Scalar AIT 220 Library

Installation and Operation

adic

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Revision History

Revision	Date	Description
A	December 1998	Initial release for Scalar AIT 220
B	June 1999	AIT-1, AIT-2 tape drives

Revisions to This Manual

This revision of *Scalar AIT 220 Library Installation and Operation* (B) contains the following changes and enhancements:

- Added information about Scalar AIT 220's support for AIT-1 & AIT-2 Tape Drives.

FCC Notice

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

Shielded cables are required for this device to comply with FCC Rules. Use shielded cables when connecting this device to others.

Industry Canadian Notice per ICES-003

English This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

French Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

CISPR 22 Compliance Notice

This equipment complies with the CISPR 22B standard for EMI radiation.

Product Warranty Caution

The ADIC Scalar AIT 220 Library is warranted to be free from defects in materials, parts, and workmanship and will conform to the current product specification upon delivery. For the specific details of your warranty, refer to your sales contract or contact the company from which the library was purchased.

The warranty for the library shall not apply to failures of any unit when:

- The library is repaired by anyone other than the Manufacturer's personnel or approved agent.
- The library is physically abused or is used in a manner that is inconsistent with the operating instructions or product specification defined by the Manufacturer.
- The library fails because of accident, misuse, abuse, neglect, mishandling, misapplication, alteration, faulty installation, modification, or service by anyone other than the factory service center or its approved agent.
- The library is repaired by anyone, including an approved agent, in a manner that is contrary to the maintenance or installation instructions supplied by the Manufacturer.
- The Manufacturer's serial number tag is removed.
- The library is damaged because of improper packaging on return.

CAUTION

Returning the library in unauthorized packaging may damage the unit and void the warranty.

If problems with the library occur, contact your maintenance organization; do not void the product warranty by allowing untrained or unauthorized personnel to attempt repairs.

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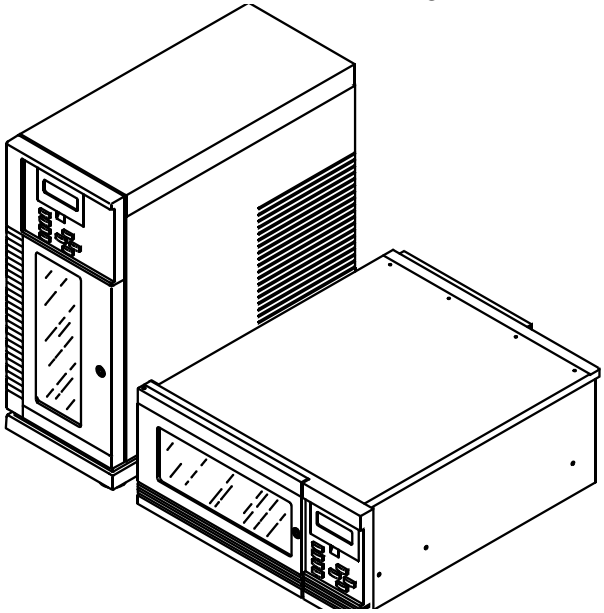
Welcome

Congratulations on selecting the ADIC Scalar AIT 220 Library. Your new library provides unattended data storage, archiving, backup, and retrieval for mid-range and high-end workstations, servers, and networks. The robotic cartridge handling mechanism (CHM) automatically moves cartridges between tape drives and storage slots, while the tape drives read and write data.

The library is available in standalone (vertical) and rack-mount (horizontal) models, as shown in the figure.



About the Scalar AIT 220

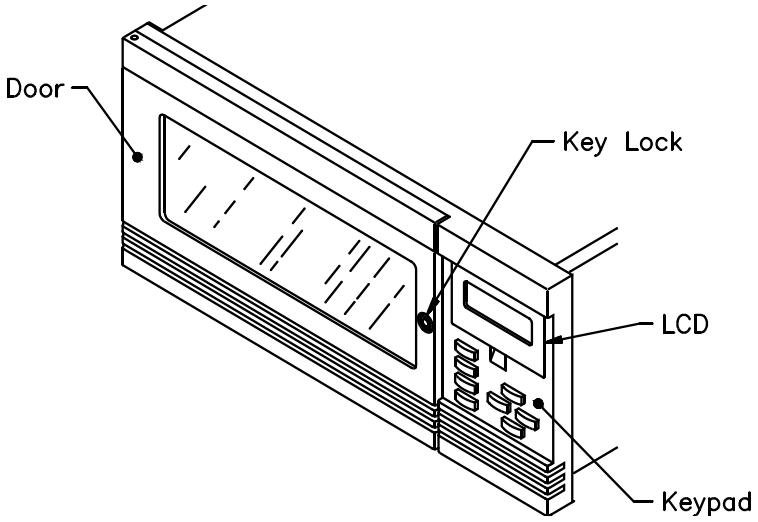
The Scalar AIT 220 includes two data cartridge magazines and either one or two 3.5" form factor Sony® AIT™ tape drives. It can operate as three SCSI devices on up to three SCSI buses. When the library is is equipped with AIT-1 drives, the library is a differential SCSI-2 device and the drives are differential Fast/Wide SCSI-2 devices. When equipped with AIT-2 drives, the library can be configured as a high voltage differential (HVD) Wide Ultra SCSI device, or as a low voltage differential (LVD) Wide Ultra SCSI device.

When operating with two AIT-2 tape drives and assuming an average data compression ratio of 2:1, the Scalar AIT 220 can store up to 2.0 terabytes of information on 20 Advanced-Metal Evaporative (AME™) data cartridges (SDX2-50C).

Employing the 3.5" form factor AIT-2 drive, the Scalar AIT 220 provides a maximum sustained data transfer rate of over 720 MB per minute (assuming 2:1 data compression). The Wide Ultra SCSI drive does not require periodic head cleaning as often as many conventioanl tape drives. The drive constantly moinitors head output to check for possible contamination. If present, the drive will invoke a built-in Active Head Cleaner. Under extreme operating conditions, a cleaning cartridge may be required and the drive indicates this by displaying a Cleaning Request message on its front panel Status LED.

The Sony SDX1-25C, SDX1-35C, SDX2-36C, and SDX2-50C data cartridges support the Advanced Intelligent Tape format. The cartridges use a new recording format, Adaptive Lossless Data Compression (ALDC), Memory In Cassette (MIC™) technology capabilities and use Sony's AME media, which incorporates dual cobalt magnetic layers, the absence of binder material to prevent tape head contamination and a super-durable "diamond-like carbon" protective coating for extreme durability.

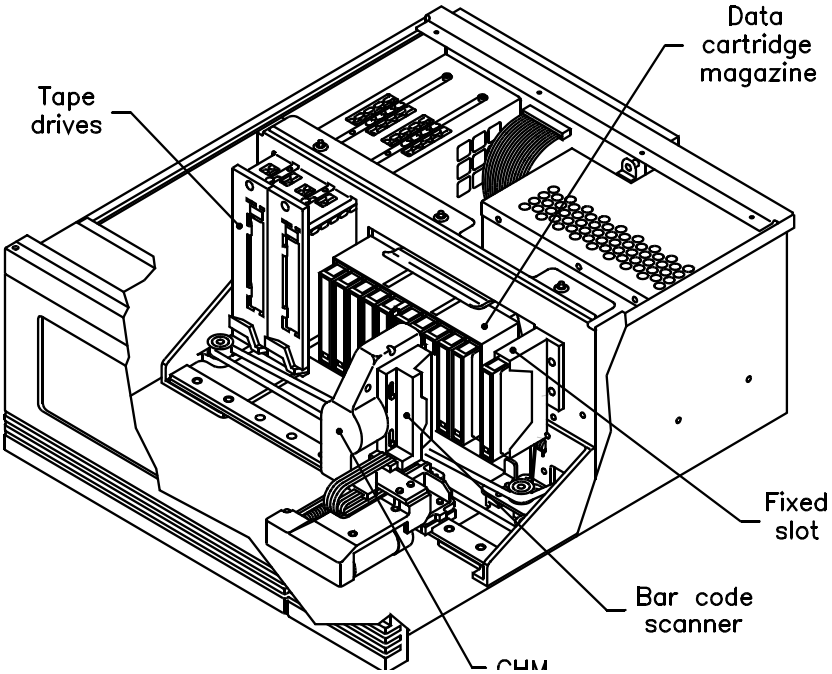
Front panel components



- **Door and key lock.** The front door features a key lock that enables you to lock the door for data security.

- **LCD and keypad (operator panel).** The LCD (liquid crystal display) and keypad allow you to view the operational status of the library, access a menu of operations, and view status messages. If necessary, you can tilt the LCD for easier viewing.

Internal components

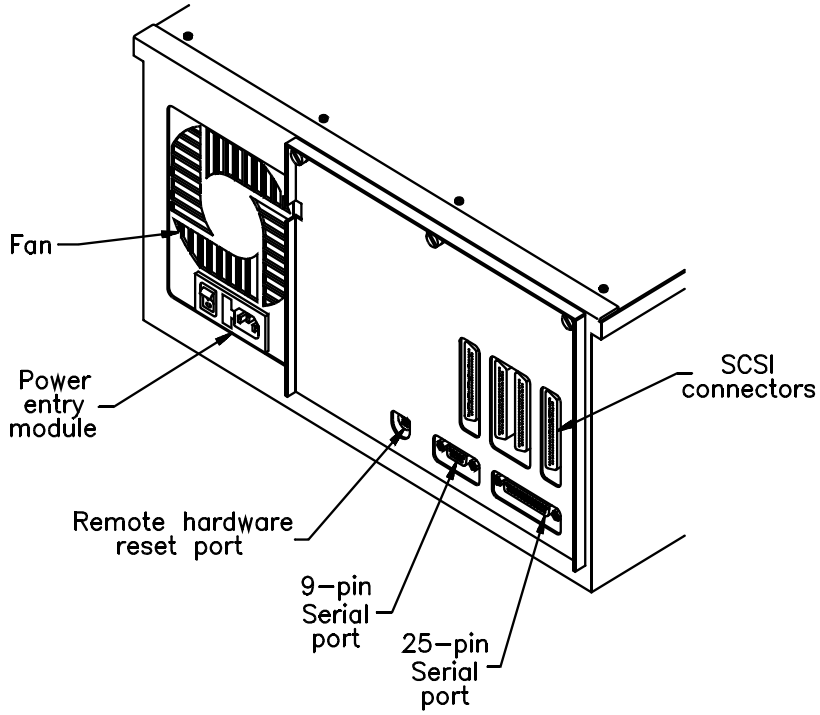


- **Tape drives.** The library can include one or two AIT-1 or AIT-2 tape drives, which are housed in drive carriers.

- **Data cartridge magazine(s) and fixed slot.** The Scalar AIT 220 includes two removable 10-tape magazines on a rotor. The fixed slot allows you to store an AIT cleaning cartridge or an additional AIT data cartridge.

- **CHM (cartridge handling mechanism)**. The CHM is the robotic assembly that moves cartridges between the storage locations and the tape drives. The CHM also includes a bar code scanner, which reads bar code labels affixed to the cartridges.

Back panel components



- **Fan and power entry module.** The fan reduces the library's operating temperature. The power entry module includes the AC power connector, power switch, and fuse drawer.
- **Remote hardware reset port.** This port allows you to connect a remote reset cable for remote resets.
- **9-pin and 25-pin serial ports.** Two serial ports allow you to connect a serial cable and terminal for diagnostics.
- **SCSI connectors.** The six SCSI connectors (four shown in illustration) allow you to connect the library to the SCSI bus.

About this manual

Use this manual to install, configure, operate, maintain, and diagnose problems with the Scalar AIT 220 and its enclosed AIT tape drives. It includes the following chapters:

- Chapter 1 explains how to install and set up the library.
- Chapter 2 describes how to configure the library.
- Chapter 3 describes how to check your setup.
- Chapter 4 describes basic library operations.
- Chapter 5 describes basic tape drive operations.
- Chapter 6 describes basic maintenance procedures.
- Chapter 7 describes how to move, pack, and ship the library.
- Appendix H provides basic library specifications.
- Appendix I provides SCSI configuration information.
- Appendix J provides LCD error codes.
- Appendix K shows the element indexes for library locations.

A quick reference card is provided at the end of the manual. Remove this card and keep it near your library. Use the *Quick Reference* as a reference for using the operator panel and interpreting error codes.

Conventions used in this manual

This manual uses the following conventions:

Enter — Boxed text indicates keys on the library's operator panel keyboard.

Note: Notes provide hints or suggestions about the topic or procedure being discussed.

➤ **Important** **Information next to the word "Important" helps you complete a procedure or avoid extra steps.**

CAUTION

Boxed text under the word "CAUTION" provides information you must know to avoid damaging the library or tape drives or losing data.

WARNING!

Boxed text under the heading "WARNING!" provides information you must know to avoid personal injury.

Related publications

For information about these libraries, the tape drives, and the standards used by these libraries, refer to the following publications available from ADIC.

- *Scalar AIT 220 Library SCSI Reference*, 62-0163-01

Contacting ADIC

For technical support:	
ADIC Technical Assistance Center (ATAC)	1-800-827-3822 (US)
	1-303-790-2083 (International)
e-mail	support@adic.com
World Wide Web	http://www.adic.com
Bulletin Board (BBS)	1-425-883-3211 Connect at up to 28,800 baud with 8 data bits, 1 stop bit, and no parity. Turn on hardware (RTS/CTS) flow control.
To order supplies and accessories:	
ADIC Sales	1-800-336-1233
	1-425-881-8004
	1-425-881-2296 (fax)
To return equipment for service:	
ADIC Technical Assistance Center (ATAC)	1-800-827-3822 (US)
	1-303-790-2083 (International)
e-mail	support@adic.com

Notes

1 Installation and Setup

This chapter describes how to install and set up your library.

Preparing for installation

This section provides step-by-step instructions for preparing the library. You can use the table below as a checklist.

✔	Step	Description
	1	Unpack the library.
	2	Obtain accessories and equipment.
	3	Prepare the host computer.
	4	Prepare the library for installation.

Step 1 – Unpack the library

Complete the unpacking steps printed on the box. Save all the original packing materials in case you need to ship or move the library later.

Step 2 – Obtain accessories and equipment

Make certain you have all the accessories and equipment for library operation, as indicated in the table below. Many of these items are included in the library accessories box, shipped in a separate box at the top of the carton.

Required accessories and equipment	
Power cord	Included with the library. (Page 135 provides power cord specifications for other voltages and international use.)
Two keys for front door	Included with the library.
Jumper(s) for connecting the library and tape drives to a single SCSI bus.	Included with the library if two tape drives are installed.
Eight 10-32 × 0.5 truss head screws and clip nuts	Included with rack-mount libraries.
Two slide rails, attached to the sides of the library	
SCSI cables	If these items are not included with the library, contact ADIC to purchase them. If you want to use your own, see Appendix A for specifications.
SCSI bus terminator(s) (required if the library or one of the tape drives is the last device on the bus)	
AIT data cartridges and cleaning cartridges	If cartridges are not included with the library, contact ADIC to purchase them. If you want to use your own, refer to page 49 for appropriate data cartridges and to page 59 for appropriate cleaning cartridges.

Step 3 – Prepare the host computer

Make certain the SCSI host bus adapter card installed in the computer and the application software are compatible with the Scalar AIT 220. You can obtain software compatibility information about ADIC products from ADIC's internet site (http://www.adic.com).

Note: If your application only supports a single AIT tape drive, you can run the library in one of the sequential modes (see page 46 and page 153).

You can install the software application on the host computer before or after library installation. However, if you install the software first, you may need to reconfigure it for use with the library.

Step 4 – Prepare the library for installation

Prepare the library as follows:

- Ensure that the work area is free from conditions that could cause electrostatic discharge (ESD). Discharge static electricity from your body by touching a known grounded surface, such as your computer's metal chassis.

- Locate an appropriate area for the library. The library must have a level surface near a readily accessible outlet. (If you have a standalone library, adjust the feet to make it level.) In addition, there must be approximately six inches (15 cm) of open area behind the library for adequate air flow.

Installing the library hardware

This section provides step-by-step instructions for installing the library hardware. You can use the table below as a checklist.

✔	Step	Description
	1	Install the library into a rack, if you have a rack-mount model.
	2	Unlock and open the front door.
	3	Remove the packing foam.
	4	Prepare and install cartridges.
	5	Close and lock the door.
	6	Connect the library to the SCSI bus.
	7	Connect the power cord.
	8	Power on the library.

WARNING!

Before performing any installation or maintenance procedures, be sure that the library power switch is in the off position and that the power cord is disconnected from the library and the outlet.

Step 1 – Install the library into a rack

If you have a rack-mount library, follow these instructions to install the library into a standard EIA 19-inch rack.

> **WARNING!**
>
> Depending on the number of drives installed, the rack-mount library weighs 50 – 70 pounds (27.2 – 31.8 kg); the standalone library weighs 70 – 90 pounds (31.8 – 40.9 kg). At least 2 people are needed to move or lift the library. Most of the weight is toward the back of the library.
>
> Make sure you install the rack-mount library in the lowest possible location in the rack. For best results, use a rack with extension support legs.

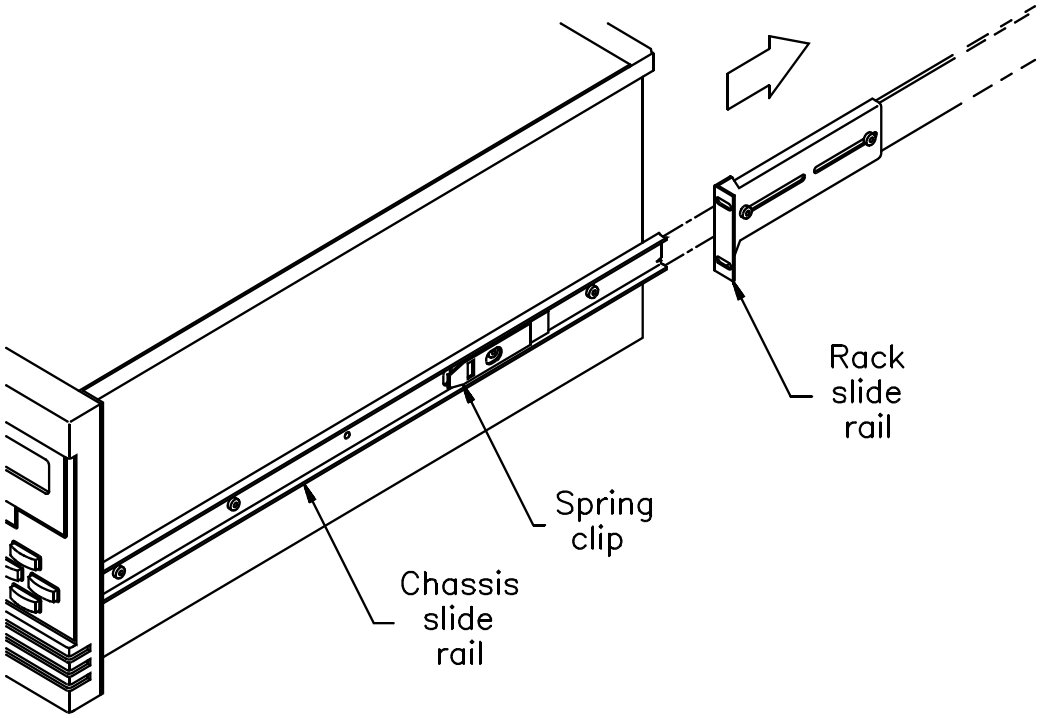
For this procedure, you will need the following:

- Standard EIA 19-inch rack
- TORX screwdriver with T-25 bit
- T-15 bit, if you need to extend the rails
- Eight 10-32 × 0.5 truss head screws (provided in the accessory box)
- Eight clip nuts (provided in the accessory box), necessary if the rack does not have threaded holes

To install the library into a rack:

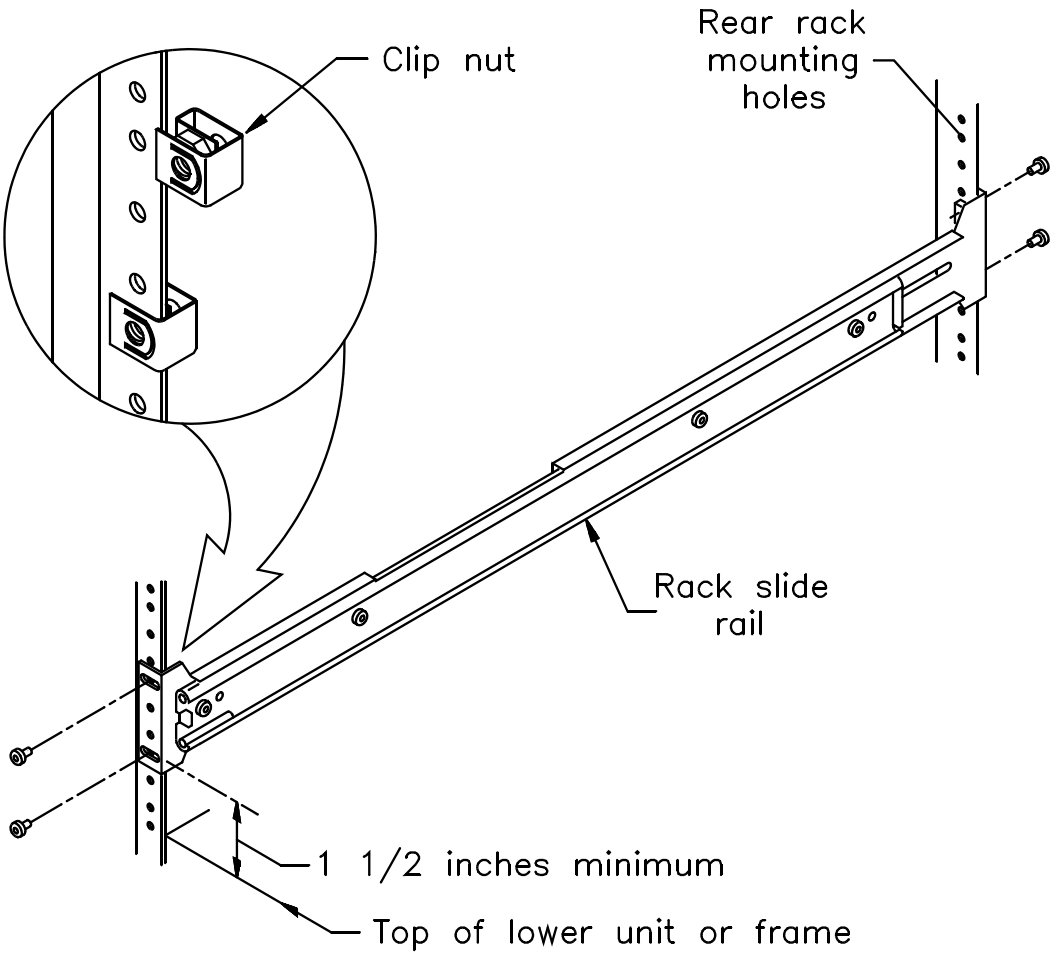
1. Locate the slide rail assembly attached to each side of the library chassis, as shown in the figure.

2. Slide the rack-slide rail toward the rear of the library, as shown in the figure. Press the spring clips to remove the rack-slide rail from the chassis-slide rail.

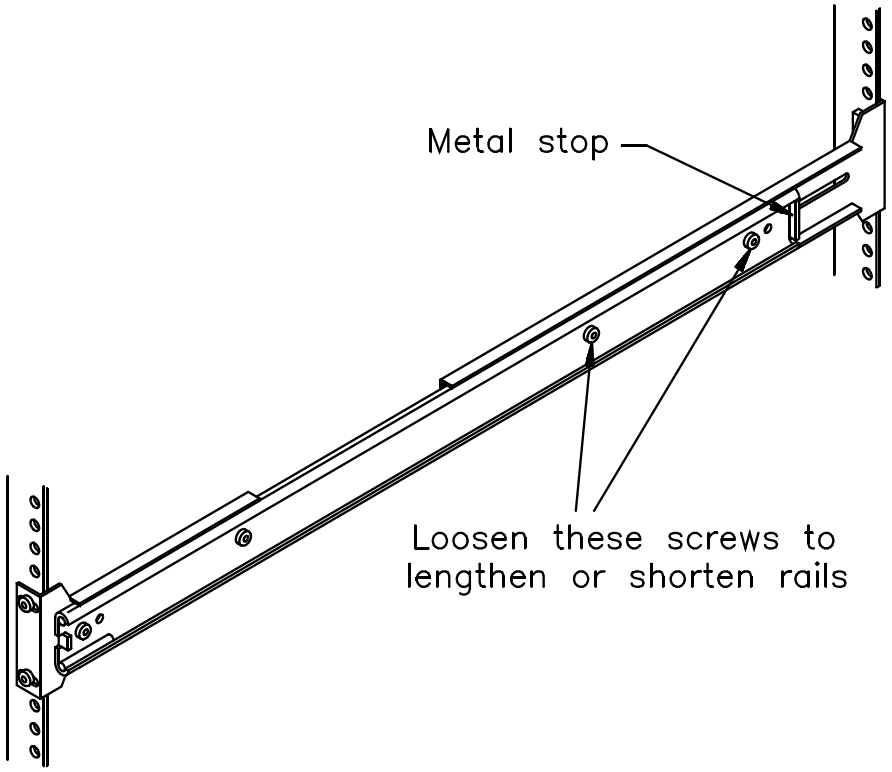


3. Locate the mounting holes on the rack where you want to install the library. Allow 1½ inches (3.8 cm) minimum clearance below the bottom mounting hole.

