

# **OptiPac 8611B User's Manual**

Manual No. 11-18611-40  
Revision A

© Copyright 2003

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## Important Notice

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## Important FCC Information

This peripheral device generates and uses radio frequency energy and if it is not installed and used properly, that is, in strict accordance with this manual, it may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class-A computing device in accordance with the specifications in subpart J of part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. However, there is no guarantee that interference will not occur in a particular installation. Operation of this equipment in a residential area is likely to cause interference and is up to the user, at his own expense, to take whatever measures may be required to correct the interference. You can test to see whether this equipment does cause interference with radio or television reception by turning the disk drive off and on. If it is causing interference, try to correct the problem by one or more of the following measures:

- Be sure you're using shielded interconnect cables.
- Reorient the receiving antenna.
- Relocate the drive with respect to the receiver.
- Move the receiver away from the disk drive, or vice versa.
- Plug the computer into a different outlet so that the computer and receiver are on different circuits.

If necessary, consult your dealer or an experienced radio/television technician for additional suggestions. You may also find a booklet prepared by the Federal Communications Commission helpful. It is entitled *How to Identify and Resolve Radio-TV Interference Problems*. Request Stock No. 004-000-00345-4, from the U.S. Government Printing, Washington, D.C., 20402.

## Warning:

To prevent fire or shock hazard, do not expose the unit to rain or moisture. To avoid electrical shock, do not open the cabinet. Refer servicing to qualified personnel only.



The OptiPac product is classified as a CLASS 1 LASER PRODUCT.

A CLASS 1 LASER PRODUCT label is located on the top cover of the internal drive mechanism.

## Printing History

If the Revision level of the manual does not change from one printing to the next, this indicates that the newer printing is a maintenance upgrade, i.e. typographic errors, page references, etc.

New revision levels of the manual indicate a new rewrite of the manual. This may include new installation instructions for a particular operating system, or a new ROM version of the OptiPac subsystem. If the new revision is because of a difference in the operating procedures for the system, the ROM version associated with the manual Rev letter will be listed in the ROM Ver column. You can determine the ROM version of your OptiPac by using the front panel LCD controls. See chapter 4 for details.

If you have upgraded your OptiPac to a later version than the last one listed in the following table, you should contact Bering Customer Service to determine the proper revision of the *OptiPac 8611B User's Manual* required for your OptiPac subsystem.

Date = Date this manual was printed  
Rev = Revision level of this manual  
ROM Ver = Applicable subsystem ROM level

Date	Rev	Rom Ver	Changes to manual
Apr 2003	A	D.C	Initial release

## **Warranty Statement**

OptiPac products sold in the U.S.A. and Canada carry a standard one year warranty against defects in materials and workmanship.\* During the warranty period, Bering will, at its option, repair or replace equipment which proves to be defective.

OptiPac cartridge media is warranted against defects for one year from the date of purchase. If the media becomes defective, Bering will replace it upon receipt of the defective media from the customer.

All repairs will be performed at the factory. Any other arrangement, such as on-site service, will be at your expense. Before any product is returned for repair, a Return Materials Authorization number (RMA#) must first be obtained from a Customer Service representative.

Customer Service  
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The selection and use of media, supplies, and consumables is the customer's responsibility. Bering reserves the right to exclude from the warranty any damage caused by misuse of the product, unauthorized modification, shipping damage, non-Bering-approved media, interface, software, or cleaning supplies.

NO OTHER WARRANTY IS EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OR MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. BERING SHALL NOT BE LIABLE FOR CONSEQUENTIAL DAMAGES, DIRECTLY OR INDIRECTLY RELATED TO THE USE OR PERFORMANCE OF BERING PRODUCTS.

\*For products sold outside the U.S.A. and Canada, contact your local Bering distributor, representative, or dealer for warranty terms. Repairs and upgrades carry a limited time warranty. Contact a Bering sales representative or Customer Service Representative for details on the warranty period for replaced parts and upgrades.

## **Configuration Settings**

Use this table to record the configuration settings of your Bering OptiPac 8611B Magneto-optical disk drive subsystem.

Model \_\_\_\_\_

Serial Number \_\_\_\_\_

Time Zone \_\_\_\_\_

HP-IB Address \_\_\_\_\_

Format Switch       on                       off

## Table of Contents

1	<i>INTRODUCTION</i> . . . . .	1
	Features. . . . .	1
	Compatibility . . . . .	2
	Magneto-Optical Technology . . . . .	2
	Conventions in this Manual . . . . .	3
	Unpacking. . . . .	4
2	<i>INSTALLING THE DISK DRIVE</i> . . . . .	5
	Quick-Start Procedure . . . . .	5
	Connecting the OptiPac Drive. . . . .	6
3	<i>OPERATING THE DISK DRIVE &amp; CARTRIDGE.</i> . . . . .	7
	8611B Controls. . . . .	7
	MO Controls . . . . .	8
	Loading a Cartridge. . . . .	8
	Compatibility. . . . .	8
	Ejecting a Cartridge. . . . .	9
	Ejecting a Cartridge Without Power . . . . .	9
	Write-Protecting a Cartridge. . . . .	10
	Importing Data From an HP7906 . . . . .	10
4	<i>OPTIPAC SYSTEM FUNCTIONS</i> . . . . .	13
	System Menu. . . . .	14
	Main Menu. . . . .	15
	Change Ring . . . . .	15
	Unload Cartridge . . . . .	15
	Spin Down Disk . . . . .	16
	Spin Up Disk . . . . .	16
	Configurations. . . . .	16
	Utilities . . . . .	16
	Display Time and Messages . . . . .	16
	Configurations Submenu. . . . .	17
	Change HP-IB Address . . . . .	17
	Change Emulation . . . . .	17
	Change Format Switch . . . . .	17
	Use 12 / 24 Hour Clock . . . . .	18
	Set Time . . . . .	18
	Set Date . . . . .	19
	Utilities Submenu. . . . .	20
	Ring Utilities Submenu . . . . .	21
	Change Ring . . . . .	21
	Change Label. . . . .	21
	Copy Ring . . . . .	22
	Backup Rings. . . . .	22
	Restore Rings . . . . .	23
	Erase Ring . . . . .	24

	Erase Rings . . . . .	24
	Fixed Disk Utilities Submenu . . . . .	25
	Show DISK Information . . . . .	25
	Spin Down / Up Disk . . . . .	25
	Verify Disk . . . . .	26
	Format Disk . . . . .	26
	Erase Disk . . . . .	27
	Removable Disk Utilities Submenu . . . . .	28
	Show CARTRIDGE Information . . . . .	28
	Unload Cartridge . . . . .	28
	Verify Cartridge . . . . .	29
	Format Cartridge . . . . .	29
	Erase Cartridge . . . . .	30
	External Disk Utilities Submenu . . . . .	31
	Show External Disks . . . . .	31
	Verify External Disk . . . . .	31
	Import External Disk . . . . .	32
	Tests Submenu . . . . .	33
	Test LCD Display . . . . .	33
	Verify Media . . . . .	33
	Show Command Trace . . . . .	34
	Enable Firmware Load . . . . .	34
5	<i>CARING FOR THE DISK DRIVE &amp; CARTRIDGE</i> . . . . .	35
	General Safeguards . . . . .	35
	Cartridge Care . . . . .	36
	Preventive Maintenance . . . . .	36
6	<i>TROUBLESHOOTING &amp; SERVICE</i> . . . . .	37
	Before You Do Anything Else . . . . .	37
	Error Codes and LCD Messages . . . . .	37
	Fuse Replacement . . . . .	37
	If You're Still Having Problems . . . . .	38
A	<i>SPECIFICATIONS</i> . . . . .	39
	1.3GB Cartridge Disk Drive . . . . .	39
	1GB Fixed Disk . . . . .	40
	General . . . . .	41
B	<i>RACK MOUNT</i> . . . . .	43
	Installation . . . . .	43
	<i>INDEX</i> . . . . .	45



## INTRODUCTION

Congratulations on purchasing what we think is the finest removable cartridge system on the market. Bering OptiPac drives are built for years of reliable service. We're sure you'll agree as you begin to work with your drive.

### Features

The Bering OptiPac 8611B subsystems is a multi-function magneto-optical removable cartridge disk drive with a 1GB fixed disk compatible with Hewlett-Packard technical computers, such as the HP1000, using the AMIGO command set. In this manual we refer to the Bering OptiPac disk drive as *OptiPac* and all HP systems as *computer* unless otherwise indicated.

The OptiPac 8611B emulates the HP 79xxH disk drives, making it plug compatible with computer systems supporting the HP 7906H interface and protocol. It can emulate the HP 7906H, 7920H and 7925H drives.

These drives support Magneto Optical (MO) technologies.

Serving a wide range of storage needs, the OptiPac series come in the following configuration with HP7906H emulation. This provides a plug and play solution to the aging inventory of HP7906H disk drives.

- 8611B - a 1.3GB Magneto-Optical / Multi Function Cartridge drive with a 1.0GB fixed disk

The OptiPac 8611B subsystem uses a 3.5 inch removable cartridge which can store 1.3GB of data. This means:

- Your storage capacity is limited only by the number of cartridges you use.
- Your data is portable and secure. Just remove the cartridge from the drive and take it with you, or store it in a safe place.
- Your data cartridge is protected in a durable lexan case.
- Your OptiPac cartridge can be used to back up the data on fixed disks if your backup software supports that option.
- Front panel controls provide off-line copying of data from the fixed disk to the cartridge or from the cartridge to the fixed disk.
- Data can be imported directly from an HP 7906, 7920, or 7925 by using the front panel controls and without the use of a computer.
- Each OptiPac cartridge contains multiple rings, so physical removal is not required to change to another ring.
- Each ring is equivalent to a 10.1 GB cartridge from a HP7906H.

The OptiPac provides fast, reliable storage that's always on hand. The installation procedure is almost identical for all models. No software or

hardware modifications are required. The OptiPacs 8611B supports the latest HP AMIGO disk command sets.

