intel

XENIX* Operating System
Installation and Configuration Guide

xenix

XENIX*
INSTALLATION AND
CONFIGURATION GUIDE

Order Number: 461206-001

THE GREEN PAGES AT THE END OF THIS
MANUAL CONTAIN ERRATA. IF NO GREEN
PAGES ARE PRESENT, WE KNEW OF NO ERRATA
AT PRESS TIME.

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Manual Overview

This manual is designed to guide you while installing and configuring the XENIX Operating System on an Intel microcomputer. While using this manual, you will occasionally be referred to other manuals within the XENIX operating system library set. Appendix B contains a complete list of the manuals in the library set, along with ordering information.

After you have installed XENIX, you must configure it for your hardware and software. The system administrator (using the **root** login) is responsible for configuring the system. Unlike the installation, ideally done only once, XENIX can be configured several times (such as whenever the hardware configuration of the computer changes).

This manual contains the following chapters and appendixes:

Chapter 1 – Introduction
> This chapter introduces the reader to the *XENIX Installation and Configuration Guide*. Included is an overview of the manual, a description of who needs to use the manual, a list of notational conventions used throughout the manual, and a brief synopsis of the chapters and appendixes in the manual.

Chapter 2 – Installing XENIX
> Chapter 2 provides the reader with instructions for installing XENIX . This chapter includes a description of equipment needed for installing XENIX, a brief description of the XENIX packages and the materials provided with each, an overview of the installation process, and step-by-step installation instructions.

Chapter 3 – Configuring XENIX (scp)
> This chapter shows how to use the system configuration program (scp) to configure standard Intel systems. This program is menu-driven and offers an easiest method of configuring XENIX.

Appendix A – Tunable Parameters
> This appendix lists and describes the tunable system parameters in the master and **xenixconf** files.

Appendix B – Related Publications
   This appendix is a list of publications related to the XENIX product. The Intel
   order number is included for Intel publications.

Appendix C – Files Saved and Restored When Updating An Existing System
   This appendix lists the files that are automatically saved and restored when an
   existing XENIX system is updated.

Appendix D – Common Errors During Installation
   This appendix discusses some common installation problems and how to correct
   them.

Intended Users

This installation and configuration guide is intended for use by anyone who installs
the XENIX operating system on an Intel System 310, 310AP, or 320 microcomputer.
Frequently, the person installing XENIX is the system administrator, who usually
has some experience with operating systems. If you have little or no experience with
operating systems, read this manual completely before starting the installation and
configuration. All users should also read the *Overview of the XENIX Operating
System* before installing or configuring XENIX.

Notational Conventions

This manual uses the following notational conventions:

- Literal names are boldface type, for example, /sys/include, printf, dev_tab,
  EOF.

- Syntactic categories are italicized where they occur and indicate that you must
  substitute an instance of the category, for example, *filename.*

- In examples of dialogue with the XENIX system, characters entered by the
  user are in boldface type.

- The term <cr> is used to designate the RETURN key on your terminal.

- In syntax descriptions, optional items are enclosed in brackets ([ ]).

- Items that can be repeated one or more times are followed by ellipses (...).

● Optional items that can be repeated zero or more times are enclosed in brackets and followed by ellipses ([ ]...).

● A choice between items is indicated by separating the items with vertical bars (|).

● The following line appears in some of the installation menus:

```
?-display general help     <sel>?-display help for <sel>     q - quit
```

`?-display general help` means type a question mark to display help information about the menu.

`<sel>?-display ;help for <sel>` means select an item in the menu and type a question mark to display help information about the item you selected.

`q - quit` means type a "q" to return to the Installation (idisk) menu.

Introduction

This chapter describes how to install the **XENIX** Operating System on a new system (**XENIX** has not previously been loaded on the system) and on an existing system (**XENIX** is loaded on the system).

As shown in Figures 2–1 and 2–1a, the **XENIX** Operating System is shipped in a media package and a documentation package.

XENIX
Operating System
Boot Diskettes

XENIX
Update
Diskette

iBR
Utility
Diskette

XENIX
Operating System
Tape Cartridge

XENIX
Media
Package

XENIX
Documentation
Package
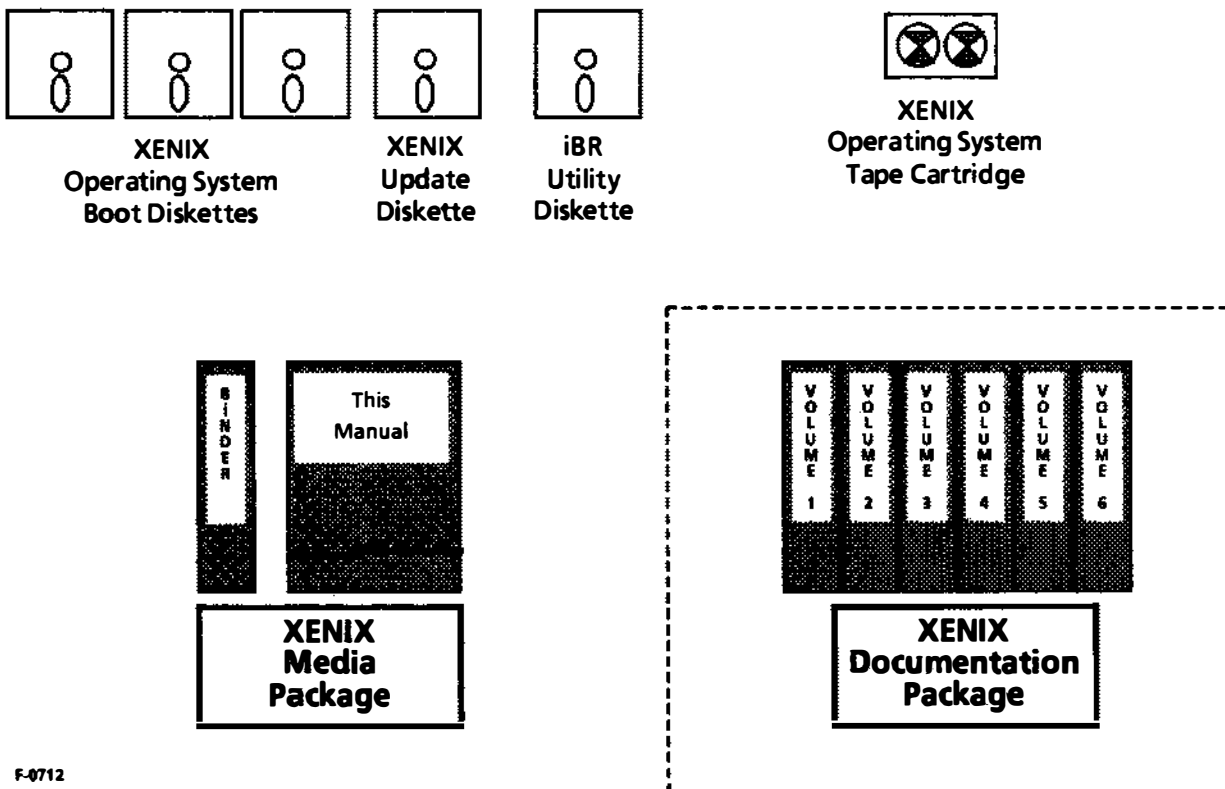
F-0712

Figure 2–1. **XENIX** Operating System Packages (For Installation From Tape)
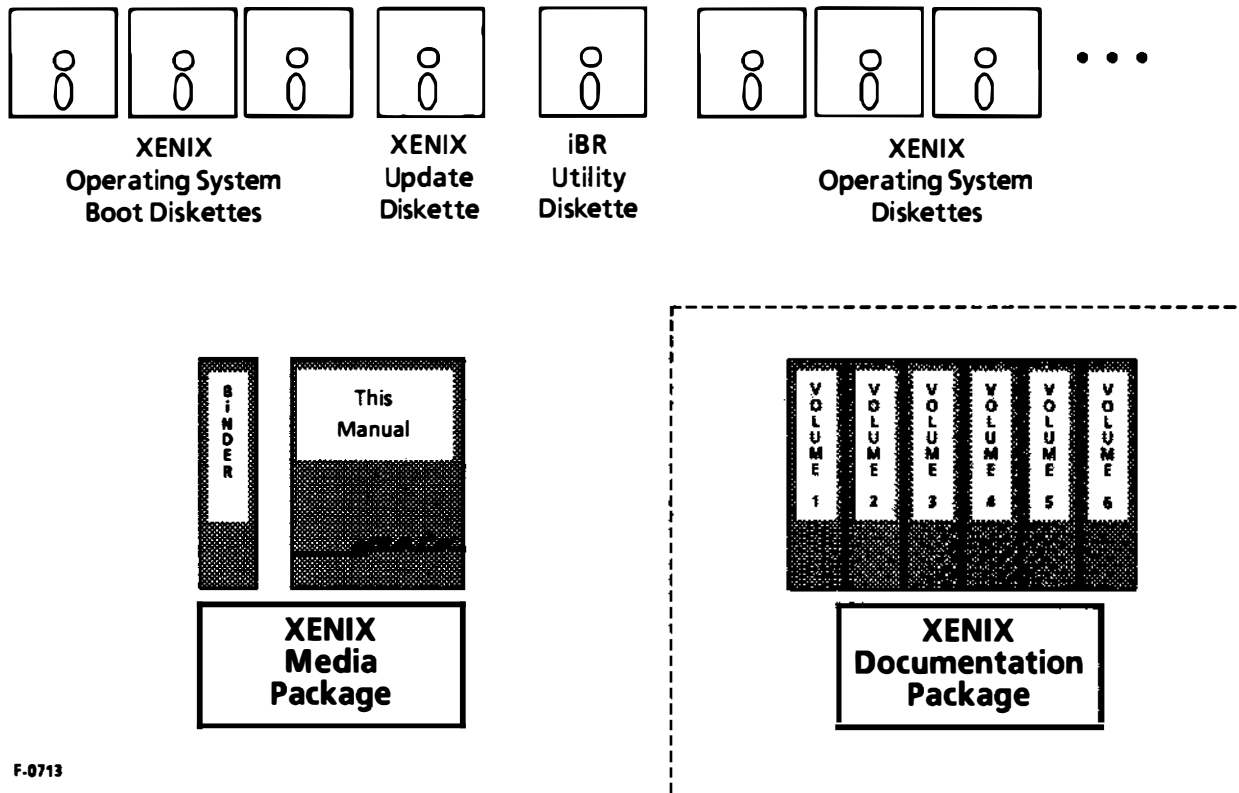
F-0713

Figure 2-1a. XENIX Operating System Packages (For Installation From Diskettes)

The media package consists of the software (on flexible diskettes and a tape cartridge, or all on flexible diskettes) that makes up the XENIX operating system, plus this manual which describes the installation and configuration process.

The software is divided into two parts: the basic operating system and system administration software; and the software development and text formatting tools. The basic operating system includes general purpose tools like the ed and vi text editors, electronic communications, and many other commands. The software development tools include utility programs, standard C libraries, a C compiler, an assembler, a linker, a loader, a debugger, a lexical analyzer, and a compiler-compiler (a program that generates a compiler). The text formatting tools include commands for improving writing, documentation macros, and the standard nroff (printer formatting) and troff (phototypesetting) programs.

When you receive a XENIX distribution package, check for damage and to be sure that you have all the manuals, tape, and diskettes. If you find that a distribution package is incomplete or damaged, contact your Intel sales representative.

Installation Process Overview (*Read This First*)

Installing XENIX involves the following basic steps (as shown in Figure 2-2):

- Booting (that is, loading the operating system into the system's memory) the system from the boot diskettes provided in your XENIX package

- Formatting the Winchester disk (done only if installing on a <u>new</u> system)

- Loading enough of XENIX onto the Winchester so that you can boot from the Winchester

- Booting from the Winchester, loading the complete XENIX package from tape or diskette onto the Winchester disk, and installing the update diskette

Start the installation process by booting the system from flexible diskette (the three boot diskettes). When you boot the system, you will see a menu that offers you three choices: installing a new system, updating an existing system, or exiting. Installing a new system is a full XENIX installation that includes formatting the Winchester disk. Updating an existing system is installing this version of XENIX over the existing version on the system and maintaining the existing user files and system configuration files on the Winchester disk.

The boot diskettes contain the operating system and the programs needed to initialize the Winchester disk and prepare it to receive the files from the tape cartridge. When the system has loaded files from all three boot diskettes, it will shut down. Then you must reset it and load XENIX from the Winchester disk. When you load XENIX from the Winchester disk, the system automatically displays a menu. The menu options allow you to load the full XENIX package from tape and configure the operating system to match your hardware.

