Operator’s Guide

D Class and R Class

HP 9000 Enterprise Servers

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1 System Overview

This chapter introduces the HP 9000 D Class and R Class Enterprise Server. Its purpose is to familiarize you with your computer and its controls, indicators, and front panel display.

Included in this chapter are the following topics:

- Overview
- System Features
- System Connections, Controls, and Indicators.

The HP 9000 D Class and R Class Enterprise Servers are self-contained, multi-user computers that use the HP-UX operating system.

Figure 1-1 **HP 9000 D Class Enterprise Server**

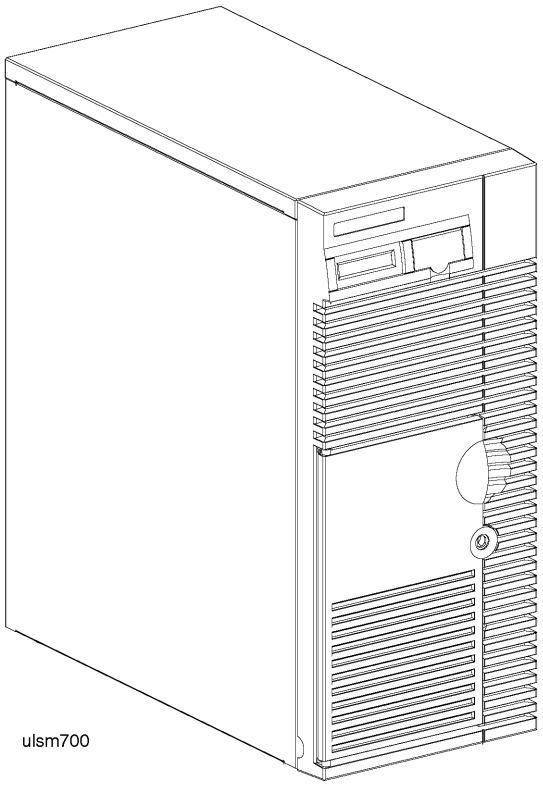
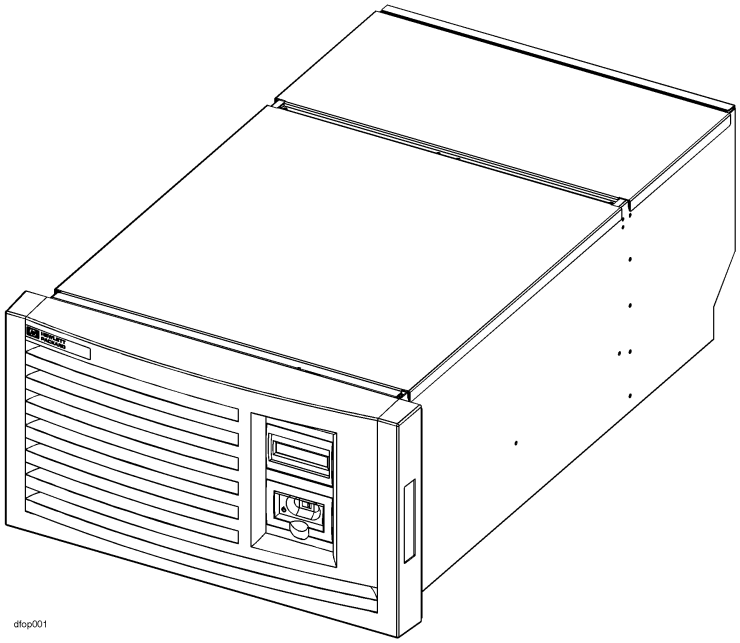


Figure 1-2 **HP 9000 R Class Enterprise Server**



There are two basic types of D Class Enterprise Servers: the D2xx and the D3xx. Within these types, several different models are available. Table 1-1 shows the D Class model types. Table 1-2 on page 1-3 shows the two R Class servers.

Table 1-1 **D Class Model Types**

Model	CPU(s)	Clock Speed
D200/1	PA7100LC 1 CPU	75MHz
D210/1	PA7100LC 1 CPU	100Mhz
D220/1	PA7300LC 1 CPU	132MHz
D230/1	PA7300LC 1 CPU	160MHz
D250/1 or /2	PA7200 1 or 2-CPUs	100MHz
D260/2	PA7200 2-CPUs	120Mhz
D270/1 or /2	PA8000 1 or 2 CPUs	160MHz

Model	CPU(s)	Clock Speed
D280/1 or /2	PA8000 1 or 2-CPUs	180MHz
D310/1	PA7100LC 1 CPU	100Mhz
D320/1	PA7300LC 1 CPU	132MHz
D330/1	PA7300LC 1 CPU	160MHz
D350/1 or /2	PA7200 1 or 2-CPUs	100MHz
D360/2	PA7200 2-CPUs	120Mhz
D370/1 or /2	PA8000 1 or 2 CPUs	160MHz
D380/1 or /2	PA8000 1 or 2-CPUs	180MHz
D390/1 or /2	PA8200 1 or 2-CPUs	240MHz

Table 1-2 R Class Model Types

Model	CPU(s)	Clock Speed
R380/1 or /2	PA8000 1 or 2-CPUs	180MHz
R390/1 or /2	PA8200 1 or 2-CPUs	240Mhz

PA7100LC, PA7200, PA7300LC, PA8000 and PA8200 are the CPU processor chips located on the Processor/Memory card inside the computer.

While there are hardware and performance differences between each model, the basic hardware installation, software configuration, and system administration tasks are the same for each of these computers.

These fully integrated computers may contain the following peripherals:

- CD-ROM disk drive
- Floppy diskette drive (D Class only)
- DDS tape drive
- DDS-2 tape drive
- DDS-3 tape drive
- Quarter Inch Cartridge (QIC) tape drive
- For D2xx/R3xx systems, integrated SCSI-2 disk drives
- For D3xx systems, manual hot-swap fast-wide SCSI-2 disk drives.

In addition, your computer comes standard with the HP-UX operating system pre-installed.

WARNING **The HP 9000 D Class and R Class Enterprise Server weighs about 49.5kg (110 lbs). You must use two people to lift the D Class and R Class Enterprise Server cabinet.**

CAUTION To avoid damage to the front panel of a D Class server, DO NOT use any part of the front panel as a handle to lift or move the cabinet. When moving or lifting the D Class server computer cabinet, be sure the front panel peripheral door is locked.

R Class servers are provided with a handle beneath the front bezel to assist in lifting and moving the server.

D Class and R Class Features

The features of both D Class and R Class server models are described in Table 1-3 and Table 1-4.

Table 1-3 System Features

System Features				
CPU Type	**PA7100LC**		**PA7200**	
Model Numbers	**D200**	**D210/D310**	**D250/D350**	**D260/D360**
Clock Speed	75MHz	100MHz	100MHz	120MHz
Number of Processors Supported	1	1	1 or 2	2
Floating Point Co-processor	Integrated			
I/D Cache	256Kb[1]	256Kb[1]	256Kb/256Kb	1Mb/1Mb
EISA I/O Slots	4	4/7	4/7	4/7
HP-HSC I/O Slots	4	4/5	4/5[2]	4/5[2]
Main Memory (Minimum) 1-Way Systems	32Mb	32Mb	128Mb[3]	N/A
Main Memory (Minimum) 2-Way Systems	N/A	N/A	128 Mb	128Mb

[1] This 256Kb is a unified Instruction and Data cache.
[2] If you have a D350, or D360, one turbo slot is available.

Table 1-4 System Features

System Features							
CPU Type	**PA7300LC**		**PA8000**			**PA8200**	
Model Numbers	**D220/ D320**	**D230/ D330**	**D270/ D370**	**D280/ D380**	**R380**	**D390**	**R390**
Clock Speed	132MHz	160MHz	160MHz	180MHz		240MHz	
Number of Processors Supported	1	1	1 or 2				
Floating Point Co-processor	Integrated						
I/D Cache	64Kb/ 64Kb[1]	1.64Mb/ 1.64Mb[1]	512Kb/ 512Kb	1Mb/ 1Mb		2Mb/2Mb	
EISA I/O Slots	4/7	4/7	4/7	4/7	4/7	4/7	4/7
HP-HSC I/O Slots	4/5	4/5	4/5	4/5	2/5	4/5	4/5
Main Memory (Minimum) 1-Way Systems	32Mb	32Mb	64Mb	64Mb	128MB	64Mb	128MB
Main Memory (Minimum) 2-Way Systems	N/A	N/A	128 Mb	128Mb	128MB	128Mb	128MB

[1] These D Class models have an additional 1Mb cache option.

Table 1-5 Features Common to all Systems

Internal SE-SCSI-2 Disk Devices	1 (Minimum) to 2 (Maximum) on D2xx and R Class Systems. Not supported on D3xx Systems.
Internal FW-SCSI-2 Disk Devices	Optional- Maximum 2 on D2xx Systems[1], 5 on D3xx Systems. Not supported on R Class systems.
Internal Removable Media Devices	1 to 3 (maximum) on D Class servers. 1 only on R Class servers.
Remote Management Access Port	Optional on D2xx and R Class systems. 1 on D3xx Systems.
O.S. Release	D Class servers: HP-UX 10.01 or later. R Class servers: HP-UX 10.20 IPR 9808
Soft Power OFF	Included.

[1] The FWD-SCSI option of D2xx Systems replaces the SE-SCSI Disk Devices.

64-Bit and 32-Bit OS Support

64-bit OS functionality is provided on the following D Class and R Class servers running HP-UX 11.00 IPR 9808 with PDC versions as follows:

Table 1-6 64-Bit OS requirements

Model	PDC Version
Dx760	38.38 or later
Dx80	38.38 or later
D390	38.39 or later
R380	38.38 or later
R390	38.39 or later

All other D Class and R Class models provide only 32-bit support.

System Connections, Controls, and Indicators

This section shows the system's hardware connections, controls, Light Emitting Diode (LED) indicator lights, and Liquid Crystal Display (LCD). In the event of a system problem, it is important to verify the system's hardware connections and take note of the system's LEDs and front panel LCD messages.

Front Panel

This section describes the front panel controls, LEDs, and LCD messages as shown in Figure 1-3 and Figure 1-4.

NOTE

In order to view the peripheral device's controls and indicators on D Class servers, you need to open the peripheral door with the supplied key.

Keep the peripheral door key in a safe place. If you lose this key, you cannot open the peripheral door or have support personnel service the inside of the computer.

Table 1-7 D2xx Front Panel Controls

Item	Description
1	System power switch
2	System power LED
3	Floppy disk drive
4	Removable media devices
5	Single-ended SCSI devices (hard disks)
6	Peripheral door and keylock
7	System LCD

Figure 1-3 D2xx Front Panel Controls

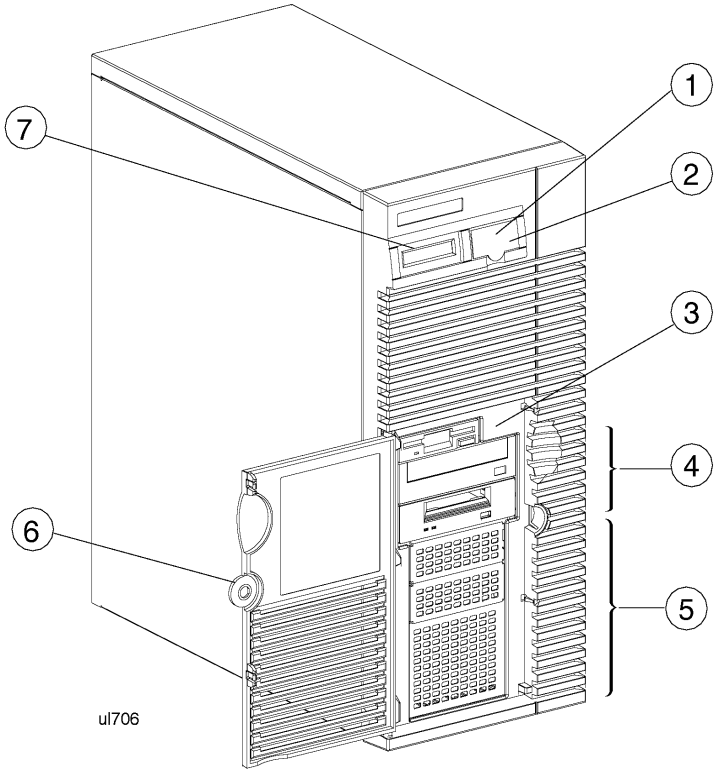


Table 1-8 D3xx Front Panel Controls

Item	Description
1	System power switch
2	System power LED
3	Floppy disk drive
4	Removable media devices
5	Manual hot-swap devices (hard disks)
6	Peripheral door and keylock
7	System LCD

Figure 1-4 D3xx Front Panel Controls

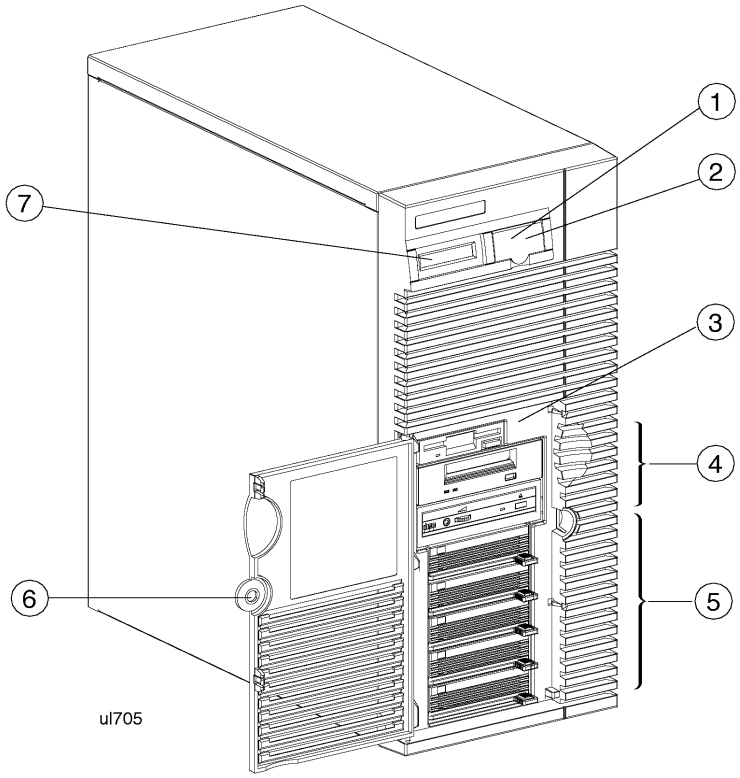
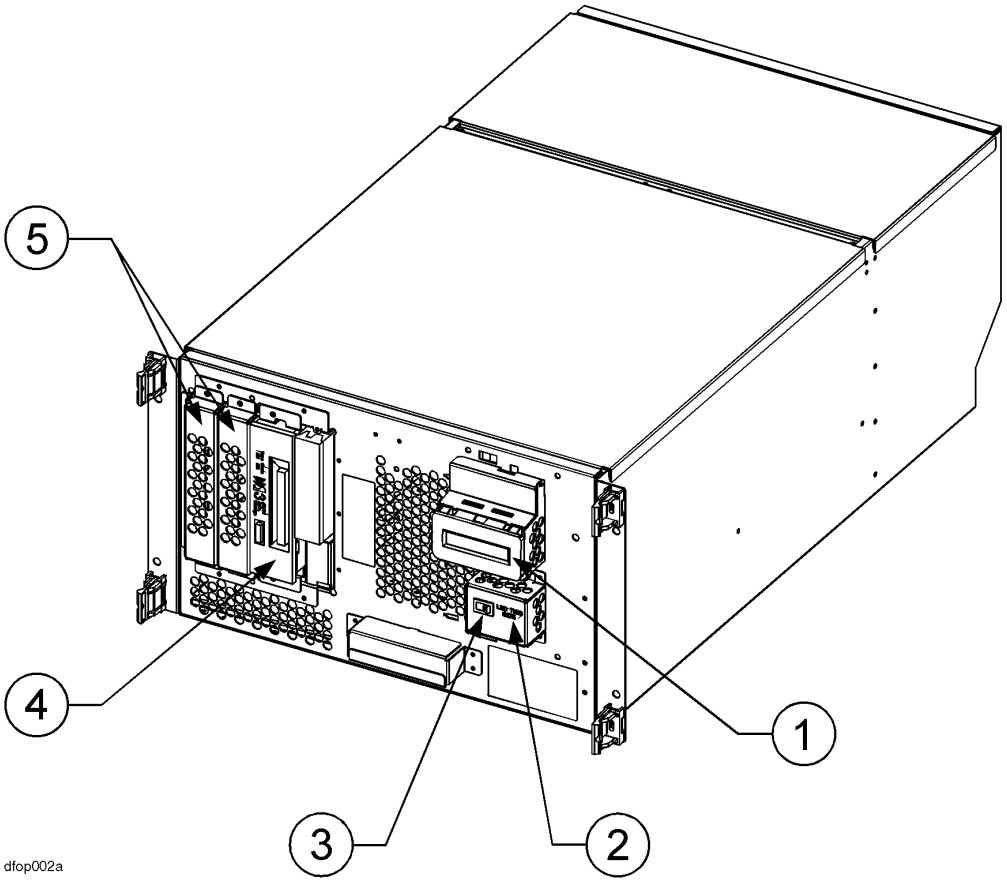


Table 1-9 R3x0 Front Panel Controls

Item	Description
1	System LCD
2	Power LED
3	Power Switch
4	Removable media device
5	SE SCSI devices (hard drives)

Figure 1-5 R3x0 Front Panel Controls (Front Bezel Removed)

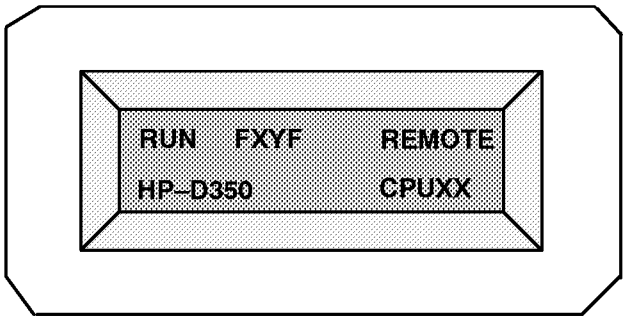


System LCD

The Liquid Crystal Display (LCD) is located on the top left side of the front panel on D Class servers and on the right front side on R Class servers. The LCD displays messages about the state of the system, including error codes.

