Optical Library

User's Guide

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Preface

This guide assumes you are familiar with computer terms. It is divided into four parts and is organized to allow you to quickly find the information you need.

Here's what you'll find in this manual:

- Chapter 1 lists the features and components of the Optical Library, and provides a technical discussion of how the Optical Library operates.

- Chapter 2 provides information about optical disks.

- Chapter 3 provides instructions for moving the Optical Library both short and long distances.

- Chapter 4 describes the controls found on the front panel and provides specific steps to perform control panel operations.

- Chapter 5 describes the switches and connectors found on the back panel and provides instructions for changing the SCSI address switches.

- Chapter 6 provides information for securing the Optical Library.

- Appendix A provides a table of all control panel configurations, defaults, and options.

- Appendix B provides a table of all control panel information logs.

- Appendix C provides tables of all control panel diagnostic tests and their parameters.

- Appendix D provides a table of solutions to problems that can occur during operation of the Optical Library.

- Appendix E provides product information relating to specific product and option numbers, as well as part numbers for supplies.

- Appendix F provides information for installing the Optical Library.

- A glossary

Table 1   Conventions Used in This Guide

Convention	Use
Italics	*Italic text* is used for titles of manuals and other publications.
Monospace type	Anything that is displayed on the control panel of the Optical Library is set in monospace type like this.
Boldface type	**Anything that you are asked to type is set in boldface type like this.**
Keys	Keys indicate the key to press on the control panel of the Optical Library.
Note	A note calls attention to information which is helpful in understanding the operation of the product.
CAUTION	Caution notes provide information that protects your Optical Library from being damaged.
WARNING	Warning notes provide information that protects you from being harmed.

1

Technical Overview

The following topics are presented in this chapter:

- Optical Library features
- Optical Library components
- Common terms
- SCSI architecture

- Control panel information logs
- Control panel diagnostic tests
- Optical Library maintenance

1.1 Optical Library Features

The Optical Library contains the following components:

Table 1–1   Product Information

Component	Small		Medium		Large	
	RW504	**RW524**	**RW510/511**	**RW530**	**RW514/516**	**RW534/536**
An autochanger mechanism (moves disks within the cabinet)	X	X	X	X	X	X
650 Mb 5.25-inch multifunction optical disk drives	1	N/A	2	N/A	4	N/A
1.3 Gb 5.25-inch multifunction optical disk drives	N/A	1	N/A	2	N/A	4
A mailslot (used to insert and remove disks)	X	X	X	X	X	X
Storage slots for optical disks	16	16	32	32	88 or 144	88 or 144
Maximum total storage capacity (GBytes) when all slots are full	10.4	20.8	20.8	41.6	57.2/93.6	114.4/187.2
A SCSI Interface (may be either single-ended or differential)	X	X	X	X	X	X

Note: X indicates that the unit contains this component.

_____ **Note** _____

For more specific product information, refer to Appendix E.

The Optical Library has many strengths which include the following:

- Reliable optical storage

  The disks are more durable than other media, have greater storage capacity, are reliable, are removable, and cost less per megabyte than magnetic disks.

- Economical online secondary storage

  The Optical Library provides an economical way to access a large amount of traditionally "offline" information such as archival or backup files, or records that were previously stored on paper or microfilm.

  The Optical Library contains multifunction optical disk drives. Multifunction drives can operate in both rewritable mode and write-once mode depending on the type of disk that is inserted into the drive. When a write-once disk is inserted, a multifunction drive operates in write-once mode, and data cannot be altered or erased once it is written to the disk. When a rewritable disk is inserted in the drive, the drive operates in rewritable mode, and data can be repeatedly written and erased.

- Security

  The Optical Library can be easily located in a secured computer room environment. Access to inserting and removing disks through the mailslot can be restricted through security configurations that must be set using a password.

  In addition, each side of a rewritable optical disk can be write-protected.

- Simplified integration

  The drive mechanisms and autochanger use SCSI. The Optical Library adheres to the SCSI-2 command set.

- Upgradable storage capacity

  The Disk Library System is upgradable as your storage capacity needs increase. (Maximum total storage capacity is given in Table 1–1.)

Although the cost per megabyte of optical disks is much lower than that of hard disks, the time it takes to access data is typically 2 to 5 times longer than with high-performance magnetic hard disks. Therefore, the Optical Library should not be used as a hard disk replacement for high-performance applications.

1.2 Optical Library Components

Figure 1–1, through Figure 1–4 illustrate the major components of the different sizes of the Optical Library. The following list describes each major component called out in Figure 1–1 through Figure 1–4.

❶ Disk Drives

The Optical Library contains from one to four optical disk drives for read/write data transfer. Each drive requires a unique SCSI address.

❷ Storage Slots

The Optical Library contains either 2, 4, 11, or 18 magazines depending on the model. Each magazine has 8 storage slots for a total of 16, 32, 88 or 144 optical disk storage slots.

❸ Mailslot

The mailslot is used to insert and remove optical disks.

❹ Front Panel

The Front Panel includes a control panel used to manage and display autochanger functions, and a mailslot to insert and remove disks. All front panel and control panel features are fully described in Chapter 4.

❺ Rear Panel

The rear panel includes SCSI and power cord connections.

Information for connecting the Optical Library to the host computer is given in Appendix F.

❻ Carriage and Rails

The carriage and rails support the picker as it moves within the Optical Library.

❼ Picker
The picker rotates, flips, and transports disks to and from storage slots, drives, and the mailslot.

Figure 1–1 Small Optical Library Components (RW504/524-ZA)

6 Carriage & Rails

3 Mailslot

2 Storage Slots

7 Picker

1 Disk Drive

MK445−01

Figure 1–2   Deskside Optical Library Components (RW510/530-ZC)

6 Carriage
and Rails

5 Rear Panel

7 Picker

4 Front
Panel

3 Mailslot

2 Storage
Slots

1 Disk
Drives

ZS-0505-MH

Figure 1–3 Rackmount Optical Library Components (RW511-ZC)

1 Disk
Drives

2 Storage
Slots

4 Front
Panel

5 Rear
Panel

6 Carriage
and Rails

7 Picker

3 Mailslot

ZS-0506-MH

Figure 1–4 Large Optical Library Components (RW514/516/534/536-ZF)
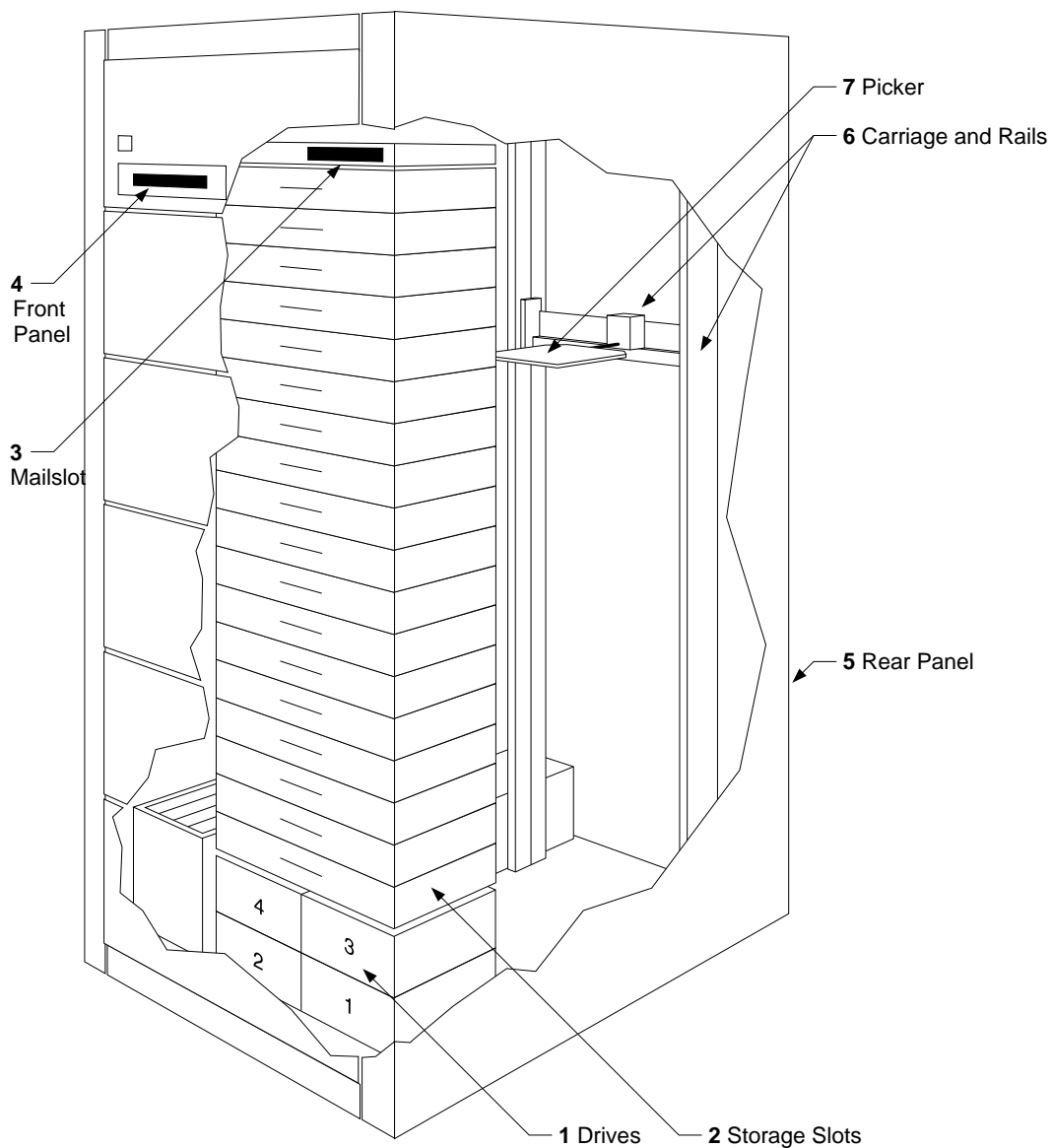
ZS-0661-MH

1.3 Definition of Common Terms

Table 1–2 defines some of the more common terms used with the Optical Library. Additional terms are defined in the glossary at the end of this guide.

Table 1–2   Common Terms

Term	Definition
Autochanger	A term synonymous with Optical Library.
Autochanger Controller	Controls the sending and receiving of SCSI commands and controls the mechanical system.
Disks, Optical Disks, Cartridges	These terms are synonymous with the 5.25-inch magneto-optical disks. Rewritable disks (data can be repeatedly written and erased) or write-once disks (data cannot be altered once it is written) can be ordered from Digital in the 512 bytes/sector format. See Chapter 2.
Element	A SCSI term for any one of the autochanger components – drives, mailslot, storage slots, or picker.
Flip	This occurs when the picker rotates to switch from one side of a disk to the other.
Magazine	A component of the Optical Library that contains 8 storage slots. The Optical Library has 2, 4, 11, or 18 magazines and therefore 16, 32, 88, or 144 optical disk storage slots.
Picker Move	This occurs when a disk needs to be transported to and from any of these elements—drives, mailslot, and storage slots.
SCSI	An acronym for the industry-standard Small Computer Systems Interface.
Swap	When a picker replaces one disk in the drive with another, returning the first to its storage slot.
Terminator	A resistor array device used for terminating a SCSI bus line. The last device in the chain of devices needs a terminator.
Translate	A picker move from one side of the carriage to the other.

1.4 SCSI Architecture

The Optical Library connects to the host system through a Small Computer Systems Interface (SCSI). This interface conforms to SCSI standards ANSI X3.131 - SCSI-2, rev 10h.

Usually each SCSI-connect peripheral requires one SCSI address. With the Optical Library, however, there are up to five unique SCSI interface addresses—one SCSI address for the autochanger controller and one for each

drive contained in the Optical Library. (The Optical Library has up to four optical drives.)

The autochanger controller and the host operating system manage communication through the SCSI bus to each drive's unique SCSI address.

The SCSI interface for the Optical Library is single-ended. The single-ended SCSI connectors are located on the lower rear panel of the Optical Library.

The Optical Library uses a 1.8 meter (6 foot) SCSI interface cable. With the single-ended SCSI interface, up to 6 meters (19.8 feet) of total cable length is allowed.

Note

An internal cable length of 2.1 meters (7 feet) for the small unit or 1.44 meters (5.76 feet) for the medium and large units, must be included in the total cable length calculation.

1.5 Control Panel Information Logs

When the autochanger hardware encounters difficulty, the system automatically goes into error recovery mode. For example, if the picker can't complete a move, the autochanger tries to remedy the problem automatically. If the recovery is successful, information about the error is recorded in an Information Log which is maintained in nonvolatile RAM. Appendix B provides a listing of all Information Logs.

If the attempted recovery fails, information about how it failed is also passed to an Information Log. Your service representative can use this information, and other information recorded in information logs, to identify the appropriate service needed.

1.6 Control Panel Diagnostic Tests

1.6.1 Power On Test

The power on test runs automatically when the Optical Library operation switch is first switched on, and may also be initiated from the control panel. The power on test initiates a controller test, a power supply test, and a motor connection test. It then initializes the mechanism by setting RAM variables to default values, and moves the picker to its home position.

1.6.2 Diagnostics

Other diagnostic tests can be initiated from the control panel. Each test exercises a specific portion of the Optical Library. Once a test completes, the control panel displays either PASS or FAIL.

These tests are combined into the following groups:

Sequence Tests	Tests 1 - 5 are not specific tests but rather execute a sequence of individual tests within the range of Tests 10 through 60. When a sequence test is selected, the Optical Library executes the tests in sequence until an error occurs or until the sequence successfully completes.
Exerciser Tests	Tests 10 - 29 perform various moves to test basic functions within the Optical Library.
Electronic Core Tests	Tests 30 - 44 perform basic tests of the autochanger controller.
Mechanism Core Tests	Tests 50 - 75 perform basic tests of the autochanger mechanism. They perform combinations of moves which can help in problem solving.

1.6.3 Using Diagnostic Tests

Typically these diagnostic tests are used by service personnel who are trained to interpret the results and follow through with the appropriate action. There are, however, a few tests which may help you in taking initial troubleshooting steps. Instructions for running diagnostic tests are found in Section 4.7. A complete list of diagnostic tests is given in Appendix C.

CAUTION

Some diagnostic tests can result in a disk being placed into an improper storage slot. If this happens, the Optical Library file system is no longer accurate.

Please contact your service representative if you feel diagnostic steps are necessary unless you are trained to perform these diagnostic tests and to interpret their results for the purposes of troubleshooting.

1	Power On Test	Checks all digital data paths and normal machine operation. This sequence runs tests that are identical to those run when the Optical Library operation switch is switched on.
2	Wellness Test	Checks out the general capability of the autochanger. Requires one loaded cartridge, and the drives and mailslot must be empty.
3	Controller Test	A sequence of tests that are run by the autochanger controller at power on to check out all paths, and operation of the servo motor and autochanger circuitry.
10	Initialize Element Status	Performs the same function as the `SCSI INITIALIZE ELEMENT STATUS` command. It physically scans the entire unit to determine which slots and drives contain disks.
23	Shipping	Moves the picker to the appropriate position in preparation for shipping. This test can also be run on the small unit
38	Control Panel Light Show and Button Test	Lights each portion of the display individually and then together. Requires pushing each control panel button to finish the test.

1.7 Optical Library Maintenance

While there are no general maintenance tasks needed, there are some precautions you should take with the Optical Library.

_____ **CAUTION** _____

Do not move the Optical Library without taking the necessary steps documented in Chapter 3.

Moving the Optical Library improperly can damage the disk drive mechanisms.

Do not press the Optical Library operation switch (located on the front panel) or the power switch (located on the rear panel) until you are sure that the SCSI bus is inactive. Pressing either button when the bus is active can cause data loss or indeterminate bus states.

Check the host system reference manuals for information on checking the status of the SCSI bus.

_____

2
Optical Disks

The following topics are presented in this chapter:

- Advantages of optical storage
- Types of optical disks
- Choosing your optical disk brand
- Labeling your disk
- Caring for your disks
- Securing your disks

2.1 Optical Storage Advantages

The Optical Library takes advantage of magneto-optical (MO) technology to write data to its optical disks. When data is written to an MO disk, a laser light focuses on the inner magnetic data layer, so minor scratches, and small amounts of dust or fingerprints on the disk's outer surface have no effect on the readability of the data. Optical disks are not susceptible to head crashes, and are more tolerant of magnetic interference and office mishandling than other types of recording media. These durable disks can be stored for at least ten years with no loss of data and, unlike conventional tape backup systems, no retensioning, reconditioning or maintenance is required. MO disks are also called rewritable optical disks because the disk can be erased and new data can be written.

The optical disk is mounted in a rigid plastic polycarbonate case with a metal shutter, similar to a 3.5-inch magnetic flexible disk. The polycarbonate case containing the disk is shipped in a plastic storage box. The MO disk has two recording sides. The disk storage capacity may be less than indicated in Table 2–1 depending on the format mode and the host system.

Table 2–1   Disk Format and Storage Capacity

Format	Disk Capacity	Total Disk Capacity	
	(one surface)	650 Mb Media	1.3 Gb Media
512 bytes/sector	297 Mbytes	594 Mbytes	1.2 Gbytes
1,024 bytes/sector	325 Mbytes	650 Mbytes	1.3 Gbytes

Since optical disk drives read only one side of an optical disk, the autochanger flips the disk over as necessary to access both sides.

_____ **NOTE** _____

Digital only supports 512 bytes/sector formatted disks.

_____

2.2 Optical Disk Types

There are two types of optical disks: rewritable optical disks and write-once optical disks. Data can be repeatedly written and erased with rewritable optical disks; however, once data is written to a write-once disk, the data cannot be altered or erased. If you have a need for data security and audit trails, write-once disks should be your disk choice.

The two disk types are distiguishable by the words "write-once" or "rewritable" printed on the disk's protective metal shutter. Both disk types are available from Digital in 512 bytes/sector format. As shown in Table 2–1, Optical disks are available in 2 capacities, 650 Mbytes and 1.3 Gbytes. The RW504, RW510 /511, RW514/516 can read from and write to the 650 Mbyte disks only. The RW524, RW530, RW534/536 can read from and write to both the 650 Mbyte and the 1.3 Gbyte disks. Model RW524, RW530, and RW534/536 users should choose the 1.3 Gbyte optical disks to receive the maximum storage capacity from the Optical Library. For part numbers to use when ordering additional optical disks, see Appendix E.

_____ **Note** _____

Some host computers or host adapters may support only one disk type or format. _Do not use write-once disks in host systems that do not support write-once disks._ Refer to your host system documentation to determine the disk types or sector sizes your computer or host adapter supports.

_____

2.3 Choosing Your Optical Disk Brand

Digital recommends that only Digital brand optical disks be used with the Optical Library because of the close relationship between optical disks and optical drives. Digital optical disks are qualified by Digital for reliable use in demanding Optical Library environments. Some optical disks are inappropriate for use in Digital optical products, and while they might seem to work initially, Digital cannot guarantee the disk's performance or long-term data integrity. Note that for an optical disk to work reliably in the Optical Library, the disk must be housed in a *polycarbonate* case.

Note

Part numbers for Digital disks are provided in Appendix E.

