

HP Series 6100 Model 700/S  
CD-ROM Drive User's Guide

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# HP Series 6100 Model 700/S CD-ROM Drive User's Guide



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## Revision History

The revision history for each edition of the manual is listed below:

Edition	Revision History
E0292	February, 1991. Original Release.  February, 1992. Added information about installing and operating the CD-ROM drive with SR10.4. Added information about CD-ROM drives manufactured during or after August, 1991. Changed information about configuring HP-UX.





# Preface

The *HP Series 6100 Model 700/S CD-ROM Drive User's Guide* describes how to install and use your CD-ROM drive.

We've organized this guide as follows:

- Chapter 1** Describes how to connect a CD-ROM drive to your system by performing the following tasks:
- Checking the system for prerequisites
  - Setting the SCSI ID and operating mode switches on the drive
  - Connecting the drive to the system or to another daisy-chained SCSI peripheral with a SCSI cable
  - Configuring a Domain/OS or HP-UX system to communicate with the CD-ROM drive
- Chapter 2** Provides an overview of the CD-ROM drive and its disc.
- Appendix A** Lists specifications for the CD-ROM drive.

## **Audience**

This guide is intended for use by technically qualified personnel and computer-knowledgeable customers to install and use their HP Series 6100 Model 700/S CD-ROM drive.

## **Installation Notice**

Products designated in the HP Apollo applicable price list as customer-installable can be installed by computer-knowledgeable customers who carefully read and follow the instructions provided. Customers who elect to have the product installed by our field personnel are charged the applicable Field Installation Charge (FIC), as covered under the standard terms and conditions. For more information, please contact your local sales representative.

## **Release Document(s)**

Please refer to the *Release Document(s)* you received with your system or system software for additional information that we may not have been able to include in this guide at the time of its publication.

## Related Manuals for Domain/OS Systems

The file `/install/doc/apollo/os.v.latest software release number__manuals` lists current titles and revisions for all available manuals. For example, at SR10.4 refer to `/install/doc/apollo/os.v.10.4__manuals` to check that you are using the correct version of manuals. (Note that there are two underscores between *latest software release number* and **manuals**.)

You may also want to use this file to check that you have ordered all of the manuals that you need. (If you are using the Aegis environment, you can access the same information through the Help system by typing **help manuals**.)

For more information using Domain/OS systems, refer to the following documents:

- *Operating the Domain Personal Workstations and Servers* (007858)
- *Domain Series 2500 Owner's Guide* (015463)
- *HP Apollo 9000 Series 400 Workstation Domain/OS Owner's Guide* (A1630-90005)
- *Using Domain Diagnostics, Volume 1* (D-9329-O)  
*Using Domain Diagnostics, Volume 2* (D-11775-C)  
*Using Domain Diagnostics, Volume 3* (D-11776-C)
- *Installing Software with Apollo's Release and Installation Tools* (008860)
- *Getting Started with Domain/OS* (002348)
- *Using Your SysV Environment* (011022)  
*Using Your BSD Environment* (011020)  
*Using Your Aegis Environment* (011021)
- *Domain/OS SysV Command Reference* (005798)  
*Domain/OS BSD Command Reference* (005800)  
*Aegis Command Reference* (002547)

- *Domain Hardware Utilities Reference* (014881)

To order manuals, call **Apollo Direct Channel** at **1-800-225-5290**. Outside the USA, please contact your local sales office.

## Related Manuals for HP-UX Systems

For more information using HP-UX systems, refer to the following documents:

- *HP Apollo 9000 Series 400 Workstation HP-UX Owner's Guide* (A1630-90006)
- *HP Apollo 9000 Model 720/730 Owner's Guide For HP-UX Users* (A1946-90001)
- *HP Apollo 9000 Model 750 Owner's Guide for HP-UX Users* (A1961-90000)
- *Installing HP-UX* (98594-90013)
- *A Beginner's Guide to HP-UX* (98594-90006)
- *A Beginner's Guide to Using Shells* (98594-90008)
- *A Beginner's Guide to Text Editing* (98594-90010)
- *HP-UX System Administration Tasks* (98594-90061)
- *HP-UX System Administration Concepts* (98594-90062)
- *The Visual User's Environment User's Guide* (B1171-90002)
- *Installing Peripherals Guide* (for Series 300 and 400 systems) (B1862-90007)
- *HP-UX Installing Peripherals: HP9000 Series 700* (B2355-90006)

- *System Administration Tasks Manual: HP 9000 Series 700 Computers (B2355-90003)*
- *Using DEX and SAX with HP-UX (A1961-90002)*

## Problems, Questions, and Suggestions

If you have any questions or problems with our hardware, software, or documentation, please contact either your HP Response Center or your local HP representative.

You may call the Tech Pubs Connection with your questions and comments about our documentation:

- In the USA, call 1-800-441-2909.
- Outside the USA, call 1-508-256-6600, extension 4965.

The recorded message that you hear when you call includes information about our new manuals.

You may also use the Reader's Response Form at the back of this manual to submit comments about our documentation.

## Documentation Conventions

Unless otherwise noted in the text, this guide uses the following symbolic conventions.

**literal values** Bold words or characters in formats and command descriptions represent commands or keywords that you must use literally. Pathnames are also in bold.

*user-supplied values* Italic words or characters in formats and command descriptions represent values that you must supply.

*sample user input* In examples, information that the user enters appears in color.

< > Angle brackets enclose the name of a key on the keyboard.

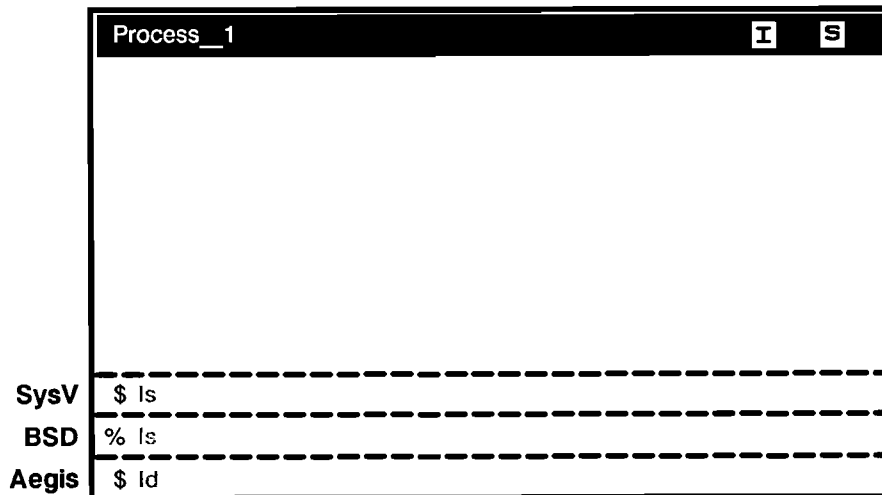
. . . Vertical ellipsis points mean that irrelevant parts of a figure or example have been omitted.

□ This symbol indicates the end of a chapter or a part of this guide.



## Domain/OS Operating Environments

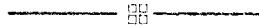
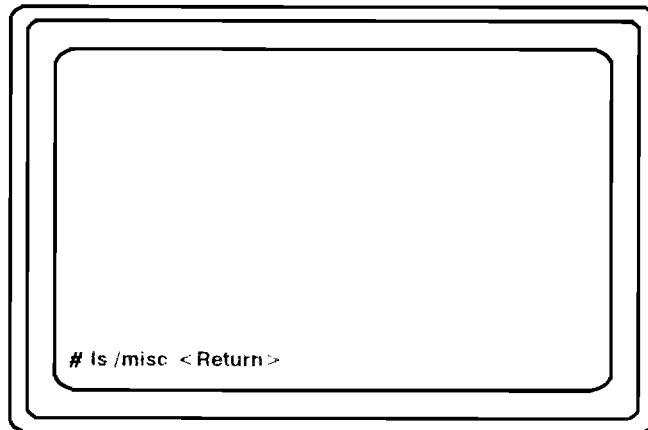
After your system is installed, the system administrator can change the default operating system environment to either SysV, BSD, or Aegis. To assist you in entering commands illustrated in the text, we provide a visual display of all three operating environments. The screen displays in the text are similar to the following example:



When there is no difference between the three environments, we show one command line only.

## HP-UX Operating Environment

To assist you in entering commands illustrated in the text, we provide a visual display of the HP-UX operating environment. The screen displays in the text are similar to the following example:



## Emissions Regulations

### **Federal Communications Commission (FCC)**

The Federal Communications Commission of the U.S. government regulates the radio frequency energy emanated by computing devices through published regulations. These regulations specify the limits of radio frequency emission to protect radio and television reception. All HP Apollo nodes and peripherals have been tested and comply with these limits. The FCC regulations also require that computing devices used in the U.S. display the agency's label and that the related documentation include the following statement.

**WARNING:** This equipment generates, uses, and may emit radio frequency energy and, if not installed and used in accordance with these instructions, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

## Canadian Department of Communications (CDC)

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus as set out in the Radio Interference Requirements of the Canadian Department of Communications.

### VCCI Class 2 ITE Equipment (A1630)

この装置は、第二種情報装置（住宅地域又はその隣接した地域において使用されるべき情報装置）で住宅地域での電波障害防止を目的とした情報処理装置等電波障害自主規制協議会（VCCI）基準に適合しております。

しかし、本装置をラジオ、テレビジョン受信機に近接してご使用になると、受信障害の原因となることがあります。

取扱説明書に従って正しい取り扱いをして下さい。

VCCI基準に適合する為に、シールドされたケーブルをご使用下さい。

## **TURVALLISUUSYHTEENVETO**

### **LASERTURVALLISUUS**

*LUOKAN 1 LASERLAITE  
KLASS 1 LASER APPARAT*

*HP Series 6100 Model 700/S laserlevyasema on turvallinen luokan 1 laserlaite. Normaalis-  
sa käytössä levyaseman suojakotelo estää lasersäteen pääsyn laitteen ulkopuolelle.*

*Levyaseman on tyyppihyväksynyt Suomessa laserturvallisuuden osalta Työsuojeluhallitus,  
Työsuojeluhallituksen hyväksyntänumero TSH 222/6019/90. Laitteen turvallisuusluokka on  
määritetty valtioneuvoston päätöksen N:o 472/1985 ja standardin SFS-IEC 825 mukaisesti.*

*Tiedot laitteessa käytettävän laserdiodin säteilyominaisuuksista:*

*Aallonpituus 780 nm  
Teho 0,4 mW  
Luokan 1 laser*



## Electrostatic Discharge (ESD) Precautions

Electrostatic charges can damage the integrated circuits on printed circuit boards. To prevent such damage from occurring, observe the following precautions during board unpacking and installation:

- Stand on a static-free mat.
- Wear a static strap to ensure that any accumulated electrostatic charge is discharged from your body to ground.
- Connect all equipment together, including the static-free mat, static strap, routing nodes, and peripheral units.
- Keep uninstalled printed circuit boards in their protective antistatic bags.
- Once you have removed printed circuit boards from their protective antistatic bags, handle them by their edges.