After installing the XENIX package, you are ready to use the scp-system configuration program-to configure your system. Chapter 3 describes using the scp.

```
┌──────────────────────────────────────────────────┐
│ If Necessary, Prepare Existing System for Updating │
└──────────────────────────────────────────────────┘
                         │
                         ▼
            ┌──────────────────────────┐
            │ Boot System From Boot Disk 1 │
            └──────────────────────────┘
                         │
                         ▼
   ┌──────────────────────────────────────────────┐
   │ Install New System Or Update Existing System?  │
   │             (Installation Menu)                │
   └──────────────────────────────────────────────┘
         │                              │
         │                              │
  ┌──────────────┐              ┌──────────────────────┐
  ┊ Install New System ┊         ┊ Update Existing System ┊
  └──────────────┘              └──────────────────────┘
         │                              │
         ▼                              ▼
  ┌──────────────┐              ┌──────────────┐
  │ Load Boot Disk 2 │            │ Load Boot Disk 2 │
  └──────────────┘              └──────────────┘
         │                              │
         ▼                              │
  ┌────────────────────┐               │
  │ Format Winchester Drive │           │
  └────────────────────┘               │
         └──────────────┬───────────────┘
                        ▼
               ┌──────────────┐
               │ Load Boot Disk 3 │
               └──────────────┘
                        │
                        ▼
               ┌──────────────┐
               │ Reset System │
               └──────────────┘
                        │
                        ▼
              ┌──────────────────┐
              │ Set Date and Time │
              └──────────────────┘
                        │
                        ▼
        ┌──────────────────────────────────┐
        │ Install XENIX From Tape Or Diskette │
        │       (idisk & imedia Menus)        │
        └──────────────────────────────────┘
```
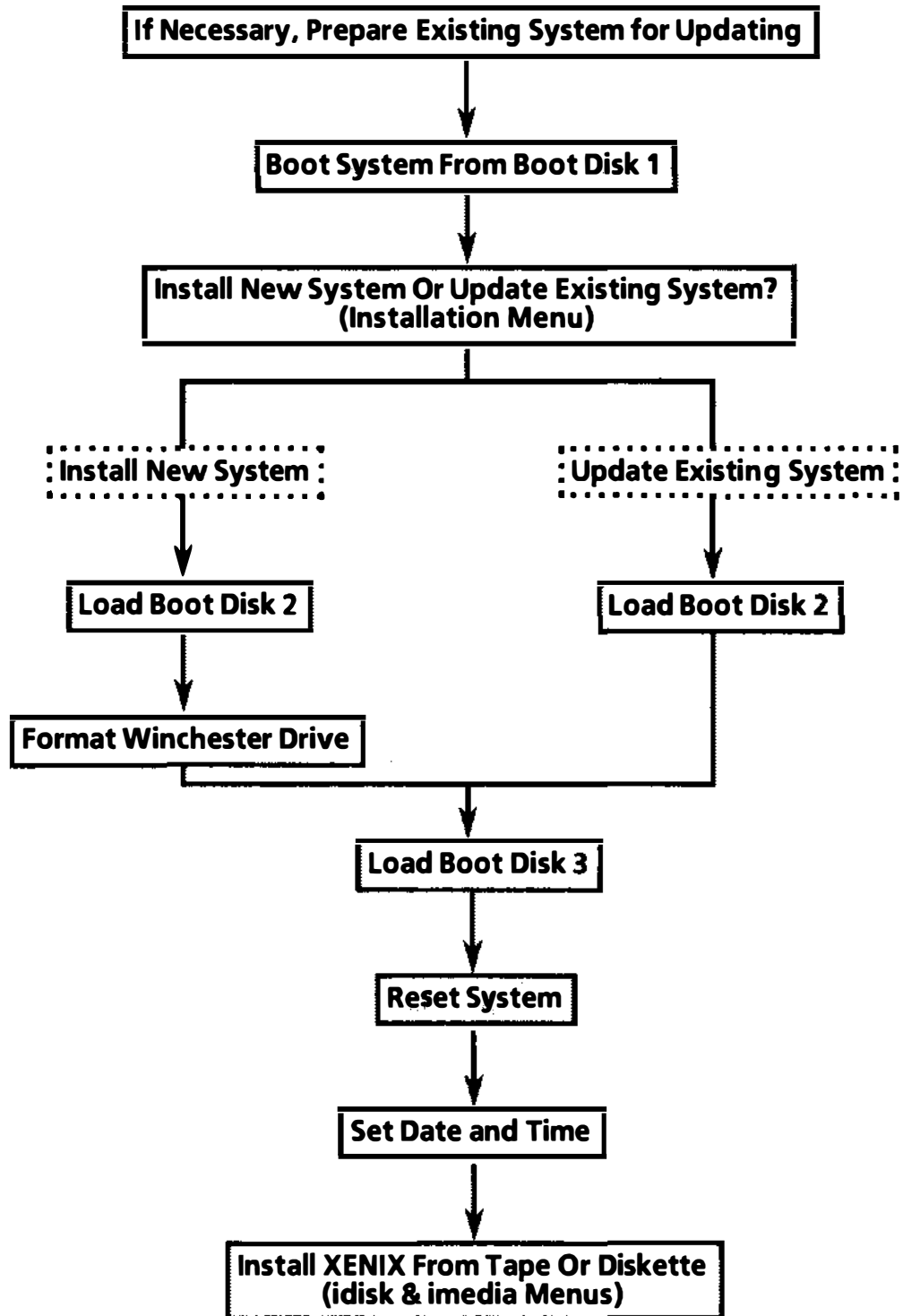
F-0711

Figure 2–2. Installation Process Overview

Installation Instructions

The following paragraphs provide step-by-step instructions for installing XENIX.

NOTE
If a system failure occurs during the installation process, the system Winchester could become corrupted. If this happens, you must restart the installation process from the beginning.

CAUTION

Never turn off the system power without first performing the XENIX shutdown procedures. These procedures are described in the *XENIX System Administrator's Guide*. The only time you should power down the system during the installation process is after performing the shutdown procedures. If you turn off the power at any other time during installation, the software on the Winchester might become corrupted. If this happens, you must restart the installation procedure.

Never attempt to remove media (a diskette or tape cartridge) from the drive while the drive's red light is on. The red light indicates that data is being written to or read from the media. If you attempt to remove the media during this time, you might corrupt the files.

Preparing a System for Updating

The installation procedures described in this chapter enable you to install version 3.5 of XENIX on systems currently running versions 3.4, without formatting the system Winchester disk. You can also reinstall version 3.5 on a system that is already running version 3.5, if you need to perform this operation. However, the software described in this chapter does not include updates to optional Intel products, such as OpenNET. For instructions on updating systems that include optional Intel products, refer to the installation instructions that accompany those products.

Before updating from a previous version of XENIX, you must prepare your system Winchester disk for the installation process. Perform the following operations:

1. Shut down the system using the **shutdown** command and reboot XENIX in system maintenance mode.

2. Remove all unwanted or redundant files from the system Winchester. During installation, a significant number of system disk blocks are used for files and processes needed during installation. Intel recommends that you make enough disk blocks available on the system Winchester to cover the maximum required for installation (700 blocks on the **root** partition and 1500 blocks on the **usr** partition). You can use the **df** command to find out how many blocks are available. If there are insufficient free blocks on the system Winchester, the installation will fail.

3. If possible, back up the system Winchester. A failure at a critical point in the installation could result in unusable files.

4. Copy **/xenix** to another file (such as **/usr/xenix.save**) and remove old or unused copies of XENIX that reside in **/sys/conf** or any other directories.

5. Copy all accounting files and log files to other media and remove them from the system Winchester.

6. Run **fsck** on the system Winchester to ensure that the file systems are not corrupted. (Refer to the *XENIX System Administrator's Guide* for information about **fsck**.) Repeat the operation until the disk is clean.

7. Bring down the system normally by entering the following commands:

   sync
   sync
   sleep 5
   haltsys

When you finish these steps, follow the steps described in the next few subsections to boot the system from flexible diskette and update the existing system.

Booting from Flexible Diskette

To install XENIX, you must first start your system from the boot diskettes provided in the XENIX package. The following procedure provides instructions to do this.

1. With the power on, do the following depending on which system you have.

   If you have a System 320, turn the keyswitch to the RESET position then back to the UNLOCK position.

   If you have a System 310 or System 310AP, press the RESET switch.

2. A series of single characters ("*" or "x" depending on system type) appears on the terminal screen. Enter an uppercase U within a few seconds after the first character appears, to start the System Confidence Test (SCT) in non-automatic boot mode–this means the SCT won't try to load an operating system when it has completed all its tests.

NOTE

If you don't enter the uppercase U within the time allowed, the SCT starts in automatic boot mode-this means the SCT will try to load an operating system when it has completed all its tests. You can reset the system again and then enter the uppercase U.

3. After the SCT completes successfully, the following prompts appear depending on which system you have.

If you have a System 320, this prompt appears:

```
Break to DMON-386 (y or [n])?
```

Enter "n". Then this prompt appears:

```
Break to iSDM monitor (y or [n])?
```

Enter "y".

If you have a System 310 or System 310AP, the prompt described in step 5 appears.

4. The terminal screen now displays a "." (period)–the monitor prompt. Insert the diskette labeled:

INTEL XENIX R3.5
BOOT DISK 1 OF 3, Vx.y

into the diskette drive. (If you are unsure about how to put diskettes into the drive, check in the hardware manuals that came with your system.)

5. Enter the following command at the terminal keyboard:

b :wfØ:/xenix.f <cr>

This command loads a minimal operating system from the boot diskette.

<div align="center">

NOTE

If you enter the wrong keys and press <cr>, the system will display the message "Error, could not load" and return to the monitor prompt, a period (.). When you see the monitor prompt, you can try again.

</div>

6.   The following message will appear for about a minute as the operating system is copied into system memory.

```
Loading :wf0:/XENIX.F
```

When loading completes, a XENIX sign-on message appears, followed by the Installation Procedure menu shown in Figure 2–3.

```
                         INTEL XENIX R3.5

                      INSTALLATION PROCEDURE

     Select the desired action:

     1)  INSTALL new system:        Choose this action to install a new system.  If the
                                    system you are installing was in use previously, all
                                    user and system data will be cleared during format.

     2)  UPDATE existing system:    Choose this action to update an existing system to
                                    XENIX 3.5.   User data and system config files will
                                    remain intact.

     3)  EXIT this procedure:       Choose this action to exit and shut your system down.

     Enter selection?
```

Figure 2–3. Initial XENIX R3.5 Installation Procedure Menu

Install New System

1. With the menu shown in Figure 2–3 on the screen, invoke the "INSTALL new system" option by entering the following:

    1 <cr>

    The system will issue the following message:

                            NEW SYSTEM INSTALL

                            *** CAUTION! ***

            ALL DATA FILES CURRENTLY STORED ON THE SYSTEM
                WINCHESTER DISK WILL BE DESTROYED!

                            *** CAUTION!***

    This procedure will format the system winchester disk
    drive on this system in preparation for a complete
    software installation

    Do you want to proceed? <yes / no>
    Are you sure? <yes / no>

    If you are sure that no XENIX operating system existed previously, answer "yes" (followed by <cr>) to the prompts and go to step 2.

    Otherwise, answer "no". The menu will be displayed again. **Skip the rest of this subsection and go on to the one titled "Update Existing System".**

2. The following prompt will appear:

```
Please insert the diskette labeled:
            INTEL XENIX R3.5
    BOOT DISK 2 of 3, Vx.y

into the drive, then type "y" . . .
(otherwise type "n" if you do not have this boot
diskette) . . .
```

Remove the first boot diskette, and insert the diskette labeled "BOOT DISK 2 of 3" into the diskette drive. After you do this, enter the following:

y <cr>

(Entering "n" returns to the main menu while you search for the missing diskette.)

3. The system will display the following information:

```
Mounting the second boot floppy . .
iSBC 214/215g controller 0 firmware:  ISO-N Vx.y

Preparing system winchester drive . . .
```

4. The system will display information about the blocks and cylinders, and then issue the following prompt:

```
do you wish to verify the disk during formatting? (y or n)
```

Choose whether you want the system to check the Winchester's ability to store information in addition to formatting the drive. This verification process checks for bad blocks that aren't listed in the Winchester's bad block table and assigns alternates for any bad blocks it finds. Formatting without verification takes between 10 and 45 minutes, depending on size of the Winchester drive. Formatting and verifying takes approximately three times as long as formatting alone. If you choose to verify the disk, you will see a list of defective tracks. On the initial installation verification is recommended.