2.4 Labeling the Optical Disk

Make it a practice to label your optical disks. Adhesive labels are provided with each disk for this purpose. Here are some suggestions for labeling:

- Disk identification, such as volume name or number

- Date of format or initialization

- Disk owner (for example, group/department)

- Storage purpose (for example, backup/date, migratable files)

Figure 2–1 shows the correct placement for the disk label.

CAUTION

Do not apply the label to an area on the optical disk that obstructs the movement of the metal shutter. On side A of an optical disk, this is the area just to the right of the metal shutter; on side B, this is the area just to the left of the metal shutter.

If a label is applied incorrectly, the disk cartridge gets caught in the drive and can only be removed by an authorized service representative.

Figure 2–1   Correct Label Position
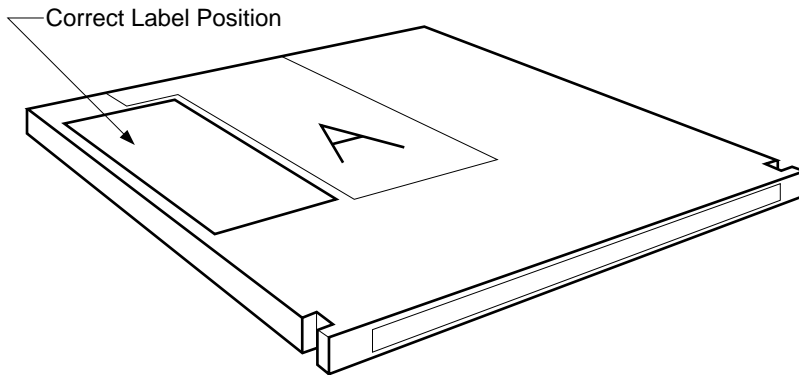
ZS-0507-MH

2.5 Caring for Your Optical Disks

Typically, optical disks do not need periodic cleaning; however, there are some everyday precautions you should take:

- Do not expose the disk to extreme magnetic fields.

- Do not expose the disk to dust particles.

- Do not expose the disk to extreme temperatures or extreme humidity. (See the specifications for environmental conditions at the end of this chapter.)

- Do not drop the disk.

- Do not open the shutter and touch the disk surface.

- Do not clean the disk surface except when absolutely necessary and then use only Digital supplied or approved cleaner.

- Do not take the disk cartridge apart.

- Do not insert disks with loose labels.

- Remove the old label before putting on a new one.

- Store your disk in the plastic storage box when it is not in use.

2.6 Securing Your Optical Disk

Each side of an optical disk can be write-protected by sliding the write-protect tab on the corner of the cartridge. Figure 2–2 shows the location of the write-protect tab.

With the rewritable optical disks, the use of the write-protect tab ensures data safety for files that have been previously written to the disk and prevents any additional files being written to the disk.

With the write-once optical disks, existing files cannot be altered or erased regardless of the setting of the write-protect button. However, the use of the write-protect button will prevent writing any additional files to the disk.

Write-protect tab closed or away from edge = writable
Write-protect tab open or next to edge = write protect.

Figure 2–2   Write-Protect Tab Location

Write-Protect Tab

ZS-0508-MH

3
Moving the Optical Library
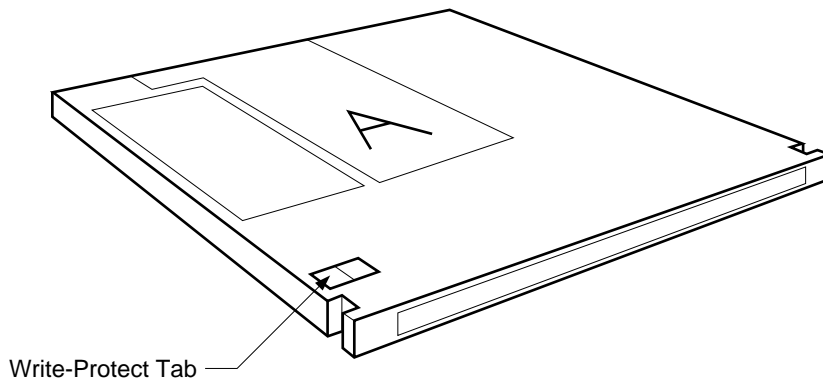
The following topics are presented in this chapter:

- How to move the Optical Library a short distance

- How to move the Optical Library a long distance

3.1 Moving a Short Distance

If you simply need to move the Optical Library down the hall, to another floor level, or to another building on site, follow these steps:

- Unmount (unreserve) any disk surfaces from the host system if necessary.

- Eject all disks from the autochanger and, if the disks are not labeled with a storage slot location prior to inserting them into the autochanger, do so now. If running under Library Host software, export disks via software.

WARNING

Disks should be imported using the software installed on your system. Use of the following procedures could confuse the system software and cause loss of data. Please refer to your software guide for proper media import and export procedures.

If you load disks from the back of the disk library and the disks are inserted incorrectly or put into the wrong storage slot, your file system will be corrupted.

Moving the Optical Library
3.1 Moving a Short Distance

———————— **CAUTION** ————————

Failure to eject the disks from the optical drives prior to transport
could result in damage to the drive mechanism and autochanger
because the disks can fall out of the storage slots during transport.
See Section 4.4 for the procedure for ejecting disks. See Section 2.4 for
suggestions for labeling disks.

———————— **WARNING** ————————

Do not press the Optical Library operation switch (located on the front
panel) or the power switch (located on the rear panel) until you are
sure that the SCSI bus is inactive. Pressing either button when the
bus is active can cause data loss and indeterminate bus states.

Check the host system reference manuals for information on checking
the status of the SCSI bus.

Once all optical disks have been removed from the Optical Library, follow these
steps to move the Optical Library.

1. Switch off the Optical Library (front and rear switches as applicable).

2. Remove the power cord and SCSI cable connections from the rear of the
   Optical Library.

3. Raise the leveler feet, if applicable, using a 1/2-inch wrench.

4. Carefully move the Optical Library to its new destination.

5. Connect the Optical Library to the host.

6. Reconnect the power cord.

7. Lower the leveler feet, if applicable, using a 1/2-inch wrench.

8. Configure the Optical Library to the host as described in your host system
   manual.

9. Reinsert the optical disks into their correct storage slot locations using host
   software. (See Section 4.3 for the procedure for loading disks manually.)

3.2 Shipping the Unit

If you need to move your Optical Library a long distance, do the following:

1. Unmount (unreserve) any disk surfaces from the host system if necessary.

2. Eject all disks from the autochanger and, if the disks are not labeled with a storage slot location prior to inserting them into the autochanger, do so now. If you are running under Library Host Software, export disks via software.

CAUTION

Failure to eject the disks from the optical drives prior to transport could result in damage to the drive mechanism and autochanger because the disks can fall out of the storage slots during transport.

See Section 4.4 for the procedure for ejecting disks.

See Section 2.4 for suggestions for labeling disks.

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3. Run `TEST 23` to position the picker for shipping.

    a. Press Option or go to step 3b for the small unit.

    b. Press Next until `TEST *` appears, and then press Enter.

    c. Press Next until `TEST 23` appears, and then press Enter, `ONCE *` displays.

    d. Press Enter. This test moves the picker mechanism to the proper position for shipment. `PASS 23` appears.

        The test displays `FAIL` if it finds any disks in the jukebox. Remove all cartridges and repeat the test.

CAUTION

Do not remove power to the Optical Library until you are sure that the SCSI bus is inactive. Removing power from a SCSI peripheral when the bus is active can cause data loss and/or indeterminate bus states. (Check the host system reference manuals for information on checking the status of the SCSI bus.)

Opening the rear cabinet door of the large unit (RW514/516/534/536) automatically removes power from the Optical Library motors however, the power cord should be removed first on all units. When the rear cabinet door is open, disks that are already in a drive can be read;

however, if the host issues an Autochanger command to access a disk not currently in a drive, an error condition results.

4. If you are moving a small unit, a deskside unit, or a rackmount unit, continue with step 5. If you are moving a large unit, go to step 10.

5. Press the ON/OFF button located on the Optical Library front panel so that it is in the OFF position.

6. Remove the power cable and SCSI cable connections from the Disk Library System.

7. Remove the right side rack panel (rack-mounted units only).

8. Attach the orange shipping bracket as shown in Figure 3–2 (Rackmount or deskside units) or lay the small unit on its side and replace the shipping screw as shown in Figure 3–1 (Small unit).

9. Go to step 16.

10. Switch off the Optical Library operation switch (located on the front panel) and the power switch (located on the rear panel).

11. Remove the power cable and SCSI cable connections from the Disk Library System.

12. Position the Optical Library so that the rear panel is accessible and the rear cabinet door can be opened.

13. Unlock and open the rear cabinet door.

14. Locate the bright orange shipping bracket located half way up the rail on the right side of the Autochanger.

15. Move the shipping bracket from its "operation mode" position ("A" in Figure 3–3 and Figure 3–4) to its shipping position ("B" in Figure 3–3 and Figure 3–4 by performing the following steps:

    a. Remove the screw that secures the shipping latch using a Torx T-15 driver.

    b. Move the end of the shipping bracket labeled "C" in Figure 3–3, from position "A" to position "B." (Detail "C" in Figure 3–3 is shown in Figure 3–4.)

    c. Attach the slot in the shipping bracket to the end of the picker that is farthest away from you.

d. Insert the peg on the other end of the shipping bracket into the
    left-most hole in the rail and pull the bracket tight against the rail.

e. Verify that the circular cut-out in the shipping bracket fits around the
    protrusion on the carriage-end of the picker (adjust if necessary).

f. Insert the screw that was removed earlier into the hole indicated in
    Figure 3–3.

Figure 3–1 Replacing the Shipping Screw (Small Unit RW504/524-ZA)

Shipping screw
location
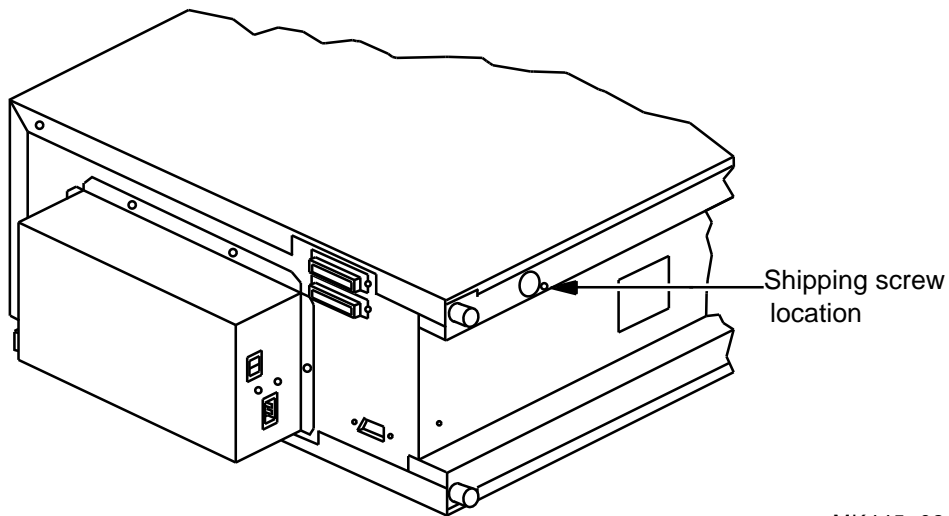
MK445−02

16. Shut and lock the cabinet rear door.

Figure 3–2   Attaching the Shipping Bracket (Deskside Unit RW510/530-ZC)
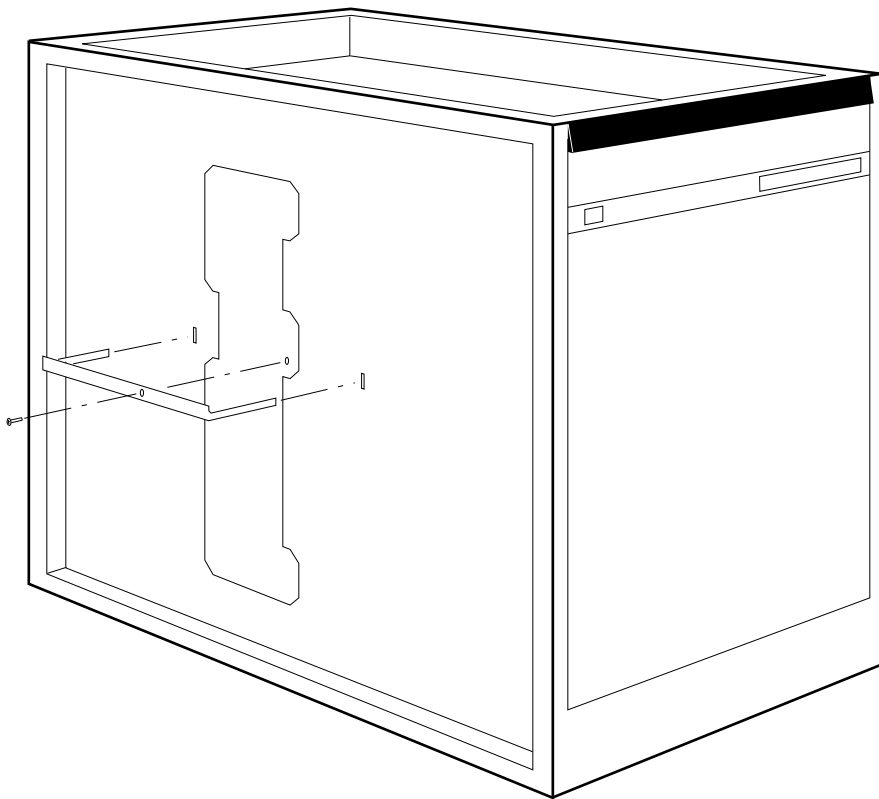
ZS-0509-MH

Figure 3–3 Positioning the Shipping Bracket (Large Unit RW514/516/534 /536-ZF)
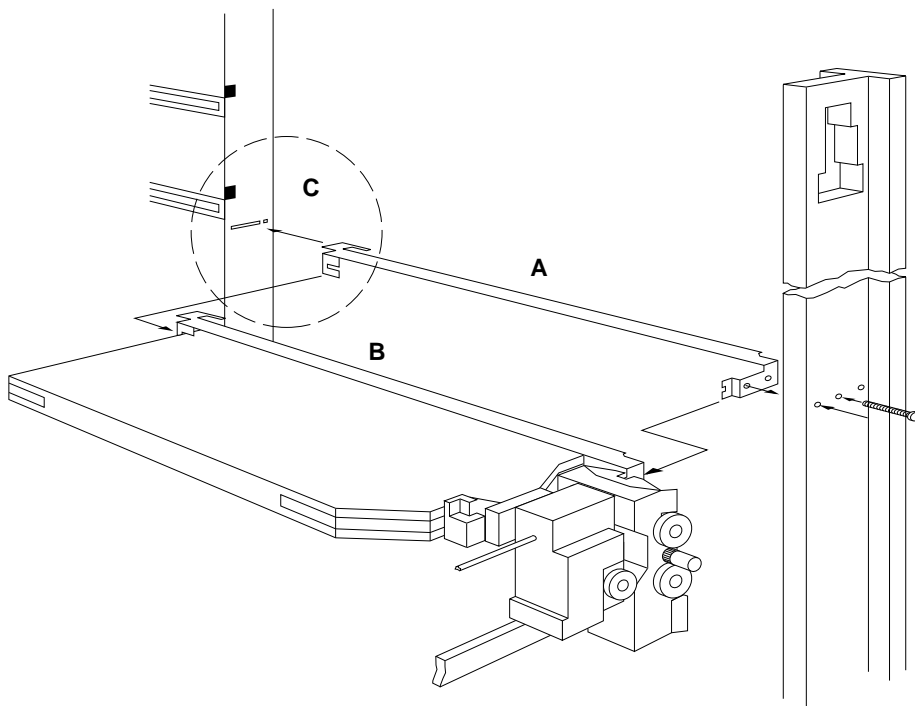
ZS-0663-MH

Figure 3–4   Shipping Bracket Detail (Large Unit RW514/516/534/536-ZF)
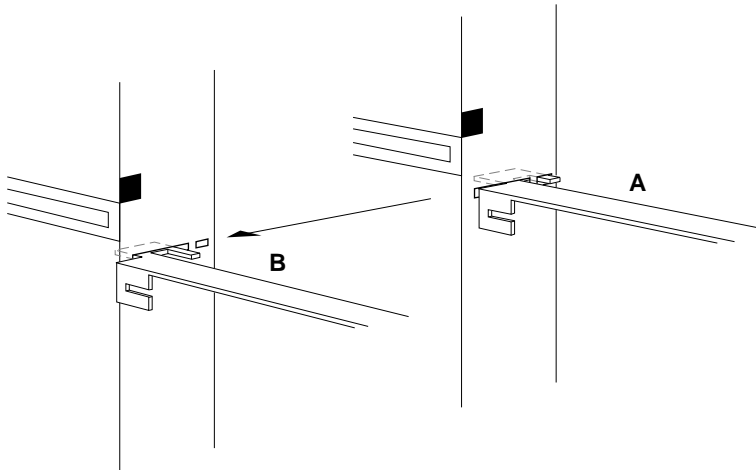
ZS-0664-MH

17. Have the unit repackaged and shipped in the same manner in which it was received.

---------------------------- **Note** ----------------------------

Your service representative can provide assistance or advise you on how to best repackage and ship your Optical Library.

Before powering on the Optical Library once it has reached its destination, the shipping bracket must be moved back to the "operation mode" position to allow free movement of the picker. To move the shipping bracket to the operation mode position perform the following steps:

1. For the small unit, remove the shipping screw (Figure 3–1). For the deskside unit, or rackmount units, remove the shipping bracket as shown in Figure 3–2. For the large unit, go to step 4.

2. Replace the right side rack panel (rack-mounted units only)

3. Go to step 10

4. Unlock and open the rear cabinet door.

5. (Refer to Figure 3–5 for clarification of these steps.)

Figure 3–5   Moving the Shipping Bracket Back (Large Unit RW514/516/534 /536-ZF)
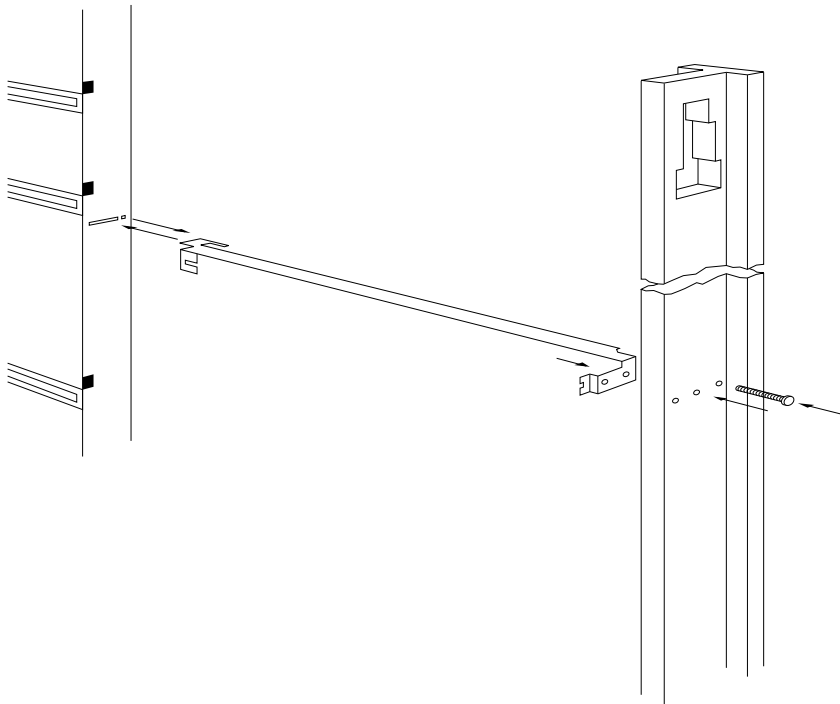
ZS-0665-MH

Find the picker and the bright orange shipping bracket that secures it, located halfway up the rail on the right side of the Autochanger.

