 586 and 986 Computer Systems Operator's Guide for instructions.

INSTALLATION SUMMARY

Installing the XENIX Operating System (for the first time on the hard disk) is summarized here.

Detailed installation procedures follow.

1. Start up (boot) the system from your copy of the XENIX Root File System diskette.
2. Load the utilities from the Utilities diskette.
3. Optionally, reconfigure (set up) the ports.
4. Create or change user login accounts.
5. Optionally, install the XENIX Development System, WorkNet communication network package, or any application software packages. (Refer to particular Altos or vendor manuals for installation instructions.)
6. Set up the system to display "login" on the other terminals so other users can use the system.

INSTALLING XENIX

Allow one-half to one hour to install the XENIX operating system for the first time. If you stop the installation before it is completed, the next time you work with the system a message indicates the system was not shut down properly. In this event, refer to Recovering from Interrupted Installation at the end of this chapter.

If you encounter problems or error messages not described in this manual (either during or after software installation), run the system diagnostic tests. See the Altos 586 Computer System Diagnostic Manual for instructions.

Installation

During installation, you can correct typing errors easily. Correct a single character by pressing the Backspace key. Erase a line with the Delete or Rubout key.

Note that the screen on the Altos II terminal automatically turns off (blanks) if there is no input from the keyboard or the computer for 15 minutes. You can restore the screen display by pressing any key on the keyboard.

1. Turn on the power switch, or with the power on, turn it off, then back on. You will see the following monitor sign-on message. Prepare to press any key when you are prompted.

```
Monitor Version n.nn
```

```
Press any key to interrupt boot
```

If you do not get the monitor sign-on message, check that your console is properly set up and attached to the computer system. (Refer to Connecting Additional Terminals and Printers in the Altos 586 and 986 Computer Systems Operator's Guide.)

If you press a key in time, you will see the display in Step 2. If not, press the RESET button, and press any key when prompted.

2. When you see the following display, insert your copy of the diskette labeled "XENIX Root File System" into the disk drive. Enter 2 to boot from the floppy diskette.

```
Enter [1] to boot from Hard Disk
      [2] to boot from Floppy Disk
      [3] to enter Monitor
```

```
Enter option: 2
Booting From floppy disk . . .
```

After a delay of about 45 seconds, the following message appears.

```
XENIX vn.na  
mem = nnnk
```

3. The screen then displays the Welcome to XENIX menu.

```
WELCOME TO XENIX  
Version 3.0a  
  
Options: a. Install XENIX for the first time on your computer  
         b. Update your computer system to XENIX version 3.0a  
         c. Restore data to the hard disk from cartridge tape  
         d. Shut down the system  
         e. Exit to the XENIX shell  
  
Enter option (a, b, c, d, or e) and press RETURN:
```

Enter a <CR>

4. The screen displays

```
Installing XENIX will overwrite ALL data on  
the hard disk.  
  
Do you want to continue? (y/n)
```

Because this is the first time you are installing the XENIX operating system, your hard disk does not have any data on it.

Enter y <CR>

5. The system then asks

```
What size disk (megabytes) are you installing? (10, 20, 30 or 40)
```

This question refers to the size of the hard disk. The computer model number has a "dash number" at the end that tells the hard disk size in megabytes. For example, the 586-10 has 10 megabytes, the 586-20 has 20 megabytes, and so on.

For our example, we will enter 20 <CR>.

Enter the size of your hard disk.

6. The screen displays

```
Do you want a standard swap size and/or number of files? (y/n)
```

```
(Normally you will want to answer "yes" to this question.)
```

This question refers to development systems that run very large application programs on the computer and need a large swap area. Most of the time you want the standard swap size.

Enter y <CR>

7. During the next phase of installation, the computer checks the hard disk, makes the file system on the hard disk, and then checks the file system.

The screen displays messages about what the computer is doing. These messages indicate that this phase is going well.

The system may find a disk sector that should not be used. The system flags that sector so that it is not used in the future, and displays information about that sector.

When the computer checks the file system, the screen displays

```
/dev/hd0b
```

```
** Phase 1 - Check Blocks and Sizes  
** Phase 2 - Check Pathnames  
** Phase 3 - Check Connectivity  
** Phase 4 - Check Reference Counts  
** Phase 5 - Check Free List
```

```
nn files nnn blocks nnn free
```

The file system on the hard disk is correct.

Copying the system files to the hard disk...

Creating the special system files on the hard disk...

If the file system on the hard disk is incorrect, the system will tell you. You should turn your system off, then back on, and try the installation procedure again. If this does not correct the problem. Contact your dealer.

If the file system is correct, the screen displays.

```
** Rebooting **
```

```
XENIX vnn.n
```

```
mem = nnnk
```

Remove the "XENIX Root File System" diskette and store it in a safe place.

Please insert the diskette labeled "XENIX Utilities" and press RETURN.

So far, so good. The XENIX Root File System is installed on the hard disk.

8. Remove the XENIX Root System diskette and store it.

If you do not see "*** Rebooting **," your hard disk has not been initialized correctly. Try repeating the installation process from the beginning. If this does not work, consult your Altos Dealer.

9. Insert your copy of the diskette labeled "XENIX Utilities" and press <CR>.

As utilities are copied from diskette to hard disk, you will see messages of the form:

```
x filename, nnnnn bytes, nn tape blocks
```

You will also see messages saying that a file has been linked to another file. These messages are for information only.

NOTE

Do not remove the diskette until the system tells you to remove it and the red indicator light on the disk drive goes off.

After the last file has been copied to hard disk from the diskette, the display of file names stops. You will see the message,

```
Remove the "XENIX Utilities" diskette and
store it in a safe place.
```

10. Remove the XENIX Utility diskette and store it.
11. Then the screen displays

```
Configuring the other system files...
```

The system begins this phase of installation by asking

```
Do you want to install a second hard disk on your
system? (y/n)
```

If you do not have a second hard disk, enter n <CR> and skip this step.

**INSTALLING
A SECOND
HARD DISK**

If you have a second hard disk connected to your computer system, enter

y <CR>

NOTE

Press the Delete or Rubout key at any time to abort installation of the second hard disk.

The screen displays

```
What size disk (megabytes) are you installing?  
(10, 20, 30, 40)
```

Enter the size of the second hard disk, and press <CR>.

Next, the screen displays

```
Do you want a standard number of files on the  
second hard disk? (y/n)
```

```
(Normally, you will want to answer "yes" to this  
questions.)
```

This question refers to development systems that run very large application programs and need a different number of files. Most of the time you want the standard number of files.

Enter y <CR>

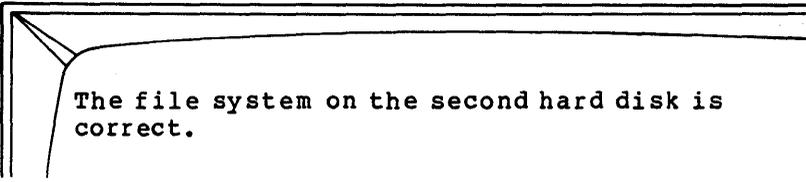
If you answer "n" to the above question, the screen displays

```
How many files (i.e., i-nodes) do you want on the  
second hard disk?
```

The default for a 10 or 20 megabyte disk is 6000 i-nodes, for a 30 or 40 megabyte disk is 10000 i-nodes.

XENIX then sets up the file system on the second hard disk, and periodically displays messages about what it is doing.

When the system finishes installing the second hard disk, the screen displays



The file system on the second hard disk is correct.

See "Recovering from Interrupted Installation" later in this chapter if the file system check does not occur as described.

During the next phase of installation, the system will ask if you want to do the following tasks:

1. Change the descriptions of the ports (reconfigure them) so the system will recognize additional terminals and printers
2. Create accounts for yourself and current users.

In the future, you will only be able to do these tasks from the Business Shell as the system administrator or "super user"; we'll explain more about the super user in Chapter 4.

CONFIGURING THE PORTS

The screen displays



Do you want to change the description of the terminal(s) and printer(s)? (y/n)

The ports on the Altos 586/986 system are already set up for Altos terminals. Port 6 is set up as the printer port. Table 1-1 shows port configuration (ports 7-10 are for the 986 system only).

Table 1-1. Port Configuration

Hardware Name	Software Name	Device Type	Terminal Type	Printer Number	Baud Rate	Parity	Word Len	Modem?
PORT 1	console	terminal	altos2		9600			
PORT 2	tty2	terminal	altos2		9600			
PORT 3	tty3	terminal	altos2		9600			
PORT 4	tty4	terminal	altos2		9600			
PORT 5	tty5	terminal	altos2		9600			
PORT 6	tty6	printer		default	9600	none	8 bits	
PORT 7	tty7	terminal	altos2		9600			
PORT 8	tty8	terminal	altos2		9600			
PORT 9	tty9	terminal	altos2		9600			
PORT 10	tty10	terminal	altos2		9600			

When you first install XENIX, you may need to reconfigure a port to tell the system what kind of terminal and/or printer is attached to the port. After the initial installation, use the Port Configuration program described in Chapter 4 to make future changes.

If you need to change a port's setting, enter

y <CR>

The Port Configuration program display appears. See Chapter 4, Configuring the Ports, for instructions. Ignore the first two steps, which tell you how to access this program from the Business Shell.

When you are finished with port configuration, return to the next section.

If you do not need to change port settings, enter

n <CR>

and continue with the next section.

CREATING AND CHANGING USER ACCOUNTS

Next, the screen displays

```

Do you want to add more users and/or change
existing user accounts? (y/n)
    
```

You should create a user account login name for each person using the system when you first install XENIX. In the future, when you want to add or change user accounts, you can access this program from the Business Shell.

Enter y <CR>

The User Administration screen appears (see Figure 4-2).

See Chapter 4, User Administration for instructions. Ignore the first three steps, which tell you how to access this program from the Business Shell. When you finish, return to the next paragraph to continue installation.

After you set up user accounts using the User Administration program, the installation proceeds and your screen displays

```
Checking the file system on the hard disk
```

```
/dev/hd0b
```

```
** Phase 1 - Check Blocks and Sizes  
** Phase 2 - Check Pathnames  
** Phase 3 - Check Connectivity  
** Phase 4 - Check Reference Counts  
** Phase 5 - Check Free List
```

```
nn files nnn blocks nnn free
```

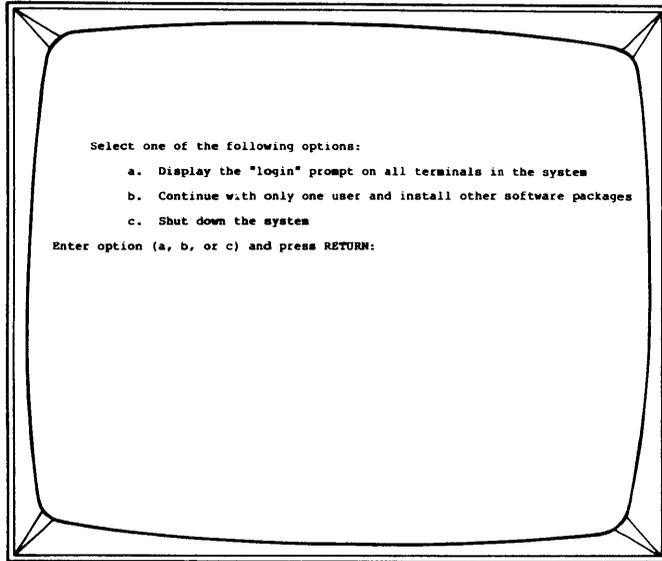
```
Xenix Version n.nn is correctly installed on your  
computer
```

If XENIX is not correctly installed, the system will tell you. You should then turn your system off, then back on, and try the installation procedure again. If this does not correct the problem, contact your dealer.

Next, the XENIX Options menu appears on the screen.

**USING
THE XENIX
OPTIONS MENU**

The XENIX Options menu allows you to install additional software (such as the XENIX Development System or Worknet), set up the system so other users can log in, or shut down the system.



**Installing
Other
Software**

If you purchased the XENIX Development System, WorkNet communication package, or other application software, enter

b <CR>

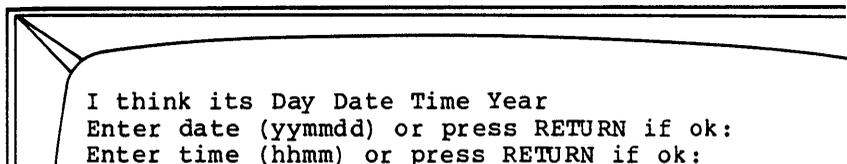
and install them now. Refer to the appropriate manual for instructions.

**Displaying
"login:" on
Other
Terminals**

To display the "login" prompt on other terminals in the system (so other users can log in and use the system), enter

a <CR>

Then the screen displays



To change the date and time, use the following format:

yy = current year
mm = current month
dd = current day of month
hh = hour (24-hour clock)
mm = minutes

For example, enter May 1, 1984 as

```
840501 <CR>
```

and enter 4:30 pm as

```
1630 <CR>
```

The screen displays the date and time as you set them, and the "login" prompt then appears.

```
Altos586 login:
```

Now the system is set up for other users.

Shutting Down the System

If you want to turn the power off, first you should shut down the system; enter

```
c <CR>
```

Returning to the Options Menu

To return to the Options menu after you are finished with an option, if needed, log in as root, and enter

```
options <CR>
```

In the future, if you need to access the Options menu you must be logged in as the super user. From the System Administration menu of the Business Shell, type **p**, Go to System Maintenance Mode. At the XENIX prompt (**#**), enter

```
options <CR>
```

**RECOVERING
FROM
INTERRUPTED
INSTALLATION**

If installation is interrupted, you may receive the following message after you press the RESET button.

```
The system was not shut down properly.  
The root file system will be cleaned.  
(Type "no" only if you want to avoid cleaning.)
```

This process begins automatically after about 5 seconds. XENIX validates the consistency of the disk file system, which may have been damaged, and automatically repairs it. If there is no damage, you will see the following:

```
/dev/root  
** Phase 1 - Check Blocks and Sizes  
** Phase 2 - Check Pathnames  
** Phase 3 - Check Connectivity  
** Phase 4 - Check Reference Counts  
** Phase 5 - Check Free List  
  
nn files nnn blocks nnn free
```

If the file system was damaged, XENIX repairs it automatically and displays a log of the corrections that have been made.

After the "*** Rebooting ***" message appears, the system may ask you to insert the Utilities diskette and press the Return key.

If nothing appears on the screen after the message "Booting from Hard Disk," the installation procedure has failed. Start the installation procedure again by booting from the diskette labeled "XENIX Root File System."

Logging In and Logging Out 2

CONTENTS

2-2 LOGGING IN

2-2 SETTING AND CHANGING PASSWORDS

2-3 LOGGING OUT OR QUITTING

LOGGING IN

To use your Altos computer system, you need to log in.

Find out your user name from the system administrator. At the login prompt, type your user name and press the Return key. For example,

```
Altos586 login: robert <CR>
```

Or, you may log in by responding to a system prompt:

```
$ login robert <CR>
```

SETTING AND CHANGING PASSWORDS

To protect files you own, you need to have a password. When you first log in, no password is assigned. You can set a password using one of the following procedures. Thereafter, each time you log in, you will be asked for your password. To maintain security, the password you type won't show on the screen.

To set or change a password, type **b**, Change Password. The screen displays

```
Changing password for (your login name)  
New password: Type in any desired password <CR>  
Retype new password: Retype in same password <CR>
```

```
[Type RETURN to continue]
```

If you are changing your password, you will be prompted for the old password. Enter the old password and press the Return key. Then you are asked to type in the new password.

The next time you log in, you will be asked for the password.

NOTE

Enter 6 or more characters for your password.

If you forget your password, you cannot access your files. The system administrator can remove your password without knowing what it is, and you can enter a new one.

**LOGGING OUT
OR QUITTING**

To log out from the Business Shell Main Menu, enter **q**,
Quit. To log off from the UNIX Shell (the # or \$
prompt), enter **<Control-D> <CR>**.