Note: If the rack does not have threaded holes, attach the clip nuts provided with the library over the mounting holes, as shown in the figure.



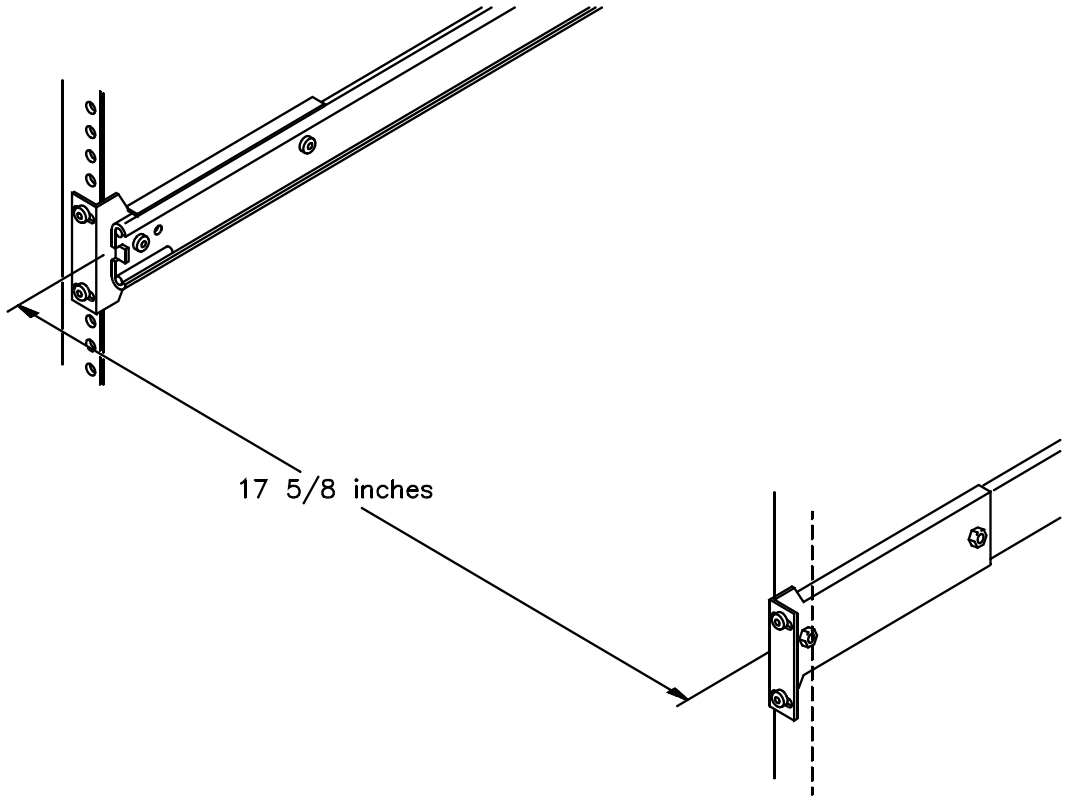
4. Orient the rack-slide rails so that the metal stop is towards the back of the cabinet, as shown in the figure. If the rails are not long enough to reach the back of the cabinet, use a T-15 TORX driver to loosen the nuts on the rails. Extend the rails to the desired length and tighten the nuts.



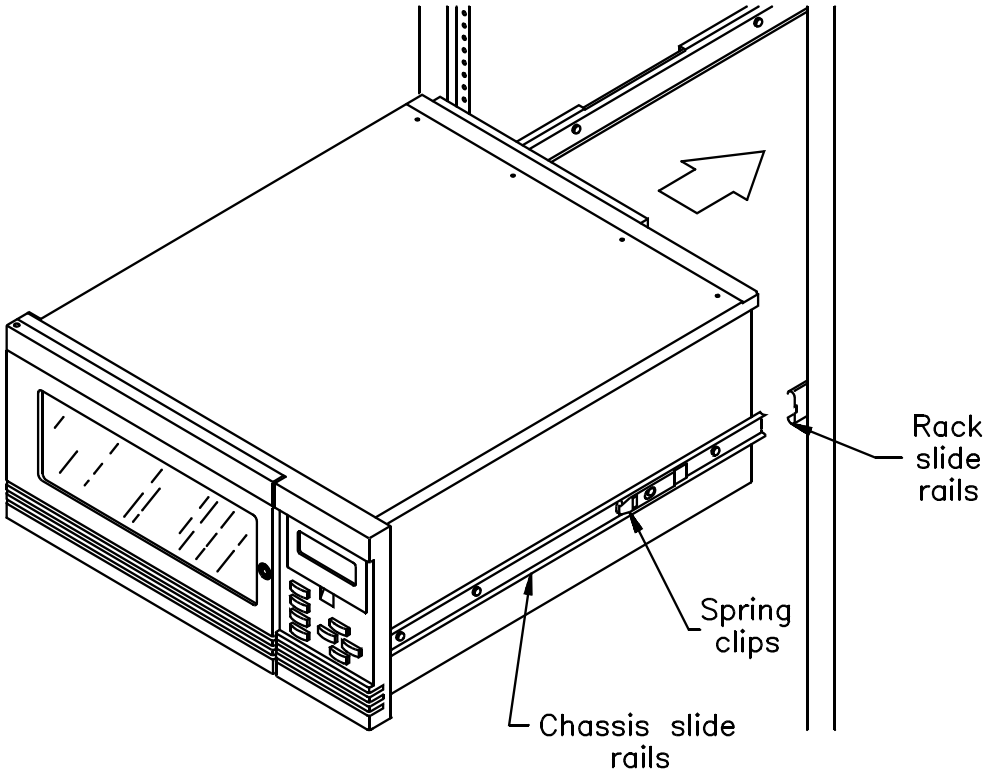
5. Using a T-25 TORX driver and four screws per rail, attach (but do not tighten) the rack slide rails to the mounting holes on the rack, as shown in the figure on page 7.

6. Adjust the distance between the rail brackets on each side of the cabinet to 17 $^{5}/_{8}$ inches (44.75 cm). Measure both the front and back.

7. Use a T-25 TORX screwdriver to tighten the screws to 12.0 inch-pounds (13.8 kg-cm) of torque.

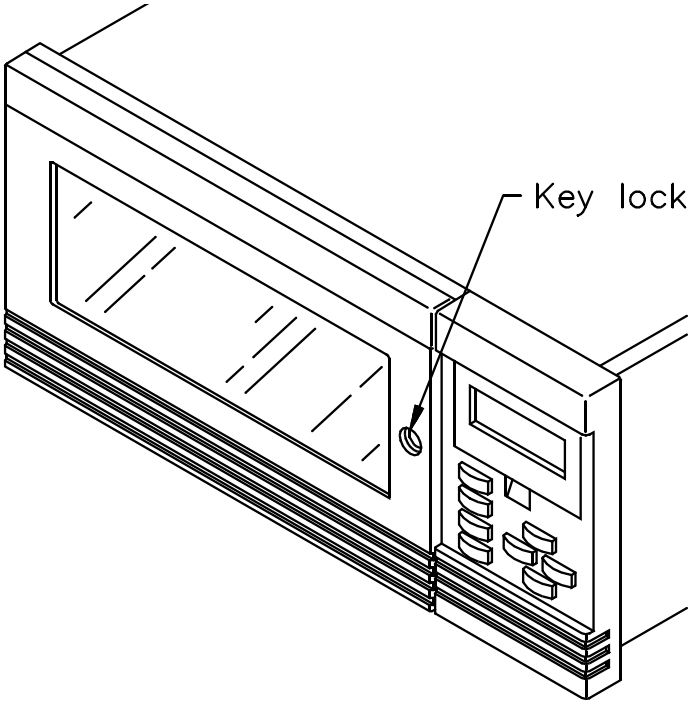


8. Using two people to lift it, slide the library into the rack by inserting the chassis slide rails into the rack slide rails, as shown in the figure. Press the spring clips while pushing the library firmly into the rack. When the library is seated properly, you will hear the latch engage.



Step 2 – Unlock and open the front door

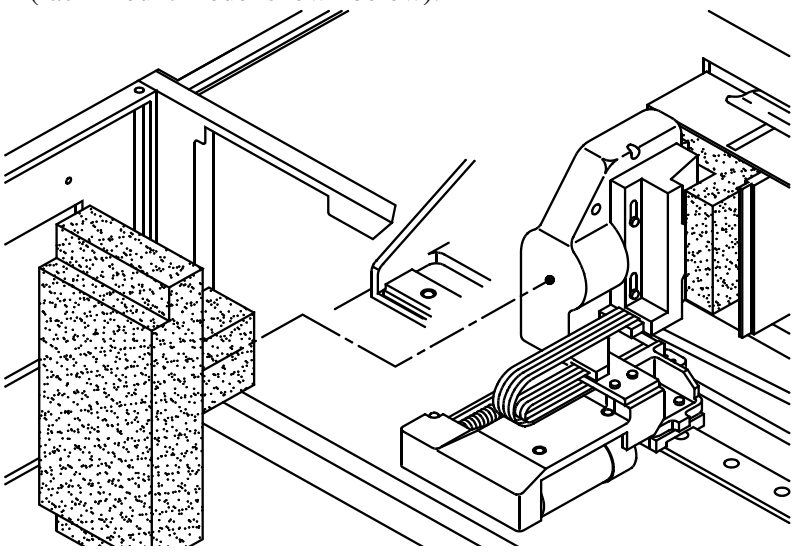
To open the front door, insert the key from your accessory kit into the lock, push in, and turn the key one-quarter turn to the right. Pull open the door.



Step 3 – Remove the packing foam

To remove the two foam packing pieces:

1. From inside the door, remove the first foam packing piece (rack-mount model shown below).



2. To remove the second foam packing piece, you must first move the cartridge handling mechanism (CHM) out and away from the magazine, as described on the next page.

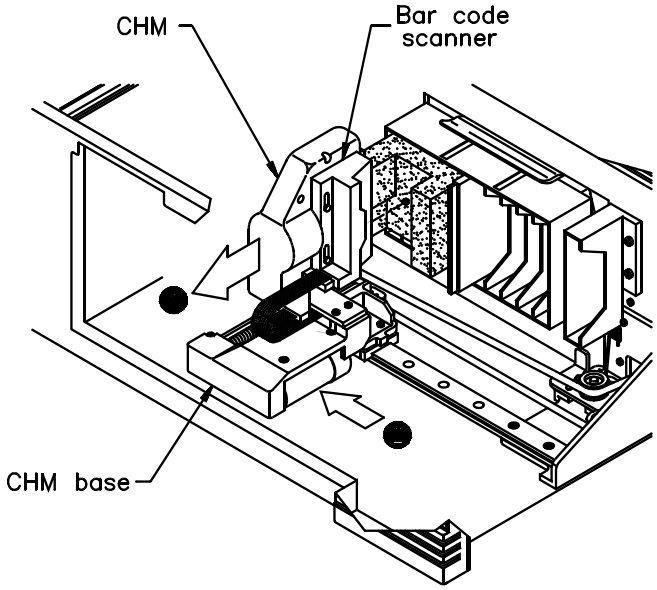
> ➤ Important The CHM contains a bar code scanner. Do not touch the lens when you move the CHM. Smudges on the lens can cause scan errors.

3. When the CHM is out of the way, remove the second foam packing piece from the magazine. Save the packing pieces with the other library packing materials.

Rack-mount model:

❶ Pull firmly on the *upper portion* of the CHM to slide it back (toward you). Do not pull on the CHM base.

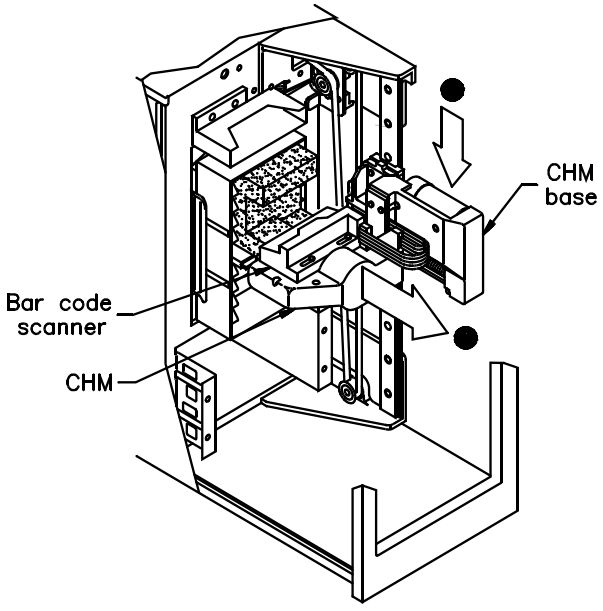
❷ Push against the CHM base, sliding it firmly to the right or left.



Standalone model:

❶ Pull firmly on the *upper portion* of the CHM to slide it back (toward you). Do not pull on the CHM base.

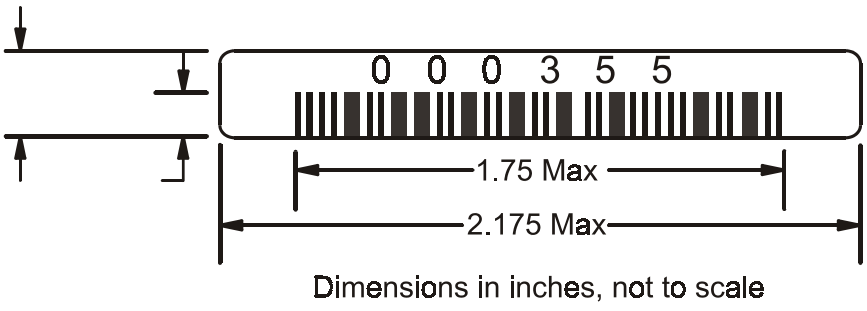
❷ Push against the CHM base, sliding it firmly to the top or bottom.



Step 4 – Prepare and install cartridges

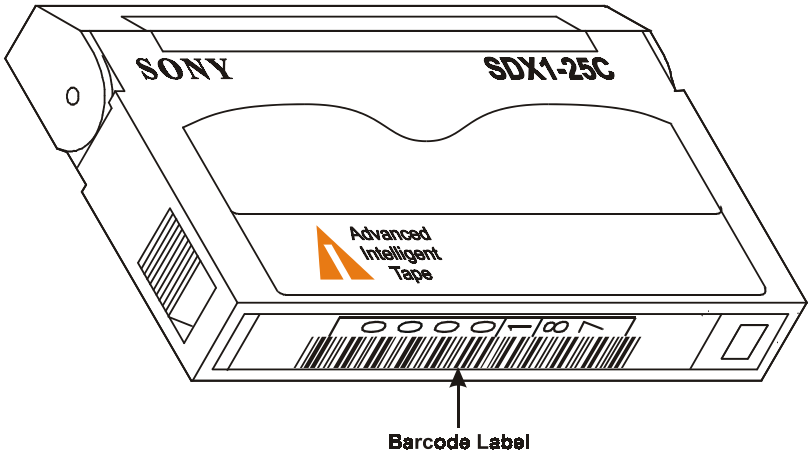
Four types of AIT data cartridges are available: SDX1-25C, SDX1-35C, SDX2-36C and SDX2-50C. The SDX1-25C and SDX2-36C are 170 meters in length, while the SDX1-35C and SDX2-50C are 230 meters in length and all use Sony's Advanced-Metal Evaporated (AME) tape. All cartridges employ MIC technology, which incorporates a Flash memory IC inside the data cartridge, allowing the architecture to capture various system and user-related statistics directly within the MIC structure to enhance data reliability, error prediction and successful performance.

AIT barcode labels (see following illustration) must conform to the Industry Standard Code 39 (3 of 9 code). Labels which meet the requirements of ANSI MH10.8M-1983 must be used. They must contain four to six alphanumeric characters plus a modulus 43 check character on an 0.40-inch by 2.175-inch label. The barcode and numerics should be centered horizontally. The narrow elements should be 0.015 +/- 0.004 inches (0.38 0.10mm), and the wide elements 0.030 +/- 0.004 inches (0.76 0.10 mm). There must be a minimum of 0.2 inches of white space at each end of the label. Use of a higher density is not recommended. If a human readable label is not required, the barcode may extend across the entire width of the label. Failure to comply with this specification may affect reliability.



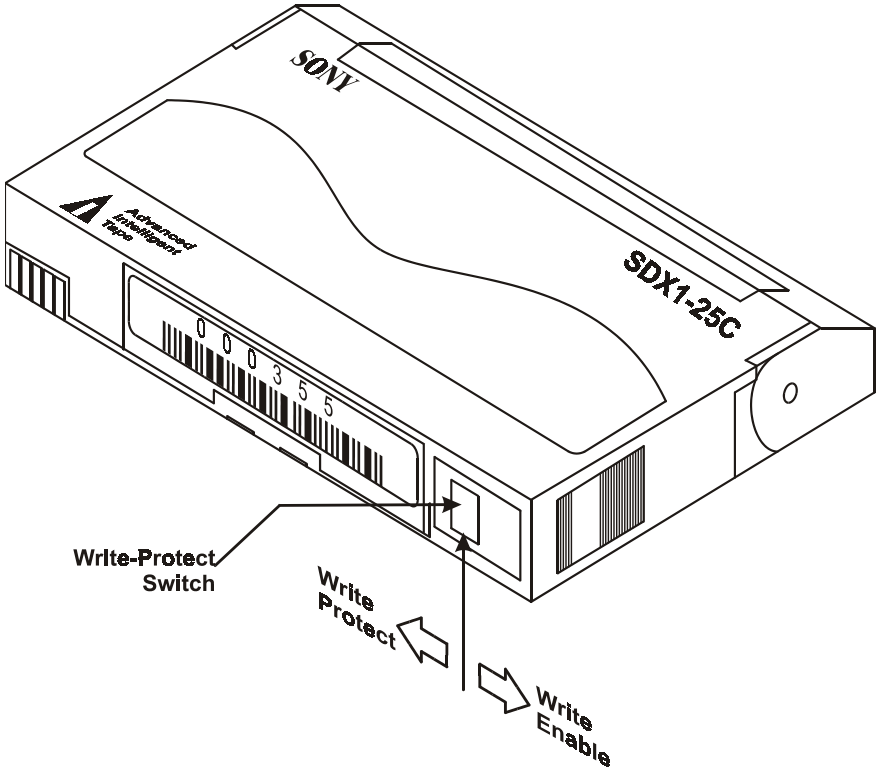
To prepare and install cartridges:

Your library is equipped with a bar code scanner. You can affix bar code labels to the cartridges. To do this, position the label using the ridge on the cartridge for guidance. Make sure you orient the label correctly, as shown in the following illustration.

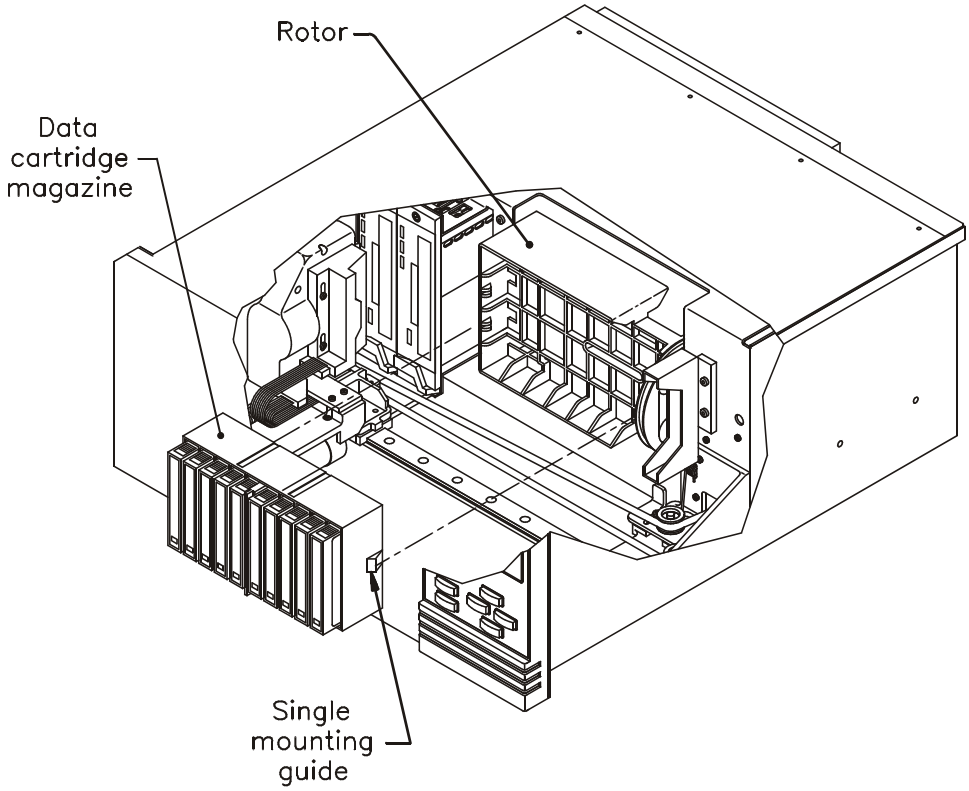


➤ **Important** If you remove a bar code label from a data cartridge without replacing it, make sure you clean the label area thoroughly. Bar code labels can leave adhesive on the label area, which may cause the data cartridge to stick to the gripper.

4. Make sure the write-protect switches on the cartridges are set correctly, as shown in the following figure. You can use a ball-point pen or similar instrument to set the write-protect switch. If the orange tab fills the window, the cartridge is write-protected.



5. Remove the cartridge magazine (shown in the following figure). For rack-mount models, pull it out first from the right, then the left; for standalone models, pull it out first from the top, and then bottom. Access the back magazine by turning the rotor manually.



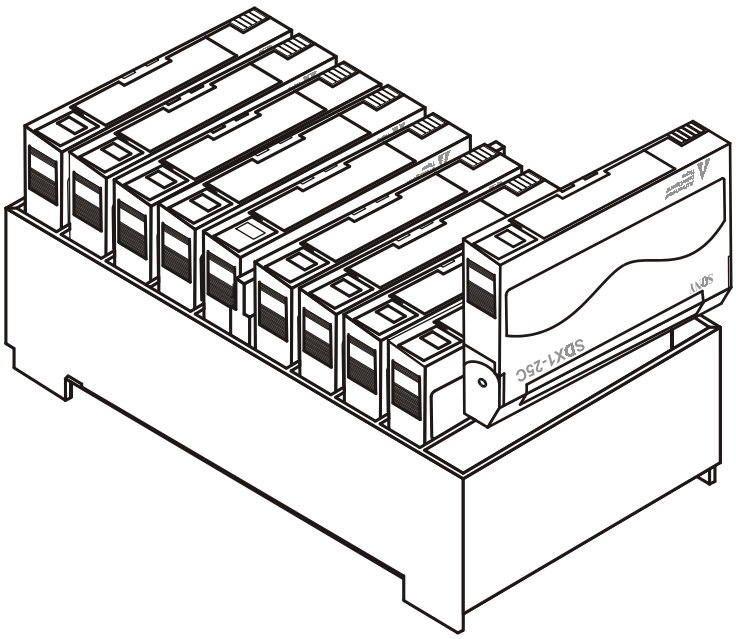
CAUTION

Make sure the CHM and its cabling are safely out of the way before you remove or install a cartridge magazine. If the CHM is blocking the magazine, move it by following the instructions on page 13.

6. Place the magazine on its feet with the single mounting guide toward the right. Position each cartridge so that the bar code label is on top and the write-protect switch is toward the front. Insert the cartridge into the magazine slot.

   Note: Very little force is needed to install a data cartridge. If it does not snap into place easily or if it protrudes further than the magazine's center rib, check the orientation of the cartridge.

7. To re-install the magazine, follow the instructions below. You can access the back magazine by turning the rotor manually.

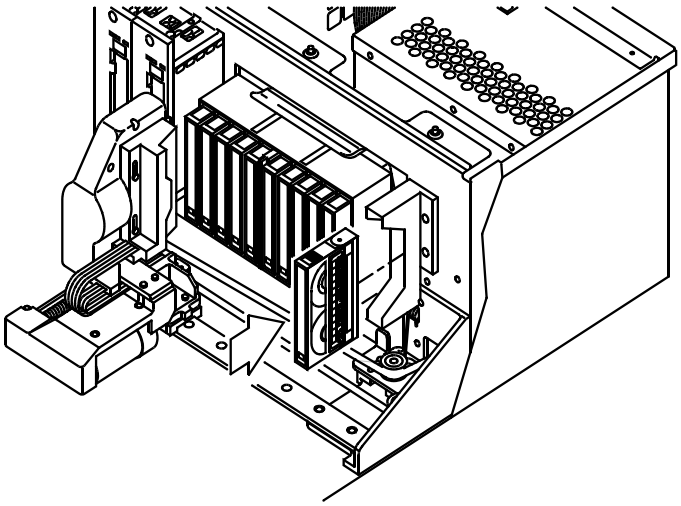


8. The library contains one fixed cartridge slot for a cleaning cartridge or an additional data cartridge. If desired, install a cleaning cartridge in the fixed cartridge slot, as shown on the following page.

➤ **Important** Use only a Sony SDX-TCL cleaning cartridge.