Figure 1-6 is an example of a typical LCD message that displays during normal operation.

Figure 1-6 **Typical LCD Operating Message**



If something similar to this message is not displayed, refer to Chapter 6, “Solving Problems,” for more information.

System Power Switch

The system power switch is used to power the system on and off.

CAUTION

Under normal operating conditions, you should not turn off the power to your computer. Your computer is a multi-user system, and other people may be using it. If you turn the computer off, you deny users access to the system, and may cause them to lose some of their work.

If you must turn off the computer, follow the procedure described in “Turning Your Computer Off” at the end of Chapter 2.

System Power LED

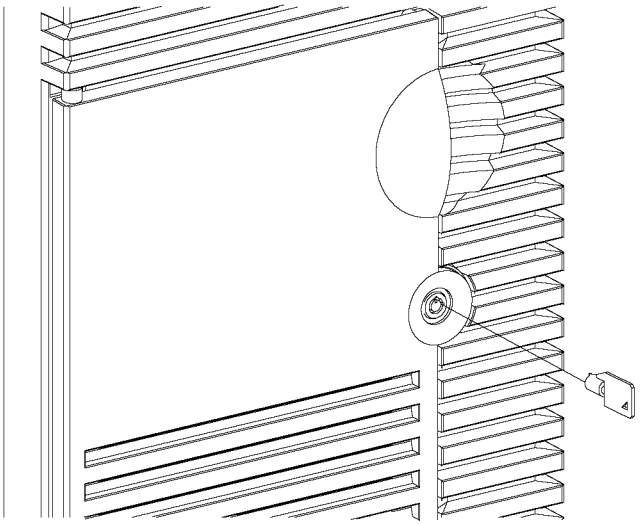
The Power Light Emitting Diode (LED) is located on the system power switch. It lights when the system's power is on.

Peripheral Door and Key (D Class Only)

The removable media drives and the SCSI-2 disk drives are protected by a door that can be locked with the key that was included with your system. To view the peripheral drives' buttons and LEDs, you must unlock the door with the key as shown in Figure 1-7.

Key Lock is not present on R Class systems or in D Class systems mounted in a rack configuration.

Figure 1-7 **Peripheral Door and Key**



NOTE Keep the key in a safe place. If you lose this key, you cannot open the peripheral door and your System Administrator cannot access the inside of the computer.

Removable Device Buttons and LEDs

Depending on your configuration, you can have from one (maximum on R Class servers) up to three (D Class servers) of the following removable device drives (:

- Floppy diskette drive (D Class only)
- DDS tape drives
- DDS-2 tape drives
- QIC tape drive (D Class only)
- CD-ROM disk drive.

The devices listed are supported in the following configurations:

- Only one floppy diskette drive
- One QIC or one DDS Device with one CD-ROM
- You can have two DDS Devices with no CD-ROM.

Each drive's controls and indicators are described in their respective chapters in this book.

Hot-Swap Disk LEDs (D Class only)

Depending on your configuration, you can have up to five manual hot-swap disk modules in your D3xx. Hot-swap disks are optional on the D2xx (two maximum). These disk modules are referred to as “manual hot-swap” because they can be installed or removed from the peripheral bay with power on.

CAUTION

The operating system may not be able to handle installing or removing manual hot-swap disk modules from the peripheral bay without your System Administrator performing a controlled system shutdown or the appropriate procedure to quiesce the SCSI bus according to the software operation documentation. If this procedure is not performed, you can lose data.

The manual hot-swap disk module LED is normally flashing when the disk module is in service. If it is not flashing, refer to Chapter 6, “Solving Problems.”

Hot-swap disk devices are not available on R Class servers.

Rear Panel

This section describes the D Class and R Class rear panel connectors, controls, and indicators as shown in Figure 1-8 and .

Table 1-10 D2xx and D3xx Rear Panel Connectors, Controls, and Indicators

Item	Description
1	I/O (HSC and EISA) card slots
2	Transfer Of Control button
3	Term power LED
4	Serial 2/UPS connector
5	SCSI (Single-ended) connector
6	PS/2 mouse connector
7	LAN 10 Base-T connector
8	Regulatory information
9	Power supply voltage switch
10	Power cord connector
11	PS/2 keyboard connector
12	Parallel connector
13	Serial 1/Console connector
14	Link beat LED

Figure 1-8 D Class Rear Panel Connectors, Controls, and Indicators

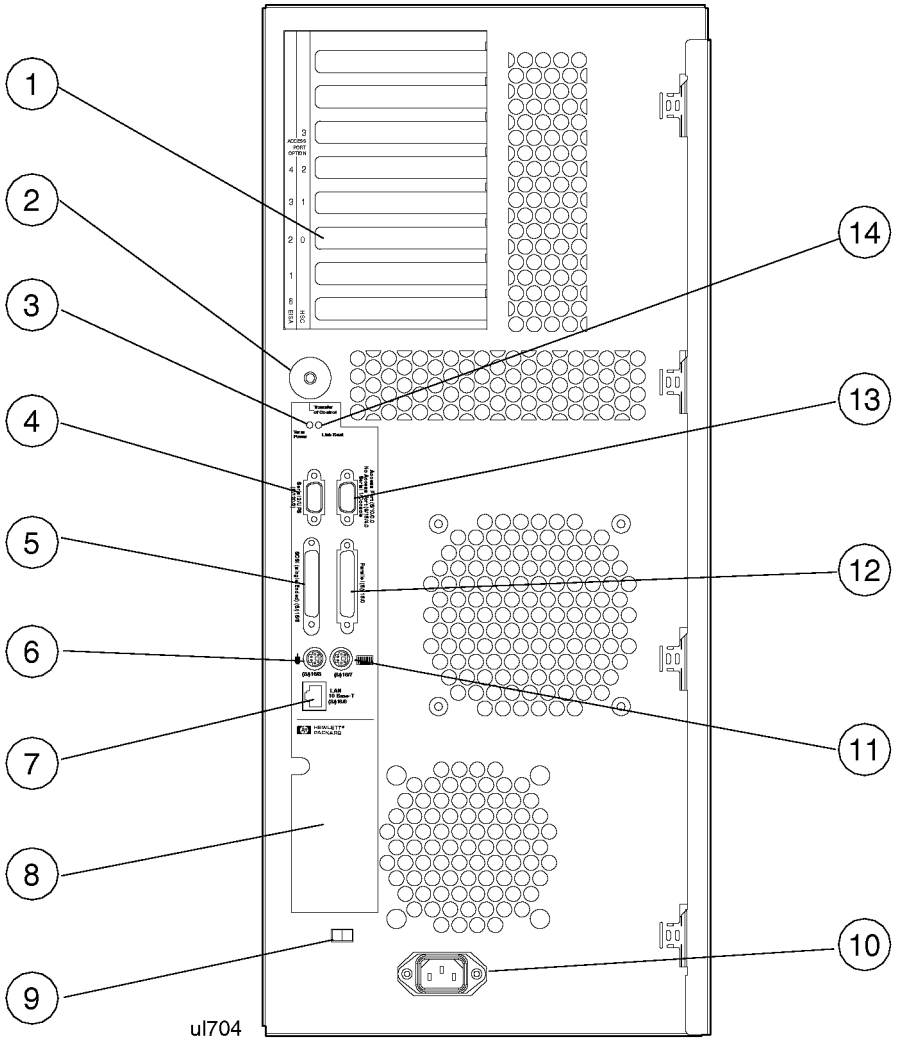
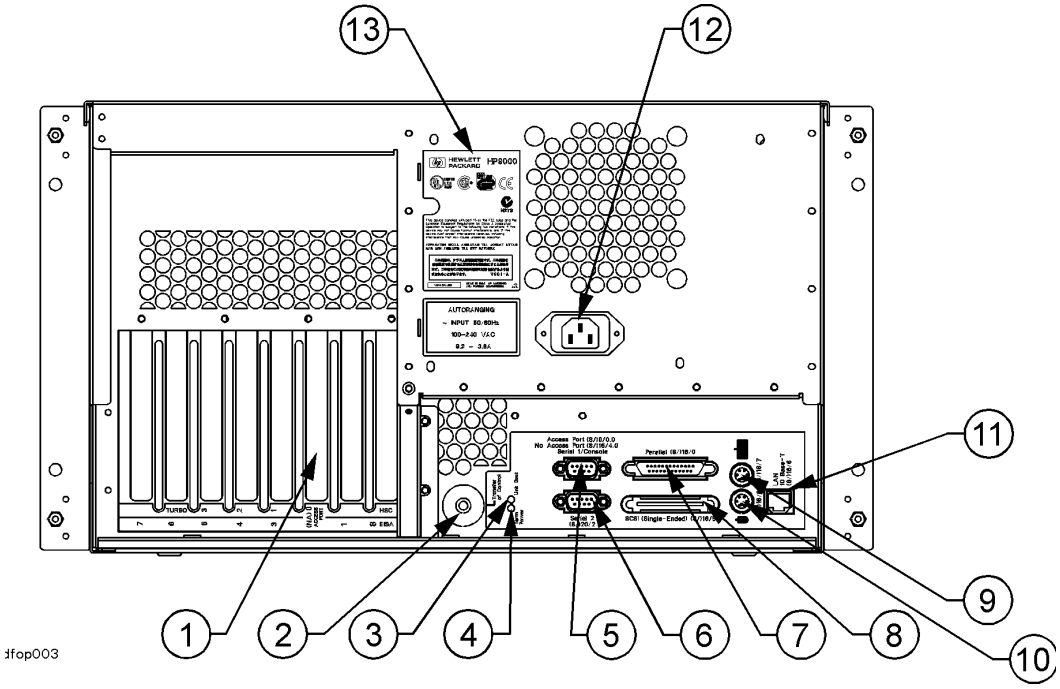


Table 1-11 R ClassRear Panel Connectors, Controls, and Indicators

Item	Description
1	I/O (HSC and EISA) card slots
2	Transfer Of Control button
3	Link beat LED
4	Term power LED
5	Serial 1/Console connector
6	Serial 2/UPS connector
7	Parallel connector
8	SCSI (Single-ended) connector
9	PS/2 keyboard connector
10	PS/2 mouse connector
11	LAN 10 Base-T connector
12	Power cord connector
13	Regulatory information

Figure 1-9 **R Class Rear Panel Connectors, Controls, and Indicators**



NOTE To maintain FCC/EMI compliance, verify that all cables are fully seated and properly fastened.

Transfer of Control Button

This button is used to reset the system and perform a Transfer Of Control (TOC).

CAUTION Contact your System Administrator before you press the TOC button. When you press this button the system will reset and, you can lose data.

Term Power LED

The Term Power LED indicates whether Single-Ended SCSI termination power is available on your system (core LAN card). During normal operation, this LED stays lit.

Link Beat LED

The Link Beat LED is used to indicate that a network is attached to your system and functional. This LED flashes when there is network activity.

PS/2 Keyboard Connector

When connecting a graphics console, the PS/2 connector provides an interface for the keyboard to the system.

PS/2 Mouse Connector

When connecting a graphics console, the PS/2 connector provides an interface for the mouse to the system.

Parallel Connector

The 25-pin HP Parallel I/O interface uses Centronics interface protocols to support peripheral devices such as printers and plotters. Consult the specific device documentation for more information.

LAN 10 Base-T

Your computer has a built-in TP (Twisted Pair- 10 Base T) ThinLAN connector for the 802.3 (ETHERNET) network. AUI network connections require an external adapter. Contact your HP sales representative for purchasing information. Your computer will autoselect the correct network setting.

Serial 1/Console

The Serial 1/Console connector allows connection of an ASCII terminal as the system console if one is connected to the system. If you are using a graphics terminal for the system console, the graphics terminal is connected to the graphics card which is typically located in the Turbo slot (on the D3xx). Consult the specific device documentation for more information.

Serial 2/UPS

If your system has an Uninterruptable Power System (UPS) and you do not have a Remote Management/Access Port card (D2xx models only), connect the UPS cable to the Serial 2/UPS system connector, otherwise the Serial 2/UPS connection can be used to connect a standard terminal or modem.

Remote Management/AP Connectors and Switch

The Remote Management/Access Port card is standard on D3xx models and optional on D2xx and R Class models. This card allows communication with a remote site via the internal modem. The modem aids Hewlett-Packard support personnel in diagnosing a system problem.

UPS Connector

If available, the Uninterruptable Power System (UPS) is connected to the Access Port/Remote Management card RS-232 connector, as shown in Figure 1-10. If you do not have a Remote Management/Access Port card, then a UPS can be connected to the Serial 2/UPS rear panel connector.

NOTE If you have a D2xx with an optional Remote Management/Access Port card in slot 3, the connections are the same.

Phone Line Connector

For Remote Management access through the AP card, a Line Access Module (LAM) plugs into the AP card, then the resident telephone line plugs into the LAM. Refer to Figure 1-10.

Figure 1-10 Connecting the UPS to the D3xx's Remote Management/Access Port Card

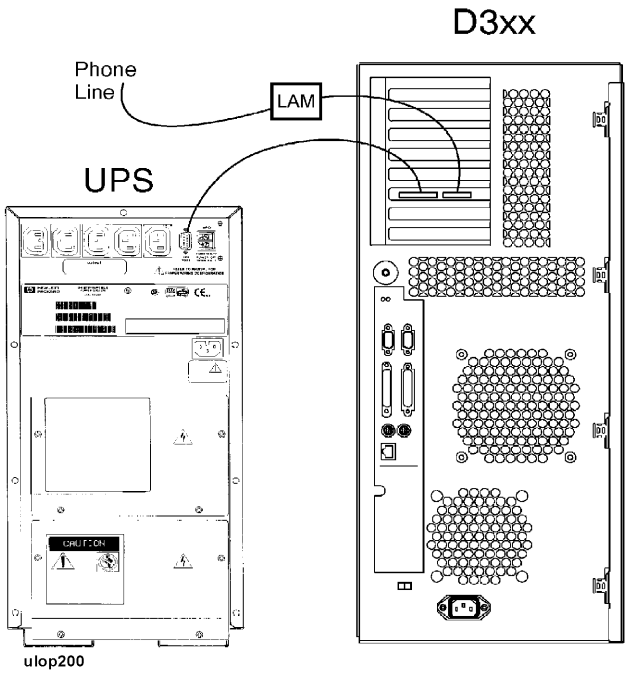
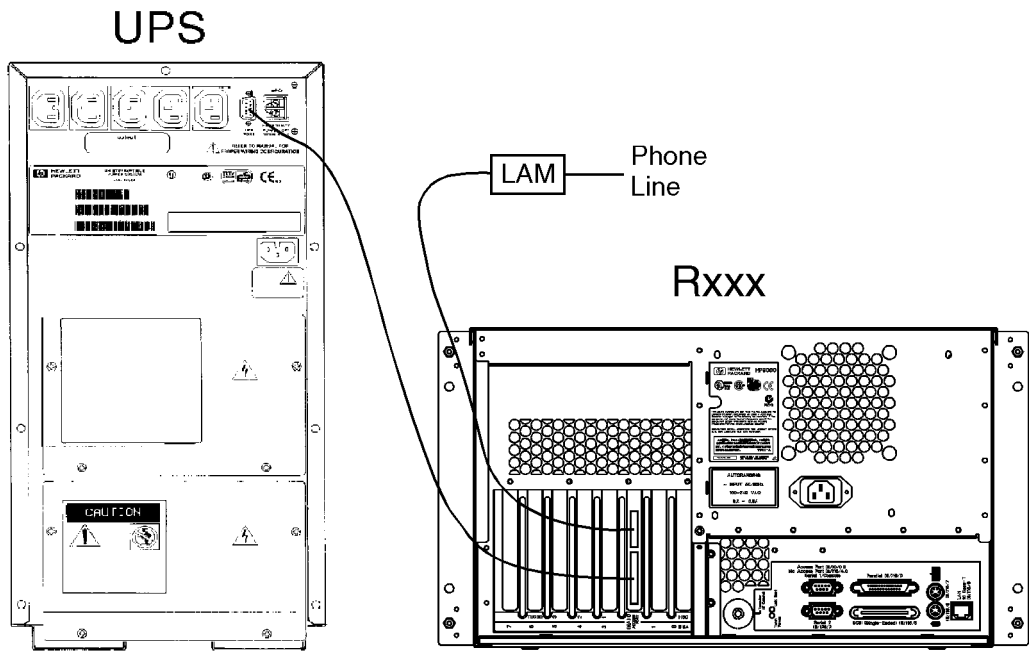


Figure 1-11 Connecting the UPS to the R Class Remote Management/Access Port Card



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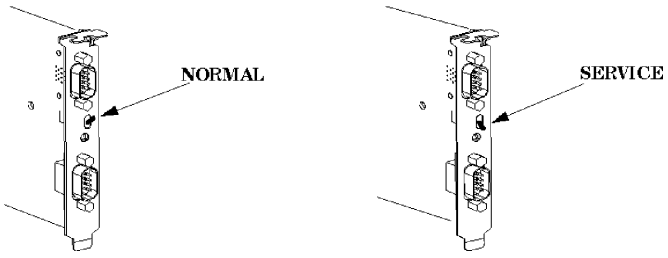
Remote Access Switch

The SERVICE/NORMAL switch is used to allow or disallow a remote site to communicate with your system. This switch should be set to NORMAL, unless a remote site will be communicating with your system.