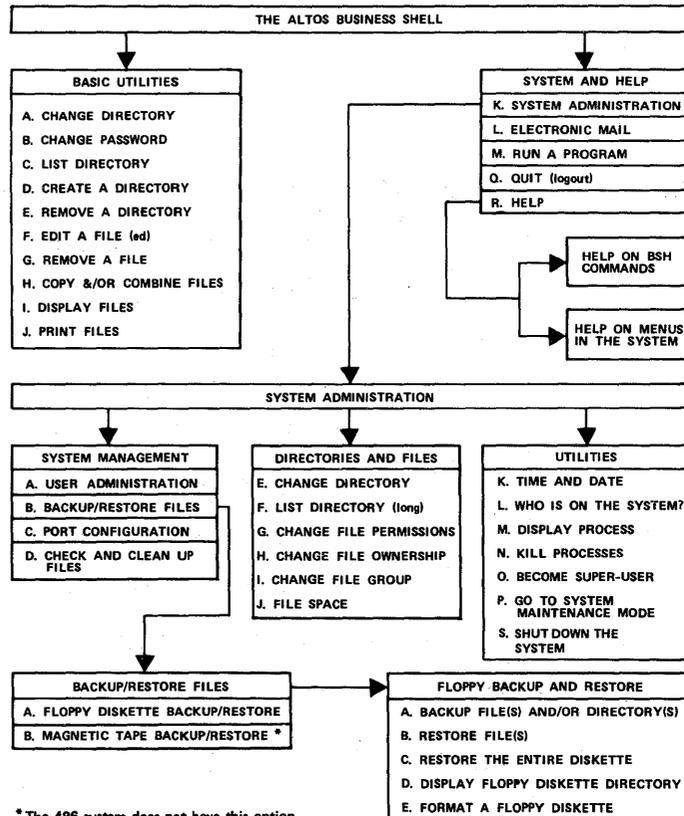
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3-3	How to Use the Business Shell
3-3	Fast Mode/Slow Mode
3-3	BASIC UTILITIES
3-5	Name a File or Directory
3-7	Create a Directory
3-9	List a Directory
3-10	Change a Directory
3-11	Remove a Directory
3-12	Create and Edit a File
3-13	Display a File
3-14	Copy and Combine Files
3-16	Print a File
3-17	Remove a File
3-18	Change a Password
3-19	USING ELECTRONIC MAIL
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3-21	RUNNING A PROGRAM
3-22	The "!" Command
3-22	OBTAINING HELP WHILE IN BUSINESS SHELL
3-23	Business Shell Commands
3-24	Business Shell Menus

ACCESSING THE BUSINESS SHELL MENU SYSTEM

This section describes programs you can use from the Business Shell menu. You use these programs to create directories and files, shut down the system, and save and restore files. Figure 3-1 shows the organization of the Business Shell menus.



* The 486 system does not have this option.

Figure 3-1. Organization of the Business Shell Menu System

Most user accounts are set up so you log in to the Business Shell. If this is not the case, you can access the Business Shell in one of the following ways:

- o Log in as **user** <CR> (for regular user)
- o Log in as **admin** <CR> (for super user)
- o From the UNIX Shell (either the # or \$ prompt), type **bsh** <CR>.

Using Xenix on a Regular Basis 3

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3-22	The "!" Command
3-22	OBTAINING HELP WHILE IN BUSINESS SHELL
3-23	Business Shell Commands
3-24	Business Shell Menus

**ACCESSING THE
BUSINESS SHELL
MENU SYSTEM**

This section describes programs you can use from the Business Shell menu. You use these programs to create directories and files, shut down the system, and save and restore files. Figure 3-1 shows the organization of the Business Shell menus.

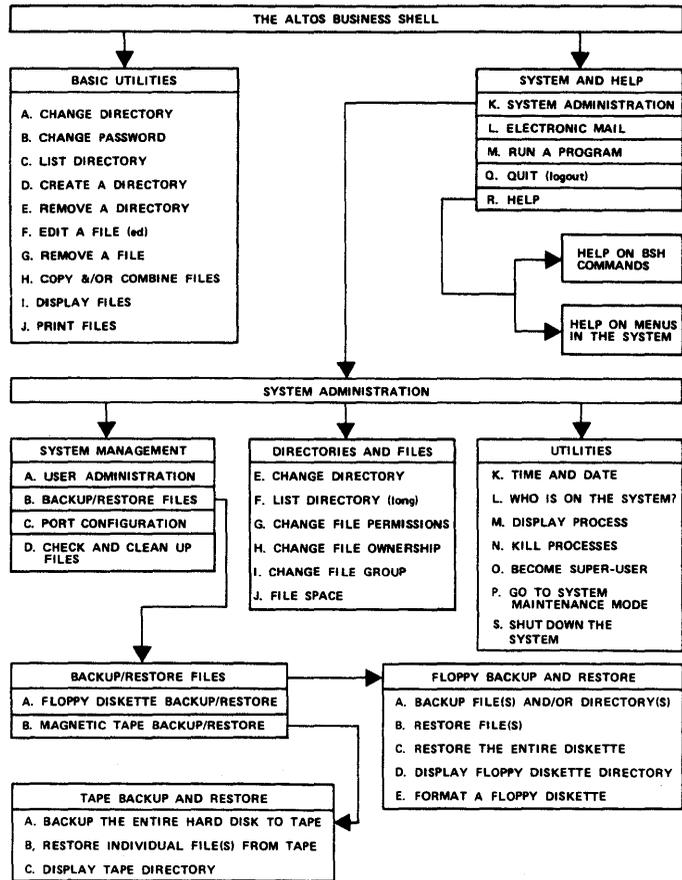


Figure 3-1. Organization of the Business Shell Menu System

Most user accounts are set up so you log in to the Business Shell. If this is not the case, you can access the Business Shell in one of the following ways:

- o Log in as **user** <CR> (for regular user)
- o Log in as **admin** <CR> (for super user)
- o From the UNIX Shell (either the # or \$ prompt), type **bsh** <CR>.

**How to
Use the
Business
Shell**

The Business shell contains programs for file management that a regular user needs, and system management utilities that an administrator needs. These programs ask you for appropriate information, and then do the necessary work for you. The programs are grouped on menus so you can access them efficiently.

To select a menu item, type the letter to the left of that item. Sometimes another menu appears with additional selections that you can choose (e.g., Back-up/Restore Files).

To return to the previous menu, press the Return key when any menu prompt is displayed.

NOTE

Do not press the Return key when you make a selection; type only the letter. If you press the Return key after typing your selection, you are returned to the previous menu.

**Fast Mode/
Slow Mode**

The Business Shell operates in either fast mode or slow mode.

In the fast mode, when you type a letter for a menu item, the system responds immediately. You do not need to press the Return key.

In the slow mode, the system does respond until you press the Return key.

In either mode, when you wish to enter a command that does not begin with a lower-case alphabetic character, such as ?, ??, or Name?, you must end the command with a carriage return.

To change from the fast mode (the factory or default setting) to the slow mode, enter

```
menu prompt > ?mode  
Mode = FAST; change to slow? (y/n) y
```

**BASIC
UTILITIES**

Basic utilities you can access include

- o Change directory
- o Change password
- o Create a directory
- o List directory
- o Remove a directory
- o Create and edit a file
- o Remove a file

- o Copy and/or combine files
- o Display files
- o Print files

Figure 3-2 shows the Business Shell main menu, which contains Basic Utilities and System and Help selections.

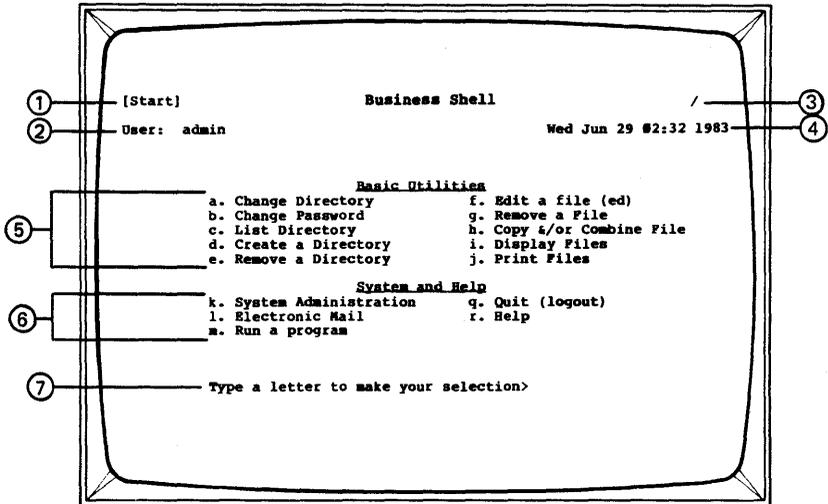


Figure 3-2. The Business Shell Main Menu

The parts of the menu are defined as follows:

- 1 The name of the menu
- 2 The current user (your login name)
- 3 The complete pathname
- 4 The current date
- 5 The basic utilities
- 6 The system and help utilities
- 7 The menu prompt.

Name a File or Directory

Figure 3-3 shows an example of the directory and file structure of the XENIX operating system. Directories and files are arranged in a hierarchical structure, with root as the top directory. The full name of any directory or file begins with a slash (/), which denotes the root (or topmost) directory. Your directories and files are located in /usr.

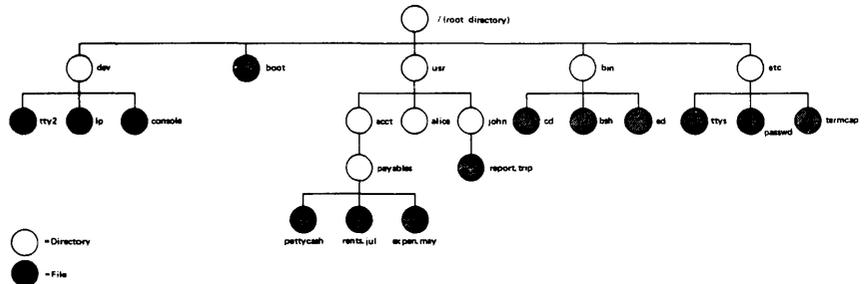


Figure 3-3. Directory Structure

Usually, a directory contains files on the same subject. Each directory and file must have a file name that you assign. A file name must be unique, and can't have the name of the directory in which it resides. A directory name or a file name can have up to 14 characters. Because the following characters have special functions, do not use them in file names:

asterisk	*	left square bracket	[
comma	,	right square bracket]
semicolon	;	slash	\
colon	:	backslash	\/
question mark	?	left single quote	'
exclamation point	!	right single quote	'
left parenthesis	(double quote	"
right parenthesis)	space	

When you first create files, you may wish to place all of them in /usr/mydirectory (/usr/acct or /usr/alice in the figure). However, as you become more adept, you can have directories and files that are many levels below /usr/mydirectory.

When you are working in a directory or file, it is called the "current" directory. To create or access a directory or file in your current directory, type the file name. To create or access a directory or file not in the current directory, you must specify the full pathname.

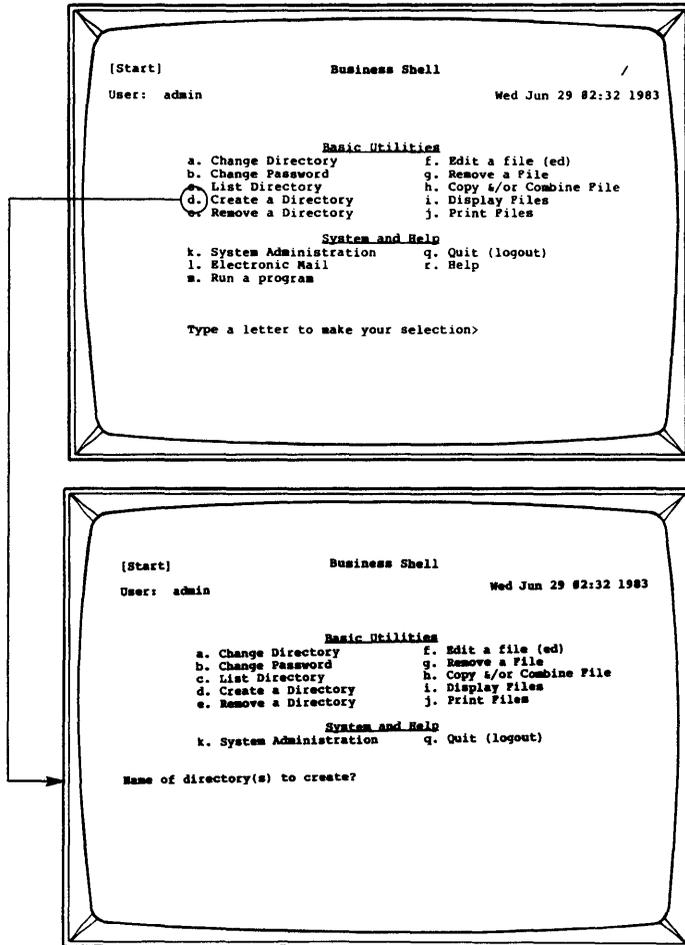
For example, there are many ways to access the file "pettycash" in Figure 3-3. One way is to change your current directory to /usr/acct/payables. You can then access the file by typing "pettycash."

Another way to access "pettycash" is to specify the full pathname: /usr/acct/payables/pettycash. A full pathname consists of a series of one or more directories and a single file name. Be sure to include the initial slash (/) and the slash after each directory along the path.

Create a Directory

You can set up a directory to contain related files. Then you can go directly to a set of files; this is similar to opening a file drawer devoted to one subject.

To create a directory, type **d**, Create a Directory. The prompt "Name of directory(s) to create?" appears. Enter the name of the directory you wish to create, and press the Return key.



To verify that the directory was created, change to the new directory, and list the directory.

After you have created a directory, you can create new files within the directory. First, to access the new directory, enter **a**, Change Directory. You are prompted: "Change to which directory?" Enter the new directory name, and press the Return key. The Basic Utili-

ties menu now relates to the new directory. Note that the pathname in the upper-right corner (above the date) ends with the new directory. If you wish, you can type **f**, Edit a file, to add a new file to the directory.

If you have two hard disks and are working on the first hard disk, you can create/access directories and files on the second hard disk. Select **a**, Change Directory, and enter

```
/usr2 <CR>
```

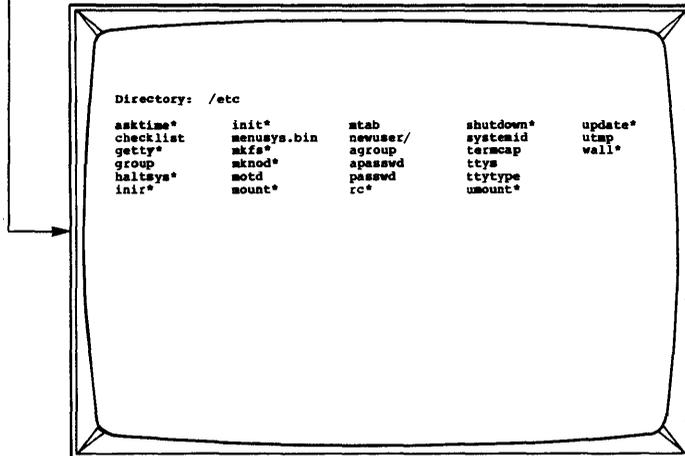
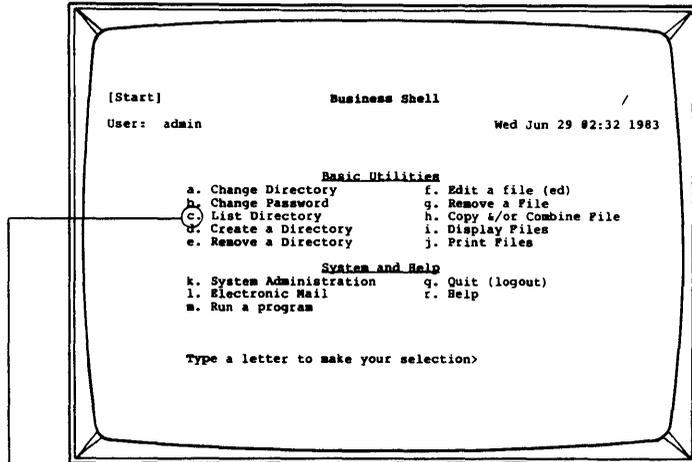
Your working directory is now on the second hard disk.

