Installation and Operation

Tektronix

Profile

PLS 200 Library

Printed in USA or United Kingdom

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Revision Status

Rev Date	Description
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Contents

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General Safety Summary

WARNING: The instructions in this manual are for use by qualified service personnel only. To avoid personal injury, do not perform any servicing unless you are qualified to do so. Refer to all safety summaries before performing service.

Review the following safety precautions to avoid injury and prevent damage to this product or any products connected to it.

While using this product, you may need to access other parts of the system. Read the *General Safety summary* in other system manuals for warnings and cautions related to operating the system.

Injury Precautions

Use Proper Power Cord

To avoid fire hazard, use only the power cord specified for this product.

Ground the Product

This product is grounded through the grounding conductor of the power cord. To avoid electric shock, the grounding conductor must be connected to earth ground. Before making connections to the input or output terminals of the product, ensure that the product is properly grounded.

Do Not Operate Without Covers

To avoid electric shock or fire hazard, do not operate this product with covers or panels removed.

Use Proper Fuse

To avoid fire hazard, use only the fuse type and rating specified for this product.

Do Not operate in Wet/Damp Conditions

To avoid electric shock, do not operate this product in wet or damp conditions.

Do Not Operate in an Explosive Atmosphere

To avoid injury or fire hazard, do not operate this product in an explosive atmosphere.

Avoid Exposed Circuitry

To avoid injury, remove jewelry such as rings, watches, and other metallic objects. Do not touch exposed connections and components when power is present.

Product Damage Precautions

Use Proper Power Source

Do not operate this product from a power source that applies more than the voltage specified.

Provide Proper Ventilation

To prevent product overheating, provide proper ventilation.

Do Not Operate With Suspected Failures

If you suspect there is damage to this product, have it inspected by qualified service personnel.

Safety Terms and Symbols

Terms in This Manual

These terms may appear in this manual:

WARNING: Warning statements identify conditions or practices that can result in personal injury or loss of life.

CAUTION: Caution statements identify conditions or practices that can result in damage to the equipment or other property.

Terms on the Product

These terms may appear on the product:

DANGER indicates a personal injury hazard immediately accessible as one reads the marking.

WARNING indicates a personal injury hazard not immediately accessible as you read the marking.

CAUTION indicates a hazard to property including the product.

Symbols on the Product

The following symbols may appear on the product:

DANGER high voltage

Protective ground (earth) terminal

ATTENTION – refer to manual

Service Safety Summary

⚠ ***WARNING: These instructions are for use by qualified service personnel only. To avoid personal injury, do not perform any servicing unless you are qualified to do so. Refer to all safety summaries before performing service.***

Do Not Service Alone

Do not perform internal service or adjustment of this product unless another person capable of rendering first aid and resuscitation is present.

Disconnect Power

To avoid electric shock, disconnect the main power by means of the power cord or, if provided, the power switch.

Use Care When Servicing With Power On

Dangerous voltages or currents may exist in this product. Disconnect power and remove battery (if applicable) before removing protective panels, soldering, or replacing components.

To avoid electric shock, do not touch exposed connections

Regulatory Information

EC Declaration of Conformity

Tektronix, Inc.
Video Networking Division
14180 SW Karl Braun Drive
P.O. Box 500
Beaverton, Oregon 97077-0001 U.S.A.

Tektronix, Inc., Video Networking Division, declares on 27 September, 1996, under our sole responsibility, that the PLS 200 Video video Archive system to which this declaration relates, is in conformity with the following standard(s) or other normative document(s):

EMC Directive 89/336/EEC

EC EN55022 Limits and methods of measurement of radio interference characteristics of Information Technology Equipment

EC 50082-1 1992 Electromagnetic compatibility generic immunity standard Part 1: Residential, commercial, and light industry.

Environmental Phenomena	Test Specification	Basic Standard
Radio-Frequency Electromagnetic Field	27-500 MHz 3V/m (unmodulated)	IEC801-3
Electrostatic Discharge	8kV (charge Voltage)	IEC801-2
Fast Transients common mode on Signal lines	0.5kV (peak) 5/50 Tr/Th ns 5kHz Rep. Frequency	IEC801-4
AC mains ports	1.0kV (peak) 5/50 Tr/Th ns 5kHz Rep. Frequency	

Low Voltage Directive 73/23/EEC

EN60950 Safety of Information Technology Equipment including Electrical Business Equipment (includes Appendix ZB)

Certifications and Compliances

Canadian Certified Power Cords

Canadian approval includes the products and power cords appropriate for use in the North America power network. All other power cords supplied are approved for the country of use.

FCC Emission Control

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 the 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. Changes or modifications not expressly approved by Tektronix can affect emission compliance and could void the user's authority to operate this equipment.

Canadian EMC Notice of Compliance

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

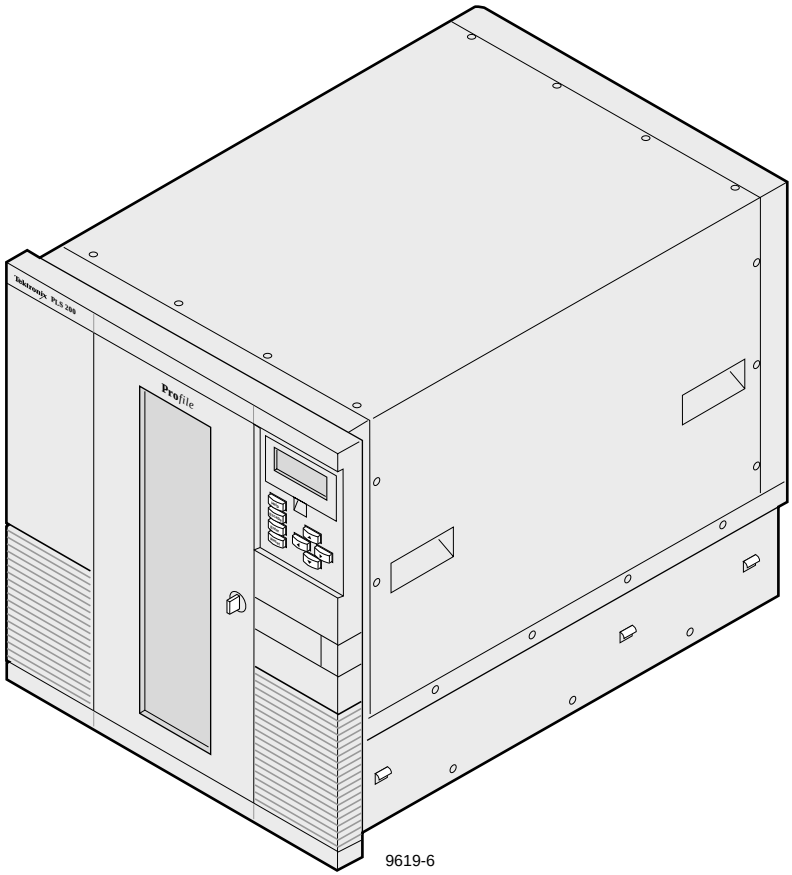
Le présent appareil numérique n'emet pas de bruits radioélectriques dépassant les limites applicables aux appareils numeriques de la classe A préscrites dans le Règlement sur le brouillage radioélectrique édicte par le ministère des Communications du Canada.

EN55022 Class A Warning

For products that comply with Class A. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Welcome

Congratulations on selecting the Tektronix PLS200 Library. Your new library provides automated data storage, archiving, backup, and retrieval for Tektronix Profile Video Disk Recorders (VDRs).



The library's robotic cartridge handling mechanism (CHM) responds to commands from the VDR to move 8mm data cartridges between tape drives and storage slots, while the tape drives read and write data. You can insert and remove cartridges through the entry/exit port without opening the library door.

The PLS200 includes 80 data cartridge slots and four tape drives. The library is connected to the VDR by three wide, differential SCSI buses.

About this Manual

This manual provides the information you need to install, configure, operate, maintain, and diagnose problems with the PLS200 Library and its enclosed 8mm tape drives. The operator information in this manual covers only the operation of the library from the library's operator panel. Information about the operation of the library from the Profile Video Disk Recorder and its software is available in the *Profile System User Manual*.

Related Documentation

The following documents are available from Tektronix:

- *Profile System User Manual*
- *PLS200 Service Manual*
- *Profile Software Developer's Kit*

Conventions Used in this Manual

Enter ***Boxed characters indicate keys on the library's keypad.***

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

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

⚠ ***The "attention" symbol and the word "CAUTION" precede information you must know to avoid damaging the library or tape drives or losing data.***

⚠ ***The "attention" symbol and the word "WARNING!" precede information you must know to avoid personal injury.***

Tektronix Product Support

You can get technical assistance, check on the status of problems, or report new problems by contacting our Product Support Group.

United States and Canada

Monday–Friday 5:30AM–5:00PM Pacific Time — (800) 547-8949

Europe

Monday–Friday 9:00AM–5:30PM

Austria	222-799-3535	Netherlands	010-495-4255
Belgium	02-714-3401	Norway	22-83-85-69
Denmark	3543-5259	Spain	91-564-4692
Finland	161-691-98559	Sweden	08-679-8419
Germany	069-935-25001	Switzerland	041-210-6009
Italy	44-1908-681-706	United Kingdom	01908-681-703
Luxembourg	400-848	Other	44-1908-681-703

Email: EuroProfile@tek.com

Asia and South America

Australia	61-2-888-7066	Korea	82-2-528-5299
Brazil	55-11-543-1911	Mexico	52-5-666-6333
Hong Kong	852-2585-6688	Singapore	65-356-3900
Japan	81-3-3448-3111	Taiwan	886-2-765-6362

World Wide

24-hour Emergency Hotline: (503) 685-2345
(Contract and warranty customers)

World Wide Web:http://www.tek.com/Profile/Support

FTP Site: ftp.tek.com (IP address: 134.62.48.21)

Email: ProfileSupport@tek.com

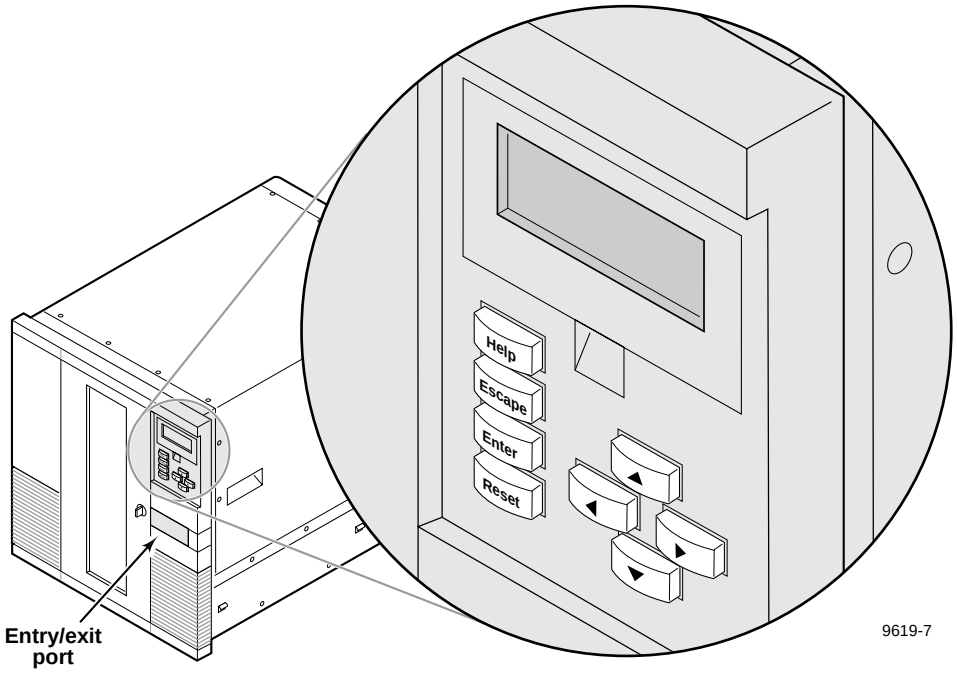
Users Group: profile-users@tek.com

About the PLS200

The following illustrations and descriptions summarize the important library features.

Operator Panel

The operator panel includes a four-line liquid crystal display (LCD) and a keypad. You use the operator panel to configure the library and monitor operations. If necessary, you can tilt the LCD for easier viewing.

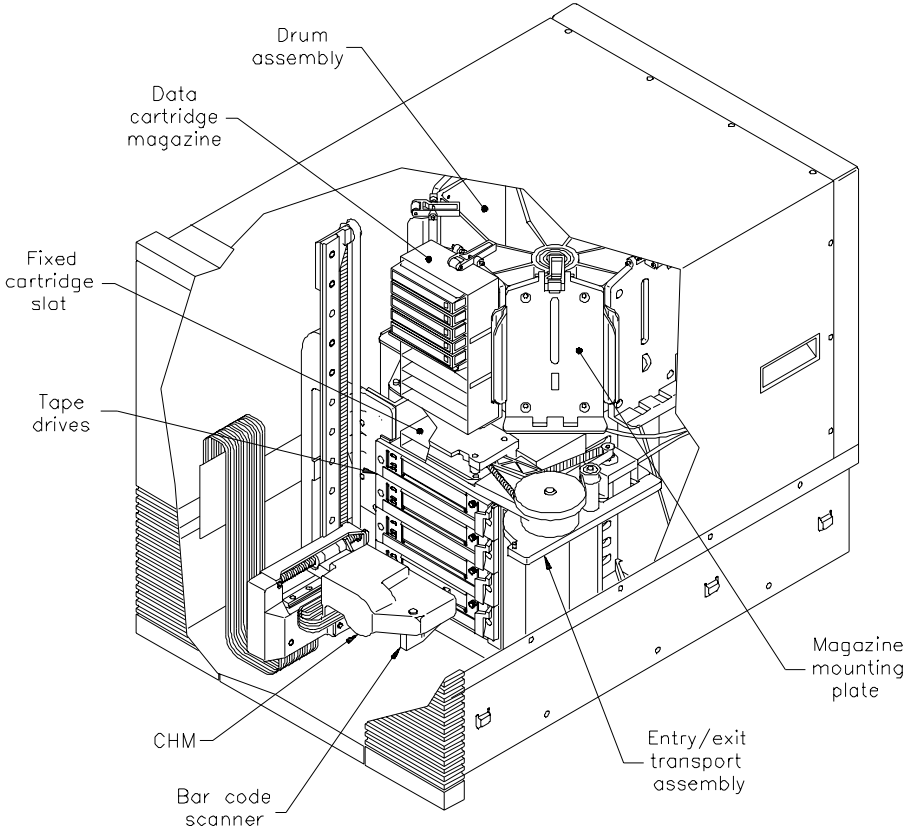


Entry/Exit Port and Transport Assembly

The entry/exit port allows you to insert or remove individual cartridges from the library without opening the door. The entry/exit transport assembly moves the transport arm to and from the entry/exit port to pick up cartridges.

Drum assembly

The drum assembly holds the data cartridge magazines and rotates 180 degrees in either direction to position the magazines in front of the cartridge handling mechanism (CHM).



Data cartridge magazines

Data cartridge magazines are the removable carriers for the 8mm data cartridges. The magazines snap onto mounting plates on the library's rotating drum assembly and allow easy removal and replacement of cartridges. Each magazine has individual cartridge slots for 10 cartridges. The PLS200 contains up to eight cartridge magazines.

Fixed cartridge slot

The fixed cartridge slot, located directly above the tape drives, provides a storage location for a single cartridge. This slot is normally used to store an 8mm cleaning cartridge.

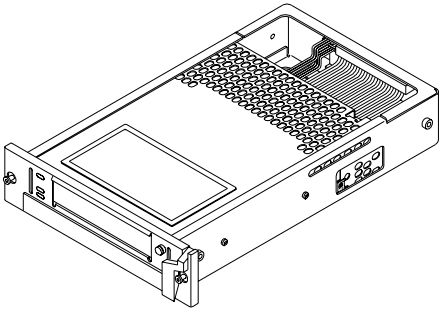
Tape drives

The PLS200 uses four Exabyte Mammoth 8mm half-height tape drives with a wide, differential SCSI configuration.

Drive carrier

When you purchase the library, each tape drive in the library is fitted inside a drive carrier. The drive carrier allows you to slide the drive in and out of the library if the tape drive needs repair.

⚠ ***CAUTION: To avoid possible damage to the tape drive, do not remove it from the drive carrier.***



Drive blank (not shown)

Drive blanks are “empty” drive carriers with solid faceplates. If you plan to operate the library with fewer than four tape drives, you must install drive blanks in the empty drive positions. The drive blanks ensure correct air flow through the library for cooling, compliance with EMI regulations, and in some configurations, correct SCSI connection.

Cartridge handling mechanism (CHM)

The cartridge handling mechanism (CHM) moves cartridges between cartridge slots, tape drives, and the entry/exit port.

Bar code scanner

The high-speed bar code scanner, mounted on the CHM, reads bar code labels affixed to the cartridges to track individual cartridges. Cartridge label information becomes part of the library's cartridge inventory stored in nonvolatile RAM.

Serial ports (not shown)

Two serial ports (25-pin and 9-pin) at the back of the library allow an external computer to communicate with the tape drives and the library across a serial cable. By running a special diagnostic program, service personnel can perform diagnostics, upgrade firmware, and test CHM motion.

SCSI connectors (not shown)

The library has ten SCSI connectors, accessible through the cabling bay on the back.

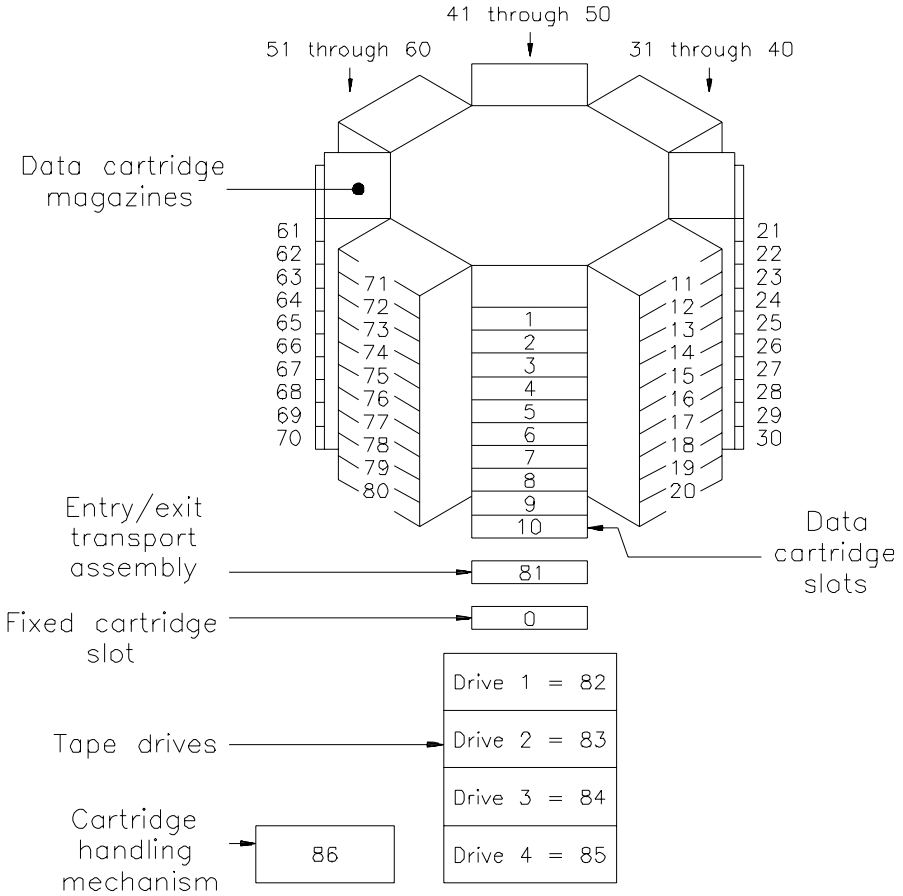
Library Elements

The library contains four types of elements:

- The CHM is the *medium transport element*.
- The entry/exit port is the *import/export element*.
- The cartridge slots are the *storage elements*.
- The tape drives are the *data transfer elements*.

Each element has an element index, which is the number you must specify when you use the entry/exit port. Element indexes must be the same as the default element addresses used in SCSI commands.

The following figure shows the element indexes for the PLS200.



Element indexes for PLS200

Chapter 1

Installing the Hardware

This chapter describes how to install and set up the library hardware.

Preparing for Installation

Before installing the library, complete the preliminary steps listed in the table below. Each step is described on the following pages.

✔	Step	Description
	1	Unpack the library.
	2	Check the accessories.
	3	Protect the library against ESD.
	4	Obtain a fork lift or at least four people.
	5	Verify your Profile software version.

Unpack the Library

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

Check the Accessories

Make certain you received the following accessories packed with the PLS200:

- Slide rails and mounting hardware
- Four power cords (North America, United Kingdom, Europe, Australia)
- BusLogic BT-757CD SCSI bus adapter board
- Three SCSI cables
- One SCSI terminator
- Four SCSI jumpers
- Eight Data Cartridge Magazines with covers
- Eighty data cartridges
- Two cleaning cartridges
- One spare drive blank (in addition to those installed)
- Bar code labels for the data cartridges (three sheets)
- PLS200 Operation and Installation Manual
- PLS200 Order Information Technical Data Sheet

Protect the Library Against ESD

If you remove the cover from the library, its internal components are susceptible to damage from electrostatic discharge (ESD). To ensure that the work area is as free from ESD as possible, place a grounded, static protection mat on the work surface, and wear a static protection wrist band. If a mat and wristband are unavailable, discharge static electricity from your body before touching the inside of the library or the tape drives. (Touch a known grounded surface, such as your computer's metal chassis.)

Prepare the Library

The slide rails and mounting hardware for rack-mounting the library are shipped in the box with the library. The library weighs 152 pounds (69 kg) with four tape drives installed. Before installing the library, make sure that your rack has extension support legs and that you have at least four people or two people and a small fork lift.

Verify Your Profile Software Version

The PLS200 requires Profile Software version 2.0 or higher, and WindowsNT 3.51 or higher.

Installing the SCSI Adapter Into the VDR

Before you install the PLS200 hardware, install the SCSI adapter board into the Profile video disk recorder. The SCSI adapter board provides an EISA-to-SCSI interface that allows the Media Manager or similar software on the VDR to control the library's cartridge handling mechanism. The procedures that follow take you step-by-step through the recommended sequence for installation of the SCSI adapter board.

WARNING: The VDR is too heavy for one person to remove from an equipment rack. To avoid possible injury, get help when removing the VDR from its rack.

WARNING: Before performing any installation or maintenance procedures, be sure that:

- ***the rear-panel power switch is in the off position***
- ***the power cord is disconnected from the video disk recorder and the outlet***

1. Loosen the front panel retaining screws and pull the cabinet out until all three slide sections latch.
2. Remove the top covers in the order shown in Figure 1-1. The front cover must be removed first since it overlaps the rear cover. Use a T-10 TORX driver to remove the screws.