5. During formatting, you will see several messages on the screen. When formatting is complete, the system will issue the following prompt:

```
Please insert the diskette labeled:
        INTEL XENIX R3.5
     BOOT DISK 3 of 3, Vx.y

into the drive, then type "y" . . .
(otherwise type "no" to restart the installation
process) . . .
```

In response, remove the second boot diskette from the drive and replace it with the diskette labeled "BOOT DISK 3 of 3". Then enter y <cr> at the keyboard.

6. The system will copy several files from the third boot diskette to the Winchester disk. Then it will display the following message:

```
The installation of the Xenix Winchester Installation
System is now completed.
Remove the Xenix R3.5, BOOT DISK 3 of 3, from the
diskette drive.

Press RETURN to continue  . . .
```

In response, remove the diskette from the diskette drive and press <cr>.

7. The system then displays information about what to do next, and then issues the message:

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

When you see this message, do the following depending on which system you have.

If you have a System 320, turn the keyswitch to the RESET position then back to the UNLOCK position.

If you have a System 310 or System 310AP, press the RESET switch.

The SCT will run and the system will boot automatically from the Winchester drive. As the system boots, status messages will be displayed.

8.   Your screen should now be displaying the following prompt:

```
Current system time is <month day time PST year>
Enter new time ([yymmdd]hhmm):
```

NOTE

The system displays "PST" (Pacific Standard Time) for the time zone. Later, during the configuration process, you will enter your time zone.

Enter the correct information using the requested format (do not include the brackets shown around the year, month and date), where

yy   last two digits in the year

mm   the number of the month

dd   the date

hh   hour in 24-hour format

mm   the minute

After you enter the date and time, the system will display the message:

```
<month day time PST year>
Is this the correct date? <y / n>
```

Type y <cr> if the date and time are correct, or n to enter the information again.

9.   The system then displays the Installation (idisk) menu shown in Figure 2–4. From this menu you install the XENIX operating system on the Winchester disk.

```
            INSTALLATION MENU                        (idisk)


        a)  Install Xenix System

        b)  Install Xenix Update

        c)  Install additional "Intel" software package

        d)  Configure System and Build Kernel


    ?-display general help      <sel>?-display help for <sel>      q  -  quit
    _____

    Enter selection?
```

Figure 2–4. Installation (idisk) Menu

Now, skip ahead to the subsection titled "Install XENIX System".

Update Existing System

If you want to update an existing system without formatting the Winchester disk, perform the following steps when you see the XENIX Installation Procedure menu (shown in the figure below). Before performing these steps, make sure to follow the instructions described earlier in the subsection titled "Preparing a System for Updating." The procedure described here does not format the Winchester disk. If you need to format your disk, refer back to the section titled "Installing a New System."

When updating an existing system, the XENIX operating system automatically saves and restores certain files. Appendix C lists the files that are saved and restored.

```
                        INTEL XENIX R3.5

                      INSTALLATION PROCEDURE

    Select the desired action:

    1)  INSTALL new system:      Choose this action to install a new system.  If the
                                 system you are installing was in use previously, all
                                 user and system data will be cleared during format.

    2)  UPDATE existing system:  Choose this action to update an existing system to
                                 Xenix 3.5.   User data and system config files will
                                 remain intact.

    3)  EXIT this procedure:     Choose this action to exit and shut your system down.

    Enter selection?
```

Figure 2–5.   Initial XENIX R3.5 Installation Procedure Menu

---

1. With the menu shown above on the screen, invoke the "UPDATE existing system" option by entering the following:

    2 <cr>

    The system will issue the following message:

    UPDATE SYSTEM TO INTEL XENIX R3.5

    *** CAUTION! ***

    XENIX AND ALL SYSTEM FILES CURRENTLY STORED ON THE SYSTEM
    WINCHESTER DISK

    WILL BE OVER-WRITTEN!

    *** CAUTION! ***

    This procedure will over-write the Xenix files
    on your system winchester disk drive in
    preparation for a complete software
    installation.   The user is responsible for
    saving any SITE specific modifications outside
    of the files listed in the Installation and
    Configuration Guide prior to starting this
    procedure, and reviewing the appropriate
    manuals for restrictions.

    Then the system will display the following prompts. To continue with the installation, answer "y" to the prompts.

    Do you want to proceed? <y /n>
    Are you sure? <y / n>

2. The following prompt will appear:

```
Please insert the diskette labeled:

   INTEL XENIX R3.5
 BOOT DISK 2 OF 3, Vx.y

into the drive, then type "y" . . .
(otherwise type "n" if you do not have this boot
diskette) . . .
```

Remove the first boot diskette, and insert the diskette labeled "BOOT DISK 2 of 3" into the diskette drive. After you do this, enter the following:

y <cr>

(Entering "n" returns to the main menu while you search for the missing diskette.)

3. The system will display information beginning with the following text. The "formatting" message applies only to track 0, which is always reformatted and updated with a new volume label when you install a new version of XENIX. The remainder of the disk is not formatted. Note that if you have an MS-DOS partition, it is not affected in any way.

```
Mounting the second boot floppy . .
iSBC 214/215g controller 0 Firmware:  ISO-N Vx.y

Starting to update the existing Xenix System . . .

ROOT file system is 9216 blocks
formatting. .
Formatted 1 track:  0, interleave 4.

Copying the system files to the system winchester disk
   .
   .
   .
```

The ROOT file system will either be 9216 blocks or 8208 blocks, depending on when the Winchester was originally formatted.

4. When the system has copied all the necessary information from the second boot diskette, it will issue the following prompt:

```
Please insert the diskette labeled:

   XENIX R3.5
  BOOT DISK 3 of 3, Vx.y

into the drive, then type "y" . . .
(otherwise type "no" to restart the installation
process) . . .
```

In response, remove the second boot diskette from the drive and replace it with the diskette labeled "Boot 3 of 3". Then enter y at the keyboard.

5. The system will copy several files from the third boot diskette to the Winchester disk. Then it will display the following message:

```
The installation of the Xenix Winchester Installation
System is now completed.
Remove the Xenix R3.5, BOOT DISK 3 of 3, from the
diskette drive.

Press RETURN to continue  . . .
```

In response, remove the diskette from the diskette drive and press <cr>.

6. The system then displays information about what to do next, and then issues the message:

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

When you see this message, do the following depending on which system you have.

If you have a System 320, turn the keyswitch to the RESET position then back to the UNLOCK position.

If you have a System 310 or System 310AP, press the RESET switch.

The SCT will run and the system will boot automatically from the Winchester drive. As the system boots, status messages will be displayed.

7.   Your screen should now be displaying the following prompt:

```
Current system time is <month day time PST year>
Enter new time ([yymmdd]hhmm):
```

NOTE

The system displays "PST" (Pacific Standard Time) for the time zone. Later, during the configuration process, you will enter your time zone.

Enter the correct information using the requested format (do not include the brackets shown around the year, month and date), where

yy   last two digits in the year

mm   the number of the month

dd   the date

hh   hour in 24-hour format

mm   the minute

After you enter the date and time, the system will display the message:

```
<month day time PST year>
Is this the correct date? <y / n>
```

Type y <cr> if the date and time are correct, or **n** to enter the information again.

8.   The system then displays the Installation (idisk) menu shown in Figure 2–6. From this menu, you install the XENIX operating system on the Winchester disk.

```
              INSTALLATION MENU                        (idisk)


          a)  Install Xenix System

          b)  Install Xenix Update

          c)  Install additional "Intel" software package

          d)  Configure System and Build Kernel


     ?-display general help      <sel>?-display help for <sel>      q  -  quit

     Enter selection?
```

Figure 2–6. Installation (idisk) Menu

Install XENIX System

1. From the installation (idisk) menu, select item **a**. The Installation Media Selection (imedia) menu shown in Figure 2–7 appears next. This menu enables you to pick whether to install XENIX from tape or from diskette.

```
                INSTALLATION MEDIA SELECTION                    (imedia)

            a)   Install from streamer tape
            b)   Install from diskettes




    ?-display general help      <sel>?-display help for <sel>      q  -  quit

    Enter selection?
```

Figure 2–7. Installation Media Selection (imedia) Menu

---

2. *IF YOU HAVE XENIX ON TAPE*

    a. Select item **a** to designate that you have XENIX on tape.

    b. The system displays the following message:

        ```
        Insert the System Installation tape labeled

            INTEL XENIX R3.5
            TAR FORMAT, Vx.y

        into the streamer tape drive,then type "y" . . .
        ```

        In response, insert the tape into the tape drive and type **y** <cr>. (If you are unsure about how to put the tape cartridge into the drive, check the hardware manuals that came with your system.)

    c. The system will rewind and retension the tape and copy files from tape to the Winchester disk, displaying information on the screen as it does this. This process takes approximately 15 minutes. Then the system completes the installation of XENIX by updating files and making device nodes.

d.   When this process is finished, the following prompt appears:

```
Installation of Xenix system files completed

Press RETURN to continue . . .
```

Press <cr> to return to the Installation (idisk) menu shown in Figure 2–4.

Now continue with step 3.

2.   *IF YOU HAVE XENIX ON FLEXIBLE DISKETTE*

a.   Select item b to designate that you have XENIX on diskette.

b.   The system displays the following message:

```
How many diskettes are there in the BASIC System
(default = 15)
```

In response, enter <cr> to install all the Basic System diskettes. (If you started an installation earlier and quit before finishing, the system lets you continue where you left off. In this case, you can start with the first diskette that you haven't installed yet. When the system asks for the first diskette, you can change the number of the diskette it requests.)

c.   The system then displays the following:

```
Insert the Xenix System Files Diskette Labeled,


BASIC SYSTEM 1 of num Vx.y


into the floppy drive, then type "y" (type "q" if
you want to quit) . . .
```

In response, insert the first of the Basic System diskettes (or the first diskette that hasn't been installed yet, if you installed part of the system earlier) into the drive and press y <cr>. The system copies the information from this diskette and requests the next one. All of the Basic System diskettes are requested in this manner. You can check the current diskette count by typing d. If you are continuing an installation begun earlier and you want to change the current diskette count, type c. Typing q lets you quit the installation process.

If you make a mistake and insert a diskette that is not one of the XENIX diskettes, the system will display the following message:

```
The last diskette does not appear to be a BASIC
SYSTEM diskette.
Please try again...
    Insert   the   Xenix,   System   Files   Diskette
    Labeled,


        BASIC SYSTEM x of num Vx.y


    into the floppy drive, then type "y" (type "q"
    if you want to quit) . . .
```

You can then correct your mistake by inserting the correct diskette.

d. You will then be prompted for the Extended System diskettes. Follow the instructions just as you did when loading the Basic System diskettes.

e. When all the diskettes have been loaded, the system completes the installation of XENIX by updating files and making device nodes. When this process is finished, the following prompt appears:

```
Installation of Xenix system files completed

Press RETURN to continue . . .
```

Press <cr> to return to the Installation (idisk) menu shown in Figure 2–8.

```
                        INSTALLATION MENU                        (idisk)


                a)  Install Xenix System

                b)  Install Xenix Update

                c)  Install additional "Intel" software package

                d)  Configure System and Build Kernel


        ?-display general help      <sel>?-display help for <sel>      q  -  quit

        Enter selection?
```

Figure 2–8. Installation (idisk) Menu

---

3. With the Installation (idisk) menu on your screen, select item **b** to install the XENIX update diskette. Follow the instructions that appear on your screen. You must install the update before you will be allowed to install additional Intel packages or configure your system.

4. If you have the Intel XENIX Network software you should install those packages now. Choose option **c** on the Installation (idisk) menu to install these packages. Refer to the documentation that accompanies the packages for installation information.

Once you install networking software packages you might have, you are ready to configure the operating system to match your hardware. Use option **d** to invoke a program called scp (System Configuration Program) that enables you to configure standard Intel systems. Chapter 3 discusses the scp program.

Introduction

This chapter describes the XENIX operating system software configuration. Software configuration involves defining the types of, and connections for, disk and tape drives, terminals, line printers (serial or parallel), and modems that are part of your system. The scp (System Configuration Program) is the facility through which you configure the operating system to correctly recognize and use those various pieces hardware. You should consult the system's hardware manuals for information about hardware configuration, such as cabling and configuring (via jumpers on the boards) controller and communication boards.