You can, if you wish, work from the first to the second hard disk. For example, if you are working on the first hard disk and want to create a directory named accounting on the second hard disk, select **d**, Create a Directory, and enter

```
/usr2/accounting <CR>
```

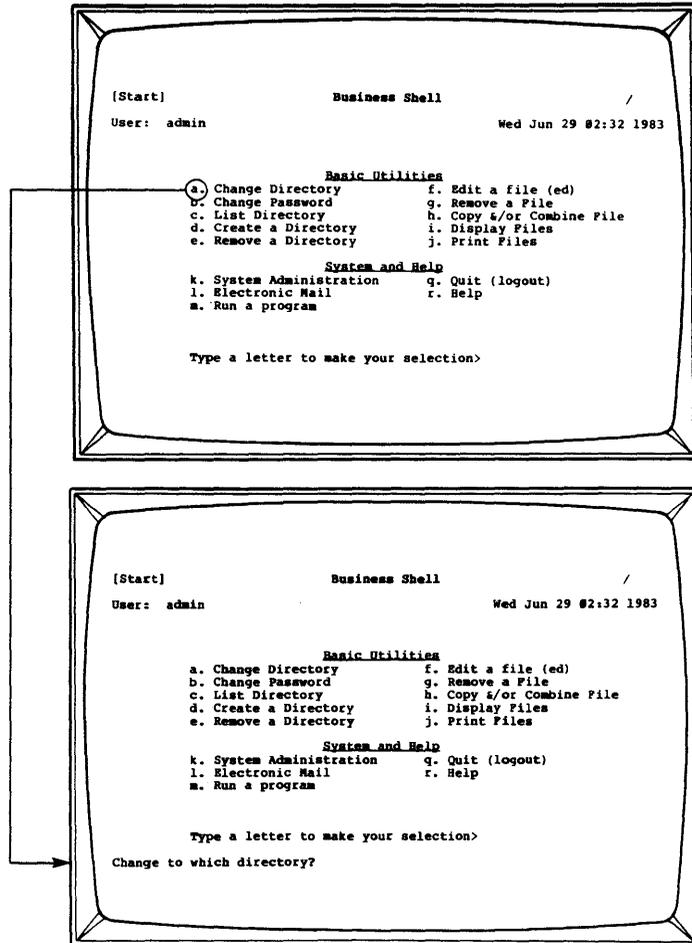
List a Directory

To list the contents of a directory, type **c**, List Directory. Directories within directories are indicated by a slash (/) after the name, for example new-user/.



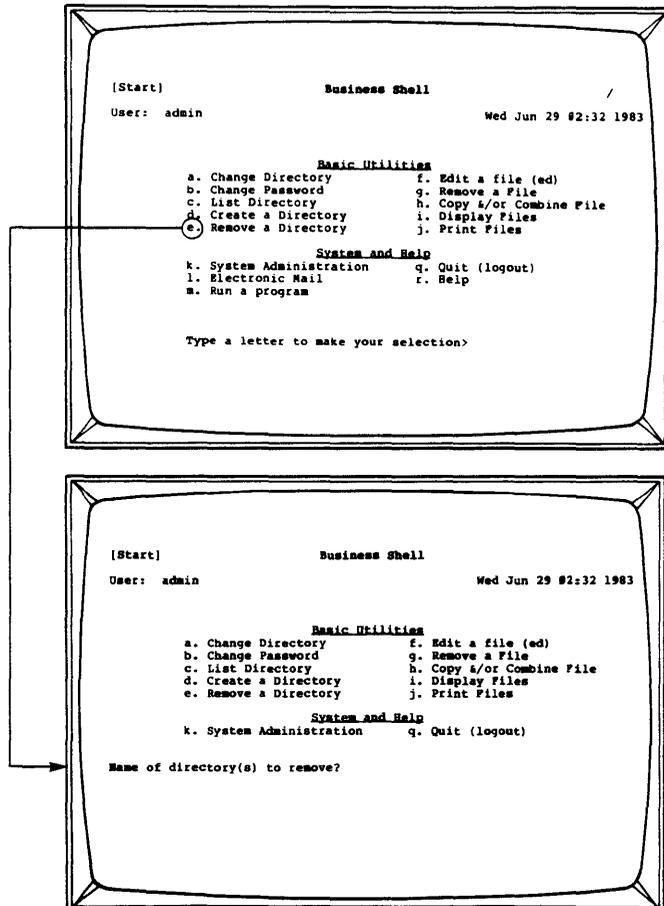
Change a Directory

To change to another directory, type a, Change Directory. The prompt "Change to which directory?" appears. Enter the name of the directory you wish to access, and press the Return key. The system changes your current directory and places the name of the current directory above the date in the upper-right corner of the Business Shell menu.



Remove a Directory

To remove a directory, type e, Remove a Directory. The prompt "Name of directory(s) to remove?" appears. Enter the directory(s) and press the Return key. Note that you cannot be working in the directory that you want to remove. Check your current pathname, which is displayed in the upper-right corner above the date. If necessary, change the directory by selecting the Change Directory menu item.



After removing a directory, type c, List Directory, to verify that it was removed.

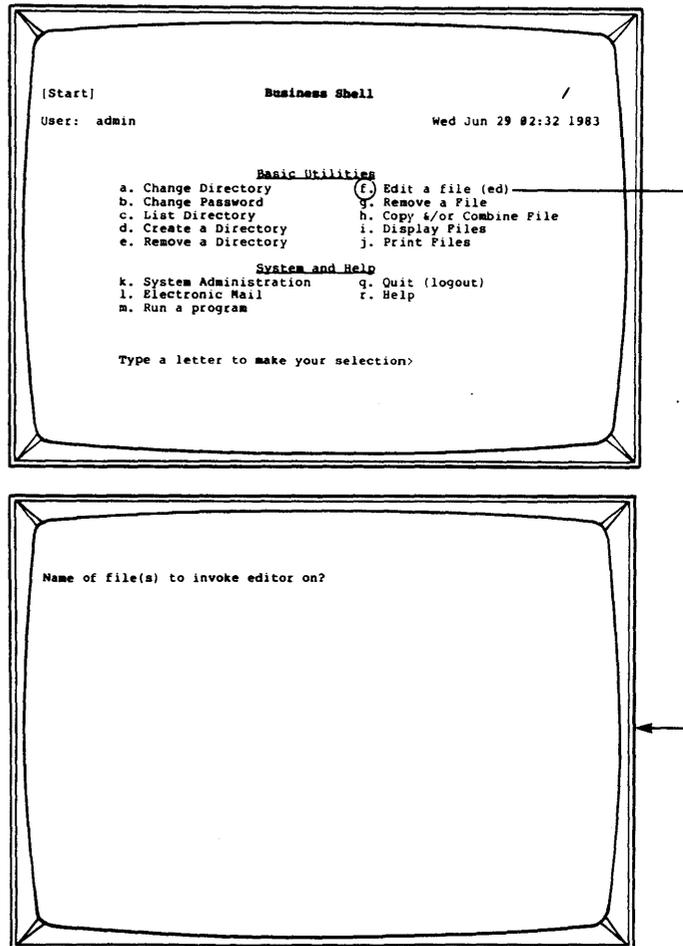
CAUTION

When you remove a directory, all of the files in that directory are also removed. If you want to save a file, copy it to another directory before you remove the first directory.

Create and Edit a File

A computer file is similar in concept to a paper file; they both contain information. A file can contain the text of a letter, financial data, or a list of customers. A file can contain as little or as much information as you want.

To create and edit a file, type `f`, Edit a File (`ed`). The prompt "Name of file(s) to invoke editor on?" appears. Enter the file name(s) and press the Return key to start your editing session. Refer to Invoking Ed, the Text Editor in Chapter 5 for editing instructions.



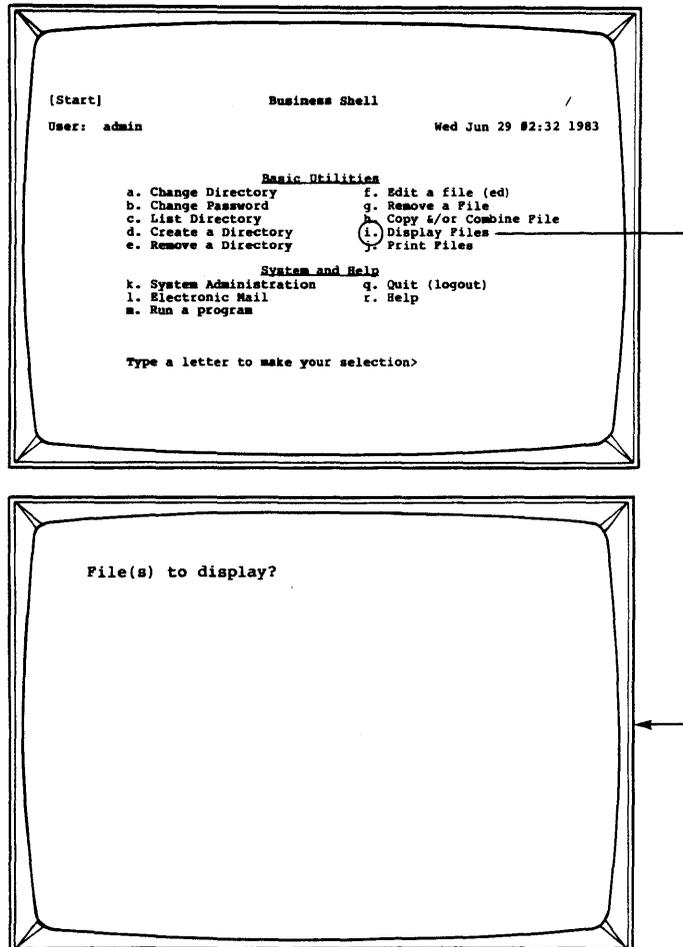
Display a File

To display a file, type `i`, Display Files. The prompt "File(s) to display?" appears. Enter one or more files, each separated by a space and press `<CR>`. Enter the full pathname of the file; if it's in your current directory, just enter the file name.

The contents of the first file is displayed. If a file is longer than one screen, "--More--" and the percentage of text that has been displayed appears at the bottom of the screen. Press the Space Bar to see the next screenful. Press the Return key to display each subsequent line in the file.

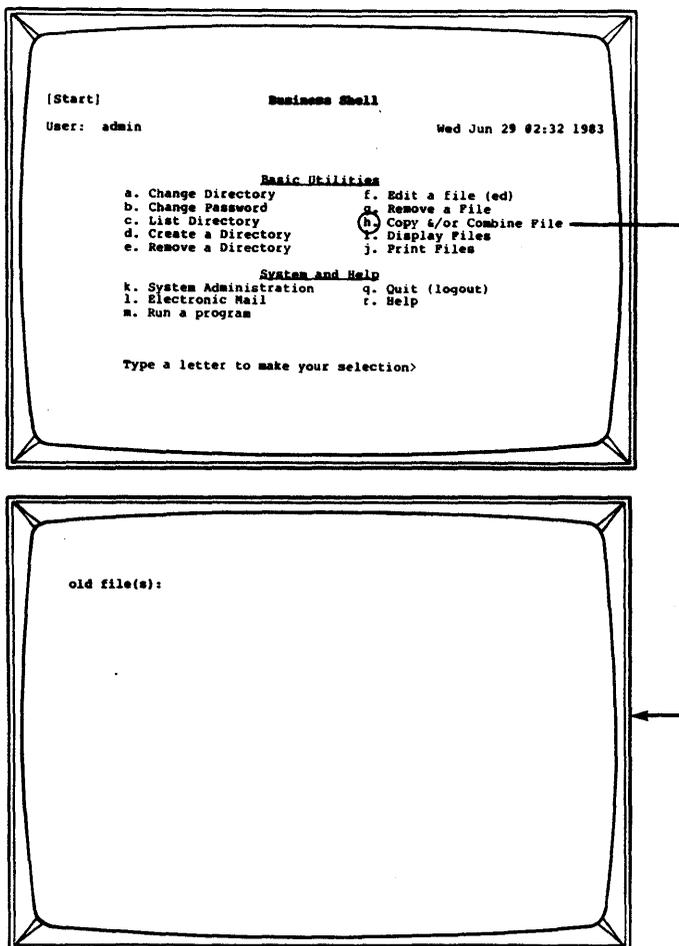
If you enter more than one file name, press `<CR>` to view the next file.

You can exit the file at any time without affecting its contents by pressing the Delete (or Rubout) key.



Copy and Combine Files

To copy or combine files, type h, Copy and/or Combine Files. The prompts for the names of the "old file(s)" and the "new file" appear. For example, if you enter a single old file, june.1 and a single new file, december.1, your directory now contains two files with different names and identical content. You have a back-up file for security. Should you destroy part of a file, you can retrieve the other copy. Note that the old file contents will write over contents (if any) in the new file.



The names of the old and new files must be different. If you copy two or more files into a new file, the new file contains all of the old files attached one after the other in the order you entered them. The old files still exist.

To copy files from the first to the second hard disk,
enter

```
old file(s)    /usr/dirname/filename  
new file       /usr2/dirname/filename
```

where

dirname = the name of the directory.

filename = the name of the file you wish to copy.

You can omit the new name if you want the file name to
be the same on both disks.

For example, to copy a file named sales (in the ac-
counting directory on the first disk), enter

```
old file(s)    /usr/accounting/sales  
new file       /usr2/accounting
```

Print a File

To print files, type j, Print Files. The prompt "File(s) to print?" appears. Enter the name of the file(s) to be printed and press <CR>. (Your XENIX system must be configured to a connected printer.)

```
(Start)                Business Shell /
User: admin                Wed Jun 29 02:32 1983

                Basic Utilities
a. Change Directory      f. Edit a file (ed)
b. Change Password      g. Remove a File
c. List Directory        h. Copy &/or Combine File
d. Create a Directory    i. Display Files
e. Remove a Directory    j. Print Files

                System and Help
k. System Administration  q. Quit (logout)
l. Electronic Mail        r. Help
m. Run a program

Type a letter to make your selection>
```

```
(Start)                Business Shell /
User: admin                Wed Jun 29 02:32 1983

                Basic Utilities
a. Change Directory      f. Edit a file (ed)
b. Change Password      g. Remove a File
c. List Directory        h. Copy &/or Combine File
d. Create a Directory    i. Display Files
e. Remove a Directory    j. Print Files

                System and Help
k. System Administration  q. Quit (logout)
l. Electronic Mail        r. Help
m. Run a program

File(s) to print?
```

Remove a File

To remove a file, type g, Remove a File. The prompt "Name(s) of file(s) to remove?" appears. Enter the file name or multiple file names each separated by a space, and press <CR>. List the directory to verify file removal.

