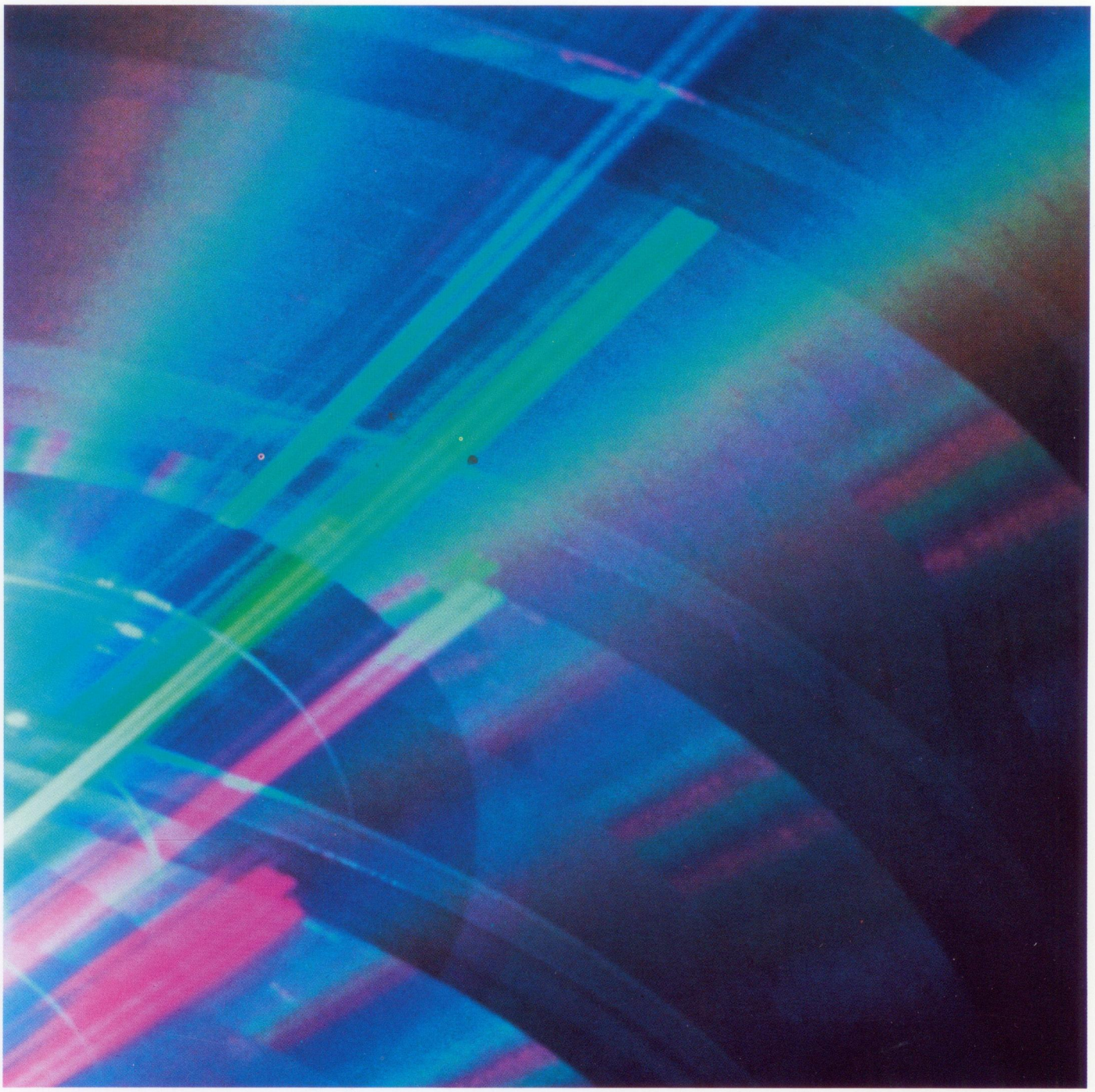
HP 9000 Series 800

HEWLETT PACKARD

Installing and Updating HP-UX



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Printing History

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Preface

This manual explains how to install and update the HP-UX operating system. Chapters 3 and 4 are the heart of the manual: they contain step-by-step procedures for installation and update, respectively.

Turn to chapter 1 for a complete guide to using the manual.

Related Documentation

- *HP 9000 Series 800 System Administrator's Guide (92453-90004)*
- *System Administration Basics—A Menu-oriented Approach (92453-90017)*
- The *Installation and Configuration Guide* for your computer
- The *Read Me First* for the current release
- Installation guides for optional products such as Networking or Native Language I/O.

Contents

1

Introduction

This manual explains how to install, update and modify HP-UX on Hewlett-Packard Series 800 computer systems. Table 1–1 shows you where to begin.

Table 1-1. Where to Begin

If you are unfamiliar with the install/update process:	Read chapter 2 (Concepts), to understand the concepts behind the steps you'll be performing.
If you feel ready to begin installing HP-UX:	Go to chapter 3 (Installing HP-UX) for the step-by-step procedure. Chapter 3 covers both the "install" and "update" portions of an initial installation. Also, refer to the appendix that gives specific information about your computer (825/835, 840 or 850).
If you feel ready to update HP-UX on your system to the current version:	Go to chapter 4 (Updating HP-UX).
If you are a Hewlett-Packard Customer Engineer (CE) and you have done several HP-UX 3.0 installations already:	Go to Appendix E (Quick Reference Guide). Also, refer to the appendix that gives specific information for your computer (825/835, 840 or 850).
If you need to modify the HP-UX kernel on your system (for example to change the configuration of I/O cards):	Go to the manual *System Administration Basics: a Menu-Oriented Approach* (part number 92453-90017) to change the kernel using the menu-driven SAM utility. This manual also explains how to change system parameters. or Go to chapter 5 (Modifying HP-UX) to change I/O configuration in the kernel by entering commands at the HP-UX prompt ($ or %).
If you need to change the default layout of your system disk:	Go to chapter 6 (Root-disk Partitioning).
If you need more information on the screens in the Update program:	Go to chapter 7 (The Update Screens).
For essential information specific to this release:	Go to appendix D (The Current Release).
If you need in-depth information on system parameters, device drivers, etc.:	See the *HP 9000 Series 800 System Administrator's Manual* (part number 92453-90004).

2

Concepts

Overview

This chapter explains the concepts behind installing and updating HP-UX on Hewlett-Packard Series 800 computers. Understanding these concepts will help you if you run into problems during install/update or if you want to learn more about your system. Reading this chapter, however, is not required to install or update HP-UX.

The first half of this chapter gives a broad picture of the install, update and modify procedures. The second half of this chapter explains install/update in more detail. (A detailed explanation of modifying HP-UX is given in chapter 5.)

For definitions of the terms used in this manual, see the glossary in appendix F.

HP-UX During Normal Operation

The HP-UX operating system is composed of modules, each with a distinct function. The central module of HP-UX is the **kernel.** The HP-UX kernel handles housekeeping chores for the system, such as managing input/output, the file system, memory, etc. As Figure 2–1 shows, the kernel isolates users and the application programs from the complexities of the hardware.

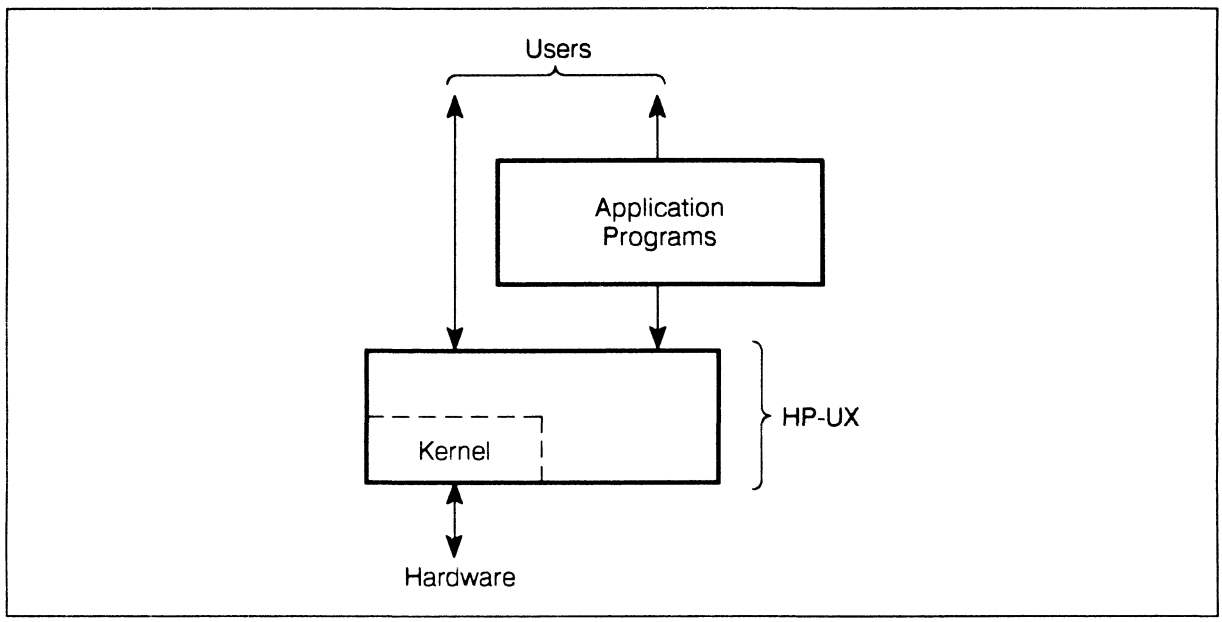


Figure 2–1. The HP-UX Kernel Isolates the User From the Hardware

During normal operation, the HP-UX kernel resides in main memory (RAM) in the computer system's SPU (System Processing Unit). However if power for the memory cards is lost, then the HP-UX kernel in main memory is also lost. This happens, for example, when the system is powered down, or if there is a power failure and the system does not have a battery back-up unit (BBU). To bring the HP-UX kernel back into memory, you must boot from the system disk.

Booting From Disk

Although the HP-UX kernel may be lost from main memory, it still exists on the system disk drive (Figure 2–2). The **system disk drive** contains all the files for HP-UX, including the files needed for the kernel.

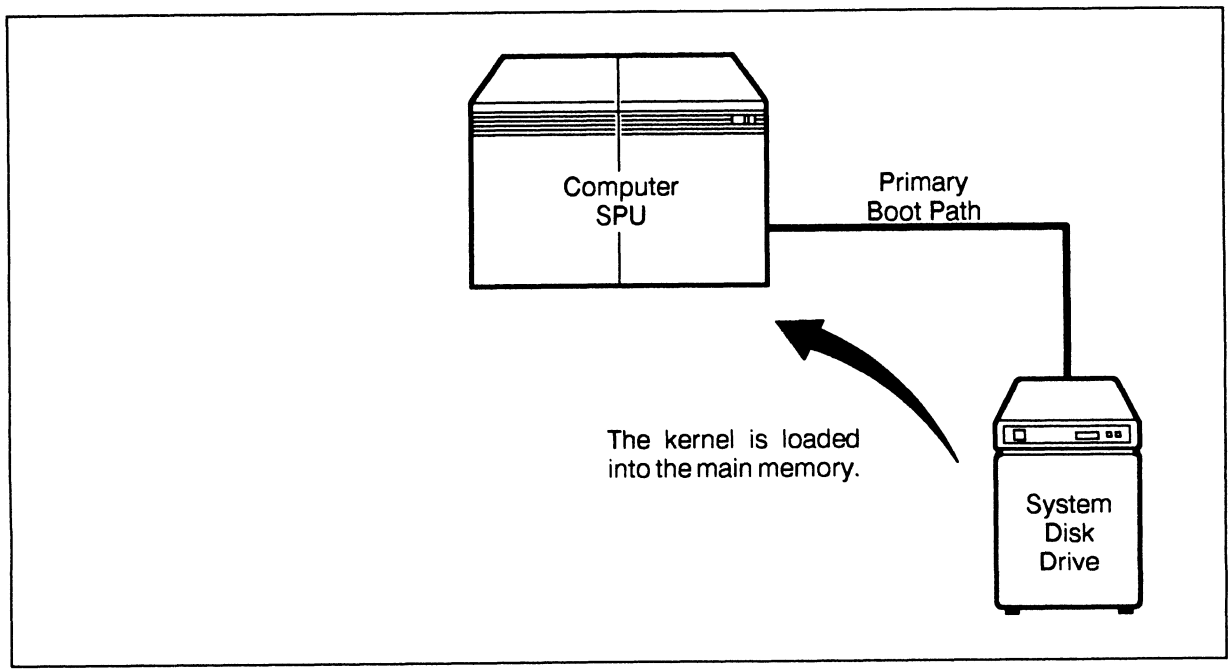


Figure 2–2. Booting From Disk: The Kernel Is Loaded into Memory From the System Disk

To load the HP-UX kernel back into memory, the computer system **boots from disk:** the system goes to the system disk, loads the necessary files into memory, then starts HP-UX running again. Normal operation of the system can then continue. The system normally boots from disk whenever the system is powered back on or is reset.

Installing HP-UX

When a Series 800 computer system is initially installed, the system disk is blank and the system cannot boot. Therefore the first item of business after the system hardware is installed is to install HP-UX (Figure 2-3). **Installing HP-UX** means copying the HP-UX files from the installation tapes onto the system disk. Installation also includes generating the kernel so that it includes the appropriate I/O configuration for the system.

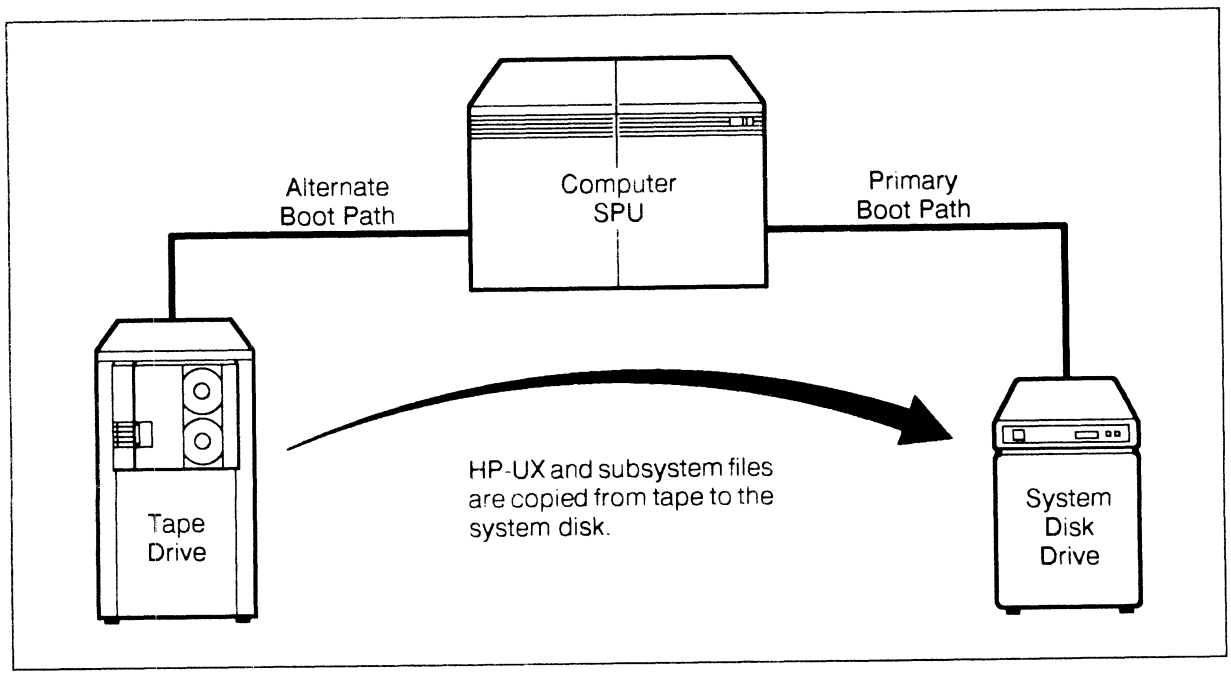


Figure 2-3. Installing HP-UX: Copying Files From Tape to the System Disk

To install HP-UX, you need the installation tapes (reel-to-reel or cartridge) supplied by Hewlett-Packard. After mounting the first tape on the tape drive, you enter a series of commands at the system console. The program tells you when to change tapes and asks for the information it needs to configure HP-UX for your particular system.

Note The information you enter during installation may differ slightly for different SPUs. The hardware appendices at the end of this manual give installation information for the individual SPUs.

After about an hour (reel-to-reel tape drives) or several hours (cartridge tape drives), installation is complete and the system automatically boots. The time required for installation depends on the number of subsystems that are installed. After installing HP-UX, you can proceed to other system administration tasks required for setting up a system (for example, creating a password for root and adding users).

Updating HP-UX

Periodically, Hewlett-Packard releases a new version of the operating system (HP-UX 2.0, HP-UX 2.1, HP-UX 3.0, etc.). New versions of HP-UX may support new peripherals or have additional features. The **update** process replaces the outdated portions of HP-UX with current versions (Figure 2–4).

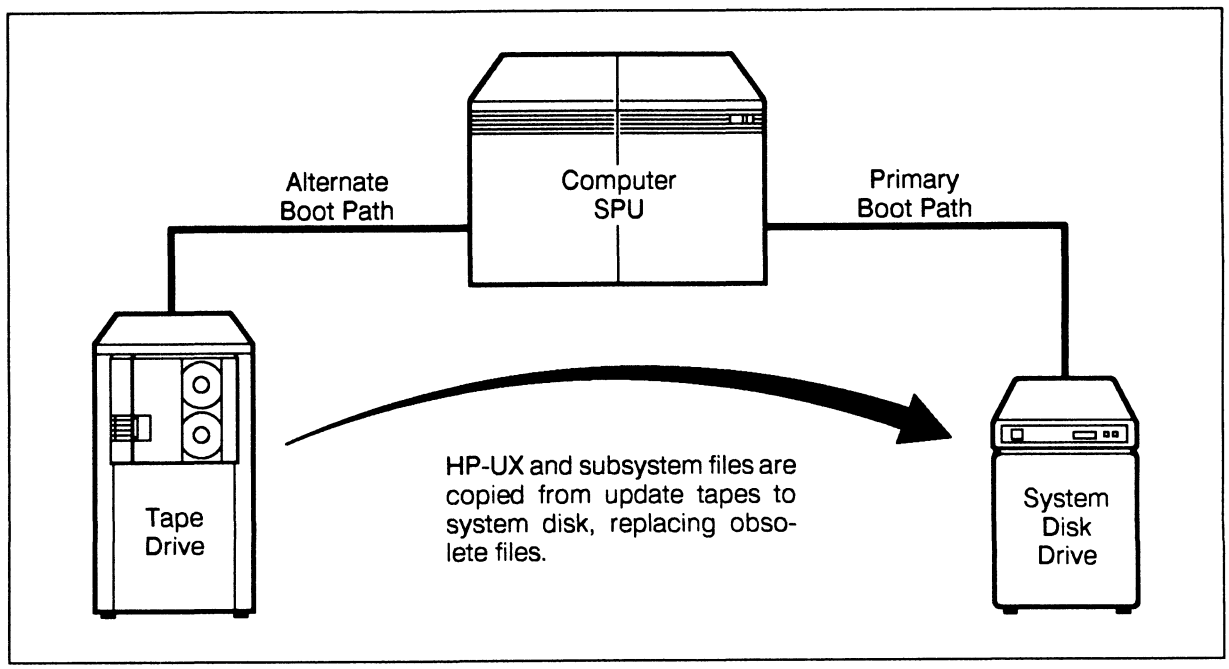


Figure 2–4. Updating HP-UX: Copying Newest Version of Files From Tape to the System Disk

To perform an update, you use the update tape(s) labelled "HP-UX CORE + SUBSYS" supplied by Hewlett-Packard. You mount the tape on a tape drive, run the Update program, and follow the instructions given by the program. The procedure is almost exactly the same as the second half of the installation procedure.

Modifying HP-UX

As you saw in Figure 2–1, the kernel is the module of HP-UX that deals directly with the hardware. Therefore if the hardware changes, the kernel may have to change. For example, if you change the **I/O configuration** (the location of I/O cards in their slots), you may have to modify the kernel. Another reason to modify HP-UX is to change system parameters. System parameters is a very technical subject; to learn more, refer to chapter 7 in the *HP 9000 Series 800 System Administrator's Manual* (part number 92453-90004).

The I/O configurations and system parameters supplied by Hewlett-Packard are appropriate for most Series 800 customers. You will probably not have to modify HP-UX.

There are two ways to modify HP-UX: by using menus or by entering commands. The easier way is to use the menus in the SAM utility (see *System Administration Basics: a Menu-Oriented Approach*, part number 92453-90017). On the other hand, you have greater control and flexibility with the command-driven method described in chapter 5. Briefly, the command-driven method requires making changes to the configuration file named **S800,** generating new device files, and generating the kernel with the **uxgen** program.

If you do need to modify HP-UX, read chapter 5 to make sure you know what you are doing before you begin. Modifying HP-UX is more complicated than install/update, and mistakes are not always easy to remedy.

Installation/Update in More Detail

This half of the chapter describes the install/update process in more detail.

HP 9000 Series 800 Computers

To understand the installation process, you need to know a little about the underlying architecture of the Series 800 computer systems (Figure 2–5). Once you understand the architecture, you will see how hardware addresses specify the location of peripheral devices on the system. For example, you will understand how the hardware address for the system disk (the Primary Boot Path) is derived.

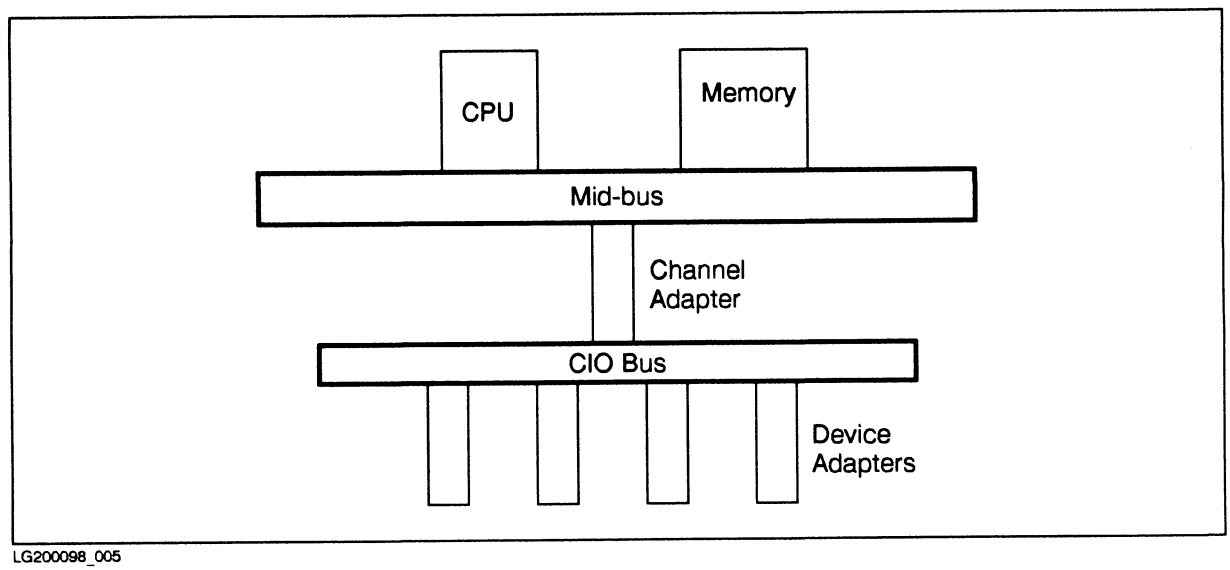


Figure 2–5. Basic Architecture of Series 800 Computers

As you can see in Figure 2–5, the CPU, memory, and Channel Adapter communicate over the Mid-bus. (A **bus** is a communications path that carries data and signals between hardware modules.) Inside the SPU, there are Mid-bus slots into which circuit cards can be inserted. These **Mid-bus cards** can then communicate over the Mid-bus. Two examples of Mid-bus cards are memory cards and Channel Adapter cards.

The Channel Adapter serves as an interface between the Mid-bus and the rest of the I/O system. Specifically, the Channel Adapter performs the conversion between the Mid-bus and the lower speed Channel Input/Output (CIO) bus.

Channel Input/Output (CIO) Bus

The **CIO bus** is the general-purpose I/O bus on Series 800 computers. Inside the SPU, there are CIO slots into which CIO cards can be inserted. These cards communicate over the CIO bus with the Channel Adapter, and from there to other parts of the system. CIO cards are also known as Device Adapters (DAs). Some examples of CIO cards are:

- HP-IB cards for HP-IB devices such as HP-IB disk drives, tape drives and HP-IB printers
- HP-FL cards for devices which use a fiber-optic link, such as HP-FL disks
- MUX cards for serial devices like terminals, modems, and serial printers
- LAN (or LANIC) cards for Local Area Networks (LANs)
- Access Port (AP) cards for remote support

Connected to each CIO card are one or more peripheral devices. Thus, in order for main memory to pass data to an I/O device (such as a disk drive), the data travels a path involving several components. The data will go from main memory over the Mid-bus, through the Channel Adapter, over the CIO bus, through the CIO card (Device Adapter) and finally to the device.

Typical I/O paths are shown in Figure 2-6.

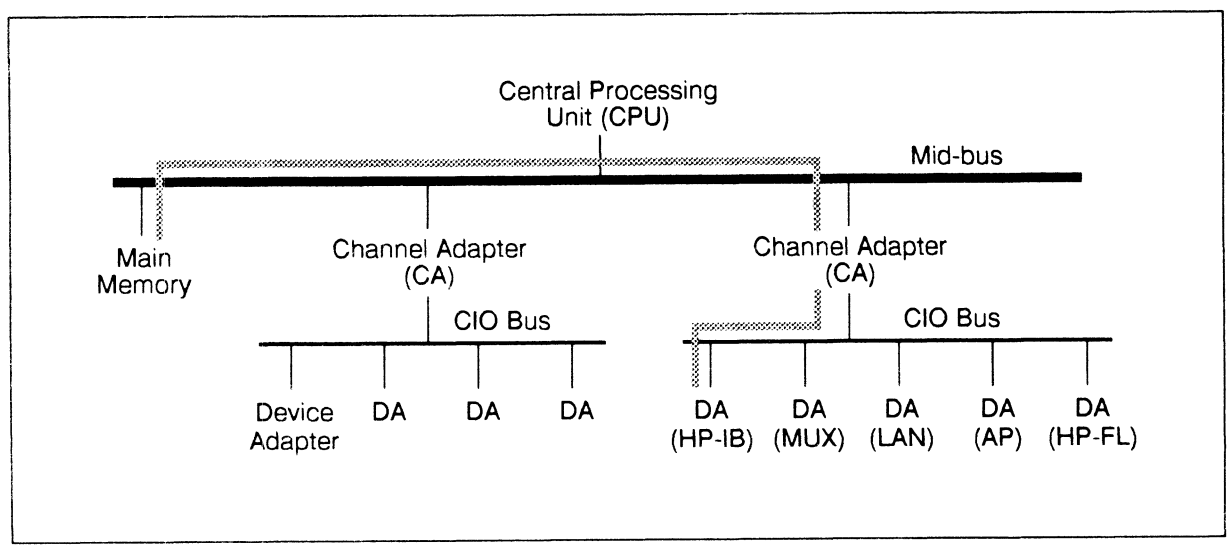


Figure 2-6. Typical I/O Paths

Hardware Addressing

Each peripheral in your system has a unique **hardware address,** which is derived from the I/O path leading to that device. Figure 2–7 shows a typical hardware address. (The 850 also includes a fourth number which will be explained shortly.)

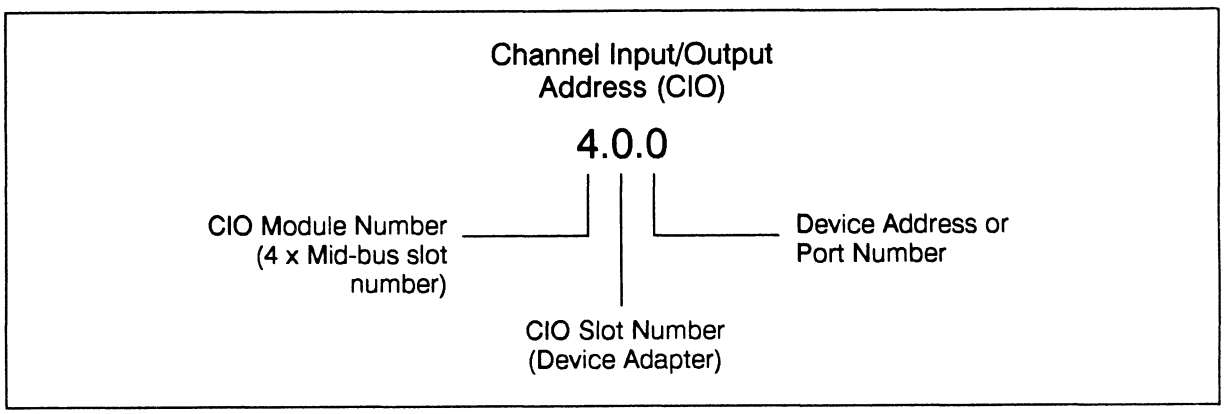


Figure 2–7. Sample Hardware Address

As shown in Figure 2–7, there are three parts to a CIO address. These parts specify a path through the I/O system. In this example, the hardware address says in effect: "Go to the Channel Adapter represented by module number 4 (the card in Mid-bus slot 1). Then go to the Device Adapter in CIO slot 0. Finally go to the device attached to this Device Adapter which has the device address of 0."

Module Number

The location of the Channel Adapter determines the Module Number, which is the first part of the hardware address. To calculate the Module Number, find out which Mid-bus slot the Channel Adapter is installed in (the Channel Adapter can be either a discrete card or a chip located on another card). Multiply the Mid-bus slot number by 4. If the Channel is in Mid-bus slot 2, for example, the Module Number is 8 (4 x 2). Module Numbers on the 850 are slightly different; this is explained in the next section.

Since Channel Adapters may be in different slots on different systems, the Module Numbers may be different. Also, an SPU may have multiple Channel Adapters. See the hardware appendices in this manual for information on individual SPUs.

CIO Slot Number

The second part of the hardware address is easier to determine than the Module Number. The number is the CIO slot number of the Device Adapter card. For example, an HP-IB card in CIO slot 2 means that all the devices attached to it will have 2 as the second part of their hardware addresses.

For a specific I/O configuration, only certain kinds of Device Adapter card can be installed in a given slot. For example, a system may be configured so that only a MUX card can go in CIO slot 5. To change the I/O configuration, use the procedure in chapter 5. However, the default I/O configuration is suitable for most systems. The default I/O configuration for

an SPU is described in the hardware appendices in this manual, as well as in the hardware Installation and Configuration Guide shipped with the SPU.

Device Address or Port Number

The third part of the hardware address is the device address or port number. Since a Device Adapter can have several devices attached to it, this number indicates which of those devices is addressed. On disk drives and magnetic tapes, this number is the HP-IB or HP-FL device address which is set on the device itself. For MUX cards, the device address is the port number.

Figure 2-8 shows how HP-IB addresses on a CIO system differentiate between the disk drives attached to an HP-IB card.

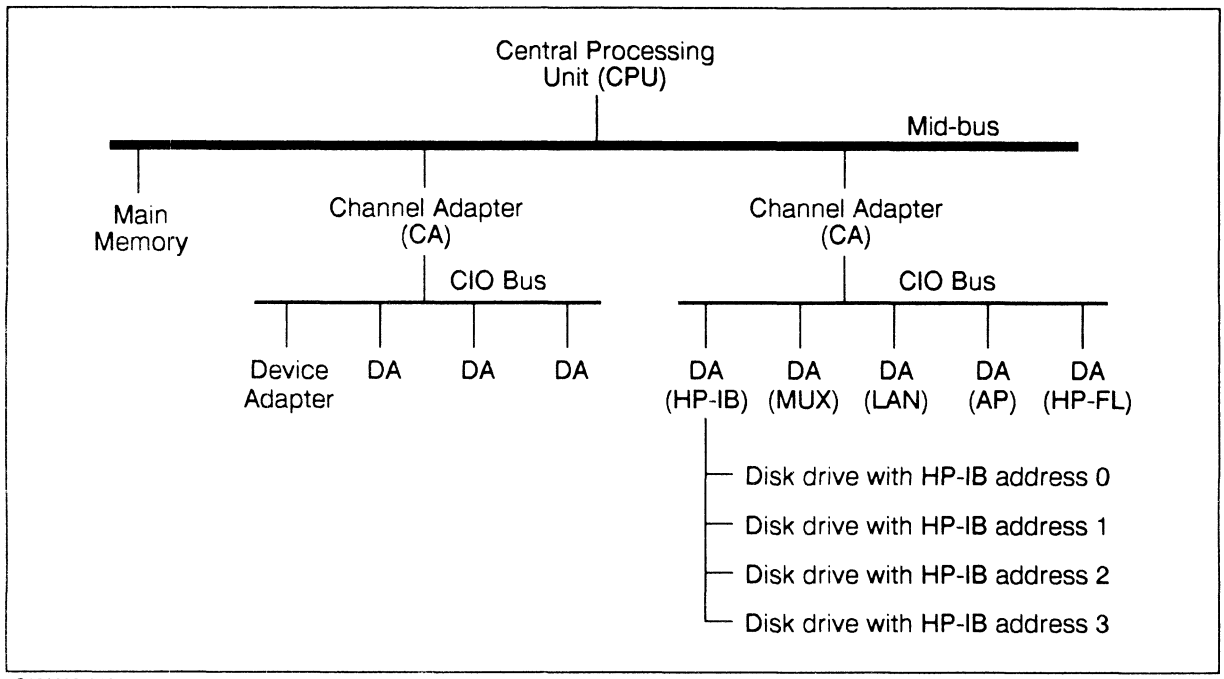


Figure 2-8. HP-IB Addressing

Hardware Paths on the 850

The 850 has two Mid-buses, Mid-bus 0 and Mid-bus 1. Each is serviced by a Bus Converter (Bus Converter 0 and Bus Converter 1). These are shown in Figure 2–9.

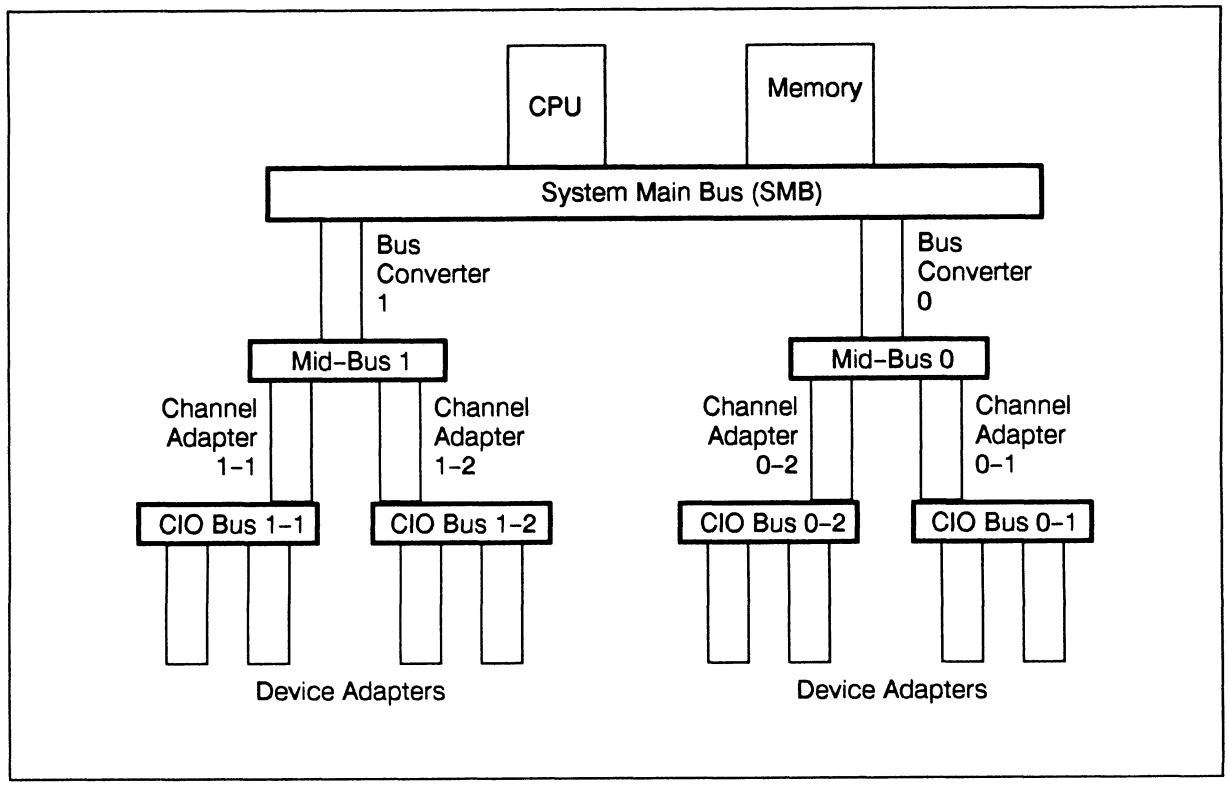


Figure 2-9. Hardware Architecture of the 850

To specify a hardware address on the 850, you must identify the correct Bus Converter. This is done by adding a Bus Converter (BC) address to the front of the hardware address (separated with the "/" symbol). A 2 is added for Bus Converter 0, and a 6 is added for Bus Converter 1.

In addition, the Module number is formed somewhat differently:

```
Module number = (BC x 64) + (MB x 4)

where BC = Bus Converter number
      MB = Mid-bus slot in which the Channel Adapter card is located
```

For an example, see Figure 2–10 For more details and examples, refer to the hardware appendix for the 850.

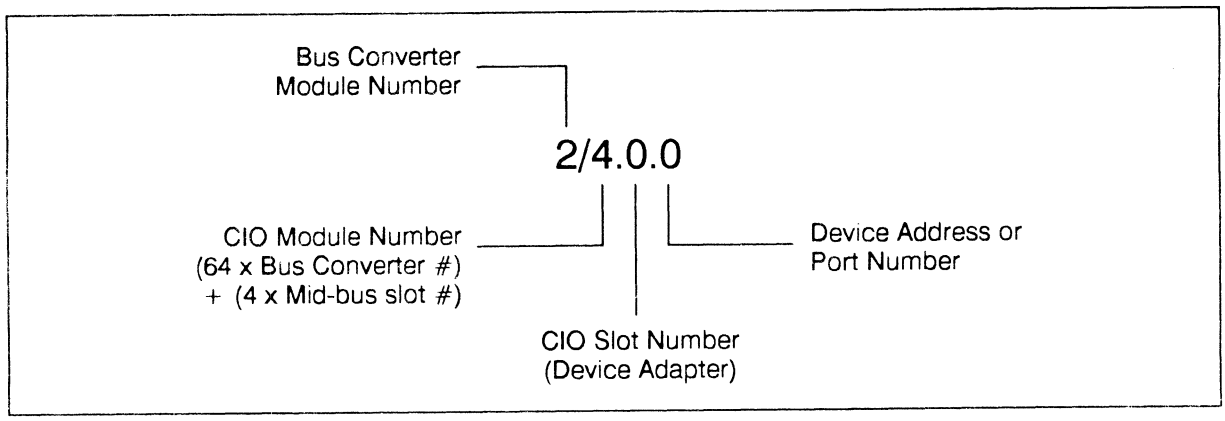


Figure 2-10. Hardware Paths on the 850

Console and Boot Paths

During installation, there are three hardware addresses we are particularly concerned with:

- **Primary Boot Path** (hardware address of the system disk)
- **Alternate Boot Path** (hardware address of the tape drive used for installation)
- **Console Path** (hardware address of the system console)

Figure 2–11 shows these three paths. Different SPUs can have different paths. Refer to the hardware appendices for information on specific SPUs.