NOTE

The scp is used both for initial configuration (when you receive your system) and, later, for reconfiguration, if necessary.

Configuration Process Overview (*Read This First*)

Before you start configuring a new system, you need to know the following about the system:

- What type of terminal the console terminal is (the one you used during the installation process)

- Whether the system is a 310, 310AP, or 320 (look at the label on the bottom of the system)

- What the system ID is (for networks or uucp)

- Number and type of Winchester drives (look at the label on the bottom of the system)

- Number of tape drives (look at the label on the bottom of the system)

- Your time zone

- Number and type (serial or parallel) of line printers

- For the serial printers, which ports they are attached to and what baud rate should the ports be set to

- Which communication ports are to be connected to terminals

- For the terminal ports, what type of terminal are they connected to and what baud rate should the ports be set to

- Which communication ports are to be connected to modems

- For the modem ports: which ones are dial-in (answer only), which ones are dial-out (call only), and what baud rate should the ports be set to

- The size (in megabytes) of the largest file the system will be dealing with

Figure 3–1 shows an overview of the process of configuring a new system as performed via **scp**.

Confirm system type Or
(Systemtype) Menu to select one

Confirm console terminal type Or
(Terminaltype) Menu to select one

START

Confirm system ID Or
Enter system ID Query

(Top) Menu
New installation or modification

Modification

New Installation

(Exist) Menu
(See Figure 3-3)

Additional Drive Configuration
Queries & (Winchesters) Menu

(Tzds) Menu
Daylight Savings

(Maxfs) Menu
Select maximum file size allowed

(Tz) Menu
Select Time zone

(Lptype) Menu
Select your printer brand

yes--Select a

(Lp) Menu
Do you have a parallel printer?

no--Select b

Default
terminal?

yes

Default terminal
menu

no

Specify

(Defaultprint) Select the
default printer

(Syshow)
Show current
configuration

yes

Last serial
controller?

Select y

(Serialcontroller) Menu
Connecting modems, terminals,
printers to serial ports?

no

Select y when done with
port

Printer Baud rate
selected

Do you wish to build your configuration?

Select port

answer yes

scp will finish and shut down the system

(Port) Menu
Select port type

Terminal Connected--Select a

Serial Printer
Connected
Select b

Terminal Selected

(Terminaltype) Menu
Select the terminal type
connected to serial port

(Lptype) Menu
Select serial printer
connected to port

Modem Connected--Select d

Dial-in
Select a

(Terminaltype) Menu
Select the type of
terminal that will access
the modem port

(Baud) Menu
Select the baud rate of
your serial printer

F-0522-1

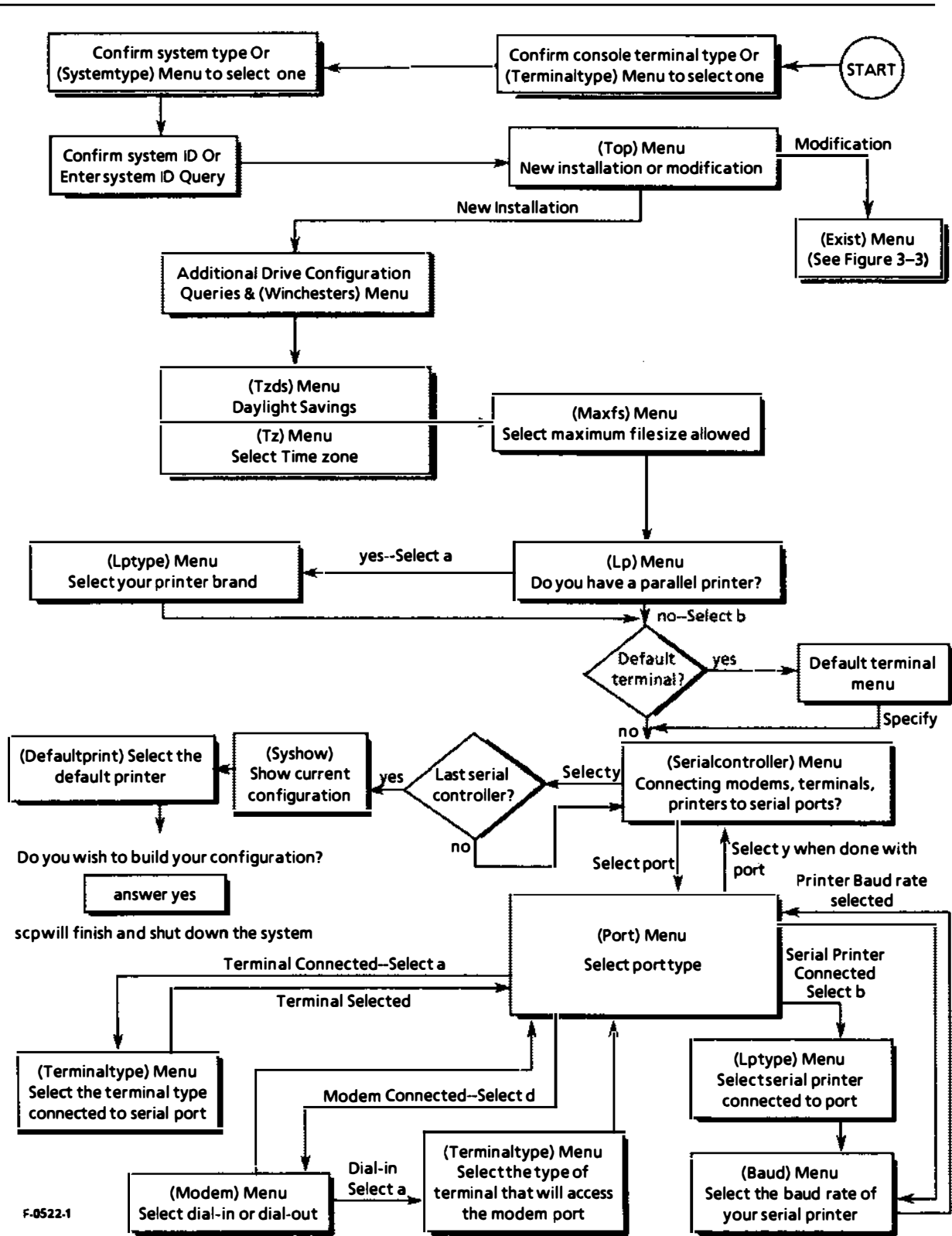(Modem) Menu
Select dial-in or dial-out

Figure 3-1. Configuring A New System

Before you start reconfiguring an existing system, you need to know any changes in the following information.

- You'll be asked to confirm the following:

    console terminal type
    system type
    system ID

- If you added or changed the types of drives in the system, you'll need to know the following:

    Number and type of additional or changed Winchester drives
    Number of additional tape drives

- If you added or changed the ports to which existing devices were connected, or changed the type of device connected to a port, you'll need to know the following:

    For the serial printers, which ports they are attached to and what baud
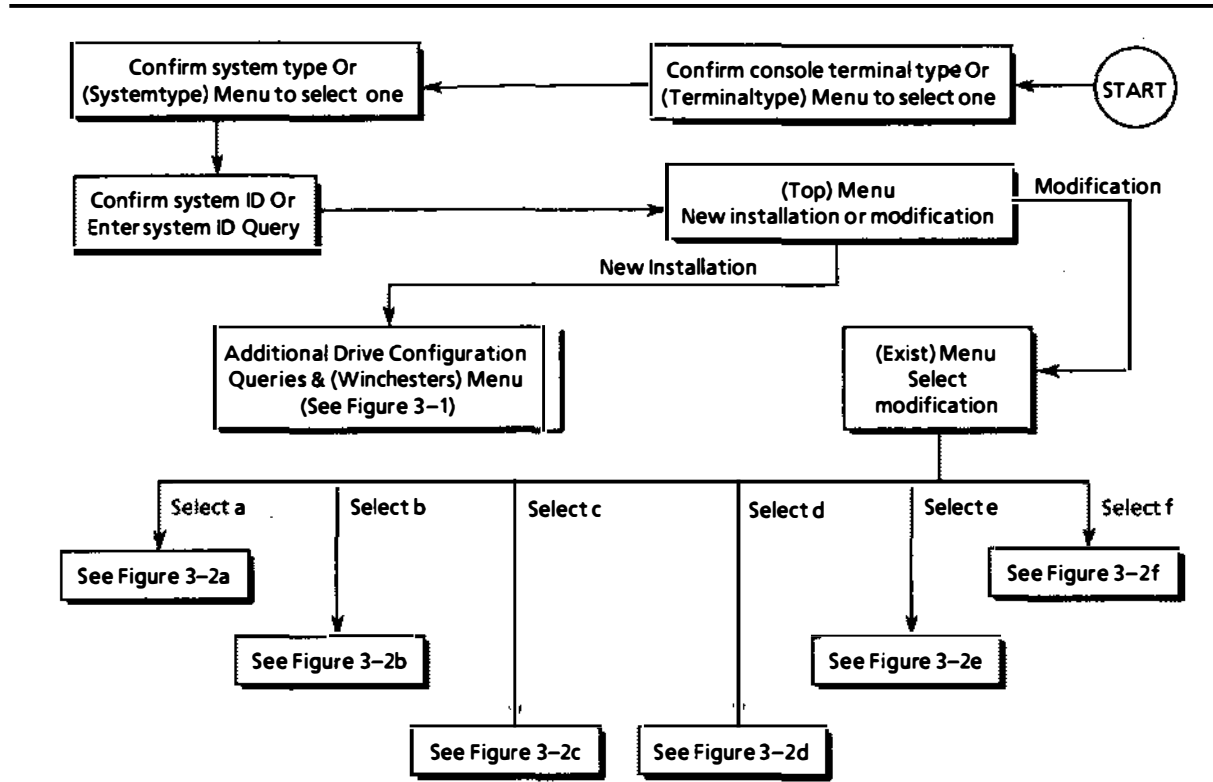   rate should the ports be set to.

    Which communication ports are to be connected to terminals.

    For the terminal ports, what type of terminal are they connected to and
        what baud rate should the ports be set to.

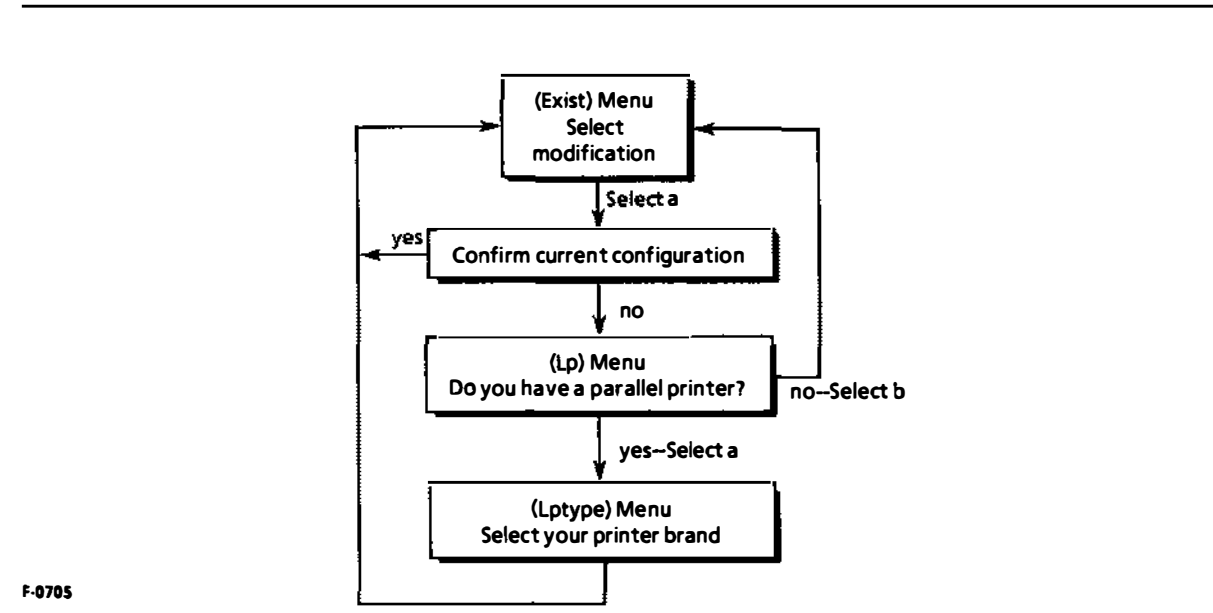   Which communication ports are to be connected to modems.

    For the modem ports: which ones are dial-in (answer only), which ones are
        dial-out (call only), and what baud rate should the ports be set to.