**▲ DANGER:**

*Use of the OptiPac other than as prescribed in this manual may result in exposure to hazardous invisible laser radiation if the case is open during operation. Avoid direct exposure to laser radiation. Do not operate the OptiPac while the cover is removed.*

**Compatibility**

The OptiPac subsystems read, write, and format ISO 128MB, 230MB, 640MB cartridges, and the GIGAMO 1.3GB MO cartridge. The number of rings is less on any cartridge smaller than 1.3GB. Use the “Show Cartridge Information” function using the front panel control buttons to determine the number of rings on an inserted cartridge.

**Magneto-Optical  
Technology**

All of the Bering OptiPac disk drives are based on magnetic and optical technology. Like hard disks, a Magneto-Optical drive writes data to the cartridge using a strong magnet that changes the magnetic fields at specific locations from 1's to 0's and vice versa. But because of the polycarbonate surface of the cartridge, the magnet is not powerful enough to change the polarity of a bit by itself. This is where the optical part of the write process comes in. In order for the magnet to change the polarity of a bit, the area must be heated to a high temperature by a focused, fine-point laser.

Because of the Polycarbonate substrate on the cartridge, data stored on Magneto-optical cartridges is highly secure for a long period of time. The estimated storage life of data stored on this media is greater than twenty years. Also the magnetic head does not “float” next to the surface such as fixed disks. This means it is virtually impossible for the head to crash.

## Conventions in this Manual

We'll use the following conventions to make the information in this manual more clear and predictable:

- **Keys** on the keyboard are indicated by capital letters enclosed in square brackets, e.g., [ENTER], regardless of whether the characters on your keys are actually capitalized. On the other hand, **buttons** on the OptiPac are indicated by underlined capital letters alone followed by the word *button*, e.g., ENTER button.
- A monospaced type font, like `this`, is used to convey text you should see on your screen, e.g., "you'll see: `Welcome!` on your monitor."
- The same monospaced font in contrast (either bold or regular) to the surrounding text, like `this`, is used to present the exact characters or keys you are to type or press, e.g., "type `UTIL` and press `[ENTER]` to continue." However, these keystrokes will not be typographically differentiated if they are conditional or theoretical. That is, if you have the option of making one of several entries or we are speaking of hypothetical situations, e.g., "If you type Y and press [ENTER] the disk will be reformatted, but if you type N and press [ENTER] you will exit the program."
- A bold font, like **this**, indicates text you should see on the LCD. The bold font will otherwise follow the conventions herein.
- Commands, program, utility, and file names are capitalized in body text to distinguish them from the rest of the text. However, when in a command line, they will be represented in lower case letters unless upper case (capital) letters are actually required, e.g.:  
in body text: "... create a LIF volume using the LIFINIT command."  
to be typed: `lifinit /dev/rdisk/B8611B`
- Italics in any type face, like *this*, have a limited number of possible meanings:  
Words as words, letters as letters, or numerals as numerals, e.g., "the word *enter* can be confused with the key on your keyboard, therefore we will use *type* in its place."  
Titles of books, booklets, or disks, e.g., *Bering OptiPac 8611B User's Manual*  
Symbolic of variable words, characters, or numerals. That is, something must be in the variable's place, but the exact contents vary with different situations and cannot be specified without knowing a particular situation. *Variable* is not synonymous with *optional*. Frequently the letter(s) *n* (for numerals), or *x* (for words or characters) are used to hold the place of the variable, e.g., "the program will respond that there are *n* widgets."

## Unpacking

Carefully unpack your OptiPac near the spot where you want to set it up, noting the packing method as you go. Save the packing materials, they'll come in handy if you ever want to ship the unit.

Besides this manual, you'll find:

- The OptiPac
- A removable data cartridge
- A power cable
- A warranty card

If any item is missing, please call your dealer or call Bering Customer Service at (408) 364-6500.

## INSTALLING THE DISK DRIVE

This chapter describes the installation procedure for the OptiPac and is divided into two sections. The “Quick-Start Procedure” section enables experienced users to begin operation right away. The “Connecting the OptiPac Drive” section helps new users connect the disk drive before going on to the next chapter for additional operating instructions.

### Quick-Start Procedure

This section describes the quick-start procedure to set up the OptiPac for use on an HP 1000 system. Most of the parameters are already set at the factory. There may be some adjustments necessary before the OptiPac can operate in your particular environment. Refer to Chapter 4 for detailed instructions.

The default parameter settings are as follows:

Time:	Pacific time
Date:	current date
HP-IB address:	0

1. Turn off your computer and connect the OptiPac.  
If necessary, refer to the next section in this chapter.
2. Turn on the OptiPac and wait for the self-test to end.  
When the test ends without incident, the time and date should be displayed on the front panel LCD and the clock should be running.
3. Check the time and date. Adjust the clock if required.
4. Check the HP-IB address in the configuration function. Make sure all devices on the HP-IB have a unique address.
5. Load a cartridge.
6. Format the cartridge from the Removable Utilities menu. This step is not necessary if the cartridge was previously formatted.
7. Format the fixed disk from the Fixed Disk Utilities menu.
8. Turn on your computer.
9. Begin using the OptiPac.

## Connecting the OptiPac Drive

### ▲ CAUTION:

These instructions are for connecting an OptiPac 8611B model to an HP-IB based computer with the OptiPac HP-IB connector.

*Turn off your computer and unplug the power cord from the wall outlet. Disconnect any other cables attached to the back panel of your computer that may be in your way.*

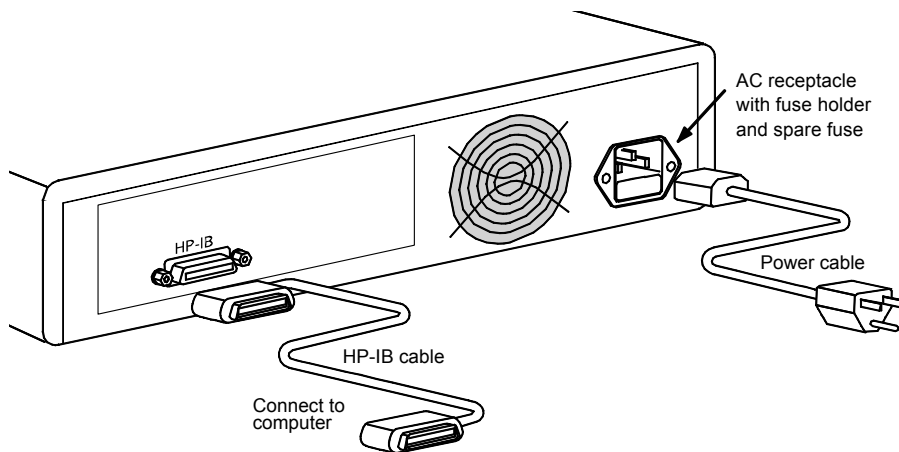


Figure 2-1: Connecting the OptiPac to an HP-IB computer

1. Turn off your computer and the OptiPac drive.
2. Connect one end of the HP-IB cable to the HP-IB connector on the back of the computer and the other end to the HP-IB connector on the back panel of the OptiPac. Tighten the thumb screws by hand.
3. Connect the power cable to the back of the OptiPac. Make sure there is at least one inch of space around the back and two inches around the sides of the drive.
4. Plug the OptiPac and the computer into a grounded electrical outlet or a surge protector.

Be sure that the outlets are grounded. The OptiPac should be on the same circuit as your computer.

### ▲ CAUTION:

*Make sure that other equipment or appliances which might generate electrical noise or a power surge (such as electric typewriters or heaters) are on separate circuits.*

5. Turn on the OptiPac, the computer, and any other peripherals.

## OPERATING THE DISK DRIVE & CARTRIDGE

### 8611B Controls

Figure 3-1 illustrates all controls and indicators required for operating the OptiPac 8611B.

1. Press the **POWER** button on the front panel of the OptiPac.

The LCD will display a self-test message and the disk drive model number. This operation should take less than a minute. If a cartridge is loaded, a read test will be performed. After the self-test is successfully completed, the time, date and current ring will be displayed on the LCD.

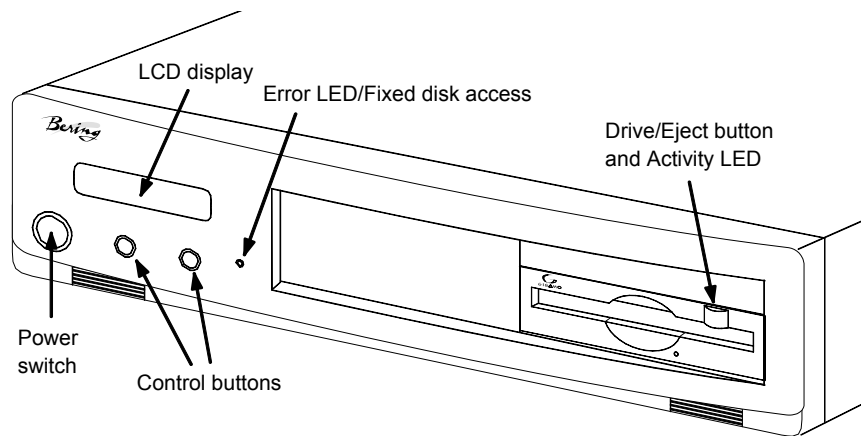


Figure 3-1: OptiPac 8611B front panel

#### Drive Button

The drive button is always locked out. The cartridge will not eject when this button is depressed because the OptiPac controller has issued a lock command to the cartridge drive. The cartridge must be ejected using the **Unload cartridge** function in the LCD main menu.

#### Fixed Disk Access Indicator

The fixed disk access indicator is on the lower middle of the front bezel. Whenever the fixed disk is accessed the LED will flash on.

#### Error LED

The Error LED turns red and stays illuminated when a system error is detected. This LED is also used as a fixed disk access LED. It flashes green when the fixed disk in the model 8611 is accessed.