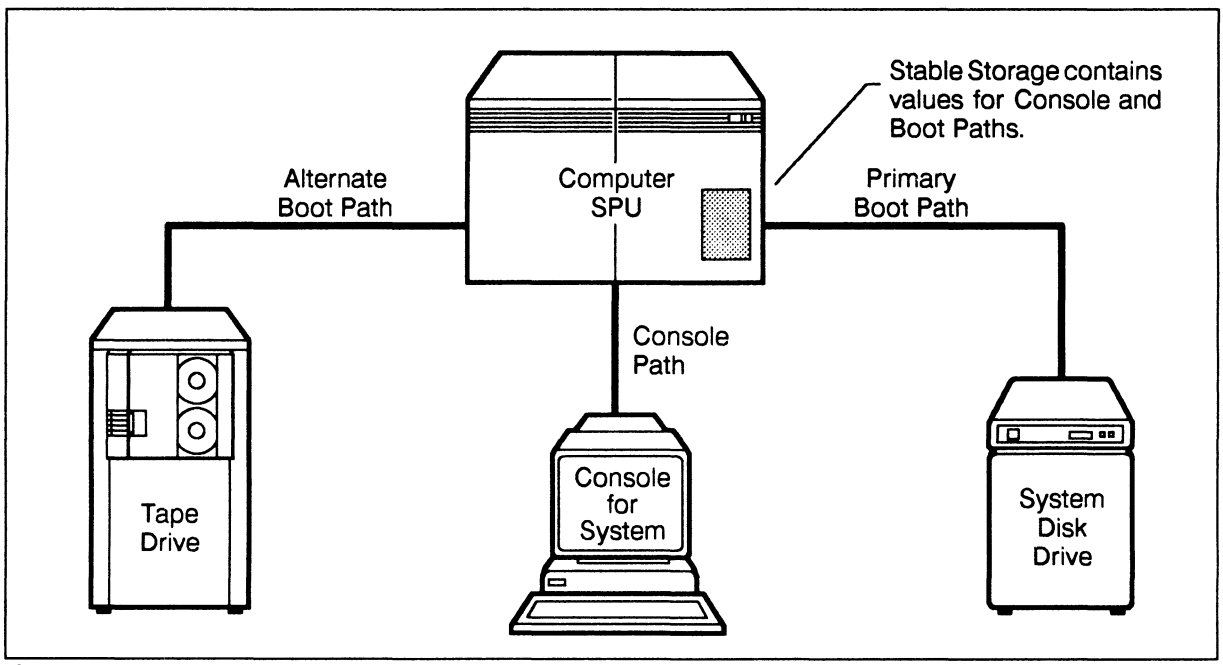


Figure 2–11. The Boot and Console Paths

Because it is important for the system to know these paths when it is booting up, path information is stored in a special non-volatile type of memory called **Stable Storage.** Stable Storage retains the data stored in it even if power is turned off. Path information in Stable Storage can be changed, as described on the next page.

A Typical Boot (System Startup)

Each SPU contains **Processor Dependent Code (PDC),** a set of instructions stored in Read-Only Memory (ROM). Each computer model has different PDC specially written for it. When the system starts up, it initially follows the instructions in PDC: it finds the system console, initializes it, and waits ten seconds for you to interrupt it (if you want) by pressing a key on the console. If you do not interrupt, the system automatically boots (**autoboots**) using what PDC finds as the boot device. First, PDC tries the Primary Boot Path in Stable Storage, and then the Alternate Boot Path in Stable Storage. If a boot device is found, the system loads HP-UX and starts it running. If no boot device is found, you must enter a hardware address for the boot device.

Note

On some Series 800 computers, the system performs an **autosearch** (if enabled), scanning the Mid-bus and CIO slots for a console (console autosearch) or a boot device (boot autosearch). Even so, you should make sure the paths in Stable Storage are correct in case autosearch isn't available on your SPU. Checking and changing hardware paths is covered below and in the hardware appendices.

A Typical Installation

To install HP-UX, you should interrupt the autoboot process by pressing any key within ten seconds. If you don't press a key, the system will try to load HP-UX from the system disk. At this point the system disk is blank since the HP-UX files haven't been copied onto it. To copy the HP-UX files, you want the system to load from the tape drive instead of from the system disk. To do this, tell the program to boot from the Alternate Boot Path (if that is correct), or enter the correct hardware address for the tape drive.

Initial System Loader (ISL)

The system loads a program from tape called **Initial System Loader (ISL).** ISL allows you to bring up the system and then to boot HP-UX. (On Series 800 computers, ISL can also be referred to as IPL).

Changing Hardware Paths

Several commands are available through ISL, including commands to change the default boot paths. When you are at the ISL prompt (ISL>), it is a good idea to check the hardware paths—incorrect hardware paths are a common cause of problems during installation. You can check the paths with the DISPLAY command, and you can change the paths with the PRIMPATH, ALTPATH, and CONSPATH commands. The modified paths are retained in Stable Storage. For help on the ISL commands, type a question mark (?) at the ISL prompt.

The Install Command (hpux)

After checking the hardware paths, you enter the command to begin the installation program. The exact command you enter depends on the model of the SPU and the system configuration. If you are installing from a reel-to-reel magnetic tape drive, you enter a command similar to:

```
ISL> hpux tape1(4.2.3;0x0a0000,1)
```

You don't have to understand the syntax of this command to do an install. Just pick the correct command for your system from one of the tables in the hardware appendices. To install from mag tape, the simplified command, **hpux install,** is sufficient. However if you're curious about the "hpux" command, the syntax is explained in Figure 2–12 and in the following paragraphs.

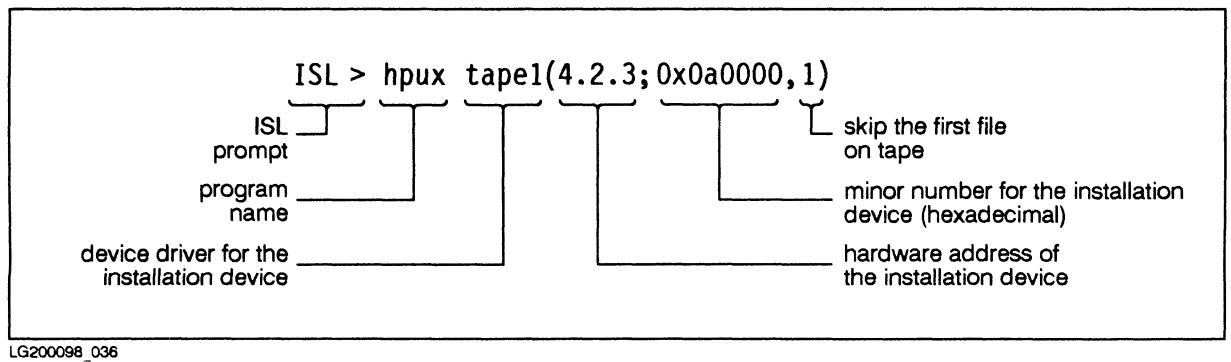


Figure 2-12. The Command to Install HP-UX

Syntax of the "hpux" Command

The command to call up the install program is **hpux.** Next on the line is **tape1,** the name of the device driver used with reel-to-reel magnetic tape drives. (A **device driver** is a software module which handles I/O for a particular class of peripherals.) The **4.2.3** inside the parentheses is the hardware address of the tape drive (it should be the same as the Alternate Boot Path). The next number, **0x0a0000,** is a minor number for the device. The **minor number** contains information about the device in coded form; it is rather complicated. You can read more about minor numbers in chapter 5 of the *HP 9000 Series 800 System Administrator's Manual.* The final **1** tells the program to skip the first file on the tape before starting to read data.

The command for installing from a cartridge tape drive (CTD) is similar. A sample command is:

```
ISL> hpux disc0(4.2.4;0x400000)
```

Notice that for cartridge tape drives, there is a different device driver (**disc0**) and minor number (**0x400000**) than for reel-to-reel tape drives. The hardware address is also different.

The Mini-kernel

After you enter the proper command, a temporary mini-kernel is loaded from tape into main memory. This mini-kernel is used to perform the rest of the installation. The mini-kernel is booted, and the installation utility begins.

Disk Partitions (Sections)

On the console, the **Root Disk Partitioning** screen appears next. This screen shows the default disk partitions (sections).

These partitions represent the way HP-UX divides physical space on the system disk. HP-UX assigns directories to certain sections by default (the particular assignment of directories varies according to the model of disk). This screen allows you to change default allocations, if desired. In this way you can determine where the files will reside on the disk after they are copied during the install procedure. Normally, you choose the default partitions (sections) unless a specific partitioning scheme is desired.

Once you have accepted the default partitions (sections) or changed them, you enter the Update portion of the install process.

The Update Portion of Installation

The Update portion of the install process is a sophisticated menu-driven program which transfers files. During install, the Update program transfers files (the HP-UX and subsystem files) from tape to the system disk.

Note

The term "update" means two different things. First, it can refer to the update process, whereby the HP-UX operating system is updated to a more current version. Secondly, it can refer to the Update program which is the menu-driven program to transfer files. The Update program is used both in the install process and in the update process.

In the first part of the Update program, you choose the subsystems to be copied to the system disk. In general you should select the Process All option which copies all available subsystems on the tape.

The program then estimates the disk space required. If there is enough space on the system disk, you can proceed. If there is not enough space, the program displays a warning message, indicating the need to free up disk space. Instructions for freeing up disk space are given in chapters 3 and 4.

At the end of the Update program, you are are asked questions about the configuration of the system. Based on your responses, the program picks one of several template files for configuration. This template file becomes the **S800** configuration file, which is used by the Update program to generate the kernel.

After generating the kernel, the new customized version of HP-UX is booted, and installation is complete.

3

Installing HP-UX

This chapter contains a step-by-step guide to installing HP-UX.

Before you get here you should have unpacked and connected the hardware, using the hardware installation manual, which is a separate book, usually called the *Installation and Configuration Guide.* This chapter explains how to install the HP-UX operating system software and any accompanying optional subsystems you may have bought (networking, for example).

You need to install HP-UX if:

- You are bringing up a new system for the first time.
- Your system has become corrupted and you need to re-install.

You may also choose to re-install to repartition your root disk. Refer to chapter 6 for more information, and to the Series 800 *System Administrator's Manual* for alternative ways to do this.

Caution

If you are re-installing (that is, you already have HP-UX running on your system), you must verify that your I/O configuration meets the specifications in the hardware installation guide for your computer. You cannot successfully install otherwise.

You **DO NOT** need to install HP-UX if you are only:

- Updating HP-UX from one release to another.
- Adding application software to the system.

Preparation

Before you start, you need to do four things:

- Read supporting documentation.
- Decide whether to use short or long filenames.
- Make sure your hardware configuration matches the specifications in the hardware guide for your computer.
- Determine the hardware path to the tape drive.

Supporting Documentation

Essential reading before you start:

- The *Read Me First* document supplied with this release.
- Appendix D of this manual for information specific to this release.
- Installation guides for any optional products you may be installing. Installation guides you may need include:
  - for Networking:
    - *Installing ARPA Services/9000 Series 800* (part number 98194-90007)
    - *Installing Network Services (NS)/9000 Series 800* (part number 98194-90008)
    - *Installing LAN/9000 Series 800* (part number 98194-60009)
  - for Native Language I/O:
    - *Native Language I/O System Adminstrator's Guide* (part number 92559-90002)
  - for ALLBASE/HP-UX
    - The ALLBASE/HP-UX *Read Me First*

Short or Long Filenames?

During installation, you'll have an opportunity to decide whether you want to use short filenames (maximum 14 characters) or long (maximum 255 characters).

New users should use the following guidelines:

- Use long filenames if you plan to use application packages that require them. (Check with the suppliers of the application software if you are not sure. None of the subsystems supplied with the standard Hewlett-Packard installation tapes requires long filenames.)
- Use short filenames otherwise.
- Always use short filenames if you are developing software to sell to third parties.

Configuration

Make a physical check of your hardware. Make sure that it matches the specifications in the hardware installation guide. If it doesn't, you must change it or the installation will fail.

825/835 Users

If your computer is an 825 or 835, and your console is a graphics device, you need to find out which model of graphics interface card you have: A1017A or A1047A.

There are two ways to find out

- Look at the packing list.

  The list of components that came with the system shows which model number you have.

- Look at the hardware.
  - If your graphics system has a single full-width card, you have model A1017A.
  - If your graphics system has one full-width and one or two half-width cards, you have model A1047A.

Make a note of the model number: you'll be asked for it during the installation.

Determining Hardware Path

Next you need to determine the **hardware path** to the magnetic tape or cartridge tape drive. A hardware path maps a physical device (disk drive, tape drive, etc.) to an address in memory. (There is more information about hardware paths under **Hardware Addressing** in chapter 2.)

Warning

Hewlett-Packard supports only those configurations that appear in the tables in the appendixes.

If you are an experienced user, do not assume you already know what configuration will work—check the appendix for your computer.

The hardware path to the tape drive is also known as the **alternate boot path,** and you need to know it so that you can direct the computer to **boot** (start up) from the software on the installation tape.

Hardware Paths on Your System

The appendixes to this manual give hardware information specific to each model of the Series 9000 computers.

FInd the appendix for your computer and write down the **Alternate Boot Path** and the **Command to Boot from Tape.** You'll find them in Tables B-1/B-3 for an 840, or Tables C-1/C-2 for an 850. For an 825/835, use Table A-1, which will in turn direct you to the table you need.

Leave the line for **Alternate Boot Path (displayed)** blank for now.

Alternate Boot Path (from appendix)_____

Command to Boot from Tape_____

Alternate Boot Path (displayed)_____

Caution

Do not proceed until you have filled in the first two lines above. You will be filling in the third shortly.

It's a good idea to remove this page from the binder and keep it in front of you while while you go through the installation procedure. You should also keep a few sheets of blank paper and a pencil handy.

You are now ready to begin installing HP-UX. Allow from 1 to 5 hours—the actual time depends on the size of your disk, the number and size of the subsystems you are installing, and whether you are using cartridge or magnetic tape (installation from cartridge tape takes about three times as long as installation from magnetic tape).

Overview

The phases of the process are as follows:

Steps	
1-2	Set-up
3-8	Boot from tape
9-11	Install file system and boot partition
12	Boot from disk
13-18	Install HP-UX core and subsystems
19-24	Run "customization" scripts and generate kernel
25-27	Termination steps

For New Users: A Note On Screens.

The word **screen** is used in two senses in this manual. Firstly it means the face of the terminal on which characters appear; secondly, by extension, it refers to a form that a program prints on the terminal. The installation software you will be working with uses screens in this second sense from step 9 on. If you turn to step 9 now, you can see an example.

On this kind of screen, you move the cursor from place to place by pressing the Tab key, and when you have finished filling in responses, you press a **function key.**

On an HP terminal keyboard, **function keys** (keys that cause the program to take action) are on the top row of the keyboard, and are marked `f1, f2, f3`, etc. The **function key labels,** describing what each key does, appear at the bottom of the CRT screen. A blank key label means that this key has no effect on this particular screen.

The function keys for the screen in step 9 are:

Perform Task	Default Sections	Refresh	Help

The directions in the procedure that follows will tell you what to do on each screen as you go along.

The Installation Procedure

Follow these steps to install your HP-UX system.

Warning

If you are re-installing HP-UX, and your system is operational, back up the system disk to tape now. If the installation should fail, this back-up will allow you to recover your system by bringing files back selectively.

Refer to chapter 5 of the Series 800 *System Administrator's Manual* **for more information on doing a backup.**

1. Turn on power to the disk drive, the tape drive, and the console. If this is a new installation, **DO NOT** turn on the SPU (the computer itself) yet.

Note

- **Users of 700/92 Terminals:** your screen will go blank after a while if you don't enter anything from the keyboard. To turn the display back on, press the Shift key. Do not use use any other key for this.
- **Users of 35401 autochanger cartridge tape drives:** before turning on the 35401, make certain that the **sequential/selective** switch on the back of the tape drive is set to **sequential.**

2. Load the tape marked **HP-UX Install Tape** on the tape drive.
   - If you are using a magnetic tape, make sure that the write ring has been removed, mount the tape and put the tape drive online (make sure that the ONLINE light is on).
   - If you are using a cartridge tape drive, make sure that the protect screw is pointing to SAFE, insert the cartridge tape, then wait for the BUSY light to go off before proceeding.
   - If you are using a 35401 cartridge tape autochanger, load the **HP-UX Install Tape** in magazine slot 1, and the **update** tapes in sequential order starting in slot 2. Then load the magazine into the drive.
3. **If you have not done an installation before, read all the way through this step before doing anything.**

   Turn on the computer, or **reset** it if you are re-installing.

Note

Reset means restarting a computer that is already running. You do this differently depending on which type of machine you're using.

On an 825 or 835, there is a keyswitch behind the hinged cover on the botom of the front cover: turn the keyswitch to **Reset** then back to **Secure.**

On an 840, the reset button is the red square at the right-center of the control panel (right underneath the status display), marked **RESET.** Press this button.

On an 850, the reset button is underneath the control panel cover. It is the leftmost button, marked **Reset.** Make sure the keyswitch, on the upper half

of the control panel, is in the **Console Enable** position, then press the reset button.

After power on or reset, the computer executes a self-test, then sends boot messages to the console. The information printed on the console includes the default hardware paths to the console, the primary boot device and the alternate boot device.

Then the following message appears on the console:

```
Autoboot from primary boot path enabled.
To override, press any key within 10 seconds.
```

Note

This prompt will be referred to as "the override prompt" from here on.

PRESS A KEY ON THE KEYBOARD IMMEDIATELY.

The default path to the alternate boot device is showing on the screen, after

```
"Alternate boot path ="
```

Copy it down on the line you left blank next to **Alternate Boot Path (displayed)** on page 3-4. Copy only the first three digits: "<n>.<n>.<n>".

For example, if your screen says

```
Alternate boot path = 8.2.3.0.0.0.0
```

then write "8.2.3" next to **Alternate Boot Path (displayed)** on page 3-4.

In case of error

Problem	What to do
Failed to press a key	Reset and start again at the beginning of this step.
Didn't get override prompt	System may be set up incorrectly: turn power off, refer to hardware installation manual, start again at the beginning of this step (**Step 3**).

4. After you interrupt the boot process, the system prompts you as follows:

```
Boot from primary boot path (Y or N)?>
```

By default, the primary boot path is the disk, which is not what you want. Respond n.

Note

- You can type these responses in upper or lower case.
- From here through step 8, press Return to make the computer accept your responses if your computer is an 840 or 850. DO NOT press Return if your computer is an 825 or 835.

In case of error

Problem	What to do
Responded y	Reset and start again at **Step 3.**
Responded anything else	Retype response.

5. The system next prompts you

```
Boot from alternate boot path (Y or N)?>
```

On page 3-4 you should by now have written down a set of numbers for **Alternate Boot Path (from appendix),** and another set for **Alternate Boot Path (displayed).**

Now compare these two numbers.

- If the numbers match, respond **y** and skip to **Step 7.**
- If the numbers don't match, respond **n** and go to **Step 6.**

In case of error

Problem	What to do
Responded **y** but meant **n**	Reset and start again from **Step 3.**
Responded **n** but meant **y**	Go to **Step 6.**
Responded anything else	Retype response

6. **Skip this step if you responded y to the prompt in Step 5.**

The system now prompts you:

```
Enter boot path, command, or ?>
```

Respond with the number you wrote down on page 3-4 as the **Alternate Boot Path (from appendix).**

Continue with **Step 7.**

7. The system prompts:

```
Interact with IPL?>
```

or

```
Interact with ISL?>
```

(IPL is the same as ISL, the Initial System Loader.)

Respond **y**.

In case of error

Problem	What to do
Responded **n**	Reset and start again from **Step 3.**
Responded anything else	Retype response
Correct response but boot still fails	1. Check correct tape is mounted and drive online. 2. Use appendix to check boot paths. 2. Reset and start again from **Step 3.**

8. The system reboots. When the boot completes, the system prints

   ```
   Booted
   ```

   and then prompts:

   ```
   ISL>
   ```

   Look again at page 3-4. Find the **Command to Boot from Tape.**

   Respond

   ```
   <command to boot from tape>
   ```

   For example

   ```
   hpux tape1(<n>.<n>.<n>;0xa0000,1)
   ```

   or

   ```
   hpux install
   ```

   —depending on your configuration.

   After a pause, the system prints

   ```
   Boot
   ```

   followed by information that scrolls off the screen. You don't need to copy any of it down—just wait for the **Root Disk Partitioning** screen to appear.

Note

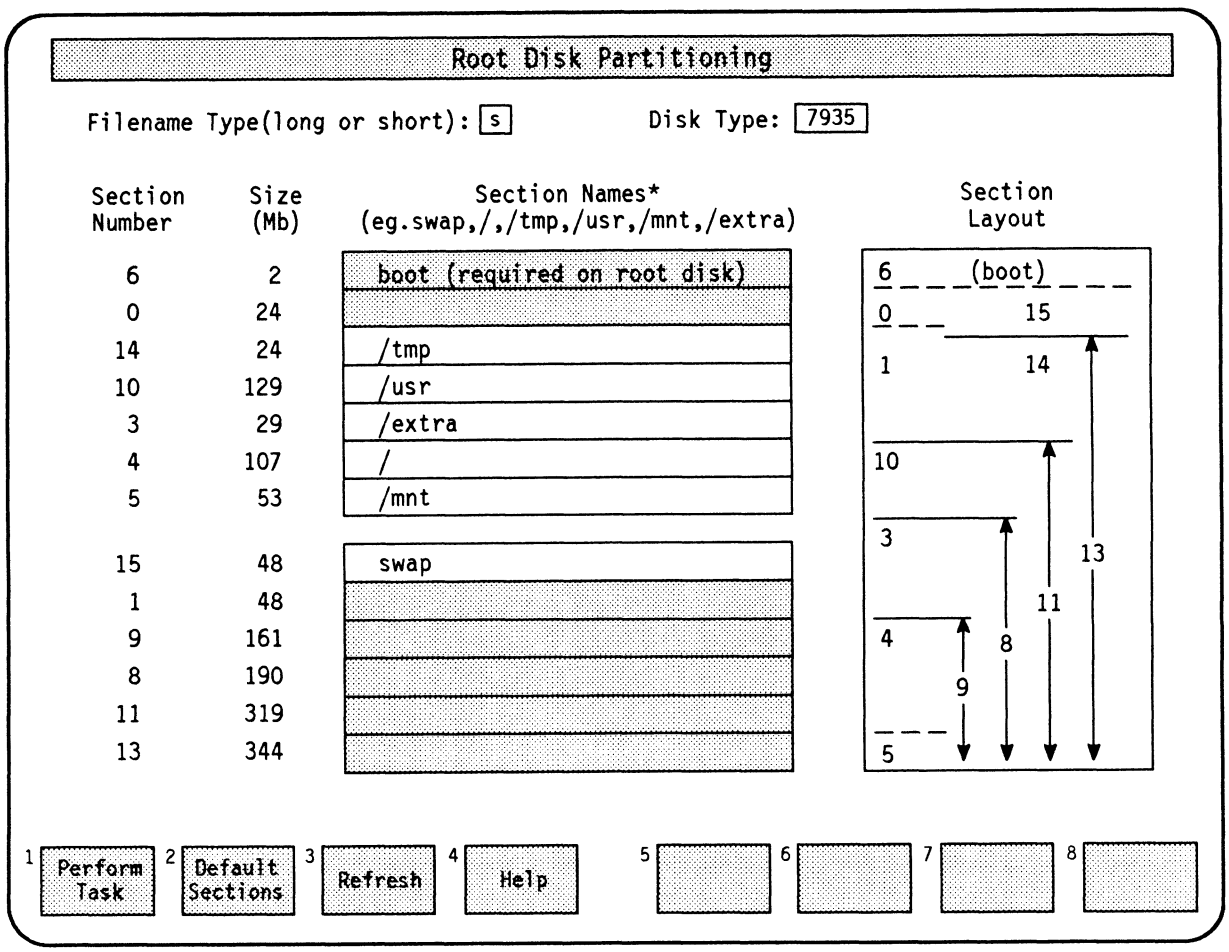
If you see the message

```
Skipping 1 file ... done
```

don't worry: it's not an error.

In case of error

Problem	What to do
Boot failed	Check command and retype. Make sure command matches text in the appendix *exactly,* including spacing.
Menu doesn't come up	Copy error information from screen. See also **Uncommon Errors** at the end of this chapter. Power off. Recheck system configuration. Make sure the **HP-UX Install Tape** is mounted and the drive is online, and start again from **Step 3.**



LG200098_010

9. This screen shows the default configuration for your system (or **root**) disk.

Note

This example is not meant to depict exactly what you see on your screen. That will depend on what type of disk you are using and the defaults that have been set for it.

The default layout of some disks is very different from this: for example, the 7959 has one large / (**root**) section and no **/tmp, /extra /usr** or **/mnt.**

Normally you should not need to change the configuration.

If you are an inexperienced user, do the following

a. Decide whether you want to use long or short filenames (see the discussion under **Preparation** near the beginning of this chapter). If you are going to use long filenames, type the letter `l` over the `s` in the `Filename Type` field.

b. Press [Perform Task]. (It's the key marked `f1` at the top left of your keyboard. See **A Note on Screens** near the beginning of this chapter if you are lost.)

If you are an experienced user and want to change the configuration of the disk, turn to chapter 6 for more information.

In case of error

Problem	What to do
Changed screen accidentally	Press [Default Sections] key.
Changed screen accidentally and pressed [Perform Task]	Respond `n` to `OK to begin installation`, then press [Default Sections].

10. You'll see a message at the bottom of the screen:

```
OK to begin installation <y/n>
```

Respond `y`. The screen clears and the system prints the following messages:

```
Begin installation

Making directories and mounting file systems
```

followed by a time estimate and a series of **mkfs** commands.

The file system structure is being built on the disk. As part of this process, the system makes backup copies of the **superblocks** and stores them at addresses which are recorded in the file **/etc/super_blocks.** After the install/update process completes, print this file and keep it with this chapter for future reference. You will need the backup copies if one or more of the superblocks becomes corrupted. (Superblocks contain critical details of each file system's size, the maximum number of files it can contain, etc. Refer to the Series 800 *System Administrator's Manual* for more information on superblocks.)

Once the file systems are built, the **install** program starts copying files from the **HP-UX Install** tape onto the disk. You'll see messages such as:

```
Downloading files to disk

Installing boot partition

Making device files
```

followed by time estimates.

11. The "install" portion of the install/update process is now almost complete. You'll see the following messages:

```
Copying checklist to disk.
Unload the install tape and mount the update tape.

Rebooting system to complete the installation.

Do not interrrupt the reboot process.
```

Dismount the install tape and mount the first of the update tapes (it will be marked

```
HP-UX CORE + SUBSYS        REEL 1 of <n>
```

where `<n>` is the total number of update tapes).

Put the tape drive back online.

A banner appears on the screen

```
********************
REBOOTING THE SYSTEM
********************
```

and the computer will reboot.

12. When you see the prompt

```
Autoboot from primary boot path enabled.
To override, press any key within 10 seconds.
```

DO NOT press a key. The bootable software is now on the disk, and the system must boot from there.

In case of error

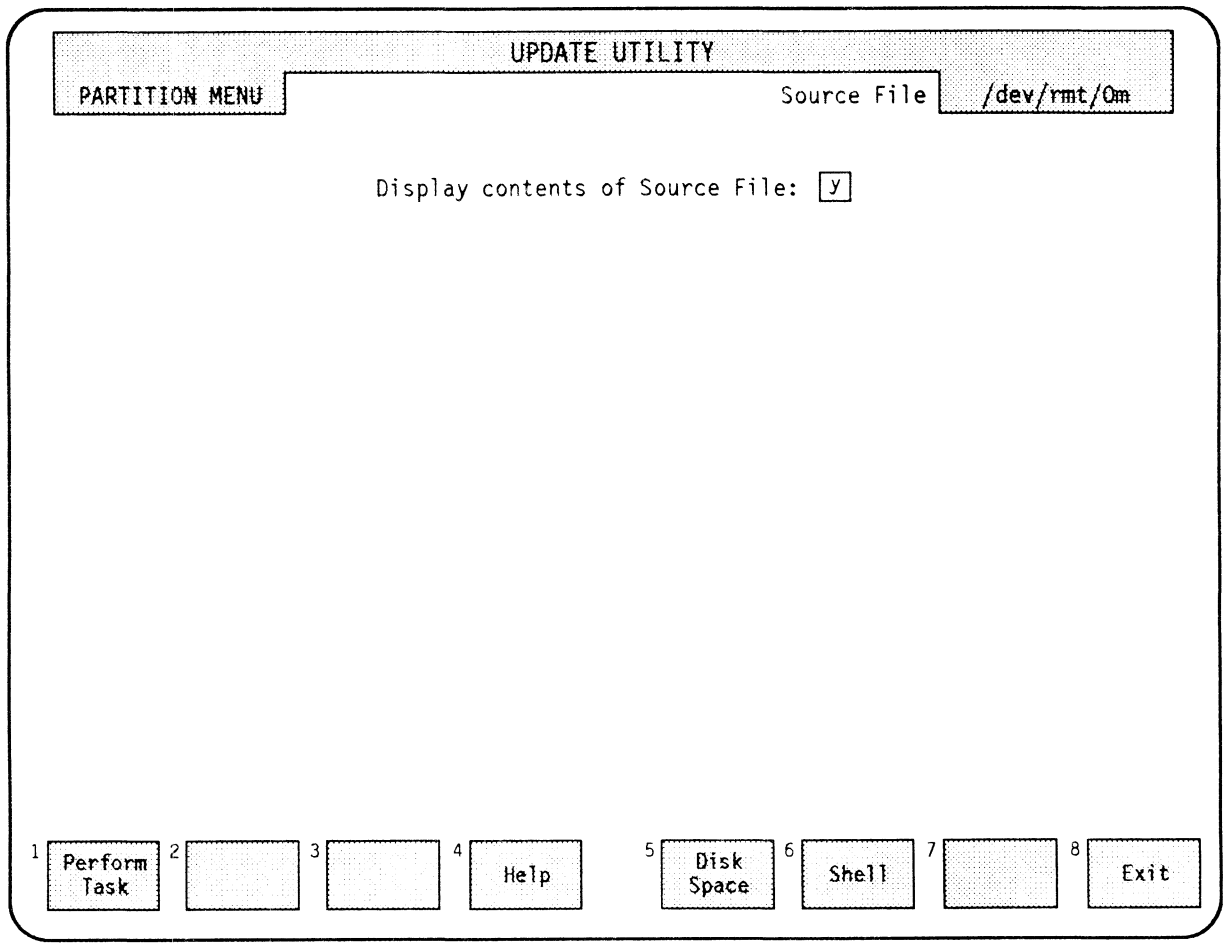
Problem	What to do
Pressed a key. Got prompt `Boot from primary path?`	Respond **y**. Respond **n** to prompt `Interact with ISL?`

The console displays boot information which scrolls off the screen. You do not need to pay attention to this information.

13. The screen eventually clears and the first menu of the **update** utility appears.

In case of error

Problem	What to do
Update menu never appears	Call HP.



LG200098_011

The **source file** identifies the tape drive. Make a note of the source file name in case you accidentally type over it.

Note

- The field containing the source file name is capable of scrolling sideways. This allows for a long path or filename, but it could also allow characters you typed accidentally to scroll off the screen. If you get the message `Source file does not exist`, and everything seems okay, you can check for extraneous characters in this field by pressing the ◄ and ► cursor keys repeatedly.
- If you are using a 35401 cartridge tape drive, wait until the READY light comes on before continuing.
- If you are using any other model of cartridge tape drive, wait for the BUSY light to go off before continuing.

The default response to the prompt (y) is what you want, so just press the Perform Task key.

(For more information on this screen, including the effect of the other function keys, refer to the section **Partition Menu (1)** *in chapter 7).*

In case of error

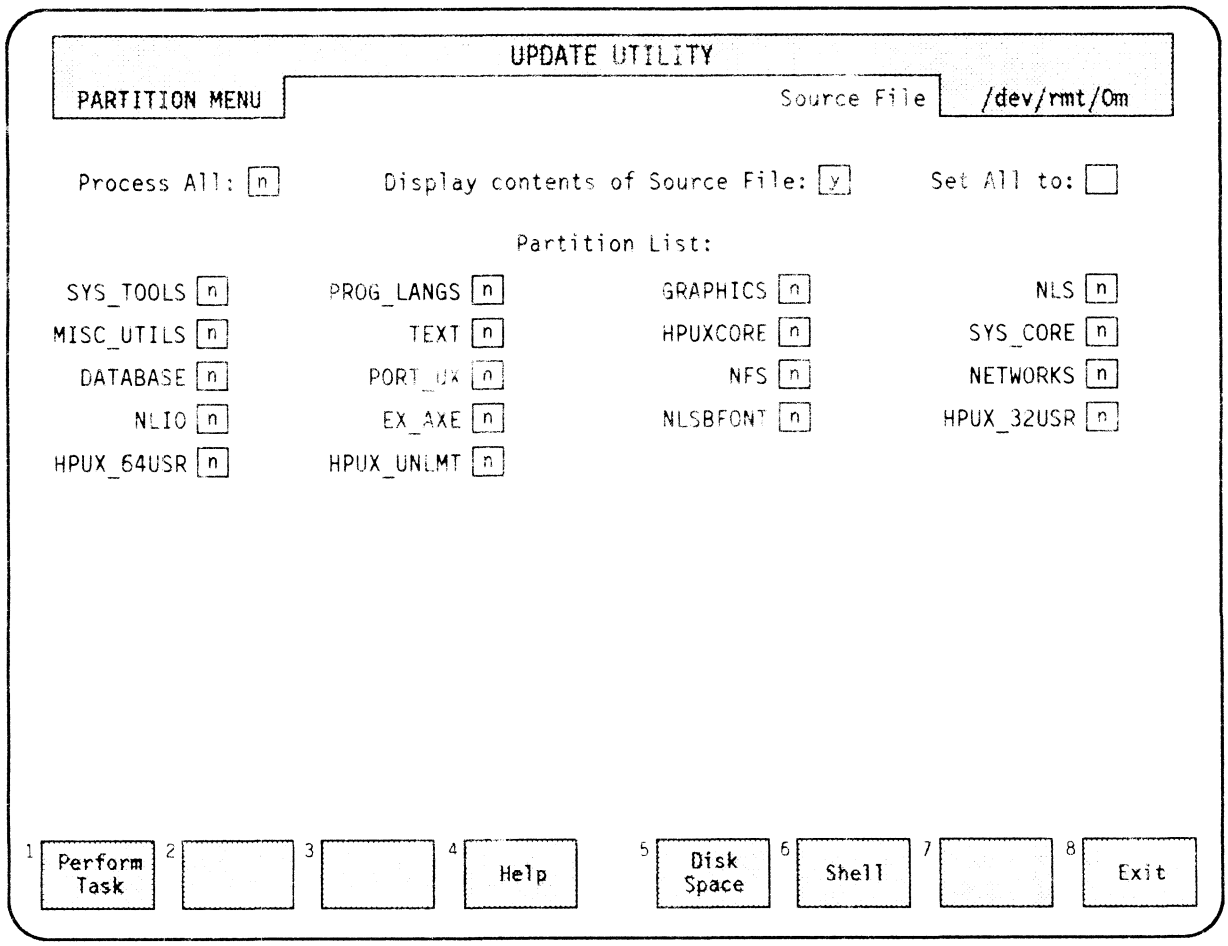
Message	What to do
`NO ACTION SELECTED`	1. Press space bar. 2. Change response back to **y**. 3. Press Perform Task.
`Cannot read table of contents on source file`	1. Check that you have changed to the **HP-UX CORE + SUBSYS** tape marked `REEL 1 of` *n* (where *n* is the total number of **HP-UX CORE + SUBSYS** tapes), and that the tape is properly loaded and the drive is online. If this is a cartridge tape drive, also check that the BUSY light is off. 2. Press space bar. 3. Press Perform Task.
`Source file does not exist`	1. Press space bar. 2. Make sure the source file name matches what you wrote down. 3. Press Perform Task.

(For more unusual errors, refer to the section **Partition Menu (1)** *in chapter 7.)*

14. The message:

    `Reading source file`

    blinks for a few seconds at the top of the screen, then the **Partition Menu** is repainted with the `Partition List` (a list of all the subsystems on the **HP-UX CORE + SUBSYS** tapes).



LG200098 012

This is a sample of what you might see—your list will differ depending on what subsystems you've purchased.

Enter y in the `Process All` field and press [Perform Task].

Warning **You MUST select `Process All`. DO NOT omit any partitions.**

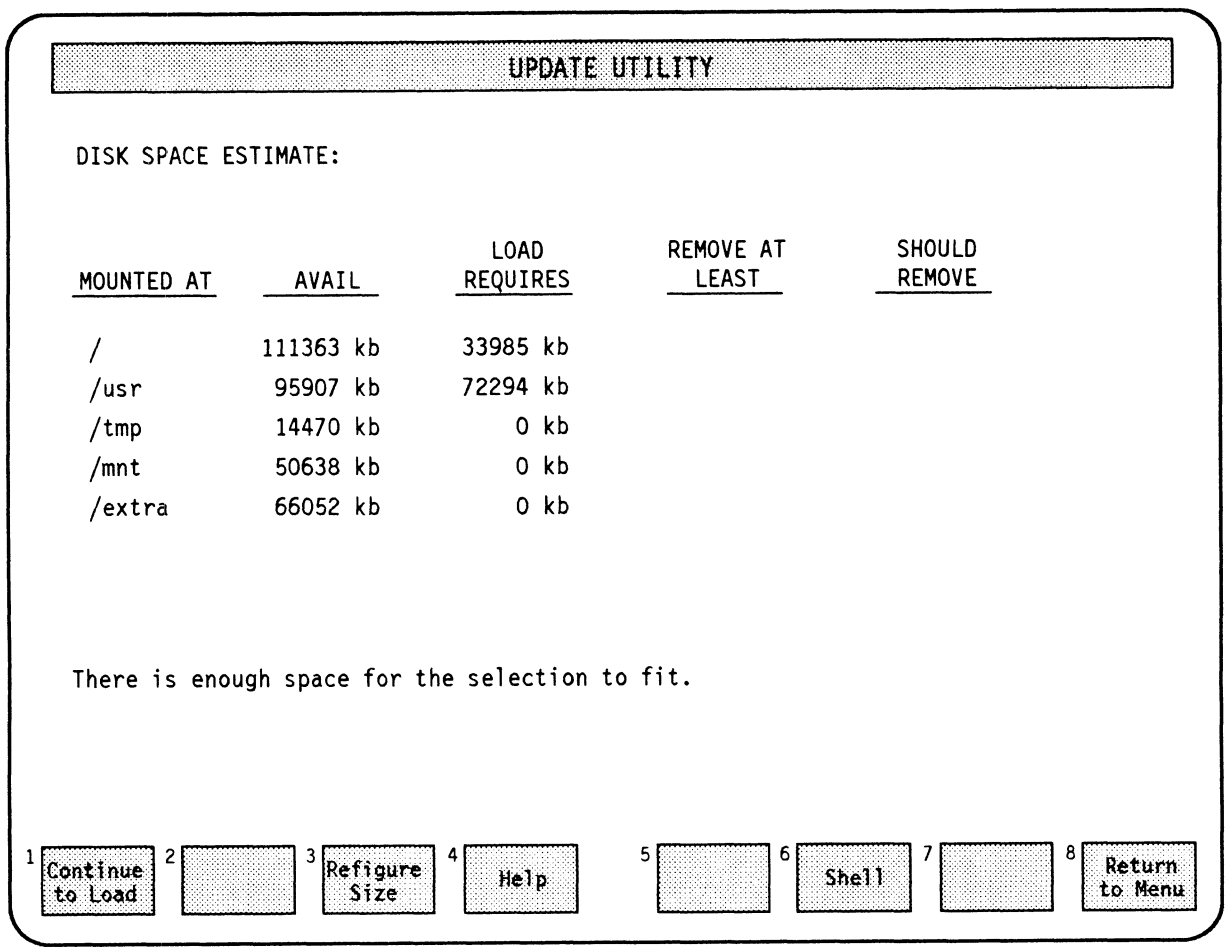
15. Now the system computes whether all the subsystems you've chosen will fit.