## Warnings and Cautions

**WARNING:**

To avoid personal injury and to prevent possible equipment damage, ensure that the ac power is off and the ac power cord is disconnected.

**WARNUNG:**

Um Verletzungen und mögliche Ausrüstungsschäden zu verhindern, muß die Wechselstromquelle ausgeschaltet sein und das Wechselstromzuführungskabel aus der Steckdose entfernt sein.

**ADVERTISSEMENT:**

Pour éviter les risques de blessures et de dommages au matériel, s'assurer que le système n'est pas sous tension et que le fil d'alimentation électrique c.a. est débranché.

**WARNING:**

Disconnect power plug from wall outlet or source power before moving or removing the device, or installing add-on components.

**WARNUNG:**

Entfernen Sie die Stromzuführung von der Steckdose oder der Stromquelle bevor Sie das Gerät bewegen, abbauen, oder zusätzliche Bauteile installieren.

**ADVERTISSEMENT:**

Débrancher la fiche de la prise de courant ou de la source d'alimentation électrique avant de déplacer ou de retirer l'unité, ou avant d'installer des modules supplémentaires.





# Chapter 1

## Installing the CD-ROM Drive

This chapter describes how to connect a CD-ROM drive to your system by performing the following tasks:

- Verifying that you have all the parts
- Checking the system for prerequisites
- Identifying your version of the CD-ROM drive
- Setting the SCSI ID and operating mode switches on the drive
- Connecting the drive to the system or to another daisy-chained SCSI peripheral with a SCSI cable
- Configuring Domain/OS or HP-UX to communicate with the CD-ROM drive
- Verifying system operation

## Checking the Contents of the Kit

Make sure that you have the following parts in the CD-ROM drive kit before you begin the CD-ROM drive installation:

- CD-ROM drive (part number A1999-69001)
- CD-ROM disc caddy (part number C2293-80001)
- ac power cable (part number 010637)

You must order the following parts separately from the CD-ROM kit. Refer to the section, "Connecting the CD-ROM Drive to Your System", later in this chapter, for listings of available SCSI cables and terminators.

- SCSI cable
- SCSI terminator

**NOTICE:** The last or only SCSI peripheral device connected to a system must have a SCSI terminator installed on its unused SCSI connector.

You can order the following parts through HP Apollo Direct Channel (1-800-225-5290):

- CD-ROM disc caddy
- SCSI cable
- SCSI terminator

## System Prerequisites

This section describes the prerequisites for connecting a CD-ROM drive to your system.

### Prerequisites for Domain/OS Systems

Table 1-1 shows the prerequisites for reading from a CD-ROM drive on Domain/OS systems.

*Table 1-1. Prerequisites for Reading from a CD-ROM Drive on Domain/OS Systems*

System	Minimum OS plus PSK	Minimum CPU Part Number	Upgrade (Required If System Lacks SCSI Port)
Series 400 <sup>1</sup> SAU12/68030 SAU11/68040	SR10.3 + LFC50BAD <sup>2</sup> SR10.3 + LFC50BAD <sup>2</sup>	No Minimum No Minimum	N/A N/A
Series 2500	SR10.3 + LFC50BAD <sup>2</sup>	No Minimum	N/A
Series 3500/3550	SR10.3 + LFC50BAD <sup>2</sup>	11858, Rev. 25 or 15652, Rev. 01	A-ADD-SWFC
Series 4000	SR10.3 + LFC50BAD <sup>2</sup>	009992, Rev. 25	A-ADD-SWFC
Series 4500	SR10.3 + LFC50BAD <sup>2</sup>	013031, Rev. 05	A-ADD-SWFC
Series 5500	SR10.3 + LFC50BAD <sup>2</sup>	No Minimum	A-ADD-SWFC
Series 10000	SR10.3.p + LFC50BBD <sup>2</sup>	No Minimum	A-ADD-TFC

<sup>1</sup> CD-ROM drive is not compatible on Series 400 systems that run SR10.3 and PSK8 (LFZ70BAD).  
<sup>2</sup> SR10.3.5

Table 1-2 shows the minimum Boot ROM revisions required if you want to boot software from the CD-ROM drive. Hewlett-Packard does not support bootable systems on Domain, but certain third parties or Independent Software Vendors (ISVs) may provide bootable software on a CD-ROM disc. Use the information in Table 1-2 if you have a bootable CD-ROM disc from one of these vendors. Note that the CD-ROM drive can only boot to the systems that are listed in Table 1-2.

*Table 1-2. Boot ROM Revisions for Booting from a CD-ROM Drive on Domain/OS Systems*

<b>System</b>	<b>Minimum Boot ROM Revisions for Booting</b>
Series 400 <sup>1</sup>	
SAU12/68030	2.1
SAU11/68040	3.0
Series 2500 <sup>1</sup>	4.1
Series 3500/3550 <sup>1</sup>	8.02
Series 4500 <sup>1</sup>	4.02
Series 5500	1.00
<sup>1</sup> Upgrade Kits are available for systems with Boot ROMs that do not meet minimum revision levels. Contact your sales representative for more information.	

To identify your system's Boot ROM revision level, first log out and shut down your system to the MD level, as described in your system *Owner's Guide*. Type `re` and press `< Return >` at the MD prompt. After your workstation beeps, press `< Return >` to display the MD banner:

```
> re < Return >
("BEEP")
> < Return >
```

The MD banner identifies the Boot ROM revision:

```
For Series 400 systems:
MD revision x.x date time
BOOTROM Rev. x, date
      ↑

For Non-Series 400 systems:
MDx REV. x.x date time
      ↑
```

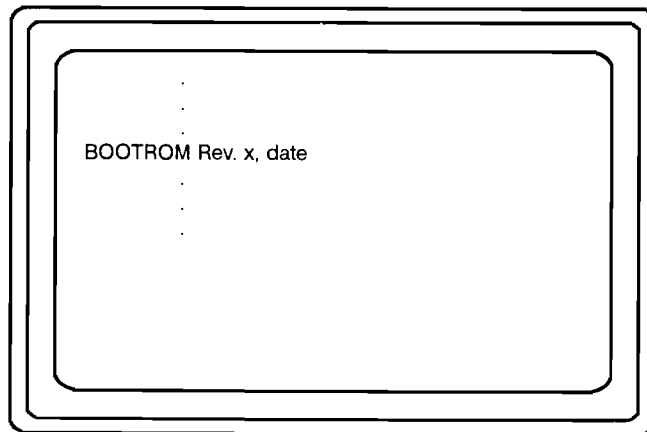
### Prerequisites for HP-UX Systems

Table 1-3 shows the minimum HP-UX and Boot ROM revisions required for reading and booting from a CD-ROM drive on an HP-UX system.

*Table 1-3. Prerequisites for Reading and Booting from a CD-ROM Drive on HP-UX Systems*

<b>System</b>	<b>Minimum OS for Reading</b>	<b>Minimum OS for Booting</b>	<b>Minimum Boot ROM Revision for Booting</b>
Series 300	HP-UX 7.0	HP-UX 8.0	D
Series 400	HP-UX 7.03	HP-UX 8.0	1.1
Series 700	HP-UX 8.05	HP-UX 8.05	No Minimum

To identify your Series 300 or 400 system's Boot ROM revision level, first shut down your HP-UX operating system, as described in your system *Owner's Guide*. Then turn your system off and back on. The power-up display lists the Boot ROM revision, as follows:



## Identifying Your Version of the CD-ROM Drive

This manual describes two versions of CD-ROM drive: drives manufactured before August, 1991 (early model drives), and drives manufactured in or after August, 1991 (late model drives). These drives have different front panel and address switch configurations. To identify your version of the CD-ROM drive, check the serial number on the lower right rear of the drive. As shown here, you can tell when your drive was manufactured from its serial number.

nnXXXXXXXX



shows the month of manufacture, as follows:

- 1 = January
- 2 = February
- 3 = March
- 4 = April
- 5 = May
- 6 = June
- 7 = July
- 8 = August
- 9 = September
- x = October
- y = November
- z = December

shows the last digit of the year of manufacture. For example, 1 = 1991.

For example, a drive with serial number 18xxxxxxxx was manufactured in August, 1991.

## **Setting the SCSI ID**

You must assign a unique SCSI ID to the CD-ROM drive and ensure that the operating mode switches (for early model drives) or parity switch (for late model drives) is set for correct drive operation. Refer to the appropriate subsection for your version of CD-ROM drive.

### **Setting the SCSI ID on Early Model Drives**

We ship the drive set to SCSI ID 3 and the operating mode switches set to operate correctly with your system.

To change the drive's SCSI ID, you can use either switches or jumpers. Perform the following steps to set the drive's SCSI ID and to check the operating mode switch settings for the CD-ROM drive:



1. Locate the switches and jumpers on the rear of the CD-ROM drive, as shown in Figure 1-1.

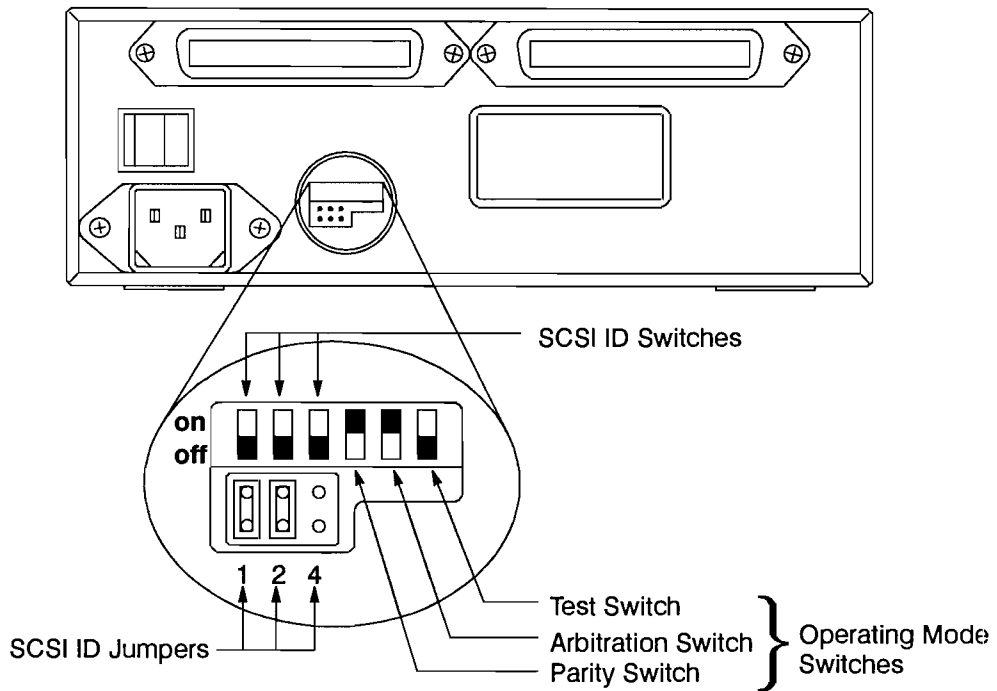


Figure 1-1. SCSI ID and Operating Mode Switches

2. Set the drive's SCSI ID to an ID that's not used by another SCSI device. Refer to Table 1-4 as you perform the following substep that is appropriate to your method of changing the SCSI ID:
  - **Switches** — Make sure that any SCSI ID jumpers are removed from their pins. Use a pointed instrument, such as a pen, to set the SCSI ID switches.
  - **Jumpers** — Use a pointed instrument, such as a pen, to set the three SCSI ID switches to 0. Place the jumpers in the correct position for the SCSI ID.