If you enter a directory name instead of a file name, the word "directory" appears and nothing is deleted.

```
[Start]                               Business Shell /
User: admin                            Wed Jun 29 02:32 1983

                                Basic Utilities
a. Change Directory                f. Edit a file (ed)
b. Change Password                 g. Remove a File
c. List Directory                  h. Copy 4/or Combine File
d. Create a Directory              i. Display Files
e. Remove a Directory              j. Print Files

                                System and Help
k. System Administration           q. Quit (logout)
l. Electronic Mail                 r. Help
m. Run a program

Type a letter to make your selection>
```

```
[Start]                               Business Shell /
User: admin                            Wed Jun 29 02:32 1983

                                Basic Utilities
a. Change Directory                f. Edit a file (ed)
b. Change Password                 g. Remove a File
c. List Directory                  h. Copy 4/or Combine File
d. Create a Directory              i. Display Files
e. Remove a Directory              j. Print Files

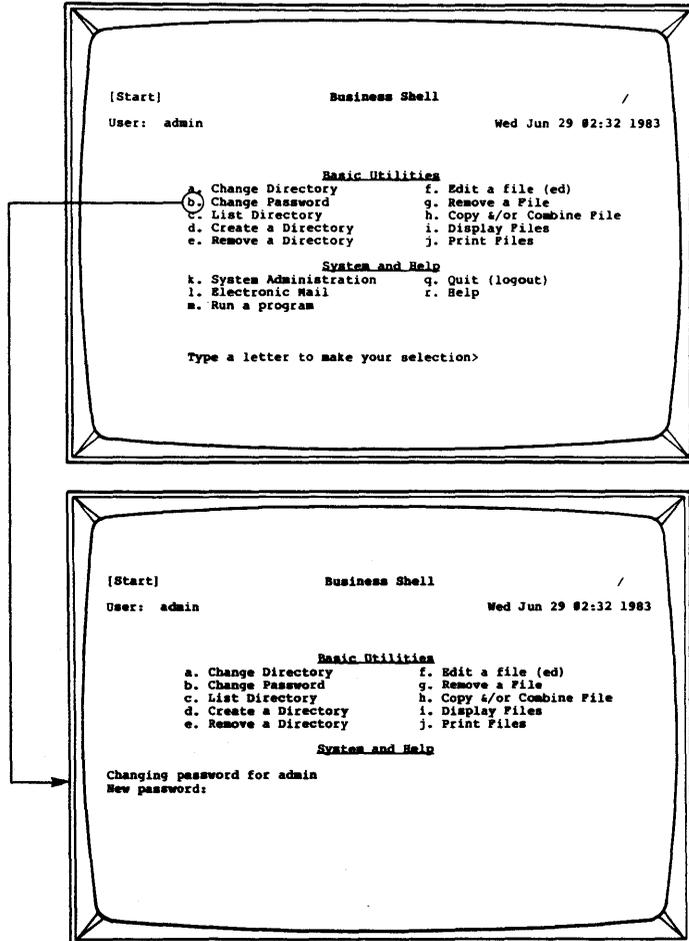
                                System and Help
k. System Administration           q. Quit (logout)

Name(s) of file(s) to remove? boise.memo

(Type RETURN to continue)
```

Change a Password

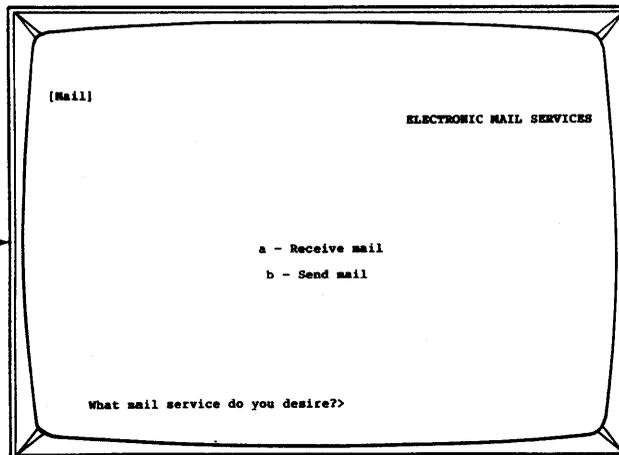
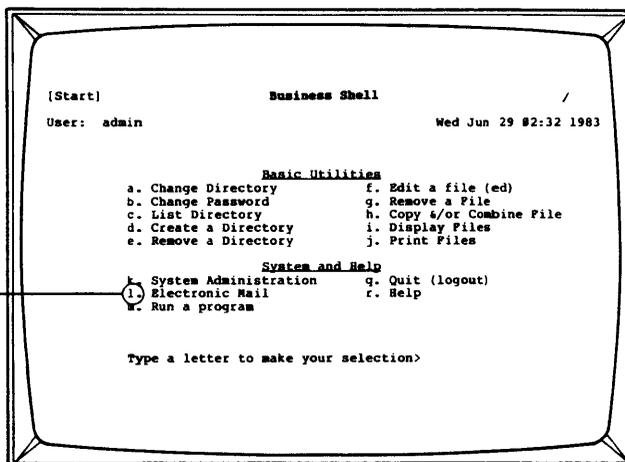
To change your password, type b, Change Password. You are prompted to enter your old password. You are asked to enter a new password, and then asked to retype the new password. The password does not show on the screen.



**USING
ELECTRONIC
MAIL**

XENIX provides a convenient way for you to send and receive messages to other users on the system via electronic mail. After receiving mail, you can save in various places (files) or discard it.

To send and receive mail, type 1, Electronic Mail, under the System and Help section of the main menu. The prompts "Receive mail" or "Send mail" appear.



**Sending
Mail**

To send mail, type **b**. Enter the login name of the person(s) to whom you are writing; separate names with a space. Then type the message. You can use the following keys when typing:

Keys	Results
Left, Right, Up, Down Arrow	Move the cursor
BACKSPACE	Delete a character to left of the cursor
DEL CHAR	Delete a character under the cursor
INS CHAR	Insert a character at the cursor
RETN	End a line; go to beginning of next line

When finished, send the message by entering <Control-D>. Press the Return key to return to the previous menu.

**Receiving
Mail**

To receive mail, type **a**. All messages in your mail file are displayed, one after the other, starting with the most recent one. After a message displays, a **?** prompt appears on the command line (see the options below).

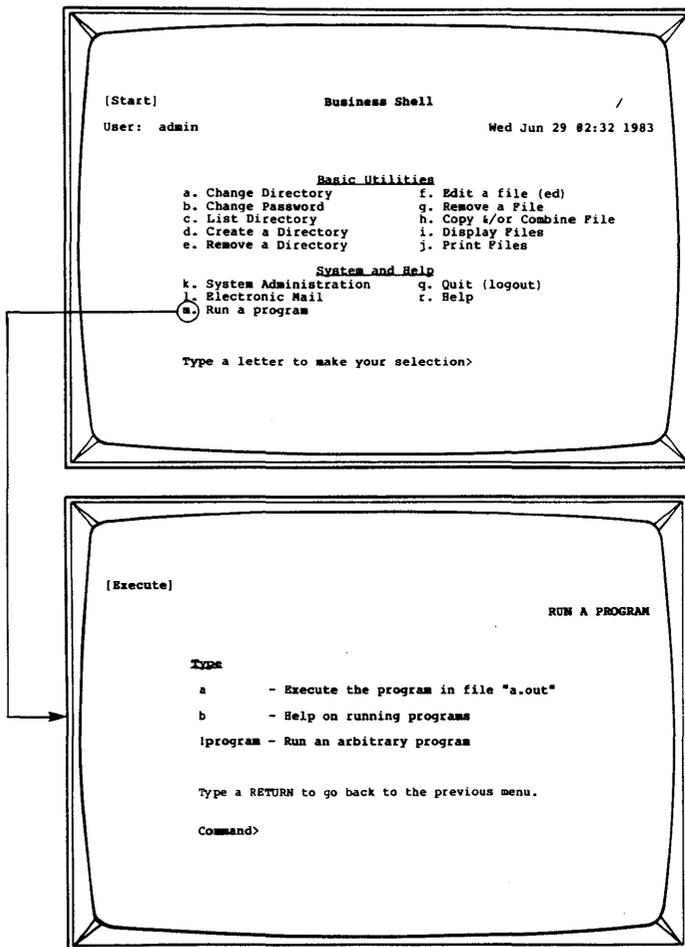
When the **?** prompt displays, you have various options:

Options	Results
<CR>	Displays the next message. If there are no more messages, returns you to the previous menu
d <CR>	Deletes last message, displays next message displays
m user <CR>	Mails message to specified user login id
p <CR>	Displays previous message again
q <CR>	Quits, returns to prompt line
s [file] <CR>	Saves message in your current directory's mbox file, or the file you specify
w [file] <CR>	Writes the message (without heading) to your current directory's mbox file, or the file you specify
x <CR>	Exits to the prompt line without changing the message

**RUNNING
A PROGRAM**

All of the menu items in the menu systems are programs. When you select a menu item you are in effect causing the program to execute. For example, pressing the "f" key in the Business Shell, causes execution of the XENIX "editor" program.

To run a program, type **m**, Run a Program, under the System and Help section of the Business Shell main menu. You may execute a program in either the a.out or arbitrary file. Type **a** to execute the program in the a.out file. The a.out file usually contains the result of the last compilation.



**The "!"
Command**

You can also run a program by entering the "!" command from almost all menu prompts in the Business Shell. When you enter "!", you exit from the Business Shell and can enter XENIX Commands directly. Then you can use other XENIX commands not available through the Business Shell. See Moving Between Shells in Chapter 4 for details.

**OBTAINING HELP
WHILE IN
BUSINESS SHELL**

The Business Shell contains Help menus for each menu in the system. To display Help information for the menu in which you are working, enter ? <CR>. The Help description for the menu is displayed. The commands that give help information are as follows:

? <CR> Display help for current menu
Name? <CR> Display help for the named menu
Mail? <CR> Display help for the "mail" menu
?index <CR> Display an index of the available menus

When asking for help for a named menu (Name? <CR>), capitalize the first letter of the name (so the menu system doesn't think you are selecting a menu item).

Type r, Help, under the System and Help section of the main menu to display the Help menu.

You have the option of selecting

- a. A list of Business Shell commands
- b. A list of menus in the system

```

[Start]                               Business Shell /
User: admin                            Wed Jun 29 #2:32 1983

                               Basic Utilities
a. Change Directory                f. Edit a file (ed)
b. Change Password                 g. Remove a File
c. List Directory                  h. Copy &/or Combine File
d. Create a Directory              i. Display Files
e. Remove a Directory              j. Print Files

                               System and Help
k. System Administration           A. Quit (logout)
l. Electronic Mail                 F. Help
m. Run a program

Type a letter to make your selection>

```

```

[Help]                                HELP IS AVAILABLE ON THESE SUBJECTS

BSH is a "user-friendly" menu system which allows you to inter-
face with the operating system in a simple manner. It is a nice
interface to the operating system for running applications and for
system maintenance and administration.

BSH contains "help" menus for each of the menus in the system.
You may display an index of the available menus by selecting the Dir
menu, or you may issue the ? index command.

a. Help on BSH commands
b. List of menus in the system

Make a selection or type a RETURN to go back to the previous menu >

```

**Business Shell
Commands**

When you type a, command descriptions are displayed as follows:

<u>COMMAND TYPE</u>	<u>SHORT EXPLANATION</u>
prompt <CR>	Execute the function associated with the menu entry (for example, type either a, b, or c).
Menu <CR>	Go to the named menu.
<return>	Return to the immediately preceding menu. By entering successive <return>s, you can retrace the path through the menus.

COMMAND TYPE SHORT EXPLANATION

- ? <CR> Show the help menu for the current display. The "?" by itself is the equivalent of entering <current menu>? Returning from a help menu is accomplished in the same way as any other menu, by entering <return>.
- ?? <CR> Display the command menu.
- name? <CR> Display help information for the named menu.
- !command <CR> The "!" causes immediate exit to the XENIX Shell. The rest of the line is executed in a sub-shell. An "!" alone initiates a sub-shell which is terminated in the normal XENIX manner <Control-D>. By using "!sh," "!csh," or "!bsh" one may select the specific shell to be used; the standard XENIX Shell (sh), the optional C Shell (csh), or the Business Shell (bsh). See Moving Between the Shells section in Chapter 4.
- ?index <CR> Display the name of every menu in the current menu system. The "Dir" menu contains a short version of the index.
- ?mode <CR> Set mode as either fast-mode or slow-mode.
- Quit <CR> Terminates the Business Shell and returns control to XENIX.

For more information, see the detailed Help menus within the Business Shell by typing r (Help).

**Business Shell
Menus**

When you type b, menus in the system are listed:

Backup	FloppyBackup	Start?
Backup?	FloppyBackup?	SysAdmin
Commands?	Help	SysAdmin?
Dir	Help?	TapeBackup
Dir?	Mail	TapeBackup?
Execute	Mail?	
Execute?	Start	

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- 4-3 SYSTEM ADMINISTRATION RESPONSIBILITIES**
- 4-3 THE SUPER USER**
 - 4-3 Becoming Super User
 - 4-4 Setting Super User Passwords
 - 4-4 Getting Started in the XENIX System
- 4-6 SYSTEM ADMINISTRATION MENU**
- 4-6 USER ADMINISTRATION**
 - 4-8 User Administration Commands
 - 4-8 Creating a User Account
 - 4-10 Guidelines
- 4-11 CONFIGURING THE PORTS**
 - 4-13 Changing a Port
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- 4-22 OTHER UTILITIES**
 - 4-22 Listing Directory (Long Form)
 - 4-23 Changing File Permissions
 - 4-24 Changing File Ownership
 - 4-24 Changing File Groups
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- 4-30 Killing Processes
- 4-30 System Maintenance Mode

4-32 SHUTTING DOWN THE SYSTEM

4-32 RECOVERING FROM IMPROPER SHUTDOWN

4-33 MOVING BETWEEN SHELLS

- 4-33 Accessing the XENIX Shell from the Business Shell
- 4-34 Accessing the Business Shell from the XENIX Shell

4-35 BOOTING FROM THE HARD DISK

4-36 TROUBLESHOOTING THE SYSTEM

**SYSTEM
ADMINISTRATION
RESPONSIBILITIES**

The system administrator needs to periodically check and maintain the XENIX operating system to keep it running smoothly.

Responsibilities of the system administrator are

- o Installing the XENIX operating system
- o Setting up (configuring ports)
- o Adding or changing user accounts
- o Checking and cleaning up files
- o Backing up the file system
- o Managing disk space
- o Shutting down the system
- o Troubleshooting the system.

**THE SUPER
USER**

You perform system administration functions as the "super user." During the installation of XENIX, the system automatically makes you the super user.

When you perform other system-administration tasks, you may also need to become the super user. If you are not the super user, and you try to do one of these tasks, the Business Shell will display a message telling you to become the super user.

**Becoming
Super User**

You can become super user by logging in as "admin" or "root," or entering "su" after you have logged in as a regular user.

Because the super user performs critical functions such as managing disk space and shutting down the system, you should assign a password to admin and root. Before setting a password, be sure you understand how to set them. Forgetting a password has annoying consequences. For more information on setting passwords, refer to Chapter 2.

To become super user in the Business Shell,

1. Log in as **admin** <CR>. The Business Shell main menu appears on the screen.
2. Type **k**, System Administration, under the System and Help section.
3. Type **n**, Become Super User. The message "Becoming Super User" is displayed on the screen, and

if a password has been established, you are prompted for it.

4. Enter admin's password. The Business Shell main menu appears on the screen.

To become super user in the XENIX Shell,

1. Log in as **root** <CR>. You are prompted for the super-user password if one has been established.
2. Enter root's password. The super-user prompt (#) is displayed.

To become su,

1. If you are in the Business Shell, enter **!su** <CR>.
2. If you are in the XENIX shell (as a regular user with the \$ prompt), enter **su** <CR>.
3. When you are prompted for the password, enter root's password.

When you finish the super-user function(s), you can return to your user account by pressing **q** (Business Shell), or <CTRL-D> (XENIX Shell).

Setting Super User Passwords

For system security, you will want to set passwords for the super-user login accounts, **root** and **admin**.

To set a password for root and admin, first log in as that user. Then follow the instructions in Setting and Changing Passwords, Chapter 2.

Getting Started in the XENIX System

Once you bring the system up for multiple users, the screen displays

Altosnnn login:

The system expects you to log in as an individual user or as the system administrator (super user).

When you first start up, the system has login names to help you get started. However, you should create individual login user accounts for each user.

When you log in to the XENIX operating system, it may display either

- o The Business Shell menu (Figure 3-2)
- o The XENIX Shell (you see a prompt: either # or \$). The prompt means the system is ready to accept your entry from the keyboard. A # is the

super-user prompt. A dollar sign (\$) prompt is for regular users.

Exercise caution when working as the super user. You have more privileges than the regular user, but this means that you can have more of an effect (positive or adverse) on system performance.

When you see the "login:" message, you can reply with one of the following login names:

- admin** -- Logs you into the Business Shell menu as a super user.
- user** -- Logs you into the Business Shell menu as a regular user.
- root** -- Logs you into the XENIX Shell as a super user (# prompt).
- unix** -- Logs you into the XENIX Shell as a regular user (\$ prompt).
- user names** -- Logs a user on the system as a regular user in the shell his user account specifies.

**SYSTEM
ADMINISTRATION
MENU**

The rest of this chapter tells you how to check and maintain the system, e.g., back up and restore files, add a new user, and change file ownership.

To access the system administration utilities from the Business Shell main menu, type **k**, System Administration. The System Administration menu appears (see Figure 4-1).

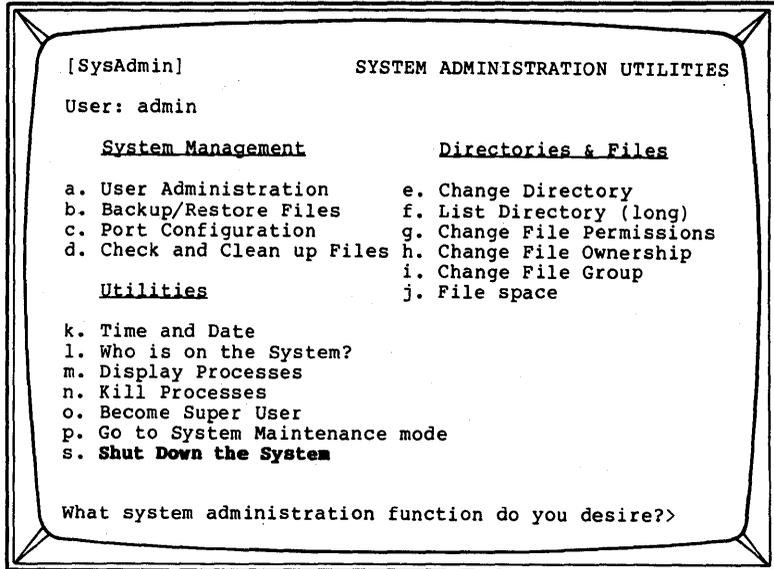


Figure 4-1. The System Administration Menu

**USER
ADMINISTRATION**

To add users to the system or change user characteristics,

1. Type **bsb** to access the Business Shell.
2. Type **k** to access the System Administration menu.
3. Type **a** to access the User Administration program.