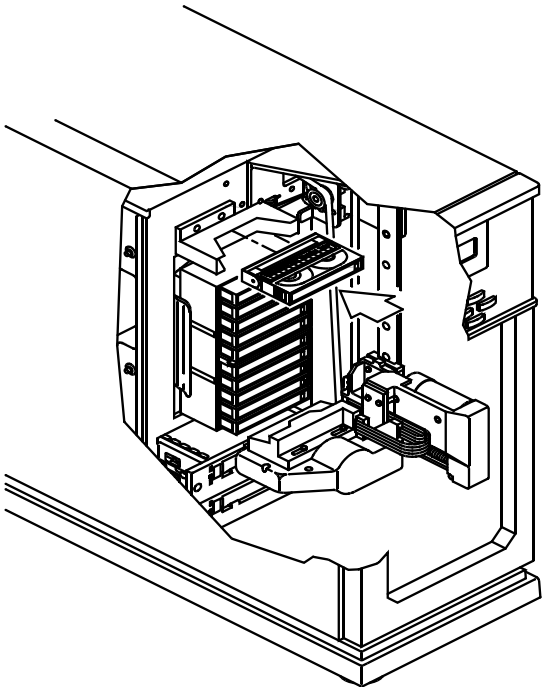
Rack-mount model:

Position the cleaning cartridge so that the window showing the tape reels is to the right and snap the cartridge into place.



Standalone model:

Position the cleaning cartridge so that the window showing the tape reels is to the top and snap the cartridge into place.



Step 5 – Close and lock the door

Close the door and turn the key a quarter-turn to the left.

Step 6 – Connect the library to the SCSI bus

This section provides general guidelines for connecting the library to the SCSI bus. The library consists of three SCSI devices: the library itself and the two tape drives. If a drive blank is installed, the library consists of two SCSI devices (the drive blank is not addressable).

Before you begin

1. Make certain the host computer and any peripheral devices are turned off.

> **CAUTION**
>
> To avoid damaging the tape drives, make sure the tape drives and library are powered off when you connect the library to the SCSI bus.

2. If you are unfamiliar with connecting devices on a SCSI bus, first read Appendix B.

3. Determine the SCSI bus configuration (that is, how many SCSI buses you will connect to the library and which bus you will connect to which device).

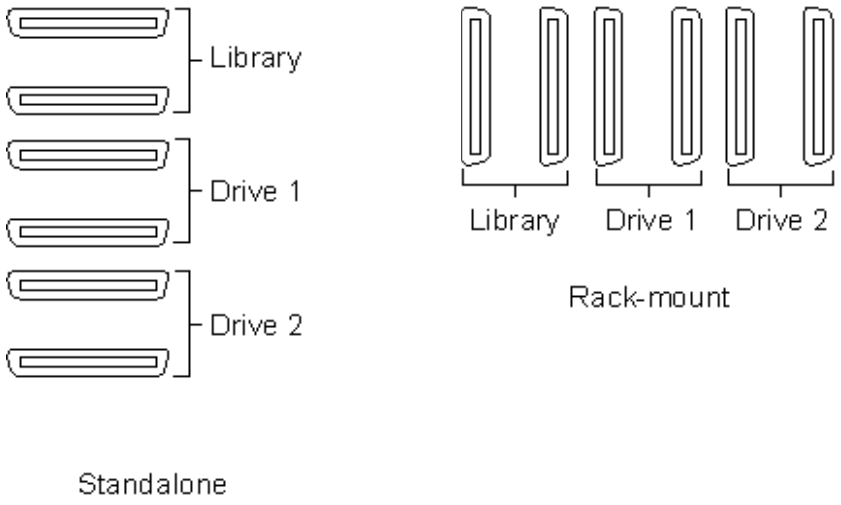
4. If you are connecting the library and two tape drives to a single bus, install a jumper over the two inside connectors, as shown in the example.

5. For each device that terminates the bus (either the library or one of the tape drives), install a terminator on one of the connectors for that device.

Connecting the Scalar AIT 220

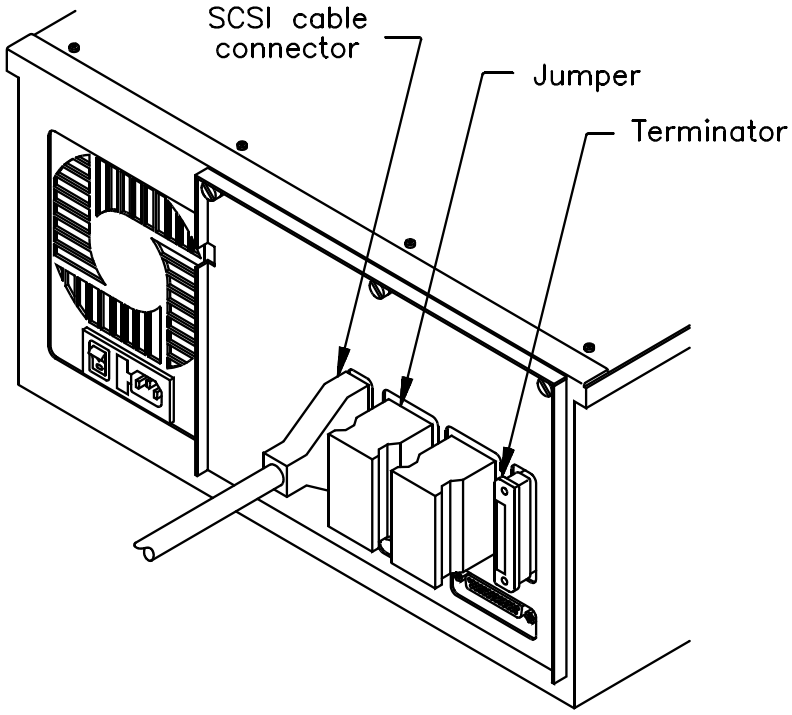
The Scalar AIT 220 can operate on one, two, or three SCSI buses. The library, Drive 1, and Drive 2 can operate on separate SCSI buses or on the same SCSI bus.

1. Connect the library to the SCSI bus, using the connector assignments shown in the following figure.



2. If you are connecting the library and two tape drives to one or two SCSI buses, install a jumper (or jumpers) over the connectors between devices, as shown in the example.

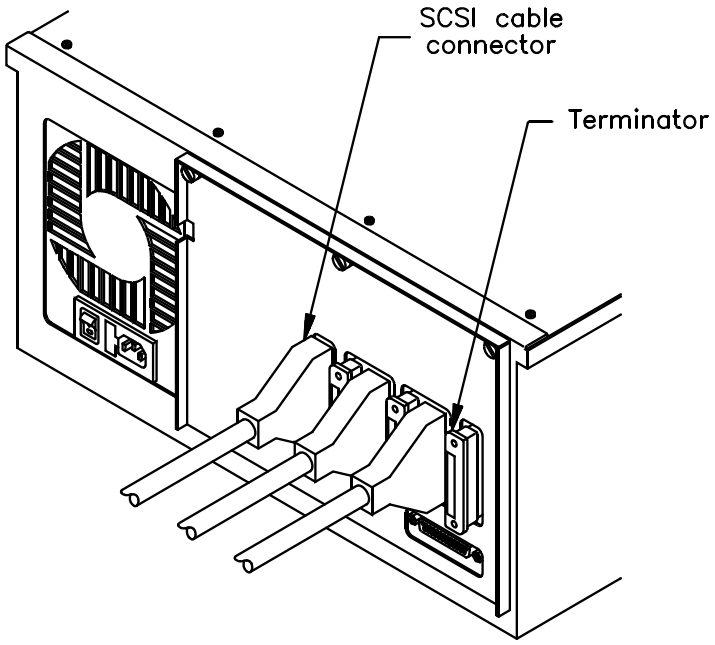
Example: Six-connector Scalar AIT 220 on one SCSI bus



3. For each device that terminates the bus (either the library or one of the tape drives), install a terminator on one of the connectors for that device.

The example below shows a Scalar AIT 220 connected to three SCSI buses. All the buses are terminated.

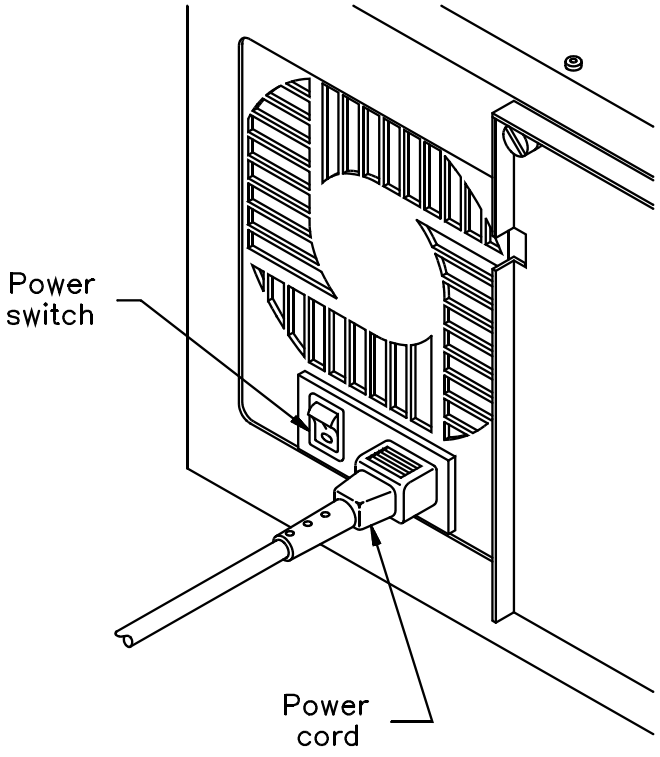
Example: Scalar AIT 220 on three SCSI buses



Step 7 – Connect the power cord

➤ **Important** The power cord shipped with the library is a 120 VAC three-conductor power cord for use in the United States and Canada. If you are planning to use an input voltage other than 120 volts AC or if you plan to use the library outside of the United States or Canada, you must supply your own power cord. Refer to page 135 for more information.

1. Make sure that the power switch on the back of the library is off (the **0** is pressed).



2. Connect the female end of the power cord to the power connector on the back of the library.

3. Plug the male end of the power cord into the power source.

   Note: The library has autoranging voltage selection, so you do not need to change the voltage setting.

Step 8 – Power on the library

1. Make certain the library's door is closed and locked.

2. Turn on the host computer system.

   Note: If your host system requires that attached peripheral devices be powered on before the host, turn on the library before you turn on the host.

3. Push the power switch on the back of the library to the on position (the **I** is pressed).

Wait while the library performs its power-on sequence. During this time, the following activities occur:

- The cooling fan begins to rotate.
- The LCD illuminates and displays the Main Screen.
- Each tape drive and the library perform a power-on self-test.

If problems occur . . .

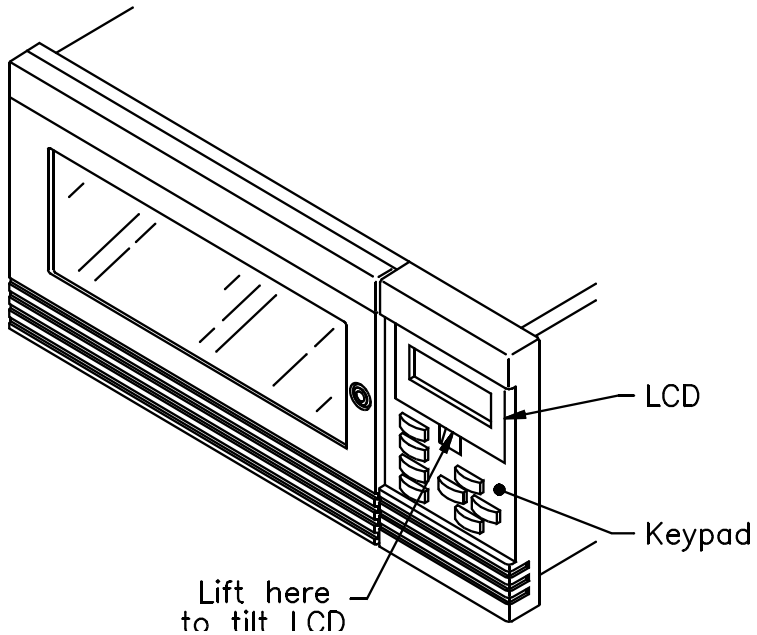
If the library does not power on as described:	Check the following: ▪ Is the power switch on (1 is pressed)? ▪ Is the power cord inserted correctly? ▪ Is the library door closed and locked? ▪ Is the SCSI bus terminated? ▪ Is the SCSI cable connected to the library and host computer? ▪ Is the host computer system turned on? For additional troubleshooting tips, see “Problems with library installation” on page 128.
If an error code is displayed on the LCD:	See Appendix J for a list of error codes and corrective actions.
If you cannot solve the problem yourself:	Contact your service provider or ADIC.

Configuring the library

Configuration steps include:

- Displaying the Configuration Menu
- Setting SCSI IDs
- Setting LCD security (optional)
- Setting other configuration options (if necessary)

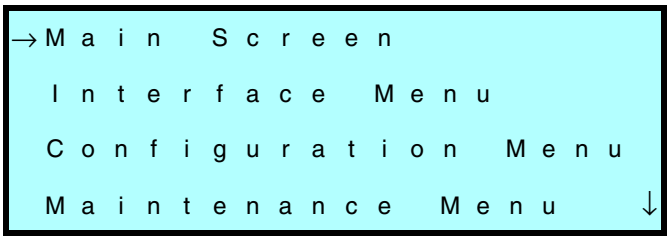
To change options, you will use the operator panel (LCD and keypad) on the front of the library, as shown in the figure. If desired, you can tilt the LCD for easier viewing.



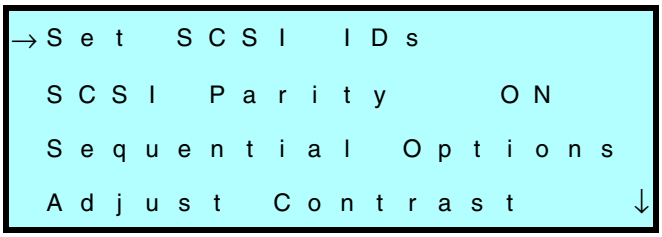
Step 1 – Display the Configuration Menu

To display the Configuration Menu:

1. Access the Main Menu by pressing Escape on the keypad. The Main Menu is shown.



2. Press ↓ to scroll down to Configuration Menu. Then press Enter. The Configuration Menu displays:



During library configuration, use the operator keys for the following functions:

To select an item from a menu:	Press ↑ or ↓ to scroll up and down through the items. When the screen arrow (→) points to the desired item, press Enter.
To move the screen arrow left and right, or toggle some options:	Press ← or →.
To return to a previous screen or cancel the operation without saving:	Press Escape.
To redisplay the Main Screen:	Select Main Screen (the first item in the Main Menu) and press Enter.

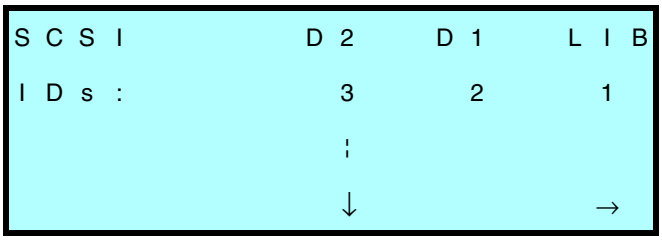
Step 2 – Set the SCSI IDs

Default SCSI IDs are assigned at the factory for the library and each tape drive. Drive blanks are assigned B (for blank). This section describes how to view the default settings and change them if necessary.

➤ **Important** The library and tape drives must each have a unique SCSI ID within each SCSI bus. Because you may have multiple buses, the library does not check for duplicate SCSI IDs. It is your responsibility to make sure you do not assign duplicate IDs within a bus.

To view or change the SCSI IDs:

1. From the Configuration Menu, select Set SCSI IDs. The following screen appears:



2. To set the SCSI ID for Drive 2 (farthest from the magazine), press ↑ or ↓ until the screen displays the correct SCSI ID.

3. Press → to move the screen arrows to Drive 1.

4. To set the SCSI ID for Drive 1 (closest to the magazine), press ↑ or ↓ until the screen displays the correct SCSI ID.

5. Press → to move the screen arrows to LIB.

6. To set the SCSI ID for the library, press ↑ or ↓ until the screen displays the correct SCSI ID.

7. When the SCSI IDs for both tape drives and the library are correct, press Enter to accept your choices.

8. If you have changed one or more of the tape drive IDs, the system displays a confirmation message. Press Enter. The system resets the tape drives with changed IDs and returns you to the Configuration Menu.

Step 3 – Set security

The Security option allows you to prevent unauthorized personnel from disrupting the operation of the library. When you enable security, the following activities are prevented:

- Changing SCSI IDs
- Changing SCSI parity checking
- Changing the control mode
- Changing the library serial number
- Using the Diagnostics Menu and the Demo Menu
- Using the Clean Drives Menu
- Opening the front door (operator panel security only)
- Changing the installed tape drive model
- Communicating with a tape drive across a serial port

If you attempt to perform any of the above operations when security is enabled, the library displays a message that states security is active. The message also states whether security was enabled from the operator panel or by the application with a SCSI command.

Methods for enabling and disabling security

Security can be enabled or disabled in either of two ways:

- You can set the security option from the operator panel using the Configuration Menu, as described in this section.

- The application software can issue a SCSI MODE SELECT command to turn security on or off (see your software documentation or the *Scalar AIT 220 Library SCSI Reference*).

Whichever method is used to enable security (operator panel or SCSI) must also be used to disable security. That is, if you enable security from the operator panel, you must disable it from the operator panel. If security is enabled by the application (SCSI), it must be disabled by the application.

Note: To determine if security has been set by your application, look at the SCSI Mode Parameters screen (see page 93).

Security remains in effect across resets.

Enabling security from the operator panel

1. From the Configuration Menu, select Set Security On. The following screen appears:

```
Set Security On:
Enter Password 000
Then                ↑
Press Enter         →
```

   Note: If the menu displays Set Security Off, the security option has already been enabled.

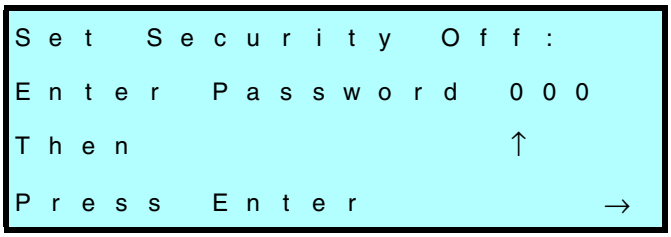
2. Select a three-digit password. Press → and ← to move from column to column and ↑ and ↓ to change the numbers. (The default password is 000.) When you are finished, press Enter.

   ➤ **Important** You must use the same password to turn security off.

3. A confirmation message appears. Press Enter. Or, to exit without saving the password, press Escape.

Disabling security from the operator panel

1. From the Configuration Menu, select Set Security Off. The following screen appears:



   Note: If the menu displays Set Security On, the LCD security function is disabled. However, security may have been enabled by your application using a SCSI command. If so, it must be disabled by your application. Refer to your software documentation.

2. To specify the three-digit password, press → and ← to move from column to column and ↑ and ↓ to change the numbers. When you are finished, press Enter.

If you enter the wrong password, the system displays an error message.

If You Forget the Password Try entering the default password (000). If the default password has been changed and you do not know what it is, call your service provider.

Step 4 – Set other configuration options

The Configuration Menu contains some other configuration options for the library, as described in the table below. If desired, you can check these settings and change them.

Configuration options	
SCSI Parity*	Allows you to enable parity checking for the library (if the SCSI adapter card connected to the library supports it). When enabled, the library checks all data on the SCSI bus for parity. This remains in effect across power cycles.
Sequential Options	Provides options for using the library's sequential modes. (See page 46 and Appendix K for more information.)
Adjust Contrast	Controls the brightness of the lettering on the LCD.
Back Light	Turns the LCD background on or off.
Set Date	Allows you to set the system date for the library. The date appears on the Command History screen and on diagnostic listings (see Chapter 6 for more information).
Set Time	Allows you to set the time that is shown on the library's Main Screen and in the Command History screen (see Chapter 6 for more information).
Set Serial Number	Allows you to make certain the serial number label on the back of the library is also displayed in this screen; and allows you to change the serial number. (The serial number entered in this screen appears on diagnostic listings; see Chapter 6 for more information.)
Use AIT	Allows you to check whether an AI-T1 drive is installed. This option is set at the factory. **Note:** If you want to upgrade from an AIT-1 to an AIT-2 tape drive, contact ADIC.

* Parity checking for the library can also be enabled by the application software using the SCSI command, MODE SELECT. The method used last to set parity checking (LCD or SCSI command) has precedence. Parity checking for tape drives is set separately.

Checking the setup

After installing the hardware and software, check the setup by performing some exercises on the library, as described below. (While these exercises are not required, it is a good idea to verify that your software and hardware are properly communicating before you begin operations.)

- Use the options on the Diagnostic Menu to exercise the hardware. This determines whether the library hardware components are operating properly. See page 117 for more information about library diagnostics.

- Instruct the application software to load some cartridges into the tape drive. This determines whether the software and library are communicating properly.

- Back up several megabytes of data and perform a comparison check on the backed up data. (If you have two tape drives, back up several megabytes to both.) This determines whether the software and tape drives are communicating properly.

If problems occur . . .

If the library and tape drive are not operating as expected:	See Chapter 7 for troubleshooting information.
If there is an error code displayed on the LCD:	See Appendix J for a list of error codes and corrective actions.
If you cannot solve the problem yourself:	Contact your service provider or ADIC.

Where to go from here

Before you begin library operations, check the following:

- A cartridge magazine is installed.
- The CHM gripper does not contain a cartridge.
- The library door is closed and locked.
- The library is in the proper control mode. The standard operating mode is SCSI (see page 45).

Notes

2 Library Operation

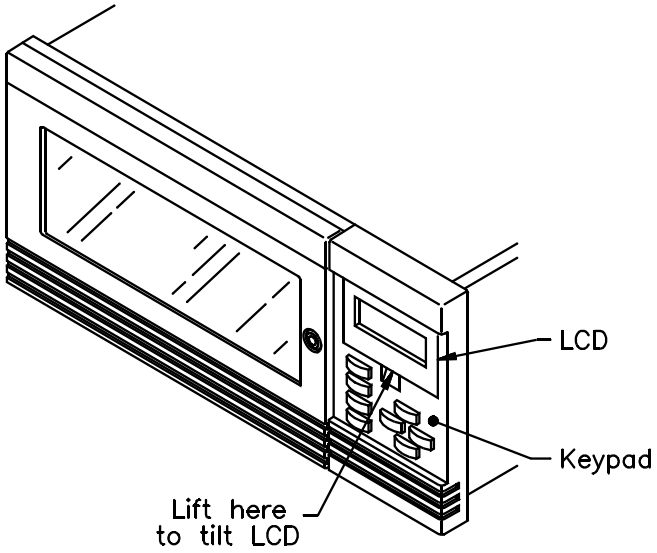
Once the library and application software are installed and configured, you can automatically perform backup and restore operations using the application software. You do not need to intervene in the cartridge processing during normal library operations.

This chapter describes library operations you may occasionally need to perform:

- Using the operator panel
- Operating the library in different control modes
- Replacing data cartridges
- Resetting the library

Using the operator panel

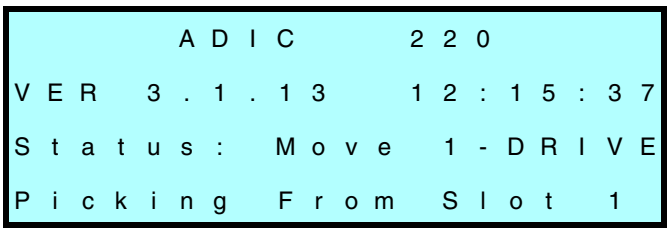
The library includes a four-line LCD and keypad, called the *operator panel*, which allows you to interactively control library operations. Using the operator panel, you can set library options, check operating statistics, and diagnose errors. If desired, you can tilt the LCD for easier viewing.



Main Screen

The Main Screen appears when you apply power to the library. The first and second lines on the Main Screen identify the product name, firmware version, and time. The third and fourth lines display status information about the library or tape drive; and if a hardware error occurs, these lines display information about the error.

An example of the Main Screen with a status message is shown below.

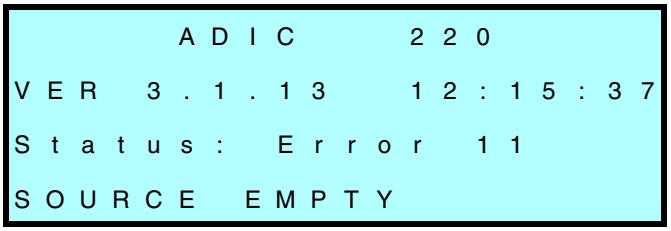


Note: The exact wording of the Main Screen may be different on your screen.

Error codes

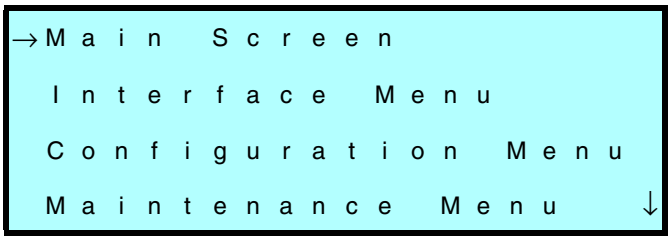
If a hardware error occurs, an error code will appear automatically on the third and fourth lines of the Main Screen. You must correct the error before operation can continue. (Refer to Appendix J for help in diagnosing and correcting errors.)