**NOTICES:** Do not use SCSI ID 7 because the system's SCSI controller uses ID 7 by default. We advise that you do not use SCSI ID 6 because the root, or boot, disk drive usually uses it.

For Series 300 systems with a Rev. D Boot ROM, you cannot use SCSI ID 0.

If you use jumpers to select the SCSI ID, you must set the SCSI ID switch settings down (off) as shown in Table 1-4. If you use the SCSI ID switches, you must remove the SCSI ID jumpers from their pins.

When you change the SCSI ID on a drive that's turned on, you must perform the following sequence: turn off the system unit, turn off the drive, change the SCSI ID, turn on the drive, and turn on the system unit.

3. Use a pointed instrument, such as a pen, to set the Parity, Arbitration, and Test Switches, as shown in Table 1-4. These switch settings enable parity checking and system arbitration, and disable the test mode.

Table 1-4. SCSI ID Switch Settings for Early Model Drives

SCSI ID	SCSI ID and Operating Mode Settings	
	Using Switches	Using Jumpers
0		
1		
2		
3		
4		
5		
6		

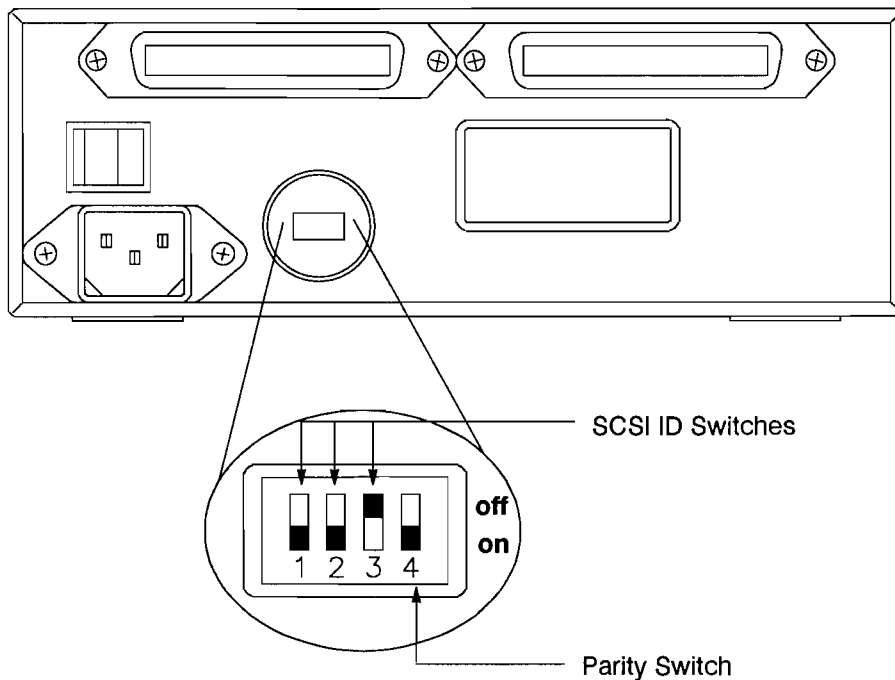
Switch Key: Switch Up (On) Switch Down (Off)

### **Setting the SCSI ID on Late Model Drives**

You must assign a unique SCSI ID to the CD-ROM drive and ensure that the parity switch is set to the **on** (down), or parity checking enabled, position. We ship the drive set to SCSI ID 3, and the parity switch set to enable parity checking (on).

Perform the following steps to set the drive's SCSI ID and make sure that the parity checking is enabled for the CD-ROM drive:

- 1.** Locate the switches on the rear of the CD-ROM drive, as shown in Figure 1-2.



*Figure 1-2. SCSI ID and Parity Switches*


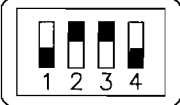
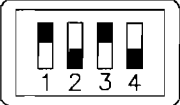

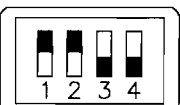


2. Use a pointed instrument, such as a pen, to set the SCSI ID switches to an ID that's not used by another SCSI device. Set the Parity switch to **on** if it's not already set. See Table 1-5 for the switch settings.



**NOTICES:** Do not use SCSI ID 7 because the system's SCSI controller uses SCSI ID 7 by default. We advise that you do not use SCSI ID 6 because the root, or boot, disk drive usually uses it.

For Series 300 systems with a Rev. D Boot ROM, you cannot use SCSI ID 0.

When you change the SCSI ID on a drive that's turned on, you must perform the following sequence: turn off the system unit, turn off the drive, change the SCSI ID, turn on the drive, and turn on the system unit.

*Table 1-5. SCSI ID Switch Settings for Late Model Drives*

SCSI ID	SCSI ID and Parity Settings
0	
1	
2	
3	
4	
5	
6	

Switch Key:  Switch Up (Off)  Switch Down (On)

## Connecting the CD-ROM Drive to Your System

This section explains how to perform the following tasks:

- Select a SCSI cable and terminator.
- Connect the CD-ROM drive to the system or to another SCSI peripheral device.

### Selecting a SCSI Cable and Terminator

You can connect the CD-ROM drive directly to your system or to another SCSI peripheral device that is already connected to your system, as shown in Figure 1-3. Figure 1-4 illustrates the different types of SCSI connectors for systems and SCSI peripherals. Use Figure 1-4 to identify the type of SCSI connectors involved in your CD-ROM installation.

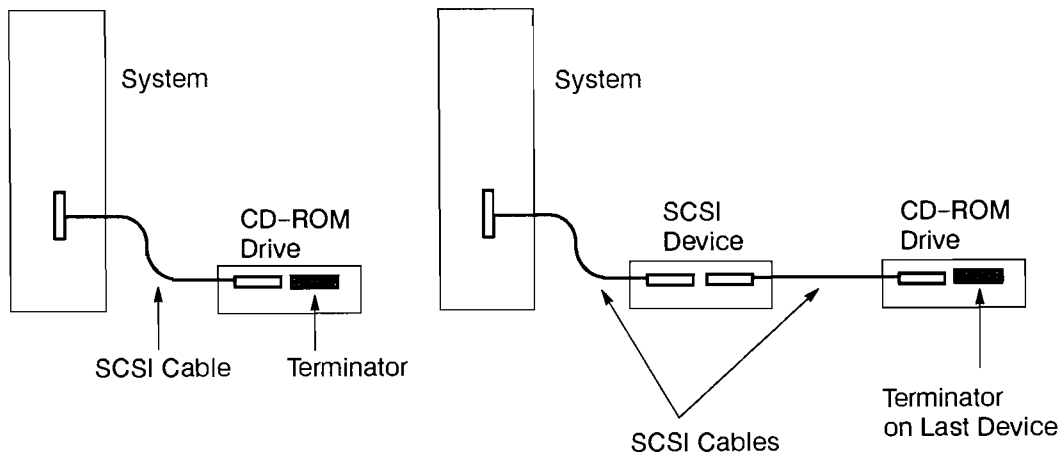
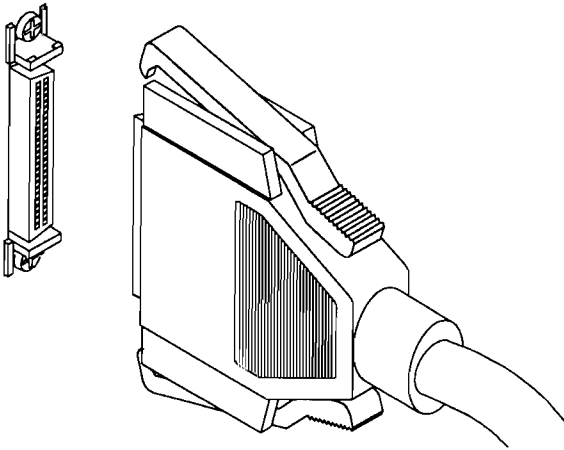
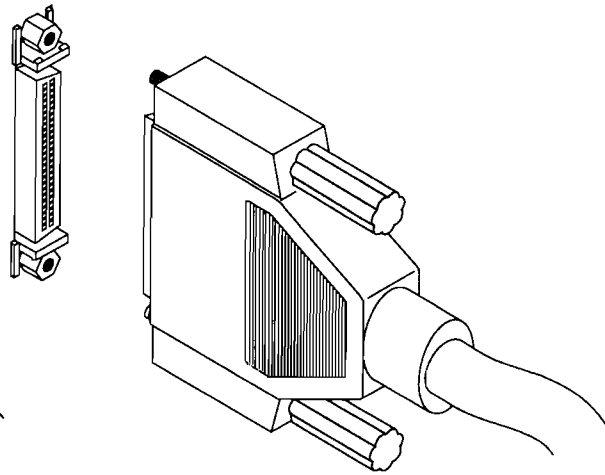