6. Remove the screw that secures the shipping bracket using a Torx T-15 driver.

7. Remove the shipping bracket from the picker by first pushing the bracket back to free the end of the picker farthest away from you. Swing the other end of the bracket to the right to free the end of the picker closest to you.

_____ **Note** _____

Once released, the picker will glide slowly downward inside the
Autochanger until the fingers are extended to a point where they catch
on the magazines.

_____

8. Secure the shipping bracket in its right-most position, which allows the
   picker to move freely along the rails and carriage.

   a. Push the shipping bracket as far as possible into the slot in the rail
      farthest away from you.

   b. Slide the bracket to the right and then pull it toward you so that the
      finger on the bracket protrudes out of the hole just to the left of the
      slot. (See Figure 3–4.)

   c. Insert the peg on the other end of the bracket into the center hole in
      the rail closest to you.

   d. Insert the screw (removed earlier) into the right-most hole in the rail
      and tighten.

9. Shut and lock the rear cabinet door.

10. Connect the power cable to the Optical Library.

11. Connect the one end of a SCSI cable to the Optical Library, and connect
    the other end to the host system.

4

Basic Front Panel Operations

The following topics and front panel procedures are presented in this chapter:

- Front panel features and controls
- Control panel operation tips
- Loading disks
- Removing disks
- Changing control panel configurations
- Retrieving performance information
- Running diagnostic tests
- Setting the Optical Library autocontroller and drive SCSI address

4.1 Front Panel Features and Controls

The main components of the Optical Library are illustrated in the following figures as indicated in the following list.

- Figure 4–1 - small Optical Library front panel
- Figure 4–2 - deskside Optical Library front panel
- Figure 4–3 - rackmount Optical Library front panel
- Figure 4–4 - large Optical Library front panel

Table 4–1 describes the components called out in the front panel figures.

Basic Front Panel Operations
4.1 Front Panel Features and Controls

Figure 4–1 Small Optical Library Front Panel (RW504/524-ZA)
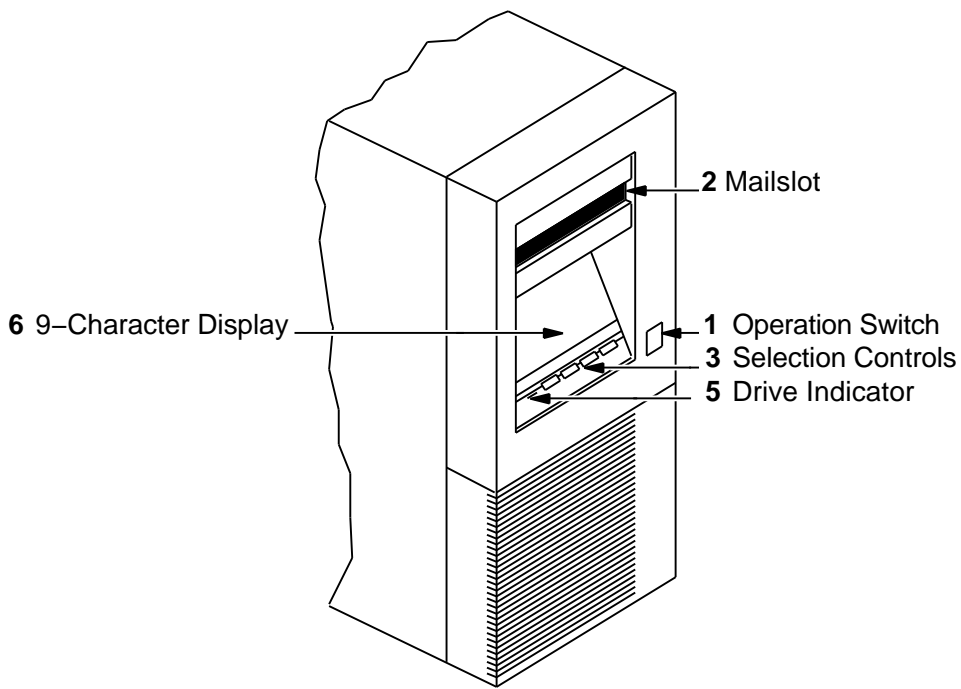
2 Mailslot

6 9–Character Display

1 Operation Switch
3 Selection Controls
5 Drive Indicator

MK445−03

Figure 4–2 Deskside Optical Library Front Panel (RW510/530-ZC)
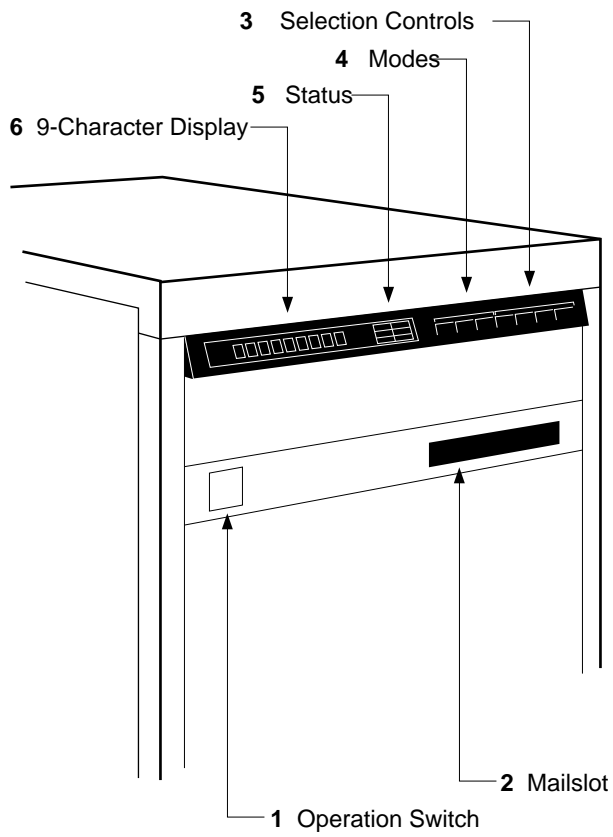
ZS-0510-MH

Basic Front Panel Operations
4.1 Front Panel Features and Controls

Figure 4–3 Rackmount Optical Library Front Panel (RW511-ZC)
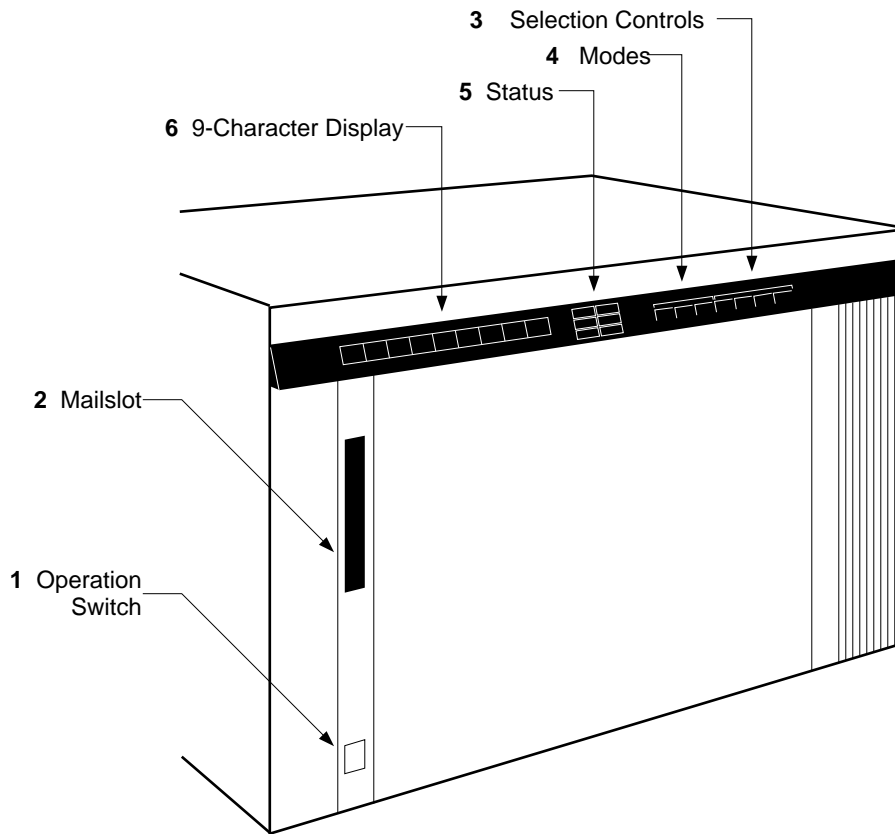
3 Selection Controls

4 Modes

5 Status

6 9-Character Display

2 Mailslot

1 Operation
Switch

ZS-0511-MH

Figure 4–4 Large Optical Library Front Panel (RW514/516/534/536-ZF)

ZS-0666-MH
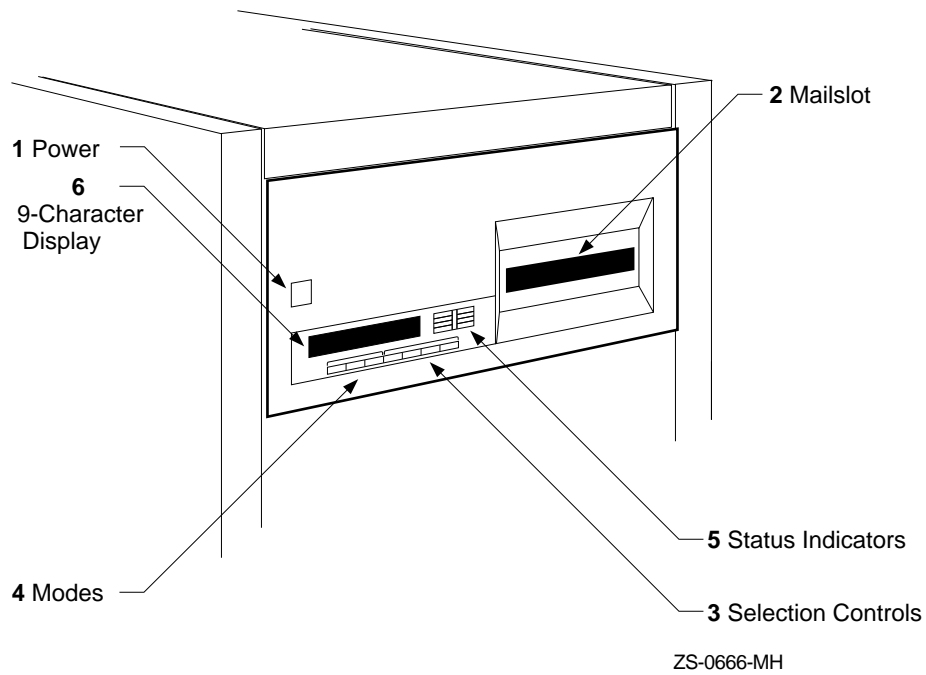
Basic Front Panel Operations
4.1 Front Panel Features and Controls

Table 4–1 Front Panel Components

Fig No.	Component	Description	Applicable to
1	Power On/Off Button	Pushed to switch the Optical Library power on or off.	Large Unit
1	Operation Switch	Pressed to enable or disable operation of the Optical Library. (This is not the power switch. The power switch is located on the rear panel.)	All but large unit
2	Mailslot	Used to insert or remove disks.	All units
3	Selection Controls	Pressed to perform the desired operation. Cancel to cancel the current operation or choice. Prev to scroll the display choice backward by one. Next to scroll the display choice forward by one. Enter to choose the displayed selection.	All units
4	Modes	Press these buttons to perform the desired operation. Load after you place the disk in the mailslot. Once Load is pressed, the display prompts you for the desired destination inside the unit. Once you choose the location, press Enter. The disk loads to that location. Eject to remove a disk from storage in the library. Once Eject is pressed, the display prompts you for which disk location to eject. Once you choose the location, press Enter. The disk is then brought from that location to the mailslot. Option to display the current operation options available such as TEST, INFO (information), CONF (configuration), and SCSI ID.	All but the small unit. Use NEXT on the small unit to display Load and Eject Commands.
5	Status Indicators	Lit when the indicated activity is taking place.	All but the small unit
5	Drive Indicator	Lit when the Optical Drive is accessed.	Only the small unit
6	9-Character Display	Displays information about the the current operation. Press Next or Prev to control the selections. Once your selection is displayed, press Enter. Press Cancel to cancel your selection.	All units

4.2 Control Panel Tips

- Pressing Option a second time returns the Optical Library display to the READY state. The Option key acts like a toggle. This feature is not available on the small unit.

- Pressing Cancel takes you back one step each time it is pressed.

- When selecting a number on the display, you can usually get to your selection three different ways.

  - Press Next or Prev to increment/decrement by one.

  - Hold Next or Prev down to increment/decrement by one at an accelerated speed.

  - Press Eject or Load to increment/decrement respectively by tens. These buttons are not available on the small unit.

For example, suppose one of the numbers in your password is 167. You could press Next to get to that number. You could press Prev to work backwards to that number. Or you could press Eject or Load to work forward or backward to the nearest ten (160 or 170) of that number and then press Next or Prev to get the exact number.

_____ **Note** _____

Using the Load and Eject buttons to increment the display numbers by tens won't work if you are loading or ejecting disks.

_____

4.3 Loading Disks

_____ **CAUTION** _____

Disks should be imported using the software installed on your system. Use of the following procedures could confuse the system software and cause loss of data. Please refer to your software guide for proper media import and export procedures.

If you load disks from the back of the disk library and the disks are inserted incorrectly or put into the wrong storage slot, your file system will be corrupted.

_____

CAUTION _____

These procedures will not work if SECURE is displayed on the front
panel. Small unit may display RESERVED. Refer to Section 6.3 for
instructions on changing security configurations.

To load disks into the Optical Library, do the following:

1. Before loading the disk cartridge, make sure it is unpackaged from the
   plastic storage box and is properly labeled.

2. With the Optical Library switched on and in the READY state, put the disk
   in the mailslot.

   - Side A faces up in the direction shown in Figure 4–5 through
     Figure 4–8.

   - The metal shutter goes in first.

Figure 4–5 Inserting a Disk into the Small Unit (RW504/524-ZA)
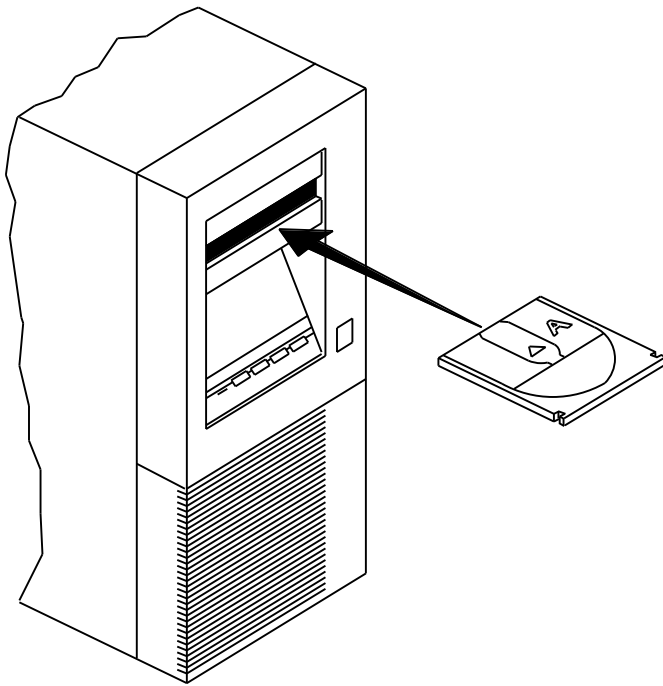
MK445−04

Figure 4–6   Inserting a Disk into a Deskside Unit (RW510/530-ZC)
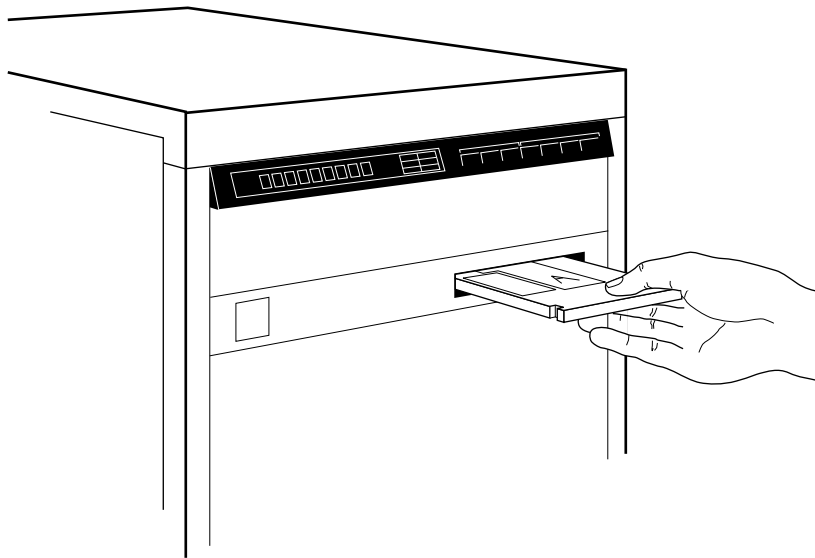
ZS-0473-MH

Figure 4–7 Inserting a Disk into a Rackmount Unit (RW511-ZC)
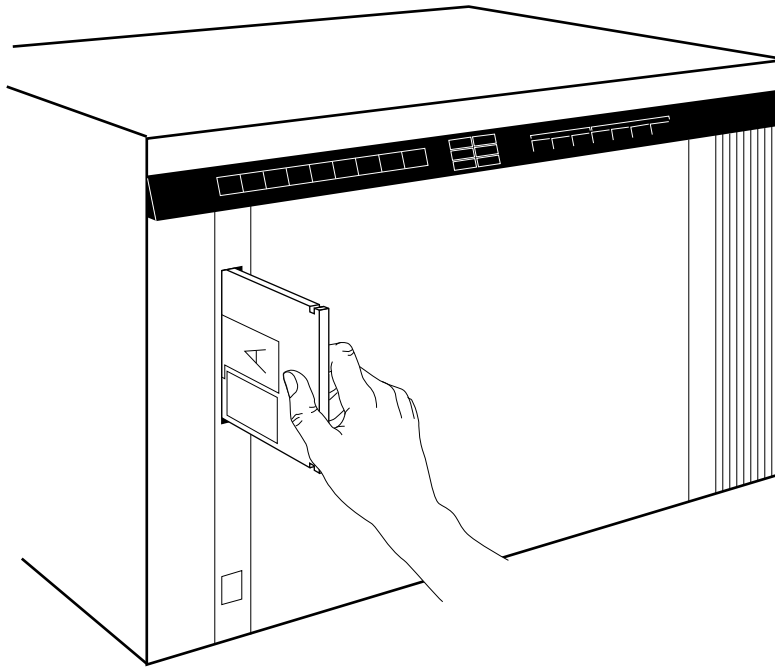
ZS-0512-MH

Figure 4–8   Inserting a Disk into a Large Unit (RW514/516/534/536-ZF)
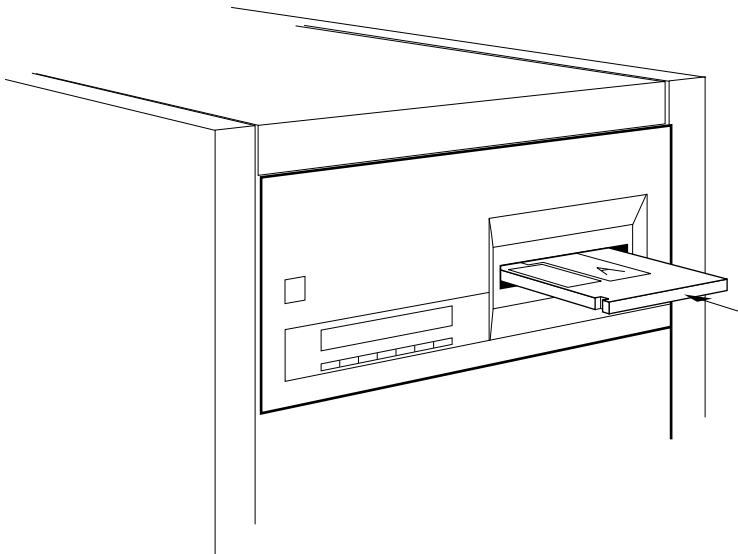
ZS-0667-MH

3. Press the ⃞Load button on medium and large units.

    SLOT 1 (or the first available slot) displays.

