

RDPac 8032AF User's Manual

Manual No. 11-18032-81
Revision A

© Copyright 2011–2022

Bering Engineering LLC.

Important Notice

Copyright ©2011–2022 by Bering Engineering LLC. All rights reserved. No part of this document may be reproduced in any way without the express written permission of Bering Engineering LLC.

Printed in the United States of America.

The information contained in this document is subject to change without notice. Every reasonable precaution has been taken in the preparation of this manual to insure its accuracy. However, Bering Engineering LLC. assumes no liability resulting from any errors or omissions in this manual, or from the use of the information contained herein, nor does it make a commitment to update the information contained herein.

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.

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 RDPac 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 RDPac by using the front panel LCD controls. See chapter 4 for details.

If you have upgraded your RDPac 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 *RDPac 8032AF User's Manual* required for your RDPac subsystem.

Date = Date this manual was printed
Rev = Revision level of this manual
F/W Ver = Applicable subsystem firmware level

Date	Rev	F/W Ver	Changes to manual
May 2012	A	F.B0	Initial release

Warranty Statement

RDPac 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.

RDPac 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
Bering Engineering LLC

EMail help@bering.com

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 RDPac cartridge disk drive subsystem.

Model _____ Serial Number _____

Time Zone _____

HP-IB address _____

Table of Contents

INTRODUCTION 9

 Features 9

 Conventions in this Manual 10

 Unpacking 11

INSTALLING THE RDPac 13

 Quick-Start Procedure 13

 Connecting the RDPac Drive 14

OPERATING THE DISK DRIVE 15

 8032AF Controls 15

 RHD Controls 15

RDPAC SYSTEM FUNCTIONS 17

 System User Menu 18

 System Administrator Menu 19

 Main Menu 20

 Change Ring 20

 Configurations 21

 Utilities 21

 Display Time and Messages 21

 Configurations Submenu 22

 Administrator Mode 22

 Change HP-IB Address 22

 Change CS80 Format 23

 Use 12 / 24 Hour Clock 23

 Set Time 23

 Set Date 24

 Utilities Submenu 25

 Ring Utilities Submenu 26

 Change Ring 26

 Label Ring 26

 Copy Ring 27

 Erase Ring 27

 Erase Rings 28

 Left/Right Disk Utilities Submenu 28

 Show Lwft/Right Disk Information 29

 Spin Down / Up Left/Right Disk 29

 Verify Left/Right Disk 29

 Format Left/Right Disk 30

 Erase Hard Disk 31

 Tests Submenu 31

 Show Statistics 31

 Test LCD Display 32

 Verify Media 32

 Enable/Disable Firmware Load 33

Install Firmware	33
Uninstall Firmware	34
<i>CARING FOR THE DISK DRIVE</i>	37
General Safeguards	37
Removable Hard Disk Care	37
<i>TROUBLESHOOTING & SERVICE</i>	39
Before You Do Anything Else	39
Error Codes and LCD Messages	39
Fuse Replacement	39
If You're Still Having Problems	40
<i>SPECIFICATIONS</i>	41
<i>Removable Hard Disk</i>	41
General	42
<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 RDPac drives are built for years of reliable service. We're sure you'll agree as you begin to work with your drive.

Features

Bering RDPac series drives are compatible with HP computer systems with HP-IB interfaces. In this manual we refer to the Bering RDPac subsystem as *RDPac* and all HP systems as *computer* unless otherwise indicated.

The Bering RDPac 8032AF is a subsystem consisting of two 3.5 inch removable hard disks to meet the mass storage requirements of any operating system.

- 8032AF – a dual 30GB removable hard disk (RHD).
- Your storage capacity is limited only by the number of RHD modules you use.
- Each RDPac removable hard disk contains multiple volumes called rings, so physical removal is not required to change to another ring. The left hard disk and the right hard disk each contain 10 rings (L0–L9 and R0–R9). The RHD module is compatible with 8631AF.
- Each ring has a capacity of 20MB. Each ring volume on the RDPac 8032AF emulates an HP 7907 20MB volume.
- Your data is portable and secure. Just remove the RHD module from the drive and take it with you, or store it in a safe place.
- Front panel controls provide off-line copying of rings.

The RDPac 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.

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 RDPac 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/B8032AF`
- 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 RDPac 8032AF 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 RDPac 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 RDPac
- 2 removable hard disk modules (installed)
- 1 set of hard disk carrier keys
- A power cable

If any item is missing, please call your dealer or email Bering Customer Service at help@bering.com.

