The Plasmon V Series

V15 Library - AIT Drive

User Manual

P/N 97701854 E

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Revision History

Revision	Date	Description
A		Initial release.
B	June, 2002	Reformated document.
C	August, 2002	Added AIT-3.
D	November, 2002	Added Bar Code Label Specification.
E	January, 2003	Added ESD Caution to Hardware Installation

NOTE

The most current information about this product is available on the Plasmon web site (www.Plasmon.com).

Safety Agency Standards

The Plasmon V15 library complies with the following domestic and international product safety standards:

- UL Standard 1950, 2nd Edition: 1995 Safety of Information Technology Equipment.

- CSA Standard C22.2 No. 950-95, Safety of Information Technology Equipment.

- EN 60950: 1992 +A1 +A2 +A3 +A4 +A11, Safety of Information Technology Equipment.

FCC Notice

NOTE

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

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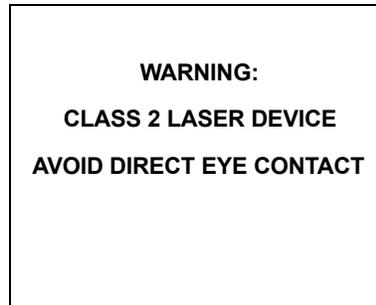
Laser Safety Notice

This library has a laser scanner bar code reader inside the housing which complies with 21 CFR 1010.10, 1040.11, and IEC 60825-1:1993 +A1+A2, and EN60825-1:1994 +A11+A2, Safety of Laser Products Part 1: Equipment Classification, Requirements and User's Guide, as a Class 1 Laser product.

WARNING

Removing a drive or access panel with the library powered on may result in exposure to the 650 nm, 1.2 mW Class 2 pulsed radiation laser scanner. Always power off the library and remove the AC power cord before removing or installing an access panel or drive.

Caution. Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

CLASS 1 LASER PRODUCT

CAUTION
CLASS 2 LASER RADIATION WHEN OPEN
DO NOT STARE INTO BEAM
VORSICHT
LASERSTRAHLUNG WENN ABDECKUNG
GEOEFFNET. NICHT IN DEN STRAHL BLICKEN

WARNING:

CLASS 2 LASER DEVICE

AVOID DIRECT EYE CONTACT

The lower label in the figure above is on the bottom of the laser scanner enclosure internal to the library, and is not visible unless the scanner is removed from the robot gripper assembly.

Industry Canadian Notice per ICES-003

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

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

European Notice

This equipment has been tested and complies with the following requirements:

- EN 55022/CISPR 22, Class A
- EN 55024
- EN 61000-3-2
- EN 61000-3-3

Australia/New Zealand

This equipment has been tested and complies with AS/NZS 3548.

Product Warranty Caution

The Plasmon® V15 library is warranted free from defects in materials, parts, and workmanship and to conform to the current product specification upon delivery. For the specific details of your warranty, refer to your sales contract or contact the company from which the library was purchased.

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

- The library is repaired by anyone other than Plasmon personnel or approved agent.

- The library is physically abused or is used in a manner that is inconsistent with the operating instructions or product specification defined by Plasmon.

- The library fails because of accident, misuse, abuse, neglect, mishandling, misapplication, alteration, faulty installation, modification, or service by anyone other than the factory service center or its approved agent.

- The library is repaired by anyone, including an approved agent, in a manner that is contrary to the maintenance or installation instructions supplied by Plasmon.

- The Plasmon serial number tag is removed.

- The library is damaged because of improper packaging on return.

CAUTION

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

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

HOW TO USE THIS MANUAL

First Time Installation

If you are installing the library for the first time, refer to the following chapters:

- **Chapter 1** provides an overview of the library's features and components. **Appendix A** lists additional library and tape drive specifications.

- **Chapter 2** provides instructions for installing the library hardware, connecting the library to the SCSI bus, and powering on the library. **Appendix B** provides additional information about SCSI configurations.

- **Chapter 3** describes how to configure the library for operation on the SCSI bus and for operation with your application software. Follow the steps at the end of this chapter to verify the setup and to begin library operation.

- **Chapter 4** describes how to connect an Ethernet cable and configure the library for Ethernet communications. **Appendix A** lists Ethernet cable specifications.

Operation

During normal library operation, you do not need to intervene in cartridge processing. However, you may need to refer to these chapters for some occasional tasks:

- **Chapter 5** describes how to operate the library in different control modes, how to replace cartridges and the cartridge magazine, and how to reset the library.

- **Chapter 6** describes how to monitor, clean, and reset the tape drive. It also describes how to eject cartridges manually.

Troubleshooting and Service

If you need troubleshooting and service information, refer to these chapters:

- **Chapter 7** provides instructions for upgrading firmware and creating diagnostic listings.

- **Chapter 8** describes basic maintenance and how to return the library for service, if necessary.

- **Chapter 9** provides troubleshooting recommendations.

- **Appendix B** provides an overview of the SCSI interface.

- **Appendix C** lists error codes and corrective actions.

If you need to contact Plasmon for supplies, technical support, or service, see the *Contacting Plasmon* at the back of this manual.

Conventions Used in This Manual

This manual uses the following conventions:

[ENTER] Boxed text indicates keys on the operator panel.

Notices

Three levels of notices are used throughout this document.

WARNING

A **WARNING** is used to alert the reader to situations or conditions that could potentially result in personal injury, fire hazard, or equipment damage.

CAUTION

A **CAUTION** is used to warn of undesirable procedures, or of situations in which equipment damage could result.

NOTE

A **NOTE** is used to emphasize an area of text or to provide additional information.

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CHAPTER 1
PRODUCT OVERVIEW

Congratulations on selecting the Plasmon® V15 AIT-2 or AIT-3 tape library. Your new library provides unattended data storage, archiving, backup, and retrieval for a wide range of systems, from small PC workgroups to mid-range networks. The V15 library can store up to 1.5 terabytes (TB) of information and can achieve a data transfer rate of up to 12 megabytes (MB) per second, even more using compression.
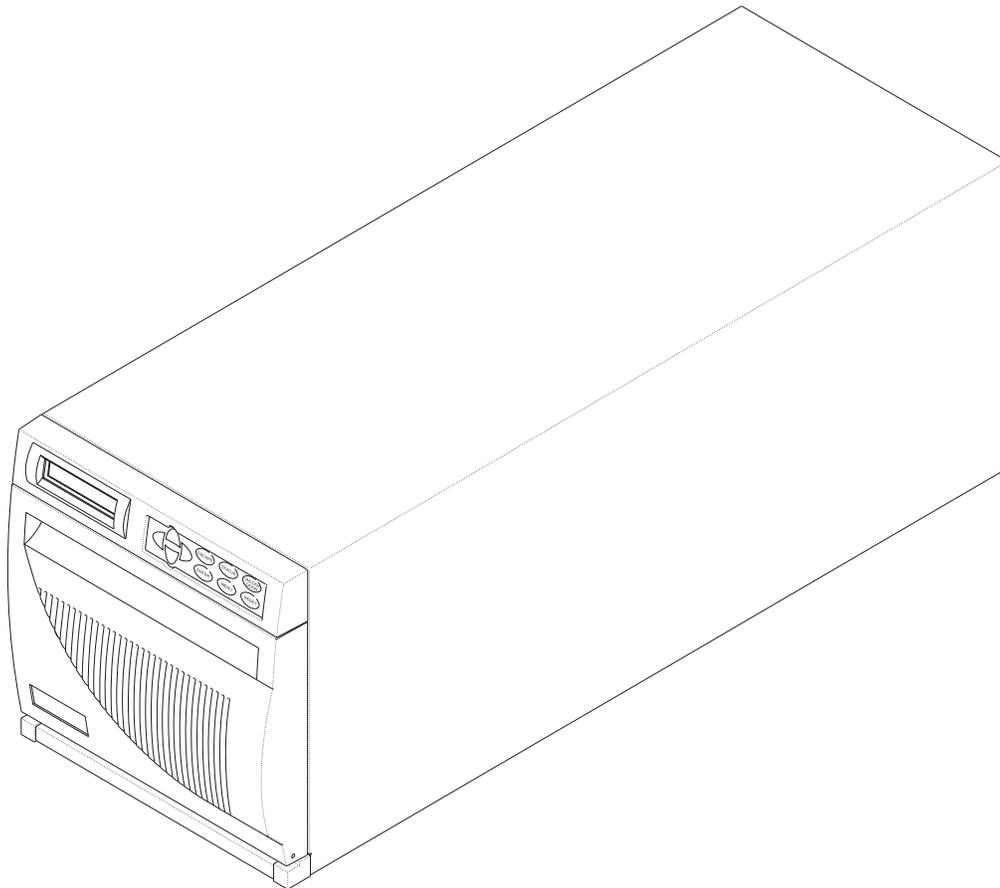
Figure 1. The Plasmon V15 Tape Library

Library Features

The Plasmon V15 library includes the following features:

- Independent Small Computer System Interface (SCSI) controllers. The library and tape drive each support independent sets of SCSI messages and commands, and are available in a wide, low-voltage differential (LVD) SCSI configuration. The wide SCSI configuration allows attachment of up to 16 devices to a single SCSI bus.

- One or two AIT tape drives (cannot mix AIT-2 and AIT-3 drives in same library). These tape drives are installed in drive carriers, which allow for easy removal and installation. As shown below, the back panel of the drive carrier includes a fan to maintain the operating temperature and SCSI connectors for connection to the SCSI bus.
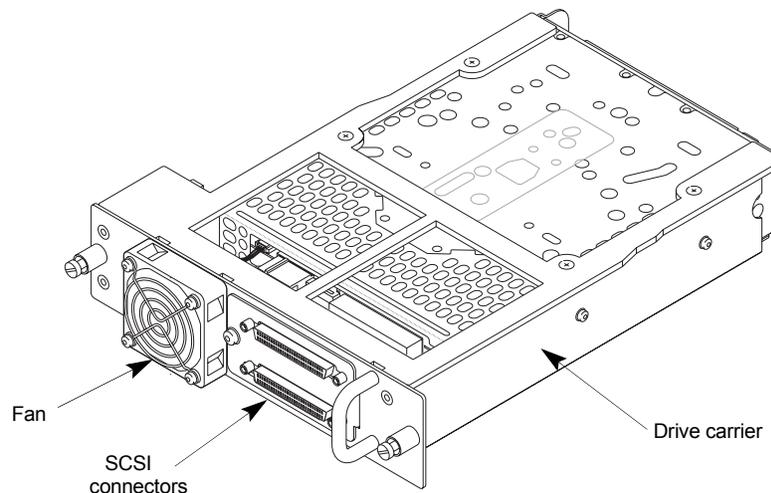
Figure 2. Tape Drive Carrier

- Fifteen storage slots. Cartridges are stored in one removable cartridge magazine containing ten slots and five additional cartridge slots mounted to the left of the tape drive.

- A robotic cartridge handler (robot). The robot moves cartridges between storage slots and the drive. As an option, the robot may also include a barcode scanner that can read labels on cartridges to maintain a cartridge inventory.

- A liquid crystal display (LCD). The LCD on the front panel provides a way to monitor library operations, select configuration options, and control the robot.

- Optional Plasmon Library Monitor software and Ethernet connector. As an option, the library can include an Ethernet connection and Library Monitor software, which can be installed on the host computer and viewed in a standard web browser. The software provides a way to check the library's status information from a remote location, create diagnostic listings, and upgrade firmware. With Library Monitor, up to 10 remote client users can simultaneously access library information without interrupting library operation.

- Tabletop or rack-mount configuration. The library is designed as a tabletop unit, but can also be mounted in a standard 19-inch rack. If desired, you can mount two V15 libraries side-by-side on a single rack shelf. Rack-mounting kits are available from Plasmon.

Library Components

This section provides an overview of the library components.

Front Panel Components
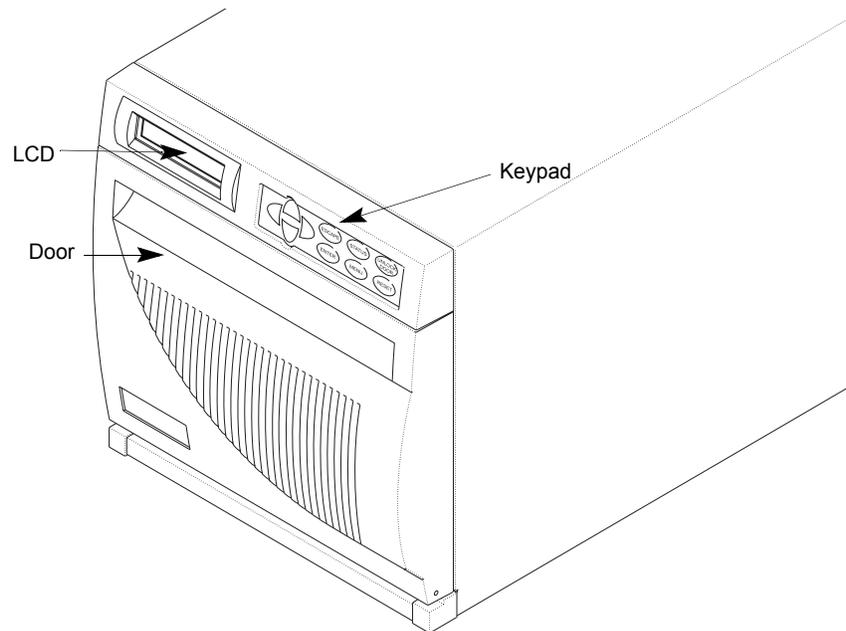
Figure 3. V15 Front Panel Components

- **Door.** The door allows manual access to the library's internal components, including the tape drive and cartridges. The door is secured by a solenoid-activated, electronic locking system.

- **LCD and keypad.** The front panel includes a keypad and a two-line, 32-character LCD. The LCD and keypad allow you to view the operational status of the library, access a menu of operations, and view messages.

Back Panel Components

Drive Carrier

Drive SCSI
Connectors

Library SCSI
Connectors

Ethernet Port

Power Entry
Module

9-pin
Serial Port

Drive Fan

Library Fan
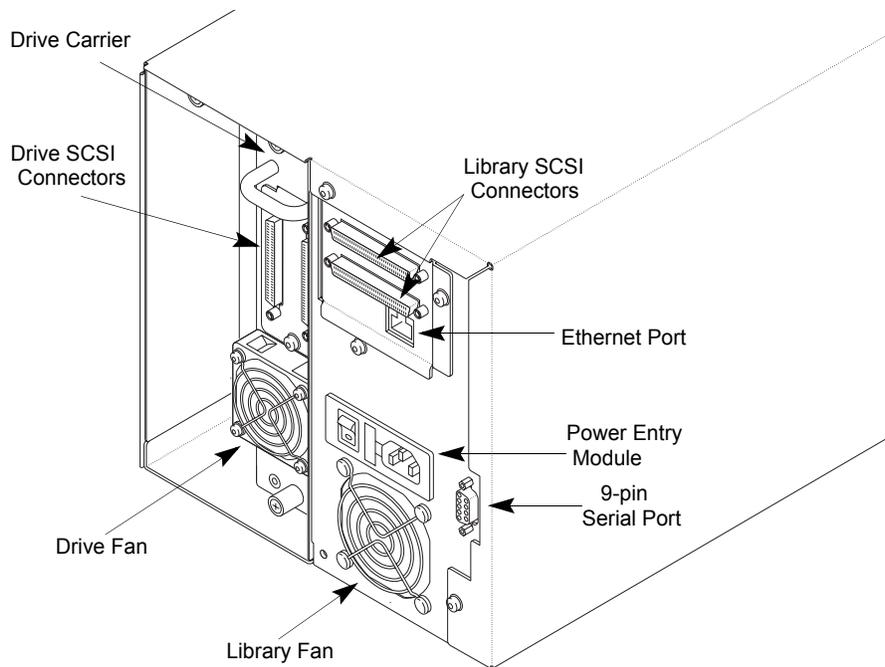
Figure 4. V15 Back Panel Components

- **Drive carrier.** Accessible from the back panel, the tape drive carrier includes a fan and two SCSI connectors. If the library contains just one tape drive, the unused drive slot is protected by a service access cover.

- **Fans.** The drive and library each include a fan to reduce operating temperature.

- **Power entry module.** The power entry module includes the AC power connector, power switch, and fuse drawer.

- **9-pin serial port.** A service technician can use the serial port to perform diagnostic procedures or upgrade firmware.

- **Ethernet port (optional).** The Ethernet port allows you to connect the library to a 10/100BaseT Ethernet network.

- **SCSI connectors.** The SCSI connectors allow you to connect the library and tape drive to one or two SCSI buses.

Internal Components
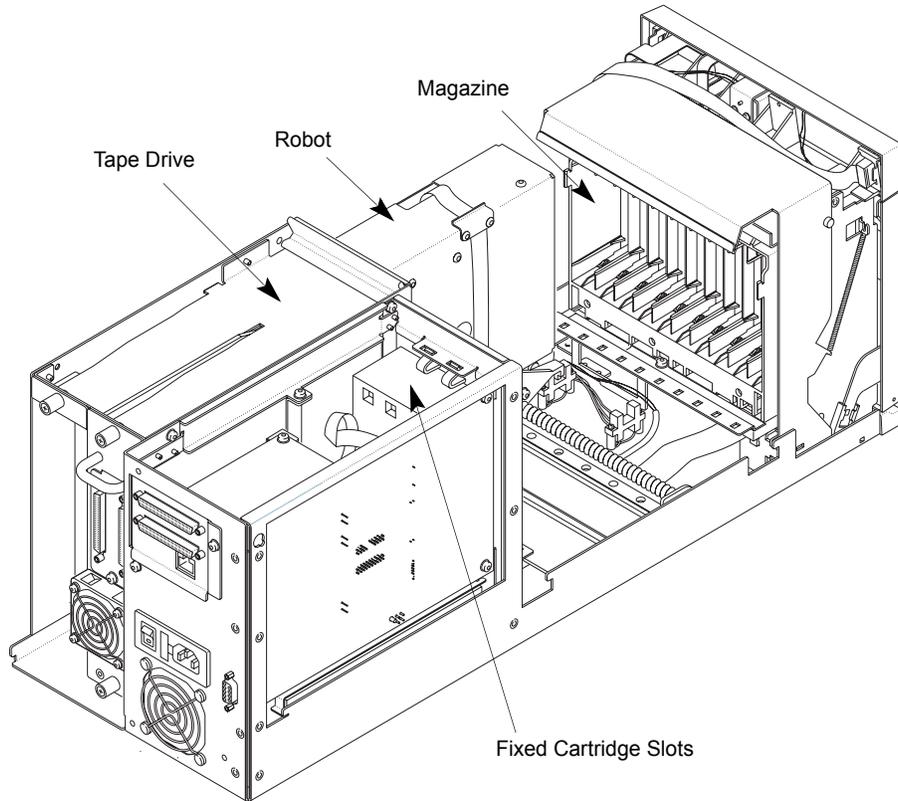
Figure 5. V15 Internal Components

WARNING

Removing a drive or access panel with the library powered on may result in exposure the 650 nm, 1.2 mW Class 2 pulsed radiation laser scanner. Always power off the library and remove the AC power cord before removing or installing an access panel or drive.

- **Tape drive.** The library includes one or two AIT-2 or AIT-3 tape drives, which are housed in drive carriers (cannot mix AIT-2 and AIT-3 drives in same library).

- **Robot.** The robotic cartridge handler moves cartridges between the cartridge slots and the tape drive. An optional laser barcode scanner attached to the robot reads barcode labels on the cartridges, enabling the library to maintain cartridge inventory information.

- **Fixed cartridge slots.** The library contains five fixed cartridge slots next to the tape drive.

- **Magazine.** The removable magazine contains ten slots. The magazine includes design features to ensure that the cartridges are always inserted correctly and never fall out.