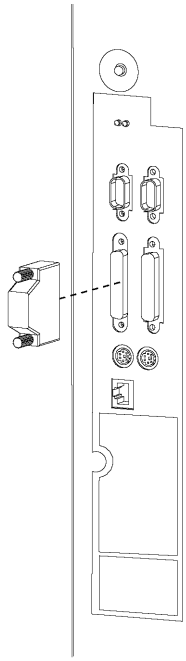
Figure 1-12 AP Service/Normal Switch



SCSI (Single-Ended) Connector

The single-ended SCSI-2 connector is used to connect external SCSI-2 devices such as disk drives. Consult the specific device documentation for more information.

Figure 1-13 **Single-Ended SCSI-2 Connector/Terminator**



NOTE When an external SCSI device is attached to the system, the last device on the external SCSI bus must be terminated. Consult the specific device documentation for more information. If no external SCSI devices are connected, the terminator included with the D Class and R Class Enterprise Server must be used.

Power Cord

The computer's power cord provides AC power to the system.

Power Supply Voltage Switch

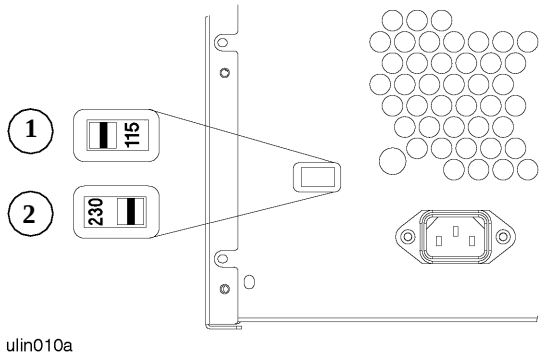
The power supply voltage switch is set to the voltage range available in your area. There are two possible settings: 115VAC and 230VAC as shown in Figure 1-14.

Table 1-12 **Voltage Switch Settings**

Item	Description
1	is the setting for 115VAC
2	is the setting for 230VAC

NOTE R Class servers and D Class models Dx70 and Dx80 have an auto-ranging power supply. There is no voltage selector switch on these models.

Figure 1-14 **Power Supply Voltage Switch**

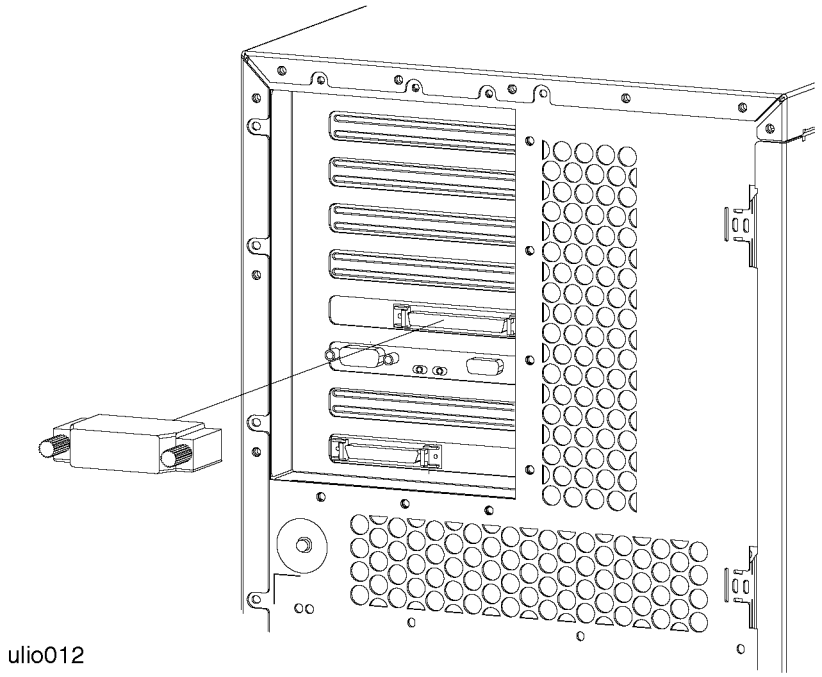


WARNING **If the power supply voltage switch is not set in the correct position, damage can occur to your system.**

Fast/Wide/Differential SCSI-2 Interface Card Connector/ Terminator

The Fast/Wide/Differential SCSI-2 interface card is standard on D3xx models and optional on R Class and D2xx models. This card allows you to communicate with the manual hot-swap disks (D Class only) installed in the peripheral bay. It is also used to connect external Fast/Wide/Differential SCSI-2 devices such as disk drives. Consult the specific device documentation for more information.

Figure 1-15 **Fast/Wide/Differential SCSI-2 Interface Card Connector/Terminator (Dxxx)**



NOTE

When an external Fast/Wide/Differential SCSI-2 device is attached to the system, the last device on the external SCSI bus must be terminated. Consult the specific device documentation for more information. If no external SCSI devices are connected, the terminator included with the D Class and R Class Enterprise Server must be connected.

2 Using Your Computer

This chapter describes how to use your system after it has been installed. It includes:

- Turning Your Computer On
- Checking the Status of Your Computer
- Turning Your Computer Off.

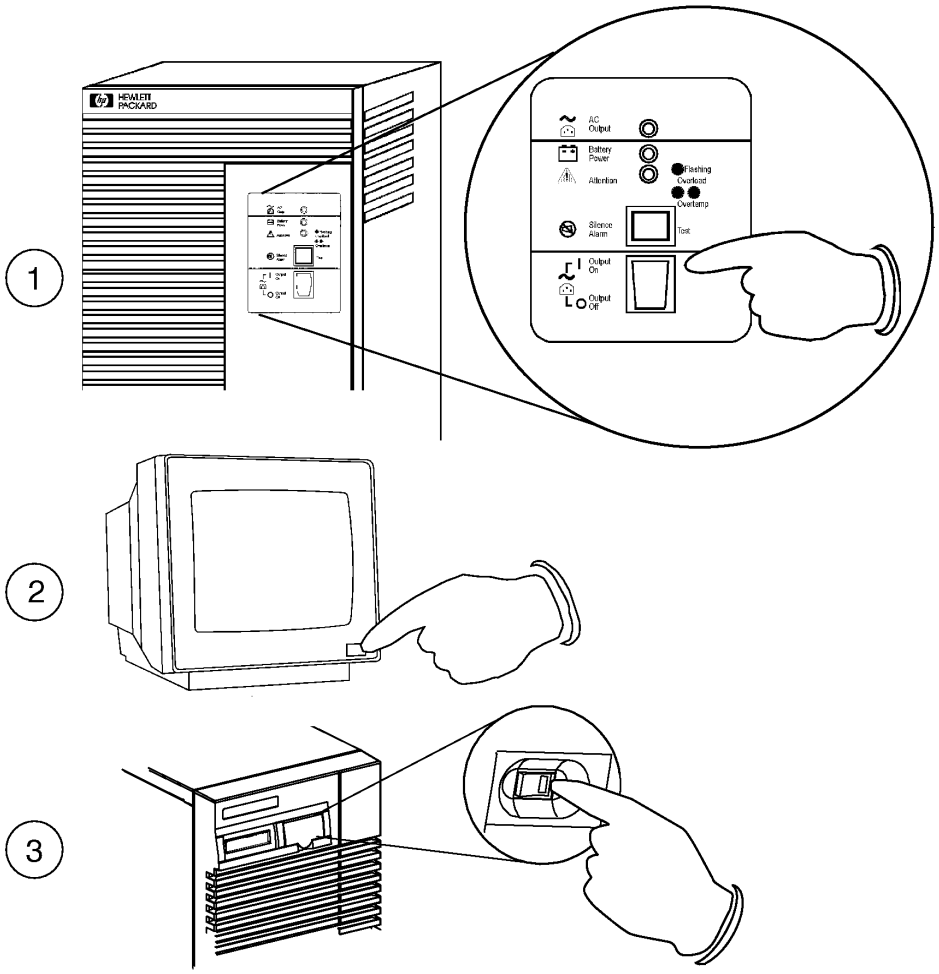
Turning Your Computer On

To turn your computer on, follow these steps and Table 2-1.

1. If a UPS is connected, press the UPS power switch to the ON position, and turn on any other external peripherals.
2. Push the system console's power button to the ON position. Adjust the screen controls as needed to clearly display the cursor.
3. Press the system unit power switch to the ON position.

When you power on your computer, a self-test program runs before the system boots. If an error occurs during self-test, refer to Chapter 6, “Solving Problems.”

Figure 2-1 **Turning Your System On**



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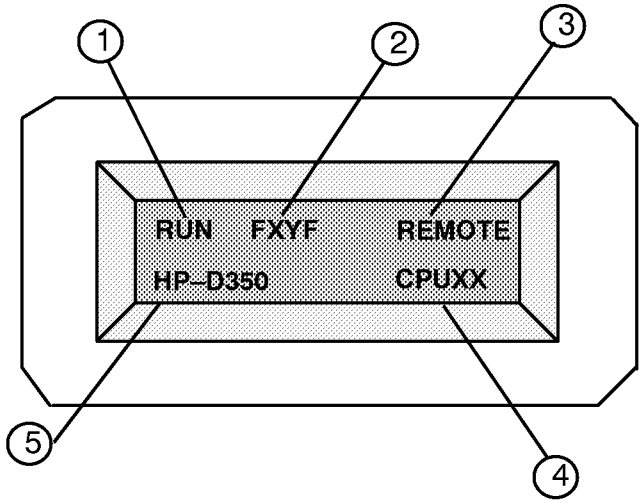
As the system starts up, the following actions occur:

- If available, the UPS LED indicators light up
- The system unit LCD displays system messages as shown in Figure 2-2
- The system console displays the progress of the startup process until the HP-UX operating system has successfully loaded.

Table 2-1 Front Panel LCD Display

Item	Description
1	System state
2	Chassis code
3	REMOTE (indicates Remote enable): blank (indicates Remote disabled)
4	Processor information
5	System information/Model identity

Figure 2-2 Typical LCD Operating Message



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During the startup process, the system checks all of the major internal functions. The results of these checks are displayed rapidly on your system console until the HP-UX operating system has successfully loaded. Typically there are many messages, and you might not get a chance to read all of the messages while they are displaying. However, after the operating system has loaded, you can scroll back through the messages if desired. When the HP-UX operating system has successfully loaded, a login prompt displays.

Checking the Status of Your Computer

During the startup process, status information is displayed on the system LCD and the system console. Table 2-2 lists the messages that can display during system operation.

Table 2-2 LCD System Status Messages

Message	Description	Action
OFF	System power OFF	
FLT	Fault	Report to System Administrator
TEST	Used for testing	
INIT	Initialize	
SHUT	Shutdown	
WARN	Warning	Report to System Administrator
RUN	Normal operating message	

Once the HP-UX operating system has successfully loaded, the RUN message displays as shown in Figure 2-2. This message also displays while the system is operating normally.

LAN Configuration Command

You have the option of turning the Core LAN ON or OFF, depending on your LAN requirements. This is accomplished with the LAN CONFIGURATION (lc) command. The lc command is located in the Configuration Menu of the Boot Console Handler. To use this command, you must perform the following steps:

1. Warn all users to log off, then issue the command `shutdown -h 0`. Once the shutdown has completed, turn the ON/OFF switch to the OFF position (wait for the green light to go out). Turn the computer back on and wait for the console message:

   ```
   To discontinue, please press any key within 10 seconds
   ```

   At this time press any key to stop the boot process and go into the Boot Console Handler.

2. When the Main Menu is displayed, enter the Configuration Menu by typing:

   ```
   Main Menu: Enter command > co
   ```

3. In the Configuration Menu enter the LanConfig command (lc) to display the state of the LAN.

   ```
   Configuration Menu: Enter command > lc
   ```

4. To enable or disable the built-in LAN enter the appropriate LC command:

   ```
   Configuration Menu: Enter command > lc enable (or disable)
   ```

5. Return to the main menu:

   ```
   Configuration Menu: Enter command > ma
   ```

6. At the main menu prompt, reset the computer with the reset command:

   ```
   Main Menu: Enter command > reset
   ```

At this time, let the computer complete the boot process. The LAN connection is enabled, you now have to complete any LAN configuration procedures necessary. Refer to your System Administrators Guide, or LAN Configuration documentation for those procedures. If you have any problems or errors that indicate a LAN problem, contact your local Hewlett-Packard Service Representative for assistance.

Turning Your Computer Off

When you are finished working on your computer, follow these steps.

1. Exit your application software.
2. Contact your System Administrator and have them broadcast a warning to all users of the computer that they should stop working and log out from the system.
3. After users have been given time to log out of the system, you should always have the System Administrator perform a controlled shutdown before turning your computer off. However, by setting the computer's power switch to the OFF position, the Soft-Power Off feature automatically shuts down the operating system (by performing a reboot-hq) before it terminates the power to ensure that your file system remains intact and that you can power up and log in correctly.

NOTE If you accidentally turn off the power switch, you have about five (5) seconds to set it back to the ON position before the Soft-Power Off feature automatically shuts down the operating system.

4. Power off the console and any peripheral devices.

NOTE If the operating system is not responding, you cannot perform a Soft-Power Off by setting the power switch to the OFF position. If you set the power switch to the OFF position, the DC power will stay on. In this case, you need to press the TOC button on the rear panel to reset the system. Be aware that pushing the TOC button causes the system to reset and you may lose data.

3 Using Your CD-ROM Drive

There are two types of CD-ROM available for the D-Class Systems. Please refer to the information that matches the CD-ROM in your System.

- CD-ROM Drive and Media Descriptions
- Loading and Unloading a CD-ROM disk
- Reading the Drive Status Light
- Troubleshooting

This chapter provides an overview of the CD-ROM drive and media, and describes how to use the CD-ROM drive. The instructions in this chapter assume you are using the HP-UX version 10.01 or later operating system.

CD-ROM Drive

The CD-ROM drive is a random access read-only mass storage device that uses removable CD-ROM Disks. You can access information from the drive just as with any other disk drive, except that you cannot write to the drive. The drive contains a semiconductor laser for reading data optically, and includes an embedded controller with a SCSI interface.

NOTE **On R Class servers, the front bezel must be removed to access the CD-ROM drive**.

Controls and Features

Figure 3-1 and Figure 3-2 displays the operating controls and features of the CD-ROM drive. Table 3-1 and Table 3-2 describes the operating controls and features.

NOTE The Volume Control, Headphone Jack, and Audio Jack features of the CD-ROM drive are supported through applications only.

Figure 3-1 **A3184A CD-ROM Drive Controls and Features**

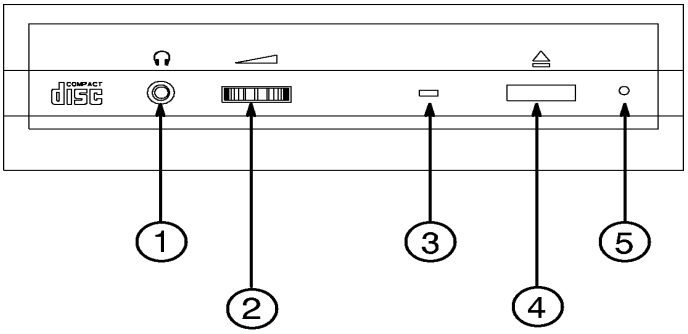

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Table 3-1 **A3184A CD-ROM Drive Controls and Features**

Item	Control or Feature	Description
1	Headphone Jack	You can plug mini-headphones with a miniature stereo plug into this jack to listen to an audio CD.
2	Volume Control	Use the volume control to adjust the audio output volume to the headphone jack.
3	Drive status LED	This LED lights during a data access operation and blinks during a data transfer. The indicator blinks initially and then stays lit when there is a drive problem.
4	Eject Button	Press the Eject Button to open the Disk Tray and insert remove a disk. When the drive is in use, you must press the eject button for more than one second to open the Disk Tray. This button does not work if the software application has disabled its operation.
5	Emergency Eject	By inserting the end of a paper clip, you can open the drive door when the computer does not have power.

Figure 3-2 A3416A and A3715A Front Panel Features

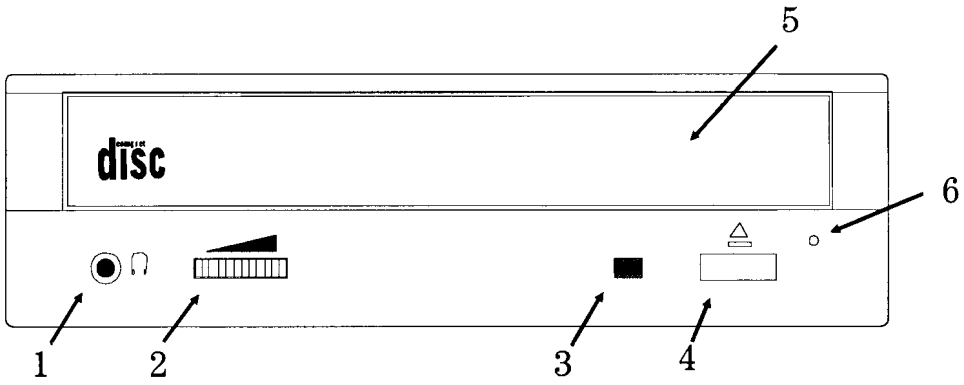


Table 3-2 A3416A and A3715A Front Panel Features

Item	Control or Feature	Description
1	Headphone Jack	You can plug mini-headphones with a miniature stereo plug into this jack to listen to an audio CD.
2	Volume Control	Use the volume control to adjust the audio output volume to the headphone jack.
3	Drive status LED	This LED lights during a data access operation and blinks during a data transfer. The indicator blinks initially and then stays lit when there is a drive problem.
4	Eject Button	Press the Eject Button to open the Disk Tray and insert remove a disk. When the drive is in use, you must press the eject button for more than one second to open the Disk Tray. This button does not work if the software application has disabled its operation.
5	Drive Door	
6	Emergency Eject access	By inserting the end of a paper clip, you can open the drive door when the computer does not have power.