NOTE: Take care not to lose these cabinet screws. They are required to meet the EMI specifications for the VDR.

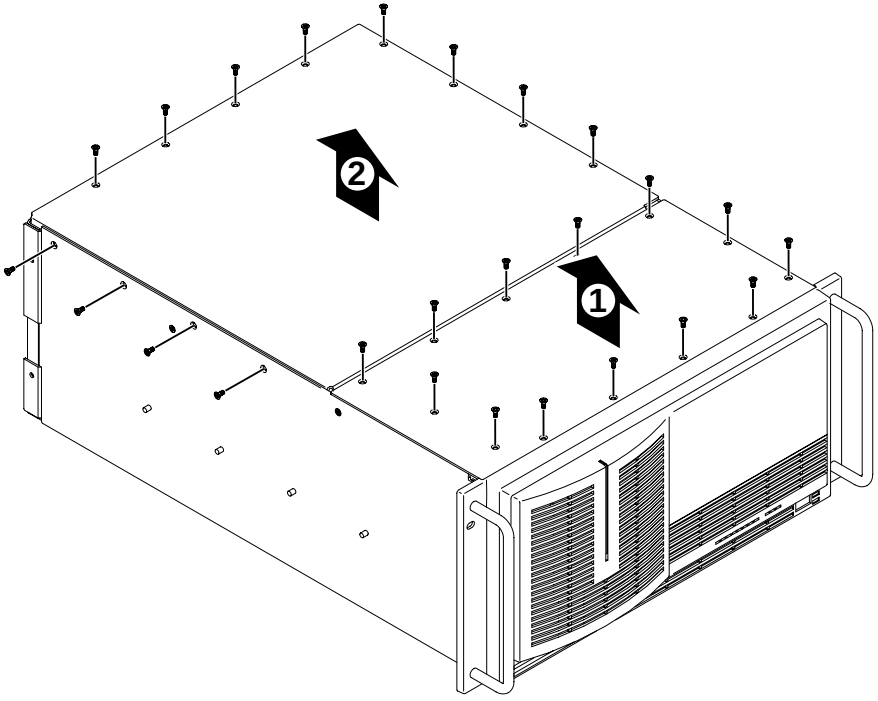


Figure 1-1 Removing the top covers

3. Remove the two circuit board hold-downs as shown in Figure 1-2. Both hold-downs are held in place by T-10 TORX head screws, and must be removed in order to install the SCSI adapter board.

➤ **Important** ***Be sure to remove the jumper as described in the following step. If the jumper is left in place, the VDR will display an error when initializing the SCSI adapter board.***

4. Unpack the SCSI adapter board and remove the jumper from W1 on the board. Refer to the manual packed with the board to locate the jumper.

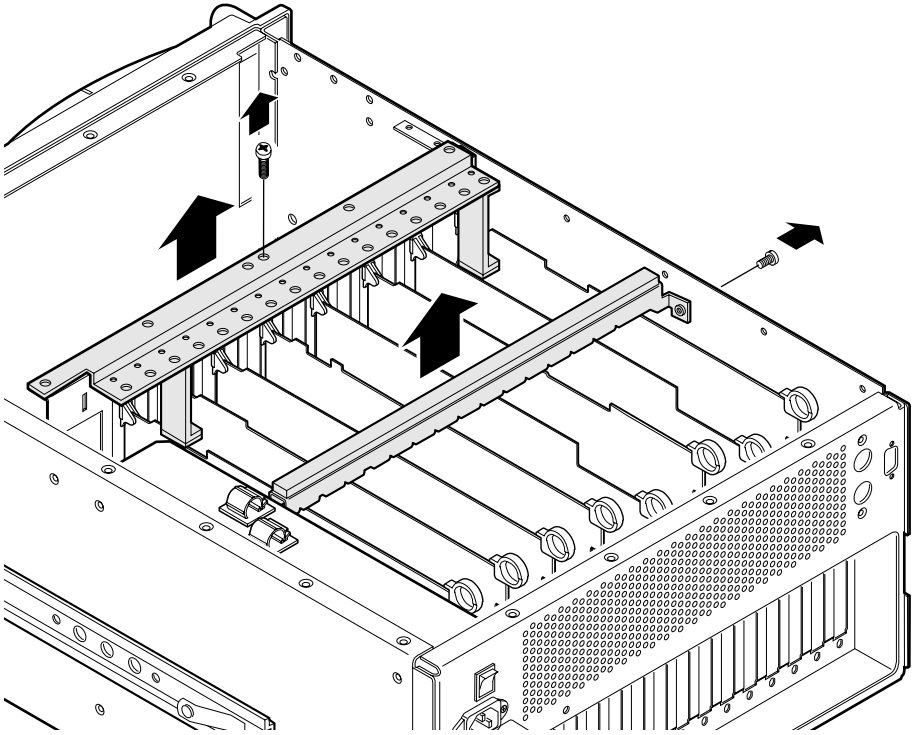


Figure 1-2 Removing the circuit board hold-downs

5. Remove the blank cover plate from the J4 slot in the VDR rear panel.
6. Plug the SCSI adapter board into the J4 socket and press down till the board is fully plugged into the socket.
7. Install the mounting screw in the top of the bracket inside the cabinet (as shown in Figure 1-3).
8. Re-install the hold-downs. Align each hold-down over the circuit boards and replace the mounting screws.
9. Re-install the cabinet covers. Do not tighten any of the screws until all the screws are started.
10. Install the VDR power cord, but *do not* turn on the VDR.

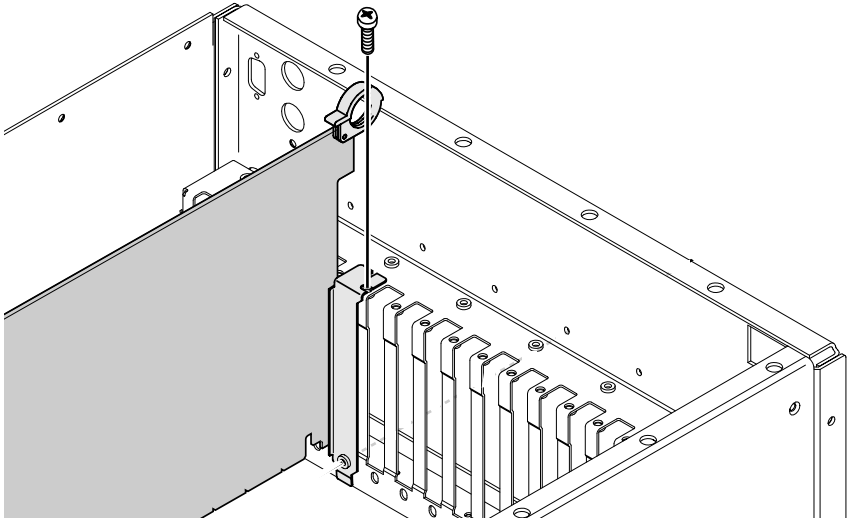


Figure 1-3 Screw locations for board mounting bracket

Installing the Library Hardware

Use the following table as a checklist for installing the library.

✔	Step	Description
	1	Install the library into a rack
	2	Unlatch and open the door
	3	Remove the packing foam
	4	Move the CHM
	5	Prepare and install cartridges in magazines
	6	Install the magazines in the library
	7	Install a cleaning cartridge
	8	Close the library door
	9	Connect the SCSI cables
	10	Connect the power cord
	11	Power on the library
	12	Complete the SCSI adapter board software update

⚠ ***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.***

Install the Library Into a Rack

Follow these instructions to install the library into a standard EIA 19-inch rack.

⚠ ***WARNING: The library weighs 137 – 167 pounds (62 – 76 kg). You need at least 4 people, or 2 people and a small fork lift, to lift it.***

Make sure you install the library in the lowest possible location in the rack and that the rack is equipped with extension support legs.

Make sure you extend the support legs before installing the library in the rack or when sliding it out of the rack.

Tools required

You need the following tools to install the library into a rack

- T-15 TORX screwdriver
- T-25 TORX screwdriver

Installing the Slide Rails

1. Identify the holes on the rack where you want to install the library. The library will extend 1 to 2 inches (3 to 4 cm) below the slide rails.
2. If the rack does not have threaded holes, attach the eight clip nuts over the holes (see Figure 1-4).
3. Using a T-25 TORX driver and eight 10-32 × 0.5 screws, attach, but do not tighten, the slide rails to the rack (see Figure 1-4).

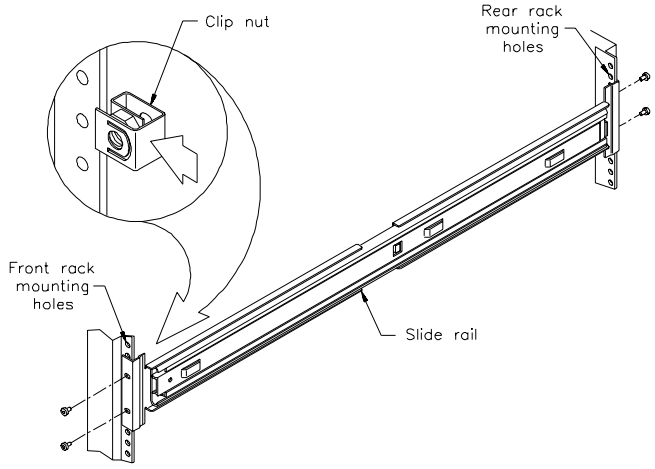


Figure 1-4 Attaching the slide rails

4. As shown in Figure 1-5, adjust the distance between the front mounting brackets to $17\frac{5}{8}$ inches (44.8 cm).

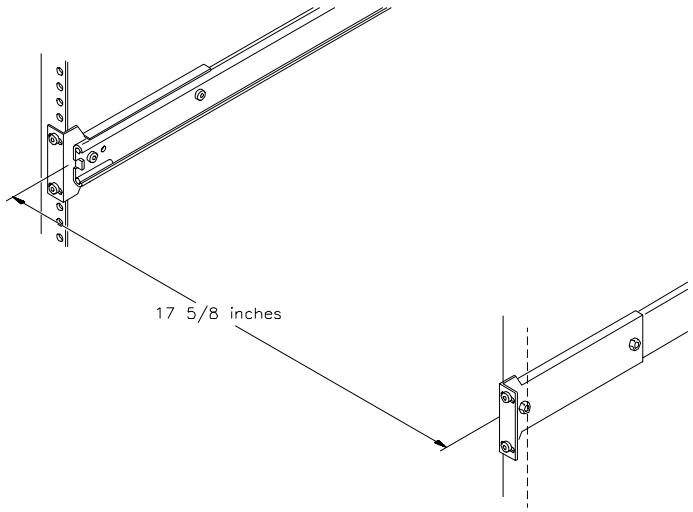


Figure 1-5 Adjusting the distance between the front mounting brackets

5. Tighten the screws.
6. Repeat steps 4 and 5 for the rear mounting brackets.

Installing the Library

1. Extend the extension support legs on the rack.
2. Slide the inside rails as far out of the rack as they will go (see Figure 1-6).

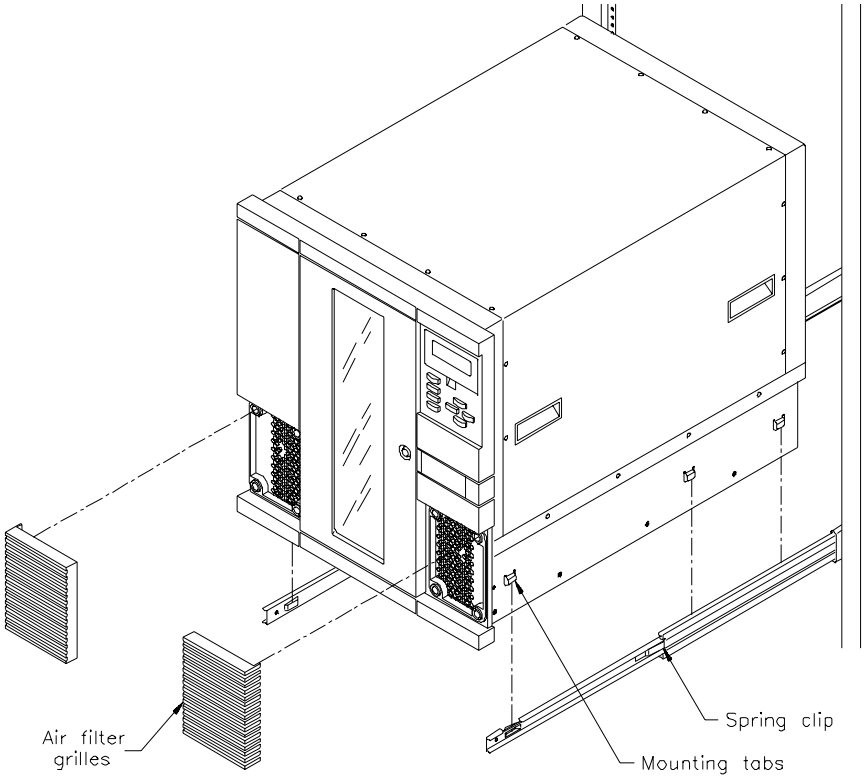


Figure 1-6 Installing the library in a rack

3. Remove the air filter grilles from the front of the library by lifting the outside edges and pulling the grilles away from the library (see Figure 1-6).
4. Using four people, or two people and a fork lift, lift the library by the handles and lower it onto the slide rails so the mounting tabs on each side of the library fit into the slots in the rails (see Figure 1-6). Make sure all six mounting tabs are fitted securely into the slots.

5. Press the spring clips and slide the library most of the way into the rack.
6. Install one 8-32 × $\frac{7}{16}$ button head screw into the screw hole on each rail, as shown in Figure 1-7.

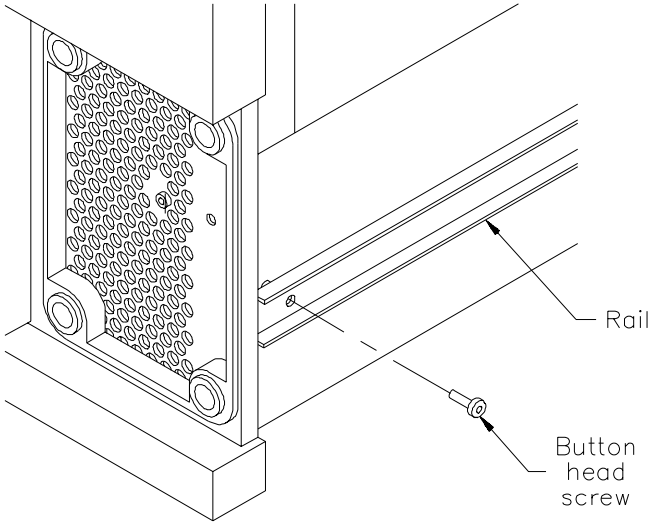


Figure 1-7 Attaching the screws to the sides of the library

7. If the holes in the rack are not threaded, install a clip nut on each side of the rack, as shown in Figure 1-8.

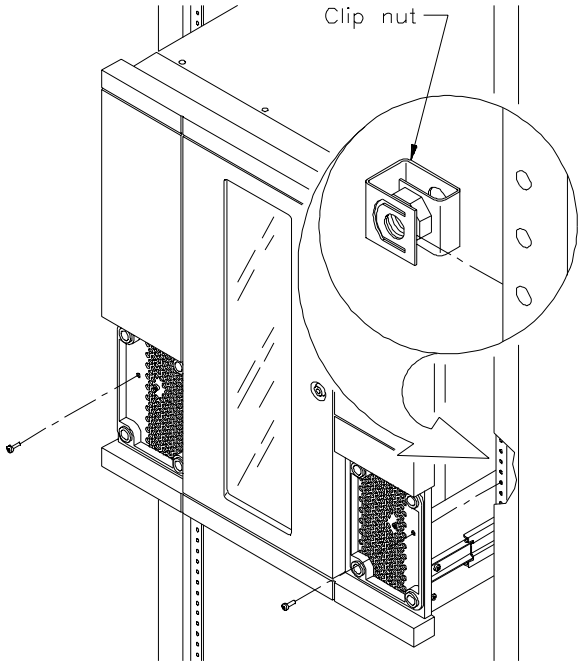


Figure 1-8 Securing the library in the rack

8. Slide the library completely into the rack. Use a T-25 TORX driver to insert the two 10-32 × 1.0 pan head screws on the front panel, as shown in Figure 1-8. These screws prevent the library from sliding out of the rack.
9. Replace the air filter grilles on each side of the front panel.

Unlatch and Open the Door

To open the door, turn the door latch handle one quarter turn to the right, as shown in Figure 1-9. Pull open the door.

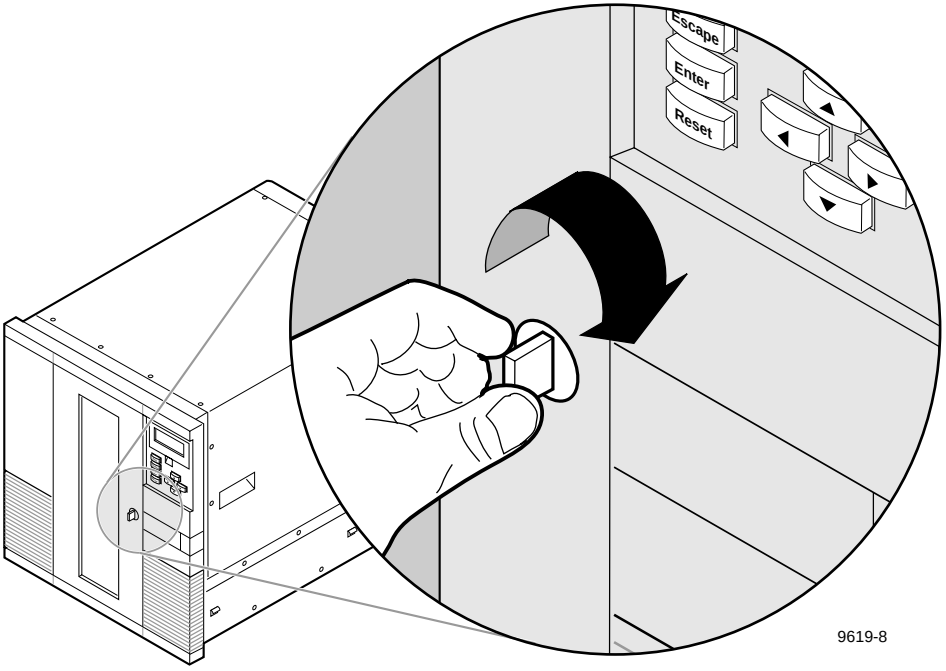


Figure 1-9 Opening the door

Remove the Packing Foam

Remove the packing foam from the library as shown in Figure 1-10.

1. Take out the center cross piece shown at arrow 1.
2. Move the vertical piece to the right as shown by arrow 2 to disengage it from the CHM.
3. Bend the top of the vertical piece to the left and remove the top cross piece.
4. Pull the top of the vertical piece out of the door enough to allow removal of the bottom cross piece, then take out the vertical piece.

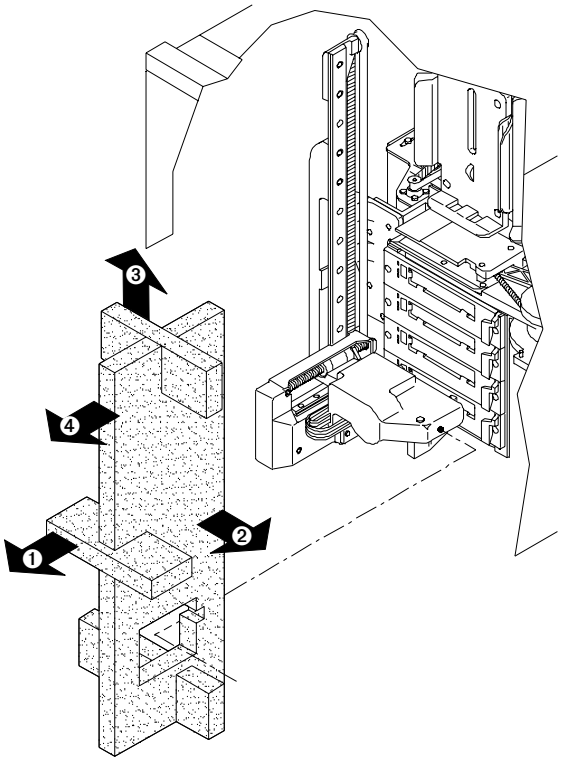


Figure 1-10 Removing the packing foam from the library

Move the CHM Out of the Way

Move the cartridge handling mechanism (CHM) so it is not blocking the magazine mounting plates on the drum. To move the CHM, reach in through the door and push against the *base* of the CHM, sliding it firmly to the bottom of the long axis until it stops. See Figure 1-11.

➤ **Important** ***Do not touch the lens on the bar code scanner; smudges on the lens can cause scanning errors.***

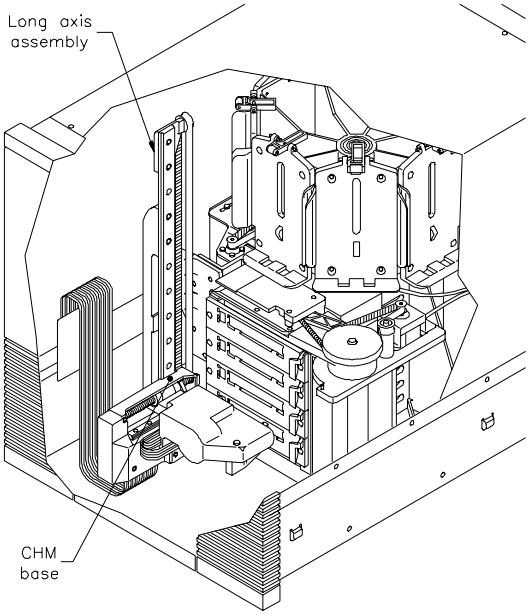


Figure 1-11 Moving the CHM to the bottom of the long axis

Prepare and Install Cartridges

Before installing data cartridges in the library, attach the bar code labels and set the write-protect switches.

➤ **Important** ***Two types of EXATAPE™ 8mm Data Cartridges are available: advanced metal evaporated (AME) and metal particle (MP). Use only the AME tape cartridges in the PLS200. The tape drives in PLS200 cannot write or read to the MP tape cartridges.***

Attach Bar Code Labels

Position the label as shown in Figure 1-12, using the recessed area on the cartridge for guidance. Make sure you orient the label correctly. For information on how to prepare bar code labels, refer to *Appendix C, Bar Code Label Specification.*

NOTE: Be sure to attach a bar code label to the cleaning cartridge as well as the data cartridges.