INSTALLING THE RDPac

This chapter describes the installation procedure for the RDPac and is divided into two sections. The “Quick-Start Procedure” section enables experienced users to begin operation right away. The “Connecting the RDPac 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 RDPac 8032AF. Most of the configuration is already set at the factory. There may be some adjustments necessary before the RDPac can operate in your particular environment.

The default configuration settings are as follows:

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

1. Turn off your computer and connect the RDPac.

If necessary, refer to the next section in this chapter.



Caution:

The left RHD module must be loaded with the key in the locked position for the 8032AF to operate.

2. Turn on the RDPac 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 (Administrator mode required).
4. Check the HP-IB address in the configuration function. Make sure all devices on the HP-IB have a unique address (Administrator mode required).
5. Load an optional RHD module in the right drive.
6. Turn on your computer.
7. Begin using the RDPac.

Connecting the RDPac Drive

These instructions are for connecting an RDPac 8032AF model to an HP-IB based computer with the HP-IB connector.

**CAUTION:**

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.

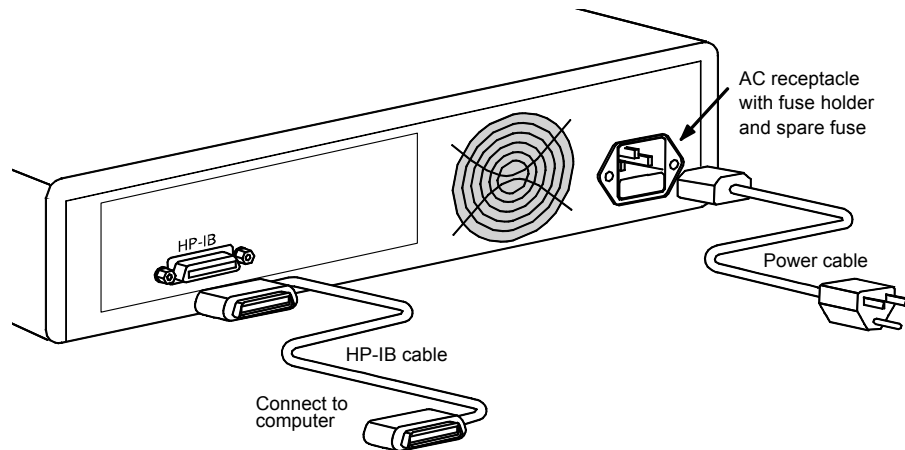


Figure 2-1: Connecting the RDPac to an HP-IB computer

1. Turn off your computer and the RDPac 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 RDPac. Tighten the thumb screws by hand.
3. Connect the power cable to the back of the RDPac. 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 RDPac and the computer into a grounded electrical outlet or a surge protector. Be sure that the outlets are grounded. The RDPac 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 RDPac, the computer, and any other peripherals.

OPERATING THE DISK DRIVE

8032AF Controls

Figure 3-1 illustrates all controls and indicators required for operating the RDPac 8032AF.

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

The LCD will display a self-test message and the Bering model number. This operation should take less than a minute. If a RHD module 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.

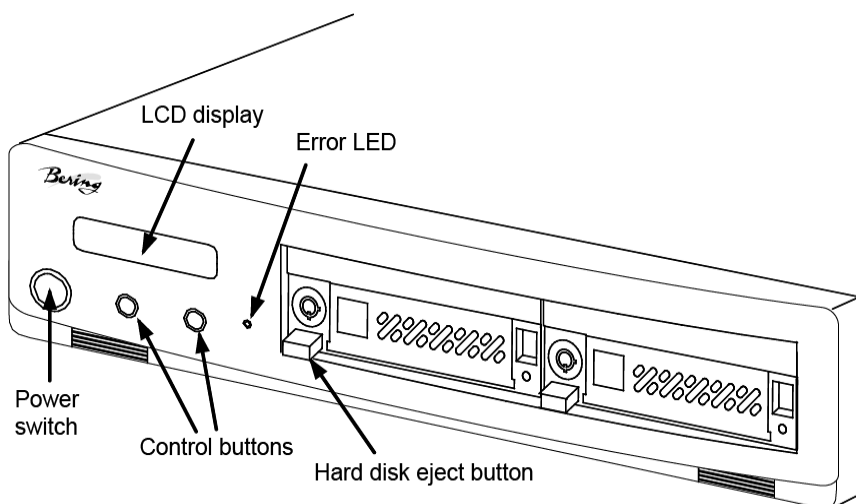


Figure 3-2: RDPac 8032AF front panel

Error LED

The Error LED turns red and stays illuminated when a system error is detected.

