Bering
MultiPac IV/IX
User's Manual

Manual No. 11-09878-01, Rev B

Note:

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 the shielded interconnect cables provided with this device.

● 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 Office, Washington, D.C., 20402.

Warranty Statement

MultiPac 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.

MultiPac 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 Inc.
246 East Hacienda Ave.
Campbell, CA 95008-6687
(408) 379-6900

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.

Contents

Chapter 1
INTRODUCTION

Congratulations on purchasing what we think is the finest removable cartridge system on the market. Bering MultiPac drives are built for years of reliable service.

Bering MultiPac drives are a family of removable Bernoulli disk drives with optional 80MB or 180MB fixed disk drives. They are compatible with Hewlett-Packard business, technical and personal computers, such as the HP1000 and HP9000 Series 200/300/500. In this manual we refer to all Bering MultiPac drive models as MultiPac and all HP systems as computer unless otherwise indicated.)

Serving a wide range of storage needs, the MultiPac comes in the following configurations:

- Model 7503 a single 44 megabyte (MB) removable Bernoulli with a microfloppy disk drive

- Model 7540 a single 44 megabyte (MB) removable Bernoulli disk drive

- Model 7580 a dual 44MB removable Bernoulli disk drive

- Model 7508 a single 44MB removable Bernoulli disk drive with an 80MB fixed disk drive

- Model 7518 a single 44MB removable Bernoulli disk drive with a 180MB fixed disk drive

- Model 7901 a single 90 megabyte (MB) removable Bernoulli

- Model 7902 a dual 90 megabyte (MB) removable Bernoulli

- Model 7903 a single 90 megabyte (MB) removable Bernoulli with a microfloppy disk drive

- Model 7908 a single 90 megabyte (MB) removable Bernoulli with an 80 MB fixed disk drive

- Model 7918 a single 90 megabyte (MB) removable Bernoulli with a 180 MB fixed disk drive

All MultiPacs use 5.25-inch removable cartridges. Each cartridge can store 44MB or 90MB of data. This can benefit you in several ways.

- 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 case.

- Your MultiPac can be used to back up the data on fixed disks if your backup software supports that option.

The MultiPac 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. All MultiPac models support the latest HP disk command sets.

Conventions in this Manual

We'll use the following conventions to make the information in this manual more precise:

- 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 MultiPac 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." For clarity, we will place entries you are to type which are longer than one word on a separate line in the monospaced font detailed above.

- A bold, sans serif font, **like this,** indicates text you should see on the LCD. The font will not be bold if it also indicates an action you are to to take.

- 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/rdsk/B7500`

- 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., *The Bible*

  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." Note, however, that a capital N is used for clarity when you are to type the letter n — usually to signify *No* — even though you don't actually have to capitalize the letter when you type it.

Unpacking

This chapter describes the unpacking procedure. Carefully unpack your MultiPac 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 MultiPac
- 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) 379-6900.

Chapter 2
INSTALLING THE DISK DRIVE

This chapter describes the installation procedure for the MultiPac and is divided into two sections. The "Quick-Start Procedure" section enables experienced users to begin operation right away. The "Connecting the Disk 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 MultiPac. Most of the parameters are already set at the factory. There may be some adjustments necessary before the MultiPac can operate in your particular environment. (Refer to Chapter 5 for detailed instructions).

The default parameter settings are as follows:

Time:	*Pacific time*
Date:	*current date*
HP-IB address:	**0**
Option:	**1024**
Drive button:	**disabled**
Default sector size:	**1024**
CS80 Format:	**enabled**

1. **Turn off your computer and connect the MultiPac.**
   If necessary, refer to the next section in this chapter.

2. **Turn on the MultiPac 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 configurations function. Make sure all devices on the HP-IB have a unique address.**

5. **Select the disk OPTION .**
   See Chapter 5 for your specific environment.

6. **Select the disk DRIVE BUTTON mode (enabled or disabled).**

7. **Load a cartridge.**

8. **Turn on your computer.**

9. **Initialize the cartridge or fixed disk and begin using the MultiPac.**

Connecting the Disk Drive

This section describes the disk drive connection procedure.   Figure 2-1 illustrates all connections required for correct installation.

▲ 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.*

1. **Turn off your computer, then connect the HP-IB cable to the HP-IB connector on the back of the computer and tighten the thumb screws by hand.**
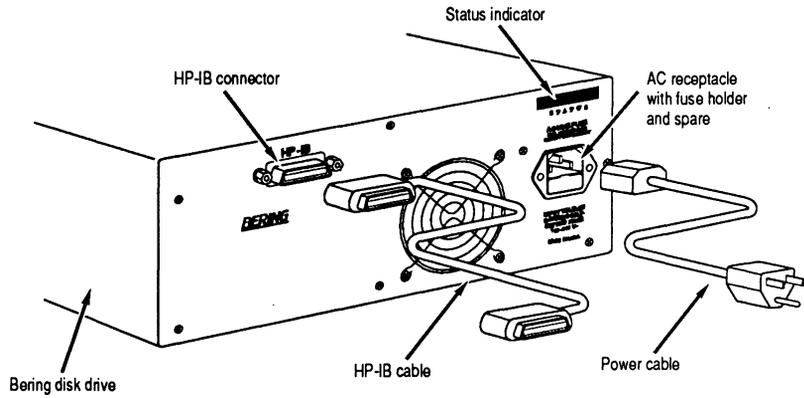
Figure 2-1: MultiPac rear panel

2. **Connect the power cable to the back of the MultiPac.**

3. **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 MultiPac and the computer into three-pronged (grounded) electrical outlets.**
   Be sure that the outlets actually are grounded — that the third prong really is connected to a ground. The MultiPac 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.*

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Chapter 3
OPERATING THE DISK DRIVE & CARTRIDGE

This chapter describes the operating procedure of the MultiPac and cartridges. It is divided into four sections: "Power Up," "Loading a Cartridge," "Unloading a Cartridge," and "Write-Protecting a Cartridge."

Power Up

Figure 3-1 illustrates all controls and indicators required for operating the MultiPac.

1. **Press the** POWER **button on the front panel of the MultiPac.**
   The LCD will display a self-test message and the disk drive model number. MultiPac disk drives containing fixed disks (models 7508 , 7518, 7908, and 7918) have a fixed disk red access LED in the lower right front panel. This LED will flash during start up to indicate a self-test operation for the fixed drive and then go out. It will also flash whenever the fixed disk drive is accessed. This operation should take less than a minute. After the self-test is successfully completed, the time and date will be displayed on the LCD.
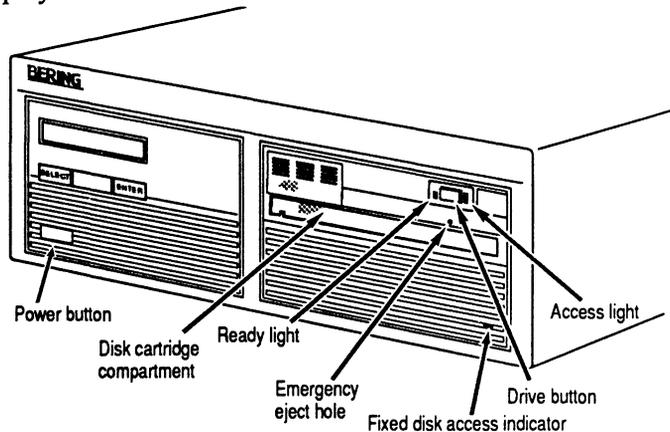
Figure 3-1: MultiPac front panel

Loading a Cartridge

Loading a data cartridge is very much like loading a cassette in your tape player.

1. **Make sure the MultiPac is turned on before you load a cartridge.**

2. **Remove the cartridge from its storage case.**
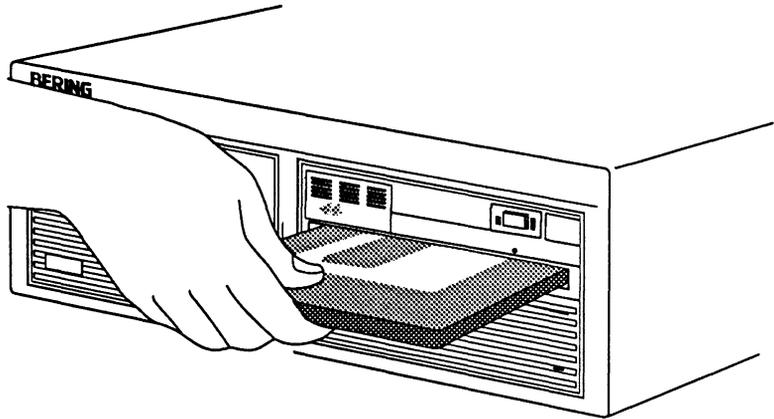
Figure 3-2: Loading a cartridge

3. **Insert the cartridge into the drive slot with the label side up and the write-protect switch toward you and push the cartridge straight in, keeping it parallel with the top and bottom of the drive, until it seats with a click.**

4. **Gently push the cartridge load lever (under the drive opening) to the left until it is flush with the front panel.**
   If the Drive button is enabled an LED will light as the drive spins up and you will hear a solid click. After a brief test, the LED will extinguish and the other LED will light to tell you the drive is ready.

   If the Drive button is disabled (the default factory setting) proceed to the following steps.

5. **With the time function displayed on the LCD, push the** <u>SELECT</u> **button on the front panel.**
   The **Load cartridge** function(s) will be displayed. For the 7580 and 7902 dual-drive systems, the following options are available.

   > **Load upper cartridge**
   > **Load lower cartrdige**

6. **Push the** <u>SELECT</u> **button to select the correct function for the drive.**
   If the **Load cartridge** function is not available the cartridge is already loaded. In that case, skip the following step.

▲ **CAUTION:** *Never move or transport the MultiPac with a cartridge in the drive. This will damage the cartridge and cause a read/write head crash.*

Unloading a Cartridge

It is important to remove the cartridge before you turn off the Multi-Pac. If you leave the cartridge in the drive, the shutter remains open and the recording media itself is vulnerable to dust. The media or the heads could easily be damaged and cause loss of valuable data.

The MultiPac must be turned on before you can unload a cartridge. If the Drive button is enabled, proceed directly to step 3.

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 7580 and 7902 dual-drive systems two options will be available:

    Unload upper cartridge
    Unload lower cartridge

    a. **Push the** SELECT **button to select the drive to be unloaded.**

2. **Press the** ENTER **button to execute the command.**
    The cartridge will spin down and both LEDs on the drive will turn off.

3. **Make sure both LEDs on the drive are off, then press the** DRIVE **button on the front panel of the drive.**

4. **Remove the cartridge carefully and place it in its protective 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 Chater 6 for further information on cartridge care.

If you can't get the cartridge to eject using any other method, or if there is no power to the drive, use the following as a last resort. Use this procedure only when absolutely necessary.

1. **Turn the MultiPac off so it won't operate while you're working with it.**

2. **Remove the motor access panel from the front panel of the drive.**
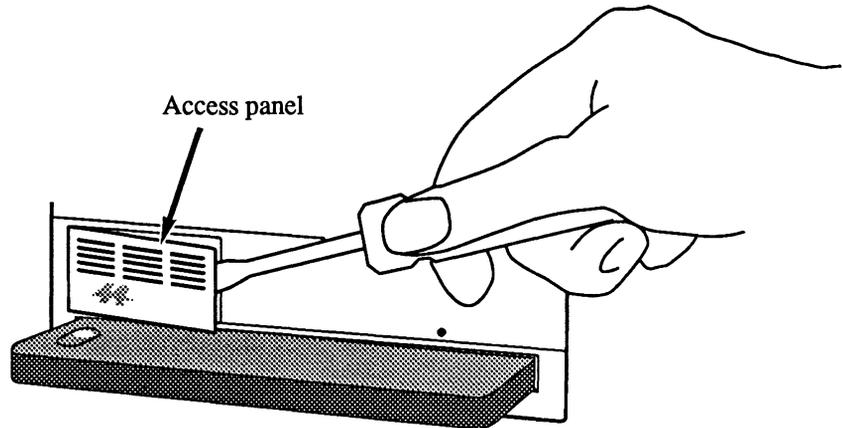
Access panel

Figure 3-3: Removing the motor access panel

3. **Insert the eraser end of a pencil into the space behind the motor housing on the right side of the space.**

4. **Rotate the motor until the dot on the motor housing aligns with the dot on the drive's pencil shield.**

Motor housing

Alignment dots
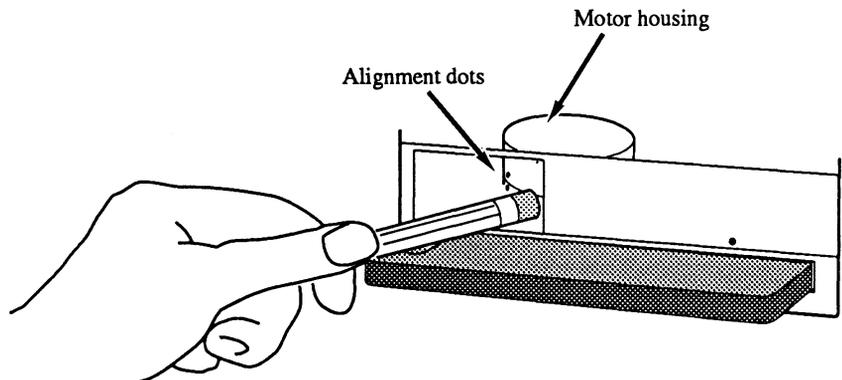
Figure 3-4: Aligning the dots

5. **With the dots aligned, insert the straightened end of a large paper clip into the small hole below the unload button.**

Removal access hole
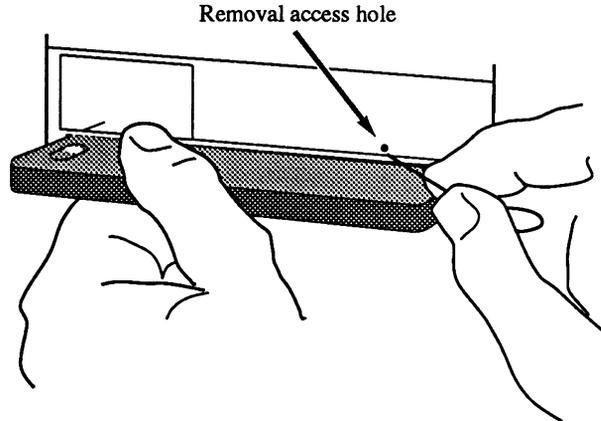
Figure 3-5: Inserting a paper clip in the access hole

⚠ CAUTION: To avoid damaging the drive and cartridge, do not remove the cartridge without first aligning the dots on the motor.

6. **Apply firm inward pressure with the paper clip and simultaneously pull the cartridge completely out of the drive.**

7. **Replace the motor access panel.**

⚠ CAUTION: Never open the metal access shutter on the data cartridge. This may damage the media and/or cause the loss of data.