The third line provides the error's numerical code; the fourth line provides a brief explanation of the error.



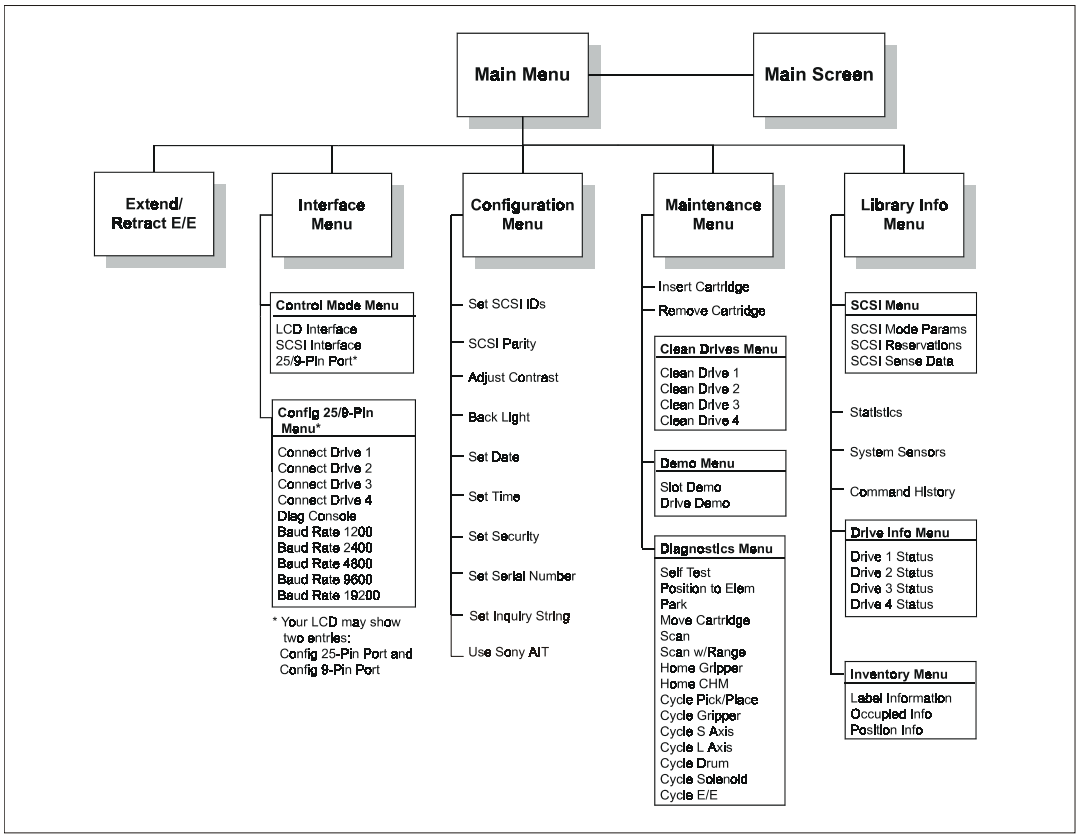
Main Menu

To access the Main Menu, press Escape from the Main Screen. The Main Menu is shown below:



The selections on the Main Menu are described in the following table. The menu structure is shown on the next page.

Main Menu selections	
Main Screen	**Returns to the Main Screen.**
Interface Menu	**Allows you to specify how CHM motion is controlled and to configure the serial ports.**
ConfigurationMenu	**Allows you to set SCSI IDs, security, and other configuration options.**
Maintenance Menu	**Allows you to clean the tape drive and perform diagnostics.**
Library Information Menu	**Provides tape drive status information and diagnostic information for service technicians.**


Main Menu
Main Screen
Extend/ Retract E/E
Interface Menu
Configuration Menu
Maintenance Menu
Library Info Menu
Control Mode Menu
LCD Interface
SCSI Interface
25/9-Pin Port*
Config 25/9-Pin Menu*
Connect Drive 1
Connect Drive 2
Connect Drive 3
Connect Drive 4
Diag Console
Baud Rate 1200
Baud Rate 2400
Baud Rate 4800
Baud Rate 9600
Baud Rate 19200
* Your LCD may show two entries: Config 25-Pin Port and Config 9-Pin Port
Set SCSI IDs
SCSI Parity
Adjust Contrast
Back Light
Set Date
Set Time
Set Security
Set Serial Number
Set Inquiry String
Use Sony AIT
Insert Cartridge
Remove Cartridge
Clean Drives Menu
Clean Drive 1
Clean Drive 2
Clean Drive 3
Clean Drive 4
Demo Menu
Slot Demo
Drive Demo
Diagnostics Menu
Self Test
Position to Elem
Park
Move Cartridge
Scan
Scan w/Range
Home Gripper
Home CHM
Cycle Pick/Place
Cycle Gripper
Cycle S Axis
Cycle L Axis
Cycle Drum
Cycle Solenoid
Cycle E/E
SCSI Menu
SCSI Mode Params
SCSI Reservations
SCSI Sense Data
Statistics
System Sensors
Command History
Drive Info Menu
Drive 1 Status
Drive 2 Status
Drive 3 Status
Drive 4 Status
Inventory Menu
Label Information
Occupied Info
Position Info

Operator keys

Use the keys on the operator panel to perform the following actions:

↑ ↓	**Scrolls the screen arrow (→) up or down. The screen arrow points to the current selection.**
← →	**In some screens, moves the screen arrow left or right. On some menu selections, toggles an option on or off.**
Help	**Displays the Help screen. To exit Help, press** [Escape]**.**
Escape	**Returns to the previous menu or screen; cancels an operation without saving changes; or if the Main Screen is displayed, goes to the Main Menu.**
Enter	**Selects the item next to the screen arrow or accepts a change.**
Reset	**Displays the Reset screen, which allows you to reset the library. See page 56 for more information.**

Operating in different control modes

To determine which interface will control CHM motion, you can set the library to one of the following control modes:

- SCSI Interface
- Sequential 1
- Sequential 2
- Dual Sequential
- LCD Interface
- 25/9-Pin

These control modes allow you to operate the library with the application software (SCSI Interface), operate the library as a sequential stacker device (Sequential 1, Sequential 2, Dual Sequential), or perform diagnostic functions on the library (LCD Interface, 25/9-Pin).

Refer to the following section for control mode descriptions. Refer to page 47 for instructions on changing the control mode.

Note: Control mode settings remain through power cycles.

Control mode descriptions

SCSI Interface mode

If you want the application software to control library operations, you must set the library to SCSI Interface mode. In this standard operating mode, the application software controls the motion of the CHM by issuing SCSI commands across the SCSI bus.

Note: The application software can issue commands to the library regardless of the control mode. However, the library must be in SCSI Interface mode for the application software to control CHM motion.

For detailed information about SCSI commands, refer to the *Scalar AIT 220 Library SCSI Reference Manual.*

Sequential modes

If you want the library to run as a sequential stacker device, you can set the library to one of three sequential modes:

- Sequential 1
- Sequential 2
- Dual Sequential

In these modes, the application software does not need to provide support for library functions, only for the tape drives. For detailed information about the sequential modes, see Appendix K.

LCD Interface mode

If you want to perform any operations from the operator panel that involve moving the CHM, you need to set the library to LCD Interface mode. All of these operations, such as cleaning the tape drives and performing diagnostics, are included under the Maintenance Menu.

Note: LCD Interface mode is required only when you want to control the motions of the CHM. For example, you do not need to switch control modes to access the menus.

25/9-Pin mode

When the library is operating in 25/9-Pin mode, you can control the motions of the CHM from a remote console program connected to the library's 9-pin or 25-pin port.

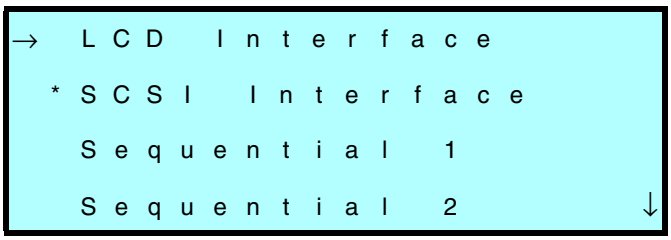
Note: Use 25/9-Pin mode to control CHM motion only. You do not need to change the control mode to access a tape drive's firmware.

For more information about how to use the 25-pin and 9-pin serial ports, see page 47.

Changing the control mode

1. Make certain the library is in the ready state (for example, no hardware errors, the door is closed, and so on).
2. If the security option has been enabled, disable it (see page 32).
3. From the Main Menu, select Interface Menu.

4. From the Interface Menu, select Control Mode Menu. The following screen appears:



Note: The Sequential 2 option does not appear in this menu if you have a drive blank installed.

The Dual Sequential option does not appear if you are operating with only one tape drive.

5. Select the desired mode. The current control mode is indicated with an asterisk (*).

Important **When the library is in LCD Interface mode or in one of the serial port modes, the software application cannot control CHM movement.**

6. When the library displays a confirmation message that it has changed the control mode, press Escape to return to the Control Mode Menu.

Replacing data cartridges

This section describes how to:

- Select the appropriate data cartridges for your tape drive
- Open the library door to access the cartridges
- Replace a single cartridge or a cartridge magazine
- Store cartridges outside the library

Selecting data cartridges

ADIC strongly recommends that you use Sony® data-grade media with your AIT tape drives. Sony media meets specifications that are the most stringent in the industry.

CAUTION

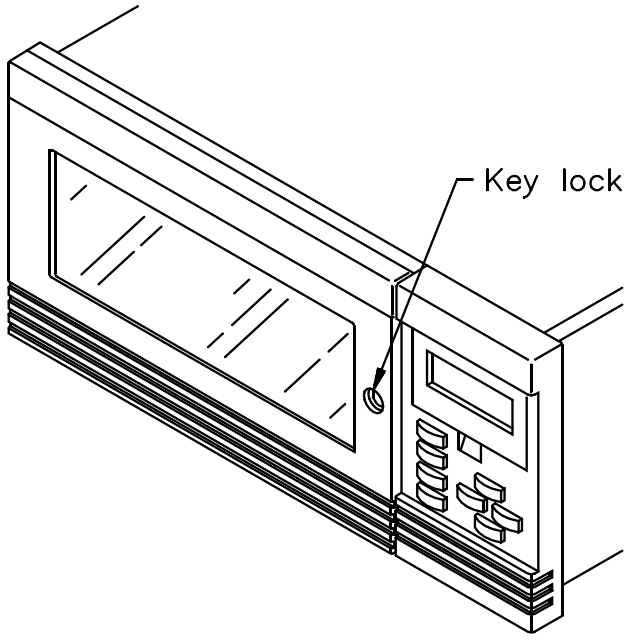
Never use video-grade tape for data storage. Video-grade tape can be less accurate than data-grade tape and is more abrasive to tape drive recording heads.

Opening the library door

To access the cartridges, you must first open the library door.

➤ **Important** **During library operation, do not open the library door unless you need to remove and replace cartridges or perform a maintenance operation. After the door has been opened and then closed, your backup application may perform a time-consuming cartridge inventory process, in addition to the library's own power-on self-test.**

1. Insert the key into the lock, push in, and turn it one-quarter turn to the right.



When the CHM finishes the current operation and moves to the park position, the door's interlock mechanism releases.

2. Open the door.

> **CAUTION**
>
> **Do not force the door open. The door's interlock mechanism may be prevented from releasing by LCD security or by the application software.**

Replacing a single cartridge

To replace a single cartridge:

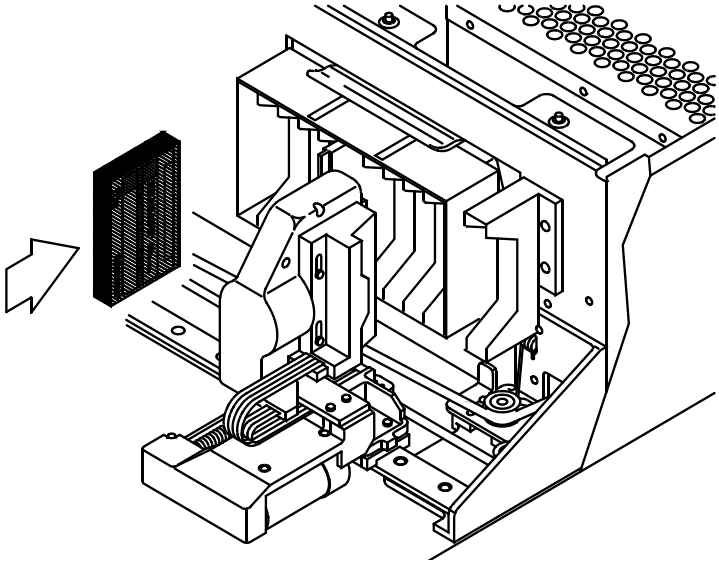
1. Remove the cartridge by pulling it straight out from its slot in the cartridge magazine. You can access the back magazine by turning the rotor manually.

2. Make sure that the write-protect switch on the replacement cartridge is set correctly for the desired operation. If the red tab fills the window, the cartridge is write-protected.

3. For rack-mount models, hold the cartridge so that the write-protect switch is down; for standalone models, hold it so the switch is to the right. Insert the cartridge into the empty slot, as shown in the following figure.

   Note: Very little force is needed to install a cartridge into the cartridge magazine. If the cartridge does not snap into place easily, check its orientation.

4. Close and lock the library's door.

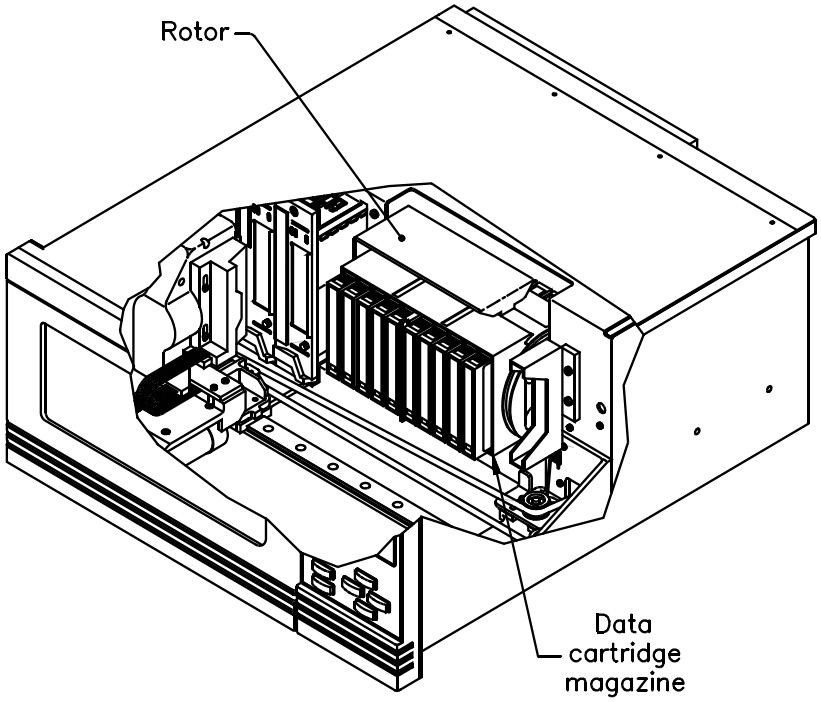


Replacing the cartridge magazine

1. Open the library door, as described on page 50.

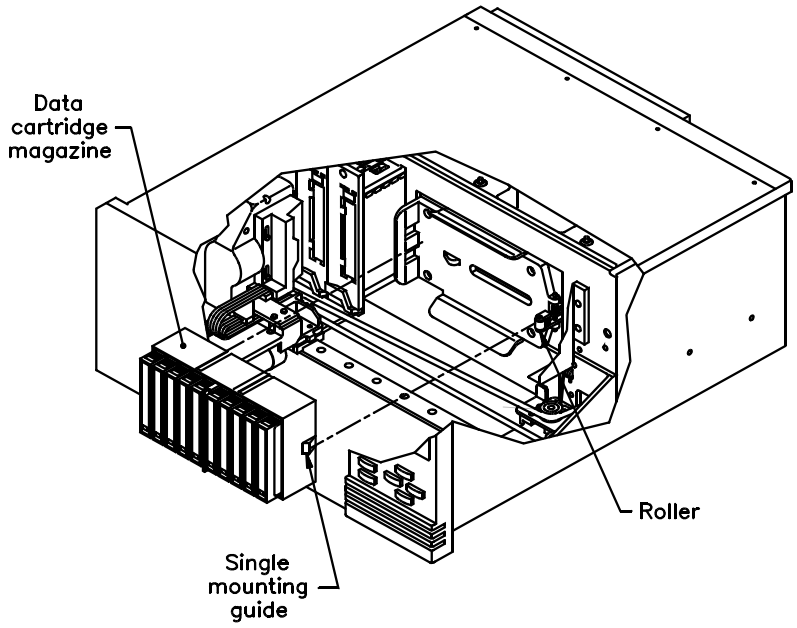
2. For rack-mount models, remove the front cartridge magazine by pulling it out first from the right, then the left. For standalone models, pull it out first from the top, then the bottom.

You can access the back magazine by turning the rotor manually. The rotor is shown below.



3. If desired, replace the cartridges (described on page 51).

4. Position the magazine so that the single mounting guide on the magazine is aligned with the roller on the mounting plate, as shown in the figure. For rack-mount models, clip the magazine onto the left side and snap it into place by pressing on the right side. For standalone models, clip the magazine onto the bottom and snap it into place by pressing on the top.



5. Close and lock the door.

Storing cartridges

To maximize the shelf life of your tapes and ensure data integrity, follow these guidelines when storing cartridges:

- **Store cartridges in a suitable environment**. Follow the specifications for storage temperature and other environmental requirements, as described on the cartridge packaging. Do not allow the temperature and humidity in the storage environment to fluctuate.

- **Keep the storage location as free of airborne particulates as possible**. To eliminate obvious sources of particulates, do not permit anyone to smoke, eat, or drink near the storage area, and do not store cartridges near a copier or printer that may emit toner and paper dust.

- **Store cartridges with the write-protect switch in the protected position**.

- **Store cartridges as soon as possible** after you remove them from the library. Immediate storage helps avoid many of the conditions that can damage tapes, such as temperature and humidity fluctuation, particulate contamination, and excessive handling.

- **If possible, store cartridges in a cartridge magazine**. In the cartridge magazine, cartridges are protected from airborne contaminants by a clear plastic cover. With the cover in place, the magazines can be stacked on top of each other to make the most efficient use of storage space.

Resetting the library

If the library has encountered an error and is still not operating after you have tried the corrective action for the error, you may need to reset the library. A reset causes the library and the tape drives to perform their power-on self tests. Unless configured otherwise, tape drives will rewind the tape after a reset, but will not eject the data cartridge.

CAUTION

Before resetting the library, make sure the library or tape drives are not communicating across the SCSI bus. Resetting the library and tape drives may disrupt communications on the SCSI bus.

To reset the library, you can use one of the following methods:

- Press Reset on the operator panel, then press Enter at the confirmation screen (or press Escape to cancel).
- Perform a power-on reset by turning the library off, then back on.
- Perform a remote hardware reset by plugging a cable into the remote reset port on the back of the library and press a reset button on the cable (see Appendix A for specifications).

Note: The library, tape drives, or the entire SCSI bus can also be automatically reset by the host.

When the library is reset, both the library and tape drives perform power-on self-tests. Then the Main Screen appears on the LCD.

Note: If the library is performing a cartridge move operation when it is reset, it completes the move operation before it performs the power-on self-test.

3 Tape Drive Operation

The application software automatically controls the tape drives to perform backup and restore operations. You do not need to intervene in the cartridge processing; however, you may need to perform the following tasks:

- Monitoring the tape drive LEDs
- Cleaning tape drives
- Displaying information about tape drives
- Ejecting a cartridge manually

Note: You cannot control tape drives from the operator panel; however, you can perform diagnostics on tape drives across the 9-pin or 25-pin port. (See page 122 for information about diagnostics.)

Monitoring the tape drive LEDs

The SDX-300C and SDX-500C tape drive use their three front panel LEDs to report the current status/operation of the drive. The following table shows the possible states of the three LEDs and the conditions they indicate.

LED state	Condition
Status and Tape LEDs flashing Mode 2, Busy LED ignored	**Error Rate Warning, cleaning request.**
Status LED flashing Code 2, Busy and Tape LEDs ignored	**Self-test failure.**
Tape LED flashing Code 1 **Busy LED flashing Code 1**	**Waiting for Eject.** **Waiting for request.**
Busy LED off, Tape LED off, Status LED ignored	**Tape drive is unloaded.**
Busy LED on or blinking, Tape LED on, Status LED off	**Write-enabled tape loaded in drive, and the tape drive is ready to perform tape motion activities**
Busy LED on or blinking, Tape LED on, Status LED on	**A write-protected tape is loaded, and the tape drive is ready to perform tape motion activities.**
Bottom LED flashing (top LED off)	**Tape motion. A fast flash indicates high-speed tape motion.**

Note: You may see other LED activity (random flashing, steady on, and so on). For a detailed description, refer to the tape drive product specification.

Cleaning the tape drives

You should clean a tape drive whenever the library displays "Drive needs cleaning" on the Main Screen of the LCD or whenever your application software notifies you. (Not all software applications display cleaning requirements.) Regular cleaning helps ensure that the tape drives function reliably.

Note: Some applications monitor the tape drives' cleaning needs and automatically insert the cleaning cartridge in the drive whenever it needs cleaning. If this is the case, you can skip the cleaning instructions in this section.

Selecting cleaning cartridges

Use a Sony TCL cleaning cartridge to clean any AIT drive.

To order cleaning cartridges, contact ADIC.

CAUTION

Using cloth swabs, cotton swabs, cleaning agents, or cleaning cartridges not approved for your tape drive by ADIC may void the tape drive warranty.

Cleaning the tape drive from the operator panel

To clean the tape drive from the operator panel:

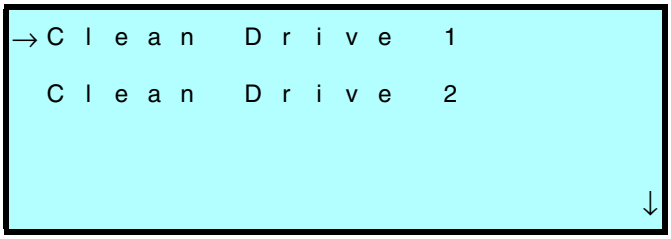
1. Determine which tape drive needs cleaning by looking at the drive LEDs. The Status LED on the drive that requires cleaning will be flashing Mode 2 (the Tape LED may also be flashing Mode 2).

2. Make certain a cleaning cartridge is installed in the fixed cartridge slot. (If the fixed slot contains a data cartridge and you follow these steps, you will have to manually eject the data cartridge from the tape drive.)

3. If security has been enabled, disable it (see page 34).

4. Switch to LCD Interface mode (see page 46).

5. From the Main Menu, select Maintenance Menu. Then select Clean Drives Menu. The following screen displays:



6. Select the tape drive you want to clean. Drive 1 is the tape drive closest to the magazine; Drive 2 is the tape drive farthest from the magazine. When you select a drive, the following activities occur:

   - The CHM picks the cleaning cartridge from the fixed slot and inserts it in the tape drive you specified.
   - The tape drive automatically performs the cleaning process and ejects the cartridge when the process is complete (in several minutes).
   - The CHM automatically picks the cartridge from the tape drive and replaces it in the fixed cartridge slot.

7. Confirm that the cleaning was done by looking at the Status LED on the front of the drive. The Status LED should be off. If the LED is still on, replace the cleaning cartridge and clean the tape drive again. If the LED is still on after the second cleaning, there may be a problem with the tape drive.

> ➤ **Important** **If the tape drive ejects the cleaning cartridge within a minute, you need to replace the cleaning cartridge. See page 51 for cartridge replacement instructions.**

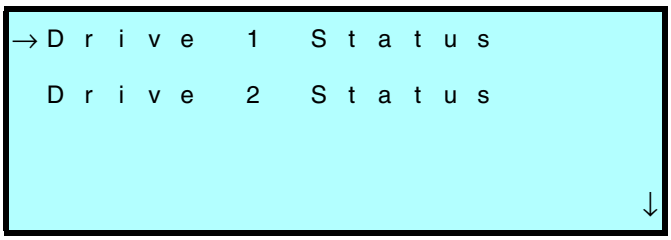
8. When the cleaning is complete, return the library to its original control mode (SCSI Interface mode or one of the sequential modes) and re-enable security.

Displaying information about tape drives

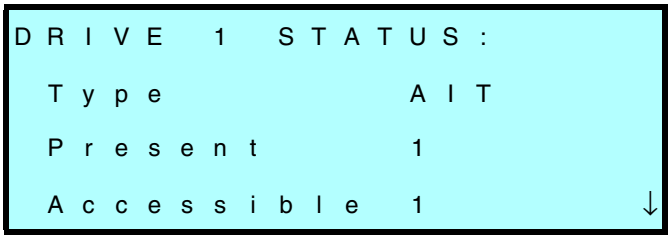
From the operator panel, you can display information about the tape drives, including the type of tape drive installed and its operational status. The information screens are updated whenever there is a change in drive status.