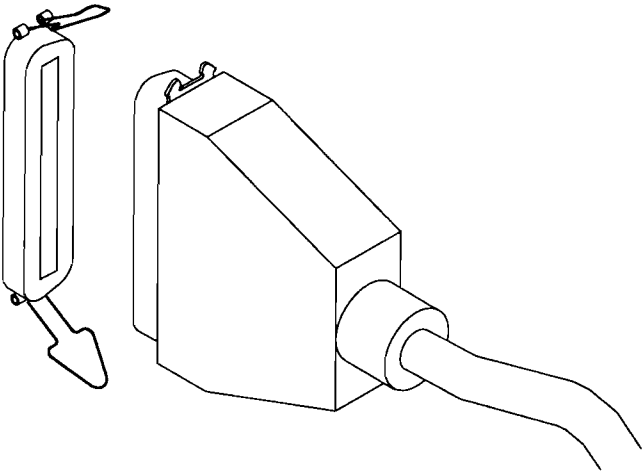
Figure 1-3. CD-ROM Drive Connections



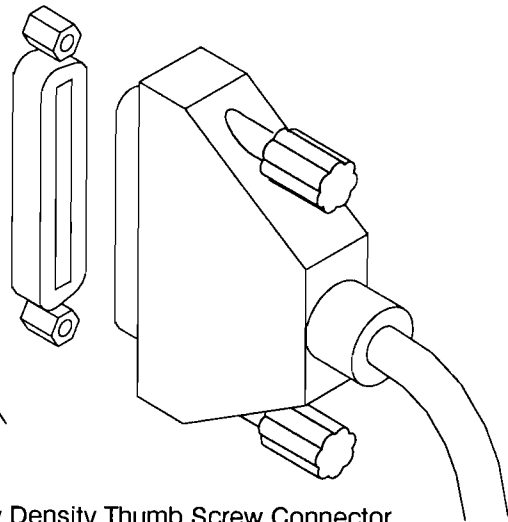
High Density Squeeze Connector



High Density Thumb Screw Connector



Low Density Bail Lock Connector



Low Density Thumb Screw Connector

*Figure 1-4. SCSI Connectors*



Refer to Tables 1-6, 1-7, and 1-8 to ensure that you have the correct cable and terminator for installing the CD-ROM drive. You can order these cables and terminators from HP Apollo Direct Channel (1-800-225-5290).

**NOTICE:** The sum of the lengths of the SCSI cables connected to your system cannot exceed 6 meters (19.7 feet). This sum includes the lengths of the SCSI cables internal to the system and connecting any daisy-chained peripheral devices. The SCSI cable internal to the CD-ROM drive measures 0.25 meters (10 inches).

You can connect a maximum of seven SCSI devices to a system's SCSI bus, including SCSI devices internal to the system.

Table 1-6 lists the cables available for connecting the CD-ROM drive directly to a system.

*Table 1-6. SCSI Cables for Connecting a CD-ROM Drive to a System*

System	SCSI Cables		
	Length	Part Number	Description
Series 400	1.0m (3.3 ft.)	K2286	High Density Squeeze to Low Density Bail Lock
	1.5m (4.9 ft.)	K2285	
Series 400 700	0.9m (3.0 ft.)	K2296	High Density Thumb Screw to Low Density Bail Lock
	1.5m (4.9 ft.)	K2297	
Series 300	0.5m (1.6 ft.)	92222A	Low Density Bail Lock to Low Density Bail Lock
	1.0m (3.3 ft.)	92222B	
	2.0m (6.6 ft.)	92222C	
Series 2500 3500 3550 4000 4500 5500 10000	0.5m (1.6 ft.)	K2207	Low Density Thumb Screw to Low Density Bail Lock
	1.5m (4.9 ft.)	K2210	
	2.0m (6.6 ft.)	K2209	

Table 1-7 lists the cables available for connecting the CD-ROM drive to a SCSI peripheral already connected to your system.

*Table 1-7. SCSI Cables for Connecting a CD-ROM Drive to Other Peripheral Devices*

Peripheral SCSI Connections	SCSI Cables	
	Length	Part Number
Low Density Thumb Screw Connector to Low Density Thumb Screw Connector	0.5m (1.6 ft.)	K2207
	1.0m (3.3 ft.)	K2210
	1.5m (4.9 ft.)	K2209
	2.2m (7.2 ft.)	K2208
	3.0m (9.8 ft.)	K2211
Low Density Bail Lock Connector to Low Density Bail Lock Connector	0.5m (1.6 ft.)	92222A
	1.0m (3.3 ft.)	92222B
	2.0m (6.6 ft.)	92222C
Low Density Thumb Screw Connector to Low Density Bail Lock Connector	1.0m (3.3 ft.)	K2284
	1.5m (4.9 ft.)	K2283

You must use a terminator to terminate the SCSI bus on the last or only external peripheral device connected to the system. Table 1-8 lists the terminators for the two types of SCSI connectors on peripheral devices.

*Table 1-8. SCSI Connector Terminators for Peripheral Devices*

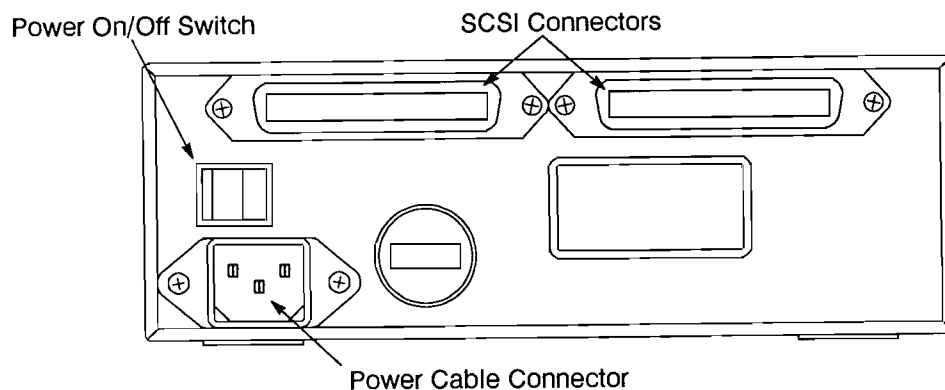
Peripheral SCSI Connector Type	SCSI Terminator Part Number
Low Density Thumb Screw Connector	K2290
Low Density Bail Lock Connector <sup>1</sup>	K2291
<sup>1</sup> SCSI connector type on CD-ROM drive	

## Connecting the CD-ROM Drive

Perform the following steps to connect the CD-ROM drive to your system or to another SCSI device already connected to your system.

**NOTICE:** You cannot use a CD-ROM drive in a Series 35xx, 4000, or 4500 system that uses a non-SCSI cartridge tape drive. You must either remove the ctape controller from the system, or replace your non-SCSI ctape drive with a SCSI ctape drive.

1. Make sure that your system and any peripherals involved are turned off and that their power cables are unplugged. For specific information about starting and stopping HP-UX, refer to the system's *Owner's Guide* or to the *HP-UX System Administration Tasks* manual. For specific information about shutting down and powering up a Domain/OS system, refer to that system's *Owner's Guide*.
2. If you are connecting the CD-ROM drive to another SCSI device that's already connected to your system, go to Step 3 (without performing this step). To connect the CD-ROM drive directly to your system, perform the following steps:
  - a. If present, remove the terminator from the system's SCSI connector.
  - b. Connect one end of the SCSI cable to the SCSI connector on the system, and the other end to one of the SCSI connectors on the CD-ROM drive. Figure 1-4 illustrates the SCSI connections for the various systems. See Figure 1-5 for CD-ROM drive connector locations.
  - c. Connect a SCSI terminator to the unused SCSI connector on the CD-ROM drive. Go to Step 4.



*Figure 1-5. CD-ROM Drive Cable Connectors and On/Off Switch*

3. Perform the following steps to connect the CD-ROM drive to another SCSI device already connected to your system:
  - a. Remove the terminator from the SCSI connector on the peripheral device.
  - b. Use the appropriate SCSI cable to connect the peripheral device to one of the SCSI connectors on the CD-ROM drive. Figure 1-4 illustrates the SCSI connections for other SCSI peripherals. Figure 1-5 shows the location of the SCSI connectors on the CD-ROM drive.
  - c. Connect a SCSI terminator to the unused SCSI connector on the CD-ROM drive.

4. Perform the following steps to power on the CD-ROM drive, the system, and other peripheral devices:
  - a. Make sure the On/Off switch on the CD-ROM drive is in the off position. See Figure 1-5 for On/Off switch and cable connector locations.
  - b. Connect the power cable to the CD-ROM drive. Then plug it into an ac outlet.
  - c. Plug in the power cable of the system and any other SCSI devices.
  - d. Turn on the power to the CD-ROM drive and any other SCSI devices. For the system to recognize the CD-ROM drive, the power to the CD-ROM drive must be on before you turn on the power to the system.
  - e. Turn on the power to the system.

## Configuring the Operating System

This section describes how to configure Domain/OS or HP-UX to communicate with the CD-ROM drive. After you complete this section, go to the “Verifying System Operation” section, later in this chapter.

### Configuring Domain/OS

This subsection describes how to create a device file for a CD-ROM drive and how to check the `/etc/daemons` directory for the necessary CD-ROM files.

To enable a Domain/OS system to use a CD-ROM drive, you must create a device file for the drive. We recommend that you use a specific device file name according to the number of CD-ROM drives connected to your system. Table 1-9 lists these recommended names. If you don't use a name listed in Table 1-9, SAX may not test the CD-ROM drive.

*Table 1-9. Device File Naming Convention*

CD-ROM Drive on the SCSI Bus	Device File Name
First Drive	<code>cdrom</code>
Second Drive	<code>cdrom_1</code>
Third Drive	<code>cdrom_2</code>
Fourth Drive	<code>cdrom_3</code>
Fifth Drive	<code>cdrom_4</code>
Sixth Drive	<code>cdrom_5</code>



**NOTICE:** The device file exists in the `/dev` directory as a matter of convention (for example, `/dev/cdrom`).

Perform the following steps to configure Domain/OS to communicate with the CD-ROM drive. Note that you must have superuser privileges (that is, logged in as **root**) to perform these steps.

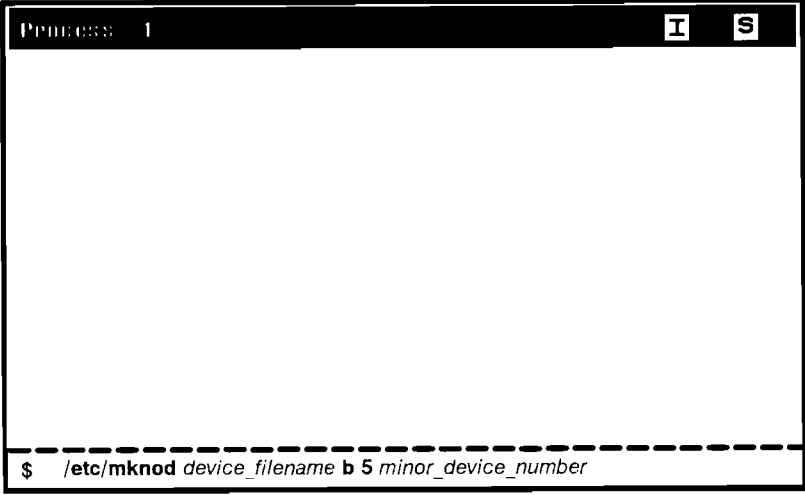
**NOTICE:** Systems that run SR10.4 or a post-SR10.4 operating system and connect the CD-ROM drive to SCSI controller **0** are pre-configured with CD-ROM device files named **cdrom** through **cdrom\_5**, as shown in Table 1-9. If your system meets these criteria, go directly to Step 3 without performing Steps 1 and 2.