The User Administration screen appears (see Figure 4-2).

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- 4-2 THE SUPER USER**
 - 4-2 Becoming Super User
 - 4-3 Setting Super User Passwords
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- 4-5 SYSTEM ADMINISTRATION UTILITIES**
- 4-6 USER ADMINISTRATION**
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 - 4-29 Killing Processes

- 4-29 System Maintenance Mode
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if a password has been established, you are prompted for it.

4. Enter admin's password. The Business Shell main menu appears on the screen.

To become super user in the XENIX Shell,

1. Log in as **root** <CR>. You are prompted for the super-user password if one has been established.
2. Enter root's password. The super-user prompt (#) is displayed.

To become su,

1. If you are in the Business Shell, enter **!su** <CR>.
2. If you are in the XENIX shell (as a regular user with the \$ prompt), enter **su** <CR>.
3. When you are prompted for the password, enter root's password.

When you finish the super-user function(s), you can return to your user account by pressing **q** (Business Shell), or <CTRL-D> (XENIX Shell).

Setting Super User Passwords

For system security, you will want to set passwords for the super-user login accounts, **root** and **admin**.

To set a password for **root** and **admin**, first log in as that user. Then follow the instructions in *Setting and Changing Passwords*, Chapter 2.

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When you log in to the XENIX operating system, it may display either

- o The Business Shell menu (Figure 3-2)
- o The XENIX Shell (you see a prompt: either # or \$). The prompt means the system is ready to accept your entry from the keyboard. A # is the

super-user prompt. A dollar sign (\$) prompt is for regular users.

Exercise caution when working as the super user. You have more privileges than the regular user, but this means that you can have more of an effect (positive or adverse) on system performance.

When you see the "login:" message, you can reply with one of the following login names:

- admin** -- Logs you into the Business Shell menu as a super user.
- user** -- Logs you into the Business Shell menu as a regular user.
- root** -- Logs you into the XENIX Shell as a super user (# prompt).
- unix** -- Logs you into the XENIX Shell as a regular user (\$ prompt).
- user names** -- Logs a user on the system as a regular user in the shell his user account specifies.

**SYSTEM
ADMINISTRATION
UTILITIES**

This section tells you how to check and maintain the system, e.g., back up and restore files, change file ownership, and display a process.

To access the system administration utilities from the Business Shell, type **k**, System Administration. The System Administration menu appears (see Figure 4-1).

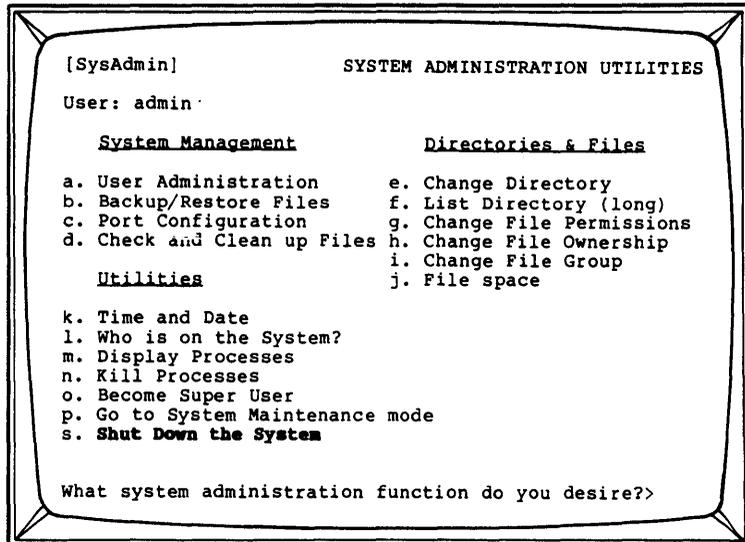


Figure 4-1. The System Administration Menu

**USER
ADMINISTRATION**

To add users to the system or change user characteristics,

1. Type **bash** to access the Business Shell.
2. Type **k** to access the System Administration menu.
3. Type **a** to access the User Administration program.

The User Administration screen appears (see Figure 4-2).

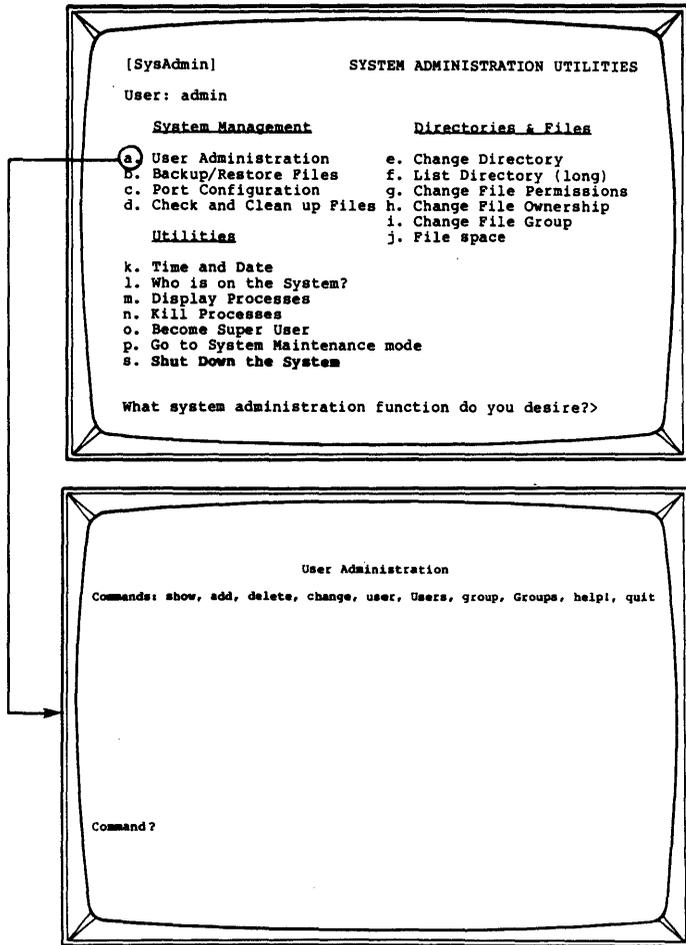


Figure 4-2. User Administration Screen

User Administration Commands

A line of commands displays at the top of the User Administration screen. A description of each command follows.

Command	Description
add user username	Adds a new user to the system
add group groupname	Adds a new group to the system
delete user username	Deletes an old user from the system
delete group groupname	Deletes an old group from the system
show user username	Displays a user's attributes
show group groupname	Displays a group's attributes
change user username	Changes a user's attributes
change group groupname	Changes a group's attributes
show Users	Shows all current users
show Groups	Shows all current groups
! [<shell command>]	Returns to XENIX Shell; execute commands
help	Displays the help screen
quit	Returns to Business Shell or Unix Shell

Creating a User Account

Enter just the first letter of a command. Guidelines for creating/changing a user account follow.

To add a user,

1. Enter a ("add" appears on the command line)
2. Enter u ("user" appears next to "add")
3. Enter a user name, and press the Return key.

You can only enter one user or group at a time; add Users and add Groups are not legal commands.

NOTE

If you make a mistake while typing, the Escape key backspaces over an entire user name or group name. <Control-x> cancels the current operation. RUBOUT or DEL returns you to the command level.

The system automatically assigns user ID, group ID, full name, directory, and shell. Initially the password is unset. The new user can set his own password. If your system is on a network, make sure the user ID and account name are the same on all machines in the network.

For example, to add a user named rich, enter the following:

```
add user rich <CR>
```

The system responds with:

```
Updating new user: rich
```

The screen then displays the system settings for rich (see Figure 4-3); you can then select a setting to change by typing the single letter that is to the left of each line.

In the future, if you want to unset a password, enter e <CR>. The password line displays <NOT SET>. Change the login shell if desired (the default is the Business Shell -- /bin/bsh).

```

                                     User Administration
Commands: show, add, delete, change, user, Users, group, Groups, help!, quit

a. User:      rich
b. User ID:   28
c. Group:     other
d. Group Id:  1
e. Password:  <NOT SET>
f. Full Name: rich
g. Directory: /usr/rich
h. Shell:     /bin/bsh

q. (quit -- return to top level)

Command: add user rich <CR>
```

Figure 4-3. Example of Creating a New User Account

Then enter q to cause the changes to take effect.

The system displays:

Installing files from /etc/newuser

Command:

You can now enter another User Administration command, or type q to return to the System Administration menu.

NOTE

If you access the User Administration screen from the system installation procedure, q will resume installation.

Guidelines

When you create or change a login user account, use the following guidelines:

1. Make the user name short (the user will enter it often). A user name can have up to 14 letters or numbers, but it cannot contain a space.

The user enters the name exactly as created, including upper-case and lower-case letters. For this reason, many people use only lower-case names, such as "mcgregor" instead of "McGregor."

2. Do not use a name with only upper-case letters unless that person actually has a terminal with only upper-case letters. If a name is created with only upper-case letters, XENIX assumes that the user has a terminal with only upper-case letters, such as a Teletype. Strange things happen, and the use of the system is hampered.
3. Always make sure that the password is not set. If one is set, no one will be able to log in to that account.
4. To remove a password that someone has forgotten, change the password to not set by entering <CR> for the password field.
5. Choose the shell the user will log in to. By default, new users log in to the Business Shell (/bin/bsh). Only the Business Shell has menus.

The shells are

- o /bin/bsh -- Business Shell (with menus)
- o /bin/sh -- XENIX Shell
- o /bin/csh -- C Shell (only available with the XENIX Development System.)

CONFIGURING THE PORTS

For your system to work properly with a printer or terminal, XENIX needs to know certain things about that printer or terminal. Your system is already set up to let you connect Altos II terminals and standard printers to the ports on the back of the computer. Tables 1-1 and 1-2 show the factory (default) settings for the ports.

If you want to connect another type of printer or terminal, use the Port Configuration program. You must be super user to use this program.

You can't change a port while it is being used. Ask the user to log off before you change the port.

To access the port configuration program,

1. Type **k** to select the System Administration menu.
2. Type **c** to select the Port Configuration program. The screen displays current terminal assignments for the ports on your system.

NOTE

To stop the screen from scrolling (the text rolling up on the screen), press **<Control-s>**.
To continue scrolling, press **<Control-q>**.

```

[SysAdmin]                SYSTEM ADMINISTRATION UTILITIES
User: admin

    System Management          Directories & Files
a. User Administration       e. Change Directory
b. Backup/Restore Files     f. List Directory (long)
c. Port Configuration       g. Change File Permissions
d. Check and Clean up Files h. Change File Ownership
                            i. Change File Group
                            j. File space

    Utilities
k. Time and Date
l. Who is on the System?
m. Display Processes
n. Kill Processes
o. Become Super User
p. Go to System Maintenance mode
s. Shut Down the System

What system administration function do you desire?>

```

```

Hardware Software Device Terminal Printer Baud Parity Word Modem?
Name      Name      Type      Type      Number Rate      Len
-----
Port 1    console terminal altos2          9600
Port 2    tty2   terminal altos2          9600
Port 3    tty3   terminal altos2          9600
Port 4    tty4   terminal altos2          9600
Port 5    tty5   printer  default 9600 none 8 bits

Commands: (c)hange port, (d)isplay, (h)elp, (q)uit,
          (r)emove port, (t)est printer

Type a command (c, d, h, q, r, t) and press RETURN:

```

Port configuration commands are

- c = Change a port assignment
- d = Display all port assignments
- h = Display the port configuration help message
- q = Exit from the port configuration program
- r = Remove a port assignment
- t = Test a printer

To select a command, type the command letter and press the Return key.

Changing a Port

To change a port's configuration,

1. Type **c** <CR> to change a port assignment. The screen displays

Change which port? Type a port name:

2. Type the port hardware or software name, for example, type **console** <CR> for the terminal connected to port 1, **port 2** for port 2, and so on.

The screen displays the current settings for that port. The system then asks you questions about the device that is attached to that port.

3. The screen displays the type of device connected to that port; valid types are terminal, printer, or none (no device connected to that port). Specify a new type of device, or press the Return key to leave this setting unchanged.
4. For terminals, the screen displays the terminal type, for example **altos2** for the Altos II terminal.

Type a ? <CR> to scroll through the screens of terminal names. Press **any key** plus <CR> to return to the name selection screen.

Type the name that corresponds to your device, or press the Return key to leave this setting unchanged.

5. Then the screen displays the current speed (baud rate) for that port. Possible speeds are 110, 150, 300, 1200, 2400, 4800, 9600, or 19200.

Specify a new speed, or press the Return key to leave this setting unchanged.

6. Next, a message tells you that there is no auxiliary (transparent) printer on that port. That is, there is no printer connected to the terminal that is connected to that port.

If you want to connect an auxiliary printer, type **y** <CR>; otherwise, press the Return key to leave this setting unchanged.

7. Finally, a message tells you there is no modem on that port. Type **y** <CR> if you wish to connect a modem, or press the Return key to leave this setting unchanged.

The final settings are displayed for that port. Then the command line reappears on the screen.

Setting Up a Printer

If you want to exit from the program, type **q** <CR>.

The system asks for confirmation that the port assignments are correct. If they are correct, type **y** <CR>. The system updates the port configuration information.

Your system is already set up for a printer (see Table 1-1 or 1-2). If you wish to change the printer port, or add a printer,

1. Specify "printer" in Step 3, Changing a Port.
2. Next, a message asks you to specify a printer number for the port. Valid numbers are 0 through 9. The default printer is printer 0. For example, the first (default) printer number is 0, the second printer connected is 1, and so on.
3. The screen displays the current speed (baud rate) for that port. Possible speeds are 110, 150, 300, 1200, 2400, 4800, 9600, or 19200. Specify a new speed, or press the Return key to leave this setting unchanged.
4. Next, the screen displays the current parity setting, either odd, even, or none. Specify a new parity, or press the Return key to leave this setting unchanged.
5. If you change the parity setting, the word length (in bits) is automatically adjusted for you. For no parity, the word length is 8, for odd or even parity, the word length is 7.
6. Finally, a message tells you there is no modem on that port. Type **y** <CR> if you wish to connect a modem, or press the Return key to leave this setting unchanged.

The screen displays the final settings for that port. Then the command line reappears on the screen. At this point, you should test the printer port.

Testing a Printer

After you set up a port for a printer, test it by selecting **t** <CR>, Test a printer.

1. Type a printer number or port name. For example, if you just set up port 4 for printer 1 (the second printer on your system), you can type either **tty4** or **1**.
2. A message tells you the system is testing the printer you specified, and the screen displays the settings for that port.

CONFIGURING THE PORTS

For your system to work properly with a printer or terminal, XENIX needs to know certain things about that printer or terminal. Your system is already set up to let you connect Altos II terminals and standard printers to the ports on the back of the computer. Table 1-1 shows the factory (default) settings for the ports.

If you want to connect another type of printer or terminal, use the Port Configuration program. You must be super user to use this program.

You can't change a port while it is being used. Ask the user to log off before you change the port.

To access the port configuration program,

1. Type **k** to select the System Administration menu.
2. Type **c** to select the Port Configuration program. The screen displays current terminal assignments for the 6 ports on the 586 or 10 ports on the 986 system.