**MO Controls**

The MO drive controls are simple.

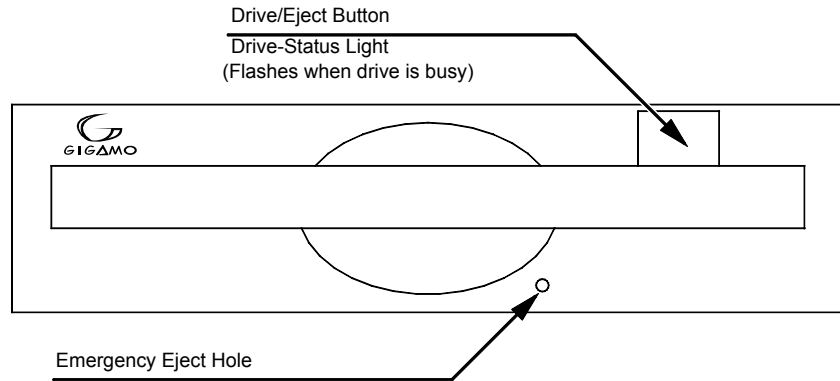


Figure 3-2: MO controls

**Emergency Eject Hole**

In an emergency, such as a power outage, the cartridge can be manually ejected by inserting a tool into this opening. Read the complete instructions in the section titled “Ejecting a Cartridge Without Power.”

**Loading a Cartridge**

Loading a data cartridge is very much like loading a diskette.

1. Make sure the OptiPac is turned on before you load a cartridge.
2. Remove the cartridge from its plastic storage case.
3. Insert the cartridge into the drive slot with the label side up and push the cartridge straight in, keeping it parallel with the top and bottom of the drive.
4. Slide the cartridge all the way into the drive.

The activity LED on the front of the removable drive will flash green as the drive spins up. After a brief test, the LED will extinguish when the drive is ready. Thereafter, the status LED will flash whenever the removable disk is accessed.

**▲ CAUTION:**

*Never move or transport the OptiPac with a cartridge in the drive. This may damage the cartridge and cause read/write head damage.*

**Compatibility**

The OptiPac subsystems read, write, and format ISO 128MB, 230MB, 640MB cartridges, and the GIGAMO 1.3GB MO cartridge. The number of rings is reduced with the smaller capacity cartridges. For full fixed disk backup capabilities, the GIGAMO 1.3GB cartridges should be used.



## Ejecting a Cartridge

It is important to remove the cartridge before you turn off the OptiPac. If you leave the cartridge in the drive, the shutter remains open and the recording media itself is vulnerable to dust. If the OptiPac is turned off prior to cartridge removal, the automatic disk spin-down operation does not occur and the cartridge disk will spin freely for up to 45 seconds. Attempting to remove the cartridge during this time may damage the media.

The OptiPac must be turned on before you can unload a cartridge. If the Drive button is enabled, which is the default, just press the eject button on the front of the MO drive and proceed directly to step 3. If the drive button is disabled perform the following steps to eject a cartridge.

1. With the time function displayed on the LCD, push the **SELECT** button on the front panel.

The **Unload cartridge** function(s) will be displayed. For the 8602 dual-drive system two options will be available:

### Unload cartridge

2. Push the **ENTER** button to execute the command.

The cartridge will spin down and eject from the drive.

**Note:** NEVER eject a cartridge while the file system is mounted on your operating system.

3. Remove the cartridge carefully and place it in the protective plastic storage case immediately.

Remember to label and date the cartridge for future reference. Do not mark on labels with a graphite pencil. The graphite dust may contaminate the disk surface. Refer to Chapter 5, "Caring for The Disk Drive & Cartridge," for further information on cartridge care.

## Ejecting a Cartridge Without Power

While the OptiPac is not powered on, you can manually eject a cartridge.

### ▲ CAUTION:

*Never manually eject a cartridge while the power is on. This can damage the drive and invalidate the warranty.*

1. Wait for 45 seconds or more after the power is off.
2. Insert a paper clip into the emergency reject hole on the front of the drive.
3. Gently push the paper clip into the hole until the cartridge pops out.
4. Return the cartridge to its protective case for storage or transport.

## Write-Protecting a Cartridge

The MO cartridge can be physically write protected by pushing open the slide cover on the cartridge. This is similar to write protecting a floppy diskette.

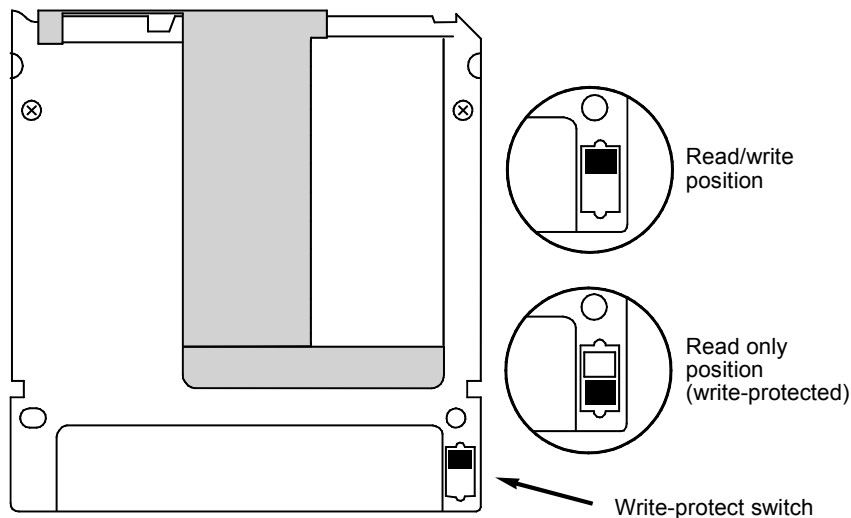


Figure 3-3: Cartridge write-protect switch

## Importing Data From an HP7906

Before attaching the OptiPac 8611B to your computer, you may want to import the data from your HP 7906H. This can be accomplished using the front panel controls of the OptiPac.

1. Power off the OptiPac 8611B and your HP 7906H.
2. Using an HPIB cable attach the OptiPac the 7906 together. Do not attach the HPIB chain to the computer.
3. Power on the 7906 and the OptiPac.
4. Insert an MO cartridge into the OptiPac, and an HP cartridge into the 7906.
5. Press **SELECT** until Change emulation is displayed, then press the **ENTER** button to choose this function.

The following message will appear:

```
HPxxxxx disk
emulation
```

6. Press the **SELECT** button to toggle through the available emulations for your OptiPac model. To import from an HP7906 you must select HP7906.
7. Press the **ENTER** button when HP7906 is displayed.

8. Change the OptiPac to the ring you wish to copy the data to. This can be a ring on the OptiPac hard drive or the MO cartridge. Press **SELECT** until Change Ring is displayed and press **ENTER**.
9. Press **SELECT** to scroll through the rings. Rings on the hard drive have an "H" in front of the ring number. Press **ENTER** when the desired ring number is displayed.
10. Using the OptiPac front panel controls press the **SELECT** button until Utilities is displayed and press **ENTER**.
11. Press **SELECT** until External Disk Utilities is displayed and press **ENTER**.
12. Press **SELECT** until Import external disk is displayed, then press the **ENTER** button. The OptiPac will find a drive on the HP-IB chain and display a message similar to the following:

```
7906 at 1,0
Import? No
```

13. If this is the drive to be imported to the OptiPac, press **SELECT** to toggle from No to Yes and press **ENTER**; otherwise, press **ENTER** while No is displayed to select another device. If you selected Yes a message similar to the following will be displayed:

```
Import from
Removable/Fixed? Yes
```

14. Press **SELECT** to toggle between Removable and Fixed and then press the **ENTER** button.

```
Start the
import? Yes
```

15. Press **ENTER** while Yes is displayed to start the import function. The progress is shown with the following message:

```
Importing
cyl nn of 411
```

When the import is complete the following message will be displayed:

```
Import done at
11:28:33AM
```



This chapter describes the OptiPac configuration and operating procedures. The OptiPac 8611B features a push-button operation for performing configuration and operating procedures. This procedure is based on a hierarchical structure of system functions displayed on the disk drive's LCD. All procedures can be performed using the two front panel push-button controls: **SELECT** and **ENTER**.

These instructions should be used in conjunction with your specific HP computer's configuration procedure given in your operating system manuals.

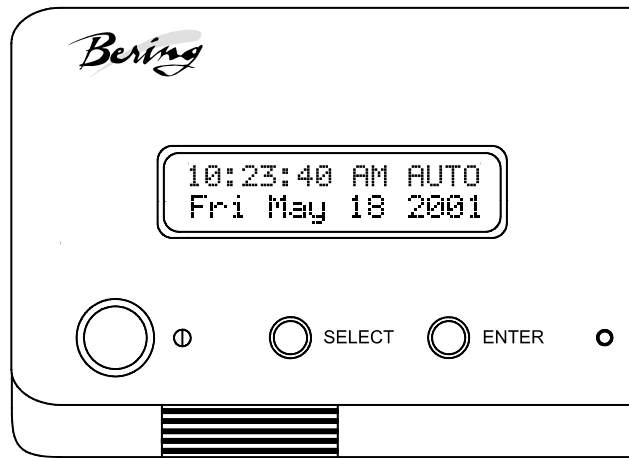


Figure 4-1: Front panel LCD and push-button controls

All system operations are performed by first selecting a function and then entering it for execution. The **SELECT** button enables you to scroll through all the available system functions and select desired choices. The **ENTER** button enables you to execute the chosen function.