    ——————————————— **WARNING** ———————————————

    The changer cannot operate when full.

    If you attempt to add more disks than the library's drive and slot capacity, you receive a FULL message on the control panel display. The Optical Library is full when all storage slots and drives contain optical disks.

    Before you can add another disk when the library is at capacity, you must first remove a disk from the Optical Library.

    ——

4. Press ⃞Enter to accept the displayed choice or press the ⃞Next or ⃞Prev key to see the other choices. Only those storage slots that are empty and unreserved/available are displayed.

    Pressing ⃞Next or ⃞Prev scrolls you through selections for the storage slots, drive 1, drive 2, drive 3, drive 4, or the mailslot. Once your choice is displayed, press ⃞Enter.

As the picker moves the disk from the mailslot to its storage slot or drive destination, the LOAD indicator blinks and SLOT ## displays, where ## is the actual number of the slot in which the disk was loaded.

After the picker moves the disk from the mailslot and puts it in the chosen slot or drive, the display returns to READY.

─────────────────── **Note** ───────────────────

When loading disks, take care to insert the disks into the mailslot correctly. If you don't insert the disk fully, you could see an EMPTY, LOAD ERR or MISLOAD message on the display. If this happens, press Cancel and try firmly inserting the disk again.

──

─────────────────── **CAUTION** ───────────────────

If SECURE or RESERVED is displayed, refer to Section 6.3 for instructions on changing security configurations.

──

4.4 Removing Disks

─────────────────── **CAUTION** ───────────────────

It is critical that disks temporarily removed from the Optical Library be labeled with their storage slot locations. If the disks are not reinserted into their original storage slot location, your file system will no longer be accurate. This procedure should only be used in catostrophic circumstances. Normally, disks are exported via the host system software.

──

4.4.1 Removing Disks from the Small Unit (RW504/524)

1. Press NEXT until EJECT * displays.

2. Press ENTER. SLOT ## displays. (## is the slot number from 1-16 where a cartridge is stored. DRIVE may also display, indicating there is a cartridge in the optical drive.)

3. If this is the number of the slot that holds the cartridge you want ejected through the mailslot, press ENTER .

   If this is not the number of the slot that holds the cartridge you want ejected, press NEXT or PREV until the desisred number displays. Then press ENTER .

4.4.2 Removing Disks from all Other Units (RW510/530, RW511, RW514/534, and RW516/536)

1. With the Optical Library switched on and in the READY state, press the Eject key. The first occupied storage slot (normally SLOT 1) is displayed.

2. Press Enter to accept the displayed choice or press the Next or Prev key to see the other choices. Only those storage slots that are filled and unreserved/available are displayed.

3. Pressing Next or Prev scrolls you through selections for the storage slots, drive 1, drive 2, drive 3, or drive 4. Once your choice is displayed, press Enter .

   While the picker moves the disk from its slot or drive to the mailslot, the EJECT indicator blinks. SLOT ## is displayed, where ## is the actual number of the slot from which the disk was ejected.

4. Once the display returns to READY, remove the disk from the mailslot.

_____ **Note** _____

If a disk is already in the mailslot when Eject is pressed, a FULL message displays. Remove the disk from the mailslot and try the Eject procedure again.

If a disk is partially in the mailslot when Eject is pressed, a MISLOAD message displays. Press Cancel , remove the disk from the mailslot and try the Eject procedure again.

_____

4.4.3 If a Cartridge Won't Eject

There are several conditions that may prevent a cartridge from ejecting:

- If EMPTY displays, there are no cartridges in the slots.

- If there is a cartridge in the mailslot, FULL briefly displays, and then READY displays. Remove the cartridge from the mailslot, then repeat the steps to eject a cartridge.

- If the host computer system has a disk reserved, the slot number of the reserved disk won't display. The disk must be unreserved to eject it. Refer to your host computer system documentation or your application software documentation for instructions on unreserving a disk.

- If the option "Prevent Media Removal" CONF 15 is set to ON, RESERVED displays and cartridges cannot be removed. CONF 15 must be set to OFF to eject a cartridge. See Section 6.3

- The host computer system is set to disallow mailslot operation. Refer to your host computer system documentation or your application software documentation.

4.5 Changing Control Panel Configurations

The following steps show you how to change a control panel configuration. See Appendix A for a listing of all configuration options and defaults.

1. Switch on the Optical Library if it is not already on. On the small unit go to step 3 when READY is displayed.

2. With READY displayed, press Option. TEST * displays.

3. Press Next. CONF * displays.

4. Press Enter. CONF 0 displays.

5. Press Next or Prev until CONF ## displays (where ## is the configuration number you want to change.)

   See Appendix A for a complete listing of configurations.

6. Press Enter.

   The default setting is displayed. It may be any one of the following:

   - OFF or ON

   - A numeral

   You may be prompted for a password before your options, if any, display. An explanation of passwords is found in Chapter 6.

7. Press Next or Prev until the setting for this particular configuration is appropriate for your situation.

8. Press Enter once your choice displays. SET ## displays followed by CONF *.

9. Press CANCEL to exit.

4.6 Retrieving Performance Information

To display information about the Optical Library (the error log or move success log, for example), you need to access the INFO option. All the information log selections are identified in Appendix B.

Here are the steps to access an information log.

Note:

There is no Option button on the small unit, therefore, on the small units, go to step 2 when READY is displayed.

---

1. With the Optical Library switched on and READY displayed, press Option. TEST * displays.

2. Press Next until INFO * displays.

3. Press Enter, a flashing 0 displays.

4. Press Next or Prev until the desired log number displays.

   See Appendix B for a complete listing of information logs.

5. Press Enter. The log information displays.

Note

Some logs display more information when Next or Prev is pressed.

Press Cancel to stop the INFO display. Press Enter then Next to choose another log.

4.7 Running Diagnostic Tests

To display test information and to choose tests to execute, you need to access the TEST option. All diagnostic tests are described in Appendix C.

Here are the steps to perform a diagnostic test.

—————————— **CAUTION** ——————————

Some diagnostic tests can corrupt your file system by moving a disk from its original storage slot to a new storage slot.

Please contact your service representative if you feel diagnostic steps are necessary unless you are trained to perform these diagnostic tests and to interpret their results for the purposes of troubleshooting.

_____

1. With the Optical Library switched on and `READY` displayed, press Option , or NEXT for the small unit, `TEST *` displays.

2. Press Enter . `TEST 0` displays.

3. Press Next or Prev until the desired test number displays.

   See Appendix C for a complete listing of diagnostic tests.

4. Once you press Enter for the chosen test, `ONCE` displays.

   Select `ONCE` by pressing Enter or press Next or Prev to choose `10`, `100`, `1000`, or `LOOP` test repetition times.

   `LOOP` indicates that the test runs continuously until Cancel is pressed or the unit is switched off.

—————————— **Note** ——————————

A test may be stopped by pressing Cancel . The current test iteration completes.

_____

5. Once you press Enter for the number of test iterations, `TESTING` displays briefly, then `RUN ##` displays (where ## is the test number.)

6. The test runs. If no problems are encountered, the message `PASS ##` displays.

   Press Option (CANCEL on the small unit) to get back to the `READY` state; or, press Enter or Cancel to perform another test.

   If a problem occurs during the test, the message `FAIL ##` displays. Press Enter to gain information about the failure. An `ERROR ##` displays. Relevant information is stored in the Error information log.

   Press Cancel or Option to exit this display.

4.8 Setting the Optical Library System Addresses

The Optical Library uses from two to five SCSI addresses: one for each of the drives, and one for the Autochanger. All of these addresses are set through the control panel. The default address settings are as follows:

_____ **NOTE** _____

You must set the SCSI addresses regardless of the defaults.

_____

Table 4–2 Default Address Settings

Description	Small Unit Address	Medium Unit Address	Large Unit Address
Autochanger Controller	3	3	5
Optical Disk Drive #1	4	4	1
Optical Disk Drive #2	N/A	5	2
Optical Disk Drive #3	N/A	N/A	3
Optical Disk Drive #4	N/A	N/A	4

If you want to change one or all of the addresses, follow these steps:

1. First verify IDs of all SCSI devices connected to the host system, before changing defaults to avoid bus conflicts.

2. Shut down the host system.

3. Ensure that the Optical Library is already on. For the small unit, go to step 5 if power is on.

4. With READY displayed, press OPTION. TEST * displays.

5. Press NEXT. until SCSI IDs * displays.

6. Press ENTER. AC ID # displays, where # may be the default number indicated in Table 4–2 or the current address.

   This is the Autochanger controller address. If you want to change this address, press ENTER, otherwise continue to press NEXT until the drive number whose address you want to change is displayed, (DRV ID 1, DRV ID 2, etc.)

7. Press NEXT or PREV until the address you want displays. (Addresses can only be a number from 0 through 7).

8. Press ENTER. The address you chose is now set.

9. If you want to change additional drive addresses, press NEXT until that drive number is displayed and repeat steps 6 through 8 to set the new address.

10. Press NEXT until UPDATE or CONFLICT displays.

    If CONFLICT displays, two or more drives and/or the controller have been set to the same address and must be reset.

    If UPDATE displays and you are satisfied with the addresses you have selected, press ENTER.

11. Record the new address setting for future reference.

12. Press CANCEL until the READY state returns.

―――――――――――――――― **Caution** ――――――――――――――――

Do not remove power to the Optical Library until you are sure that the SCSI bus is inactive. Removing power from a SCSI peripheral when the bus is active can cause data loss and/or indeterminate bus states. (Check the host system reference manuals for information on checking the status of the SCSI bus.)

Opening the rear cabinet door of the large unit automatically removes power to the Optical Library motors. When the rear cabinet door is open, disks that are already in a drive can be read; however, if the host issues an Autochanger command to access a disks not currently in a drive, an error condition results.

―――

13. Power cycle the Optical Library so the new address setting will be recognized by the host system.

―――――――――――――――――― **Note:** ――――――――――――――――――

Rebooting is required for the system to recognize the new IDs.

―――

5

Rear Panel Configurations and Connections

This chapter shows where SCSI and power connectors are located on the rear panel.

If you are configuring the Optical Library to a host computer other than those listed above, refer to your host system manuals for configuration steps.

5.1 Rear Panel Connectors

The main components of the Optical Library back panel are illustrated in the figures as indicated in the following list.

- Figure 5–1 - Small Optical Library (RW504/524-ZA)
- Figure 5–2 - Deskside Optical Library (RW510/530-ZC)
- Figure 5–3 - Rackmount Optical Library (RW511-ZC)
- Figure 5–4 - Large Optical Library (RW514/516/534/536-ZF)

Table 5–1 describes the components called out in the rear panel figures.

Rear Panel Configurations and Connections
5.1 Rear Panel Connectors

Figure 5–1 Small Optical Library Rear Panel (RW504/524-ZA)
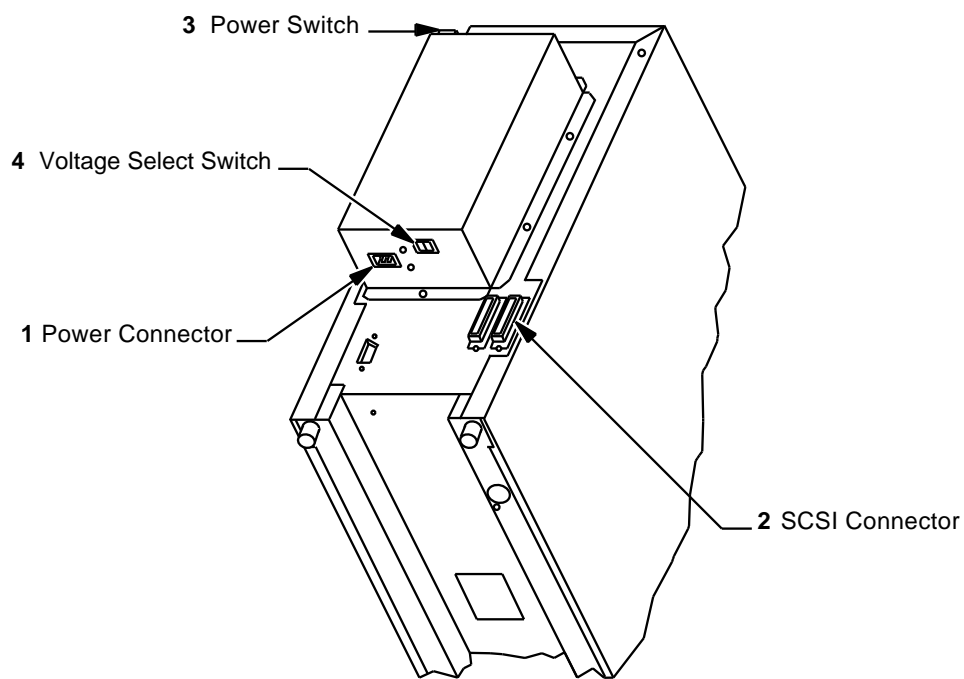
3 Power Switch

4 Voltage Select Switch

1 Power Connector

2 SCSI Connector

MK445−05

Figure 5–2 Deskside Optical Library Rear Panel (RW510/530-ZC)
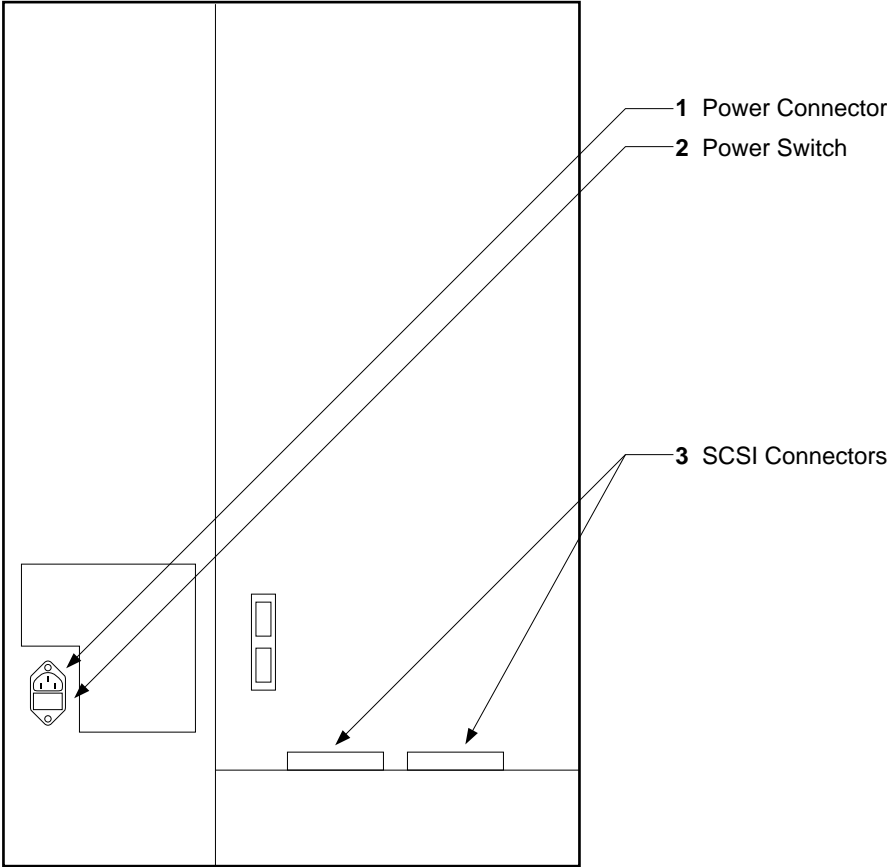
ZS-0513-MH

Rear Panel Configurations and Connections
5.1 Rear Panel Connectors

Figure 5–3 Rackmount Optical Library Rear Panel (RW511-ZC)
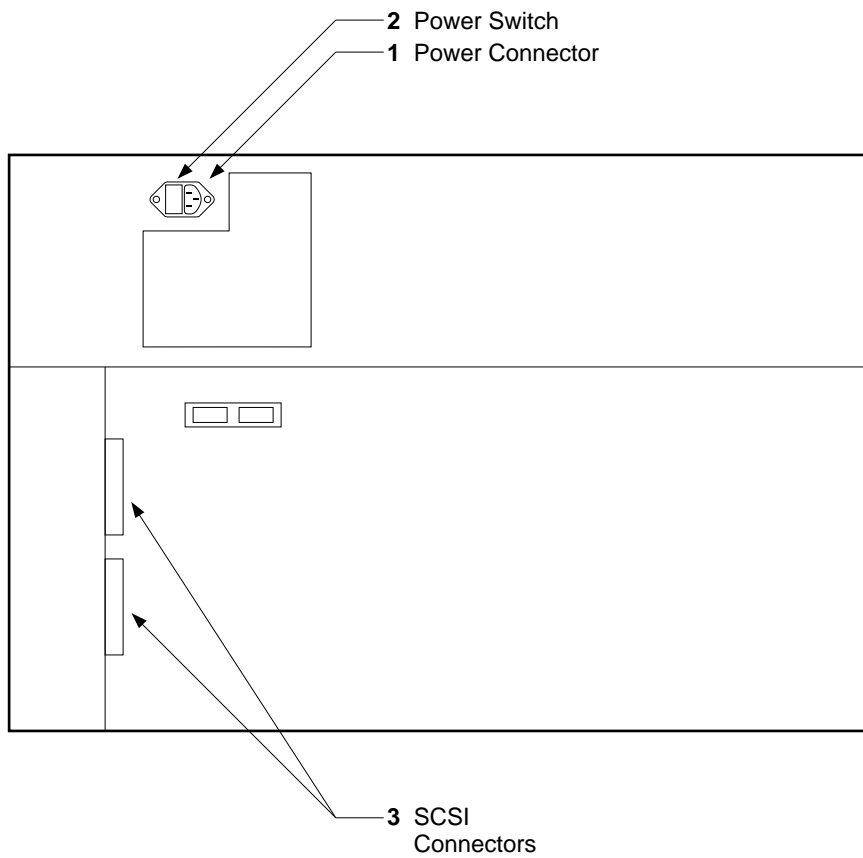
2 Power Switch
1 Power Connector