CD-ROM Media

CD-ROM Disks store up to 600 megabytes of data. You may access files and data stored on a CD-ROM Disk, but you may not write files or data to a CD-ROM Disk.

CAUTION

Handle CD-ROM Disks by the edges only. Always be sure a CD-ROM Disk is either in the CD-ROM drive or its protective case when not in use. This will lessen the chance of exposing the disk surface to dust. Over time, dust reduces the reliability of the optical read lens in the CD-ROM drive and can damage the disk surface.

Caring for CD-ROM Disks

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

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

Operating the HP A3184A CD-ROM Drive

This section describes how to perform tasks with your A3184A CD-ROM drive.

Loading and Unloading a CD-ROM Disk

This CD-ROM drive has an automatic loading/ejecting feature. To load and unload a disk in the CD-ROM drive, follow these steps:

1. Press and release the Eject button on the CD-ROM drive, as shown in Figure 3-3 and Figure 3-4. The drive door opens part way.
2. Gently pull the drive door fully open.
3. For loading a CD-ROM Disk:
    a. Hold the disk by the edges with the label side up and place it in the disk tray as shown in Figure 3-5 and Figure 3-6.
    b. Press down gently on the center of the CD-ROM Disk to make sure it is seated on the disk tray hub.
    c. Gently push the disk tray in until it is closed.

Figure 3-3 CD-ROM Drive Door Part way Open (D Class View)

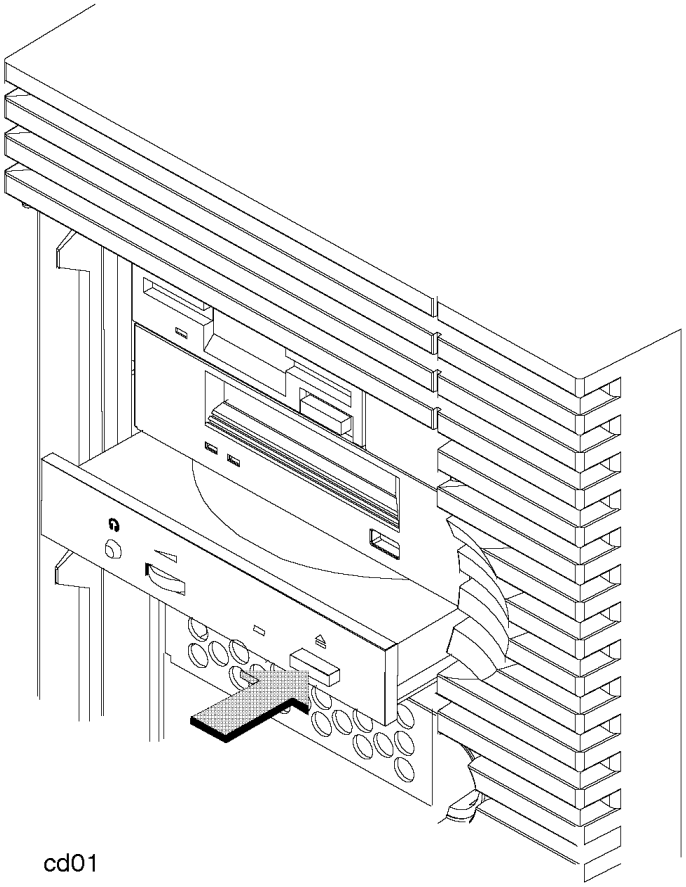


Figure 3-4 CD-ROM Drive (R Class)

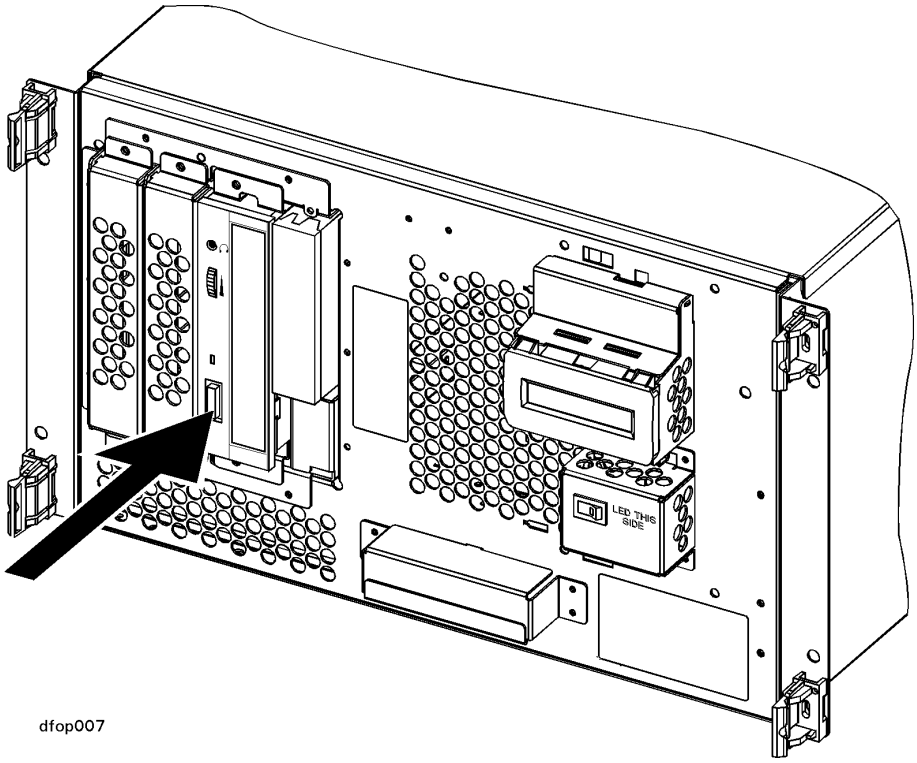


Figure 3-5 Loading the CD-ROM Disk in the Disk Tray (D Class View)

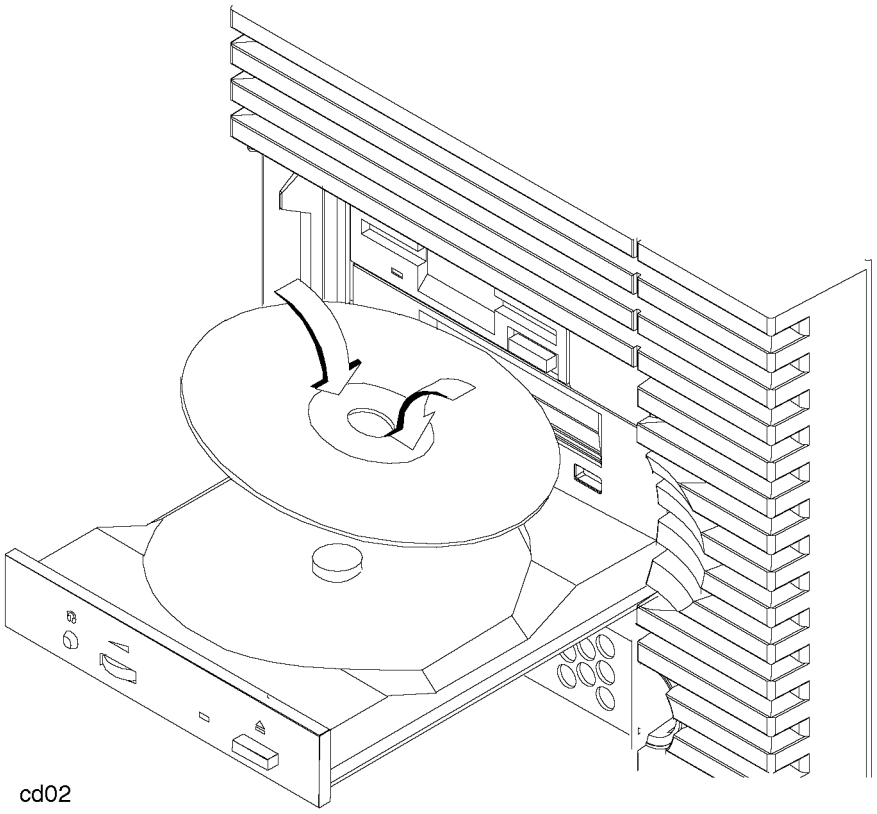
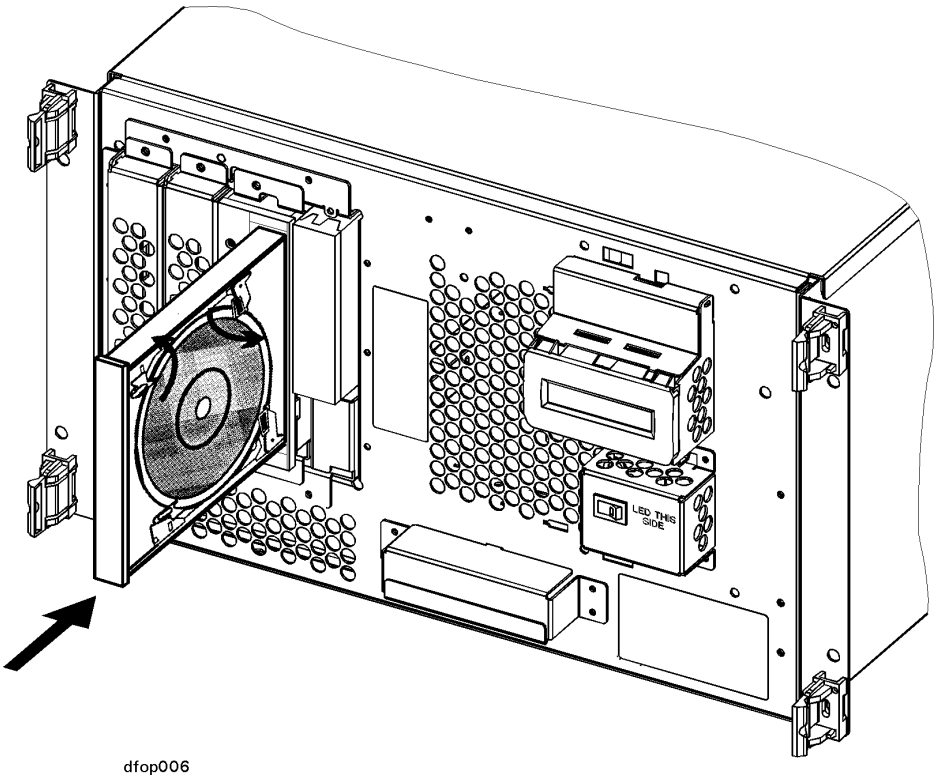


Figure 3-6 Loading the CD-ROM Disk in the Disk Tray (R Class View)



4. For unloading a CD-ROM Disk:

   a. Press and release the Eject button on the CD-ROM drive. The drive door opens part way, as shown in Figure 3-5 and Figure 3-6.

   b. Grasp the disk by the edges and lift it out of the disk tray. Be careful to touch only the edges of the disk.

   c. Gently push the disk tray in until it is closed.

Reading the Drive Status LED

The CD-ROM status LED shows the status of the drive during the self-test and during activity with the host system. The CD-ROM drive performs the self-test when one of the following events occur:

- You load a disk and close the Drive Door or,

- You turn on the computer with a disk already loaded in the CD-ROM drive.

During the self-test, the status LED operates in the following sequence:

1. LED On - The status LED goes on when the disk loads into the drive.
2. LED Flashing - The LED flashes while a read test is performed on the disk.
3. LED Off - The LED goes off when the self-test is complete.

After the self-test, the LED flashes when there is disk activity.

Troubleshooting

If you have trouble with any of these procedures for using your CD-ROM drive, see Chapter 6, “Solving Problems.”

HP A3416A and A3715A CD-ROM Drives

Front Panel

The HP A3416A/A37115A CD-ROM drive front panel is shown in Figure 3-2.

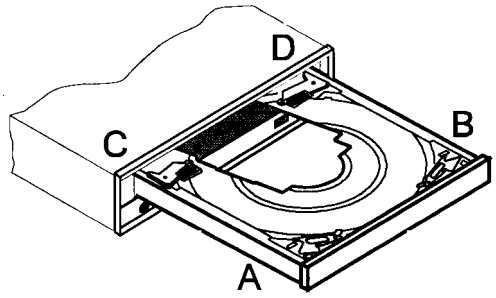
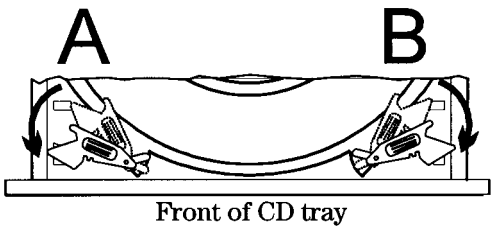
Operating the CD-ROM Drive

This section describes how to perform tasks with your CD-ROM drive.

CD Loading Procedures

The procedures for loading and unloading CDs in the drive are described in Table 3-3.

Table 3-3 **CD Loading in the Horizontal Mount Position (D Class)**

Horizontal Mount Loading	
1. Press the Eject Button. The CD tray will slide out of the drive. Note the position of the front retaining tabs (A, B) and rear retaining tabs (C,D)	
2. Snap the front retaining tabs (A, B) toward the front of the CD tray.	

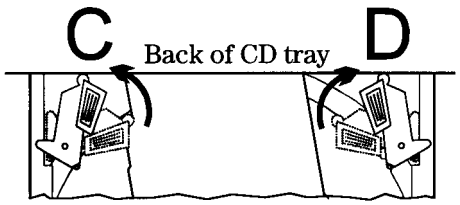
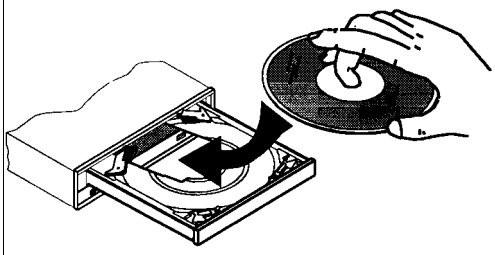
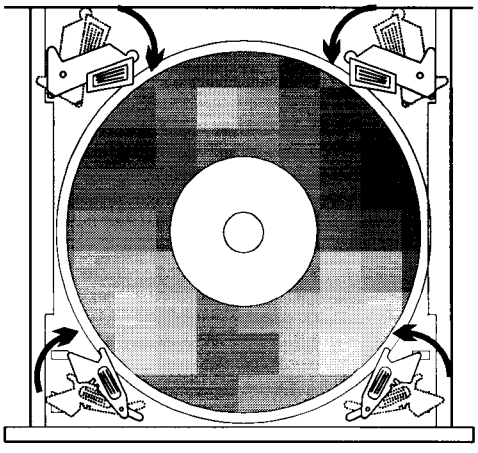
Horizontal Mount Loading	
3. Snap the rear retaining tabs (C,D) toward the rear of the CD tray.	
4. Place the CD in the CD tray.	
5. Snap the four retaining tabs over the CD. 6. Push the CD tray back into the CD drive. The Drive Status LED will light while the drive reads the CD, then turn off.	

Table 3-4 CD Unloading in the Horizontal Mount Position

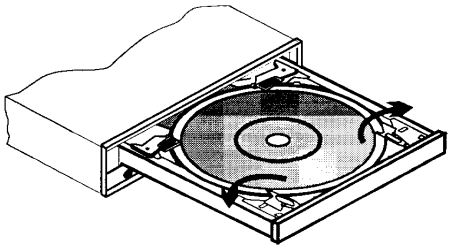
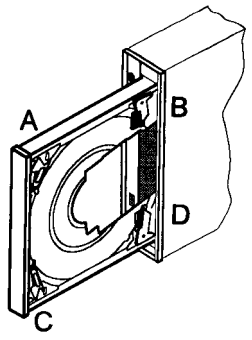
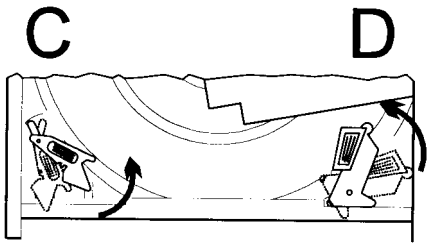
Horizontal Mount Unloading	
1. Wait for the CD-ROM drive activity to stop. 2. Press the Eject Button. 3. Snap the front retaining tabs away from the CD and remove the CD from its tray.	

Table 3-5 CD Loading in the Vertical Mount Position (R Class)

Vertical Mount Loading	
1. Press the Eject Button. The CD tray will slide out of the drive. Note the position of the top retaining tabs (A, B) and bottom retaining tabs (C,D)	
2. Snap the bottom retaining tabs (C,D) toward the center of the CD tray to prevent the CD from slipping out.	