    At the top of the screen you'll see the message

    ```
    ESTIMATING DISK SPACE
    ```

Warning **Do not touch the keyboard while the estimate is in progress: the program will store your input and may react in a way you didn't intend later on.**

When the estimate is ready, you'll see a screen that looks something like this:



LG200098_013

The number of entries and their content will vary depending on your particular hardware and software. Note the message

```
There is enough space for the selection to fit.
```

- If you see this message, press [Continue to Load] and go to **Step 17**
- If you **DO NOT** see this message, go to **Step 16.**

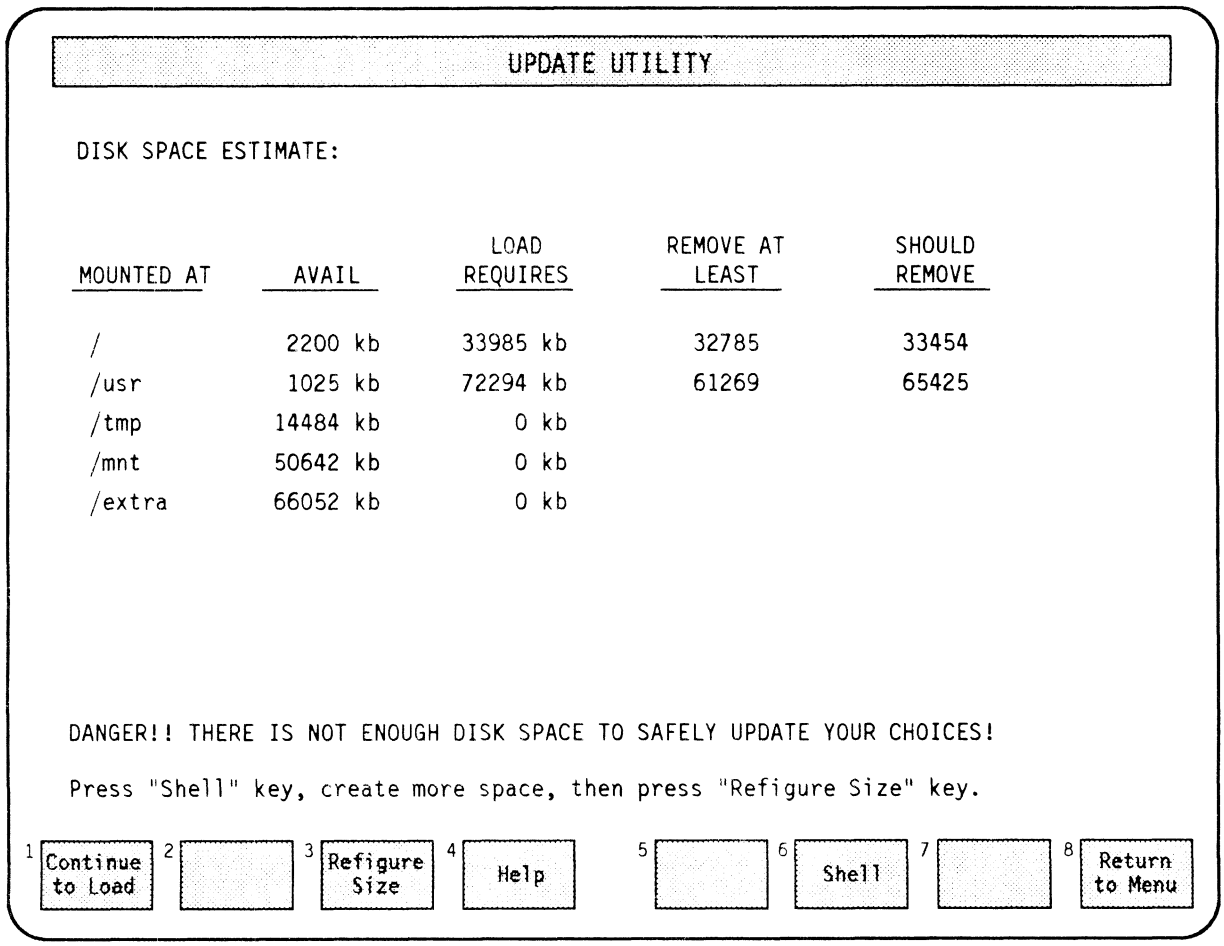
16. **Skip this step unless your screen is now showing one of the following messages:**

DANGER!! THERE IS NOT ENOUGH SPACE TO SAFELY UPDATE YOUR CHOICES!

or

WARNING: DISK SPACE WILL BE ABOVE THE RECOMMENDED MAXIMUM!!

In this case, your screen will look something like this:



LG200098_014

The problem is that the subsystems you've chosen to load will not all fit into the sections where the system is trying to load them.

Your options are:

a. **Create symbolic links**

b. **Change the layout of your root disk**

Option a: Create Symbolic Links:

Do this ONLY if you did not change the default sections in Step 9 and you need to make room only in /usr and all other sections are ok (that is, there is an entry in the SHOULD REMOVE column for /usr and there are no other SHOULD REMOVE entries). This should be true if you are installing HP-UX for the first time.

a. Press the [Shell] key.

b. Type

```
mkdir /mnt/lib
ln -s /mnt/lib /usr/lib
```

This creates a link from **/usr/lib** to **/mnt/lib,** redirecting all the files that would have been loaded into **/usr/lib** into **/mnt/lib** instead. Once your system is up and running, HP-UX will interpret all references to **usr/lib** as references to **/mnt/lib.**

c. Type

```
exit
```

d. This returns you to the **Partition Menu.**

Press [Refigure Size]

The program will re-compute the space, and then you should see the message

```
There is enough space for the selection to fit.
```

- If you see this message, press [Continue to Load] and continue with **Step 17.**
- If instead you see a DANGER or WARNING message, repeat this procedure (steps **a** through **d**), but in step **b.,** link **/usr/man** to **/mnt/man,** using the same commands as before but substituting man for lib in all cases:

```
mkdir /mnt/man
ln -s /mnt/man /usr/man
```

If this still does not give you enough space, repeat the procedure linking **/usr/include,** and then **/usr/etc** if you need to (substitute include and etc, respectively, in the commands).

When you see the message

```
There is enough space for the selection to fit.
```

press [Continue to Load] and continue with **Step 17.**

Option b: Change Root Disk Layout

Warning **Attempt this only if you are an experienced HP-UX user. Read chapter 6 before you proceed.**

a. Copy the entire table that is on your screen.

b. Press [Return to Menu].

c. This will take you back to the **Partition Menu**. Press the [Exit] key.

d. Respond y to the prompt:

```
OKAY to EXIT Update and reboot? <y/n>
```

e. The system will reboot.

f. Press a key at the override prompt (see **Step 3**), dismount the **HP-UX CORE + SUBSYS** tape, remount the **install** tape and put the tape drive online.

g. Start over from **Step 4**.

h. When you reach the **Root Disk Partitioning** screen (**Step 9**), shuffle the section names so that those that have LOAD REQUIRES entries in the table you copied from the **Disk Space Estimate** screen have at least 25% more space than what is shown under LOAD REQUIRES. (Remember that the numbers you copied from the screen are in kilobytes whereas the sizes on the **Root Disk Partitioning** screen are in megabytes.)

Use the directions under **Using the Screen** in chapter 6 to move about the screen and to handle errors.

i. Continue with the installation from **Step 10**.

17. Now the screen displays

```
LOAD STARTED
```

and then

```
LOADING files from "<fileset name>" file set ...
```

and the screen fills up as often as needed with the names of files until all the files on this tape have been copied to the system disk.

Warning **Do not touch the keyboard while the load is in progress: the program will store your input and may react in a way you didn't intend later on.**

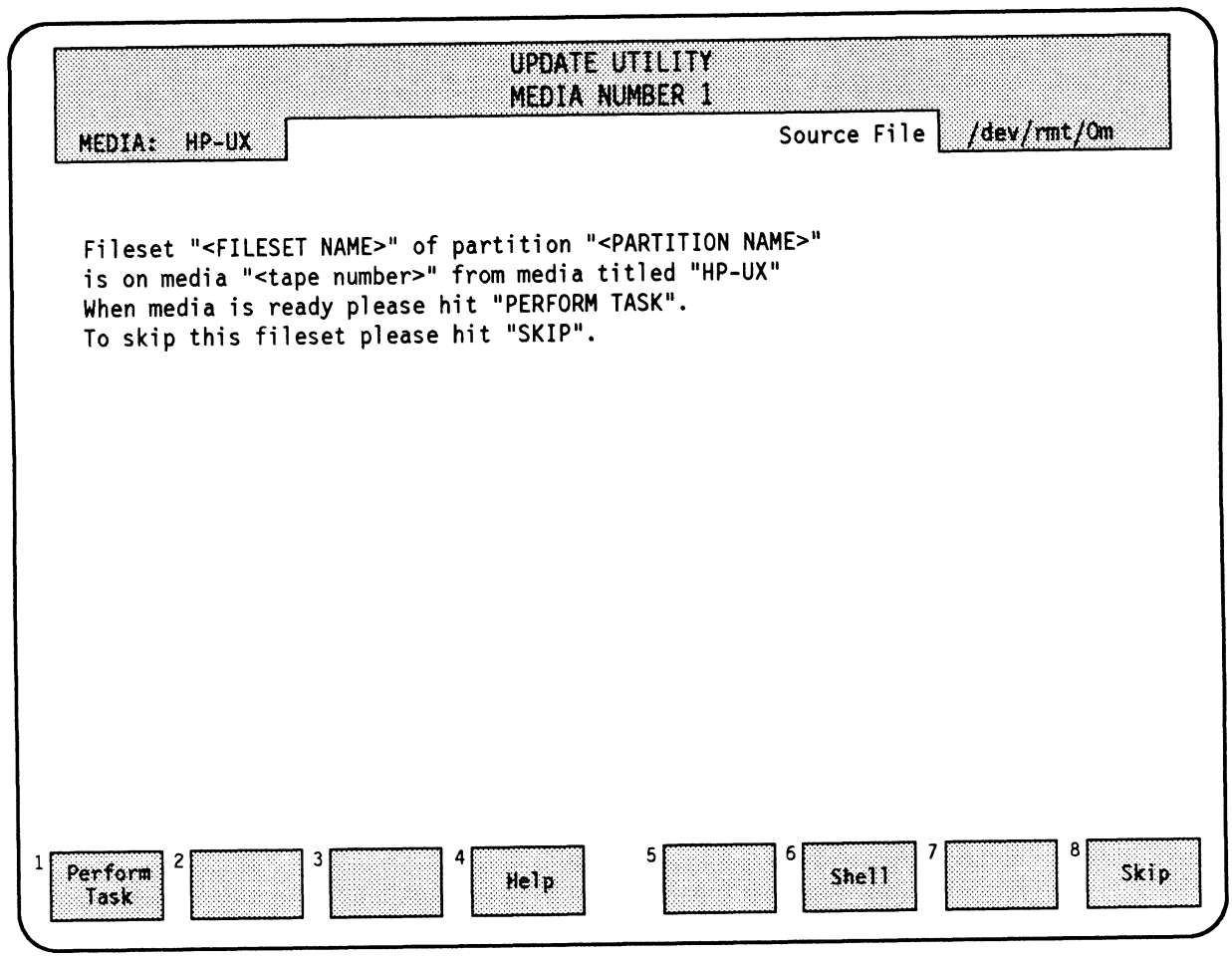
At that point you'll see the message:

```
THE END OF LOAD for present media
```

If there are no more tapes, go to **Step 19,** otherwise continue with **Step 18.**

(The number of tapes depends on how many subsystems you've purchased and how large they are.)

18. The screen now looks like this:



LG200098_019

The message on the screen means that the program is looking for a fileset which is on the next tape.

Dismount the tape that's on the drive and mount the next one. Make sure the drive is online and press [Perform Task].

Note

If you have a 35401 autochange cartridge tape drive, wait for the READY light to come on before continuing. For other models of cartridge tape drive, wait for the BUSY light to go off.

The message

```
Reading source file
```

appears at the top of the screen, followed by the messages described in **Step 17.**

Continue to mount tapes and follow directions on the screen until there are no more tapes to load.

Warning

DO NOT dismount the last tape or take the drive offline until after you have left update (after Step 25).

In case of error

Problem	What to do
Error message `Unable to read table of contents on source file`	1. Check that you have an **HP-UX CORE + SUBSYS** tape in the tape drive and the drive is online. Make sure the `Source file` name on the screen matches what you wrote down. 2. Press space bar. 3. Press [Perform Task].
Screen continues to prompt for `media "<tape number>"`	You've mounted an **HP-UX CORE + SUBSYS** tape out of order. Mount the tape whose number corresponds to `media "<tape number>"`.

Note

From here on, exactly what happens depends on what subsystems you are updating. Use the steps that match what you see on your screen.

For more information, refer to the installation manuals for any optional subsystems you are installing.

19. At the end of the last tape **update** invokes a series of scripts to "customize" the software it has loaded onto your system.

    Then it invokes the the **HP-UX Kernel Configuration Utility.** The following text appears on the screen:

```
Determining configuration parameter file
>>>When replying to questions in this section, the following
>>>answers are valid:

   y - yes
   n - no
   ! - escape to shell
```

```
q - quit

Does this system have a standard configuration <y|n|!|q> [y]>>
```

Respond y and press Return.

20. Now the screen displays information about the current configuration and asks,

```
Is this configuration acceptable? [y]>>
```

Respond y and press Return.

If your computer is an 825 or 835 and you are using a graphics processor as the console, you'll be prompted further:

```
Because your console is an ITE, you must have a graphics
interface card.  Is it an A1017A/graph0 or A1047A/graph2?
Allowable responses are: A1017A or A1047A>>
```

Respond with the number you wrote down before you began installation (see **Preparation** at the beginning of this chapter).

21. The program prompts for the difference between local time and GMT in hours west of Greenwich. In the United States, respond 5 for EST, 6 for CST, 7 for MST (default) or 8 for PST.

Note

This changes the timezone variable in the kernel. The **TZ** variable needs to be set at the user level also. Refer to the section **After installing HP-UX** in chapter 2 of the Series 800 *System Administrator's Guide.*

The program then generates a new kernel and prints the following messages:

```
Generating new kernel.

 ... Copying gen file to /etc/conf/gen/S800
 ... Rebuilding kernel (This will take a few minutes)
 ... Copying devices file to /etc/devices
 ... Saving previous kernel in /SYSBCKUP
 ... Moving kernel to /hpux.
Done

 ... Installing device files ...
```

22. Exactly what happens now depends on which subsystems you are installing. Most of what you'll see will be messages telling you what customization scripts are running. If you encounter questions that are not covered below, use the installation manuals for individual subsystems to guide you through the dialog.

23. **Skip this step if you are not installing any networking products.**

If you are installing networking products, the following prompt appears:

```
What is the name of your uxgen input file? <S800>
```

Press Return to accept the default, which identifies the file **/etc/conf/gen/S800.**

The program re-prompts you:

```
Is the file name S800 correct? (y|n|!|q) ?
```

Respond **y**.

The program prints

```
Creating new kernel using the configuration file S800

Installing new hp-ux
```

and more customization messages appear.

24. **Skip this step if you are not installing any networking products.**

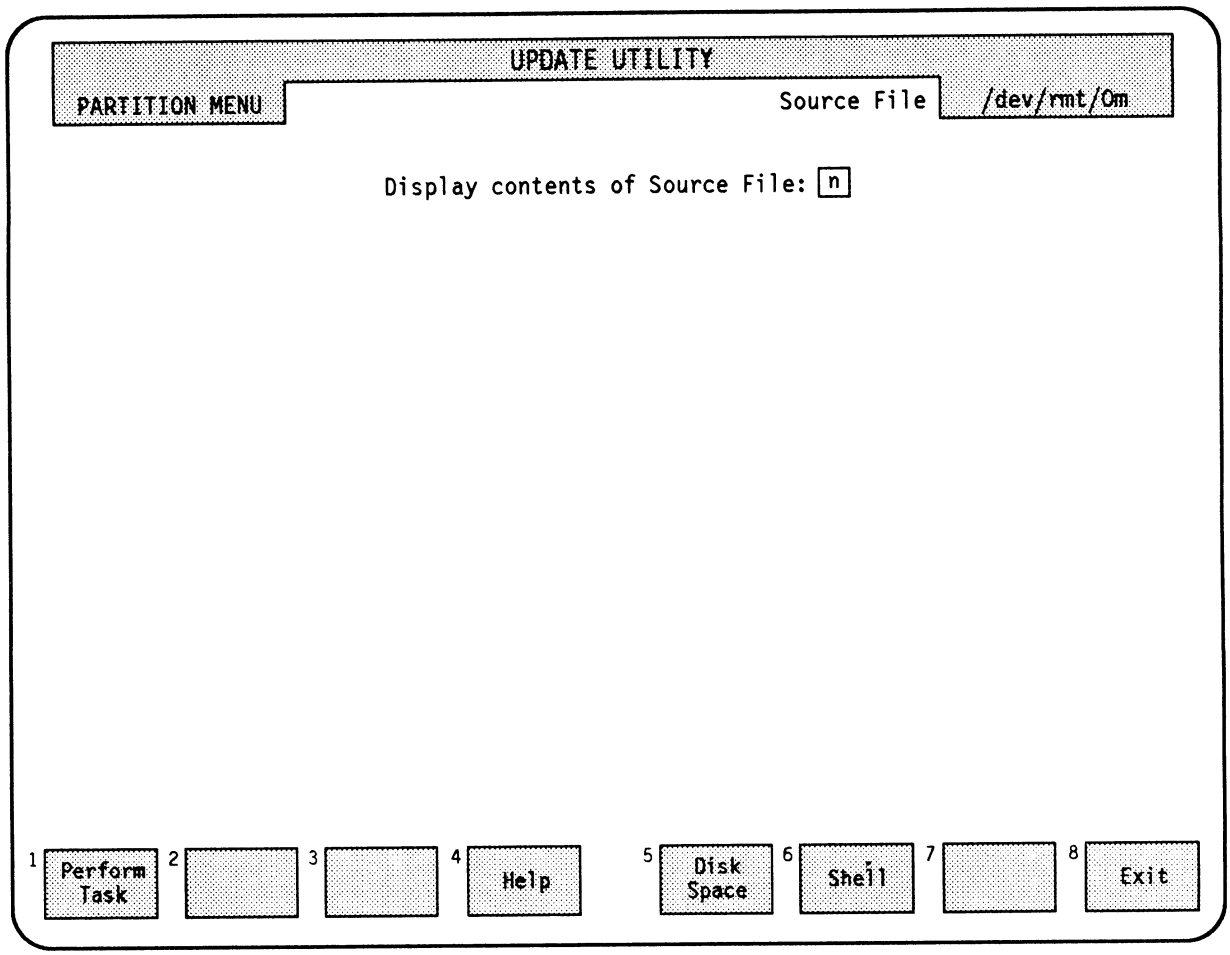
    Depending on what networking subsystems you are installing, the dialog in the previous step may be repeated several times (with minor variations). The system must regenerate the kernel for each subsystem that needs to modify it.

    Respond to the questions about the **uxgen** file as you did in the previous step, and respond as indicated to any other directions that may appear—for example:

    ```
    Hit RETURN to continue
    ```

    Refer to the networking manuals for more information—you'll find a list of them near the beginning of this chapter.

25. Finally you'll return to the **Partition Menu** of **update:**



LG200098_015

Only those subsystems you've chosen not to load (if any) are showing, and you'll see the message

```
Returned from TASK!  Hit the spacebar to continue.
```

Warning **If update has warned you about serious errors and you cannot resolve them, DO NOT exit update. Call HP for help.**

Press the space bar and then press [Exit] to leave the **update** program.

Update prompts you

```
OKAY to EXIT Update and reboot? <y/n>
```

Respond **y**. The screen clears and you'll see boot information followed by the prompt:

```
Do you want to check the file systems (y or n)?
```

Don't respond to this prompt—the file system check happens by default, which is what you want.

Ignore the message about "interleaved swap area".

In case of error

Message	What to do
`mt0: not online during open` *or* `mt0: no write ring`	Nothing. It just means that you have already dismounted the tape.

26. Eventually a `login:` prompt appears.

    Log in as `root` and check to see if there are any files in the directory **/etc/newconfig/update_info.** Also check for problems in **/tmp/update.log.** Follow any instructions you find in these files.

27. Begin the tasks listed under **After Installing HP-UX** below.

Note

Remember to:

- dismount the last **HP-UX CORE + SUBSYS** tape and store all the tapes you have been using in a secure place;
- print the file **/etc/super_blocks** and save it with this document.

After Installing HP-UX

Essential tasks are:

- Setting up system security
  - Begin by setting a password for the **root** user (see chapter 2 of the Series 800 *System Administrator's Manual*)
- Customizing the system

  Tasks include:
  - Setting the system clock
  - Reconfiguring the system to add peripherals
  - Creating an accounting system
  - Adding groups
  - Adding users
  - Mounting file systems
  - Setting up the LP Spooler

- Setting up UUCP
- Creating sytem run levels

These tasks are covered in chapters 4, 5 and 6 of the Series 800 *System Administrator's Manual*

- Backing up the system

  This is covered in chapter 5 of the Series 800 *System Administrator's Manual.*

Networking

If you are installing networking products, you now need to configure the network. The networking manuals listed under **Supporting Documentation** (near the beginning of this chapter) explain how to do this. Start with *Installing LAN/9000 Series 800*

Uncommon Installation Errors

The following error in the installation process is unlikely, but possible.

Configuration Error

The following is a sample of the error messages you might see at **Step 8** if your hardware configuration is incorrect:

```
Can't identify root disk: I/O error
(one of several possible errors)
Installation device is <tape drive> at <n.n.n>

Your installation device is a mt, at <n.n.n.>



INITIAL STARTUP FAILED!
The tape drive is at <n.n.n.>
Destination disk is at <n.n.n.>
Consult the manual that contains Install/Update instructions
(The reference is to this manual, and you also need to consult the hardware installation manual
for your computer.)
Then correct your configuration and start again.

IF YOU WISH TO IGNORE THIS FATAL ERROR
PRESS RETURN TO CONTINUE (You cannot successfully continue).
```

DO NOT CONTINUE.

Copy the information that is on your screen, then turn off the power to the SPU. Recheck the hardware configuration, using the *Configuration and Installation Guide* for your computer and the appendix specific to your computer in the back of this manual.

When you have found and corrected the problem, make sure the **HP-UX Install** tape is properly loaded and the tape drive is online. Then turn on the SPU and start again at **Step 3.**

4

Updating HP-UX

This chapter describes how to update the HP-UX operating system from one release to another, and how to install optional products such as Allbase or Network Services. (The procedure is the same whether you are updating the operating system or adding products.)

Warning

Do not use this chapter if you are using the HP-UX Install Tape to initialize or re-initialize your system disk. Use chapter 3 instead.

Before You Run Update

- BACK UP THE FILE SYSTEM!

  If you make a mistake during **update**, you will be able to recover your data *if and only if you have backed up the system.* Refer to the Series 800 *System Administrator's Manual* for information on how to do a system back-up.

- Make sure you have a good copy of the kernel (**SYSBCKUP**).
- Read Appendix D for essential information specific to the current release.

Warning **DON'T PROCEED until you have read Appendix D!**

- Clean up files.

  Delete any obselete files on the root disk. Archive and remove files that must be kept but do not have to be online.

  To clean up the **root** section before starting an **update**, follow these steps:

Caution Only an experienced system administrator familiar with this particular system should do this.

1. Identify any non-standard Series 800 Hp-UX files and directories in the / (**root**) directory.

   The standard files and directories under / (**root**) are:

   - *Files:* **.profile, hp_ux** (kernel), **SYSBCKUP** (backup of kernel).
   - *Directories:* **bin, dev, etc, lib, system, lost+found.**
   - All mounted file systems. The **mount** command will list the file systems mounted at bootup.

2. Find any standard directories under / (**root**) which are larger than than expected:

   ```
   du -s /etc      the size of /etc should not exceed 12 megabytes
   du -s /dev      the size of /dev should not exceed 50 kilobytes
   du -s /bin      the size of /bin should not exceed 6 megabytes
   du -s /lib      the size of /lib should not exceed 6 megabytes
   du -s /system   the size of /system should not exceed 1.5 megabytes
   ```

   Remember that there may be directories and/or files already symbolically linked to other sections.

3. If any directory exceeds the maximum size, scan the directory and identify files that do not belong in the / (**root**) section, such as:

- user files
- core dump files (these can be very large)
- extra backups of the kernel (only one backup—**SYSBCKUP**—is necessary)

  (Check for extra copies of the kernel in / and **/etc/conf/*.**)

4. Non-standard files and directories identified in step 1 and files identified in step 3 are candidates for removal from the **root** section. If the file or directory must be online, move it to another section that has room. Otherwise back it up to tape and remove it.

Note

If you are not sure whether or not you can remove any file or directory from the **root** section, DO NOT MOVE IT.

5. The files **/etc/btmp** and **/etc/wtmp** should be truncated periodically (they grow without bound).

- Make sure you have at least 2.5 mb free space in / (**root**)—or 0.5 mb in / and 2 mb in **/tmp** if they are in separate sections. (This is working space for the **update** program.)
- Run **fsck** to check the file systems:

  ```
  fsck -P
  ```

  This will take about ten minutes.
- Identify the device file for the tape drive.

  Update needs to know the device filename for the tape drive you'll be using. The following table shows the usual filenames for Hewlett-Packard drives:

Type of tape drive	Usual device file name
7974, 7978, 7979, 7980 (set to 1600 bpi)	**/dev/rmt/0m**
9144, 9145, 35401	**/dev/rct/c7d0s2**
7914 (separate controllers)	**/dev/rct/c7d0s2**
7914 (single controller)	**/dev/rct/c0d1s2**

  If you have a non-standard I/O configuration, determine the **/dev** file that corresponds to the CIO module, slot and port numbers where your drive is located.
- Read supporting documentation

  Essential reading before you start:

  - The *Read Me First* document supplied with this release.
  - Appendix D of this manual for information specific to this release.
  - Installation guides for any optional products you may be installing. Installation guides you may need include:

- for Networking:
  - *Installing ARPA Services/9000 Series 800* (part number 98194-90007)
  - *Installing Network Services (NS)/9000 Series 800* (part number 98194-90008)
  - *Installing LAN/9000 Series 800* (part number 98194-60009)
- for Native Language I/O:
  - *Native Language I/O System Adminstrator's Guide* (part number 92559-90002)
- for ALLBASE/HP-UX
  - The ALLBASE/HP-UX *Read Me First*

- If the **update** program has changed in this release, load the new version of the program onto your system—see Appendix D.
- Comment out any remote mounted file systems in **/etc/checklist.**

  To comment out a **checklist** file entry, move the line you want to comment out to the end of the file and put a #-sign in column 1. (It's important to move the line to the end of the file because, once you've commented it out, all subsequent lines will also be treated as comments.)
- Have a few sheets of paper and a pencil handy for notes.

Note

- Do not run jobs in the background during **update.**
- **Users of 700/92 Terminals:** to turn the display back on after a timeout, press the Shift key. Do not use use any other key for this.

You are now ready to run **update.**

The Update Procedure

This procedure documents the "main line" of **update**—it does not attempt to pursue every possible option. Chapter 7 contains a comprehensive guide to the screens, and also documents uncommon error conditions.

1. Load the first **HP-UX CORE + SUBSYS** tape onto the tape drive. (The tape will be marked `REEl 1 of` *n*, where *n* is the total number of tapes.)
   - If you are using a magnetic tape, make sure that the write ring has been removed, mount the tape and put the tape drive online (make sure that the ONLINE light is on).
   - If you are using a cartridge tape drive, make sure that the protect screw is pointing to SAFE, insert the cartridge tape, then wait for the BUSY light to stop flashing before proceeding.
   - If you are using a 35401 cartridge tape autochanger, load the **HP-UX CORE + SUBSYS** tapes in sequential order starting in slot 1. Then load the magazine into the drive.
2. Log in as the **root** user on the system console and make sure you are in the / (**root**) directory.
3. Make sure all users are off the system.
4. Invoke the **update** program:

   `/etc/update` *source_devicefile*

   The *source_devicefile* is the full path name for the tape drive, which you identified earlier under **Before You Run Update**—for example **/dev/rmt/0m.** If you omit this parameter, it defaults to **/dev/rmt/0m.**

In case of error

Error message	What to do
`This update may only be run from a release <n> system or above`	Update your system to the required release.
`You must be root to run this program! Permission denied`	Log in as root or type **su**.
`Update can't be run till "/" has <n> kb free space`	Move or remove files from / until you have freed up the required space.
`WARNING: You need to create room in /tmp`	Move or remove files until you have at least 2 mb free space in the section in which **/tmp** resides. If possible, clean all files out of the **/tmp** directory.
`update needs /etc/init and /etc/update to exist`	Call HP.
`update requires that <filename> exists`	Call HP.

5. Now the system warns you it is about to reboot.

(If for some reason you want to prevent the reboot, enter the interrupt sequence—normally ctrl C—immediately after you see the message

```
The system will reboot in 10 seconds unless you interrupt this program
```

The interrupt sequence aborts the **update** program.)

6. When you see the prompt

```
Autoboot from primary boot path enabled.
To override, press any key within 10 seconds.
```

DO NOT press a key. Allow the system to boot from disk.

In case of error

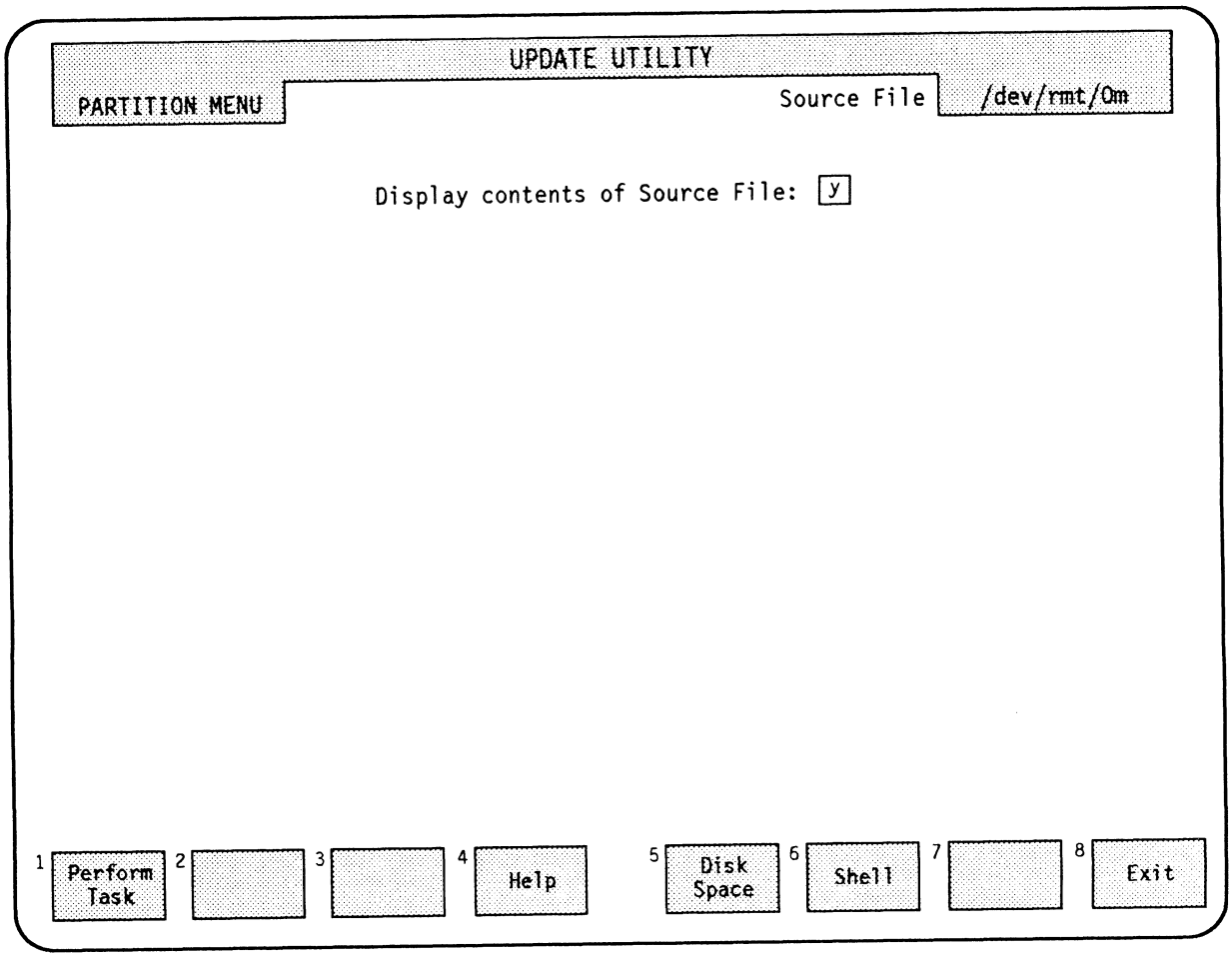
Problem	What to do
Pressed a key. Got prompt `Boot from primary path?`	Respond `y`. Respond `n` to prompt `Interact with ISL?`

The console displays boot information which scrolls off the screen. You do not need to pay attention to this information.

7. The screen eventually clears and the first menu of the **update** utility appears.

In case of error

Problem	What to do
Update menu never appears	Call HP.



LG200098_011

The **source file** identifies the tape drive. Make a note of the source file name in case you accidentally type over it.

Note

- The field containing the source file name is capable of scrolling sideways. This is to allow for a long path or filename, but it could also allow characters you typed accidentally to scroll off the screen. If you get the message `Source file does not exist`, and everything seems okay, you can check for extraneous characters in this field by pressing the ◄ and ► keys repeatedly.
- If you are using a 35401 cartridge tape drive, wait until the READY light comes on before continuing.
- If you are using any other model of cartridge tape drive, wait for the BUSY light to go off before continuing.

The default response to the prompt (`y`) is what you want, so just press the Perform Task key.

(For more information on this screen, including the effect of the other function keys, refer to the section **Partition Menu (1)** *in chapter 7).*

In case of error

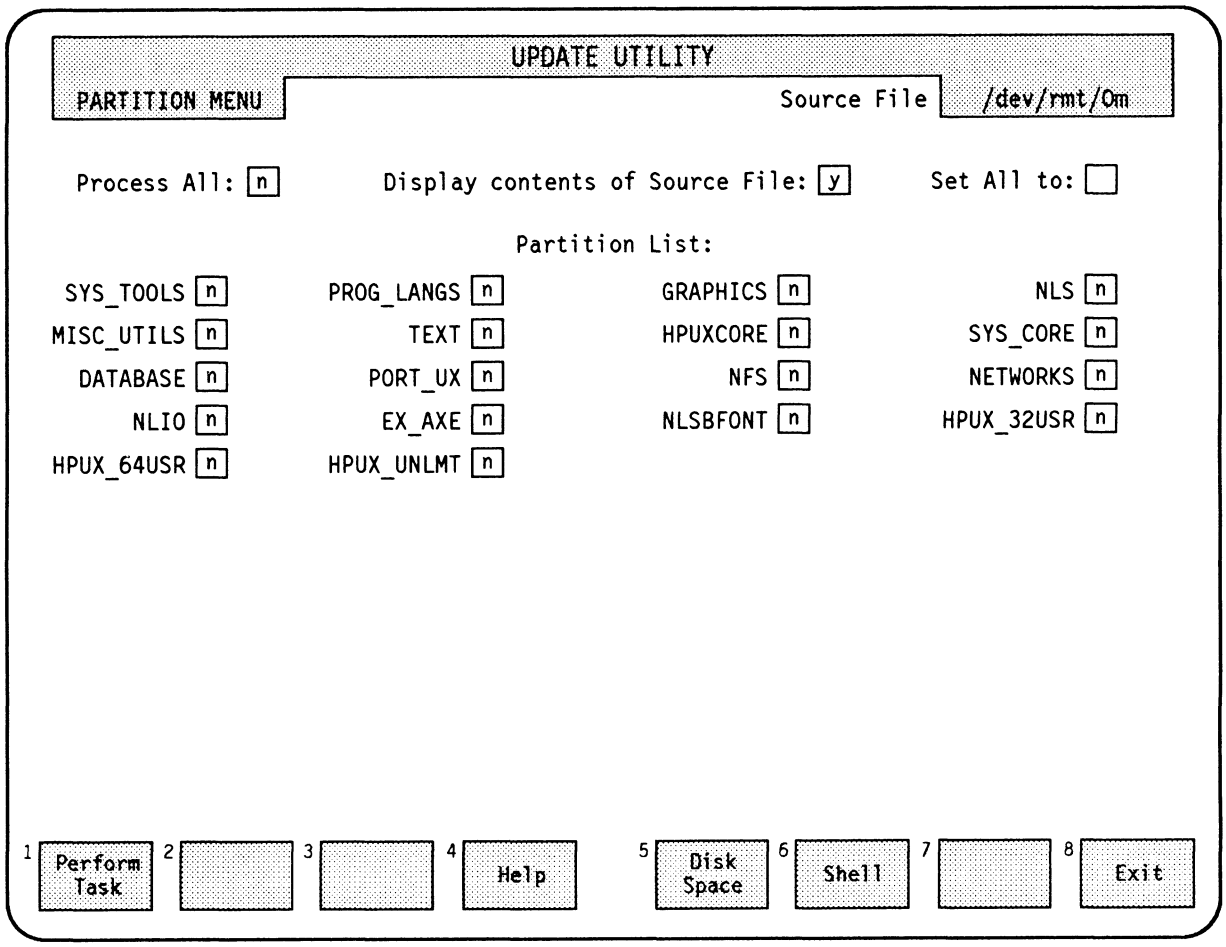
Message	What to do
`NO ACTION SELECTED`	1. Press space bar. 2. Change response back to `y`. 3. Press Perform Task.
`Cannot read table of contents on source file`	1. Check that you have loaded the **HP-UX CORE + SUBSYS** tape marked `REEL 1 of` *n* (where *n* is the total number of **HP-UX CORE + SUBSYS** tapes), and that the tape is properly loaded and the drive is online. If this is a cartridge tape drive, also check that the BUSY light is off. 2. Press space bar. 3. Press Perform Task.
`Source file does not exist`	1. Press space bar. 2. Make sure the source file name matches what you wrote down. 3. Press Perform Task.

(For more unusual errors, refer to the section **Partition Menu (1)** *in chapter 7.)*

8. The message:

   `Reading source file`

   blinks for a few seconds at the top of the screen, then the **Partition Menu** is repainted with the `Partition List` (a list of all the subsystems on the **update tapes**).



LG200098_012

This is a sample of what you might see—your list will differ depending on what subsystems you've purchased.

- If you are updating from one release to another, **you must enter y in the Process All field and press** Perform Task. **DO NOT omit any partitions.**
- Otherwise, if you want to load only particular application subsystems, you can make selections by entering n in the `Process All` field and changing the n next to the subsystem name to a y. (If you want to load most but not all subsystems, you can use the `Set all to` field to change every n to y, then change those you *don't* want to load back to n.) Use the Tab key to move through the list.

Press Perform Task when you have finished making selections.

(For more information about this screen, including the effect of other function keys, refer to the section **Partition Menu (2)** *in chapter 7.)*

Note

If you select only one subsystem, you will now see the **Fileset Menu.** This gives you a chance to pick individual filesets from those in the subsystem, or you can choose to load them all. This screen is very similar to the **Partition Menu**—just make your selection and press [Perform Task].

Refer to the section **Fileset Menu** in chapter 7 if you need more information.