Write-Protecting a Cartridge

You may want to write-protect the cartridge after removing it from your MultiPac. Write-protection prevents accidentally erasing or overwriting data on the removable cartridge. The write-protection switch is located at the front of the cartridge.

1. **To write-protect a cartridge slide the write-protect tab away from the metal shutter on the opposite edge of the cartridge.**
    Now data cannot be written to the cartridge and existing data cannot be changed or erased.

Read/write position

Read only position
(write-protected)

Write-protect switch

44 MB Bernoulli®
Disk Cartridge
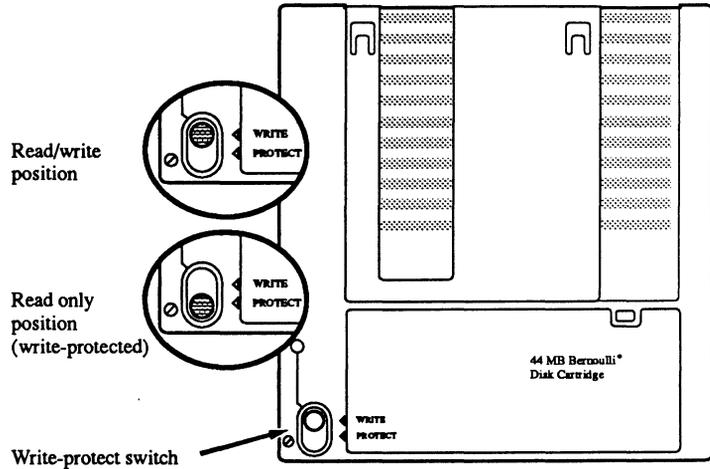
Figure 3-6: The cartridge write-protect switch

1. **To disable write-protection, slide the tab toward the metal shutter on the opposite side of the cartridge.**

Inserting & Removing Floppy Disks

Insert and remove floppy disks just as you would on a PC.
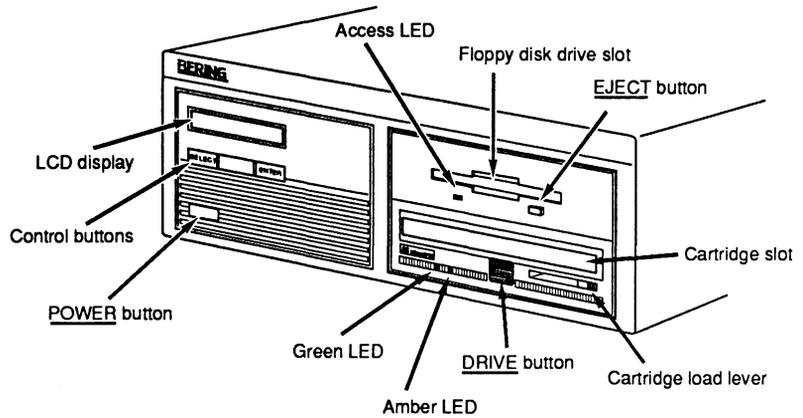
Figure 3-7: MultiPac 7503 front panel

INSERTING

1. Hold the labeled edge of the disk between thumb and forefinger — the label up, the metal shutter facing the drive slot, and the angled corner of the disk on your right.

2. Align the disk with the drive slot, then carefully insert the edge with the metal shutter into the drive and push the disk all the way in until it drops into place.

REMOVING

1. Press the floppy disk drive eject button on the lower right corner of the drive.
   The floppy disk will pop out part way.

2. Pull the floppy disk straight out of the drive.

3. Label the disk, if it isn't already, then store it in a safe place.

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Write-Protecting a Floppy Disk

You may want to write-protect the floppy disk after removing it from your drive. Write-protection helps prevent accidental erasure of data on the floppy disk. The write-protection switch is opposite the angled corner.

1. **To write-protect the floppy disk, slide the tab away from the metal shutter until the tab snaps into place.**
   A fingernail or the tip of a pen may prove useful in moving the tab. When you can see through the rectangle this opens in the floppy disk, data cannot be written to the cartridge and existing data cannot be erased by any ordinary means.

Read/write position

Read only position (write-protected)

Write-protect switch
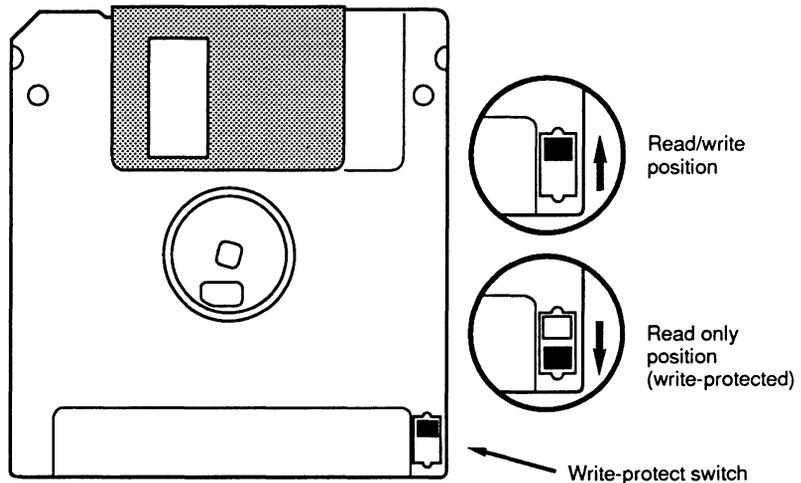
Figure 3-8: Floppy disk write-protect tab

1. **To disable write-protection, slide the tab away from the metal shutter until the tab clicks and the hole is closed.**

Floppy Disk Precautions

Follow these precautions when using floppy disks.

- Don't use single-sided floppy disks with manual shutters. The drive and/or disk may be damaged. Make sure that your HP single-sided disks have the words *AUTO SHUTTER* on the shutter.

- Avoid continual use of single-sided disks in this drive. The unused side of single-sided disks is not burnished and therefore will abrade the lower read/write head, eventually ruining it.

Chapter 4
MULTIPAC SYSTEM FUNCTIONS

This chapter describes the MultiPac configuration and operating procedures. The MultiPac 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. The menu trees in this chapter give an overview of the various procedures within the hierarchy. 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 Chapter 5.
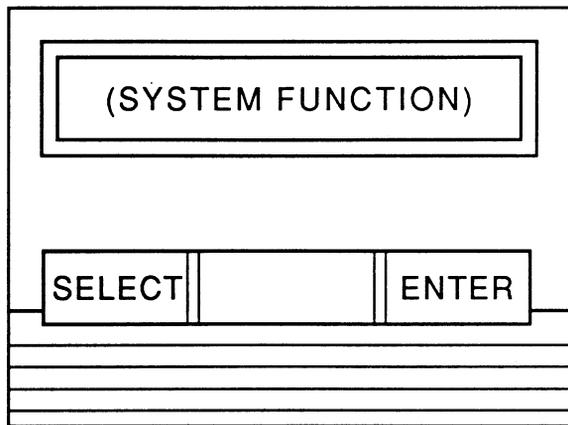
Figure 4-1: Front panel LCD and push-button controls

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.

- To cancel 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 Overviews

7540 / 7901 Menu Tree

The menu tree below should help you orient yourself within the command structure for the MultiPac 7540 and 7901.

Time/Date
    Unload cartridge
    Configurations
        Change HPIB address
        Change option
        Change drive button
        Change default sector size
        Change CS80 format
        Set time
        Set date
        Return to main
    Utilities
        Bering model
        ROM version / date
        Removable disk utilities
            Show cartridge information
            Unload or Lock / unlock cartridge
            Verify cartridge
            Format cartridge
            Previous menu
        Tests
            Show statistics
            Test LCD display
            Certify media
            Verify media
            Previous menu
    Display time and messages

MULTIPAC 7580 / 7902 MENU TREE

The menu tree below should help you orient yourself within the command structure for the MultiPac 7580 and 7902.

Time / Date
    Unload upper cartridge
    Unload lower cartridge
    Copy cartridge to lower drive
    Copy cartridge to upper drive
    Configurations
        Change HPIB address
        Change option
        Change drive button
        Change default sector size
        Change CS80 format
        Set time
        Set date
        Return to main
    Utilities
        Bering model
        ROM version / date
        Upper disk utilities
            Show cartridge information
            Unload or Lock / unlock cartridge
            Verify cartridge
            Format cartridge
            Copy cartridge to lower drive
            Previous menu
        Lower disk utilities
            (like Upper disk utilities, but copies to upper drive)
        Tests
            Show statistics
            Test LCD display
            Certify media
            Verify media
            Previous menu
        Return to main
    Display time and messages

**MULTIPAC 7508/7518
7908/7918 MENU TREE**

The menu tree below should help you orient yourself within the command structure for the MultiPac 7508/7518 and 7908/7918.

Time / Date
    Unload cartrige
    Local backup
    Local restore
    Configurations
        Change HPIB address
        Change option
        Change drive button
        Change default sector size
        Change emulation
        Change fixed disk volume protect
        Change CS80 format
        Set time
        Set date
        Return to main
    Utilities
        Bering model
        ROM version / date
        Fixed disk utilities
            Show disk information
            Park disk heads
            Verify disk
            Format disk
            Previous menu
        Removable disk utilities
            Show cartridge information
            Unload or Lock / unlock cartridge
            Verify cartridge
            Format cartridge
            Previous menu
        Tests
            Show statistics
            Test LCD display
            Certify media
            Verify media
            Previous menu
        Return to main
    Display time and messages

MULTIPAC 7503 & 7903 MENU TREE

The menu tree below should help you orient yourself within the command structure for the MultiPac 7503 and 7903.

Time / Date
    Load/Unload cartrige
    Configurations
        Change HPIB address
        Change option
        Change drive button
        Change default sector size
        Change CS80 format
        Set time
        Set date
        Return to main
    Utilities
        Bering model
        ROM version / date
        Removable disk utilities
            Show disk information
            Load/Unload or Lock / unlock cartridge
            Verify cartridge
            Format cartridge
            Previous menu
        Floppy disk utilities
            Show floppy information
            Verify floppy
            Format floppy
            Previous menu
        Tests
            Show statistics
            Test LCD display
            Certify media
            Verify media
            Previous menu
        Return to main
    Display time and messages

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 following options are available from the Main menu:

> **Unload cartridge**
> **Local backup** (7508 / 7518 and 7908 / 7918 only)
> **Local restore** (7508 / 7518 and 7908 / 7918 only)
> **Configurations**
> **Utilities**
> **Display time and messages**

These options are available from the Main menu of the MultiPac 7580 and 7902 dual-drive subsystems:

> **Unload upper cartridge**
> **Unload lower cartridge**
> **Copy cartridge to lower drive**
> **Copy cartridge to upper drive**
> **Configurations**
> **Utilities**
> **Display time and messages**

UNLOAD CARTRIDGE, UNLOAD UPPER CARTRDIGE, OR UNLOAD LOWER CARTRIDGE

Use this function to unload the cartridge when the Drive button is disabled (the default setting).

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

   For the 7580 and 7902:
   Unload upper cartridge or
   Unload lower cartridge

2. **Press the** ENTER **button.**
   If the drive button is disabled in the Configurations menu, a request is sent to the host system for permission to remove the cartridge. If the system grants the request or if there is no response for one second, the cartridge will be ejected. This is required for some operating systems and also prevents accidental ejection during cartridge use.

   If the cartridge is in use by the operating system, you'll see:
   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 initiate this action.**
See "Unloading a Cartridge" in Chapter [C#,Operating for more details.

COPY CARTRIDGE

This function is available only for the MultiPac 7580 and 7902. Use COPY CARTRIDGE to copy an image of one cartridge to another.

1. **Write-protect your source cartridge to preclude the possibility of erasure.**

2. **Load the source and destination cartridges into the drives.**

3. **Choose the appropriate COPY command from the Main menu and press the** ENTER **button to start the COPY command.**
This warning message will appear:

> **Erase entire**
> **media? No**

4. **Use the** SELECT **button to choose Yes and press the** ENTER **button.**
If the destination cartridge is unformatted or has a different format than the source (e.g., different sector size) the following message will appear:

> **Format destination? No**

a. **If you decide not to start the process, choose No and press the** ENTER **button to quit.**
If you do not see the above format query, you'll automatically pick up the process with the paragraph at the top of step 5a.

5. **Use the** SELECT **button to choose Yes and press the** ENTER **button to begin the process.**

> **Formatting cartridge**

will appear and formatting will take about 30 minutes. Once the destination cartridge has been formatted, the data from the source will automatically be copied.

As the copy progresses, the record address will be updated on the display:

> **Copy CARTRIDGE**
> **record** ***n***

a. **To stop the COPY process at any time, press and hold the** SELECT **and** ENTER **buttons simultaneously until you see this message:**
> **Abort received**
> **Wait . . .**

b. **Release the buttons.**
The function will abort and you'll see:
> **User abort**

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

When the COPY process is complete

> **Unloading CARTRIDGE**

will flash on the LCD momentarily and then you'll be asked to

> **Remove cartridge 1!**

6. **Push the** DRIVE **button and** release the cartridge.

7. **Remove the cartridge, label it appropriately, and then press the** ENTER **button.**

You will see

> **Copy done at**
> **10:30 am**

8. **Press the** ENTER **button to exit the COPY process.**

LOCAL BACKUP

This function is available only on the Bering 7508, 7518, 7908, and 7918 subsystems. Use it to back up the fixed disk in those units. The entire image of the fixed disk is copied onto as many cartridges as are required.

Note: For tutorial purposes the following steps assume that you do not have a cartridge in the drive when you initiate the LOCAL BACKUP function.

1. **Select Local Backup from the Main menu and press the** ENTER **button to choose this option.**

You will be asked:

> **Erase entire**
> **media? No**

2. **If your fixed disk is formatted with multiple volumes (see the FORMAT DISK function), you will be asked**

> **Backup volume**
> **all?**

a. **Press the** SELECT **button to scroll through the choices:**

> **all** = entire disk
> **0** = volume 1
> **1** = volume 2
> etc.

b. **Press the** ENTER **button to continue when the desired choice is visible.**

3. **Press the** SELECT **button to choose Yes and press the** ENTER **button to continue.**

> **Load cartridge**
> **1 & continue? Yes**

    a. **If you change your mind and want to quit the BACKUP process, use the the** SELECT **button to choose No and press the** ENTER **button.**
You'll see

User abort

    b. **Press the** ENTER **button and you'll be returned to the Time and Date display in the Main menu.**

4. **Load a cartridge which is not write-protected into the drive, wait for it to spin up, and press the** ENTER **button to continue.**
You'll see:

    Loading
    CARTRIDGE

If you inserted a blank, formatted disk the backup will begin immediately. Otherwise, the message you see next will depend on your situation.

5. **If the cartridge is not formatted or has a different sector size than the fixed disk you will see:**

    Format
    destination? No

    a. **Use the** SELECT **button to choose Yes and press the** ENTER **button to continue.**
You will see:

    Formatting
    CARTRIDGE

When the cartridge has been formatted the LOCAL BACKUP procedure will automatically begin the backup without your intervention.