To display tape drive information:

From the Main Menu, select Library Info Menu. Then select Drive Info Menu. The following screen appears:



9. Press ↑ or ↓ to select the desired tape drive and press Enter. A Drive Status screen appears, similar to the following:



The following table describes the information in the Drive Status screen.

Drive Status screen	
Drive *N* STATUS	**Identifies the tape drive, as follows:** **Drive 1 – The tape drive closest to the magazine.** **Drive 2 – The tape drive farthest from the magazine.**
Type	**Identifies the tape drive model.** **Note: If *8mm* appears, it indicates one of the following conditions:** ▪ No tape drive is present in that slot. ▪ A tape drive firmware error has occurred.
Present	**Indicates whether a tape drive is installed:** **0 – A tape drive is not present.** **1 – A tape drive is present.**

Drive Status screen	
Accessible	**Indicates the accessibility of the tape drive to the CHM:** **0 – A cartridge is loaded in the tape drive or the tape drive's status is unknown.** **1 – A cartridge is protruding from the tape drive or the drive is empty.**
Clean	**0 – The tape drive is clean.** **1 – The tape drive needs to be cleaned or the cleaning tape is used up.**
Warning	**Not currently used.**
Occupied	**0 – There is no cartridge loaded in the tape drive.** **1 – There is currently a cartridge loaded in the tape drive.**
Occ Valid (Occupied Valid)	**0 – The door has been opened or some other interruption has occurred so the occupied information may not be reliable.** **1 – The occupied information is reliable.**

Ejecting a cartridge manually

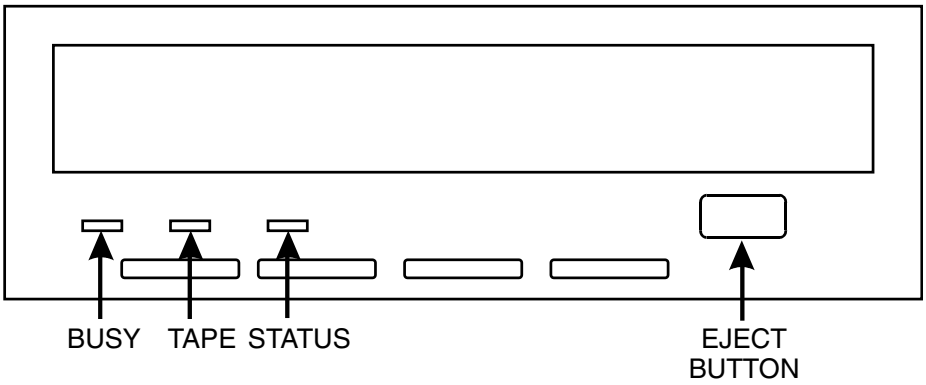
If a problem occurs that requires intervention, you may need to manually eject a cartridge.

To eject a cartridge:

1. Open the library door (see page 50).

2. Press the eject button on the tape drive's faceplate.

The following figure shows the location of the eject button on the AIT drive.


BUSY
TAPE
STATUS
EJECT
BUTTON

4 Maintenance

This chapter describes the following:

- Cleaning requirements for the library
- Replacing the fuse
- Replacing the air filter
- Replacing the tape drives

CAUTION

Unless you have a self-maintenance contract with ADIC, do not attempt to replace any components in the library, other than the tape drives, fuse, and air filter. If you do so, you will void your warranty.

Cleaning requirements

The only library components that should be cleaned are the tape drives and the window in the door. Instructions for cleaning the tape drives are provided on page 59.

CAUTION

The library's internal components are lubricated at the factory and should not be cleaned or relubricated.

To protect the internal components from dust, keep the library door closed and locked.

Cleaning the library window

To clean the library's window, use the cleaning packet provided with the library. (To order additional cleaning packets, see page xv)

CAUTION

To avoid scratching the window, do not use abrasive cleaners, abrasive cleaning implements, harsh chemicals, or solvents.

Replacing the fuse

The library uses a 2.5 amp, 250-volt fuse, which is located in the fuse drawer at the back of the library next to the power cord connector. An extra fuse is provided in the fuse drawer. To order additional fuses, see page xv.

CAUTION

When replacing the library's fuse, use only the same type and rating of fuse.

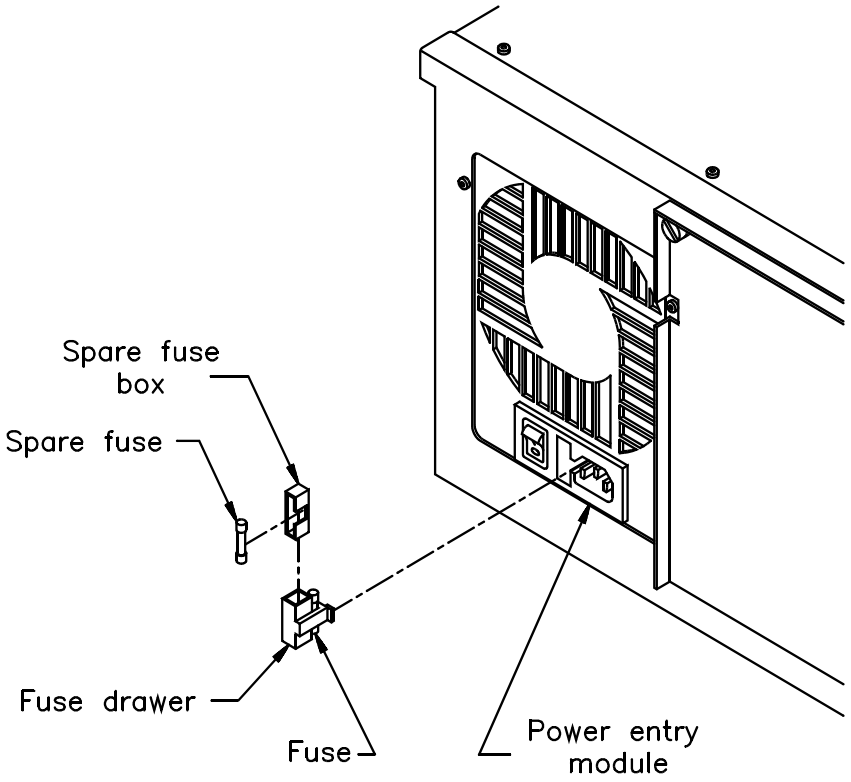
To replace the library's fuse:

1. Turn off the library and remove the power cord.

WARNING!

Before performing any of the following steps, be sure that the power switch is off and the power cord is disconnected from the library.

2. Place a small screwdriver underneath the tab on the fuse drawer. Gently lift out the fuse drawer.



3. Pull the blown fuse out of the fuse slot.

4. Use the screwdriver to push the spare fuse box out of the fuse drawer. Remove the spare fuse and place it in the fuse slot.

5. Insert the fuse drawer into the back panel. Push in until you hear it snap into place.

6. If desired, order another spare fuse for the fuse drawer.

Replacing the air filter

The library includes an air filter, located behind the door. The air filter should be replaced once a year (or more frequently if the library is operating in a dirty environment). To order replacement filters, see page xv.

➤ **Important** **Air filters protect the library from large contaminants, but are not intended to keep the tape drives clean. You must still clean the tape drives on a regular basis as described on page 59.**

To replace the air filter:

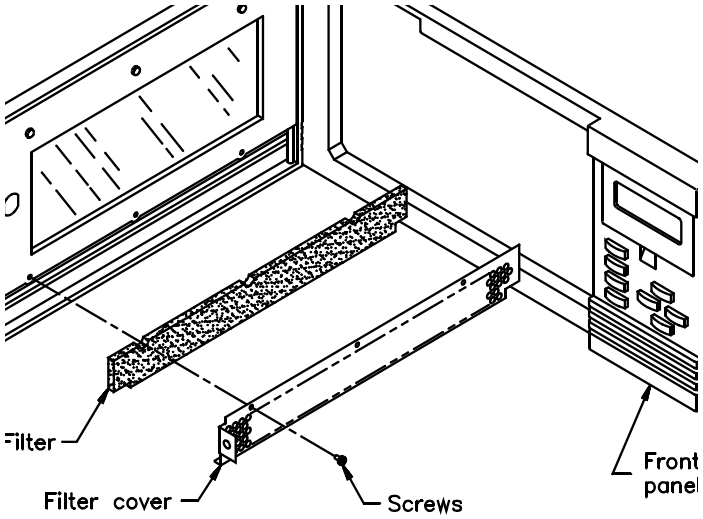
1. Unlock and open the library's door (see page 50).
2. From inside the door, use a T-15 TORX bit to remove the three screws that secure the metal filter cover to the front door, as shown in the figures on the next page.
3. Remove the metal filter cover and pull out the filter.

Note: The rack-mount model contains one long filter; the standalone contains two smaller filters.

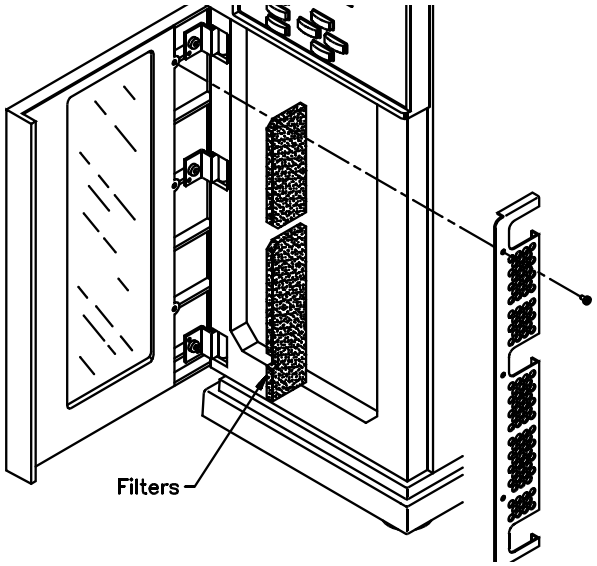
4. Replace the new filter inside the door.

5. Position the metal cover over the filter. Using a T-15 TORX bit, replace the three screws that secure the metal cover inside the front panel.

Rack-mount model:



Standalone model:



Replacing a tape drive (or drive blank)

➤ **Important** **Do not mix different SCSI configurations within the same library.**

Replacing a tape drive (or drive blank) involves the following steps:

✔	Step	Description
	1	**Prepare for the replacement procedure.**
	2	**Remove the tape drive.**
	3	**Install the tape drive.**
	4	**Resume library operations.**

Note: When you order a new tape drive for the library, the tape drive will be shipped to you in the drive carrier. You cannot install a tape drive into the library without a drive carrier.

Step 1 – Prepare for replacement

1. Obtain a flat blade screwdriver. (Some models may require a #1 Phillips screwdriver.)

2. Ensure that the environment is free of conditions that could cause electrostatic discharge (ESD). If possible, use an antistatic mat and grounded static protection wristband during installation. If a mat and wristband are not available, touch a known grounded surface, such as the computer's metal chassis.

3. Unlock and open the library's door (see page 50).

4. Turn the library's power switch to off.

5. Disconnect the power cord.

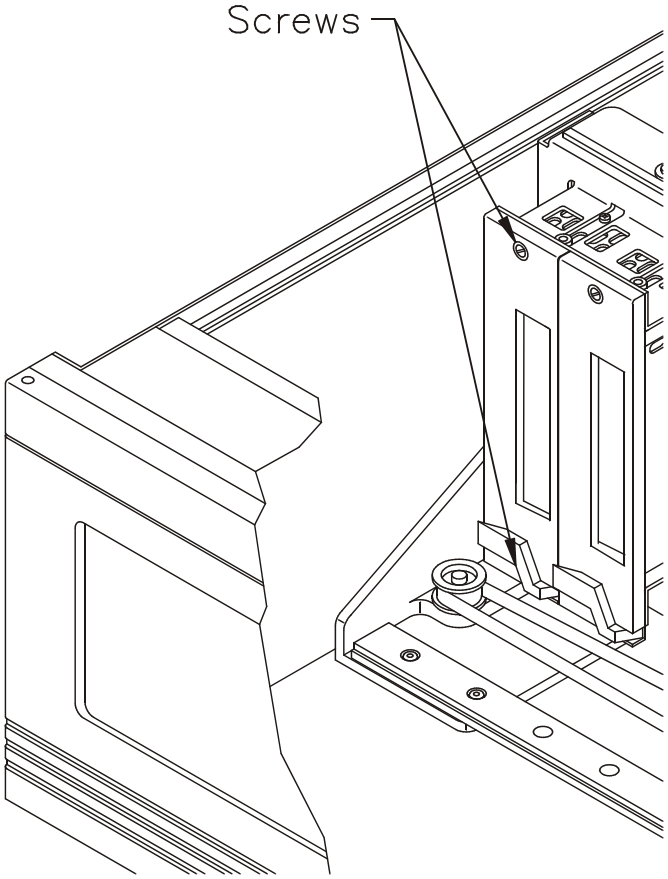
> **WARNING!**
>
> **Before performing any of the following steps, be sure that the power switch is off and the power cord is disconnected from the library.**

6. If necessary, reach in and push firmly against the base of the CHM to move it so it is not blocking access to the tape drives.

Step 2 – Remove the tape drive

To remove the tape drive:

1. Using a flat blade screwdriver, loosen the two captive screws on each side of the faceplate. (Some models may require a #1 Phillips screwdriver.)



2. Using your finger, pull out the lever on the faceplate. The figures on page 75 show the location of the lever.

> **CAUTION**
>
> **Do not pull out the lever without first loosening the screws.**

3. Pull the tape drive out of its slot.

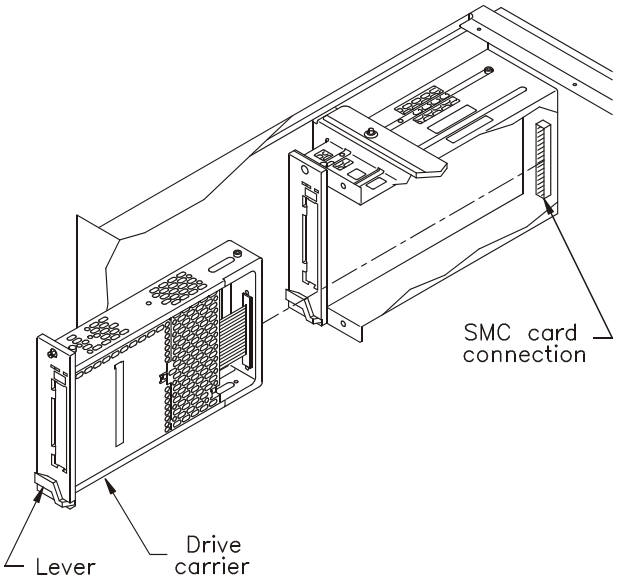
Step 3 – Install the tape drive

> **Important** **While installing a tape drive, make sure you do not stick your fingers in the drive door.**

1. Insert the tape drive as shown on the next page. Make sure the lever is closed. The drive should slide easily toward the back.

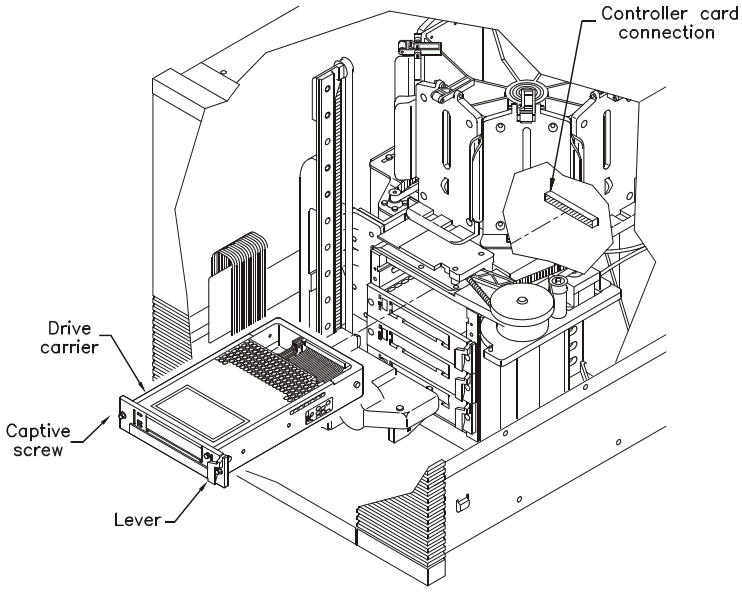
Rack-mount model:

Insert the tape drive with the lever toward the bottom.



Standalone model:

Insert the tape drive with the lever toward the right.



2. When the tape drive is almost completely inside the slot, you will feel some resistance. This is caused by the connection between the tape drive and the library's controller card. **To seat the connection, push firmly against the drive until you can push no further.**

3. Tighten the captive screws on each end of the drive carrier faceplate.

Step 4 – Resume operations

1. Reconnect the power cord.

> **CAUTION**
>
> **To avoid damaging the tape drive, make sure the library is powered off when you connect it to the SCSI bus.**

2. Close and lock the library's door.

3. Turn on the library. The library will take approximately one minute to complete its power-on self-test.

Note: When you replace a tape drive, the new drive automatically assumes the SCSI ID of the old tape drive. If you want to view or change the SCSI ID of the new tape drive, see page 30.

5 Shipping the Library

This chapter describes procedures for:

- Returning the library for service
- Packing the library

Returning the library for service

Most service procedures for your ADIC library will be performed on-site. In the event that you need to return the library to the factory for service, contact your service provider. If your service provider instructs you to return the library directly to ADIC, contact ADIC Technical Support to obtain a Return Materials Authorization (RMA) number and the shipping address (see page xv). When you have the RMA number, follow the packing instructions on the following pages.

Packing the library

Use the original packing materials to pack the library (shipping containers, foam packing pieces, and antistatic bag). You will also need packing tape and banding material.

CAUTION

To avoid damaging the library and voiding your warranty, be sure to use the original shipping materials (or replacement materials obtained from your vendor) when repacking and shipping the library. Do not use the shipping carton and packing materials to ship items other than a library.

Preparing the library for shipping

To prepare the library for shipping:

1. Remove all cartridges from the magazines. Make certain the CHM gripper and the tape drives do not contain cartridges. Do not remove the magazines.

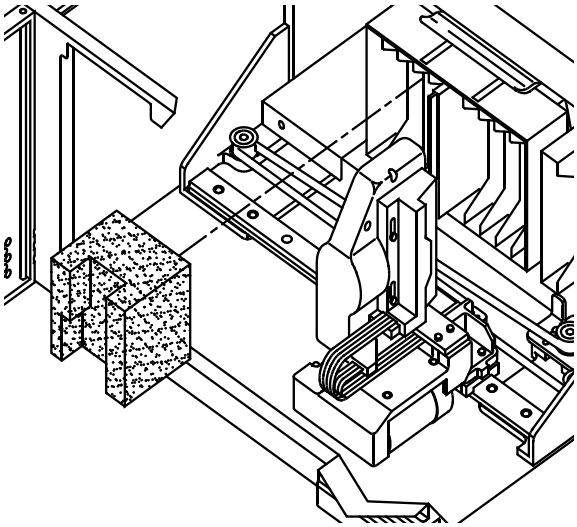
2. Power off the library.

3. Remove the keys, power cord, the SCSI cables and any terminators or jumpers. Do not ship these items if you are returning the library to the factory.

4. Insert the small foam packing piece in the cartridge magazine, as shown in the figures.

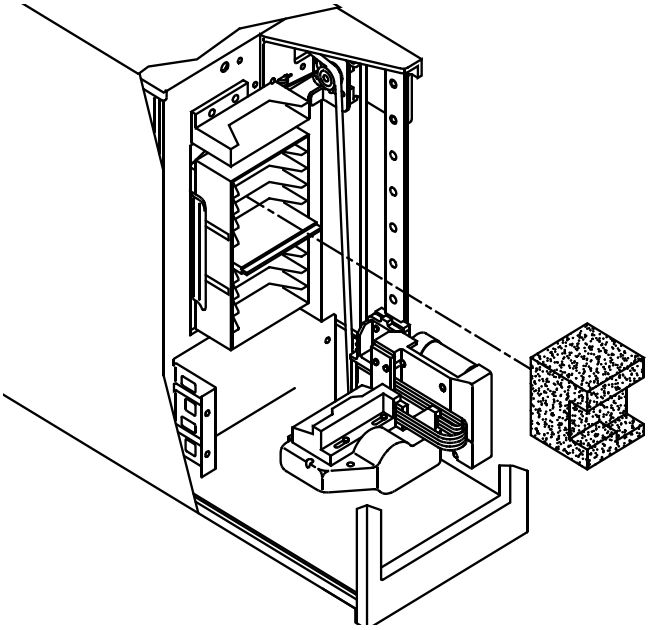
Rack-mount model:

Place the foam on the left side of the magazine.



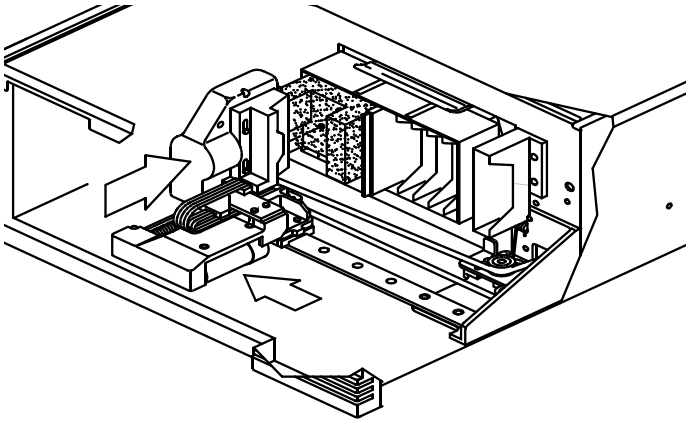
Standalone model:

Place the foam on the top half of the magazine.

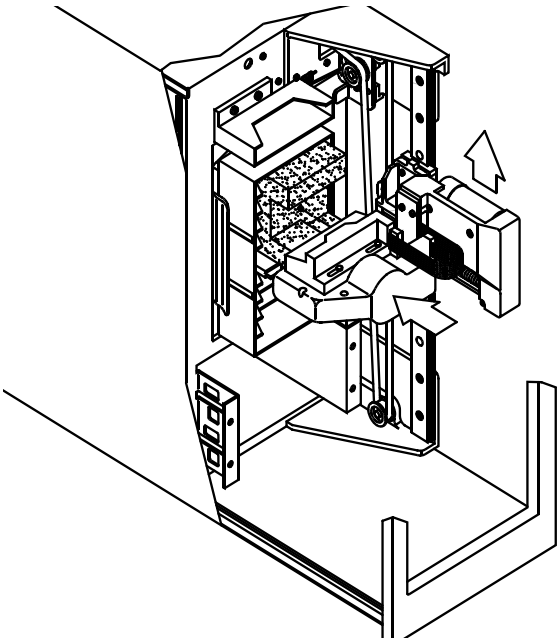


5. Move the CHM so that it is centered in front of the foam packing piece. Push the upper portion of the CHM forward until it is secure between the sides of the foam.

Rack-mount model:

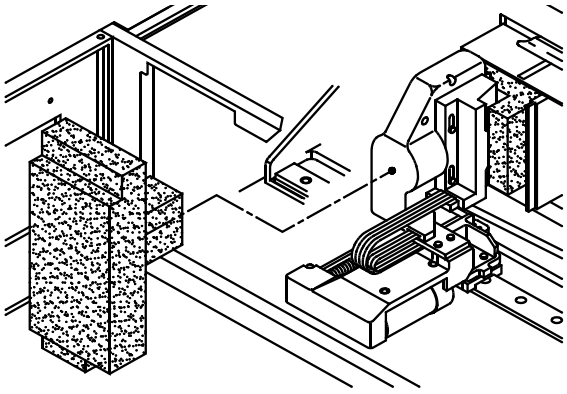


Standalone model:

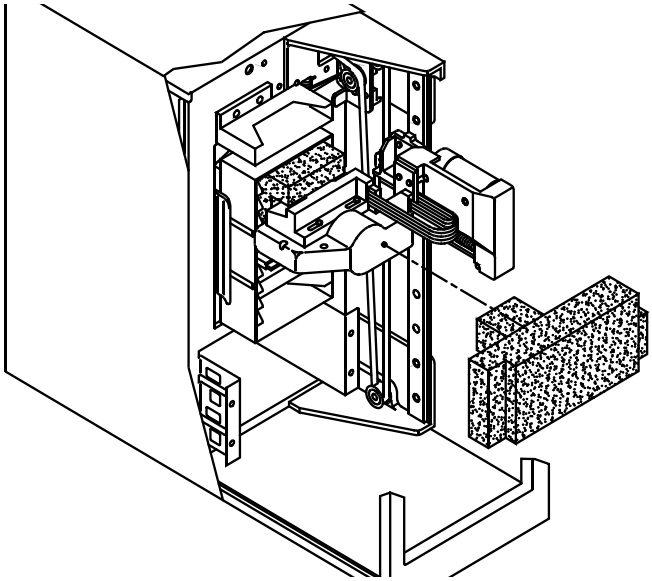


6. Insert the large foam packing piece between the CHM and the door opening, as shown below. Make certain the foam is flush against the upper base of the CHM.