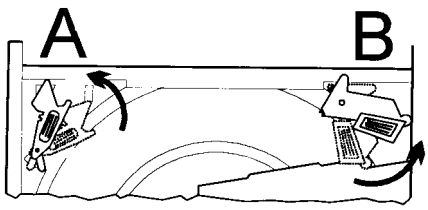
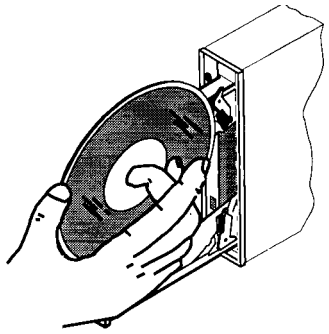
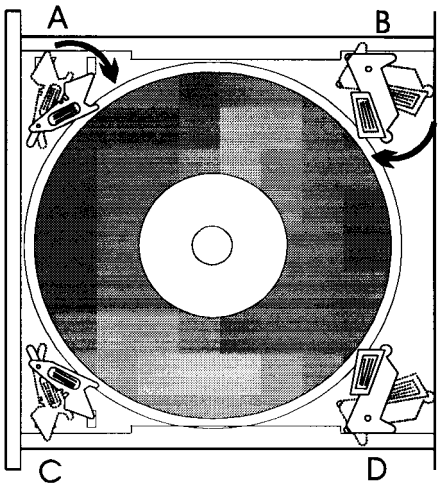
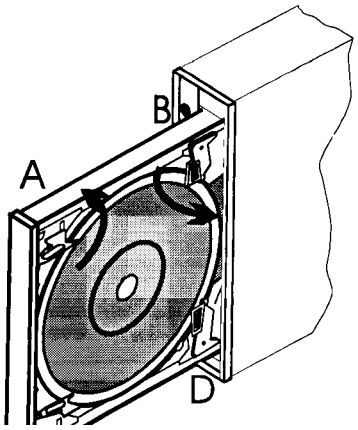
Vertical Mount Loading	
3. Snap the top retaining tabs (A,B) away from the center of the CD tray.	
4. Place the CD in the CD tray so that it is held by the bottom retaining tabs. Be sure the printing on the CD is facing to the RIGHT.	
5. Snap the top retaining tabs (A, B) into place over the top of the CD. 6. Push the CD tray back into the CD drive. The Drive Status LED will light while the drive reads the CD, then turn off.	

Table 3-6 **CD Unloading in the Vertical Mount Position**

Vertictal Mount Unloading	
1. Wait for the CD-ROM drive activity to stop. 2. Press the Eject Button. 3. Snap the top retaining tabs (A, B) away from the CD and remove the CD from its tray.	

Reading the Drive Status LED

1. After Drawer is closed:
   a. LED OFF after short blinking sequence = Drive Ready or Stand-by.
   b. LED ON = No disk present.
   c. LED Blinking at 3.2 second interval = Cleaning of disk or optics required.
2. While Playing an Audio Track:
   a. LED Blinking at 1.6 second interval.
3. When Accessing Data:
   a. LED Steady.

4 Using Your 3.5-Inch Floppy Disk Drive

- Setting the Write-Protect Tab on a Diskette
- Floppy Disk Drive
- Operating the Floppy Disk Drive
- Inserting and Removing a Diskette
- Drive Status LED
- Troubleshooting
- Ordering Information

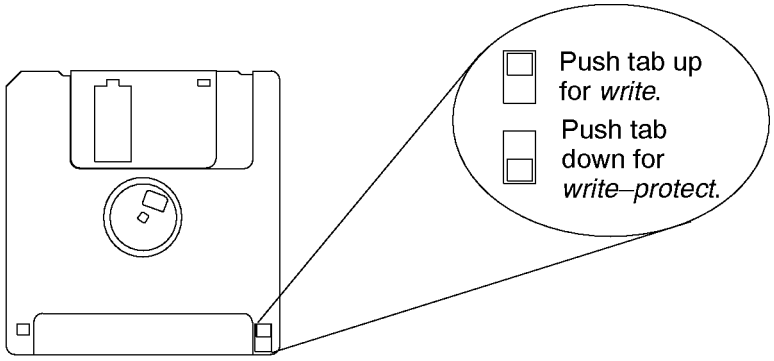
This chapter describes how to perform tasks that allow you to archive to or transfer data from the optional 3.5-inch floppy disk drive. The instructions in this chapter assume you are using the HP-UX 10.01 or later operating system.

NOTE **Floppy drives are not supported on R Class systems.**

Setting the Write-Protect Tab on a Diskette

You can only store or change information on a diskette when the write-protect tab is in the write position. So, before trying to write to the diskette, make sure that the write-protect tab is in the write position, as shown in Figure 4-1.

Figure 4-1 **Setting the Write-Protect Tab on a Floppy Diskette**



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To protect files on a diskette from being overwritten, set the write-protect tab to the write-protect position, as shown in Figure 4-1.

NOTE The write-protect tab should always be in the write position for formatting a new diskette and transferring data to a diskette.

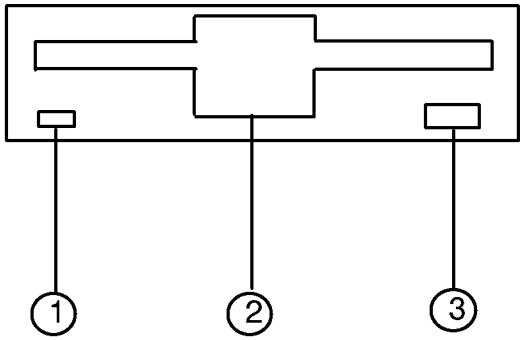
Floppy Disk Drive Description

Figure 4-2 shows the parts of the floppy drive.

Table 4-1 **Floppy Disk Drive**

Item	Description
1	Drive status LED
2	Diskette slot
3	Diskette eject button

Figure 4-2 **Floppy Disk Drive**



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Operating the Floppy Disk Drive

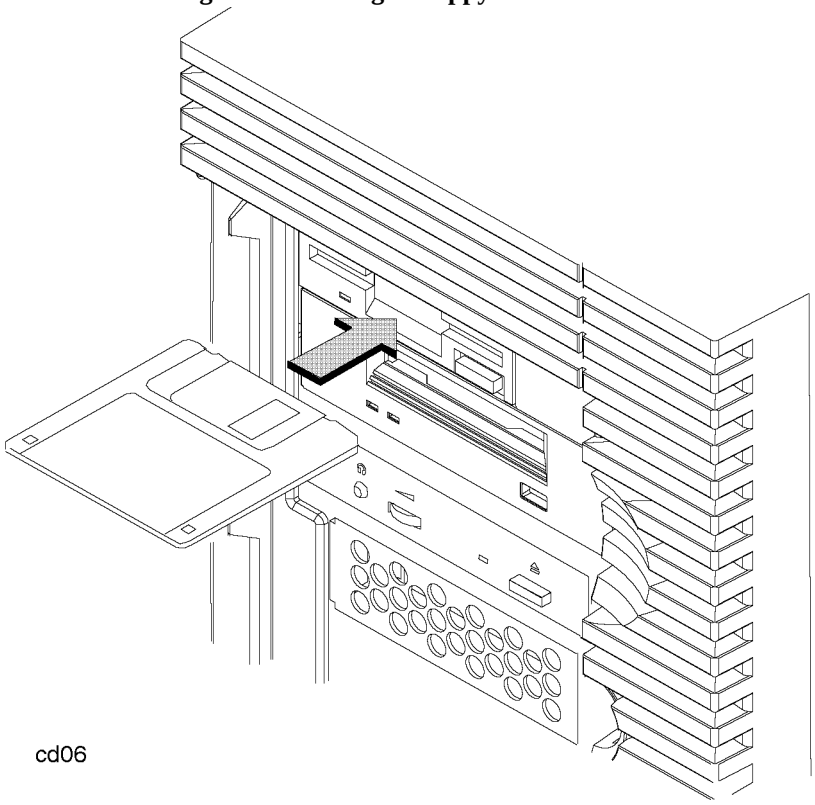
This section describes how to perform tasks with your floppy disk drive.

Inserting and Removing a Diskette

Follow these steps to insert and remove a diskette from the floppy disk drive:

1. Insert the diskette into the drive, as shown in Figure 4-3.

Figure 4-3 Inserting and Removing a Floppy Diskette



2. Push the diskette into the floppy drive until it clicks into place.
3. To remove the diskette, push the eject button (see Figure 4-3), then take out the diskette.

Drive Status LED

The floppy drive status LED flashes during the self-test and during activity with the host system.

Troubleshooting

If you have trouble with any of these procedures for using your floppy disk drive, see Chapter 6, “Solving Problems.”

Ordering Information

To order Hewlett-Packard micro flexible diskettes for use in your 3.5 inch floppy disk drive, use the following order number:

HP-92192X	High-Density Micro Flexible Disks (1.44MB Formatted Capacity) - box of ten diskettes.

5 Using Your Tape Drives

- DDS Tape Drives
- DDS-2 Tape Drives
- DDS-3 Tape Drives
- QIC Tape Drives.

This chapter describes the optional SCSI-2 Digital Data Storage (DDS), DDS-2, DDS-3, and Quarter-Inch Cartridge (QIC) tape drives. It also describes how to maintain and care for the drives.

The instructions in this chapter assume that you are using the HP-UX version 10.01 or later operating system.

DDS Tape Drives

This section contains the following information about DDS tape drives:

- DDS Drive and Media Descriptions
- DDS Tape Drives
- DDS Tape Drive LEDs
- Media Restrictions.

DDS Tape Drive and Data Cassette Descriptions

This section describes basic information needed for using your DDS tape drive and data cassettes.

NOTE

The DDS tape drive is also referred to as a DDS DCLZ drive. The DCLZ stands for Data Compression.

On R Class servers, the front bezel must be removed to access the DDS tape drive.

DDS Tape Drives

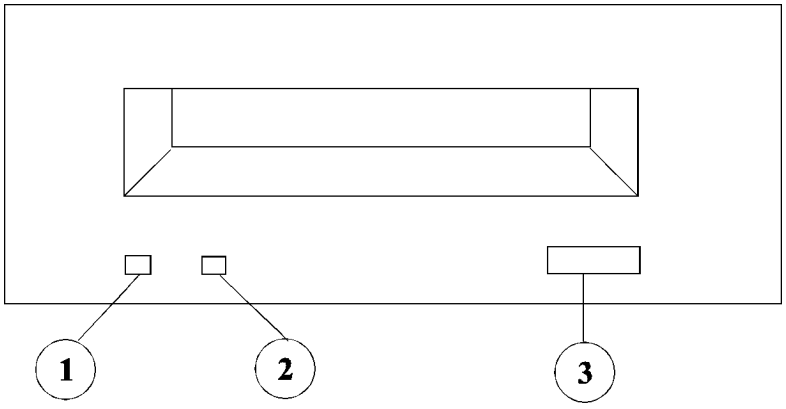
Your DDS tape drive is a 3 1/2 inch form factor DDS tape drive with a SCSI-2 interface. They conform to the DDS format standard for storing computer data and incorporate a data compression capability. It's a high-capacity, high transfer-rate device for data storage on tape.

Figure 5-1 shows the LEDs and the Eject button of the DDS tape drive.

Table 5-1 DDS Tape Drive

Item	Description
1	Cassette LED
2	Drive LED
3	Eject button

Figure 5-1 DDS Tape Drive, Product Number C1504B/DDS-1 Tape Drive, Product Number C2478SZ



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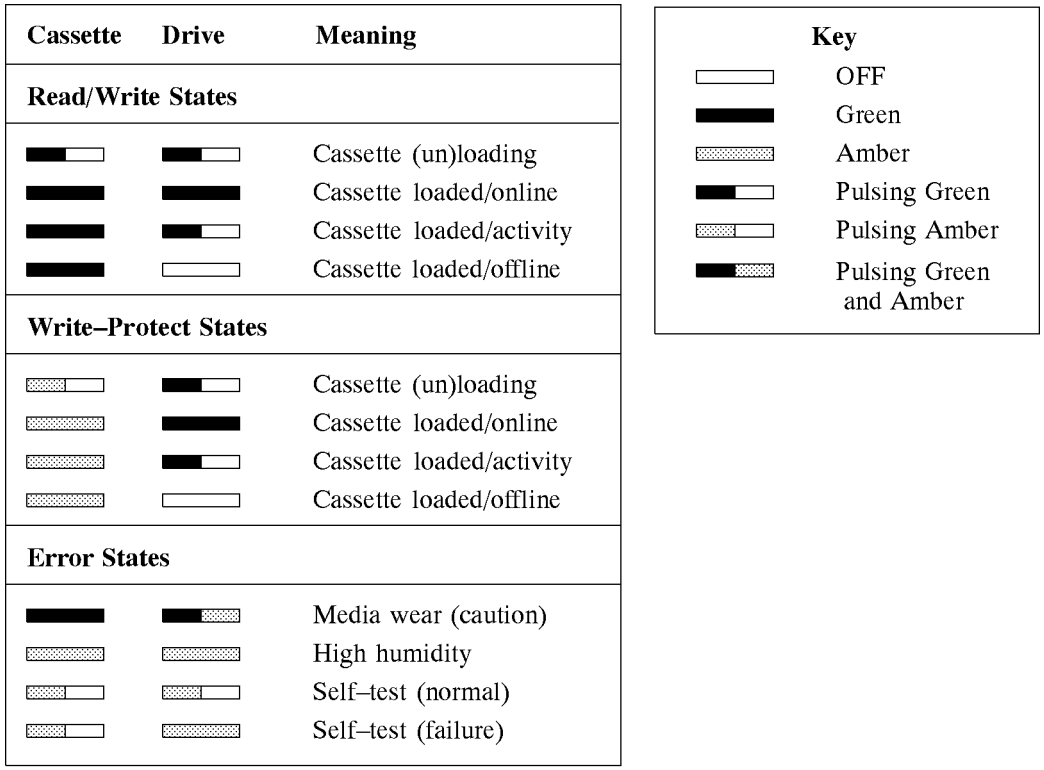
DDS Tape Drive LEDs

This section describes the LED codes that can be displayed. The front panel has two colored LEDs: the Cassette Light and the Drive Light. Figure 5-2 lists the LED codes.

Figure 5-2 DDS Tape Drive LEDs



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Media wear (caution)

The tape drive head needs cleaning. This condition can be caused by dirty heads or by a cartridge approaching the end of its life. The flashing light reoccurs after the initial cleaning. The data cartridge involved should be removed from use by reading the data from the tape and copying that data to a new tape.

Self-test	During power-on, the drive executes a self-test diagnostic. This is shown by both the Drive and Cassette lights flashing yellow. If the self-test fails, the Drive LED shows a steady yellow while the Cassette LED flashes yellow. If this happens, contact your System Administrator for further problem investigation.

NOTE The Media wear (caution) condition is only cleared by completing a cleaning cycle.

Media Restrictions

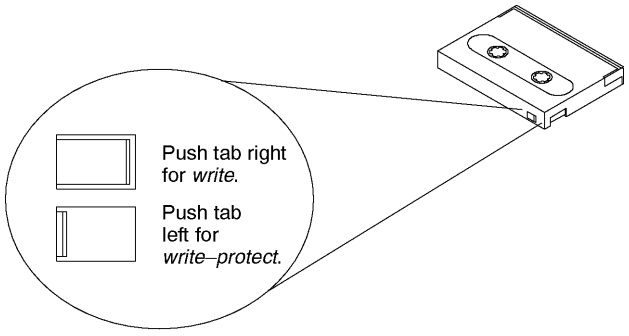
If you interchange media between other HP computer DDS tape drives, be advised that data cassettes with compressed data can only be read by tape drives that have data compression capabilities.

CAUTION Use only data cassettes labeled DDS (Digital Data Storage) cassettes. Never use audio cassettes labeled, “DAT” (Digital Audio Tape) in your DDS format drive.

Setting the Write-Protect Tab on a DDS Data Cassette

You can only store or change information on a data cassette when the write-protect tab is in the write position. So, before trying to write to the data cassette, make sure that the write-protect tab is in the correct position, as shown in Figure 5-3.

Figure 5-3 Setting the Write-Protect Tab on a Data Cassette



To protect information on a data cassette from being overwritten, set the write-protect tab to the write-protect position, as shown in Figure 5-3.

Loading and Unloading a DDS Data Cassette

Follow these steps to load and unload a data cassette from the DDS tape drive:

NOTE The front bezel must be removed to load and unload data cassettes on R Class servers.

1. To load a data cassette, insert the data cassette into the drive, as shown in Figure 5-4 and Figure 5-5.

Figure 5-4 Loading and Unloading a DDS Data Cassette (D Class)

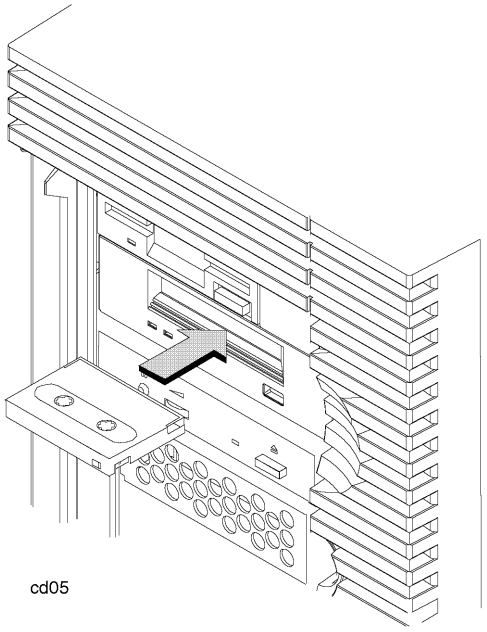
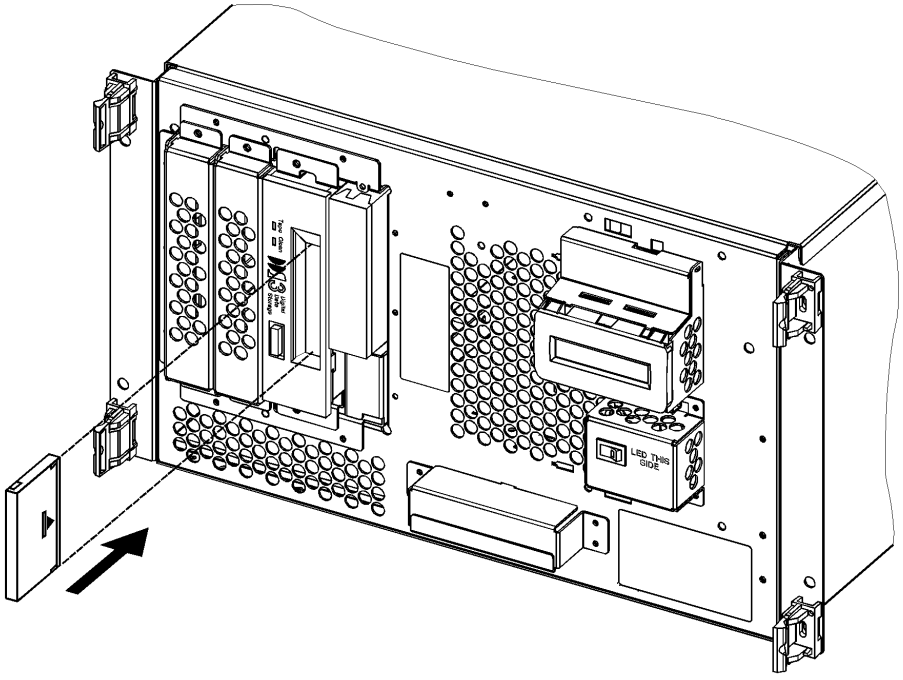


Figure 5-5 **Loading and Unloading a DDS Data Cassette (R Class)**



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2. Push the data cassette about three quarters of the way into the drive. The drive automatically pulls the data cassette the rest of the way in. When the LEDs on the front of the drive stop flashing, the drive has loaded the data cassette.