➤ **Important** ***If you create your own bar code labels, be sure to follow the specification precisely.***

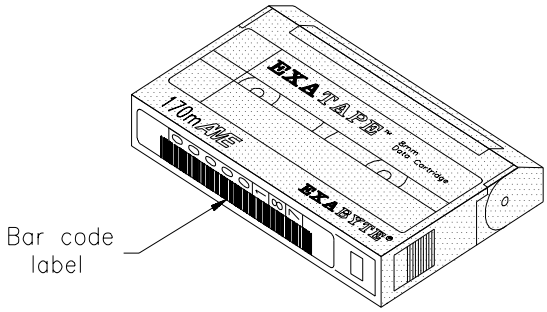


Figure 1-12 Positioning a bar code label on a data cartridge

⚠ ***CAUTION: If you remove a bar code label from a data cartridge without replacing it, make sure to 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 CHM.***

Set the Write-protect Switches

Make sure the write-protect switch on each data cartridge is set appropriately (see Figure 1-13). You can use a ball-point pen or similar instrument to move the write-protect switch. If the write-protect switch window is red, the cartridge is write-protected.

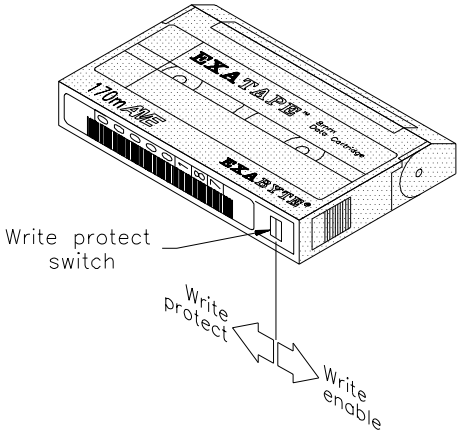


Figure 1-13 Setting the write-protect switch on a data cartridge

Install Data Cartridges in the Magazines

The empty magazines are packed in the box of accessories shipped with the PLS200.

1. Place the magazine on its feet with the single mounting guide toward the right, as shown in Figure 1-14.
2. Position each cartridge so that the bar code label is on top and the write-protect switch is toward the front (see Figure 1-14).
3. 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.

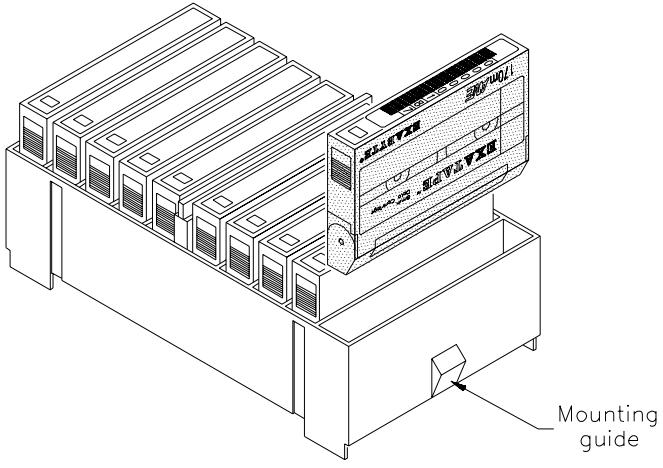


Figure 1-14 Installing data cartridges in the magazine

Install Cartridge Magazines

➤ **Important** ***Use only magazines designed for half-height Exabyte 8mm libraries. Do not use Exabyte Data Cartridge Holders designed for full-height Exabyte 8mm libraries.***

The following instructions describe how to install cartridge magazines onto the mounting plates on the drum.

⚠ ***CAUTION: Make sure the CHM and its cabling are safely out of the way before installing cartridge magazines.***

1. If necessary, manually rotate the drum to access the mounting plate where you want to install the magazine.
2. On the magazine mounting plate, locate the roller on the top end of the plate.
3. Position the magazine over the mounting plate with the single mounting guide toward the top, as shown in Figure 1-15.
4. Insert the bottom end of the magazine first, then snap the magazine into place by pressing against the top.

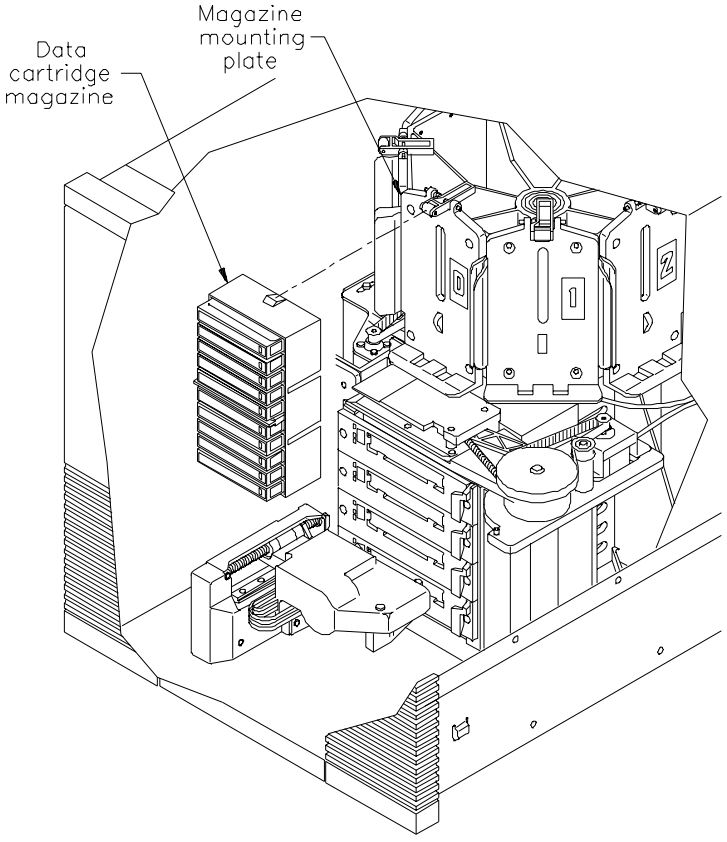


Figure 1-15 Installing a cartridge magazine in the library

Install a Cleaning Cartridge

The following procedure describes how to manually install a cleaning cartridge in the fixed cartridge slot. To replace this cartridge later, use the Export Cartridge and Import Cartridge functions of the Media Manager in the Profile Tool Box. Refer to the discussion of the Media Manager in the *Profile System User Manual*.

⚠ ***CAUTION: Use Tektronix-approved cleaning cartridges only. Using cloth swabs, cotton swabs, cleaning agents, or cleaning cartridges not approved by Tektronix will void the tape drive warranty.***

To install a cleaning cartridge in the fixed cartridge slot:

1. Position the cartridge so that the window showing the tape reels is toward the top (see Figure 1-14).

➤ **Important** ***The cleaning cartridge must have a bar code label.***

2. Insert the cartridge into the fixed cartridge slot until it snaps into place.

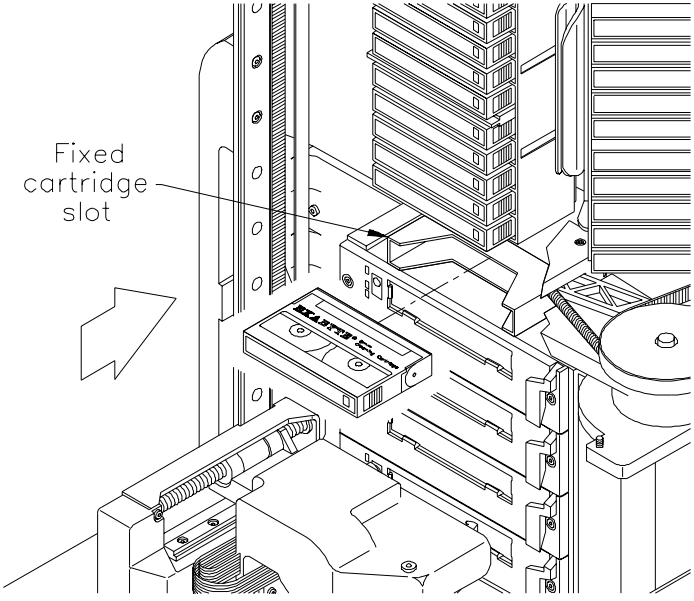


Figure 1-16 Installing a cartridge in the fixed cartridge slot

Close the Library Door

Close the library door and turn the door latch handle a quarter turn to the left.

Connect the SCSI Cables

The library is connected to the Profile system with three SCSI cables. One cable controls the library and attaches to the SCSI adapter board. The other two cables transfer data to and from the tape drives. These cables connect to the SCSI A and SCSI B busses at the VDR Disk Recorder boards, the PDX103, or PRS 200 as shown in Figures 1-18, 1-19, and 1-20. All cables are fast wide, differential with screw fasteners on both ends.

The SCSI connectors for the library and tape drives are accessible through the cabling bay at the back of the library.

1. Remove the terminator plugs from the Master and Slave Disk Recorder boards (or from the loop-through connectors on the PDX103 or PRS200). Retain these plugs for use in the next step.
2. Install the SCSI jumpers and terminators on the PLS200 as shown in Figure 1-17.
3. Connect the SCSI cables included with the PLS200. Refer to Figures 1-18, 1-19, and 1-20 as appropriate for your installation.

⚠ ***CAUTION: To avoid damaging the tape drives, make sure the power is off in all devices connected to the SCSI bus when you connect the tape drives to the SCSI bus.***

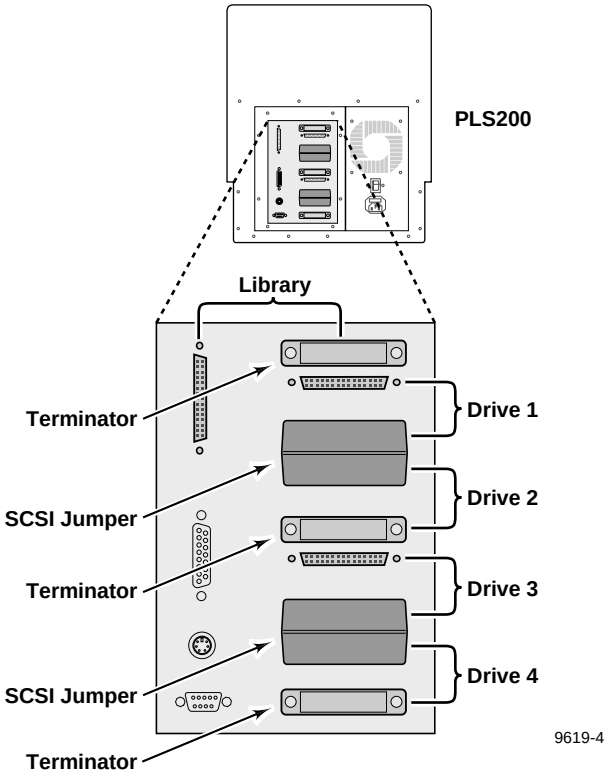


Figure 1-17 Installing the terminators and SCSI jumpers

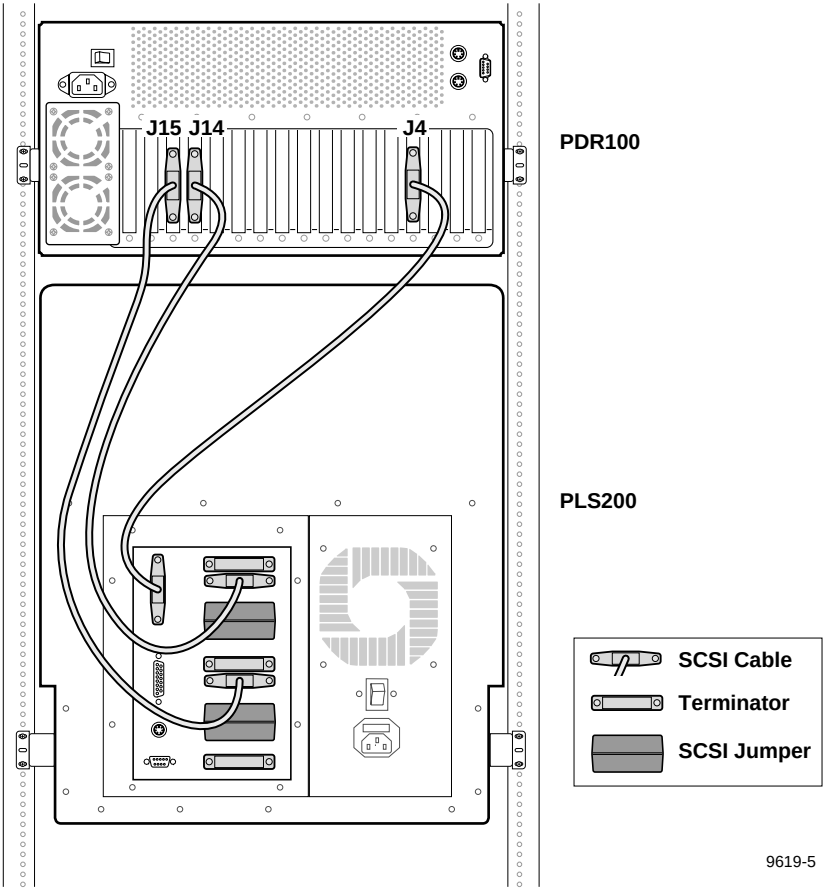


Figure 1-18 SCSI connections from the VDR to the PLS200

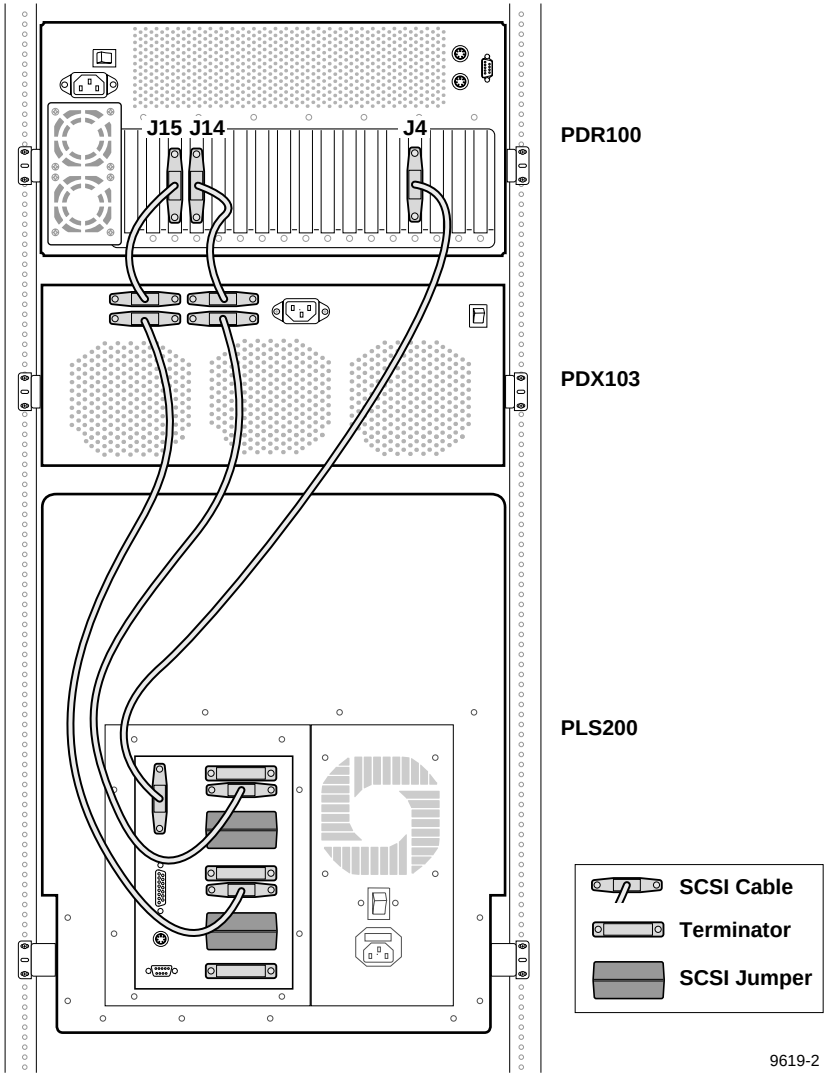


Figure 1-19 SCSI connections through the PDX103 to the PLS200

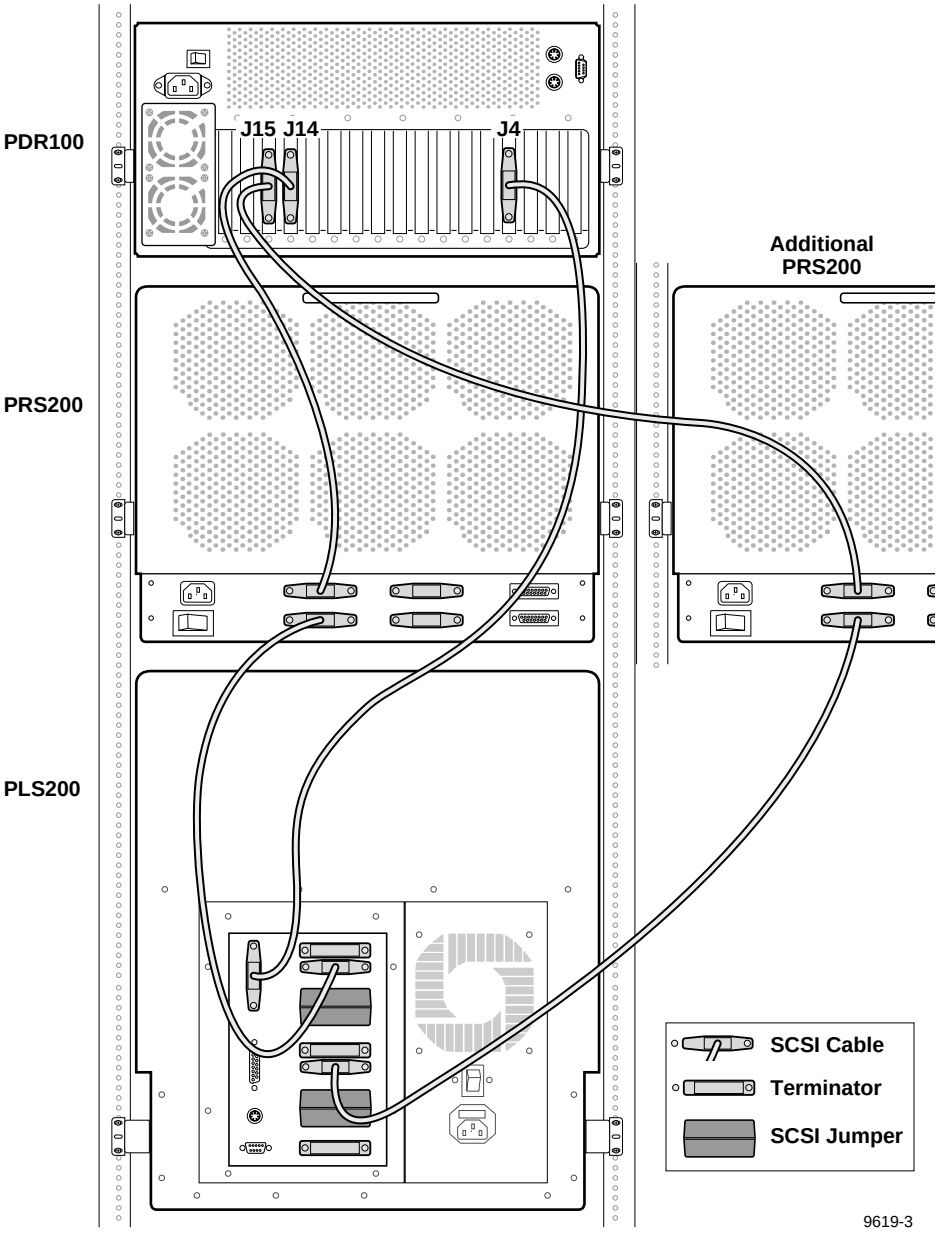


Figure 1-20 SCSI connections through the PRS200 to the PLS200

Connect the Power Cord

➤ **Important** ***Tektronix ships the PLS200 with four power cords, each for use in a different location. If none of the power cords are appropriate for your location, you must supply a power cord with the proper plug that meets the specifications listed in Appendix A, Specifications.***

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.

Power-on the Library

1. Make certain the library's door is closed and latched.
2. Push the power switch on the back of the library to the on (l) position.
3. Turn on the PDX103 or PRS200 if one of them is attached to the SCSI bus.
4. Turn on the Profile video disk recorder.

NOTE: When you turn on the VDR, a warning will appear that slot 2 needs to be configured. This is normal and is addressed when you complete the SCSI adapter board software update at the end of this chapter.

5. Wait while the library performs its power-on self-test. During this time, the following activities occur:
   - The cooling fan begins to rotate.
   - The LCD illuminates and displays the Main Screen.
   - The tape drives perform their power-on self-tests.
   - The library performs its power-on self-test.

Tape Drive Power-on Self-test

During its power-on self-test, each tape drive checks its operating conditions and sends status information to the library.

Library Power-on Self-test

During its power-on self-test, the library:

- Engages the locking solenoid in the door.
- Moves the CHM to the home positions on the short and long axes.
- Moves the drum to the home position.
- Retracts the entry/exit port transport arm.
- Verifies the CHM's full range of motion by moving it to the top of the long axis.
- Touches each cartridge to update the cartridge inventory.
- Moves to the home position on the long axis.

If Problems Occur...

If the library does not complete its power-on self-test and nothing is displayed on the LCD, check the following:

- Is the power switch on? (Is the **|** pressed?)
- Is the power cord inserted correctly?
- Is the library door closed?
- Is the video disk recorder on?

If the library does not complete its power-on self-test and the LCD displays an error code, see Appendix B, *LCD Error Codes*.

For more detailed troubleshooting information, see Chapter 9, *Troubleshooting*.

SCSI Adapter Board Software Update

When you applied power to the Profile VDR (in the step on page 28), a warning appeared that Slot 2 needed to be configured. The following procedure updates software on the VDR and enables communication between the VDR and the PLS200.

1. Double click the “Load DTI CMOS” icon to rewrite a new image into CMOS. The console window indicates that the software has found the BT-757CD (the SCSI adapter board) and has used the correct .cmo file.
2. Restart the VDR, and verify that the card in EISA slot two initializes correctly. At this point the Buslogic BT-757CD SCSI card will be initialized but can not be used by the PLS200 software until you install the driver for the SCSI adapter board.
3. Install the driver for the SCSI adapter board.
   a. Double click the “Windows NT Setup” icon in the Main group.
   b. Pull down the “Options” menu and select “Add/Remove SCSI Adapters...”, then click the “Add...” button.
   c. Select the “Buslogic Standard SCSI Host Adaptor” driver from the list and click the “Install” button. In the box that requests the location, type “c:\i386” and click the “Continue” button.
   d. Restart the Profile VDR, and log in as *administrator* (hold down the shift key when the blue screen appears — factory-loaded password is *triton*).
4. Verify that Windows NT on the Profile VDR found the SCSI robot device.
   a. Double click the “Windows NT Diagnostics” icon in the “Administrative Tools” group.
   b. Select “Registry Editor” found under the “Tools” menu.
   c. In the “HKEY_LOCAL_MACHINE on Local Machine” window expand the “HARDWARE,” then the “DEVICEMAP,” and then the “Scsi” selections. Look for “SCSI” There should be a selection under “Scsi0” for “ScsiPort0” that can be expanded to the “ScsiBus0” selection with selections for the Initiator and each SCSI device on the bus. The PLS200 device will display as an EXABYTE EXB-480 under the “LogicalUnit0” selection of the “Target” selection.