---

9. Now the system computes whether all the subsystems you've chosen will fit.

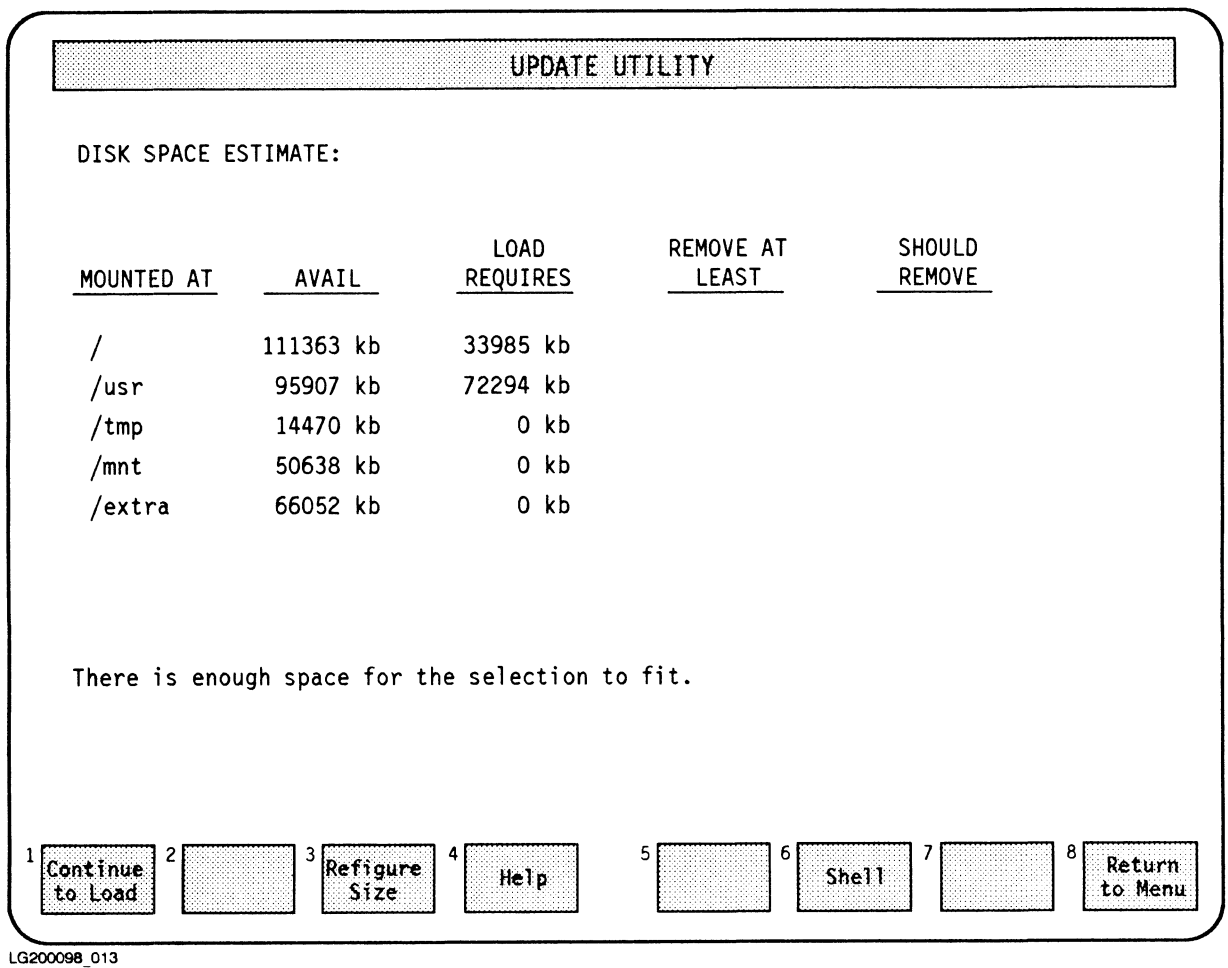
   At the top of the screen you'll see the message

   ```
   ESTIMATING DISK SPACE
   ```

Warning

Do not touch the keyboard while the estimate is in progress: the program will store your input and may react in a way you didn't intend later on.

When the estimate is ready, you'll see a screen that looks something like this:



LG200098_013

The number of entries and their content will vary depending on your particular hardware and software. Note the message

```
There is enough space for the selection to fit.
```

- If you see this message, press [Continue to Load] and go to **Step 11**
- If you **DO NOT** see this message, go to **Step 10.**

(For more information on this screen, including the effect of other function keys, refer to the section **Disk Space Menu (2)** *in chapter 7.)*

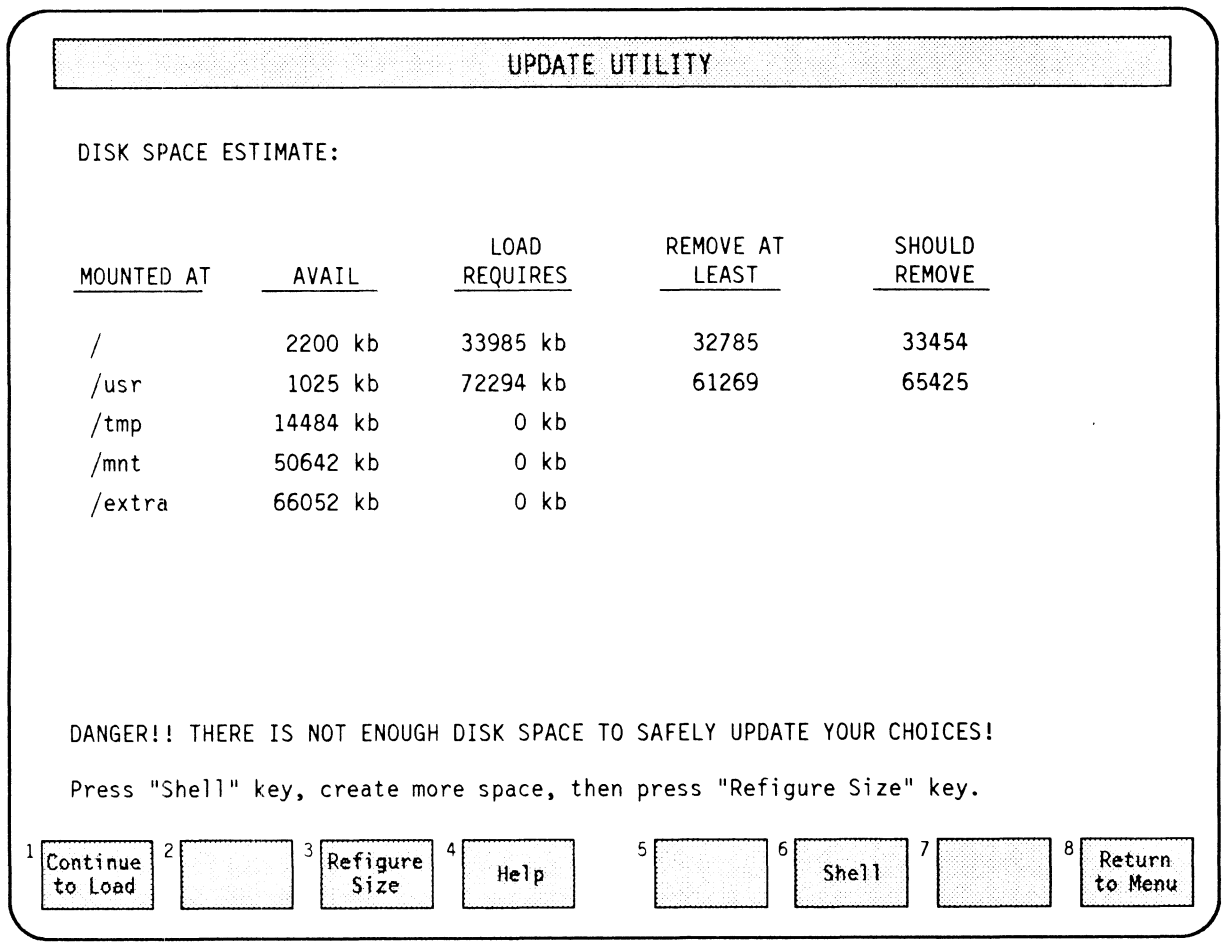
10. **Skip this step unless your screen is now showing one of the following messages:**

```
DANGER!! THERE IS NOT ENOUGH SPACE TO SAFELY UPDATE YOUR CHOICES!
```

or

```
WARNING: DISK SPACE WILL BE ABOVE THE RECOMMENDED MAXIMUM!!
```

In this case, your screen will look something like this:



LG200098_014

The problem is that the subsystems you've chosen to load will not all fit into the sections where the system is trying to load them.

You will need to move some files and create **symbolic links** pointing from the files' old locations to their new locations.

Use the following procedure:

Caution

If you are an inexperienced user, some of the tasks in this procedure may be unfamiliar to you. Read through the instructions to the end before doing anything. If there's anything you're not certain you know how to do, don't attempt it: get expert help before you start.

Symbolic Link Procedure

a. Look at the list of sections on your screen. Make a note of those that have entries in the REMOVE AT LEAST and SHOULD REMOVE columns. In each case, write down the name of the section and the number under SHOULD REMOVE. (The number is in kilobytes.)

   In our example, you would write down:

```
/              33454 kb
/usr           65425 kb
```

b. Now make a note of those sections which have space that could be used to supplement the sections that need more space. Write down the amount of available space shown under AVAIL.

   In our example, you would write:

```
/mnt           50642 kb
/extra         66052 kb
```

c. Press [Shell] to escape to the shell.

d. Free up space by moving medium-sized and large directories from sections that are short to those that have more space than they need, then create symbolic links between the old directories and the new.

   In the example below, we move the directory **yourdir** from **/usr** to **/extra** and symbolically link it back to **/usr.**

```
(I) cd /usr                                  /* copy directory
    find yourdir -print | cpio -pdumv        from /usr
                                             to /extra */
(II) mv /usr/yourdir /usr/yourdir.old        /* temporarily
                                             rename
                                             directory within
                                             /usr */
(III) ln -s /extra/yourdir /usr/yourdir      /* symbolically link
                                             /extra/yourdir to
                                             /usr/yourdir */
(IV) ls /usr/yourdir                         /* via symbolic link,
                                             list contents of
                                             directory
                                             /extra/yourdir */
(V) ls /usr/yourdir.old                      /* list contents of
                                             temporary directory
                                             /usr/yourdir.old */
```

The outputs from steps (IV) and (V) should be identical. If they are not, use the following commands to undo the link and put things back the way they were:

```
rm -rf /usr/yourdir /extra/yourdir
mv /usr/yourdir.old /usr/yourdir
```

and then go back to step (I)

```
(VI) rm -rf /usr/yourdir.old    /* remove temporary directory */
```

The space available in /usr has increased by the size of directory **yourdir.**

The tables below give approximate sizes of directories in / (**root**) and /**usr.** To get the actual sizes (in kilobytes) of these directories on your system, do the following:

i. `du -s <directory>` gives the number of blocks in the directory.

ii. Blocks / 2 = size in kilobytes

If you need to make room in /**usr,** follow steps (I) through (VI) above to move as many of the following directories as necessary:

Directories in /usr

Directory	Approx. Size (mb)
/usr/etc	2
/usr/include	2
/usr/man	5
/usr/lib	15
/usr/bin	30

If you need to make room in / (**root**), follow steps (I) through (VI) above to move as many of the following directories as necessary:

Warning

Do not attempt to move and link directories that are not in this table—if you do you could leave yourself with an unbootable system.

Directories in /

Directory	Approx. Size (mb)
/etc/conf	5
/lib	5
/system	1.5

Note

You may inadvertantly try to create a link that already exists. This will not do any harm: you just won't free up the space you expected.

e. When you think you've freed enough space, type `exit` and press Return. Then press Refigure Size.

f. If you see the message

```
There is enough space for the selection to fit.
```

press Continue to Load and proceed to **Step 11.**

If instead you see the `DANGER!!` or `WARNING` message again, you still need to create more space. Go back to step a. at the beginning of this **Symbolic Link Procedure.**

If there is still not enough space after you've moved everything in the table(s):

- If you don't have enough space in / (**root**), DO NOT attempt to move files that are not in the table. Go back to **Before You Run Update** at the beginning of this chapter. Follow the directions under the bullet "Clean up files".
- If you don't have enough space in **/usr,** you can continue to move and link other directories under **/usr** until there is enough room for the files from the **HP-UX + SUBSYS** tape.

11. Now the screen displays

```
LOAD STARTED
```

and then

```
LOADING files from "<fileset name>" file set ...
```

and the screen fills up as often as needed with the names of files until all the files on this tape have been copied to disk.

Warning

Do not touch the keyboard while the load is in progress: the program will store your input and may react in a way you didn't intend later on.

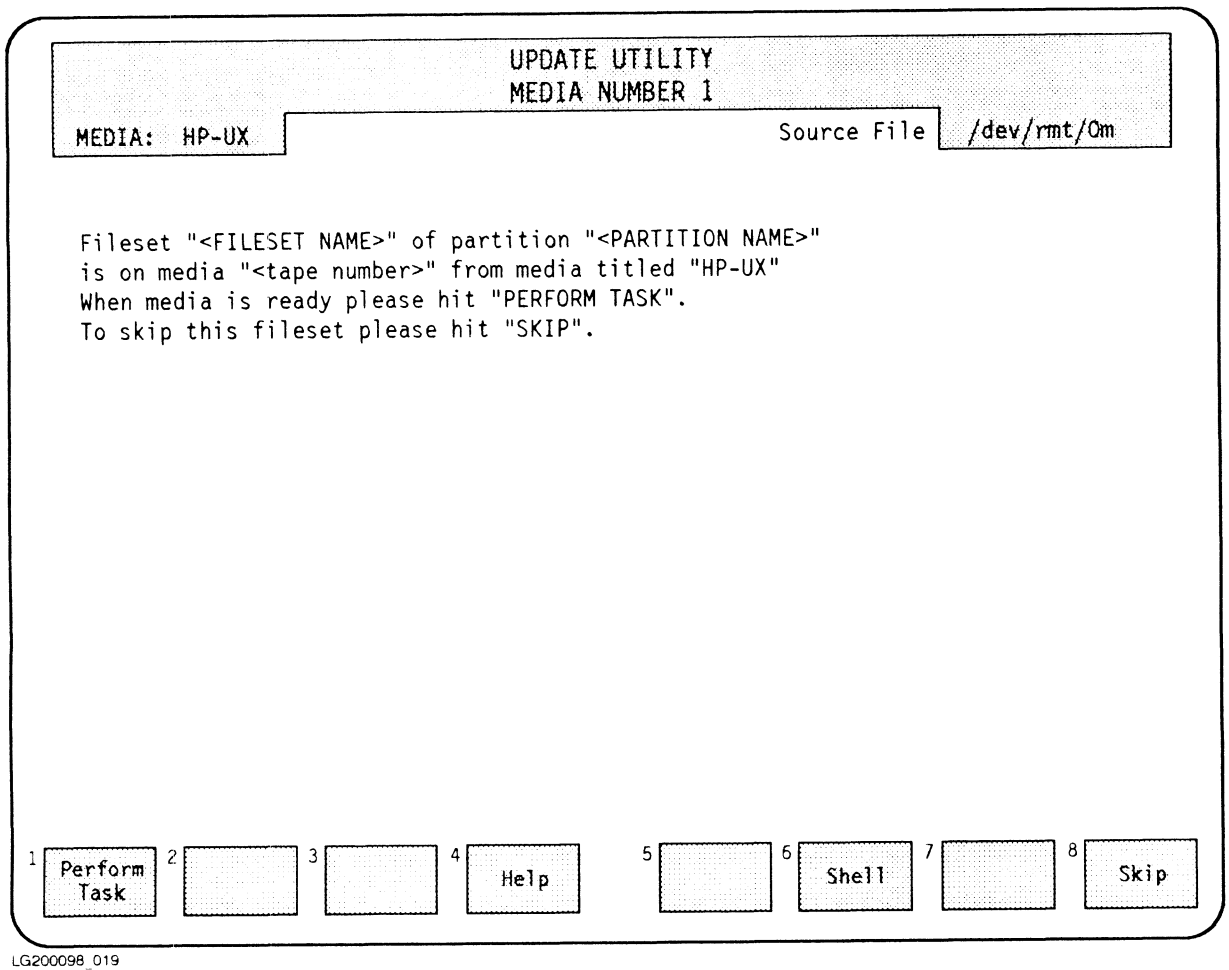
At that point you'll see the message:

```
THE END OF LOAD for present media
```

If there are no more tapes, go to **Step 13,** otherwise continue with **Step 12.**

(The number of tapes depends on how many subsystems you've purchased and how large they are.)

12. The screen now looks like this:



LG200098_019

The message on the screen means that the program is looking for a fileset which is on the next tape.

Dismount the tape and mount the next. Make sure the drive is online and press Perform Task.

Note

If you have a 35401 autochange cartridge tape drive, wait for the READY light to come on before continuing. If you have any other kind of cartridge tape drive, wait for the BUSY light to go off.

The message

```
Reading source file
```

appears at the top of the screen, followed by the messages described in **Step 11.**

Continue to mount tapes and follow directions on the screen until there are no more tapes to load.

Warning **DO NOT dismount the last tape or take the drive offline until after you have left update (after Step 19).**

In case of error

Problem	What to do
Error message `Unable to read table of contents on source file`	1. Check that you have an **HP-UX CORE + SUBSYS** tape in the tape drive and the drive is online. make the `Source File` name matches what you wrote down. 2. Press space bar. 3. Press [Perform Task].
Screen continues to prompt for `media "<tape number>"`	You've mounted an **HP-UX CORE + SUBSYS** tape out of order. Mount the tape whose number corresponds to `media "<tape number>"`.

Note

From here on, exactly what happens depends on what subsystems you are updating. Use the steps that match what you see on your screen.

For more information, refer to the installation manuals for any optional subsystems you are installing.

13. At the end of the last tape the **update** invokes a series of scripts to "customize" the subsystems it has loaded onto your system. You'll see messages telling you that various scripts are in progress. Then the following prompt appears:

    ```
    Do you want the boot partition updated?
    ```

    Respond `y`

14. The system now prompts you

    ```
    Where is your boot partition? (usually c0d0s6 - NO DEFAULT - )
    ```

    (`c0d0s6` identifies disk zero, controller zero, section 6.)

    Respond with the address of your boot partition: normally `c0d0s6` if your system disk is connected via HPIB, or `c2000d0s6` if it's connected with a fiber-optic link.

In case of error

Problem	What to do
Error because you have renamed files in **/dev**	Call HP

15. Next **update** invokes the **HP-UX Kernel Configuration Utility.** The following text appears on the screen:

```
Determining configuration parameter file
>>>When replying to questions in this section, the following
>>>answers are valid:

   y - yes
   n - no
   ! - escape to shell
   q - quit

Does the gen file /etc/conf/gen/S800 correctly reflect the configuration and
options of this system<y|n|!|q> [y]>>
```

Respond y and press Return.

In case of error

Message	What to do
`etc/conf/gen/S800 does not exist` `Do you have a file that currently reflects the hardware configuration and options of this system?`	Your gen (system generation) file must have some name other than S800. Respond y and then supply the name of your gen file. See warning below.

Warning

If you are using your own gen (system generation) file, DO NOT USE the q (quit) option until you are sure you have a a properly configured kernel—otherwise you may leave yourself with an unbootable system.

16. Now you'll see the message

```
... Converting /etc/conf/gen/S800 into current release format
```

The program then generates a new kernel:

```
Generating new kernel.

 ... Rebuilding kernel (This will take a few minutes)
 ... Copying devices file to /etc/devices
 ... Saving previous kernel in /SYSBCKUP
 ... Moving kernel to /hpux.
Done
 ... Installing device files ...
```

17. **Skip this step if you are not installing any networking products.**

If you are installing networking products, the following prompt appears:

```
What is the name of your uxgen input file? <S800>
```

Press Return to accept the default, which identifies the file **/etc/conf/gen/S800.**

The program re-prompts you:

```
Is the file name S800 correct? (y|n|!|q) ?
```

Respond `y`.

The program prints

```
Creating new kernel using the configuration file S800

Installing new hp-ux
```

and more customization messages appear.

18. **Skip this step if you are not installing any networking products.**

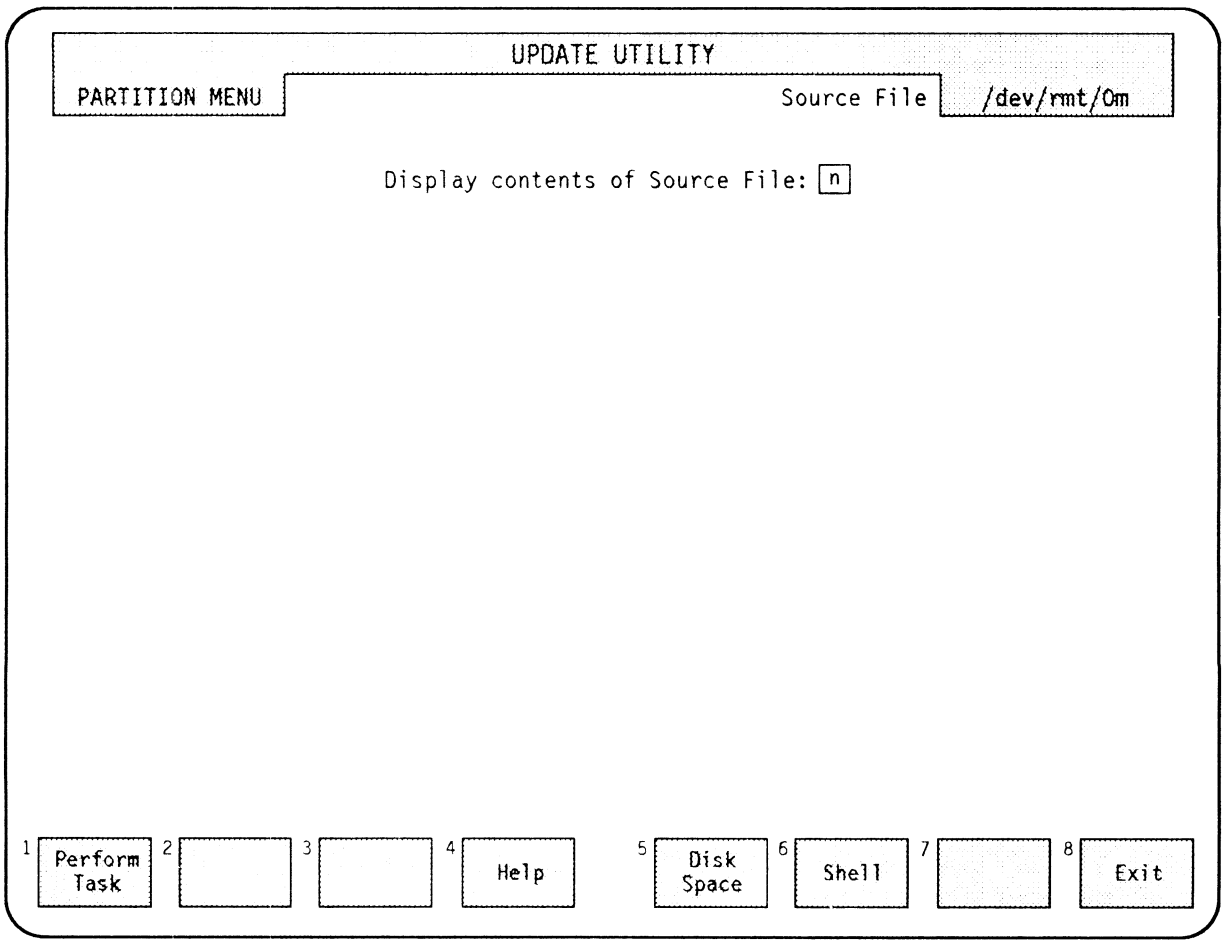
    Depending on what networking subsystems you are installing, the dialog in the previous step may be repeated several times (with minor variations). The system must regenerate the kernel for each subsystem that needs to modify it.

    Respond to the questions about the **uxgen** file as you did in **Step 17,** and respond as indicated to any other directions that may appear—for example:

    ```
    Hit RETURN to continue
    ```

    Refer to the networking manuals for more information—you'll find a list of them near the beginning of this chapter.

19. Finally you'll return to the **Partition Menu** of **update:**



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Note

If you have been loading selected filesets from a single subsystem, you'll return to the **Fileset Menu** at this point. Press [Exit] to get back to the **Partition Menu.** From there you can choose more subsystems to load, or leave **update** by pressing the [Exit] key.

Only those subsystems you've chosen not to load (if any) are showing, and you'll see the message

```
Returned from TASK!  Hit the spacebar to continue.
```

Press the space bar.

Warning **If update has warned you about serious errors and you cannot resolve them, DO NOT exit update. Call HP for help.**

Press [Exit] to leave the **update** program.

Update prompts you

```
OKAY to EXIT Update and reboot? <y/n>
```

Respond `y`. The screen clears and you'll see boot information followed by the prompt:

```
Do you want to check the file systems (y or n)?
```

Don't respond to this prompt—the file system check happens by default, which is what you want.

Ignore the message about "interleaved swap area".

In case of error

Message	What to do
`mt0: not online during open` *or* `mt0: no write ring`	Nothing. It just means that you have already dismounted the tape.

20. Eventually a `login:` prompt appears.

    Log in and check to see if there are any files in **/etc/newconfig/update_info.** Also check **/tmp/update.log.** Follow any instructions you find in these files.

In case of error

Problem	What to do
Errors in **/tmp/update.log** that you can't resolve	Call HP

21. If you had any remote mounted file system entries in **etc/checklist,** uncomment them and then enter the command

    ```
    mount -a
    ```

    to mount them.

22. Restore customization.

    Each file in **/etc/newconfig** is the new version. Your old version is untouched.

    a. Use the **diff** command to find the differences between the two sets of files.

    b. Merge the old and new versions so as to retain the changes HP has made for this release as well as whatever customization you have done.

Note

Remember to dismount the last **HP-UX CORE + SUBSYS** tape and store all the tapes you have been using in a secure place.

5

Modifying HP-UX

Overview

This chapter explains the command-driven approach for modifying the HP-UX kernel.

For most systems, the default configurations supplied by HP are sufficient and you will not have to modify HP-UX. However, if you do want to change the default I/O configuration or the system parameters, you will have to modify the kernel. There are two ways to modify the kernel:

- The menu-driven SAM utility. For further information, see the *System Administration Basics: a Menu-Oriented Approach* (part number 92453-90017).
- The command-driven procedure described in this chapter.

The SAM utility is the easier approach, especially for those are new to HP-UX system administration. On the other hand, the command-driven approach offers more flexibility and control.

Warning

Do not attempt to modify HP-UX unless you have read this chapter and you know what you are doing. Recovering from errors can be difficult.

To demonstrate the command-driven approach, this chapter shows how to modify the HP-UX kernel to add a CIO Expander to Series 800 computer systems. You can make other modifications of the I/O configuration in a similar fashion.

This chapter won't explicitly cover system parameters, but you can change these using the same procedure as described here. For an explanation of system parameters, refer to chapter 7 in the *HP 9000 Series 800 System Administrator's Manual* (part number 92453-90004). You can also use the SAM utility to modify system parameters.

The procedure for modifying HP-UX has four general parts:

- For an initial installation, use a default configuration to get HP-UX up and running.
- Edit the file **/etc/conf/gen/S800** so that it corresponds to the new I/O configuration.
- Run **uxgen** to regenerate the HP-UX kernel so that it includes data for the new I/O configuration.
- Run **insf** to create the special files needed by HP-UX to communicate with peripherals.

Before we go through the procedure in detail, let's review why HP-UX needs to be modified.

If you are already familiar with the process for modifying HP-UX, you can turn to the "Cookbook Procedure for Modifying HP-UX" at the end of this chapter.

The HP-UX Kernel and Device Drivers

The HP-UX operating system is made up of several modules, each with distinct tasks. At the center is the **kernel,** the part of HP-UX that deals directly with the hardware. The kernel provides low-level functions for the rest of the operating system and insulates it from the details of the hardware.

Inside the kernel are software modules known as **device drivers,** each of which handles I/O for a particular peripheral or class of peripherals. For example, the driver **disc0** handles I/O for disk drives and CTDs which use an HP-IB interface. Table 5-1 shows the drivers available in HP-UX.

Table 5-1. Device Drivers Available for HP-UX

Driver Name	Supported Devices
disc0	CS-80 and SS-80 devices (disk drives and cartridge tapes) connected via HP-IB interface
disc2	CS-80 and SS-80 devices (disk drives) connected via HP-FL interface
tape1	1/2 inch magnetic tape drives
lpr0	256X (CIPER) line printers
lpr1	2934 (Amigo) line printers
mux0	RS-232 peripherals; includes terminals, printers and plotters (MUX card)
instr0	All other HP-IB peripherals (plotters, general HP-IB instruments)
graph0/graph2	98720A, 98550A, or 98730A graphics controller and its HIL modules (e.g. Graphics Interface card for SRX)
lan0	Networking (LAN card)
gpio0	General-purpose parallel I/O interface (AFI card)

The kernel also contains information that matches the device drivers to CIO slot numbers (hardware addresses). In the default I/O configuration, for example, the **lan0** driver is matched to CIO slot 4. Thus, to change the I/O configuration, you must regenerate the kernel so that it contains the proper drivers and hardware address information. How do you enter the new I/O information so that it can be included in the kernel? The answer is: by editing the **S800** file (/etc/conf/gen/S800).

The S800 File

When you run **uxgen** to regenerate the kernel, information about the device drivers and hardware addresses is provided by the **S800** file (full path name: **/etc/conf/gen/S800**). The **S800** file contains the names of the device drivers and the hardware addresses matched to them. In other words, it is with the **S800** file that I/O hardware and software are linked. The key to reconfiguring I/O lies in understanding the **S800** file. The role of the **S800** file is shown in Figure 5–1.

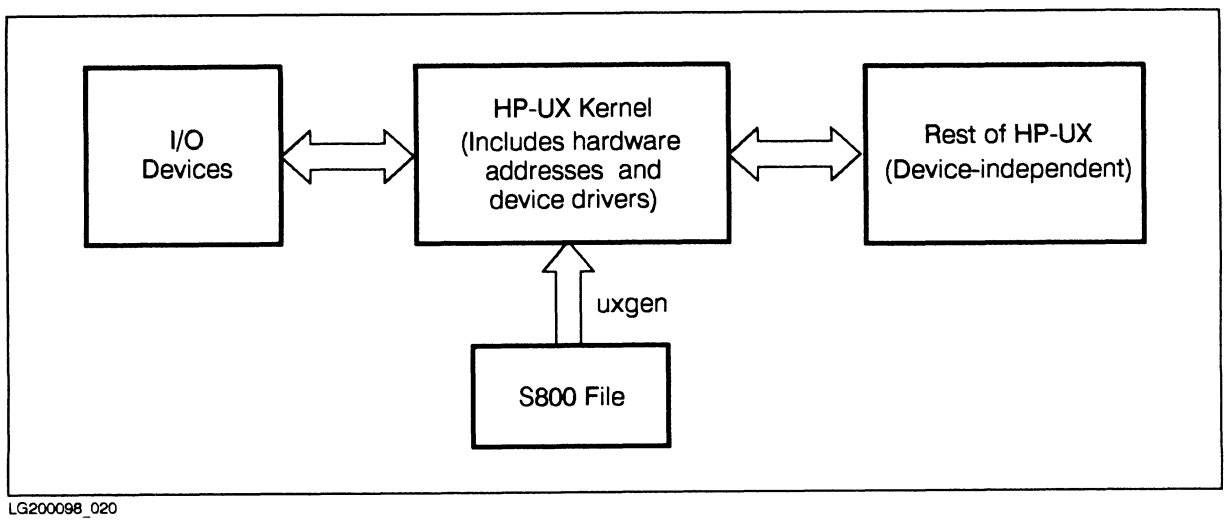

Figure 5-1. The Role of the S800 File

(The **S800** file also contains operating system parameters, such as **maxusers,** which are covered in chapter 7 of the *HP 9000 Series 800 System Administrator's Manual.*)

The following procedure describes how to view and modify the **S800** file. Read through this chapter before you actually edit the file. The first step in editing the **S800** file is to log in as root.

Since the **S800** file is a regular text file, you can use an editor like **vi** to make the required changes. Before you begin editing the file, change your working directory with the command:

```
cd /etc/conf/gen
```

(This saves you from entering long path names.)

Next, make a backup copy of the **S800** file in case you run into problems:

```
cp S800 S800BACKUP
```

Finally, call up the **vi** editor:

```
vi S800
```

I/O information is contained in the last part of the **S800** file. Figure 5–2 shows the I/O portion of a sample **S800** file. This **S800** file is for an 825 without an Access Port (AP), with an RS232C (non-graphics) console, and with an HP-IB root disk. Figure 5–3 shows the default physical I/O configuration of the 825/835 without an AP.

Note

If **vi** displays the file improperly, the terminal may not be processing tabs correctly. To correct this, exit **vi**, and enter the following commands at the HP-UX prompt:

```
tabs
tset
TERM=name_of_your_terminal
export TERM
```

For the TERM value, enter the model number of your terminal, e.g. hp2392.

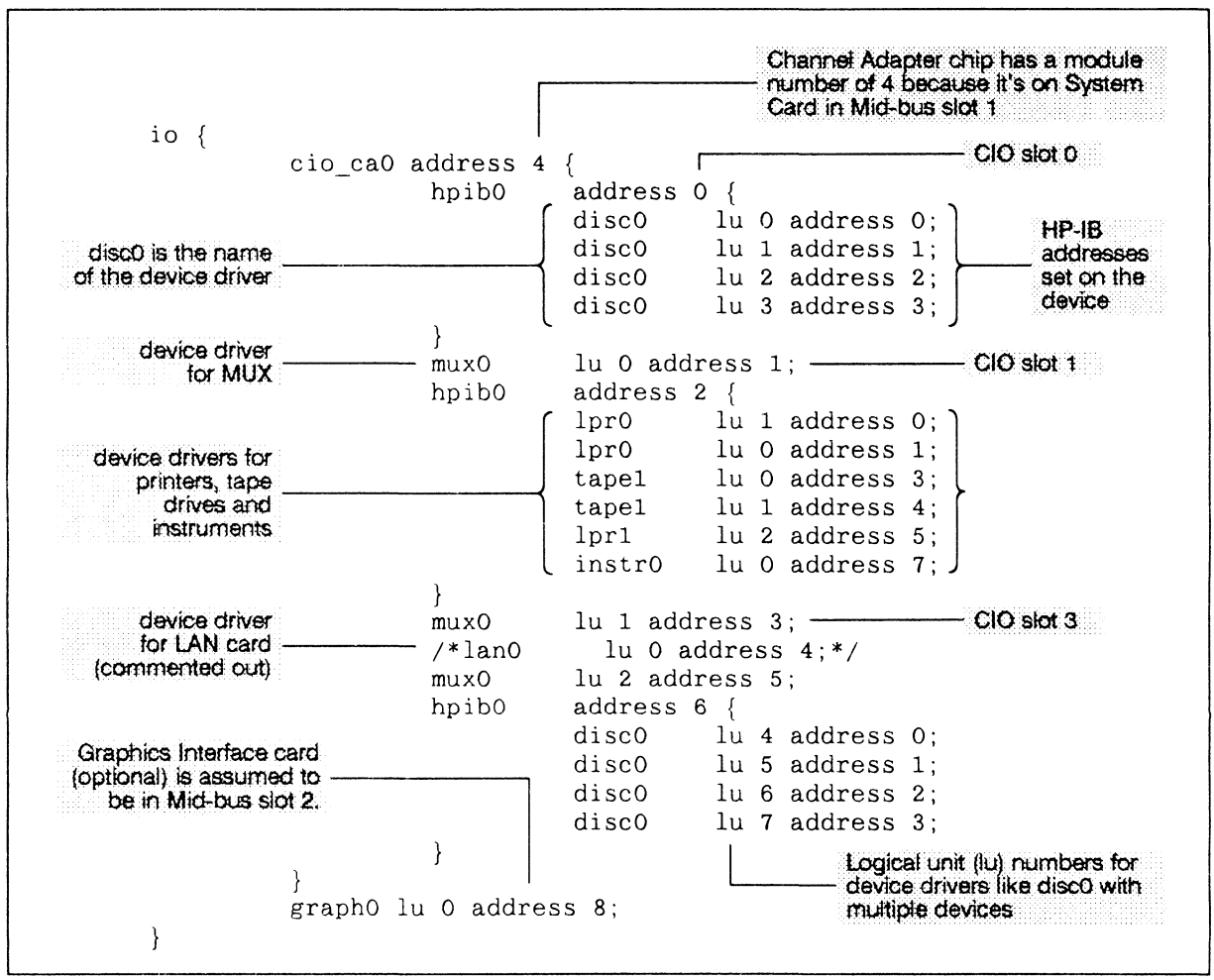

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Figure 5-2. The I/O Block in a Sample S800 File

Model 825/835 Without Remote Support

high priority ↕ low priority

CIO Slot	825/835 (No Access Port)		MB Slot
0	HP-IB/HP-FL (root disc)		8
1	MUX (console)		7
2	HP-IB (mt/lp/etc)		6
3	MUX		5
4	LAN		4
5	MUX, HP-IB (disc)[1]		3
6	HP-IB (disc)	Graphics or CA[2]	2
n/a	System Card (825), PDH Card (835)		1
n/a	Main CPU Card (825), Processor Card (835)		0

FRONT

low priority ↕ high priority

[1]MUX on multi-user systems, HP-IB (disc) on graphics systems.

[2]Full-size Graphics Interface card can go here (recommended).
Full-size Channel Adapter card can go here (825 only).

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Figure 5-3. Sample Default CIO Configuration for the Model 825/835

How to Read an S800 File

In this section we'll explain the syntax of **S800** files, using Figure 5-2 as an example.

First, notice that the file is written in a format similar to the C programming language. Blocks of statements are set off by beginning braces ({) and ending braces (}). A semicolon (;) ends each statement which assigns a driver to a slot.

The io Block

The first statement:

```
io {
```

specifies that this is the I/O section of the **S800** file. The I/O section continues up to the ending curly brace on the very last line of this sample file.

The Channel Adapter Block

The second statement:

```
cio_cao address 4 {
```

introduces the block of statements concerning the first channel adapter.

The "address" here refers to the module number of the channel adapter. Recall that the module number equals the Mid-bus slot number times 4. In this case, the channel adapter for the CIO slots in the SPU is a chip located on the System card. Since the System card is in Mid-bus slot 1, the channel adapter chip has a module number of 4 (4 = 1 x 4).

All the statements about devices serviced by this channel adapter are contained in the block that begins with the brace on this line, and ends with the matching ending brace.

The HP-IB Block

The next statement:

```
hpib0   address 0 {
```

signifies that there is an HP-IB card in CIO slot 0. (The "address" in this line refers to the CIO slot number.) The block beginning here contains all the statements about devices connected to this HP-IB card:

```
disc0    lu 0 address 0;
disc0    lu 1 address 1;
disc0    lu 2 address 2;
disc0    lu 3 address 3;
```

The "addresses" on the right of each line refer to HP-IB addresses—the addresses that are physically set on the devices themselves. Here, HP-IB addresses 0 through 3 are assigned the **disc0** driver.

Logical Unit (lu) Numbers

The `lu` in the middle of each statement stands for the **logical unit number.** These lu numbers allow one device driver to handle many devices. A different lu number is assigned to each device supported by a particular driver. The lu numbers for a driver start at 0, and continue upward in sequence.

In the HP-IB block for CIO slot 0 (just shown), lu numbers 0 through 3 are assigned. If more devices are to be driven by **disc0,** they are assigned lu numbers in sequence. For example, in the HP-IB block for CIO slot 6, more devices are assigned to the **disc0** driver; these devices receive lu numbers 4, 5, 6 and 7:

```
hpib0    address 6 {
         disc0    lu 4 address 0;
         disc0    lu 5 address 1;
         disc0    lu 6 address 2;
         disc0    lu 7 address 3;
}
```

Note

When modifying the **S800** file, do not assign duplicate lu numbers for the **same** device driver. For example, if you assign lu 1 for disc0, do not assign another lu 1 for disc0. If you assign duplicate lu numbers, the **uxgen** program will issue error messages and abort when you try to regenerate the kernel. Also, remember to assign lu numbers in sequence (0, 1, 2, and up).

The mux0 Statement

The next statement assigns the **mux0** driver (lu 0) to CIO slot 1:

```
mux0        lu 0 address 1;
```

Any terminal attached to the MUX card in CIO slot 1 will be driven by the **mux0** driver. In the **S800** file, you don't have to specify the terminals attached to a MUX card.

Different Drivers in an HP-IB Block

The next block of statements assigns several different drivers for devices connected to an HP-IB card in CIO slot 2:

```
hpib0   address 2 {
        lpr0      lu 1 address 0;
        lpr0      lu 0 address 1;
        tape1     lu 0 address 3;
        tape1     lu 1 address 4;
        lpr1      lu 2 address 5;
        instr0    lu 0 address 7;
}
```

The **lpr0** driver (lu 1) is assigned to HP-IB address 0. In the next line, lu 0 for the same driver is assigned to HP-IB address 1. It seems illogical to assign lu 1 to address 0 and lu 0 to address 1. Yet there is a reason behind it—to maintain compatibility with older configurations.

A few lines later, the driver **lpr1** (lu 2) is assigned to HP-IB address 5. Why does this address receive lu 2 instead of lu 0? After all, this is the first instance of the **lpr1** driver. The reason is that the **lpr0** and **lpr1** drivers are so closely related that they are assigned lu numbers jointly, as if they were the same driver. This is the only exception to the rule that lu numbers for a specific device driver start with 0 and continue upward sequentially.

The rest of the HP-IB block is straightforward. The **tape1** driver (lu 0) is assigned to HP-IB address 3. HP-IB address 4 is assigned lu 1 for the same driver. HP-IB address 7 is assigned to the **instr0** driver (lu 0).