1. Use the **/etc/mkdevno** command to create an entry in the device number table for CD-ROM drives.

A terminal window with a black title bar containing the text "Process: 1" on the left and two small square icons labeled "I" and "S" on the right. The main area of the terminal is white and mostly empty. At the bottom of the terminal, a dashed horizontal line separates the command prompt from the rest of the window. Below the dashed line, the text "\$ /etc/mkdevno -a cddev b 5 <Return >" is displayed.



2. Use the `/etc/mknod` command to create a device file for the drive:

A terminal window with a title bar that says "Process: 1" and window control buttons "I" and "S". The terminal content shows a shell prompt "\$" followed by the command `/etc/mknod device_filename b 5 minor_device_number`.

```
Process: 1 [I] [S]  
$ /etc/mknod device_filename b 5 minor_device_number
```

where

*device\_filename* is the name of the device file (for example, `/dev/cdrom`).

*minor\_device\_number* specifies the following information:

- The system's SCSI controller number (always **0** for SR10.3 systems)
- The CD-ROM drive's SCSI ID that you selected with the drive's SCSI ID switches

To find the *minor\_device\_number*, refer to Table 1-10 or 1-11, depending on your operating system. Use the table to cross-reference the system's SCSI controller number with the CD-ROM drive's SCSI ID. For example, for an SR10.4 system with a **SCSI controller number** = 0 and a CD-ROM drive **SCSI ID** = 3, the *minor\_device\_number* = 6144.

Table 1-10. SR10.3 minor\_device\_number Matrix

SCSI ID	minor_device_number
0	0
1	128
2	256
3	384
4	64
5	192
6	320

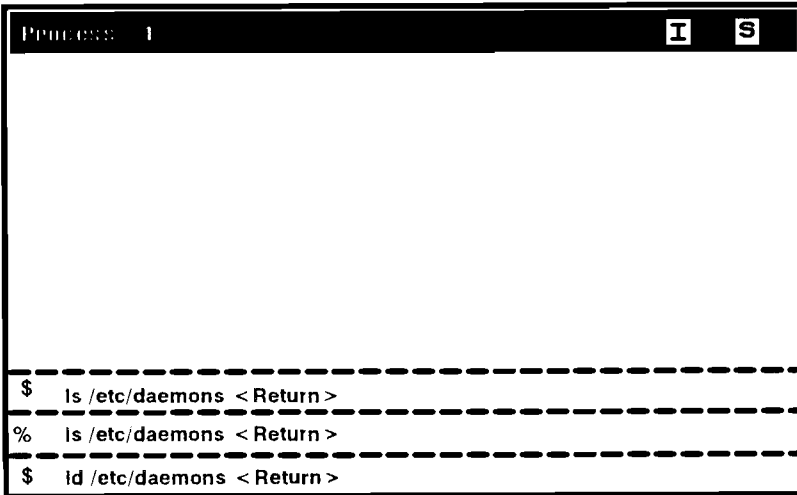
**NOTICE:** SR10.3 systems support only SCSI controller 0.

Table 1-11. SR10.4 minor\_device\_number Matrix

SCSI ID	SCSI Controller Number			
	0	1	2	3
0	0	32768	65536	98304
1	2048	34816	67584	100352
2	4096	36864	69632	102400
3	6144	38912	71680	104448
4	8192	40960	73728	106496
5	10240	43008	75776	108544
6	12288	45056	77824	110592

**NOTICE:** For SR10.4 and post-SR10.4 systems, the SCSI controller number is usually 0, unless you have more than one SCSI controller in your system.

3. Make sure that the **llbd**, **cdfsd**, and **xpager** (for SR10.4 and post-SR10.4 systems only) files exist in the **/etc/daemons** directory:



```
Process: 1 [I] [S]
-----
SysV $ ls /etc/daemons <Return>
BSD  % ls /etc/daemons <Return>
Aegis $ ls /etc/daemons <Return>
```

## **Configuring HP-UX**

This subsection describes how to configure the HP-UX operating system to communicate with a CD-ROM drive by performing the following steps:

- Ensure that the device driver for the drive is part of the current kernel configuration.
- Create a device file for the CD-ROM drive.

You can use either the System Administration Manager (SAM) or HP-UX commands to perform these tasks. For more detailed information about SAM and configuring HP-UX to communicate with peripherals, refer to the *Installing Peripherals Guide* for your system type.

### **Configuring Series 300 and Series 400 Workstations**

The following steps describe how to configure HP-UX on Series 300 and 400 systems by using a combination of HP-UX commands and SAM:

1. Log in as user **root**.
2. Check **/etc/conf/dfile** to determine if the device drivers for the CD-ROM drive are part of the current kernel configuration by entering the following commands:

```
# grep scsi /etc/conf/dfile < Return >
scsi
# grep cdfs /etc/conf/dfile < Return >
cdfs
```

The screen displays the device driver entries (**scsi** and **cdfs**). If both entries exist, go to Step 6. If an entry doesn't exist or is commented out with a **\***, go to Step 3.

3. If a device driver doesn't exist in the `/etc/conf/dfile` file or an entry exists but is commented out with a `*`, add the necessary driver(s) to the file by entering the following commands:

```
# cat >> /etc/conf/dfile <Return>
# scsi <Return>
# cdfs <Return>
# <ctrl><d>
```

4. After you add the driver(s) to the `/etc/conf/dfile` file, reconfigure the kernel by performing one of the following substeps, depending on whether you use SAM or HP-UX commands. We recommend using SAM as the simplest method.
  - **SAM** — After invoking SAM, first select **Kernel Configuration**, then select **View/Modify I/O Configuration**. Select **y** for the SCSI disks selection, then follow the prompts to generate the new kernel and reboot the system. For more information, refer to the *System Administration Tasks Manual* for your system type.
  - **HP-UX commands** — Perform the following steps to reconfigure the kernel:

```
# cd /etc/conf <Return >
# /etc/config dfile <Return >
# make -f config.mk <Return >
# mv /hp-ux /SYSBCKUP <Return >
# mv hp-ux /hp-ux <Return >
# exec reboot <Return >
.
.
login:
```

**NOTICE:** Refer to Chapter 11 of the *HP-UX System Administration Tasks Manual*, “Reconfiguring the HP-UX Kernel”, for more information about reconfiguring the kernel.

5. Log in as user **root**.

6. The CD-ROM drive requires one character type device file and one block type device file. Use the **mknod** command to create these device files. The **mknod** command uses the following syntax:

**mknod** *pathname file\_type major\_number minor\_number*

where

- pathname* is the pathname of the device file to be created. Create the following:
- A character device file in the **/dev/rdisk/#s0** directory
  - A block device file in the **/dev/dsk/#s0** directory
- where # is the SCSI target address of the CD-ROM drive.
- file\_type* Use **c** to specify a character device file.  
Use **b** to specify a block device file.
- major\_number* Use **47** to specify the *major\_number* for a character device file.  
Use **7** to specify the *major\_number* for a block device file.
- minor\_number* The *minor\_number* is address-dependent and is the same for both character and block device files. It uses the form **0x0eBa00**, which consists of the following components:
- **0x** indicates a hexadecimal format.
  - **0e** specifies the SCSI select code 14 (hexadecimal 0e).
  - **Ba** specifies the bus address that you set with the drive's SCSI ID switches.
  - **00** is a reserved number that represents the Unit and Volume values.



For example, for Series 300 and 400 systems with a CD-ROM drive using bus address (SCSI ID) 03, type the following **mknod** command lines:

```
$ mknod /dev/rdisk/3s0 c 47 0x0e0300 < Return >
$ mknod /dev/dsk/3s0 b 7 0x0e0300 < Return >
```

**NOTICE:** If your system already uses bus address (SCSI ID) 03, you must use a different bus address.

### **Configuring Series 700 Workstations**

Your HP-UX operating system has preconfigured device files and drivers. You don't need to configure the operating system to use your CD-ROM drive if you use these preconfigured device files and drivers.

These device files are in the `/dev/dsk` or `/dev/rdsk` directories. The first number in the device file name indicates the SCSI address used in the file. For example, the device file `3s0` located in `/dev/dsk` was created for SCSI address 3.

If you wish to create your own device files, you must reconfigure the operating system. You can use either the System Administration Manager (SAM) or HP-UX commands to set up the kernel and device files. With each, you must perform the following steps.

- 1.** Check the kernel for a device driver. If the device driver is not there, you must create one and then reconfigure the kernel. For more information on checking or reconfiguring the kernel for a device driver or file, see the *System Administration Tasks Manual: HP 9000 Series 700 Computers*.

**NOTICE:** All SCSI devices can use the `scsi` device driver.

- 2.** Create the appropriate device files.
- 3.** Add a CD-ROM file system (`cdfs`).

## Verifying System Operation

Refer to the following appropriate subsection for your operating system.

### Domain/OS Systems

To verify your Domain/OS system's operation after you install the CD-ROM drive, run the System Acceptance Exerciser (SAX) as explained in your system's *Owner's Guide*.

**NOTICE:** Before you run SAX on the CD-ROM drive, make sure that you've inserted an HP CD-ROM disc, as all discs from HP contain diagnostic tracks for self-test and SAX diagnostics.


Refer to the "Inserting a Disc" subsection in Chapter 2 before you attempt to insert a disc into the CD-ROM drive.

### HP-UX Systems

To verify your HP-UX system's operation after you install the CD-ROM drive, run the system verification tests as explained in your system's *Owner's Guide* or *HP-UX System Administration Tasks* manual.