Chapter **2**

Configuring the Library

After installing the library hardware, you need to set or check the library's configuration options. Configuration steps include:

- Displaying the Configuration Menu
- Setting the SCSI IDs
- Setting or checking other configuration options as required

To change options, you will use the operator panel (LCD and keypad) on the front of the library, as shown in Figure 2-1.

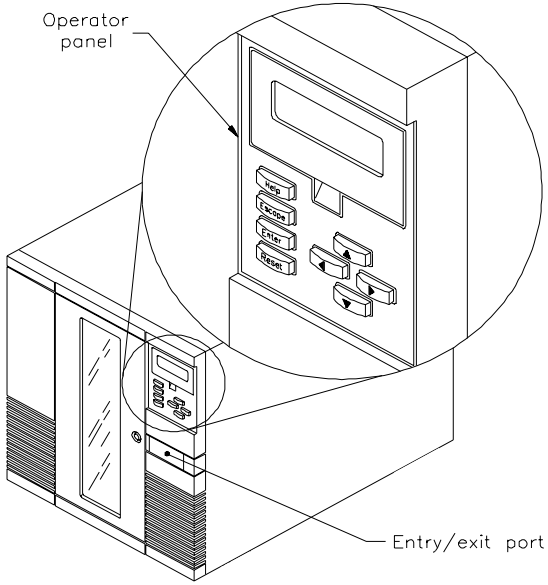
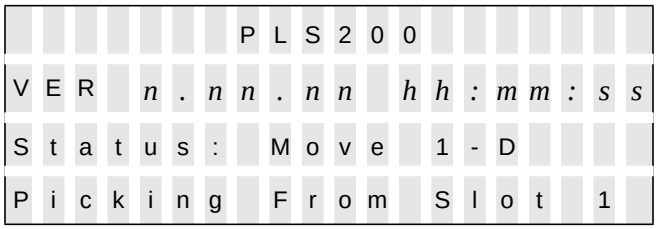


Figure 2-1 Operator panel

Main Screen

The Main Screen appears when you apply power to the library. The first and second lines on the Main Screen display the product name, version, and the current time. The third and fourth lines display status information about the library and tape drives.

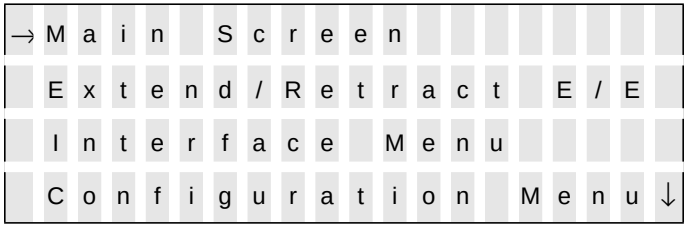


NOTE: The exact wording on your Main Screen may be different, and the information that appears at power-up is overwritten as the PLS200 software executes.

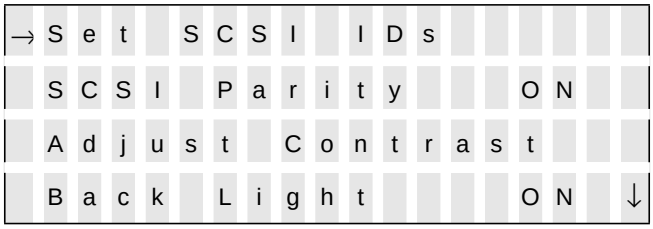
Displaying the Configuration Menu

To display the Configuration Menu:.

1. Access the Main Menu by pressing **Escape** on the keypad. The Main Menu is displayed:



2. Press ▼ to scroll down to Configuration Menu. Press **Enter**. The Configuration Menu is displayed:



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

▲ ▼	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.
Enter	Selects the item next to the screen arrow or accepts a change.
Escape	Returns to the previous menu or screen, or cancels an operation without saving changes.
Help	Displays the Help screen. To exit Help, press **Escape**.

Setting the SCSI IDs

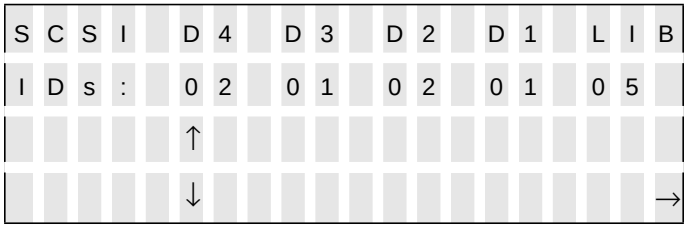
NOTE: The SCSI IDs shown are factory default settings. The default settings are the correct IDs for use with the Profile system. Unless the SCSI IDs in the Profile system have been altered, you should not need to change the library's SCSI ID settings. If one of the drive carrier slots contains a drive blank, the library displays a B (for blank) instead of a SCSI ID.

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 have multiple SCSI buses, the library does not check for duplicate SCSI IDs. It is your responsibility to make sure you do not assign duplicate SCSI IDs within a SCSI bus.***

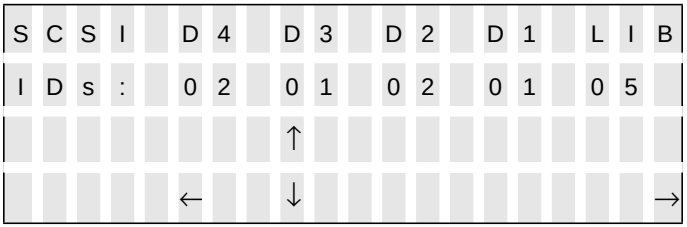
To view or change SCSI IDs:

1. From the Configuration Menu, make sure the screen arrow is pointing to Set SCSI IDs and press Enter. The following screen appears, where D*n* indicates a tape drive and LIB indicates the library:



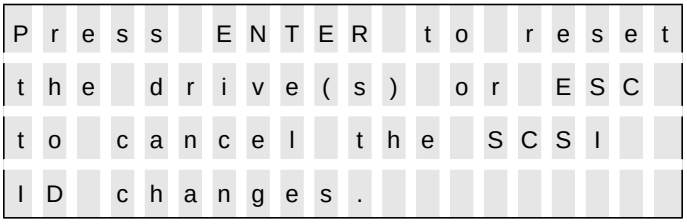
2. To set the SCSI ID for the bottom tape drive (D4), press ▲ or ▼ until the screen displays the SCSI ID you want. SCSI IDs for wide SCSI configurations range from 0 to 15.

3. Press ▶ to move the up and down screen arrows to D3, as shown. Press ▲ or ▼ until the screen displays the SCSI ID you want.



NOTE: If any drive carrier slot contains a drive blank, the cursor will skip over the SCSI ID field for that slot.

4. Continue this process until you have set the SCSI IDs for all tape drives and the library.
5. When the SCSI IDs for all tape drives and the library are correct, press **Enter** to accept your choices. If you have changed one or more of the tape drive IDs, the library displays the following screen:



6. Press **Enter**. The library resets the tape drives that have changed IDs and redisplays the Configuration Menu.

Setting Other Configuration Options

After setting the SCSI IDs, you may need to set or check the following configuration options before putting your library into operation:

- SCSI parity checking for the library
- LCD contrast
- LCD back light
- Library date
- Library time
- Library serial number
- Tape drive model

Setting Parity Checking

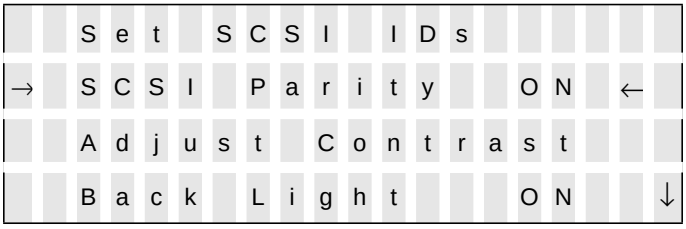
NOTE: The BusLogic BT-757CD SCSI adapter board used to connect the PLS200 to the video disk recorder does not support parity checking for the library. As a result, it makes no difference whether the setting for the library is ON or OFF.

The SCSI Parity option allows you to enable parity checking for the library if the SCSI adapter card connected to the library supports it. When the parity option is enabled, the library checks all data coming across the SCSI bus for parity. The setting you specify remains in effect across power cycles.

NOTE: Parity checking can also be enabled and disabled by application software using a SCSI MODE SELECT command. The method last used to set parity checking (LCD or SCSI command) has precedence.

To change parity checking:

1. From the Configuration Menu, press ▼ to select SCSI Parity.

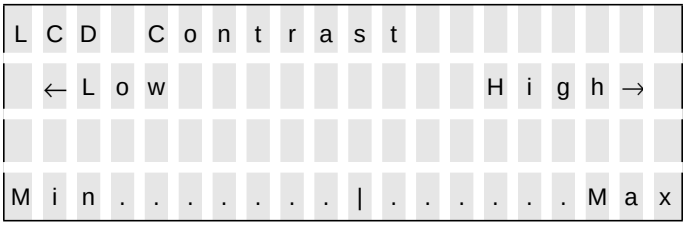


2. Use ◀ and ▶ to toggle parity checking on and off.

Adjusting the Contrast

The Adjust Contrast option controls the brightness of the lettering on your LCD. To adjust the contrast:

1. From the Configuration Menu, press ▼ to select Adjust Contrast and press **Enter**. The library displays the following screen:



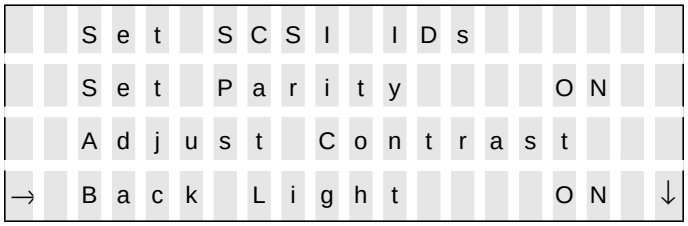
2. Press ▶ and ◀ to change the contrast. Press **Enter** to save your changes and exit the Adjust Contrast screen.

Setting the Back Light

The Back Light option turns the LCD background on or off.

To change the back light:

1. From the Configuration Menu, press ▼ or ▲ to select Back Light.



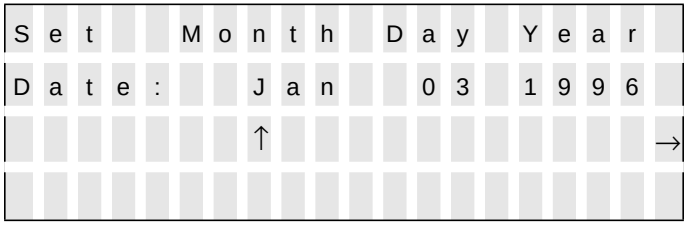
2. Press ◀ and ▶ to toggle back lighting on and off.

Setting the Library Date

The Set Date option allows you to set the date for the library. The date appears on the Command History screen (see page 108) and on diagnostic listings.

To set the date:

1. From the Configuration Menu, press ▼ or ▲ to select Set Date and press **Enter**.



2. Press ▲ and ▼ to cycle through the selections under Month, Day, and Year. Use ◀ and ▶ to move between the columns.
3. Press **Enter** to save your changes and exit the Set Date screen.

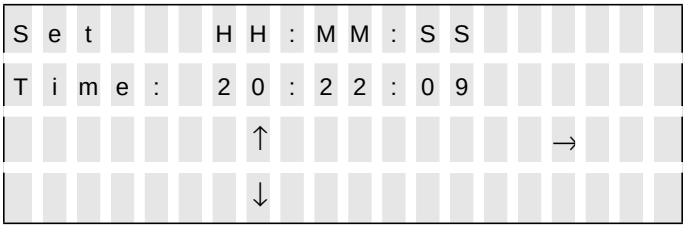
Setting the Library Time

The Set Time option allows you to set the time that is shown on the library's Main Screen and Command History screen (see page 108).

NOTE: The clock in the library is independent of outside clocks. It is not locked to any external synchronization, and cannot be set or accessed by the Media Manager on the Profile video disk recorder.

To set the time:

1. From the Configuration Menu, press ▼ to select Set Time and press **Enter**.
2. Use ▲ and ▼ to toggle through the selections under HH (hours), MM (minutes), and SS (seconds). Use ◀ and ▶ to toggle between the columns.



3. Press **Enter** to save your changes and exit the Set Time screen.

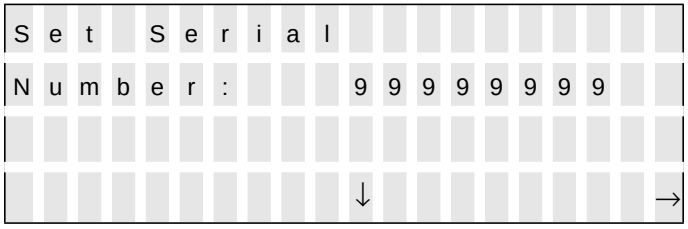
Checking the Serial Number

The serial number is entered into the library firmware at the factory. You can read the serial number label on the back of the library or use the Set Serial Number option. The serial number displayed on this screen appears on diagnostic listings.

NOTE: If the serial number has never been entered, the number stored in memory is 99999999.

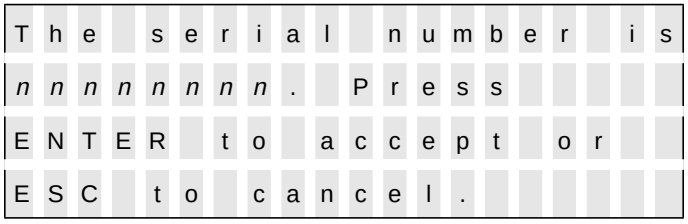
To check the serial number:

1. From the Configuration Menu, press ▼ or ▲ to select Set Serial Number and press **Enter**.



2. If necessary, enter the serial number by pressing ▲ and ▼ to change each digit. Press ◀ and ▶ to move from column to column.

3. Press **Enter**. The library displays the following screen:



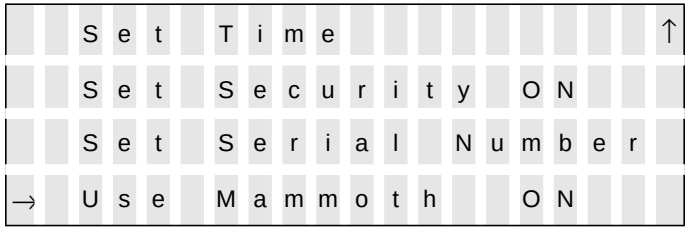
4. Press **Enter** to save your changes or press **Escape** to cancel changes.

Checking the Tape Drive Model

The tape drive model is entered into the library firmware at the factory. The PLS200 uses only the Mammoth drives, and normally displays “ON” for the Use Mammoth option.

To view the tape drive model:

1. From the Configuration Menu, press ▼ or ▲ to select Use Mammoth.



2. Press **Escape** to return to the Configuration Menu.

Chapter **3**

Operating the Library

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

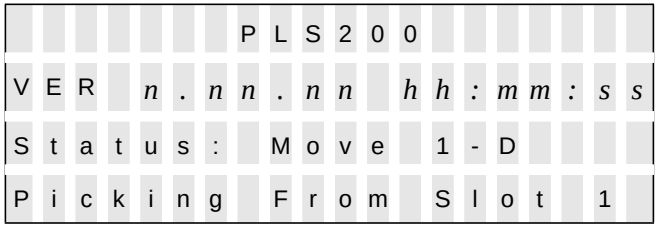
- Using the operator panel
- Operating the library in different control modes
- Resetting the library

Using the Operator Panel

The library includes a four-line LCD and keypad, called the *operator panel*, that allows you to 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

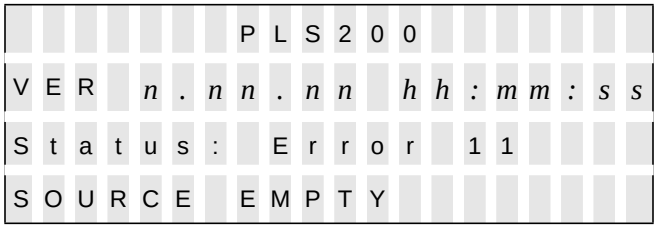
The Main Screen appears when you apply power to the library. The first and second lines on the Main Screen display the product name, version, and the current time. The third and fourth lines display status information about the library and tape drives.



NOTE: The exact wording on your Main Screen may be different, and the information that appears at power-up is overwritten as the PLS200 software executes.

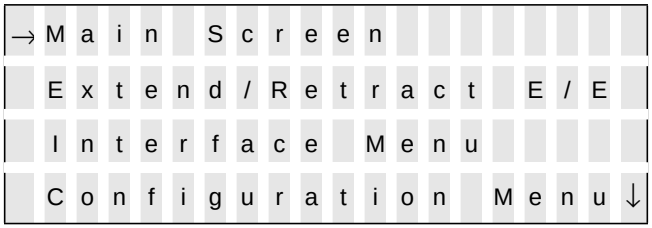
Error Codes

If a library hardware error occurs, an error code appears on the third and fourth lines of the Main Screen. The third line provides the error's numerical code; the fourth line provides a brief explanation of the error. You must correct the error before operation can continue; refer to Appendix B for a list of error codes and corrective actions.



Main Menu

Use the Main Menu (shown below) to access LCD options and functions. To access the Main Menu, press **Escape** from the Main Screen.



- Select **Main Screen** to return to the Main Screen.
- Select **Interface Menu** to change the control mode (see page 48) and configure the serial ports (see page 95).
- **Extend/Retract E/E** can be used to control the entry/exit port. Not recommended for adding tapes because it upsets the tape inventory database.
- Select **Configuration Menu** to set or change the library's configuration options (see Chapter 2).
- Select **Maintenance Menu** to run demos (see page 95), or perform diagnostic tests (see page 85).

- Select **Library Info Menu** to learn about library operations (see page 97) and tape drive operations (see page 54).

The library menu structure is shown in Figure 3-1.

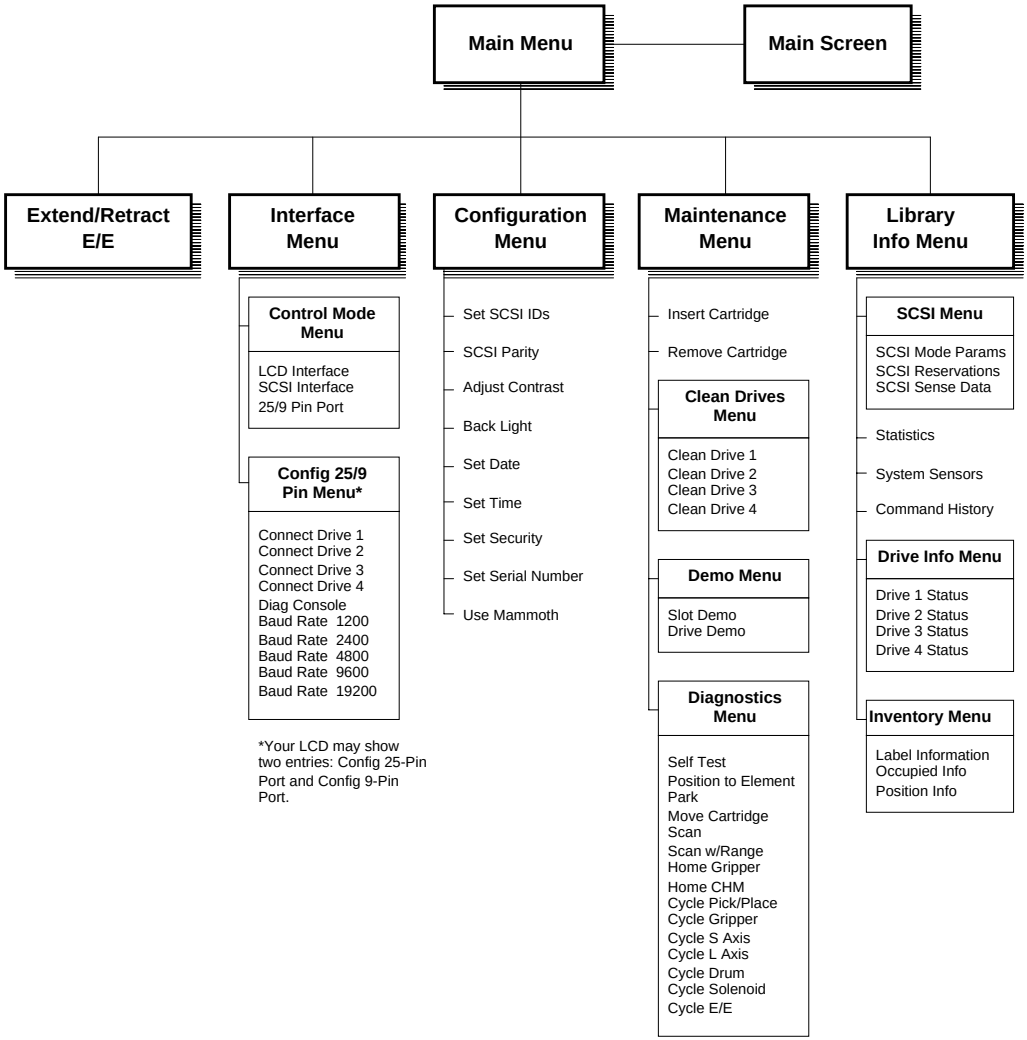


Figure 3-1 Library menu structure

Operator Keys

The keys on the operator panel perform the following functions:

▲ ▼	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.
Enter	Selects the item next to the screen arrow or accepts a change.
Escape	Returns to the previous menu or screen, or cancels an operation without saving changes.
Reset	Displays the Reset screen, which allows you to reset the library and the tape drives.
Help	Displays the Help screen. To exit Help, press Escape.

Operating in Different Control Modes

The library's control mode determines which interface controls CHM motion.

In this control mode...	The CHM is controlled by...	Purpose
SCSI Interface	Media Manager (or other similar application software)	Standard operating mode
LCD Interface	A user at the operator panel	Diagnostics
25/9 Pin	A user operating a console interface to access library firmware across the 25- or 9-pin port	Diagnostics

NOTE: Control mode settings remain in effect when library power is shut off.

SCSI Interface Mode

In SCSI Interface mode, application software such as Media Manager controls the motion of the CHM by issuing SCSI commands across the SCSI bus attached to the library. This is the normal operating mode for the PLS200.

NOTE: The library must be in SCSI Interface mode for the software to control the motion of the CHM.

For detailed information about the SCSI commands supported by the PLS200 contact your Tektronix representative.

LCD Interface Mode

When the library is operating in LCD Interface mode, you can control the motions of the CHM from the operator panel.

NOTE: You can use many operator panel features without changing to LCD Interface mode. LCD Interface mode is required only when you want to control the motions of the CHM from the operator panel.

25/9 Pin Serial Port 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 the 25/9 Pin mode to control CHM motion only. You do not need to change the control mode to access a tape drive's serial port.