CHAPTER 2
HARDWARE INSTALLATION

This chapter describes how to install the library hardware, which includes the following steps:

- Unpacking the library

- Obtaining accessories and equipment

- Preparing for hardware installation

- Preparing and installing cartridges

- Connecting the library to the SCSI bus

- Connecting the power cord

- Powering on the library

- Verifying the hardware installation

Unpacking the Library

1. Remove the library from the packing materials, as shown in the unpacking steps printed on the box.

2. Grasp the front door by the top and pull it open, as shown in the following figure.
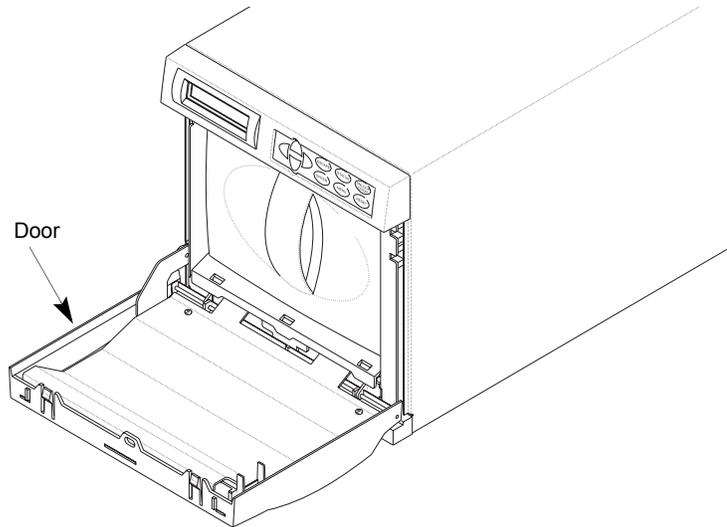
Figure 6. V15 Front Door

3. From inside the door, remove the magazine by grasping the handle and pulling it straight out, as shown in the following figure.

4. Remove the packing material from the magazine and save it with the other packing materials.
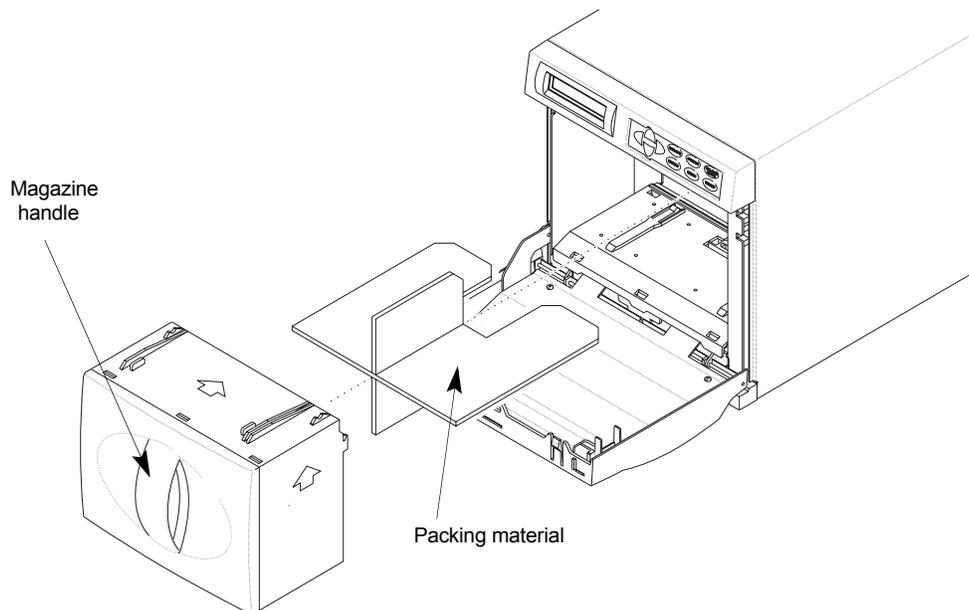
Figure 7. V15 Magazine Packing Material

Obtaining Accessories and Equipment

Make certain you have all the accessories and equipment for library operation, as indicated in the table below. Many of these items are included in the library accessories box in the shipping carton. If necessary, you can purchase these items from Plasmon (see *Contacting Plasmon* at the back of this manual).

Table 1. Accessories and Equipment

Required Accessories and Equipment	
Power cord	Included with the library.
SCSI cables	These items are included with the library. If you want to use your own, see *Appendix A* for specifications.
SCSI bus terminator(s)	
Barcode labels	For libraries that have a barcode scanner, sample barcode labels are included. For information about preparing your own barcode labels, refer to the *Plasmon Barcode Label Specification for AIT Cartridges*. For information about approved barcode label vendors, visit www.plasmon.com.[1]
Cartridges	If cartridges are not included with the library, contact Plasmon to purchase them.
Rack mount hardware	If you want to install the library in a rack, contact Plasmon for the required hardware.

[1]If you create your own barcode labels, be sure to follow the specification precisely. For best results, use a reliable vendor to create barcode labels.

Selecting Cartridges

The Sony SDX-500 AIT-2 or SDX-700 AIT-3 tape drive reads and writes to the highly reliable AME cartridges for AIT-2 or AIT-3 drives. AIT-2 or AIT-1 cartridges may be used in an AIT-3 drive, but degrade performance. AIT-1 cartridges may be used in an AIT-2 drive, but degrade performance.The drive automatically ejects cartridges it does not support.
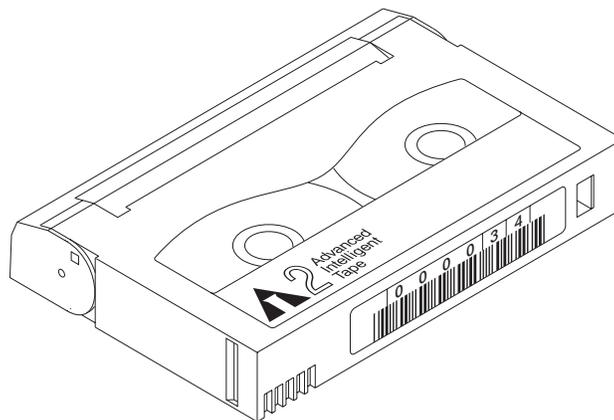
Figure 8. AME Data Cartridge

Selecting Cleaning Cartridges

The Sony AIT tape drives do not require periodic cleaning with a separate cleaning cartridge except under extreme environmental conditions. To clean the tape drive, use a cleaning cartridge made exclusively for AIT technology tape drives. These can be purchased from Plasmon. See *Contacting Plasmon* at the back of this manual.

Selecting Application Software

To obtain information about which software applications and operating systems work with the Plasmon V15 library, visit The Plasmon web site (www.plasmon.com). You can install the software application on the host computer before or after library installation. However, if you install the software first, you may need to reconfigure it for use with the library.

NOTE

With the Ethernet option, the library includes a CD with the Plasmon Library Monitor software. This software allows you to monitor library operations and status from a remote location. For information on installing this software, see the readme file included with the CD. Also, follow the instructions in the *Ethernet Configuration* chapter.

Preparing for Hardware Installation

- Before you begin hardware installation, do the following:

- Make certain the SCSI host bus adapter card installed in the host computer and the application software are compatible with the Plasmon V15. Compatibility information is available from www.plasmon.com.

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

- Locate an appropriate area for the library. The library must have a level surface near a readily accessible outlet. In addition, there must be approximately 6 inches (15 cm) of open area behind the library for adequate air flow.

- If you want to install the library into a rack, contact Plasmon for a rack-mount kit, which includes hardware and installation instructions. See *Contacting Plasmon* at the back of this manual.

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.

WARNUNG

Vor der Ausfuhrung von Installations- oder Wartungsarbeiten ist daraufzu achten, daß der Library-Netzschalter auf "Aus" gestellt ist und daß das Anschlußkabel non der Library und der Steckdose entfernt ist.

ATTENTION

Avant de procéder a l'installation ou a l'entretien, vérifiez que l'interrupteur d'alimentation de la librarie se trouve en position "arret" et que le cable d'alimentation ne soit pas branché a la librairie et a la prise de courant.

Preparing and Installing Cartridges

This section describes how to remove the packing material from the cartridge magazine, prepare cartridges for use in the library, and install cartridges in the fixed slots and in the magazine.

Preparing Cartridges

1. If your library includes a barcode scanner, you can affix barcode labels to the cartridges. To do this, position the label using the ridge on the cartridge for guidance, as shown below.
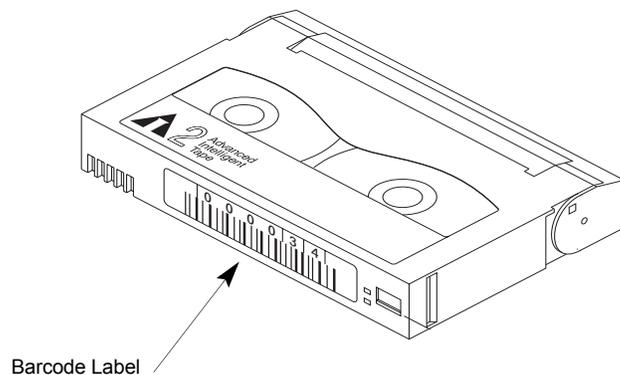
Barcode Label

Figure 9. Barcode Label Placement

NOTE

To ensure barcode labels are read accurately, use labels with checksum characters. Also, make sure the Verify Barcode Checksums option is turned on.

2. Make sure the write-protect switches on the cartridges are set correctly, as shown in the following figure. You can use a ball-point pen or similar instrument to set the write-protect switch.
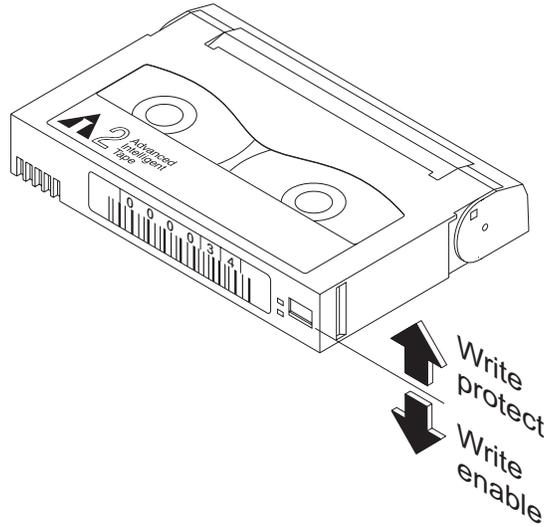
Figure 10. Data Cartridge Write Protect Switch

Installing Cartridges in Fixed Slots

1. With the magazine removed, install cartridges into the fixed slots, with the write-protect switches down and facing out.
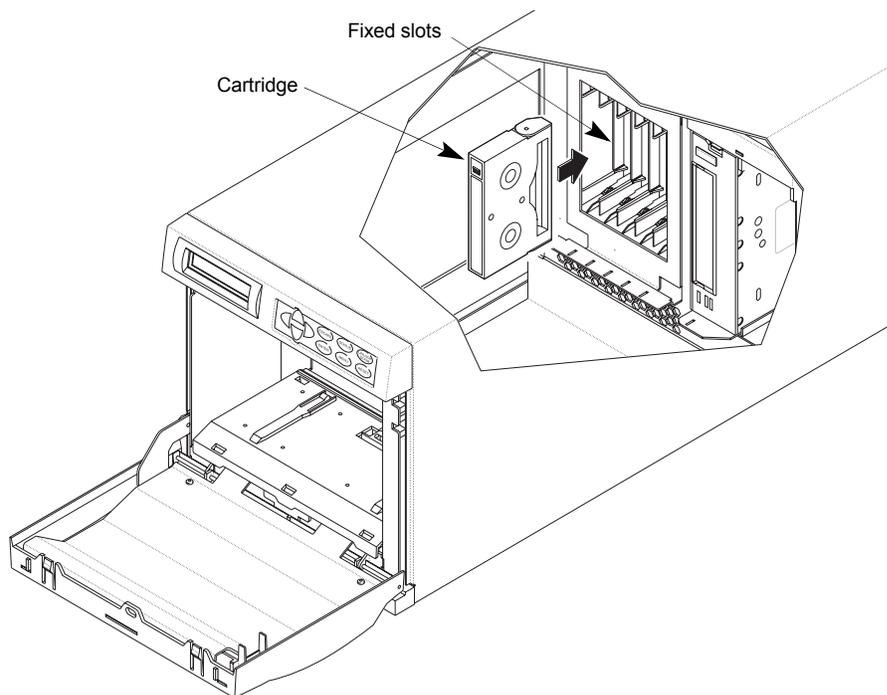
Figure 11. Installing Data Cartridges

2. If you plan to use a cleaning cartridge to clean the tape drive, place a cleaning cartridge in the fixed slot closest to the tape drive, as shown in the following figure.

Cleaning
cartridge
slot (optional)
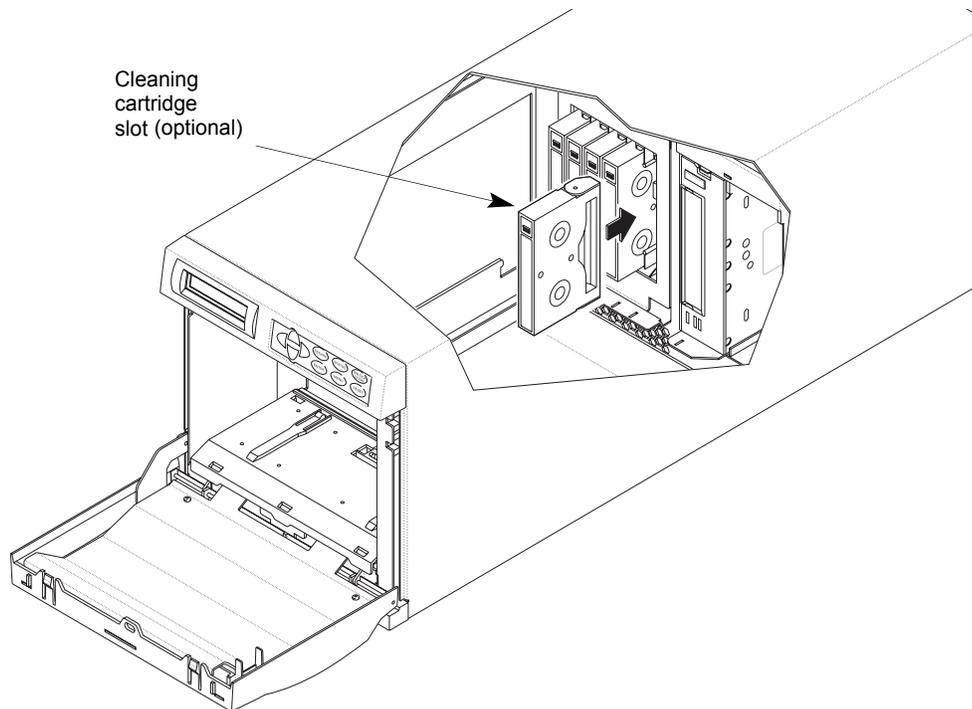
Figure 12. Installing a Cleaning Cartridge

CAUTION

Use only cleaning cartridges specifically designed for AIT tape drives. Using other types of cleaning cartridges voids your warranty. Carefully follow all instructions and recommendations provided with the cleaning cartridge.

Installing Cartridges in Magazine

1. Install cartridges in the magazine so that the write-protect switches are up, next to the plastic alignment tabs on the top of the magazine, as shown in the following figure.
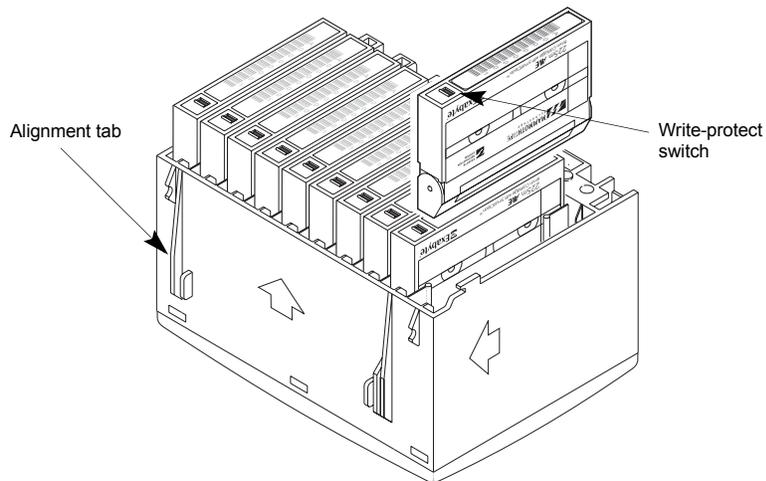
Figure 13. Installing Cartridges in the Magazine

2. Insert the cartridge magazine into the library so that the plastic alignment tabs are up (as shown in the following figure) and the alignment grooves are down.

NOTE

The magazine can only be inserted one way; do not try to force it into the library. If the magazine does not slide in easily, check it's orientation and re-insert it.
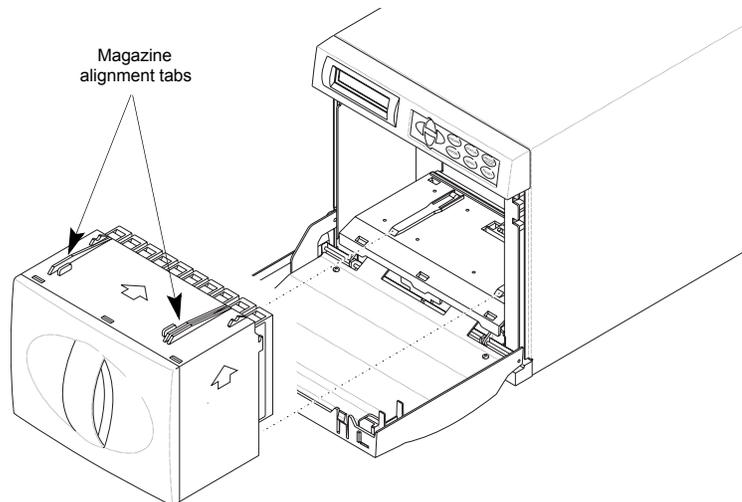
Figure 14. Inserting the Magazine

3. Close the library door.

Connecting the Library to the SCSI Bus

This section provides general guidelines for connecting the library to the SCSI bus. The library includes two SCSI devices: the library itself and one tape drive. Each device is a wide, low-voltage differential (LVD) SCSI configuration.

CAUTION

Do not connect an LVD library to a high-voltage differential (HVD) SCSI bus. Doing so may cause damage to the library or other devices on the bus.

Before you begin connecting the library to the SCSI bus:

- Read *Appendix B* if you are unfamiliar with connecting devices on a SCSI bus, especially issues concerning LVD configurations.

- Determine how many SCSI buses you want to connect to the library and which bus you want to connect to which device.

- Make sure you have the necessary SCSI cables and terminators. For information about SCSI cable specifications, see *Appendix B*. If you need to order any of these items, see *Contacting Plasmon* at the back of this manual.

- Make certain the host computer and any peripheral devices are powered off.

CAUTION

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

Ensure that an ESD wrist strap is worn during any cable connecting and any servicing procedures.

To Connect the library to the SCSI Bus:

1. Connect the host computer's SCSI cable to one of the library's SCSI connectors. The location of the library's SCSI connectors is shown in the following figure.
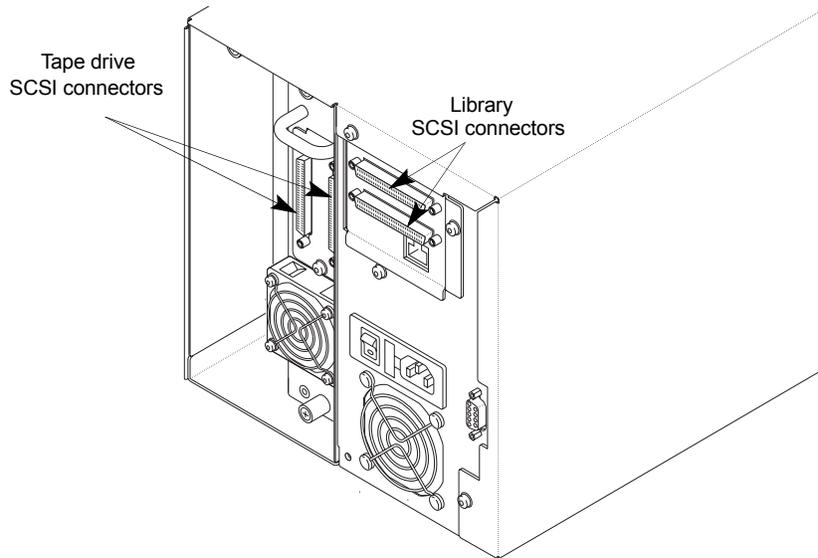
Figure 15. SCSI Bus Connectors

NOTE

When you attach the SCSI cables to the SCSI connectors, tighten the SCSI cable jack screws to no more than 2.0 inch-pounds (2.3 kg-cm) of torque.