3 SCSI
Connectors

ZS-0514-MH

Figure 5–4 Large Optical Library Rear Panel (RW514/516/534/536-ZF)

1 Power

2
SCSI Connectors
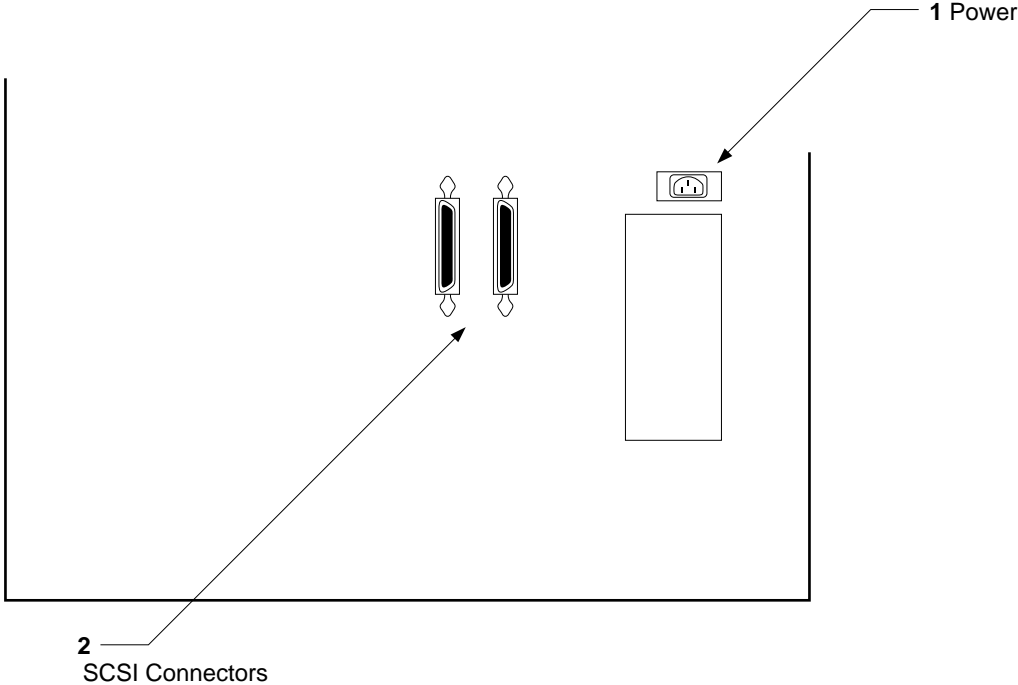
ZS-0662-MH

Rear Panel Configurations and Connections
5.1 Rear Panel Connectors

Table 5–1 Rear Panel Components

Fig No.	Component	Description	Applicable to
1	Power Connector	Connection for the power cord.	All Units
2	SCSI Connectors	Two SCSI bus connectors that allow SCSI devices to be daisy-chained. If no other SCSI device exists after the current device on the chain, a terminator must be connected to the unused connector.	All units

_____ **CAUTION** _____

Do not plug a single-ended device into a differential bus or a differential device into a single-ended bus.

_____

Fig No.	Component	Description	Applicable to
3	Power Switch	Used to switch power on and off	All but large unit
4	Voltage Select Switch	Sets the voltage to either 115 volts or 230 volts	Small Unit

6
Securing the Optical Library

The following topics are presented in this chapter:

- Security considerations
- Setting a password
- Setting security configurations

6.1 Security Considerations

In its default condition, the Optical Library is unsecured, however, system control software may secure the Optical Library automatically. Any user can insert or remove disks or access control panel displays, configurations, or tests. In an open environment, some precautions should be taken to secure access to the control panel as well as to the following:

- Sensitive data stored on optical disk surfaces
- Configuration settings
- Diagnostic log information

If you are concerned about security you should do the following:

- Set a new Optical Library password periodically and limit the number of people who know the password.
- Implement the following security configurations:
  - Configuration 15—restricts disk insertion and removal
  - Configuration 20—maintains the configuration 15 setting in the event of a power failure
- Consider locating the Optical Library in a physically secure environment.

6.2 Setting a New Password

-------------------------------- **Note** ---------------------------------

Remember your password. If you forget it, only your service
representative can reset the password to the default.

The default factory set password is 0-0-0. When setting a new
password you must first key in the the old one and then the new one.

Follow these steps to set a new password.

-------------------------------- **NOTE** ---------------------------------

The small unit doesn't have an OPTION button, therefore, when READY
is displayed go to step 2 for the small unit.

----

1. With READY displayed, press Option. TEST * displays.

2. Press Next until CONF * displays.

3. Press Enter. CONF 0 displays (0 is flashing for the small unit).

4. Press Next until CONF 17 displays.

5. Press Enter. 0 displays. (CODE1 and a flashing 0 displays for the small
   unit).

6. Enter the current password (or the default password, 0-0-0).

   a. Press Next or Prev until first number of the old or default password
      displays.

   b. Press Enter. 0 displays. (CODE2 and a flashing 0 displays for the small
      unit).

   c. Press Next or Prev until second number of the old or default password
      displays.

   d. Press Enter. 0 displays. (CODE3 and a flashing 0 displays for the small
      unit).

   e. Press Next or Prev until third number of the old or default password
      displays.

f.   Press ⎡Enter⎤.

——————————————— **Note** ———————————————

If the password is keyed in successfully, the display prompts you for the
new one. If a mistake is made in keying in the password, NO CONFIG
briefly displays and the unit returns to the CONF 17 display.

If you realize you've made a mistake in keying in a password, press
⎡Cancel⎤ to return to the CONF 17 option.

———————————————————————————————————————

7.   Enter a new password.

——————————————— **Note** ———————————————

It is a good idea to write down your new password prior to entering it
into the Optical Library. Also, store this information in a place where
you can find it easily in case you forget your password.

———————————————————————————————————————

a.   Press ⎡Enter⎤. A displays with the old first number blinking. (NEW1 and a
     flashing 0 displays for the small unit).

b.   Press ⎡Next⎤ or ⎡Prev⎤ until first number of new password displays.

c.   Press ⎡Enter⎤. B displays with a blinking second number of the old
     password. (NEW2 and a flashing 0 displays for the small unit).

d.   Press ⎡Next⎤ or ⎡Prev⎤ until second number of new password displays.

e.   Press ⎡Enter⎤. C displays with a blinking third number of the old
     password. (NEW3 and a flashing 0 displays for the small unit).

f.   Press ⎡Next⎤ or ⎡Prev⎤ until third number of new password displays.

g.   Press ⎡Enter⎤. SET 17 displays briefly.

h.   Press ⎡Cancel⎤ to return to READY

6.3 Setting Security Configurations

The following are two security configurations you might consider implementing.

- CONF 15

  When this is set to ON, you cannot insert or remove disks. If you need to insert or remove disks, you must set CONF 15 back to OFF. (Setting CONF 15 requires a password.) This restricts users from "illegally" inserting or removing disks.

- CONF 20

  When this is set to ON, the CONF 15 status is maintained when a power failure occurs. Also the reserved status of optical platters is maintained if the Optical Library System power fails.

  When setting CONF 15 or CONF 20, the display prompts you for a password. This password is 0-0-0 or the new one you set for CONF 17.

Setting CONF 15 or CONF 20

1. Press Option and then Next until CONF * displays. For the small unit, just press Next.

2. Press Enter. CONF 0 displays. (0 is blinking on the small unit)

3. Press Next or Prev until CONF 15 or CONF 20 displays.

4. Press Enter. 0 displays. (CODE1 and a flashing 0 are displayed on the small unit.)

5. Press Next or Prev until the first password number displays.

6. Press Enter. 0 displays.(CODE2 and a flashing 0 are displayed on the small unit.)

7. Press Next or Prev until the second password number displays.

8. Press Enter. 0 displays.(CODE3 and a flashing 0 are displayed on the small unit.)

9. Press Next or Prev until the third password number displays.

10. Press Enter. SET 15 or SET 20 displays.

    NO CONFIG is displayed if you entered the wrong security code.

11. Press Cancel twice to return to Ready.

A
Configuration Options and Defaults

This appendix lists the Optical Library configuration options and defaults. Chapter 4 describes how to access and set these configurations.

Note

Your service representative can assist you in implementing the right configuration selections for your Optical Library.

A.1 Mailslot Configurations

Configurations 31 and 32 allow you to control the mailslot as described below. (Instructions for setting Optical Library configurations are located in Chapter 4.)

Note

In its default state, the Optical Library mailslot stays open, ready to accept an optical disk.

The following configurations allow you to change the mailslot's default position of open to closed.

- `CONF 31` - when this is set to ON and `CONF 15` is also set to ON, the mailslot's default position is closed. The mailslot cannot be opened and disks cannot be inserted or removed until `CONF 15` (which requires a password to set), is set to OFF. Setting this configuration to ON makes it visible to the user that the mailslot cannot be used until security configuration 15 is switched OFF.

  If the autochanger disk capacity is full, the mailslot only opens for an eject command.

- `CONF 32` - when this is set to ON, the mailslot can be rotated open or closed from the control panel or it allows the host to control mailslot rotation using a SCSI rotate mailslot command. Pressing ⎡Option⎤ on the Optical Library control panel displays an `OPEN MS` or `CLOSE MS` message. When the open or close message displays, press ⎡Enter⎤ to toggle the mailslot open or closed.

  If the autochanger disk capacity is full, the `OPEN/CLOSE MS` is not displayed and the mailslot only opens for an eject command.

A.2 Security Configurations

The following security-related configurations may be of value to you and are discussed in detail in Chapter 6.

- `CONF 15` - when this is set to ON, you cannot insert or remove disks without a password. This restricts users from "illegally" inserting or removing disks.

- `CONF 20` - when this is set to ON, the `CONF 15` status is maintained when a power failure occurs. Also, the reserved status of optical platters is maintained if the Optical Library power fails.

- `CONF 17` - this configuration allows you to set a password that is needed when either `CONF 15` or `CONF 20` are implemented. The default factory-set password is 0-0-0. When setting a new password you must key in the old one first and then the new one.

Note

Don't forget your password. If you forget it, only your service representative can reset the password to default.

A.3 Configuration Options and Defaults

Table A–1 lists the Optical Library configuration options and defaults. Chapter 4 describes how to access and set these configurations.

Note

Your service representative can assist you in implementing the right configuration selections for your Optical Library.

Table A–1   Configuration Selections

No.	Function	Default	Options
0	Clear/Save Error Log (Information Log 0)	SAVE	CLEAR - clears the error log immediately. SAVE - saves the error log until CLEAR is configured.
8	No Break on Failure	OFF	OFF - if a test encounters a failure, the test stops. ON - if a test encounters a failure, the test continues.
10	Clear/Save Move Log (Information Log 10)	SAVE	CLEAR - clears the move log immediately. SAVE - saves the move log until CLEAR save is configured.
11	Clear/Save Runtime Log (Information Log 11)	SAVE	CLEAR - clears the runtime log immediately. SAVE - saves the runtime log until clear is configured.
*15	Prevent Media Removal (password required)	OFF	ON - Cartridges cannot be loaded or ejected. OFF - Cartridges can be loaded or ejected.
*16	Set Default Configurations (password required)	SAVE	CLEAR - restores default configurations immediately. SAVE - maintains all set configurations.
*17	Set New Password (password required)	0-0-0	
*18	Clear/Save Logs (password required) Clears/zeros these logs: #4 - Drive Load Count #5 - Power on Hours #9 - Move #12 - Flip #13 - Translate #14 - Mailslot Rotation	SAVE	CLEAR - clears/zeros the specified logs. SAVE - maintains the specified logs until CLEAR is configured.

*Configurations 15 - 20, 31, 32, 50 and 66 require a password. See Chapter 6.

Table A–1 (Cont.)   Configuration Selections

No.	Function	Default	Options
*19	Set Autochanger Retries (password required)		Sets the number of attempts to retry moves before giving up.
			A - Max. attempts to find home 4
			B - Max. attempts to do move 2
			C - Max. attempts to restore move after failure 1
*20	Power On Cartridge Security (password required)	OFF	ON - maintains the status of Configuration 15 upon power cycle or power failure. OFF - Configuration 15 is not maintained through a power cycle or power failure.
21	Enable Autochanger Retries	ON	ON - Autochanger attempts to correct itself when it encounters difficulty. OFF - Autochanger does not attempt to correct itself when it encounters difficulty.
22	Clear Drive 1 Load Count Log (Information Log 4)	SAVE	CLEAR - clears the Drive 1 Load Count Log immediately. SAVE - saves the Drive 1 Load Count Log until clear is configured.
23	Same as Config. 22, for Drive 2		
24	Same as Config. 22, for Drive 3		
25	Same as Config. 22, for Drive 4		
27	Report Recovered Error	OFF	ON - reports the SCSI-level error to the host. OFF - no reports of SCSI-level errors to the host.

*Configurations 15 - 20, 31, 32, 50 and 66 require a password. See Chapter 6.

Table A–1 (Cont.)   Configuration Selections

No.	Function	Default	Options
*31	Secured Mailslot Rotation (password required)	OFF	OFF - Normal mailslot operation. ON - The mailslot rotates in when Configuration 15 is set to ON or a Prevent Media Removal command is received. The mailslot remains closed until Configuration 15 is set to OFF or an Allow Media Removal command is received. If the autochanger is full, the mailslot opens only for an EJECT command.
*32	Mailslot Rotation Command (password required)	OFF	OFF - Normal mailslot operation. If the host sends a Rotate Mailslot command and Config. 32 is set to OFF, the host receives a Check Condition followed by a Sense Key of Illegal Request. ON - When a Rotate Mailslot command is received (either from the host or via the control panel), the mailslot is toggled open or closed.
40	DEC/OEM Mode	OFF	OFF - Changes inquiry mode to DEC mode. Required when connected to a DEC computer to ensure integrity. This changes default of Autocontroller PCA. ON - For use with OEM computers (HP).
41	DEC/OEM Mode	OFF	OFF - Changes inquiry mode to DEC mode. Required when connected to a DEC computer to ensure integrity. This changed default of 1.3 Gbyte multifunction drive only. ON - For use with OEM computers (HP).

_____ **NOTE** _____

If drives need to be switched from DEC mode to OEM standard mode, contact your Digital Services representative.

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*Configurations 15 - 20, 31, 32, 50 and 66 require a password. See Chapter 6.

B

Information Logs

Table B–1 lists the information logs available through the control panel. To access these logs, see Chapter 4.

Note

Your service representative can help you interpret the information held in the information logs.

These information logs will be of value to you:

- Log 1—Firmware Version Number
- Log 16—Drive 1 SCSI Address
- Log 17—Drive 2 SCSI Address
- Log 18—Drive 3 SCSI Address
- Log 19—Drive 4 SCSI Address

Other information logs record information that tell you how much your Optical Library is used.

Table B–1 Information Logs

No.	Log Name	Description
0	Autochanger Error Log	A time-stamped history of past diagnostic test errors. The error message maintained for each error indicates the failure and the possible Field Replaceable Units (FRUs) which may have caused the failure.

Information Logs

Table B–1 (Cont.)   Information Logs

No.	Log Name	Description
1	Firmware Version Number	Displays the current autochanger firmware version number.
2	Element Status	Displays the status (empty or full; see Data mask, below) of the selected autochanger element. Three numbers are displayed: First Number - Element number 0 - picker 1 - drive 1 2 - drive 2 3 - drive 3 4 - drive 4 10 - mailslot The number of storage slots depends on the model as follows: 11 - 26 - storage slots for the Small Unit 11 - 42 - storage slots for the Deskside or Rackmount Units 11 - 160 - storage slots for the Large Unit Second Number-Element type 1 - picker 2 - storage slot 3 - mailslot 4 - drive Third Number-Data mask 00 - empty 01 - full
3	Software Clock	Displays the current "count" in seconds of the software clock (hexadecimal).
4	Drive Load Count	Displays the number of cartridge loads for either Drive 1, 2, 3, or 4.
5	Power On Hours	Displays the number of operation hours (operation button on-time).

Table B–1 (Cont.) Information Logs

No.	Log Name	Description
6	Current Move* Success Count	Displays the number of successful moves since the most recent failure.
7	Move* Success Average	Displays the average of the values in Log #10 - Move Success Log.
8	Current Move* Retry Count	Displays the number of move retries performed since the most recent failure.
9	Total Move* Count	Displays the total number of moves and move attempts.
10	Move* Success Log	Contains the number of successful moves which have occurred without a failure. Each time a failure occurs, the number of good moves is entered into the log and a new count is started. This INFO display shows the most recent 10 (or less) entries in the log. This log also shows the retry counts corresponding to each log entry. Example (two displays for each entry): 1 33482 3 First display: 1 - entry number and 33482 - number of moves Second display: 3 - number of retries
11	Display Runtime Log	Flashes to each display until CANCEL is pressed. A - Moves performed B - Retries C - Automatic recoveries D - Hard errors
12	Display Flip Count	Displays total number of picker flips.
13	Display Translate Count	Displays total number of picker translates.
14	Display Mailslot Rotation Count	Displays total number of mailslot rotations.
15	Number of Drives	Displays the number of disk drives in the unit.
16	Drive #1 SCSI Address	Displays the SCSI address for Drive #1.

*The term **Move** used in Logs 6 - 10 means SCSI-level moves by the picker mechanism.

Information Logs

Table B–1 (Cont.) Information Logs

No.	Log Name	Description
17	Drive #2 SCSI Address	Displays the SCSI address for Drive #2.
18	Drive #3 SCSI Address	Displays the SCSI address for Drive #3 (if installed).
19	Drive #4 SCSI Address	Displays the SCSI address for Drive #4 (if installed).
20	Distance	Displays the maximum distance that your carriage can move (hexadecimal).
21	Picker Core Angle	Displays the measured picker core angle from the nominal position (hexadecimal).
22	Stack Tilt	Displays the measured stack tilt of the box (hexadecimal).
	Minimum Clearance:	Minimum clearance for cartridge insertion into
23	Mailslot	a magazine or mailslot. Up/down clearance
24	Magazine 1	is calculated by Test 65 and Test 67 and is
25	Magazine 2	displayed in hexadecimal format.
26	Magazine 3	Example:
27	Magazine 4	
28	Magazine 5	`00DC 0028 - 220, 40`
29	Magazine 6	`FFEC 0014 - -20, 20`
30	Magazine 6	
31	Magazine 8	**Note:** Your autochanger contains up to 18
32	Magazine 9	magazines depending on the model.
33	Magazine 10	
34	Magazine 11	
35	Magazine 12	
36	Magazine 13	
37	Magazine 14	
38	Magazine 15	
39	Magazine 16	
40	Magazine 17	
41	Magazine 18	

C

Control Panel Diagnostic Tests

The following tables describe these Optical Library diagnostic tests:

- Table C–1, Sequence Tests describes tests 1 through 5.

- Table C–2, Exerciser Tests describes tests 10 through 29.

- Table C–3, Electronic Core Tests describes tests 30 through 44.

- Table C–4, Mechanism Core Tests describes tests 50 through 75.

A brief discussion of diagnostic tests can be found in Chapter 1. Procedures for how to perform a diagnostic test are found in Chapter 4.

_____ **VERY IMPORTANT** _____

Some diagnostic tests can result in a disk being placed into an improper storage slot. If this happens, the Optical Library file system is no longer accurate.