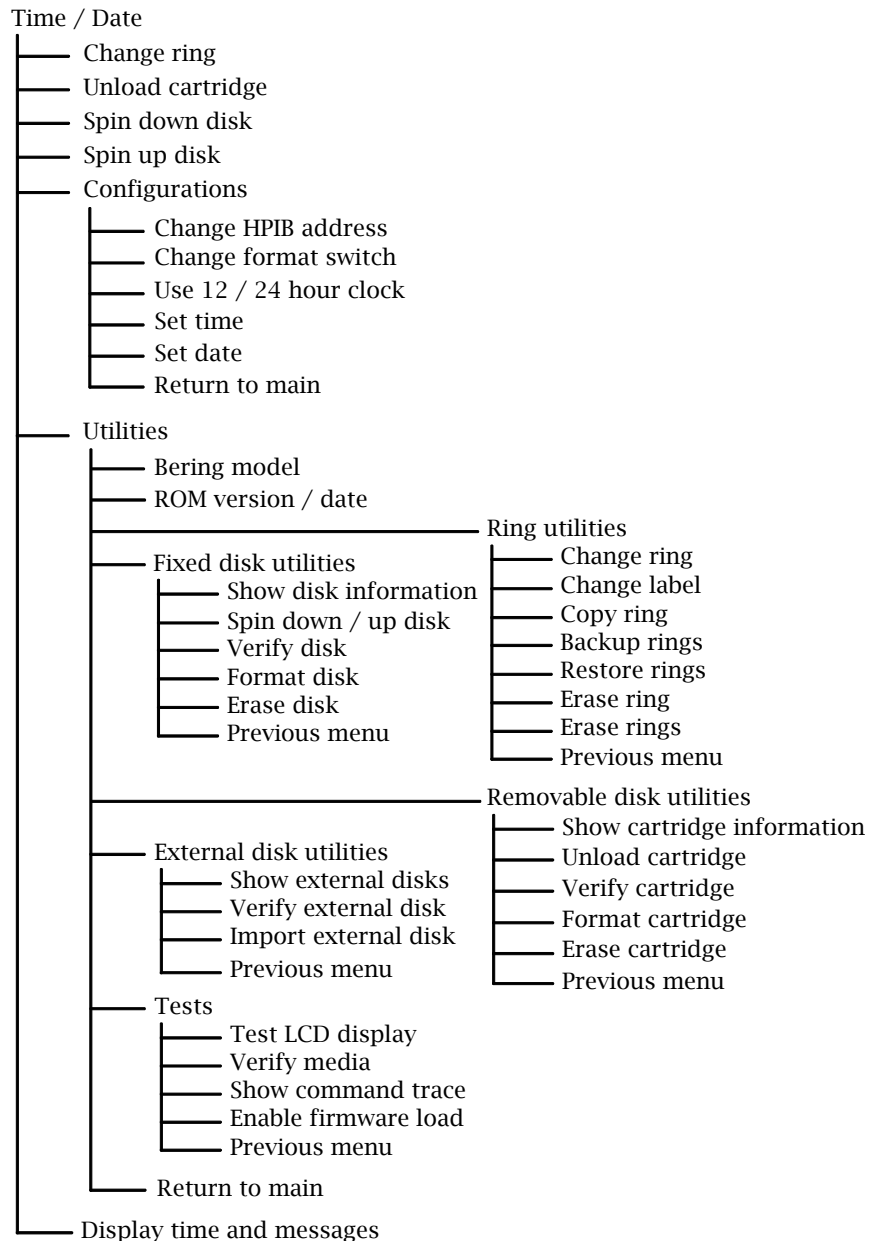
- To select a system function, press the **SELECT** button until the desired function appears on the LCD.
- To execute the chosen function or display its options, press the **ENTER** button.
- If you want to abort the current operation, press the **SELECT** and **ENTER** buttons simultaneously.

The abort function is allowed only during certain operations.

- To scroll or step backward in a menu, press and hold the **SELECT** button first and then the **ENTER** button.

**System Menu**

This section contains a menu structure of the commands which can be accessed from the front panel LCD display and controls.



## Main Menu

The default display on the front panel LCD is the time/date. When the **SELECT** button is pressed, the first choice of the Main menu will be displayed. You can scroll the Main menu by repeatedly pressing the **SELECT** button. To execute the selected function or to enter the sub-menu, press the **ENTER** button. The time/date display will look appear similar to the following display when the system is first powered on and when the unit is on-line:

```
14:15:12AM 10/12  
Ring 04 LABEL
```

**Note:** Attempting to perform any function on a new and/or unformatted cartridge will cause the following message to display.:

```
Media not  
initialized!
```

The cartridge must be formatted from the Removable Utilities menu before it can be used.

The following options are available from the Main menu:

```
Change ring  
Unload cartridge  
Spin down / up disk  
Configurations  
Utilities  
Display time and messages
```

## Change Ring

This function allows you to change the current ring. When you return to the main menu the current ring will be displayed. Rings that begin with 'H' indicate a ring on the hard disk. Ring H00 emulates the hard disk in a 7906H. All other rings emulate removable disks.

1. Press the **SELECT** button until the Change ring function is displayed on the Main menu.
2. Press **ENTER** to select this option.
3. Use the **SELECT** button to scroll through the ring selections until you see the desired ring, then press the **ENTER** button.

**Note:** Removing a cartridge while the current ring is on the cartridge will cause the unit to go off-line.

## Unload Cartridge

Use this function to unload the cartridge from the drive.

1. Use the **SELECT** button to choose the function you want to initiate from the Main menu:  

```
Unload cartridge
```
2. Press the **ENTER** button.

If the cartridge is in use by the operating system, the following message will appear.

**Cartridge in use  
UNLOAD IT! (NO)**

3. Press the **SELECT** button to select **Yes**, if need be; when **Yes** is selected, press the **ENTER** button to eject the cartridge.

### **Spin Down Disk**

This function will spin the drives down. Using this function will help prevent wear on a drive which is constantly powered on. These functions will affect the optical drive as well as any fixed disks in the OptiPac.

1. Press the **ENTER** button to execute the displayed function.

The drives will then spin down.

### **Spin Up Disk**

This function will spin the drive(s) up. If the drive is already spinning, this function will have no effect.

1. Press the **ENTER** button to execute the displayed function.

The drives will then spin up.

### **Configurations**

This function sets the HP-IB address, changes format switch, selects the 24 hour clock format, and sets the date and time. See the "Configurations Submenu" section for detailed information.

### **Utilities**

This function shows cartridge/disk information; verifies, and formats the cartridge; formats the fixed disk; erases cartridge data; performs ring functions, and performs test functions. Refer to the "Utilities Submenu" section for detailed information.

### **Display Time and Messages**

This function exits the Main menu and displays the current date, time, and system messages.



## Configurations Submenu

This function sets the HP-IB address, changes the format switch, and sets the date and time.

1. Press the **ENTER** button when the Configurations function is displayed on the Main menu.

The Configurations submenu will offer these functions:

Change HP-IB address  
Change emulation  
Change format switch  
Use 12 / 24 hour clock  
Set time  
Set date

2. Press the **SELECT** button to scroll through the functions.

To return to the Main menu, press the **ENTER** button when you see **Return to main**.

## Change HP-IB Address

This function sets the HP-IB address of the OptiPac. The values range from 0 to 7. When selecting the HP-IB address, make sure each device on the same HP-IB has a unique address.

1. Press the **ENTER** button to execute this function.

The following message will appear:

HP-IB address = 0

2. Press the **SELECT** button to scroll through all the choices, then press the **ENTER** button to select the correct address.

The OptiPac will reset to the new value.

## Change Emulation

This function enables or disables HP disk emulation for the OptiPac 8611B. When enabled, the OptiPac will emulate an HP disk. The default setting is enabled.

1. With the Change emulation function displayed, press the **ENTER** button to choose this function.

The following message will appear:

HPxxxxx disk  
emulation

2. Press the **SELECT** button to toggle through the available emulations for your OptiPac model (disabled, HP7906, HP7920, HP7925).
3. Press the **ENTER** button to choose the desired setting.

## Change Format Switch

This emulates the switch on the front panel of a HP 7906H disk drive. Setting the switch to on enables formatting of the current ring from the computer.

To change the setting of the format switch between on and off follow these instructions:

1. Press the **ENTER** button when the Configurations function is displayed on the Main menu.
2. Use the **SELECT** button to scroll through the selections until you see **Change format switch**.
3. Press the **ENTER** button to select this option.

The LCD display will now show the following message:

**Change format  
switch (on)**

4. Press the **ENTER** button to select this option or the **SELECT** button to scroll between off and on and then press **ENTER** at the desired setting.

### Use 12 / 24 Hour Clock

This function changes the clock display on the front panel LCD from a 12 hour clock to a 24 hour clock or vice versa.

1. Press the **ENTER** button until the **Use 12 / 24 hour clock** function is displayed on the Configurations menu.
2. Press **ENTER** to select this option.
3. Use the **SELECT** button to toggle between 12 and 24. Then press the **ENTER** button when the desired option is displayed.

### Set Time

This function allows you to change the time.

1. With the **Set time** function displayed, press the **ENTER** button.

You'll see:

**Set time  
3:15:27 PM**

The actual time displayed will vary. The hour field will be blinking.

2. Press the **SELECT** button to increment the hour.

Holding the **SELECT** button will cause the hour to increment (through twelve hours) continuously. If you continue to hold down the **SELECT** button, incrementing will speed up.

To decrement the hour, press and hold the **SELECT** button, and then press the **ENTER** button. Again, decrementing will be continuous and speeds up if you hold the buttons down.

3. When the correct hour is displayed, press the **ENTER** button.
4. **SELECT** and **ENTER** the correct minute setting just as you did the hour.
5. **SELECT** and **ENTER** the correct setting for seconds.
6. **SELECT** and **ENTER** the correct AM/PM setting.

## **Set Date**

You will now be returned to the **Set time** option.

This function allows you to change the date.

1. With the **Set date** function displayed, press the **ENTER** button.

You'll see:

**Set date**  
*Wed Jan 16, 2002*

The actual date displayed will vary. The day field will be blinking.