6. **If the cartridge already contains a readable backup...**
You will see:

    Overwrite backup
    *Thu Feb 21, 1991***? No**

If that is the cartridge on which you want your backup ...

    a. **Use the** SELECT **button to choose Yes and press the** ENTER **button to continue.**
You'll see the messages detailed in step 8 if you choose Yes.

If you want to use a different cartridge ...

a. Use the SELECT **button to choose No , if need be, then press the** ENTER **button.**
You will see

Unloading
CARTRIDGE

then you'll be promted to:

Remove
cartridge!

b. Remove the cartridge from the drive, and press the ENTER **button.**
Now you'll be notified to

Load cartridge
1 & continue? Yes

c. Go back to step 4.

7. **If, after you back up onto a cartridge or two, you accidently insert a cartridge which contains part of the current backup, you will be notified:**
Part of current
cartridge set!

In that case, you'll need to eject the cartridge and replace it with the proper one.

a. Press the ENTER **button and you'll see:**
Unloading
CARTRIDGE

Then you'll be prompted:

Remove
cartridge!

b. Remove the cartridge from the drive and press the ENTER **button.**
Now you'll be notified to

Load cartridge
1 & continue? Yes

c. Go back to step 4 to resume the backup.

8. **As the backup progresses, the record address of the fixed disk will be updated on the LCD:**
Backup disk ...
record n

When the cartridge is full you'll see:

Remove
cartridge n

9. **Press the drive button and flip the cartridge load lever to remove the cartridge and label it carefully, including the date and cartridge number, then press the** ENTER **button to continue.**
   If another cartridge is required, you will be prompted to:

   **Load cartridge
   2 & continue? Yes**

10. **Load the next cartridge, wait for it to spin up, and press the** ENTER **button to choose Yes and continue the backup.**

    a. **To abort the function at any time, press and hold the** SELECT **and** ENTER **buttons simultaneously until you see the following message:**
       **Abort received
       Wait . . .**

    b. **Release the buttons.**
       The function will abort and you'll see:
       User abort

    c. **Press the** ENTER **button to exit and return to the Main menu.**
       Continue in the loop until the backup is complete. You will be notified:
       **Backup done at
       10:30 pm**

11. **Press the** ENTER **button to exit the LOCAL BACKUP function and return to the Main menu.**

LOCAL RESTORE

Use this function to restore the fixed disk in the Bering 7508, 7518, 7908, or 7918 subsystems. The entire image of the disk is restored from the cartridges generated by the LOCAL BACKUP function.

You can restore the backup set in any order.

1. **Load one of the cartridges from the set containing the desired backup image.**

2. **With the Local restore function displayed, press the** ENTER **button to choose the RESTORE function.**
   You will see one of the following messages:

   **Restore to
   Wed Jan 24, 1990? No**

   This message shows the date of the total fixed disk backup on the cartridge you inserted.

   **Restore vol n
   Wed Jan 24, 1990? No**

   This message, on the other hand, shows the date of the fixed disk volume backup on the cartridge you inserted.

If you choose No and press the ENTER button you will return to the Main menu.

3. **Press the** SELECT **button to choose Yes and press the** ENTER **button to continue.**

4. **If the fixed disk is not formatted or has a different sector size than the backup image you will see:**
   Format
   destination? No

   a. **Use the** SELECT **button to choose Yes and press the** ENTER **button to format the fixed disk.**
   You'll be notified:
   Formatting
   DISK

   Formatting the fixed disk will take up to an hour.

   If you choose not to format the fixed disk by selecting No and pressing the ENTER button, you will instead see:
   User abort

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

5. **If both formats match, the restoration process will begin.**
   As a standard restoration progresses the record address of the fixed disk is updated with the following message:
   Restore disk ...
   record *n*

   When the data from a cartridge has been restored to the fixed disk, you will see:
   Remove
   cartridge *n!*

6. **Remove the cartridge from the MultiPac and press the** ENTER **button to continue.**
   If another cartridge is required to continue or complete the restoration you will see:
   Load cartridge
   n **to continue? Yes**

   If the restoration is complete you'll see:
   Restore done at
   10:30 pm

7. **If the backup isn't complete, load the next cartridge with the backup set into the MultiPac, make sure that Yes is still selected, and press the** ENTER **button to continue the restoration.**

If you want to stop the restoration, choose **No** and press the **ENTER** button. You'll see:

> **User abort**

a. **Press the** ENTER **button and you'll be returned to the Main menu.**

8. **If the cartridge you inserted in the MultiPac does not belong to the current backup set, you'll be advised:**
   > **Not part of**
   > **cartridge set!**

   a. **Press the** ENTER **button to unload the cartridge.**

   b. **Go back to step 6.**

9. **If the data on the cartridge is already restored you will see:**
   > **Data already**
   > **restored!**

   a. **Press the** ENTER **button to unload the cartridge and go to step 6.**

10. **Press the** ENTER **button to complete and exit the LOCAL RESTORE process.**

CONFIGURATIONS

Functions in this submenu set the HP-IB address, emulation mode, change the drive button function, default sector size, CS80 format, command mode, and set the date and time. (See the "Configurations Submenu" section for detailed information.)

UTILITIES

This function shows cartridge information; locks and unlocks, verifies, and formats the cartridge and the fixed disk; copies cartridge data; 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 time, date, and system messages.

Configurations Submenu

The functions in this submenu set the HP-IB address, change the emulation, change the drive button function, default sector size, CS80 format command, and set 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 HPIB address (n)**
   > **Change option (normal)**
   > **Change drive button (disabled)**
   > **Change default sec[tor] size**
   > **Change emulation (disabled)** (7508, 7518, 7908, 7918)
   > **Change fix[ed] disk volume protect** (7508, 7518, 7908, 7918)
   > **Change CS80 format**
   > **Set time**
   > **Set date**
   > **Return to main**

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

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

CHANGE HPIB ADDRESS (0)

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

1. **With the Change HPIB address function displayed, press the** ENTER **button to choose this function and you'll see:**
   > **HPIB address = *n***

2. **Press the** SELECT **button to scroll through all the choices, then press the** ENTER **button to choose an address.**
   The MultiPac will reset to the new value.

CHANGE OPTION (NORMAL)

This function selects one of four special options:

> **normal** — the drive will report the exact configuration of the cartridge to the host system. For example, configuration is a removable cartridge with 512 bytes/sector.

> **fix disk** — the drive will report similar configuration information to the host system as in the normal mode, except for a fixed disk. This is intended for systems that can't handle a removable disk. For example, the HP9000 PASCAL system can't boot from a removable cartridge with an HFS directory organized as a fixed disk.

256 bps — logically organizes the cartridge as 256 bytes/sector regardless of its sector size. Use this only if the cartridge is not formatted to 256 bytes/sector for systems that do not support other sector sizes, e.g., the HP1000 RTE).

1024 bps — logically organizes the cartridge as 1024 bytes/sector regardless of its sector size. Use this only if the cartridge is not formatted to 1024 bytes/sector for systems that do not support other sector sizes.

1. **With the Change option function displayed, press the** ENTER **button to choose this option and the following message will appear:**
   Set option to
   (normal/fix disk/256 bps/1024 bps)

2. **Press the** SELECT **button to step through the normal, fix disk, 256 bps, and 1024 bps functions, then press the** ENTER **button to choose the one which is displayed.**

CHANGE EMULATION

This function enables or disables HP disk emulation for the Bering fixed disk. When enabled, the Bering fixed disk will emulate an HP fixed disk. The default setting is disabled.

1. **With the Change emulation function displayed, press the** ENTER **button to choose this function.**
   The following message will appear:
   disable/enable HPxxxxx emulation

   where xxxx is the HP model to be emulated

2. **Press the** SELECT **button to toggle between disable and enable.**

3. **Press the** ENTER **button to choose the desired setting.**

CHANGE DRIVE BUTTON (DISABLED)

This function enables or disables (default) the Drive button. The default setting permits cartridge removal only by using the **Unload cartridge** function. This allows the MultiPac to communicate with the host system to request permission for cartridge removal.

1. **With the Change drive button function displayed, press the** ENTER **button to choose this function.**
   The following message will appear:
   disable/enable drive
   button

2. **Press the** SELECT **button to toggle between disable and enable.**

3. **Press the** ENTER **button to choose the desired setting. The disable function is recommended.**

CHANGE DEFAULT SEC[TOR] SIZE   This function sets the default physical sector size when the fixed disk is formatted by the host computer.

Note: The physical sector size for the cartridge is always 512 bytes. The sector size may be specified by the FORMAT option in the FORMAT or INITIALIZE utilities (or commands) from your host computer. Refer to Chapter 5 for details.

1. **With the Change default sec size function displayed, press the ENTER button to choose this function.**
   You'll see this message:

   > **Set bytes/sector**
   > **to same/256/512/1024**

2. **Press the SELECT button to scroll through the selections:**
   same   = no change
   256   = 256 bytes/sector
   512   = 512 bytes/sector
   1024   = 1024 bytes/sector

   A sector size of 256 bytes/sector is required for some systems. HP 9000, and HP-UX users may use 1024 bytes/sector. See Appendix A for capacities.

3. **Press the ENTER button to choose the desired value.**

CHANGE FIXED DISK VOLUME PROTECT   This function is available only for the Bering 7508, 7518, 7908, and 7918. Use it to toggle write-protection on or off for each individual volume on the fixed disk.

1. **With the Change fixed disk volume protect function displayed, press the ENTER button to choose this function.**
   You'll see

   > **Write protect**
   > **volume *n*? No**

2. **Choose Yes or No and press the ENTER button to protect or unprotect each volume on the fixed disk as you step through them one-by-one.**
   When you've stepped through each volume on the fixed disk you'll return to the Configurations submenu.

**CHANGE CS80 FORMAT
(ENABLED)**

Use this function to disable the CS80 FORMAT command when you want to speed up the initilization process or to prevent accidental execution of the FORMAT utility.

▲ **Caution:**

When the FORMAT command is disabled, the INITIALIZE utility or command may 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.**
   You will see:

   **disable/enable CS80
   format command**

2. **Use the** SELECT **button to toggle between Enable and Disable and press the** ENTER **button to choose the desired setting.**
   The **Enable** setting is recommended.

SET TIME

This function allows you to change the time.

1. **When Set time is 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.

   To decrement the hour, press and hold the **SELECT** button, and then press the **ENTER** button.

3. **When the correct hour is displayed, press the** ENTER **button.**
   The minute field will start to blink.

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

SET DATE

This function allows you to change the date.

1. **When Set date is displayed, press the ENTER button. You'll see:**
   Set date
   Sat Feb 24, 1990

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

2. **Press the SELECT button to increment the day.**
   Holding the <u>SELECT</u> button will cause the day to increment (through twelve hours) continuously.

   To decrement the day, press and hold the <u>SELECT</u> button, and then press the <u>ENTER</u> button.

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 like 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 information; locks and unlocks, verifies, and formats the cartridge; copies and erases cartridge data; and performs test functions via the following options:

- **MODEL NUMBER** — Displays the model number of the MultiPac.

- **ROM VERSION** — Displays the firmware version number and release date.

- **REMOVABLE DISK UTILITIES** — Shows cartridge information; locks and unlocks, verifies, and formats the cartridge copy. The Bering 7580 and 7902 will offer functions for the upper and lower disks. Refer to the "Removable Disk Utilities Submenu" section for detailed information.

- **FIXED DISK UTILITIES** — (For the Bering 7508, 7518, 7908, and 7918 only.) Shows disk information, parks the heads, verifies and formats the fixed disk. (See the "Fixed Disk Utilities Submenu" section for detailed information.)

- **TESTS** — Shows statistics, tests the LCD, and certifies media. (See 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 then appears and displays the following options:

   Bering model number
   ROM version, date
   Removable disk utilities
   Fixed disk utilities (7508, 7518, 7908, and 7918)
   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.**

FIXED DISK UTILITIES SUBMENU

This group of functions shows fixed disk information; verifies and formats the disk; and parks the read/write head.

1. **Press the** ENTER **button when the Fixed disk utilities function is displayed on the Utilities submenu.**
   The Removable disk utilities submenu then appears displaying the following functions:

   Show DISK information
   Park disk head
   Verify disk
   Format disk
   Previous menu

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

3. **You can return to the Utilities menu by pressing the** ENTER **button when you see Previous menu .**

REMOVABLE / UPPER / LOWER DISK UTILITIES SUBMENU

This group of functions shows cartridge information; locks and unlocks, verifies, and formats the cartridge; and erases cartridge data. The same basic functions, where appropriate, are available for all subsystems, though there are some product-specific additions and variations.

1. **Press the** ENTER **button when the Removable/Upper/Lower disk utilities function is displayed on the Utilities submenu.**
   The Removable disk utilities submenu then appears displaying the following functions:

Show CARTRIDGE information
Load/Unload cartridge
Lock/Unlock cartridge
Verify cartridge
Format cartridge
Copy to upper/lower cartridge (7580 / 7902)
Previous menu

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

3. **You can return to the Utilities menu by pressing the** ENTER **button when you see Previous menu .**

Show Disk / Cartridge Information

This function displays the following information about the disk / cartridge:

Number of volumes on disk / cartridge (if more than 1)
Volume capacity in KB
Volume size in cylinders
Volume cylinder size in tracks
Volume track size in sectors
Volume size in sectors
Logical sector size
Physical sector size
Date disk / cartridge last formatted *
Date disk / cartridge last written *
Date disk / cartridge last accessed *
Last full backup date *+
Volume *n* backup date *+
Last backup of disk *#
Disk number *n* of *n* *#

* only if disk / cartridge is formatted
+ fixed disk only
# cartridge only

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

Unload Cartridge

This function is available only if the DRIVE button is disabled in the Configurations menu. It is the same as **Unload cartridge** in the Main menu.

Lock / Unlock Cartridge

This function is available only if the <u>DRIVE</u> button is enabled in the Configurations menu. It is used to lock the cartridge in the drive to prevent accidental ejection during cartridge use.

1. **With the Lock cartridge function displayed, press the** ENTER **button to lock the cartridge in the drive.**
   The function will change to

   Unlock cartridge?

1. **To unlock the cartridge, press the** ENTER **button when the Unlock cartridge function is displayed.**
   The function will change to

   Lock cartridge?

Park Disk Head

This function moves the read / write head of the fixed disk into the inner-most tracks for safety.

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

Verify Disk / Cartridge

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

1. **With the Verify cartridge function displayed, 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 take awhile to stop and the following message will appear:

   **CARTRIDGE
   verified**

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 / Removable disk utilities submenu.**

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Format Disk / Cartridge

This function is used to format the disk / cartridge if the FORMAT utility is not available in your host system or if you want to partition the disk / cartridge into multiple volumes. After the disk / cartridge is formatted into multiple volumes, you must use the HP-IB address, unit number (0) and the volume number (0 to 7) to access each of the volumes.