# **Chapter 2**

## **Using the CD-ROM Drive**

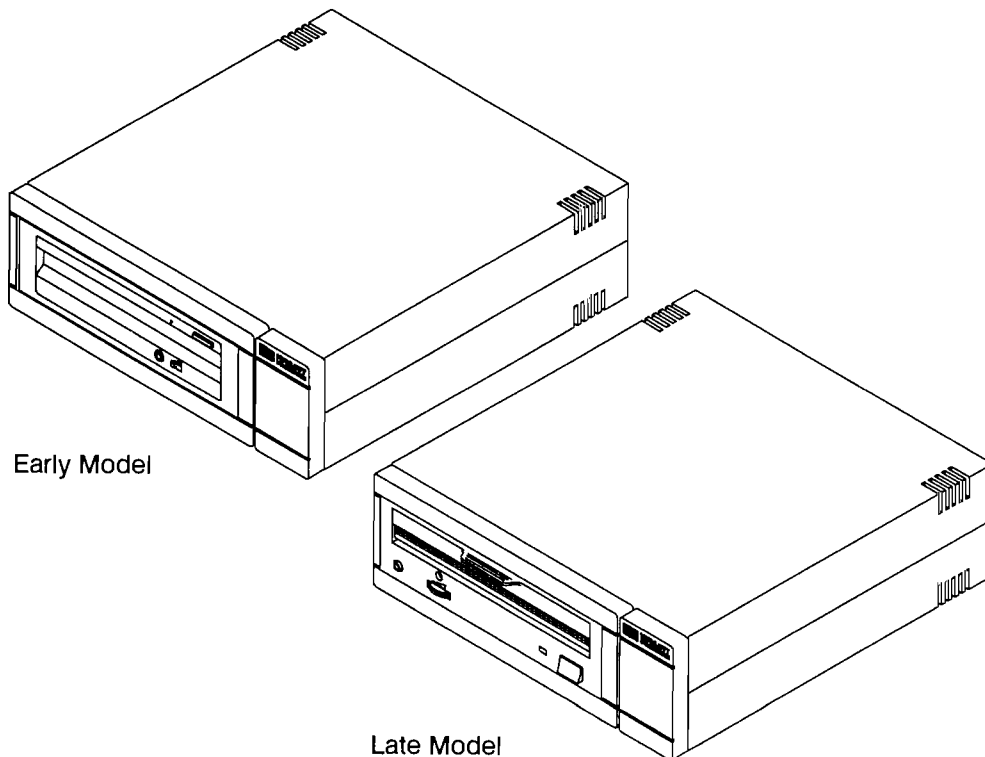
This chapter provides an overview of the CD-ROM drive and its discs.

## **CD-ROM Drive and Disc Descriptions**

This section describes the CD-ROM drive and CD-ROM discs.

### **CD-ROM Drive**

The CD-ROM drive is a random access, read-only, mass storage device that uses removable CD-ROM discs. The drive contains a semiconductor laser for reading data optically, and includes an embedded controller with a SCSI interface. Figure 2-1 shows the two versions of CD-ROM drives: drives manufactured before August 1991 (early model), and drives manufactured after July 1991 (late model).



*Figure 2-1. CD-ROM Drives*

The CD-ROM disc supports the ISO 9660 and High Sierra format standards. You can access information from the drive like any other disk drive, except that you cannot write to the drive. For some systems, you can boot an operating system from the CD-ROM drive. Check Tables 1-1 and 1-2 for your system's prerequisites for booting from a CD-ROM drive.

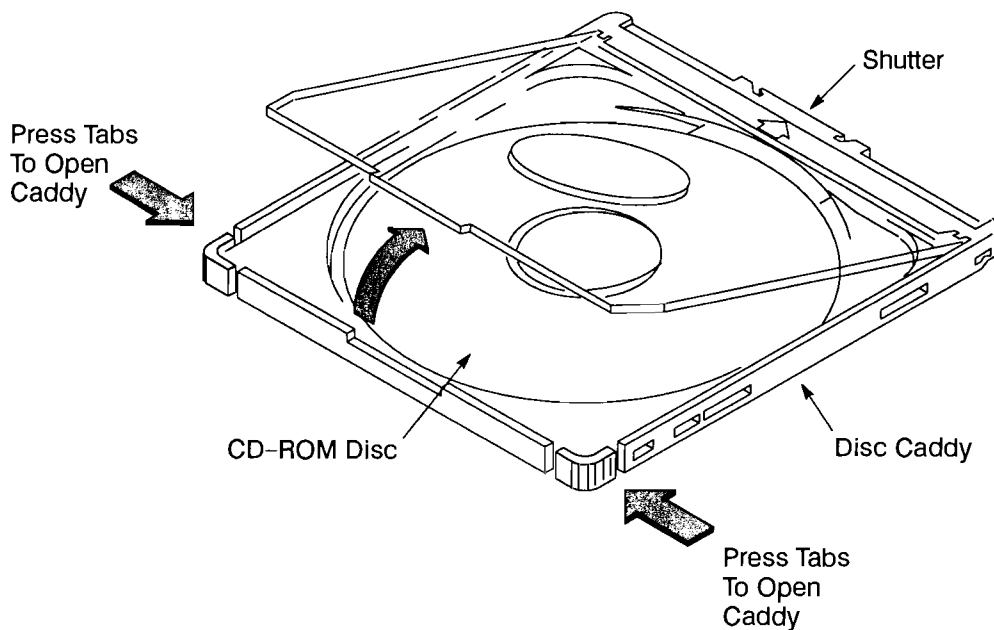
### **CD-ROM Discs**

CD-ROM discs are identical to audio compact discs (CDs), except that CD-ROM discs store computer data. CD-ROM discs are 120mm (4.7 in.) in diameter and use one data surface with a capacity of 599 megabytes. The data surface contains pits and flat spots arranged in a continuous spiral track, which is read at a constant speed.

A CD-ROM disc mounts into a rigid plastic caddy (part number C2293-80001), as shown in Figure 2-2. The drive accesses data on the CD-ROM disc through a shutter in the bottom of the caddy. When you insert the disc caddy into the drive, the shutter opens automatically to expose the disc surface. When you eject the disc caddy from the drive, the shutter closes to protect the disc surface.

**NOTICE:** CD-ROM drives are only compatible with a part number C2293-80001 disc caddy. You cannot use a disc caddy from other HP devices.

**CAUTION:** Do not open the shutter manually, as this exposes the disc surface to dust. Over time, dust reduces the reliability of the read head in the CD-ROM drive.



*Figure 2-2. CD-ROM Disc and Disc Caddy*

### **Putting CD-ROM Discs into the Disc Caddy**

Refer to Figure 2-2 as you perform the following steps to install a CD-ROM disc into a caddy:

- 1.** Press the tabs on the outside edges of the CD-ROM caddy inward and open up the top cover of the caddy.
- 2.** Center the CD-ROM disc on the tray in the disc caddy, label side up.
- 3.** Push the cover of the caddy down to close it.



### **Caring for CD-ROM Discs**

Observe the following guidelines to prevent data loss and to prolong the life of your CD-ROM discs and drive:

- Use CD-ROM discs in a clean environment to prevent dust particles from scratching disc surfaces.
- Store CD-ROM discs in a cool, dry place to prevent moisture and heat damage.
- Don't try to clean the surface of a CD-ROM disc with cleaning solvents, as some cleaning solvents may damage the disc.

## Features of the CD-ROM Drive

Figure 2-3 shows the operating controls and features of the early model CD-ROM drive; Figure 2-4 shows the controls and features of the late model CD-ROM drive. Table 2-1 describes the features of these CD-ROM drives.

**NOTICE:** Your CD-ROM drive can play ordinary Redbook (IEC-809) audio discs by using an application program that generates the appropriate SCSI commands. The application program enables stereo audio signals at the headphone jack on the front of the drive. The CD-ROM drive does not play audio discs without an application program.

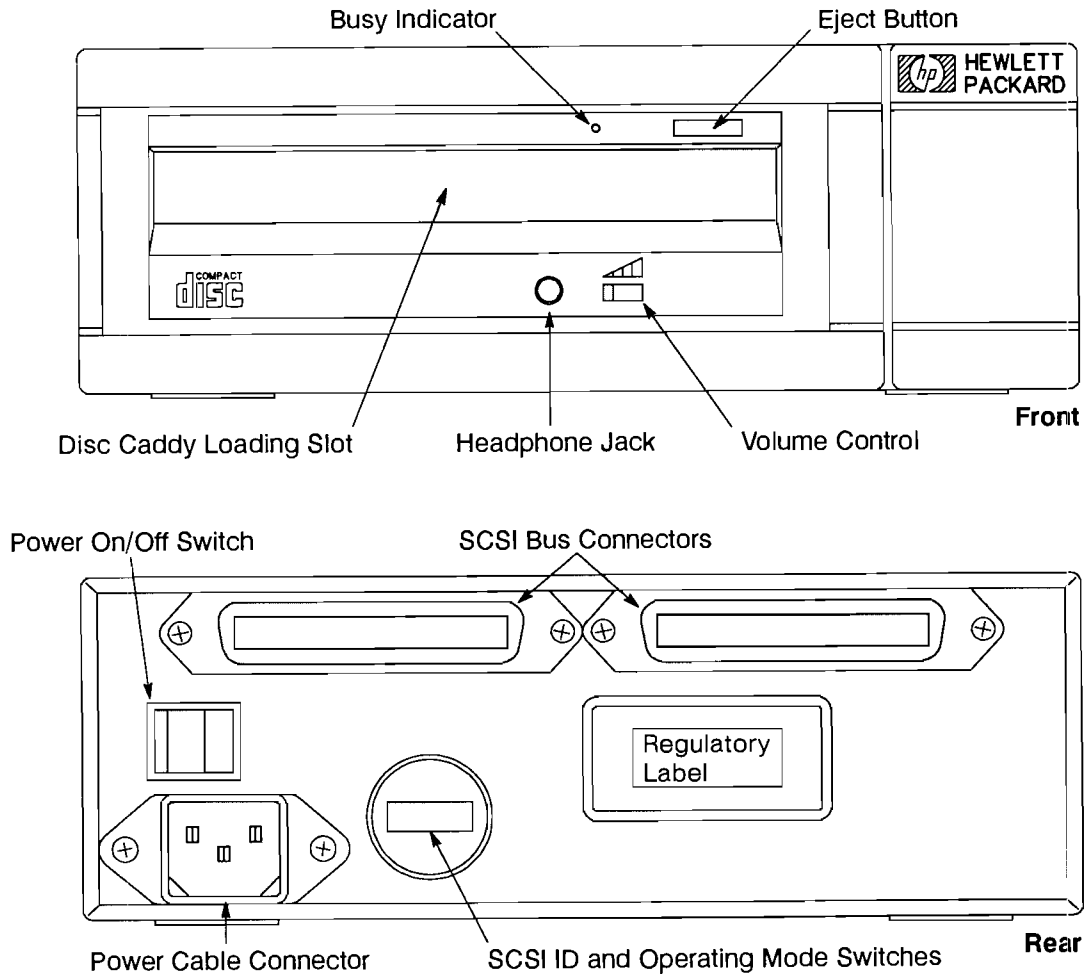


Figure 2-3. CD-ROM Drive Controls and Features (Early Model)