2. Connect other SCSI cables, as necessary, depending on your bus configuration. If the library and tape drives are to share one bus, use jumper cables to connect them. For any device that terminates the bus, install a terminator on one of the SCSI connectors for that device.

For example, the illustration below shows how the library and tape drives can be connected to one SCSI bus.
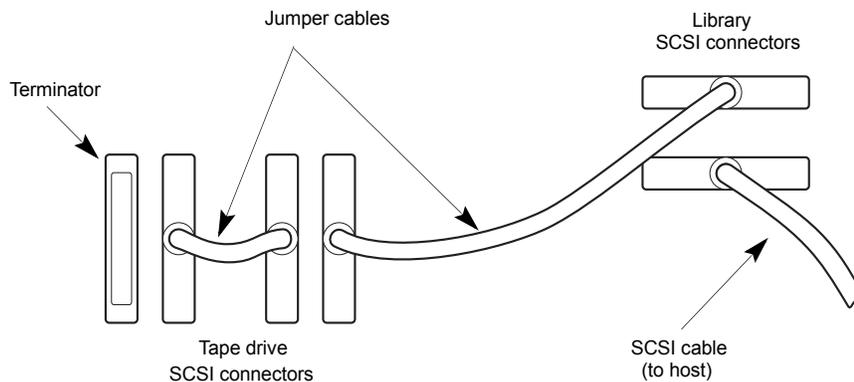
Figure 16. SCSI Bus Connections

Connecting the Power Cord

The type of AC power cord supplied with the library depends upon the configuration ordered, and the country of destination.

To connect the power cord:

1. Make sure that the power switch on the back of the library is off (the **0** is pressed).
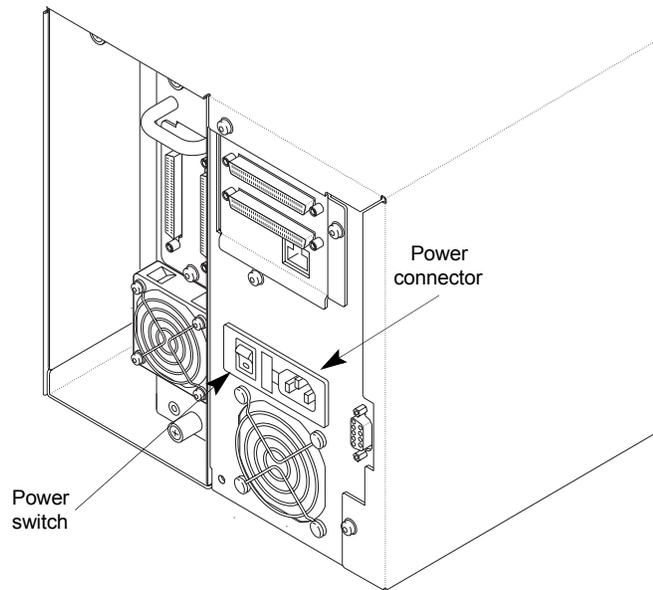
Figure 17. Power Cord Connection

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.

Powering on the Library

To power on the library:

> 1. Make sure the library's door is closed and latched.

> 2. Power on the host computer system.

NOTE

If your host system requires that attached peripheral devices are powered on before the host, power on the library before you power on the host.

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

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

- The cooling fans begin to operate.

- The LCD illuminates and displays power-on messages.

- The tape drive and the library perform a power-on self-test.

Verifying the Hardware Installation

After the library powers on, the LCD displays the Status Screen. As shown in the example below, the first line of the Status Screen displays the product name and the second line shows status for the drive (ready, no tape loaded).

```
Plasmon      V15.1
DReady  No  Tape
```

If the library powered on as described above, continue with library configuration in the next chapter. If the library did not power on as described above, check the following:

- Is the power switch on?

- Is the power cord inserted correctly?

- Is the library door closed and locked?

- Is the SCSI bus terminated?

- Is the SCSI cable connected to the library and host computer?

- Is the host computer system turned on?

- Is there an error code displayed on the library LCD? (See *Appendix C.*)

If you cannot resolve the problem yourself, contact Plasmon (see *Contacting Plasmon* at the back of this manual).

CHAPTER 3
CONFIGURATION

This chapter provides steps for configuring the library, as follows:

- Start by reading the first section, *Using the Operator Panel*, for general information about the keypad, LCD, and menus.

- Then follow the instructions in the *Configuring the Library* section to set the SCSI IDs and other configuration options.

- Then follow the guidelines in the *Checking the Setup* section.

- Finally, read the *Beginning Library Operations* section.

Using the Operator Panel

The library includes a two-line LCD and keypad, called the operator panel, which allows you to interactively control library operations. Using the operator panel (shown in the following figure), you can set library options, check operating statistics, and diagnose errors.
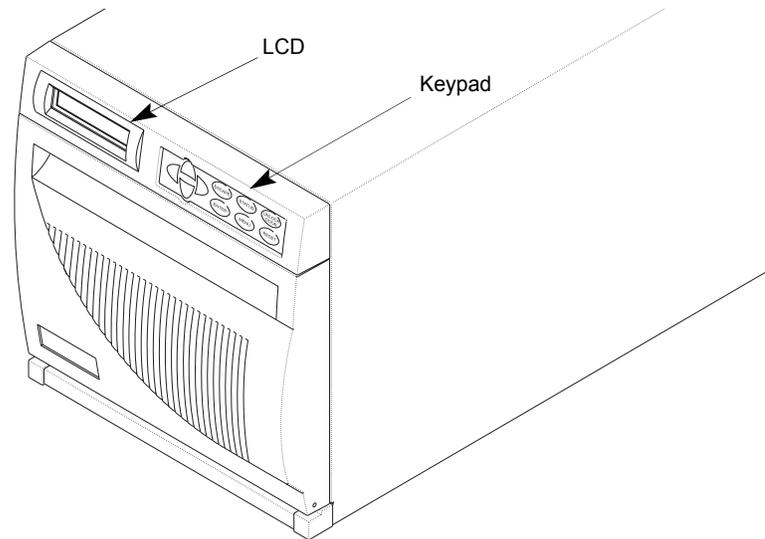
Figure 18. V15 Operator Panel

Status Screen

During normal operation, the Status Screen is displayed on the LCD. You can use this screen to monitor library activities. By default, the Status Screen displays the current operating status of the library and tape drive.

NOTE

As an option, the library may also include an Ethernet connection and Plasmon Library Monitor software. You can use this software to monitor library operations remotely. For instructions, see the *Ethernet Configuration* chapter.

Menus

To access the menus, press [MENU] from the keypad. The first selection to display is "Cartridge Inventory." You can then press the up and down arrow keys to loop through the menu options. Menus with a triangle symbol (▶) contain changeable options. Menus with a square symbol (■) contain viewable information only. Press [ENTER] to view the options or information available from the menu you want. Press [ESCAPE] to move back to a higher level menu.

The menu structure for the library is shown below.
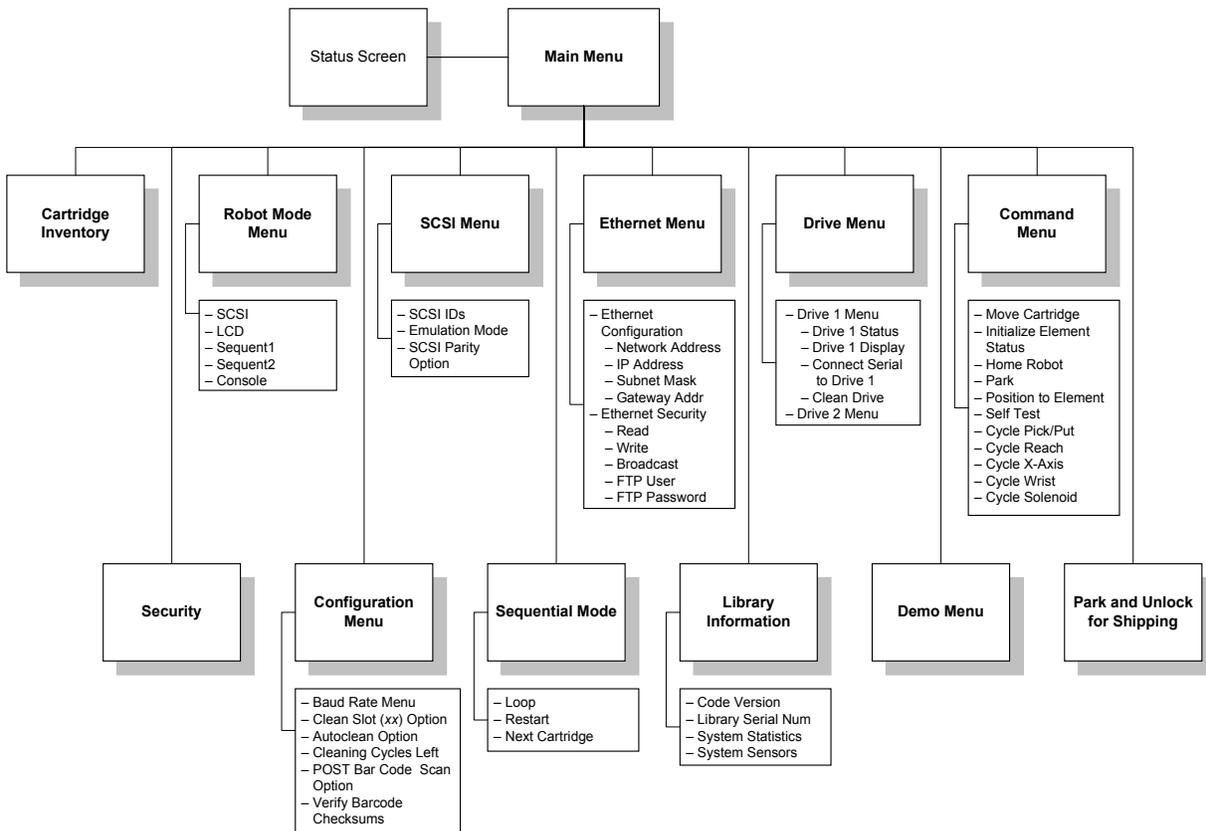
Figure 19. V15 Menu Structure

The Main Menu selections are described in the following table.

Table 2. Main Menu Selections

Menu Selection	Description
Cartridge Inventory	Displays the library's current cartridge inventory on three sequential screens.
Security (Enabled/ Disabled)	Allows you to enable or disable security from the LCD with a password. This prevents unauthorized personnel from disrupting library operation through either the LCD or the SCSI bus.
Robot Mode	Displays the current robot control mode (SCSI, LCD, Sequential, or Console) and allows you to change the mode.
Config (Configuration) Menu	Allows you to change the serial port baud rate, set the auto-clean function, reserve a fixed slot for a cleaning cartridge, and choose whether the library scans the cartridge barcode labels after power up.
SCSI Menu	Displays the SCSI IDs for the library and tape drive. Allows you to set the SCSI IDs, emulation mode, and SCSI parity checking.
Sequential Mode	Allows you to select options for sequential mode operation, if you intend to operate the library as a sequential stacker device.
Ethernet Menu	Allows you to configure the library for operation on an Ethernet network.
Library Information	Displays information about the library code versions, system statistics, and system sensors.
Drive Menu	Allows you to view the status of the tape drives. This menu also allows you to connect the serial port to the tape drives to perform diagnostics or upgrade firmware.
Demo Menu	Allows you to run various demonstration programs to observe how the library operates.
Command Menu	Allows you to issue commands for basic robot motion operations and perform diagnostic tests.
Park and Unlock for Shipping	Moves the robot to the park position for shipment and unlocks the door.

Operator Keys

Use the operator keys to perform the following actions:

Table 3. Operator Keys

Key	Description
 (Arrow keys)	Moves up, down, left, or right through the menus and screens, depending on which directional arrow you press.
[ESCAPE]	Returns to the previous menu or screen, or cancels an operation without saving changes.
[ENTER]	Selects the item next to the screen arrow or accepts a change.
[STATUS]	Displays the Status Screen, which shows library status, tape drive status, and operator messages.
[MENU]	Displays a menu of options for configuring the library, viewing information screens, and issuing commands to the library.
[UNLOCK DOOR]	Stops robot operations and releases the door's interlock mechanism. The door can then be opened manually.
[RESET]	Displays the Reset screen, which allows you to reset the library.

Error Codes

If a hardware error occurs, an error code appears on the Status Screen, one frame at a time. Refer to *Appendix C* for help in diagnosing and correcting errors. You must correct the error before operation can continue.

Configuring the Library

This section describes how to set the library's configuration options. Refer to the table below for an explanation of each configuration item and determine which ones you need to set. Then follow the appropriate steps in this section to set those options.

NOTE

Ethernet configuration, control modes and sequential mode configuration are described later in this manual.

Table 4. Library Configuration Options

Configuration Option	Description
SCSI Menu:	
SCSI IDs	Setting SCSI IDs is required for library operation. View the default settings and change them if necessary.
Emulation Mode	Setting an emulation mode is required if your application software does not support a Plasmon V15.
SCSI Parity	By default, parity checking is enabled. If desired, you can disable parity checking for the library if the SCSI adapter card connected to the library does not support parity checking.
Configuration Menu:	
Baud Rate	Setting a baud rate is only required for communicating over the serial port for firmware upgrades and diagnostics. You do not need to set this option for normal library operations.
Clean Slot Autoclean Clean Cycles Left	These three options allow you to set up automatic tape drive cleaning. **Note:** To use automatic cleaning, a cleaning cartridge must be installed.
POST Barcode Scan	If your software application does not automatically scan barcode labels when the library powers up or when the door is opened and closed, you can set this option so the library automatically scans the labels. By default, this option is turned off when the library is shipped. **Note:** If your library does not include a barcode scanner, the LCD shows "N/A" after the option.
Verify Barcode Checksums	This option instructs the library to look for barcode labels with checksum characters. If you plan to use barcode labels that include checksum characters, you should enable this feature. By default, this option is turned off when the library is shipped. **Note:** If your library does not include a barcode scanner, the LCD shows "N/A" after the option.
Security Menu:	
Security	By setting security, you prevent unauthorized personnel from disrupting the operation of the library through either the LCD keypad or the SCSI bus.

Setting the SCSI IDs

This section describes how to view the default SCSI IDS for the library and change them, if necessary.

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

To view and change the SCSI IDs:

1. If the security option is enabled, disable it.

2. From the operator panel's keypad, press [MENU] to display the menus. The first menu item to appear is "Cartridge Inventory".

3. Press the down arrow key until "SCSI Menu" displays. The SCSI Menu screen shows the current ID settings. In the example below, the tape drive is set to 01 and the library is set to 00.
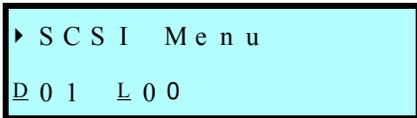
```
▸ S C S I   M e n u

D 0 1    L 0 0
```

4. If these default IDs are correct for your library setup, you do not need to change the settings and can press [ESCAPE] to return to the SCSI Menu. If you want to change the settings, continue with the following steps.

5. Press [ENTER]. The SCSI IDs screen displays.
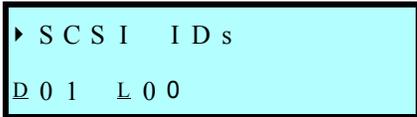
```
▸ S C S I   I D s

D 0 1    L 0 0
```

6. Press [ENTER] again to display the next screen for changing the IDs.
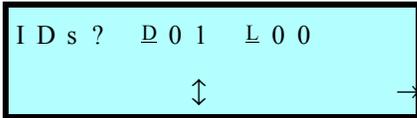
```
I D s ?   D 0 1    L 0 0

          ↕              →
```

7. To select the drive or library, use the left and right arrow keys to move the screen arrow (↕) to the appropriate column. To change the ID, use the up and down arrow keys to toggle through values.

8. When you have set the SCSI IDs, press [ENTER] to save your changes. The screen displays a status message for the ID you changed. When the library has finished changing the IDs, the SCSI IDs screen displays the new settings.

9. If desired, press [ESCAPE] to return to the SCSI Menu.

Setting the Emulation Mode

This section describes how to configure the library so that it emulates an Exabyte 210 or 480 library by returning "EXB-480", "EXB-430", or "EXB-210" in response to a SCSI INQUIRY command. You may need to set emulation if your software package does not yet support the Plasmon V15, but does support an Exabyte 480, 430, or 210.

To emulate an Exabyte 480, 430, or 210:

1. If the security option is enabled, disable it.

2. Display the SCSI Menu. If necessary, press [MENU] to display the menus (or return to the top of the menu selections). Press the down arrow key until "SCSI Menu" is displayed on the screen, then press [ENTER]. The SCSI IDs screen appears.

3. Press the down arrow key until "Emulation Mode" displays, as shown below. This screen shows the current emulation mode (none, EXB-210, EXB-480, or EXB-430).

```
▶Emulation   Mode:
 None
```

4. Press [ENTER]. The following screen displays.
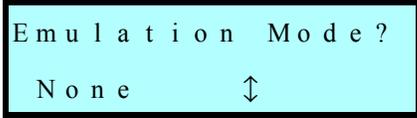
```
Emulation   Mode?
 None          ↕
```

5. Use the up or down arrow key to select EXB-210 or EXB-480, then press [ENTER]. The Emulation Mode screen shows the new selection.

6. If desired, press [ESCAPE] to return to the SCSI Menu.

Setting the SCSI Parity Option

When the SCSI Parity option is enabled, the library checks all data coming across the SCSI bus for parity (if the SCSI adapter card connected to the library supports parity checking). This setting remains in effect across power cycles. By default, SCSI parity is turned on when the library is shipped.

NOTE

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

To set parity checking:

1. If the security option is enabled, disable it.

2. Display the SCSI Menu. If necessary, press [MENU] to display the menus (or return to the top of the menu selections). Press the down arrow key until "SCSI Menu" is displayed on the screen, then press [ENTER]. The SCSI IDs screen appears.

3. Press the down arrow key until "SCSI Parity" displays, as shown below. This screen shows whether parity is enabled (1) or disabled (0).

```
▶S C S I   P a r i t y

  O p t i o n :   1
```

4. Press [ENTER]. The following screen displays.

```
S C S I

P a r i t y ?   1 ↓
```

5. Use the up or down arrow key to select "1" to turn on parity checking or "0" to turn off parity checking, then press [ENTER]. The SCSI Parity Option screen shows the new setting.

6. If desired, press [ESCAPE] to return to the SCSI Menu.

Setting the Clean Slot Option

The Clean Slot option designates the right-most fixed cartridge slot (closest to the tape drive) as a permanent storage location for a cleaning cartridge.

To set the Clean Slot option:

1. If the security option is enabled, disable it.

2. Change the control mode to LCD (see page 66).

3. Display the Config Menu. If necessary, press [MENU] to display the menus. Press the down arrow key until "Config Menu" displays, then press [ENTER]. The Baud Rate menu appears.

4. Press the down arrow key to display "Clean Slot Option," then press [ENTER]. The Clean Slot Option screen shows which slot is designated as the cleaning slot (15 in the example below) and whether the option is on (1) or off (0).

```
▶C l e a n   S l o t   ( 1 5 )

  O p t i o n :         0
```

5. Press [ENTER]. The following screen appears.

```
C l e a n i n g   S l o t   a t

S l o t   1 5 ?         0 ↑
```

6. Press the up or down arrow key to select "1" to turn the fixed cleaning slot option on or "0" to turn it off, then press [ENTER]. The Clean Slot screen shows the current selection.

Setting the Autoclean Option

The Autoclean option allows the library to automatically perform the cleaning process without interrupting normal library operation. With Autoclean enabled, the library monitors the cleaning requirements of the tape drive. When the drive indicates a "Needs Cleaning" status, the robot automatically removes the cleaning cartridge from the cleaning cartridge slot and inserts it into the tape drive. After completing the cleaning cycle, the library decreases the Clean Cycles Left counter by one.