Rack-mount model:



Standalone model:



7. Close and lock the library door. Remove the key.

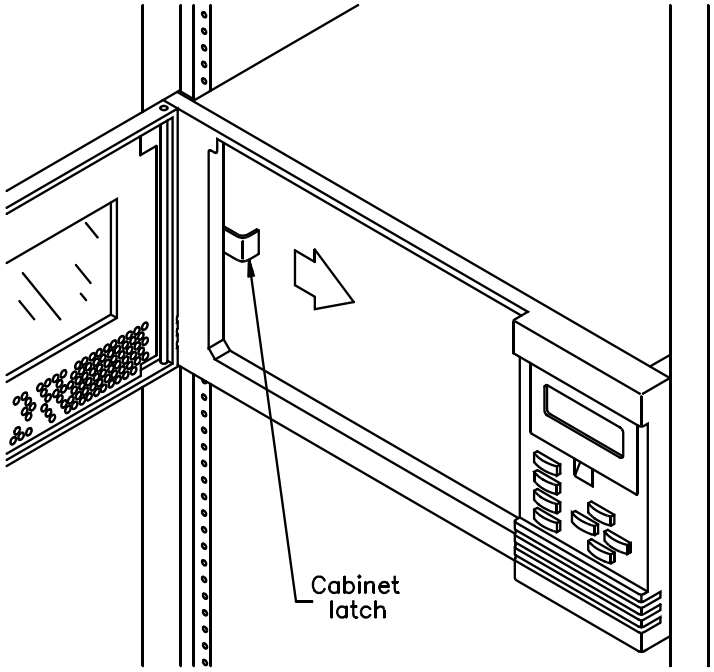
Removing the rack-mount model from the rack

WARNING!

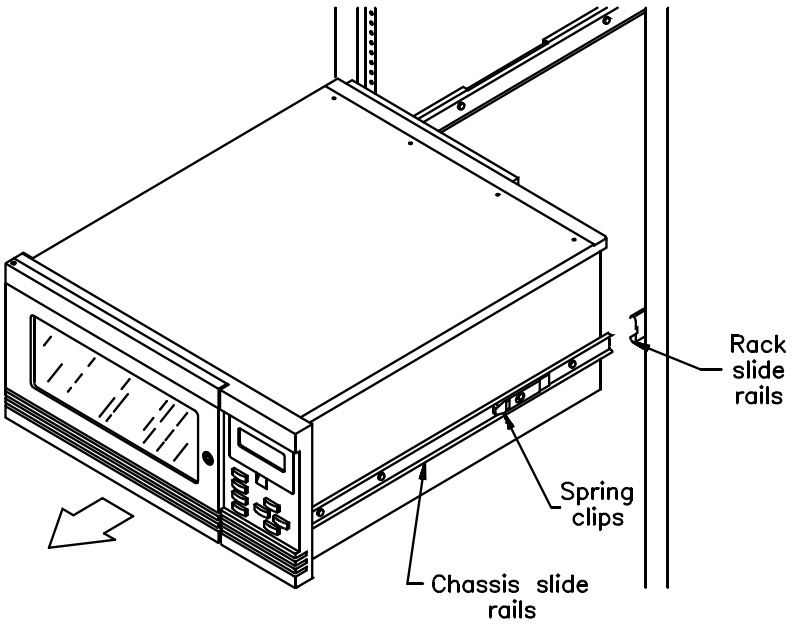
Depending on the number of drives installed, the rack-mount library weighs 50 – 70 pounds (27.2 – 31.8 kg). At least 2 people are needed to move or lift the library. Most of the weight is toward the back of the library.

To remove the rack-mount library from the rack:

1. Locate the cabinet latch, as shown in the figure below. Pull on the latch.



2. Slide the library forward until the rails stop at their spring clips. Using two people, press the spring clips to disengage the rails and lift the library out of the rack.



3. If you are shipping the slide rails with the library, use a T-20 TORX driver to remove the four screws that attach each rack slide rail to the front and rear of the cabinet. (See the figure on page 5.)

   Note: If clips nuts are attached to the rack, remove them.

4. Attach the two rack slide rails to the sides of the library.

Packing the library

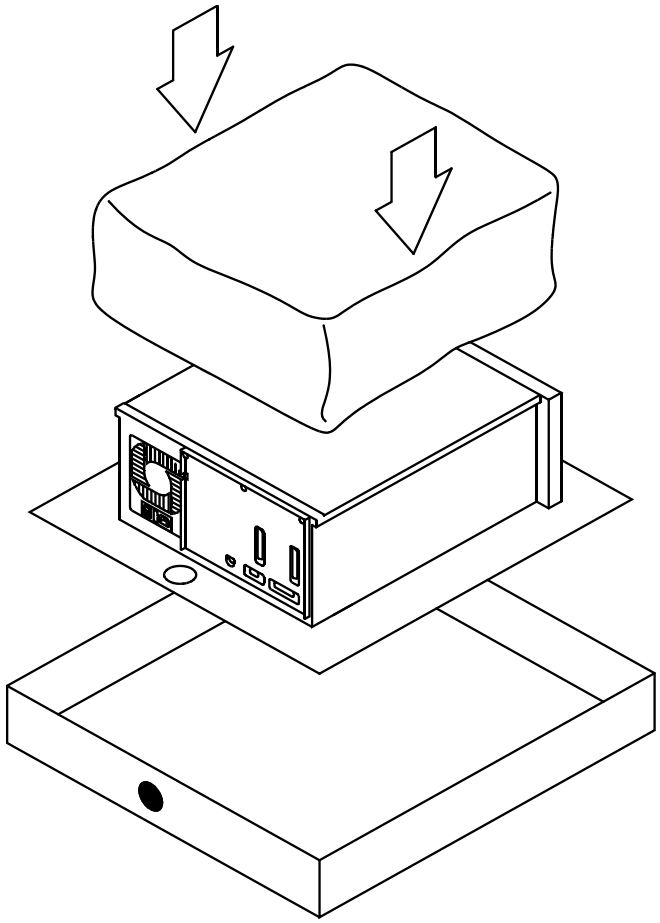
WARNING!

The rack-mount library weighs 50 – 70 pounds (27.2 – 31.8 kg); the standalone library weighs 70 –90 pounds (31.8 – 40.9 kg). At least 2 people are needed to move or lift the library. Most of the weight is toward the back of the library.

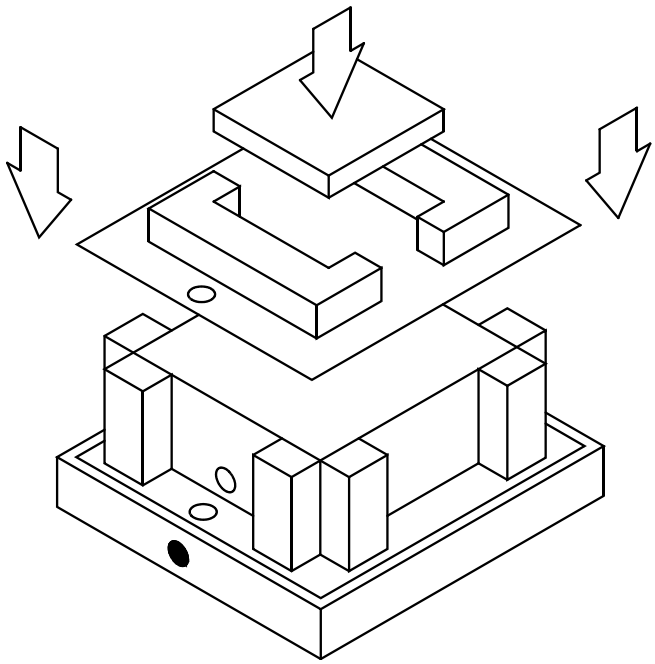
Note: The packaging for your library may differ from the packaging described in these instructions. For the most current packing instructions, contact ADIC Technical Support.

Refer to the figure on the next page and pack the library as follows:

1. Place the library on top of the bottom cushion, then place the antistatic bag over the library, as shown in the figure on the next page. For the standalone model, place the library on its side (CHM base down).



2. Place the cushioned packaging around the library, as shown below. (Use the alignment holes in the packing pieces as a guide.)

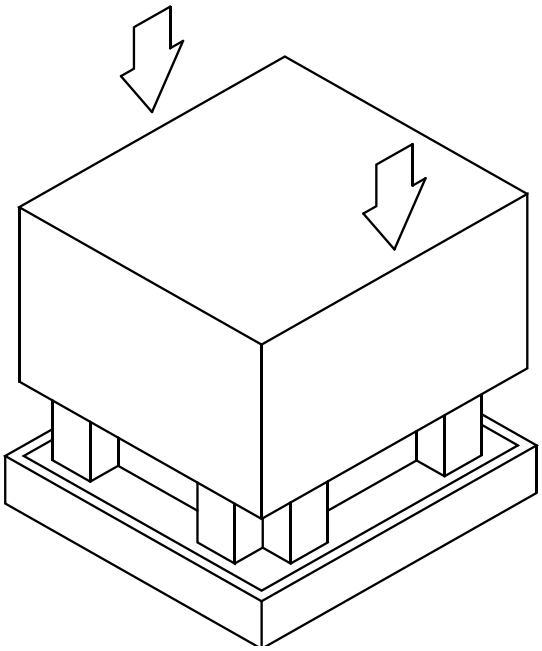


3. Place the cushioned top over the library. (Use the alignment holes in the packing pieces as a guide.)

4. If you are shipping accessories with the library, place the accessory box between the two top packing cushions.

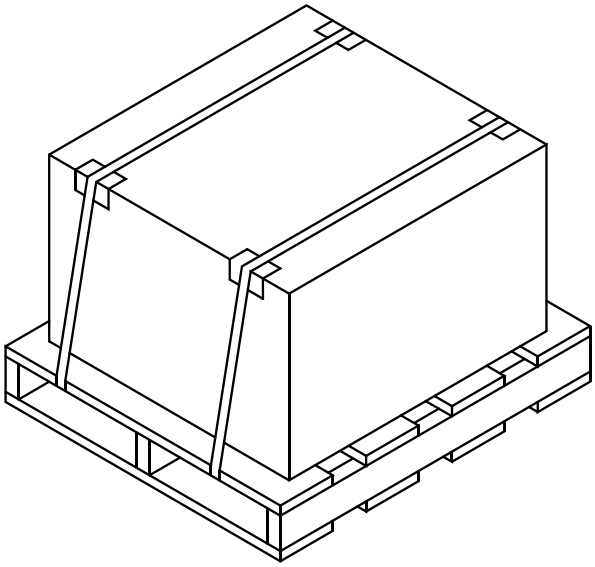
5. Lay the necessary paperwork in the top of the library box.

6. Place the carton over the library, as shown in the figure, and tape the box shut.



7. Place the shipping label on the box.

8. Place the library on the wooden pallet. Secure banding material around the box and through the wooden pallet.



6 Advanced Operation

This chapter describes advanced operations you can perform from the operator panel:

- Viewing library information, which includes SCSI data, hardware operating statistics and status, command history, and cartridge inventory
- Performing diagnostics on the library
- Configuring ports for diagnostics

Many of the tasks described in this chapter may be necessary if you want to troubleshoot library hardware operations.

Using elements

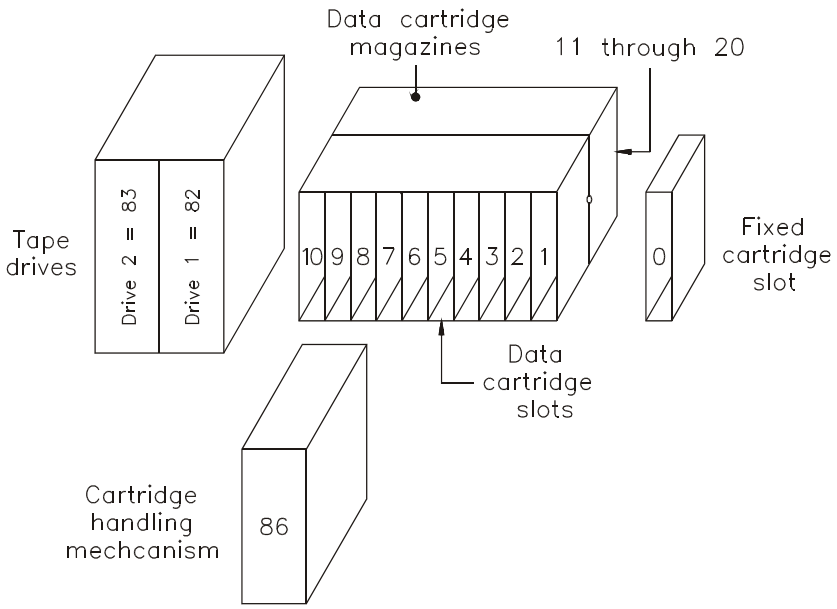
Elements are the physical locations in the library that can accept a cartridge (the CHM, the magazine slots, the fixed slot, and the two tape drives).

Element indexes

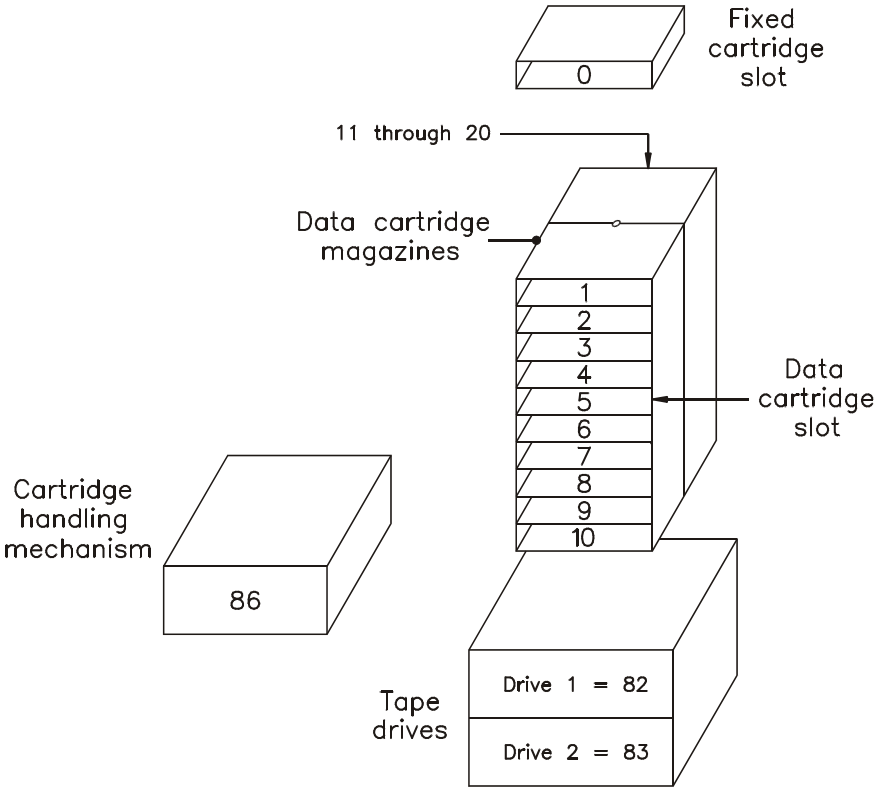
Each element has an *element index*, which enables the library to identify the elements. Many LCD functions require you to use element indexes. For example, to move a cartridge using the Diagnostics Menu, you must specify the source and destination element indexes. The *source* is either a cartridge slot or the tape drive where the CHM will pick a cartridge. The *destination* is either the slot or the tape drive where the CHM will place the cartridge.

The following diagrams show the element indexes assigned for the library.

Indexes for the rack-mount model:



Indexes for the standalone model:



Element addresses

Your application software may use *element addresses* to identify elements in the library. The difference between an element index and an element address is that an index is a fixed number set by the library, whereas an address can be changed by your application software (using the SCSI command, MODE SELECT).

The element indexes correspond to the library's default element addresses. To verify the current element addresses, display the SCSI Mode Parameters screen (see page 93).

Viewing library information

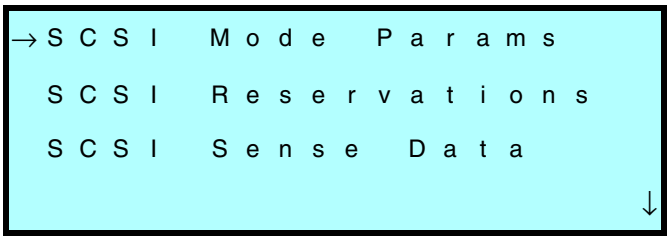
The functions in the Library Information Menu are mainly for use by technical support and application developers. If you are an end-user, you may be asked by technical support to display one of these screens and locate information that will help troubleshoot a problem.

This section describes the following library information:

- **SCSI Menu**. Contains SCSI mode parameters, reservations, and sense data.
- **Statistics.** Contains data about CHM operations and elements.
- **System sensors.** Contains information about the library's mechanical sensors.
- **Command history.** Displays the contents of the history buffer.
- **Inventory Menu.** Contains information about bar code labels and elements.

Viewing SCSI data

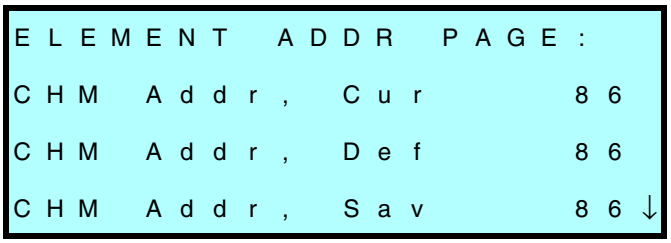
SCSI information is available through the SCSI Menu. To display this menu, select Library Info Menu from the Main Menu, then select SCSI Menu. The following menu appears:



SCSI Mode parameters

The SCSI Mode Parameters screen displays the settings of various operating mode parameters. These parameters are equivalent to the parameters reported by the library in response to a MODE SENSE command, issued by the application software. Typically, the values of these parameters are changed by a MODE SELECT command.

To view these parameters, select SCSI Mode Params from the SCSI Menu. The following screen appears:



For each parameter, the SCSI Mode Parameters screen shows the current (Cur), default (Def), and saved (Sav) values:

- The *current* value is the value currently active. It is either the power-on default or a temporary value set by the latest MODE SELECT command.
- The *default* value is the original value set at the factory.
- The *saved* value is the value specified as the power-on default by a MODE SELECT command. After a saved value has been specified with a MODE SELECT command, this value takes effect immediately and each time you power on the library.

The table below describes the items on the SCSI Mode Parameters screen:

SCSI Mode parameters:	
CHM Addr*	**The element address of the cartridge handling mechanism (CHM).**
Stor Addr*	**The element address of the first storage location, which is the fixed cartridge slot. See pages 90 and 91 for a complete numbering scheme.**
Drive Addr*	**The element address of the first tape drive (closest to the magazine). The other tape drive is numbered consecutively.**
Drive Num	**The number of tape drives installed.**
Parity	**Whether SCSI parity checking is enabled for the library. When the parity option is on, the library checks all data coming across the SCSI bus for parity.**
Pty Retry	**The number of times the library will retry a SCSI phase after detecting a parity error.**

SCSI Mode parameters:	
Security	**Whether security has been enabled by SCSI or not. (Security also can be enabled from the LCD; see page 32 for more information.)**
Wr Line 1 *through* **Wr Line 4**	**Whether the text displayed on each of the four lines on the Main Screen is defined by the LCD Mode page in SCSI.**

*** When set to their default values, the element addresses reported on this screen are the same as element indexes shown on pages 90 and 91. However, unlike element indexes, which cannot be changed, addresses can be changed with a MODE SELECT command.**

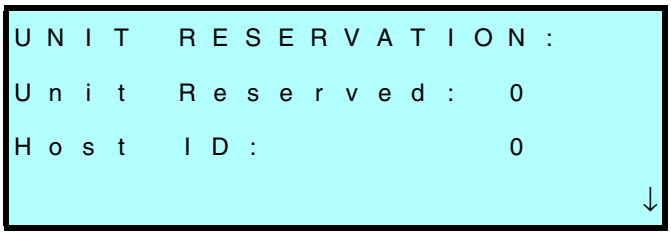
SCSI reservations

The SCSI Reservations screen indicates if the library or its elements are reserved for exclusive use by a host computer. The library and its elements are reserved and released through SCSI commands (RESERVE and RELEASE).

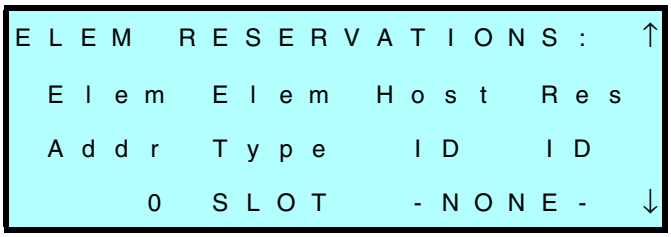
You may want to view SCSI reservations if you are operating the library in a multi-host environment and you want to determine which elements are reserved by which host. Multiple hosts can reserve different elements within a single library. For example, Host 1 could reserve the first magazine, while Host 2 could reserve the second magazine.

To view SCSI reservations:

1. Select SCSI Reservations from the SCSI Menu. The first screen to appear is the Unit Reservation screen:



2. To display the Element Reservations screen, press ↓ to scroll past the last item in the Unit Reservation screen.



3. To view other elements, press ↑ and ↓. To return to the SCSI Menu, press Escape.

The information in the SCSI Reservations screen is described in the following table.

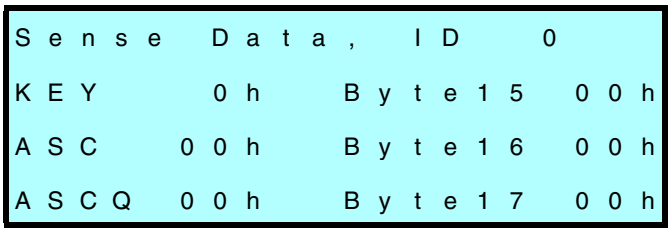
Unit reservations:	
Unit Reservation	**The library's reservation status (1 if it is reserved or 0 if it is not) and the host's ID, if the library is reserved.**
Elem reservations:	
Elem Addr	**The address of the element.**
Elem Type	**The category of elements. There are three categories: CHM, Drive, and Slot.**
Host ID	**The SCSI ID of the host that currently has the element reserved.**
Res ID	**The ID that the element is reserved under. This is a number assigned to the element by a host when the reservation was made. If there is no reservation, the Res ID and Host ID columns display "-NONE-".**

SCSI sense data

When an error or change of state occurs, the application software can issue a SCSI REQUEST SENSE command to the library to obtain information. Some of this information, called *sense data*, is displayed on the SCSI Sense Data screen. Sense data provides information to help you diagnose problems with the library.

To view the sense data:

1. Select SCSI Sense Data from the SCSI Menu. The following screen appears:



   The ID at the top of the display is the SCSI ID of the host that the sense data is being held for. (Note that sense data is supplied for inactive IDs as well as active IDs.)

2. To view other devices, press ↑ and ↓. To return to the SCSI Menu, press Escape.

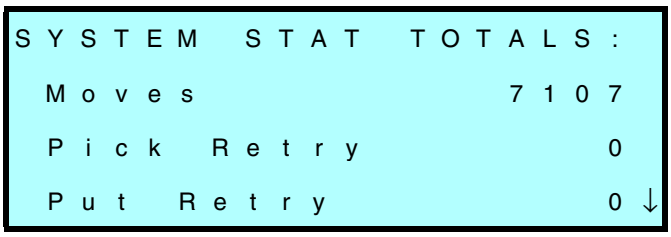
The following table describes the information in the Sense Data screen.

Sense data:	
KEY	**This is the sense key returned by the REQUEST SENSE command. The sense keys are:** **0h–No Sense There is no specific sense key information to report.** **2h–Not Ready The library is not ready to perform motion commands.** **4h–Hardware Error The library detected a hardware failure during a self-test or while performing a command. Operator intervention may be required.** **5h–Illegal Request There was an illegal parameter in the command descriptor block or in the additional parameters supplied as data for a command, or the library is in the wrong mode to execute the command.** **6h–Unit Attention The cartridge inventory may have been violated.** **Bh–Aborted Command The library aborted the command. The initiator may be able to recover by trying the command again.**
ASC	**This is the Additional Sense Code, which, along with the Additional Sense Code Qualifier, provides information describing a specific error condition.**
ASCQ	**This is the Additional Sense Code Qualifier, which, along with the Additional Sense Code, provides information describing a specific error condition.**
Byte 15	**This is the Sense Key Specific data, which provides additional information about an error condition. This information is valid only for the Illegal Request (5h) sense key.**
Byte 16	**This is the first byte of the Field Pointer data. It indicates which byte in the command had an error. This information is valid only for the Illegal Request (5h) sense key.**
Byte 17	**This is the second byte of the Field Pointer data. This information is valid only for the Illegal Request (5h) sense key.**

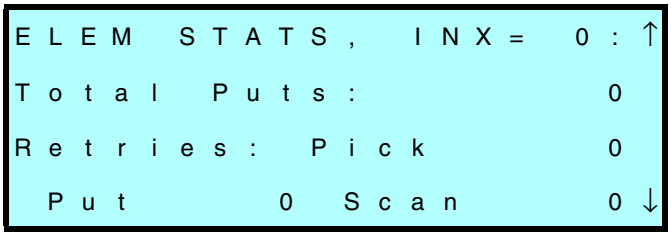
Viewing statistics

The Statistics Menu contains two selections: one for reviewing information about CHM movements and one for reviewing information about elements. To view statistics:

1. Select Library Info Menu from the Main Menu, then select Statistics. The first screen to appear is the System Stat Totals screen:



2. To display the Element Stats screen, press ⏎ to scroll past the last item in the System Stat screen.



The following table describes the information in the Statistics screen.