It is strongly recommended that you only execute tests 1, 2, 3, 10, 23, and 38 as described in Section 1.6.

All other tests should be performed by a trained service representative. Please contact your service representative if you feel diagnostic steps are necessary unless you are trained to perform these diagnostic tests and to interpret their results for the purposes of troubleshooting.

_____

Control Panel Diagnostic Tests

Table C–1 Sequence Tests

No.	Test Name	Description
1	Poweron	Checks all digital data paths and normal machine operation. This test runs the same sequence of tests that are run when the Optical Library operation button is switched on, but does NOT execute all operations.
		Sequence Order: 3 - Controller Test 40 - Power Supply Test — Motor Connection Test (no number) 5 - Initialize Mechanism 46 - Board Configuration —Restore (if needed.) If power failed in the middle of a move, the autochanger tries a "restore" of the last move. The autochanger tries to put the cartridge back to where it came from. This attempt could fail (the Poweron sequence fails.) A restore attempt only occurs if power fails during the Poweron test.
		10 - Initialize Element Status (if needed.) 38 - Control Panel Light Show
		—Mailslot rotation (if not secured.) The rotation could fail (Poweron sequence fails.) Poweron only.
2	Wellness Test	Checks out the general capability of the autochanger. Requires one loaded cartridge; drives and mailslot empty.
		Sequence Order: 1 - Poweron test 11 - Mechanical Exerciser Test

Table C–1 (Cont.)   Sequence Tests

No.	Test Name	Description
3	Controller Test	This sequence is run by the autochanger controller when the Optical Library operation switch is switched on to check out all paths, and operation of the servo motor and autochanger circuitry. Sequence Order: 30 - Processor Test 31 - ROM Checksum Test 33 - Non-Destructive RAM Test 32 - RAM Checksum Test 34 - SCSI Interface Controller IC Test 35 - Multi-Function Peripheral IC Test 36 - Motor Control IC Test 37 - Drive Connect Test
5	Initialize Mechanism	Prepares the unit for movement. Sequence Order: Initialize RAM variables to defaults 50 - Find Home

Table C–2   Exerciser Tests

No.	Test Name	Description
10	Initialize Element Status	Performs the same function as the SCSI Initialize Element Status command. It physically scans the entire unit to determine which storage slots and drives contain disks.
11	Mechanism Exercise Test	Performs a combination of moves with a pass/fail result. This exerciser is actually a sequence of other exerciser tests—12, 13, 14, 15, 16, and 17. This exercise returns an error code **#57H Invalid Configuration** if there are no cartridges loaded into the unit. Requires one loaded cartridge, drives and mailslot empty.

(continued on next page)

Control Panel Diagnostic Tests

Table C–2 (Cont.)   Exerciser Tests

No.	Test Name	Description
12	Carriage/Picker Move Test	Performs a combination of carriage moves with a pass/fail result. Moves the picker assembly the full length of the rails with the picker on first one side and then the other. No cartridges are required.
13	Translate Test	Performs a combination of moves with a pass/fail result. It performs several translations from various starting positions. No cartridges are required.
14	Flip Test	Performs a combination of moves with a pass /fail result. It performs several flips at various locations. No cartridges are required.
15	Storage Slot Test	Performs a combination of moves with a pass/fail result. It moves a cartridge from a randomly-chosen full slot to a randomly-chosen empty slot, with a random flip. It then moves the cartridge back to its original storage slot with its original orientation. This exerciser returns an error code `#57H Invalid Configuration` if there are no cartridges loaded into the unit, or if any drive is full. Requires one loaded cartridge.
16	Drive I/O Test	Performs a combination of moves with a pass/fail result. It moves a cartridge from a randomly-chosen full slot to a drive, with a random flip. It then moves the cartridge back to its original slot with its original orientation. It does this once for each optical drive. Returns an error code `#57H Invalid Configuration` if there are no cartridges loaded into the unit. Requires one loaded cartridge; drives must be empty.
17	Mailslot I/O	Performs a combination of moves with a pass /fail result. It moves a cartridge from the lowest-numbered full slot to the mailslot with a random flip. It then moves the cartridge back to its original slot with its original orientation. Returns an error code `#57H Invalid Configuration` if there are no cartridges loaded into the unit. Requires one loaded cartridge; mailslot must be empty.

Table C–2 (Cont.) Exerciser Tests

No.	Test Name	Description
18	Speed Factor Setting Utility	Allows the setting of the speed factor as the first parameter given. The speed factor determines how fast the system moves the mechanics. The number provides 1/*Parameter* speed (for example, Parameter=3 runs the motors at 1/3 of full speed). This test can only be run from the SCSI Interface.
19	Zero Maximum Force Log	The maximum force log is initialized to all zeros.
20	Set Speed Factor to Full Speed	Allows the mechanics to be run at full speed.
21	Set Speed Factor to Half Speed	Allows the mechanics to be run at half speed.
22	Set Speed Factor to Quarter Speed	Allows the mechanics to be run at quarter speed.
23	Shipping	Moves the picker to the appropriate position in preparation for shipping.
24	Fill Picker	Moves a cartridge into the picker from the first full storage slot.
25	Empty Picker	Moves a cartridge from the picker to the first empty storage slot.
26	Zero Runtime Log	The entire runtime log is initialized to all zeros.
27	Set Minimum Retries	This sets the number of retries to 1. This may be set to see if the chosen test is doing what you want it to do. After you are satisfied that the test is what you want, run Test 28 which resets the number of retries to default values.
28	Set to Default Number of Retries	Resets the number of retries to poweron default values. Used after setting retries to 1 by Test 27.
29	Zero Error Log	Sets Information Log 0, Autochanger Error Log back to zero.

Control Panel Diagnostic Tests

Table C–3 Electronic Core Tests

No.	Test Name	Description
30	Microprocessor Operation Test	Performs a functional check of the microprocessor. This test shuts down the servo system; a Power On sequence is run when this test finishes.
31	ROM Checksum Test	Performs a checksum verification of the ROM.
32	RAM Checksum Test	A checksum of the "Controlled" area of RAM is kept on an ongoing basis. This test verifies that the checksum is still valid.
33	Non-Destructive RAM Test	Tests all of the controller's RAM, checking for data acceptance and retention. The test is non-destructive unless interrupted by a power failure. This test shuts down the servo system; a Power On sequence is run when this test finishes.
34	SCSI Interface Controller Chip Test	Checks out operations of the SCSI interface controller chip. This test does not run if initiated via SCSI; it reports PASS.
36	Motor Control Chip Test	Exercises the registers of the motor control IC. To perform correctly, this test shuts down the servo system; a Power On sequence is run when this test finishes.
37	Drive Connect Test	Checks for expected drive configuration. This is done by polling the drive connect signal on each of the possible drives. This line is grounded at the drive end if a drive is connected. If the drives physically connected do not match the expected configuration, an error is reported.
38	Control Panel Light Show	Lights each portion of the display individually and then together. Requires pushing each front panel button to finish test.
39	Control Panel Button Check	Displays the name of the button pressed. Press CANCEL twice to exit.
40	Power Supply Test	Looks at both the 12-volt and the 24-volt power supplies to verify that they are within limits. The limits for the 12V supply are 11V and 13V and the 24V supply limits are 23.5V and 25.5V.

(continued on next page)

Table C–3 (Cont.) Electronic Core Tests

No.	Test Name	Description
41	SCSI Connector Loopback Test (Interactive)	Performs a loopback through SCSI connectors, checking proper operation of the SCSI drivers, receivers, and cables. Requires an external loopback hood with terminator power. Does not run if it was initiated via SCSI; if so, it reports error FCH Test Did Not Run.

WARNING

The Optical Library must not be connected to a system. It will crash the system.

No.	Test Name	Description
42	Optical Sensor Test (Interactive if done through the control panel)	Checks the status of the four optical sensors. Also checks the status of the mailslot sensor (see Test 43). For the Large Unit (RW514/516), four "0"s are placed on the control panel display; two at the left position in the display, and two at the right position in the display. For the medium unit (RW510/511) three "0"s are placed on the control panel display; one at the left position, one in the middle, and one at the right position. For the small unit (RW504) two "0"s are placed on the control panel; one at the left position and one at the right position in the display. The mark is an open zero if the sensor is good, and a zero filled in with lit segments if the sensor is bad or blocked. No FRU is returned.
43	Mailslot Sensor Test (and Optical Sensor) (Interactive)	For the large unit (RW514/516) this test checks the status of the two mailslot flag sensors. Displays F-0 (front sensor) and B-0 (back sensor). If a sensor is blocked, the "0" is filled in with lit segments, otherwise the "0" is open. For the medium unit (RW510/511), and small unit (RW504) see the description for test 42

(continued on next page)

Control Panel Diagnostic Tests

Table C–3 (Cont.)   Electronic Core Tests

No.	Test Name	Description
44	"Cartridge-in-path" (Infrared beam) Test (Interactive if done through the control panel)	Displays max/min intensity and ambient readings for the left and right beams. You must enter a parameter to choose the beam to display (0=left, 1=right). The following is an example of an error message for the right beam and how it is translated: `F0` is hexadecimal for 240 `E1` is hexadecimal for 225 `R` means right beam `06` is the maximum ambient reading `00` is the minimum ambient reading

```
Intensity            L/R            Ambient
Max   Min                           Max    Min

240   225       F0E1 0600            6      0
```

Press Cancel to stop.

Table C–4   Mechanism Core Tests

No.	Test Name	Description
50	Find Home Sequence	Moves the picker to a known "home" position. This test assumes nothing about the state of the mechanics. The "home" location is the lower left position of the box. The servo system is initialized to the "home" location. It then automatically runs Test 51.
51	Carriage/Picker Assembly Calibration Test	Runs the portion of the mechanism recalibration related to the optical sensors. It measures sensor offsets and calculates picker tilt and droop. This test assumes that the mechanics and servo system are functional.

(continued on next page)

Table C–4 (Cont.) Mechanism Core Tests

No.	Test Name	Description
60	FRU Isolation Test	Assumes that something has physically failed, either electronic or mechanical. A series of special low-level tests are executed to select the three (or fewer) FRUs which are most likely to be at fault. Tests 30, 31, 33, 35, 36, 40, and 50 are executed as a part of the isolation process. Returns an error code, three suspect FRUs in decreasing order of fault probability, and a time stamp.
65	Calibrate Magazines	Calculates a min/max clearance for each storage slot magazine. (The selected magazine should be empty.) The autochanger should be empty and it requires a disk in the mailslot. The test passes if clearance is 85 encoder counts (1 mm) up and down. (See Info 23 for actual values.) If this test is run by SCSI command, set Byte 1 to the magazine number (2, 4, 11, or 18 depending on the model). The test returns: PASS or FAIL.
66	Clear Magazine Min /Max.	Clears the value calculated in Test 65.
67	Calibrate Mailslot	Calculates a min/max clearance for the mailslot. The autochanger requires a disk in the mailslot. The test passes if clearance is 85 encoder counts (1 mm) up and down. (See Info 23 for actual values.) The test returns: PASS or FAIL.
68	Clear Mailslot Max/Min	Clears the value calculated in Test 67.
75	UPS Test	Tests whether or not the UPS is connected properly. The test returns PASS if connected properly, FAIL if the UPS is not connected properly or if there is no UPS connected.

D

Troubleshooting

This appendix provides solutions to problems that can occur in the operation of the Optical Library. If you are experiencing difficulty operating the system, Table D–1 lists steps you should take before consulting your service representative.

---------------------------------- **Note** ----------------------------------

If you decide that a service call is needed, record the following information about your Optical Library prior to calling your service representative. This information is found on the product information labels located on the Optical Library rear panel. (The information on the labels should also be transferred to the tables in Appendix E for quick reference in the future.)

- Product Number

- Option Number(s)

- Serial Number

For problems that may be host system related, refer to your host system documentation.

Troubleshooting

Table D–1   Troubleshooting

Task	Problem/Symptom	What to do
Changing Drive Addresses	Changed drive address but the new addresses aren't recognized.	After changing the addresses be sure to switch off the autochanger and then switch it on again. New addresses won't be recognized until this is done. System reboot is necessary.
Inputting Password	Can't remember the autochanger password.	First, try the default password (0-0-0). If the default does not yield results, call your service representative for assistance.
Installing Optical Library	Initial Installation.	Call your service representative if your Optical Library is the rackmount version, or was ordered as part of a system. If your Optical Library is an add-on and you are familiar with the installation of SCSI devices, follow the instructions in Appendix F.
Loading Disks	Disk inserted in the mailslot, but the display reads EMPTY, LOAD ERR or MISLOAD.	Press Cancel and try inserting the disk in the mailslot again. Check Figure 4–8 for the correct disk loading orientation.

Table D–1 (Cont.) Troubleshooting

Task	Problem/Symptom	What to do
Removing a Disk	Disk removal attempted, but a FULL, MISLOAD, or RESERVED message displays.	• If there is a disk in the mailslot, remove the disk and try to remove the desired disk again. • If there isn't a disk in the mailslot and a MISLOAD message still displays, this could indicate a drive failure; call your service representative for assistance. • In RESERVED case, a security code was set to prevent disk removal. See Table A–1 number 15.
Performing Diagnostic Tests	Started a test in Loop Mode and need to stop.	Press Cancel .
	Performed a diagnostic test which resulted in a FAIL message.	Write down the displayed error code and call your service representative to discuss the problem and possible solutions.

Troubleshooting

Table D–1 (Cont.)   Troubleshooting

Task	Problem/Symptom	What to do
Powering On	Optical Library won't power on.	• Ensure that the power switch on both the rear panel and the front panel (enable Switch on large unit) is ON.
		• Check to make sure the power cord connections are tight.
		• Check to make sure the rear cabinet door is shut and locked.
		• Check to make sure the power outlet is operating.
		• Replace the power cord with a known good one.
		• If the Optical Library still won't power on, call your service representative.
		• Check to make sure that the power outlet is operating.
		• Check to make sure that the voltage setting is correct on RW504/524. The voltage was set to 115V at the factory.

Table D–1 (Cont.)   Troubleshooting

Task	Problem/Symptom	What to do
	Poweron selftest fails.	For the small unit, ensure that the shipping screw is removed. Turn the unit off and then on again. Observe the Poweron test result. If the unit continues to fail the Poweron selftest, write down the displayed error code and call your service representative for assistance. On the large unit, check that the rear cabinet door is locked. (You will receive a `FAIL 1` error message if the door is not locked.)
	Poweron Sequence.	Make sure your boot disk is spun-up and ready before the Optical Library is powered on.

CAUTION

Do not remove power to the Optical Library until you are sure that the SCSI bus is inactive. Removing power from a SCSI peripheral when the bus is active can cause data loss and/or indeterminate bus states.

Check the host system reference manuals for information on checking the status of the SCSI bus.

Task	Problem/Symptom	What to do
Reading the Control Panel	No display messages appear.	Check to see if the power cord is connected. Power cycle the autochanger. Still no display, call your service representative for assistance.

Troubleshooting

Table D–1 (Cont.)   Troubleshooting

Task	Problem/Symptom	What to do
Reading/Writing Optical Disks	Can't write to the disk.	
		• Check the host file system access permissions.
		• Check the write-protect tab on each disk side to assure write-enabled status.
		• Check to make sure the disk was initialized.
		• Make sure your disk is labeled "Rewritable." If you are unable to eject the disk from the drive, call your service representative for assistance.
		• Check your application software.
	An optical drive doesn't seem to be working correctly (excessive retries).	Power cycle your autochanger. If the drive still isn't working, call your service representative for assistance.

Table D–1 (Cont.)   Troubleshooting

CAUTION

Do not remove power to the Optical Library until you are sure that the SCSI bus is inactive. Removing power from a SCSI peripheral when the bus is active can cause data loss and/or indeterminate bus states.

Check the host system reference manuals for information on checking the status of the SCSI bus.

Power Failure	The unit's power failed while a disk was in the drive.	Try powering on the unit. If the Poweron is unsuccessful, switch off the unit. *Do not move the unit.* Moving the unit risks damaging the optical drive. Call your service representative for assistance.

E

Product Numbers, Options, and Supplies

This appendix lists the product numbers and options for the Optical Library, and the available supplies.

This manual covers the products and options shown in Table E–1. To determine which product you have, find the product information labels located on the Optical Library rear panel and check the corresponding information in Table E–1.

Table E–1 Optical Library Products Matrix

Model Number	Description
RW504-ZA	A 10 gigabyte Optical Jukebox with a 16 disk slot capacity, one mail slot, one 650 Mbyte multi-function drive, one auto changer mechanism. Plus packaging, skid, ESD bag, and accessory kit. Single ended SCSI.
RW524-ZA	A 20 gigabyte Optical Jukebox with a 16 disk slot capacity, one mail slot, one 1.3 Gbyte multi-function drive, one auto changer mechanism. Plus packaging, skid, ESD bag, and accessory kit. Single ended SCSI.
RW510-ZC	A 20 gigabyte Optical Jukebox with a 32 disk slot capacity, one mail slot, two 650 Mbyte multi-function drives, one auto changer mechanism. Floor stand model. Plus packaging, skid, ESD bag, and accessory kit. Single ended SCSI.
RW530-ZC	A 40 gigabyte Optical Jukebox with a 32 disk slot capacity, one mail slot, two 1.3 Gbyte multi-function drives, one auto changer mechanism. Floor stand model. Plus packaging, skid, ESD bag, and accessory kit. Single ended SCSI.
RW511-ZC	A 20 gigabyte (Rackmount) Optical Jukebox with a 32 disk slot capacity, one mail slot, two multi-function drives, one auto changer mechanism. Plus packaging, skid, ESD bag, and accessory kit. Single ended SCSI.

Product Numbers, Options, and Supplies

Table E–1 (Cont.)   Optical Library Products Matrix

Model Number	Description
RW514-ZF	A 57 gigabyte Optical Jukebox with a 88 disk slot capacity, one mail slot, four 650 Mbyte multi-function drives, one auto changer mechanism. Plus packaging, skid, ESD bag, and accessory kit. Single ended SCSI.
RW534-ZF	A 114 gigabyte Optical Jukebox with a 88 disk slot capacity, one mail slot, four 1.3 Gbyte multi-function drives, one auto changer mechanism. Plus packaging, skid, ESD bag, and accessory kit. Single ended SCSI.
RW516-ZF	A 94 gigabyte Optical Jukebox with a 144 disk slot capacity, one mail slot, four 650 Mbyte multi-function drives, one auto changer mechanism. Plus packaging, skid, ESD bag, and accessory kit. Single ended SCSI.
RW536-ZF	A 188 gigabyte Optical Jukebox with a 144 disk slot capacity, one mail slot, four 1.3 Gbyte multi-function drives, one auto changer mechanism. Plus packaging, skid, ESD bag, and accessory kit. Single ended SCSI.
RW516-UA	Slot upgrade kit only for (RW514 to RW516) Consists of 56 slots, controller and hardware. Plus packaging, and ESD bag.
RW536-UA	Slot upgrade kit only for (RW534 to RW536) Consists of 56 slots, controller and hardware. Plus packaging, and ESD bag.
RW500-ZZ	Single ended to differential adapter and hardware. Plus packaging, and ESD bag.

Product Numbers, Options, and Supplies

Table E–2 lists the basic supplies and reorderable parts for the Optical Library.