2. Press the **SELECT** button to increment the day.

Holding the **SELECT** button will cause the day to increment (through twelve hours) continuously. If you continue to hold down the **SELECT** button, incrementing will speed up.

To decrement the day, press and hold the **SELECT** button, and then press the **ENTER** button. Again, decrementing will be continuous and speeds up if you hold the buttons down.

3. When the correct day is displayed, press the **ENTER** button. The month field will start to blink.
4. **SELECT** and **ENTER** the correct month setting just as you did the day.
5. **SELECT** and **ENTER** the correct date setting.
6. **SELECT** and **ENTER** the correct year setting.

After you have made this setting, you'll be returned to the **Set date** option.

## Utilities Submenu

This function shows cartridge or fixed disk information; verifies, and formats the cartridge; copies and erases cartridge data; formats and verifies the fixed disk; and performs test functions via these options:

- **MODEL NUMBER** — Displays the model number of the OptiPac.
- **ROM VERSION** — Displays the firmware version number and release date.
- **SERIAL NUMBER**— Displays the serial number of the OptiPac stored in the CMOS memory.
- **RING UTILITIES** — Changes rings; changes ring labels, copies rings, backs up and restores rings, and erases rings. Refer to the “Ring Utilities Submenu” section for detailed information.
- **FIXED DISK UTILITIES** — Shows disk information; verifies, and formats the disk. Refer to the “Fixed Disk Utilities Submenu” section for detailed information.
- **REMOVABLE DISK UTILITIES** — Shows cartridge information; unloads, verifies, and formats the cartridge. Refer to the “Removable Disk Utilities Submenu” section for detailed information.
- **EXTERNAL DISK UTILITIES** — Shows information about other disk units attached to the HP-IB chain, tests other disk units, and imports data from other disk units.
- **TESTS** — Tests the LCD, verifies, and certifies media. Refer to the “Test Submenu” section for detailed information.

To access and exit these utilities ...

1. Press the **ENTER** button when the Utilities function is displayed on the Main menu.

The Utilities submenu appears and displays the following functions:

```

Model number
ROM version
Serial number
Ring utilities
Fixed disk utilities
Removable disk utilities
External disk utilities
Tests
Return to main

```

2. Press the **SELECT** button to scroll through the information or functions.
3. When you see Return to main , press the **ENTER** button to return to the Main menu.

## Ring Utilities Submenu

This function changes rings, labels rings, copies rings backs up and restores groups of rings and erases rings.

1. Press the **ENTER** button when the Ring utilities function is displayed on the Utilities submenu.

The Ring utilities submenu then appears displaying these functions:

Change ring  
Change label  
Copy ring  
Backup rings  
Restore rings  
Erase ring  
Erase rings  
Previous menu

2. Press the **SELECT** button to scroll through the information or functions.
3. You can return to the Utilities menu by pressing the **ENTER** button when you see Previous menu.

## Change Ring

This function allows you to change the current ring. When you return to the main menu the current ring will be displayed. Rings that begin with 'H' indicate a ring on the hard disk. Ring H00 emulates the hard disk in a 7906H. All other rings emulate removable disks.

1. Press the **SELECT** button until the Change ring function is displayed.
2. Press **ENTER** to select this option.
3. Use the **SELECT** button to scroll through the ring selections until you see the desired ring, then press the **ENTER** button.

### Note:

Removing a cartridge while the current ring is on the cartridge will cause the OptiPac to go off-line.

## Change Label

This function allows you to change the label of the current ring. The main menu will display the current ring label. The label can be up to seven characters in length.

1. Press the **SELECT** button until the Change Label function is displayed on the Ring utilities menu.
2. Press the **ENTER** button to select this option.  
The current label will display.
3. Press the **SELECT** key to scroll through the characters (A-Z, 0-9) for the desired digit. A space is represented by an underscore character.
4. Press the **ENTER** key to select a letter and go to the next digit.

**Copy Ring**

This function allows you to copy any ring to any other ring, except the H00 ring, which cannot be copied to or from. This function can be used to declassify a ring by copying a declassified ring to it. The label of the source ring will also be copied to the target ring.

1. Press the **SELECT** button until the **Copy ring** function is displayed on the Ring utilities menu.
2. Press **ENTER** to select this option.
3. Use the **SELECT** button to scroll through the copy from ring selections until you see the desired source ring, then press the **ENTER** button.
4. Use the **SELECT** button to scroll through the copy to ring selections until you see the desired target ring, then press the **ENTER** button.

You will see a display similar to this:

```
H02 Label to
03 Label No
```

5. Press the **SELECT** button to change **No** to **Yes** and press the **ENTER** button to start the copy process.

**Backup Rings**

This function allows you to backup a group of rings from one location to another. The destination can be from one drive to the other or from one area of a drive to another area of the same drive. This function begins by asking for the beginning, or first ring, of the group to be backed up, then asks for the beginning, or first ring, where the group of rings is to be backed up to, and then asks for the number of rings to be backed up.

The default values backup the highest numbered rings on the fixed disk equivalent to the number of rings on the cartridge (100 on the 2.6GB cartridge), so rings H00 through H98 will be backed up.

1. Press the **SELECT** button until the **Backup rings** function is displayed on the Ring utilities menu.
2. Press **ENTER** to select this option

You will see the following display:

```
From ring
H00
```

3. Press the **SELECT** button to scroll through all of the rings and press **ENTER** when the desired beginning or first source ring is displayed.

You will see a display similar to the following:

```
To ring
00
```

4. Use the **SELECT** button to scroll through the rings and press **ENTER** when the desired beginning or first target ring is displayed.

You will see a display similar to the following:

```
H00          to
00 99 rings NO
```

5. Press the **SELECT** button to toggle between **Yes** and **No** on the display and press **ENTER** when the correct selection is displayed.

If you selected Yes, the selected number of rings will be backed up from the source rings to the target rings.

## Restore Rings

This function allows you to restore a group of rings from one location to another. The destination can be from one drive to the other or from one area of a drive to another area of the same drive. This function begins by asking for the beginning, or first ring, of the group to be restored, then asks for the beginning, or first ring, where the group of rings is to be restored to, and then asks for the number of rings to be restored.

The default values will restore all rings on the cartridge (99 on 2.6GB cartridge, 64 on 1.3GB cartridge) to the last rings of fixed disk.

1. Press the **SELECT** button until the **Restore rings** function is displayed on the Ring utilities menu.
2. Press **ENTER** to select this option

You will see the following display:

```
From ring
00
```

3. Press the **SELECT** button to scroll through all of the rings and press **ENTER** when the desired beginning or first source ring is displayed.

You will see a display similar to the following:

```
To ring
H00
```

4. Use the **SELECT** button to scroll through the rings and press **ENTER** when the desired beginning or first target ring is displayed.

You will see a display similar to the following:

```
00          to
H00 99 rings NO
```

5. Press the **SELECT** button to toggle between **Yes** and **No** on the display and press **ENTER** when the correct selection is displayed.

If you selected Yes, the selected number of rings will be restored from the source rings to the target rings.

**Erase Ring**

This function will erase the current ring by performing a DOD wipe delete. This wiping of data is done by first filling the sectors with the hexadecimal characters FF and 00 three times each, then to write the hexadecimal character F6 once. This method prevents any traces of data from being read, even with sophisticated techniques.

1. Press the **SELECT** button until the **Erase ring** function is displayed on the Ring utilities menu.
2. Press **ENTER** to select this option.
3. Press the **SELECT** button to toggle between **Yes** and **No** and press the **ENTER** button when your selection is displayed.

A display similar to the following will display.

```
Erasing ring 25
pattern 1 of 7 <>
```

After confirming your selection the erase function will begin. When the erase function is complete, the label of the erased ring will be “aaaaaa” because that was the last pattern written.

**Erase Rings**

This function is identical to the Erase ring function, except it will erase a sequential range of rings. You will be asked for a beginning ring and the number of rings to be erased.

1. Press the **SELECT** button until the **Erase rings** function is displayed on the Ring utilities menu.
2. Press **ENTER** to select this option.
3. Use the **SELECT** button to scroll through the erase from ring selections until you see the desired beginning ring, then press the **ENTER** button.
4. Use the **SELECT** button to scroll through the number of rings selections until you see the desired number of rings to be erased, then press the **ENTER** button. The value will default to the number of rings between the current ring and the end of the drive you are currently on.

**▲ CAUTION:**

*Remember to count the first ring as one of the rings to be erased. So, to erase rings 25 through 30 will be a total of six rings—not five.*

You will see a display similar to this:

```
Erase 06 rings
(25) label No
```

5. Press the **SELECT** button to change **No** to **Yes** and press the **ENTER** button to start the erase process.

A display similar to the one in the **Erase ring** function above will display the progress of the **Erase rings** function and the current pattern.



**Fixed Disk Utilities Submenu**

This function shows disk information; verifies, and formats the fixed disk, and spins the disk down or up.

1. Press the **ENTER** button when the Fixed disk utilities function is displayed on the Utilities submenu.

The Fixed disk utilities submenu then appears displaying the following functions:

Show DISK information  
Spin down/up disk  
Verify disk  
Format disk  
Erase disk  
Previous menu

2. Press the **SELECT** button to scroll through the information or functions.
3. You can return to the Utilities menu by pressing the **ENTER** button when you see Previous menu.

**Show DISK Information**

This function displays information similar to the following list about the fixed disk.

Number of rings  
Ring capacity  
Ring size (cylinders)  
Ring cylinder size (tracks)  
Ring track size in sectors  
Total sectors in ring  
Total capacity of drive (kbytes)  
Logical sector size  
Physical sector size  
Interleave  
Date disk last formatted\*  
Date disk last written\*  
Date disk last accessed\*

\* only if disk is formatted.

1. Press the **ENTER** button to scroll through each field.

**Spin Down / Up Disk**

This function will spin the fixed disk drive down or up. Using this function will help prevent wear on a drive which is constantly powered on.