CAUTION

Do not force the data cassette into the drive. You may cause damage to the data cassette or the drive.

3. To unload the data cassette, press and release the eject button on the front ofthe drive as shown in Figure 5-4 and Figure 5-5. The LEDs on the drive flash on and off. Ten to twenty seconds later, the data cassette slides part way out of the drive. Remove the cassette from the drive.

Cleaning the DDS Tape Heads

Regular cleaning of the tape heads is essential to maintain the reliable operation and performance of the tape drive. This procedure in no way damages or shortens the life of either the drive mechanism or the tape heads. The recommended cleaning frequency is every 25 hours of tape pulling time. Do not wait for the Cleaning

Needed signal to appear on the front panel before implementing the cleaning procedure. By the time the indicator is present, the performance of the drive may already have been impacted.

CAUTION Only use HP Cleaning Cassettes (HP92283K) to clean the tape heads. Do not use swabs or other means of cleaning the tape heads.

Follow this procedure to clean the tape heads:

1. Insert the HP cleaning cassette into the drive. The tape automatically loads the cassette and cleans the heads. At the end of the cleaning cycle, the drive ejects the cassette.
2. If the cleaning cartridge ejects after only 14 seconds, the cartridge has reached the end of its useful life (about 25 cleaning cycles).
3. Write the current date on the label on the cleaning cassette so that you know how many times you have used it. Discard the cleaning cassette after you have used it 25 times.

Table 5-2 Recommended Cleaning Frequency

Cartridge Use per Day	Cleaning Interval
1	Weekly
2 or 3	Every other day
4 or more	Daily

DDS Forced Eject

It is possible to press the eject button and not have the tape eject from the drive. If after 35 seconds, the drive has not ejected the tape, press and hold down the eject button for at least five seconds. This will force the drive to eject the cartridge regardless of any outstanding operating or error recovery actions that may be in progress.

CAUTION Since a forced ejection of the tape causes the drive to eject the tape no matter what action is taking place, it is possible to eject a tape during a write and data may be lost. For this reason, the drive waits 35 seconds in which a normal eject can take place. If the normal eject succeeds, within the 35 second period, then any pending forced eject will be canceled.

If the tape cartridge still does not eject from the drive, contact the System Administrator.

DDS-2 Tape Drives

This section contains the following information about DDS-2 tape drives:

- DDS-2 Tape Drive Description
- Setting the Write Protect Tab on the DDS-2 Data Cassette
- Loading and Unloading a DDS-2 Data Cassette
- DDS-2 Preventative Maintenance
- DDS-2 Forced Eject.

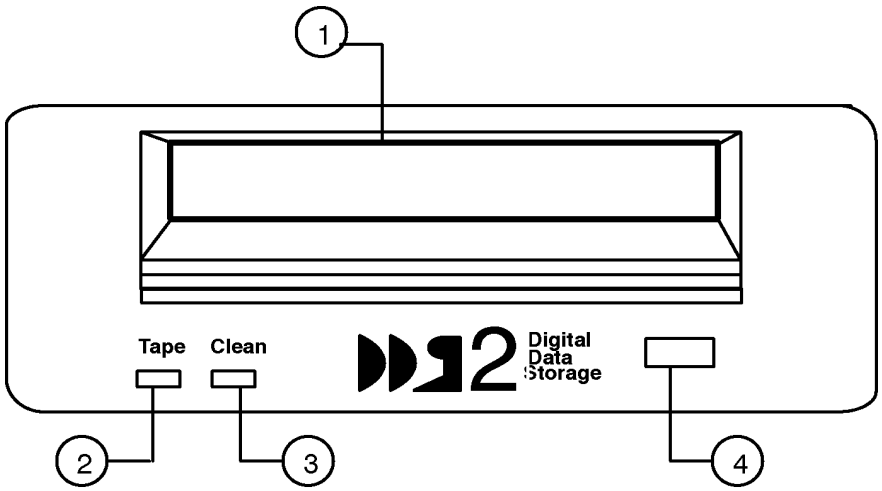
DDS-2 Tape Drive Description

Figure 5-6 shows the front of an HP DDS-2 tape drive.

Table 5-3 DDS-2 Tape Drive

Item	Description
1	Tape drive door
2	Tape status LED
3	Clean/Attention LED
4	Eject button

Figure 5-6 **DDS-2 Tape Drive, Product Number A3183A**



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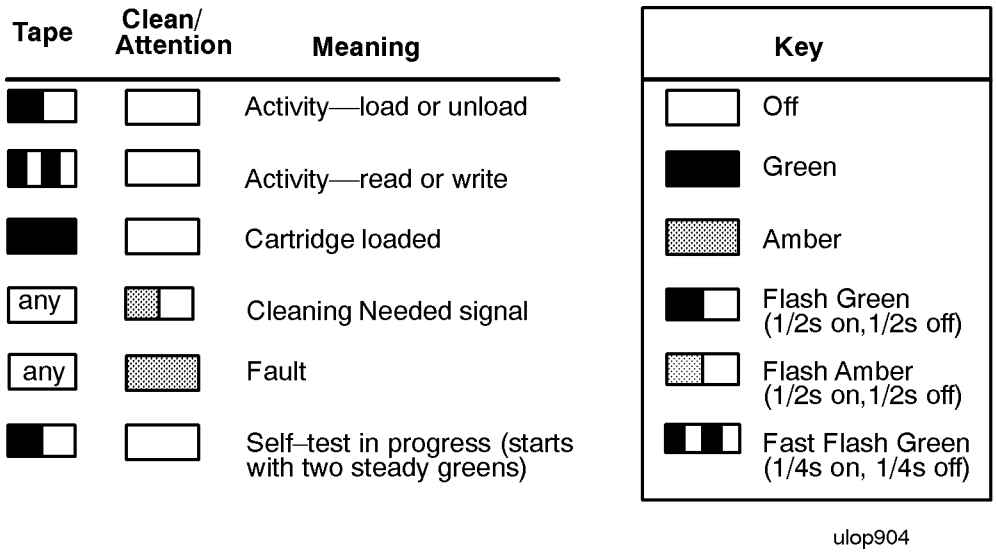
DDS-2 Drive Status LEDs

Figure 5-7 describes the possible DDS-2 status conditions.

Figure 5-7 DDS-2 Drive Status LEDs



Tape LED — Flashes green to show activity, loading, unloading, reading, and writing. It remains lit to indicate a cartridge is loaded and the unit is ready.

Clean/Attention LED — Flashes amber to indicate head cleaning is needed. This condition can be caused by dirty heads or by a cartridge approaching the end of its life. If the flashing light reoccurs after the initial cleaning, the data cartridge involved should be removed from use by reading the data from the tape and copying that data to a new tape.

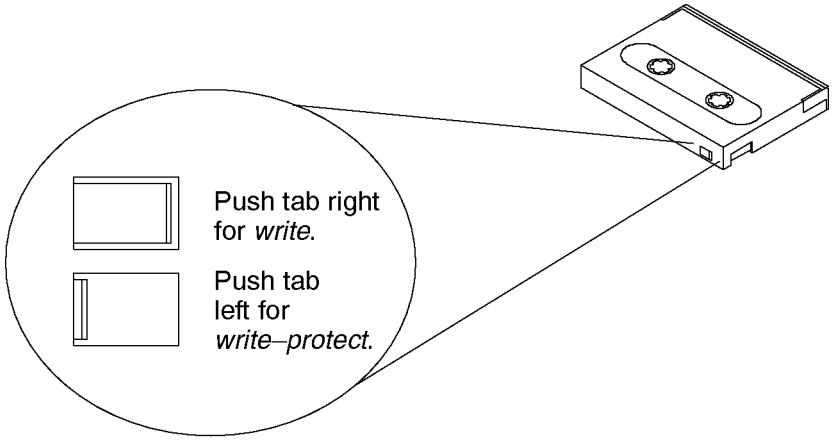
NOTE The cleaning needed indication is only cleared by completing a cleaning cycle, no matter what the cause is, however, the indication does not stop the activity of the tape drive.

Self-test — During power on, the drive executes a self-test diagnostic. This is shown by the Tape LED flashing green. If the self-test fails, the Clean/Attention LED continuously displays amber.

Setting the Write-Protect Tab on a DDS-2 Data Cassette

You can only store or change information on a data cassette when the write-protect tab is in the write position. So, before trying to write to the data cassette, make sure that the write-protect tab is in the correct position, as shown in Figure 5-8.

Figure 5-8 **Setting the Write-Protect Tab on a DDS-2 Data Cassette**



To protect information on a data cassette from being overwritten, set the write-protect tab to the write-protect position, as shown in Figure 5-8.

Loading and Unloading a DDS-2 Data Cassette

Refer to “Loading and Unloading a DDS Data Cassette” on page 5-5.

DDS-2 Tape Drive Preventive Maintenance

Regular cleaning of the tape heads is essential to maintain the reliable operation and performance of the tape drive. This procedure in no way damages or shortens the life of either the drive mechanism or the tape heads. The recommended cleaning frequency is every 25 hours of tape pulling time. Do not wait for the Cleaning Needed signal to appear on the front panel before implementing the cleaning procedure. By the time the indicator is present, the performance of the drive may already have been impacted.

Follow this procedure to clean the tape heads:

1. Use the HP Cleaning Cartridge (part nmber HP92283K)
2. Insert the HP cleaning cartridge into the drive.
3. The tape cleans the drive heads and ejects the cartridge after 30 seconds.
4. If the cleaning cartridge ejects after only 14 seconds, the cartridge has reached the end of its useful life (about 25 cleaning cycles).
5. If the cycle is successful, remove the cleaning cartridge and record the use count on the label supplied with the cartridge.

Table 5-4 DDS-2 Recommended Cleaning Frequency

Cartridge Use per Day	Cleaning Interval
1	Weekly
2 or 3	Every other day
4 or more	Daily

DDS-2 Forced Eject

It is possible to press the eject button and not have the tape eject from the drive. If after 35 seconds, the drive has not ejected the tape, press and hold down the eject button for at least five seconds. This will force the drive to eject the cartridge regardless of any outstanding operating or error recovery actions that may be in progress.

CAUTION Since a forced ejection of the tape causes the drive to eject the tape no matter what action is taking place, it is possible to eject a tape during a write and data may be lost. For this reason, the drive waits 35 seconds in which a normal eject can take place. If the normal eject succeeds, within the 35 second period, then any pending forced eject will be canceled.

If the tape cartridge still does not eject from the drive, contact the System Administrator.

DDS and DDS-2 Ordering Information

To order Hewlett-Packard data cartridges and cleaning cartridges for use in your DDS tape drives, use the following order numbers:

- For DDS and DDS-2, use HP92283A - Box of five 60-meter DDS data cartridges.
- For DDS and DDS-2, use HP92283B - Box of five 90-meter DDS data cartridges.
- For DDS-2 only, use HP92300A - Box of five 120-meter DDS data cartridges.
- HP92283K - Package of two cleaning cartridges.

CAUTION Use only data cartridges labeled as DDS (Digital Data Storage) cartridges. Never use audio cartridges labeled DAT (Digital Audio Tape) in your DDS-format drive.

Quarter Inch Cartridge (QIC) Tape Drive

This section contains the following information about Quarter Inch Cartridge (QIC) tape drives:

- QIC Tape Drive Description
- QIC Tape Formats
- Setting Write Protect on a QIC Data Cartridge
- Loading and Unloading a QIC Tape Cartridge
- Caring for the QIC Tape Cartridges
- QIC Preventative Maintenance.

NOTE **QIC tape drives are not supported on R Class servers.**

QIC Tape Drive Description

Figure 5-9 shows the optional QIC tape drive. It uses the industry standard QIC-1000 data format.

Figure 5-9 **QIC Tape Drive**

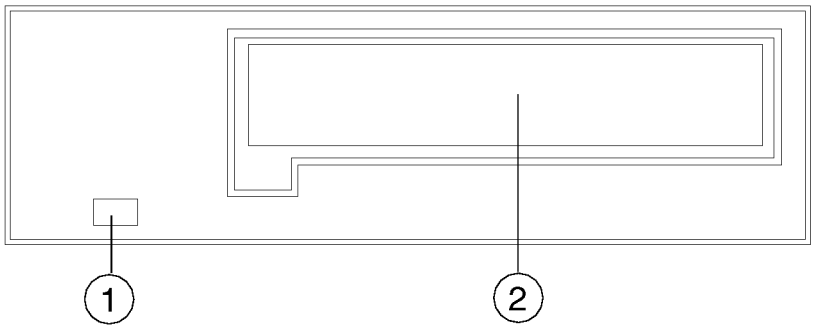


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Table 5-5 QIC Tape Drive

Item	Description
1	Drive LED
2	Drive door

CAUTION The QIC tape drive is NOT compatible with the 16 and 32 track formatted tape drives such as the HP 9144 and HP 9145. Do not use QIC tapes in these drives. Do not use 16 or 32 track formatted tapes in the QIC drive.

QIC Tape Formats

The QIC tape drive supports the following tape formats for reading data:

- QIC-1000
- QIC-525
- QIC-150
- QIC-120
- QIC-24.

The QIC tape drive supports the following tape formats for writing data:

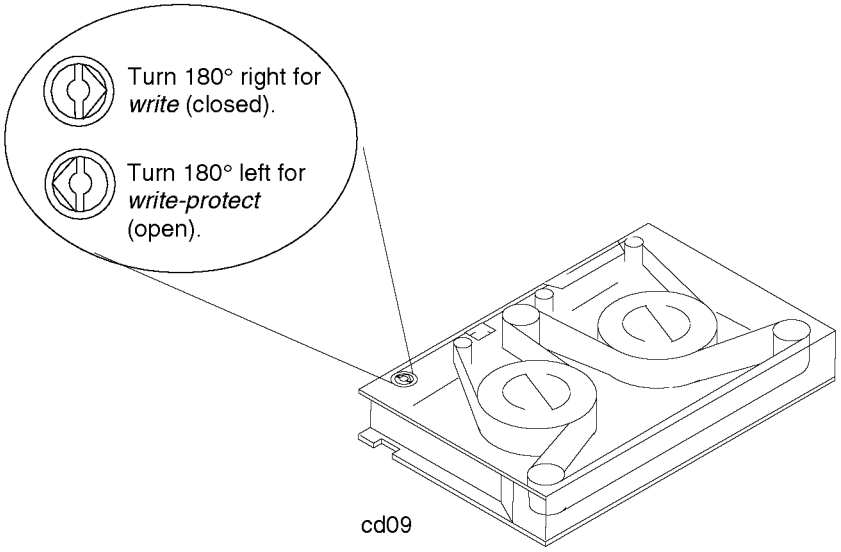
- QIC-1000
- QIC-525
- QIC-150
- QIC-120.

The drive automatically determines the format of the tape it is reading. Only 3M brand tape is supported.

Setting Write-Protect on a QIC Tape Cartridge

You can only store or change information on a tape cartridge when the tape cartridge is set to the write position. So, before trying to write to the tape cartridge, make sure it is set to the write-protect position, as shown in Figure 5-10.

Figure 5-10 **Setting Write-Protect on a QIC Tape Cartridge**

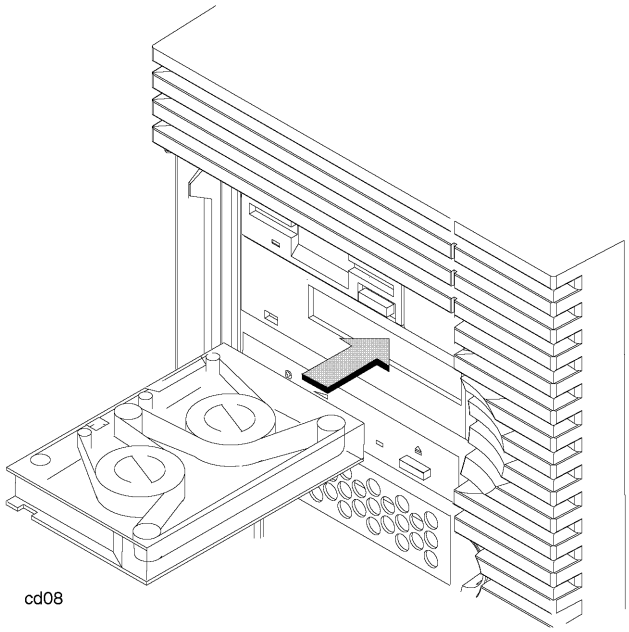


To protect information on a tape cartridge from being overwritten, set the cartridge to the write-protect position, as shown in Figure 5-10.