Table E–2 Basic Supplies and Reorderable Parts

Item	Part Number
Rewritable Optical Disk (512 bytes/sector) 594 Mbytes per disk formatted	RWX1K-01 (30-38754-01)†
Rewritable Optical Disk (512 bytes/sector) 1.2 Gbytes per disk formatted	RWX5K-01 (30-38754-02)†
Write-Once Optical Disk (512 bytes/sector) 594 Mbytes per disk formatted	RWX1K-02 (30-40952-01)†
Write-Once Optical Disk (512 bytes/sector) 1.2 Gbytes per disk formatted	RWX5K-02 (30-40952-02)†
2.7m (9 ft) SCSI interface cable; Champ to Honda connectors	BC09D-09 (Storage Server)
0.9m (3 ft) SCSI jumper cable; Champ to Champ connectors	BC09K-03
1.8m (6 ft) SCSI interface cable	BC06P-06 (17-02659-02)
Single-ended SCSI terminator	H8574-A
Power cord	RW1KA-AA

†To reorder media, call 1-800-DIGITAL or 1-800-344-4825

Product Numbers, Options, and Supplies

Table E–3 Related Documentation

Item	Part Number
Optical Storage Desktop Software Installation Guide	AA-PXYKA-TE
Optical Storage Desktop Software User's Guide	AA-PXYLA-TE
Optical Storage Management Software Installation Guide	AA-PXYPA-TE
Optical Storage Management Software Installation Guide	AA-PXYQA-TE
Storage Server 100 Installation Guide	EK-D59SS-IN
Small Optical Disk Library Service Manual	EK-SOL10-SV
Medium Optical Disk Library Service Manual	EK-STSOP-SV
Large Optical Disk Library Service Manual	EK-SS100-SV
Storage Server 100 Optical Disk Service Manual	EK-STSOP-SV †

†Only for older model 10/20 Jukeboxes shipped with (Ninja) storage server systems.

F

Installing the Optical Library

This appendix provides information on:

- Contents of shipment

- Uncrating and installing an add-on small (RW504/524), or medium (RW510/530/511) Optical Library

- Connect more than one Optical Library systems together

- Uncrating and installing an add-on large (RW514/516/534/536) Optical Library

F.1 Contents of Shipment

The contents will vary depending on which unit you receive but you should receive a crate containing the Optical Library, and a box, shipped separately, labeled **OPEN FIRST**. Inside this box are several additional packages containing the following:

- READ ME FIRST instructions

- This guide, *Optical Library User's Guide*

- SCSI cable

- SCSI terminator

- Power cord

In addition to these items, to complete the installation you may need two wrenches—a 1/2 inch wrench and a 9/16 inch wrench—and a TORX T10, T15, T20, and T25 screwdriver (the blade is star-shaped) as well as wire cutters or a knife.

F.1.1 Uncrating and Installing the Small and Medium Optical Library

Uncrate the Optical Library. See Figure F–1. For the small unit (RW504 /524-ZA), remove the packaging material and go to Section F.1.2 :

Figure F–1   Uncrating the Optical Library (RW510/530-ZC)
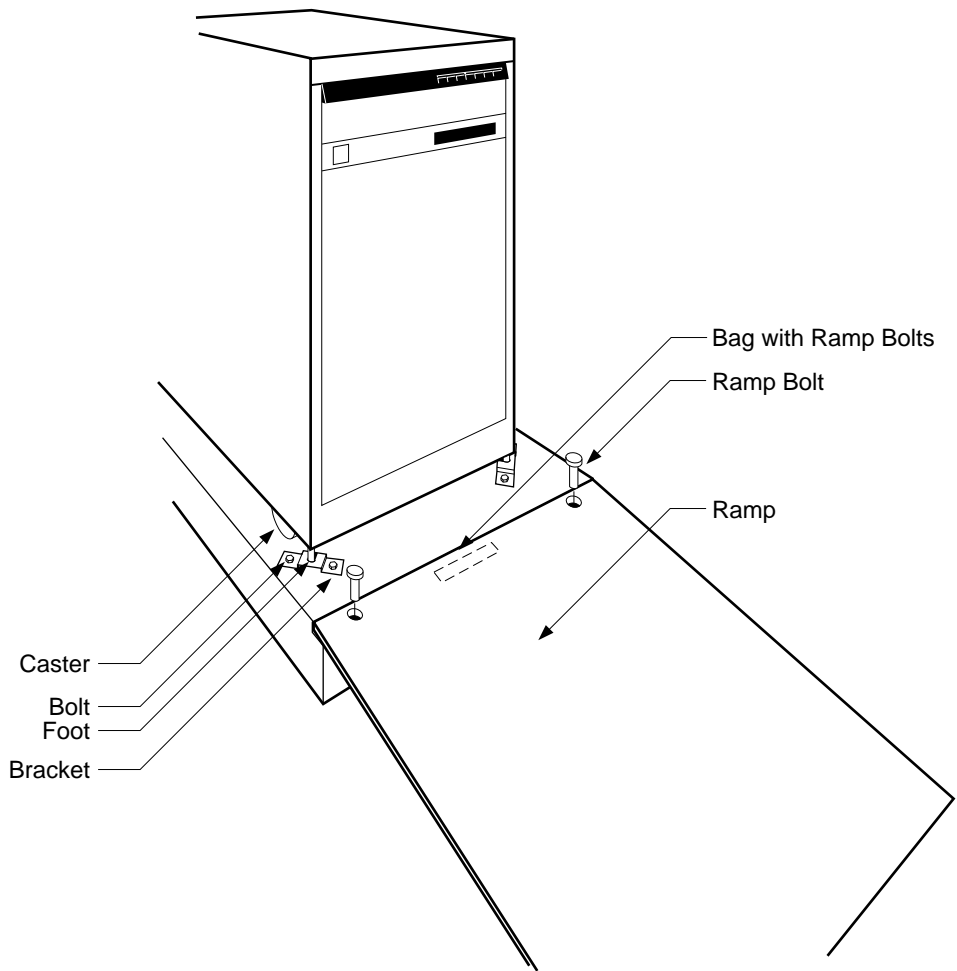
ZS-0516-MH

1. The Optical Library is shipped on a pallet covered by a cardboard box. Move the crate to its final destination before installing the Optical Library.

2. Use wire cutters or a knife to cut the shipping straps.

3. Lift the cardboard box off of the pallet. A plywood ramp is packed on top; remove it and set it aside. Remove the large foam blocks, and the plastic bag surrounding the Optical Library.

4. Locate the small plastic bag containing two large bolts. The bag is stapled to the top of the shipping pallet near the front of the Optical Library. Remove the bolts from the bag.

5. Place the plywood ramp on top of the shipping pallet so that the holes in the ramp line up with the holes in the pallet. Drop the bolts through the holes to secure the ramp to the pallet.

6. Using a 9/16-inch wrench, remove the eight bolts and four brackets that lock the Optical Library feet to the pallet.

7. Using a 1/2-inch wrench, raise the leveler feet so that the Optical Library is free to move on its casters.

_____ WARNING _____

Do not stand at the bottom of the ramp when you perform step 8.

_____

8. Carefully roll the unit down the ramp.

The Optical Library is now uncrated. If possible, save all the shipping materials in case you need to ship the unit to another site, or return it.

F.1.2 Remove the Shipping Bracket

For the small unit, lay the unit on its side and remove the shipping screw as shown in Figure F–2. For the medium unit, See Figure F–3 and follow these steps:

Figure F–2   Removing the Shipping Screw (Small Unit RW504/524-ZA)

Shipping screw location
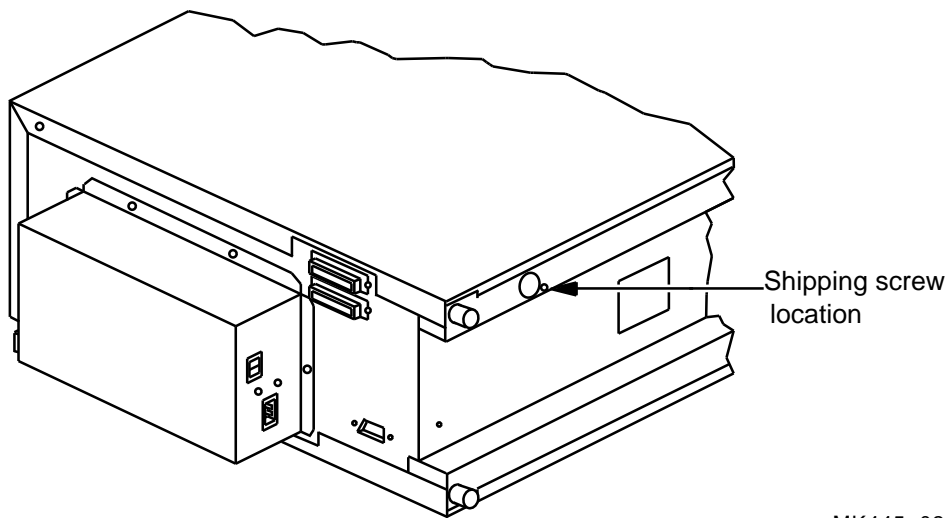
MK445−02

Figure F–3 Removing the Shipping Bracket (Deskside Unit RW510/530-ZC)
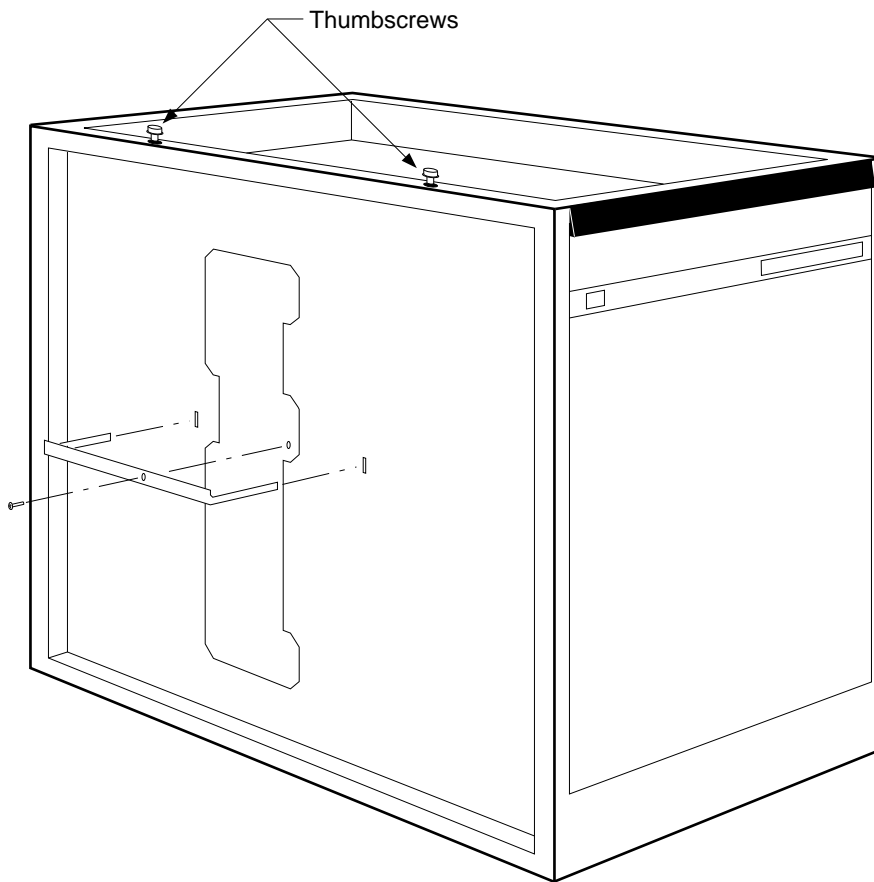
Thumbscrews

ZS-0517-MH

1. Remove the shipping bracket.

2. Remove the top cover of the Optical Library by pulling up on the back edge of the cover. Set the top cover aside. Remove the small foam pads from under the front edge.

3. Locate the two knurled thumbscrews on the top, left-edge of the Optical Library. Unscrew them using your fingers or a screwdriver. They are spring loaded and pop up when they are free.

4. Once the screws are loose, pull the left side panel out and off, and set it aside.

5. Locate the orange sheet metal bracket on the left side of the Optical
   Library. Using a TORX T15 screwdriver, remove the screw holding the
   bracket in place. Remove the bracket by pulling it straight out. Save the
   screw and bracket with the rest of the packing material. The bracket must
   be replaced if the machine needs to be shipped to a different location.

6. Replace the side panel by hooking the bottom edge in place first. Slide
   the top edge back under the thumbscrews. Tighten the thumbscrews by
   pressing down and turning. Do not replace the top cover just yet.

F.1.3 Attach SCSI Cable, SCSI Terminator, and Power Cord

The third step is to attach the SCSI cable, SCSI terminator, and the power
cord. See Figure F–5 and Figure F–4 and follow these steps:

**Figure F–4 Attaching the SCSI Cable and Power Cord to the Small Unit
(RW504/524-ZA)**
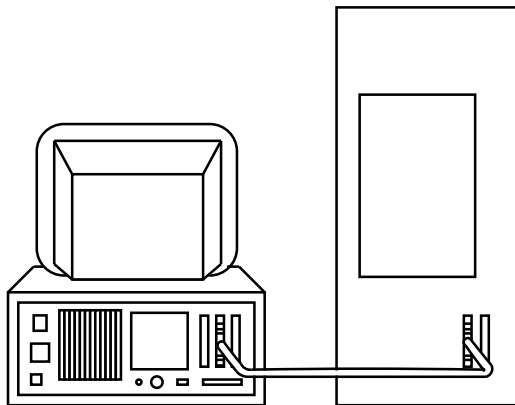
MK445−06

1. Remove the rear cover by pulling the top edge out away from the machine
   (Medium units only RW510/530/511-ZC).

2. Locate the SCSI cable and SCSI terminator shipped in the same small box
   containing the wrench and screwdriver.

**Figure F–5   Attaching the SCSI Cable and Power Cord to the Deskside Unit
(RW510/530-ZC)**
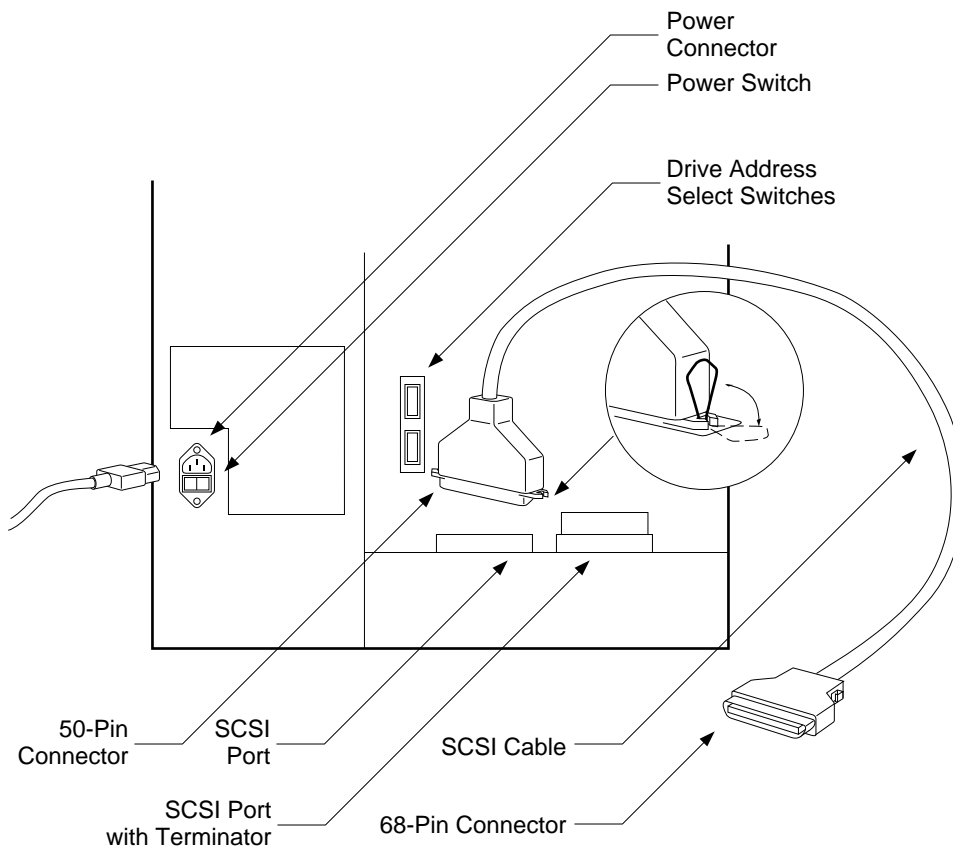
ZS-0518-MH

3. Locate the two SCSI ports on the rear of the machine.

    Plug the 50-pin Champ connector end of the SCSI cable into the port
    nearest the Drive Address Select Switches. The 50-pin Champ end is the
    one housed in plastic. (The other end is a metal connector with 50 pins and
    is labeled Honda.) The 50-pin Champ connector is keyed so that it only
    attaches one way. Lock the wire brackets into the grooves on the sides of
    the connector.

4. Plug the SCSI terminator into the second SCSI port, the port furthest from the Drive Address Select Switches.

Note

The terminator must remain plugged into the second SCSI port on the back of the Optical Library unless you are connecting two Optical Library systems to your host computer. See Section F.2 for instructions on connecting two Optical Library systems.

---

5. Leave the 50-pin Honda end of the SCSI cable disconnected for now. Instructions for connecting this end to your host computer are provided in your host system documentation.

6. Locate the power cord shipped in the country kit box. Locate the yellow safety sticker covering the power plug on the rear of the Optical Library. Pull the sticker away and plug in the power cord. Plug the other end of the power cord into an electrical outlet.

7. Before turning on the black power switch, verify that the white operation switch on the front of the Optical Library is off. The operation switch is off when it is in the out position. Turn on the black power switch on the back of the machine, located immediately under the power cord.

F.2 Connecting More Than One Optical Library

If the back panel of your host computer is configured with more than one SCSI port, you can attach an Optical Library to each port. See Section F.2.1 for directions.

You can also connect two Optical Library units to a single SCSI port on your host computer by daisy-chaining the units together; that is, by connecting the first Optical Library to the host computer, and then connecting the second Optical Library to the first Optical Library. See Section F.2.2 for directions.

─────────────── **Note** ───────────────

Only two Optical Library units may be daisy-chained together and connected to a single SCSI port. Each SCSI port is limited to a total of seven SCSI addresses, therefore, the large unit (RW514/516/534/536) is not supported for daisy chaining because each unit has 5 IDs.

───

If two Optical Library units are daisy-chained to one SCSI port on the host computer, you must properly terminate the SCSI chain by installing the SCSI terminator in the second SCSI port of the second Optical Library. See Section F.2.2 for directions. You must also set a new SCSI address for the autochanger controller and the two optical disk drives of the second Optical Library unit. See Section F.2.3 for directions.

F.2.1 Connecting Two Optical Library Units to Two SCSI Ports

To connect two Optical Library units to separate SCSI ports on your host computer, first check the back panel of your host computer to see that two SCSI ports are available. SCSI ports are marked by the PMAZ label and the SCSI icon:
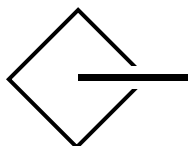
ZS-0557-MH

If there are two SCSI ports available, follow the steps in Section F.1.1 to uncrate and prepare each Optical Library for connection to the host computer.

Change SCSI IDs for drive and controller address if necessary before connecting to the host computer. Refer to Section F.2.3.