1. Press the **ENTER** button to execute this function.

If the drive is already spun down, you will see the following message:

Spin up  
disk

2. Press the **ENTER** button to spin the drive up.

The drive will spin up at the first sign of activity on the HP-IB bus, or when the LCD front panel controls access the drive.

**▲ CAUTION:**

*If the computer system attempts to access the OptiPac while it is spun down, the drive will automatically spin up, but the computer system may time-out before the drive is ready, causing a system error.*

**Verify Disk**

This function scans every sector on the fixed disk for defects. If a bad sector is found, this function will terminate with the LCD showing the error.

1. Press the **ENTER** button to start.

As the verification progresses, the record address is updated. The following message will appear:

```
Verify DISK
record n
```

2. To abort the function at any time, press and hold both the **SELECT** and **ENTER** buttons simultaneously until the following message appears:

```
Abort received.
wait ...
```

3. Release the buttons.

The function will abort at the appropriate time and you'll see:

```
User abort
```

4. Press the **ENTER** button to exit.

When you've exited the function, the following message will appear:

```
n complete
verifies done
```

5. Press the **ENTER** button to return to the Fixed disk utilities submenu.

**Format Disk**

This function is used to format the fixed disk if the FORMAT utility is not available in your host system.

**▲ CAUTION:**

*The Format Disk function will erase all data on the fixed disk.*

1. Press the **ENTER** button when the **Format disk** function is displayed on the Fixed disk utilities submenu.

The Format disk submenu then appears displaying the following message:

```
Erase entire
media? NO
```

2. Press the **SELECT** button to toggle between YES and NO.
3. Select YES and press the **ENTER** button to continue.

The following message will appear:

```
Set interleave  
to 1
```

4. Use the **SELECT** button to select button to scroll through the options (I-10), choose one and press the **ENTER** button to start the format process.

The following message will appear:

```
1 vols      256 bps  
continue?   No
```

If you choose **No** the FORMAT option will quit and you'll be returned to the Removable disk utilities menu.

5. Use the **SELECT** button to select **Yes** and press the **ENTER** button to start the format process.

The following message will appear:

```
Formatting  
DISK
```

Formatting will take up to 1 hour. When the process is complete, the following message will appear:

```
DISK  
formatted
```

6. Press the **ENTER** button to return to the Fixed disk utilities submenu.

## Erase Disk

This function will erase the entire fixed disk by performing a DOD wipe delete. This wiping of data is done by first filling the sectors with the hexadecimal characters FF and 00 three times, then to write the hexadecimal character F6 once. This method prevents any traces of data from being read, even with sophisticated techniques.

### ▲ CAUTION:

*The erased fixed disk will be unreadable and must be formatted again to be usable.*

1. Press the **ENTER** button when the Erase disk function is displayed on the fixed disk utilities submenu.

The Erase disk submenu will appear and ask:

```
Erase entire  
media? NO
```

2. Use the **SELECT** button to select YES and press the **ENTER** button to continue.

Upon successful completion, the following message will appear:

**DISK  
erased**

3. Press the **ENTER** button to return to the Fixed disk utilities submenu.

### Removable Disk Utilities Submenu

This function shows cartridge information; locks and unlocks, verifies, and formats the cartridge.

1. Press the **ENTER** button when the Removable disk utilities function is displayed on the Utilities submenu.

The Removable disk utilities submenu then appears displaying the following functions:

**Show CARTRIDGE information**  
**Unload cartridge**  
**Verify cartridge**  
**Format cartridge**  
**Erase cartridge**  
**Previous menu**

2. Press the **SELECT** button to scroll through the information or functions.
3. You can return to the Utilities menu by pressing the **ENTER** button when you see Previous menu.

### Show CARTRIDGE Information

This function displays information similar to the following list about the cartridge.

Number of rings  
Ring capacity  
Ring size (cylinders)  
Ring cylinder size (tracks)  
Ring track size in sectors  
Sectors in ring  
Total capacity of drive (kbytes)  
Logical sector size  
Physical sector size  
Interleave  
Date cartridge last formatted\*  
Date cartridge last written\*  
Date cartridge last accessed\*

\* Not displayed for unformatted cartridges.

1. Press the **ENTER** button to scroll through each field.

### Unload Cartridge

This is the same as **Unload cartridge** in the Main menu.

**Verify Cartridge**

This function scans every sector on the cartridge for defects. If a bad sector is found, this function will terminate with the LCD showing the error.

1. Press the **ENTER** button to start.

As the verification progresses, the record address is updated. The following message will appear:

```
Verify CARTRIDGE  
record n
```

2. To abort the function at any time, press and hold both the **SELECT** and **ENTER** buttons simultaneously until the following message appears:

```
Abort received.  
wait ...
```

3. Release the buttons.

The function will abort at the appropriate time and you'll see:

```
User abort
```

4. Press the **ENTER** button to exit.

When you've exited the function, the following message will appear:

```
n complete  
verifies done
```

5. Press the **ENTER** button to return to the Removable disk utilities submenu.

**Format Cartridge**

All new cartridges must be formatted with this utility before using on the computer system. This function is used to format the cartridge if the FORMAT utility is not available in your host system.

1. Press the **ENTER** button when the **Format cartridge** function is displayed on the Removable disk utilities submenu.

The Format cartridge submenu then appears displaying the following message:

```
Erase entire  
media? NO
```

2. Press the **SELECT** button to toggle between YES and NO.
3. Select YES and press the **ENTER** button to continue.

The following message will appear showing the number of volumes (**vol**s) and the sector size (**bps** = bytes per sector):

```
1 vol 256 bps  
continue? NO
```

4. Use the **SELECT** button to select **YES** and press the **ENTER** button to start the format process.

The following message will appear:

```
Formatting
CARTRIDGE
```

Formatting will take up to 1 hour. When the process is complete, the following message will appear:

```
CARTRIDGE
formatted
```

5. Press the **ENTER** button to return to the Removable disk utilities submenu.

### Erase Cartridge

This function will erase the entire cartridge by performing a DOD wipe delete. This wiping of data is done by first filling the sectors with the hexadecimal characters FF and 00 three times, then to write the hexadecimal character F6 once. This method prevents any traces of data from being read, even with sophisticated techniques.

#### ▲ CAUTION:

*The erased cartridge will be unreadable and must be formatted again to be usable.*

1. Press the **ENTER** button when the **Erase cartridge** function is displayed on the Removable disk utilities submenu.

The Erase cartridge submenu will appear and ask:

```
Erase entire
media? NO
```

2. Use the **SELECT** button to select **YES** and press the **ENTER** button to continue.

Upon successful completion, the following message will appear:

```
CARTRIDGE
erased
```

3. Press the **ENTER** button to return to the Removable disk utilities submenu.

## External Disk Utilities Submenu

This function shows information about other disk units on the HP-IB bus, verifies (tests) the external units, and imports data from external disk units to the OptiPac cartridge.

**Warning:** These utilities will not function if the OptiPac and other devices on the HP-IB chain are connected to the computer and the computer is powered on. The OptiPac will lock up with a blank display. Disconnect the computer from the HP-IB cable before using the External Disk Utilities.

1. Press the **ENTER** button when the External disk utilities function is displayed on the Utilities submenu.

The External disk utilities submenu then appears displaying the following functions:

Show external disks  
Verify external disk  
Import external disk  
Previous menu

2. Press the **SELECT** button to scroll through the information or functions.
3. You can return to the Utilities menu by pressing the **ENTER** button when you see Previous menu.

## Show External Disks

This function displays the following about the external disk:

Model and address  
Volume capacity in KB  
Interleave  
Logical sector size

1. Press the **SELECT** button to scroll through each field.

When the last device is completed, the following message will be displayed:

No more disks

This message is also displayed if no devices are attached to the OptiPac.

## Verify External Disk

This function reads the volume to ascertain the integrity of all sectors in the volume.

1. Press the **ENTER** button when Verify external disk is displayed on the External Disk Utilities menu. The OptiPac will find the a drive on the HP-IB chain and display a message similar to the following:

Verify 7906  
at 1,0? Yes

2. If this is the drive to be verified, press the **ENTER** button while Yes is displayed; otherwise press **SELECT** to toggle to No and press the **ENTER** button to find the next available device on the HP-IB chain.

When you select a drive a message similar to the following message will be displayed:

```
Verifying
7906 at 1,0
```

When the verify is complete the following message will be displayed:

```
11:22:42AM
verified
```

### Import External Disk

This function imports data from another disk drive to the current ring of the MO cartridge in the OptiPac.

1. Press the **ENTER** button when Import external disk is displayed on the External Disk Utilities menu. The OptiPac will find a drive on the HP-IB chain and display a message similar to the following:

```
7906 at 1,0
Import? No
```

2. If this is the drive to be imported to the OptiPac, press **SELECT** to toggle from No to Yes and press **ENTER**; otherwise, press **ENTER** while No is displayed to select another device. If you selected Yes a message similar to the following will be displayed:

```
Import from
Removable/Fixed? Yes
```

3. Press **SELECT** to toggle between Removable and Fixed and then press the **ENTER** button.

```
Start the
import? Yes
```

4. Press **ENTER** while Yes is displayed to start the import function. The progress is shown with the following message:

```
Importing
cyl nn of 411
```

When the import is complete the following message will be displayed:

```
Import done at
11:28:33AM
```



## Tests Submenu

This function shows statistics, tests the LCD, and certifies media.

1. Press the **ENTER** button when the **Tests** function is displayed on the Utilities submenu.

The Tests submenu will appear displaying the following functions:

Test LCD display  
Verify media  
Show command trace  
Enable firmware load

2. Press the **SELECT** button to scroll through the information or functions.
3. To return to the Utilities menu, press the **ENTER** button when you see Previous menu.

## Test LCD Display

This function is used to make sure the LCD is working properly.

1. Press the **ENTER** button to start the test.

All of the dots on the LCD will be turned on. If there are any missing dots (except the last character with an \*), call the Bering Technical Support Department for a replacement.