For more information on these drivers, consult chapter 5 in the *HP 9000 Series 800 System Administrator's Manual.*

The lan0 Statement

The **lan0** statement is "commented out".

```
/*lan0     lu 0 address 4;*/
```

(If text is surrounded by **/*** and ***/**, it is treated as a comment and is ignored by the **uxgen** program.)

The **lan0** statement is meant to be commented out as the software comes from the factory. If appropriate, the line will be modified by LAN software. (See the example in Figure 5-4.)

The graph0/graph2 Statement

The last statement allows a Graphics Interface card (Display Controller Interface card) to be installed for graphics systems:

```
graph0 lu 0 address 8;
```

Unlike CIO cards, the Graphics Interface card communicates directly with the Mid-bus. As a Mid-bus card, the Graphics Interface card is addressed by module number. In the 825/835, the card is assumed to be installed in Mid-bus slot 2 and hence has a module number of 8 (2 x 4). In Figure 5–2, notice how the "graph0" statement lines up with the "cio_ ca0" statement—that's because they're both considered Mid-bus cards.

The driver **graph0** is used with the single Graphics Interface card (A1017A); **graph2** is used with the Graphics Interface card (A1047A) for multiple units.

Hardware Addresses

Now that you've seen the syntax for the I/O statements in the **S800** file, you can deduce the hardware addresses of the different drivers. Each level of indentation (actually each set of braces) indicates a different level of hardware. For example, to find the hardware address of driver **disc0** (lu 2), look at the first few lines of the "io" statement:

```
cio_cao address 4 {
     hpib0   address 0 {
          disc0    lu 0 address 0;
          disc0    lu 1 address 1;
          disc0    lu 2 address 2;
          disc0    lu 3 address 3;
     }
```

The "cio_ ca0" statement tells you that the module number is 4. The "hpib0" statement tells you that the slot number is 0. Finally the "disc0" assignment statement tells you that the HB-IB address for lu 2 is 2. Therefore, the hardware address for **disc0** (lu 2) is 4.0.2.

Modifying HP-UX for a CIO Expander (825)

The previous sections explained how to interpret the **S800** file; this section shows how to change it. As an example, we'll describe how to edit the **S800** file to add a CIO Expander to a Model 825. You modify the I/O configuration of other SPUs in a similar fashion.

Before you physically install a CIO Expander on an 825, you must assign device drivers for the eight CIO slots in the Expander. You do this by adding a block of statements to the **S800** file, as in Figure 5–4.

The sample in Figure 5–4 differs in several ways from the previous example. This portion of an **S800** file was taken from an existing system configured for a LAN; note that the **lan0** line is no longer commented out. Another difference is that an HP-FL card has been installed in slot 5 in the SPU:

```
hpfl0     address 5 {
          disc2     lu 0 address 0;
          disc2     lu 1 address 1;
          disc2     lu 2 address 2;
          disc2     lu 3 address 3;
}
```

Note the syntax for HP-FL: `hpfl0` is used instead of `hpib0`. Also, **disc2** is the driver, not **disc0.**

On the 825, when a full-size card like a Channel Adapter card is installed, it occupies both a Mid-bus slot and a CIO slot. (See Figure 5–3.) The Channel Adapter card in this example takes up both Mid-bus slot 2 and CIO slot 6, Therefore the I/O statements for CIO slot 6 in the SPU should be omitted. Similarly, if a full-size Graphics Interface card is installed in Mid-bus slot 3, it will occupy CIO slot 5 and all the I/O statements for CIO slot 5 are meaningless. You can see this by studying Figure 5–3.

On the 825S, the block describing the CIO Expander starts with the line:

```
cio_ca0 address 8 {
```

In Figure 5–4, statements have been added for additional MUX cards and HP-IB disks. The particular statements you add will depend on the devices to be attached to the CIO Expander.

When assigning slots, keep in mind that the lower the CIO slot number, the higher the service priority; devices attached to CIO cards in the lower numbered slots are serviced more promptly than those attached to CIO cards in higher numbered slots. Also, HP-FL disks (except for a system disk) should be attached to the low priority slots.

When adding statements for the CIO Expander, follow the format and syntax of the original **S800** file:

- Delimit blocks with curly braces ({, }).
- End assignment statements with semicolons (;).

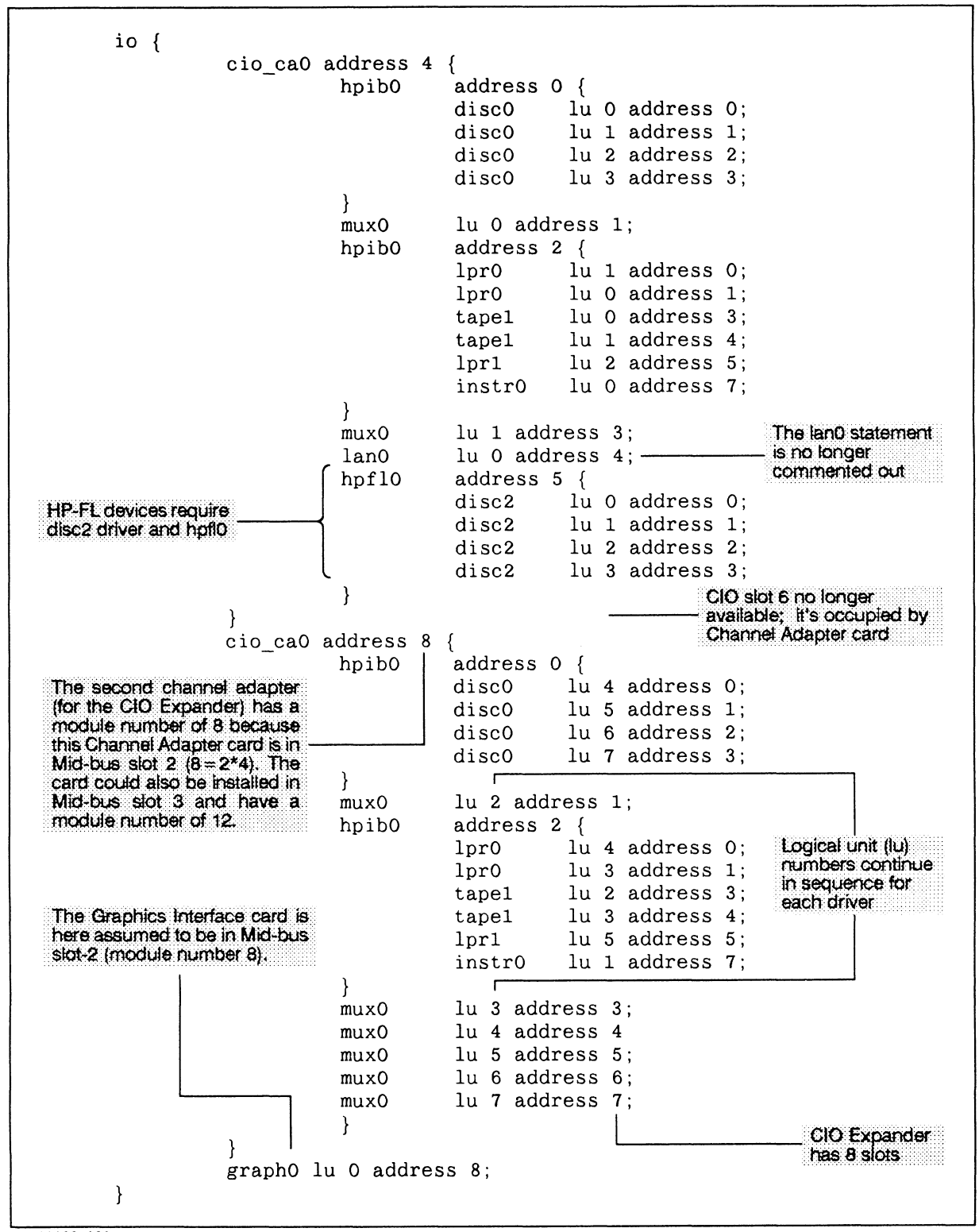

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Figure 5-4. Part of an S800 File for a CIO Expander (825)

Modifying HP-UX for a CIO Expander (835)

To add a CIO Expander to an existing 835SE, you follow a procedure similar to that for an 825. On the 835SE, however, the Channel Adapter chip for the CIO Expander is given an arbitrary module number of 36. Therefore the block describing the CIO Expander on an 835 starts with:

```
cio_ca0 address 36 {
```

The 835 has configuration template files for a CIO Expander, such as **/etc/conf/gen/templates/835/genfiles/9.** Refer to the 825/835 hardware appendix for information on viewing these files.

Modifying HP-UX for a CIO Expansion Bay (840)

To add a CIO Expansion Bay to an existing 840, you follow a procedure similar to that for an 825 or 835. (Refer to Appendix B for hardware information on the 840.)

The 840 Expansion Bay contains 16 slots which can be configured in two different ways:

- as one set of 16 slots (Channel Adapter card in Mid-bus slot 4)
- as two sets of 8 slots (Channel Adapter cards in Mid-bus slots 4 and 6)

Expansion Bay Configured as One 16-Slot Card Cage

If the Expansion Bay is configured as one set of 16 slots, add text to the **S800** file similar to the following:

```
cio_ca0 address 16 {    /* exp bay, 1 set of 16 slots */
        mux0    lu 6 address 0;
        mux0    lu 7 address 1;
        mux0    lu 8 address 2;
        mux0    lu 9 address 3;
        mux0    lu 10 address 4;
        mux0    lu 11 address 5;
        mux0    lu 12 address 6;
        mux0    lu 13 address 7;
        mux0    lu 14 address 8;
        mux0    lu 15 address 9;
        mux0    lu 16 address 10;
        mux0    lu 17 address 11;
        mux0    lu 18 address 12;
        mux0    lu 19 address 13;
        mux0    lu 20 address 14;
        mux0    lu 21 address 15;
}
```

Many systems will only require mux0 drivers as in the above example. However, other device drivers may be added as well. The logical unit (lu) numbers are assigned in sequence. Remember not to assign duplicate lu numbers for any device driver used.

The module number for a 16-slot configuration is 16, since the Channel Adapter card is in Mid-bus slot 4 (Mid-bus slot 4 x 4 = 16).

Expansion Bay Configured as Two 8-Slot Card Cages

If the Expansion Bay is configured as two sets of 8 slots, add text similar to the following to the S800 file:

```
cio_ca0 address 16 {    /* exp bay, 1st set of 8 slots */
        mux0    lu 6 address 0;
        mux0    lu 7 address 1;
        mux0    lu 8 address 2;
        mux0    lu 9 address 3;
        mux0    lu 10 address 4;
        mux0    lu 11 address 5;
        mux0    lu 12 address 6;
        mux0    lu 13 address 7;
}
cio_ca0 address 24 {    /* exp bay, 2nd set of 8 slots */
        mux0    lu 14 address 0;
        mux0    lu 15 address 1;
        mux0    lu 16 address 2;
        mux0    lu 17 address 3;
        mux0    lu 18 address 4;
        mux0    lu 19 address 5;
        mux0    lu 20 address 6;
        mux0    lu 21 address 7;
}
```

When an Expansion Bay is configured as two sets of 8 slots, the module number is 24 for the second set since the Channel Adapter card is in Mid-bus slot 6 (Mid-bus slot 6 x 4 = 24).

Modifying HP-UX for a CIO Terminal Expander Bay (850)

To add a CIO Terminal Expander Bay to an existing 850, you follow a procedure similar to that for an 825, 835, or 840. (Refer to Appendix C for hardware information on the 850.)

Channel Adapter Card in Mid-bus 0

The 850 Expander Bay contains two sets of 8 slots into which MUX cards can be inserted. Each set of 8 slots is connected to a separate Channel Adapter card. We recommend that these Channel Adapter cards be installed in Mid-bus slot 3 and higher of the SPU; slots 1 and 2 are usually occupied by Channel Adapter cards for CIO slots in the SPU.

Therefore for each set of 8 slots, there should be text similar to the following in the **S800** file:

```
cio_ca0 address 12 {    /* exp bay #1 */
        mux0    lu 1 address 0;
        mux0    lu 2 address 1;
        mux0    lu 3 address 2;
        mux0    lu 4 address 3;
        mux0    lu 5 address 4;
        mux0    lu 6 address 5;
        mux0    lu 7 address 6;
        mux0    lu 8 address 7;
}
```

In the above example, the module number is 12 because the Channel Adapter card is assumed to be in Mid-bus slot 3 (Mid-bus slot 3 x 4 = 12). If the Channel Adapter card were in Mid-bus slot 4, the module number would be 16, and so forth, for all the Mid-bus slots on the right-side of the card cage (Mid-bus 0).

Channel Adapter Card in Mid-bus 1

If the Channel Adapter card is installed on the left-side of the card cage (Mid-bus 1), the module number is formed somewhat differently, since the Bus Converter number is 1 and the formula for the Module Number is:

```
Module number = (BC x 64) + (MB x 4)

where BC = Bus Converter number
      MB = Mid-bus slot in which the Channel Adapter card is located
```

For example, let's say that a set of 8 slots in a Terminal Expander Bay is connected to a Channel Adapter card in Mid-bus slot 3 on the left side of the card cage (Mid-bus 1). The Module number would be 76:

```
Module number = (1 x 64) + (3 x 4)

              =    64    +    12

              =         76
```

The text in the S800 file should look like this:

```
cio_ca0 address 76 {    /* exp bay #2 */
        mux0    lu 9 address 0;
        mux0    lu 10 address 1;
        mux0    lu 11 address 2;
        mux0    lu 12 address 3;
        mux0    lu 13 address 4;
        mux0    lu 14 address 5;
        mux0    lu 15 address 6;
        mux0    lu 16 address 7;
}
```

Executing uxgen

After you've finished editing the **S800** file, you're ready to regenerate the kernel. Issue the command:

```
/etc/uxgen S800
```

(If you named the configuration file something other than **S800,** use that name instead. We strongly recommend sticking with **S800.**)

The **uxgen** program generates a new kernel, calling it **hp-ux** and putting it in the directory **/etc/conf/S800.** Another file—**devices**—is also created in the same directory. The **devices** file describes the I/O configuration for the new kernel, listing the device drivers, hardware addresses and other information.

If you make a syntax error in the **S800** file (for example if you spelled a driver incorrectly), the **uxgen** program complains by issuing error messages. You'll also get error messages if you don't assign lu numbers correctly. In either case, re-edit the **S800** file so that it is correct, and run **uxgen** again.

After **uxgen** has successfully executed, make backup copies of the old kernel and **/etc/devices** file:

```
cp /hp-ux /SYSBCKUP
cp /etc/devices /etc/DEVBACKUP
```

Change the working directory:

```
cd /etc/conf/S800
```

(Again, this saves you from typing in long path names.)

With the backups made, you can now move the two new files created by **uxgen:**

```
mv hp-ux /hp-ux
mv devices /etc/devices
```

Special Files (Device Files)

You've seen that the **S800** file is the link between I/O devices and the kernel. By modifying the **S800** file, you can change the device drivers and hardware addresses inside the kernel.

Next, we have to consider the link between the kernel and the rest of HP-UX. How does the rest of HP-UX communicate with the device drivers in the kernel? For example, how does an application program know how to send data to the printer driver?

On HP-UX, the link between the kernel and the rest of the operating system is provided by **special files** (also known as **device files**). Figure 5-5 shows the role of the special files.) Each I/O device has one or more special files located in the **/dev** directory. Special files don't contain data as ordinary files do. Instead, they specify how HP-UX is to communicate with the device.

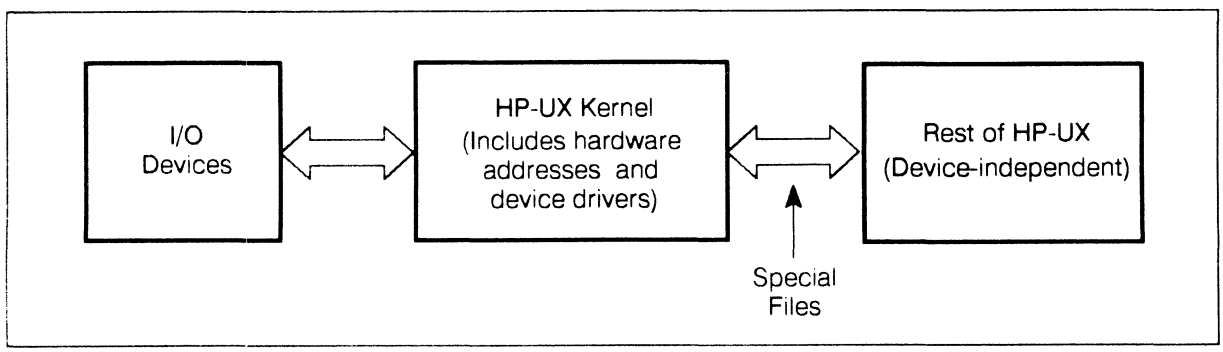

Figure 5-5. Special Files Link the Kernel with the Rest of HP-UX

Special files have a major number (which identifies the driver) and a minor number (which contains the lu number and miscellaneous information for the device). Special files also have a flag indicating block or character data transfer. For a detailed explanation of special files, see chapter 5 in the *HP 9000 Series 800 System Administrator's Manual.*

Using these special files, HP-UX can handle I/O to devices just as it handles data for ordinary files. Programs and functions written for files can also be used for devices. For example, the following command transfers data between two files, creating a new file with identical contents to the original.

```
cp partslist partslist2
```

The contents of the file **partslist** is copied into the new file **partslist2.** (If **partslist2** already exists, the original contents of the file are overwritten.)

A similar command can be used to transfer data to a device:

```
cp partslist  /dev/lp0
```

The contents of **partslist** is sent to the line printer specified by the special file **/dev/lp0.**

How to Create Special Files

If you change the I/O configuration, you will have to create special files that match the new devices and new addresses. We recommend that you do this with the **insf** command (INstall Special Files).

First, change the working directory:

```
cd /dev
```

Then, issue the command:

```
/etc/insf
```

The **insf** command takes the text file **/etc/devices** and creates all the special files necessary for HP-UX. This includes both the block and character special files needed, special files for each section of each disk, as well as special files for all options of a tape device. In addition, **insf** sets file permission and file ownership to appropriate values, and creates diagnostic files if needed. (The **insf** command takes about four minutes to complete.)

Although there are other ways to create special files (**mksf** and **mknod**), they are not as easy and are not recommended.

Trying the New Configuration

After you've created the special files, you can reboot the system to try the new configuration. First, gather the information needed to reboot if the new kernel fails to boot properly. You should write down:

- Device driver name for the system disk (disc0 for HP-IB, disc2 for HP-FL):
- Hardware address of the system disk (e.g. 4.0.0):
- The section number of the root file system (e.g. 4):
- The name of the backup kernel (typically /SYSBCKUP):

To find the section number of the root file system, look at the **/etc/checklist** file by entering:

```
$ cat /etc/checklist
```

You'll see a display similar to this:

```
/dev/dsk/c0d0s4 / hfs rw 0 1 # root disc
/dev/dsk/c0d0s3 /tmp hfs rw 0 2 # /tmp directory
/dev/dsk/c0d0s9 /usr hfs rw 0 3 # /usr directory
/dev/dsk/c4d0s8 /users hfs rw 0 3 # /users directory
/dev/dsk/c6d0s7 /extra2 hfs rw 0 3 # /extra2 directory
/dev/dsk/c0d0s10 /extra hfs rw 0 4 # extra space
/dev/dsk/c4d0s10 /mnt hfs rw 0 4 # /mnt directory
/dev/dsk/c6d0s8 /dd8 hfs ro 0 4 # source
/dev/dsk/c7d0s11 /mnt1 hfs rw 0 4 # edc
```

Find the entry in this list that contains the root directory; this entry will have a single slash (/ for root). In this example, it is the first entry:

```
/dev/dsk/c0d0s4 / hfs rw 0 1 # root disc
```

On this system, the entry has been labelled "root disk" in addition to having the single slash in the second field. The number we're interested in is the last digit in the first field, the

number following the `s` in `c0d0s4`. In this example, the section number of the root file system is 4.

Next, shut down the system with a command sequence like:

```
cd /
shutdown -h 0
```

Warning

Before shutting down the system, be sure to write down the information required for booting from the old kernel. Otherwise it may not be easy to get HP-UX running if the new kernel fails to boot.

Wait until the console displays a message like:

```
Halting (in tight loop) -- OK to Hit Reset Button
```

Turn the power off, then install the cards that match the new I/O configuration. Be sure to follow the ESD precautions when handling the cards. (ESD precautions are described in the hardware Installation and Configuration Guides.) Turn the power back on, and allow the system to reboot. The kernel with the new I/O configuration should load.

If the New Kernel Doesn't Boot

If the kernel does not boot properly, you can boot from the backup kernel instead:

1. Reset the SPU.
2. Interrupt the autoboot process by pressing any key.
3. Respond Y to the prompt: "Boot from primary path?".
4. Respond Y to the prompt: "Interact with IPL?".
5. Using the information you acquired before shutting the system down (see previous section), formulate the ISL command using the syntax in Figure 5–6.

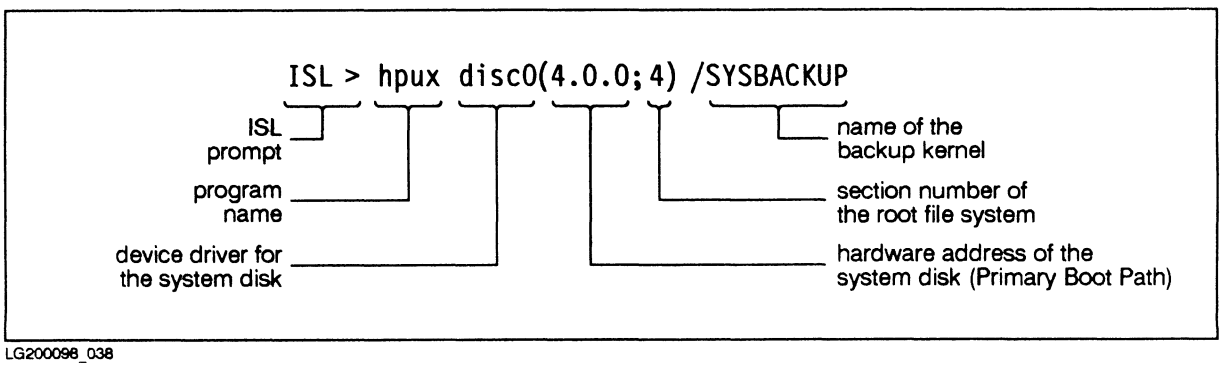

Figure 5-6. The Command to Boot From the Backup Kernel

The sample command in Figure 5–6 is for a system with an HP-IB system disk (**disc0**), at hardware address **4.0.0.** The root file system is in section **4,** and the name of the backup kernel is **/SYSBCKUP.** If you named the backup kernel something other than **/SYSBCKUP,** use that name instead. Once you have the backup kernel running, you can re-edit the **S800** file and try the process again.

Cookbook Procedure for Modifying HP-UX

This section briefly describes the steps to modify HP-UX for a new I/O configuration. Refer to chapters 5 and 7 in the *HP 9000 Series 800 System Administrator's Manual* for a complete explanation.

1. Log in as root.
2. At the HP-UX prompt, issue the command:

```
cd /etc/conf/gen
```

3. Copy the existing **S800** file to a different name, so that you will have a backup copy in case of problems. For example:

```
cp S800 S800BACKUP
```

4. Edit the **S800** file so that it contains the device drivers and hardware addresses for the new I/O configuration. (See the previous section, "How to Read an S800 File.") You can use the **vi** screen editor to edit the file. For example:

```
vi S800
```

5. Regenerate the kernel with **uxgen,** using the edited **S800** file as input:

```
/etc/uxgen S800
```

6. Copy the old kernel (**/hp-ux**) in the root (/) directory and the old devices file (**/etc/devices**). Write down the names of these files in case the new kernel does not boot. For example:

```
cp /hp-ux /SYSBCKUP
cp /etc/devices /etc/DEVBACKUP
```

7. Change the working directory:

```
cd /etc/conf/S800
```

8. Move **hp-ux** to **/hp-ux** and **devices** to **/etc/devices,** by entering the commands:

```
mv hp-ux /hp-ux
mv devices /etc/devices
```

9. Create the special files (device files) for the new configuration by entering the commands:

```
cd /dev
/etc/insf
```

10. Write down the information you need in case the new kernel doesn't boot. You'll need the name of the device driver for the system disk (disc0 for HP-IB, disc2 for HP-FL), hardware address of the system disk (Primary Boot Path), section number of the root file system, and the name of the backup kernel (typically /SYSBCKUP).
11. Shut down the system:

```
cd /
shutdown -h 0
```

12. Turn off system power.

13. Install cards in the desired slots, following ESD precautions.
14. Turn on the system and reboot.
15. If the new kernel doesn't boot properly, reboot with the old kernel by entering:

```
ISL> hpux disc0(x.y.z;s) /SYSBCKUP
```

Where `x.y.z` is the hardware path of the system disk and `s` is the section number of the root file system. If the system disk is HP-FL, then use disc2 instead of disc0. If you named the backup kernel something other than /SYSBCKUP, use that name instead.

6

Root Disk Partitioning

This chapter explains how to use the **Root Disk Partitioning** screen to change the names and section locations of the **mount points**, the directories (**/**, **/usr**, etc.) into which the system will be loaded.

Warning **Do not attempt to use this chapter if you are a novice user—accept the default set by Hewlett-Packard for your type of disk.**

The **Root Disk Partitioning** screen comes up during the installation process described in chapter 3. You must do a full installation, or re-installation, in order to use this screen. (There are other ways to repartition your root disk: these are described in the Series 800 *System Administrator's Guide*)

Sections and Directories

HP-UX divides the physical space on the disk into sections in order to manage the space more efficiently and flexibly.

Directories are assigned to certain sections by default (which directories are associated with which sections depends on the type of disk). **Install** and **Update** load files from tape into the directories. The **Root Disk Partitioning** screen allows you to change the default assignments, and thus to determine where the files will reside in physical space on the disk.

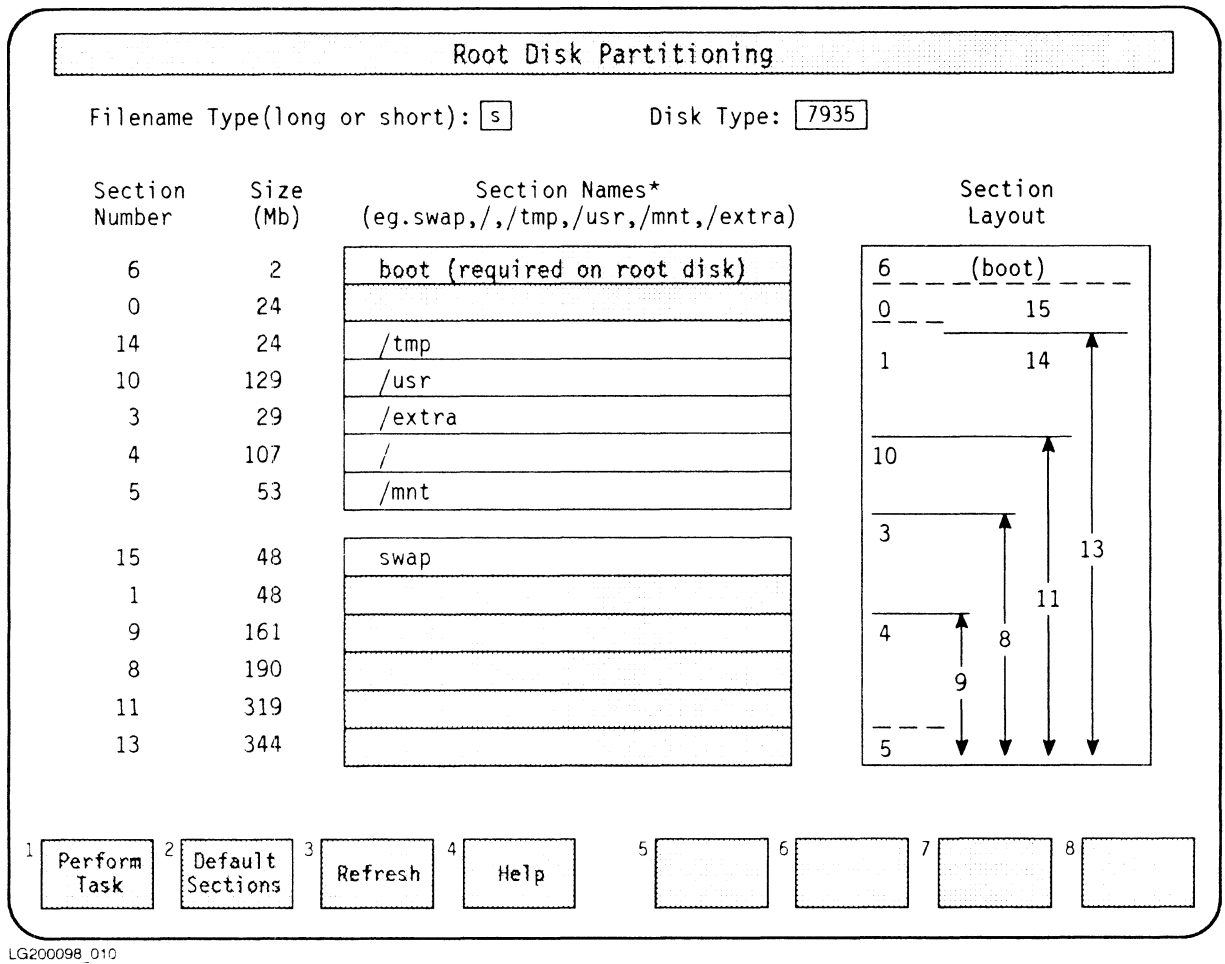

Figure 6-1. Root Disk Partitioning screen

Disk sections can be represented by a map, such as the one on the right side of the screen shown in figure 6-1. On the left side of the screen are two columns. The first column lists all the sections on the disk; the second shows the size of each section in megabytes.

Note

If you are at present doing an installation, and this screen is showing on your console, look at that rather than the picture—you'll see the default layout for your type of disk.

Since the section to which a given directory is assigned determines the size of that directory, you can change the size of a directory by moving it to another section. For example, in figure 6-1, **/mnt** is 53 megabytes and **/usr** is 129 megabytes. You could shrink **/usr** and enlarge **/mnt** by switching their positions on the screen.

Or you might decide essentially to do away with separate directories by assigning / (**root**) to section 13, thereby creating a directory covering the entire disk except for **boot** and **swap.** This would cause **update** to load all files into the **root** directory.

Things to Consider

If you want to change the default configuration, bear the the following in mind:

- As you can see from the map on the screen, some sections are formed by merging smaller sections, so that the same physical space is defined twice. (For example, section 11 encompasses sections 10, 3, 4 and 5 (or 10, 9 and 8): if you are using any of these smaller sections, you can't also use section 11, and vice versa.) The program will prevent you from using the same space twice.

  You'll also get a warning if you have not used all the sections available (e.g., if you have used 3 and 4 but not 5). Make sure you allocate all the space on the disk.

- Don't leave holes. If you choose to use sections 0 and 14, or 0 and 13, you will waste disk space—24 megabytes on a 7935.

- The **swap** section is not a directory: it is a piece of raw storage used by the HP-UX memory manager. You must assign at least one section to **swap.**

Note

You can assign more than one **swap** section, but if you do, they should be next to each other on the disk.

- Advantages of having multiple sections for file systems (as in the default configuration) include:
  - Logically related files are stored in contiguous physical space, reducing disk access time.
  - You can tune block/fragment sizes according to the types of file in a particular file system. (Refer to the discussion of blocks and fragments in the Series 800 *System Administrator's Manual*)
  - Making the **root** directory self-contained reduces risk of **root** being corrupted by other activity on the disk.
  - You are better protected against **root** overflow. When the **root** directory is full, the operating system will not work correctly. If **root** is in a separate section from **/tmp** and all user directories, it will be unaffected if one of these other directories fills up its section.
- The disadvantage of having multiple sections is that you may run out of space in a particular section while there is still space elsewhere on the disk (if you have small sections you are still more likely to run out of space in one of them). Merging everything into one large section eliminates this problem, but loses the advantages listed above.
- Creating **symbolic links** can help if you run out space in a particular section—see **Step 10** in chapter 4.

- If you will be installing XWINDOWS, put / (**root**) at section 13, making the entire disk one large file system. This will allow for the large amount of space in **/usr** that XWINDOWS needs.

Using the Screen

To change the configuration:

1. Move from line to line on the screen by using the Tab key.
2. Space through the default names that you want to change, move or delete. (Remember that `boot`, **/ (root)** and `swap` must appear in the list. You can have more than one swap area if you wish.)
3. Now type in the new names where you want them to go.

   Restrictions

   The program will not let you:

   - Enter duplicate names.

     You'll see a highlighted message

     ```
     ERROR:  File system names in Section [number] and Section
             [number] cannot be identical.
     ```

     Press the space bar, delete the current entry, tab to the duplicate, delete it. Now you can tab back to where you were when you got the message and make the entry you want.

   - Use a section that is overlapped by another already in use.

     The line for a given section will remain **protected** (you won't be able to tab to it) if there's an entry for an overlapping section. "Clean out" overlapping sections by spacing through them.

   - Enter section names that do not begin with **/** (except for **swap**).

     The error message will tell you the number of the offending section. Press the space bar and then correct the error.

   - Enter section names with embedded spaces.

     Press the space bar and retype the name without spaces.

   - Enter section names longer than 14 characters (if you have selected short filenames).

     Press the spacebar and type a shorter name—or enter `1` in the `Filename Type` field if you really intend to use file names longer than 14 characters. (See the discussion near the beginning of chapter 3.)

   - Put **swap** in section 0 in some circumstances.

     If you see the message

     `A swap partition on c0d0s0 is not allowed`

     you must move **swap** out of section 0.

4. Press `Perform Task`

5. If the **install** software detects that this is an unworkable configuration, you'll see a highlighted error message at the bottom of the screen, for example:

```
ERROR: Root disk must have a / file system
```

   Press the space bar to acknowledge the message and correct the error as the message indicates. In this case, you would need to add an entry for **/** (root).

   Press [Perform Task] to try again.

   You will also get a warning if you do not use all the sections available to you:

```
Not all sections were used! Continue installation?(y/n)
```

   It is bad practice to leave unused sections. Respond `n` and fill in the vacant sections.

6. When there are no more errors, continue with **Step 10** of the installation procedure (see chapter 3).

Using the Function Keys

On an HP terminal keyboard, **function keys** (keys that cause the program to take action) are on the top row of the keyboard, and are labelled `f1, f2, f3`, etc. The **function key labels,** describing what each key does, appear at the bottom of the CRT screen. A blank key label means that this key has no effect on this particular screen.

Figure 6-1 shows the keys for the **Root Disk Partitioning** screen. The effect of pressing each key is as follows:

`Perform Task`	Implements the layout shown on your screen.
`Default Sections`	Restores the default section layout shown when the screen first came up. If you start to change the default layout of the disk and then change your mind or want to start over, use this key to get the defaults back. This key does not restore the default file name option.
`Refresh`	Repaints the screen, clearing out any "noise" characters caused by datacom transmission errors. Does not restore default data to the input fields.
`Help`	Brings up a **Help** screen explaining the options on this screen.

7

The Update Screens

This chapter is a reference guide to the **update** screens introduced in chapter 4.

It contains a representation of each screen, explains what the screen is for and how you get to it, explains each field and function key, and tells you how to correct errors.

It also explains screens that **update** displays when it encounters a serious error.

Caution

Do not use this chapter as a guide to running **update**—use chapter 4 for that. Use this chapter if you want to use options, or if you encounter errors, not covered in chapter 4.

Partition Menu (1)

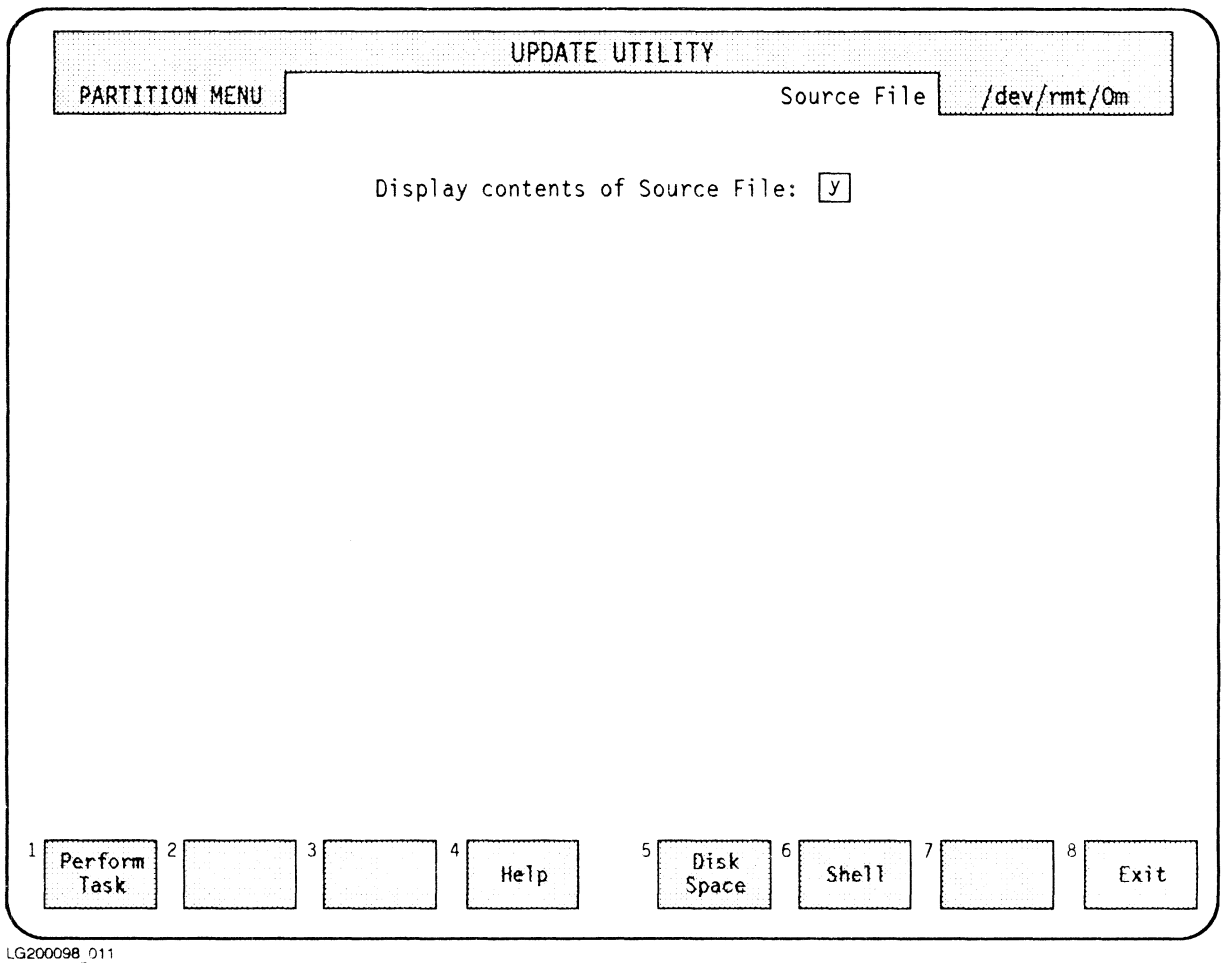

Figure 7-1.

This is the first screen in **update.** If you are doing an installation, this screen comes up automatically when the **install** portion of the procedure is complete (see chapter 3). If you are running **update** standalone, this is the first screen you'll see.

Its purpose is to allow you to change the `Source File` if you need to, or to enter it for the first time if you ran **update** without the *source_devicefile* parameter.

You will see this screen again at the end of the update/customizaton cycle, if you have loaded all the subssytems on the tape(s); if you haven't, you'll see the variant marked **Partition Menu (2)** later in this chapter.

Fields

`Source File`

Device filename identifying the tape drive. Defaults to **/dev/rmt/0m.** Change it if this is not correct (see **Before You Run Update** at the beginning of chapter 4). **Write the filename down in case you accidentally type over it.**

Note

The field containing the source file name is capable of scrolling sideways. This is to allow for a long path or filename, but it could also allow characters you typed accidentally to scroll off the screen. If you get the message `Source file does not exist`, and everything seems okay, check for extraneous characters in this field by pressing the ◄ and ► keys repeatedly.