Changing the Control Mode

➤ **Important** ***When you change from SCSI Interface control mode to any other mode, you cannot control CHM motion with Media Manager or other similar software.***

1. Make sure the library is in the ready state (that is, no hardware errors, door closed, and no cartridge move operations occurring).
2. From the Main Menu, press ▼ to select Interface Menu.
3. From the Interface Menu, press ▼ to select Control Mode Menu and press **Enter**.
4. From the Control Mode Menu, press ▼ to select the control mode and press **Enter**. The current control mode is indicated with an asterisk (*). The library changes from the current control mode and displays a screen similar to the following:

```
ACTIVE INTERFACE:
From:    SCSI
To:      LCD
Status:  DONE
```

5. Press **Escape** to return to the Interface Menu, and **Escape** again to return to the Main Menu.

Replacing Data Cartridge Magazines

To open the door and replace a data cartridge magazine:

1. Turn the door latch handle one quarter turn to the right, as shown in Figure 3-2.

➤ **Important** ***Do not open the library door unless you need to remove and replace cartridge magazines or perform a maintenance operation. It takes 2 to 5 minutes for the library to update the cartridge inventory after the door is opened and closed.***

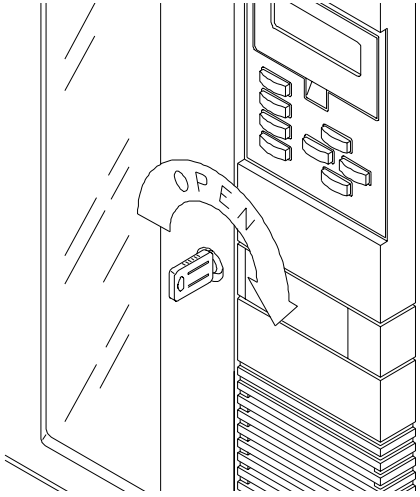


Figure 3-2 Opening the library door

When you unlock the door:

- The library completes its current operation, moves the CHM to the home position at the bottom of the long axis, rotates the drum assembly to the home position, and turns off current to all motors.
- The interlock mechanism releases.

2. When the door's interlock mechanism releases, 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 Media Manager (or other similar software).***

3. Make sure the CHM and its cabling are safely out of the way of the magazines. If necessary, move the CHM to the bottom of the long axis by pushing firmly against its base.
4. If necessary, manually rotate the drum assembly to access the cartridge magazine you want to remove.
5. Grasp the cartridge magazine on either side, pull the upper end out first, and remove it from the mounting plate (see Figure 3-3).

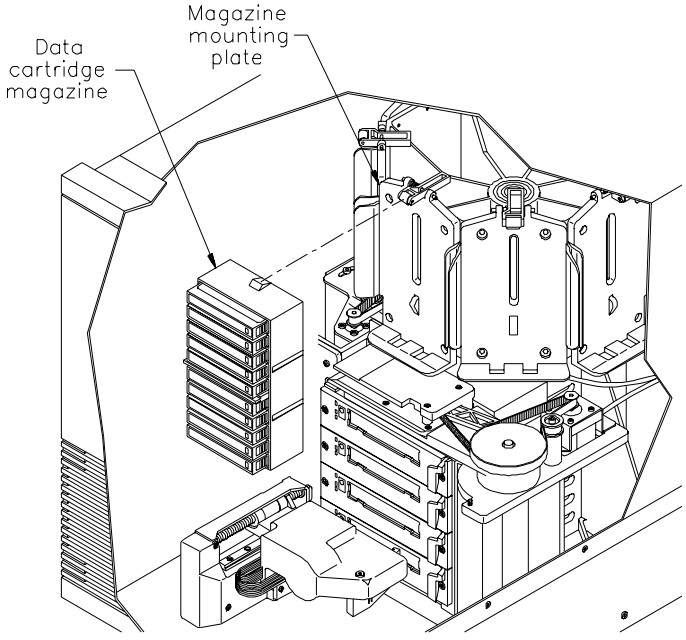


Figure 3-3 Replacing a cartridge magazine

6. Replace the magazine by positioning it over the mounting plate with the single mounting guide toward the top.
7. Insert the bottom end of the magazine first, then snap the magazine into place by pressing against the top.
8. Close the door and lock it by turning the key a quarter turn to the left. After the door is closed:
   - The library performs its power-on self-test.
   - The library returns Unit Attention status to the Profile system.
   - The software such as Media Manager may update its own cartridge inventory.

Resetting the Library

⚠ ***CAUTION: Resetting the library disrupts operation of the Profile video disk recorder to which the library is connected, requiring that the video disk recorder be restarted. Avoid resetting the library while it is connected to the video disk recorder.***

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.

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.

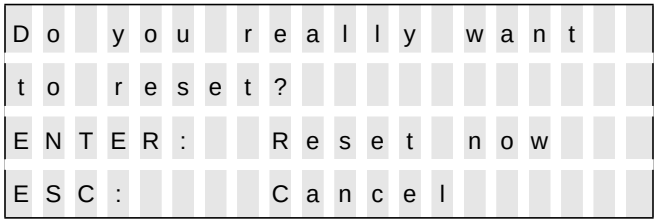
⚠ ***CAUTION: Before resetting the library, make sure the library or tape drives are not communicating across the SCSI bus. Resetting the library and tape drives may disrupt communications on the SCSI bus.***

As described in this section, you can use any of the following methods to reset the library and tape drives:

- Press the reset key on the operator panel
- Turn the library's power off and back on again

Reset Key

When you press **Reset**, the following message appears:



Press **Enter** to reset the library and tape drives, or press **Escape** to cancel the reset and return to the previous menu or screen.

Power-on Reset

⚠ ***CAUTION: Unless necessary for mechanical reasons, do not turn the power off while there are cartridges in the tape drives or CHM.***

Turn the library off, then on. A power-on reset also resets the tape drives.

NOTE: The library and tape drives can also be reset automatically by SCSI bus resets or Bus Device Reset messages.

Chapter 4

Operating the Tape Drives

Once installed and configured, the Media Manager or similar software automatically controls the tape drives as you perform store and retrieve operations. Unless there is a problem with the tape drives, you should never need to touch them. However, you may need to perform the following tasks, which are described in this chapter:

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

NOTE: You cannot control the tape drives from the operator panel. However, you can perform diagnostics on the tape drives across the 9-pin or 25-pin serial port.

Monitoring the Tape Drive LEDs

The tape drives use light-emitting diodes (LEDs) to indicate their operating states. Normally, you do not need to monitor the LEDs when the tape drives are installed in the library; however, basic tape drive LED states are described below for your reference.

The following table shows basic LED states.

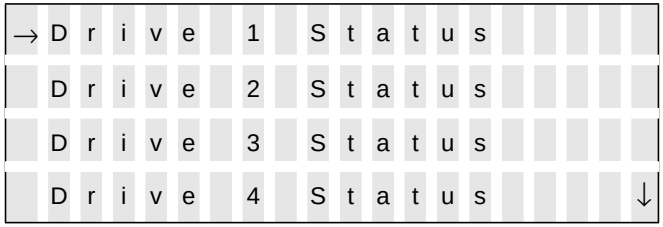
LED state	Condition
All LEDs on	The tape drive was reset or it is performing its power-on self-test.
Top LED on	Cleaning required.
Top LED flashing	Hardware error.
Middle LED on	A tape is loaded, and the tape drive is ready to perform tape motion activities.
Bottom LED flashing	Tape motion. A fast flash indicates high-speed tape motion.

Displaying Information About Tape Drives

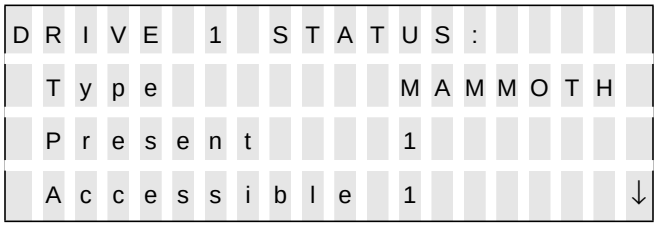
You can display information about your tape drives from the Drive Info Menu, accessible under the Library Info Menu. The information screens are updated whenever there is a change in drive status.

To display tape drive information:

1. From the Main Menu, press ▲ or ▼ to select the Library Info Menu and press **Enter**.
2. Press ▲ or ▼ to select the Drive Info Menu and **Enter**. The library displays the following screen:



3. Press ▲ or ▼ to select the tape drive for which you want to display information and press **Enter**. For each installed tape drive, the library displays a screen similar to the following:



4. Press **Escape** to return to the previous menus.

Fields on Drive Status Screen

Drive Status:	
DRIVE *N* STATUS	Identifies the tape drive, as follows: DRIVE 1 – The top tape drive DRIVE 2 – The second from top tape drive DRIVE 3 – The third from top tape drive DRIVE 4 – The bottom tape drive
Type	Identifies the tape drive model. This information is updated at power-up and after a reset. **Note:** "8mm" for Type indicates one of the following conditions: • No tape drive is present in this slot. • A Mammoth tape drive is installed, but the Use Mammoth configuration option is set to OFF. (See page 41.) • A tape drive firmware error has occurred.
Present	Indicates whether a tape drive is installed in this slot: 0 – A tape drive is not present. 1 – A tape drive is present.
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.
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.

Additional Fields on Mammoth Drive Status Screen

Mammoth Drive Status:	
Cart	Displays the status of a data cartridge, if any, in this tape drive: Loaded – A cartridge is in the tape drive and the tape is loaded into the tape path. Loading – A cartridge is being loaded into the tape drive. Unloading – A cartridge is being unloaded from the tape drive. Present – A cartridge is in the tape drive, but the tape is not loaded in the tape path. Empty – The tape drive does not contain a cartridge.
Write ECC	Displays the number of blocks rewritten during write operations, divided by the total number of blocks written.
Read ECC	Displays the number of blocks requiring error correction code (ECC) during read operations, divided by the total number of blocks read.
Tape left	Displays how much tape is left, in megabytes, on the cartridge currently in this tape drive.
Tape size	Displays the total amount of tape, in megabytes, on the cartridge currently in this tape drive.
Tape fmt	Displays the data format of the cartridge currently in the tape drive.
Serial	Displays the tape drive's serial number.
BOOT	Displays the code level of the tape drive's boot ROM.
FLASH	Displays the code level of the tape drive's flash EPROM.
ENTER = LCD Display	Allows you to switch to Mammoth LCD display mode by pressing **Enter**. When you do so, the third line of the library's LCD shows additional information that would be displayed on the tape drive's LCD. To return to the Drive Status screen from Mammoth LCD display mode, press **Escape**.

Ejecting a Cartridge Manually

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

1. Turn the door latch handle one quarter turn to the right.
2. When the door's interlock mechanism releases, 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.***

3. Press the eject button on the tape drive's faceplate. See Figure 4-1.

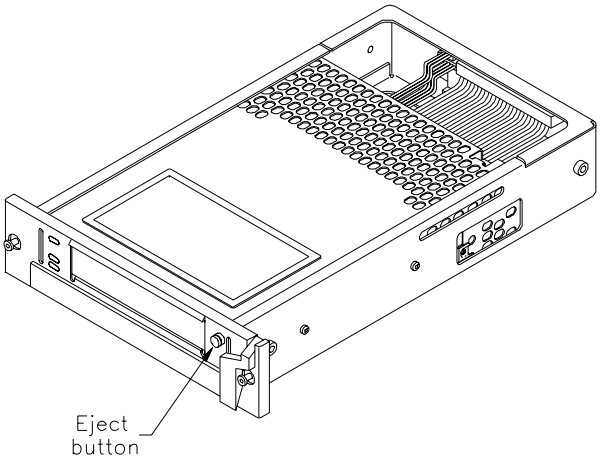


Figure 4-1 Eject button

Chapter **5**

Maintaining the Library

This chapter provides information about the following maintenance functions that you may need to perform on your library:

- Replacing tape drives or drive blanks
- Replacing the fuse
- Replacing the air filter
- Cleaning the front window
- Using touch-up paint on the library housing

➤ **Important** ***Do not attempt to replace any components in the library other than the tape drives, drive blanks, fuse, or air filters unless you are qualified to do so. When replacing other components, refer to the procedures in the maintenance manual.***

The library's internal components are lubricated at the factory and should not be cleaned or re-lubricated. To protect internal components from dust, keep the library door closed and locked.

Replacing Tape Drives or Drive Blanks

These instructions describe how to replace a drive blank or a tape drive that is already installed in a drive carrier.

Using Drive Blanks

If you are using fewer than four tape drives, you must install a drive blank in the unused drive carrier slots. You cannot operate the library with empty drive carrier slots.

NOTE: The library is shipped with one extra drive blank in the accessory box.

Replacing Tape Drives

To replace a tape drive, complete the steps listed in the table below. Each step is described on the following pages.

✓	Step	Description
	1	Prepare for replacement.
	2	Remove the tape drive from the library.
	3	Install a drive blank or tape drive in the library.
	4	Resume library operations.

Preparing for Replacement

1. Obtain a flat-blade screwdriver.
2. To avoid damaging the library, be sure that the work area is free of conditions that could cause electrostatic discharge (ESD). See page 2.

⚠ ***CAUTION: Do not force the door open. The interlock mechanism may be prevented from releasing by Media Manager (or similar software).***

3. Turn the door latch handle.
4. When the door's interlock mechanism releases, open the door.
5. Turn the library's power switch to off.
6. Disconnect the power cord.

⚠ ***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.***

7. If necessary, reach in and push firmly against the base of the CHM to move it to the top or bottom of the long axis so it is not blocking access to the tape drives.

Remove the Tape Drive

1. Using a flat-blade screwdriver, loosen the two captive screws on the drive carrier faceplate (see Figure 5-1).
2. Using your finger, pull out the lever on the faceplate.

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

⚠ ***CAUTION: To avoid possible damage to the tape drive, do not remove it from the drive carrier.***

3. Pull the tape drive out of the slot.

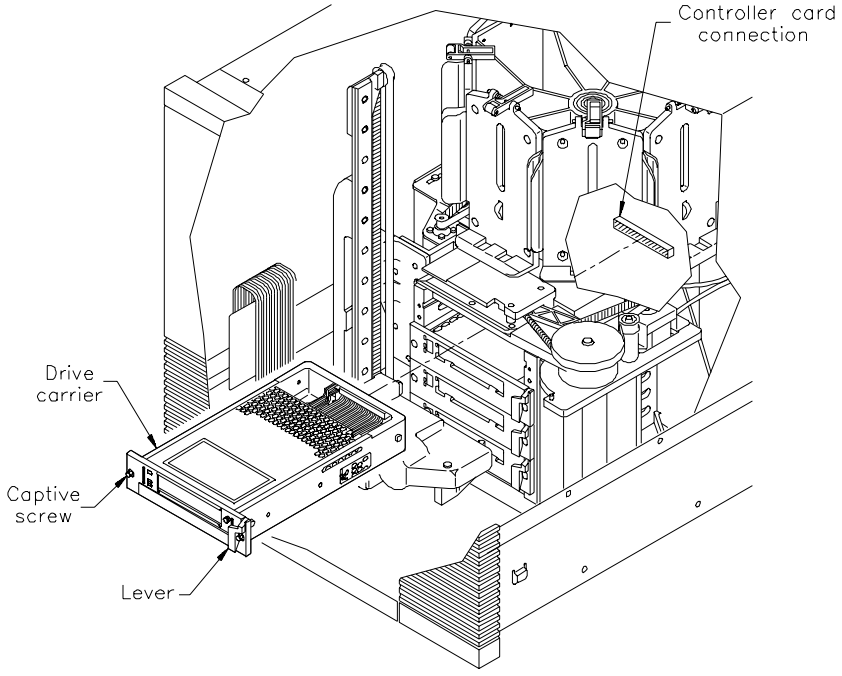


Figure 5-1 Removing and installing a tape drive

Install the Tape Drive

➤ **Important** ***Do not insert your fingers in the tape drive door.***

1. As shown in Figure 5-1, insert the tape drive into the slot with the lever to the right. Make sure the lever is closed. The tape drive should slide easily toward the back.
2. When the drive is almost completely inside the slot, you will feel some resistance. This is caused by the connection between the library's controller card and the tape drive. To seat the connection, push firmly against the drive until you can push no further.
3. Using a flat-blade screwdriver, tighten the captive screw on each end of the drive carrier faceplate (two screws).

Resume Library Operations

1. Connect the power cord to the back of the library.
2. Close and lock the library's door.
3. Turn the library power switch to on.

NOTE: When you replace a tape drive, the new tape drive automatically assumes the SCSI ID of the old tape drive. See page 34 if you want to change the SCSI ID.

Replacing the Fuse

The library uses a T4A (4.0-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. Replacement fuses are available generally from electronic parts suppliers.

⚠ ***CAUTION: When replacing the fuse, use only the same type and rating of fuse.***

⚠ ***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.***

To replace the fuse:

1. Set the power switch to the off (**O**) position, and remove the power cord.
2. Place a small screwdriver underneath the tab on the fuse drawer. Lift out the fuse drawer.

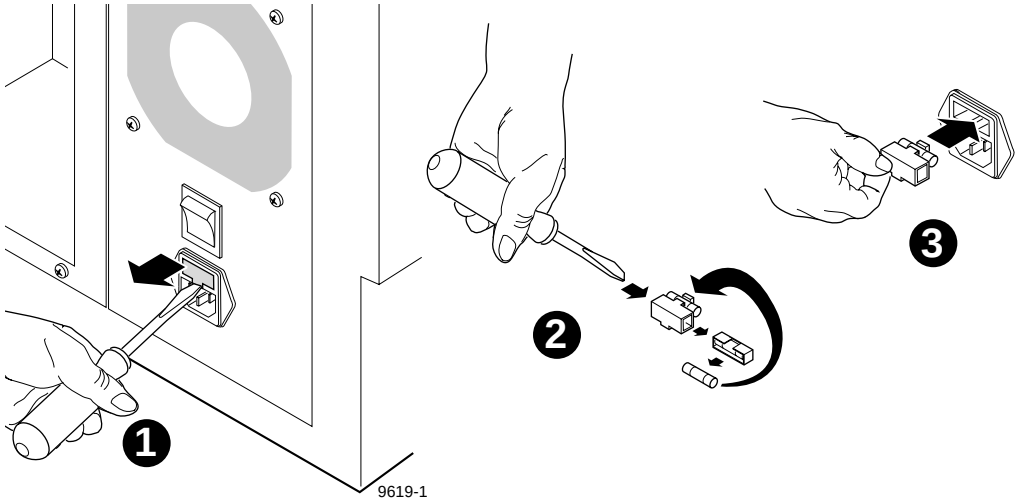


Figure 5-2 Replacing the fuse

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. Place another spare fuse in the spare fuse box and replace the spare fuse box in the fuse drawer.
6. Insert the fuse drawer into the back panel. Push it in as far as you can.

Replacing the Air Filter

The library has two air filters, one on each side of the front panel (see Figure 5-3). You should replace the air filters once a year (or more frequently if the library is operating in a dusty environment). Replacement filters are available from Tektronix (part number 378-2082-00).

To replace the air filters:

1. As shown in Figure 5-3, push against the outer edge of each air filter grille and pull the grille off the front panel.

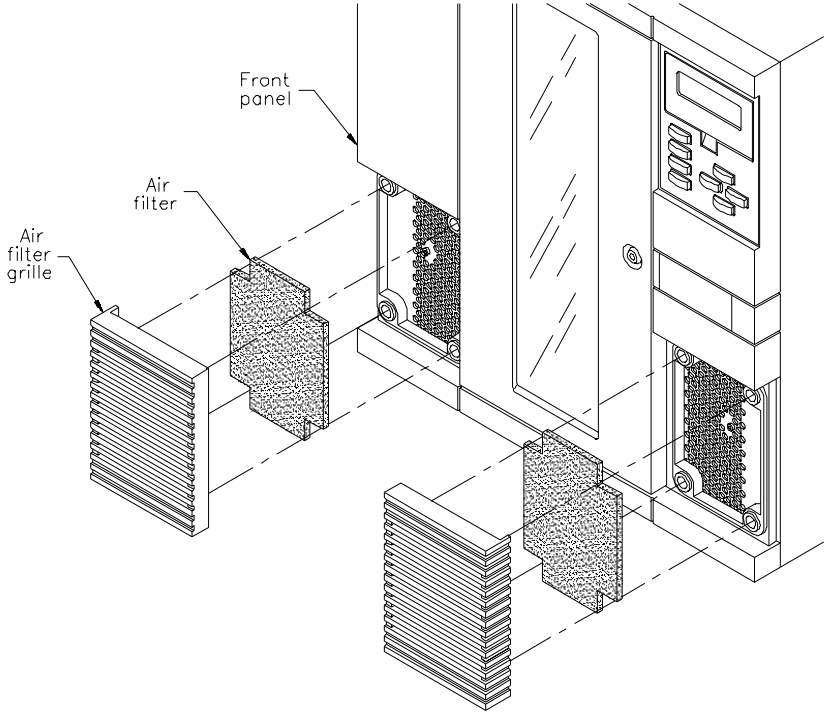


Figure 5-3 Replacing the air filters

2. Remove the air filter from inside of the air filter grille (see Figure 5-4).
3. Place a new filter inside each grille, tucking the mesh over the mounting pins inside the grille.

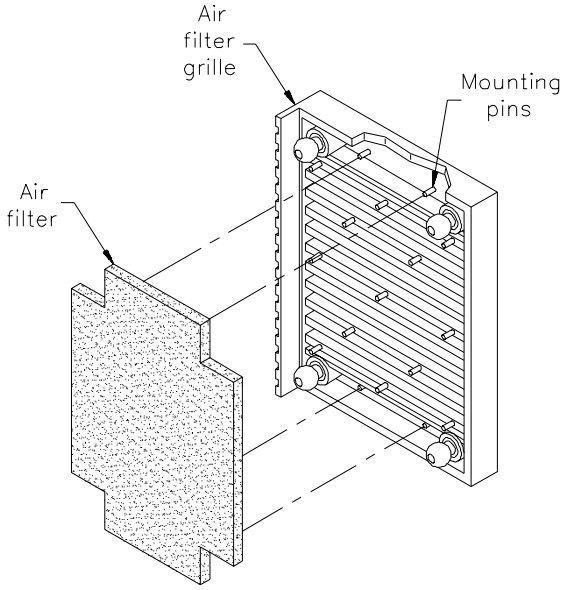


Figure 5-4 Replacing the air filter inside the air filter grille

4. Replace each grille by inserting the tabs into the holes and pushing against the grille until it is seated.

Cleaning the Front Window

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

Aside from the tape drives, the only library component that you should clean is the window in the front door. To clean the library's window, use a soft cloth moistened with a mild detergent solution. Finish with a soft, lint-free cloth.

Chapter 6

Packing and Shipping the Library

This chapter describes the procedures for:

- Returning the library for service
- Shipping the library

Returning the Library for Service

If you need to return the library to the factory for service, contact Tektronix Technical Support. See “Tektronix Product Support” on page xvii. If your service representative instructs you to return the library, follow the shipping instructions on the following pages.