1. **Press the** ENTER **button when the Format disk / cartridge function is displayed on the Fixed / Removable disk utilities submenu.**
   The Format cartridge submenu then appears displaying the following message:
   > **Erase entire**
   > **media? No**

2. **Press the** SELECT **button to choose Yes and press the** ENTER **button to continue.**
   The following message will appear:
   > **Set bytes/sector**
   > **to same**

3. **Use the** SELECT **button to scroll through the options (same, 256, 512, 1024) , choose one, and press the** ENTER **button.**
   We recommend that you choose 256 bytes per sector. When you've made your choice, you'll see:
   > **Set interleave**
   > **to 1**

4. **Use the** SELECT **button to scroll through the options (1-10), choose one, and press the** ENTER **button.**
   You'll see:
   > **Set volumes**
   > **to** *n*

5. **Use the** SELECT **button to scroll through the choices for number of volumes 1-8 and press the** ENTER **button to choose the desired value.**
   You'll see a display showing the number of volumes (**vols**) and the sector size (**bps** — bytes per sector):
   > **1 vols 1024 bps**
   > **continue?   No**

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

6. **Use the** SELECT **button to select Yes and press the** ENTER **button to start the format process.**
   The following message will appear:
   > **Formatting**
   > **DISK / CARTRIDGE**

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

DISK / CARTRIDGE
formatted

7. **Press the** ENTER **button to return to the Fixed / Removable disk utilities submenu.**

Copy Cartridge to Upper / Lower Drive

These are the same as the functions in the main menu. See the "Copy Cartridge" section in this chapter for details.

FLOPPY DISK UTILITIES SUBMENU

This group of functions shows floppy disk information; verifies and formats the disk.

1. **Press the** ENTER **button when the Floppy disk utilities function is displayed on the Utilities submenu.**
The Floppy disk utilities submenu then appears displaying the following functions:

Show FLOPPY information
Verify floppy
Format floppy
Previous menu

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

3. **You can return to the Utilities menu by pressing the** ENTER **button when you see Previous menu .**

Show floppy Information

This function displays the following information about the floppy disk:

Floppy capacity in bytes
High/Low density
Single/Double sided
Sector size
Interleave
IBM format
Write-protected

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

Verify Floppy

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

1. **With the Verify floppy function displayed, press the** ENTER **button to start. You'll see**
   Verifying
   FLOPPY

   As the verification progresses, the track address is updated. The following message will appear:
   Verifying
   Cyl *n* **Head** *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 take awhile to stop and the following message will appear:
   FLOPPY
   verified

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

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

Format Floppy

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

1. **Press the** ENTER **button when the Format floppy function is displayed on the Floppy disk utilities submenu.**
   The Format cartridge submenu then appears displaying the following message:
   Erase entire
   media? No

2. **Press the** SELECT **button to choose Yes and press the** ENTER **button to continue.**
   The following message will appear:
   Set bytes/sector
   to same

3. **Use the** SELECT **button to scroll through the options (same, 256, 512, 1024, PC) , choose one, and press the** ENTER **button.**
We recommend that you choose 256 bytes per sector. When you've made your choice, you'll see:
> **Set interleave**
> **to 1**

4. **Use the** SELECT **button to scroll through the options (1-10), choose one, and press the** ENTER **button and you'll see:**
> **256 bps**
> **Interleave 1**

5. **Press the** ENTER **button again and you'll see:**
> **OK to format?**
> **No**

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

6. **Use the** SELECT **button to select Yes and press the** ENTER **button to start the format process.**
The following message will appear:
> **Formatting**
> **FLOPPY**

and then
> **Formatting**
> **Cyl** *n* **Head** *n*

When the process is complete, yoy'll see:
> **FLOPPY**
> **formatted**

7. **Press the** ENTER **button to return to the Floppy disk utilities submenu.**

TESTS SUBMENU

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

1. **Press the** ENTER **button when the Tests function is displayed on the Utilities submenu.**
The Tests submenu will appear offering the following options in sequence:
> **Show statistics**
> **Test LCD display**
> **Certify media**
> **Verify media**

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

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. The options and LCD messages vary, depending on the MultiPac model you have.

1. **With the Show statistics function displayed, press the** ENTER **button and you'll see one of the following messages**
   For the 7508, 7518, 7908, and 7918:

   Fixed disk statistics
   Cartridge disk statistics

   For the 7580 and 7902:

   Upper cartridge statistics
   Lower cartridge statistics

2. **Press the** SELECT **button to scroll through the options and press the** ENTER **button to choose a drive and see the statistics for it.**

3. **Press the** ENTER **button once for each message to step through the following counters:**
   Blocks read = n
   Blocks written = n
   Read errors = n
   Write errors = n
   Seek errors = n
   Other errors = n

4. **Press the** ENTER **button after viewing Other errors and you'll see:**
   Clear statistic counters? No

5. **Press the** SELECT **button to choose Yes and then press the** ENTER **button to exit.**
   Since the statistic counters are stored on the disk or cartridge, this information will not be available if the media 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. **With the Test LCD display function displayed, press the** ENTER **button to start the test.**
   All of the dots on the LCD will be turned on. The last character block will alternate between dots and an asterisk (*). If there are any missing dots (except the last character with an *), call the Bering Service Department for replacement.

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

Certify Media

This function will first write test patterns on the entire cartridge and then executes the **Repeat verify** function.

1. **Press the** ENTER **button when the Certify media function is displayed on the Tests submenu.**
   The Certify media submenu will appear:

   Erase entire
   media? No

2. **Press the** SELECT **button to select Yes, then press the** ENTER **button to choose this function.**
   The following message will appear:

   Verify media
   until abort? No

3. **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 (7503, 7508, 7518, 7580, 7902, 7903, 7908, and 7918) you will first be asked:

   Test all drives?
   No

If you choose **No** you'll also be asked sequentially to select the drive(s) to be tested.

For the 7580 and 7902:

   Test upper cartridge? No
   Test lower cartridge? No

For the 7508, 7518, 7908, and 7918:

   Test fixed disk? No
   Test cartridge disk? No

For the 7503 and 7903:

   Test cartridge disk? No
   Test floppy disk? No

a. **Use the** SELECT **button to choose Yes for the drive you want to test and press the** ENTER **button to begin the test.**
   The record address will advance while the test pattern is written on the cartridge and the following message will appear:

   Write CARTRIDGE
   record _n_

The verify pass will begin when the test patterns have been written and the following message will appear:

   Verify CARTRIDGE
   record _n_

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Note: The messages will include **DISK** or **FLOPPY** rather than **CAR-TRIDGE** when you are testing a fixed disk or the floppy disk.

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 4.

If you chose multiple verification passes you must stop the process yourself unless a bad sector is found.

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 after awhile and the following message will appear:
User abort

c.   **Press the** ENTER **button to exit.**
You will see:
n **complete**
verifies done

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

Verify Media

This function is similar to the **Certify media** function, except Verify media does not write test patterns. 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 Repeat verify 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 (7580, 7508, 7518, 7902, 7503, 7903, 7908, and 7918) 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 the 7508, 7518, 7908, and 7918:

Test fixed disk? No
Test cartridge disk? No

For the 7580 and 7902:

Test upper cartridge? No
Test lower cartridge? No

For the 7503 and 7903:

Test cartridge disk? No
Test floppy 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: The messages will include **DISK** or **FLOPPY** rather than **CARTRIDGE** when you are verifying a fixed disk or the floppy disk.

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. **You can do this at any time, by pressing both the** SELECT **and** ENTER **buttons simultaneously and holding them until you see:**
Abort received.
wait ...

b. **Release the buttons.**
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. When the verification stops, you will see **User abort.**

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.**

Chapter 5
CONFIGURING
YOUR HP SYSTEM

This chapter describes how to configure different types of HP computer systems for the MultiPac. It is divided into the following sections: HP 9000 Series 200-BASIC 2.0, Series 200-BASIC 3.0/4.0, Series 200/300-BASIC 5.0, Series 200-PASCAL 2.0/3.0/3.1, Series 200/300-PASCAL 3.2, Series 300-HP-UX, Series 200-SRM, Series 500-HP-UX, HP 1000-A, HP and 1000-M/E/F. Refer to the section which applies to your computer.

Each section describes how to boot the operating system from a micro-floppy disk, prepare the cartridge, install the operating system and application software on the cartridge, and how to boot from the MultiPac.

It is assumed that a built-in or external flexible disk drive is connected to the computer. Other combinations of disk drives and peripherals may require modifications of the procedures and settings.

UNIT NUMBER

Unit numbers are used for subsystems with multiple drives. The following table lists those unit numbers.

Model	Drive	Unit #
7580/7902	upper drive	0
	lower drive	1
7503/7903	cartridge	0
	floppy	1
7508/7518	fixed disk	0
& 7908/7918	cartridge	1

Table 5.1:
Drive unit numbers

Formatting a Floppy Disk

You must choose a formatting option and interleave factor when you format (initialize) a floppy disk. See the following tables for explanations of the various choices. The default setting is 0.

▲ CAUTION: *Single-sided disks must not be formatted as double-sided. Format options 2 and 16 (512-byte) don't work with BASIC or Pascal.*

Media	Frmt Optn	Bytes/ Sector	Sctrs/ Track	Tracks/ Surface	Srfcs/ Disk	Total Sectors	Capacity (bytes)
0.5 MB	4	256	16	66	1	1,056	270,336
1 MB	0	256	16	77	2	2,464	630,784
	1*	256	16	77	2	2,464	630,784
	2	512	9	77	2	1,386	709,632
	3	1,024	5	77	2	770	788,480
	4	256	16	66	1	1,056	270,336
	16	512	9	80	2	1,440	737,280
2 BM	0	256	32	77	2	4,928	1,261,568
	1**	256	32	77	2	4,928	1,261,568
	2	512	18	77	2	2,772	1,419,264
	3	1,024	10	77	2	1,540	1,576,960
	4**	256	32	77	2	4,928	1,261,568
	16	512	18	80	2	2,880	1,474,560
*Same as Option 0 (default) when using 1 MB media. **Same as Option 0 (default) when using 2 MB media.							

Table 5.2: Floppy disk formatting options

Frmt Optn	0.5 MB Media	1 MB Media	2 MB Media
0	Don't use	Normal usage	Normal usage
1	Don't use	Normal usage	Normal usage
2	Don't use	512-byte sectors	512-byte sectors
3	Don't use	1024-byte sectors	1024-byte sectors
4	Compatible with HP single-sided disk drives	Compatible with HP single sided disk drives	Defaults to Format Option 0
16	Don't use	IBM compatible	IBM compatible

Table 5.3: Formatting options and media usage

Series 200 - Basic 2.0

SYSTEM REQUIREMENTS

The following is a list of hardware and software required or recommended to interface with the MultiPac subsystems.

- Binary Extension AP2.1 is required.

- The LOADER utility with Boot ROM 3.0 is needed to boot from the MultiPac.

- Disk Interface HP98625A and Dual Channel DMA HP98620B are recommended to utilize the 1 MB/sec transfer rate.

CONFIGURATION

Use the MultiPac controls to set the configuration options according to the following settings. Refer to Chapter 4 for detailed instructions.

HP-IB address:	*0-7*
Option:	256 bps
Drive button:	**disabled**
Default sector size:	**256 bps**

MASS STORAGE UNIT SPECIFIER

The Mass Storage Unit Specifier (MSUS) is what the computer uses to identify your disk drive. For example, the MSUS of the MultiPac might appear as follows:

```
":CS80,700,1"
```

Note: The MSUS is composed of three parts, separated by commas:

Device type:	:CS80
Device selector:	700
Unit number:	1

The device selector is the address of your MultiPac. The first digit is the select code of your HP-IB interface. For the internal HP-IB, it is 7. The last two digits are the HP-IB address of the MultiPac as set by the front panel control buttons. The range of addresses is from 00 to 07.

See table 5.1 for the correct unit number. For the Disk Interface card, which is normally select code 14, the MSUS will be :CS80,1400,0.

BOOTING YOUR SYSTEM

1. **Verify that the HP-IB address of the MultiPac is set as desired and that the setting is different from other disk drives (i.e., HP9121 micro-floppy drive).**

2. **Turn off your computer.**

3. **Turn on your disk drive(s) and wait for the self-test to complete.**

4. **Insert the BASIC system disk into the internal or external flexible disk drive.**

5. **Turn on your computer.**
   Your computer will automatically load the operating system and prompt: BASIC READY.

6. **Remove the BASIC system disk from the floppy drive.**

7. **Insert the AP2.1 disk into the floppy drive.**

8. **Type**

   LOAD BIN "AP2_1"

   and press [EXECUTE].
   Now the BASIC 2.0 is ready to use.

DISK INITIALIZATION

The interleave factor affects the performance of your computer. It is recommended that you set the interleave factor at 1 for best performance.

1. **Type a command similar to**

   INITIALIZE ":CS80,700,0",1

   and press [EXECUTE] **to initialize the cartridge.**
   The last character represents the interleave (1). The first eight characters (CS80,700,0) represent the MSUS.

BOOTING FROM THE DISK

To boot from the MultiPac, the Boot ROM 3.0 or later should be installed and all of the system files need to be copied from the flexible disk onto the fixed disk or cartridge.

1. **Insert the BASIC 2.0 system disk into the internal or external disk drive.**

2. **Copy the LOADER utility onto the disk using commands similar to:**

   ```
   COPY "SYSTEM_LD" to "SYSTEM_LD:CS80,700,0"
   COPY 'CONFIGER' to 'CONFIGER:CS80,700,0"
   COPY "CONFIG_CHK" to "CONFIG_CHK:CS80,700,0"
   ```

3. **Copy the system using a command similar to:**

   ```
   COPY "SYSTEM_BAS" to "SYSTEM_BAS :CS80:700,0"
   ```

4. **Insert the AP2.1 disk into the internal or external disk drive.**

5. **Copy the AP2.1 using a command similar to the following:**

   ```
   COPY "AP2_1" to 'AP2_1:CS80,700,0"
   ```

6. **Load the CONFIGER utility using commands similar to the following:**

   ```
   MSI ":CS80,700,0"
   LOAD 'CONFIGER'
   ```

7. **Then press** [RUN] **to start loader configuration.**

8. **Type the loader command file name**

   ```
   CONFIG_LD
   ```

   and press [ENTER].

9. **Type the files to be loaded:**

   ```
   SYSTEM_BAS
   ```

   and press [ENTER]

   ```
   AP2_1
   ```

   and press [ENTER] **, then press** [ENTER] **again.**

10. **Remove the disk from the floppy drive and turn off your computer.**
    Now you should be able to boot from the MultiPac by turning on your computer.

Series 200 - Basic
3.0/4.0

SYSTEM REQUIREMENTS

The following is a list of hardware and software required or recommended to interface with the Bering MultiPac subsystem.