NOTE

If you enable Autoclean, make sure the cleaning option in your software is turned off.

To set the Autoclean option:

1. If the security option is enabled, disable it.

2. Display the Config Menu. If necessary, press [MENU] to display the menus. Press the down arrow key until "Config Menu" displays, then press [ENTER].

3. Press the down arrow key until "Autoclean Option" displays. This screen shows whether Autoclean is enabled (1) or not (0).
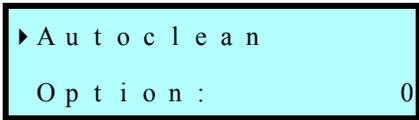
```
▶ A u t o c l e a n
  O p t i o n :            0
```

NOTE

To use Autoclean, the clean slot must contain a cleaning cartridge and the Clean Slot option must be enabled.

4. Press [ENTER]. The following screen displays.
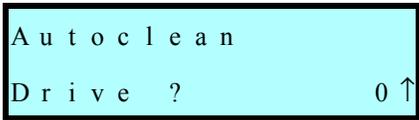
```
A u t o c l e a n
D r i v e  ?          0 ↑
```

5. Press the up or down arrow key to select "1," which turns on the Autoclean option, or "0" to turn the option off, then press [ENTER].

NOTE

When the library's Clean Cycles Left counter reaches zero, the library disables Autoclean and displays a message on the status screen reminding you to replace the cleaning tape.

Setting the Clean Cycles Left Option

The Clean Cycles Left option is a counter that tracks the number of times a cleaning cartridge has been used. When you install a new cleaning cartridge, you must use this option to set the number of cleaning cycles that remain. After completing a cleaning cycle, the library automatically decreases the Clean Cycles Left counter by one.

NOTE

Refer to the information provided with your cleaning cartridge to determine how many cleaning cycles it contains.

To set the Clean Cycles Left option:

1. If the security option is enabled, disable it.

2. Display the Config Menu. If necessary, press [MENU] to display the menus. Press the down arrow key until "Config Menu" displays, then press [ENTER].

3. Press the down arrow key to display "Cleaning Tape Cycles Left."
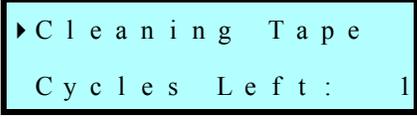
```
▶ C l e a n i n g    T a p e
  C y c l e s   L e f t :        1
```

NOTE

To set the Cleaning Cycles Left option, the clean slot must contain a cleaning cartridge, and the Clean Slot option must be enabled.

4. Press [ENTER]. The following screen displays.
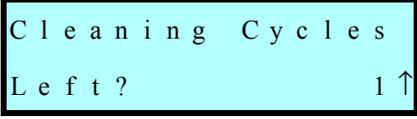
```
C l e a n i n g    C y c l e s
L e f t ?                 1 ↑
```

5. Use the arrow keys to set the number of cleaning cycles that remain on the installed cartridge, then press [ENTER].

Setting the POST BarCode Scan Option

When the POST Barcode Scan option is enabled, the library automatically scans the barcode labels whenever the library door is opened and closed or whenever the library powers up. By default, this option is turned off. Enabling this option increases the time required to complete POST during startup.

NOTE

If your library does not include a barcode scanner, the LCD displays "N/A" next to this option.

To turn on the POST Barcode Scan option:

1. If the security option is enabled, disable it.

2. Display the Config Menu. If necessary, press [MENU] to display the menus (or return to the top of the menu selections). Press the down arrow key until "Config Menu" is displayed on the screen, as shown below. The second line of the Config Menu shows the current baud rate and whether autoclean is enabled.
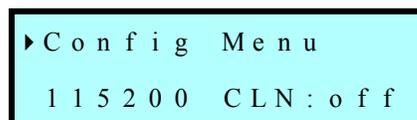
```
▸C o n f i g   M e n u

  1 1 5 2 0 0   C L N : o f f
```

3. Press [ENTER].

4. Press the down arrow key until "POST Barcode Scan Option" displays. This screen shows whether barcode scanning is enabled (1) or disabled (0).

```
▸P O S T   B a r c o d e

  S c a n   O p t i o n :   0
```

5. Press [ENTER]. The following screen displays.

```
S c a n   B a r c o d e s

d u r i n g   P O S T ?   0 ↑
```

6. Use the up or down arrow key to select "1," which turns on the option, or select "0" to turn the option off. Press [ENTER]. The POST Barcode Scan Option screen displays the new setting.

7. If desired, press [ESCAPE] to return to the Config Menu.

Setting the Verify Barcode Checksums Option

If you use barcode labels that contain checksum characters, you should enable the Verify Barcode Checksums option. If you do not use barcode labels that include checksum characters or if you mix labels containing checksum characters with labels that do not, you should turn off the Verify Barcode Checksums option. By default, this option is turned off.

NOTE

If your library does not include a barcode scanner, the LCD displays "N/A" next to this option.

You can determine whether your barcode labels contain checksum characters by contacting your vendor or by following these steps:

1. Count the number of black bars on the label. (The number will be a multiple of 5.)

2. Divide this number by 5 to get the number of characters.

3. Subtract the number of human-readable characters on the label from the result of step 2. If the result is 2, the label does not include a checksum character; if the result is 3, the label includes a checksum character.

To set the Verify Barcode Checksums option:

1. If the security option is enabled, disable it.

2. Display the Config Menu. If necessary, press [MENU] to display the menus (or return to the top of the menu selections). Press the down arrow key until "Config Menu" is displayed on the screen, then press [ENTER]. The Baud Rate screen appears.

3. Press the down arrow key until "Verify Barcode Checksum" displays, as shown below. This screen shows whether this option is enabled (1) or disabled (0).

```
▸Verify  Barcode
 Checksums:        0
```

4. Press [ENTER]. The following screen displays.
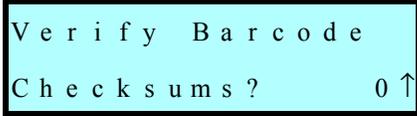
```
Verify  Barcode
Checksums?      0 ↑
```

5. Use the up or down arrow key to select "1," which turns on the option, or select "0" to turn the option off. Press [ENTER]. The new setting appears on the Verify Barcode Checksums screen.

6. If desired, press [ESCAPE] to return to the Config Menu.

Setting the LCD Security Option

The library's security option allows you to prevent unauthorized personnel from disrupting the operation of the library. Security can be enabled or disabled in either of two ways:

- LCD security. You can set the security option from the LCD, as described in this section.

- SCSI security. The application software can issue a SCSI MODE SELECT command to turn security on or off, as described in the *Plasmon V15 SCSI Reference* (or see your software documentation).

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

When you enable security, the following activities are prevented:

- Changing SCSI IDs

- Changing the robot control mode

- Using the Commands Menu and the Demo Menu

- Opening the front door (LCD security only)

- Communicating with the tape drive across the serial port

- Changing SCSI parity checking

- Changing emulation mode

- Cleaning the tape drives

- Changing the POST Barcode Scan option

- Changing the Ethernet options

If you attempt to perform any of these operations when security is enabled, the library displays a message that states security is active.

Enabling Security from the LCD

1. Display the Security screen. If necessary, press [MENU] to display the menus (or return to the top of the menu selections). Press the down arrow key until "Security" is displayed on the screen, as shown below. This screen shows whether security is currently enabled or disabled.
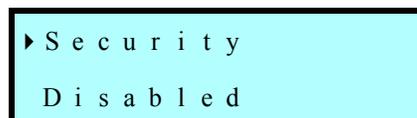
```
▶ S e c u r i t y

  D i s a b l e d
```

2. Press [ENTER]. An informational message displays, then the following screen appears.
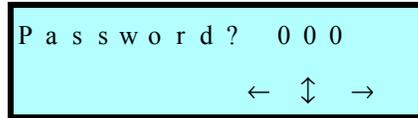
```
P a s s w o r d ?   0 0 0

              ←  ↕  →
```

3. Use the left and right arrow keys to move across the columns. Use the up and down arrow keys to select a number. When you have selected a password, press [ENTER]. A prompt similar to the one below appears.

```
P a s s w o r d :   0 0 0

A c c e p t ?
```
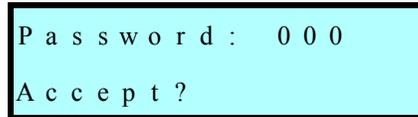
4. Press [ENTER] to accept the new password. The Security Screen then displays "LCD Password." (Security remains in effect across resets.)

NOTE

You must use the same password to turn security off.

Disabling Security from the LCD

1. Display the Security screen. If necessary, press [MENU] to display the menus (or return to the top of the menu selections). Press the down arrow key until "Security" is displayed on the screen, as shown below. If security is enabled, "LCD Password" displays on this screen.

NOTE

Security may have been enabled by your application using a SCSI command (the LCD will display "SCSI"). If this is the case, security must be disabled by your application. Refer to your software documentation or to the *Plasmon V15 SCSI Reference*.

```
▶ S e c u r i t y

  L C D   P a s s w o r d
```

2. Press [ENTER]. The following screen appears.
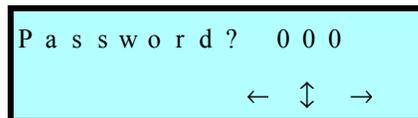
```
P a s s w o r d ?   0 0 0

              ←  ↕  →
```

3. Use the left and right arrow keys to move across the columns. Use the up and down arrow keys to select a number. Press [ENTER]. Security is then disabled.

Checking the Setup

After you install the library hardware and configure the library, check the setup by performing the suggested exercises below. While these exercises are not required, it is a good idea to verify that your software and hardware are properly communicating before you begin operations.

- Use the options on the Demo Menu or Command Menu to exercise the hardware. These exercises help determine whether the library hardware components are operating properly. See the *Performing Hardware Exercises* section in the *Library Operation* chapter.

NOTE
These hardware exercises require changing the control mode to LCD. When you complete the exercises, be sure to change the library's control mode back to SCSI, which is the library's standard operating mode.

- If you have not already done so, install the software application on the host computer. Instruct the software to perform a cartridge load and unload operation for the tape drive. This test helps determine whether the software and library are communicating properly.

- Back up several megabytes of data to the tape drive and perform a comparison check on the backed up data. This determines whether the software and tape drive are communicating properly.

If the library and tape drive are not operating as expected, refer to the *Troubleshooting* chapter for information. If there is an error code displayed on the LCD, see *Appendix C*. If you cannot resolve the problem yourself, contact Plasmon (see *Contacting Plasmon* at the back of this manual).

Beginning Library Operations

Before you begin library operations, check the following:

- The cartridge magazine is installed.

- The robot gripper does not contain a cartridge.

- The library door is closed.

- The library is in the proper control mode. SCSI is the standard operating mode (see the *Changing the Robot Control Mode* section in the *Library Operations* chapter).

When you have successfully completed the hardware installation and library configuration, use the application software to perform backup and restore operations automatically. During normal library operations, you do not need to intervene in the cartridge processing. However, for occasional tasks you may need to perform, refer to the *Library Operation* and *Tape Drive Operation* chapters.

If your library includes the optional Ethernet connector and Plasmon Library Monitor software, and you want to use it to monitor library operations remotely, follow the instructions in the *Ethernet Configuration* chapter.

CHAPTER 4
ETHERNET CONFIGURATION

As an option, your library may include an Ethernet connection, which can be used to remotely view the library's operation (with the Plasmon Library Monitor software) and to access the library's firmware via FTP. (For more information about upgrading firmware, see the *Diagnostics and Firmware* chapter.)

This chapter describes the following:

- Configuring the library for use with Ethernet

- Viewing the Ethernet Security screens

- Connecting the Ethernet cable

- Monitoring the Ethernet LEDs

NOTE

If the library includes an Ethernet connection, it also includes a CD that contains the Plasmon Library Monitor software. For software installation instructions, refer to the readme file on the CD. (The Library Monitor software can be installed before or after Ethernet configuration.)

Setting Ethernet Addresses

This section describes how to set the network addresses that enable the library to communicate in the Ethernet network. For more detailed information about these addresses, see the table on the next page and the readme file for the Library Monitor software.

NOTE

If your library does not include an Ethernet configuration, the Ethernet screens are not available on the LCD display.

To set the Ethernet addresses:

1. From the operator panel keypad, press [MENU] to display the menus. Press the down arrow key until "Ethernet Menu" is displayed on the screen. This menu shows the current Ethernet addresses, similar to the ones in the following example.

```
▶Ethernet  Menu
S205.161.   8.   9
```

2. Press [ENTER]. The Ethernet Configuration Menu displays, as shown below.

```
▶Ethernet
  Configuration
```

3. Press [ENTER]. The Network Address screen appears.

```
▶Network
  Address:Static
```

There are four screens for setting Ethernet configuration options: Network Address, IP Address, Subnet Mask, and Gateway Address. Each is described in the following table.

4. For each screen, press [ENTER] to display another screen for setting values, use the arrow keys to select the values, then press [ENTER] when you are done.

Table 5. Ethernet Configuration Options

Ethernet Address	Description
Network Address	Selects the method used to set the Internet Protocol (IP) address of the library, as follows: • Static – The library uses a fixed IP Address, which is assigned in the IP Address field, described below. • DHCP – The library uses an IP address assigned by the network DHCP (Dynamic Host Configuration Protocol) server. For ease of use, Plasmon recommends using a Static IP address.
IP Address	Sets the IP address of the library, which acts as a Simple Network Management Protocol (SNMP) device in the network.
Subnet Mask	Sets the subnet (subnetwork) mask, a set of numbers that allows routing of communication to designated devices within the network. **Note:** This option is only displayed if the network address is set to Static.
Gateway Address	Sets the default TCP/IP (Transmission Control Protocol/Internet Protocol) gateway address, which allows routing of communication outside the subnet. **Note:** This option is only displayed if the network address is set to Static.

Viewing the Ethernet Security Screens

The Ethernet security screens allow you to view the read-only values for the following community access strings: Read, Write, and Broadcast. Community strings provide security for Simple Network Management Protocol (SNMP) communication. Ethernet security also contains information about the user name and password for the secure transfer of library and Ethernet firmware upgrades via File Transfer Protocol (FTP).

NOTE

You can change these values in the Library Monitor software shipped with the library (see the Help file shipped with the software) or by using the library's console interface (see the *Diagnostics and Firmware* chapter for more information about accessing the console interface).

To view the Ethernet security screens:

1. From the operator panel keypad, press [MENU] to display the menus. Press the down arrow key until "Ethernet Menu" is displayed on the screen.

```
▶E t h e r n e t   M e n u
S 2 0 5 . 1 6 1 .     8 .   9
```
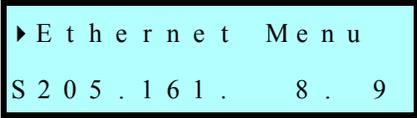
2. Press [ENTER]. The Ethernet Configuration Menu displays, as shown below.

```
▶E t h e r n e t
   C o n f i g u r a t i o n
```

3. Press the down arrow until "Ethernet Security" displays.

```
▶E t h e r n e t
   S e c u r i t y
```

4. Press [ENTER]. The first screen to appear is shown below.

```
■R e a d :
   " P u b l i c "
```

The following table describes each Ethernet security screen.

Table 6. Ethernet Security Screens

Ethernet Security	Description
Read	Displays the alphanumeric string for the Read Community contained in the SNMP administration framework. (This value can only be changed in the library's console interface.)
Write	Displays the alphanumeric string for the Write Community contained in the SNMP administration framework. (This value can be changed in the library's console interface or in the Library Monitor software.)
Bcast (Broadcast)	Displays the alphanumeric string for the Broadcast Community contained in the SNMP administration framework. (This value can be changed in the library's console interface or in the Library Monitor software.)
FTP User	Displays the FTP user name, up to 16 characters. The default is "anonymous."
FTP PW (Password)	Displays the FTP password, up to 16 characters. The default is "Plasmon.

Connecting the Ethernet Cable

This section describes how to connect the library to the server by attaching an Ethernet cable to the Ethernet port. The Ethernet port is located on the back of the library, as shown in the following figure. (For Ethernet cable specifications, see *Appendix A*.)
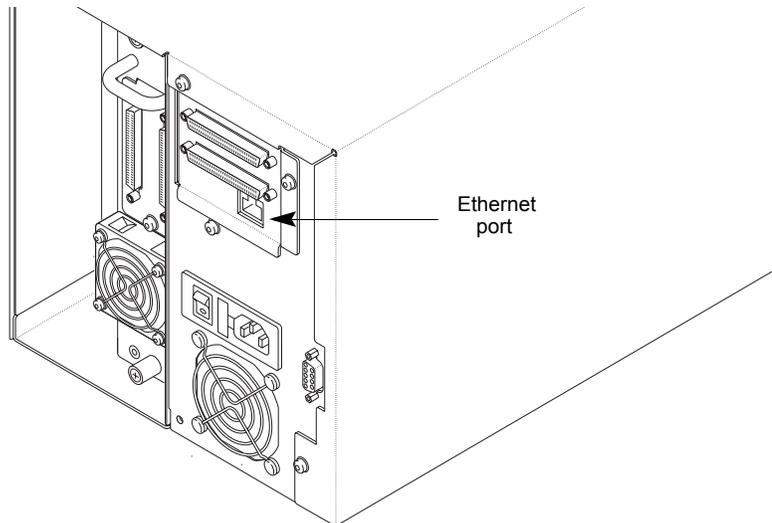
Ethernet port

Figure 20. Ethernet Connector

To connect the Ethernet cable:

1. Insert one end of the cable into the Ethernet port until you hear it snap into place.

2. Connect the other end of the cable to the server where you plan to install the Library Monitor software.

Monitoring the Ethernet LEDs

The Ethernet light-emitting diodes (LEDs) indicate the operating status of the Ethernet connection. The two LEDs are located above the Ethernet port, as shown below.
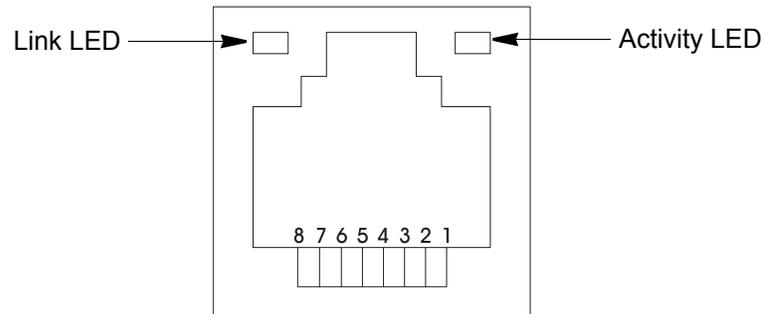
Figure 21. Ethernet LEDs

The Link LED turns on when a link to the network has been established. The Activity LED blinks when data transmission or reception is taking place.

CHAPTER 5
LIBRARY OPERATION

This chapter describes the following library operations you may need to perform:
Replacing cartridges and the magazine

- Storing cartridges

- Changing the robot control mode

- Operating the library in sequential mode

- Viewing the cartridge inventory

- Resetting the library

- Performing hardware exercises

- Displaying information about the library

NOTE

The application software automatically controls the library's robotics to perform backup and restore operations. Normally you do not need to intervene in the cartridge processing. However, you may occasionally need to perform the tasks described in this chapter.

Replacing Cartridges and the Magazine

This section describes how to replace cartridges and the magazine by opening the front door.

NOTE

When you open and re-close the door, the library performs the cartridge inventory process.

Opening the Front Door

1. If the security option has been enabled, disable it.

2. On the operator panel's keypad, press the [UNLOCK DOOR] button. At the Unlock Door prompt, press [ENTER].

3. Wait while the library moves the robot to the park position (between the fixed slots and the tape drive).

NOTE

Do not force the front door open. Forcing the door could prevent the interlock mechanism from releasing by security or through the application software.