RHD Controls

The RDPac 8032AF contains two removable hard disk drives. Each RHD has ten volumes called rings. Each ring is 20MB in size. The RHD drive uses a key lock to power on and lock the drive in place. The eject button cannot be pressed while the drive is locked.

The RDPac is shipped to you with the drives locked in place. When the RDPac is powered on, the drives will also power on. When the RDPac is on and the RHD is unlocked, a small letter “u” will appear on the drive’s LCD display. The hard disk

cannot be accessed in this mode. The hard disk can be ejected while the disk is unlocked by pressing the eject button.

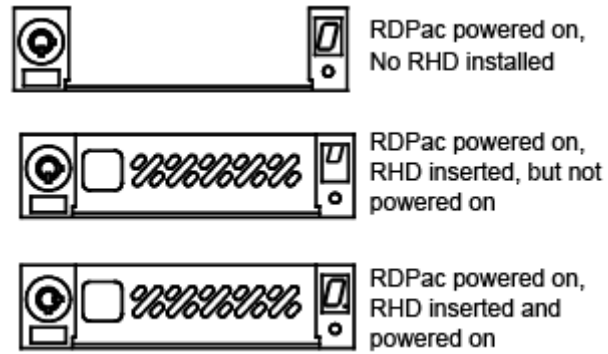


Figure 3-3: RHD LCD indicator

Note: The key is required to lock and unlock the RHD for removal and power. To prevent loss, please attach a key to the unit with a wire, string, or other means.

Ejecting the RHD

To unlock the RHD, insert and turn the key clockwise. Wait until the LCD changes to a lower case “u.” Push the eject button to eject the RHD. The module can be ejected with the RDPac powered on or off.

Inserting the RHD

To lock and power on the RHD, push the module all the way into the chassis. The LCD will display a lower case “u”, indicating unlocked. Insert and turn the key counter clockwise to power on the drive. The LCD will change to a zero indicating the unit number.

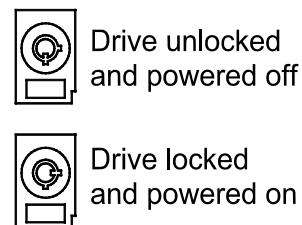


Figure 3-4: Locking and unlocking the RHD

RHD Activity Indicator

While the RHD module is powered on, the RHD activity indicator will flash when the RHD is accessed.



Figure 3-5: RHD activity indicator

RDPAC SYSTEM FUNCTIONS

This chapter describes the RDPac configuration and operating procedures. The RDPac 8032AF 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.

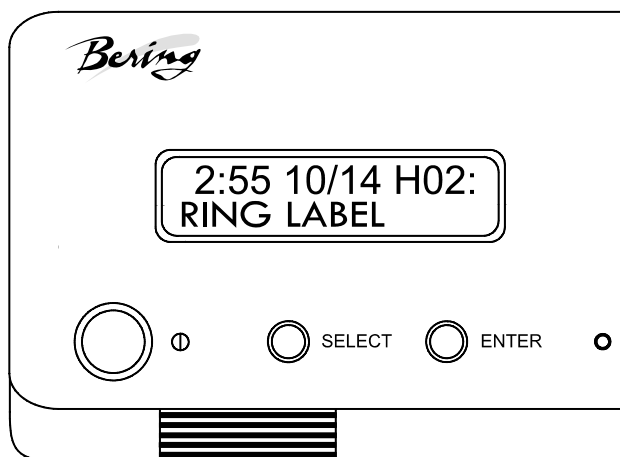


Figure 4-2: Front panel LCD and push-button controls

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.

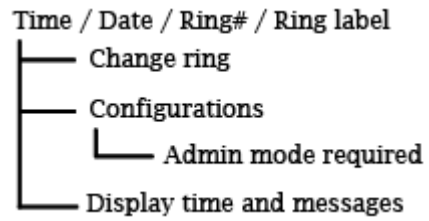
- To select a system function, press the **SELECT** button until the desired function appears on the LCD.
- To execute the chosen function or display its options, press the **ENTER** button.
- If you want to abort the current operation, press the **SELECT** and **ENTER** buttons simultaneously.

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.