- The following binary programs are required:
  CS80
  HP-IB

- Disk Interface HP98625A and Dual Channel DMA HP98620B are recommended to utilize the 1 MB/sec transfer rate.

- If the Disk Interface is installed, the binary program, FHPIB, is also required.

CONFIGURATION

Use the MultiPac controls to set the configuration options according to the following settings. Refer to Chapter 4 for detailed instructions.

HP-IB address:	**0-7**
Option:	**1024**
Drive button:	**disabled**
Default sector size:	**1024**

MASS STORAGE UNIT SPECIFIER

The Mass Storage Unit Specifier (MSUS) is what the computer uses to identify your disk drive. For example, the MSUS of the MultiPac might appear as follows:

`":CS80,700,1,0"`

Note:

The MSUS is composed of four parts, separated by commas:

Device type:	:CS80
Device selector:	700
Unit number:	1 (default 0)
Volume number:	0 (default 0)

The device type is optional with the BASIC 3.0/4.0 operating system. You may type your MSUS as `":,700,1,0"`, leaving out the device type.

The device selector is the address of your MultiPac. The first digit is the select code of your HP-IB interface. For the internal HP-IB, it is 7. The last two digits are the HP-IB address of the MultiPac as set by the front panel control buttons. The range of addresses is from 00 to 07.

See table 5.1 for the correct unit number.

BOOTING YOUR SYSTEM

The following procedure assumes that Boot ROM 3.0 or later is installed in your computer. Otherwise, boot your system with the floppy drive.

1. **Verify that the HP-IB address of your MultiPac is set as desired and that the address is different from other disk drives (i.e., HP9121 micro-floppy drive). If you are booting from the external floppy drive, make the HP-IB address different from the MultiPac.**

2. **Turn off your computer.**

3. **Turn on your disk drives and wait for the self-test to complete.**

4. **Insert the BASIC 3.0/4.0 system disk in the flexible disk drive.**

5. **Turn on your computer.**
   Your computer will automatically load the operating system and prompt, BASIC READY.

6. **Remove the BASIC system disk from the floppy drive.**

7. **Insert the BASIC 3.0/4.0 Drivers disk into the flexible disk drive.**

8. **If you are connecting the disk to the built-in HP-IB, type**

   `LOAD BIN "HPIB"`

   and press `[RETURN]`.

9. **If you are connecting the disk to the Disk Interface HP98625A, type**

   `LOAD BIN "FHPIB"`

   and press `[RETURN]`.

10. **When you see the prompt** `BASIC HPIB 3.0` **or** `BASIC FHPIB 4.0`**, type**

   `LOAD BIN "CS80"`

   and press `[RETURN]`.
   Now the system is ready to use with BASIC 3.0/4.0.

DISK INITIALIZATION

The interleave factor affects the performance of your computer. An interleave of 1 is recommended for the best performance.

1. **Initialize the cartridge, using a command similar to the following:**

   `INITIALIZE ":,700,0",1`

   The first four characters represent the MSUS (700,0). The last character represents the interleave (1).

BOOTING FROM THE DISK

To boot from the MultiPac, the system files need to be stored on the cartridge.

1. **Insert the BASIC 3.0/4.0 Drivers disk into the floppy drive.**

2. **You have already loaded the disk drivers HP-IB and CS80. Load any other driver by typing**

   `LOAD BIN "filename"`

   then press [RETURN].

3. **Insert the BASIC 3.0/4.0 Language Extension into the flexible disk drive and load any language extension BIN files by typing**

   `LOAD BIN "filename"`

   and pressing [RETURN].

4. **Create a system file on the disk, using a command similar to:**

   `STORE SYSTEM "SYSTEM_BA3 :,700,0,0"`

   The first characters represent the System file name ("SYSTEM_BA3). The last characters represent the MSUS (:,700,0,0).

5. **Remove the flexible disk.**

6. **Now you should be able to boot from the MultiPac by typing** `SYSBOOT`.
   Otherwise, you will boot from the MultiPac when you turn on your computer the next time.

Series 200/300 - BASIC 5.0

SYSTEM REQUIREMENTS

The following is a list of hardware and software required or recommended for use with the Bering MultiPac subsystem.

- The following binary programs are required :
  CS80
  HP-IB

- Disk Interface HP98625A and Dual Channel DMA HP98620B are recommended for a 1 MB/sec data transfer rate.

- If the Disk Interface is installed, the FHPIB binary program is required.

If you want to run BASIC 5.0 with HP-UX you will need to go through the following procedures before you load BASIC 5.0.

1. **Type** `su` **and press** `[RETURN]` **to log in as a superuser.**

2. **Type** `cd /` **and press** `[RETURN]` **to change to the root directory.**

3. **Type**

   `chmod 777 /`

   and press `[RETURN]` **to write-enable the root directory.**

4. **Type**

   `shutdown -h`

   and press `[RETURN]` **to shutdown the system.**

5. **Wait for the prompt** `halted` **, then power down the system.**

CONFIGURATION

Use the MultiPac controls to set the configuration options according to the following settings. Refer to Chapter 4 for detailed instructions.

HP-IB address:	*0-7*
Option:	*1024*
Drive button:	**disabled**
Default sector size:	**1024**

MASS STORAGE UNIT SPECIFIER

The computer uses the Mass Storage Unit Specifier (MSUS) to identify your disk drives. For example, the MSUS of a MultiPac might appear as follows:

```
":CS80,700,0,0"
```

Note:

The MSUS is composed of four parts, separated by commas:

Device type:	:CS80
Device selector:	700
Unit number:	0 (default 0)
Volume number:	0 (default 0)

The device type is optional with the BASIC 5.0 operating system. You may type your MSUS as `":,700,0,0"` leaving out the device type.

The device selector is the address of your MultiPac. The first digit is the select code of your HP-IB interface. For the internal HP-IB it is usually 7. The last two digits are the HP-IB address of the MultiPac set by the front panel control buttons. The range of addresses is from 00 to 07. For the Disk Interface card, which is normally select code 14, the MSUS will be :CS80,1400,0.

See table 5.1 for the correct unit number. Before you can install your new MultiPac, you will need to load your BASIC 5.0 operating system into memory from the system disks. After loading BASIC, the operating system can be installed on your MultiPac.

BOOTING YOUR SYSTEM

If you will be sharing your disk with other operating systems such as HP-UX or PASCAL, you should usually install the other operating system before installing BASIC 5.0. Refer to "Installing, Using, and Maintaining the BASIC 5.0 System" in your HP manual.

LOADING BASIC 5.0

The following procedure lists the steps for loading BASIC 5.0 into memory. For further information, refer to the section in your BASIC 5.0 manual.

Note:

You also need to follow this procedure if your system is ROM-based.

1. **Verify that the HP-IB address of your MultiPac is set as desired and that the address is different from other disk drives (i.e., HP9121 micro-floppy drive).**

2. **Turn off the computer.**

3. **Turn on the disk drives and wait for the self-test to complete.**

4. **Insert the BASIC system disk (disk one) into a floppy drive.**

5. **Turn on the computer and hold down the** [SPACE BAR] **.**
   All the bootable operating systems will be listed in the upper
   right hand corner of the screen, e.g.
   ```
   :HP7600,700,0,0
   1B - SYSTEM_B40
   2B - SYSTEM_B50
   ```

6. **Choose a system to load by typing the letters to the left of the system. For instance, type 2B to load BASIC 5.0.**

7. **Follow the instructions on the screen.**
   You will be instructed to load the BASIC Language Extension
   and Drivers Disk (disk two).

8. **BASIC is ready when the following message appears at the bottom of your monitor:**
   ```
   The BASIC system is now loaded for your use.
   ```

DISK INITIALIZATION

Follow this procedure to format the MultiPac disk.

1. **Insert the HFS Utilities disk into the default floppy drive.**

2. **Type**

   ```
   LOAD "DISC_UTIL"
   ```

   and press [RETURN] **to load the Utility.**
   This may take a minute or so to complete.

3. **Now run the program by pressing** [RETURN].

4. **Next press the** [CONTINUE] **soft key to start.**
   The screen will display a menu from which you can select a function by using the soft keys.

5. **Use the** [NEXT] **and** [PREVIOUS] **soft keys to select the**
   Format a disk **function from your display and press the**
   [SELECT] **soft key.**
   The display should now list a choice of drives from which to select the one to format.
   For example:
   ```
   =>    MultiPac Flexible :,700,0
         9122 Flexible :,701,0
   ```

6. **Use the** [NEXT] **and** [PREVIOUS] **soft keys to select the Multi-Pac disk you want formatted and press the** [SELECT] **soft key.**
The screen will display the directory format choices:

```
LIF directory format
HFS directory format
```

7. **Choose the directory format and press** [SELECT] **soft key.**
If you are not sure which format you prefer, refer to your HP BASIC 5.0 manual. In general, use the HFS format for hard disks.

If the disk is already formatted, the following prompt will appear:

```
Do you wish to proceed?
```

8. **Type** Y **to continue.**
The format procedure will take from 20 minutes to 1 hour. When the format procedure is complete, Done will appear at the bottom of the screen.

BOOTING FROM THE DISK

After the disk is formatted, you'll need to install the system and binaries to boot directly from the MultiPac. The next procedure is necessary for booting directly from your MultiPac.

Note: If you are already using HP-UX you need to be sure the root is write-enabled. Refer to the HP-UX manual for information about running BASIC 5.0 and HP-UX together.

1. **If the HFS utility is no longer in memory, insert the HFS Utilities disk into the default drive. Type**

```
LOAD DISC_UTIL
```

press [RETURN] **, and then press** [RUN] **.**
If it is already loaded into main memory, press the [Main Menu] soft key.

2. **Insert disk two, BASIC Language Extensions and Drivers, into the disk drive.**

3. **Select** Store the system and binaries from product discs **from the Main menu.**

4. **Select the MultiPac as the destination device and select the source drive from which you want to copy the system and binary files.**
The source will be the floppy drive which contains the BASIC Language Extensions and Drivers disk.

5. **Press** [CONTINUE] **to start storing.**

6. **Now you should be able to boot from the MultiPac by turning off your computer and turning it back on again, or by executing one of the following commands:**

`SYSBOOT [RETURN]`

or

`SYSBOOT SYSB50:,700 [RETURN]`

Be sure to press the [SPACE BAR] if you have multiple systems. You should see that the SYSB50 is in the file directory. For example:

```
lost + found
WORKSTATIONS
SYSB50
```

Series 200/300 -
PASCAL 2.0/3.0/3.1

SYSTEM REQUIREMENTS

The following is a list of hardware and software required or recommended to interface with the Bering MultiPac subsystem.

- The CS80 driver is required. Make sure it is included in the INITLIB module.

- Disk Interface HP98625A and Dual Channel DMA HP98620B are recommended to utilize the 1 MB/sec transfer rate.

- If the Disk Interface is installed, the DISC-INTF driver must be included in the INITLIB module.

CONFIGURATION

Use the MultiPac controls to set the configuration options according to the following settings. Refer to Chapter 4 for detailed instructions.

HP-IB address:	**0-7**
Option:	**1024**
	(256 for 2.0; 1024 for 3.0 or later)
Drive button:	**disabled**
Default Sector size:	**256** (for 2.0)
	1024 (for 3.0 or later)

BOOTING YOUR SYSTEM

1. **Verify that the HP-IB address of your MultiPac is set as desired and that the address is different from other disk drives (i.e., HP9121 micro-floppy drive).**

2. **Turn off your computer.**

3. **Turn on your disk drive and wait for the self-test to complete.**

4. **Insert the Pascal BOOT: disk in the flexible disk drive.**

5. **Turn on your computer.**
   Your computer will automatically load the operating system and you will be prompted by,
   PLEASE PUT SYSVOL IN UNIT #3 AND PRESS THE X KEY.

6. **Remove the BOOT: disk, insert the SYSVOL: disk in the floppy drive, and type X .**

7. **When you see NEW SYSTEM DATE?, type the** date **and press [ENTER].**

8. **When the screen displays** `NEW SYSTEM CLOCK TIME?`**, type the**
    `time` **and press** `[ENTER]`**.**
    Now your screen will display the command line,
    ```
    Compiler Editor Filer Initialize Librarian Run eXe-
    cute Version?
    ```

    and is ready for a command.

LOGICAL UNITS

During the boot process, the TABLE utility in the operating system finds all of the available disk drives and assigns one or more logical unit numbers to each drive. Since the MultiPac disk is larger than 1 megabyte, it will be assigned with multiple logical unit numbers starting at #11.

CTABLE MODIFICATIONS

This section outlines procedures to modify the CTABLE to support high capacity volumes. Details of editing, compiling and installing the new CTABLE can be found in the "Technical Reference" section of the PASCAL User's Manual.

Always make a copy of the original CTABLE.TXT file before editing. For example, copy the CTABLE.TXT to NEWCTABLE.TXT before entering the Editor.

1. **Enter the Editor to edit the NEWCTABLE file.**

2. **Locate the following section in the beginning of the CTABLE.**
    ```
    {local hard disk partitioning parameters}
          type
                  ...
          const
                  ...
                  minimum_volume_size = {in bytes}
                          1000000;
    ```

3. **Change** `1000000` **to the desired value (e.g., 20000000).**

DISK INITIALIZATION   Use the following steps to initialize a disk.

1. **Insert the ACCESS: disk into the flexible disk drive.**

2. **Type x for EXECUTE.**

3. **When the screen displays** `Execute What File?`, **type**

   `ACCESS:MEDIAINIT`

   and press `[ENTER]`.

4. **When the screen displays** `Volume ID?` **type** `#11` **to initialize the MultiPac disk.**
   The screen will then display:

   ```
   WARNING: the initialization will also destroy:
           #12 <no dir>>
           #13 <no dir>>
           . . .
   ```

   This indicates the number of logical units assigned to the disk drive. The information can be used to modify the CTABLE for configuring the SIS unit.

5. **Remove the ACCESS: disk from the floppy drive.**

6. **When the screen displays** `Are you SURE you want to proceed? (Y/N)`, **type** `Y`.
   When you do, the screen will display:

   `Interleave factor? (default to 1)`

7. **Type 1 and press** `[ENTER]`.
   An interleave of 1 will achieve the best performance.

BOOTING FROM THE DISK

After your MultiPac disk is initialized, you can copy all of the system files onto it. Use the following steps to copy all of the files on all of the floppy disks.

1. **Insert the ACCESS: disk into the flexible disk drive.**

2. **When the command line,** `Command: Compiler Editor Filer ...` **appears, type** `F` **for FILER.**

3. **When the FILER line,** `Filer:Change Get...` **appears, remove the ACCESS: disk and insert the BOOT: disk in the flexible disk drive.**

4. **Type** `F` **for FILECOPY.**

5. **When the screen displays** `Filecopy what file?`, **type** `#3:=` **and press** `[ENTER]`.
   This tells the FILECOPY utility to copy all files from the flexible disk.