Loading and Unloading the QIC Tape

To load the QIC tape cartridge into the drive, push the cartridge into the drive until it stops and the cartridge will slide in no further as shown in Figure 5-11. When you release the cartridge, it will eject slightly indicating that the tape is properly loaded.

Figure 5-11 **Loading and Unloading QIC Data Cartridges**



To unload the QIC tape cartridge, push the cartridge into the drive until starts to resist and the latch releases. The cartridge will be partially ejected, and it can now be removed.

Caring for QIC Tape Cartridges

To keep your QIC tape cartridges in good working order, follow these rules:

1. Store the cartridge in its protective case.
2. Store the cartridge at temperatures between 5° C to 45° C (40° F to 115° F).
3. Allow the cartridge to stabilize after moving from one temperature extreme to another before using.
4. Keep magnetic sources away from the cartridge.
5. Replace damaged or contaminated cartridges.
6. Do not drop the cartridge.
7. Do not expose the cartridge to moisture or high humidity.
8. Do not place the cartridge is direct sunlight.
9. Do not touch the tape at the head access door or cartridge capstan.
10. Do not use force while inserting or removing the cartridge from the drive.

QIC Preventive Maintenance

The QIC tape drive head should be cleaned after every 8 hours of service. The QIC tape drive capstan should be cleaned after every 20 hours of service.

QIC Tape Drive Head Cleaning

To clean the QIC tape drive head, use the HP Cleaning Cartridge Kit (HP 92281C).

QIC Tape Drive Capstan Cleaning

1. Use a cotton swab soaked with only water to clean the capstan.
2. Wipe the cotton swab around the entire circumference of the capstan until all debris is removed.
3. Allow the capstan material to dry completely before inserting a tape cartridge.

CAUTION Never clean the capstan with head-cleaning solution as severe damage may result.

To order Hewlett-Packard tape cartridges and cleaning cartridges for use in your QIC tape drive, use the following order numbers:

- A2585A - 1.2 GB non-formatted data capacity

- HP 92281C HP Cleaning Cartridge.

CAUTION The QIC tape drive is NOT compatible with the 16 and 32 track formatted tape drives such as the HP 9144 and HP 9145. Do not use QIC tapes in these drives. Do not use 16 or 32 track formatted tapes in the QIC drive.

Troubleshooting

If you have trouble with any of these procedures for using your tape drive, see Chapter 6, “Solving Problems.”

6 Solving Problems

- Problem Solving Strategy
- Common Problems and Solutions
- LCD-Indicated Problems

This chapter contains information to help you determine what's wrong with your system when you have problems. If you have a problem that isn't listed in this chapter, or if your problem persists, contact your System Administrator. When calling Hewlett-Packard for service, always have your system's model number and serial number ready.

The instructions in this chapter assume you are using the HP-UX version 10.01 or later operating system.

Problem Solving Strategy

In the event of a system problem, check the condition of the system by observing the following:

- LCD messages
- Console messages
- Drive status LEDs
- The events that led to the error condition

Your first level of support should be your System Administrator; however, before you contact your System Administrator with the above information, make sure that all of the system connections are secure. (Refer to Chapter 1, “System Overview.”)

Common Problems and Solutions

This section lists common problems you may encounter with your computer. It also includes suggestions to help solve the problems.

Problems With LAN 10 Base-T Network

Problem	Solution
Can't reach other systems on the network. Applications that rely on the network won't run.	Check the network connector on the back of the system unit. Make sure that the network cable or transceiver is fastened securely to the connector. Check to be sure LAN is enabled on the system core I/O Card.

Problems Using the CD-ROM Drive

After the self-test, the status LED stays ON when one of the following conditions exist:

- A defective disk
- A disk insertion error (for example, an upside-down disk)

After the self-test, the status LED goes OFF when one of the following conditions exist:

- A drive power failure exists.
- The drive is idle on the SCSI bus.
- The drive is ready with the disk installed.

Problem	Solution
The CD-ROM drive does not respond when a disk is loaded or the status LED stays on.	Re-load the disk. Check the status of the status LED. See Chapter 3, “Reading the Drive Status Light.” If an error condition occurs, contact your System Administrator.

Problems Using the DDS Tape Drive

Problem	Solution
The tape drive does not respond when a cartridge is inserted.	Make sure the cartridge is properly loaded in the drive, and the LED is lit.
The status LEDs indicate a warning condition.	Refer to the following section, "DDS Tape Drive LED Warning Conditions."

DDS Tape Drive LED Warning Conditions

This section describes actions to take if the LEDs indicate a warning condition.

High Humidity

If the LEDs display the high humidity signal, the humidity is too high and the drive does not perform any operations until the humidity drops.

Self-Test (Failure)

If the LEDs display the self-test (failure signal), a fault was diagnosed during the self-tests. Note the pattern of the flashing, and contact your System Administrator.

Media Wear (Caution)

Hewlett-Packard DDS drives continually monitor the number of errors they have to correct when reading and writing to a tape to determine tape wear and tape head cleanliness. If excessive tape wear or dirty tape heads are suspected, the drive warns you by displaying the Media Wear (Caution) signal on the LED indicators.

If the LED indicators on your DDS drive display the Media Wear (Caution) condition, follow this procedure:

1. Check the system console for any tape error messages. A hard error during a read or write operation may have occurred.
2. Clean the heads with a cleaning cassette (HP92283K) as described in the "Cleaning the DDS Tape Heads" section, in Chapter 5.
3. Repeat the operation you performed when the Media Wear (Caution) signal displayed. If the Media Wear (Caution) signal still displays, then the data cassette should be replaced.

4. If you are performing a backup from disk to tape, discard the data cassette and back up your files using a new data cassette.
5. If you are performing a restore from tape to disk, complete the restore, then discard the data cassette and back up the files to a new data cassette.

Problems Using the DDS-2 Tape Drive

Problem	Solution
The DDS-2 tape drive does not respond when a cartridge is inserted and the LED is flashing.	A failure may have occurred. Contact your System Administrator.

DDS-2 Tape Drive LED Warning Conditions

This section describes actions to take if the LEDs indicate a warning condition.

Self-Test (Failure)

If the LEDs display the self-test (failure signal), a fault was diagnosed during the self-tests. Note the pattern of the flashing, and contact your System Administrator.

Media Wear (Caution)

Hewlett-Packard DDS-2 drives continually monitor the number of errors they have to correct when reading and writing to a tape to determine tape wear and tape head cleanliness. If excessive tape wear or dirty tape heads are suspected, the drive warns you by displaying the Media Wear (Caution) signal on the LED indicators.

If the LED indicators on your DDS-2 drive display the Media Wear (Caution) condition, follow this procedure:

1. Check the system console for any tape error messages. A hard error during a read or write operation may have occurred.
2. Clean the heads with a cleaning cassette (HP92283K) as described in the “Cleaning the DDS-2 Tape Heads” section, in Chapter 5.
3. Repeat the operation you performed when the Media Wear (Caution) signal displayed. If the Media Wear (Caution) signal still displays, then the data cassette should be replaced.
4. If you are performing a backup from disk to tape, discard the data cassette and back up your files using a new data cassette.
5. If you are performing a restore from tape to disk, complete the restore, then discard the data cassette and back up the files to a new data cassette.

Problems Using the QIC Tape Drive

Problem	Solution
The QIC tape drive does not respond when a cartridge is inserted.	Make sure the cartridge is properly loaded in the drive, and the LED is lit.

Problems Using the Manual Hot-Swap Disk Drive

Problem	Solution
The manual hot-swap module LED stays lit.	There is something wrong with the disk drive module, contact your System Administrator.

CAUTION

Do not remove a manual hot-swap disk module unless your System Administrator has performed a controlled shutdown or the appropriate procedure to quiesce the SCSI bus according to the software operation documentation. To do so may cause possible data corruption.

Problems Using the Floppy Disk Drive

Problem	Solution
The Floppy drive does not respond.	Make sure the diskette is properly loaded in the drive, and the LED is lit.

Fan Failure Problems

If any one of the fans inside the system unit fails, a message will display on the system console and the system will automatically shut down (performing an HP-UX `reboot -h`) in about 30 seconds. Contact your System Administrator about the fan failure problem.

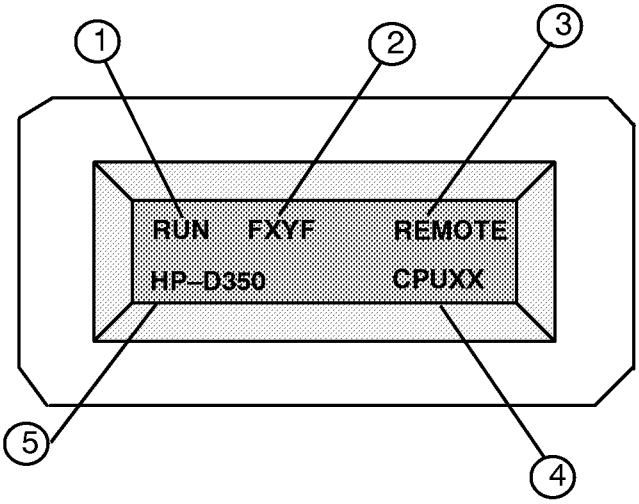
LCD-Indicated Problems

Your computer uses an LCD on the front panel to display firmware and HP-UX operating system progress codes.

Table 6-1 Front Panel LCD Display

Item	Description
1	System state
2	Chassis code
3	REMOTE (indicates Remote enabled): blank (indicates Remote disabled)
4	Processor information
5	System information/Model Identity

Figure 6-1 Front Panel LCD Display



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LCD-Indicated Problems

The possible system states are listed below.

- FLT - A hardware error has been detected
- TEST - Hardware being tested
- INIT - Hardware being initialized
- SHUT - System being shutdown
- WARN - A non-optimal operating condition exist
- RUN - System is running the operating system

When the system is operating normally, the RUN message should display. If a FLT or WARN message displays, write down all of the information displayed in the LCD and contact your System Administrator.

A Safety and Regulatory Statements

- Regulatory Information
- Safety
- Declaration of Conformity
- FCC Statement (USA Only)
- FCC Regulations for Telephone Line Interconnection
- Canada RFI Statement
- European Union RFI Statement
- Japan RFI Statement
- Acoustics (Germany)
- UK General Approval (United Kingdom Only)
- Internal Modem and HP A2991 600xx Line Access Module (LAM)
- Terminal DOC (Canada Only)
- National Post and Telecom Agency Statement (Sweden Only)
- AUSTEL Telecom Statement (Australia Only)
- New Zealand Telecom Statement (New Zealand Only)
- CD-ROM Drives
- Laser Safety Statement (US Only)
- Finland
- Germany (Only)

Regulatory Information

For your protection, this product has been tested for conformance to various national and international regulations and standards. The scope of this regulatory testing includes electrical and mechanical safety, electromagnetic emissions, immunity, acoustics and hazardous materials.

When required, approvals are obtained from third party test agencies. Approval marks appear on the product label. In addition, various regulatory bodies require some information under the headings listed in this section.

Safety

This product has not been evaluated for connection to an “IT” power system (ac distribution system having no direct connection to earth according to IEC 950).

Locate the AC outlet near the computer! The ac power cord is this product's main ac disconnect device and must be easily accessible at all times.

Declaration of Conformity

Figure A-1 **Declaration of Conformity**

FCC STATEMENT (USA Only)

The United States Federal Communications Commission has specified that the following notice be brought to the attention of users of this product:

NOTE

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Hewlett-Packard's system verification tests were conducted with HP-supported peripheral devices and HP shielded cables, such as those you receive with your computer. Changes or modifications not expressly approved by Hewlett-Packard could void the user's authority to operate the equipment. Cables used with this device must be properly shielded to comply with the requirements of the FCC.

FCC Regulations for Telephone Line Interconnection

- This equipment complies with Part 68 of the FCC rules. On the outside surface of this equipment is a label that contains, among other information, the FCC registration, the FCC registration number and ringer equivalence number (REN). If requested, this information must be provided to the telephone company.

DECLARATION OF CONFORMITY
according to ISO/IEC Guide 22 and EN 45014

Manufacturer's Name: Hewlett-Packard Company

Manufacturer's Address: 8000 Foothills Blvd.
Roseville, CA 95747
USA

declares, that the product

Product Name: PA-RISC Computer System

Model Number(s): HP 9000, Model Dxyz (x, y, z is any number 0–9)

Product Options: All

conforms to the following Product Specifications:

Safety: IEC 950:1991 + A1, A2, A3 / EN 60950:1992 + A1, A2, A3

EMC[1]: CISPR 22:1993 / EN 55022:1994 - Class A[2]

EN 50082-1:1992
IEC 801-2:1991 / prEN 55024-2:1992, 4 kV CD, 8 kV AD
IEC 801-3:1984 / prEN 55024-3:1991, 3 V/m
IEC 801-4:1988 / prEN 55024-4:1992, 0.5 kV Signal Lines
1 kV Power Lines
IEC 1000-3-2:1995 / EN 61000-3-2:1995, Class A, harmonics
IEC 1000-3-3:1994 / EN 61000-3-3:1995, flicker

Supplementary Information:

The product herewith complies with the requirements of the Low Voltage Directive 73/23/EEC and the EMC Directive 89/336/EEC and carries the CE marking accordingly.

1) Product models where y is equal to 0 through 5 meet the EMC Directive as attested to in Certificate Number RFI/CBC1/3397A.

2) The Product was tested in a typical configuration with Hewlett-Packard computer peripherals.

Roseville, July 1, 1997

Frank D. Dembski Jr., Quality Manager

European Contact: Your local Hewlett-Packard Sales and Service Office or Hewlett-Packard GmbH, Department TRE, Herrenberger Straße 130, D-71034 Böblingen (FAX: + 49-7031-14-3143)

- This equipment uses the following Universal Service Code (USOC) jacks: RJ11C or RJ11W (single line).
- The REN is used to determine the quality of devices which may be connected to the telephone line. Excessive RENs on the telephone line may result in the devices not ringing in response to an incoming call. In most, but not all areas,

the sum of the RENs should not exceed five (5.0). To be certain of the number of devices that may be connected to the line, as determined by total RENs, contact the telephone company to determine the maximum REN for the calling area.

- If this equipment causes harm to the telephone network, the telephone company will, where practicable, notify you in advance that temporary discontinuance of service may be required. If advance notice isn't practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.
- The telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the operation of the equipment. If this happens, the telephone company will provide advance notice in order for you to make the necessary modifications in order to maintain uninterrupted service.
- If trouble is experienced with this equipment, please contact the Field Engineering Support Manager, Telephone number: (916) 785-**XXXX**, M/S 5657, Hewlett-Packard Company, 8000 Foothills Blvd., Roseville CA 95747-6588 in the USA for repair and/or warranty information. If the trouble is causing harm to the telephone network, the telephone company may request that you remove the equipment from the network until the problem is resolved.
- No repairs are to be made by you. Repairs are to be made only by Hewlett-Packard or its licensees. Unauthorized repairs void registration and warranty.
- This equipment cannot be used on telephone company-provided coin service. Connection to Party Line Service is subject to state tariffs. (Contact the state public utility commission, public service commission, or corporation commission for information).
- If so required, this equipment is hearing-aid compatible.

Canada RFI Statement

- This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.
- Cet appareil numÅrique de la classe A respecte toutes les exigences du RÉglement sur le matÅriel brouilleur du Canada.

European Union RFI Statement

This is a Class A product. In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures.

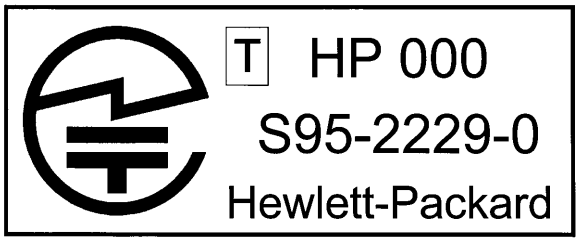
Japan RFI Statement

この装置は，第一種情報装置（商工業地域において使用されるべき情報装置）で商工業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。

従って，住宅地域またはその隣接した地域で使用すると，ラジオ，テレビジョン受信機等に受信障害を与えることがあります。

取扱説明書に従って正しい取り扱いをして下さい。

Japan-Only JATE Mark



Japan Harmonic Statement

ulop201

Acoustics (Germany)

Acoustic noise level per ISO 9296 (25° C):

LpA_m <41dB (operators position)
LWA_d <5.7 bels

Geräuschemission nach ISO 9296 (25° C):

LpA_m <41dB (Arbeitsplatte)
LWA_d <5.7 bels

UK General Approval (United Kingdom only)

Pursuant to Section 22 of Telecommunications Act of 1984, this product is approved for indirect connection to Public Telecommunications systems within the United Kingdom under the General Approval number NS/G/1234/J/100003.

Internal Modem and HP A2991-600xx Line Access Module (LAM)

The following warnings apply to the use of the HP 2991-60001 internal modem and HP A2991-600xx LAM that may be provided with the computer.

Terminal DOC (Canada only)

NOTE

The Canadian Department of Communications label identifies certified equipment. This certification means that the equipment meets certain telecommunication network protective operational and safety requirements. The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified assembly (telephone extension cord). The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

The Load Number (LN) assigned to each terminal device denotes the percentage of total load to be connected to a telephone loop which is used by the device to prevent overloading. The termination on a loop may consist of any combination of devices subject only to the requirement that the total of the Load Numbers of all devices does not exceed 100. The load number for this product is 33.