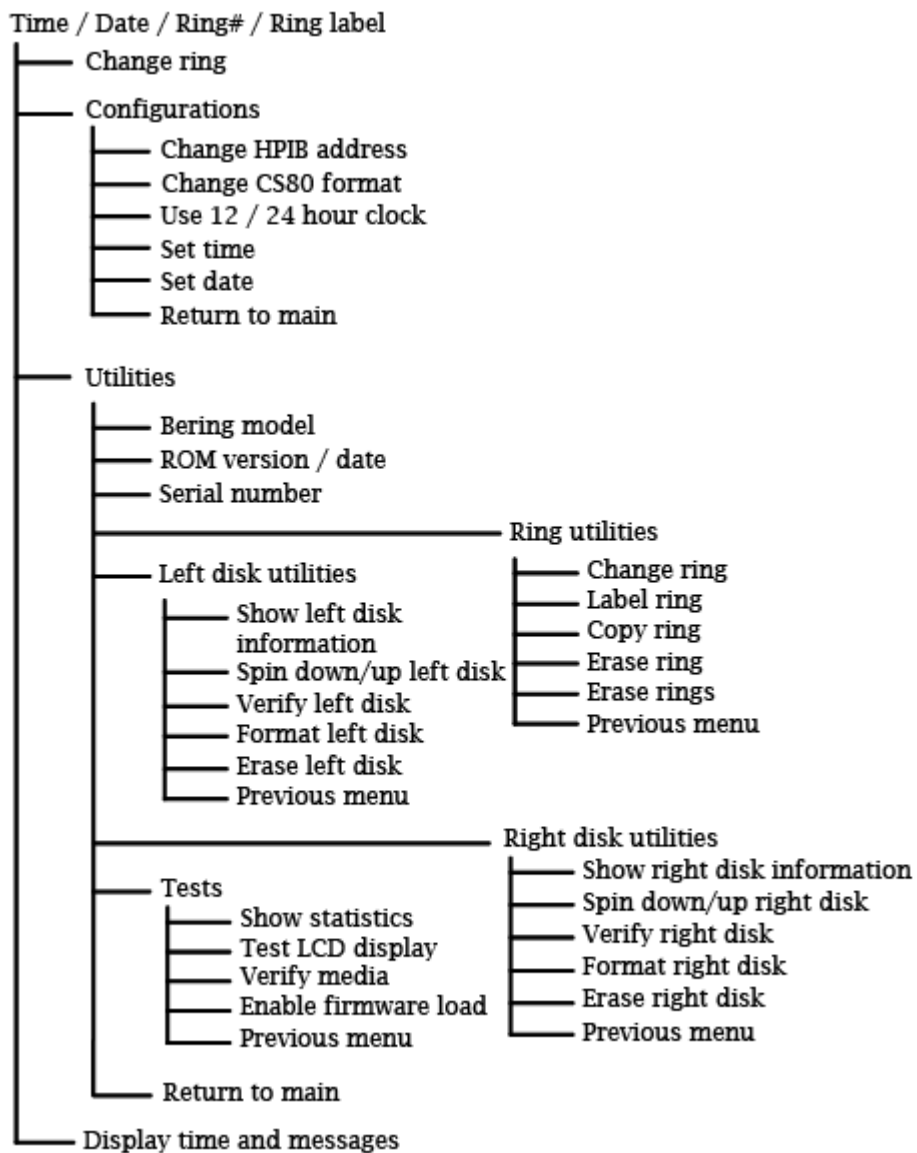
System User Menu

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



**System
 Administrator
 Menu**

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



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:

```
2:15  7/12 H02:
RING LABEL
```

The time, date, current ring, and ring label are displayed. If the current ring has not been labeled, the bottom of the display will be blank.

The hard disk and the cartridge each have ten volumes called rings. You can load multiple sets or copies of data or software on different rings. Changing to another ring is equivalent to removing and replacing an HP 7907 20MB cartridge.

Ring L00 is always unit 0, and the ring displayed on the LCD will be unit 1. Rings beginning with L, such as L05, are on the left RHD, while rings with R, such as R07, are on the right RHD. The rings are numbered from L00 to L09 and R00 to R09.

Note: Attempting to perform any function on a new or unformatted RHD will cause the following message to display:

```
Media not
initialized!
```

The RHD must be formatted from the Disk Utilities menu before it can be used.

If a RHD was formatted on an RDPac 8600 other than the 8631AF or 8032AF, only one ring will be configured. If the data on the RHD is more than 20MB, only the first 20MB will be accessible. The RHD must be formatted in the 8631AF or 8032AF to see all ten rings.

The following options are available from the Main menu:

```
Change ring
Unload cartridge
Configurations
Utilities
Display time and messages
```

Change Ring

This function allows you to change the current ring. Each ring is equivalent to a 7907 20MB cartridge. When you return to the main menu the current ring will be displayed. You cannot change to ring L00 on the left RHD.

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 RHD while the current ring is set to the RHD will cause the unit to go off-line.