4. Pull open the door as shown in the following figure.
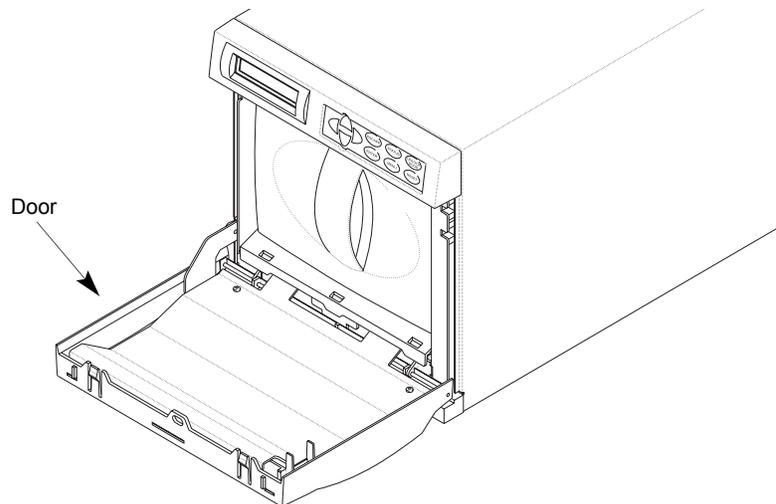
Figure 22. Opening the Front Door

Replacing the Magazine

1. From inside the door, remove the magazine by grasping the handle and pulling it straight out, as shown in the following figure.
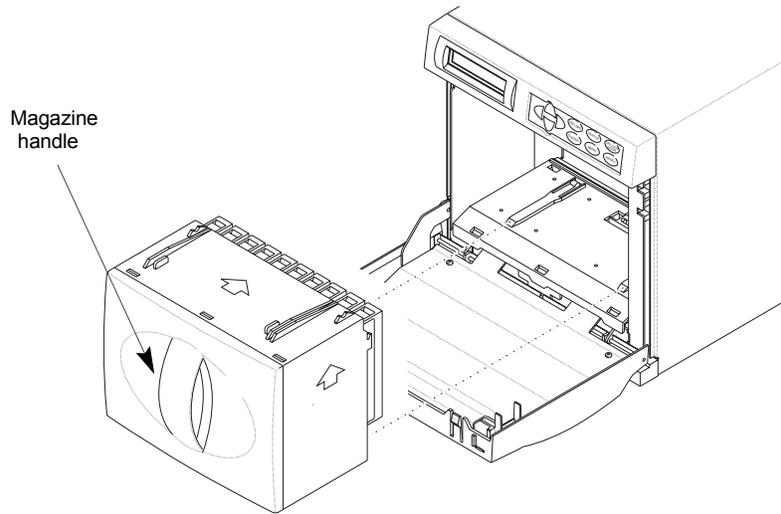
Magazine
handle

Figure 23. Removing the Magazine

2. If desired, replace cartridges in the magazine (see the *Hardware Installation* chapter for instructions).

3. Insert the magazine into the library so that the plastic alignment tabs are up (as shown in the following figure) and the alignment grooves are down. The magazine can only be inserted one way; do not try to force it into the library.

Magazine
alignment tabs
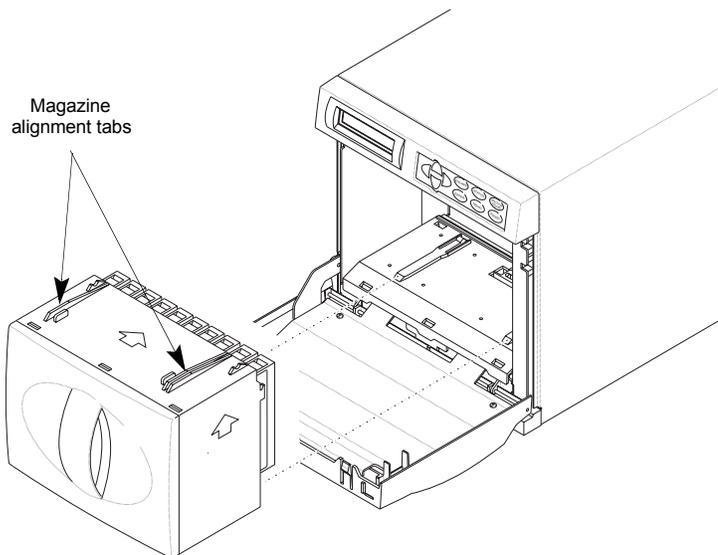
Figure 24. Replacing the Magazine

Closing the Front Door

1. Close the front door. Make certain the door closes completely so the door locks can engage. The door locks automatically.

2. If necessary, re-enable security.

Storing Cartridges

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

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

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

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

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

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

Changing the Robot Control Mode

To determine which interface controls robot motion, you can set the library to one of the following control modes: SCSI, LCD, Sequential, or Console. These control modes allow you to operate the library with the application software (SCSI), operate the library as a stacker device (Sequential), or perform diagnostic functions on the library (LCD or Console). The standard operating mode is SCSI, which is also the default setting for the library.

NOTE
Control mode settings remain set through subsequent power cycles.

Control modes are described in the following table.

Table 7. Robot Control Modes

Control Mode	Description
SCSI mode	In this standard operating mode, the application software controls the motion of the robot by issuing SCSI commands across the SCSI bus. **Note:** The application software can issue commands to the library regardless of the control mode. However, the library must be in SCSI mode for the software to control robot motion.
Sequent1 and Sequent2	In these modes, the robot picks all cartridges sequentially, from the first cartridge in the magazine through the last cartridge in the fixed slots (or the last data cartridge slot specified by the Max Addressable Slot option. In Sequent1 mode, the cartridges are processed in Drive 1 only. In Sequent2 mode, the cartridges are processed in Drive 2 only.
LCD mode	If you want to perform any operations from the operator panel that involve moving the robot, you need to set the library to LCD mode.
Console mode	In this mode, you can control the motions of the robot from a remote console program connected to the library's 9-pin serial port. For more information about the console program, see the *Diagnostics and Firmware* chapter

To change the control mode:

1. If the security option is enabled, disable it.

2. Press [MENU] to display the menus, then press the down arrow until "Robot Mode" displays. The Robot Mode screen shows the currently activated mode.

```
▶R o b o t   M o d e
  S C S I
```
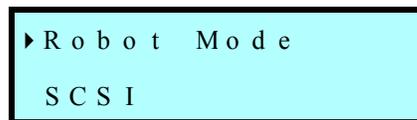
3. Press [ENTER]. An informational message displays, then the following screen displays.

```
R o b o t   M o d e ?
S C S I           ↕
```
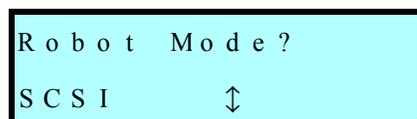
4. Use the arrow keys to select the desired mode and press [ENTER]. The Robot Mode screen shows the new selection.

Operating the Library in Sequential Mode

When the library is operating in Sequential mode, its internal firmware instructs the robot to move cartridges sequentially between the cartridge slots and the tape drive. Sequential mode is useful with software applications that support functions performed by the tape drive but not functions performed by the library robotics.

In Sequential mode, the library performs the following steps:

1. Picks the cartridge from slot 1 and places it in the tape drive. If the slot is empty, the robot picks the next cartridge in the magazine.

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

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

4. Returns to the first cartridge and begins the process again or stops, depending on how the Loop option is set.

Sequential options

To customize how Sequential mode works, you can set the Loop, Restart, and Next Cartridge options. These options are not affected by a reset or power cycle.

Loop Option

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

Table 8. Sequential Mode Loop Option

If Loop is...	The Library...
On	Returns to cartridge 1 and starts processing the cartridges again.
Off	Stops processing cartridges and waits for operator intervention.

Restart Option

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

As shown in the following table, the Restart option determines what the library does next.

Table 9. Sequential Mode Restart Option

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

Before restarting, the library performs the following actions:

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

NOTE

If you attempt to open the door, the library does not release the door interlock until it the move completes.

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

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

Next Cartridge Option

The Next Cartridge option allows you to interrupt sequential processing and specify that the next cartridge the library selects is the cartridge in slot 1. If you want to resume sequential processing from the first cartridge, select Next Cartridge from the Sequential Mode menu.

Setting Sequential Options

To set sequential options:

1. If the security option is enabled, disable it.

2. Press [MENU] to display the menus, then press the down arrow until "Sequential Mode" displays. The Sequential Mode screen shows the current settings for the Loop option (L), the Restart option (R), and the Next Cartridge option (N).

```
▸ S e q u e n t i a l    M o d e

  L 0    R 1    N 0
```

3. Press [ENTER]. The Loop Option screen appears. The screen shows whether the Loop option is on (1) or off (0).

```
▸ L o o p    O p t i o n :

  0
```

4. Press [ENTER] again to display the screen for changing the Loop option.

```
L o o p

O p t i o n ?    0 ↑
```

5. Use the up or down arrow key to change the setting, then press [ENTER]. The Loop Option screen shows the new setting.

6. Press the down arrow key to display the Restart Option screen. The screen shows whether the Restart option is on (1) or off (0).

```
▶Restart  Option:

  1
```

7. Press [ENTER] again to display the screen for changing the Restart option.

```
Restart

Option?  1↓
```

8. Use the up or down arrow key to change the setting, then press [ENTER]. The Restart Option screen shows the new setting.

9. Press the down arrow key to display the Next Cartridge Option screen.

```
▶Next  Cartridge:

  ?
```

10. Press [ENTER] to set the next cartridge to 1 or [ESCAPE] to cancel.

11. Press [ESCAPE] to return to the Sequential Mode screen.

Avoiding Interruptions

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

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

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

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

Viewing the Cartridge Inventory

The Cartridge Inventory screens allow you to view information the library maintains for each storage element (the magazine slots, the fixed slots, the tape drive, and the robot).

To view the cartridge inventory:

1. From the operator panel keypad, press [MENU] to display the menus. The first menu item to appear is "Cartridge Inventory," as shown in the following example.

> ▸ C a r t r i d g e
>
>   I n v e n t o r y
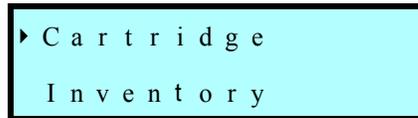
2. Press [ENTER] to display the first inventory information screen. Press the down arrow key to display additional screens.

   There are two screens that show inventory information. The first screen shows information about the slots in the magazine (M 1 through 10), and for the drives (D1 and D2).

> M 1 2 3 4 5 6 7 8 9 10   D 1 2 ↕
>
> ← ■ ■ ■   ■   →
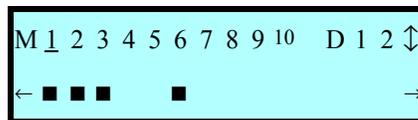
   The second screen shows information about the fixed cartridge slots (F1 through 5), and the robot (R).

> F 1 2 3 4 5   R   ↕
>
> ← ■   ■   →
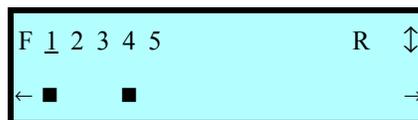
   A bar (■) underneath the element number indicates that a cartridge is stored in that element.
   A blank space indicates that no cartridge is stored in that element.
   A dash (-) indicates that the slot is not usable (beyond Max Addressable Slot value).
   A question mark (?) indicates an invalid Occupied flag.

3. To select an element, use the left and right arrow keys to move across the columns. The underline indicates the currently selected element. For example, in the screen above, the first slot in the magazine is selected (1).

4. When you have selected an element, press [ENTER]. The Index and Type information for this element appear on the screen. Use the up and down arrow keys to scroll through the fields.

The following table provides a description of each field.

Table 10. Cartridge Inventory Fields

Cartridge Inventory Field	Description
Index:	Displays the element index for which the information is being displayed.
Type:	Indicates the type of element: either a cartridge slot, drive, or robot.
Warning:	Displays 0 if there are no failures or errors associated with this element; or, displays an error code. See *Appendix C* for a list of error codes and corrective actions.
Occupied:	Indicates whether the specified element contains a cartridge (1) or not (0).
Valid:	Indicates whether the Occupied flag is accurate (1) or is questionable (0).
Accessible:	Indicates if the element is accessible (1) or not (0). If the element is a magazine slot, it is accessible if the magazine is installed. If the element is the tape drive, it is accessible if the drive is installed in the drive bay and does not contain a cartridge.
Present:	Shows whether the tape drive or magazine is installed (1) or not (0). **Note:** If the element references a slot, this flag indicates whether the magazine is installed.
Label/Valid:	Indicates whether the Label field is valid (1) or not (0).
Label Error:	Indicates if the barcode scan was successful (0) or displays an error condition: 60 – The barcode scanner could not read the barcode label because there was no label on the cartridge. 61 – The barcode scanner could not read the barcode label because the label was unreadable. 62 – The barcode scanner could not read the label because the magazine is not present. 63 – The barcode scanner could not read the label for a single slot because the inventory is questionable. 64 – The barcode scanner could not read the label because of a problem with the checksum character. 67 – The library could not collect barcode data for the fixed slot because of a firmware or hardware problem.
Sndvol Match: (Send Volume Match)	Indicates whether the cartridge label matched the template sent with the last SCSI SEND VOLUME TAG command (1) or not (0).

Cartridge Inventory Field	Description
Source:	Displays the index of the last storage element from which the cartridge was moved. If the Source displays "255", the cartridge in that element has not been moved since the last reset.
Address:	Displays the SCSI address of this element.
Reserved:	Indicates whether the element is reserved by the host (1) or not (0).
Rsv Host ID:	Displays the SCSI ID of the host that has reserved the library (if it is reserved).
Reserve ID:	Displays the ID that the element is reserved under. This is a number assigned by a host when the reservation was made. If there is no reservation, the Reservation ID and Host ID columns display "0".
X Axis:	Displays the distance the robot must move along the X axis to the specified element location.
W Axis:	Displays the distance the robot must move along the W axis to the specified element location. A value of 0 indicates the robot is at the front; a value of 500 indicates the robot is at the back.
Total Puts:	Displays the number of times the library placed a cartridge in that element since the last reset.
Total Put Retries:	Displays the number of times the library retried placing a cartridge in that element since the last reset.
Total Pick Retries:	Displays the number of times the library retried picking from that element since the last reset.

Resetting the Library

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

- Press [RESET] from the front panel's keypad, then press [ENTER] at the confirmation screen.

- Turn the library off, then back on.

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 drive is not communicating across the SCSI bus. Otherwise, resetting may disrupt communications on the SCSI bus.

Performing Hardware Exercises

This section describes hardware exercises you can perform from the operator panel. Many of the tasks may be necessary if you want to test library hardware operations.

Hardware exercises are available from the Demo Menu and Command Menu. The Demo Menu provides options for running the library in a continuous demo mode, where the robot randomly moves cartridges between slots. The Command Menu provides options for performing specific robot movements.

NOTE

You can perform diagnostics using console. For information, see the *Diagnostics and Firmware* chapter.

Using Elements

Elements are the physical locations in the library that can accept a cartridge (the robot, the magazine slots, the fixed slots, and the tape drive).

Element Indexes

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

The following diagram shows the element index assignments for the library.
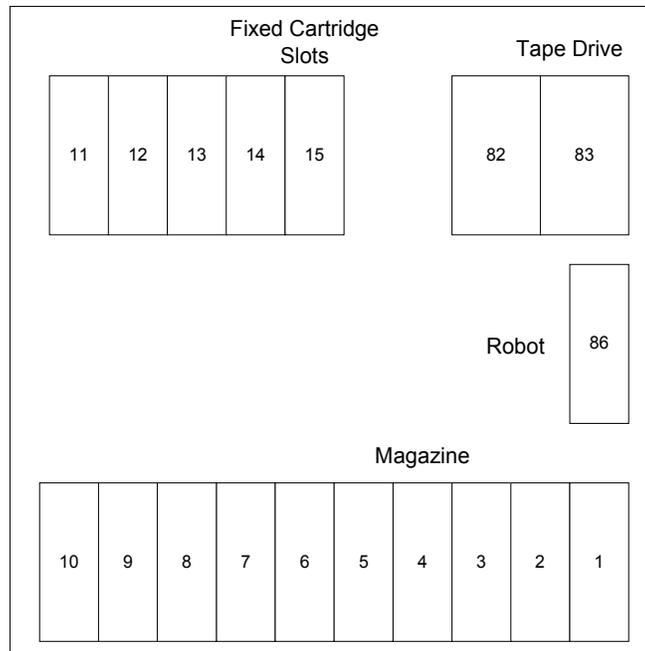
Figure 25. V15 Element Indexes

Element Addresses

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

The library's default element addresses correspond to the element indexes.

Using the Demo Menu

The Demo option causes the robot to randomly move cartridges from slot to slot, including the fixed cartridge slots.

To run the demo option:

1. If necessary, disable security.

2. Change the robot mode to LCD.

3. Make sure there is at least one cartridge present and one empty slot before you begin the test.

4. From the operator panel keypad, press [MENU] to display the menus. Press the down arrow key until "Demo Menu" displays, as shown below.

> ‣ D e m o
>
>   M e n u

5. Press [ENTER]. The following screen appears.

```
U  s  e
D  r  i  v  e  ? N ↑
```

6. Use the up or down arrow keys to indicate whether you want the tape drive used in the demo, then press [ENTER]. If you selected Yes, the following screen appears.

```
L  o  a  d
D  r  i  v  e  ? N ↑
```

7. Use the up or down arrow keys to indicate whether you want cartridges loaded in the drive or just inserted into the drive opening during the demo. Press [ENTER}. An informational message displays, then the following screen appears.

```
   0  0  0  0  0  1  0
←        ↕        →
```

8. Use the arrow keys to set the number of moves (the left and right arrow keys move across the columns; the up and down arrow keys change the numbers). Then press [ENTER].

The library begins the demo and displays status messages. If you want to abort a demo in progress, press [ESCAPE]. Press [ESCAPE] again to return to the Demo Menu.

Using the Command Menu

The Command Menu provides basic exercising functions for components in your library. Refer to the diagram in this chapter showing the element indexes. These numbers correspond to the library components and are necessary for some tests.

To perform diagnostic commands:

1. If necessary, disable security.

2. Change the control mode to LCD.

3. From the operator panel keypad, press [MENU] to display the menus. Press the down arrow key until "Command Menu" displays, as shown below.

```
▸ C  o  m  m  a  n  d
  M  e  n  u
```

4. Press [ENTER]. The LCD displays the first diagnostic test.

```
▸ M  o  v  e
  C  a  r  t  r  i  d  g  e
```

5. Use the up or down arrow keys to select one of the tests (described in the following table), then press [ENTER].

6. When the test is finished, the screen displays a status message. Press [ESCAPE] to return to the Command Menu or to abort a test in progress.

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

Table 11. Command Menu Selections

Test	Description
Move Cartridge	Moves a cartridge from one location to another. **Important:** Do not insert a cartridge in the tape drive. The tape drive will not automatically eject the cartridge.
Initialize Element Status	Scans cartridges for labels and checks for cartridge presence.
Home Robot	Causes the robot to move to the home position.
Park	Moves the robot to the park position, which is located between the last fixed slot (index 15) and the tape drive, and rotated toward the back (facing the tape drive).
Position to Element	Positions the robot in front of the tape drive, a fixed cartridge slot, or a magazine slot.
Self Test	Causes the robot to perform a self test, as follows: Moves from its current position to a position in front of the drive. Rotates 180 degrees on the wrist axis and moves to a position in front of slot 1. Rotates 180 degrees on the wrist axis and returns to a position in front of the drive.
Cycle Pick/Put	Causes the robot to move in and out of a slot a specified number of times.
Cycle Reach	Causes the robot to move in and out on the reach axis.
Cycle X-Axis	Causes the robot to move left and right on the horizontal (X) axis.
Cycle Wrist	Causes the robot's wrist to rotate from the rear-facing position to the front-facing position.
Cycle Solenoid	Exercises the solenoid that controls the locking mechanism on the front door.