NOTE

To stop the screen from scrolling (the text rolling up on the screen), press **<Control-s>**.
To continue scrolling, press **<Control-q>**.

```

[SysAdmin]                SYSTEM ADMINISTRATION UTILITIES
User: admin

  System Management          Directories & Files
a. User Administration      e. Change Directory
b. Backup/Restore Files    f. List Directory (long)
c. Port Configuration      g. Change File Permissions
d. Check and Clean up Files h. Change File Ownership
                            i. Change File Group
                            j. File space

  Utilities
k. Time and Date
l. Who is on the System?
m. Display Processes
n. Kill Processes
o. Become Super User
p. Go to System Maintenance mode
s. Shut Down the System

What system administration function do you desire?>

```

```

PORT 1 console terminal altos2      9600
PORT 2 tty2   terminal altos2      9600
PORT 3 tty3   terminal altos2      9600
PORT 4 tty4   terminal altos2      9600
PORT 5 tty5   terminal altos2      9600
PORT 6 tty6   printer  default  9600  none  8 bits

Commands: (c)hange port, (d)isplay, (h)elp, (q)uit,
          (r)emove port, (t)est printer

Type a command (c, d, h, q, r, t) and press RETURN:

```

Port configuration commands are

- c = Change a port assignment
- d = Display all port assignments
- h = Display the port configuration help message
- q = Exit from the port configuration program
- r = Remove a port assignment
- t = Test a printer

To select a command, type the command letter and press the Return key.

Changing a Port

To change a port's configuration

1. Type **c** <CR> to change a port assignment. The screen displays

Change which port? Type a port name:

2. Type the port hardware or software name, for example, type **console** <CR> for the terminal connected to port 1, **port 2** for port 2, and so on.

The screen displays the current settings for that port. The system then asks you questions about the device that is attached to that port.

3. The screen displays the type of device connected to that port; valid types are terminal, printer, or none, which means there is no device connected to that port. Specify a new type of device, or press the Return key to leave this setting unchanged.
4. For terminals, the screen displays the terminal type, for example **altos2** for the Altos II terminal.

Type a **?** <CR> to scroll through the screens of terminal names. Press **any key** plus <CR> to return to the name selection screen.

Type the name that corresponds to your device, or press the Return key to leave this setting unchanged.

5. Then the screen displays the current speed (baud rate) for that port. Possible speeds are 110, 150, 300, 1200, 2400, 4800, 9600, or 19200.

Specify a new speed, or press the Return key to leave this setting unchanged.

6. Next, a message tells you that there is no auxiliary (transparent) printer on that port. That is, there is no printer connected to the terminal that is connected to that port.

If you want to connect an auxiliary printer, type **y** <CR>; otherwise, press the Return key to leave this setting unchanged.

7. Finally, a message tells you there is no modem on that port. Type **y** <CR> if you wish to connect a modem, or press the Return key to leave this setting unchanged.

Setting Up a Printer

The final settings are displayed for that port. Then the command line reappears on the screen. If you want to exit from the program, type **q** <CR>.

The system asks for confirmation that the port assignments are correct. If they are correct, type **y** <CR>. The system updates the port configuration information.

Port 6 is already set up for a printer. If you wish to specify another port, or add additional printers,

1. Specify "printer" in Step 3, Changing a Port.
2. Next, a message asks you to specify a printer number for the port. Valid numbers are 0 through 9. The default printer is printer 0. For example, the first (default) printer number is 0, the second printer connected is 1, and so on.
3. The screen displays the current speed (baud rate) for that port. Possible speeds are 110, 150, 300, 1200, 2400, 4800, 9600, or 19200. Specify a new speed, or press the Return key to leave this setting unchanged.
4. Next, the screen displays the current parity setting, either odd, even, or none. Specify a new parity, or press the Return key to leave this setting unchanged.
5. If you change the parity setting, the word length (in bits) is automatically adjusted for you. For no parity, the word length is 8, for odd or even parity, the word length is 7.
6. Finally, a message tells you there is no modem on that port. Type **y** <CR> if you wish to connect a modem, or press the Return key to leave this setting unchanged.

The screen displays the final settings for that port. Then the command line reappears on the screen. At this point, you should test the printer port.

Testing a Printer

After you set up a port for a printer, test it by selecting **t** <CR>, Test a printer.

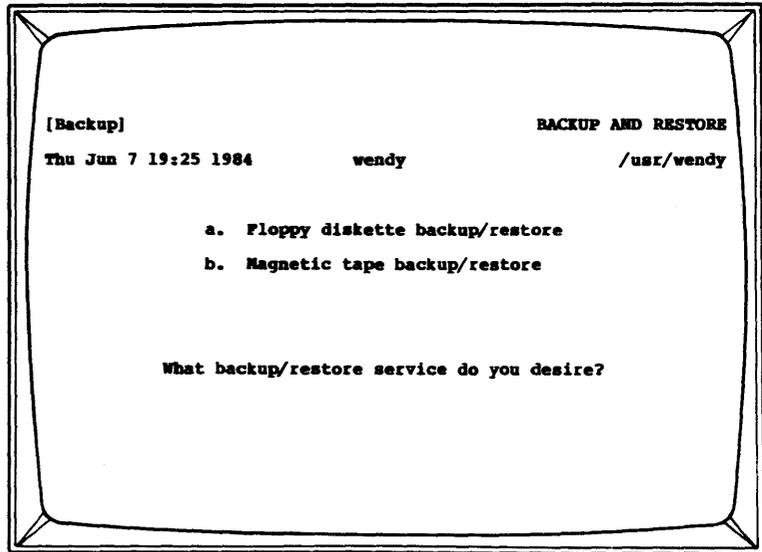
1. Type a printer number or port name. For example, if you just set up port 7 for printer 1 (the second printer on your system), you can type either port 7 or 1.
2. A message tells you the system is testing the printer you specified, and the screen displays the settings for that port.

**BACKING
UP AND
RESTORING
FILES**

You should regularly back up the file system on your hard disk by making copies of those files on floppy diskettes or magnetic tape. You should make several copies of sensitive or potentially expensive data or programs. If a file system crash occurs, or if your tape or floppy diskette becomes damaged, you will then have a backup copy.

You can back up and restore single files and whole directories or subdirectories.

1. Type **k** to access the System Administration menu.
2. Type **b** to access the Backup/Restore Files menu.
3. The Backup/Restore Files menu appears. Make a selection.



**Floppy
Diskette
Backup/Restore**

Formatting
Diskettes

You can back up and restore directories and files via floppy diskette.

To save a file or a group of files, you need a sufficient number of floppy diskettes that have been formatted for double-density operation.

To estimate the number of diskettes you will need, figure that each diskette can hold approximately 250 printed pages. Files are saved across diskette boundaries, so you can use all diskette space. Be sure to format enough floppy diskettes before you begin the backup process.

Backing Up
Files

To format a floppy disk,

1. Type **k**, System Administration.
2. Type **b**, Backup/Restore Files.
3. Type **a**, Floppy Diskette Backup/Restore.
4. Type **e**, Format a floppy disk.

You are prompted to choose a number:

- 1 - Format Floppy Diskette
- 2 - Quit

To back up a file on floppy diskette,

- Select **k**, System Administration
b, Backup/Restore Files
a, Floppy Diskette Backup/Restore

```
[Backup]
                                           FLOPPY BACKUP AND RESTORE

Fri Jul 1 04:42 1983                admin

a. Backup file(s) and/or directory(s)
b. Restore file(s)
c. Restore the entire diskette
d. Display floppy diskette directory
e. Format a floppy diskette

What floppy backup/restore service do you desire?
```

The form of file and directory names you use is important. If you specify a file or directory with a complete path name, such as

/usr/john/tempest.c <CR>

The backup procedure makes note that a complete path-name was used. When the file is restored, it's put back as **/usr/john/tempest.c**, regardless of the working directory of the restorer. The restore overwrites any

previous file of that name, and, if necessary, creates a directory in which to put it. A complete pathname is one that begins with "/."

The system asks you to remove and insert diskettes whenever files or directories are too big for a single diskette. Label and number the diskettes. (Be sure to indicate the total number, such as 1 of 5, 2 of 5, etc.) The sequence of diskettes is important because files are being saved across diskette boundaries. The first part of a file may be on one diskette, the rest on the next diskette. Restore files in the order they were backed up. When you are finished, store the diskettes in a safe place.

Restoring Files

To restore a directory with all its subdirectories and files, proceed as follows.

1. Insert the first floppy disk in the sequence.
2. Change to the name of the directory to be restored.
3. Type **b**, Restore file(s) or **c**, Restore the entire diskette.

For example, to restore all the files in the directory named `/usr/wendy` (the only contents of one diskette), load the diskette, and type **c**, Restore the entire diskette.

It is not necessary for the restore designation to match the designation used to save the files. In the example above, the `/usr/wendy` files can be restored from files saved under `/usr`.

Listing Saved Files

To list the files on a floppy disk, type **e**, Display floppy diskette directory.

Magnetic Tape Back-Up/Restore

You can back up and restore from the hard disk to magnetic tape.

NOTE

The 486 system does not have this option.

Backing Up the Hard Disk

To back up the entire hard disk to tape,

1. Type **k**, System Administration.
2. Type **b**, Backup/Restore Files.
3. Type **b**, Magnetic Tape Backup/Restore.

Backing Up
Files

To format a floppy disk,

1. Type **k**, System Administration.
2. Type **b**, Backup/Restore Files.
3. Type **a**, Floppy Diskette Backup/Restore.
4. Type **e**, Format a floppy disk.

You are prompted to choose a number:

- 1 - Format Floppy Diskette
- 2 - Quit

To back up a file on floppy diskette,

- Select **k**, System Administration
b, Backup/Restore Files
a, Floppy Diskette Backup/Restore

```
[Backup]
                                     FLOPPY BACKUP AND RESTORE

Pri Jul 1 04:42 1983                admin

a. Backup file(s) and/or directory(s)
b. Restore file(s)
c. Restore the entire diskette
d. Display floppy diskette directory
e. Format a floppy diskette

What floppy backup/restore service do you desire?
```

The form of file and directory names you use is important. If you specify a file or directory with a complete path name, such as

/usr/john/tempest.c <CR>

The backup procedure makes note that a complete path-name was used. When the file is restored, it's put back as /usr/john/tempest.c, regardless of the working

directory of the restorer. The restore overwrites any previous file of that name, and, if necessary, creates a directory in which to put it. A complete pathname is one that begins with "/."

The system asks you to remove and insert diskettes whenever files or directories are too big for a single diskette. Label and number the diskettes. (Be sure to indicate the total number, such as 1 of 5, 2 of 5, etc.) The sequence of diskettes is important because files are being saved across diskette boundaries. The first part of a file may be on one diskette, the rest on the next diskette. Restore files in the order they were backed up. When you are finished, store the diskettes in a safe place.

Restoring Files

To restore a directory with all its subdirectories and files, proceed as follows.

1. Insert the first floppy disk in the sequence.
2. Change to the name of the directory to be restored.
3. Type **b**, Restore file(s) or **c**, Restore the entire diskette.

For example, to restore all the files in the directory named /usr/wendy (the only contents of one diskette), load the diskette, and type **c**, Restore the entire diskette.

It is not necessary for the restore designation to match the designation used to save the files. In the example above, the /usr/wendy files can be restored from files saved under /usr.

Listing Saved Files

To list the files on a floppy disk, type **e**, Display floppy diskette directory.

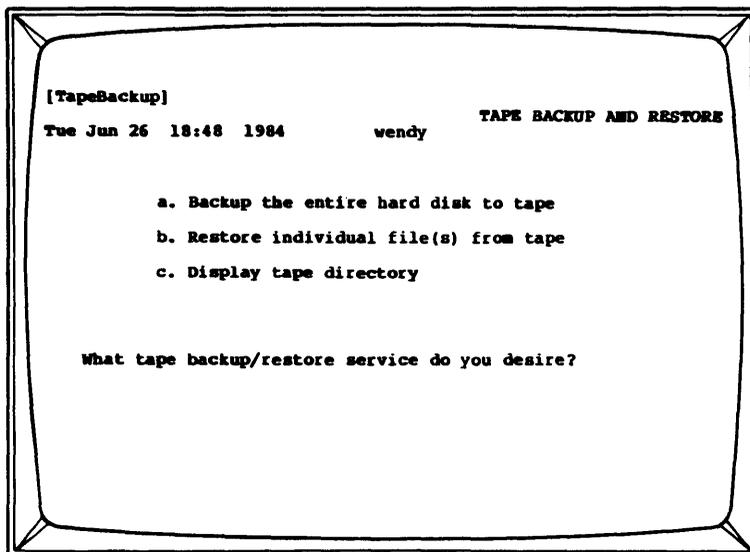
Magnetic Tape Backup/Restore

You can back up and restore from the hard disk to magnetic tape.

Backing Up the Hard Disk

To back up the entire hard disk to tape,

1. Type **k**, System Administration.
2. Type **b**, Backup/Restore Files.
3. Type **b**, Magnetic Tape Backup/Restore.



The Tape Backup/Restore menu asks you to select one of the following:

- a. Backup the entire hard disk to tape
- b. Restore individual file(s) from tape
- c. Display tape directory

When backing up to tape, the menu system copies the entire file system on the hard disk on to tape.

When restoring from tape, the menu system can only restore individual files from the tape to the hard disk. It is not possible to restore the entire tape to the hard disk using the menu system.

If you want to restore every file from the tape to the hard disk, use the restore option on the Welcome to XENIX menu. You must shut down and reboot the system from a copy of the diskette labeled "XENIX Root File System" to display this menu. However, be aware that you will overwrite all existing data on the hard disk and restore the hard disk to the condition at the time of the dump.

Additional information about using tape backup is available in the help menus.

Restoring the
Hard Disk

To restore the contents of your hard disk from a tape

1. Shut down and reboot XENIX from the "XENIX Root File System" diskette (follow the procedures described in Installation, Chapter 1).

2. From the Welcome to XENIX menu, enter c <CR>, Restore data to the hard disk from cartridge tape.
3. Insert the tape and follow instructions on the screen.

CAUTION

The restore utility will overwrite all existing data on the hard disk and restore the hard disk to the condition at the time of the backup was made.

Backing Up/
Restoring the
Second Hard
Disk

To back up all files on the second hard disk,

1. Insert the tape.
2. Enter b <CR>, Magnetic Tape Backup/Restore. Then enter

```
! /etc/umount /dev/hdla <CR>
! dump #uf /dev/rct /dev/hdla <CR>
```

To restore files from magnetic tape to the second hard disk,

1. Insert the tape.
2. Enter b <CR>, Magnetic Tape Backup/Restore. Then enter

```
! /etc/umount /dev/hdla <CR>
! restor rf /dev/rct /dev/hdla <CR>
```

**CHECKING AND
CLEANING UP
FILES**

The file system check program examines and cleans up the file system. You should run this program at least once a day; all users should be logged off. It should be run more often if problems become evident, such as the system not recognizing valid commands.

To verify and repair any inconsistencies in the /dev/root file system,

1. Log in as admin and enter admin's password. The Business Shell main menu appears on the screen.
2. Type k to select the System Administration.
3. Type d, Check and Clean Up Files. If the file system is in good order, the screen displays the following:

```
/dev/root
** Phase 1 - Check Blocks and Sizes
** Phase 2 - Check Pathnames
** Phase 3 - Check Connectivity
** Phase 4 - Check Reference Counts
** Phase 5 - Check Free List
2131 files 23863 blocks 7078 free
```

The following example shows file system inconsistencies noted by this file system check program.

```
** Phase 1 - Check Blocks and Sizes
** Phase 2 - Check Pathnames
** Phase 3 - Check Connectivity
** Phase 4 - Check Reference Counts
UNREF FILE I = 2124 OWNER=RICH MODE=100644
SIZE=30574 MTIME=Apr 27 07:56 1983
CLEAR? y

** Phase 5 - Check Free List
63 BLK(S) MISSING
BAD FREE LIST
SALVAGE? y
```

The system automatically clears and salvages the file system, and the following message appears:

```
The system is shutting down.
```

Press the RESET button to restart the system. See Booting From Hard Disk later in this chapter for instructions.