Configurations The Configuration functions are only available while in the Administrator mode. The Administrator mode is enabled in the Configurations menu.

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

Utilities The Utilities menu is only available while in the Administrate mode. This function shows disk information; verifies, and formats the RHD; erases RHD 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 drive eject button and the CS80 format, 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:

Admin mode required
Change HP-IB address*
Change CS80 format*
Use 12 / 24 hour clock*
Set time*
Set date*
Return to main*

*Only visible after Administrator mode is enabled.

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.

Administrator Mode

To utilize the configuration and utility functions of the RDPac, you must enter the Administrator mode.

1. Press **SELECT** until Configurations is displayed, then press the **ENTER** button.

The following message will appear:

Admin mode required

2. Press the **SELECT** and **ENTER** buttons at the same time until Administrator mode appears on the LCD screen.

All of the configuration and utility functions will now be available.

To exit the Administrator mode:

1. While in the Configurations or Utilities menu press **SELECT** until Return to Main appears, then press **ENTER**.
2. Press **SELECT** until Display time and messages appears, then press **ENTER**.

The RDPac is now in user mode.

Change HP-IB Address

This function sets the HP-IB address of the RDPac. 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 RDPac will reset to the new value.

Change CS80 Format

Use this function to disable the CS80 FORMAT command when you want to speed up the initialization process or to prevent accidental execution of the FORMAT utility. The default is enabled. Each time the RDPac is powered on, this function will change to enabled.

CAUTION:



When the FORMAT command is enabled, the INITIALIZE utility or command can overwrite the existing directory with a new one causing the loss of all of your files.

1. With the Change CS80 format function displayed, Press the **ENTER** button to initiate this function.

The following message will appear.

Disable/Enable CS80
format command

2. Press the **SELECT** button to toggle between disable and enable.
3. Press the **ENTER** button to select the desired function.

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.

Set Date

5. **SELECT** and **ENTER** the correct setting for seconds.
6. **SELECT** and **ENTER** the correct AM/PM setting.

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 12, 2005

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 hard disk information; verifies, and formats the cartridge; copies and erases cartridge data; formats and verifies the hard disk; and performs test functions via these options:

- **MODEL NUMBER** — Displays the model number of the RDPac.
- **F/W VERSION** — **Displays the firmware version number and release date.**
- **SERIAL NUMBER** — Displays the serial number of the RDPac which is stored in CMOS memory.
- **RING UTILITIES** — Changes rings; labels rings, copies rings, and erases rings. Refer to the “Ring Utilities Submenu” section for detailed information.
- **LEFT DISK UTILITIES** — Shows left RHD information; verifies, and formats the RHD. Refer to the “Left/Right Disk Utilities Submenu” section for detailed information.
- **RIGHT DISK UTILITIES** — Shows right RHD information; unloads, verifies, and formats the RHD. Refer to the “Left/Right Disk Utilities Submenu” section for detailed information.
- **TESTS** — Tests the LCD, verifies, and certifies media. Refer to the “Tests Submenu” section for detailed information.

Note: The Utilities submenu is not accessible until the Administrator mode is enabled from within the Configurations menu.

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
F/W version
Serial number
Ring utilities
Left disk utilities
Right 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, and erases rings.

Ring “L00” indicates the first ring on the left RHD. Ring L00 emulates the fixed hard disk in a HP 7907 disk unit. All other rings emulate removable disks.

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
Label ring
Copy ring
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. Press the **SELECT** button until the Change ring function is displayed. You cannot change to ring L00.

1. Press **ENTER** to select this option.
2. 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 set to the cartridge will cause the RDPac to go off-line.

Label Ring

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 15 characters in length. You cannot access ring L00 with this function. To label ring L00, copy L00 to another ring, label the new ring, then copy the labeled ring to H00.

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. 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:

```
L00 Label...  
R00      No
```

The above example copies from ring L00 on the left RHD to ring R00 on the right RHD.

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

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 L06  
1/7 nnnnnnn
```

After confirming your selection the erase function will begin. It takes approximately 2 minutes to erase a 20MB ring on the hard disk and 3 minutes to erase a ring on the cartridge.

When the erase function is complete, the label of the erased ring will be "aaaaaaaaaaaa" 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 5 through 9 will be a total of five rings—not four.



You will see a display similar to this:

```
Erase 06 rings
(03) 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. It takes approximately 2 minutes to erase each ring on the hard disk and 3 minutes to erase each ring on the cartridge.