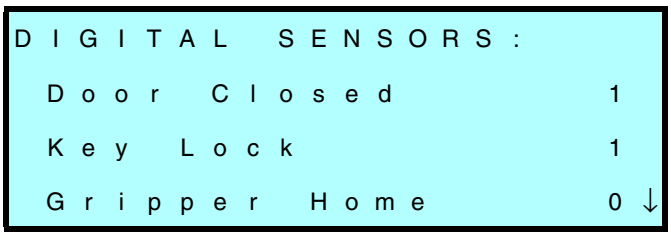
System statistics:	
Moves	**The number of times the CHM has picked a cartridge and placed it in a slot or tape drive.**
Pick Retry	**The number of times the CHM retried picking a cartridge.**
Put Retry	**The number of times the CHM retried placing a cartridge.**
D1 Dbl Piks **D2 Dbl Piks**	**The number of times the library had to grab a cartridge twice to remove it from the tape drive in Drive slot 1 or 2. A Dbl Pik results when the cartridge is not ejected far enough for the CHM to grasp.**
Scans*	**The number of times the library scanned a bar code label.**
Scan Retry*	**The number of times the library retried scanning a bar code label.**
Scan Fail*	**The number of times the library failed to scan a bar code. The library tried to scan a bar code several times before it logs a failure.**
Element statistics:	
Total Puts	**The number of times a cartridge was placed in that element since the library was turned on.**
Retries: Pick	**The number of times the library retried picking from that element.**
Retries: Put	**The number of times the library retried placing a cartridge in that element.**
Retries: Scan	**The number of times the library retried scanning that element.**

*** If your library does not include a bar code scanner, these fields always display zero.**

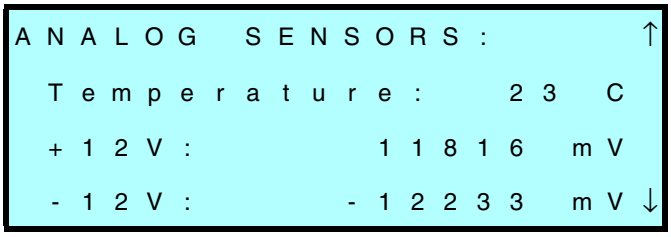
Viewing system sensors

The System Sensors screens enable you to troubleshoot hardware problems by checking the current status of the library's internal mechanical sensors. To view system sensors:

1. Select Library Infer Menu from the Main Menu, then select System Sensors. The Digital Sensors screen is the first to appear:



2. To display the Analog Sensor screen, press ↓ to scroll past the last item on the Digital Sensors screen.



The following table describes the information in the System Sensors screens.

Digital system sensors:	
Door Closed	**Indicates whether the front door is closed (1) or open (0).**
Key lock	**Indicates whether the front door is locked (1) or unlocked (0).**
Gripper Home	**Indicates whether the gripper is located in its home position (1) or not (0). The gripper is in its home position when the gripper fingers are open.**
Cart Seated	**Indicates whether the cartridge is seated in the CHM (1) or not (0).**
Analog system sensors:	
Tem-perature	**Indicates the temperature of the library in degrees Celsius.**
+12V	**Indicates the output of the +12-volt power supply in millivolts.**
-12V	**Indicates the output of the –12-volt power supply in millivolts.**
+24V	**Indicates the output of the 24-volt power supply in millivolts.**

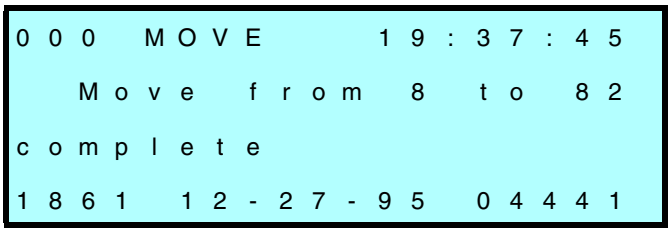
Viewing the command history

The Command History screen creates a display of the most recent 300 events that have occurred in the library. If you contact technical support personnel, a technician may ask you to scroll through this buffer looking for particular events.

To display the command history:

1. From the Main Menu, select Library Info Menu.

2. From the Library Info Menu, select Command History. The system displays a screen similar to the following:



3. Scroll through the buffer by pressing ↑ and ↓.

4. To exit the command history screen, press Escape.

The following table briefly describes the Command History screen. For complete details, refer to the History Buffer Display in the maintenance manual for your library.

Shown in sample	Field name	Description
000	IDX (Index)	The line number of this event within the Command History. The range is 000 (the most recent event) through 299. The most recent event is displayed first.
MOVE	From	The process that logged this event.
19:37:45	Time	The time, according to the library's internal clock, that the event took place.
Move from 8 to 82 complete	Description	Description of the event.

Shown in sample	Field name	Description
1861	Line	The line number of the source code that logged this event.
12-27-95	Date	The date, according to the library's internal calendar, that the event took place.
04441	Seq	The sequence number of this event across all system buffers.

Viewing inventory information

The library stores inventory information in nonvolatile RAM and uses the information to process SCSI commands from the application software. The inventory contains information about the following element locations:

- CHM
- Cartridge slots
- Tape drives

The Inventory Menu allows you to display the following information:

- **Bar Code Label information.** This includes data about whether the bar code scanner could accurately scan the label.

- **Element occupied information.** This includes data about whether the element contains a cartridge and whether a magazine or tape drive is installed.

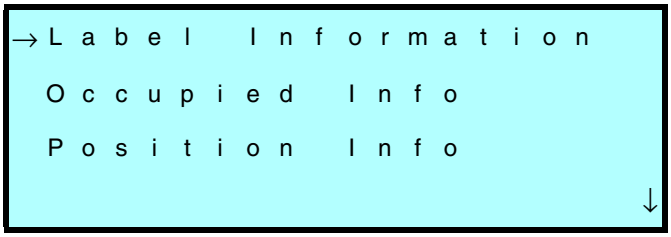
- **Element position information.** This includes data about the exact position of each element.

Bar code label information

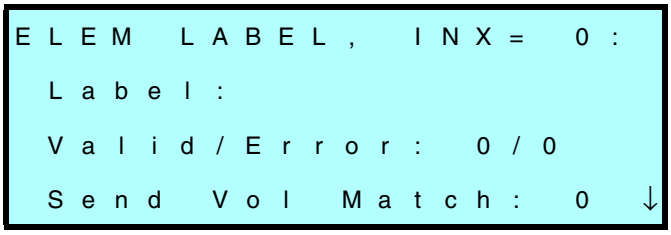
If your library is equipped with a bar code scanner, you can view information about the bar code labels attached to your cartridges. To display bar code label information:

1. From the Main Menu, select Library Info Menu.

2. From the Library Info Menu, select Inventory Menu. The following menu appears:



3. From the Inventory Menu, select Label Information. The following screen appears:



4. Press ↑ to view a higher element index; press ↓ to view a lower element index.

The following table describes the fields on the Element Label screen.

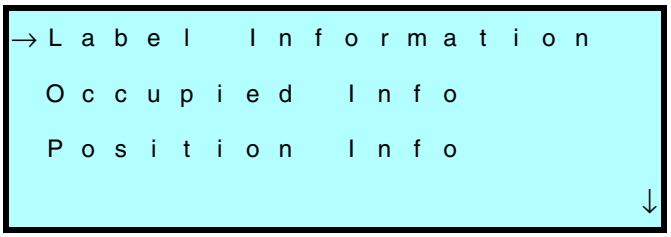
Element label:	
INX	**Displays the element index for which information is being displayed.**
Label	**If the element location contains a cartridge whose bar code label has been scanned, the Label field contains the cartridge label. (If the library is not equipped with a bar code scanner, this field is blank.)**
Valid	**Indicates whether the Label field is accurate, as follows:** **0 – The Label field is not accurate.** **1 – The Label field is accurate.** **(If the library is not equipped with a bar code scanner, this field is 0.)**

Element label:	
Error	Indicates whether the bar code scanner was unable to read the cartridge label, as follows: 0 – The bar code scan was successful, a reset condition occurred, or the door was opened. 60 –The bar code scanner could not read the bar code label because there was no label on the cartridge. 61 –The bar code scanner could not read the bar code label because the label was unreadable. 62 –The bar code scanner could not read the label because the magazine or tape drive is not installed. 65 –The bar code scanner could not read the label because a Direct Memory Access overrun occurred. 67 –The bar code scanner could not read the bar code label because a Direct Memory Access channel time-out occurred. 69 –The bar code scanner could not read the label because the label was upside down or misplaced. (If the library is not equipped with a bar code scanner, this field is 0.)
Send Vol Match	Indicates whether the cartridge label matched the template sent with the last SEND VOLUME TAG SCSI command, as follows: 0 – The label did not match the template. 1 – The label matched the template.

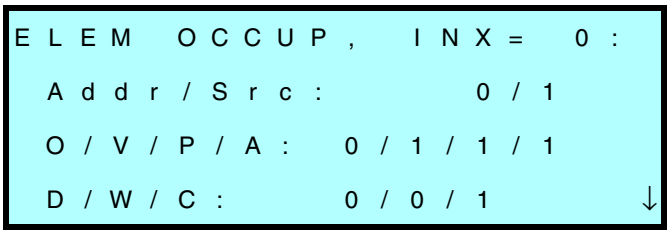
Element occupied information

1. From the Main Menu, select Library Info Menu.

2. From the Library Info Menu, select Inventory Menu. The following menu appears:



3. From the Inventory Menu, select Occupied Info. The following screen appears.



4. Press ↑ to view an element with a higher index; press ↓ to view an element with a lower index.

The following table describes the fields in the Occupied Info screen.

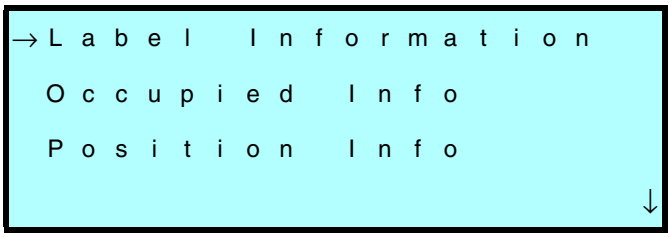
Occupied Info screen:	
INX	Displays the element index for which information is being displayed.
Addr (Address)	Shows the SCSI address of this element.
Src (Source Element Index)	Shows the index of the last storage element from which the cartridge was moved.
O (Occupied)	Indicates whether the library considers the specified element location to contain a data cartridge, as follows: 0 – The element location does not contain a data cartridge. 1 – The element location contains a data cartridge.
V (Occupied Valid)	Indicates whether the Occupied flag is accurate, as follows: 0 – The Occupied flag is questionable (may not be accurate). 1 – The Occupied flag is accurate.
P (Cartridge Magazine or Tape Drive Present)	Indicates whether the magazine or tape drive is installed. If the element index references a storage element, this flag indicates whether the magazine is installed. If the element index references a tape drive, this flag indicates whether that particular drive is installed. The values for this flag are as follows: 0 – Not installed 1 – Installed Note: The P (Present) flag is not used for the CHM.

Occupied Info screen:	
A (Tape Drive Accessible)	**Indicates whether a drive is empty, a cartridge is loaded in the drive, or the cartridge is ejected:** **0 – A cartridge may be loaded in the drive.** **1 – The drive is empty, or the cartridge is ejected and ready to be picked.**
D (Drive)	**Indicates whether this element is a tape drive:** **0 – The element is not a tape drive.** **1 – The element is a tape drive.**
W (Warning)	**Currently not used.**
C (Calibrated)	**Indicates whether the element position has been calibrated:** **0 – Not calibrated.** **1 – Calibrated.**

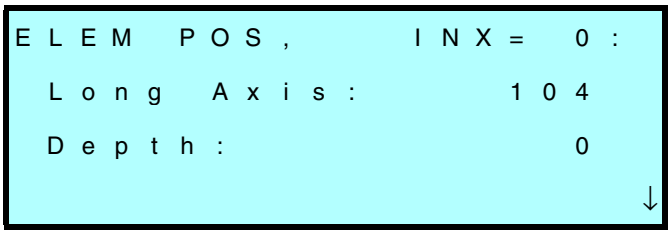
Element position information

1. From the Main Menu, select Library Info Menu.

2. From the Library Info Menu, select Inventory Menu. The following screen appears:



3. From the Inventory Menu, select Position Info. The following screen appears:



4. Press ↑ to view an element with a higher index; press ↓ to view an element with a lower index.

The following table describes the fields in the Position Info screen.

Position Info screen:	
INX	**Displays the element index for which information is being displayed.**
Long Axis	**Indicates the distance (in thousandths of an inch) the CHM has to move along the long axis from its home position to the specified element location.**
Depth	**Indicates the distance the CHM has to move along the short axis from its home position to touch the magazine or a cartridge in the magazine. (This field is not used for the tape drives or CHM.)**

Performing diagnostics

This section describes how to perform diagnostics using the Demo Menu and Diagnostics Menu from the operator panel. Both of these menus are available from the Maintenance menu. The Demo Menu provides options for running the library in a continuous demo mode, where the CHM randomly moves cartridges between slots and tape drives. The Diagnostics Menu provides options for performing specific CHM movements.

Note: You can also perform diagnostics using the library's internal firmware, which resides in the flash EEPROM. This firmware also allows you to upgrade to new library firmware and print a diagnostic listing. For information, see the maintenance manual for the library.

Using the Demo Menu

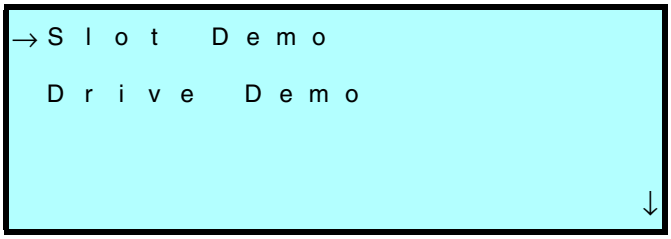
The Demo Menu includes two selections:

- **Slot Demo**. This option causes the CHM to randomly move cartridges from slot to slot, including the fixed cartridge slot.
- **Drive Demo.** This option causes the CHM to randomly move cartridges between magazine slots, the fixed slot, and the tape drives.

Starting a demo option

Before running a demo option:

1. If necessary, disable security (see page 34).
2. Change the control mode to LCD Interface (see page 47).
3. Make sure there is at least one data cartridge present and one empty slot before you begin the test.
4. From the Main Menu, select Maintenance Menu. Then select Demo Menu.The following menu appears:



Slot demo

To run the slot demo:

1. Select Slot Demo from the Demo Menu.

2. The library asks if you want cartridges scanned during the demo. If your library is equipped with a bar code scanner and you want to include bar code scanning in your demo, select YES. Otherwise, select NO.

   The system begins the demo cycles and displays the following screen:

   ```
   SLOT DEMO:
     Total Moves: n
   Status: Move nn-nn
   ```

   In the example above, *n* indicates the number of moves that have run so far, and *nn - nn* indicates the source and destination element indexes of the current move.

3. To abort the demo, press Escape, then Enter at the next screen. The library displays the total number of cycles that were run during the demo and an Error 91 message, indicating that you have aborted the demo.

Drive Demo

To run the drive demo:

1. Select Drive Demo from the Demo Menu.

2. The library asks if you want cartridges loaded into the tape drives during this demo. Select NO. The CHM will insert the cartridge into the drive slot, but will not push the cartridge all the way into the drive.

> **Important** **Do not select YES. If you do, the CHM will push the cartridge all the way into the drive and the drive will not automatically eject the cartridge.**

3. The system then asks if you want cartridges scanned during the demo. If your library is equipped with a bar code scanner and you want to include bar code scanning in your demo, select YES. Otherwise, select NO.

   The system begins the demo and displays the following screen.

```
DRIVE DEMO:
  Total Moves:  n
Status:  Move  nn-nn
```

   In the example above, *n* indicates the number of cycles that have run so far, and *nn - nn* indicates the source and destination element indexes of the current move.

4. To abort the demo, press Escape, then Enter at the next screen. The system displays the total number of cycles that were run during the demo and an Error 91 message, indicating that you have aborted the demo.

Using the Diagnostics Menu

The Diagnostics Menu provides basic exercising functions for components in your library. You can use these functions to test the hardware after installation.

Starting diagnostics

Before performing diagnostic exercises from the operator panel, do the following:

1. If necessary, disable security (see page 34).

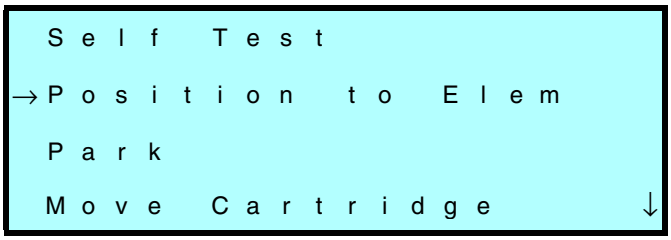
2. Change the control mode to LCD Interface (see page 47).

3. Refer to the table below for the element indexes. These numbers correspond to the library components and are necessary for some tests.

Library Component	Element Index
Fixed cartridge slot	**0**
Cartridge slots	**Scalar AIT 220: 1 to 20** **(See pages 90 and 91 for entire numbering scheme.)**
Tape drive 1	**82**
Tape drive 2	**83**
CHM	**86**

Performing diagnostic tests

1. From the Main Menu, select Maintenance Menu, then select Diagnostics Menu. A screen of diagnostic tests appears:



2. Select one of the tests. (Each test is described in the table starting on the next page.)

3. When the test is finished, the screen displays Status Complete and you can press Escape to return to the Diagnostics Menu.

   Note: If you want to abort a test in progress, press Escape, then Enter.

The following table describes each test and also provides additional instructions for performing the tests (if applicable).

Test	Description	Additional instructions
Self Test	**Causes the CHM to do the following:** ▪ Perform a Home CHM test. ▪ Cycle the short axis once. ▪ Cycle the long axis once. ▪ Move the CHM to home position.	
Position to Elem	**Positions the CHM in front of a tape drive, fixed cartridge slot, or a magazine slot.**	**When you select Position to Elem, another screen appears that requires you to press** W **or** Z **to select the element index where you want to position the CHM, then press** [Enter].
Park	**Moves the CHM to the park position (at the top of the long axis for the standalone model or the right of the long axis in the rack-mount model).**	
Move Cartridge	**Moves a cartridge from one location to another.** **Important: Do not insert a cartridge in a tape drive. The tape drive will not automatically eject the cartridge.**	**When you select Move Cartridge, the Set Source screen appears. Press ↑ or ↓ to select the source index (the slot you want the CHM to pick from), then press Enter. The Set Destination screen appears. Press ↑ or ↓ to select the destination index (the slot where you want the CHM to place the cartridge), then press Enter.**

Test	Description	Additional instructions
Scan	If your library is equipped with a bar code scanner, the Scan test scans all the elements. If your library is not equipped with a bar code scanner, the CHM will touch the cartridges and update the cartridge inventory.	After the system scans all the elements, it stores the data in the cartridge inventory and displays any scan errors on the Label Information screen (see page 106).
Scan with Range	If your library is equipped with a bar code scanner, the Scan with Range test scans a range of bar code labels. If your library is not equipped with a bar code scanner, the CHM will touch the cartridges and update the cartridge inventory.	When you select Scan with Range, the Set Scan Start screen appears. Press ↑ or ↓ to specify an element index where you want the scanner to begin, and press Enter. The Set Scan Stop screen appears. Press ↑ or ↓ to specify an index where you want the scanner to stop, and press Enter. After the system scans the labels, it stores the data in the cartridge inventory and displays any scan errors on the Label Information screen (see page 106).
Home Gripper	Causes the gripper to move to its home position (open). This test also recalibrates the home or zero position for the gripper.	

Test	Description	Additional instructions
Home CHM	**Causes the CHM to retract on its short axis, move to the home position (the top of the long axis for standalone models or to the right for rack-mount models), move in front of the tape drives, then open and close its gripper** **This test also recalibrates the home or zero position for the long axis, the short axis, the gripper and the drum.**	
Cycle Pick/Place	**Causes the CHM to take a cartridge from a specified element and replace it in the same location.**	**When you select Cycle Pick/Place, the Set Source screen appears. Press ↑ or ↓ to select the source index (where you want the CHM to pick and place the cartridge). The Set Cycles screen appears. Press ↑ or ↓ to select the number of cycles you want this test to run and press Enter.**
Cycle Gripper	**Causes the CHM gripper to open and close the number of times you specify.**	**When you select Cycle Gripper, the Set Cycles screen appears. Press ↑ or ↓ to select the cycles for the Cycle Gripper test to run and press Enter.**
Cycle S Axis	**Causes the CHM to move end to end along the short axis (the axis on which the CHM moves in and out).**	**When you select Cycle S Axis, the Set Cycles screen appears. Press ↑ or ↓ to select the number of cycles you want the Cycle S Axis test to run and press Enter.**
Cycle L Axis	**Causes the CHM to move end to end along the long axis (the axis on which the CHM moves left and right for the rack-mount model or up and down for the standalone model).**	**When you select Cycle L Axis, the Set Cycles screen appears. Press ↑ or ↓ to select the number of cycles you want the Cycle L Axis test to run and press Enter.**

Test	Description	Additional instructions
Cycle Solenoid	**Exercises the solenoid that controls the locking mechanism on the front door.**	**When you select Cycle Solenoid, the Set Cycles screen appears. Press ↑ or ↓ to select the number of cycles you want the Cycle Solenoid test to run and press Enter. You will hear a click each time the solenoid extends and retracts**
Cycle Drum	Rotates the drum assembly 180 degrees.	

Configuring the serial ports for diagnostics

You can use one of the library's serial ports and a console interface program (such as CHSTERM) to access the library firmware. The console interface, also referred to as the *Diagnostic Console*, allows you to view information about the library, perform diagnostics tests, create diagnostic listings, and download new firmware. You can also use the library's serial ports to perform diagnostics on the tape drives.

The following table illustrates the functions you can perform using the serial ports. As the table indicates, unless you want to control the motion of the CHM, you do not need to switch to 9-Pin or 25-Pin Serial Port control mode (or to 25/9 Pin control mode).

Function	Serial Port		Must change control modes?
	9-Pin	25-Pin	
Controlling the CHM for diagnostic purposes	✔	✔	✔
Upgrading library firmware	✔		

Creating diagnostic listings for the library	✔	✔	
Upgrading tape drive firmware	✔	✔	
Controlling the tape drives for diagnostic purposes	✔	✔	

For detailed information about using the Diagnostic Console and the serial ports, refer to the maintenance manual for your library.

Procedure for configuring ports

To configure the port:

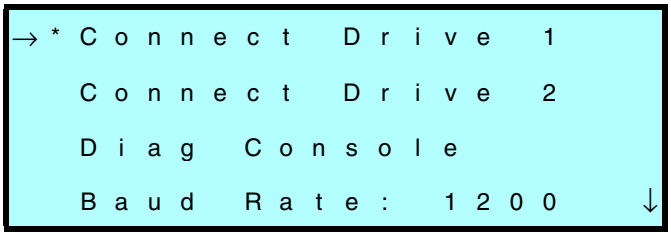
1. If necessary, disable security (see page 34).

2. If you want to control CHM motion, change the control mode to the appropriate serial port mode (see page 47).

> ➤ **Important** **Do not change to a serial port control mode if you want to connect a serial port to a tape drive.**

3. From the Interface Menu, press ↑ and ↓ to select Config 25/9 Pin Menu.

Note: An asterisk (*) indicates the current connection.



Important **If you connect a serial port to a tape drive, you will interrupt any SCSI commands being sent to that drive.**

4. Select one of the options listed below:

   - Connect to Drive 1 (closest to the magazine)
   - Connect to Drive 2 (farthest from the magazine)
   - Diag Console (the library's diagnostic firmware)

5. When you have selected the option you want, press Enter. The system configures the port and displays a confirmation message. Press Escape to exit this message.

6. Press ↑ to assign one of the baud rates to the port and press Enter. An asterisk (*) indicates the current connection. (Use 9600 baud to connect to a tape drive.)

If you selected Connect to Drive 1 or Connect to Drive 2 to perform tape drive diagnostics, be aware of the following:

- The library changes back to the default setting, Diag Console, after the library door has been opened and closed or after the library has been reset.

- If you attempt to exit the Config Port menu while the library is still set to Connect to Drive 1 or Connect to Drive 2, the library displays a message that instructs you to change the port setting back to Diag Console.

Notes

7 Troubleshooting

This chapter provides a list of suggestions for solving problems that may occur when you are installing and operating the library and the enclosed tape drives. The instructions in this chapter are basic troubleshooting guidelines. For more advanced troubleshooting, contact your service provider.

This chapter is divided into the following sections:

- Problems with library installation
- Problems with tape drive operation
- Problems with library operation

Note: If an error code is displayed on the LCD, refer to Appendix C. If LEDs on the tape drive are flashing, see page 58.

Problems with library installation

If your library and application software are not communicating after installation, check the following:

- ✔ **SCSI IDs.** Make sure that the SCSI IDs you selected for the tape drives and library are not the same as the ID used by any other SCSI device on that bus, including the SCSI adapter card. Refer to page 30 for information about setting the SCSI IDs.

- ✔ **SCSI bus connections.** Make sure that you have connected the SCSI cables to the appropriate SCSI connectors on the back of the library. See page 21 and Appendix B for more information.