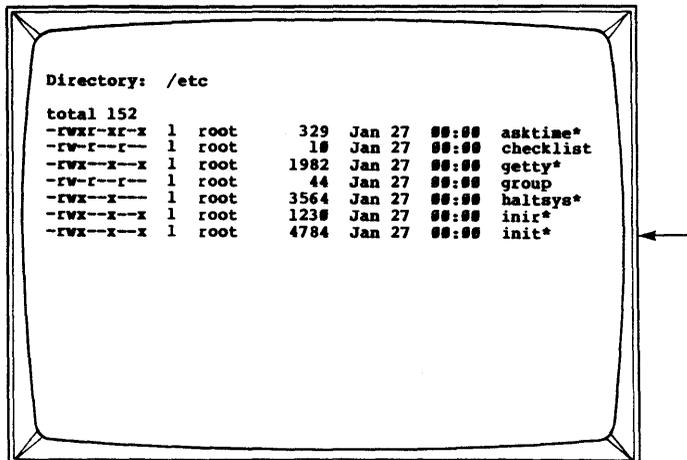
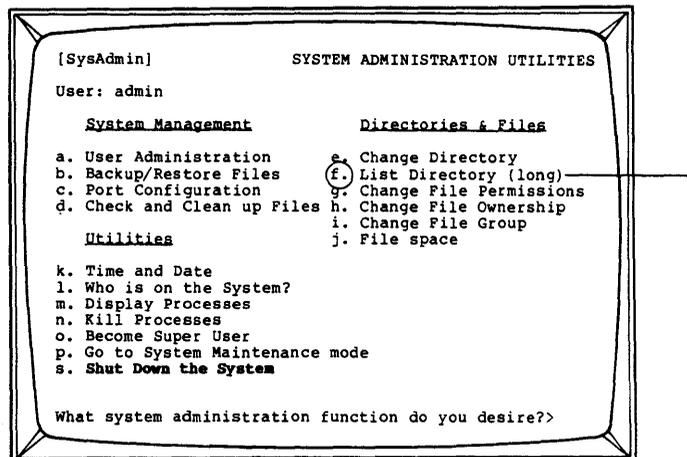
**OTHER
UTILITIES**

**Listing
Directory
(Long Form)**

The utilities discussed in this section are listed in the Utilities and Directory Files menus in the System Administration menu. The Change Directory utility is discussed in Chapter 3. Become Super User is described at the beginning of this chapter.

Listing your current directory in the long format displays access permissions, the number of characters in the file, and the date of the last changes made to the file.

To list your current directory (long form), type k, System Administration. Then type f, List Directory (long).



The directory name is at the top of the listing. Each column entry (for the first entry) has the following meaning:

total = total number of 512-byte blocks
-rwxr-xr-x = permission mode (refer to Changing File Permissions in this section)
1 = number of links to the asktime file
root = file owner
329 = number of characters (bytes) in asktime
Jan 29 = date of last change
00:00 = time (24-hour clock) of last change
asktime* = file name

Changing File Permissions

Files can be shared by members of your group and other system users unless you restrict access to files by changing the permission. When a file is created, it can be read by all users. (Directories can be read and searched by all users.)

There are three levels of permission (read, write, and execute) and three kinds of users (you, your group, and all other system users). You have read, write, and, if appropriate, execution permission for your files. Some files, such as a letter file, can't be executed.

To check your file access permissions, type `k`, System Administration. Then type `f`, List Directory (long). A line is displayed for each file. Note the positioning of `r`, `w`, `x`. For example,

```
-rwx rwx rwx 1 carol 9 Apr 27 15:13 memo
  |   |   |
  user group other
(you)
```

where

- (first column) = file; d = directory

r = read

w = write

x = execute

- (after first column) = permission denied, whether read, write, or execute depends on placement.

For example, a "r-x" means that write permission is denied.

To change file permission, type **k**, System Administration. Then type **g**, Change File Permissions. The prompt "File(s) for which permissions are to be changed?" appears. Enter the file name(s) separated by a space and press the Return key. The screen displays the current permissions and prompts: "Change files to permission."

First, enter the class(es) of users for which permission is to be changed. This is some combination of "u" (user), "g" (group), or "o" (other) (or all three; "a" (all) is the default). You can add (+) or remove (-) one of the three permissions: "r" (read), "w" (write), or "x" (execute). For example, if you want group members to execute one of your files, enter

```
g+x <CR>
```

If you want to deny group members and all others read permission for a file, enter

```
go-r <CR>
```

Changing File Ownership

To change file ownership, type **k**, System Administration. Then, type **h**, Change File Ownership. The prompt "File(s) for which ownership is to be changed?" appears. Enter the file name(s) and press the Return key. You are shown the current owner(s) for the file(s), and prompted "Change file to owner." Enter a valid owner name. When you list your directory, that directory's file(s) are displayed with their new owner name.

Changing File Groups

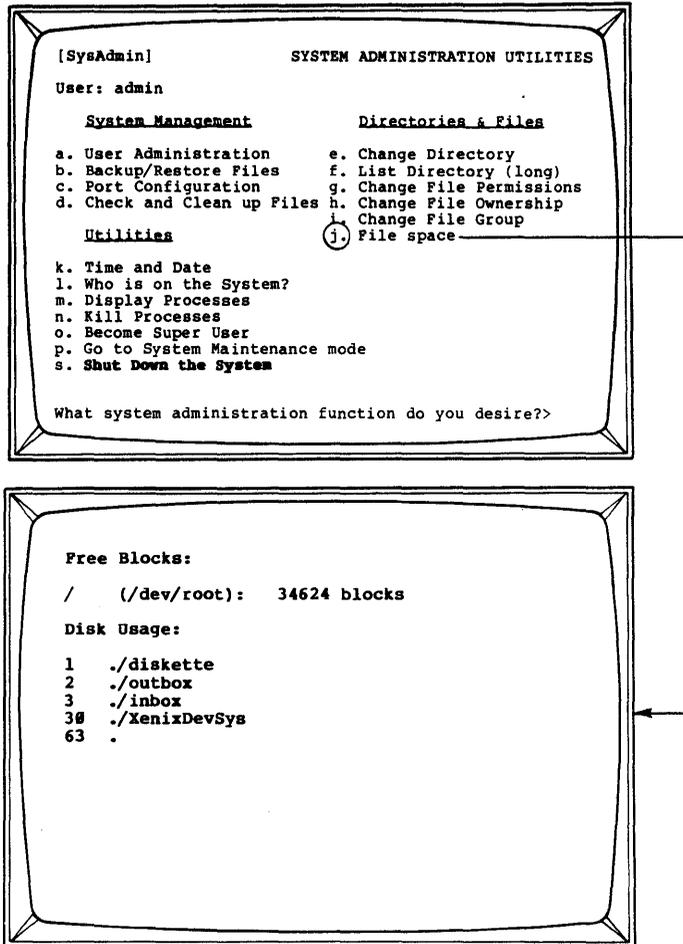
To change file groups, log in as a super user. Type **k**, System Administration. Then, type **i**, Change File Group. The prompt "file(s) for which the group is to be changed?" appears. Press <CR> if you wish to see the current groups for the files. After you enter the file name(s), the "current group(s) for these files" displays. Then the prompt "Change files to group:" appears. Enter a valid group name.

**Displaying
Disk Usage
(File Space)**

We recommend you run this program at least once a day. If you run out of disk space, perhaps because you are running a lot of processes, you can lose what you are working on, or worse, won't be able to clean up the disk space. If the latter occurs, you have to reboot the system.

If you are consistently reaching 500 blocks of available space, you should consider obtaining additional space by deleting files no longer used.

To display disk usage, type k, System Administration. Then type j, File Space.



**Displaying
or Setting
the Date
and Time**

The screen displays

- o The remaining disk space (free blocks)
- o The directories and their block size (in 512-byte blocks)
- o The total number of the blocks in your current directory (denoted by the period).

To determine individual file sizes, display disk usage via the XENIX Shell (see Appendix D).

To display or set the date and time, type `k`, System Administration. Then type `k`, Time and Date.

You can press the Return key to display the date and time. You can set the time and date by entering the year, month, day, hour, and minutes in the following format:

YYMMDDHHMM

where

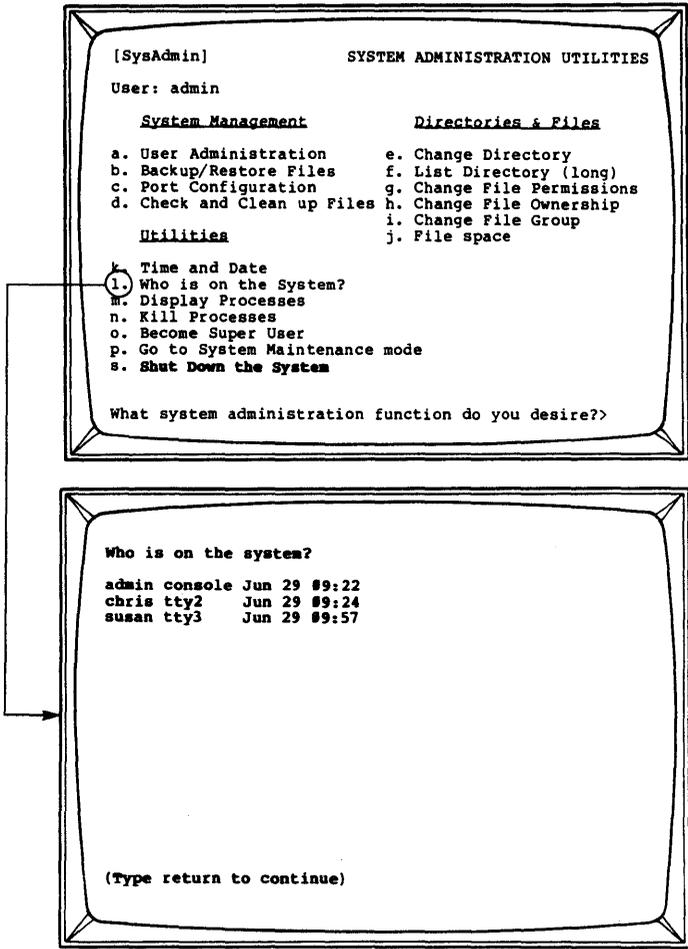
YY = current year
MM = current month
DD = current day of month
HH = hour (24 hour clock)
MM = minutes

For example, enter December 31, 1983, 2:30 p.m. as

```
8312311430 <CR>
```

**Displaying
Who is on
the System**

To display who is currently logged on the system, type **k**, System Administration. Then type **l**, Who is on the System?

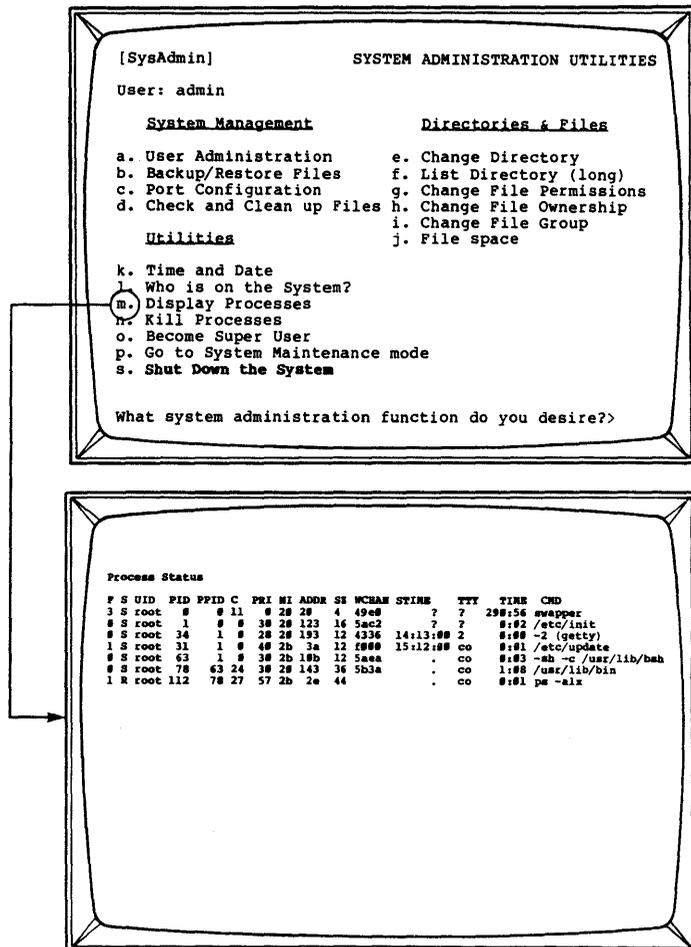


Displaying Processes

All processes on the system are assigned a process identification (PID) number.

Occasionally, a program may go awry; it may loop forever or lock up your terminal. If this happens, identify the process causing the problem.

To display currently active processes, type **k**, System Administration. Then type **m**, Display Processes, to display information on all system processes in the long listing format.



The column headings that display are explained as follows:

<u>COLUMN HEADING</u>	<u>MEANING</u>
F	Flags associated with the process: 01: in core 02: system process 04: locked in core (physical I/O) 10: being swapped 20: being traced by another process
S	State of the process O: nonexistent S: sleeping W: waiting R: running I: intermediate Z: terminated T: stopped
UID	The login name of the process owner.
PID	The process identification (PID) number.
PPID	The identification number for the parent process.
C	Process utilization for scheduling.
PRI	Priority of the process; high numbers are low priority.
NI	Number used in priority computation.
ADDR	If resident in memory, the core address. Otherwise, the disk address.
WCHAN	The event for which the process is waiting (sleeping). If blank, the process is running.
STIME	The starting time of the process.
TTY	The number of the tty (terminal or printer) controlling the process.
TIME	The cumulative execution time for the process.
CMD	The process.

Killing Processes

You may find it necessary to stop a process because, for example, it locks up a terminal so you can't enter anything, or it is consuming too much of the system's resources that other tasks cannot be performed.

To kill a process,

1. Type **k**, System Administration, under the System and Help section of the main menu.
2. Type **m** to display system processes. Note the process identification (PID) number for the processes you want to kill.
3. Then type **n**, Kill Processes. The prompt "Kill which processes?" displays.
4. Enter the process identification number(s) and press the Return key.

After you kill a process via the Business Shell, the main menu returns to the screen.

CAUTION

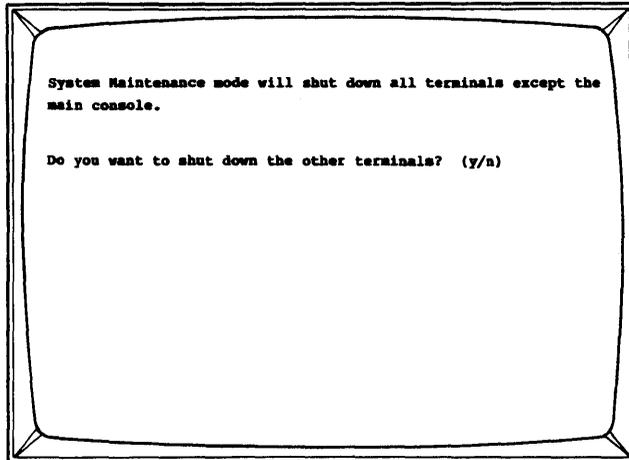
Do not kill the init, cron, and the swapper processes. These processes must continue to run if the system is to operate properly.

If you receive the message, "No such process," the process may have completed. Verify by displaying the process.

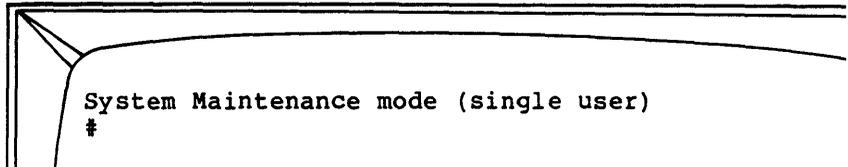
System Maintenance Mode

You can go to System Maintenance mode when you need to become the only user on the system. You can, for example, install other software.

To go to System Maintenance mode, type **p**. The screen displays the following:



Enter y <CR>. The screen will ask you to enter the number of minutes (0-15) until shutdown. After the specified number of minutes, XENIX shuts down and reboots, and displays



At this point you can work in the XENIX shell as the super user, or to display the Options menu you can enter

options <CR>

To bring the system back up for other users, return to the Options menu and enter

a <CR>

SHUTTING DOWN THE SYSTEM

If you have to turn off the power or reset your Altos computer system, you need to shut it down properly. You must be the super user to perform this function.

To shut down the system,

1. Log in as **admin** on the system console.
2. Type **k**, System Administration.
3. Type **s**, Shut Down the System.

The system asks

```
┌───────────────────────────────────────────────────────────────────────────────────┐
│ Minutes untill shutdown (0 - 15):
```

4. Enter the desired number of minutes. The system will send a message to all users to finish and log off because the system will shut down in the number of minutes you specify.
5. If there is a floppy diskette in the disk drive, remove it.
6. The shutdown procedure terminates with the message

```
||| ** Normal System Shutdown **
```
7. Press the power switch to OFF or press RESET.