Displaying Library Information

This section describes how to view the following library information:

- Code (firmware) version and serial number

- Statistics (data about robot operations and elements)

- System sensors (data about the library's mechanical sensors)

Viewing the Code Version and Serial Number

To view the code version and serial number:

1. From the operator panel keypad, press [MENU] to display the menus. Press the down arrow key until "Library Information" displays, as shown below.

```
▸ L i b r a r y

  I n f o r m a t i o n
```
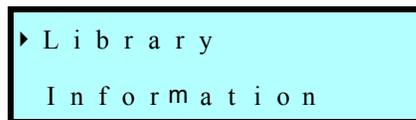
2. Press [ENTER]. The screen displays the library code version, similar to the example below.

```
■ C o d e   V e r s i o n

  V n . n   n
```

3. Press the down arrow key to display the serial number.
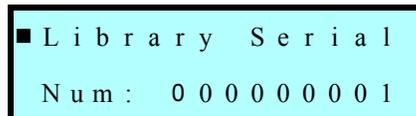
```
■ L i b r a r y   S e r i a l

  N u m :   0 0 0 0 0 0 0 1
```

4. Press [ESCAPE] to return to the Library Information Menu.

Viewing Statistics

The Statistics Menu allows you to review information about robot movements. To view statistics:

1. From the operator panel keypad, press [MENU] to display the menus. Press the down arrow key until "Library Information" displays, as shown below.

```
▸ L i b r a r y

  I n f o r m a t i o n
```
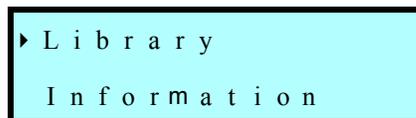
2. Press [ENTER]. The screen displays the library code version. Press the down arrow key twice until "System Statistics" displays, as shown below.

▸ S y s t e m

S t a t i s t i c s

3. Press [ENTER]. The first statistic to display is Total Moves, as shown in the example below.

▪ T o t a l   M o v e s :

1 4 2 4 0 6

4. To display additional Statistics screens, press the down arrow.

The following table describes the information in the Statistics screen.

Table 12. System Statistics Screens

System Statistic	Description[1]
Total Moves	The number of times the robot has picked a cartridge and placed it in a slot or the tape drive.
Pick Retries	The number of times the robot retried picking a cartridge.
Put Retries	The number of times the robot retried placing a cartridge.
Rotate Retries	The number of times the robot retried rotating on the wrist axis.
PTE Retries	The number of times the robot performed a position to element (PTE) retry.
Powerup Count	The number of time the library has been power cycled.

[1]Cumulative over the life of the library.

Viewing System Sensors

The System Sensors screen enables you to check the current status of the library's internal mechanical sensors. To view system sensors:

1. From the operator panel keypad, press [MENU] to display the menus. Press the down arrow key until "Library Information" displays, as shown below.

```
▶ L i b r a r y

  I n f o r m a t i o n
```
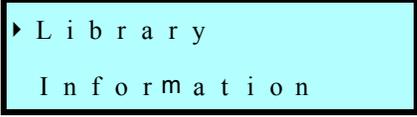
2. Press [ENTER]. The screen displays the library code version. Press the down arrow key until "System Sensors" displays, as shown below.

```
▶ S y s t e m

  S e n s o r s
```

3. Press [ENTER]. The first screen to display is Door Locked, as shown in the example below.
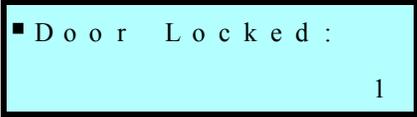
```
▪ D o o r    L o c k e d :

                              1
```

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

Table 13. System Sensor Screens

System Sensor	Description
Door Locked:	The front door is locked (1) or unlocked (0).
Door Closed 1:	The first front door sensor is on (1) or off (0).
Door Closed 2:	The second front door sensor is on (1) or off (0).
Cartridge Seated:	A cartridge is seated in the robot (1) or the robot is empty (0).
Reach Position:	The robot fingers are closed (1) or open (2).
Magazine Present:	The magazine is installed (1) or removed (0).
X Axis Home:	The robot is in the home position on the X axis (1) or not (0).
X Axis EOT:	The robot is at the EOT (end of travel) position on the X axis (1) or not (0).
Wrist Back:	The robot wrist position is toward the back of the library (1) or not (0).
Wrist Front:	The robot wrist position is toward the front of the library (1) or not (0).
Bay 1 Occupied:	The drive is installed in the drive bay (1) or the drive bay is empty (0).
Bay 2 Occupied:	The drive is installed in the drive bay (1) or the drive bay is empty (0).
Library Fan Fail:	The library's fan is operational (0) or has failed (1).
Drive 1 Fan Fail:	The fan for the drive is operational (0) or has failed (1). Note: Drive 1 is located next to the fixed slots.
Drive 2 Fan Fail:	The fan for the drive is operational (0) or has failed (1).

CHAPTER 6
TAPE DRIVE OPERATION

This chapter describes how to perform the following tasks:

- Monitoring the tape drive status

- Cleaning the tape drive

- Ejecting a cartridge manually

NOTE

The application software automatically controls the tape drive to perform backup and restore operations. You do not need to intervene in the cartridge processing; however, you may need to occasionally perform the tasks described in this chapter.

Monitoring Tape Drive Status

You can monitor the status of the tape drives in several ways:

- Reading the status lights on the front of the drive
- Viewing the library's Drive Display screens
- Viewing the library's Drive Status screens

Reading the Tape Drive LED Indicators

The meaning of the status lights differ between the AIT-2 and AIT-3 tape drives. Both are illustrated and explained below.
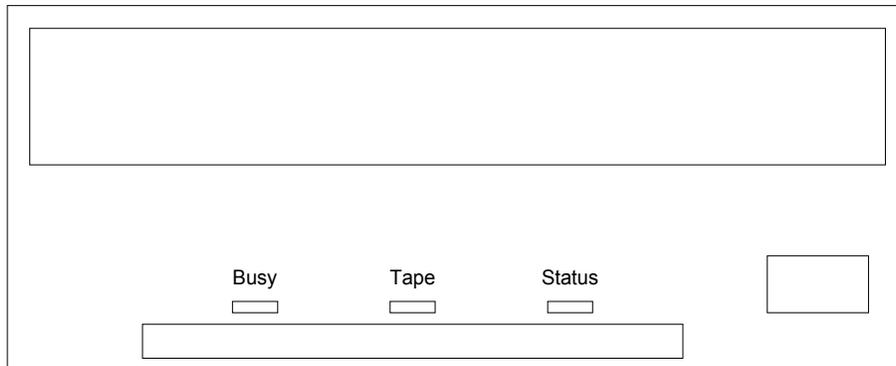
Figure 26. AIT-2 Tape Drive Status Indicators

The following table describes some of the AIT-2 tape drive LED states. For a complete listing of LED states, contact Sony. To read the LEDs you must open the library door and remove the magazine in front of the drive.

Table 14. AIT-2 Tape Drive Status Light Conditions

LED States	Condition
Busy (left) LED on	SCSI activity is occurring.
Tape (middle) LED on	Tape is loaded
Status (right) LED on	Cartridge is write-protected.
Tape LED is flashing (0.25 seconds on; 0.25 seconds off)	Tape is loading or unloading.
Tape LED is flashing (3.5 seconds on; 0.5 seconds off)	Error has occurred.
Status LED is flashing (3.5 seconds on; 0.5 seconds off)	Cleaning is required.
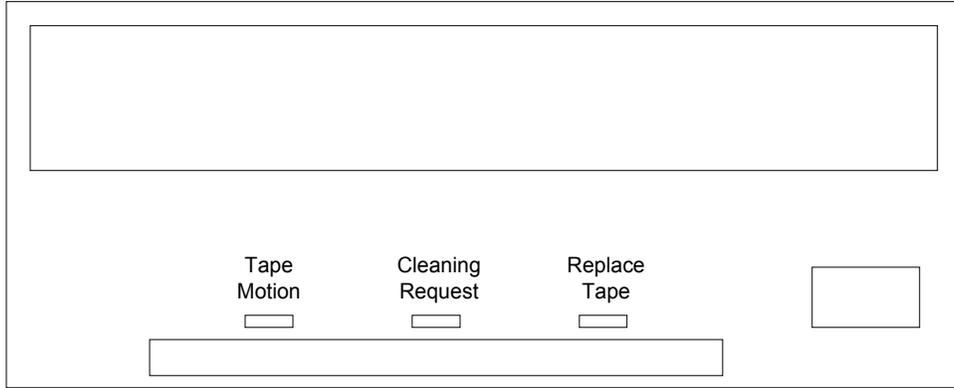
Figure 27. AIT-3 Tape Drive Status Indicators

The following table describes some of the AIT-3 tape drive LED states. For a complete listing of LED states, contact Sony. To read the LEDs you must open the library door and remove the magazine in front of the drive.

Table 15. AIT-3 Tape Drive Staus Light Conditions

LED States	Condition
Tape Motion (left) LED on	Tape is loaded.
Tape Motion (left) LED flashing	SCSI activity is occurring.
Cleaning Request (middle) LED on	Cleaning is required.
Cleaning Request (middle) LED flashing	Cleaning activity is occurring.
Replace Tape LED (right) on.	Media error.
All LEDs flashing.	Hardware error.

Viewing the Drive Display Screens

You can view additional information about the drive's status from the Drive Display screens.

To view the Drive Display screens:

1. From the operator panel keypad, press [MENU] to display the menus. Press the down arrow key until "Drive Menu" appears.

```
▶D r i v e   M e n u

 A I T
```

2. Press [ENTER]. The "Drive 1 Menu" appears.

```
▶D r i v e   1   M e n u

 A I T
```

3. Use the up or down arrow key to select the desired drive menu, then press [ENTER]. A screen similar to the example below displays.

```
▶D r i v e   1   S t a t u s

 R e a d y - N O T A P E
```

4. Press the down arrow until "Drive *n* Display" appears, then press [ENTER].

The following table lists some messages that can appear for the selected AIT tape drive.

Table 16. Drive Display Messages

Message	Condition
READY-NOTAPE	The tape drive is ready to accept a cartridge.
LOADING....	Tape is loaded
READY-TAPE	The tape drive has successfully loaded the tape and is ready for read/write operations.
READING	The tape drive is reading data.
WRITING	The tape drive is writing data.
TAPE IN MOTION	The drive is moving tape.
SPACE FORWARD	The tape drive is performing a forward search.
REWIND	Rewind is in progress.
ERASE	The tape drive is erasing data on the tape.
UNLOADING	The tape drive is unloading a tape.
CLEAN DRIVE	The tape drive should be cleaned at the next convenient time.
CLEANING...	Cleaning is in progress.

Viewing the Drive Status screens

From the Drive Status screens, you can view status information about the tape drives. These information screens are updated whenever there is a change in drive status.

To display tape drive information:

1. From the operator panel keypad, press [MENU] to display the menus. Press the down arrow key until "Drive Menu" appears.

```
▶D r i v e   M e n u
 A I T
```

2. Press [ENTER]. The "Drive 1 Menu" appears.

```
▶D r i v e   1   M e n u
 A I T
```

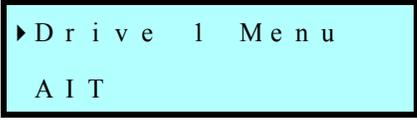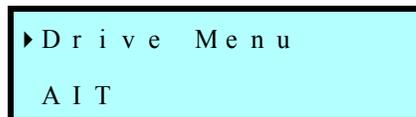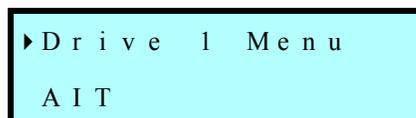3. Use the up or down key to select the drive menu from which you want information. Press [ENTER]. A screen similar to the example below displays.

```
▶Drive  1  Status
  Ready-NOTAPE
```
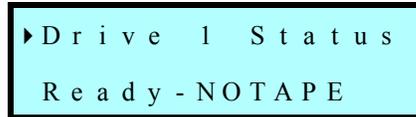
4. Press [ENTER] again and use the arrow keys to scroll through the status screens.

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

Table 17. Drive Status Screens

Status Field	Description
Type	Identifies the tape drive model.
Serial Number	Displays the drive's serial number.
Inq Version	Displays the four-character Inquiry version returned by the drive's SCSI Inquiry command.
Needs Cleaning	Indicates if the drive needs cleaning (1) or not (0).
Cart Status	Displays the status of the cartridge, if any, in the tape drive.
Format	Displays the data format of the cartridge currently in the tape drive.
Warning	Indicates that the drive is free of errors (0) or displays an error code.
Present	Indicates whether the drive is not installed (0) or is installed (1).
Access	Indicates whether the drive is not accessible to the robot (0) because a cartridge is already loaded or the drive's status is unknown; or the tape drive is accessible (1) because a cartridge is ready to be loaded in the tape drive or the drive is empty.
Occupied	There is no cartridge loaded in the tape drive (1) or a cartridge is loaded (0).
Occup Valid (Occupied Valid)	The door has been opened or some other interruption has occurred so the occupied information may not be reliable (0) or the occupied information is reliable (1).

Cleaning the Tape Drive

When a drive does require cleaning, the library displays a cleaning message on the Status Screen. You can clean the tape drives in several ways:

- Use the Autoclean option and store a cleaning cartridge in the appropriate fixed slot. The Autoclean option instructs the library to clean the tape drive automatically when necessary and without disrupting normal library operations.

- Set the cleaning option in your software application (if available) so that the software monitors drive cleaning. If your application software supports automatic cleaning, store a cleaning cartridge in the slot specified by the application.

- Use the Clean Drive option (described in this section) to manually clean the tape drives when the library or software notifies you of the need.

Setting up for The Clean Drive Option

Before using the Clean drive option you must install a cleaning cartridge in the appropriate slot and set the drive cleaning options.

Installing a Cleaning Cartridge

For the cleaning operation, install an approved cleaning cartridge in the library as described in the *Hardware Installation* chapter.

Configuring the Library for Cleaning

Before you begin the procedure for drive cleaning, make sure the following configuration options are set:

- Clean Slot option, which designates a permanent storage location for a cleaning cartridge.

- Clean Cycles Left option, which is a counter that tracks the number of cleaning cycles remaining on a cleaning cartridge.

Using the Clean Drive Option

1. If security is enabled, disable it.

2. Make sure a cleaning cartridge is installed, the Clean Slot option is set, and the Clean Cycles Left option is set.

3. Change the robot control mode to LCD.

4. From the operator panel keypad, press [MENU] to display the menus. Press the down arrow key until "Drive Menu" appears.

```
▶Drive  Menu

 AIT
```

5. Press [ENTER]. The Drive 1 menu appears.

```
▶ D r i v e   1   M e n u

   A I T
```

6. Use the up or down arrow key to select the menu for the drive you want to clean, then press [ENTER]. The Drive Status screen appears..

```
▶ D r i v e   1   S t a t u s

   R e a d y - N O T A P E
```

7. Use the down arrow key to select "Clean Drive n", where n is the number of the drive you want to clean. Then press [ENTER[. The following activities occur:

  • The robot picks the cleaning cartridge from the designated slot and inserts it in the specified tape drive.

  • The tape drive automatically performs the cleaning process and ejects the cleaning cartridge when the process is complete (after several minutes).

  • The robot automatically picks the cleaning cartridge from the tape drive and replaces it in the designated slot.

8. Confirm the cleaning process by looking at the library's LCD information. The cleaning message should be gone. If the cleaning message is still present, the cleaning cartridge may need replacing.

9. When cleaning is complete, return the library to its original control mode and re-enable security if desired.

NOTE

After cleaning, the library automatically decrements the Clean Cycles Left counter. However, if you install a new cleaning cartridge, you must manually reset the Clean Cycles Left counter (see *Setting the Clean Cycles Left Option* in *Chapter 3*).

Ejecting a Cartridge Manually

If a problem occurs that requires intervention, you may need to eject a cartridge from the tape drive.

<u>CAUTION</u>

Discharge static electricity from your body before touching the drive's front panel components. Touch a known grounded surface, such as the library's metal chassis.

Before pressing the unload button, make sure the tape drive is not communicating across the SCSI bus. Pressing the unload button may disrupt communications on the SCSI bus.

To manually eject a cartridge:

1. Open the library door and remove the magazine.

2. Press the eject button on the tape drive's faceplate, as shown by the arrow in the following figure.
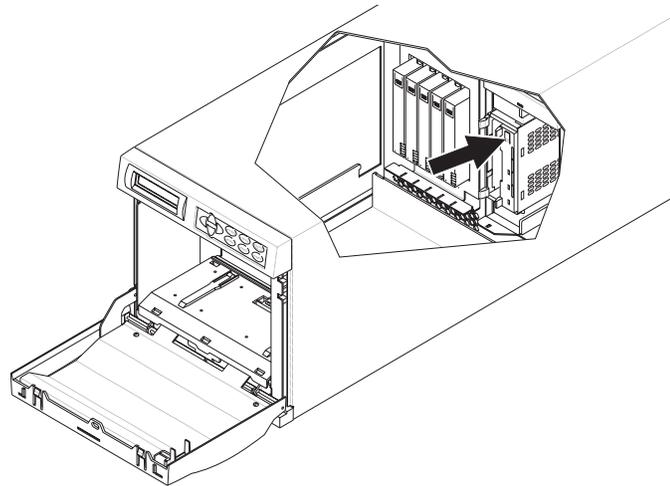
Figure 28. Tape Drive Eject Button

Resetting a Tape Drive

Resetting a tape drive causes the drive to perform its power-on self-test and rewind any loaded tape to the beginning. If a cartridge is present, a tape drive reset may take as long as 2.5 minutes, depending on what size cartridge you are using.

CAUTION

Before resetting the tape drive, make sure the tape drive is not communicating across the SCSI bus. Resetting the tape drive may disrupt communications on the SCSI bus.

NOTE

Performing a drive reset does not cause a cartridge loaded in the drive to eject. If a cartridge is in the drive during a reset, make sure that it is safe to overwrite the cartridge before performing a backup. If you perform a backup without checking the loaded cartridge, you may lose important data from a previous backup.

To reset the tape drive:

1. Press the [RESET] key. The following screen appears.

```
▶Reset  Library
  &  Drives
```

2. Use the down arrow key to display the "Reset Drive *n*" screen, where n is the number of the drive you want to reset.

```
▶Reset  Drive  1
  READY - NOTAPE
```

3. Press [ENTER]. At the confirmation prompt, press [ENTER] again.

The tape drive performs a power-on self-test and rewinds any loaded tape to the beginning, but does not eject the cartridge. If a cartridge is loaded in the drive, this reset may take several minutes, depending on the size of the cartridge.

CHAPTER 7
DIAGNOSTICS AND FIRMWARE

This chapter describes how to do the following:

- Upgrade library firmware via the console interface

- Create a diagnostic listing via the console interface

- View the LCD password via the console interface

- Upgrade library firmware via FTP

- Create a diagnostic listing via FTP

This chapter uses the following conventions:

- Keys shown in brackets (for example, [ENTER]), are keys you press on your host computer's keyboard.

- Words shown in `Courier`, for example `chsterm`, are commands you type.

Connecting to the Console Interfaced

This section describes how to connect your library to the host computer and access the console interface. You can use console for upgrading firmware, creating a diagnostic listing, and viewing the LCD password. Before accessing the console interface, you must have the following:

- Host computer that uses an RS232 serial port.

- A straight-through 9-pin serial cable (not a null modem cable) with a male "D" connector.

- Terminal emulation software, such as HyperTerminal, that supports the ANSI 3.64 terminal protocol.

NOTE

Plasmon recommends that you use HyperTerminal, a standard communications package available with Windows.

Connecting the Serial Cable

Connect the 9-pin cable to the back of the library and to the host computer. The following figure shows the location of the 9-pin serial port on the back of the library.
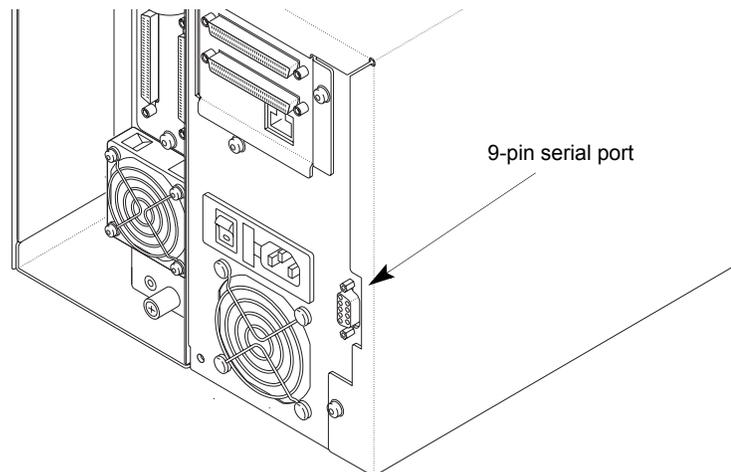
9-pin serial port

Figure 29. Serial Port Connector

Setting the Library's Baud Rate

Before accessing console, you must set the baud rate for the library to the host computer's baud rate.