Left/Right Disk Utilities Submenu

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

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

The disk utilities submenu then appears displaying the following functions:

```
Show left/right disk information
Spin down/up left/right disk
Verify left/right disk
Format left/right disk
Erase left/right 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 Left/Right Disk Information

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

```
Number of rings (10)
Ring capacity (20480 kbytes)
Ring size (627 cylinders)
Ring cylinder size (2 tracks)
Ring track size in sectors (64)
```

Sectors in ring (80256)
Logical sector size (256)
Physical sector size (512)
Interleave (1)
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 Left/ Right Disk

This function will spin the RHD 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
left/right 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 RDPac 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 Left/Right Disk



This function scans every sector on the RHD 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 left/right 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 disk utilities submenu.

Format Left/Right Disk

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

CAUTION:

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

The format may take up to three hours to complete.

1. Press the **ENTER** button when the Format hard disk function is displayed on the 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:

Format (256 bps)
continue? No

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

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

The following message will appear:

Formatting
left/right disk

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

hard disk
formatted

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

Erase Hard Disk

This function will erase the entire RHD 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 disk will be unreadable and must be formatted again to be usable. The erase takes approximately 38 hours.



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

The Erase left/right 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:

Left/Right Disk
erased

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

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

Tests Submenu

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

The Tests submenu will appear displaying the following functions:

Show statistics
Test LCD display
Verify media
Enable firmware load
Load firmware cartridge (when firmware load is enabled)
Uninstall firmware (when firmware load is enabled)

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.

Show Statistics

This function displays a list of statistical information.

1. Press the **ENTER** button and you'll see Cartridge statistics:
2. Press the **ENTER** button to show each of the following counters:

Blocks read
Blocks written
Read errors
Write errors
Seek errors
Other errors

3. Press the **ENTER** button after viewing Other errors and you'll see:

Clear statistic
counters? No

4. Press the **SELECT** button to choose Yes and then press the **ENTER** button to exit.

Since the statistic counters are stored on the cartridge, this information will not be available if that cartridge becomes unreadable, or is not formatted. Normally there are

no errors. Any soft errors due to dust particles or electrical noise should be recoverable using error correction code.

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 disk function in the 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:

```
Test left disk? No
Test right 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 disk
record n
```

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

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.

Enable/Disable 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. This also enables a feature to uninstall a firmware upgrade in case of a problem after upgrading. Contact Bering Technical Support for more information on this feature.

Install Firmware

1. Remove the RHD from the right drive of the RDPac if one is inserted.
2. Power off the RDPac.
3. Unplug the data cable from the RDPac.
4. While pressing both the SELECT and ENTER buttons power on the RDPac and wait for the time and date to appear.
5. Press the SELECT button until "Utilities" is displayed and press ENTER.
6. Press the SELECT button until "Tests" is displayed and press ENTER.
7. Press SELECT until "Enable Firmware Load" is displayed and press ENTER.
8. Press SELECT until "Load Firmware Disk" is displayed.
9. Insert the RHD containing the new firmware into the RDPac right drive.
10. Wait for the drive LED to turn green.
11. A message similar to the following will appear after a few seconds:

Bering Disk 8032AF
Ver F.B0 No

The model and firmware version may vary from the above message depending on your RDPac model and the new firmware version. Make sure the model matches your unit. If you have a 8602, it will still say 8600.

12. Press SELECT until Yes appears in the LCD display.

Bering Disk 8032AF

Ver F.B0 Yes

13. Press the ENTER button while Yes is displayed to begin the upgrade process.
14. The LED will alternate between Erasing Flash and Programming Flash.

Erasing	Programming
C000 - C800	C000-C800

When the Process is complete, the RDPac will reboot.

15. If the RDPac asks for a serial number, enter the S/N printed on the S/N label on the bottom of the RDPac. This S/N will now be displayed in the Utilities menu.
16. Enter the Administrator mode and go to the utilities menu to check the version now installed. See the user's manual for administrator mode instructions.
17. Power off the RDPac.
18. Connect the data cable to the back of the RDPac.
19. Power on the RDPac.

Uninstall Firmware

This feature appears in the menu when firmware load is enabled. It allows you to erase the part of the flash memory containing a firmware upgrade. It will revert back to the original factory installed firmware version.

1. Go to the Tests menu.
2. Press **SELECT** until you see Enable Firmware load or Disable firmware load.
3. If the LCD says "Enable firmware load" press the **ENTER** button.
4. Press the **SELECT** button until Uninstall firmware is displayed and press **ENTER**.

The firmware will immediately erase the flash memory.