Plug the 50-pin Honda connector of the SCSI cable from the first Optical Library unit into the lowest-numbered SCSI port on the host computer back panel.

Then, plug the 50-pin Honda connector of the SCSI cable from the second Optical Library unit into the next-lowest-numbered SCSI port on the host computer back panel.

For example, if option slots 0 and 2 are labeled PMAZ and have the SCSI icon, plug the SCSI cable from the first Optical Library unit into the 50-hole connector in option slot 0, and plug the second Optical Library unit into option slot 2.

F.2.2 Connecting Two Optical Library Units to One SCSI Port

To connect two Optical Library units to one SCSI port on your host computer, follow the steps in Section F.1.1 to uncrate and prepare each Optical Library for connection to the host computer. Then, see Figure F–7 and Figure F–6 and follow these steps:

Figure F–6 Connecting Two Small Optical Library Units (RW504/524-ZA) to One SCSI Port
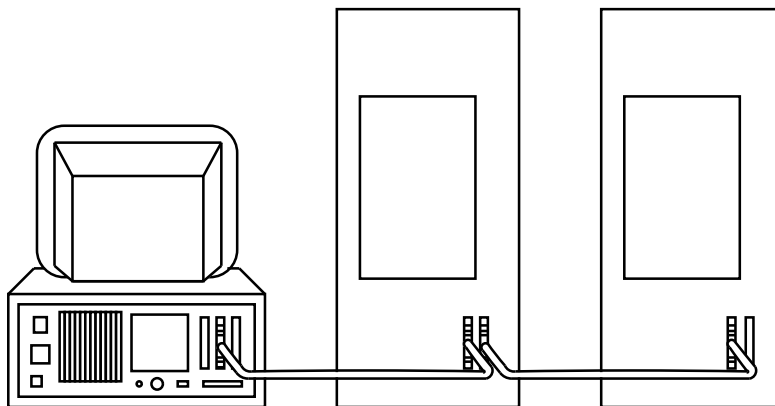
MK445–07

**Figure F–7 Connecting Two Deskside Optical Library Units (RW510/530-ZC)
to One SCSI Port**
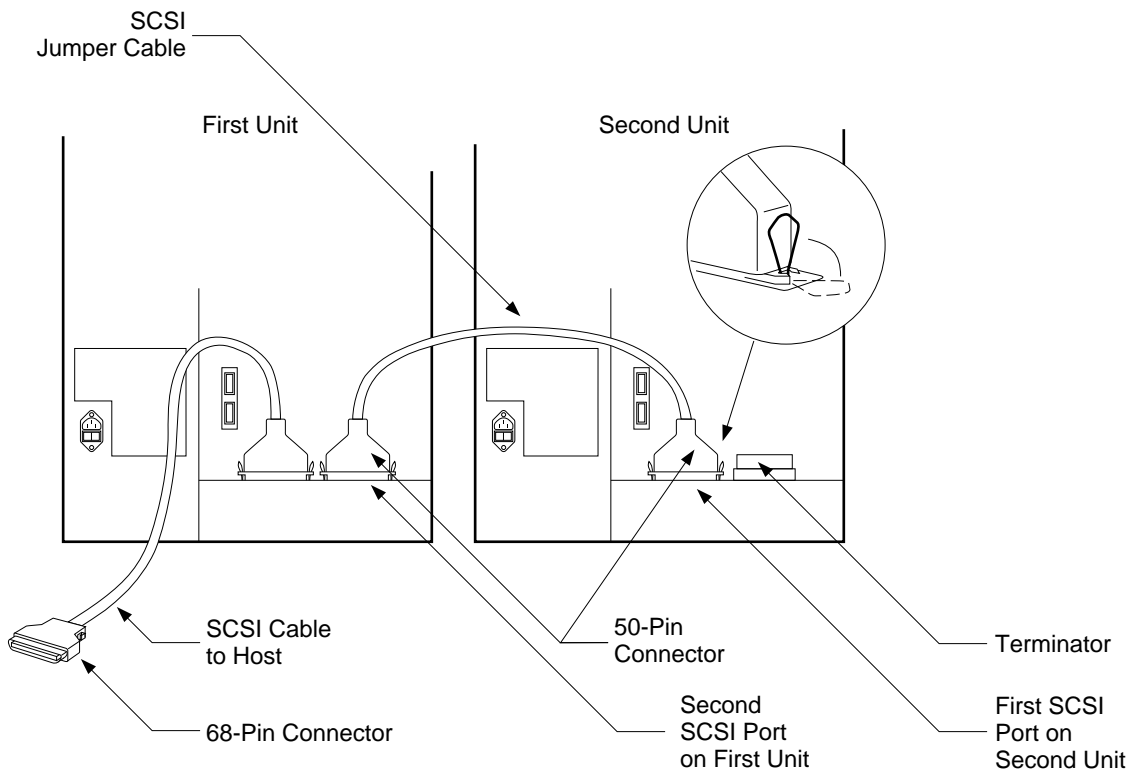
ZS-0560-MH

1. If you have already connected one Optical Library to the host system, as
    described in Step 4 in Section F.1.1, then go to the next list item.

    If you have not already connected one Optical Library to the host system,
    then locate the lowest-numbered SCSI port on the host computer back
    panel.

    Each SCSI port is labeled with the option identifier PMAZ and the SCSI
    icon:
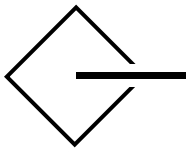
ZS-0557-MH

Plug the 50-pin Honda connector of the SCSI cable from the first Optical Library unit into the lowest-numbered SCSI port on the host computer.

2. Remove the terminator from the second SCSI port on the back panel of the first Optical Library if a terminator is in place.

   Plug the terminator into the second SCSI port of the second Optical Library. The second SCSI port is the port furthest from the Drive Address Select Switches.

3. Locate the 50-pin Champ to 50-pin Champ SCSI jumper cable shipped in the box marked **OPEN FIRST**.

4. Plug one end of the SCSI jumper cable into the second SCSI port on the first Optical Library (the port from which you removed the terminator). The connector is keyed so that it only attaches one way. Lock the wire brackets into the grooves on the sides of the connector.

5. Plug the other end of the SCSI jumper cable into the first SCSI port on the back of the second Optical Library. The first SCSI port is the port nearest the Drive Address Select Switches. Lock the wire brackets into the grooves on the sides of the connector. If you have not already done so, place the terminator on the second port of the second Optical Library.

Then, complete the installation by following the directions in Section F.2.3 to change the SCSI addresses of the second Optical Library.

If the first Optical Library is not already connected to the host system, connect the first Optical Library unit to the host by following the instructions in your host system documentation, after SCSI IDs are changed.

F.2.3 Resetting Controller and Drive SCSI Addresses

If two Optical Library units are daisy-chained together such that the first Optical Library unit is connected to one SCSI port on the host computer and the second unit is connected to the SCSI port on the first Optical Library, the SCSI addresses of the second unit's controller and disk drives must be reset so that they are different from the controller and drive addresses of the first unit. Follow the instructions in Section F.2.3.1 to reset the controller and optical disk drive SCSI addresses.

F.2.3.1 Changing the Optical Library Controller Address

The autochanger controller default SCSI address is 3 for both the medium and small units. Leave the SCSI address of the autochanger controller in the first Optical Library unit set to the current ID number, and change the address of the controller in the second unit to an unused ID number by following the steps below. (See Section 4.8 for general instructions on setting the controller address.)

1. To avoid bus conflicts, before changing defaults, first verify the IDs of all SCSI devices connected to the host system and the autochanger and drive IDs of the first Optical Library.

2. Shut down the host system.

3. Ensure that the Optical Library is switched on. For the small unit, go to step 5.

4. With READY displayed, press OPTION. TEST * displays.

5. Press NEXT until SCSI IDs * displays.

6. Press ENTER. AC ID # displays where # may be the default number indicated in Table 4-2 or the current address.

    This is the Autochanger controller address. If you want to change this address press ENTER, otherwise continue to press NEXT until the drive number whose address you want to change is displayed, (DRV ID 1, DRV ID 2, etc)

7. Press PREV or NEXT until the desired address number displays.

8. Press ENTER. The message SET # displays. Address is now set.

9. If you want to change additional drive addresses, Press NEXT until that drive number is displayed and repeat steps 6 through 8 to set the new address.

10. Press NEXT until UPDATE or CONFLICT displays.

    If CONFLICT displays, two or more drives and/or the controller have been set to the same address and must be reset.

    If UPDATE displays and you are satisfied with the address you have selected, press ENTER.

11. Record the new address settings for future reference.

─────────────────────── **CAUTION** ───────────────────────

Do not press the Optical Library operation switch (located on the front panel) or the power switch (located on the rear panel) until you are sure that the SCSI bus is inactive. Pressing either button when the bus is active can cause data loss and indeterminate bus states.

Check the host system reference manuals for information on checking the status of the SCSI bus.

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12. Push the operation switch (located on the Optical Library front panel) off and then back on so the new address setting is recognized by the host system.

F.3 Uncrating and Installing a Large (RW514/516/534/536) Optical Library

F.3.1 Uncrate the Optical Library

---------- CAUTION ----------

Two people are required to move the Optical Library Unit.

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1. Remove packaging Materials
2. Roll the unit into position.
3. Move the shipping bracket into "operation mode" position to allow free movement of the picker as follows: (Refer to Figure F–8 for clarification of these steps.)

Figure F–8   Moving the Shipping Bracket into Operation Mode (Large Unit RW514/516/534/536-ZF)

ZS-0665-MH

a. Unlock and open the rear cabinet door.

b. Find the picker and the bright orange shipping bracket that secures it, located halfway up the rail on the right side of the Autochanger.

c. Remove the screw that secures the shipping bracket using a Torx T-15 driver.

d. Remove the shipping bracket from the picker by first pushing the bracket back to free the end of the picker farthest away from you. Swing the other end of the bracket to the right to free the end of the picker closest to you.

_____ **Note** _____

Once released, the picker will glide slowly downward inside the
Autochanger until the fingers are extended to a point where they catch
on the magazines.

_____

e. Push the shipping bracket as far as possible into the slot in the rail
    farthest away from you.

f. Slide the bracket to the right and then pull it toward you so that the
    finger on the bracket protrudes out of the hole just to the left of the
    slot. (See Figure F–8.)

g. Insert the peg on the other end of the bracket into the center hole in
    the rail closest to you.

h. Insert the screw (removed earlier) into the right-most hole in the rail
    and tighten.

The picker is now secured into the right-most position. This allows the
picker to move freely along the rails and carriage.

4. Shut and lock the rear cabinet door.

F.3.2 Attaching the SCSI Cable, SCSI Terminator, and Power Cord

To attach the SCSI cable, SCSI terminator, and the power cord. See Figure F–9
and follow these steps:

1. Locate the SCSI cable and SCSI terminator.

2. Locate the two SCSI ports on the rear of the machine.

    Plug the 50-pin Champ connector end of the SCSI cable into either port.
    The 50-pin Champ end is the one housed in plastic. (The other end is a
    metal connector with 50 pins and is labeled Honda.) The 50-pin Champ
    connector is keyed so that it only attaches one way. Lock the wire brackets
    into the grooves on the sides of the connector.

3. Plug the SCSI terminator into the other SCSI port.

_____ **Note** _____

The terminator must remain plugged into the second SCSI port on the
back of the Optical Library.

_____

Figure F–9   Attaching the SCSI Cable and Power Cord (Large Unit RW514 /516/534/536-ZF)

Power
Connector

SCSI
Connectors

68-Pin Connector
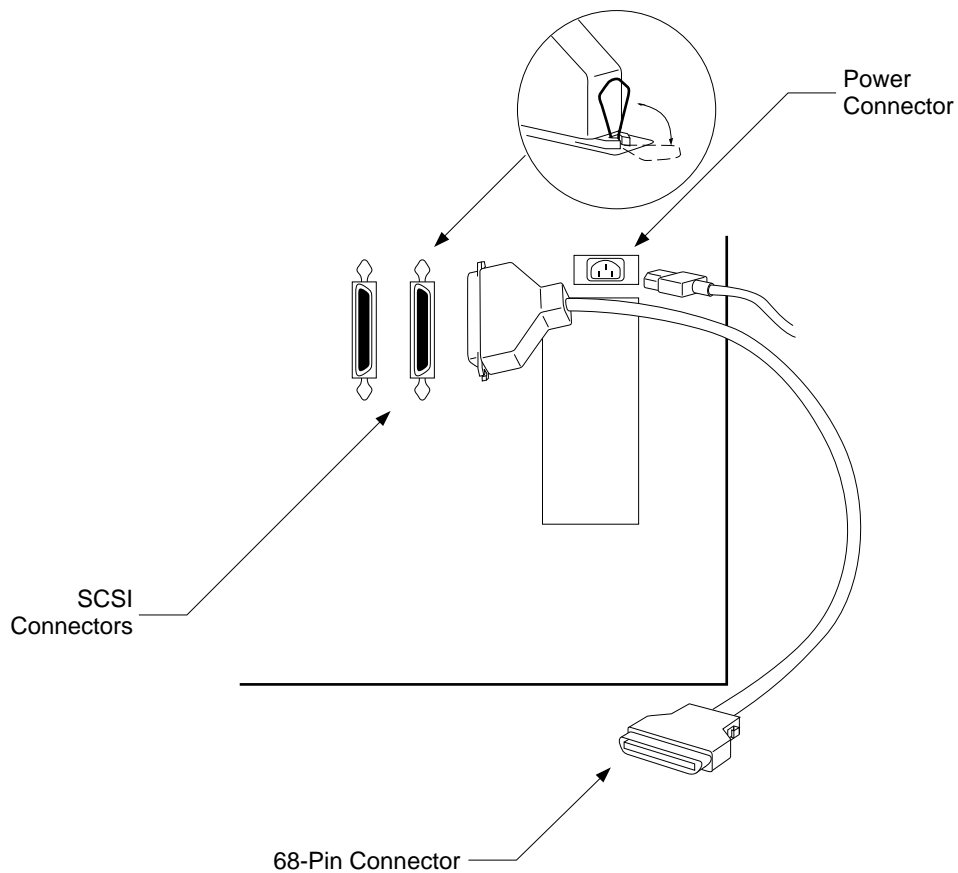
ZS-0668-MH

4. Leave the 50-pin Honda end of the SCSI cable disconnected for now. Instructions for connecting this end to your host computer may be found in the host system documentation.

5. Locate the power cord. Locate the yellow safety sticker covering the power plug on the rear of the Optical Library. Pull the sticker away and plug in the power cord.

6. Remove the clamp from the rear panel using a Torx T-10 driver. Attach the clamp to the power cord approximately 4 to 5 inches from the end of the power cord plugged into the Optical Library. Reattach the clamp.

7. Plug the other end of the power cord into an electrical outlet.

F.3.3 Enable Operation

To enable operation of the Optical Library. Follow these steps:

1. Close the rear cover of the Optical Library.

2. Position the Optical Library.

3. Press the white operation switch on the front of the Optical Library to enable operation of the Optical Library system.

4. The message TESTING is displayed, and the Drive 1, Drive 2, Drive 3 and Drive 4 lights are illuminated briefly, indicating the start of self-test. After about a minute, all the lights on the front panel are illuminated briefly for a lamp check, the current Rev # is displayed, and finally the READY message is displayed, indicating successful completion of the self-test. If the self-test fails, call your service representative.

Your Optical Library is now installed.

───────────────── **Note** ─────────────────

If you want to move the Optical Library, see Chapter 3.

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Glossary

Autochanger

Synonymous with the Optical Library.

Autochanger Controller

Controls the sending and receiving of SCSI commands and controls the picker.

Block Device File

A type of device file that buffers the I/O. Reads and writes to block devices are done in "block" mode (data is transferred one block at a time).

Carriage Move

Used to correctly position the picker in front of a storage slot and to position the picker for translates.

Cartridge

See *Optical Disk*.

Continuous Composite (C*C)

A format that describes the physical, optical, and data format characteristics of a disk that complies with ISO DP 10089-2A.

Disk

See *Optical Disk*.

Element

A SCSI term for any one of the autochanger components—drives, mailslot, storage slots, or picker.

Error Detection and Correction

The process of identification and correction of data errors that occur in the reading and writing processes. Redundant information on the disk is used to detect errors. Error detection codes along with Error correction codes are used to reconstruct the data after an error occurs.

Flip

A picker rotation used to switch the disk from one side to the other.

Front Panel

Includes a power switch, a control panel used to manage and display autochanger functions, and a place to insert and remove disks. (All front panel features are fully described in Chapter 4.)

Magneto-Optical (MO)

A type of optical technology that uses a laser to read from and write to a magnetic layer on an MO disk. To write, a spot on the magnetic layer is heated by a laser to a point where it can be magnetically altered by the write magnetic head. To read, a light from the laser is reflected from the spot. The magnetic alteration causes the light to be polarized in one direction (interpreted as a "1") or the opposite direction (interpreted as a "0").

Magazine

Magazines contain 8 optical disk storage slots. The Optical Library has 18 magazines and therefore 144 optical disk storage slots.

Mailslot

Where disks are inserted and removed from the Optical Library.

Multifunction Drive

An optical disk drive that supports both rewritable and write-once optical disks. The drive detects the disk type by reading a factory-stamped code on the disk, and automatically determines whether to operate in rewritable or write-once mode.

Operation Switch

The white power switch on the front panel of the Optical Library that enables operation of the Optical Library. Contrast with the Power Switch (see *Power Switch*.)

Optical Disks

Synonymous with the 5.25-inch magneto-optical, or rewritable optical, disks.

Picker

The part of the Optical Library that rotates, flips, and transports disks to and from storage slots, drives, and the mailslot.

Platter

See *Optical Disk*.

Power Switch

The black power switch on the back of the Optical Library that turns on the power supply; contrast with the Operation Switch (see *Operation Switch*.)

Rails and Carriage

The parts that support the picker for movement within the autochanger.

Read/Write Head

The part of the disk drive assembly that uses a laser and a magnet to read and write data on the MO disk. To write, a spot on the magnetic layer of the disk is heated by the laser to a point where it can be altered by the magnet. To read, the light from the laser (at low power) is reflected from the spot. The magnetic alteration causes the light to be polarized in one direction (interpreted as a "1") or the opposite direction (interpreted as a "0").

Rear Panel

The rear panel of the autochanger provides either single-ended or differential SCSI connections, and power connection.

Rewritable Optical

An optical disk technology in which data can be repeatedly written using magneto-optical reading and writing technology.

Rewritable Optical Disk Drives

An Optical Disk Drive that supports only rewritable optical disks where data can be repeatedly written and erased.

SCSI

An acronym for the Small Computer Systems Interface.

Storage Slots

Hold cartridges when they are not in the drives or being passed out through the mailslot.

Swap

Occurs when a picker replaces one disk in the drive with another, returning the first to its storage slot.

Terminator

A resistor array device used for terminating a SCSI bus. A SCSI bus must be terminated at its two physical ends. A peripheral device uses a terminator only if it is at the end of the bus.

Translate

A picker movement from one side of the carriage to another.

Write-Once

An additional operating mode available with multifunction drives. When a write-once disk is inserted, the drive writes data, but does not write over data that has been previously written. This feature is useful for applications that need permanent data security and audit trails.

Write-Protect

Prevents data from being written to a disk. A write-protect tab is located on both sides of the optical disk cartridge to enable write-protection on one or both surfaces of the disk.

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