➤ **Important** ***If you are returning the library for service, remove and keep all cartridges, cartridge magazines, SCSI cables, terminators, jumpers, and power cables.***

Shipping the Library

If you need to ship the library to another location, make sure you pack the library in the original packing materials. These include:

- Shipping containers
- Packing foam
- 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 Tektronix) when repacking and shipping the library. Do not use the shipping carton and packing materials to ship items other than or in addition to a library.***

Preparing the Library for Shipping

Before you pack the library, complete the preliminary steps that follow:

⚠ ***CAUTION: Do not force the door open. The interlock mechanism may be prevented from releasing by the application software.***

1. Turn the door latch handle. When the interlock mechanism releases, open the door.
2. Turn off the power.
3. Remove the power cord, SCSI cables, terminators, and jumpers from the back of the library. Leave the tape drives and drive blanks in the library.
4. Remove all data cartridge magazines.

Inserting the Packing Foam in the Library

Be sure the packing foam assembly is disassembled before you begin.

1. Put the vertical piece of the foam assembly into the library next to the CHM, as shown in Figure 6-1. Bend it as needed to get it through the door.
2. Maneuver the bottom cross piece (the one with the off-center notch) into position and fit its notch to the notch in the vertical piece (arrow 1 in Figure 6-1). Then bend the top of the vertical piece enough to attach the top cross piece (arrow 2 in Figure 6-1).
3. Adjust the CHM on the long axis so that it will fit into the opening in the vertical piece.

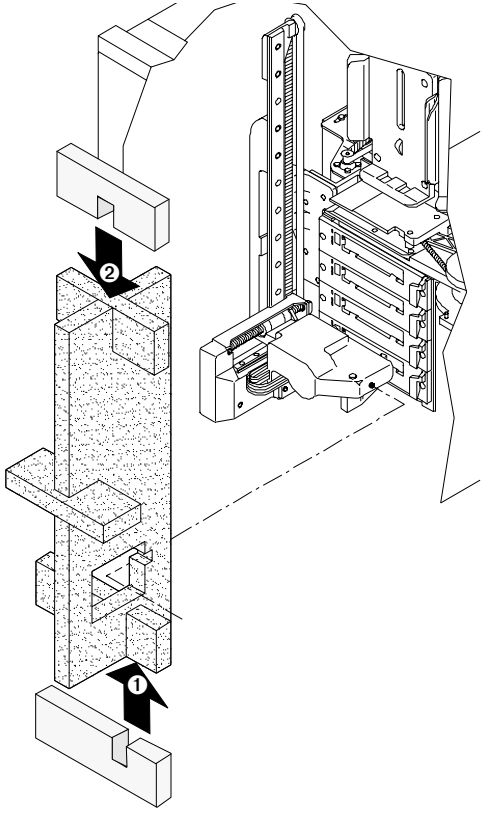


Figure 6-1 Installing the packing foam in the library

4. Slide the foam assembly to the left (arrow 1 in Figure 6-2) so the CHM fits in the pocket as shown.
5. Fit the front cross piece to the vertical piece (arrow 2 in Figure 6-2).
6. Close the library door and latch it.
7. Refer to the instructions on the following pages for removing the library from the rack.

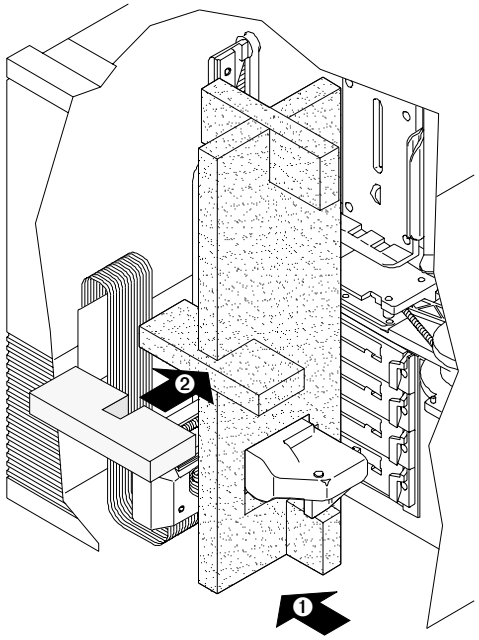


Figure 6-2 Adjusting the packing foam

Removing the Library From the Rack

⚠ ***WARNING: The library weighs 137 – 167 pounds (62 – 76 kg). To avoid possible injury, you need at least 4 people, or 2 people and a small fork lift, to lift the library.***

Preparation

- Obtain a fork lift or enlist the help of at least three additional people.
- Obtain the following tools:
  - T-15 TORX driver
  - T-25 TORX driver

Removing the library

To remove the library from the rack:

1. Extend the extension support legs on the rack.
2. Remove the air filter grilles from the front of the library by lifting on the outside edges and pulling the grilles away from the library.
3. Use a T-25 TORX driver to remove the two pan head screws that secure the library to the rack, as shown in Figure 6-3. A clip nut may have been installed over the screw hole on the rack.

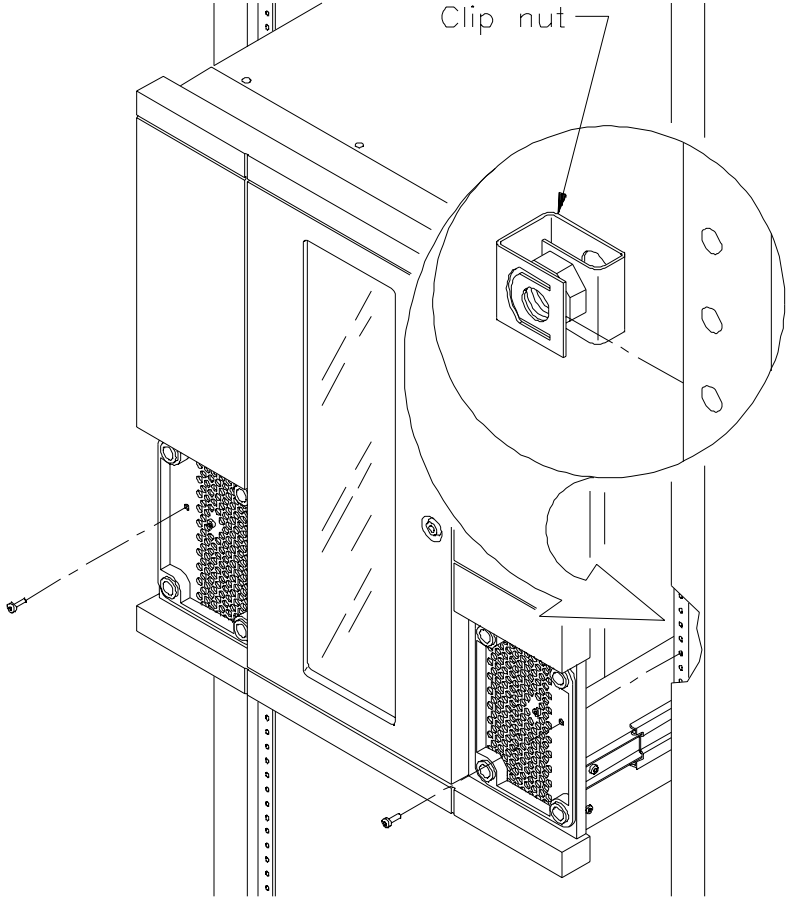


Figure 6-3 Removing the screws from the front of the rack

4. Slide the library a few inches out of the rack.
5. Use a T-15 TORX driver to remove the two button head screws attaching the rails to the sides of the library, as shown in Figure 6-4.

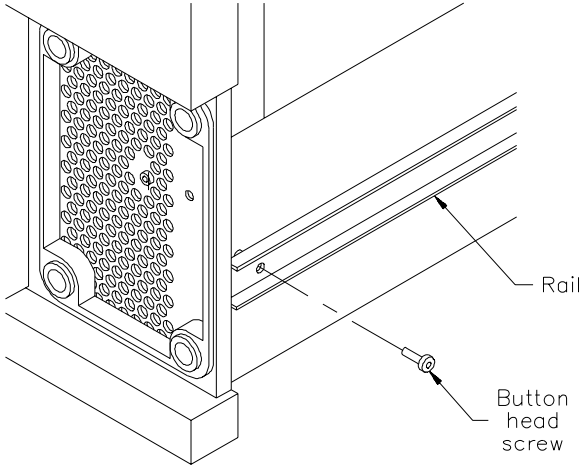


Figure 6-4 Removing the screws from the sides of the library

6. Making sure the library is supported so that the rack will not tip, slide the library forward until the rails stop at the spring clips (see Figure 6-5).
7. Lift the library from the rack and lower it to a low workbench or the floor.
8. Replace the air filter grilles on each side of the front panel.
9. Press the spring clips on the rails and push the rails back into the rack.

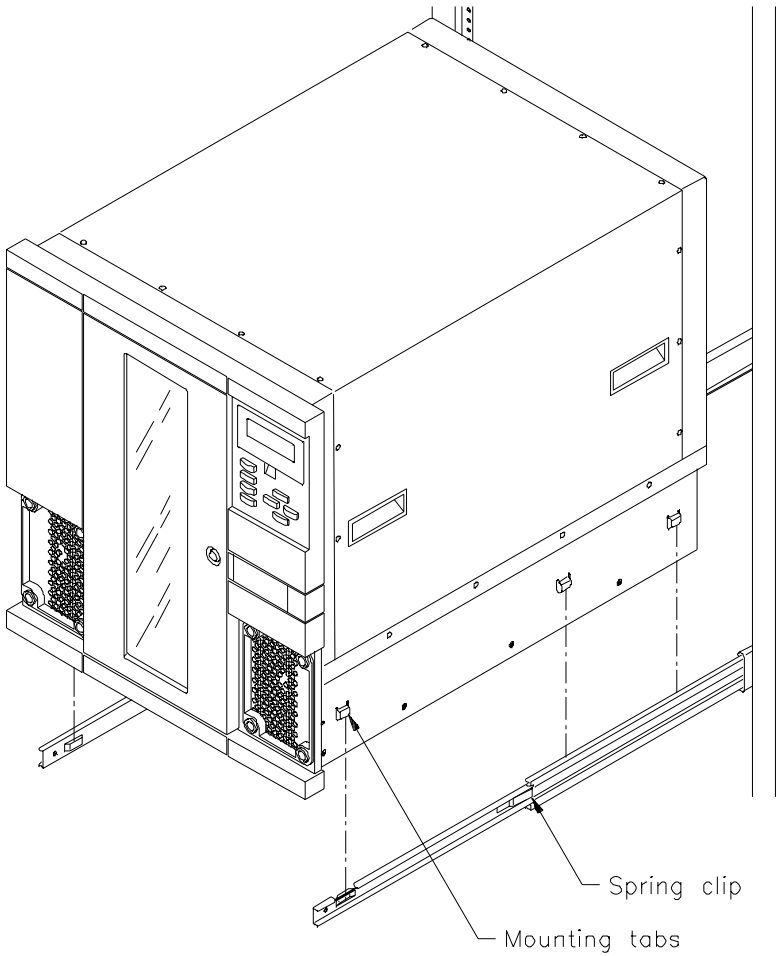


Figure 6-5 Lifting the library from the rack

Packing the Library in the Shipping Containers

1. Lay the bottom packing cushion over the tray, which is stapled to the pallet.
2. Using four people, or two people and a fork lift, place the library on top of the bottom cushion.
3. Place the antistatic bag over the library as shown in Figure 6-6.

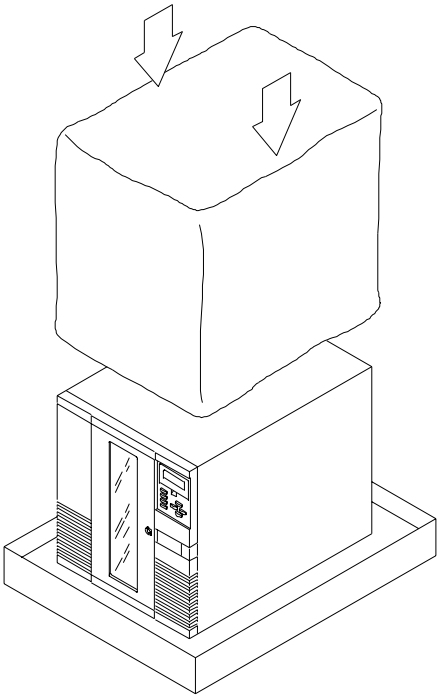


Figure 6-6 Placing the antistatic bag over the library

4. Place the cushioned packaging around the library, as shown in Figure 6-7. Use the alignment holes in the packing pieces as a guide.

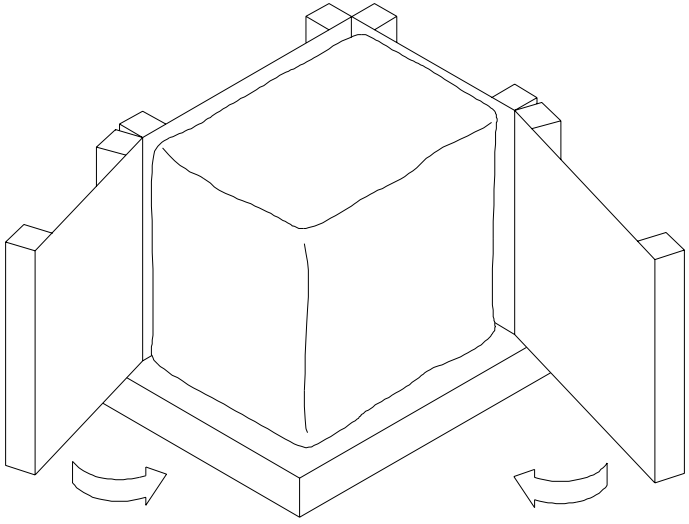


Figure 6-7 Placing the cushioned packaging around the library

5. If you are shipping the library's accessories, place the accessory box on top of the library, as shown in Figure 6-8.

➤ **Important** ***If you are returning the library for service, do not return the library's accessories (cartridges, cartridge magazines, SCSI cables, terminators, jumpers, and power cables).***

6. Place the cushioned top over the accessory box, as shown in Figure 6-8.

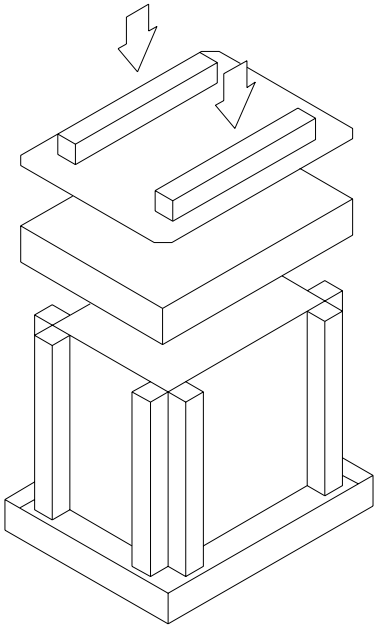


Figure 6-8 Placing the accessory box and top on the library

7. Lay the necessary paperwork on top.
8. Place the carton over the library, as shown in Figure 6-9, and tape the box shut.

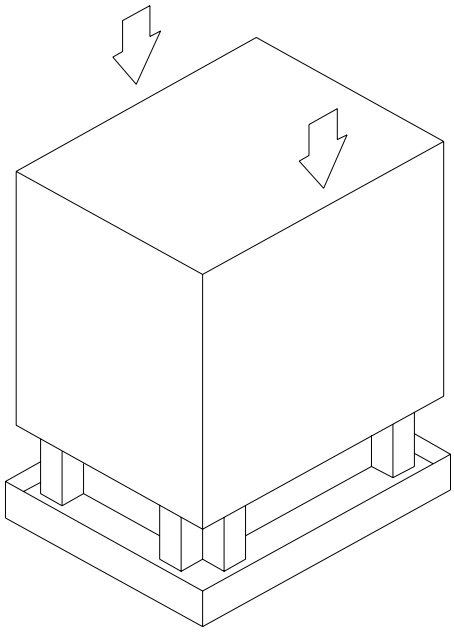


Figure 6-9 Placing the carton over the library

9. Place the shipping label on the box.
10. Secure banding material around the box and through the wooden pallet, as shown in Figure 6-10.

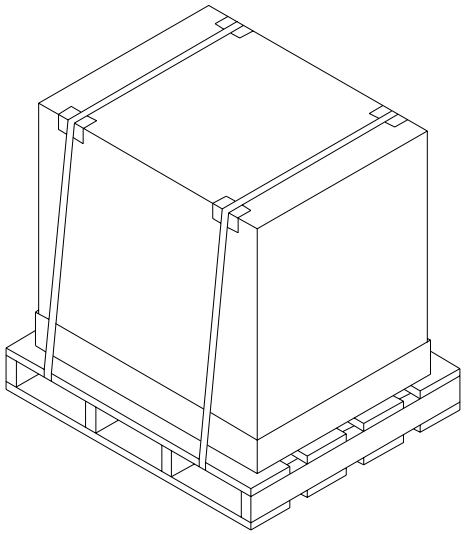


Figure 6-10 Securing the banding material

Chapter 7

Performing Diagnostics

This chapter describes how to use the LCD Diagnostics Menu to test the library hardware. It also provides information about using the serial ports to perform diagnostics on the library and tape drives.

Using the LCD Diagnostics Menu

The Diagnostic Menu provides basic functions to test or exercise the following hardware components:

- CHM and drum assembly
- Bar code scanner
- Entry/exit port
- Solenoid on the front door

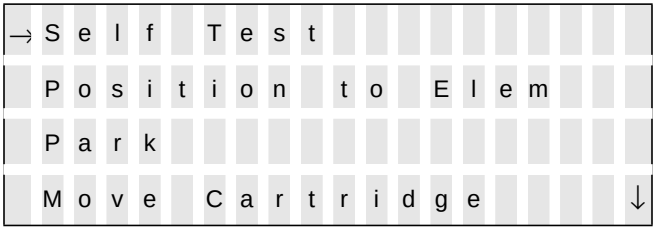
Summary of Diagnostic Tests

Diagnostic test	Description
Self Test	Opens and closes the gripper fingers, moves the CHM along the short and long axes, extends and retracts the entry/exit port, and rotates the drum assembly.
Position to Elem	Moves the CHM to a tape drive, cartridge slot, or the entry/exit port.
Park	Causes the CHM to move to the park position at the bottom of the long axis.
Move Cartridge	Moves a cartridge from one location to another.
Scan	Scans all of the elements.
Scan with Range	Scans a range of elements.
Home Gripper	Causes the gripper to move to its home position (open).
Home CHM	Causes the CHM to move to its home position at the top of the long axis.
Cycle Pick/Place	Causes the CHM to take a cartridge from a specified slot and replace it in the same slot.
Cycle Gripper	Causes the gripper to open and close.
Cycle S Axis	Causes the CHM to move in and out on the short axis.
Cycle L Axis	Causes the CHM to move up and down on the long axis.
Cycle Drum	Rotates the drum assembly 180 degrees.
Cycle Solenoid	Exercises the solenoid that controls the locking mechanism on the front door.
Cycle E/E	Extends and retracts the entry/exit port.

Accessing the Diagnostics Menu

To access the Diagnostics Menu:

1. Change to LCD Interface control mode. See page 48.
2. From the Main Menu, press ▼ to select Maintenance Menu and press **Enter**.
3. From the Maintenance Menu, press ▼ to select Diagnostics Menu and press **Enter**. The library displays the Diagnostics Menu:



4. Refer to the appropriate section on the following pages to perform each test.

Specifying Element Indexes

Some of the tests require you to specify one or more element indexes. Refer to Appendix C for diagrams showing the element indexes for the PLS200.

Stopping Diagnostic Tests

To stop a diagnostic test, press **Escape**, then **Enter**.

Self Test

The Self Test is an automated combination of most of the exercises described in this section. During the Self Test, the following actions occur:

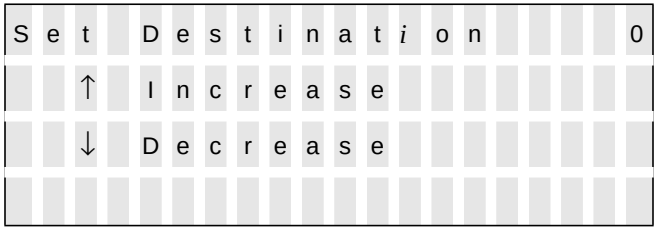
- The CHM's gripper fingers move to the home position.
- The CHM cycles the short and long axes once (moves to each end of each axis), then moves to the park position at the bottom of the long axis.
- The drum assembly rotates 180 degrees and moves to its home position.
- The transport arm extends to the entry/exit port, then retracts to its home position.

To run the Self Test, select Self Test from the Diagnostics Menu and press **Enter**.

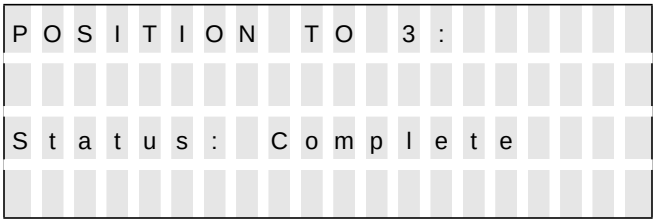
Position to Element

The Position to Element test positions the CHM in front of a tape drive, fixed cartridge slot, or magazine slot. To run the Position to Element test:

1. From the Diagnostics Menu, press ▲ or ▼ to select Position to Element and press **Enter**. The library displays the following screen:



2. Press ▲ and ▼ to select the element index (shown in the upper right corner) where you want to position the CHM, and press **Enter**. The library moves the CHM and, if necessary, rotates the drum so the CHM is positioned in front of the element you indicated. When the move is complete, the library displays a message similar to the one in the following screen (the element index will differ):



3. To run the test again with a different element index, press **Escape** to return to the Diagnostics Menu and repeat steps 1 and 2.

Park

The Park test moves the CHM to the bottom of the long axis (the park position).

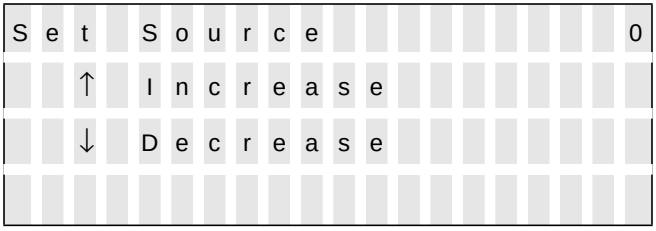
To run the Park test, press ▲ or ▼ from the Diagnostics Menu to select Park and press **Enter**. The library moves the CHM to the bottom of the long axis.