`Display contents of Source File?`

Defaults to `y` at the beginning of **update:** press [Perform Task] to continue to the next screen. If you have returned to this screen at the end of **update,** the default is `n`: change it to `!` if you want to review the list of all the subsystems on the tapes.

Function Keys

On an HP terminal keyboard, **function keys** (keys that cause the program to take action) are on the top row of the keyboard, and are marked `f1, f2, f3`, etc. The **function key labels,** describing what each key does, appear at the bottom of the CRT screen. A blank key label means that this key has no effect on this particular screen.

Figure 7-1 shows the keys for the **Partition Menu** screen. The effect of pressing each key is as follows:

Key	Action
[Perform Task]	If `Display contents of Source File` is set to `y`, causes **update** to read the table of contents on the tape and to bring up the next screen (see **Partition Menu (2)**). Otherwise causes error: `NO ACTION SELECTED`.
[Help]	Brings up the **Help** screen.
[Disk Space]	Brings up **Disk Space** screen. See **Disk Space Menu(1)** later in this chapter.
[Shell]	Breaks to the shell. When you have finished working in the shell, type `exit` and press [Return] to return to this screen.
[Exit]	Exits **update.** When you press this key, **update** will ask you to confirm that you really mean it: `OKAY to EXIT Update and reboot? <y/n>`

Do not respond **y** unless you have completed the **update** cycle (you should have seen the message `Returned from TASK!`); otherwise you may be left with an unbootable system.

Errors

Message	What to do
`NO ACTION SELECTED`	If on **Partition Menu (1):** 1. Press space bar. 2. Change response to **y** or **!**. 3. Press [Perform Task]. If not on **Partition Menu (1):** 1. Press space bar. 2. Choose action from choices on screen. 3. Press [Perform Task].
`Cannot read table of contents on source file`	1. Check **HP-UX CORE + SUBSYS** tape mounted, drive online and (if cartridge tape drive) BUSY light is off. 2. Press space bar. 3. Press [Perform Task].
`Source file does not exist`	1. Make sure the source file name showing on the screen matches what you wrote down, and is a valid file. 2. Press space bar. 3. Press [Perform Task].
`Missing table of contents in source file, or lack of space in /tmp or /system`	1. Check **HP-UX CORE + SUBSYS** tape mounted and drive online. 2. Use [Disk Space] key to check that you have at least 3mb free space in **/** and 2mb in **/tmp.** Create space by moving or removing files if you need to. 3. Press space bar. 4. Press [Perform Task]. 5. If you're still getting this message, double check 1. and 2. If nothing is wrong, you could have a bad tape: call HP.

Errors (cont.)

Message	What to do
`Missing table of contents in source file`	1. Check **HP-UX CORE + SUBSYS** tape mounted, drive online and (if cartridge tape drive) BUSY light is off. 2. Use [Disk Space] key to check that you have at least 3mb free space in / and 2mb **/tmp.** Create space if you need to by moving or removing files. 3. Press space bar. 4. Press [Perform Task]. 5. If you're still getting this message, double check 1. and 2. If nothing is wrong, you could have a bad tape: call HP.
`Media name must be <name>. This media is <name>`	1. You've mounted the wrong tape. Mount the right one and put the drive online. 2. Press the space bar. 3. Press [Perform Task].
`Present source file media name is <name>. Use media named <name>`	1. You've mounted the wrong tape. Mount the right one and put the drive online. 2. Press the space bar. 3. Press [Perform Task].

Partition Menu (2)

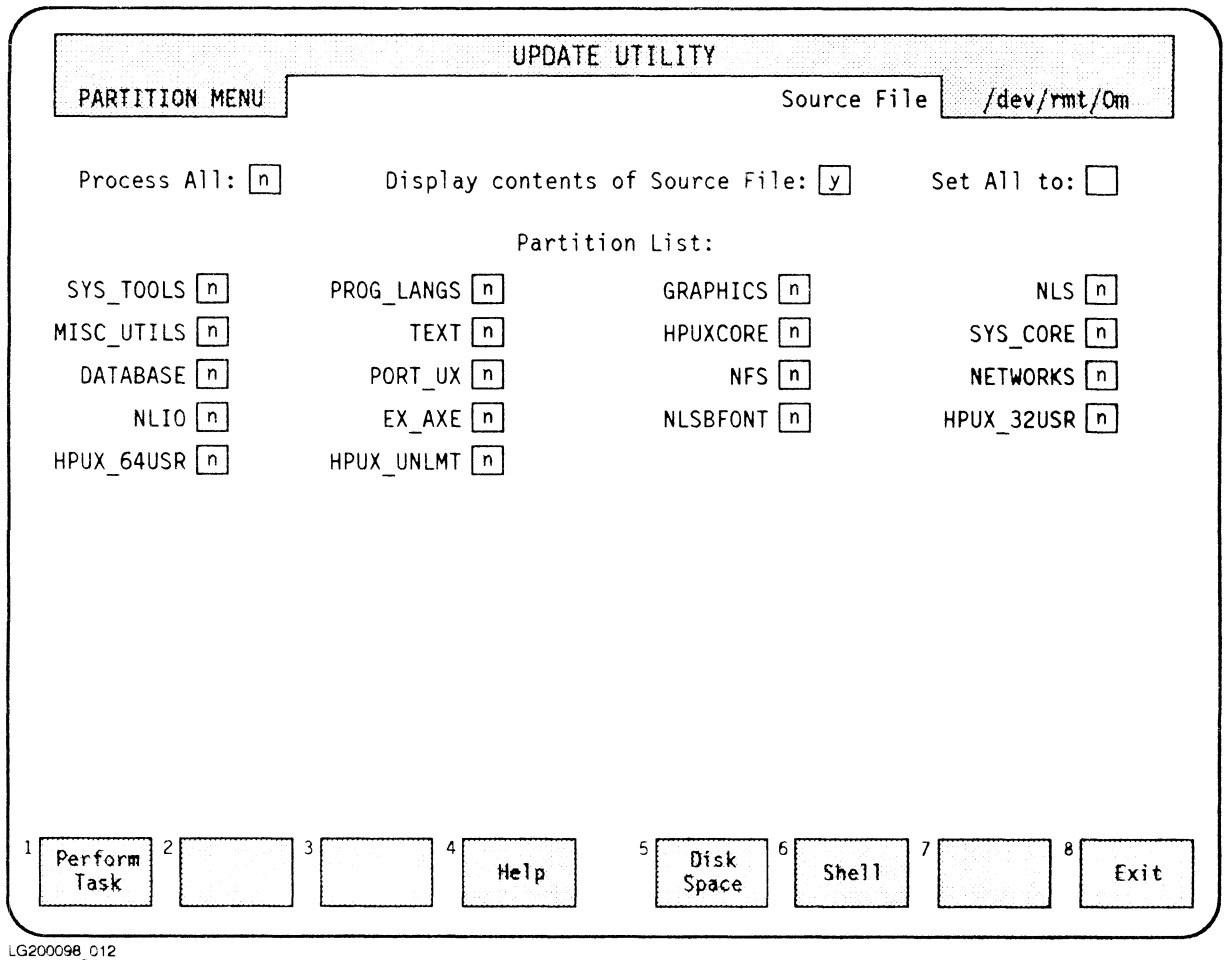

Figure 7-2.

This is the second screen you'll see in **update.** It allows you to choose to load some or all of the subsystems on the **HP-UX CORE + SUBSYS** tape(s).

You may also see this screen at the end of **update** if you have chosen not to load all the subsystems on the tapes, or during **update** under certain conditions. If you are seeing the screen for the second (or later) time around, only those subsystems not yet loaded will appear on the `Partition List:` you can force **update** to display them all by typing `!` in the `Display contents of Source File` field.

Fields

`Source File`

Device filename identifying the tape drive. **Write this filename down in case you accidentally type over it.**

Note

The field containing the source file name is capable of scrolling sideways. This is to allow for a long path or filename, but it could also allow characters you typed accidentally to scroll off the screen. If you get the message `Source file does not exist`, and everything seems okay, check for extraneous characters in this field by pressing the [◄] and [►] keys repeatedly.

`Process All`

Defaults to `n` if this is the first time around for this screen. Set it to `y` if you want to load all the subsystems on the **HP-UX CORE + SUBSYS** tapes; otherwise leave it as `n` and change individual entries in the `Partition List` to `y`.

DO NOT load subsystems individually if you are installing or updating the HP-UX operating suystem.

`Display contents of Source File?`

(The `Partition List` on the screen is the table of contents).

Accepts `y`, `n` or `!` (to force display of subsystems already loaded, if any).

`Set All to`

Sets every entry in the `Partition List` to either `y` or `n`. Useful if you want to load most but not all subsystems—enter `y` here and then change those entries you don't want to load back to `n`.

`Partition List`

List of all the subsystems not yet loaded. Set individual entries to `y` and press [Perform Task] to load them. (Use `Process All` to load everything.) If there are more subsystems in the list than will fit on the screen, you'll see the following message at the top of the list:

```
Use arrow keys to Scroll Partition List!
```

Use the [▲] and [▼] keys to move through the list.

Function Keys

On an HP terminal keyboard, **function keys** (keys that cause the program to take action) are on the top row of the keyboard, and are marked `f1`, `f2`, `f3`, etc. The **function key labels,** describing what each key does, appear at the bottom of the CRT screen. A blank key label means that this key has no effect on this particular screen.

Figure 7-2 shows the keys for the **Partition Menu** screen. The effect of pressing each key is as follows:

Key	Action
Perform Task	If you have chosen to load more than one subsystem, causes **update** to bring up the **Disk Space Estimate** screen (see (**Disk Space Estimate (2)** later in this chapter). If you have chosen only one subsystem, brings up the **Fileset Menu,** also covered later in this chapter. If you have not chosen any action, causes error: `NO ACTION SELECTED`.
Help	Brings up the **Help** screen.
Disk Space	Brings up **Disk Space** screen. See **Disk Space Menu(1)** later in this chapter.
Shell	Breaks to the shell. When you have finished working in the shell, type `exit` and press Return to return to this screen.
Exit	Exits **update.** When you press this key, **update** will ask you to confirm that you really mean it: `OKAY to EXIT Update and reboot? <y/n>` Do not respond `y` unless you have completed the **update** cycle (you should have seen the message `Returned from TASK!`); otherwise you may be left with an unbootable system.

Errors

See **Partition Menu (1).**

Fileset Menu

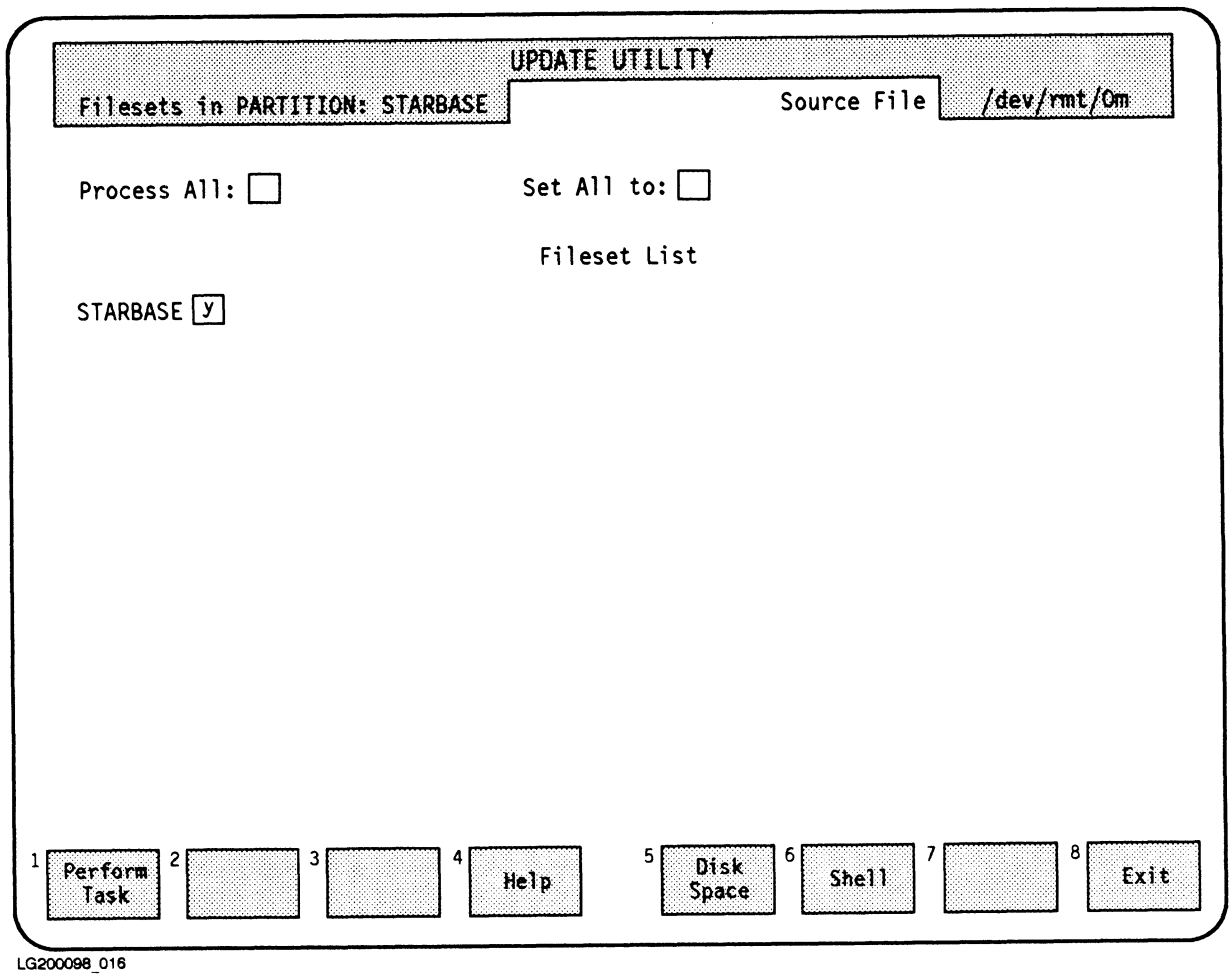

Figure 7-3.

This screen allows you to pick individual filesets from a given subsystem. You will see this screen only if you select subsystems one at a time from the **Partition Menu** (see **Partition Menu (2)** earlier in this chapter.)

This screen behaves in a manner very similar to the **Partition Menu** screen.

Fields

`Source File`	Device filename identifying the tape drive.
Process All	Set this to `y` if you want to load all the filesets in the subsystem; otherwise set it to `n` and change individual entries in the `Fileset List` to `y`.
`Set All to`	Sets every entry in the `Fileset List` to either `y` or `n`. Useful if you want to load most but not all subsystems—enter `y` here and then change those entries you don't want to load back to `n`.
`Fileset List`	List of all the filesets in this subsystem not yet loaded. Set individual entries to `y` and press `Perform Task` to load them. (Use `Process All` to load all the filesets in this subsystem.) If there are more filesets in the list than will fit on the screen, you'll see the following message at the top of the list: `Use arrow keys to Scroll Fileset List!` Use the ▲ and ▼ keys to move through the list.

Function Keys

On an HP terminal keyboard, **function keys** (keys that cause the program to take action) are on the top row of the keyboard, and are marked `f1`, `f2`, `f3`, etc. The **function key labels,** describing what each key does, appear at the bottom of the CRT screen. A blank key label means that this key has no effect on this particular screen.

Figure 7-3 shows the keys for the **Fileset Menu** screen. The effect of pressing each key is as follows:

Key	Action
Perform Task	Causes **update** to bring up the **Disk Space Estimate** screen (see (**Disk Space Estimate (2)** later in this chapter). If you have not chosen any action, causes error: `NO ACTION SELECTED`.
Help	Brings up the **Help** screen.
Disk Space	Brings up **Disk Space** screen. See **Disk Space Menu(1)** later in this chapter.
Shell	Breaks to the shell. When you have finished working in the shell, type `exit` and press Return to return to this screen.
Exit	Returns to **Partition Menu(2).**

Errors

See **Partition Menu (1).**

Disk Space Menu (1)

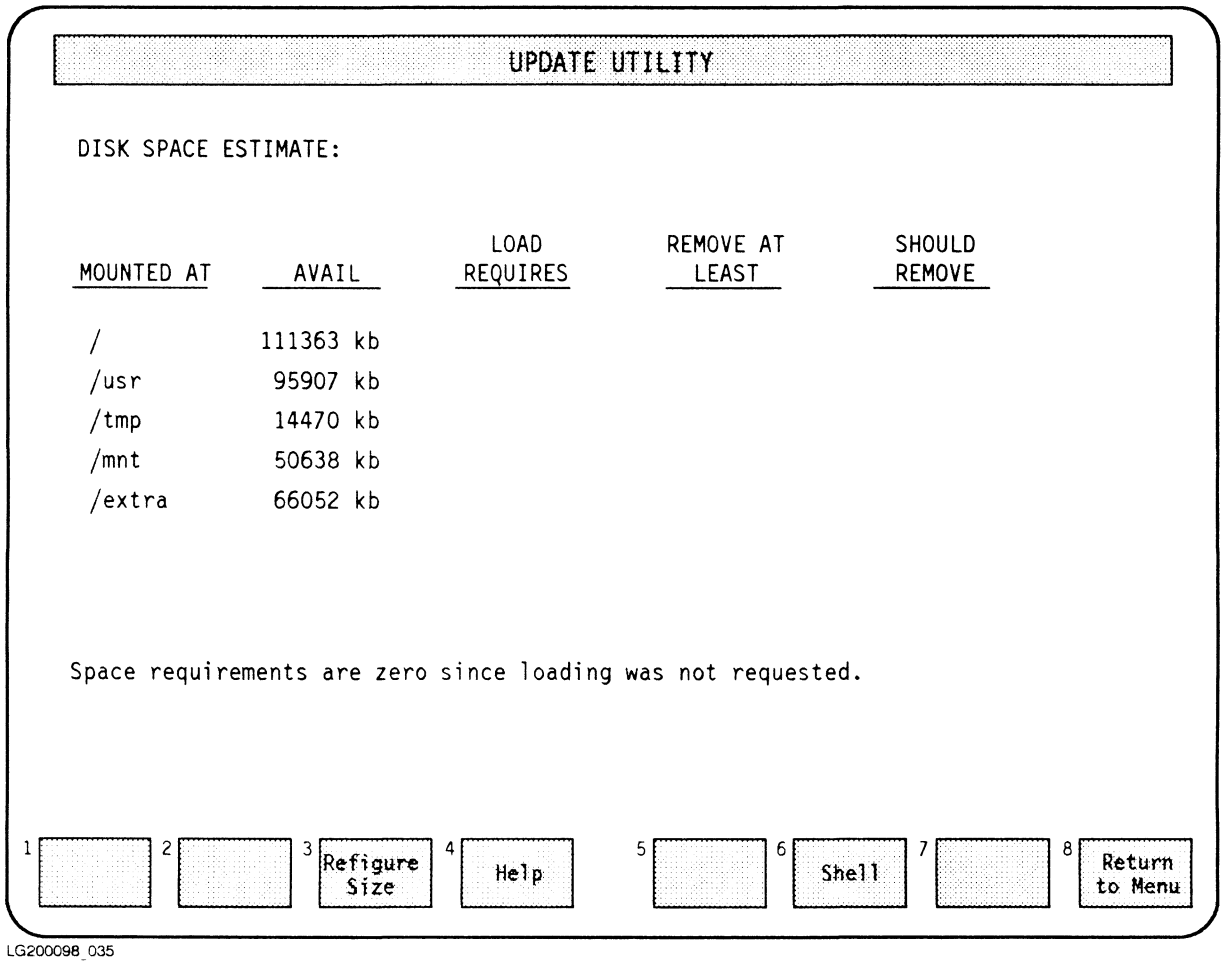

Figure 7-4.

You get to this screen by pressing the Disk Space key on a **Partition Menu** or the **Fileset Menu.**

It shows how much disk space is free in each section of the **root** or system disk. This version of the screen does not show the space required to load subsystems or filesets since you have not yet told **update** which you intend to load. (See **Disk Space Menu (2)** later in this chapter.)

Note

If there are more than 15 mounted file systems on your system, they will not all fit on this screen. To scroll them, move the cursor to the bottom line using the [▼] key. Each time you press the [▼] key after that, you'll bring up a new line of the display.

Explanation of the Screen

`MOUNTED AT` The name of the disk section.

`AVAIL` The amount of free space in this section.

Function Keys

On an HP terminal keyboard, **function keys** (keys that cause the program to take action) are on the top row of the keyboard, and are marked `f1`, `f2`, `f3`, etc. The **function key labels,** describing what each key does, appear at the bottom of the CRT screen. A blank function key label means that this key has no effect on this particular screen.

Figure 7-4 shows the keys for the **Disk Space Menu (1)** screen. The effect of pressing each key is as follows:

Key	Action
`Refigure Size`	Causes **update** to recalculate the space available. Use this key if you have returned to this screen from the shell after creating more space and want to see how much you have freed up.
`Help`	Brings up the **Help** screen.
`Shell`	Breaks to the shell. When you have finished working in the shell, type `exit` and press [Return] to return to this screen.
`Return to Menu`	Returns to the last menu you were on—either the **Fileset Menu** or the **Partition Menu (2).**

Errors

Message	What to do
`WARNING: You need to create room in /tmp`	1. Press Shell. 2. Remove files until you have at least 2mb of free space in the section in which **/tmp** resides (usually /). Preferably clean all files out of the **/tmp** directory. 3. Type `exit` to return to this screen. 4. Press Return to Menu to get back to the screen you were on before—either the **Partition Menu (1)** or the **Fileset Menu.** 5. Re-select the subsystems or filesets you want to load and press Perform Task.

Disk Space Menu (2)

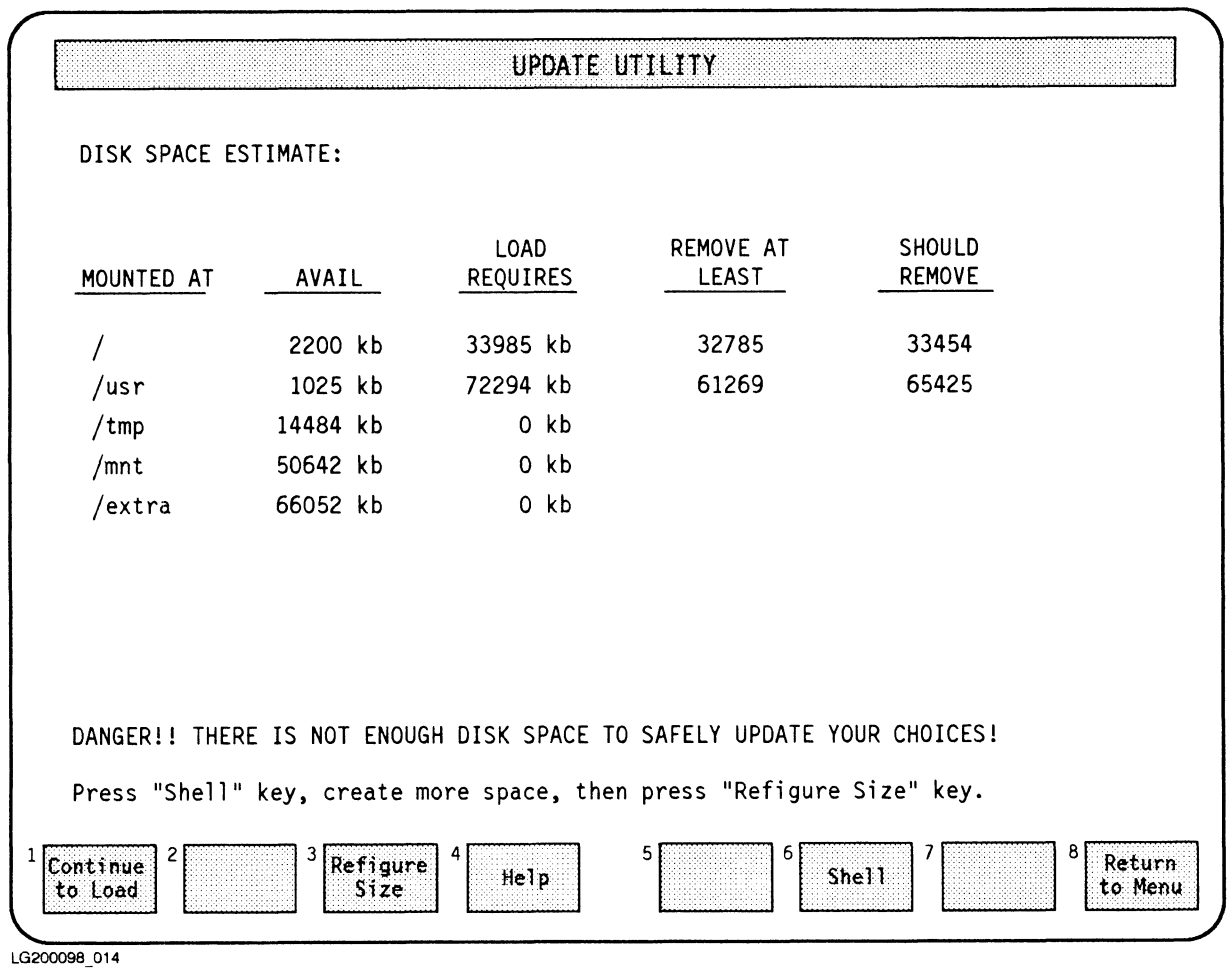

Figure 7-5.

You get to this screen automatically from the **Partition Menu (2)** or the **Fileset Menu.**

It shows the disk space free in each section on the **root** or system disk, and the space required to load the subsystems or filesets you have chosen.

- If everything you've selected will fit, the two rightmost columns (REMOVE AT LEAST and SHOULD REMOVE) are blank and you'll see the message

  ```
  There is enough space for the selection to fit
  ```

- If there is not enough space, you'll see one of two messages: either

  ```
  DANGER!!  THERE IS NOT ENOUGH DISK SPACE TO SAFELY UPDATE YOUR CHOICES!
  ```

  or

  ```
  WARNING: DISK SPACE WILL BE ABOVE THE RECOMMENDED MAXIMUM!!
  ```

  Follow the procedure in chapter 4 for creating more space.

Note

If there are more than 15 mounted file systems on your system, they will not all fit on this screen. To scroll them, move the cursor to the bottom line using the [▼] key. Each time you press the [▼] key after that, you'll bring up a new line of the display.

Explanation of the Screen

MOUNTED AT	The name of the disk section.
AVAIL	The amount of free space available in this section.
LOAD REQUIRES	The amount of space, in kilobytes, needed in this section to load the subystems or filesets you have chosen.
REMOVE AT LEAST	The amount of space, in kilobytes, you must remove from this section to make room for the subsystems or filesets you have chosen to load.
SHOULD REMOVE	The amount of space, in kilobytes, you should remove from this section to make room for the subsystems you have chosen to load, and still leave the 5% operating headroom that HP recommends.

Function Keys

On an HP terminal keyboard, **function keys** (keys that cause the program to take action) are on the top row of the keyboard, and are marked `f1`, `f2`, `f3`, etc. The **function key labels,** describing what each key does, appear at the bottom of the CRT screen. A blank key label means that this key has no effect on this particular screen.

Figure 7-5 shows the keys for the **Disk Space Menu (2)** screen. The effect of pressing each key is as follows:

Key	Action
Continue to Load	Causes **update** to load the files you have requested. Do not use this key if you see either the DANGER or WARNING message shown above.
Refigure Size	Causes **update** to recalculate the space available. Use this key if you have returned to this screen from the shell after creating more space and want to see how much you have freed up.
Help	Brings up the **Help** screen.
Shell	Breaks to the shell. When you have finished working in the shell, type `exit` and press Return to return to this screen.
Return to Menu	Returns to the last menu you were on—either the **Fileset Menu** or the **Partition Menu (2).**

Errors

Message	What to do
`WARNING: You need to create room in /tmp`	See **Errors** under **Disk Space Menu (1).**
`Size information not available for <fileset>`	Call HP.
`Size information missing. Do you want to continue? (y/n)`	**Do not continue.** Call HP.

Change Tape Screen

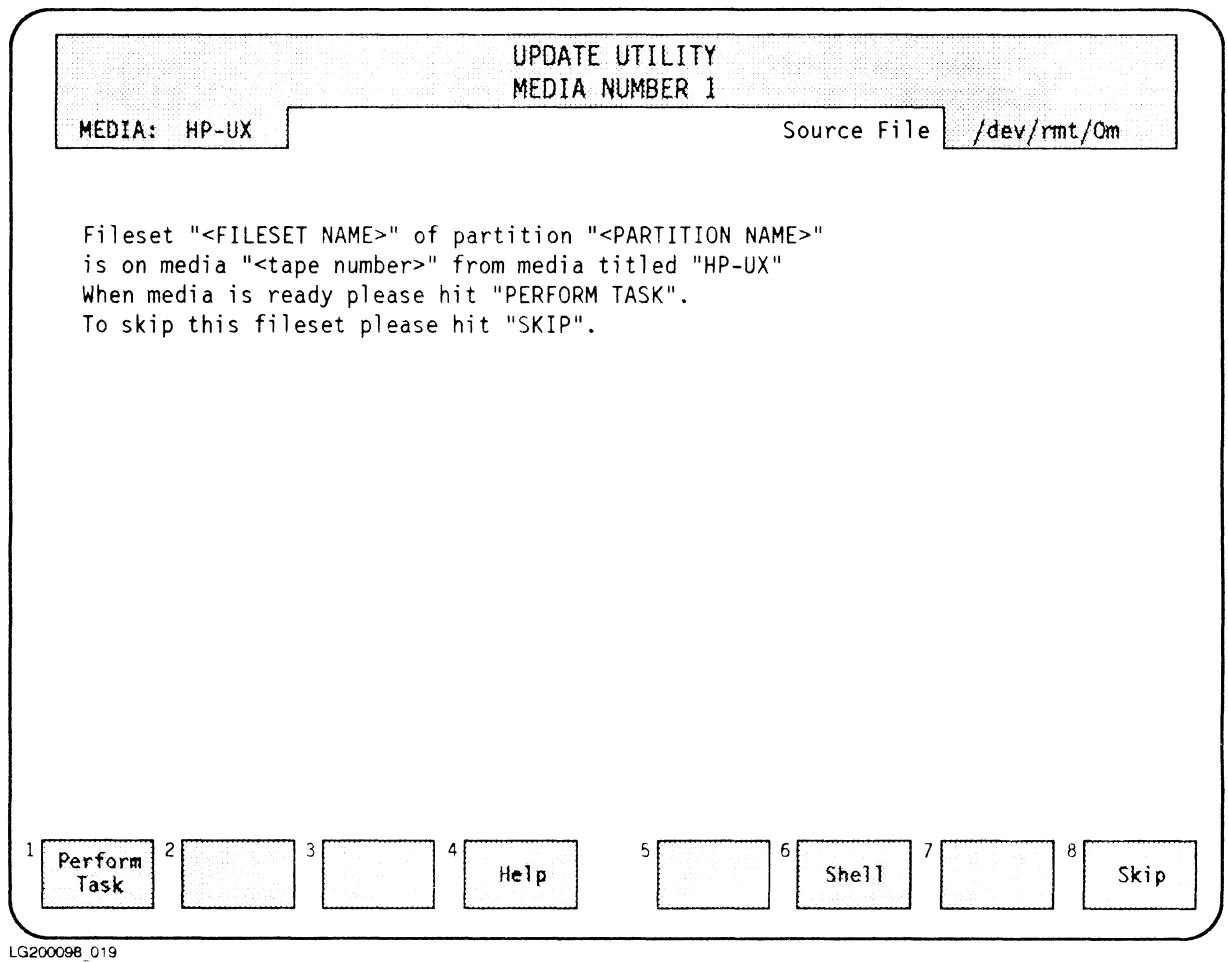

Figure 7-6.

Update displays this screen when it is looking for a fileset that is not on the current tape: you'll normally see it after **update** has loaded all the files (or all the files you requested) from the tape. Mount the next tape and press Perform Task.

If you still see this screen after mounting a new tape and pressing Perform Task, you have probably mounted a tape out of order: the number in the body of the message on your screen (identified in Figure 7-6 as <tape number>) is the number of the tape you need to mount. (If

you are intentionally skipping filesets, continue to press [Skip] until you have bypassed all the missing filesets.)

Function Keys

On an HP terminal keyboard, **function keys** (keys that cause the program to take action) are on the top row of the keyboard, and are marked `f1`, `f2`, `f3`, etc. The **function key labels,** describing what each key does, appear at the bottom of the CRT screen. A blank key label means that this key has no effect on this particular screen.

Figure 7-6 shows the keys for the **Change Tape** screen. The effect of pressing each key is as follows:

Key	Action
[Perform Task]	Causes **update** to start loading files from the new tape, if it is the next tape in order. (If it's not, you'll see this same screen again—the number identified as **<tape number>** in Figure 7-6 is the number of the tape you should load).
[Help]	Brings up the **Help** screen.
[Shell]	Breaks to the shell. When you have finished working in the shell, type **exit** and press [Return] to return to this screen.
[Skip]	Skips the current fileset.

Update Error Screen

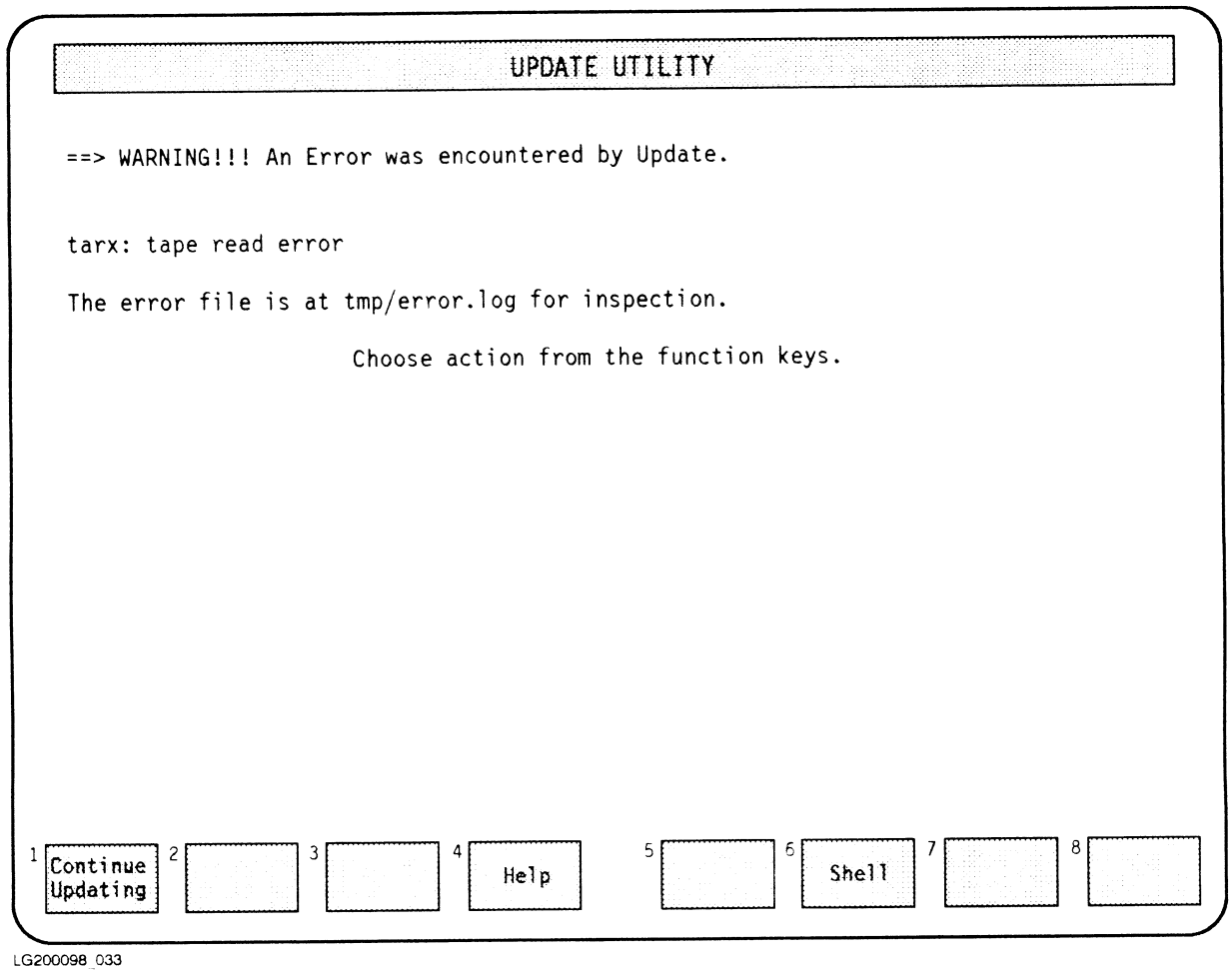

Figure 7-7.

The text in Figure 7-7 is an example of what you may see—the actual wording depends on the error.

You should:

1. Read the screen carefully.
2. Press the Help key. This brings up a **Help** screen which will tell you likely causes of the problem and what you can do to fix it.

3. Follow all directions on the **Update Error** screen and the **Help** screen, using the Shell key to get to the shell if you need to.

4. Press Continue Updating when you have done everything you can to investigate and resolve the problem.

Note

If the error resulted in **update** failing to copy a file, you may see this screen again at the end of the load, with a message such as:

```
Error reading media on /dev/rmt/0m
```

This means that **update** did not load all the subsystems you requested, because of the previous error. Go back to the **Partition Menu:** it will show you which subsystems have not been loaded (it's possible, depending on when the error occurred, that none of them have been). Re-select the subsystems you want to load.

Function Keys

On an HP terminal keyboard, **function keys** (keys that cause the program to take action) are on the top row of the keyboard, and are marked `f1`, `f2`, `f3`, etc. The **function key labels,** describing what each key does, appear at the bottom of the CRT screen. A blank key label means that this key has no effect on this particular screen.

Figure 7-7 shows the keys for the **Update Error** screen. The effect of pressing each key is as follows.

Key	Action
Continue Updating	Returns to the **update** process.
Help	Brings up the **Help** screen.
Shell	Breaks to the shell. When you have finished working in the shell, type `exit` and press Return to return to this screen.

Customize Error Screen

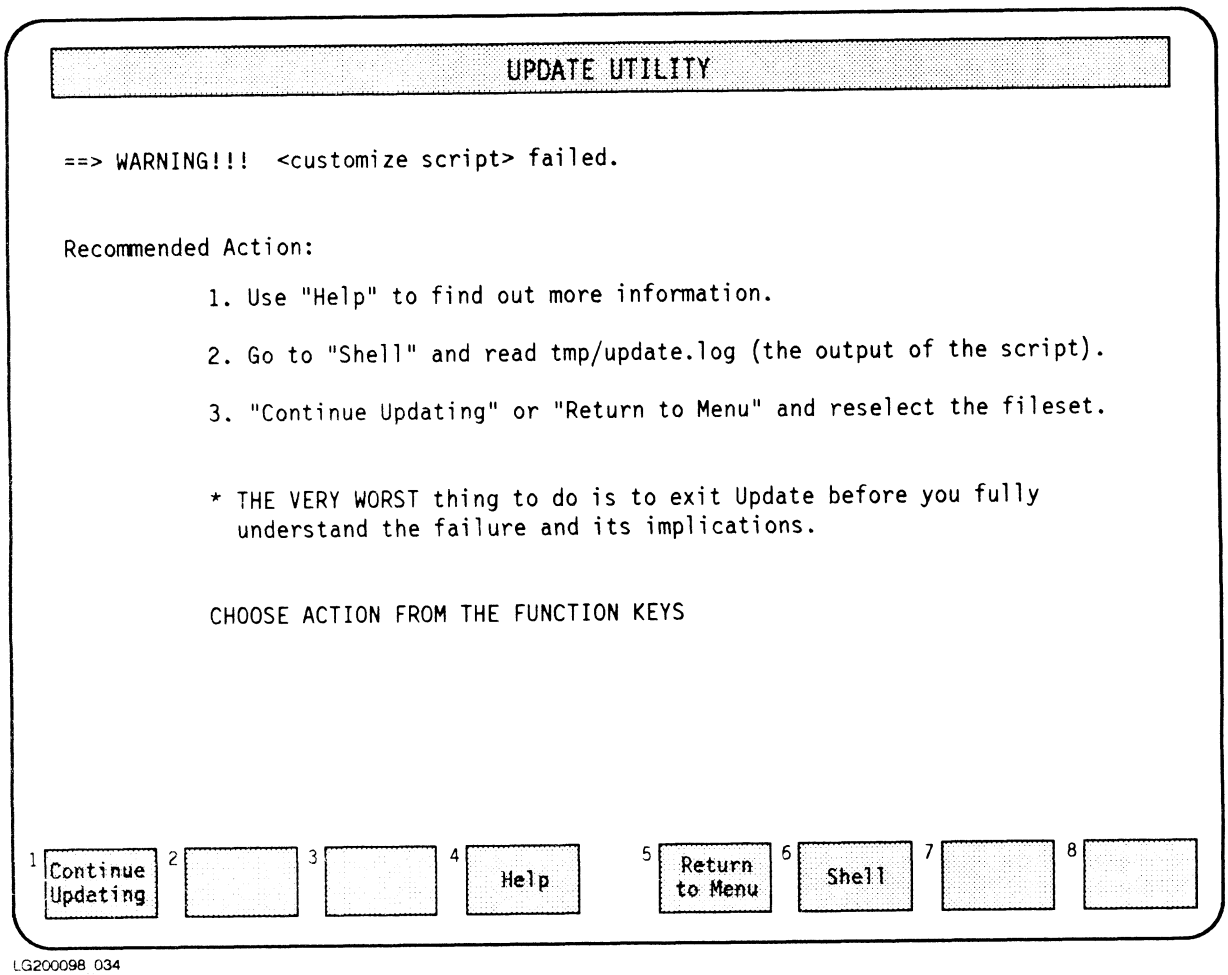

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Figure 7-8.