2. Press the **ENTER** button again to exit.

## Verify Media

This function is similar to the **Verify cartridge** function in the Removable disk utilities menu, except **Verify media** processes indefinitely unless an error is found. Usually the process must be aborted by the user.

1. Press the **ENTER** button when the **Verify media** function is displayed on the Tests submenu.

The Verify media submenu will appear with this message:

Verify media until  
abort? No

2. Press the **SELECT** button to toggle between **YES** and **NO**. For multiple verify passes, select **YES** and press the **ENTER** button. Otherwise, select **NO** for a single verify pass and press the **ENTER** button to start.

For subsystems with multiple drives you'll be asked whether you want to

Test all drives?  
No

If you choose **Yes** the verification will begin immediately. If you choose **No**, you will need to select the drive(s) you do want tested:

For models with a fixed disk:

Test fixed disk? No  
Test cartridge disk? No

- a. Use the **SELECT** button to choose **Yes** for the drive(s) you want to test and press the **ENTER** button to begin the test procedure.

The record address is updated on the display as the verification progresses. The following message will appear:

Verify CARTRIDGE  
record *n*

**Note:**

If a bad sector is found, this function will terminate with the LCD showing the error.

The messages will include **DISK** rather than **CARTRIDGE** when you are verifying a fixed disk.

If you chose a single verification pass, you will be prompted when the process is complete, at that time jump to step 3.

If you chose multiple verification passes in step 2, you must stop the process yourself.

- a. To abort the function at any time, press both the **SELECT** and **ENTER** buttons simultaneously and hold them until you see:

Abort received.  
wait ...

- b. Release the buttons.

The function will abort at the appropriate time and you will see **User abort**. It may take some time to stop the process and the display may resume showing the records being verified while it finds a stopping place.

- c. Press the **ENTER** button to exit.

Upon successful completion, you will be notified:

*n* complete  
verifies done

3. Press the **ENTER** button to return to the Tests submenu.

**Show Command Trace**

This function is for troubleshooting purposes by Technical support personnel. It displays the last sequence of commands sent to the drive.

**Enable Firmware Load**

This function allows you to upgrade the firmware on the controller board from a cartridge. The new firmware version will be read from a cartridge and loaded into FLASH memory on the controller board. Full instructions for the upgrade will be included with the upgrade cartridge. Contact Bering Technical Support for more information on this feature.

## CARING FOR THE DISK DRIVE & CARTRIDGE

This chapter describes how to care for your OptiPac and cartridges. It is divided into two sections. The “General Safeguards” section tells you what to look out for. The “Cartridge Care” section explains how to handle removable cartridges. The “Preventive Maintenance” section will explain user maintenance procedures. As long as you protect your OptiPac from hazards, it will provide you with years of service.

### General Safeguards

To protect the OptiPac:

- To avoid overheating, place it where the air can circulate around it. Be particularly careful to avoid blocking the cooling vent at the rear of the unit.
- Make sure it is plugged into a grounded (three-hole) electrical outlet. Verify that the outlet actually is grounded — that the third prong really is connected to a ground. The OptiPac should be on the same circuit as your computer.
- Make sure that other equipment or appliances which might generate electrical noise or a power surge (such as electric typewriters or heaters) are on separate circuits.
- Do not expose your OptiPac to extreme heat or cold. Prolonged exposure to excessive heat, direct sunlight, or freezing conditions will harm the drive.
- Keep it away from moisture, dirt, and contaminants such as spilled liquids, steam, or excessive dust. Do not smoke near the OptiPac.
- Do not apply cleaners or lubricants to any part of the drive.
- Avoid exposure to magnetic fields such as those emitted by magnets, telephones, televisions, speakers, or large electric motors.
- Never bump the OptiPac when it's running.
- Always set the OptiPac upright on a flat surface.

#### ▲ CAUTION:

*Never transport the OptiPac with a cartridge in the drive. This could damage the media.*

You don't need to worry about leaving the OptiPac on for a long time — it doesn't use much power. It's normal for the drive to feel warm (but not hot) after it's been running for a while.

If the OptiPac does get hot, make sure the fan is running properly, the vent at the rear is not blocked, and that the unit is placed where air can circulate around it.

## Cartridge Care

Removable cartridges are highly reliable and have a very long service life if you care for them properly.

- Store them properly. Remove the cartridge from the drive when you are not using it and store it in its protective case in a cool, dry, safe location.
- Do not leave the cartridge in the OptiPac after it is powered down. This leaves the cartridge shutter open and makes the recording media itself vulnerable to dust.
- Do not turn the computer off to remove the cartridge. This will not eject the cartridge. If the power is turned off, wait at least 60 seconds before removing the cartridge. See “Unloading a Cartridge” in Chapter 3 for more details.
- Keep your cartridges clean and dry and out of harm's way. Protect cartridges from dirt, spills, and smoke. Avoid handling the shutter edge of the cartridge since oil and dirt from your hands may be transferred to the disk media or to the inside of the drive.
- Do not open the cartridge access shutter. Minute particles such as smoke, pollen, or dust can contaminate the disk surface and damage the cartridge.
- Do not disassemble the cartridge.
- Use them at the correct temperature. Avoid using cartridges at temperatures above 104° F (40° C) or below 41° F (5° C). To avoid permanently damaging data, the drive, cartridge, and room should all be about the same temperature within the above operating range when you insert the cartridge into the drive.
- Do not move the drive with a cartridge loaded.
- Do not drop the cartridge. Sudden jolts may damage the media and/or cause the loss of data.
- Label the cartridge clearly and make sure the label is securely attached before loading the cartridge. Do not mark on labels with a graphite pencil. The graphite dust from the pencil may contaminate the disk surface.
- Do not use defective or questionable cartridges on another drive. You may spread the problem.

## Preventive Maintenance

Bering subsystems will provide extended and reliable service as long as the drives are properly maintained. The Bering OptiPac subsystems require no preventive maintenance. If you have any questions concerning the proper preventive maintenance procedures please contact Bering Customer Support.

## TROUBLESHOOTING & SERVICE

This chapter describes basic trouble-shooting procedures. It is divided into four sections: “Before You Do Anything Else,” “Error Codes and LCD Messages,” “Fuse Replacement,” and “If You’re Still Having Problems.”

### Before You Do Anything Else

Often, problems you're having can be resolved by verifying that:

- The power cord is securely connected to the OptiPac and a wall outlet.
- The power is switched on, and the AC fuse in the back of the drive is not blown.
- None of the pins on the cable connectors are loose, broken, or shorted.
- All cables are installed correctly.
- The cartridge has been properly formatted.
- Each peripheral connected to your computer has a unique address.

### Error Codes and LCD Messages

Occasionally, after installing an OptiPac, the system will display a disk initialization error code upon start up. It is sometimes possible to solve the problem by following the LCD instructions. Sometimes the LCD will display an error code in the form of a number. This error code indicates a problem that may be associated with another hardware device other than the OptiPac. If this occurs, shut down your system and restart it again. If the problem still occurs, contact Bering Technical Support at (408) 364-6500.

### Fuse Replacement

If the drive fails to power on the AC fuse may be blown. The fuse is located in the AC input jack.

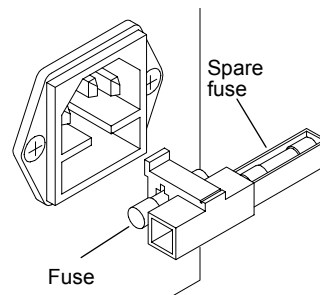


Figure 6-1: Replacing the AC fuse

**If You're Still Having Problems**

If you are able to start up from the floppy but not the OptiPac, the system files on the OptiPac may be damaged.

**START-UP PROBLEMS**

If you're unable to start up from an OptiPac, try starting up the computer with a floppy disk. If you're still unable to start up, the problem is with the computer rather than the OptiPac. Refer to the troubleshooting section in your computer manual for more information.

**WHEN ALL ELSE FAILS...**

If you still have problems after following the procedures in this chapter, call Bering Technical Support at (408) 364-6500. When you call, be ready to tell the service representative:

- The model number and serial number of the OptiPac, the firmware version of the OptiPac, the type of computer you're using, the operating system, and the software version.
- Any error messages that have appeared.
- A description of the problem(s) and the steps you've taken to correct it.
- Any recent changes to your system, such as new software installed, software upgrades, new hardware, even a new brands of cartridge.

Bering Customer Service can be reached by several methods. The mailing/shipping address and phone numbers are:

Bering Technology, Inc.  
Customer Service/Technical Support  
1400 Dell Avenue, Suite B  
Campbell, CA 95008

(408) 364-6500  
Fax: (408) 364-6501'  
EMail: help@bering.com

**▲ CAUTION:**

*Never remove the cover of the OptiPac box. This voids the warranty.*

## SPECIFICATIONS

### 1.3GB Cartridge Disk Drive

#### 1.3GB MO Cartridge

The specifications listed on this page are for a 1.3GB cartridge. The 1.3GB, 1024 bps cartridge is identical in capacity to the hard drive. Using any other cartridge will cause fewer than 100 rings to be backed up.