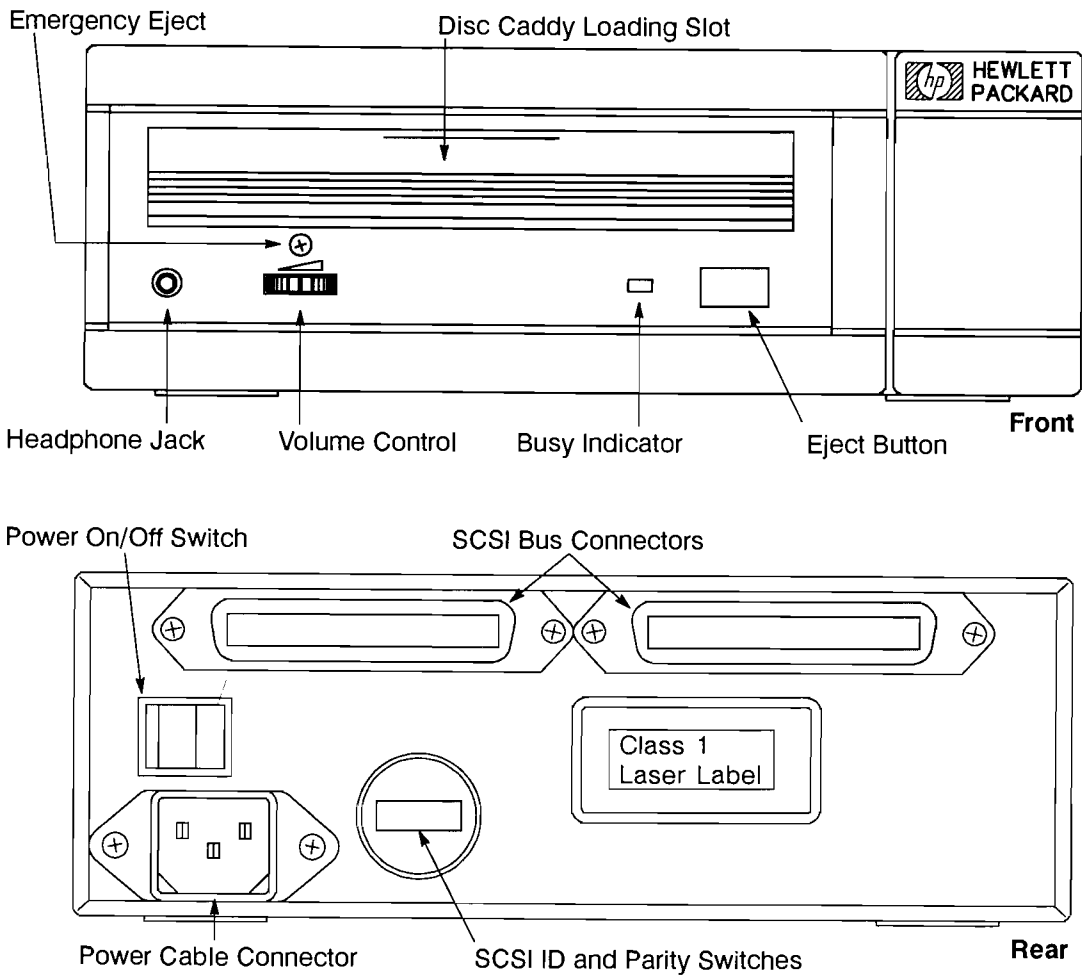


Figure 2-4. CD-ROM Drive Controls and Features (Late Model)



Table 2-1. CD-ROM Drive Control Descriptions

Control/Feature	Purpose
<b>Front</b>	
Busy Indicator	<p>The Busy Indicator lights continually during a data access operation and blinks during a data transfer. The indicator blinks initially and then stays lit when there is one of the following:</p> <ul style="list-style-type: none"> <li>● Defective disc</li> <li>● Disc insertion error (for example, an upside-down disc)</li> <li>● No disc present</li> </ul>
Eject Button	Press the Eject Button to eject the disc caddy. When the drive is in use, you must press the Eject Button for more than one second.
Disc Caddy Loading Slot	Slot for inserting the disc caddy. You must open a door on late model drives to access the loading slot. If you eject the disc caddy and want to reinsert it, you must pull the caddy out more than 5 mm (0.2 in.) from the ejected position before reinserting it. The slot does not accept a disc caddy if the drive's power is off.
Headphone Jack <sup>1</sup>	The Headphone Jack is a 3.5 DIA miniature jack for stereo audio output.
Volume Control <sup>1</sup>	The Volume Control increases the volume for the headphones.
Emergency Eject (Late Model Only)	By removing the Phillips screw and inserting the end of a paper clip, you can eject the disc caddy if the workstation does not have power.
<b>Rear</b>	
Power On/Off Switch	The Power On/Off switch turns the drive's power on and off.
SCSI Bus Connectors	Connectors for SCSI bus cables and SCSI terminators. The two connectors allow you to daisy-chain SCSI devices. If the drive is the last or only peripheral connected to the system, you must put a SCSI terminator on the unused SCSI Bus Connector.
Power Cable Connector	The receptacle for the ac power input cable.
SCSI ID and Operating Mode Switches (Early Model only)	Selects SCSI ID and the parity, arbitration, and test options. To change a switch setting, you must perform the following sequence: turn off the system unit, turn off the drive, change the SCSI ID, turn on the drive, and turn on the system unit.
SCSI ID and Parity Switches (Late Model only)	Selects SCSI ID and enables parity checking. To change a switch setting, you must perform the following sequence: turn off the system unit, turn off the drive, change the SCSI ID, turn on the drive, and turn on the system unit.
<sup>1</sup> Only supported as noted at the beginning of this section.	

## Using the CD-ROM Drive

This section provides the following information about using the CD-ROM drive:

- How to insert and eject the CD-ROM disc caddy
- How to mount and unmount a CD-ROM disc
- How to read the drive's busy light

### Inserting a Disc

Perform the following steps to insert a disc into the CD-ROM drive:

1. Press the Power On/Off switch on the rear of the drive to turn on the drive. To locate the switch, see Figure 2-3 for early model drives or Figure 2-4 for late model drives.
2. If your CD-ROM drive has a door (late model drives), open it. Carefully insert the disc caddy in the direction of the arrow on the caddy, as shown in Figure 2-5, about one third of the way into the loading slot until you hear a click. The drive then automatically pulls the caddy the rest of the way into the slot. If your drive has a door, close it.

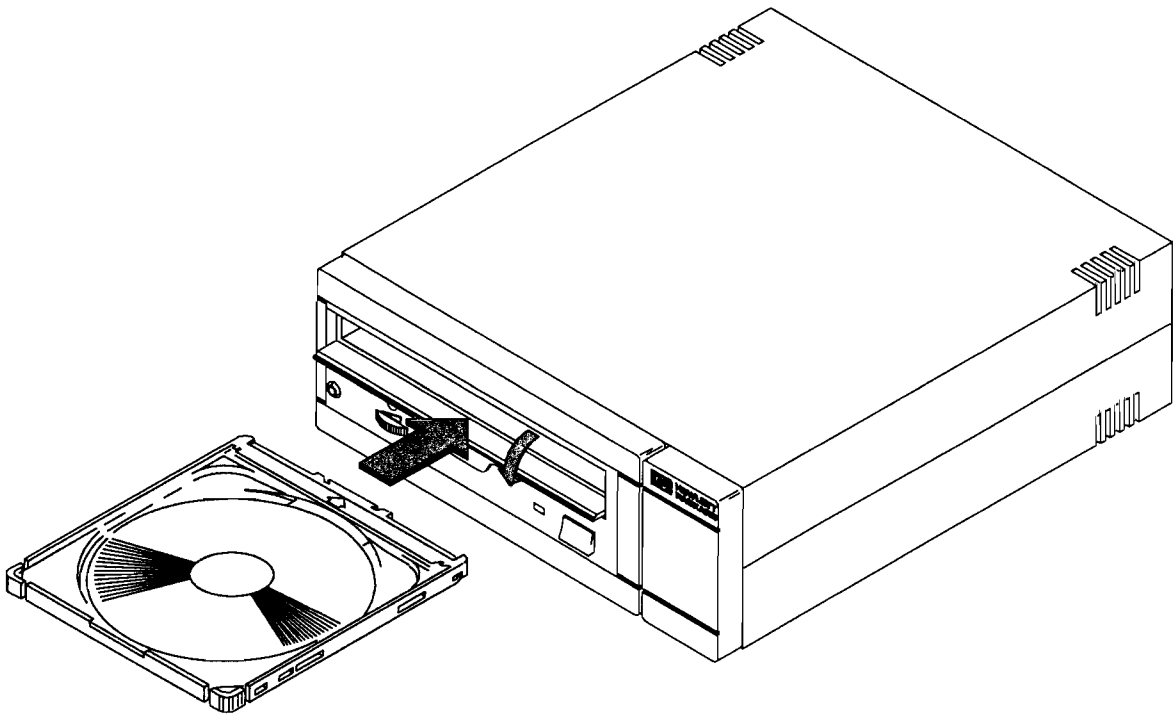
**CAUTION:** Do not force the disc caddy into the drive's loading slot, as this may damage the drive's load mechanism.

**NOTICES:** CD-ROM drives with doors operate with the door open, but we recommend that you always close the door before operating the drive.

The CD-ROM drive does not load a disc caddy if the drive's power is off.

If you eject the disc caddy and want to reinsert it, you must pull the caddy out more than 5 mm (0.2 in.) from the ejected position before reinserting it.

You must mount the disc after inserting it into the drive. Refer to the subsection, "Mounting and Unmounting a CD-ROM Disc" later in this chapter, for instructions about mounting a disc.



*Figure 2-5. Inserting a CD-ROM Disc Caddy*

### **Ejecting a Disc**

Press the eject button to eject a disc caddy from the drive. If the drive is in use, you must press the eject button for more than one second to eject the disc caddy. For late model drives, you can eject the disc caddy if the workstation does not have power by removing the Phillips screw from the emergency eject and inserting the end of a paper clip. Refer to Figure 2-4 for the location of the emergency eject.

**NOTICE:** You must unmount the disc before ejecting it from the drive. Refer to the following subsection, “Mounting and Unmounting a CD-ROM Disc”, for instructions about unmounting a disc.