RECOVERING FROM IMPROPER SHUTDOWN

If the system is not shut down properly you may receive the following message after you press the RESET button:

```
The system was not shut down properly.
The root file system will be cleaned.
(Type "no" only if you want to avoid cleaning.)
```

This process begins automatically after about 5 seconds. XENIX validates the consistency of the disk file system, which may have been damaged, and automatically repairs it. If there is no damage, you will see the following:

```
/dev/root
** Phase 1 - Check Blocks and Sizes
** Phase 2 - Check Pathnames
** Phase 3 - Check Connectivity
** Phase 4 - Check Reference Counts
** Phase 5 - Check Free List

nn files nnn blocks nnn free
```

If the file system was damaged, XENIX repairs it automatically and displays a log of the corrections that were made.

Then the system reboots automatically and asks you to enter the time and date.

If you have any doubt whether the file system has been repaired satisfactorily, you can restore the hard disk from backup files.

MOVING BETWEEN SHELLS

Accessing the XENIX Shell from the Business Shell

You can move from the Business Shell to the XENIX Shell and from the XENIX Shell to the Business Shell.

You can move from the Business Shell to the XENIX Shell in one of two ways. From the prompt line at the bottom of the menu screen, enter

```
! <CR>
```

The XENIX prompt displays (# or \$). Enter the command you wish to execute.

To return to the Business Shell, press **<Control-D>**. You are then prompted to press the Return key to return to the menu system.

The following example lists a working directory.

```

menu prompt > ! <CR>

$ pwd <CR> (list working directory)
/usr/rich

$cd schedules <CR> (change to directory named
                    schedules)
$ls <CR>           (list contents of directory)
planning          monthly      old.plan
weekly            budget
$rm old.plan <CR> (delete file)
$<Control-D>
$[Type RETURN to continue] <CR>

```

Or, you can enter

```
! command <CR>
```

The command can be any command supported by your system. For example, to see how much disk space remains, you can either go through the sequence of Business Shell menus, or enter

```
menu prompt > ! df <CR>
```

The system responds with the amount of disk space, for example /dev/rroot 11174, and the menu prompt:

```
[Type RETURN to continue]
```

If you press the Return key, the system returns you to your last screen in the menu.

In both examples, the exclamation point "connects" you directly to the XENIX Shell.

Accessing the Business Shell from the XENIX Shell

To move to the Business Shell Menu from the XENIX Shell, after the prompt, enter:

```
$ bsh <CR>
```

Then the Business Shell menu appears on the screen. If you type q at the Business Shell prompt line, you are back in the XENIX Shell at the \$ prompt.

**BOOTING
FROM THE
HARD DISK**

The following procedure explains how to start up (boot) your computer system from the hard disk.

Correct an error made when entering information by pressing the Backspace, Rubout, or Delete key.

1. Be sure that your terminal is connected to port 1 at the back of the Altos computer system.
2. Turn on the Power Switch or, with the power on, press the RESET button. The screen displays

```
PASSED POWER-UP TEST  
Monitor Version n.nn
```

```
Press any key to interrupt boot
```

Don't press a key, the monitor will go to the hard disk and read in the XENIX operating system. This requires about 20 seconds or so. Go to step 3.

If you happen to press a key, within a few seconds you will see a choice of possible entries for booting. Enter 1 to boot from the hard disk.

```
Enter (1) to boot from Hard Disk  
Enter (2) to boot from Floppy Disk  
Enter (3) to enter from Monitor
```

```
Enter option: 1
```

3. The XENIX message appears.

```
XENIX vn.na  
mem = nnnK
```

4. Then the screen displays

```
I think it's Day Month Date Time Year  
Enter date (yymmdd) or press RETURN  
Enter time (hhmm) or press RETURN
```

Sometimes you may get a different message. It starts "The system was not shut down properly..." If you see this message, see Recovering From Improper Shutdown in this chapter.

5. The login prompt appears on all terminals. Respond with your user name and password, if one has been set.

TROUBLESHOOTING THE SYSTEM

If you perform daily preventive maintenance procedures, such as checking and cleaning up files, saving and backing up files, managing disk space on the system, and monitoring processes, your operating system should run smoothly.

However, emergencies do occur. There may be a power failure; or, someone may accidentally pressed the Reset button (causing the system to reset and shutdown improperly).

The XENIX operating system displays error messages to indicate problems to the console. Additional error messages can also come from the individual application programs that you have installed.

Some errors, such as the entering of illegal commands, are simple errors that an individual user can solve. Others, such as bad sectors on the hard disk, may require the running of Altos diagnostics.

If the problem persists, and you have tried all of the available maintenance tools listed in this chapter, try checking and cleaning up files by typing `d` on the System Administration menu. If you still cannot fix the problem, refer to the Diagnostics manual.

Using "ED," The Text Editor 5

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INTRODUCTION

Ed, the standard XENIX text editor, is an interactive program for creating, viewing, and modifying files. Ed is a line-oriented text editor. It allows you to enter a single command or manipulate text on a line-by-line basis. A line consists of a single command or text entered until you press the Return key. Once you are in the proper operating mode, you can enter text as you would on an electric typewriter.

The ed editor is not a screen-oriented text editor or a word processor.

A screen-oriented text editor allows you to move the cursor around in a file. Changes and additions that you make to the file are reflected on your terminal screen.

A word processor is a program that includes both a screen-oriented editor (for typing text) and a program that sends codes or commands to the printer. The codes cause the printer to underline, etc; this program allows you to backspace, underline, justify margins, expand tabs, and type in boldface type.

Ed is adequate for creating simple text files (i.e., creating files for the electronic mail program), or performing system maintenance functions (such as modifying the ttys file).

This chapter will give you enough information about the ed text editor for most of your daily needs.

ED BASIC CONCEPTS

Before using ed, you should be familiar with some basic concepts.

Files and Directories

A file is a collection of information, either text or data. Each file has a name. Files are normally grouped under directories. Similar files are normally grouped under the same directory.

Text

The term "text" refers to a document (such as a memo), or data for a program.

Buffer and Disk Space

The buffer serves as a temporary work space. Text being worked on is kept in the buffer. You need to copy (write) your file from the buffer to the hard (or floppy) disk to save it. Otherwise, when you exit the editor your file will be lost. Don't worry, ed will tell you how to save your file.

Command Mode and Input Mode

Ed has two modes: the command mode and the input mode. The first mode allows you to give the editor directions; the second mode allows you to enter and manipulate text or data.

The system searches for the file and responds with a zero indicating that the file is not present. This is the editor's way of letting you know it is a new file (that is, a file that contains zero bytes). The editor is now in the command mode (shown with the *) awaiting further instructions from you.

CREATING A NEW FILE

You create a new file by invoking the ed text editor with a new file name. See Chapter 3 for file name limitations.

BASIC ED COMMANDS

Here are some of the basic ed commands.

COMMAND	FUNCTION
a	Adds text to a file
.	Exits from add or append (a) command mode
p	Prints or lists a file
s	Substitutes or makes changes within a line
u	Undoes the last command
d	Deletes line (s)
m	Moves lines around in a file
r	Reads or appends existing files to the current file
w	Writes or copies (saves) current file to disk
q	Quits or exits the editor

Adding Text Lines To a File (a)

To add text to a new or existing file, use the a command. This command enables you to enter text on the "blank" lines that follow. Each time you press the Return key, a new line becomes available.

When you are adding text to a newly created file, enter a <CR>. For example, type f on the Business Shell menu. The screen displays

```
Name of file(s) to invoke editor on? example <CR>
*a <CR>
This is the text portion of a newly <CR>
created file, named example. Once I <CR>
have finished adding lines of text, I <CR>
will exit the input mode by entering a <CR>
period followed by pressing the Return <CR>
key.
. <CR>
```

To add text, you can enter the input mode in the following ways:

- o Type a <CR> to add text after the current line in the file.
- o Type Na <CR> to add text after line N (a specific line number) in the file.
- o Type i <CR> to add text before the current line in the file.
- o Type Ni <CR> to add text before line N in the file.

Exit the input mode by entering:

```
|||
|||
|||
. <CR>
```

To add lines starting with line 26, enter

```
|||
|||
|||
*25a
```

Displaying (Printing) a File (p)

To display the file or current line on your terminal, use the print, **p**, command. You can display part or all of the file by entering one of the following:

- o Type **l,\$p**, to display the entire file.
- o Type **Np**, to display line N.
- o Type **N,Zp**, to display lines N through Z.

For example, to display the contents of the "example" file created above, enter,

***1,\$p <CR>**

This is the text portion of a newly created file, named example. Once I have finished adding lines of text, I will exit the input mode by entering a period followed by pressing the Return key.

Note the "a" and "." are not displayed.

The example below displays lines 4 and 5 of the example file:

***4,5p <CR>**

will exit the input mode by entering a period followed by pressing the Return

The command

***.**

will also display the current line.

Making Changes Within a Line (s)

To make changes within a line, use the **s** command. This command is useful for correcting typos, adding or deleting words, or substituting words with a line. The format for the **s** command is:

line#s/old text/new text/p <CR>

where

Line# = the line you want to change. If you do not enter a line number, the editor changes the current line.

s = the substitute command

old text = what you want to change

new text = what you want to change to

p = prints the line after the changes are made

Note that a period (.) in the old text matches any character.

For example, to correct the typo (budgt), enter

```
Your budgt figures are higher than projected.  
*s/budgt/budget/p <CR>  
Your budget figures are higher than projected.
```

The editor replaces the word "budgt" with the word "budget."

For example, to delete a word(s) in a line, enter

```
Please submit your vacation schedules to me today.  
*s/to me//p <CR>  
Please submit your vacation schedules today.
```

The words "to me" are deleted from the line.

For example, to change a word or words throughout a large file (a global change), use the format

```
*1,$s/manual/document/gp <CR>  
This document describes the 586 computer system.  
Refer to the reference document for more information.  
This document will be revised as needed.
```

This command substitutes the word "document" for the word "manual" throughout the file and then prints the last line of the last occurrence of the word that was changed. The "g" that was added to the command line indicates that it is a global substitution.

For example, to add text within the line by using the s command, enter

```
Please return the keys you borrowed.  
*s/keys/keys and book/p <CR>  
Please return the keys and book you borrowed.
```

As you can see the s command is an important editing tool. You can reverse the last substitution you made by using the undo, u, command. The undo command only reverses the most recent substitution and only works if the editor is currently positioned on the affected line. To use the undo command, enter

```
*u <CR>
```

Deleting Text (Lines) (d)

To delete lines of text, use the `d` command. The format for the `d` command is

```
(first line to delete), (last line to delete) d
```

For example, if you want to delete line 4 of the file in the buffer, type

```
*4d <CR>
```

To delete more than one line, for example, lines 4 through 7 of the file, type

```
*4,7d <CR>
```

The delete command does not prompt you nor does it display the buffer. To display the file before or after deleting text, use the `print, l,$p,` command.

Moving Text (Lines) Around In a File (m)

To move lines of text around within the buffer, use the `m` command. For example, if you want to move lines 3 through 5 to the end of the buffer, type

```
*3,5m$ <CR>
```

The dollar sign (\$) indicates the end of the file (last line).

Another example is

```
*3m1 <CR>
```

This example moves line 3 after line 1.

Combining Files (r)

You can combine more than one file in the `ed` text editor buffer by using the `r` command. This command allows you to "read" a file into the buffer without destroying anything that is already there. For example, you have a file named `report`, which contains a report of your expenses. You can edit a file or create a new file in the buffer and then combine it with an existing file (in this case `report`). Enter

```
*r report <CR>
```

This command causes the report file to be copied into the buffer after the text already there. You can rename the combined files by using the w command to write to the disk as shown below:

```
*w newfilename <CR>
```

To save your files, use the w command. This command makes a copy of the buffer contents and puts it on a storage medium such as a hard disk or floppy diskette.

To save the additions or modifications you make to your file, exit the input mode and type w. The system responds with the number of bytes in the file. For example,

```
*w <CR>  
294
```

You now have a saved copy of your file with the latest changes. The text in the buffer remains unchanged. You can continue adding or modifying the buffer without affecting the saved file until you write to the disk again.

You should save the text in the buffer before you exit the editor. You should also write to the disk periodically while working on text in the editor buffer. This is important for the following reasons:

- o If there is a power surge, power outage, or if someone accidentally resets the system, your text in the buffer is lost. If you save your file periodically (i.e., once a page), at the most, you only have to retype one page.
- o If you are editing a large file and saving (writing) your text in the buffer periodically, you can recover from an error. For example, consider the following possible circumstances:

You invoke an existing file.

You add some new text (lines).

You save the additional lines by writing to disk.

You make some changes to some existing lines.

**Saving Your
Text/File
(Copying File
To Disk) (w)**

You save the changes by writing to disk. You accidentally type in the delete command by mistake and press the Return key. You just "lost" several lines of text.

- o If you exit the editor and re-invoke it, you recover the deleted lines and do not lose the changes made prior to the mistake. If you did not save the previous changes, when you invoke the editor, you have to re-enter the changes made before the last write command.

**Exiting
(Leaving) The
Editor (q)**

To leave the ed text editor (after saving the text), use q command. For example,

```
*w <CR>
134
*q <CR>
```

The system exits the editor and returns to the Business Shell.

If you attempt to exit the editor without saving (writing) your file, the system responds with a question mark. If you type q again, you exit the editor, and the text in the buffer is lost.

EXAMPLES

**Creating a
New File**

The examples in this section use the basic commands of the ed text editor.

The following example creates a new file named "mtgnotice." You will create a file, print, edit, and save it on the disk.

Type f on Business Shell main menu. The screen displays the following:

Name of file(s) to invoke editor on? mtgnotice <CR>

0

*a <CR>

DATE: February 14, 1983 <CR>

TO: Department Managers <CR>

FROM: John Wilson <CR>

SUBJECT: Scheduling Meeting Notice <CR>

<CR>

<CR>

We will meet on Tuesday, February 15, 1983, <CR>

at 2:00 in the engineering conference room <CR>

to go over the department planning schedules. <CR>

Please bring a copy of department's schedules. <CR>

. <CR>

*a <CR>

The meeting will last about 2 hours. <CR>

Each schedule should include man-hour <CR>

requirements, project start and completion <CR>

dates, and other pertinent information. <CR>

<CR>

Don't be late. <CR>

. <CR>

Printing
the File

To print (display) the file, enter

*1,\$p <CR>

DATE: February 14, 1983

TO: Department Managers

FROM: John Wilson

SUBJECT: Scheduling Meeting Notice

We will meet on Tuesday, February 15, 1983,

at 2:00 in the engineering conference room

to go over the department planning schedules.

Please bring a copy of department's schedules.

The meeting will last about 2 hours.

Each schedule should include man-hour

requirements, project start and completion

dates, and other pertinent information.

Don't be late.

**Editing
the File**

After reading the printed version on the screen, you decide to improve the memo by deleting the line "Don't be late." Count the line number, starting with the first line and including blank lines. Since "Don't be late" is the sixteenth line, you can delete the line as follows:

```
*16d <CR>
```

You notice that "department" is misspelled and that "your" is missing in the phrase "bring a copy of department's schedules." The substitute command can fix these errors.

```
*9s/depatment/department/p <CR>  
to go over the department planning schedules  
*10s/of/of your/p <CR>  
Please bring a copy of your department's schedules.
```

You decide that the line "The meeting will last about 2 hours" should be the last line of the file. The text that follows needs to be moved above this sentence. Move line 12 through 14 after line 10 by entering

```
*12,14m10 <CR>
```

Paragraphs will make the memo easier to read. Add a blank line after a line by entering that line number and the "a" command. Press the Return key twice to create a blank line. Enter

```
*10a <CR>  
<CR>  
. <CR>  
*14a <CR>  
<CR>  
. <CR>
```

**Displaying
the File**

Display the edited file on the screen by entering

```
*1,$p <CR>  
DATE: February 14, 1983  
TO: Department Managers  
FROM: John Wilson  
SUBJECT: Scheduling Meeting Notice
```

We will meet on Tuesday, February 15, 1983,
at 2:00 in the engineering conference room
to go over the department planning schedules.
Please bring a copy of your department's schedules.

Each schedule should include man-hour
requirements, project start and completion
dates, and other pertinent information.

The meeting will last about 2 hours.

When you are satisfied with the memo, save it and quit
the editor.

```
w <CR>  
451  
q <CR>
```


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