#### PERFORMANCE

Rings	100	1024 bps
	w/ 1.3GB cartridge	
Ring capacity	10.1	MB
Rotation speed	1.3GB cartridge 3,214	rpm
	other cartridge 4,558	rpm
Average seek time	23	ms, read
MTBF	120,000	Power on Hours

#### ENVIRONMENTAL (operational)

Temperature	5° to 45°	C
Relative humidity	10 to 85	% non-condensing
Vibration	5 to 500	Hz, 0.4 G's p-p
Shock	2	G, 10 ms half sine pulse
Altitude	0 to 10,000	feet
	0 to 3,048	meters

#### (non-operating)

Temperature	-20° to 60°	C
Relative Humidity	5 to 90	% non-condensing
Vibration	5 to 500	Hz, 1 G p-p
Shock (cartridge removed)	5	G's at 10 ms half sine pulse
transport	50	G's at 10 ms half sine pulse
Altitude	0 to 40,000	feet
	0 to 12,192	meters

#### LASER DIODE

Type	Semiconductor Laser
Wavelength	785nm, Continuous
Output power	30mW (max)
Classification	Class 1 (IEC. 825) GaAIAs

**1GB Fixed Disk**

<b>PERFORMANCE</b>	Rings	100	
	Ring capacity	10.1	MB
	Rotation speed	5400	rpm
	Average latency	5.5	ms
	Minimum seek time	3	ms
	Average seek time	10	ms
	Maximum seek time	20	ms
	HP-IB burst transfer rate	1	MB/sec
	HP-IB average transfer rate	940	KB/sec
	SCSI average transfer rate	4.1	MB/sec
	SCSI maximum transfer rate	5	MB/sec (asynchronous)
		10	MB/sec (synchronous)
	MTBF	500,000	POH
<b>ENVIRONMENTAL (operational)</b>	Temperature	0° to 50°	C
		32° to 122°	F
	Temperature gradient	20	°C/hour
		36	°F/hour
	Relative humidity	8 to 85	% non-condensing
	Vibration	0.5	G, 5 to 500Hz sine
	Shock	10	G, 11 ms half sine pulse
	Altitude	-60 ~ 3,000	meters
		-200 ~ 10,000	feet
	<b>(non-operating)</b>	Temperature	-40° to 65°
		-40° to 149°	F
Relative Humidity		5 to 95	%
Vibration		2.0	G, 22 to 400 Hz sine
Shock		60	G, 11 ms half sine pulse
Altitude		-60 ~ 12,200	meters
	-200 ~ 40,000	feet	



**General**

**Power Requirements**

Line voltage	96 - 240	volts
Line frequency	47 - 63	Hz
Current	0.5	Amps
Fuse	"Slow blow" 1.6A, 250V	

**General Dimensions**

Interface	HP-IB, Amigo command set	
Dimension	5"x 12.8"x 11" 12.7 x 32.5 x 27.9 cm	
Shipping weight	30 lbs. 13.6 Kg	

**Accessories**

Cartridge, MO, 1.3GB, 1024bps	ACCS-3070
Cartridge MO, 1.3GB, 1024bps, 5 Pack	ACCS-3071
HP-IB Cable 1.0m (3.3 ft.)	ACCS-7110
HP-IB Cable 2.0m (6.7 ft.)	ACCS-7115
Rack Mount Kit - 19" EIA	ACCS-7206

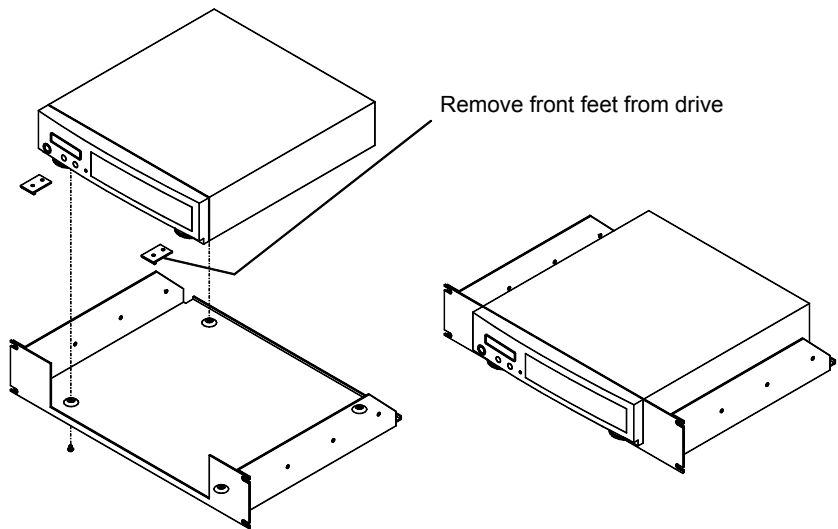


## RACK MOUNT

### Installation

If you purchased the rack mount kit, ACCS-7206 from Bering, these instructions will show the installation procedures. It fits in a standard 19" rack cabinet. The front is a 3.5 in. panel with the holes on 3 in. centers. The holes on the sides of the rack are 3.625 centers for installation of a standard C300S-22 slide rail. The following instructions are for installing the drive into a rack without slide rails.

1. Remove the front feet from the Bering drive by removing two screws in each foot.
2. Mount the Bering drive to the rack mount shelf with four (4) 8-32x¼ screws inserted from the bottom through the shelf into the bottom of the drive.



*Figure B-1: Attaching the drive to the rack mount assembly*

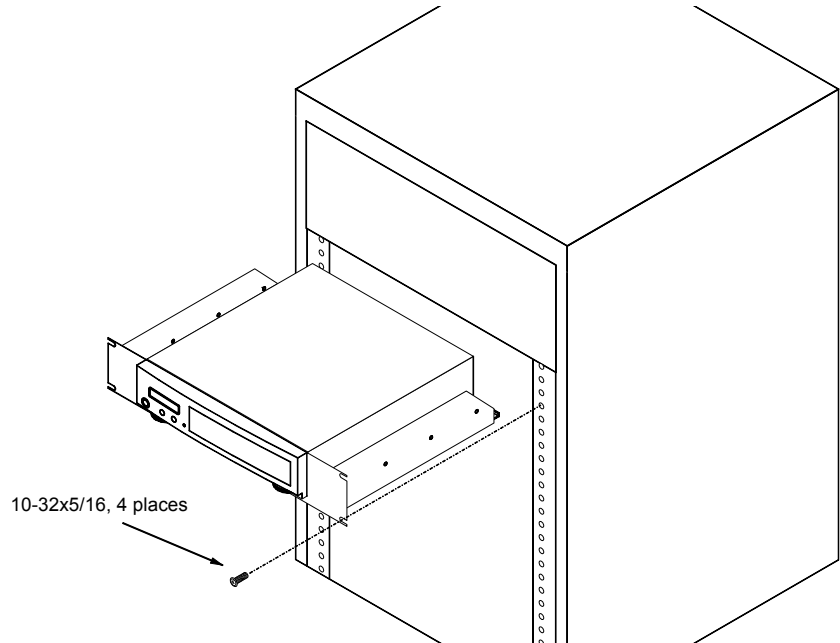
This step may be performed by turning the drive upside down and placing the shelf on the drive while aligning the screw holes.

**▲ CAUTION**

*The following steps require two people to install the unit in a cabinet.*

The shelf requires 3.5 inches of vertical clearance.

3. Insert the shelf with the Bering drive into the cabinet and hold it in place.
4. Insert the four (4) 10-32x5/16 screws from the front through the holes in the cabinet. Screw the 10-32 nuts on the screws from the rear of the panel and tighten.



*Figure B-2: Installing the rack mount in the chassis*

# INDEX

## A

Accessories 41

## B

Backup rings 22

## C

Cartridge

Care 36

Erase 30

Format 29

Loading 8

Show information 28

Unload 15, 28

Unloading 9

Verify 29

Change emulation 17

Change format switch 17

Change HP-IB Address 17

Change label 21

Change ring 15, 21

Clock, 12 / 24 setting 18

Command trace 34

Configurations submenu 17

Controls 7

Copy ring 22

Customer Service 38

## D

Date

Setting 19

Disk

Format 26

Show information 25

Spin down 25

Verify 26

Display Time and Messages 16

DOD wipe delete 24

## E

Emergency eject hole 8

Emulation, change 17

Erase 24

Erase cartridge 30

Erase ring 24

Error LED 7

External disk

Import 32

Show information 31

Verify 31

External disk utilities 31

## F

FCC iii

Firmware load 34

Fixed disk access indicator 7

Format cartridge 29

Format disk 26

Fuse replacement 37

## H

HP-IB

Address 17

## I

Import external disk 32

Importing data 10

## L

Label, change 21

LCD

Backup rings 22

Change emulation 17

Change format switch 17

Change HP-IB Address 17

Change label 21

Change ring 15, 21

Configurations submenu 17

Copy ring 22

Enable firmware load 34

Erase cartridge 30

Erase ring 24

Format cartridge 29

Format disk 26

Import external disks 32

Model number 20

Removable disk utilities submenu 28

Restore rings 23

ROM version 20

Serial number 20

Set date 19

- Set time 18
- Show cartridge information 28
- Show command trace 34
- Show disk information 25
- Show external disks 31
- Spin down / up disk 25
- Spin down disk 16
- Spin up disk 16
- Test LCD display 33
- Tests submenu 33
- Unload Cartridge 15
- Unload cartridge 28
- Use 24 hour clock 18
- Utilities submenu 20
- Verify cartridge 29
- Verify disk 26
- Verify external disks 31
- Verify media 33

LCD Menu 14

LCD messages 37

LCD, testing 33

LED, error 7

**M**

Magneto-Optical technology 2

Main menu 15

Menu, system 14

Model number 20

**N**

New cartridges 15

**O**

Operation 7

**P**

Preventive maintenance 36

**R**

Rack mount installation 43

Removable disk utilities submenu 28

Ring

- Backup 22
- Erase 24
- Restore 23

ROM version 20

**S**

Serial number 20

Set date 19

- Set time 18
- Show cartridge information 28
- Show command trace 34
- Show disk information 25
- Show external disk 31
- Specifications
  - 1.3GB cartridge drive 39
  - Fixed disk 40
  - General 41
- Spin down / up disk 25
- Spin down disk 16
- Spin up disk 16

**T**

Table of Contents vii

Technical Support 38

Test LCD display 33

Tests submenu 33

Time

- Setting 18

**U**

Unload Cartridge 15

Unload cartridge 28

Unpacking 4

Utilities submenu 20

**V**

Verify cartridge 29

Verify disk 26

Verify external disk 31

Verify media 33

**W**

Warranty statement v

Write protection 10