CAUTION Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

National Post and Telecom Agency Statement (Sweden only)

The LAM Interface shall be connected to SELV (max.42.4 V peak, or 60 V DC) according to EN 60950. (The internal modem complies with this requirement.)

AUSTEL Telecom Statement (Australia only)

When setting the number of automatic redials for the modem, ensure the following:

The number of automatic redials that the modem performs should be limited to a maximum of 9 redials plus the original call. If the above retries are unsuccessful, no further attempts should be made to the same number for a minimum period of 5 minutes.

CAUTION Failure to set the modem, and any communication software used with the modem to the values contained in the listing will result in the modem being operated in a non-compliant manner. Consequently, there would be no permit in force for this equipment, and the Telecommunications Act 1991 prescribes a penalty of A$12,000 for the connection of non-permitted equipment.

Australian C-Tick Label

Figure A-2 **Australian C-Tick**

New Zealand and Telecom Statement (New Zealand only)

When using an application software that allows the setting of automatic redialing, the following guidelines should be followed:

- Not more than five call attempts to the same number within a one hour period.
- A minimum of 60 seconds between each attempt.
- Not more than a total of 10 call attempts to the same number.

Any setting that violates the above guidelines will cause the equipment to go out of compliance, and thus no Telepermit will be in force for this equipment which will make it subject to penalties.

The operation of this equipment on the same line as telephones or other equipment with audible warning devices or automatic ring detectors will give rise to bell tinkle or noise and may cause false tripping of the ring detector. Should such problems occur, the user is not to contact Telecom Faults Service.

CD-ROM Drives

The following warnings apply to those products that support CD-ROM drives. Please also refer to the documentation provided with the CD-ROM drive.

Laser Safety Statement (US only)

The CD-ROM mass storage system contains a laser system and is classified as a "Class 1 Laser Product" under a U.S. Department of Health and Human Services (DHHS) Radiation Performance standard according to the Radiation Control for Health and Safety Act of 1968.

To ensure proper use of this product, please read the CD-ROM instruction manual carefully and retain for future reference. Should the unit ever require maintenance, contact an authorized service location.

WARNING **Use of controls, adjustments or performance procedures other than those specified herein may result in hazardous radiation exposure. To prevent direct exposure to laser beam, do not try to open the enclosure.**

Finland

```
LASERTURVALLISUUS
LUOKAN 1 LASERLAITE
KLASS 1 LASER APPARAT
```

HP 9000 Model Dxxx -tietokoneisiin voidaan asentaa lisävarusteena laitteensisäinen CD-ROM-lukulaite (9164-0393), joka on laserlaite.

Kyseinen CD-ROM-lukulaite on käyttäjän kannalta turvallinen luokan 1 laserlaite. Normaalissa käytössä lukulaitteen suojakotelo estää lasersäteen pääsyn laiteen ulkopuolelle.

CD-ROM-levyaseman on tyyppihyväksynyt Suomessa laserturvallisuuden osalta Työministeriön työsuojeluosasto. Laitteen turvallisuusluokka on määritetty standardin EN 60825 (1991) mukaisesti.

Tiedot CD-ROM-lukulaitteessa käytettävän laserdiodin säteilyominaisuuksista:

```
Aallonpituus   790 nm
Teho         0,145 mW
Luokan 1 laser
```

Germany (Only)

VORSICHT

Dieses Gerät ist ein Laser Klasse 1 nach IEC 825. Beachten Sie die Bedienungsanleitung und verwahren Sie diese für späteren Gebrauch.

Gerät nicht Îffnen. Lassen Sie Instandhaltungsarbeiten durch Vertragswerkstätten durchfÏhren.

WARNING **Führen Sie Einstellungen und Prüfungen entsprechend den hier beschriebenen Anleitungen durch, um Gefährdungen durch den Laserstrahl zu vermeiden.**

B Hot-Swap (D Class Only)

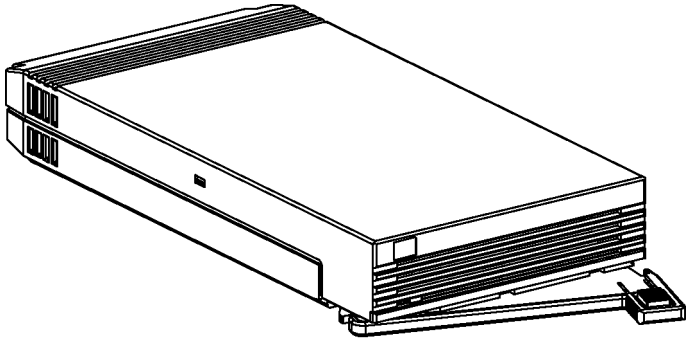
Module Replacement

Overview

The HP 9000 D Class Enterprise Server implements the use of the newly developed HP Hot-Swap hard disk drives on a common Fast/Wide SCSI bus. The hot-swap feature implies the ability to remove or add an inactive disk drive module to a system while DC power is still applied and the SCSI bus is still active.

Two versions of the Hot-Swap chassis have been implemented. The D2xx systems will offer an optional Hot-Swap upgrade which will allow the low end servers to replace their single-ended SCSI disks with the Fast/Wide SCSI hot-swap disk modules. This upgrade will supply a Hot-Swap module that will support up to two hot-swap disk modules. The D3xx systems will come standard with a Hot-Swap module that supports up to five hot-swap disk modules.

Figure B-1 **Hot-Swap Disk Module**



pshtpl2

The hot-swap disk modules used in the HP D Class Server are low-profile disks that have a 1, 2, 4, and 9 gigabyte capacity. Each module contains a low-profile disk, EMI shielding, and an interface PCA.

Hot-Swap Disk Features

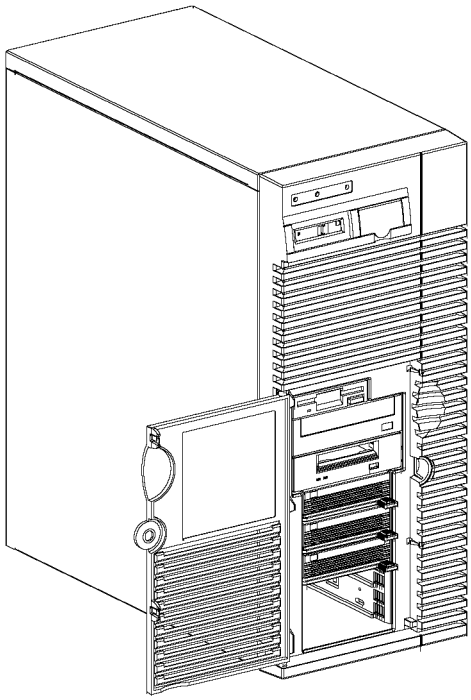
- The delay start feature prevents large surge currents from occurring when several disk drives spin up at the same time. Spin delays are also necessary for hot-swap event detection when LVM mirroring is used. The delay spin signal is hard strapped active on all but the top position which is normally the “root” drive.
- The delay spin feature causes the spin-up to delay for a time approximately equal to ten times the SCSI address selected for a given drive in seconds. Delay spin can be overridden if the software attempts to access a disk drive before it has timed out and begun its spin up. The disk in the top position will spin-up as soon as power is applied.
- The remote spin feature gives the controlling software complete control over the disk drive spindle motor. Software can accordingly issue appropriate SCSI commands to spin-up or spin-down on the drive. The current HP UNIX software does not support this feature; therefore, it is hard disabled at the Hot-Swap backplane.

The module addresses are hard wired on the PCA for each position in the Hot-Swap module. A switch position on the backplane selects one of two address ranges.

Hot-Swap Bay

The hot-swap bay is common to both the D3xx system package and the D2xx optional add on product.

Figure B-2 **Hot-Swap Disk Bay**



Manual Hot-Swap Procedure

Customers using manual hot swap on 10.01 HP-UX Releases, will need to pick up two LVM patches to install on their system. There will be two documents included in every Model D Class server informing the customer of the patch and the manual procedure.

With 10.10 HP-UX Release, or later, the LVM patches will be included in the OS.

Hot Swap Example

The following example describes a particular system problem where the solution is to replace a hot-swap disk module.

Example configuration:

Volume group /dev/vg00 contains the three disks, with the logical volume configuration as shown:

Table B-1 Example Configuration

Volume Description	Volume Description	Volume Description
lvol 1	lvol 3	lvol 4
lvol 2	lvol 4	lvol 5
lvol 3	lvol 5	

```
hardware address          52.6.0        52.5.0          52.4.0
device file (/dev/dsk/)   c2t6d0        c2t5d0          c2t4d0
```

The system problem for this example is that the disk at hardware address 52.4.0 has a head crash, and as a result it is unusable. The steps described in the *Hot-Swap Procedure* section of this document outline a method that can be used to recover from this state.

1. All of the replaced disk's in-use extents must belong to mirrored logical volumes which were created with the 'strict' option (-s).
2. You must have an up to date configuration backup file. This is done by default each time an LVM command changes the LVM configuration.

   The default backup file's path is:

   ++/etc/lvmconf/base_vg_name.conf.++
3. The replacement disk must be the same product ID as the replaced one.

NOTE HP often uses different manufacturers for disks having the same product number. The hot-swap manual procedure will not update the disk driver's internal information to that of the replaced disk.

The replacement disk will have the same capacity and block size as the defective disk because they have the same product number. The only field that could be incorrect is the string specifying the vendor's name. This will not affect the behavior of the LVM. If it is desired to update the manufacturers' name, then the disk's volume group must be deactivated and reactivated.

4. You must have previously installed the following two software patches:

- PHKL_5840, kernal(HP-UX Version 10.01 only)
- PHCO_5841, utility(HP-UX Version 10.01 only).

Hot-Swap Procedure

Follow these steps to replace a hot-swap disk module.

Step 1

- Check if the LVM found the physical volume to be defective when the volume group was activated.
- The *vgchange* would have printed the following message on the console:

```
WARNING:

VGCHANGE: WARNING: COULDN’T ATTACH TO THE VOLUME GROUP PHYSICAL
VOLUME “/DEV/DSK/cXtXdX”

THE PATH OF THE PHYSICAL VOLUME REFERS TO A DEVICE THAT DOES
NOT
EXIST, OR IS NOT CONFIGURED INTO THE KERNAL.
```

- If the status of the *vgchange* is unknown, you may check if this occurred by doing a *vgdisplay* command:

  # vgdisplay <VG name>

  For our example:

  # vgdisplay /dev/vg00

- If the disk was defective at *vgchange* time, the following messages will be printed one or more times.

```
WARNING:

VGDISPLAY: WARNING: COULDN’T QUERY PHYSICAL VOLUME
 “/DEV/DSK/cXtXdX”
THE SPECIFIED PATH DOES NOT CORRESPOND TO PHYSICAL VOLUME
ATTACHED

TO THE VOLUME GROUP.
VGDISPLAY: WARNING: COULDN'T QUERY ALL OF THE PHYSICAL VOLUMES
.
```

- If you see these messages, the disk was defective at the time the volume group was activated.

Hot swapping a disk which was defective during activation requires a different sequence of commands. Skip to the alternative procedure, *”Hot Swap Procedure for Unattached Physical Volumes,”*, at the end of this document.

Otherwise, your disk became defective after the *vgchange* and you must continue with step 2 of this procedure.

Step 2

- Reduce any logical volumes that have mirror copies on the faulty disk so that they no longer mirror onto that disk (note the -A n option):

lvreduce -m 0 -A n /dev/dsk/cXtXdX for 1 way mirroring

OR

lvreduce -m 1 -A n /dev/dsk/cXtXdX for 2 way mirroring

For our example:

lvreduce -m 0 -A n /dev/vg00/lvol4 /dev/dsk/c2t4d0

lvreduce -m 0 -A n /dev/vg00/lvol5 /dev/dsk/c2t4d0

Step 3

- Replace the faulty disk. Please refer to the appropriate administration guide for instructions on how to replace the disk.
- Do an *ioscan* on the replaced disk to insure that it is accessible and also as a double check that it is a proper replacement (see Note in step 3 on page B-4).

For our example:

ioscan /dev/dsk/c2t4d0

Step 4

- Restore the LVM configuration/headers onto the replaced disk from your backup of the LVM configuration:

  # vgcfgrestore -n /dev/rdsk/cXtXdX

- where X is the Logical unit number of the disk that has been replaced.

  For our example:

  # vgcfgrestore -n /dev/vg00 /dev/rdsk/c2t4d0

Step 5

- Attach the new disk to the active volume group with the *vgchange* command.

  # vgchange -a y

  For our example:

  # vgchange -a y /dev/vg00

Step 6

- If this disk is not a mirror of a root disk, then skip this step.
- The *mkboot* command must be run.

  For our example:

  # mkboot /dev/rdsk/c2t4d0

- After running the *mkboot* command, do an *lvlnboot -R* to re-link the replaced disk into the Boot Data Reserved Area of all the Physical Volumes in the Volume Group.

  # lvlnboot -R

Step 7

- *Lvextend* the mirrors back onto the replaced disk. This may take several minutes as it will have to copy all the data from the original copy of the data to the mirrored extents. The logical volume(s) are still accessible to users' applications during this command.

lvextend -m 1 <LV name> /dev/dsk/cXtXdX

OR

lvextend -m 2 <LV name> /dev/dsk/cXtXdX for 3-way mirroring

For our example:

lvextend -m 1 /dev/vg00/lvol4 /dev/dsk/c2t4d0

lvextend -m 1 /dev/vg00/lvol5 /dev/dsk/c2t4d0

At this stage, your system should be fully functioning.

Hot Swap Procedure for Unattached Physical Volumes

Follow these steps to replace a hot-swap disk module for unattached physical volumes.

Step 1

- Replace the faulty disk.
- Do an ioscan on the replaced disk to insure that it is accessible and also as a double check that it is a proper replacement (see Note in step 3 on page B-4).

  For our example:

  # ioscan /dev/dsk/c2t4d0

Step 2

- Restore the LVM configuration/headers onto the replaced disk from your backup of the LVM configuration:

  # vgcfgrestore -n <volume group name> /dev/rdsk/cXtXdX
- where X is the Logical unit number of the disk that has been replaced.

  For our example:

  # vgcfgrestore -n /dev/vg00 /dev/rdsk/c2t4d0

Step 3

- Attach the new disk to the active volume group with the *vgchange* command.

  # *vgchange* -a y <volume group name>

  For our example:

  # *vgchange* -a y /dev/vg00

Step 4

- If this disk is not a mirror of a root disk, then skip this step.

- The mkboot command must be run.

  For our example:

  # mkboot /dev/rdsk/c2t4d0

- After running the mkboot command, do an *lvlnboot -R* to re-link the replaced disk into the Boot Data Reserved Area of all the Physical Volumes in the Volume Group.

  # lvlnboot -R

Step 5

- Resynchronize the mirrors of the replaced disk. This may take several minutes as it will have to copy all the data from the original copy of the data to the mirrored extents. The logical volume(s) are still accessible to users' applications during this command.

  # vgsync <VG name>

  For our example:

  # vgsync /dev/vg00

Glossary

AUI Connector on the computer for attaching Thick LAN, Twisted Pair, and other types of network cables.

console terminal The dedicated terminal used for system administration. It is connected directly to the computer and must be connected to a specific port. The D Class Server can use a either a graphics or character-based terminal for the console.

DDS Digital data storage. A specification for tape storage media, similar to but different from the DAT, digital audio tape, specification. A DDS tape is specified to have no dropouts whereas a DAT tape could have them. DDS and DAT specification names and respective media are not meant to be interchangeable.

disk drive A peripheral, either integrated into the computer or external to the computer, that provides for semi-permanent storage of files and data.

I/O card A computer card installed in your computer to provide a connection to peripherals or networks.

LAN The Local Area Net is the communication connection between computers located in the same area.

manual hot-swap disks modules

Manual hot-swap disk modules (also known as manual hot-pluggable disk modules) can be removed from or added to the system's hot-swap peripheral bay while the operating system is in a particular state. Refer to the operating system documentation for more information about system operation with manual hot-swap devices.

MAU The Media Attachment Unit connects networks such as Thick LAN and Twisted Pair to your computer.

operating system The software program that allows you to access your files, operate terminals and printers, run applications, and perform other user and system administration functions. The operating system is the interface between the user and the hardware/ software in the computer.

Glossary

parallel communications A method of providing communications to peripherals, mainly printers. In parallel communications, data is passed on multiple parallel lines simultaneously. This typically makes it much faster than serial data communications but requires more wires in the cable and also requires that the peripheral be located closer to the computer than with serial data communications.

peripherals Devices such as terminals, printers, and modems which are attached to your computer.

remote The computer with which you are trying to communicate. Your computer is called the host.

RS-232 A method for providing serial data communications in which data is passed down a single wire. Typically this technique is used for modem connections.

SAM The System Administration Manager is a feature of HP-UX which aids the system administrator is completing tasks such as adding user and peripherals.

serial data communications A method of providing communications to peripherals, mainly terminals and modems. This can be much slower than parallel communications but requires less wires in the cable and also permits the peripheral be located further from the computer than with parallel communications.

SPU System Processing Unit. This is also often referred to as the computer.

superuser A user who has the authority to use all system administration commands. The superuser is identified to the operating system as “root” and is required to provide the superuser password.

system administration The process of configuring and maintaining the operating system. System administration tasks include adding users, adding peripherals and configuring the network.

tape drive A peripheral, either integrated into the computer or external to the computer, that stores files and data on removable magnetic tape.

terminal The display device, consisting of a keyboard and monitor, that is used to communicate with your computer.

UPS Uninterruptible Power System. The UPS contains a battery backup system that supplies power to your computer if the normal line power should fail or move below a specified voltage level.

Glossary

user The individual person who is using the computer. The user's name and password must be added to the operating system by the superuser.

Glossary