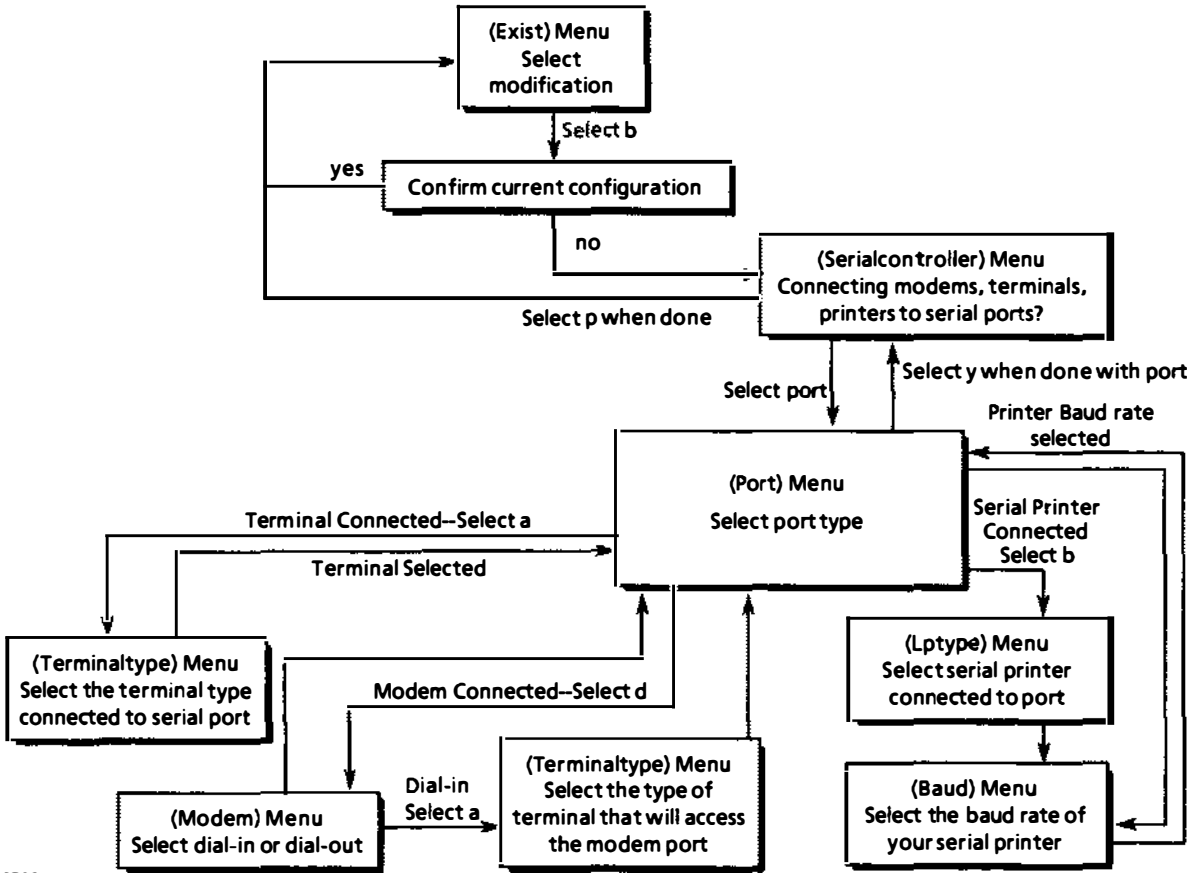Figure 3–2 shows an overview of the process of reconfiguring an existing system as performed via scp.

Confirm system type Or
(Systemtype) Menu to select one

Confirm console terminal type Or
(Terminaltype) Menu to select one

START

Confirm system ID Or
Enter system ID Query

(Top) Menu
New installation or modification

Modification

New Installation

Additional Drive Configuration
Queries & (Winchesters) Menu
(See Figure 3-1)

(Exist) Menu
Select
modification

Select a

Select b

Select c

Select d

Select e

Select f

See Figure 3-2a

See Figure 3-2f

See Figure 3-2b

See Figure 3-2e

See Figure 3-2c

See Figure 3-2d

F-0704

Figure 3-2. Reconfiguring An Existing System

(Exist) Menu
Select
modification

Select a

yes

Confirm current configuration

no

(Lp) Menu
Do you have a parallel printer?

no--Select b

yes--Select a

(Lptype) Menu
Select your printer brand

F-0705

Figure 3-2a. Reconfiguring Parallel Printer

3-5

```
                          ┌─────────────────┐
                          │ (Exist) Menu    │
                          │    Select       │
                          │  modification   │
                          └─────────────────┘
                                   │ Select b
              yes      ┌───────────────────────────────┐
              ┌────────│ Confirm current configuration │
              │        └───────────────────────────────┘
              │                    │ no
              │                          ┌────────────────────────────┐
              │                          │ (Serialcontroller) Menu     │
              └──────────────────────────│ Connecting modems, terminals,│
                    Select p when done   │ printers to serial ports?   │
                                         └────────────────────────────┘
                                                                    ↑ Select y when done with port
                                         Select port                 Printer Baud rate
                                              │                       selected
                    ┌──────────────────────────────────┐
   Terminal Connected--Select a      │ (Port) Menu      │  Serial Printer
                    │  Terminal Selected  Select port type│  Connected
                    │                  └──────────────────┘  Select b
         ┌──────────────────────┐                        ┌──────────────────────┐
         │ (Terminaltype) Menu  │                        │ (Lptype) Menu        │
         │ Select the terminal type│  Modem Connected--Select d │ Select serial printer│
         │ connected to serial port│                     │ connected to port    │
         └──────────────────────┘                        └──────────────────────┘
              ┌──────────────────┐  Dial-in ┌──────────────────────┐  ┌──────────────────────┐
              │ (Modem) Menu     │ Select a │ (Terminaltype) Menu  │  │ (Baud) Menu          │
              │ Select dial-in   │─────────→│ Select the type of   │  │ Select the baud rate of│
              │ or dial-out      │          │ terminal that will access│ │ your serial printer  │
              └──────────────────┘          │ the modem port       │  └──────────────────────┘
 F-0706                                     └──────────────────────┘
```

Figure 3–2b. Reconfiguring Terminal, Modem, or Serial Printer
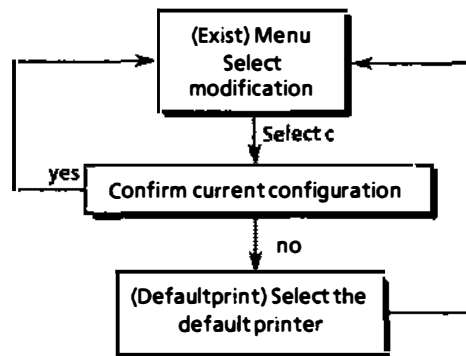
```
                          ┌─────────────────┐
                          │ (Exist) Menu    │
                          │    Select       │
                          │  modification   │
                          └─────────────────┘
                                   │ Select c
              yes      ┌──────────────────────────────┐
              ┌────────│ Confirm current configuration│
              │        └──────────────────────────────┘
              │                    │ no
              │        ┌──────────────────────────────┐
              └────────│ (Defaultprint) Select the    │
                       │   default printer            │
                       └──────────────────────────────┘
 F-0707
```
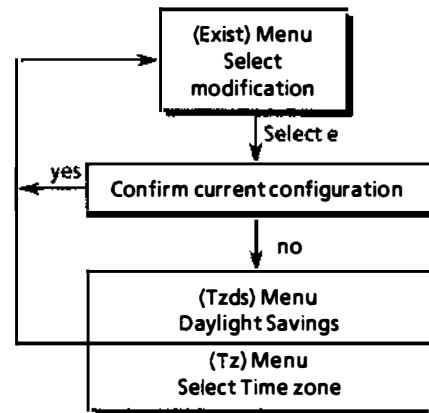
Figure 3–2c. Reconfiguring Default Printer
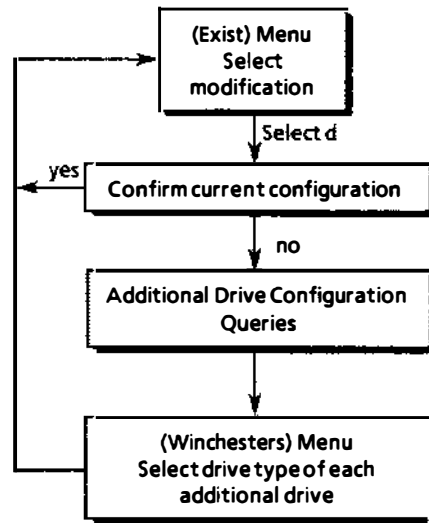
F-0708

Figure 3–2d. Reconfiguring Winchester and Tape Drives

F-0709

Figure 3–2e. Reconfiguring Time Zone

```
                    ┌──────────────────┐
              ┌────►│   (Exist) Menu   │
              │     │      Select      │
              │     │   modification   │
              │     └──────────────────┘
              │              │ Select f
              │         yes  ▼
              │     ┌──────────────────────────────┐
              ◄─────│  Confirm current configuration │
              │     └──────────────────────────────┘
              │              │ no
              │              ▼
              │     ┌──────────────────────────────┐
              └─────│        (Maxfs) Menu          │
                    │  Select maximum file size allowed │
                    └──────────────────────────────┘
```
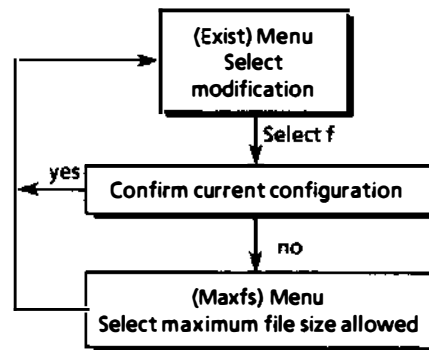
F-0710

Figure 3–2f. Reconfiguring Maximum File Size

Configuring New Systems Instructions

This section provides instructions for configuring a new system. If your system <u>has</u> <u>not</u> previously been configured using scp, follow the instructions here. If your system <u>has</u> been previously been configured using scp, follow the instructions in the next section, titled "Reconfiguring Existing Systems Instructions".

NOTE

Where appropriate, the selections for the initial configuration of a new system are shaded.

1.   When the Installation (idisk) menu shown in Figure 3–3 is displayed on your screen, invoke the scp program by selecting item **d**.

```
                          INSTALLATION MENU                     (idisk)


              a)  Install Xenix System

              b)  Install Xenix Update

              c)  Install additional "Intel" software package

              d)  Configure System and Build Kernel



         ?  -  display general help <sel>?  -  display help for <sel>   q  -  quit
         -------------------------------------------------------------------
         Enter selection?
```

Figure 3-3. Installation (idisk) Menu

2.   The (Terminaltype) menu will appear. For the system console, select the type of terminal used as the system console.

3.   Next the (System) menu is displayed. Selections are:

Select a   if you have a System 310

Select b   if you have a System 310AP

Select c   if you have a System 320

The type you selected is displayed and you are asked to confirm that it is correct.

4.   You are now asked to enter a system ID. This name will be used if the system is configured into a network. The system can be given any name, however, limiting the name to seven characters or less will enable other software (for example, uucp) to operate correctly. If no entry is made, the default name of "xenixR3__5" is assigned.

5.   The (Top) menu is displayed. Selections include:

▓▓▓▓▓▓ to build a new configuration. This option starts from a base
           configuration. Any existing configuration information is ignored
           and <u>destroyed</u>.

The **scp** now reads the volume label of the first Winchester drive (drive 0, the one
installed behind the front control panel). If there is a problem reading the label, a
menu of drive types is displayed. Select your drive type. If you are unsure about
which type you have, look either on the options list that was packed with your
system or on the label on the bottom of the system.

6.   Next you will be asked:

```
How many additional winchester disk drives do you
have?
(not including your system wini):
```

Answer:

       0   if you do not have any additional Winchester drives installed in the
                system

       1, 2, or 3   if you have additional Winchester drives installed in the
                system

7.   The next question appears:

```
How many tape drives do you have:
```

Answer:

       0   if you do not have any tape drives installed in the system

       1 or 2 -   if you have tape drives installed in the system

8.   If you specified a nonzero number of additional Winchesters drives, the
        (Winchesters) menu appears. Select the type of the drive. If you specified more
        than 1 additional drive, the (Winchesters) menu reappears for each additional
        drive. Your Winchester and tape configuration will then be displayed.