```
erasing flash
C000:0000
```

When complete you should recycle the power to boot with the original factory installed firmware.

CARING FOR THE DISK DRIVE

This chapter describes how to care for your RDPac 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 RDPac from hazards, it will provide you with years of service.

General Safeguards

To protect the RDPac:

- 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 RDPac 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 RDPac 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 RDPac.
- 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 RDPac when it's running.
- Always set the RDPac upright on a flat surface.

You don't need to worry about leaving the RDPac 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 RDPac 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.

Removable Hard Disk Care

- Do not disassemble the RHD.
- Do not drop the RHD. Sudden jolts may damage the media and/or cause the loss of data.
- Unlock the RHD before ejecting it.
- Do not force the RHD out of the receiver chassis. Use the eject button after the RHD is unlocked using the attached key.

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 RDPac 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 and hard disk have been properly formatted.
- Each peripheral connected to your computer has a unique address.

Error Codes and LCD Messages

Occasionally, after installing an RDPac, 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 RDPac. If this occurs, shut down your system and restart it again. If the problem still occurs, contact Bering Technical Support at help@bering.com

Fuse Replacement

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

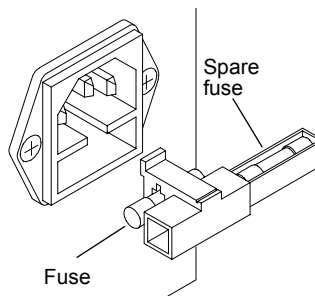


Figure 6-3: Replacing the AC fuse

**If You're Still
Having Problems**

If you are able to start up from other source but not the RDPac, the system files on the RDPac may be damaged.

START-UP PROBLEMS

If you're unable to start up from an RDPac, try starting up the computer with other disk. If you're still unable to start up, the problem is with the computer rather than the RDPac. 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, contact Bering Technical Support at help@bering.com. When you call, be ready to tell the service representative:

- The model number and serial number of the RDPac, the firmware version of the RDPac, 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 brand of cartridge.

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

BeringEngineering Ltd. Co.
Customer Service/Technical Support
5086 Main Street
Waitsfield, VT 05673

E-Mail: help@bering.com

CAUTION:

Never remove the cover of the RDPac box. This voids the warranty.





SPECIFICATIONS

Removable Hard Disk

Ring capacity Use the show disk information on the front panel to determine the correct values, such as ring capacity, heads, tracks, and cylinders.

PERFORMANCE	Rings	10	
	Ring capacity	20	MB
	Rotation speed	5400+	rpm