To set the library's baud rate:

1. From the operator panel keypad, press [MENU] to display the menus. Press the down arrow key until "Config Menu" displays, then press [ENTER]. The Baud Rate Menu displays the currently selected baud rate, similar to the following example.

```
▸ B a u d   R a t e   M e n u

   1 1 5 2 0 0
```

2. Press [ENTER]. An informational message displays, then the following screen appears.
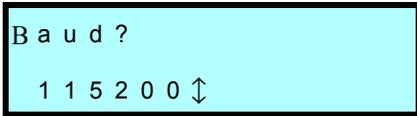
```
B a u d ?

   1 1 5 2 0 0 ↕
```

3. Use the up or down arrow key to select the baud rate that matches the baud rate of the host computer, then press [ENTER].

Accessing Console Using HyperTerminal

NOTE

These instructions assume you are using HyperTerminal, a communications package available with Microsoft Windows. If desired, you can use a different terminal emulation software package.

To access Console using HyperTerminal:

1. From your computer, launch HyperTerminal.

2. In HyperTerminal's Connection Description screen, enter a name and choose an icon for this communications session.

3. In HyperTerminal's Connect To screen, choose the communications port you are using from the Connect Using field. Click OK.

4. In the Properties screen, make sure the fields contain the following values, then click OK.

   - *Bits per second*: (baud rate of the computer)

   - *Data bits:* 8

   - *Parity bits:* none

   - *Stop bits:* 1

   - *Flow control:* none

5. Check the ASCII setup from HyperTerminal:

    a. From the File menu, select Properties.

    b. In the Properties screen, select the Settings tab.

    c. In the Emulation mode field, select "ANSI."

    d. Click on the ASCII Setup button.

    e. In the ASCII Setup screen, make sure none of the boxes have check marks. Uncheck the boxes, if necessary.

    f. Click OK in the ASCII Setup screen.

    g. Click OK again in the Properties screen.

6. The Console program should now appear in HyperTerminal's main window. If necessary, type `redraw` and then press [Enter] to refresh the screen.

7. If desired, type `help` and then press [Enter] to display Console's Help screen, as shown in the following figure.

```
Generic Commands:
  help [<screen_name>] - show available commands
  <screen_name>        - run console screen
  redraw    dump
Console Screen Names:
  config  drive   estats  inv      modesel1  scsim    stats
  demo    ehist   flash   machine  modesel2  sensors  xcards
  diag    enet    hist    mail     schip     seqmode
```

NOTE

If garbled characters or no characters appear on the screen, make sure you have the same baud rate set for the host as you do for the library.

Upgrading Firmware via Console

These instructions describe how to upgrade the library firmware using the console interface and a terminal emulation program (such as CHS Terminal or HyperTerminal).

<u>CAUTION</u>

Do not upgrade firmware unless Plasmon Technical Support advises you to do so. If performed improperly, the upgrade procedure can render your device inoperable. Please consult with Technical Support before performing an upgrade. They can help you select the most appropriate upgrade method for your particular model.

To upgrade the library firmware:

1. Obtain new firmware for the library. You can download new firmware from Plasmon's web site (www.plasmon.com), or you can contact Plasmon Technical Support.

2. Connect the library to the console interface by following the steps in the *Connecting to the Console Interface* section of this chapter.

3. Copy the current firmware as a precautionary measure. You can make a copy of the current firmware with the READ BUFFER command. To do this, use a software application that can issue SCSI commands. For more information about the SCSI commands, refer to *Plasmon V15 SCSI Reference*.

4. From the console's Program Flash screen (shown below), transfer the firmware file by typing: `loadimage`. Press [ENTER].

The library erases the current firmware and then displays the following prompt: `Begin XMODEM download of flash code`.
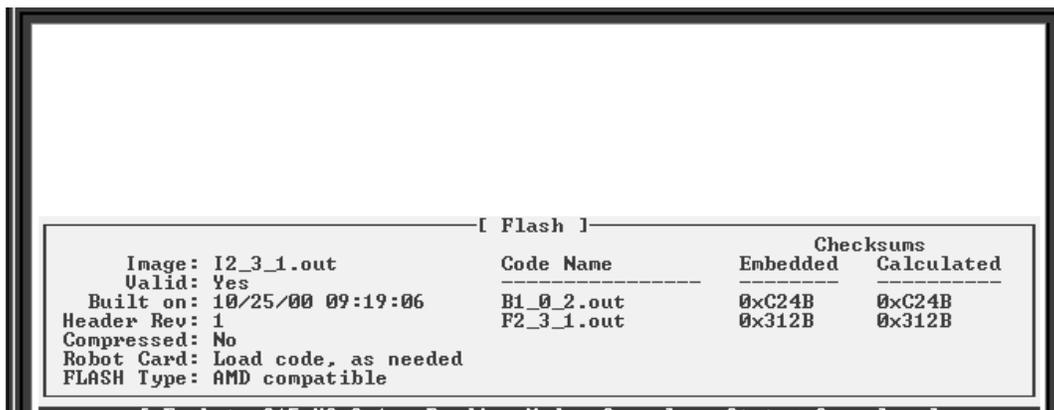
```
                                    ─[ Flash ]─
                                                      Checksums
          Image: I2_3_1.out           Code Name      Embedded   Calculated
          Valid: Yes                  ───────────    ────────   ──────────
       Built on: 10/25/00 09:19:06    B1_0_2.out     0xC24B     0xC24B
     Header Rev: 1                     F2_3_1.out     0x312B     0x312B
     Compressed: No
     Robot Card: Load code, as needed
     FLASH Type: AMD compatible
```

5. Use your terminal emulation program to specify the source location (path and filename) of the new firmware.

6. Select or type in the file name you want and then press [ENTER].

The system initiates the firmware upgrade and displays its progress on the screen. When the upgrade is successfully completed, the library automatically resets.

<u>CAUTION</u>

Do not attempt to perform library operations or to power down the library until after the library automatically resets.

Creating a Diagnostic Listing via Console

If you report a problem to Plasmon Technical Support, you may be asked to create a library diagnostic listing via the console interface. A diagnostic listing is created when you use a terminal emulation program (such as HyperTerminal) to send an ASCII copy of the diagnostic buffer from the library to the host computer. This buffer information can be used by support personnel to troubleshoot incidents with the library.

To create a diagnostic listing:

1. Access the console interface by following the steps in the *Connecting to the Console Interface* section of this chapter.

2. From the Help screen, type `dump` for a library diagnostic listing. Press [ENTER].

3. Using your terminal emulation program, specify the file name for the diagnostic listing and specify ASCII as the file transfer type for the diagnostic data.

NOTE
If you do not specify a path with the file name, the file is written to the default directory on the current drive.

4. When the file is completely transferred, your terminal emulation program may require you to close the file and press [ENTER] to return to the console screen.

Viewing the LCD Password via Console

You can view the LCD password from the Configuration Information screen in the console interface.

To view the LCD password:

1. Access the console interface by following the steps in the Connecting to the Console Interface section of this chapter.

2. From the Help screen, type config and then press [ENTER].

3. When the Configuration Information screen appears, you can view the password next to the LCD password field.

Connecting to an FTP Utility

This section describes how to connect your library to a host computer and how to access an FTP utility. You can use an FTP utility to upgrade library firmware or create a diagnostic listing.

Before accessing an FTP utility, you must have the following:

- Host computer that uses a pin-through-hole RJ-45 shielded Ethernet connector.

- A Category 3 (10BaseT connection) or Category 5 (100BaseT connection) data-grade cable.

- Software that supports RFC 959 file transfer protocol.

Connecting the Ethernet Cable

Connect the Ethernet cable as described in the *Ethernet Configuration* chapter.

Accessing the FTP Utility

From your host computer, activate the FTP utility you are going to use.

NOTE
If you do not know the FTP user name or password, you can view them on the front panel display from the Ethernet Security screen.

Upgrading Firmware via FTP

CAUTION

Do not upgrade firmware unless Plasmon Technical Support advises you to do so. If performed improperly, the upgrade procedure can render your device inoperable. Please consult with Technical support before performing an upgrade. They can help you select the most appropriate upgrade method for your particular model.

To upgrade the library firmware via FTP:

1. Obtain new firmware for the library. You can download new firmware from Plasmon's web site (www.plasmon.com), or you can contact Plasmon Technical Support.

2. Connect to an FTP utility by following the steps in the *Connecting to an FTP Utility* section of this chapter.

3. As a precautionary measure, make a copy of the current firmware by creating a new directory for it and using a get FTP command to copy the current firmware into the new directory. If necessary, you can obtain the current library firmware version number as described in the *Displaying Library Information* section of the *Library Operation* chapter.

CAUTION

Do not attempt to perform library operations or to power down the library until after it automatically resets.

4. Use the FTP command for your utility to transfer the new firmware to the library. For example, issue `put filename.out`, where "`filename.out`" is the name of the new firmware.

The system initiates the firmware upgrade and displays its progress on the library's LCD screen. When the upgrade has completed successfully, the library automatically resets.

Creating a Diagnostic Listing via FTP

If you report a problem to Plasmon Technical Support, you may be asked to create a library diagnostic listing via FTP. A diagnostic listing is created when you use an FTP utility to send an ASCII copy of the diagnostic buffer from the library to the host computer. This buffer information can be used by support personnel to troubleshoot incidents with the library.

To create a library diagnostic listing via FTP:

1. Access the FTP utility by following the instructions in the *Connecting to an FTP Utility* section of this chapter.

2. Make sure the FTP file transfer type is set to ASCII.

3. Use the FTP command for your utility to get the diagnostic listing, as follows: `get libtrace.txt`.

4. If necessary, specify a destination location (path and filename) for the diagnostic listing.

CHAPTER 8
MAINTENANCE AND SERVICE

This chapter describes the following:

- Using touch-up paint on the housing

- Cleaning the library

- Replacing the tape drive

- Returning the library for service

CAUTION

Do not attempt to replace any components in the library, other than the tape drive. If you do so, you void your warranty.

Using Touch-up Paint on the Housing

A paint kit is available for touching up nicks and scratches on the finish. For ordering information, see *Contacting Plasmon* at the back of this manual.

Cleaning the Library

The only library component that should be cleaned is the tape drive. Instructions for cleaning the tape drive are provided in the *Tape Drive Operation* chapter.

CAUTION

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

Replacing the Tape Drive

This section describes how to replace the tape drive. Tape drive kits are available from Plasmon. The tape drive is shipped to you in the drive carrier. You cannot install a tape drive into the library without a drive carrier.

WARNING

Removing a drive or access panel with the library powered on may result in exposure to the 650 nm, 1.2 mW Class 2 pulsed radiation laser scanner. Always power off the library and remove the AC power cord before removing or installing an access panel or drive.

Preparing for Replacement

1. Obtain a #2 Phillips cross recess screwdriver.

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

3. Power off the library and disconnect the power cord.

<div align="center">

WARNING

</div>

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.

<div align="center">

WARNUNG

</div>

Vor der Ausfuhrung von Installations- oder Wartungsarbeiten ist daraufzu achten, daß der Library-Netzschalter auf"Aus" gestellt ist und daß das Anschlußkabel non der Library und der Steckdose entfernt ist.

<div align="center">

ATTENTION

</div>

Avant de procéder a l'installation ou a l'entretien, vérifiez que l'interrupteur d'alimentation de la librarie se trouve en position "arret" et que le cable d'alimentation ne soit pas branché a la librairie et a la prise de courant.

Removing the Tape Drive

1. Disconnect the SCSI cables from the back of the tape drive. The SCSI connectors for the tape drive are accessible from the back panel.

Tape drive
SCSI connectors
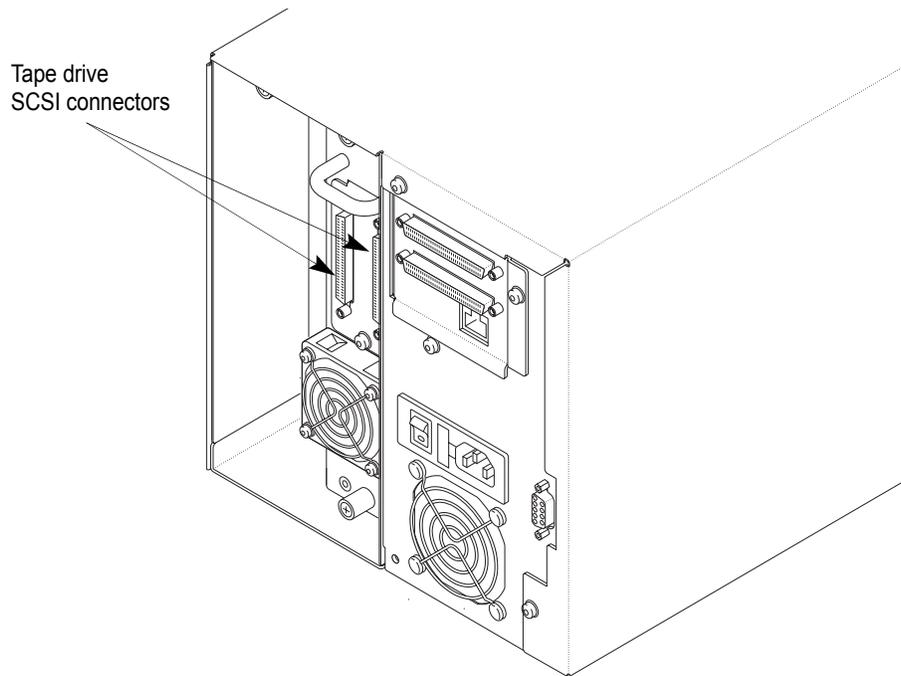
Figure 30. SCSI Connectors

2. From the back panel, use a #2 Phillips cross recess screwdriver to release the captive screw that secures the tape drive carrier to the library, as shown in the following figure.

Handle

Captive screws
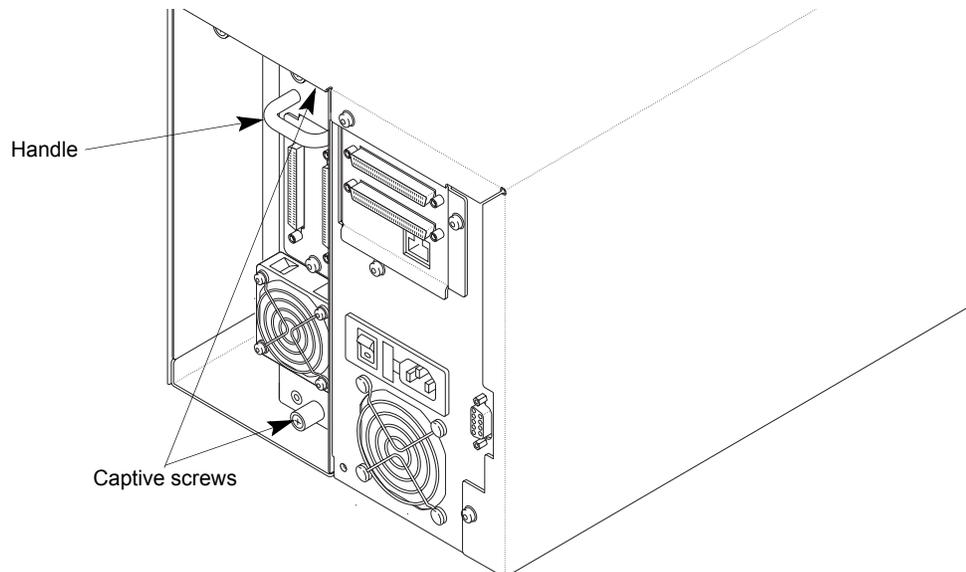
Figure 31. Removing the Tape Drive Carrier

3. Remove the drive carrier by grasping the handle and pulling it directly out of the library.

CAUTION

The drive carrier weighs five pounds (2.3 kg); make sure you support the bottom of the carrier as you remove it.

Installing the Tape Drive

1. As shown in the following figure, insert the tape drive so that the SCSI connectors are at the top. The drive should slide easily toward the front of the library.
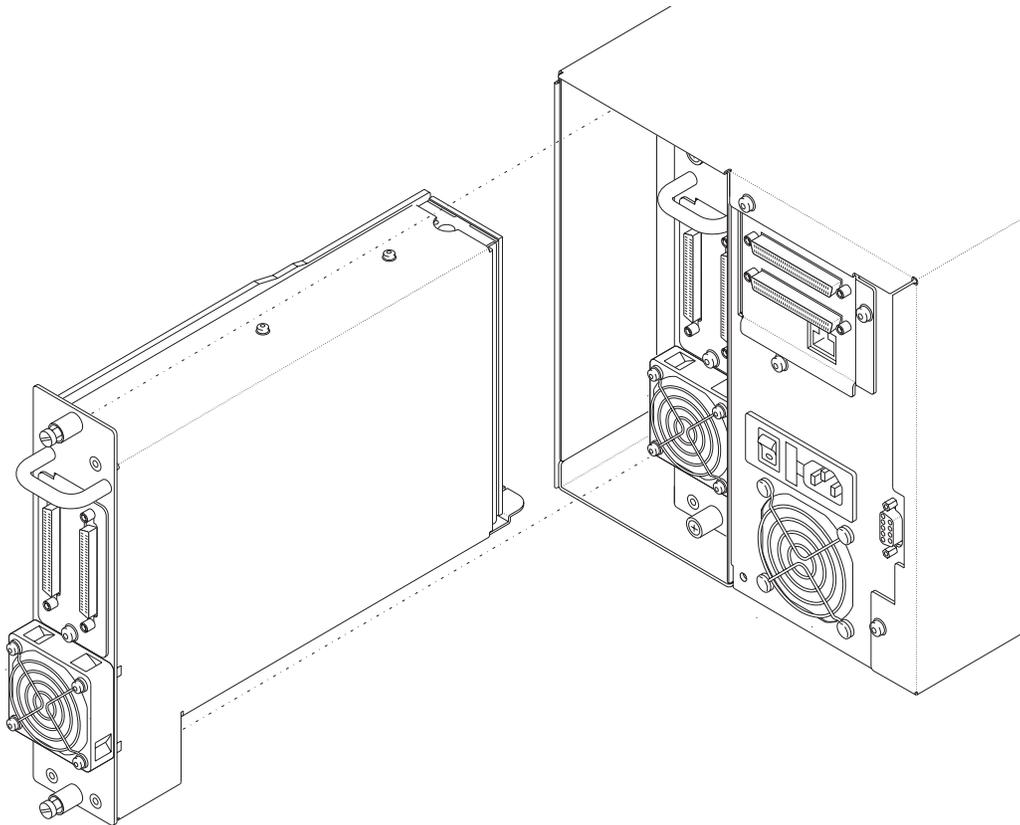
Figure 32. Installing a Tape Drive

2. Tighten the captive screw to 8.0 inch-pounds (9.2 kg-cm) of torque.

3. Connect the SCSI cables to the tape drive.

CAUTION

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

NOTE

When you power on the library, the new tape drive automatically assumes the SCSI ID of the old drive. If desired, you can change the SCSI ID for the drive, as described in the *Configuration* chapter.

Resuming Operation

1. Reconnect the power cord and power on the library.

WARNING

Do not power on the library with an empty drive bay. You must install a tape drive or service access cover in each of the bays.

2. If installed a new tape drive, set the SCSI ID for the drive. If you replaced an existing drive, the new tape drive automatically assumes the SCSI ID of the old drive.

You may want to use the Demo Menu to ensure that the robot and the newly installed tape drive are communicating correctly. (See *Using the Demo Menu* in the *Library Operation* chapter.) You may also want to enable security if you disabled it. (See *Setting the LCD Security Option* in the *Configuration* chapter.)

If Problems Occur...

If your library does not resume normal operation after calibration, check the following:

- Are the devices on each SCSI bus attached to the library all LVD?

- Are the SCSI buses terminated?

- Are the SCSI cables firmly connected to the library and host computer?

- Are the SCSI IDs unique for the devices on each SCSI bus?