9. The daylight savings menu (Tzds) appears next.

    Select a   if you are in an area where daylight savings time is used (even if it's not during daylight savings months)

    Select b   if daylight savings is never used.

10. Then specify the time zone in the (Tz) menu.

    Enter the abbreviation if your time zone is listed.

    If your time zone is not listed enter O (Other), then you will be prompted to enter the number of time zones you are away from Greenwich England. WEST of Greenwich is a positive number (Pacific Standard Time is 8, for example), and EAST of Greenwich is a negative number (for example, Italy is -1, Australia is -8).

11. When the (Maxfs) menu appears, we recommend that you press <cr> to use the default maximum file size of 4 MB, unless you are using unusually large files for a particular application.

12. In the (Lp) menu, select a if you have a parallel printer, b if you do not (the system is configured for serial printers later in the procedure). If you select a, the (Lptype) menu appears. Enter the letter (a - l) for your printer or o if your printer is not listed. If you select o, you may need to construct print filters in the operating system. See the *XENIX Reference Manual* under "printcap" and the information in the /usr/lib/pf directory.

13. You are now asked if you want to specify a default terminal. If all or most of the terminals that are to be connected to the system are of one type, answer yes and select that type from the menu. If your terminal type is not on the menu, select other; you will be asked to supply information about the terminal.

    Your entry here will be used in the next portion of the configuration process where the serial I/O ports are set up.

14. Next, the (Serialcontroller) menu appears. A (Serialcontroller) menu is displayed in turn for each serial controller board in the system beginning with controller 0, which **scp** assumes is in the lowest available slot. This menu shows the port names, the port labels on the back panel, the port baud rates, the usage for the port (terminal, modem, printer), and the type of equipment attached to the port. If you did not specify a default terminal, during your initial installation the menu will appear similar to the one shown in Figure 3–4. If you did specify a terminal type, it will be indicated in the menu.

```
- - - - - - - - - - - - - - - - - - -(Serial Controller #0)
  PORT      Label     Baud      Usage       Type
  c0        J1        9600      Terminal    Unknown
  c1        J2        9600      Terminal    Unknown
  c2        J3        9600      Terminal    Unknown
  c3        J4        9600      Terminal    Unknown
```

Figure 3–4 Serial Controller Menu Display

NOTE

The number of ports, their names, and their labels depend on which serial I/O controllers are installed in your system.

You then select from the following choices:

Select y   to accept the ports as shown and continue with the next set of ports on the next serial controller (if there is one).

Select p   to accept all of the serial configuration on all of the controllers and proceed with system configuration.

Select r   to restart the port configuration process with the first serial controller (controller 0). All of the ports revert to their condition before you began the port configuration process.

Enter   to select the port to configure.
port
name

15. When you have entered a port name, the (Port) menu appears.

Select **a**   to set up the port for a terminal. The (Terminaltype) menu appears. In the (Terminaltype) menu, enter **a - g** to enter a terminal type, **n** to to view an another list of terminals, or **o** to specify your own terminal type.

Select **b**   to set up the port for a printer. The (Lptype) menu appears, select a - l or **o** if the printer type is not listed. The (Baud) menu is then displayed, enter a listed baud rate (must match the printer setting).

Select **c**   to change a port to unused status.

Select **d**   To set up the port for a modem. The (Modem) menu appears. Select **a** if the system is going to initiate the call, **b** if the system is going to be called. If you have a short haul modem, set up the port as a direct connect to whatever is attached to the other end of the modem (do not use selection **c**). If you selected **b** (dial-in modem) the (Terminaltype) menu appears, select the type of terminal (**a-g, n, o**) that will be used when calling this port.

Select **e**   to set up a non-standard serial I/O device, such as a plotter. The (Baud) menu will appear. Enter the baud rate from those displayed.

Select **f**   if you want to change the printer or terminal type for a port that has already been set up. If the port is connected to a terminal the (Terminaltype) menu appears, if connected to a printer the (Lptype) menu appears.

Select **g**   to change the baud rate from the default setting for a terminal, printer, or modem. When the (Baud) menu appears, enter the number from those displayed.

After making all the changes, select y to return to the (Serialcontroller) menu.

16. Repeat step 12 for each port on the serial controller that must be configured. When all ports are set up, enter y to accept ports as shown. The next set of ports on the next serial controller will be displayed. Repeat step 12 for each port on that serial controller that must be configured. Repeat until all of the ports have been configured.

NOTE

> On some systems, if you have specified more than sixteen terminals (including the console), you will be asked to change the port configuration to bring the total number of terminals down to sixteen or less.

17. If you have specified more than one printer in your system, you will now be prompted to define the default printer via the (Defaultprint) menu. Select the printer that you wish to receive all output if a specific printer is not referenced.

18. Your current configuration is displayed. Then you are asked:

```
Do you wish to build your configuration?
```

Enter y <cr> if the information is correct. Enter n<cr> if you want to change some configuration information.

    a.   If you answered y, the system will build the configuration and shut itself down. Building the configuration takes approximately 10 minutes.

        When you see the message

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

        If you have a System 320, turn the keyswitch to the RESET position then back to the UNLOCK position.

        If you have a System 310 or System 310AP, press the RESET switch.

        Let the system run through the SCT, boot XENIX, and start multiuser mode operation.

b. If you answered n, the (Exist) menu will appear. Select the item that was incorrectly configured and reconfigure it. When the (Exist) menu re-appears, select m to build the configuration. You will be asked:

```
Are you certain you wish to make a configuration
at this time <y/n>?
```

Enter y <cr> to build the configuration. Building the configuration takes approximately 10 minutes.

Shut down the system by entering the following commands:

sync
sync
sleep 5
haltsys

When you see the message

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

If you have a System 320, turn the keyswitch to the RESET position then back to the UNLOCK position.

If you have a System 310 or System 310AP, press the RESET switch.

Let the system run through the SCT, boot XENIX, and start multiuser mode operation.

Reconfiguring Existing Systems Instructions

If you want to modify an existing system configuration, invoke the **scp** program. Enter the following command at the system's console terminal, while in system maintenance (single-user) mode. See the *XENIX System Administrator's Guide* for information about the console terminal and system maintenance mode.

> **scp** <**cr**>

NOTE

> Where appropriate, the menu selections for reconfiguring an existing system are shaded.

1. You will be asked to confirm the console terminal type by the following message:

```
Console terminal type is _____
Is this correct <y/n>?
```

If you answer n, the (Terminaltype) menu appears. Enter **a – g** to enter a terminal type, n to to view an another list of terminals, or **o** to specify your own terminal type. After you have made a selection you are asked to confirm it.

2. Next you will be asked to confirm the system type by the following message:

```
System type is _____
Is this correct <y/n>?
```

If you answer n, the (Systemtype) menu appears. After you have made a selection you are asked to confirm it.

3. You will now be asked to confirm the system ID by the following message:

```
System ID is _____
Is this correct <y/n>?
```

If you answer n, a query for system ID appears. If you answer with only a <cr>, the default name of "xenixR3_5" is assigned.

4.   The (Top) menu is displayed. Selections include:

Select **a**   to build a new configuration. This option starts from a base configuration. Any existing configuration information is ignored and <u>destroyed</u>.

▓▓▓▓▓▓   to modify your existing configuration. This displays the (Exist) menu which provides a list of items that you can select for reconfiguring.

Select **c**   to rebuild the kernel with the changes you've made. When you make this selection, you are asked to confirm that this is what you want to do. Rebuilding the kernel will take less than 10 minutes.

5.   The (Exist) menu offers the following selections:

Select **a**   to change the parallel printer configuration. You will be asked:

```
Printer is a type _____
Is this correct <y/n>?
```

Enter **n**<cr> if you want to change the printer. The (Lp) menu appears. Select **a** if you have a parallel printer, **b** if you do not. If you select **a**, the (Lptype) menu appears. Enter the letter (a - l) for your printer or **o** if your printer is not listed.

Select **b**   to change the terminal, printer, or modem configuration on any of the serial communication ports. The (Serialcontroller) menu appears. Enter the PORT that you want to change. When the (Port) menu appears, select **a** to set up a terminal, **b** for a printer, **c** to deactivate a port, **d** for a modem, **e** for a non-standard device, **f** to change the printer or terminal type, or **g** to change the baud rate of the port. When corrected, select **y** to return to the (Serialcontroller) menu. Select **y** again in the (Serialcontroller) menu after all have been modified.

Select **c**   to change the printer specified as the default printer. If you have specified more than one printer, you will be prompted with the current default printer and asked:

```
Is this correct <y/n>?
```

Reply with **n** if you wish to change this specification. The (Defaultprint) menu will appear to allow you to select the default printer.

Select d   to change your Winchester or tape configuration. The current
           Winchester and tape configuration is displayed. You will be asked:

           ```
           Is this correct <y/n>?
           ```

           Enter **n<cr>** to modify the configuration. You are then asked:

           ```
           How many additional winchester disk drives do
           you have? (not including your system wini):
           ```

           Answer:

           0 -   if you do not have a Winchester drive installed in the central
                     peripheral bay

           1 -   if you have a Winchester drive installed in the central
                     peripheral bay

           The next question appears:

           ```
           How many tape drives do you have:
           ```

            Answer:

           1 -   You have a tape drive.

           If you added Winchester drives, the (Winchesters) menu will appear
           (for each additional drive) so that you can select the drive types.

Select e   to change the time zone. The current time zone setting is displayed
           and you are asked:

           ```
           Is this correct <y/n>?
           ```

           Reply with **n** if you wish to change this specification. You must
           specify whether daylight savings time is in effect during any part of
           the year at your location. Next enter the the three-character
           abbreviation for your time zone listed in the (Tz) menu. If your time
           zone is not listed, enter O (Other). You will then be prompted to
           enter the number of time zones you are away from Greenwich
           England. WEST of Greenwich is a positive number (Pacific
           Standard Time is 8, for example), and EAST of Greenwich is a
           negative number (for example, Italy is -1, Australia is -8).

Select f   to change the maximum user file size. You will be prompted with the current setting and asked:

```
Is this correct <y/n>?
```

Reply with **n** if you wish to change this specification. It is recommended that you use the default maximum file size of 4 MB, unless you are using unusually large files for a particular application.

Select **g**   to display an existing configuration item.

Select **m**   to rebuild the kernel after modifying any of the items in the (Exist) menu. The configuration will take approximately 10 minutes to build. If you have changed the printers that are configured into the system (parallel or serial), you will be asked whether to list these changes to the hard-copy device attached to the default printer port. It is recommended that you generate this hard copy listing, because most application programs will require some of this information.

6.   When you are done making all of the changes you want, select m in the (Exist) menu to rebuild the kernel.

7.   When you see the message

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

<u>If you have a System 320</u>, turn the keyswitch to the RESET position then back to the UNLOCK position.

<u>If you have a System 310 or System 310AP</u>, press the RESET switch.

Let the system run through the SCT, boot XENIX, and start multiuser mode operation.

If you added additional Winchester drives, you must format them (after rebooting the system to use the new kernel) by entering the following command:

/etc/scpinitialfmt <cr>

This command also builds user file systems on the additional drives. Before the additional drives are formatted, you will be asked, for each additional drive, to confirm that the drives are to be formatted. The formatting and file system builds will take from 15 minutes to 2 hours, depending on the number and size of the disk drives.

The configuration process is now complete. To establish a multiuser environment, follow the instructions in the next section "User Administration."

User Administration

The final step in setting up your XENIX system is creating the environment for multiple users on the system. This consists of establishing user names, passwords, and groups; creating home directories for each user; and establishing the user environment. This should be done by the person designated as the system administrator. An interactive XENIX command called **mkuser** simplifies this process. If you have the iDIS software package, use its facilities exclusively for setting up users.

As the system was rebooted in the previous section, the time was displayed followed by the **login:** prompt. Follow these steps to create users with the **mkuser** command.

1.   Enter "root" as the login name. Press <cr>.

2.   Enter the password that you want to use as system administrator. The password must be at least five characters and contain a mix of upper and lower case characters. Press <cr>.

3.   The root prompt (<root>) will appear.

4.   Enter the following command to create users:

      mkuser <cr>

5.   You will be asked the following:

      ```
      Do you require detailed instructions?  (y/n)
      ```

      Enter y <cr> if you are unfamiliar with this command. A description of the command is then provided. Read the description and press <cr> to start. Enter the first user's login name (8 characters maximum) when you see the following prompt:

      ```
      Enter new user's login name:
      ```

      This is the name that the user will enter at the login prompt to gain access to the system.