Move Cartridge

➤ **Important** ***If you insert a cartridge in a tape drive, the tape drive will not automatically eject the cartridge.***

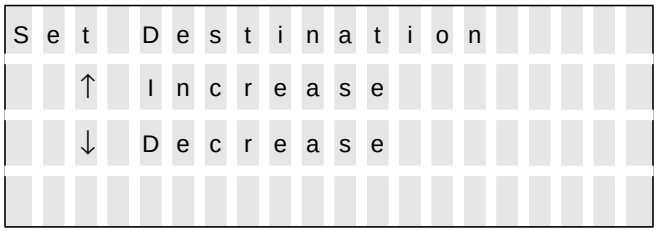
The Move Cartridge test picks a cartridge from one element and moves it to another. To run the Move Cartridge test:

1. From the Diagnostics Menu, press ▲ or ▼ to select Move Cartridge and press **Enter**. The library displays the following screen:



2. Press ▼ and ▲ to select the element index (shown in the upper right corner) of the cartridge slot from which you want the CHM to pick the cartridge.

3. Press Enter. The library displays the following screen:



4. Press ▼ and ▲ to select the element index (shown in the upper right corner) of the cartridge slot in which you want the CHM to place the cartridge.

5. Press Enter. The CHM moves the cartridge from the source to the destination.

Scan

The Scan test scans all of the bar code labels. The information is stored in the cartridge inventory. Any scan errors encountered are displayed on the Label Info screen (see page 110).

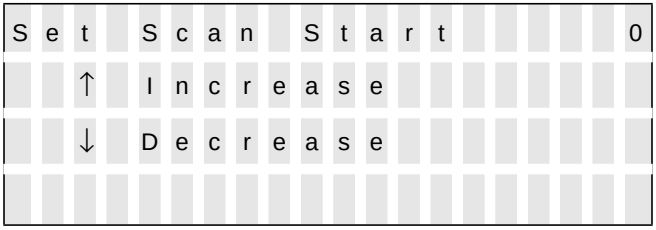
To run the Scan test, press ▲ or ▼ from the Diagnostics Menu to select Scan and press Enter.

Scan with Range

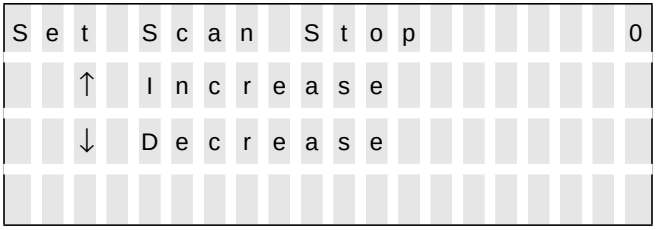
The Scan with Range test scans a range of bar code labels. The information is stored in the cartridge inventory.

To run the Scan with Range test:

1. From the Diagnostics Menu, press ▲ or ▼ to select Scan with Range and press **Enter**. The library displays the following screen.



2. Press ▼ and ▲ to specify an element index where you want the bar code scanner to begin scanning. Press **Enter**. The library displays the following screen.



3. Press ▼ and ▲ to specify an element index where you want the bar code scanner to end scanning. Any scan errors encountered are displayed on the Label Info screen (see page 110).

Home Gripper

The Home Gripper test closes and opens the gripper on the CHM.

To run the Home Gripper test, press ▲ or ▼ from the Diagnostics Menu to select Home Gripper and press **Enter**.

Home CHM

During the Home CHM test, the following actions occur:

- The CHM moves in and out on the short (horizontal) axis.
- The CHM moves down and up on the long (vertical) axis.
- The drum assembly rotates to its home position (with cartridge magazine 0 toward the front).
- The CHM gripper closes and opens.

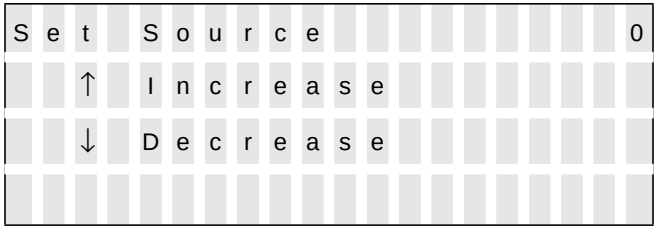
To run the Home CHM test, press ▲ or ▼ from the Diagnostics Menu to select Home CHM and press **Enter**.

Cycle Pick/Place

The Cycle Pick/Place test picks a cartridge from the element you specify and places it back in the same element. The test repeats the number of times you specify.

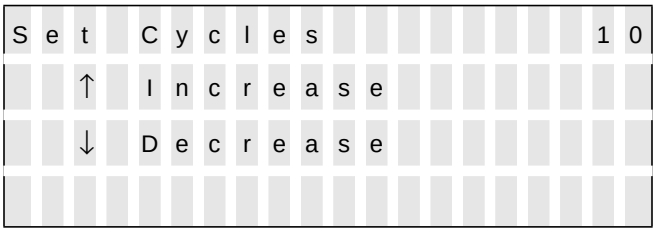
To run the Cycle Pick/Place test:

1. From the Diagnostics Menu, press ▲ or ▼ to select Cycle Pick/Place and press **Enter**. The library displays the following screen:



2. Press ▼ and ▲ to select the element index (shown in the upper right corner) of the cartridge slot where you want the CHM to pick and place the cartridge.

3. Press **Enter**. The library displays the following screen:



4. Press ▼ and ▲ to select the number of cycles, in increments of ten, that you want the Cycle Pick/Place test to run.

5. Press **Enter**. The CHM picks and replaces the cartridge the number of times you specified.

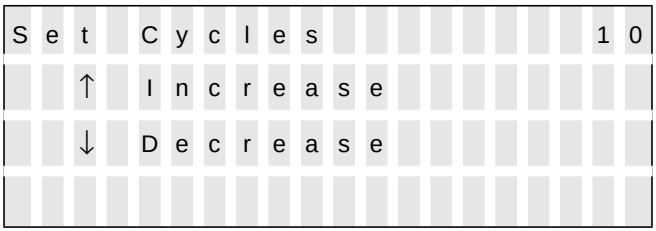
Cycle Gripper

The Cycle Gripper test closes and opens the gripper the number of times you specify. For best results, move the CHM to the park position so you can see the movement of the gripper through the library window.

1. From the Diagnostics Menu, press ▲ or ▼ to select Park and press **Enter**. The library moves the CHM to the park position at the bottom of the long axis.

2. Press **Escape** to return to the Diagnostics Menu.

3. Press ▼ to select Cycle Gripper and press **Enter**. The library displays the following screen:

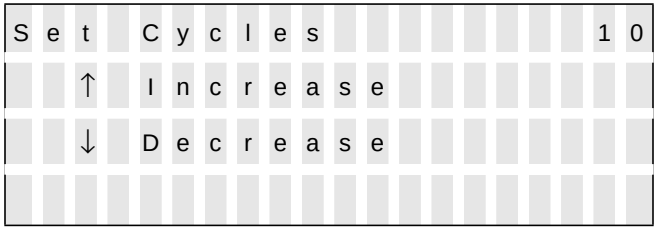


4. Press ▼ and ▲ to select the number of cycles, in increments of ten, that you want the Cycle Gripper test to run. Press **Enter**.

Cycle S Axis

The Cycle S Axis test positions the CHM in front of the fixed cartridge slot and moves the CHM back and forth on the short axis the number of times you specify.

1. From the Diagnostics Menu, press ▲ or ▼ to select Cycle S Axis and press **Enter**. The library displays the following screen:

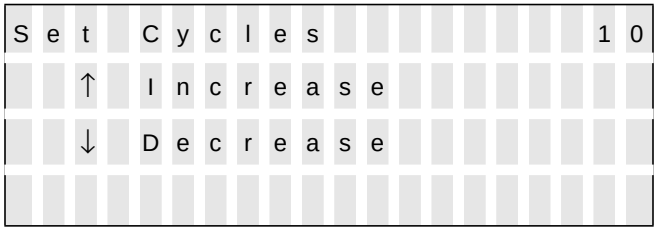


2. Press ▼ and ▲ to select the number of cycles, in increments of ten, that you want the Cycle S Axis test to run and press **Enter**.

Cycle L Axis

The Cycle L Axis test moves the CHM up and down on the long axis the number of times you specify.

1. From the Diagnostics Menu, press ▲ or ▼ to select Cycle L Axis and press **Enter**. The library displays the following screen:

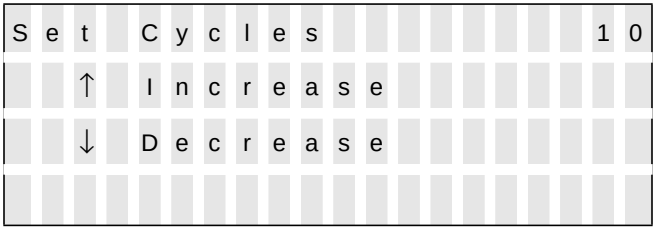


2. Press ▼ and ▲ to select the number of cycles, in increments of ten, that you want the Cycle L Axis test to run and press **Enter**.

Cycle Drum

The Cycle Drum test rotates the drum assembly 180 degrees.

1. From the Diagnostics Menu, press ▲ or ▼ to select Cycle Drum and press **Enter**. The library displays the following screen:

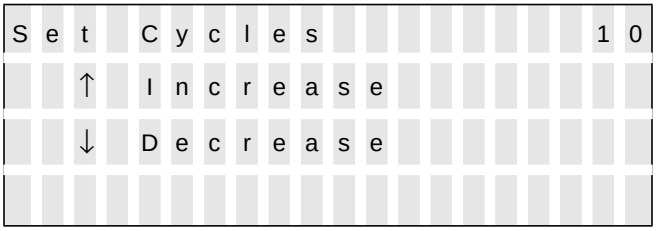


2. Press ▼ and ▲ to select the number of cycles, in increments of ten, that you want the Cycle Drum test to run and press **Enter**.

Cycle Solenoid

The Cycle Solenoid test exercises the solenoid that controls the locking mechanism on the front door.

1. From the Diagnostics Menu, press ▲ or ▼ to select Cycle Solenoid and press **Enter**. The library displays the following screen:

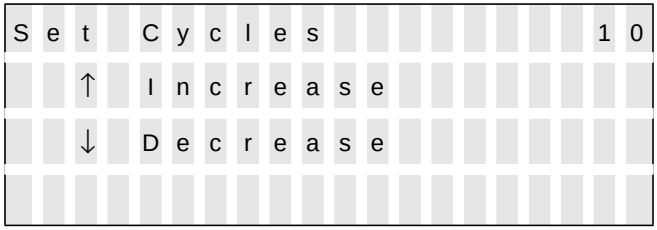


2. Press ▼ and ▲ to select the number of cycles, in increments of ten (up to 250), that you want the Cycle Solenoid test to run and press **Enter**. You will hear a clicking sound.

Cycle E/E

The Cycle E/E test exercises the entry/exit port transport assembly.

1. From the Diagnostics Menu, press ▲ or ▼ to select Cycle E/E and press **Enter**. The library displays the following screen:



2. Press ▼ and ▲ to select the number of cycles, in increments of ten, that you want the Cycle E/E test to run and press **Enter**.

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 25/9 Pin control mode (for wide libraries).

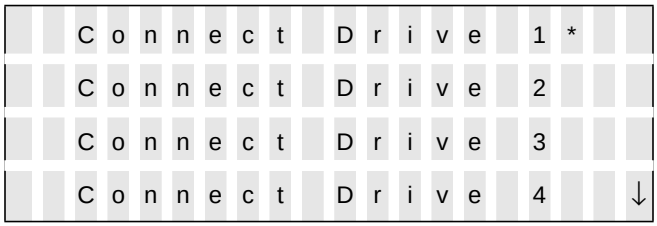
Function	Serial Port		Must change control modes?
	9-Pin	25-Pin	
Controlling the CHM for diagnostic purposes	✔	✔	✔
Upgrading library firmware	✔		
Creating diagnostic listings for the library	✔	✔	
Upgrading tape drive firmware	✔	✔	
Controlling the tape drives for diagnostic purposes	✔	✔	

To configure the serial port:

1. If you want to control CHM motion, change the control mode to the appropriate serial port mode (see page 48).

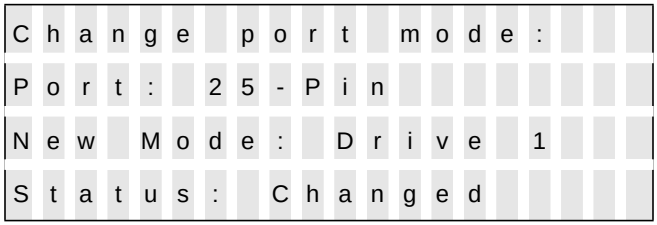
➤ **Important** ***Do not change to a serial port control mode if you want to connect a serial port to a tape drive.***

2. From the Interface Menu, press ▼ and ▲ to select Config 25/9 Pin Menu (for wide SCSI libraries). The library displays a screen similar to the following:



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

3. Press ▼ and ▲ to select one of the following options:
   - Connect Drive 1 (the top tape drive)
   - Connect Drive 2
   - Connect Drive 3
   - Connect Drive 4 (the bottom tape drive)
   - Diag Console (connect to the library's resident diagnostic program)
4. When you have selected the option you want, press **Enter**. The library assigns the port and displays a screen similar to the following (the ports and assigned devices may differ):



5. Press ▼ to select the 19200 baud rate for the port and press **Enter**. An asterisk (*) indicates the current connection.

   The library assigns the baud rate and displays a confirmation message.

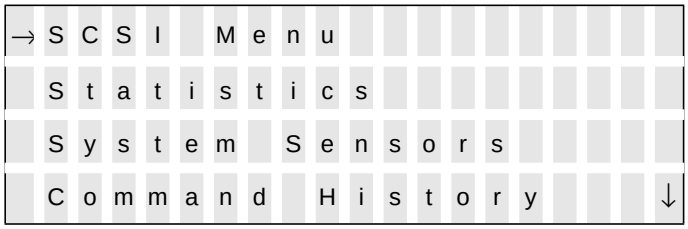
Chapter **8**

Using the Library Info Menu

This chapter describes how to use the Library Info Menu. The functions on this 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.

Accessing the Library Info Menu

From the Main Menu, select Library Info Menu. The library displays the Library Information Menu:

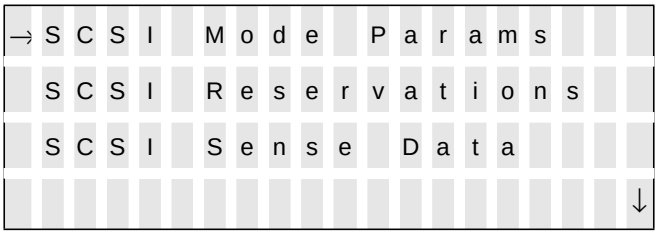


The Library Information Menu provides the following screens:

- The **SCSI Menu** contains information about SCSI mode parameters, reservations, and sense data (see page 98).
- The **Statistics** screens contain information about CHM operations and library elements (see page 104).
- The **System Sensors** screens contain information about the library's electro-mechanical sensors (see page 106).
- The **Command History** screen displays the contents of the history buffer (see page 108).
- The **Drive Info Menu** displays information about the tape drives (see page 54).
- The **Inventory Menu** displays information about bar code labels and the cartridge inventory (see page 110).

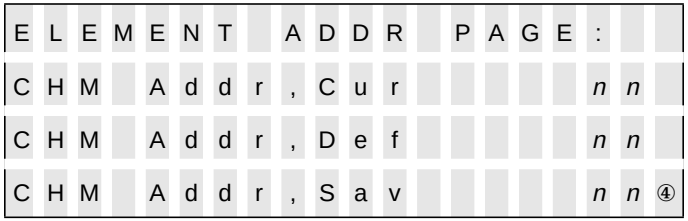
Using the SCSI Menu

From the Library Info Menu, select SCSI Menu. The library displays the SCSI Menu:



SCSI Mode Parameters

To view the SCSI Mode Parameters screen, select SCSI Mode Params from the SCSI Menu. The library displays the following screen:



Use this screen to check 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 software application. Typically, the values of these parameters are changed by a MODE SELECT command.

The SCSI Mode Parameters screen provides the current (Cur), default (Def), and saved (Sav) values for each parameters listed below.

- 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 each time you power on the library.

Fields on 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, the fixed cartridge slot. The remaining cartridge slots are numbered consecutively.
Drive Addr*	The element address of the first tape drive (the top tape drive). The remaining tape drives are numbered consecutively.
Drive Num	The number of tape drives installed.
E/E Addr*	The element address of the entry/exit port.
Parity	Whether parity checking is enabled for the SCSI bus that is connected to the library. When the parity option is enabled, 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.
Write Line 1 *through* Write Line 4	Whether the text displayed on each of the four lines on the Main Screen is defined by the application software.

* When set to their default values, the element addresses reported on this screen are the same as the element indexes shown in Appendix C. However, unlike element indexes, which cannot be changed, addresses can be changed by the application software using a MODE SELECT command.

SCSI Reservations

NOTE: The PLS200 in its role as a video data archive is never connected to multiple hosts. The PLS200 software does not use the RESERVE and RELEASE SCSI commands.

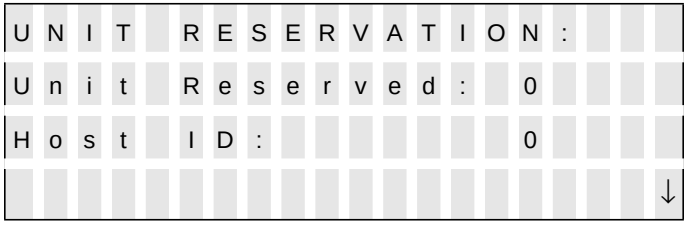
Use these screens to check if the library or its elements are reserved for exclusive use by a host computer. Elements are reserved and released by the application software using the RESERVE and RELEASE SCSI commands.

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 for operations under which host. Multiple hosts can reserve different elements within a single library. For example, one host may reserve cartridge slots 1 through 10 for its exclusive use, while a second host may reserve slots 11 through 20.

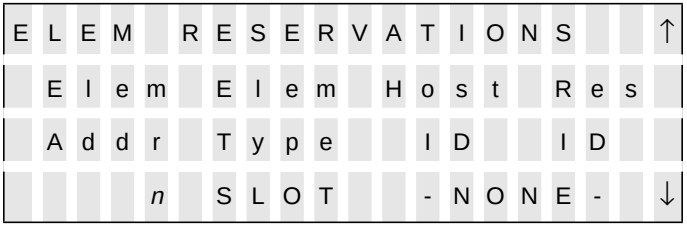
To view SCSI reservations:

1. From the Library Info Menu, select SCSI Menu.
2. From the SCSI Menu, select SCSI Reservations. The library displays the Unit Reservation screen.
3. To display the Element Reservations screen, press ▼.
4. Press ▲ and ▼ to cycle through all element numbers.

Unit Reservation Screen



Element Reservations Screen



Fields on Reservation Status Screens

Unit Reservation:	
Unit Reserved	The library's reservation status: 0 – The entire library is not reserved. 1 – The entire library is reserved.
Host ID	The SCSI ID of the host reserving the library.
Elements Reservations:	
Elem Addr	The current address of this element.*
Elem Type	Slot, tape drive, CHM, or entry/exit port.
Host ID	The SCSI ID of the host reserving the element.
Res ID	The ID that the element is reserved under, assigned by the host when the reservation was made.

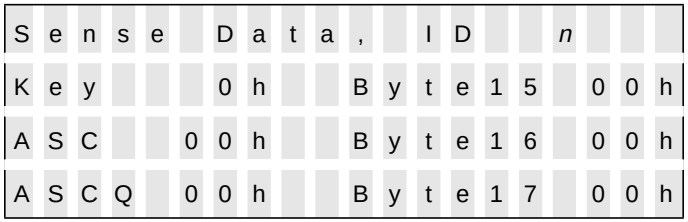
* The Element Reservation screen displays the element addresses currently set by the MODE SELECT command. If no element addresses were set, the default element addresses appear.

SCSI Sense Data

Sense data provides information to help diagnose problems with the library. This is a subset of the data that is returned to a host when it issues a REQUEST SENSE command to the library.

To view the sense data:

1. From the Library Info Menu, select SCSI Menu.
2. From the SCSI Menu, select SCSI Sense Data. The library displays the following screen:



The ID at the top of the display (*n*) 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.

Fields on SCSI Sense Data Screens

SCSI Sense Data:	
KEY	This is the sense key returned by the REQUEST SENSE command, as follows: **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 while performing the command or during a self-test. 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.
Byte 17	This is the second byte of the Field Pointer data.

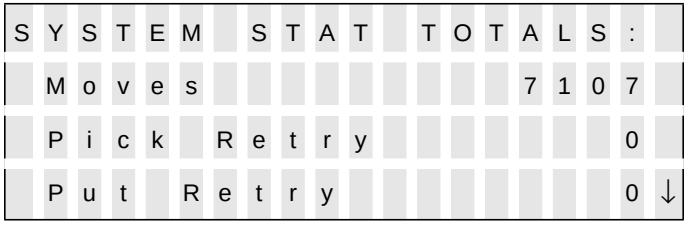
Viewing Statistics

The Statistics screens contains selections for reviewing information about CHM movements and for reviewing information about elements.

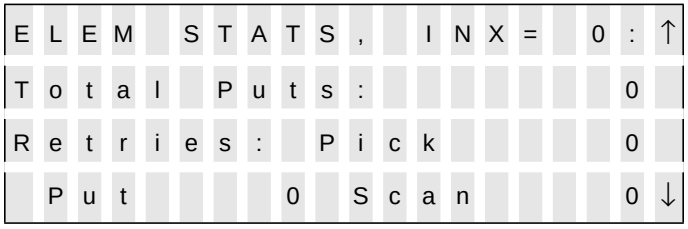
To view statistics:

1. From the Library Info Menu, select Statistics. The library displays the System Statistics screen.
2. To display the Element Statistics screen, press ▲ or ▼ to scroll past the last item on the System Statistics screen.
3. Press ▲ or ▼ to scroll through the element numbers.

System Statistics Screen



Element Statistics Screen



Fields on Statistics Screens

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 moves that required retries picking a cartridge.
Put Retry	The number of moves that required retries placing a cartridge.
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 was unable to scan a bar code label. The library tries to scan a bar code six times before it logs a failure.
E/E Cycles	The number of times the entry/exit port has been extended and retracted.

Element Statistics:	
Total Puts	The number of times a cartridge was placed in the element since the library was turned on.
Retries: Pick	The number of times the library retried picking a cartridge from the element.
Retries: Put	The number of times the library retried placing a cartridge in the element.
Retries: Scan	The number of times the library retried scanning the element.