6. **When the screen displays** `Filecopy to what?`, **type** `#11:$` **and press** `[ENTER]`.
   This tells the FILECOPY utility to copy all files to volume 11 using the same file names.

   When the copying is complete, the FILER line,
   `Filer: Change Get ...`,
   will reappear on the screen.

7. **Remove the flexible disk. If more disks are to be copied (i.e., ACCESS:, SYS-VOL, ...), insert the next disk and repeat steps 4 to 7.**

8. **When the copy process is complete, type** `Q` **for quit and press** `[ENTER]` **to exit the FILER.**
   The command line will appear on the screen.

9. **Turn off your computer.**
   Now you should be able to boot from the MultiPac by turning on your computer.

Series 200/300 - PASCAL 3.2

PASCAL 3.2 supports two different file formats: LIF and HFS. If HFS is desired, follow the procedures in this section. If LIF is desired, follow the procedures in the PASCAL manual.

SYSTEM REQUIREMENTS

The following is a list of hardware and software required or recommended to interface with the Bering MultiPac subsystem.

- The CS80 driver is required. Make sure it is included in the INITLIB module.

- The HFS_DAM driver is needed to support HFS format. Make sure it is loaded into INITLIB.

- Disk Interface HP98625A and Dual Channel DMA HP98620B are recommended for a 1 MB/sec data transfer rate.

- If the Disk Interface is installed, the DISC_INTF driver is required in the INITLIB module.

CONFIGURATION

Use the MultiPac controls to set the configuration options according to the following settings. Refer to Chapter 4 for detailed instructions.

HP-IB address:	*0-7*
Option:	*1024*
Drive button:	**disabled**
Default sector size:	**1024**

If you want to boot from the MultiPac and organize your files like a fixed disk (i.e. using SYSTEM: volume), set the emulation to **fixed disk.**

BOOTING YOUR SYSTEM

1. **Verify that the HP-IB address of your MultiPac is set as desired and that the address is different from other disk drives (i.e., HP9121 micro-floppy drive).**

2. **Turn off your computer.**

3. **Turn on your disk drive and wait for the self-test to complete.**

4. **Insert the Pascal BOOT: disk in the flexible disk drive.**

5. **Turn on your computer.**
   Your computer will automatically load the operating system and prompt,
   ```
   PLEASE PUT SYSVOL IN UNIT #3 AND  PRESS THE X KEY.
   ```

6. **Remove the BOOT: disk, insert the SYSVOL: disk in the floppy drive, and type X to continue.**

7. **When the screen displays** `NEW SYSTEM DATE?` **type the** *date* **and press** `[ENTER]`.

8. **When the screen displays** `NEW SYSTEM CLOCK TIME?` **type the** *time* **and press** `[ENTER]`.
   Now your screen will display the command line to indicate that it is ready for a command.
   ```
   Command: Compiler Editor Filer Initialize Librarian
   Run eXecute Version?
   ```

INITLIB CONFIGURATION

To include the DISC_INTF and the HFS_DAM into INITLIB, the Librarian must be used.

1. **Insert the ACCESS: disk into the floppy drive and type L to load the Librarian.**

2. **Make sure the BOOT: disk is online, type I to select the input file, and then type**

   `BOOT:INITLIB.`

   Make sure the period (.) is typed.

3. **Type O to select the output file, then type**

   `BOOT:NEWLIB.`

   Don't forget to type the period (.). Now you should see the first module in the INITLIB listed:

   `M input Module: KERNEL`

4. Type `T` to copy the module listed and the next module will be shown, e.g., `SYSDEUS` .

5. Repeat step 4 to copy modules until `HPIB` appears on the screen.

6. Type `I` to change the input file to `ACCESS:DISC_INTF`, then type `T` to transfer the DISC_INTF module.

7. Type `I` to return to the original INITLIB.

8. When you see `BOOT:INITLIB` , press the `[SPACE BAR]` to skip the modules that are already transferred until you see `HPIB` at the input module line.

9. Continue typing `T` to transfer modules until you see `LIF_DAM` .

10. Remove the ACCESS: disk from the floppy drive and load the HFS: disk, type `I` to change the input file to `HFS:HFS_DAM` and then type `T` to transfer the HFS_DAM module to NEWLIB.

11. Type `I` and get the original INITLIB again (`BOOT:INITLIB`).

12. Press the `[SPACE BAR]` to skip the modules until LIF_DAM is shown, then continue typing `T` to copy the rest of the modules.

13. Type `K` to keep the new NEWLIB, then type `Q` to exit.

14. Now type `F` to enter the FILER and change the file names.

15. Type `C` to change a file name.

16. When `Change what file?` appears, type

    `BOOT:INITLIB`.

    Don't forget to type the period (.).

17. When `Change to what?` appears, type

    `OLDLIB`.

    Remember to type the period (.).

18. Then repeat the Change command to change `BOOT:NEWLIB`. to

    `INITLIB`.

    Type the period (.) too.

19. Reboot the system to use the new INITLIB.

LOGICAL UNITS

During the boot process, the TABLE utility in the operating system finds all of the available disk drives and assigns one or more logical unit numbers to each unit. Since the MultiPac's disk is larger than 10MB, it will partition the disk into multiple volumes of 1MB each and assign a unit number to each volume starting with #11. Only one unit will be configured after each disk is initialized with the HFS directory format. Two units will be configured for the dual-drive (7580 & 7902) and fixed-disk (7508, 7518, 7908, and 7918) subsystems.

DISK INITIALIZATION

Use the following steps to initialize the MultiPac disk.

1. **Insert the HFS: disk into the flexible disk drive and type** `X` **for execute.**

2. **When the screen displays** `Execute What File?` **type**

   `HFS:MKHFS`

   and press `[ENTER]` .
   The screen will display `Volume ID?`

3. **To initialize the cartridge, type** `#11` .
   The screen will display:
   ```
   WARNING: the initialization will also destroy:
   #12 <no dir>>
   #13 <no dir>>
   . . .
   ```

   This indicates the number of logical units assigned to the drive.

4. **Remove the HFS: disk from the floppy drive.**

5. **When the screen displays** `Change or examine default parameter? (Y/N),` **type** `N` .

6. **When the screen displays** `Are you SURE you want to overwrite the disk (Y/N)` **type** `Y` .

7. **If the screen displays** `Interleave factor? (default to 1)` **, type** `1` **and press** `[ENTER]` .

8. **Reboot PASCAL so that the new HFS volume is configured into the system correctly and use the FILER Vols command to list the volumes.**
   It should list `hfs11:` .

BOOTING FROM THE DISK

After your MultiPac disk is initialized, you can copy all system files to it.

Use the following steps to copy all of the files on any flexible disk.

1. **Insert the ACCESS: disk into the flexible disk drive.**

2. **When the command line,** `Command: Compiler Editor Filer ...` **appears, type** `F` **for FILER.**

3. **When the FILER line,** `Filer:Change Get ...,` **appears remove the ACCESS: disk and insert the BOOT: disk in the flexible disk drive.**

4. **Make a new directory on the MultiPac disk by typing** `M` **.**

5. **When** `Make file or directory (F/D)?` **appears on the screen, type** `D` **.**

6. **When** `Make what directory?` **appears, type**

   `hfsll:WORKSTATIONS`

   and type `Y` **in response to the warning.**

7. **Repeat steps 4 through 6 to make another directory, but type**

   `hfsll:WORKSTATIONS/SYSTEM`

   in response to the request for a directory name.

8. **When the directories have been created, type** `F` **for FILECOPY.**

9. **When the screen asks** `Filecopy what file?` **type** `#3:=` **and press** `[ENTER]` **.**
   This tells the FILECOPY utility to copy all files from the flexible disk.

10. **When the screen queries** `Filecopy to what?` **type**

    `hfsll:WORKSTATIONS/SYSTEM/$`

    and press `[ENTER]` **.**
    This tells the FILECOPY utility to copy all of the files to the volume 11 SYSTEM directory using the same file names. When the copying is complete, the FILER line, `Filer: Change Get ...` again appears on the screen.

11. **Use the FILECOPY command again, as described in steps 8-10, to copy the system file from #3:SYSTEM_P to hfsll:SYSTEM_P .**

12. **Load the HFS: disk into the floppy drive and type** `Q` **to exit the FILER, and then type** `X` **to execute the OSINSTALL utility.**

13. **When the** `OSINSTALL: Check Install...` **command line appears, type** `I` **to install.**

14. **When** `Volume: file to install...` **appears, type the name of the system file:**

    `hfsll:SYSTEM_P`

15. **Type** `Q` **to quit.**
    The command line again appears on the screen. Now you should be able to boot from the MultiPac by pressing [RESET], or turning your computer off and back on.

Series 300 - HP-UX

SYSTEM REQUIREMENTS

The Bering MultiPac is supported by HP-UX version 5.0 or later. The following is a list of hardware and software required or recommended for use with the Bering MultiPac.

- HP 98620B dual channel DMA card for a 1MB/sec data transfer rate.
- HP 98625A Disk Interface, high speed HP-IB.

CONFIGURATION

Use the MultiPac controls to set the configuration options according to the following settings. Refer to Chapter 4 for detailed instructions.

HP-IB address:	*0-7*
Option:	*1024*
Drive button:	**disabled**
Default sector size:	**1024**

INSTALLING HP-UX

The following is a summary of the procedure to install HPUX on your MultiPac cartridge. For details, refer to the HPUX manual.

1. **Turn on the source and destination drives.**
   The source device is either a flexible disk drive or a cartridge tape drive. The destination device is the MultiPac.

2. **Write-enable the media containing the HP-UX software and insert it into the drive.**

3. **Turn on the computer and system console to boot HP-UX.**

4. **When prompted, type Y to choose the main installation interface.**
   The HP-UX INSTALLATION UTILITY – MAIN MENU will appear on the screen showing the source and destination devices.

5. **If the destination device doesn't indicate the address of the MultiPac, press the [NEXT] or [PREVIOUS] key to select the Change DESTINATION device function and press [SELECT]. Then type the**

   correct address

   of the MultiPac as prompted.

Note: The major number of the MultiPac is 0.

6. **Select CONTINUE installation process to proceed.**

7. **Select the correct swap sizes.**

8. **When the Install menu appears on the screen, select the BEGIN installation function.**

9. **When you see** `Do you want to mediainit your disk?` **type** `Y` **to format your MultiPac.**
Although the disk is pre-formatted, it is a good idea to re-format it to detect any media defects encountered during shipping.

Note: The formatting will take from 20 minutes to 1 hour.

10. **Follow the on-screen instructions to load file sets or partitions on the disk.**

ADDING THE MULTIPAC TO YOUR HP-UX SYSTEM

This section covers adding the MultiPac to your existing HP-UX system. We assume the MultiPac is an add-on storage device on a system with HP-UX already loaded and that there is another hard disk.

DEVICE FILES

The first step for installing your MultiPac is to create two device files: a block special file and a character special file. To do this, use the MKNOD command with the following items:

- File name: In a directory, a character device starts with r, whereas a block device does not. For example:
  /dev/dsk/B7500   (block)
  /dev/rdsk/B7500   (character)

- Major numbers: for the MultiPac, the major number will be 0 for block devices and 4 for the character device files.

- Minor numbers: address-dependent, and the same for both block and character entries. Minor numbers consist of a select code (set on interface card), an HP-IB address (set on MultiPac), a unit number (see table 5.1), and a volume number (set at 0), e.g.

For upper drive in 7540, 7580, 7901, or 7902 or fixed disk in 7508, 7518, 7908, or 7918, or cartridge drive in 7503 or 7903:

```
mknod /dev/dsk/multipac0 b 0 0x0e0100
```
- unit 0
- HP-IB address 1
- select code 14
- major number
- block device

```
mknod /dev/rdsk/multipac0 c 4 0x0e0100
```
- major number
- character device

For lower drive in 7580 / 7980 or cartridge drive in 7508, 7518, 7908, or 7918 or microfloppy drive in 7503 / 7903:

```
mknod /dev/dsk/multipac1 b 0 0x0e0110
mknod /dev/rdsk/multipac1 c 4 0x0e0110
```
- unit 1

INITIALIZING YOUR MULTIPAC

The following initialization procedure prepares your MultiPac for use by setting up a directory, checking the media for defects, and assigning an interleave factor.

1. **Be sure you have created a character device file for your MultiPac.**

2. **Begin the initialization process by typing the MEDIAINIT command using the character special device files, similar to the following:**

    ```
    mediainit   /dev/rdsk/multipac0
    ```

    Now you are ready to create a file system on the disk.

LIF VOLUME

If you plan to use your MultiPac to transfer files between other operating systems such as BASIC or PASCAL, you need to create a LIF volume using the LIFINIT command, as follows:

    ```
    lifinit    /dev/rdsk/multipac0
    ```

CREATING A NEW FILE SYSTEM

Use the following command to create a new file system for each drive of the MultiPac.

    ```
    /etc/mkfs -L device_file size nsect ntrack 8192
    1024 16 10 60 2048
    ```

    where: *device_file* = character device file
       size = volume size in sectors
       nsect = volume track size in sectors
       ntrack = volume cylinder size in tracks

You can find the values in the Show Disk/Cartridge Information menu or listed as logical values in the specifications section of this manual. Make sure the logical size is 1024.

CREATING A NEW FILE SYSTEM USING NEWFS

NEWFS may be used to create a new file system.

1. **To use NEWFS, you must edit the disk information file, `/etc/disktab`, to include an entry for the MultiPac, as follows:**

   ```
   multipac :\
       :n MB swap:ns#nsect:nt#ntrack:nc#ncyl:\
       :s0#size:b0#blksize:f0#fragsize:\
       :se#1024:rm#rpm:
   ```

   where: n = the size of the swap area in multiples of 2 MB

   $nsect$ = sectors per track (see specifications)

   $ntrack$ = tracks per cylinder (see specifications)

   $ncyl$ = cylinders per drive (see specifications)

   $size$ = nsect times ntrack times ncyl

   $blksize$ = primary block size of files on the file system (8192)

   $fragsize$ = smallest amount of disk space allocated to a file (1024)

   rpm   = spindle rotation speed (3600)

2. **Then create the file system by typing**

   ```
   newfs device_file  disk_type
   ```

   You must be in super-user root.

   where: *device_file* = character device file for the MultiPac
   disk_type = name for the MultiPac created in the etc/disktab

   For example:

   ```
   /etc/newfs /dev/rdsk/multipac multipac
   ```

Series 200 - SRM

SYSTEM REQUIREMENTS

The following hardware must be installed in your computer to utilize the Bering MultiPac subsystem.

- Disk Interface HP98625A
- Dual Channel DMA HP98620B

CONFIGURATION

Use the MultiPac controls to set the configuration options according to the following settings. Refer to Chapter 4 for detailed instructions.)