6.   Next, **mkuser** issues the following prompt to ask if you want to use the default group:

```
Do you want to use the default group?  (y/n):
```

Group file permissions allow members of the group access to files of other group members. If you anticipate that several users will need to share files, answer n < cr >. If users are going to access files independently, answer y < cr >.

If you answered no, **mkuser** will display existing groups and then ask:

```
Do you want to use these groups?  (y/n):
```

Answer **n** < cr > to create a new group. Then create the group name and group number (must be greater than 200) when prompted.

Answer **y** < cr > to use existing groups. Enter the group number or name when prompted.

7.   Next you will be prompted to enter the user's password. It will not be displayed when entered, and you will be prompted to repeat the entry to ensure accuracy.

8.   The shell type prompt appears next. There are four selections:

Selection 1   The Bourne shell (user interface) that you used when logging in as **root**.

Selection 2   The Visual shell. It provides a menu of commands. To select a command, enter the first letter of a displayed command. The Visual shell provides a simple, easy-to-use interface to the XENIX operating system.

Selection 3   The C shell. The C shell is the user interface with a batch command processing language much like the C programming language. It is most often used in development environments.

Selection 4   A user-specified shell. If there are other shells available on the system (besides the ones above), this is how you would select one of them. You are asked to enter the pathname for the shell you want.

9.   The final entry is an optional comment. This comment, used by the **finger** command typically contains the real name of the user and their office location, is entered into the **/etc/passwd** file for that user. Once entered, **mkuser** displays all entered parameters and asks if you want to change any of the entries. If the information is correct, enter **n** <cr>. The user definition files are updated. Then you are asked if you want to add another user. Answer **y** <cr> until all users have been entered.

Upon exiting the **mkuser** command, the XENIX installation and configuration procedures are complete. The system is fully functional for all specified users. If you have any application packages to install, refer to the documentation accompanying those packages for information about installing them.

Tunable Parameters

These entries form the tunable parameter table:

PARAMETER	NAME	DEFAULT VALUE
buffers	NBUF	192
sabufs	NSABUF	2
hashbuf	NHBUF	128
inodes	NINODE	145
files	NFILE	165
mounts	NMOUNT	7
coremap	CMAPSIZ	(NPROC * 2)
swapmap	SMAPSIZ	(NPROC * 2)
calls	NCALL	25
procs	NPROC	80
texts	NTEXT	40
locks	NFLOCKS	10
maxproc	MAXUPRC	25
timezone	TIMEZONE	(8 * 60)
pages	NCOREL	0
daylight	DSTFLAG	1
cmask	CMASK	0
maxprocmem	MAXMEM	0
shdata	NSDSEGS	25
maxbuf	MAXBUF	(64*EXPBUFSEL)
ttys	MAXCBUF	(2*MAXTTYS)
ulimcfg	ULIMITCFG	8192
slroot	SLROOT	0
numdrsel	NDRSEL	9

These parameters are found in two files: **master** and **xenixconf**. The **xenixconf** file contains parameters unique to your system, whereas **master** contains the defaults for all systems. Any parameters that exist in **xenixconf** override the defaults in **master**. Therefore, any changes you make should be done in the **xenixconf** file, not in the **master** file. The **kparams** utility can be used to edit the **xenixconf** file.

The format of the kparams utility is as follows:

kparams [-p *path*] [-f *file*] [-F] *param* [*value*] [*"comment"*]

where *path* and *file* are the directory and file name of the file to be edited if you decide to edit a file other than /sys/conf/xenixconf (/sys/conf/xenixconf is the default). The *param* value is one of the parameters listed under the parameters column, *value* is the value to which you want to set the parameter, and *comment* is any comment you want associated with the value in the xenixconf file. If you include the -F option, a new entry is added to the xenixconf file. This option is necessary if the parameter is not already listed in xenixconf. If you omit the *value*, kparams shows you the current value of the parameter.

As an example of how to use kparams, in a 2MB, 12-user system, the following commands add tunable parameters in xenixconf to override the defaults set in master:

kparams -F inodes 120
kparams -F files 120
kparams -F procs 70
kparams -F buffers 192

Because the kernel-tunable parameters affect data structures in the kernel data segment, you should take care in modifying any of these parameters.

Consider, for example, what might happen if the value of a parameter were increased, causing the kernel data segment to exceed its limit of 64KB. While making XENIX, the ld utility will abort the link. In this case, the following error message warns that you might need to decrease the value of another parameter to ensure that the kernel data structures reside within 64K bytes.

```
Group "DGROUP" Larger than 64Kbytes
                    •
```

buffers NBUF 192

The **buffers** parameter denotes the number of exported buffers in the kernel's buffer pool.

The buffer pool contains two kinds of buffers: system-addressable buffers (inside the kernel data segment) and exported buffers (outside the kernel data segment). Because the kernel reserves seven segments for the exported buffers, up to 448 exported buffers can be configured into the system.

If buffers=0 is used, the kernel determines the number of exported buffers. It begins by computing the minimum number of system buffers required. When the amount of system memory is less than 512KB, no equation is needed: the kernel uses 40 buffers. When the amount of memory is larger than 512KB, the kernel uses the following equation to calculate the minimum number of system buffers.

$$\text{buffers} = 40^+ ((\text{ amount of memory} > 512K) / 8) / 1024$$

Because the number of exported buffers required is application-dependent, the best way to determine the optimal number is to run the application with a number of different configurations and then choose the one that yields the highest performance. Begin by trying 40 to 60 exported buffers for a 512KB system and the default value of 192 exported buffers for a 1MB system. (When the system boots, it displays the number of exported buffers being used; however, this number does not include the number of system-addressable buffers.)

sabufs NSABUF 2

System-addressable buffers (sabufs) are buffers directly addressable by the kernel. They reside in the kernel data segment. For normal system operation, leave this parameter set to its default value. You should change the value only if user-supplied drivers require system-addressable buffers.

hashbuf NHBUF 128

The hashbuf parameter designates the size of the buffer hashing array.

The kernel uses a hashing algorithm to quickly locate a group of buffers, then it searches that group until it finds the required buffer. The algorithm works by determining the buffer header where the search will begin. (The system contains an array of buffer headers, each of which is linked to a group of buffers.)

The size of the array and the number of buffer headers are determined by hashbuf. The hashing algorithm, in turn, is determined by the macro bhash in the file sys/h/buf.h. If hashbuf is changed in any way, make sure that bhash will still map to all buffer headers in the array.

inodes NINODE 145

The **inodes** parameter indicates the total number of active inodes in the system.

The kernel keeps a cache of all active inodes in an internal inode table. If system usage exceeds the table, then the system displays this error message:

    Inode table overflow

A -1 is returned to the system call that caused the overflow, and the process that executed the system call will have its **errno** variable set to **ENFILE**.

files NFILE 165

The **files** parameter indicates the total number of active file descriptors in the system. This is the number of files that can be open at one time.

The kernel keeps a cache of all active file descriptors in a table. If system usage exceeds the table, no one can open a file until someone closes an open one. In this case, the system displays the following error message:

    No file

A -1 is returned to the system call that caused the overflow, and the process that executed the system call will have its **errno** variable set to **ENFILE**.

mounts NMOUNT 7

The **mounts** parameter indicates the size of the kernel's mount table, which is the maximum number of devices that can be mounted on the system at one time.

The kernel keeps a cache of mounted devices in an internal mount table. If system usage exceeds the size of the table, then a -1 is returned to the system call that caused the overflow, the process that executed the system call will have its **errno** variable set to **EBUSY**, and the mount will fail.

coremap CMAPSIZ (NPROC * 2)

The **coremap** parameter indicates the size of the coremap array, which keeps track of all available memory in the system.

The array itself is an array of structures. Each structure describes a fragment of free memory. If system memory becomes fragmented enough to overflow the coremap array, then the system displays this error message:

```
coremap or swapmap overflow (xxxx), shutdown and reboot
```

The (**xxxx**) is a pointer to the coremap array in the kernel data segment.

swapmap SMAPSIZ (NPROC * 2)

The **swapmap** parameter signifies the size of the swapmap array, which keeps track of all available swap space.

The array itself is an array of structures. Each structure describes a fragment of free swap space. If the swap space becomes fragmented enough to overflow the swapmap array, then the system displays this error message:

```
coremap or swapmap overflow (xxxx), shutdown and reboot
```

The (**xxxx**) is a pointer to the swapmap array in the kernel data segment.

calls NCALL 25

The **calls** parameter indicates the size of the callout table, which the timeout function uses to keep track of procedures to be executed at a specific time. In general, the timeout function is used by serial device drivers.

If system usage overflows the callout table, then the system displays this error message:

```
panic: Timeout table overflow
```

The panic condition results because a timeout function is called only within the kernel. The kernel reacts by displaying the error message and suspending processing.

procs NPROC 80

The **procs** parameter defines the total number of active processes in the system.

If the number exceeds the procs parameter value, then the system returns a -1 to the **fork** system call that caused the overflow. The process that executed the **fork** call has its **errno** variable set to **EAGAIN** and does not run.

An overflow usually occurs from the shell, which displays this error message:

    Cannot fork: too many processes

In this case, no more processes can run until another process finishes.

texts NTEXT 40

The **text** parameter defines the size of the text table, which describes the sharable text segments of one or more processes. The table notes whether the segments are located in memory or swap space.

The text table defines the number of pure texts that can be active at any one time. If the table overflows, the system displays this error message:

    Out of text

The exec system call is the only system call that detects this error condition. Because there is no return from an exec call, the process performing the exec is killed.

Since the processes listed in the table have separate text and data segments, a text segment can be shared among processes.

Note that all XENIX utilities have separate text and data segments, as do large- and middle-model processes. Small-model processes must be compiled with the -i option in order for them to have separate text and data segments.

locks NFLOCKS 10

The **locks** parameter defines the maximum number of file locks.

If system usage exceeds this number, then the system returns a -1 to the system call that caused the overflow. The process that executed the system call has its **errno** variable set to **EDEADLOCK**. Refer to the description of the locking system call in the XENIX Device Driver Guide.

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maxproc MAXUPRC 25

This is the maximum number of processes a user can create. **(A** user is defined by a user ID, or UID, contained in the /etc/passwd file.)

If a user exceeds **maxproc** number of processes, a -1 is returned to the **fork** system call that caused the overflow. The process that executed the **fork** call has its **errno** variable set to **EAGAIN**.

An overflow usually occurs from the shell, which displays this error message:

```
Cannot fork: too many processes
```

timezone TIMEZONE (8 * 60)

This is the number of minutes west of G.M.T., set with **scp**.

pages NCOREL 0

Reserved for future use.

daylight DSTFLAG 1

This flag indicates the timekeeping method the system is currently using.

If the flag is set to 1, the system is operating on daylight savings time. If the flag is set to 0, it is operating on standard time; set with **scp**.

The flag is used by the ftime system call.

cmask CMASK 0

This is the default **cmask** for all files. For more information, see the description of the system call **umask** in the XENIX C Library Guide and the **umask** entry in the "Commands" section of the XENIX Reference Manual.

maxprocmem MAXMEM 0

This parameter defines the size of memory in kilobytes. (If **maxprocmem** equals 512, for example, then the total system memory is 512KB.)

The kernel performs a memory scan to determine the size of contiguous system memory. The scan stops when it reaches **maxprocmem** or once it finishes scanning all contiguous memory, whichever comes first. If **maxprocmem** equals 0, then the kernel scans up to 16 Mbytes.

shdata NSDSEGS 25

The shdata parameter indicates the total number of shared data segments active in the system.

If system usage exceeds this parameter value, then a -1 is returned to the system call that caused the overflow. The process that executed the system call has its **errno** variable set to EMFILE. For more information, see the descriptions of the system calls sdenter, sdget, sdgetv, and sdwaitv in the XENIX 286 C Library Guide.

maxbuf MAXBUF (64*EXPBUFSEL)

This indicates the maximum number of exported buffers. (See the entry describing the **buffers** parameter, earlier in this appendix.)

The **maxbuf** parameter can be set to a number between 40 and 448 only (EXPBUFSEL is currently set to 7); it cannot be set to a number greater than 448.

ttys MAXCBUF (2*MAXTTYS)

This indicates the maximum number of cbuffers. For example, each terminal has one cbuffer that consists of at the most four ring buffers: an output ring buffer, two input ring buffers (a raw buffer and a cooked buffer), and a temporary buffer.

ulimcfg ULIMITCFG 8192

This indicates the number of 512-byte blocks that can be allocated to a file. 8192 represents 4 megabytes; set with scp as the "maximum file size".

slroot SLROOT 0

This parameter is reserved for future use.

numdrsel NDRSEL 9

This identifies the maximum number of selectors in the Global Descriptor Table (GDT) allowed for use by device drivers. If valid, a selector corresponds to one segment. Read about the 80386 architecture to find out about GDTs.