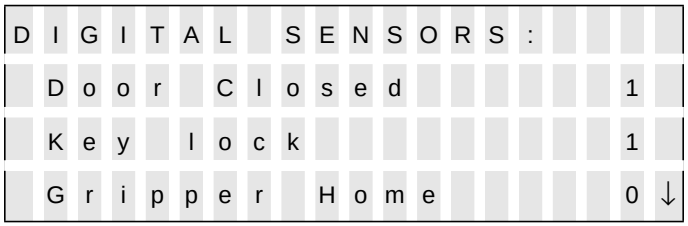
Viewing System Sensors

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:

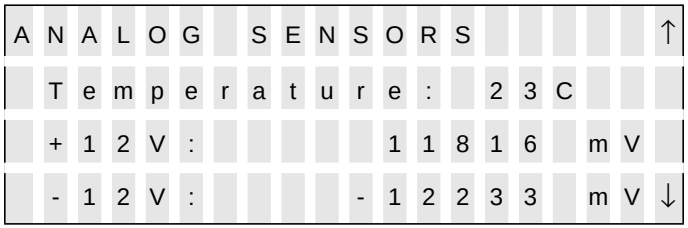
1. From the Library Info Menu, select System Sensors. The library displays the Digital Sensors screen.

2. To display the Analog Sensors screen, press ▼.

Digital Sensors Screen



Analog Sensors Screen



Fields on System Sensors Screens

Digital Sensors:	
Door Closed	Indicates whether the front door is closed (1) or not (0).
Key lock	Indicates whether the front door is locked (1) or not (0).
Gripper Home	Indicates whether the gripper is located in its home position (1) or not (0). The gripper's home position is open.
Cart Seated	Indicates whether the cartridge is seated in the CHM (1) or not (0).
Drum Axis Home	Indicates whether the drum is located in its home position (1) or not (0). The drum axis's home position is with mounting plate 0 toward the front.
E/E Port Home	Indicates whether the entry/exit transport arm is in its home position (1) or not (0). The entry/exit transport arm's home position is with the arm retracted from the entry/exit port.
E/E Limit	Indicates whether the entry/exit transport arm is retracted (0) or extended to the entry/exit port (1).

Analog Sensors:	
Temperature	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.

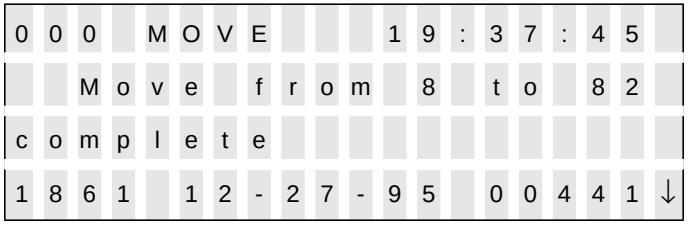
Viewing Command History

The Command History screen displays the most recent 300 events that have occurred in the library. You may be asked by a technical support person to scroll through this display looking for particular events.

To display the Command History screen:

1. From the Library Info Menu, select Command History.
2. Press ▼ and ▲ to scroll through the events.

Command History Screen



Fields on Command History Screen

Command History:		
Example	**Field**	**Description**
000	IDX (Index)	The number of this event in the command history. The range is 000 (the most recent event) through 299. The most recent event is displayed first.
MOVE	From	The process name that caused 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.
1861	Line	The line number of the source code that caused 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.

Using the Inventory Menu

The library maintains a cartridge inventory in nonvolatile RAM and uses the information to process SCSI commands from the application software.

The inventory contains information about all element locations:

- CHM (the medium transport element)
- Entry/exit port (the import/export element)
- Cartridge slots (the storage elements)
- Tape drives (the data transfer elements)

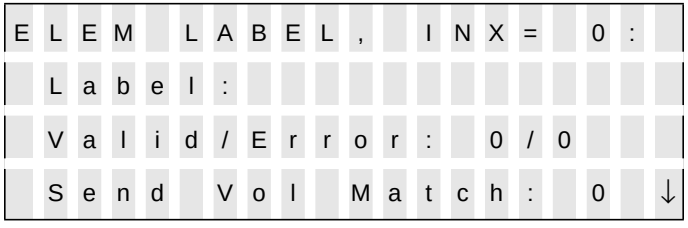
The Inventory Menu allows you to display the following information:

- **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

To display bar code label information:

1. From the Library Info Menu, select Inventory Menu.
2. From the Inventory Menu, select Label Info. The library displays the following screen:



3. Press ▼ and ▲ to scroll through the information for each element index.

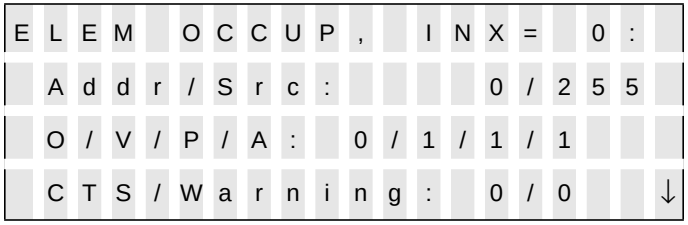
Fields on Label Info Screen

Label Info:	
INX	Indicates the element index for which information is being displayed.
Label	If the element location contains a cartridge for which the bar code label has been scanned, contains the cartridge label.
Valid	Indicates whether the Label field is accurate: 0 – The Label field is not accurate. 1 – The Label field is accurate.
Error	Indicates whether the bar code scanner was unable to read the cartridge label: 0 – The bar code scan was successful, a reset condition occurred, or the door was opened. 0 – 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 bar code label because a Direct Memory Access overrun occurred. 67 – The bar code scanner could not read the bar code label because DMA channel 2 timed out. 69 – The bar code scanner could not read the bar code label because the label was upside down or misplaced.
Send Vol Match	Indicates whether the cartridge label matched the template sent with the last SEND VOLUME TAG SCSI command: 0 – The label did not match the template. 1 – The label matched the template.

Element Occupied Information

To display information about elements in the library:

1. From the Library Info Menu, select Inventory Menu.
2. From the Inventory Menu, select Occupied Info. The library displays the following screen:



3. Press ▼ and ▲ to scroll through the information for each element index.

Fields on Element Occupied Screen

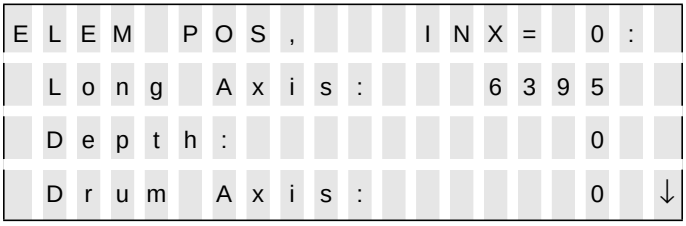
Element Occupied:	
INX	Indicates the element index for which information is being displayed.
Addr (Address)	Indicates the SCSI address of this element.
Src (Source)	Indicates the index of the last storage element from which the cartridge was moved.
O (Occupied)	Indicates whether the library considers the specified element location to contain a data cartridge: 0 – The element location does not contain a data cartridge. 1 – The element location contains a data cartridge.
V (Valid)	Indicates whether the Occupied flag is accurate: 0 – The Occupied flag is questionable (may not be accurate). 1 – The Occupied flag is accurate.

Element Occupied:	
P (Present)	Indicates whether a specific magazine or tape drive is installed. If the element index references a storage element, this flag indicates whether that particular magazine is installed. If the element index references a tape drive, this flag indicates whether that particular drive is installed. 0 – Not installed. 1 – Installed. **Note:** This flag is not used for the CHM or the entry/exit port.
A (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.
CTS	Indicates whether the element is a tape drive: 0 – The element is a tape drive. 1 – The element is not a tape drive.
Warning	Not currently used.

Element Position Information

To display information about the position of elements in the library:

1. From the Library Info Menu, select Inventory Menu.
2. From the Inventory Menu, select Position Information. The library displays the following screen:



3. Press ▼ to scroll through the information for each element index.

Fields on Element Position Screen

Element Position:	
INX	Indicates the element index for which information is being displayed.
Long Axis	The distance the CHM has to move along the long axis from its home position to the specified element location.
Depth	For storage elements, the distance the CHM has to move along the short axis from its home position to touch the magazine or a data cartridge in the magazine. (This field is not used for the tape drives, CHM, or entry/exit port.)
Drum Axis	For storage elements, this element's rotational position on the drum.

Chapter 9

Troubleshooting

This chapter provides a list of suggestions for solving problems that may occur when you are installing and operating the library and enclosed tape drives. The instructions in this chapter are basic troubleshooting guidelines. For more advanced troubleshooting, contact Tektronix Product Support (see page xvii).

NOTE: If an error code is displayed on the LCD, refer to Appendix B. If LEDs are flashing on the tape drives, refer to page 53.

Problems With Installation

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

- **Differential SCSI cable lengths.** Make sure that the total length of all internal and external cables on the SCSI bus does not exceed 25.0 meters (82 feet). See *Determining the cable length for each bus* beginning on page 121 for instructions for calculating the total cable length.
- **Termination.** All termination must be external.
- **SCSI bus connections.** Make sure that all SCSI cables and terminators are securely connected to the appropriate SCSI connectors on the back of the library. See *Connect the SCSI Cables* beginning on page 23 for more information.
- **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. The library does not check for duplicate IDs. See *Setting the SCSI IDs* beginning on page 34 for instructions.
- **SCSI adapter card installation.** Make sure that you installed the SCSI adapter card correctly. Make sure that the jumper is removed and that the card is properly seated. Refer to *Installing the SCSI Adapter Into the VDR* beginning on page 3.
- **Software installation.** Make sure that your application software is installed correctly.

- **Control mode.** Make certain the library is operating in the correct control mode. When Media Manager software is controlling the CHM, the library must be set to SCSI Interface control mode. See *SCSI Interface Mode* beginning on page 47 for more information.

After checking these items, restart the Profile system. Retry your operation.

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 that the cartridge is write enabled. See *Set the Write-protect Switches* beginning on page 18 for instructions.
- **Cartridge brand.** Check the brand of cartridge you are using. Use EXATAPE 8mm data cartridges only.
- **Cartridge type.** Use only AME data cartridges. Because of media management and application software issues, do not use MP data cartridges in the library.
- **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.
- **Use Mammoth option.** Make sure that the Use Mammoth configuration option is set to ON, as described on *Checking the Tape Drive Model* beginning on page 41. Otherwise, the library will not be able to receive information from the 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.** Make sure the library is operating in the correct control mode. The library must be in SCSI Interface mode for the application software to control CHM motion. See *Changing the Control Mode* beginning on page 48 for instructions.
- **Door open.** Check to make sure that the door is closed and locked.
- **Fuse.** Check to make sure that the fuse is good. See *Replacing the Fuse* beginning on page 63 for instructions.

If You Cannot Resolve the Problem

If you cannot resolve the problem, contact Tektronix Product Support (see page xvii). Before calling, gather the following information:

- **For the library:** serial number (found on the Serial Number screen on the LCD or on the rear panel) and firmware number (found on the Main Screen of the LCD).
- **For the tape drives:** model, serial numbers (found on the top of the tape drive housing) and FECODE and EECODE numbers (found on the top of the tape drive housing).

Appendix **A**

Specifications

This appendix provides general specifications for the library.

Storage Capacity

The storage capacity of the PLS200 with 80 AME data cartridges is 1.6 terabytes.

Operating Environment

Ambient temperature range	+5°C to +35°C (+41°F to +95°F)
Maximum allowable temperature variation	1°C per minute; max 10°C per hour (2°F per minute; max 18°F per hour
Relative humidity range	20% to 80%, non-condensing
Wet bulb temperature	26°C (79°F) max
Altitude range	–304.8 m to +3,048 m (–1,000 ft. to +10,000 ft.)

Power

Input voltages	Accepts 90 to 259 VAC at 48 to 62 Hz; automatic input voltage selection
Power consumption (AC true power)	95 watts minimum; 145 watts maximum. Based on the AC true power consumption, the library generates between 325 and 495 BTU/hour.

Power Cord Requirements

The library is shipped with four 18 AWG, 3-conductor AC power cords for use in North America, the United Kingdom, Europe, and Australia. Each power cord has a molded IEC type CEE-22 female connector at one end. At the other end is a molded attachment plug of the proper type, rating, and safety approval for the intended country. The North American power cord is UL Listed and CSA Certified.

SCSI Terminator Specifications

The SCSI terminator must match the PLS200 SCSI bus configuration (wide differential). 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, Tektronix recommends the following external terminator:

- AMP Amplimite 869515-1

SCSI Cable Specifications

Use cables that conform to SCSI-3 specifications.

Cable length for differential configurations

The total length of all internal and external cables on the SCSI bus must not exceed 25.0 meters (82 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 28 cm (11 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.).

   Add 13 cm (5 in.) for the internal cable used by the library itself.

Appendix **B**

LCD Error Codes

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

⚠ ***CAUTION: Library components should be replaced only by qualified service personnel. If you cannot find an obstruction or other obvious cause for the error, contact your service provider.***

⚠ ***CAUTION: Resetting the library will interrupt operation of the attached Profile video disk recorder. If you must reset the library, shut down the VDR first.***

The columns in the table indicate the following:

- **Error**. The error code's number, which appears on the library's operator panel LCD when the error occurs.
- **Description.** The error message that appears on the LCD, followed by a more complete description of the error.
- **Corrective Action**. The recommended corrective action or actions.

Error	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 gripper.
11	SOURCE EMPTY. There is no cartridge in the source location.	Request a new inventory of the cartridges in the library.
12	DESTINATION FULL. A cartridge already exists in the destination location.	Request a new inventory of the cartridges in the library.

Error	Description	Corrective Action
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.	
15	NO SRC ELEMENT; NO DEST ELEMENT. No data cartridge magazine was installed at the selected location.	Request a new inventory of the cartridges in the library.
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 CTS. 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.

Error	Description	Corrective Action
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.	
26	CANNOT OPEN GRIPPER. The gripper could not open.	
30	S AXIS DOES NOT MOVE. 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.
31	S AXIS FAILED HOME. The CHM could not return to the home position along the short axis.	
36	S LM629 RESET FAIL. 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.

Error	Description	Corrective Action
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 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.
41	L AXIS FAILED HOME. The CHM could not return to the home position on the long axis.	
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 error 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. If the error persists, contact your service provider.
67	DMA CH. 2 TIMEOUT. Controller board error.	

Error	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.
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.

Error	Description	Corrective Action
77	INTERFACE DISABLED. The library was not in the correct control mode when the operator sent a command.	Make certain the library is in the correct control mode. If it is, contact your service provider.
80	E/E FAILED TO EXTEND. The entry/exit port could not be extended.	Open the door and look for obstructions around the entry/exit transport arm. If there are no obstructions, contact your service provider.
81	E/E FAILED TO RETURN. The entry/exit port could not be retracted.	
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 fewer than four drives, you must have drive blanks installed in the empty slots. Tape drives must be installed in contiguous slots, starting with the top 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.
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, S AXIS 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. Contact your service provider.

Error	Description	Corrective Action
108	INCOMPATIBLE 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 and try cleaning the tape drive again. If the error persists, contact your service provider. **Note:** This error is only displayed if the cleaning was requested from the LCD.
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 to for diagnosis, and you may need a new controller card.
131		
132		
133		
134		
135		
136		
137		

Appendix **C**

Bar Code Label Specification

This appendix provides specifications for creating bar code labels used on cartridges in the PLS200 Library. These specifications include:

- Materials for the label
- Dimensions of the label
- Bar code characters
- Quality
- Optional features

Materials for the Label

Use the materials listed below to construct the bar code labels.

Base Material	White polyester film.
Laminate:	A 0.001-inch (0.025-mm) thick, matte-finish polyester film, which is secured with the same adhesive on the back.
Adhesive:* (on the back)	High tack. Acrylic based. Pressure sensitive. Double sided.
Release liner:	90-lb release liner stock.

* After 24 hours on an actual data cartridge, the adhesive should exhibit a minimum peel strength of 48 oz. per inch (536 gm/cm) of width using a peel rate of 10 inches/minute (25.4 cm/minute).

Dimensions of the Label

Use the dimensions listed in Figure C-1.

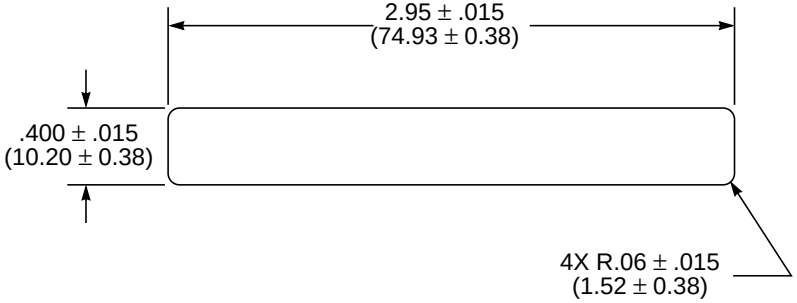


Figure C-1 Dimensions of the bar code label

Bar Code Characters

Print the bar code itself in the area indicated in Figure C-2, in accordance with the ANSI MH10.8M-1983 specification.

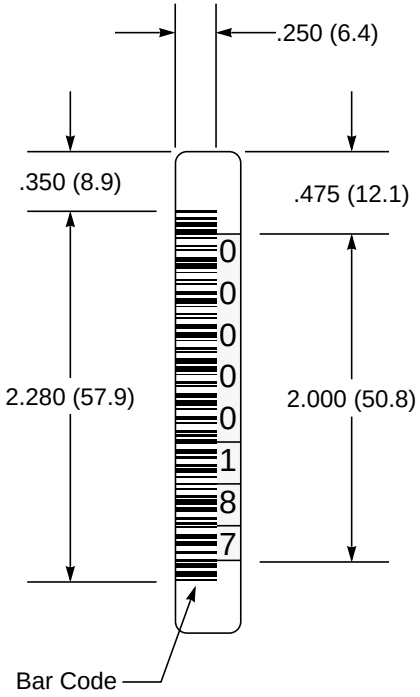


Figure C-2 Area for printing bar code characters

The bar codes are industry-standard Code 39 (also known as 3-of-9 code) and have between 7 and 11 characters, as shown in the table below.

Top	1 start/stop character 4 to 8 alphanumeric characters, which you select from the table on page 134. 1 checksum character
Bottom	1 start/stop character

Checksum Character

The checksum character is computed as the character corresponding to the modulus 43 sum of all the values in the eight-character section of the bar code. Character values are derived from the table below.

Label Character	Value	Label Character	Value	Label Character	Value
0	0	F	15	U	30
1	1	G	16	V	31
2	2	H	17	W	32
3	3	I	18	X	33
4	4	J	19	Y	34
5	5	K	20	Z	35
6	6	L	21	–	36
7	7	M	22	.	37
8	8	N	23	space	38
9	9	O	24	$	39
A	10	P	25	/	40
B	11	Q	26	+	41
C	12	R	27	%	42
D	13	S	28		
E	14	T	29		

Bar Code Element Widths

The table below and Figure C-3 list the widths of the bar code elements.

Element	Width	
	inches	millimeters
Narrow Element	0.015	0.38
Wide Element	0.030	0.76
Intercharacter Gap	0.030	0.76

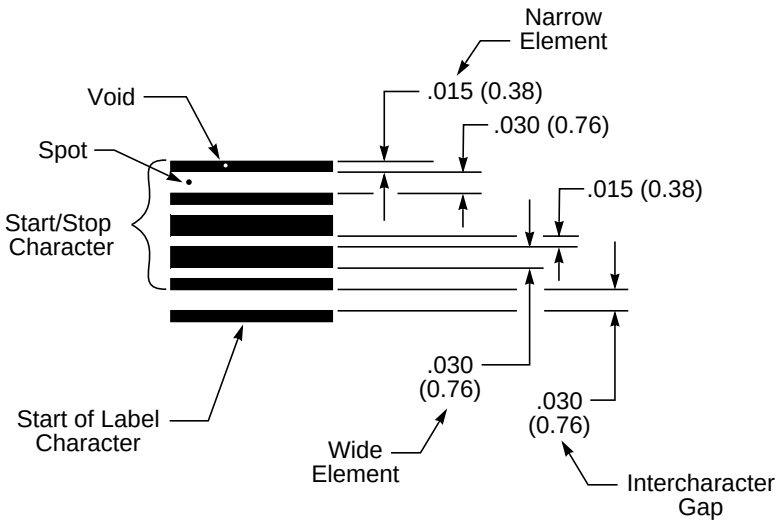


Figure C-3 Element dimensions; spots and voids

Quality

Use the specifications listed in this section for bar code label quality.

Spots and Voids

A *spot* is an area within the white background in which the reflectivity is less than 55%. The area indicated in Figure 3 is a spot.

A *void* is an area within the black element in which the reflectivity is more than 20%. The area indicated in Figure 3 is a void.

Spots and voids are allowable as long as the following conditions are met:

- The spot or void can be contained within a circle whose diameter is 0.4 times the nominal width of the narrow element.
- The spot or void occupies no more than 25% of the area of a circle whose diameter is 1.2 times the nominal width of the narrow element.
- There are no more than five spots per label.
- No two spots are within 0.02 inches (0.5 mm) of each other.
- No spot or void is coincident with the edge of any narrow or wide elements.

Edge Quality

When a spot of 0.003 inches (0.03 mm) in diameter is moved along the axis of the label, over and edge, the area under the spot must change from maximum reflectance to minimum reflectance (or from minimum reflectance to maximum reflectance) after moving a distance of 0.003 inches (0.08 mm).

Reflectance and Contrast

The reflectance and contrast measurements should be determined using a light source of nominal 700 nm wavelength with a smooth spectral response curve of no more than 120 nm bandwidth for a 50% power level.

Incident irradiation should be at 45° from normal to the surface and reflected flux collected within a 15° angle centered on the normal.

The minimum allowable reflectance of the spaces is 50%. The minimum ratio of space (light) reflectance to bar (dark) reflectance is 5 to 1.

Label Degradation after Exposure to Light

The ratio of space (light) reflectance to bar (dark) reflectance should not fall below 4 to 1 after 30 days' exposure to a fluorescent source at 100 foot-candles.

Optional Features

If desired, you can include alphanumeric characters and background colors on the bar code labels.

NOTE: Alphanumeric characters and background colors are optional. You do not need to include them for proper library operation. They are recommended, however, to allow humans to easily identify tapes by number.

Alphanumeric Characters

If you want to use alphanumeric characters on the labels, the characters should be centrally located in the area indicated in Figure C-4. Label characters must also have a sequence that is identical to the adjacent bar code.

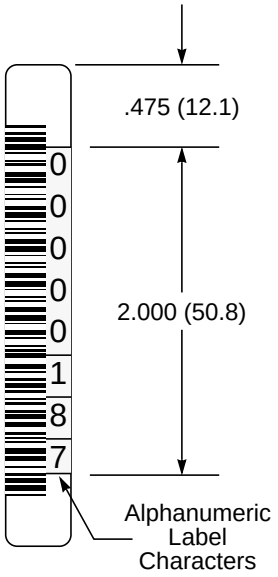


Figure C-4 Area for printing alphanumeric characters

Background Color

If you want to use colored labels, the colors should be generated with permanent inks. The table below lists background color assignments associated with each alphanumeric character.

Character	Background Color
1	Yellow
2	Light Green
3	Light Blue
4	Gray
5	Dark Orange
6	Pink
7	Dark Green
8	Light Orange
9	Purple
0	Red
alphabetic characters and symbols	White

Testing the Bar Code Labels

After the bar code labels are created, make certain that the library can scan the labels.

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