HP-IB address:	**0-7**
Option:	**1024**
Drive button:	**disabled**
Default sector size:	**1024**

INSTALLING MULTIPAC

1. **Shut down your SRM by typing** `System Down` **, then type** `Y` **when prompted.**
2. **Turn off your SRM system.**
3. **Set the HP-IB address of your new MultiPac and make sure there are no address conflicts.**
4. **Connect the MultiPac to your SRM system, turn on the MultiPac, and load a cartridge.**
5. **Turn on your disk drive(s) and your SRM system, then boot your SRM operating system from the existing hard disk or tape.**
   Your MultiPac should be configured into the SRM system, but it needs to be initialized before it can be used as an SRM volume.

DISK INITIALIZATION

Use the following command to initialize the disk:

```
Initialize sc,ba,su name<pass word>> <root pass word>>
```

where: *sc*   =   the select code of the HP-IB channel

       ba   =   the bus address of the disk

       su   =   the unit number (see table 5.1)

Example:

```
Initialize 14,0,0 SRM_MULTIPAC
```

INSTALLING THE SYSTEM

Use the following command to install the SRM boot files on the disk.

Install *frompathname topathname*

where: *frompathname*= the source of the files
    topathname = the name of your disk

Example:

Install SRM_2.0:SYSTEM_SRM SRM_MULTIPAC:
SYSTEM_SRM

where: SRM_2.0   = th e tape
    SRM_MULTIPAC = the volume as initialized
                    in the previous example

Series 500 - HP-UX

CONFIGURATION

Use the MultiPac controls to set the configuration options according to the following settings. Refer to Chapter 4 for detailed instructions.

HP-IB address: **0-7**
Option: **1024**
Drive button: **disabled**
Default sector size: **1024**

INSTALLATION

1. **Make sure the HP-IB interface card is installed correctly with these options:**
   High speed operation
   System controller
   HP-IB address of 30

2. **Change the HP-IB address of your cartridge tape drive (HP9144A or built-in cartridge tape drive of HP7908P/R, HP7911P/R, HP7912P/R or HP7914P/R) to** 0 **.**

3. **Change the HP-IB address of your MultiPac to** 1 **.**

4. **Connect the cartridge tape drive and the disk drive to your computer.**

5. **Make sure the write-protect switch on the HP-UX cartridge tape is pointing away from SAFE and insert the cartridge into the tape drive. Wait for the drive's BUSY light to go out before continuing.**

6. **If your computer is not already powered down, switch off its power and wait for a few seconds, then switch the power on again.**
   The system loader will begin to load HP-UX from the cartridge tape. After about 10 minutes, the HP-UX is ready to accept commands at the super-user's prompt (#).

7. **At the super-user's prompt (#), type** `sysinstall` **and press** `[RETURN]`**.**
   This will install all products supplied on the tape. When the task is complete, the HP-UX FILE SYSTEM INSTALLATION UTILITY will display the default values for the source device and the destination device and then ask:
   ```
   Are these values satisfactory for your system?
   If they are not, ...
   (Enter Y or N, then RETURN; default is 'yes')
   ```

8. **Type** N **and press** `[RETURN]` **to change the parameters.**
   The default source device will be displayed:
   ```
   select code = 5
   bus address = 0
   unit number = 1
   ```

9. **If you are using an HP9144A cartridge tape drive, type** `n` **and press** `[RETURN]` **, otherwise press** `[RETURN]` **and skip step 10.**

10. **Change the source device as follows:**

   a. **When you are asked for the select code of the source device:**
   ```
   Enter the select code of your 88140 tape
   drive.
   ```
   type `5` **and press** `[RETURN]`**.**

   b. **When you are prompted for the bus address of the source device:**
   ```
   Enter the bus address of your 88140 tape
   drive.
   ```
   type `n` **(the appropriate HP-IB address) and press** `[RETURN]`**.**

   c. **When the unit number of the source device is requested:**
   ```
   Type the unit number of your 88140 tape
   drive.
   ```
   type `n` **(the appropriate unit number from Table 5.1) and press** `[RETURN]`**.**
   The default destination drive will be displayed:
   ```
               select code = 5
               bus address = 0
               unit number = 0
   ```

11. **Type** `n` **and press** `[RETURN]` **, then follow the procedures in steps a, b, and c of step 10, but change the destination disk parameters to:**
   ```
   select code = 5
   bus address = 1
   unit number = 0
   ```
   When you finish, the system will ask about the size of the boot area to be created on the destination medium.

12. **Press** `[RETURN]` **to accept the default value.**

13. **If the settings displayed for the source and destination disk drives are correct proceed to step 15. If changes are needed, go back to step 9.**

14. **When you see** `Are you sure you are ready ... ?`**, type** `Y` **and press** `[RETURN]` **to start the disk initialization and HP-UX installation.**

15. **After the disk is initialized (about 1 minute per MB) and the files are copied (approximately 1 hour), remove the cartridge tape from the tape drive.**

16. **Now you should be able to boot the HP-UX from the MultiPac by powering down the computer, waiting a few seconds, then powering up the computer again.**
   After some initial set-up, the login prompt will be displayed:
   ```
   login:
   ```

   Now you can log onto your HP-UX system.

Series 800 - HP-UX

SYSTEM REQUIREMENTS

The Bering MultiPac is supported by HP-UX version 7.0. The Multi-Pac can be installed on the same HP-IB card with the system disk. The following hardware and software must be installed in your computer to utilize the Bering MultiPac subsystem.

- HP 27110B HP-IB interface configured for high speed mode.
- Device Driver disc0

CONFIGURATION

Use the MultiPac controls to set the configuration options according to the following settings. Refer to Chapter 4 for detailed instructions.

HP-IB address:	**0-7**
Option:	**1024**
Drive button:	**disabled**
Default sector size:	**1024**
Emulation:	**enable HP7958B**

INSTALLING HP-UX
(for 7518 / 7918 only)

A summary of the steps to install HP-UX on your MultiPac follows. For details, see "Installing and Updating" in the HP-UX manual.

1. **Turn on the source and destination drives.**
   Source: a cartridge or mag tape drive. Destination: MultiPac.

2. **Write-protect the media containing the HP-UX software and insert it into the source drive.**

3. **Turn on the computer and system console to boot HP-UX.**

4. **Choose the Alternate boot path by hitting any key when the following message appears on the system console.**
   ```
   FT = Autoboot from primary boot path enabled
   To override, press any key within 10 seconds.
   ```

   Make sure the source tape drive path matches the Alternate boot path of the computer.

5. **See the HP manual for installation commands at the ISL prompt, e.g.:**
   ```
   ISL> hpux -a disc0(4.0.0) disc0(4.2.3;0x400000)
   ```

   Destination drive: HP-IB card slot 0, address of MultiPac=0

   Source drive: HP-IB card slot 2, address of 9144 cartridge tape drive=3

   The system console will be processed to the Root Disk Partitioning screen.

6. **Press softkey [F1 Perform Task] to continue installing HP-UX.**
   See the HP manual for the rest of this task.

ADDING THE MULTIPAC TO THE HP-UX SYSTEM MANUALLY

Use the following procedures to add the MultiPac to your existing HP-UX system. These steps assume the MultiPac is being added to an HP-UX system already loaded on another hard drive.

KERNEL CONFIGURATION

The HP-UX kernel may have to be modified to add a disk to your system. The procedure for modifying HP-UX is summarized below. See the HP-UX System Administration Tasks Manual for details.

1. **Check and, if necessary, modify the file /etc/conf/gen/S800 so that it contains the desired I/O configuration for the MultiPac.**
   Sometimes the kernel will already be configured for additional disk drives. In that case no kernel configuration is needed. For example, the following I/O configuration may be in the S800 file.

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

   Where lu 0 can be your system disk. Then you can pick lu 1 for your MultiPac and no configuration is required.

2. **Run the UXGEN utility to regen the HP-UX kernel from the new S800 file.**

3. **Reboot the system.**

DEVICE FILE

Use /etc/mknod to create two device files: a block and a character special file. See the *HP-UX System Administration TASK Manual* and *Configuring HP-UX for Peripherals* for more detailed instructions.

For hard disk in 7508, 7518, 7908, 7918 and upper cartridge in 7540, 7580, 7901, and 7902:

```
/etc/mknod /dev/dsk/MultiPac b 0 0x00nn02
/etc/mknod /dev/rdsk/MultiPac c 4 0x00nn02
```

For removable cartridge in in 7508, 7518, 7908, 7918 and lower cartridge in 7580 and 7902:

```
/etc/mknod /dev/dsk/MultiPac_C b 0x00nn22
/etc/mknod /dev/rdsk/MultiPac_C c 4 0x00nn22
```

nn = LU number in /etc/conf/gen/S800

For floppy drive in 7503 and 7903:

```
mksf -d disc0 -l nn -u 1 -s 2 -r /dev/dsk/cnn dls2
mksf -d disc0 -l nn -u 1 -s 2 /dev/rdsk/cnn dls2
mksf -d disc0 -l nn -u 1 -r -t /dev/diag/dsk/cnn dls2
```

nn= LU number in /etc/conf/gen/S800

INITIALIZING THE MULTIPAC

Create a special file with the Transparent Mode option and use the MEDIANIT command to format the media.

For hard disk in 7508, 7518, 7908, and 7918 and upper cartridge in 7540, 7580 7901, and 7902:

    /etc/mknod /dev/rdsk/MultiPac c 4 0x80nn02

For removable cartridge in 7508, 7518, 7908, and 7918 and lower cartridge in 7580 and 7901:

    /etc/mknod /dev/rdsk/MultiPac_C c 4 0x80nn22

Then use one of the following commands to format the media.

    mediainit /dev/rdsk/MultiPac

or

    mediainit /dev/rdsk/MultiPac_C c

nn = LU number

CREATING A NEW FILE SYSTEM

Use the following command to create a new file system for each drive of the MultiPac.

    /etc/mkfs -L device_file size nsect ntrack 8192
    1024 16 10 60 2048

where: *device_file* = character device file
      size = volume size in sectors
      nsect = volume track size in sectors
      ntrack = volume cylinder size in tracks

You can find the values in the Show Disk/Cartridge Information menu or listed as logical values in the specifications section of this manual. Make sure the logical size is 1024.

HP 1000 A

CONFIGURATION

Use the MultiPac front panel controls to set the configuration options according to the following settings. Refer to Chapter 4 for detailed instructions.

HP-IB address: **0-7**
Option: **256 bps**
Drive button: **disabled**
Default sector size: **256 bps**

SYSTEM REQUIREMENTS

Device Driver: DD.33
Interface Card: HP-IB Interface Card
Interface Driver: ID.37

SYSTEM RELOCATION PHASE

The following modules of code must be relocated during this phase:

%DD.33 (Disk device driver)
%ID.37 (HP-IB interface driver)

TABLE GENERATION PHASE

The Interface Table (IFT) for drive ID.37 must be constructed in this phase. Use the following command:

`IFT,%ID.37,SC:scB`

where: sc = the octal select code of the interface card

A Device Table (DVT) must be constructed for each logical unit (LU) on the disk in this phase. Use the following command:

```
DVT,dir/%DD*33,M7935:0,LU:lu,TO:1000,-
DP:1: address:0,-
DP:3:sb2 :sb1 :sb0,
DP:6: tracks: bpt:0
```

where: dir = directory containing RTE-A relocatables
lu = logical unit
$address$ = HP-IB address of the MultiPac
$sb2,sb1,sb0$ = 3-word starting block address of that lu
$tracks$ = number of RTE tracks in that lu
bpt = number of blocks in each RTE track (48)

The total number of available blocks for each side of the cartridge can be calculated as follows:

$$blocks = \frac{Logical\ cylinders * Logical\ cylinder\ size * Track\ size * Sector\ size}{256}$$

where *Logical cylinders, Logical cylinder size, Track size,* and *Sector size* can be found in the "Specifications" section of this manual. Make

sure the *Track size* entry corresponds to the *Sector size* of your cartridge.

Now you can calculate the total number of available RTE tracks using the following formula.

Total RTE tracks = *Blocks / bpt*

where *bpt* used by RTE is 48. With this information you can divide the cartridge with Total RTE tracks into multiple LU's. Each LU may have a different number of tracks. For the first LU, the values for *sb2,sb1,* and *sb0* are 0. For the subsequent LU's, these values can be calculated as follows.

Tracks used = *tracks in LU0 + tracks in LU 1...*

Offset = *Tracks used * bpt*

sb2 = Offset / 65536

sb1 = (Offset − sb2 * 65536) / 65536

sb0 = (Offset − sb2 * 65536 * 65536 − sb1 * 65536)

LIST ENTRIES

All devices with multiple LU's using the same controller must have their LU numbers placed in a node list. Use the following command.

```
NODE, lu of subdivision 0, -
      lu of subdivision 1, -
      lu of subdivision 2, -
      lu of subdivision 3, -...
```

FORMATTING THE CARTRIDGE

Before the Bering disk is put on line, it is a good idea to go through the format procedure. This will allow any defective tracks to be spared. Use the FORMC utility supplied by HP and enter a command similar to the following.

```
RU,FORMC,,FO,disk lu, 1
```

where: FO   = the format option
      disk lu = the logical unit of the cartridge
      1   = interleave factor

Follow the instructions in the software installation manual to load the program. Detailed instructions for FORMC can be found in the *Hewlett-Packard RTE-A Utilities Manual.*

HP 1000 M/E/F

CONFIGURATION

Use the MultiPac controls to set the configuration options according to the following settings. Refer to Chapter 4 for detailed instructions.

HP-IB address: **0-7**
Option: **normal**
Drive button: **disabled**
Default sector size: **256**

SYSTEM REQUIREMENTS

Device Driver: DVM33
Interface Card: 12821A HP-IB Interface Card

Disks managed by DVM33 (CS80 disks) and disks managed by DVA32 (ICD disks) cannot be on the same 12821A HP-IB card.

If an additional 12821A is used, the DVN33 and $TN33 should be used for the CS80 disks or the DVP32 and $TC32 should be used for the ICD disks.

SUBCHANNEL CONFIGURATION

MultiPac disk subsystems are compatible with HP Command Set 80 disk drives. Therefore, in general the system generation instructions for the CS80 disk can be applied to MultiPac disk drives. Use the following assignments.

```
available blocks = available tracks * bpt
```

Chapter 6
CARING FOR THE DISK DRIVE & CARTRIDGE

This chapter describes how to care for your MultiPac and cartridges. It is divided into three sections. The "General Safeguards" section tells you what to look out for. The "Cartridge Care" section explains how to handle removable cartridges. "Cleaning the Read/Write Head" gives you step-by-step instructions on this aspect of maintenance. As long as you protect your MultiPac from hazards, it will provide you with years of service.

General Safeguards

To protect the MultiPac:

- 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 MultiPac 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 MultiPac 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 MultiPac.

- Avoid exposure to magnetic fields such as those emitted by magnets, telephones, televisions, speakers, or large electric motors.

- Never bump the MultiPac when it's running.

- Always set the MultiPac upright on a flat surface.