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Intel Publications

Copies of the following publications can be ordered from

Literature Department
Intel Corporation
3065 Bowers Avenue
Santa Clara, CA 95051

XENIX Reference Library

Change Package: XENIX Reference Library, Order Number 461204 – corrections and updates to manuals in the library.

Overview of the XENIX Operating System, Order Number 174385 – XENIX history, XENIX uses, basic XENIX concepts, and an overview of other XENIX manuals.

XENIX User's Guide, Order Number 174387 – a brief survey of common commands plus full chapters on the ed text editor, the vi text editor, electronic mail, the Bourne shell (sh), and the bc calculator.

XENIX Visual Shell User's Guide, Order Number 174388 – a XENIX command interface ("shell") that replaces the standard command syntax with a menu-driven command interpreter.

XENIX Installation and Configuration Guide, Order Number 461206 – how to install XENIX on your hardware and tailor the XENIX configuration to your needs.

XENIX System Administrator's Guide, Order Number 174389 – how to perform system administrator chores such as adding and removing users, backing up file systems, and troubleshooting system problems.

XENIX Communications Guide, Order Number 174461 – installing, using, and administering XENIX networking software.

XENIX Reference Manual, Order Number 174390 – all commands in the XENIX Basic System, with a master index to the XENIX Basic System and Extended System.

XENIX Programmer's Guide, Order Number 174391 – XENIX Extended System commands used for developing and maintaining programs.

XENIX C Library Guide, Order Number 174542 – standard subroutines used in programming with XENIX 286, including all system calls.

XENIX Device Driver Guide, Order Number 174393 – how to write device drivers for XENIX and add them to your system.

XENIX Text Formatting Guide, Order Number 174541 – XENIX Extended System commands used for text formatting.

XENIX System Backup and Restore Operations iBR Order Number 461185 – how to do file system backups and how to restore file systems from the backups.

Other XENIX Publications

XENIX Networking Software Installation and Configuration Guide, Order Number 135146 – installing, configuring, and administering the XENIX OpenNET™ network.

XENIX Networking Software User's Guide, Order Number 135147 – user's and programmer's reference to the XENIX OpenNET™ network.

Introduction

When you use the installation procedure described in Chapter 2, an update disk is required (even on initial installations). The system automatically saves some of the files on the system Winchester disk so that you won't lose any changes you might have made to these files. When installation is complete, some of these files are automatically restored, and others remain in a directory called /usr/save_dir for your use. In addition, the installation procedure automatically deletes a number of old files that are no longer required in version 3.5.

During installation, the system looks in three files to see which files to restore, save, and delete. These files are /etc/sysfile, /etc/savefile, and /etc/remfile, respectively. This appendix describes the contents of these files.

/etc/sysfile

/etc/sysfile contains a list of files that the system automatically saves and restores when the update diskette is installed. The files listed in /etc/sysfile include the following:

usr/lib/crontab	etc/default/ibr/default
etc/motd	usr/lib/mail/aliases.hash
etc/passwd	usr/lib/mail/aliases
etc/group	usr/lib/mail/faliases
etc/systemid	usr/lib/mail/mailrc
etc/ttys	usr/lib/mail/maliases
etc/ttytype	usr/lib/uucp/L.sys
etc/profile	usr/lib/uucp/L.cmds
etc/default/login	usr/lib/uucp/L-devices
etc/default/instlupdate	usr/lib/uucp/L-dialcodes
etc/default/micnet	usr/lib/uucp/L_stat
etc/default/su	usr/lib/uucp/R_sub
etc/default/uucp	usr/lib/uucp/USERFILE
etc/default/cleave	usr/adm/pacct
etc/default/ibr/always	usr/spool/uucp/LOGFILE
etc/default/ibr/selected	sys/conf/lib_os

Whenever you update a system to version 3.5 of XENIX, the installation program will attempt to save all of these files. If you are updating a system on which an earlier version of XENIX was installed, some of these files might not exist when the installation program attempts to save them. In this case, a message will appear indicating that the file does not exist.

NOTE

If your log files (such as **usr/adm/pacct** and **usr/spool/uucp/LOGFILE**) are large, you should back up those files and remove them before performing the installation procedures. Failure to do so could cause the partition to overflow.

/etc/savefile

/etc/savefile contains a list of files that the system automatically saves. If you are updating a system that currently contains version 3.5 of XENIX, the installation program also restores all of these files after installation is complete. However, if you are updating from an earlier version of XENIX, the installation program attempts to restore only the value-added modules from the following files:

    sys/io/lib_io
    sys/cfg/c215g.c
    sys/cfg/lib_ioc

The remaining files are stored in the directory /usr/save_dir in files that have the extension .old. The .old files are not compatible with version 3.5 of XENIX. Therefore, you should never attempt to restore these .old files over the new files that were just installed. Instead, you should duplicate any changes you made in the new versions of the files.

The following files are listed in /etc/savefile:

    etc/rc   sys/cfg/cramd.c
    etc/bootcfg   sys/cfg/c208.c
    etc/termcap   sys/cfg/c344.c
    etc/printcap   sys/cfg/c534.c
    etc/default/dump   sys/cfg/c8274.c
    etc/default/dumpdir   sys/cfg/cecc.c
    etc/default/restor   sys/cfg/clp.c
    sys/conf/xenixconf   sys/cfg/fcramd.c
    sys/conf/master   sys/cfg/ports.c
    sys/cfg/c215g.c   sys/h/i215g.h
    sys/cfg/c226.c   sys/io/lib_io
    sys/cfg/c188.c   sys/cfg/lib_ioc
    sys/cfg/c544.c

/etc/remfile

/etc/remfile contains a list of files that are automatically deleted during installation when updating an existing XENIX system to version 3.5. The following files are listed in /etc/remfile.

/usr/bin/VSHELL.HPP	/etc/idsk.mnu
/usr/bin/retension	/etc/imedia.hlp
usr/bin/rdheader_226	/etc/imedia.hlpa
/usr/bin/slip_226	/etc/imedia.hlpb
/usr/bin/defects_226	/etc/imedia.mnu
/usr/bin/net	/etc/instl.onet
/usr/lib/uucp/dial.vad	/etc/new_311_box
/usr/lib/dos/Sdcrt0.o	/etc/procedure1
/usr/lib/dos/Mdcrt0.o	/etc/new_SMD_box
/usr/lib/dos/Ldlibm.a	/etc/proced_smd
/usr/lib/dos/Mdlibm.a	/etc/sitespec.sav
/usr/lib/dos/Sdlibm.a	/etc/sidespec.res
/usr/lib/dos/rawmode.o	/etc/fsbackup
/usr/lib/c1.10	/etc/instlnet-
/usr/lib/c1.15	/etc/instlnet
/bin/tar.20	/etc/instlxnet
/dev/dboot	/etc/tarroot
/dev/dram	/etc/upinstl
/dev/rdboot	/etc/.patch
/dev/rdram	/sys/conf/master.f
/dev/flp	/sys/cfg/icp
/dev/slp	/swap_gt_1188
/etc/base.perms	/tmpprofile
/etc/soft.perms	/rootprofile
/etc/text.perms	/usr/include/sys/nfs/netsys.h
/etc/c	/usr/include/sys/nfs/dsa.h
/etc/idisk.hlp	/usr/include/sys/nfs/netself.h
/etc/idisk.hlpa	/usr/include/sys/nfs/netad.h
/etc/idisk.hlpb	/usr/include/sys/nfs/netutmp.h
/etc/idisk.hlpc	

Introduction

This appendix discusses some of the common errors that occur during the installation process.

Problems with the System's Winchester Drive

If your system Winchester becomes corrupted, you might feel that the only way to correct the problem is to reformat the Winchester when you install XENIX. However, in some instances you can boot the system from flexible diskette and fix the problem without reformatting the Winchester. Non-mountable file systems and non-bootable drives are two conditions that you might be able to correct.

If your system is experiencing one of these conditions, follow the instructions listed here before reformatting the Winchester.

1. Follow the boot procedure described in Chapter 2 in the section entitled "Booting from Flexible Diskette." When you finish, your screen will display the menu shown in Figure 2-3.

2. Hold down the Ctrl key and press the backslash (\) key. The following prompt will appear:

        Please insert the diskette labeled:

        BOOT DISK 2 of 3

        and type RETURN to continue:

    Follow the instructions on the screen.

3.   The system will display the following information:

```
Starting the salvage with instl -s
  ROOT file system is x blocks
  bootsys>
```

When you see the **bootsys>** prompt, follow the instructions in one of the next two sections, depending on the type of problem you are experiencing.

Non-Mountable File System

If you ran the installation program previously and it was unable to mount the system Winchester's file system, perform a file system consistency check by invoking the following command at the **bootsys >** prompt:

fsck -y /dev/w0a

If the **fsck** command experiences problems resulting in a system crash, you cannot update your system Winchester. Instead, you must treat your system as if you were installing XENIX on it for the first time, including reformatting the system Winchester. Go to the section in Chapter 2 entitled "Booting from Flexible Diskette" and continue with the section entitled "Install New System."

If the **fsck** command completes successfully and you see the **bootsys >** prompt again, the system is clean and able to be updated to version 3.5 of XENIX . You can continue with the installation by entering the following commands:

sync
umount /dev/dvf0
sync
sync

Now press **Ctrl-D** to continue with the installation process.

Non-Bootable System Winchester

Occasionally, a system Winchester will be unable to boot XENIX because of a corrupted track. To correct this problem, enter the following command at the **bootsys>** prompt:

    install -u

This command installs a new track, a new third stage of the bootstrap loader, and a bootable XENIX kernel onto the system Winchester. When this command completes, you should be able to boot XENIX from the Winchester. Before doing this, shut down the system by entering the following commands:

    sync
    umount /dev/dvf0
    sync
    sync
    haltsys

Checking File Permissions

Occasionally, you might have difficulty with system operations due to improper permissions on system files. The operating system provides a utility called **setperms** that you can use to set the file permissions of system files back to their released level of permission. The **setperms** command automatically invokes **fixperms**, using all files with the **.perms** suffix in **/etc** as input. These **.perms** files contain the complete definition of all files in the XENIX product. Therefore, running **setperms** sets up all product file permissions as intended by the operating system.

The format for invoking the **setperms** command is as follows:

    setperms [-n] [-h]

When invoked with no options, **setperms** corrects all files with improper permissions. The **-n** option checks the files against the **.perms** files without changing the files. It returns a list of files that aren't set up as per the **.perms** files. The -h option returns a list of all available options for the **setperms** command. Refer to this list for information about the remaining options.

Files Not Linked

Occasionally while updating a system to a new version, the system will display a message indicating a problem with two files that should be linked, but aren't. This message will look similar to the following:

> *file a* not linked to *file b*

If you see messages such as this, take the following steps to correct the situation after the installation process finishes:

- Use the rm command to remove the first file (*file-a* in the example just shown).

- Invoke the setperms command to set up all product file permissions as intended by the operating system.

Files Not Saved or Restored

When applying an update to version 3.5 from earlier versions of XENIX without reformatting your system Winchester, the system saves certain files before installing and restores them after it finishes. Appendix C lists the files that are saved and restored. When the system saves and restores files, you might see messages that make you think that problems are occurring. Often, these messages are merely informative and do not indicate a problem.

For example, when the system is saving files prior to installation, you might see a message similar to the following one:

> WARNING: could not find *filename*. . . skipping

This message occurs because the system attempts to save files that are not available in earlier versions of XENIX. Because the files aren't there, they can't be saved. Therefore, don't worry about the message. It doesn't indicate a problem.

When the system restores files after the installation, you might see messages that look similar to the following one:

> *filename* is not a XENIX_R3-5 file,
>   leaving file in /usr/save_dir

This message indicates that the specified file (which was saved earlier) cannot be restored because it doesn't contain a legitimate version stamp for version 3.5. Earlier versions of such files will not work with version 3.5 of XENIX. The file will remain in the **/usr/save_dir** directory and be given the extension **.old**. If you had made changes to those files earlier, you should retrieve the changes from the **.old** files and apply them to the new files just installed.

Note: For a master index to the XENIX reference library, see the *XENIX 286 Reference Manual.*

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