	Minimum seek time	1.0	ms
	Average seek time	12	ms
	Maximum seek time	18	ms
	HP-IB burst transfer rate	1	MB/sec
	HP-IB average transfer rate	940	KB/sec
ENVIRONMENTAL (operational)	Temperature	5° to 55°	C
		41° to 131°	F
	Relative humidity	8 to 90	% non-condensing
	Vibration	0.67	G, 5 to 500Hz
	Shock	200	G, 2 ms
	Altitude	-60 ~ 3,000	meters
		-200 ~ 10,000	feet
(non-operating)	Temperature	-40° to 65°	C
		-40° to 149°	F
	Relative Humidity	5 to 95	%
	Vibration	3.0	G, 22 to 500 Hz
	Shock	1,000	G, 1 ms
	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, CS80 command set	
Dimension	5"x 12.8"x 11" 12.7 x 32.5 x 27.9 cm	
Shipping weight	28 lbs. 12.7 Kg	

Accessories

Removable Fixed Drive Module, 30GB	ACCS-3072
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-7207

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) 8-32x $\frac{1}{4}$ screws inserted from the bottom through the shelf into the bottom of the drive.

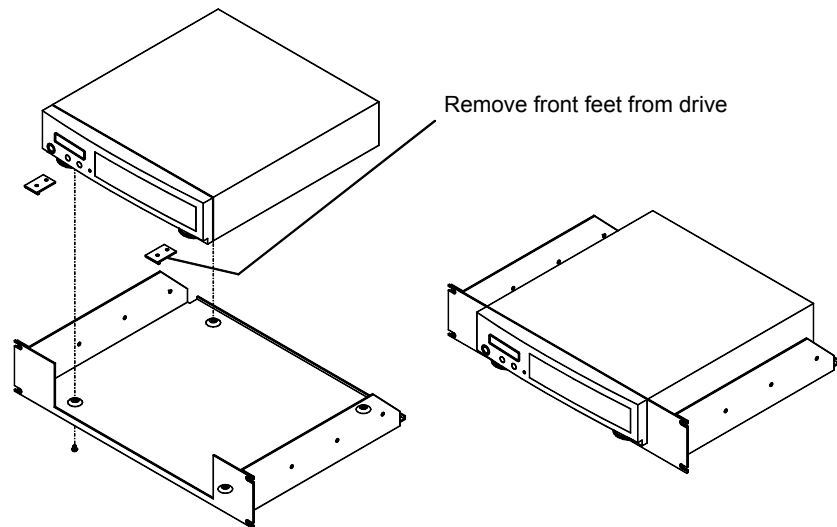


Figure B-3: Attaching the drive to the rack mount assembly

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.

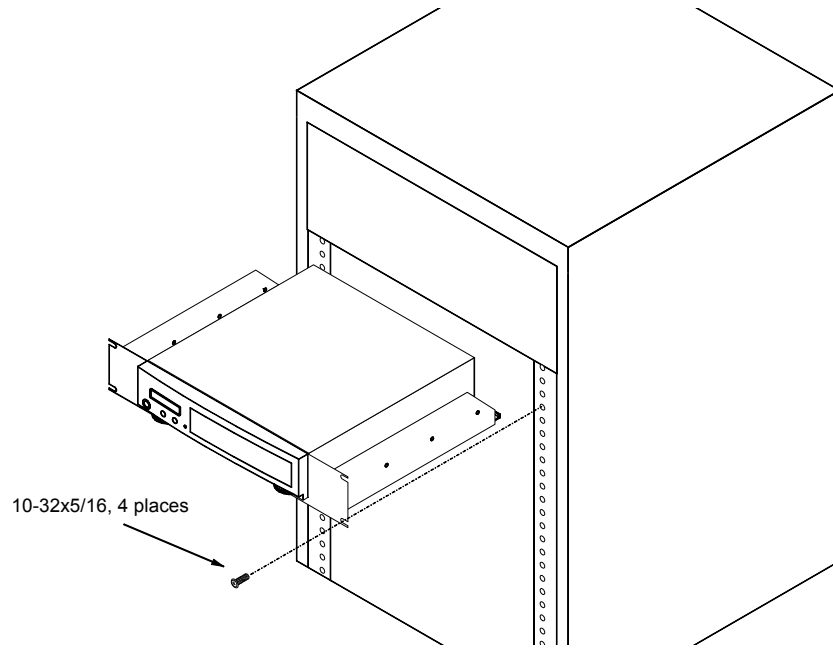


Figure B-4: Installing the rack mount in the chassis

INDEX

A

Accessories 42
Administrator mode 22
Adminstrator menu 19

C

Change CS80 format 23
Change drive button 23
Change HP-IB Address 22
Change ring 20, 26
Clock, 12 / 24 setting 23
Configurations submenu 22
Controls 15
Copy ring 27
CS80 Format 23
Customer Service 40

D

Date, setting 24
Disk
 Erase 31
 Format 30
 Show information 29
 Spin down 29
 Verify 29
Display Time and Messages 21
DOD wipe delete 27
Drive button 23

E

Erase 28
Erase disk 31
Erase ring 27
Error LED 15

F

FCC iii
Firmware load 33
Firmware version 25
Firmware, uninstall 34
Format disk 30
Fuse replacement 39

H

HP-IB address 22

L

Label ring 26
Label, change 26
LCD
 Change CS80 format 23
 Change drive button 23
 Change HP-IB Address 22
 Change ring 20, 26
 Configurations submenu 22
 Copy ring 27
 Enable firmware load 33
 Erase disk 31
 Erase ring 27
 Fimware version 25
 Format disk 30
 label ring 26
 Model number 25
 Serial number 25
 Set date 24
 Set time 23
 Show disk information 29
 Show statistics 31
 Spin down / up disk 29
 Test LCD display 32
 Tests submenu 31
 Uninstall firmware load 34
 Use 24 hour clock 23
 Utilities submenu 25
 Verify disk 29
 Verify media 32
LCD Menu 18
LCD messages 39
LCD, testing 32
LED, error 15

M

Main menu 20
Menu, administrator 19
Menu, user 18
Model number 25

N

New cartridges 20

O

Operation 15

R

Rack mount installation 43

Ring, erase 27

S

Serial number, displayed 25

Set date 24

Set time 23

Show disk information 29

Show statistics 31

Specifications

 1.3GB cartridge drive 41

 General 42

 Hard disk 41

Spin down / up disk 29

T

Table of Contents vii

Technical Support 40

Test LCD display 32

Tests submenu 31

Time, setting 23

U

Uninstall firmware 34

Unpacking 11

Utilities submenu 25

V

Verify disk 29

Verify media 32

W

Warranty statement v