- ✔ **SCSI cabling.** Make sure that all SCSI cables are securely connected at both ends.

- ✔ **Single-ended and differential devices.** Make sure all devices on the bus are all single-ended or differential. These devices include the controller cards, cables, and terminators.

- ✔ **Narrow SCSI and wide SCSI**. Make sure all devices within the library are either narrow SCSI or wide SCSI. Do not mix narrow and wide SCSI within the library.

- ✔ **SCSI cable lengths**. Make sure the internal SCSI cabling does not exceed maximum lengths (see page 140).

- ✔ **Termination**. Make sure your bus is properly terminated as described in Appendix B. If another SCSI device previously terminated the SCSI bus and is no longer at the physical end of the bus, be sure to remove the terminators from that device.

- ✔ **Compatibility.** Make sure that your tape drive and library are compatible with the SCSI adapter card and application software you plan to use.

- ✔ **SCSI adapter card installation.** Make sure that you installed your SCSI adapter card correctly. Refer to the documentation that came with your card for installation and troubleshooting instructions. Pay special attention to steps describing setting various jumpers and switches on the card. Make sure that the card is properly seated.

- ✔ **Software installation.** Make sure that your application software is installed correctly. Refer to the documentation that came with your software. Pay special attention to steps describing configuring the software for use with the library and tape drives.

- ✔ **Control mode.** Make certain the library is operating in the correct control mode. For most applications, the control mode should be set to SCSI Interface. See page 46 for more information.

After checking the items above, reset the library as described on page 56.

Problems with tape drive operation

If you have been successfully operating the application software and library in the past, but are now experiencing problems reading and writing data, check the following:

✔ **Write-protect switch**. If you are writing data, make sure the cartridge is write enabled (move the write-protect switch toward the edge of the cartridge).

Cartridge brand. Only use Sony SDX1-25C or SDX1-35C AIT data cartridges in AIT-1 drives, and SDX2-36C or SDX2-50C AIT data cartridges in AIT-2 drives. These data cartridges support the Advanced Intelligent Tape format. The cartridges use a new recording format, Adaptive Lossless Data Compression (ALDC), Memory In Cassette (MIC™) technology capabilities and use Sony's AME media, which incorporates dual cobalt magnetic layers, the absence of binder material to prevent tape head contamination and a super-durable "diamond-like carbon" protective coating for extreme durability. See page 49 for more information.

✔ **Cartridge age**. If the cartridge has been in use for a long time or if it has been used frequently, try using a new cartridge.

✔ **Cleaning**. Clean the tape drive as described on page 59. Make sure you are using the recommended cleaning cartridge for your tape drive.

Problems with library operation

If the library has been successfully operating in the past, but is now experiencing problems, check the following:

- ✔ **Control mode**. If you are using an application software package to control CHM operations, the library must be set to SCSI Interface mode. See page 47 for more information. If you are trying to operate the library in one of the sequential modes, be sure to read Appendix D.

- ✔ **Security**. Make sure that security is set correctly for the operation you are trying to perform. If security is enabled, you cannot perform many operations on the LCD and you cannot open the door. Security can be enabled from the LCD (see page 32) or from your application software with a SCSI command.

- ✔ **Door open**. Make sure the door is closed and locked. You can check the Door Closed and Key Lock lines on the System Sensors screen to determine if the door and key lock sensors are properly working (see page 102).

- ✔ **CHM operation**. You can use the selections in the Diagnostics Menu and the Demo Menu to determine if the CHM is functioning properly. See page 113.

- ✔ **Fuse**. Make sure the fuse is good. See page 67.

Notes

A Specifications

This appendix provides general specifications for the library, including:

- Storage capacities
- Overall specifications
- Power cord requirements
- SCSI cable specifications
- SCSI terminator requirements

Storage capacities

The Scalar AIT 220 library with 20 Sony SDX2-50C AIT data cartridges has a maximum capacity of 2.0 Terabytes (2:1 compression).

Overall specifications for the library

General specifications	
Interface:	When equipped with AIT-1 drives, Fast/Wide SCSI When equipped with AIT-2 drives, Wide Ultra SCSI
Maximum sustained data transfer rate:*	12.0 MB per second
Size and weight	
Size (rack-mount model):	8.6 high × 19.0 wide × 21.1 long (inches) (21.98 × 48.26 × 53.67 cm)
Size (standalone model):	22.0 high × 9.4 wide × 21.4 long (inches) (55.88 × 24.0 × 54.36 cm)
Weight (rack-mount model):	63.4 lbs (28.76 kg) with two tape drives installed
Weight (standalone model):	82.0 lbs (37.2 kg) with two tape drives installed
Operating environment	
Ambient temperature:	+5°C to +35°C (+41°F to +95°F)
Relative humidity:	20% to 80%, noncondensing
Wet bulb:	26°C (79°F) max
Power	
Input voltages:	Accepts 90 to 259 VAC at 48 to 62 Hz; automatic input voltage selection
Power consumption:	60 watts minimum; 110 watts maximum
BTU consumption:	205 BTU/hour minimum; 375 BTU/hour maximum

* Assumes AIT-2 drive with an average 2:1 compression ratio.

Power cord requirements

The library is shipped with a seven-foot (2.1 meter), 18 AWG, 3-conductor AC power cord for 120 volt use in the United States and Canada. The power cord has a molded NEMA 5-15P male connector on one end and a molded IEC type CEE-22 female connector on the other end. The power cord is UL Listed and CSA Certified.

Other voltages and international use

If you are planning to use an input voltage other than 120 volts AC or if you plan to use the library outside of the United States or Canada, you must supply your own power cord.

Criteria for U.S. and Canadian 220 VAC power cord

- It must have a molded NEMA 6-15P attachment plug on one end.
- It must have a molded IEC type CEE-22 female connector on the other end.
- The cordage must be an SJT or SVT type, 3-conductor, 18 AWG minimum.
- The power cord must comply with local electrical code.

Criteria for international 220 VAC power cord

- It must have an attachment plug of the proper type, rating, and safety approval for the intended country.
- It must have an IEC type CEE-22 female connector on one end.
- The flexible cord must be of a HAR (harmonized) type H05VV-F-three-conductor cord with a minimum conductor size of 0.03 square inches (1.0 square millimeters).

SCSI terminator specifications

The SCSI terminator must match the SCSI bus configuration (LVD or HVD). In addition, all termination must be external. Do not use internal terminators to terminate the library or the tape drives.

To ensure proper performance of the library and tape drives, ADIC recommends one of the following external terminators:

Differential wide external terminator:

- LVD — ADIC p/n 61-3020-02
- HVD — ADIC p/n 61-1140-01

SCSI cable specifications

The following tables list the recommendations for external SCSI cables for the library.

Wide SCSI cables
Use cables that conform to SCSI-3 specifications.

Cable length for differential configurations

The total length of all internal and external cables on the HVD SCSI bus should not exceed 25.0 meters (82 feet).

The total length of all internal and external cables on the LVD SCSI bus should not exceed 12.0 meters (41 feet).

Determining the cable length for each bus

1. For each bus, add the lengths of all external SCSI cables.

2. To that total, add the SCSI cable lengths used by the library *for each bus*:

   - For each tape drive, add 23 cm (9 in) to allow for the cable used by the tape drive inside the library.
   - For each jumper you plan to install on the library to connect sequential devices to the same bus, add 5 cm (2 in.).
   - For the library, add 5 cm (2 in.) for the internal cable used by the library itself.

Remote reset cable specifications

The remote hardware reset port on the back panel allows you to perform a manual hardware reset on the library to clear hardware errors. This port requires an 8-pin circular DIN connector and a two-wire cable capable of providing momentary contact between pin 1 and pin 2.

Notes

B SCSI Configuration

This appendix provides an overview of the *Small Computer System Interface 2* (*SCSI-2*) and gives an overview of how to configure the SCSI bus. *SCSI* is a standard specification that allows an application running on a host computer to communicate with peripheral SCSI devices, such as the library and the enclosed tape drives. The library uses SCSI commands to receive instructions from the host and to report its status to the host.

SCSI components

The SCSI system consists of the following components:

- **Initiator.** The host computer system acts as the initiator of commands. It consists of the application software, the operating system, the device driver, and the SCSI adapter card.

- **Bus.** The SCSI cables connected to the adapter card and to the library (as well as other devices on the bus) provide a pathway (or "bus") for passing commands.

- **Targets.** The library and the tape drives are peripheral devices (or targets) that are capable of receiving commands from the host. Up to eight devices (including the host computer) can be connected to the SCSI bus, in what is referred to as a *daisy chain*.

Installing the library on the SCSI bus

This section provides the basic rules and considerations for setting up the library on the SCSI bus.

Single-ended or differential

Every SCSI device attached to the SCSI bus must be of the same type: either *single-ended* or *differential*. On a single-ended SCSI bus, one signal line is used to transmit a bus signal between devices. On a differential bus, two signal lines are used.

Your library is differential; all devices must be differential. These other devices include the tape drives installed in the library, the adapter card installed in your host computer, and terminators.

Narrow or wide SCSI

The Scalar AIT 220 supports AIT tapes drives with wide SCSI configurations.

Fast SCSI

The library supports AIT tapes drives with fast SCSI, which does not require any special cabling or configuration. However, proper cable lengths, stub length, and termination are more important on a fast SCSI bus than on a regular SCSI bus.

SCSI cabling

When connecting the library and other devices on the SCSI bus, follow these guidelines for SCSI cabling:

- ✔ **Differential SCSI cable lengths**. Make sure the total length of all internal and external cables on the SCSI bus does not exceed 82 feet (25.0 meters). If LVD devices are connected to the bus the total length of all internal and external cables on the SCSI bus does not exceed 41 feet (12.0 meters).

- ✔ **Internal cabling**. You must include the amount of internal cabling in your calculations. See "Determining the cable length for each bus" on page 136 for information.

  If you have any other external devices on the bus (not installed inside your host computer), these devices may have some amount of internal SCSI cabling as well.

Termination

If the library or any of the tape drives is the last device on the SCSI bus, you must attach a terminator to the appropriate SCSI connector at the back of the library. The SCSI terminator must match the SCSI bus configuration (differential, wide) .

SCSI IDs

Each device on the SCSI bus must have a unique ID. The host computer uses these IDs to identify each device. The SCSI ID also determines which device has priority when more than one device is trying to communicate with the host. The lower the ID, the lower the priority of the device.

Note: The SCSI ID does not depend on physical location. For example, the last device on a multi-device SCSI bus can have a SCSI ID of 2.

If you have one tape drive installed, the library uses two SCSI IDs, one for the library itself and one for the tape drive. If you have two drives installed, the library uses three IDs. Separate IDs allow the library and tape drives to operate as independent devices, receiving different sets of SCSI commands from the host.

C Error Codes

This appendix describes the error codes that appear on the library's LCD (liquid crystal display). LCD error codes do not reflect tape drive errors.

> **CAUTION**
>
> **Library components can be replaced only by ADIC-approved service providers. If you cannot find an obstruction or other obvious cause for the problem, contact your service provider. Unless you have a self-maintenance contract, do not attempt to replace any components. If you do, you will void your warranty.**

For information about SCSI error conditions (sense data), refer to pages 97 and to the *Scalar AIT 220 Library SCSI Reference*.

CAUTION

Some corrective actions advise you to reset the library. Before resetting, make sure there is no SCSI activity on any connected SCSI bus, so you do not disrupt communications.

The following table lists the library hardware error conditions in numerical order.

Error no.	Description	Corrective action
10	DROPPED A CARTRIDGE. The CHM dropped a cartridge.	If the cartridge label was removed, make sure that there is no label adhesive remaining on the cartridge. If the label was not removed, contact your service provider. CAUTION: Do not try to put the cartridge back in the CHM gripper.
11	SOURCE EMPTY. There is no cartridge in the source location.	Install a cartridge in the source location or redirect the CHM to another location.
12	DESTINATION FULL. A cartridge already exists in the destination location.	Remove the cartridge from the destination or redirect the CHM to another location.
13	PUT MECH. FAILURE. The CHM could not successfully place a cartridge because of mechanical problems.	Make sure there is nothing blocking the CHM or the tape drives. If the error persists, contact your service provider.
14	PICK MECH. FAILURE. The CHM could not successfully pick a cartridge because of mechanical problems.	

Error no.	Description	Corrective action
15	NO SRC ELEMENT; NO DEST ELEMENT. No data cartridge magazine was installed at the selected location.	Install a data cartridge magazine or redirect the CHM.
16		
17	CHM FULL BEFORE MOVE. There was a cartridge in the gripper when the operator powered-on or reset the library, or before a move operation.	Remove the cartridge and put it back in the cartridge magazine if you know where it goes. Make sure the library and tape drives are not being used by any host, then press Reset on the operator panel. If the error persists, contact your service provider.
18	SRC CART INSIDE DRIVE. The CHM could not successfully pick a cartridge because it was still loaded in the tape drive.	Press the tape drive eject button and wait for the cartridge to be unloaded, or redirect the CHM to another location.
19	PICK MECH. FAILURE. The CHM could not successfully pick from a full cartridge slot.	Open the door and look for anything that might be obstructing the gripper. Make sure the library and tape drives are not being used by any host, then press Reset on the operator panel. If the error persists, contact your service provider.
21	GRIP HOME ERROR. A gripper error occurred.	
22	GRIP MOTION TIMEOUT. A gripper motion took longer than the maximum time allocated for it. When motion functions do not complete in the allocated time, the current to the servo motors is shut off.	
25	PICK STALL. The CHM stalled while trying to pick a cartridge from the tape drive.	

Error no.	Description	Corrective action
26	CANNOT OPEN GRIPPER. The gripper could not open.	Open the door and look for anything that might be obstructing the CHM gripper. Make sure the library and tape drives are not being used by any host, then press [Reset] on the operator panel. If the error persists, contact your service provider.
30	S AXIS DOES NOT MOVE. The CHM could not move along the short axis.	
31	S AXIS FAILED HOME. The CHM could not return to the home position along the short axis.	
36	S LM629 FAILURE. The library could not reset the servo chip for the short axis.	Make sure the library and tape drives are not being used by any host, then press [Reset] on the operator panel. If the error persists, contact your service provider.
38	CANNOT LOAD DRIVE. The CHM could not load the cartridge into the tape drive. (It could not move in far enough on the short axis.)	▪ Open the door and look for anything that might be obstructing the CHM along its short axis. ▪ Make sure that a cartridge is not already loaded in the tape drive. ▪ Make sure that the flap on the cartridge is closed. ▪ Make sure the library and tape drives are not being used by any host, then press [Reset] on the operator panel. If the error persists, contact your service provider.
40	L AXIS DOES NOT MOVE. The CHM could not move along the long axis.	Open the door and look for anything that might be obstructing the CHM gripper. Make sure the library and tape drives are not being used by any host, then press [Reset] on the operator panel. If the error persists, contact your service provider.
41	L AXIS FAILED HOME. The CHM could not return to the home position on the long axis.	

Error no.	Description	Corrective action
46	L LM629 RESET FAIL. The library could not reset the servo chip for the long axis.	Make sure the library and tape drives are not being used by any host, then press Reset on the operator panel. If the problem persists, contact your service provider.
50	D AXIS DOES NOT MOVE. The drum could not move on its axis.	Open the door and look for any obstructions around the drum. If there are no obstructions, contact your service provider.
51	D AXIS FAILED HOME. The library could not determine the home position for the drum.	Contact your service provider.
60	NO LABEL. The bar code scanner could not read the bar code label because there was no label on the cartridge.	If present, this error appears on the Label Info screen. If the cartridge does not have a label, place a label on the cartridge. If the cartridge does have a label, reposition or replace it. If the error persists, contact your service provider.
61	READ ERROR. The bar code scanner could not read the bar code label because the label was unreadable.	
62	NOT PRESENT. The bar code scanner could not read the bar code labels because there was no data cartridge magazine present.	If present, this error appears on the Label Info screen. If necessary, install a data cartridge magazine.
65	DMA OVERRUN. The bar code scanner could not read the bar code label because a Direct Memory Access overrun occurred.	If present, this error appears on the Label Info screen. Make sure the library and tape drives are not being used by any host, then press Reset on the operator panel.
67	DMA CH. 2 TIMEOUT. Controller board error.	If the error persists, contact your service provider.

Error no.	Description	Corrective action
69	**LABEL UPSIDE DOWN. The bar code scanner could not read the bar code label because the label is upside down.**	**If present, this error appears on the Label Info screen. Remove the label and reposition it on the cartridge. If the label is affixed correctly, contact your service provider.**
70	**L SERVO TIMEOUT. The CHM could not reach its destination along the long axis.**	**Open the door and look for anything that might be obstructing the CHM along its long axis.** **Make sure the library and tape drives are not being used by any host, then press Reset on the operator panel. If the error persists, contact your service provider.**
71	**PARAMETER > LIMIT. Firmware error.**	**Make sure the library and tape drives are not being used by any host, then press Reset on the operator panel.** **If the error persists, contact your service provider. You may be asked to supply a diagnostic listing, and you may need new firmware.**
72	**FRONT DOOR OPEN. The front door is open or the door solenoid is malfunctioning.**	▪ **Close and lock the door.** ▪ **If the error still appears, make sure the library and tape drives are not being used by any host, then press** [Reset] **on the operator panel.** ▪ **If the error persists, contact your service provider.**
73	**S SERVO TIMEOUT. The CHM could not reach its destination along the short axis.**	**Open the door and look for anything that might be obstructing the CHM along its short axis.** Make sure the library and tape drives are not being used by any host, then press Reset on the operator panel. If the error persists, contact your service provider.

Error no.	Description	Corrective action
75	INTERNAL S/W ERROR. Firmware error.	Make sure the library and tape drives are not being used by any host, then press Reset on the operator panel. If the error persists, contact your service provider. You may be asked to supply a Diagnostic listing, and you may need new firmware.
76	POS ERROR TIMEOUT. The CHM could not reach its destination along the long axis.	Open the door and look for anything that might be obstructing the CHM along its long axis. Make sure the library and tape drives are not being used by any host, then press Reset on the operator panel. If the error persists, contact your service provider.
77	INTERFACE DISABLED. The library was not in the correct control mode when the operator sent a command.	Make certain you have set the correct control mode. If it is, contact your service provider.
90	INVALID BLANK CONFIG. The drive blank configuration is invalid.	This error applies to earlier models of the library only. If you operate the library with one drive, you must have a drive blank installed in the outermost slot.
91	OPERATOR ABORTED. A diagnostic was aborted while it was in progress.	No corrective action required.
97	DRIVE NOT INSTALLED. The tape drive could not be cleaned because no tape drive is installed in this location.	This error only appears on the Clean Drives Menu. If no tape drive is installed in the location, redirect the CHM. If a tape drive is installed, make sure that the drive carrier is correctly seated. If the error persists, contact your service provider.

Error no.	Description	Corrective action
98	NO MAGAZINE. There is no magazine installed in this location.	If no magazine is installed in that location, redirect the CHM. If a magazine is installed, make sure that it is correctly seated on the mounting plate. If the error persists, contact your service provider.
101	DRUM MOVE, SAXIS EXT. The CHM could not move along the short axis.	Open the door and look for anything that might be obstructing the CHM along its short axis. Make sure the library and tape drives are not being used by any host, then press Reset on the operator panel. If the error persists, contact your service provider.
104	DRIVE DID NOT EJECT. The CHM timed out waiting for a tape drive to eject a cartridge.	There may be a problem with the tape drive. Call your service provider.
108	INVALID BOOT ROM. The installed boot ROM is not compatible with the flash EEPROM code.	You do not have the correct boot ROM for the firmware you are trying to run in your library. Contact your service provider.
109	CHECK CLEANER. The cleaning cartridge was ejected immediately after being loaded into the tape drive.	Replace the cleaning cartridge. Make sure you are using the correct cleaning cartridge as described on page 59. If the error persists, contact your service provider. Note: This error displays only if the cleaning was requested from the operator panel.
115	EMPTY DRIVE SLOT. There is no tape drive in this drive slot.	Make sure that all tape drive slots have either a tape drive or a drive blank installed.

Error no.	Description	Corrective action
130	**FAS216 Error** **SCSI Unexpected Int** **SCSI Int Stuck Error** **There is a SCSI chip failure.**	**Make sure the library and tape drives are not being used by any host, then press Reset on the operator panel.** **If the error persists, contact your service provider. You may be asked to supply a diagnostic listing; you may need new firmware or a new controller card.**
131		
132		
133		
134		
135		
136		
137		
190	**HIT CART IN DEST. The CHM performed a move that caused a cartridge collision.**	**Open the door and look for anything that might be obstructing the CHM along its short axis.** **Make sure the library and tape drives are not being used by any host, then press Reset on the operator panel. If the error persists, contact your service provider.**

Notes

D Sequential Operation

This appendix describes how you can operate the library in the sequential control mode: Sequential 1.

How sequential operation works

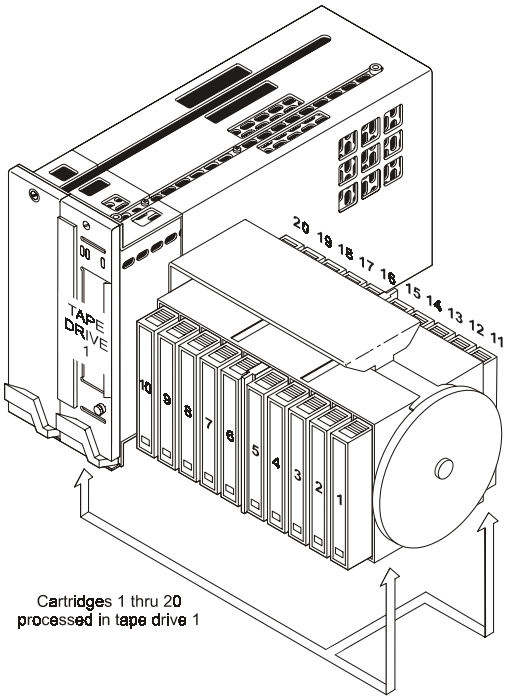
When the library is operating in one of the sequential modes, its internal firmware instructs the CHM to move cartridges sequentially between the cartridge slots and one or both tape drives. No application software is required to support cartridge pick and place functions.

In Sequential 1 mode, the CHM moves cartridges between the slots and only one of the tape drives.

Sequential 1 mode

Sequential 1 mode provides efficient sequential operation when you have just one tape drive installed. In this mode, the CHM picks cartridges sequentially from the slots and processes them in one tape drive. (The fixed cartridge slot is not included.)

In Sequential 1 mode, the library processes the cartridges in tape drive 1 (closest to the magazine).



Sequential 1 Mode

In Sequential 1 mode, the library performs the following steps:

1. Picks the cartridge from slot 1 and places it in the tape drive specified by the mode (1 or 2). If the slot is empty, the CHM picks the next cartridge in the magazine.

2. Waits until the tape drive ejects the cartridge, then returns the cartridge to its original slot.

3. Repeats these steps for the next cartridge until it has processed all of the cartridges.

4. Depending on how the *Loop* option is set, either returns to the first cartridge and begins the process again, or stops. The Loop option is described on page 156.

Note: In the sequential mode, the tape drive specified by the mode must be installed; the library will not switch to the other tape drive. If both drives are installed, the library ignores the additional drive.

Sequential options

For Sequential 1 mode, you can set the Restart and Loop options. These options are not affected by a reset or power cycle.

Restart options

The Restart options determine where the library restarts after it is reset or power cycled, or after the door is opened and closed. The library can restart either at the beginning of the cartridge sequence or where it left off when the interruption occurred.

Before the library restarts...

Before restarting, the library performs the following actions:

1. If the CHM was moving a cartridge, it finishes the move. (This includes inserting the cartridge into the tape drive if the CHM was moving a cartridge to a tape drive.)

   Note: If you attempted to open the door, the library does not release the door interlock until it has completed the move.

2. The library performs a power-on self-test (POST). If you opened the door, the library performs its POST after you close the door.

3. If a cartridge is in a tape drive, the CHM waits for the cartridge to be ejected, then returns it to its original slot.

As shown in the following tables, the Restart options determine what the library does next.

Sequential 1 mode

If Restart is...	The library...
On	Restarts at slot 1.
Off	Resumes where it left off.

Loop options

The Loop options determine what the library does after it has finished processing the last cartridge in a sequence. As shown in the following tables, the library can either loop back to the first cartridge in the sequence and start processing the cartridges again or stop and wait for operator intervention. (Operator intervention typically means opening the library's door, removing the cartridge magazine, installing a new magazine, and closing the door.)

Resetting sequential processing

If you want to resume sequential processing from the first cartridge, select “Set Next Cart to 1” from the Sequential Options menu.

Avoiding interruptions

Although the library has effective methods for resuming operation, it is best to avoid interruptions when the library is operating sequentially. In particular:

- **Do not reset or power cycle the library unless absolutely necessary**. Reset the library only to clear certain error conditions and power off the library only to perform maintenance or to store it. Avoid resetting or power cycling the library when a cartridge is in a tape drive or the CHM.

- **Do not open the door unless absolutely necessary**. During operation, open the door only to replace the magazine after the library has processed all the cartridges. Never force the door. The library will not release the door until it has completed a cartridge move or load already in progress. Certain applications may also prevent the door from being opened.

- **Do not remove a cartridge from a tape drive or insert a cartridge into a tape drive**. If you want to remove a cartridge, wait until the CHM has placed it in the magazine before removing it. If you want to add a cartridge, add it directly to the magazine.

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