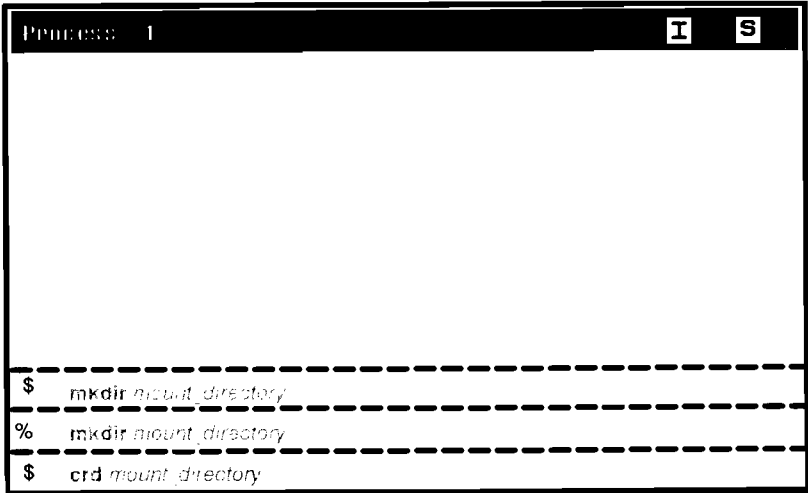
## Mounting and Unmounting a CD-ROM Disc

You must mount a CD-ROM disc every time you insert it into the drive, and unmount the disc before you eject it from the drive.

### Mounting and Unmounting a Disc for Domain/OS Systems

Perform the following steps to mount and unmount a disc for Domain/OS systems:

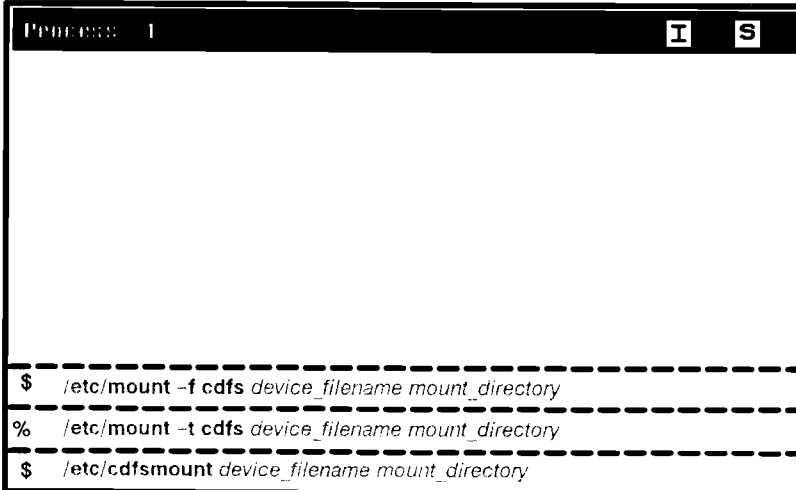
1. If your system is running SR10.3 or SR10.3.p, go to Step 2 (without performing this step). If your system is running SR10.4 or a post-SR10.4 operating system, you must create a mount directory (for example, `/cd`) to define where to access the CD-ROM file system. To create a mount directory, type the following command:



The image shows a terminal window with a title bar that reads "Process: 1" and contains window control buttons "I" and "S". The terminal content is as follows:

```
-----  
SysV $ mkdir mount_directory  
BSD % mkdir mount_directory  
Aegis $ cd mount_directory
```

2. Mount the CD-ROM file system every time you insert a CD-ROM disc into the drive. In the following example, *device\_filename* is the device file of the CD-ROM drive (for example, **/dev/cdrom**) and *mount\_directory* is the directory where you want the CD-ROM file system to appear (for example, **/cd**).

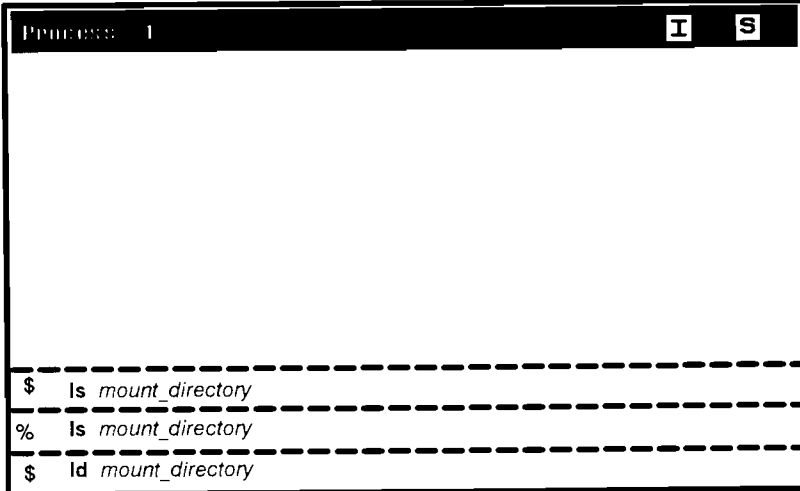


The image shows a terminal window with a title bar that says "Process 1" and window control buttons "I" and "S". The terminal content is as follows:

```
-----  
SysV $ /etc/mount -f cdfs device_filename mount_directory  
-----  
BSD % /etc/mount -t cdfs device_filename mount_directory  
-----  
Aegis $ /etc/cdfsmount device_filename mount_directory
```

**NOTICE:** For SR10.3 and SR10.3.p, the mount directory must not exist before you mount the drive. At SR10.4, the mount directory must exist before you mount the drive.

- Now you can access the CD-ROM disc as you would any other disk (except that you cannot write to the CD-ROM disc). For example, to list the contents of the CD-ROM disc, enter the following command:



The image shows a terminal window with a title bar that reads "Process: 1" and two window control buttons labeled "I" and "S". The terminal content is as follows:

```
-----  
SysV $ ls mount_directory  
-----  
BSD % ls mount_directory  
-----  
Aegis $ ls mount_directory
```

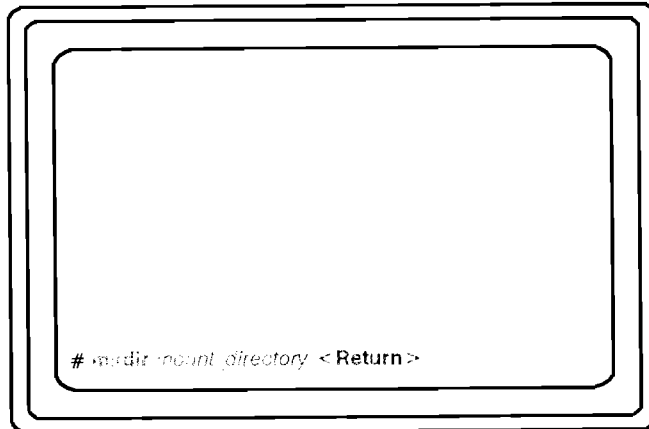
4. Unmount the CD-ROM disc before ejecting it from the drive by entering the following command:

	Process	I	S
SysV	\$	<i>/etc/unmount device filename</i>	
BSD	%	<i>/etc/unmount device filename</i>	
Aegis	\$	<i>/etc/cdromount de. cd filename</i>	

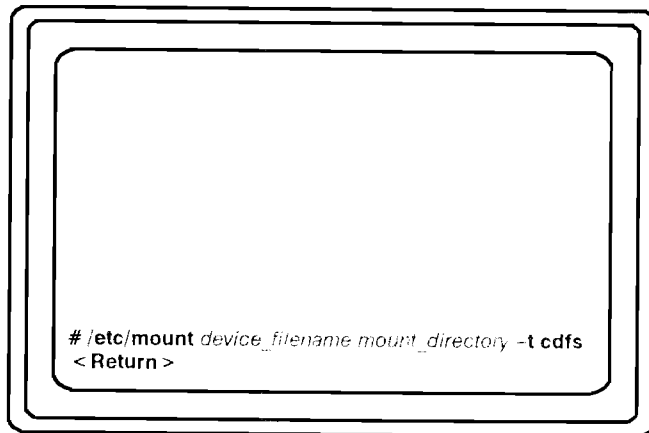
### **Mounting and Unmounting a Disc for HP-UX Systems**

Perform the following steps to mount and unmount a disc for HP-UX systems:

1. Create a mount directory (for example, /cd) to define where to access the CD-ROM file system by entering the following command:



2. Use the `/etc/mount` command to mount the CD-ROM disc every time you insert it into the drive:



where

*device\_filename* is the name of the block device file that's associated with the CD-ROM drive.

For Series 300 and 400 systems, use the block device file that you created in the "Configuring HP-UX" subsection in Chapter 1 (for example, `/dev/dsk/3s0`).

For Series 700 systems, select the preconfigured block device file that corresponds to the CD-ROM drive's SCSI ID (for example, `/dev/dsk/3s0` for SCSI ID 3).

*mount\_directory* is the mount point directory, which is the directory where the file system is to be mounted. You just created this directory in Step 1 (for example, `/cd`).

3. Now you can access the drive as you would any other disk (except that you cannot write to the CD-ROM disc). For example, to list the contents of the disc, enter the following command:

```
# ls mount_directory < Return >
```

4. Unmount a CD-ROM disc before you remove it from the drive by entering the following command:

```
# /etc/umount device_filename < Return >
```

### **Checking the Busy Light**

The CD-ROM busy light shows the status of the drive during the self test and during activity with the host system. The busy light flashes during normal activity with the system.

#### **Self Test**

The CD-ROM drive performs the self test when you do one of the following:

- Insert a disc caddy into the drive's loading slot.
- Turn on the drive with a disc caddy already loaded.

For the self test, the busy light operates in the following sequence:

1. **Light On**  
The busy light goes on when the disc loads into the drive.
2. **Light Flashing**  
The light flashes six times while a read test is performed on the disc.
3. **Light Off**  
The light goes off when the self test is complete.

#### **Status Indicator**

The busy light stays on after the self test when one of the following conditions exists:

- Defective disc
- Disc insertion error (for example, an upside-down disc)
- No disc present

The busy light goes off when one of the following conditions exists:

- A CD-ROM drive power failure exists.
- The drive is idle on the SCSI bus.



# Appendix A

## CD-ROM Drive Specifications

This appendix lists specifications for the CD-ROM drive.

### Performance

The CD-ROM drive meets the following performance specifications:

#### Computer Data Transfer Rate (asynchronous)

Average	153 kilobits/second
Maximum	1400 kilobits/second (early model) 1500 kilobits/second (late model)

#### Access Time (including latency)

Track-to-track	1 ms
Average random	350 ms
Maximum	700 ms (early model) 650 ms (late model)

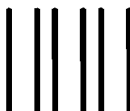
#### Functional

Load time	6 seconds
Unload time	3 seconds
Motor spin-up time	1 second
Rotational speed	530 to 200 rpm *

\* Decreases from inner track diameter to outer track diameter to maintain constant speed at read head.

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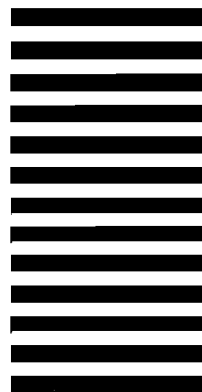
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