Customize scripts are needed to tailor certain subsystems for your system. They run after **update** has finished loading files onto the disk.

If you see this screen, it means that one of the scripts has failed.

Follow the directions on the screen. When you have done as much as you can to investigate and resolve the problem, press Continue Updating or Return to Menu:

- Press Continue Updating if you want to continue customizing other subsystems. Be sure to reload the subsystem whose customization failed.
- Press Return to Menu to return to the **Partition Menu** and start over.

Function Keys

On an HP terminal keyboard, **function keys** (keys that cause the program to take action) are on the top row of the keyboard, and are marked `f1`, `f2`, `f3`, etc. The **function key labels,** describing what each key does, appear at the bottom of the CRT screen. A blank key label means that this key has no effect on this particular screen.

Figure 7-8 shows the keys for the **Customize Error** screen. The effect of pressing each key is as follows.

Key	Action
Continue Updating	Returns to the **update** process. Runs the remaining customization scripts.
Help	Brings up the **Help** screen.
Return to Menu	Returns to the **Fileset Menu** or **Partition Menu (2),** depending on which you were last on. Does not customize the remaining subsystems.
Shell	Breaks to the shell. When you have finished working in the shell, type `exit` and press Return to return to this screen.

A

Model 825/835

This appendix contains the information you need to install HP-UX on the 825/835. The first part of the appendix lists installation commands and paths for different configurations of the 825/835. The second part of the appendix explains hardware paths on the 825/835. (For general information on paths and installation, see Chapter 2.) The third part of the appendix describes the default configuration files for the 825/835.

For a diagram of the 825/835 card cage with CIO card assignments, see Figure A–1.

Note

When installing HP-UX for the first time on a system, you must use one of the default configurations listed in the following tables. After HP-UX is installed, you can modify the configuration as explained in chapter 5.

Boot Paths and Installation Commands

Before installing an 825/835, answer the following questions:

- Is there an Access Port (AP) card in CIO Slot 0?
- Is the tape drive a Mag Tape (MT) drive?
- Is the tape drive a cartridge tape drive (CTD)?
- If the tape drive is a CTD, is it a 7914 CTD, and does it have one or two controllers? If the 7914 has two controllers, its model/serial number plate says Option 001.
- If the tape drive is a CTD, is the system console a graphics terminal?
- If the tape drive is a CTD, does the system contain A1047A Graphics Animation Interface (GAI) cards? (If so, see the Read Me First document that accompanies this release.)

Refer to Table A–1 for the configuration table that applies to your system.

Table A–1. Configuration Tables

	No Access Port (AP)	With Access Port (AP)
Mag Tape	Table A–2	Table A–5
Non-7914 CTD, Non-Graphics Console	Table A–3	Table A–6
7914 CTD, Non-Graphics Console	Table A–4	Table A–7
Non-7914 CTD, Graphics Console	Table A–8	Table A–10
7914 CTD, Graphics Console	Table A–9	Table A–11
CTD, A1047A GAI cards	Read Me First document	Read Me First document

The configuration tables appear on the following pages. The left-hand side of each configuration table describes a particular configuration. The right-hand side gives the commands and boot path information.

Table A-2. Installation of 825/835 (Mag Tape Drive; No Access Port; All Consoles)

CIO Configuration	Installation Commands and Boot Paths
CIO Slot 0: HP-IB/HP-FL Disk Drive; HP-IB/HP-FL Address 0 **CIO Slot 2:** Tape Drive with HP-IB Address 3 (7974, 7978, 7979, 7980, 7980CX);	**Command to Boot from Tape:** hpux install or hpux tape1(4.2.3;0x0a0000,1) **Primary Boot Path:** 4.0.0 (default) **Alternate Boot Path:** 4.2.3 (default)

Table A-3. Installation of 825/835 (CTDs exc. 7914; No Access Port; Non-Graphics Console)

CIO Configuration	Installation Commands and Boot Paths
CIO Slot 0: HP-IB/HP-FL Disk Drive HP-IB/HP-FL address 0 **CIO Slot 6:** Cartridge Tape Drive (CTD) (9144, 9145, 35401); CTD with HP-IB Address 3	**Command to Boot from Tape:** hpux disc0(4.6.3;0x400000) **Primary Boot Path:** 4.0.0 (default) **Alternate Boot Path:** 4.6.3

Table A-4. Installation of 825/835 (7914 CTD; No Access Port; Non-Graphics Console)

CIO Configuration	Installation Commands and Boot Paths
CIO Slot 0: 7914 CTD/Disk with One Controller HP-IB Address 0	**Command to Boot from Tape:** hpux disc0(4.0.0;0x400020) **Primary Boot Path:** 4.0.0 (default) **Alternate Boot Path:** 4.0.0.1
CIO Slot 0: 7914 CTD/Disk with Two Controllers (Opt 001) HP-IB Address 0 **CIO Slot 6:** 7914 CTD/Disk with Two Controllers (Opt 001) HP-IB Address 3	**Command to Boot from Tape:** hpux disc0(4.6.3;0x400000) **Primary Boot Path:** 4.0.0 (default) **Alternate Boot Path:** 4.6.3

Table A-5. Installation of 825/835 (Mag Tape Drive; Access Port; All Consoles)

CIO Configuration	Installation Commands and Boot Paths
CIO Slot 0: Access Port(AP) **CIO Slot 1:** HP-IB/HP-FL Disk Drive HP-IB/HP-FL Address 0 **CIO Slot 2:** Tape Drive with HP-IB Address 3 (7974, 7978, 7979, 7980, 7980CX);	**Command to Boot from Tape:** hpux install or hpux tape1(4.2.3;0x0a0000,1) **Primary Boot Path:** 4.1.0 **Alternate Boot Path:** 4.2.3 (default)

Table A-6. Installation of 825/835 (CTDs exc. 7914; Access Port; Non-Graphics Console)

CIO Configuration	Installation Commands and Boot Paths
CIO Slot 0: Access Port(AP) **CIO Slot 1:** HP-IB/HP-FL Disk Drive HP-IB/HP-FL Address 0, **CIO Slot 6:** Cartridge Tape Drive (CTD) (9144, 9145, 35401); CTD with HP-IB Address 3	**Command to Boot from Tape:** hpux disc0(4.6.3;0x400000) **Primary Boot Path:** 4.1.0 **Alternate Boot Path:** 4.6.3

Table A-7. Installation of 825/835 (7914 CTD; Access Port; Non-Graphics Console)

CIO Configuration	Installation Commands and Boot Paths
CIO Slot 0: Access Port(AP) **CIO Slot 1:** 7914 CTD/Disk with One Controller HP-IB Address 0	**Command to Boot from Tape:** hpux disc0(4.1.0;0x400020) **Primary Boot Path:** 4.1.0 **Alternate Boot Path:** 4.1.0.1
CIO Slot 0: Access Port (AP) **CIO Slot 1:** 7914 CTD/Disk with Two Controllers (Opt 001) HP-IB Address 0 **CIO Slot 6:** 7914 CTD/Disk with Two Controllers (Opt 001) HP-IB Address 3	**Command to Boot from Tape:** hpux disc0(4.6.3;0x400000) **Primary Boot Path:** 4.1.0 **Alternate Boot Path:** 4.6.3

Installations with a CTD and a Graphics Terminal

If you install HP-UX with a cartridge tape drive (CTD) and a graphics terminal as a system console, the bootpaths and installation commands are slightly different than for other configurations.

On other 825/835 configurations, CIO slot 6 contains the HP-IB card used by all CTDs except the one-controller 7914. The problem is that graphics systems have a full-size Interface card that occupies CIO slot 6, and a new location must be found for the HP-IB card.

The solution is to install an HP-IB card in CIO slot 5 and attach it to the CTD. Then **4.5.3** is the Alternate Boot Path and **hpux disc0(4.5.3;0x400000)** is the installation command. See Table A–8 to Table A–11.

Note

To install graphics systems with A1047A Graphics Animation Interface cards, refer to the Read Me First document that accompanies this release.

Table A–8. Installation of 825/835 (CTDs exc. 7914; No AP; Graphics Console)

CIO Configuration	Installation Commands and Boot Paths
CIO Slot 0: HP-IB/HP-FL Disk Drive HP-IB/HP-FL address 0 **CIO Slot 5:** Cartridge Tape Drive (CTD) (9144, 9145, 35401); CTD with HP-IB Address 3	**Command to Boot from Tape:** hpux disc0(4.5.3;0x400000) **Primary Boot Path:** 4.0.0 (default) **Alternate Boot Path:** 4.5.3

Table A–9. Installation of 825/835 (7914 CTDs; No Access Port; Graphics Console)

CIO Configuration	Installation Commands and Boot Paths
CIO Slot 0: 7914 CTD/Disk with One Controller HP-IB Address 0	**Command to Boot from Tape:** hpux disc0(4.0.0;0x400020) **Primary Boot Path:** 4.0.0 (default) **Alternate Boot Path:** 4.0.0.1
CIO Slot 0: 7914 CTD/Disk with Two Controllers (Opt 001) HP-IB Address 0 **CIO Slot 5:** 7914 CTD/Disk with Two Controllers (Opt 001) HP-IB Address 3	**Command to Boot from Tape:** hpux disc0(4.5.3;0x400000) **Primary Boot Path:** 4.0.0 (default) **Alternate Boot Path:** 4.5.3

Table A-10. Installation of 825/835 (CTDs exc. 7914, Access Port, Graphics Console)

CIO Configuration	Installation Commands and Boot Paths
CIO Slot 0: Access Port(AP) **CIO Slot 1:** HP-IB/HP-FL Disk Drive HP-IB/HP-FL Address 0, **CIO Slot 5:** Cartridge Tape Drive (CTD) (9144, 9145, 35401); CTD with HP-IB Address 3	**Command to Boot from Tape:** hpux disc0(4.5.3;0x400000) **Primary Boot Path:** 4.1.0 **Alternate Boot Path:** 4.5.3

Table A-11. Installation of 825/835 (7914 CTDs, Access Port, Graphics Console)

CIO Configuration	Installation Commands and Boot Paths
CIO Slot 0: Access Port(AP) **CIO Slot 1:** 7914 CTD/Disk with One Controller HP-IB Address 0	**Command to Boot from Tape:** hpux disc0(4.1.0;0x400020) **Primary Boot Path:** 4.1.0 **Alternate Boot Path:** 4.1.0.1
CIO Slot 0: Access Port (AP) **CIO Slot 1:** 7914 CTD/Disk with Two Controllers (Opt 001) HP-IB Address 0 **CIO Slot 5:** 7914 CTD/Disk with Two Controllers (Opt 001) HP-IB Address 3	**Command to Boot from Tape:** hpux disc0(4.5.3;0x400000) **Primary Boot Path:** 4.1.0 **Alternate Boot Path:** 4.5.3

Factory Settings

As the 825/835 comes from the factory, the boot and console paths are set as in Table A–12.

Table A-12. Factory Setting for Boot and Console Paths

Path	Setting	Configuration
Primary boot path (system disk)	4.0.0	HP-IB or HP-FL disk drive attached to a card in CIO Slot 0 (no AP)
Alternate boot path (tape drive)	4.2.3	Reel-to-reel tape drive attached to an HP-IB card in CIO Slot 2 of the SPU; HP-IB address is set to 3.
Console path	4.1.0	RS-232-C (non-graphics) terminal for the console (no AP)

If the configuration of your 825/835 is different from the factory settings, you should change the boot and console paths. Find the correct boot paths for your configuration in the preceding configuration tables. Change the boot paths with the ALTPATH and PRIMPATH commands at the ISL prompt.

Console Paths

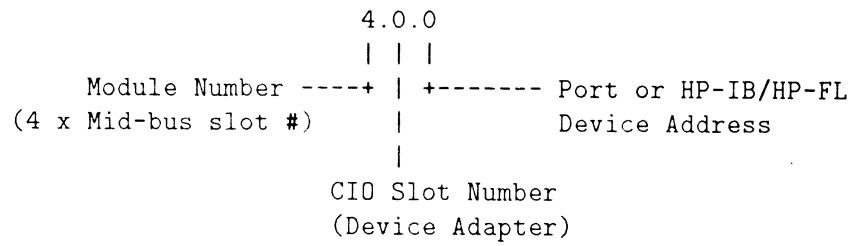
The 825/835 can have one of several console paths. Three possible paths are listed in Table A–13. You can use the CONSPATH command at the ISL prompt to change the default console path.

Table A-13. Console Paths for the 825/835

Configuration	Console Path
RS-232-C (non-graphics) terminal for the console; no Access Port (AP)	4.1.0 (default)
RS-232-C (non-graphics) terminal for the console; Access Port (AP)	4.3.0
Graphics terminal for the console; Graphics Interface card in Mid-bus slot 2	8.0.0

Hardware Paths on the 825/835

Hardware paths on the 825/835 follow the usual pattern:



Module Number

The module number for devices attached to the SPU of the 825/835 SPU is 4. For example, a system disk connected to an HP-IB card in CIO slot 0 in the SPU has a hardware address of 4.0.0. (The HP-IB address on the disk is 0.)

The module number for devices attached to the CIO Expander is 36 (on the 835) or 8 (on most Model 825s). For example, consider a tape drive with an HP-IB address of 3. If it is connected to an HP-IB card in CIO slot 2 of the CIO Expander, it has a hardware address of 36.2.3 (835) or 8.2.3 (825). This example assumes that the 825 has a Channel Adapter (CA) card in Mid-bus slot 2. If the 825 instead has the CA card in Mid-bus slot 3, the hardware address is 12.2.3 (4 x Mid-bus slot 3 equals 12.).

CIO Slot Number

The second number in the hardware address is the CIO slot number. Figure A-1 shows the recommended location for CIO cards in the 825/835.

Port or HP-IB/HP-FL Address

The third number in the hardware address is the port number (in the case of MUX cards) or the HP-IB/HP-FL address (in the case of HP-IB or HP-FL cards). The HP-IB/HP-FL address is set on the device itself.

Model 825/835 Without Remote Support

high priority ↕ low priority

CIO Slot	825/835 (No Access Port)		MB Slot
0	HP-IB/HP-FL (root disc)		8
1	MUX (console)		7
2	HP-IB (mt/lp/etc)		6
3	MUX		5
4	LAN		4
5	MUX, HP-IB (disc)[1]		3
6	HP-IB (disc)	Graphics or CA[2]	2
n/a	System Card (825), PDH Card (835)		1
n/a	Main CPU Card (825), Processor Card (835)		0

FRONT

low priority ↕ high priority

Model 825/835 With Remote Support

high priority ↕ low priority

CIO Slot	825/835 (With Access Port)		MB Slot
0	Access Port (AP)		8
1	HP-IB/HP-FL (root disc)		7
2	HP-IB (mt/lp/etc)		6
3	MUX (console)		5
4	LAN		4
5	MUX, HP-IB (disc)[1]		3
6	HP-IB (disc)	Graphics or CA[2]	2
n/a	System Card (825), PDH Card (835)		1
n/a	Main CPU Card (825), Processor Card (835)		0

FRONT

low priority ↕ high priority

[1]MUX on multi-user systems, HP-IB (disc) on graphics systems.

[2]Full-size Graphics Interface card can go here (recommended).
Full-size Channel Adapter card can go here (825 only).

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Figure A-1. 825/835 Default CIO Card Locations

825/835 Configuration Files

At the end of the update portion of the installation, you are asked about the configuration of the system:

- HP-IB or HP-FL interface to the system disk?
- Graphics or RS-232-C (non-graphics) system console?
- Access Port (AP) or not?
- CIO Expander or not?

Depending on your answers, the program selects the appropriate configuration for your system. It does this by selecting a file from one of several template files and using it as the **S800** file for compiling the kernel.

The 16 configuration template files for the Model 825/835 are in the directory named:

```
/etc/conf/gen/templates/825/genfiles
```

This directory is also named:

```
/etc/conf/gen/templates/835/genfiles
```

(The two directories are linked, since the template files are identical for the 825 and the 835.)

The template files are named **1** though **16,** and their meanings are shown in Table A–14. These files are text files, so you can view them with the `cat` or `more` commands.

Files 9 through 16 have entries for a CIO Expander:

```
cio_ca0 address 36 {
        /*
         * specify cards in expander here
         */
        mux0    lu 3 address 0;
        mux0    lu 4 address 1;
        mux0    lu 5 address 2;
        mux0    lu 6 address 3;
        mux0    lu 7 address 4;
        mux0    lu 8 address 5;
        mux0    lu 9 address 6;
        mux0    lu 10 address 7;
}
```

As you can see, the channel adapter for the CIO Expander has an address of 36 (`cio_ca0 address 36`). If you are installing an 825 with a CIO Expander, you will have to modify the **S800** file, as described in Chapter 5, so that the cio_ ca0 address is 8, 12, 16, etc., depending on the location of the Channel Adapter card. For example if the Channel Adapter card is in Mid-bus 2, the cio_ ca0 address is 8 (Mid-bus slot 2 x 4 = 8).

The default entries for the CIO Expander specify a MUX card in every slot. If you want to change these defaults (for example to add a LAN card to the CIO Expander), consult Chapter 5.

Table A-14. Configuration Template Files for the 825/835

File Name	Console	Root Disk	AP	CIO Expander
1	RS-232-C	HP-IB	No AP	No CIO Exp
2	Graphics	HP-IB	No AP	No CIO Exp
3	RC-232-C	HP-IB	AP	No CIO Exp
4	Graphics	HP-IB	AP	No CIO Exp
5	RS-232-C	HP-FL	No AP	No CIO Exp
6	Graphics	HP-FL	No AP	No CIO Exp
7	RS-232-C	HP-FL	AP	No CIO Exp
8	Graphics	HP-FL	AP	No CIO Exp
9	RS-232-C	HP-IB	No AP	CIO Exp
10	Graphics	HP-IB	No AP	CIO Exp
11	RS-232-C	HP-IB	AP	CIO Exp
12	Graphics	HP-IB	AP	CIO Exp
13	RS-232-C	HP-FL	No AP	CIO Exp
14	Graphics	HP-FL	No AP	CIO Exp
15	RS-232-C	HP-FL	AP	CIO Exp
16	Graphics	HP-FL	AP	CIO Exp

By following the procedure in Chapter 5, you can change the I/O configuration by editing the **S800** file and generating a new HP-UX kernel with **uxgen.** You can refer to the configuration template files to get an idea for the edits that are required for the S800 file. For example, you may be changing the interface to the root disk from HP-IB to HP-FL. If you had an AP card and an RS-232-C (non-graphics) console on a Model 825, you could consult the file named

```
/etc/conf/gen/templates/825/genfiles/7
```

to see how the S800 configuration file could be changed.

B

Model 840

This appendix contains the information you need to install HP-UX on the 840. The first part of the appendix lists installation commands and paths for different configurations of the 840. The second part of the appendix explains hardware paths on the 840. (For general information on paths and installation, see Chapter 2.) The third part of the appendix describes the default configuration files for the 840.

Boot Paths and Installation Commands

Before installing an 840, answer the following questions:

- Is the tape drive a Mag Tape (MT) drive?
- Is the tape drive a Cartridge Tape Drive (CTD)?
- If the tape drive is a CTD, is it a 7914 CTD, and does it have one or two controllers? If the 7914 has two controllers, its model/serial number plate says Option 001.

Refer to Table B–1, Table B–2, and Table B–3 for installation commands and boot paths. Scan through the tables for the one that applies to your system. The left-hand side of each table describes a particular configurationr. The right-hand side gives the commands and boot path information.

Note

When installing HP-UX for the first time on a system, you must use one of the default configurations listed in the following tables. After HP-UX is installed, you can modify the configuration as explained in chapter 5.

Table B-1. Installation of the 840 (with Mag Tape Drive)

CIO Configuration	Installation Commands and Boot Paths
CIO Slot 0: HP-IB/HP-FL Disk Drive; HP-IB/HP-FL Address 0 **CIO Slot 2:** Tape Drive with HP-IB Address 3 (7974, 7978, 7979, 7980, 7980CX);	**Command to Boot from Tape:** hpux install or hpux tape1(8.2.3.0x0a0000,1) **Primary Boot Path:** 8.0.0 (default) **Alternate Boot Path:** 8.2.3 (default)

Table B-2. Installation of the 840 (with CTD; except 7914 CTD)

CIO Configuration	Installation Commands and Boot Paths
CIO Slot 0: HP-IB/HP-FL Disk Drive HP-IB/HP-FL Address 0 **CIO Slot 6:** Cartridge Tape Drive (CTD) (9144, 9145, 35401); CTD with HP-IB Address 3	**Command to Boot from Tape:** hpux disc0(8.6.3;0x400000) **Primary Boot Path:** 8.0.0 (default) **Alternate Boot Path:** 8.6.3

Table B-3. Installation of the 840 (with 7914 CTD)

CIO Configuration	Installation Commands and Boot Paths
CIO Slot 0: 7914 CTD/Disk with One Controller; HP-IB Address 0	**Command to Boot from Tape:** hpux disc0(8.0.0;0x400020) **Primary Boot Path:** 8.0.0 (default) **Alternate Boot Path:** 8.0.0.1
CIO Slot 0: 7914 CTD/Disk with Two Controllers (Opt 001) HP-IB Address 0 **CIO Slot 6:** 7914 CTD/Disk with Two Controllers HP-IB Address 3	**Command to Boot from Tape:** hpux disc0(8.6.3;0x400000) **Primary Boot Path:** 8.0.0 (default) **Alternate Boot Path:** 8.6.3

Factory Settings

As the 840 comes from the factory, the boot and console paths are set as in Table B–4.

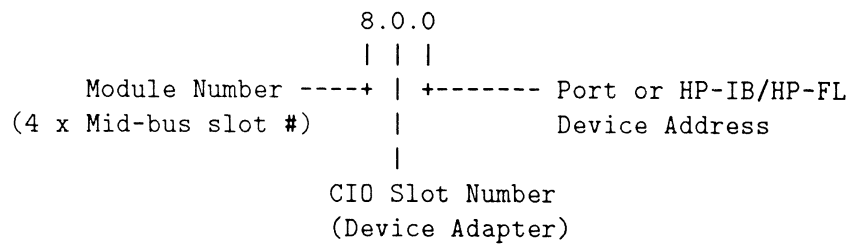
Table B–4. Factory Setting for Boot and Console Paths

Path	Setting	Configuration
Primary boot path (system disk)	8.0.0	HP-IB or HP-FL disk drive attached to a card in CIO Slot 0
Alternate boot path (tape drive)	8.2.3	Reel-to-reel tape drive attached to an HP-IB card in CIO Slot 2 of the SPU; HP-IB address is set to 3.
Console path	8.1.0	Terminal for the console attached to a MUX card in CIO Slot 1.

If the configuration of your 840 is different from the factory settings, you should change the boot and console paths. Find the correct boot paths for your configuration in Table B–1 through Table B–3. Change the boot paths with the ALTPATH and PRIMPATH commands at the ISL prompt. You can change the console path with the CONSPATH command.

Hardware Paths on the 840

Hardware paths on the 840 follow the usual pattern:



Module Number

The module number for devices attached to the 840 SPU is 8. For example, a system disk connected to an HP-IB card in CIO slot 0 in the SPU has a hardware address of 8.0.0. (The HP-IB address on the disk is 0.)

The module number for devices attached to the Expansion Bay depends on whether it is configured as one 16-slot CIO card cage or as two 8-slot CIO card cages.

Expansion Bay Configured as One 16-Slot Card Cage

If the Expansion Bay is configured as one 16-slot card cage, then all devices attached to it will have hardware addresses in the form 16.x.x. The module number is 16, because the Channel Adapter Mid-bus card is in Mid-bus Slot 4 (4 x Mid-bus Slot 4 equals 16).

Expansion Bay Configured as Two 8-Slot Card Cages

If the Expansion Bay is configured as two 8-slot card cages, then there will be two forms for the hardware addresses: 16.x.x and 24.x.x.

Devices attached to the first of the 8-slot modules have hardware addresses in the form 16.x.x. The module number is 16 because the Channel Adapter Mid-bus card for this module is in Mid-bus Slot 4 (4 x Mid-bus Slot 4 equals 16.)

Devices attached to the second of the 8-slot modules have hardware addresses in the form 24.x.x. The module number is 24 because the the Channel Adapter Mid-bus card for this module is in Mid-bus Slot 6 (4 x Mid-bus Slot 6 equals 24).

CIO Slot Number

The second number in the hardware address is the CIO slot number. Figure B–1 shows the recommended location for CIO cards in the 840 with no Expansion Bay. Figure B–2 shows the recommended location for CIO cards in the 840 with an Expansion Bay.

Port or HP-IB/HP-FL Address

The third number in the hardware address is the port number (in the case of MUX cards) or the HP-IB/HP-FL address (in the case of HP-IB or HP-FL cards). The HP-IB/HP-FL address is set on the device itself.

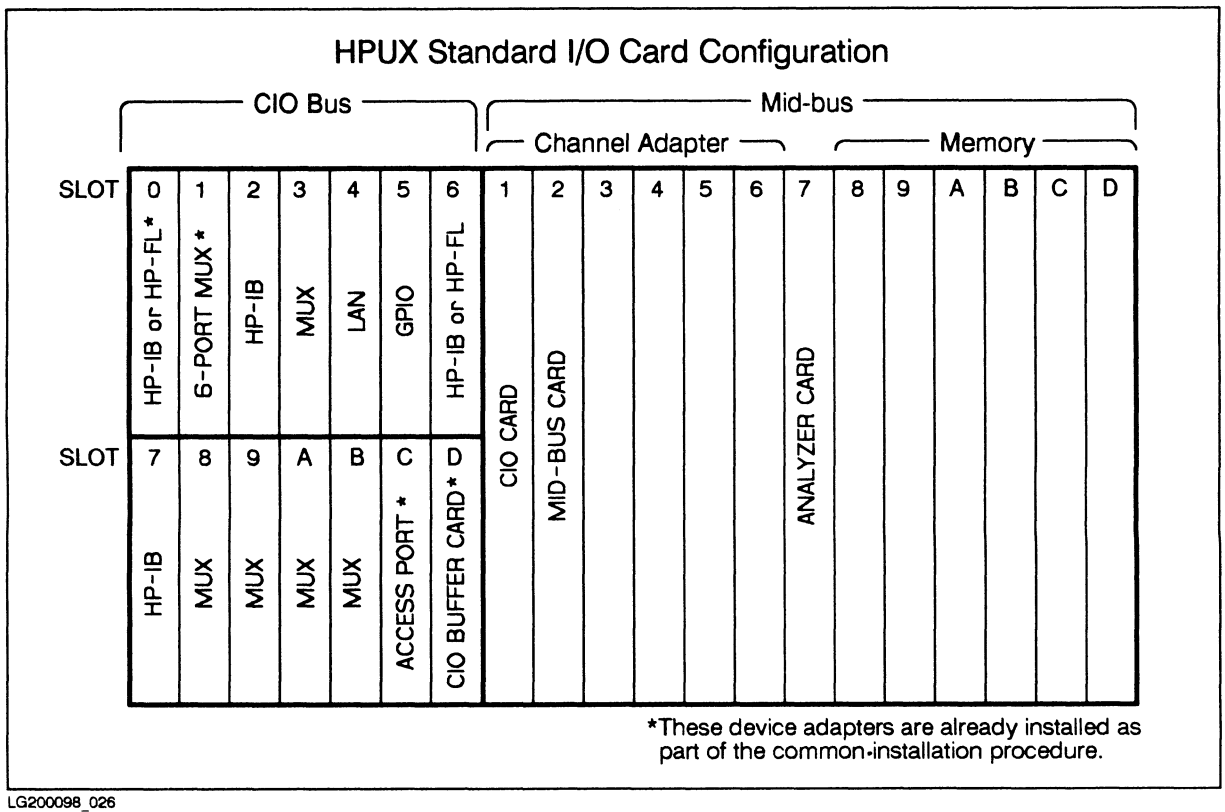
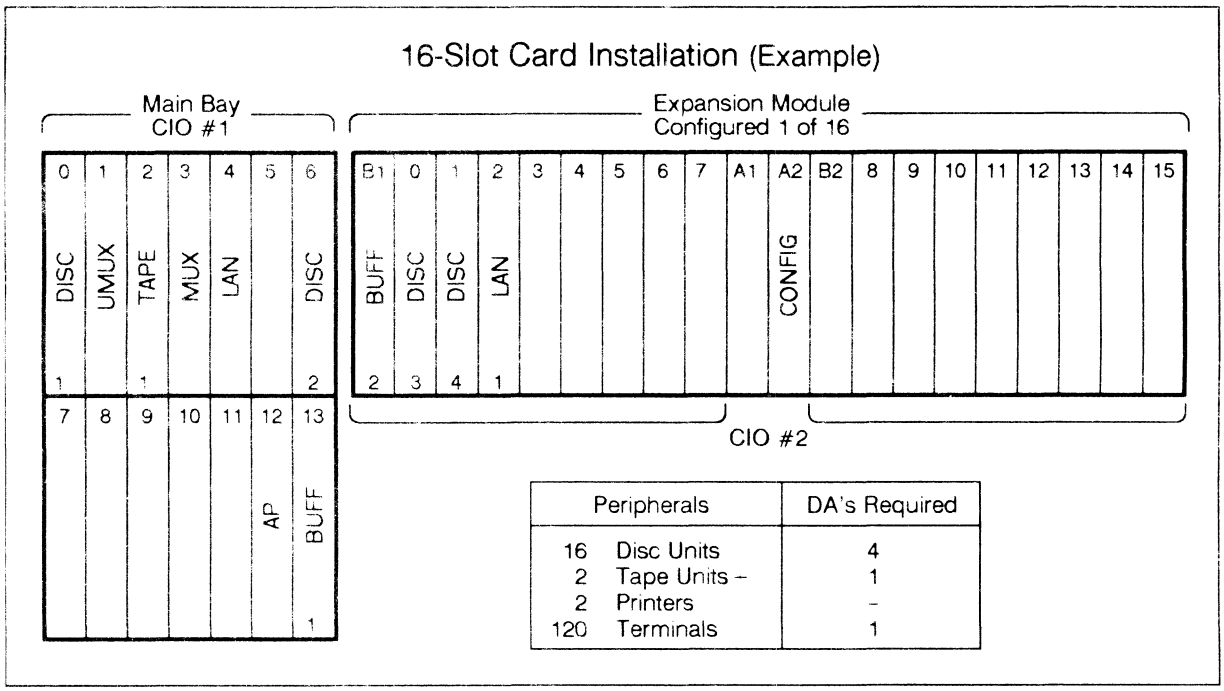


Figure B-1. 840 Default CIO Card Locations (No Expansion Bay)

Note

To intall HP-UX from Cartridge Tape Drive (CTD), CIO slot 6 must contain an HP-IB card.



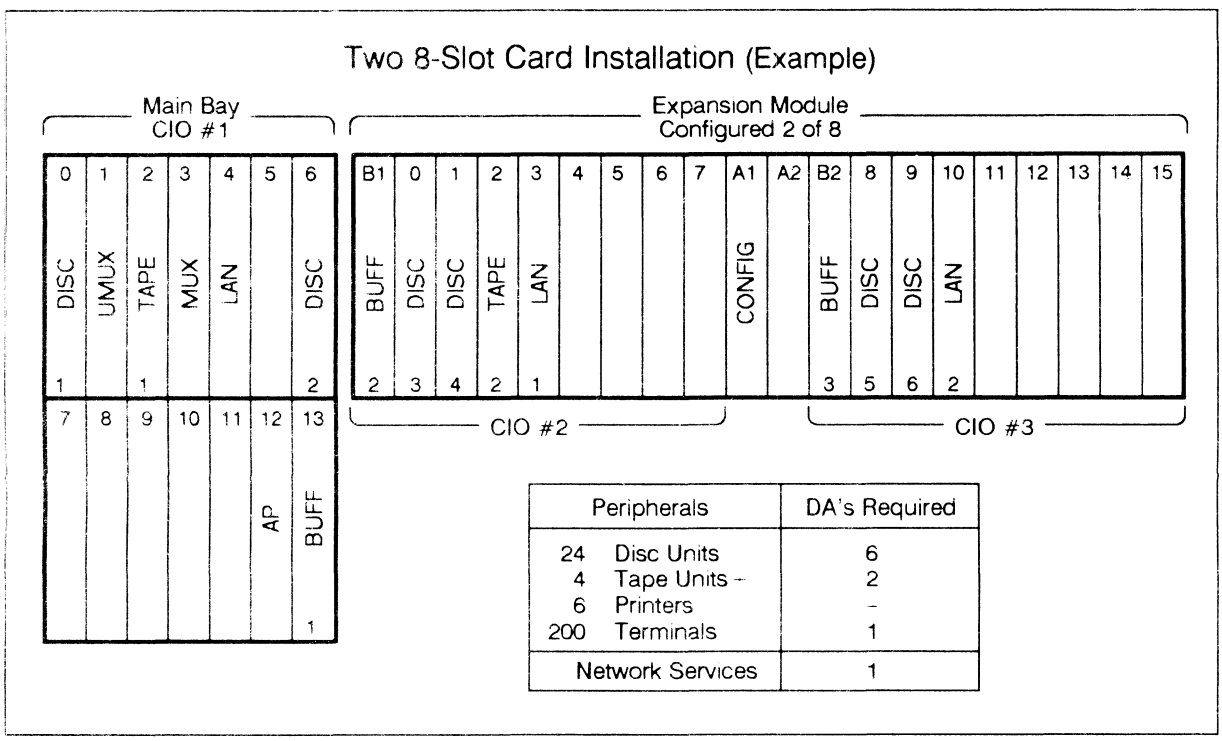


Figure B-2. 840 Default CIO Card Locations with Expansion Bay

840 Configuration Files

At the end of the update portion of the installation, you are asked about the configuration of the system:

- HP-IB or HP-FL interface to the system disc?
- Graphics or RS-232-C (non-graphics) system console?

Depending on your answers, the program selects the appropriate configuration for your system. It does this by selecting a file from one of several template files and using it as the **S800** file for compiling the kernel.

The four configuration template files for the 840 are in the directory named:

```
/etc/conf/gen/templates/840/genfiles
```

The files are named **1** through **4**, and their meanings are shown in Table B–5. These four files are text files, so you can also view them with the **cat** or **more** commands.

Table B-5. Configuration Template Files for the 840

File name	Console	Root Disk
1	RS-232-C	HP-IB
2	Graphics	HP-IB
3	RS-232-C	HP-FL
4	Graphics	HP-FL

Note

A graphics terminal is not supported as a console for the 850 on this version of HP-UX.

By following the procedure in Chapter 5, you can change the I/O configuration by editing the **S800** file and generating a new HP-UX kernel with **uxgen.** You can refer to the configuration template files to get an idea for the edits that are required for the **S800** file. For example, you might have to change the interface to the root disc from HP-IB to HP-FL. If you had an RS-232-C (non-graphics) console on a Model 840, you could consult the file named

```
/etc/conf/gen/templates/840/genfiles/3
```

to see how the **S800** configuration file might be changed.

C

Model 850

This appendix contains the information you need to install HP-UX on the 850. The first part of the appendix lists installation commands and paths for different configurations of the 850. The second part of the appendix explains hardware paths on the 850. (For general information on paths and installation, see Chapter 2.) The third part of the appendix describes the default configuration files for the 850.

Boot Paths and Installation Commands

To install an 850, refer to Table C–1 or Table C–2 for installation commands and boot paths. The left-hand side of each table describes a particular configuration. The right-hand side gives the commands and boot path information.

Note

When installing HP-UX for the first time on a system, you must use one of the default configurations listed in the following tables. After HP-UX is installed, you can modify the configuration as explained in chapter 5.

Note

Currently on the 850 you must use mag tape to install HP-UX onto an HP-FL (fiber-optic link) disk drive.

Table C-1. Installation of the 850 (with Mag Tape Drive)

CIO Configuration	Installation Commands and Boot Paths
CIO Slot 0 (CIO Cardcage 0_1): HP-IB/HP-FL Disk Drive; HP-IB/HP-FL Address 0 **CIO Slot 2 (CIO Cardcage 0_1):** Tape Drive with HP-IB Address 3 (7974, 7978, 7979, 7980, 7980(X);	**Command to Boot from Tape:** hpux install or hpux tape1(2/4.2.3:0x0a0000,1) **Primary Boot Path:** 2/4.0.0 (default) **Alternate Boot Path:** 2/4.2.3 (default)

Table C-2. Installation of the 850 (with CTD)

CIO Configuration	Installation Commands and Boot Paths
CIO Slot 0: HP-IB Disk Drive HP-IB Address 0 **CIO Slot 0:** Cartridge Tape Drive (CTD) (9144, 9145, 35401) CTD with HP-IB Address 3	**Command to Boot from Tape:** hpux disc0(2/4.0.3:0x400000) **Primary Boot Path:** 2/4.0.0 **Alternate Boot Path:** 2/4.0.3

Factory Settings

As the 850 comes from the factory, the boot and console paths are set as in Table C-3.

Table C-3. Factory Setting for Boot and Console Paths

Path	Setting	Configuration
Primary boot path (system disk)	2/4.0.0	HP-IB or HP-FL disk drive attached to a card in CIO Slot 0 (CIO Cardcage 0_1)
Alternate boot path (tape drive)	2/4.2.3	Reel-to-reel tape drive attached to an HP-IB card in CIO Slot 2 (CIO Cardcage 0_1); HP-IB address is set to 3.
Console path	2/4.1.0	Terminal for the console attached to a MUX card in CIO Slot 1 (CIO Cardcage 0_1).

If the paths in Stable Storage are different from the proper paths, change them with the ALTPATH and PRIMPATH commands at the ISL prompt. For correct boot paths, refer to Table C-1 and Table C-2. You can change the console path with the CONSPATH command.

Hardware Paths on the 850

Hardware paths on the 850 follow the usual pattern, but have an initial number to specify the Bus Converter (BC):

```
Bus Converter (BC) ------+
Module Number            |
                        2/4.0.0
                          | | |
          Module Number ----+ | +------- Port or HP-IB/HP-FL
(64 x BC) + (4 x MB slot #)   |          Device Address
                              |
                        CIO Slot Number
                       (Device Adapter)
```

Bus Converter (BC) Module Number

The 850 has two Bus Converters: Bus Converter 0 and Bus Converter 1. Bus Converter 0 services Mid-bus 0 which is on the right as you look at the SPU from the rear. Bus Converter 1 services Mid-bus 1 which is on the left of the SPU. See Figure C–1.

To specify a Bus Converter, you add a bus address to the front of the hardware address (separated with the "/" symbol). Add 2 for Bus Converter 0, or 6 for Bus Converter 1. For example, the above hardware address (**2/4.0.0**) specifies a device which is serviced by Bus Converter 0.