▲ CAUTION: *Never transport the MultiPac with a cartridge in the drive. This could damage the media and the read/write heads.*

You don't need to worry about leaving the MultiPac 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 MultiPac 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 MultiPac after it is powered down. This leaves the cartridge shutter open and makes the recording media itself vulnerable to dust. Also, the heads are not parked (placed on a safe "landing zone") if you leave the cartridge in the drive. The media or the heads could easily be damaged in this risky situation.

- 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.

- Use them at the correct temperature. Avoid using cartridges at temperatures above 90° F (32° C) or below 60° F(16° C). To avoid permanently damaging data, the drive, cartridge, and room should all be about the same temperature (between 60° F and 90° F) when you insert the cartridge into the drive.

- Do not expose cartridges to magnetic fields greater than 30 Oersteds (e.g., telephones, televisions, speakers, large electric motors, or magnets), moisture, or prolonged direct sunlight.

- Do not touch the bottom metal plate on the cartridge.

- Do not move the drive with a cartridge loaded.

- Do not drop the cartridge.

- 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 may contaminate the disk surface.)

- Do not open the access door. Minute contaminants such as smoke particles, pollen, or dust can cause excessive media wear.

- Make sure the label does not cover the air vent on the cartridge.

▲ **CAUTION:** *Do not use defective or questionable cartridges on another drive. You may spread the contaminants to that drive.*

Cleaning the Read/Write Head

The MultiPac 7500 series removable drive read/write head should be cleaned regularly with a head cleaning kit. You can order head cleaning kits from Bering (Part # 18-04186-01). The kit contains a head cleaning cartridge that's reliable and easy to use.

The 7900 series drives are equipped with a self-cleaning feature which eliminates the need for periodic head cleaning in a normal office environment. However, if the units are operated in an unusually dirty or dusty environment, use the head cleaning kit.

Clean the drive heads after every 50 hours (about one month) of use — more often if you use the MultiPac in a dusty environment or if you're having frequent drive or cartridge errors. The cleaning procedures are printed on the insert in the head cleaning kit as well as in this section. Use only the cleaning solution in the kit. This solution is different from the solution used to clean diskette drive heads.

▲ CAUTION: Clean the drive head immediately if you're having problems with your drive or cartridge. Operating with a dirty drive head or defective or worn cartridge can cause permanent damage.

The head cleaning kit comes with three wiper pads. Each pad is good for five cleanings. (Note that if your MultiPac contains two removable drives, you will perform two cleanings — one per drive.) The kit also comes with two labels. Place label A on the head cleaning cartridge. Place label B on the outside of the sleeve.

Here's how to use the cleaning kit:

1. **Change the head wiper pad after five uses by popping each of the rear snaps open with a coin.**

Label A goes here
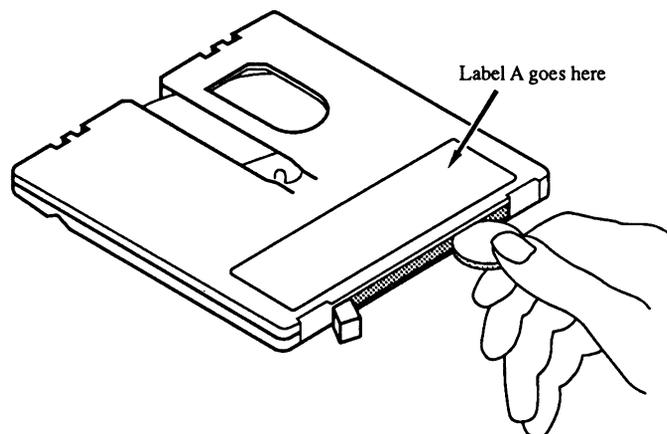
Figure 6-1: Popping the snaps on a head cleaning cartridge

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2. **Remove the contaminated pad-arm assembly and install a new one. Make sure that the pad side of the assembly faces up, as shown below.**
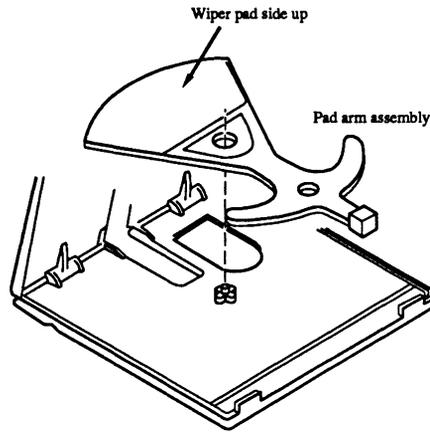
Figure 6-2: Changing the wiper pad

3. **Turn on the MultiPac drive. Do not turn on your computer.**

4. **Press the black front panel button on the drive and hold it down until the green light starts flashing (about two seconds).**
The disk drive is now ready to accept the cleaning cartridge.

5. **To prepare the cleaning cartridge, position the wiper lever of the cartridge all the way to one side to expose the maximum area of wiper pad in the side window, as shown below.**
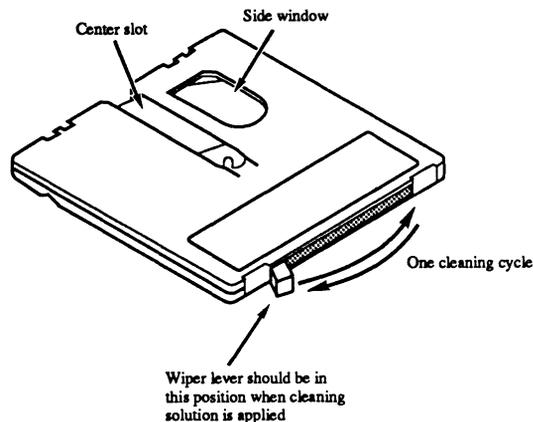
Figure 6-3: Preparing the cleaning cartridge

6. Gently squeeze the cleaning solution onto the pad, evenly distributing the solution through the side window and center slot. Dampen but do not over-saturate the wiper pad. Apply cleaner only to one side of the the pad.

7. Quickly insert the cleaning cartridge into the drive.
   When the green light glows steadily, the heads are ready to be cleaned.

8. Move the wiper lever, in full strokes, back and forth a total of 30 cleaning cycles, as shown above.

9. When the cleaning is complete, press the unload button and wait for the green light to go out. Remove the cartridge and store it in its storage sleeve. Record the drive identification and cleaning data on a Head Cleaning Record label (label B).

Chapter 7
IF YOU HAVE
PROBLEMS

This chapter describes basic trouble-shooting procedures. It is divided into three sections: "Before You Do Anything Else," "Error Codes and LCD Messages," 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 MultiPac and a wall outlet.
- The power is switched on, and the AC fuse in the back of the drive is not blown.
To check the fuse, use a screwdriver to open the fuse compartment on the back of the MultiPac. If the fuse is blown, replace it with the spare in the compartment, or buy a replacement. The proper replacement is a "slow blow" 1.6 Amp, 250 Volt fuse.

- None of the pins on the cable connectors are loose, broken, or shorted.
- All cables are installed correctly.
- The removable cartridge has been properly formatted.
- There isn't a flexible disk loaded or an internal hard disk connected when you want to start up from the MultiPac.
- A cartridge is properly loaded in the MultiPac and the drive is up to speed. If you try to start up or otherwise access a MultiPac without a cartridge, the computer may not recognize the drive.
- Each MultiPac connected to your computer has a unique HP-IB address.

Error Codes and LCD Messages

Occasionally, after installing a MultiPac, 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 MultiPac. If this occurs, shut down your system and restart it again. If the problem still occurs, contact Bering Technical Support at (408) 379-6900.

STARTUP PROBLEMS

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

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

WHEN ALL ELSE FAILS...

If you still have problems after following the procedures in this chapter, call Bering Technical Support at 408/379-6900. When you call be ready to tell the service representative:

● The model number and serial number of the MultiPac, the type of computer you're using, 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.

▲ CAUTION:

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

SPECIFICATIONS

180MB Fixed Disk

PERFORMANCE

Formatted capacity	161	178	182	MB
Logical sector size	256	512	1,024	bytes
Logical track size	81	45	23	sectors
Logical cylinder size	5	5	5	tracks (heads)
Logical cylinders	1,558	1,553	1,554	cylinders
Logical drive size	630,990	349,425	178,710	sectors

Rotation speed	3600	RPM
Average latency	16.67	ms
Minimum seek time	4	ms
Maximum seek time	35	ms
Average seek time	18	ms
Burst transfer rate	1	MB/sec
Average transfer rate	940	KB/sec

ENVIRONMENTAL (operational)

Temperature	10 to 40	°C
	50 to 104	°F
Temperature gradient	10	°C/hour
	50	°F/hour
Relative humidity	8 to 85	%
Vibration	0.25	G, 5 to 500 Hz sine
Shock	2	G, 20 ms half sine pulse
Altitude	-305 ~ 3048	Meters
	-1000 ~ 10000	Feet

ENVIRONMENTAL (non-operational)

Temperature	-10 to 50	°C
	14 to 122	°F
Relative Humidity	8 to 95	%
Vibration	2	G, 5 to 500 Hz sine
Shock	30	G, .5 ms half sine pulse
Altitude	-305 ~ 12210	Meters
	1000 ~ 40000	Feet

80MB Fixed Disk

PERFORMANCE

Formatted capacity	83	91	94	MB
Logical sector size	256	512	1,024	bytes
Logical track size	64	35	18	sectors
Logical size	5	5	5	tracks (heads)
Logical cylinders	1,021	1,021	1,021	cylinders
Logical drive size	326,720	178,675	91,890	sectors

Rotation speed	3600	RPM
Average latency	16.67	ms
Minimum seek time	4	ms
Maximum seek time	35	ms
Average seek time	18	ms
Burst transfer rate	1	MB/sec
Average transfer rate	909	KB/sec

ENVIRONMENTAL (operational)

Temperature	10 to 45	°C
	50 to 113	°F
Temperature gradient	10	°C/hour
	50	°F/hour
Relative humidity	8 to 85	%
Vibration	0.25	G, 5 to 500 Hz sine
Shock	2	G, 20 ms half sine pulse
Altitude	-305 ~ 3048	Meters
	-1000 ~ 10000	Feet

ENVIRONMENTAL (non-operational)

Temperature	-10 to 50	°C
	14 to 122	°F
Relative Humidity	8 to 95	%
Vibration	2	G, 5 to 500 Hz sine
Shock	30	G, .5 ms half sine pulse
Altitude	-305 ~ 12210	Meters
	1000 ~ 40000	Feet

44MB Cartridge Disk

PERFORMANCE

Formatted capacity	44	44	44	MB
Physical sector size			512	bytes
Logical sector size	256	512	1,024	bytes
Logical track size	64	32	16	sectors
Logical cylinder size	4	4	4	tracks (heads)
Logical cylinders	679	679	679	cylinders
Logical drive size	173,824	86,912	43,456	sectors

Rotation speed	2027	RPM
Average latency	14.8	ms
Minimum seek time	4	ms
Maximum seek time	66	ms
Average seek time	33	ms
Burst transfer rate	1	MB/sec
Average transfer rate	600	KB/sec
Loading time	15	sec
Unloading time	3	sec

ENVIRONMENTAL (operational)

Temperature	10 to 40	°C
	50 to 104	°F
Temperature gradient	10	°C/hour
	50	°F/hour
Relative humidity	10 to 80	%
Vibration	0.85	G, 5 to 17 Hz sine
	0.25	G, 17 to 500 Hz sine
Shock	10	G, 11 ms half sine pulse
Altitude	-305 ~ 3048	Meters
	-1000 ~ 10000	Feet

ENVIRONMENTAL (non-operational)

Temperature	-40 to 60	°C
	40 to 140	°F
Relative Humidity	10 to 90	%
Vibration	1.3	G, 5 to 27 Hz sine
	2.0	G, 27 to 60 Hz sine
	5	G, 60 to 500 Hz sine
Shock	40	G, 10 ms half sine pulse
Altitude	-305 ~ 10011	Meters
	1000 ~ 35000	Feet

90MB Cartridge Disk

PERFORMANCE

Formatted capacity			90	MB
Physical sector size			512	bytes
Logical sector size	256	512	1,024	bytes
Logical track size	116	58	29	sectors
Logical cylinder size	8	8	8	tracks (heads)
Logical cylinders	378	378	378	cylinders
Logical drive size	350,784	175,392	87,696	sectors

Rotation speed	2368	RPM
Average latency	12.7	ms
Minimum seek time	3	ms
Maximum seek time	57	ms
Average seek time	27	ms
Burst transfer rate	1	MB/sec
Average transfer rate	600	KB/sec
Loading time	4	sec
Unloading time	4	sec

ENVIRONMENTAL (operational)

Temperature	10 to 46	°C
	50 to 115	°F
Temperature gradient	10	°C/hour
	50	°F/hour
Relative humidity	10 to 80	%
Vibration	0.85	G, 5 to 17 Hz sine
	0.25	G, 17 to 500 Hz sine
Shock	10	G, 11 ms half sine pulse
Altitude	-305 ~ 3048	Meters
	-1000 ~ 10000	Feet

ENVIRONMENTAL (non-operational)

Temperature	-40 to 60	°C
	-40 to 140	°F
Relative Humidity	10 to 90	%
Vibration	1.3	G, 5 to 27 Hz sine
	2.0	G, 27 to 60 Hz sine
	5	G, 60 to 500 Hz sine
Shock	40	G, 11 ms half sine pulse
Altitude	-305 ~ 10011	Meters
	1000 ~ 35000	Feet
Cartridge Shock		withstands 3 foot drop onto smooth, clean, hard surface

Floppy Disk

PERFORMANCE

Formatted capacity			1.42	MB
Physical sector size			512	bytes
Sector size	256	512	1024	bytes
Heads			2	
Cylinders			80	
Rotation speed			300	RPM
Average latency			100	ms
Minimum seek time			18	ms
Average seek time			94	ms
Burst transfer rate			1	MB/sec
Average transfer rate			32	KB/sec
Motor start time			500	ms

ENVIRONMENTAL (operational)

Temperature	5 to 40	°C
	50 to 104	°F
Relative humidity	8 to 80	%
Vibration	0.5	G, 10 to 500 Hz sine
Shock	5	G, 11 ms half sine pulse

ENVIRONMENTAL (non-operational)

Temperature	-40 to 60	°C
	40 to 140	°F
Relative Humidity	5 to 90	%
Vibration	2	G, 10 to 500 Hz sine
Shock	70	G, 11 ms half sine pulse

All Subsystems

POWER REQUIREMENTS

Line voltage	100-200	volts
Line frequency	47-63	Hz
Current	0.5	AMP

GENERAL

Interface	HP-IB, CS80
Dimension	5" x 12.8" x 11"
Shipping weight	30 lbs

ACCESSORIES

44MB Cartridge	ACCS-3011
90MB Cartridge	ACCS-3026
Rack mount kit - 19" EIA	ACCS-7204
Head cleaning kit	ACCS-3508