Module Number

The Module Number identifies the location of the Channel Adapter. To determine the Module number, use this formula:

```
Module number = (BC x 64) + (MB x 4)

where BC = Bus Converter number
      MB = Mid-bus slot in which the Channel Adapter card is located
```

Example with Bus Converter 0

For example, assume that a device is serviced by a Channel Adapter card located in Mid-bus slot 1, and by Bus Converter 0. The Module Number is 4:

```
Module number = (0 x 64) + (1 x 4)

              =    0     +    4

              =          4
```

The full hardware address is in the format 2/4.x.x, and the CIO card for this device is located in the lower right CIO card cage.

Example with Bus Converter 1

As a second example, assume that a device is serviced by a Channel Adapter card located in Mid-bus slot 2, and by Bus Converter 1. The Module Number is 72:

```
Module number = (1 x 64) + (2 x 4)

              =    64    +    8

              =         72
```

The full hardware address is in the format 6/72.x.x, and the CIO card for this device is located in the upper left CIO card cage.

CIO Slot Number

The second number in the hardware address is the CIO slot number. Figure C-1 shows the recommended location for CIO cards in the SPU.

Port or HP-IB/HP-FL Address

The third number in the hardware address is the port number (in the case of MUX cards) or the HP-IB/HP-FL address (in the case of HP-IB or HP-FL cards). The HP-IB/HP-FL address is set on the device itself.

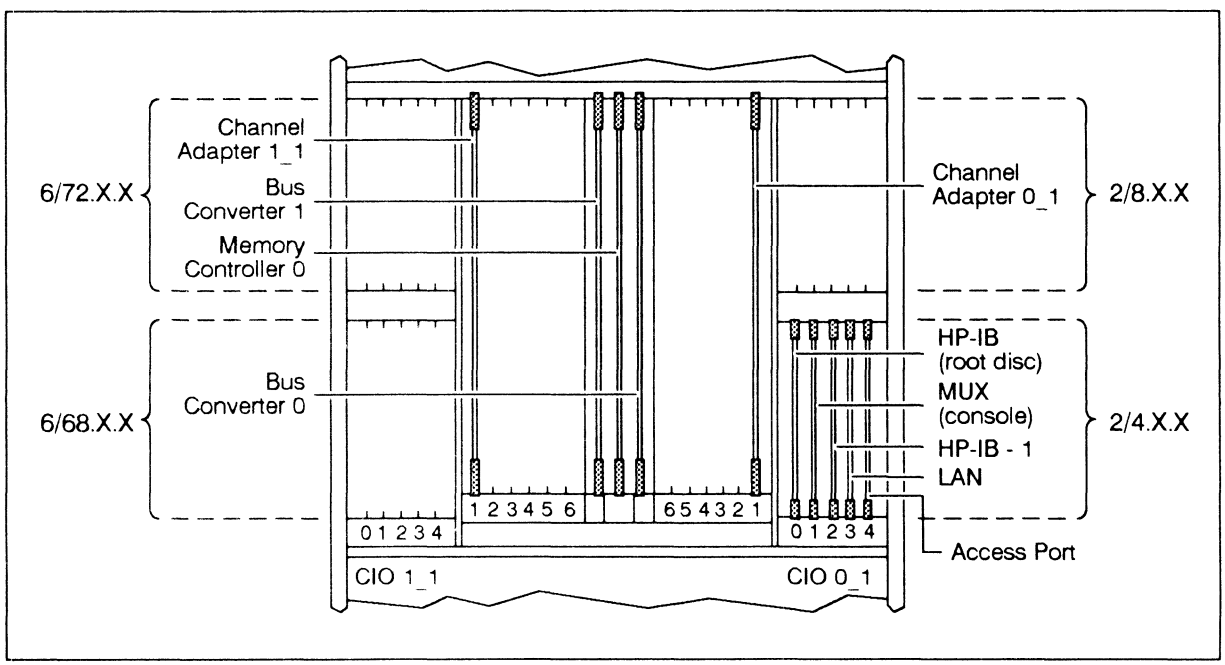


Figure C-1. 850 Default CIO Card Locations

Hardware Paths for a CIO Terminal Expander Bay (850)

The 850 Expander Bay contains two sets of 8 slots into which MUX cards can be inserted. Each set of 8 slots is connected to a separate Channel Adapter card. We recommend that these Channel Adapter cards be installed in Mid-bus slot 3 and higher of the SPU; slots 1 and 2 are usually occupied by Channel Adapter cards for CIO slots in the SPU.

Therefore for each set of 8 slots, there should be text similar to the following in the **S800** file:

```
cio_ca0 address 12 {    /* exp bay #1 */
        mux0    lu 1 address 0;
        mux0    lu 2 address 1;
        mux0    lu 3 address 2;
        mux0    lu 4 address 3;
        mux0    lu 5 address 4;
        mux0    lu 6 address 5;
        mux0    lu 7 address 6;
        mux0    lu 8 address 7;
}
```

In the above example, the module number is 12 because the Channel Adapter card is assumed to be in Mid-bus slot 3 (Mid-bus slot 3 x 4 = 12). If the Channel Adapter card were in Mid-bus slot 4, the module number would be 16, and so forth, for all the Mid-bus slots on the right-side of the card cage (Mid-bus 0).

If the Channel Adapter card is installed on the left-side of the card cage (Mid-bus 1), the module number is formed somewhat differently, since the Bus Converter number is 1 and the formula for the Module Number is:

```
Module number = (BC x 64) + (MB x 4)
```

For example, let's say that a set of 8 slots in a Terminal Expander Bay is connected to a Channel Adapter card in Mid-bus slot 3 on the left side of the card cage (Mid-bus 1). The Module number would be 76:

```
Module number = (1 x 64) + (3 x 4)

              =    64    +    12

              =         76
```

The text in the S800 file should look like this:

```
cio_ca0 address 76 {    /* exp bay #2 */
        mux0    lu 9 address 0;
        mux0    lu 10 address 1;
        mux0    lu 11 address 2;
        mux0    lu 12 address 3;
        mux0    lu 13 address 4;
        mux0    lu 14 address 5;
        mux0    lu 15 address 6;
        mux0    lu 16 address 7;
}
```

850 Configuration Files

At the end of the update portion of the installation, you are asked about the configuration of the system:

- HP-IB or HP-FL interface to the system disk?
- Graphics or RS-232-C (non-graphics) system console?

Depending on your answers, the program selects the appropriate configuration for your system. It does this by selecting a file from one of several template files and using it as the **S800** file for compiling the kernel.

The four configuration template files for the 850 are in the directory named:

```
/etc/conf/gen/templates/850/genfiles
```

The files are named **1** through **4,** and their meanings are shown in Table C-4. These four files are text files, so you can also view them with the `cat` or `more` commands.

Table C-4. Configuration Template Files for the 850

File name	Console	Root Disk
1	RS-232-C	HP-IB
2	Graphics	HP-IB
3	RS-232-C	HP-FL
4	Graphics	HP-FL

Note

A graphics terminal is not supported as a console for the 850 on this version of HP-UX.

By following the procedure in Chapter 5, you can change the I/O configuration by editing the **S800** file and generating a new HP-UX kernel with **uxgen.** You can refer to the configuration template files to get an idea for the edits that are required for the `S800` file. For example, you might have to change the interface to the root disk from HP-IB to HP-FL. If you had an RS-232-C (non-graphics) console on a Model 850, you could consult the file named

```
/etc/conf/gen/templates/850/genfiles/3
```

to see how the `S800` configuration file might be changed.

D

The 3.0 Release

The **update** and **install** programs have changed significantly as of this release. Chapters 3 and 4 contain essential instructions for running the new software—don't rely on past experience!

This appendix contains:

- Instructions for loading the new **update** software onto your system. *(Essential if you are about to do an* **update.** *Not needed if you're doing an* **install.***)*
- A list of all the filesets in the release. *(Not crucial.)*
- A special procedure for those who have 7959 or 7963 disk drives, and who are updating from **Release 2.0** *(Needed only if you are doing an* **update** *from* **Release 2.0.***)*

Loading the Update Software

- Use this procedure if you are updating from **Release 2.0** or **Release 2.1**

Caution You must be running **2.0** or **2.1** to update to **3.0.**

- You do not need to use this procedure if you are doing a new installation (or a re-installation): the **install** program loads and invokes the new **update** automatically.

You must load the **3.0 update** onto your system:

1. Mount the first **HP-UX CORE + SUBSYS** tape onto your tape drive. (The tape will be marked `REEL 1 of` *n* where *n* is the total number of **HP-UX CORE + SUBSYS** tapes.) Put the drive online.
2. Log in as **root.**
3. Change to the / directory:

   ```
   cd /
   ```

4. Type

   ```
   tar xv ATOOL
   ```

   This will take about 10 minutes (about 30 minutes if you are using a cartridge tape drive).
5. You'll see a list of files. When the shell prompt comes back, the **tar** is complete.
6. Type the following command:

   ```
   mv /etc/newconfig/update /etc
   ```

Warning **Do not proceed until you have completed the above procedure successfully.**

You now have all the software you need to run the new version of **update.**

Procedure for 7959 and 7963 Disk Drives

The procedure on the following pages explains how to update your 7959 and 7963 disk drives to **3.0.**

- Use this procedure *only* if you have a 7959 or a 7963 *and* you are updating from **Release 2.0**
- DO NOT use this procedure if you are updating from **Release 2.1**
- DO NOT use this procedure if you doing an **install.**

Note

Follow this procedure for each 7959 and 7963 on your system. If the disk does not contain **/**, **/usr** or **/tmp**, skip to **Step K.**

Special Procedure for Updating 7959 and 7963 Disk Drives

Caution

If you are an inexperienced user, some of the tasks in this procedure may be unfamiliar to you. Read through the instructions to the end before doing anything. If there's anything you're not certain you know how to do, don't attempt it: get expert help before you start.

If your 7959 or 7963 disk does not contain / (root), /usr or /tmp, skip to Step K.

A. Use the date utility to make your system date and time accurate, if necessary.

B. Unmount all file systems that are not on the **root** disk (that is, disks whose devicefile name does not begin with `c0`). Verify that you have unmounted all these file systems by typing the following command:

```
mount | grep -v c0
```

There should be no output from this command. If there is output, unmount the file systems listed out by the command, then type the command again to make sure that you have unmounted them all.

C. Back up your 7959 or 7963 using one of the following commands, depending on what kind of tape drive you are using for the backup:

- 7978 or 7980 magnetic tape drive:

```
find / -print | cpio -oBv >/dev/rmt/0h
```

- 7974 or 7979 magnetic tape drive:

```
find / -print | cpio -oBv >/dev/rmt/0m
```

- any cartridge tape drive:

```
find / -print | cpio -o | tcio -ov /dev/rct/c<hpib address>d0s2
```

where `<hpib address>` is the hpib address of your tape drive.

If your backup needs more than one tape, you will be prompted for subsequent tapes as follows:

```
End of volume
If you want to go on, type device/file name when ready
```

Change the tape, then type the name of your devicefile, which is the last argument you typed in the **cpio** command to begin the backup. For example, if you used the command

```
find / -print | cpio -oBv >/dev/rmt/0h
```

your devicefile name is **/dev/rmt/0h**

D. Perform an installation, using the **3.0 Install** tape, and the directions in chapter 3.

Warning

Do not rely on your experience of previous installations—things are very different in 3.0. Use the directions in chapter 3, except as noted below.

When you get to step 14 of the installation procedure in chapter 3, **DO NOT** enter **y** in the `Process All` field. Do the following instead:

1. Enter **n** in the `Process All` field. (Ignore the warning in chapter 3 about selecting individual partitions.)
2. Select the following subsystems from the **Partition List** by typing **y** next to each:

   SYS_TOOLS
   PROG_LANGS
   NLS
   MISC_UTILS
   TEXT
   HPUXCORE
   SYS_CORE
   EX_AXE

   Now press [Perform Task] and continue with the installation procedure in chapter 3 through step 24.

E. When the **Partition Menu** re-appears on your screen, press [Shell] to escape to the HP-UX shell, and use the date utility to correct the date and time of your system, if necessary.

F. Change the time stamp on all the files you have just loaded:

```
cd /
find . -exec touch {} \;
```

   The command will take between 5 and 15 minutes to complete.

G. Remove the file **/usr/adm/shutdown.**

H. Use the following command to change the time stamp of the files named in the command to January 1, 1970, so that only these files will be updated:

```
touch 0101000070 \
/.cshrc \
/.login \
/.profile \
/etc/bcheckrc \
/etc/brc \
/etc/conid \
/etc/csh.login \
/etc/d.cshrc \
/etc/d.exrc \
/etc/d.login \
/etc/d.profile \
/etc/gettydefs \
/etc/group \
/etc/inittab \
/etc/issue \
/etc/mklp \
/etc/motd \
/etc/passwd \
/etc/powerfail \
/etc/profile \
/etc/rc \
/etc/rpc \
/usr/lib/aliases \
/usr/lib/cron/.proto \
/usr/lib/cron/at.deny \
/usr/lib/cron/cron.deny \
/usr/lib/cron/queuedefs \
/usr/lib/crontab.root \
/usr/lib/dialit \
/usr/lib/dialit.c \
/usr/lib/mailx/mailx.rc \
/usr/lib/tztab \
/usr/spool/lp/pstatus \
/usr/spool/lp/qstatus
```

I. Restore the files you backed up in **Step C,** using one of the following commands, depending on what type of tape drive you are using:

- 7978 or 7980 magnetic tape drive:

  ```
  cpio -iRBvdm </dev/rmt/0h
  ```

- 7974 or 7979 magnetic tape drive:

  ```
  cpio -iRBvdm </dev/rmt/0m
  ```

- any cartridge tape drive:

  ```
  tcio -iv /dev/rct/c<hpib address>d0s2 | cpio -i
  ```

  where `<hpib address>` is the hpib address of your tape drive.

Follow the instructions for changing tapes in **Step C.**

J. Update all the subsystems on the **3.0** tapes that you did not already load in **Step D** (you must update all the subsystems that were on your system to avoid having old subsystems in the **3.0** environment):

1. Type `exit` to return to the **update** program. The systems you have not yet loaded will be listed on the **Partition Menu** screen.
2. Enter `y` in the `Process All` field and press `Perform Task`.
3. Turn back to step 15 of the installation procedure in chapter 3. Repeat the installation from the beginning of step 15 through step 27.

If you have other 7959 disk drives, or you have a 7963 disk drive, continue from **Step K** to the end.

If you have only one 7959 and it is your root disk, you have finished.

K. Follow steps **L** through **P** to back up, reformat and restore each of your non-root 7959 or 7963 disks.

L. Back up each of your 7959 or 7963 disk sections. Use one of the commands below, depending on what type of tape drive you are using.

You will need to determine the mount points for each drive before you start.

- 7978 or 7980 magnetic tape drive:

```
find <mount point> -print | cpio -oBv >/dev/rmt/0h
```

- 7974 or 7979 magnetic tape drive:

```
find <mount point> -print | cpio -oBv >/dev/rmt/0m
```

- any cartridge tape drive:

```
find <mount point> -print | cpio -o | tcio -ov /dev/rct/c<hpib address>d0s2
```

where `<hpib address>` is the hpib address of your tape drive, and `<mount point>` is the directory where a disk section is mounted, for example `/mt3`, `/database`.

If your backup needs more than one tape, you will be prompted for subsequent tapes as follows:

```
End of volume
If you want to go on, type device/file name when ready
```

Change the tape, then type the name of your devicefile, which is the last argument you typed in the **cpio** command to begin the backup. For example, if you used the command

```
find <mount point> -print | cpio -oBv >/dev/rmt/0h
```

your devicefile name is **/dev/rmt/0h**

M. Unmount each section you just backed up by typing the command:

```
unmount <mount point>
```

N. Make a new file system on each disk section by tying the command:

```
newfs -n <devicefile name>
```

where `<devicefile name>` is the name of the special file in the **/dev** directory that corresponds to this particular disk section.

O. Remount each file system using the following command:

```
mount <devicefile name> <mount point>
```

P. Restore the files you backed up in **Step L,** using one of the following commands, depending on what type of tape drive you are using:

- 7978 or 7980 magnetic tape drive:

```
cpio -iRBvdm </dev/rmt/0h
```

- 7974 or 7979 magnetic tape drive:

```
cpio -iRBvdm </dev/rmt/0m
```

- any cartridge tape drive:

```
tcio -iv /dev/rct/c<hpib address>d0s2 | cpio -i
```

where `<hpib address>` is the hpib address of your tape drive.

To change tapes, follow the instructions in **Step L.**

The 3.0 Filesets

The tables on the following pages show all the filesets in this release. These are for reference only—it's not crucial that you read and understand them.

SYS_CORE PARTITION

Fileset	Description
CORE	Essential core files
ACORE	Almost essential files
TOOL	Update tools
APAM	Personal Application Manager
ACAT	Run-time message catalogs
AXE_SAM	Basic system administration package

SYS_TOOLS PARTITION

Fileset	Description
ACMD	Editor and csh
ABCMD	Additional utilities

MISC_UTILS PARTITION

Fileset	Description
ATRMINFO	Basic set of term info
ACONFIG	Kernel configuration files

PROG_LANGS PARTITION

Fileset	Description
APROG	Build files
AC	C compiler, library
FORTRAN	FORTRAN compiler
PASCAL	Pascal compiler

TEXT PARTITION

Fileset	Description
ATEXT	Manual processing tools
AMANUAL	Critical manual pages

EX_AXE PARTITION

Fileset	Description
EX_UTIL	Important utilities
EX_MAN	Manual pages for above utilities
EX_TEXT	Text processing commands
EX_APPLIC	Important applications
ACCT	AT&T accounting utilities
SYSCOM	Communication utilities
FILTER	
SCCS	

HPUXCORE PARTITION

Fileset	Description
DIAGS	Sherlock Diagnostics
SW_DEV	Software development
PORT_NLS	Port-NLS files

PORT_UX PARTITION

Fileset	Description
PORTUX	HP 1000 operating system
PORT_MAN	Manual pages for PORTUX

NETWORKS PARTITION

Fileset	Description
ARPA	ARPA files
LANLINK	LANLINK files
NFS_MAN	NFS manual pages
NFS_RUN	NFS run-time files
NSSERV	NS Services files

GRAPHICS PARTITION

Fileset	Description
AGPDGL	AGP/DL
ALMANAC	Starbase display list
HP_GKS	HP_GKS
STARBLD	Starbase build environment
STAR_DEMO	Starbase demos
STAR_MAN	Starbase manual pages
STAR_RUN	Starbase run-time enviroment
XWINDOW	X Windows
AFA_FM	Fast Alpha font manager for ASCII & KATAKANA
PFA_FM	Fast Alpha font mgr. libraries, manual pages
X11WIN	Execution environment
X11WINP	Programming environment
X11WINM	Manual pages, unformatted
X11WINC	Manual pages, formatted
X11WINSA	Server for 98730A display
X11WINSB	Server for 98550A

DATABASE PARTITION

Fileset	Description
ALLBASE1	Runtime SQL
SAMPLEDB	Sample database
VISOR	Visor files
ALLBASE2	Allbase
RDA	Remote Database Access

NLIO PARTITION

Fileset	Description
NLIOCHS	NLIO for Simplified Chinese
NLIOCHT	NLIO for Traditional Chinese
NLIOCORE	Shared NLIO files
NLIOJPN	NLIO for Japanese
NLIOKOR	NLIO for Korean
NLX10CHS	Simplified Chinese input for X10
NLX10CHT	Traditional Chinese input for X10
NL10JPN	Japanese input for X10
NLX10KOR	Korean input for X10
NLX11CHS	Simplified Chinese input for X11
NLX11CHT	Traditional Chinese input for X11
NL11JPN	Japanese input for X11
NLX11KOR	Korean input for X11
STICKCHS	Simplified Chinese Stick font
STICKCHT	Traditional Chinese Stick font
STICKJPN	Japanese Stick font
STICKKOR	Korean Stick font
NLX10SUB	Shared X10 fonts
NLX11SUB	Shared X11 fonts
KFA_FMT	Fast Alpha font manager for Kanji fonts

NLSBFONT PARTITION

Fileset	Description
HLVTCJPN	Helvetica-like Japanese font
ROMANJPN	Roman-like Japanese font
SMPLXCHT	Simplex Traditional Chinese font
SMPLXJPN	Simplex Japanese font
SMPLXKOR	Simplex Korean font

NLS PARTITION

Fileset	Description
AMERICAN	American English
CFRENCH	Canadian French
CHINESES	Simplified Chinese
CHINESET	Traditional Chinese
DANISH	Danish
DUTCH	Dutch
ENGLISH	British English
FINNISH	Finnish
FRENCH	French
GERMAN	German
ICELANDIC	Icelandic
ITALIAN	Italian
JAPANESE	Japanese
KATAKANA	KATAKANA (phonetic Japanese)
KOREAN	Korean
NORWEGIAN	Norwegian
PRTUGUESE	Portuguese
SPANISH	Spanish
SWEDISH	Swedish

MULTIUSER PARTITION

Fileset	Description
32_USER	Upgrade to 32 users
64_USER	Upgrade to 64 users
UNL_USR	Upgrade to unlimited users

E

Quick Reference

Warning

This quick reference is intended for qualified personnel only. Do not attempt to install or update HP-UX using this quick reference without the proper training. Instead, use the complete instructions in chapters 3 and 4.

Warning

Attention CEs! The installation procedure for HP-UX 3.0 is greatly changed from previous releases. The first few times you install HP-UX 3.0, follow the procedure in chapter 3. Don't use this quick reference until you are familiar with HP-UX 3.0.

To Install HP-UX

Install HP-UX with the following steps:

1. Install the computer hardware, including peripheral devices.
2. Determine the boot paths for the installation device (magnetic or cartridge tape drive) and for the destination disk drive.
3. Load the INSTALL tape on the installation device.
4. Power up the SPU.
5. The console displays the primary and alternate boot paths. Press a key to interrupt autoboot.
6. Select the alternate boot path for the installation device (tape drive) if it is correct. Otherwise, enter the boot path for the tape drive from the keyboard. Refer to the appropriate hardware appendix to find the correct boot paths for your system. If the default boot paths are different for your system, change them with the `PRIMPATH`, `ALTPATH`, and `CONSPATH` commands at the ISL prompt.
7. Enter the ISL command to install HP-UX. To install from a magnetic tape drive, enter:

   ```
   ISL> hpux install
   ```

   To install from a Cartridge Tape Drive (CTD), find the installation command in the tables in the appropriate hardware appendix. The installation command downloads a temporary HP-UX kernel onto the system disk, boots it, and begins the installation utility.
8. The installation program displays a screen showing the default disk partitions (sections). Unless the customer tells you otherwise, select the default partition/section names and short file names. Do this by pressing the "Perform Task" function key.

9. The program creates the file systems, and copies the minimum system software to the system disk. The console displays several messages as the installation takes place.
10. The program finishes displaying installation messages, and the system automatically reboots. Do not override the autoboot process (do not press any key).
11. Remove the INSTALL tape and mount the first of the tapes labelled "HP-UX CORE + SUBSYS."
12. The Update Partition Menu appears on the console. Press the "Perform Task" function key to read the tape's table of contents.
13. Process all partitions/subsystems.
14. The Update program will test for suffficient disk space to load all the software. If there is enough space, press the "Continue to Load" soft key. If there is not enough space, follow the procedure in chapter 4 to make more room on the disk. The Update program then copies a large number of files from the tape drive onto the destination disk.
15. The program asks several questions about system configuration. The system will regenerate the kernel at least once and up to four times depending on what products are being installed.
16. When the main update screen is displayed, press the "Exit" soft key. The system then reboots one last time, this time in the "normal" fashion. If you encounter problems or failures, do not exit the Update program until they have been resolved.
17. Print out the file **/etc/super_blocks** and insert it in the binder with this manual. This file contains a record of superblock back-up numbers. These numbers are needed in the event of a file system crash.
18. If you need to modify the default configuration (for example, to change the I/O configuration), use the SAM utility by logging in as root and typing **sam** at the system prompt. An alternative method is to edit the **S800** file as described in chapter 5.

The installation is complete.

Updating HP-UX

Update HP-UX with the following steps:

1. Determine the device file for the tape drive used. See Table E–1.
2. Load the first tape marked "HP-UX CORE + SUBSYS" on the tape drive.
3. Log in as root on the system console.
4. Make sure all users are off the system
5. Invoke the update program:

   `/etc/update` *source_ devicefile*

   The *source_ devicefile* is the full path name for the tape drive which you identified in Step 1. If you omit this parameter, you'll be prompted for **Source File** on the first update screen.
6. The system automatically reboots. Do not override the autoboot process (do not press any key).
7. The Update main menu appears on the console. Press the "Perform Task" soft key to read the tape's table of contents.
8. Process all partitions/subsystems.
9. The Update program will test for suffficient disk space to load all the software. If there is enough space, press the "Continue to Load" function key. If there is not enough space, follow the procedure in chapter 4 to make more room on the disk. The Update program then copies a large number of files from the tape drive onto the destination disk.
10. The program asks several questions about system configuration. The system will regenerate the kernel at least once and up to four times depending on what products are being installed.
11. When the main update screen is displayed, press the "Exit" soft key. The system then reboots one last time, this time in the "normal" fashion. If you encounter problems or failures, do not exit the Update program until they have been resolved.
12. If you need to modify the default configuration (for example, to change the I/O configuration), use the SAM utility by logging in as root and typing **sam** at the system prompt. An alternative method is to edit the **S800** file as described in chapter 5.

The update is complete.

Table E-1. Device File Names for Tape Drives

Type of Drive	Usual Device File Name
7974, 7978, 7979, 7980 (set to 1600 bpi)	/dev/rmt/0m
9144, 9145, 35401	/dev/rct/c7d0s2
7914 (two controllers; Opt 001)	/dev/rct/c7d0s2
7914 (one controller)	/dev/rct/c0d1s2

F

Glossary

Table F-1. Glossary of Terms for Installing and Updating HP-UX

Term	Definition
Access Port (AP)	The Access Port card is a CIO card that permits remote access to the system primarily for diagnostic purposes.
Alternate Boot Path	The Alternate Boot Path is the hardware address of the tape drive used for installation.
Autoboot	An autoboot occurs when the boot ROM automatically boots the operating system from the device at the primary boot path defined in Stable Storage.
Autosearch	On some Series 800 computers, the system will perform an autosearch, if enabled, scanning the Mid-bus and CIO slots for a console (console autosearch) or a boot device (boot autosearch).
Battery Back-up Unit (BBU)	The BBU is a separate unit that provides power to main memory in the SPU for a period of time if an AC power failure occurs.
Board	A board is a printed circuit card that is typically installed in a slot in a computer system. Also known as cards or PCAs. In this manual, boards are usually referred to as cards. Some examples of boards/cards are CIO cards and Mid-bus cards.
Boot from disk	When a computer system boots from disk, it goes to the system disk, loads the necessary files into memory, then starts HP-UX running.
Bus	A bus is a communications path that carries data and signals between hardware subsystems, such as memory, I/O and the CPU.
Card	A card is a printed circuit card that is typically installed in a slot in a computer system. Some examples of cards are CIO cards and Mid-bus cards. Also known as boards or PCAs.
Cartridge Tape Drive (CTD)	A CTD is a tape drive that uses cartridge tapes rather than reel-to-reel tapes.
Central Bus (CTB)	The CTB is the same as the Mid-bus. This manual uses the term Mid-bus instead of CTB.
Central Processing Unit (CPU)	The CPU is the hardware subsystem which performs arithmetic and logical operations on data. Other hardware subsystems are memory and I/O. On the S800 computers, the CPU is implemented as CPU cards or processor cards located in the SPU.

Table F-1. Glossary of Terms for Installing and Updating HP-UX
Continued

Term	Definition
Channel Adapter (CA)	The Channel Adapter serves as an adapter between the Mid-bus and the rest of the I/O system. Specifically, the Channel Adapter performs the conversion between the Mid-bus and the lower speed CIO bus. The Channel Adapter may consist of a chip on a card with other components, or it may consist of one or several Mid-bus cards.
Channel I/O Bus (CIB)	The CIB is the same as the CIO bus. This manual uses the term CIO bus instead of CIB.
Channel Input/Output Bus (CIO)	The CIO bus is the general-purpose I/O bus on Series 800 computers. It connects the Channel Adapter to the Device Adapters (CIO cards).
CIO cards	CIO cards are cards (such as HP-IB cards or MUX cards) installed in CIO slots to enable the SPU to communicate with peripherals (terminals, printers, disc drives, etc.). Also known as Device Adapters.
CIO Expander	A CIO Expander provides general purpose CIO slots in addition to those in the SPU. Also known as an Expander, Expansion Bay, or Expansion Module.
CIO slot number	The CIO slot number is the second part of a hardware address. It is the CIO slot number of the Device Adapter card (CIO card) connected to the peripheral device. In the hardware address 4.2.3, the CIO slot number is 2.
Configuration file	The configuration file for HP-UX is the file named S800. See the entry under "S800 file".
Console	The system console is the terminal used to monitor and control system activity during boot-up.
Console Path	The Console Path is the hardware address of the system console.
Device Adapter (DA)	Device Adapters are cards (such as HP-IB cards or MUX cards) installed in CIO slots to enable the SPU to communicate with peripherals (terminals, printers, disc drives, etc.). Also known as CIO cards.
Device Address	Since a Device Adapter (CIO card) can have several devices attached to it, a device address is required to indicate which of the devices you want to address. On disk drives and magnetic tapes, the device address is the HP-IB (or HP-FL) address set on the device itself. On terminals, the device address is the port number.
Device driver	Compiled inside the kernel are software modules known as device drivers, each of which handles I/O for a particular peripheral or class of peripherals. For example, the driver disc0 handles I/O for disc drives and CTDs which use an HP-IB interface.

Table F-1. Glossary of Terms for Installing and Updating HP-UX Continued

Term	Definition
Device file	Device files provide the link between the kernel and the rest of the operating system. Each I/O device has one or more device files located in the /dev directory. Device files don't contain data as ordinary files do. Instead, they specify how HP-UX is to communicate with the device. Device files are also known as special files.
Display Controller Interface card	The Display Controller Interface card is a Mid-bus card required for graphics systems. Also known as a Graphics Interface card.
Expander, Expansion Bay, Expansion Module	An Expander provides general purpose CIO slots in addition to those in the SPU. Also known as an Expansion Bay, Expansion Module, or CIO Expander.
Fileset	The program for updating HP-UX uses the term "fileset" to mean a group of files. One or more filesets make up an update partition (this is different from a disk partition).
Graphics Interface card (GI)	The Graphics Interface card is a Mid-bus card required for graphics systems. Also known as a Display Controller Interface card.
Hardware address	A hardware address specifies the location of a peripheral device on the system. There are three parts to a hardware address; together they specify a path through the I/O system to the device. For example, the address 4.0.0 says in effect: "Go to the Channel Adapter represented by module number 4 (the card in Mid-bus slot 1). Then go to the Device Adapter in CIO slot 0. Finally go to the device attached to this Device Adapter which has the device address of 0."
HP Fiber-optic Link (HP-FL)	The HP-FL interface allows HP-FL devices (such as HP-FL disk drives) to be connected to HP-PA computers.
HP-FL card	HP-FL cards are CIO cards for devices like HP-FL disk drives which support a fiber-optic link.
HP Interface Bus (HP-IB)	HP-IB is Hewlett-Packard's implementation of the IEEE standard 488-1975 interface. Disc drives, tape drives and HP-IB printers are connected to HP-PA computers via HP-IB channels.
HP-IB cards	HP-IB cards are CIO cards for HP-IB devices like disk drives, tape drives, and HP-IB printers.
HP Precision Architecture (HP-PA)	HP Precision Architecture is the reduced complexity architecture used by Hewlett-Packard's new computer systems (including Series 800 computers). HP-PA is an embodiment and extension of Reduced Instruction Set Computer (RISC) architectural principles.
HP-UX	HP-UX is HP's implementation of the UNIX operating system. (UNIX is a registered trademark of AT&T in the United States and other countries.)

Table F-1. Glossary of Terms for Installing and Updating HP-UX
Continued

Term	Definition
I/O configuration	The I/O configuration is the location of the I/O cards in the slots, and the device drivers assigned to the slots.
I/O subsystem	The I/O subsystem provides an interface between I/O devices and main memory, and between I/O devices and the CPU. The I/O subsystem consists of both software and hardware components. The I/O subsystem consists of the following parts: Channel Adapter, CIO Bus, CIO buffer circuitry, Device Adapters (such as HP-IB, MUX, LAN cards, etc.), and I/O software.
Initial Program Load (IPL)	In an HP-PA system, Initial Program Load (IPL) is the first code brought into memory from disk or tape. For example, ISL is an IPL program. On Series 800 systems, ISL is the Initial Program Load. (On MPE-XL systems, however, ISL is not the IPL.)
Initial System Loader (ISL)	On Series 800 computers, ISL is the first RAM-based software brought in by PDC from a boot device. ISL allows you to bring up the system, and then to boot HP-UX. Several commands are also available at ISL, including the commands to change the default boot paths. See IPL.
Installation device	The installation device is the tape drive used to install or update HP-UX.
Installing HP-UX	Installing HP-UX means that the system disk drive is erased, new file systems are created, and all the files needed for HP-UX are copied onto the system disk from tape.
Kernel	The kernel is the module of HP-UX that deals directly with the hardware. The kernel provides low-level functions for the rest of the operating system and insulates it from the details of the hardware.
Local Area Network (LAN) card	LAN cards are CIO cards for Local Area Networks (LANs). Also known as LANIC cards.
Local Area Network Interface Controller (LANIC) card	A LANIC card is the same as a LAN card.
Logical unit (lu) number	Logical unit numbers allow one device driver to handle many devices. A different lu number is assigned to each device supported by a particular driver. The lu numbers appear in the S800 file.
Main memory	Main memory on Series 800 computers is implemented as memory cards connected to the Mid-bus.

Table F-1. Glossary of Terms for Installing and Updating HP-UX
Continued

Term	Definition
Manual mode	If autoboot is disabled, you are in manual mode. In manual mode, you can select the boot device from all the available peripheral devices.
Mid-bus	The Mid-bus is a synchronous high-speed bus used for communication by the I/O, memory, and CPU subsystems.
Mid-bus cards	Mid-bus cards are cards which are inserted into Mid-bus slots to connect to the Mid-bus. Two examples of Mid-bus cards are memory cards and Channel Adapter cards.
Modifying HP-UX	The HP-UX kernel can be modified to change the I/O configuration or system parameters. Modifying HP-UX can be done through the SAM utility or by editing the S800 configuration file, generating new device files, and running the uxgen program.
Module number	The module number is the first part of a hardware address. To find the module number, find out which Mid-bus slot the Channel Adapter is installed in, then multiply the Mid-bus slot number by 4. If the Channel Adapter is in Mid-bus slot 2, for example, the module number is 8 (4 x 2). For the 850, use this formula instead: module number = (64 x Bus Converter Number) + (4 x Mid-bus slot number).
Multiplexer (MUX) card	MUX cards are CIO cards for serial devices like terminals, modems, and serial printers.
Operating System	An operating system is a computer program that performs "housekeeping" chores for the computer and the computer user. It offers users and programmers a convenient way to get at the computer's hardware and software resources. An operating system allows you to run programs; to examine, change, and delete files; and to perform many other tasks. Two examples of operating systems are HP-UX and MPE-XL.
Partition (disk)	HP-UX divides the physical space on a disk drive into sections (partitions) in order to manage the space more efficiently and flexibly. Directories are assigned to certain sections by default. The Root Disk Partitioning screen allows you to change the default allocations, and thus to determine where the files will reside in physical space on the disk. In this manual, the term "section" is used rather than "partition".
Partition (update)	An update partition consists of one or more filesets which usually make up either one product or a well defined software function. Multiple partitions can be on a single tape. Individual partitions are listed in the update menu. In this manual, the term "subsystem" is synonymous with "partition".
Path	A path specifies the location of a peripheral device on the system. Also known as hardware address. See hardware address.

Table F-1. Glossary of Terms for Installing and Updating HP-UX Continued

Term	Definition
Primary Boot Path	The Primary Boot Path is the hardware address for the system disk.
Printed Circuit Assembly (PCA)	A PCA is a printed circuit card that is typically installed in a slot in a computer system. Also known as cards or boards. In this manual, PCAs are usually referred to as cards. Some examples of PCAs/cards are CIO cards and Mid-bus cards.
Processor Dependent Code (PDC)	The PDC is firmware which provides architected functions for a specific processor. The PDC provides code to boot and reset the system, to conduct the power-on selftest, etc.
Reset	To reset means to restart a computer that is already running.
RS232 console	When installing or updating HP-UX, an RS232 console refers to a non-graphics terminal being used as the system console.
Section	HP-UX divides the physical space on a disk drive into sections (partitions) in order to manage the space more efficiently and flexibly. Directories are assigned to certain sections by default. The Root Disk Partitioning screen allows you to change the default allocations, and thus to determine where the files will reside in physical space on the disk. In this manual, the term "section" is used rather than "partition".
S800 file	The I/O information in the S800 file is used by the uxgen program when it compiles or recompiles the kernel. The S800 file also contains system parameters. You can modify the I/O configuration or system parameters of HP-UX with the SAM utility, or by editing the S800 file and running uxgen. The full pathname of the S800 file is /etc/conf/gen/S800.
Slot	Series 800 computers provide slots into which printed circuit cards are inserted to make connection with the Mid-bus or CIO bus.
Special Files	Special files provide the link between the kernel and the rest of the operating system. Each I/O device has one or more special files located in the /dev directory. Special files don't contain data as ordinary files do. Instead, they specify how HP-UX is to communicate with the device. Special files are also known as device files.

Table F-1. Glossary of Terms for Installing and Updating HP-UX
Continued

Term	Definition
Stable Storage (SS)	Stable storage is a special non-volatile type of memory, which retains the data stored in it even if power is turned off. Path information (such as the Primary Boot Path) is stored in stable storage.
Subsystems (software)	A subsystem consists of one or more filesets which usually make up either one product or a well defined software function. Multiple individually selected subsystems can be on a single tape. Individual subsystems are listed in the update menu. Subsystems are also known as partitions.
Superblock	Superblocks contain details of the size of each file system, the maximum number of files it can contain, etc. Backup copies of the superblocks are stored in addresses that are recorded in the /etc/super_ blocks file.
Symbolic link	Links are an easy way to give two (or more) names to the same file. Links are created with the command **ln.** For example, the command **ln flim flam** links the file flim to the file flam; you can then use either filename to refer to the file. Symbolic links are created with the command **ln -s.** Unlike ordinary links, symbolic links can span file systems and refer to directories as well as files. You can use symbolic links during the HP-UX Update program to free up space on the system disk.
System Administration Manager (SAM)	A menu-driven utility which enables you to perform common system administration tasks on HP-UX. See the manual *System Administration Basics: a Menu-Oriented Approach* (part number 92453-90017).
System disk	The system disk is the disk drive that contains all the files for HP-UX.
System Processing Unit (SPU)	The SPU is the main processing agent in a computer system. An HP-PA SPU typically contains the CPU cards, memory cards, CIO (DA) cards, motherboard and power supply.
Updating HP-UX	The term "update" means two different things. First, it can refer to the update process, whereby the HP-UX operating system is updated to a more current version. Secondly, it can refer to the Update program which is the menu-driven program to transfer files. The Update program is used both in the install process and in the update process.
Uxgen	The uxgen program compiles (or recompiles) the kernel, using I/O and system parameter information from the S800 file.

SALES & SUPPORT OFFICES
Arranged alphabetically by country

Product Line Sales/Support Key

Key Product Line
- **A** Analytical
- **CM** Components
- **C** Computer Systems
- **E** Electronic Instruments & Measurement Systems
- **M** Medical Products
- **P** Personal Computation Products
- * Sales only for specific product line
- ** Support only for specific product line

IMPORTANT: These symbols designate *general* product line capability. They do not insure sales or support availability for all products within a line, at all locations. Contact your local sales office for information regarding locations where HP support is available for specific products.

HEADQUARTERS OFFICES

If there is no sales office listed for your area, contact one of these headquarters offices.

ASIA
Hewlett-Packard Asia Ltd.
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18507 **PIRAEUS**
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A

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Cable: HEWPACK HONG KONG
E,C,P

CET Ltd.
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64-66 Gloucester Road
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CM

Schmidt & Co. (Hong Kong) Ltd.
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Telex: 0845-430 BSLBIN
Cable: BLUESTAR
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Band Box House
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Blue Star Ltd.
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414/2 Vir Savarkar Marg
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Blue Star Ltd.
13 Community Center
New Friends Colony
NEW DELHI 110 065
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PUNE 411 011
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Blue Star Ltd.
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Telex: 0155-459
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Blue Star Ltd.
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