- Is the library operating in the correct control mode? (For most applications, the control mode should be set to SCSI.)

If you cannot solve the problem yourself, contact your service provider or Plasmon Technical Support (see *Contacting Plasmon* at the back of this manual).

Returning the Library for Service

If you need to return the library to the factory for service, contact your service provider. If your service provider instructs you to return the library directly to Plasmon, contact Plasmon Technical Support to obtain a Return Materials Authorization (RMA) number and the shipping address (see *Contacting Plasmon* at the back of this manual). When you have the RMA number, follow the instructions starting on the next page.

Preparing the Library for Shipping

To prepare the library for shipping:

1. Before powering off the library, select "Park and Unlock for Shipping" from the front panel's keypad. The robot then moves to the correct position to accommodate the packing materials, and the front door unlocks.

2. If necessary, remove all cartridges from the magazine and fixed slots. Make certain the robot gripper and the tape drive do not contain cartridges.

3. Power off the library.

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

Removing the Library from the Rack

If the library is installed in a rack, remove it as follows:

1. From the back of the library, use a T-20 TORX driver to remove the three screws that secure the retention bracket to the rack shelf and library, as shown in the following figure. Remove the bracket.
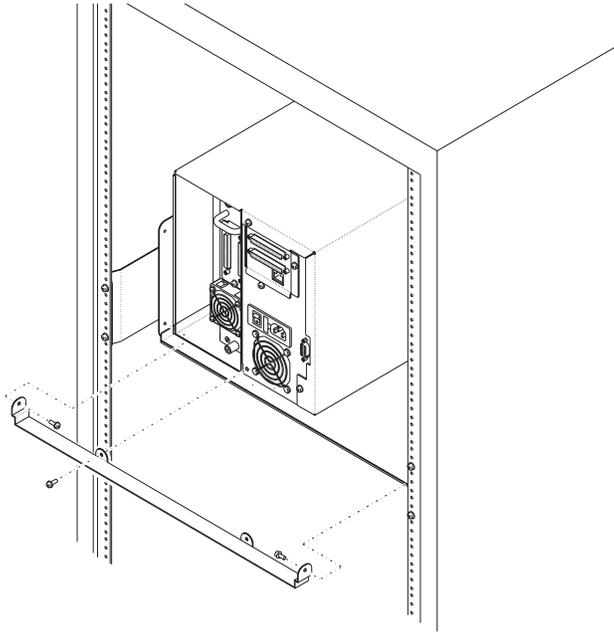
Figure 33. Removing Rack Mount Bracket

2. If the library is the only device on the rack shelf, remove the blank panel from the empty side of the rack, as shown in the following figure.
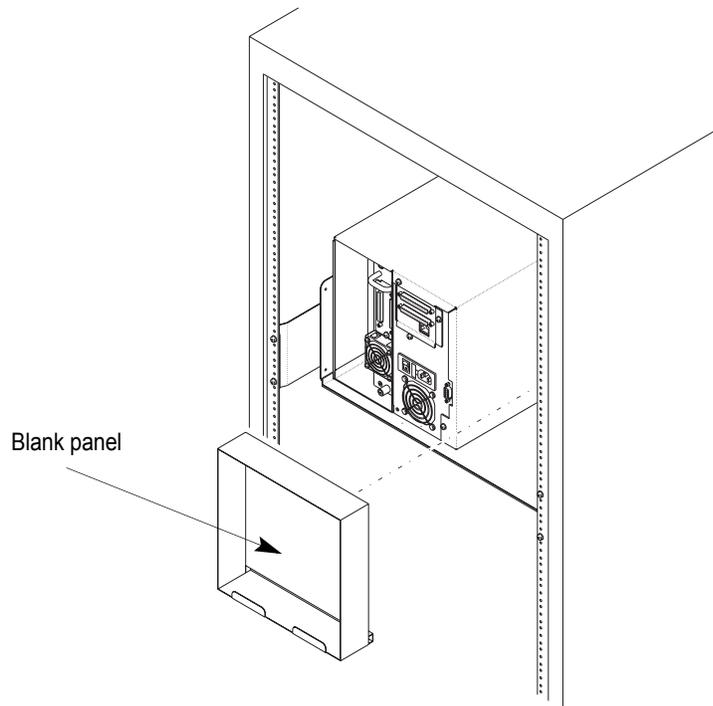
Blank panel

Figure 34. Removing Rack Mount Blank Panel

3. From the back, slide the library off of the rack shelf.

WARNING

The library weighs approximately 40 pounds (18 kg). Two people are needed to move or lift the library. Most of the weight is toward the back of the library.

WARNUNG

Die freistehende Library wiegt 18 kg. Es sind mindestens 2 personen erforderlich, um die Library zu bewegen oder zu heben. Der hintere Teil der library hat das großete Gewicht.

ATTENTION

La version tour pese entre 18 kg. Deux personnes au moins sont necessaries pour deplacer ou soulever la librarie. La majeure partie du poids se trouve a l'arriere de la librarie.

Packing the Library

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

CAUTION

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

To pack the library:

1. Secure the robot in the robot packing piece, as follows:

   a. Remove the magazine from the library.

   b. Place the robot's packing material inside the magazine so it is centered vertically and horizontally, as shown in the following figure.

Robot packing material
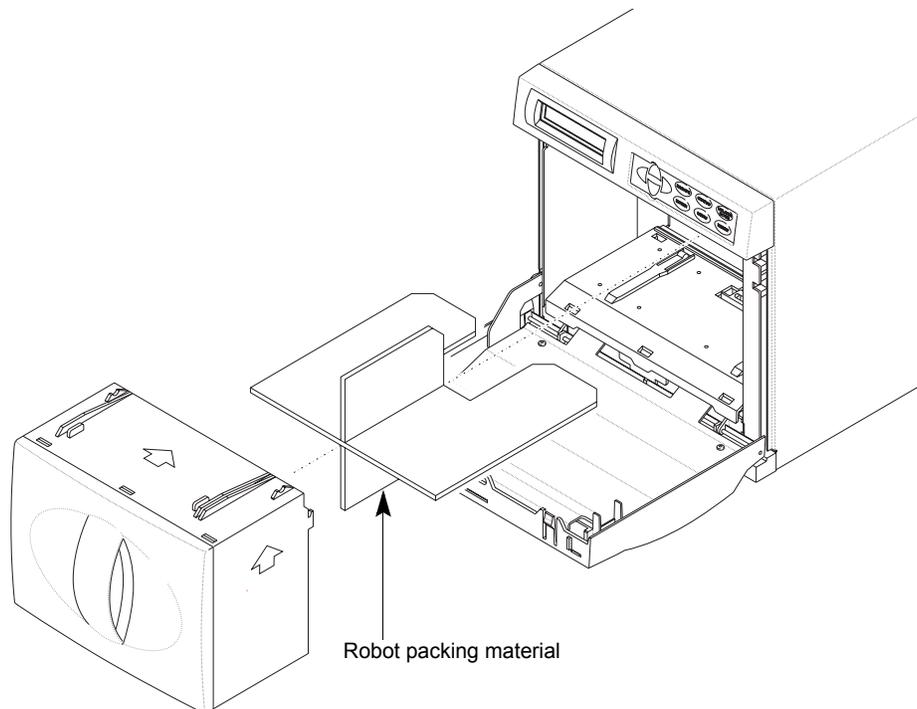
   c. Place the magazine back in the library, and close the library door.

2. Insert the empty accessory box or filler tube (if your library did not come with an accessory box) into the library box, as shown in the following figure.

NOTE
If you are shipping the library for repair, do not include the accessories.

3. Place the antistatic bag over the library, and place the library into the cushion at the bottom of the box.

4. Place the top cushion over the library.

Antistatic bag

Library

Accessory box or filler tube
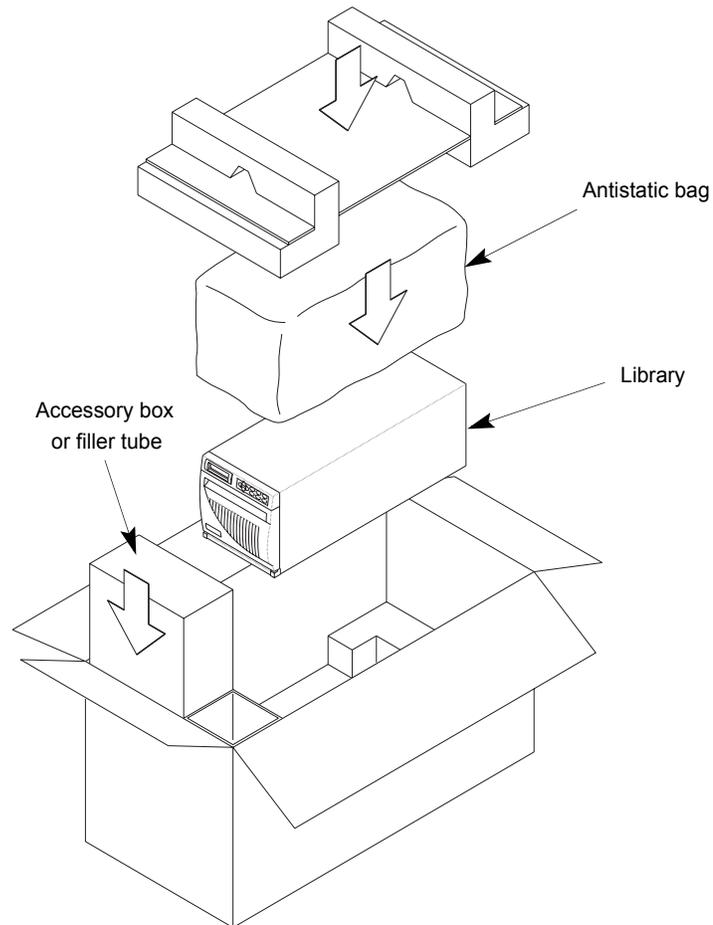
Figure 35. Packing the V15 Library

5. Place any necessary paperwork in the top of the library box.

6. Close and seal the box.

7. Place the shipping label on the box.

CHAPTER 9
TROUBLESHOOTING

This chapter provides troubleshooting information for the library. It provides a list of suggestions for solving problems that may occur when you are installing and operating the library and the enclosed tape drive.

NOTE

If an error code appears on the LCD, refer to *Appendix C*. If the status light on the tape drive is flashing, see *Reading the Tape Drive Status Light* in *Chapter 6*.

Problems with Library Installation

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

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

- **SCSI Bus Connections.** Make sure that you have connected the SCSI cables to the appropriate SCSI connectors on the back of the library. See the *Configuration* chapter and *Appendix B* for more information.

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

- **LVD, HVD, and Single-ended SCSI Devices.** Because the library is an LVD device, all other devices on the SCSI bus must be LVD.

- **Narrow SCSI and Wide SCSI.** Because the library is a wide SCSI device, all other devices on the bus must be wide.

- **SCSI Cable Lengths.** Make sure the internal SCSI cabling does not exceed maximum lengths (see *Appendix B*).

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

- **Compatibility.** Make sure that your tape drive and library are compatible with the SCSI adapter card and application software you plan to use. Visit Plasmon's web site at www.plasmon.com for compatibility information.

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

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

- **Control Mode.** Make certain the control mode is set to SCSI or Sequential. See the *Library Operation* chapter for more information.

After checking these items, reset the library as described in the *Library Operation* chapter.

Problems with Tape Drive Operation

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

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

- **Cartridge Type.** Use AIT cartridges (see the *Hardware Installation* chapter).

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

- **Cleaning.** Clean the tape drive as described on the *Tape Drive Operation* chapter. Make sure you are using an AIT cleaning cartridge.

Problems with Library Operation

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

- **Control Mode.** If you are using an application software package to control robot operations, the library must be set to SCSI mode.

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

- **Door Open.** Make sure the door is closed.

- **Robot Operation.** You can use the selections in the Commands Menu and the Demo Menu (described in the *Library Operation* chapter) to determine if the robot is functioning properly.

APPENDIX A
SPECIFICATIONS

This appendix provides overall specifications for the library, power cord requirements, SCSI cable specifications, SCSI terminator requirements, and Ethernet cable specifications.

Overall Specifications for the Library

Table 18. Plasmon V15 Tape Library Specifications

General Specifications	
Interface	SCSI-2, Ultra, or Ultra-2
Maximum sustained data transfer rate	112 gigabytes (GB) per hour assuming a 2.6:1 compression ratio
Maximum data capacity	1.9 terabytes (TB) assuming a 2.6:1 compression ratio
Size and Weight	
Size	8.65 high × 8.56 wide × 24.25 long (inches) (21.97 × 21.7 × 61.6 cm)
Weight	42 pounds (19 kg) without the cartridge magazine and cartridges installed.
Operating Environment	
Ambient temperature	+5°C to +35°C (+41°F to +95°F)
Relative humidity	20% to 80%, non-condensing
Wet bulb	26°C (79°F) max
Power	
Input voltages	Accepts 100 to 240 VAC at 50 to 60 Hz; automatic input voltage selection

Power Cord Requirements

The type of AC power cord supplied with the library depends upon the configuration ordered, and the country of destination.

Criteria for U.S. and Canada 120 VAC power cord:

- The power cord must have a molded NEMA 5-15P male attachment plug on one end.

- The power cord must have a molded IEC type CEE-22 female connector on the other end.

- The power cord must be UL Listed and CSA Certified.

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

- The power cord must have a molded NEMA 6-15P attachment plug on one end.

- The power cord must have a molded IEC type CEE-22 female connector on the other end.

- The cordage must be an SJT or SVT type, 3-conductor, 18 AWG minimum.

- The power cord must comply with local electrical code.

Criteria for an international 220 VAC power cord:

- The power cord must have an attachment plug of the proper type, rating, and safety approval for the intended country.

- The power cord must have an IEC 320 female connector on one end.

- The flexible cord must be harmonized to CENELEC publication HD-21. The electrical characteristics and rating must be minimum H05VVF3G0.75 (6 A).

SCSI Cable and Terminator Specifications

This section describes the SCSI cable and terminator requirements.

SCSI Cables

Plasmon recommends using wide LVD SCSI cables that conform to SCSI-3 specifications.

NOTE

To comply with the regulations and standards listed at the front of this manual, all SCSI cables you use with the library must be properly shielded.

SCSI Cable Length

The maximum allowable cable length for an LVD SCSI bus, including all internal and external cables, is specified as follows:

- If you have more than two devices on the LVD bus, the maximum allowable length is 12 meters (39 feet).

- If you are making a point-to-point connection (target and initiator only), the maximum length is 25.0 meters (82 feet).

To determine the cable length of the bus, measure the lengths of all external SCSI cables. Add those lengths together. To that sum, add 20 centimeters (8 inches) for the internal cable length used by the tape drive and 5 centimeters (2 inches) for the internal cable length used by the robot.

SCSI Terminator

Plasmon recommends using an AMP 796051-1 (SE/LVD Multi-mode) SCSI terminator. Termination must be external; do not use internal terminators.

Ethernet Cable Requirements

As an option, the library may include an Ethernet port on the back panel. The Ethernet port connector is an RJ-45 shielded connector. To connect to the Ethernet port, use an approved Category 3 (10BaseT connection) or Category 5 (100BaseT connection) data-grade cable compliant with EIA/TIA 568.

NOTE

To comply with the regulations and standards listed at the front of this manual, all Ethernet cables you use with the library must be properly shielded.

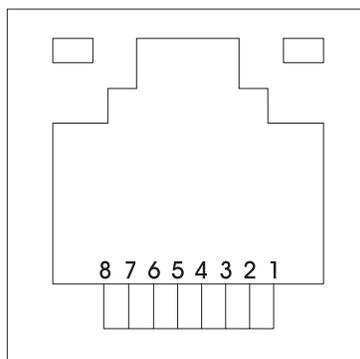The figure below shows the Ethernet port's pin locations.

Figure 36. Ethernet Port Pin Locations

The following table indicates the Ethernet port's pin assignments and functions.

Table 19. Ethernet Port Pin Assignments and Functions

Pin number	Function
1	TD+
2	TD–
3	RD+
4	Not used
5	Not used
6	RD–
7	Not used
8	Not used

APPENDIX B
SCSI CONFIGURATION

This appendix provides an overview of the SCSI interface and some general guidelines for connecting the library to the SCSI bus.

SCSI Components

The SCSI system consists of the following components:

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

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

- **Targets.** The library and the tape drive are peripheral devices (or targets) that are capable of receiving commands from the host. Up to sixteen devices (including the host computer) can be connected to the wide SCSI bus and up to eight devices can be connected to the narrow SCSI bus.

SCSI Bus Considerations

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

LVD SCSI

The Plasmon V15 supports an LVD (low-voltage differential) SCSI configuration. Every SCSI device attached to the SCSI buses connecting to or from the library must also be LVD.

NOTE
Although LVD SCSI is compatible with single-ended SCSI, Plasmon does not support single-ended devices on the library's LVD SCSI bus.

Do not connect the LVD library to a high-voltage differential (HVD) SCSI bus.

Wide SCSI

The library is available in wide SCSI configurations only. A wide SCSI bus uses 68 parallel lines to transmit signals between devices on the bus.

SCSI ID

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

NOTE

A device's SCSI ID does not depend on physical location. For example, the last device on a multi-device SCSI bus can have a SCSI ID of 2.

The library can use two SCSI IDs, one for the robot and one for the tape drive. Separate IDs allow the robot and tape drive to operate as independent devices, receiving different sets of SCSI commands from the host.

SCSI Bus Termination

If the library is the last device on the SCSI bus, you must terminate the bus by installing a pass-through terminator on the library's unused SCSI connector. Or, if there is an unused connector at the end of the SCSI cable, you can terminate the bus there. The library does not supply terminator power.

For the recommended terminator to use with the library, see *Appendix A*.

NOTE

Plasmon recommends using active termination. Plasmon testing has shown that older passive termination does not provide rising edge transitions that are fast or clean enough at fast SCSI speeds.

APPENDIX C
BAR CODE LABEL SPECIFICATION

This appendix provides specifications for creating bar code labels used on cartridges in Plasmon AIT libraries. The specifications are defined to both standardize the label and allow users the option of purchasing or printing their own labels.

Overview

The AIT cartridge label uses the bar code symbology of USS-39. A description and definition of this symbology is available from the Automatic Identification Manufacturers (AIM) specification Uniform Symbol Specification (USS-39) and the ANSI MH10.8M-1993 ANSI Barcode specification.

Bar Code Characters

Print the bar code in accordance with the latest revision of the ANSI MH10.8M specification (Code 3-of-9). The bar code can have between seven and nine characters as shown in the following table.

Top	1 start character 4 to 6 alphanumeric characters, which you select from the following table. 1 checksum character
Bottom	1 stop character.

Checksum Character

NOTE
The checksum character is mandatory to these labels.

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 following table.

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	5k	K	20	Z	35
6	6	L	21	-	36
7	7	M	22	.	36
8	8	N	23	space	38
9	9	O	24	$	39
A	10	P	25	/	39
B	11	Q	26	+	41
C	12	R	27	%	42
D	13	S	28		
E	14	T	29		

Encodation

Refer to the *AIM Uniform Symbol USS-39 specification* for the description and format of the start, series of characters, and stop character.

Quiet Zone

The quiet zones are the areas preceding the start and after the stop characters. They are clear of any printing or reflective properties that would cause spurious reflections. The quiet zones are further defined in the *AIM Uniform Symbol USS-39 specification*.

Optical Specification

The optical specifications for the bar code labels are listed below.

- Use the white calibration standard to calibrate the print contrast of the Mcbeth PCMII. Be sure the filter select switch is on position A for all calibration and measurements.

- The reflectivity of the white background (RW) is the reflectivity measured in the center of narrow spaces using the Mcbeth PCMII print contrast meter. The RW must be between 70% and 85%. At this measurement, isolated print defects and edge roughness are avoided.

- A spot is defined as an area anywhere within the white background in which the reflectivity is less than 65%. Spots may not be greater than 0.004 inches (0.102 mm) enclosed diameter. There may be no more than five spots in the bar code area per label. Spots may not be any closer to each other than 0.01 inches (0.254 mm).

- The reflectivity of the black areas (RB) may be measured anywhere within any black area on the barcode. The print contrast signal (PCS) is defined as (RW-RB)/RW and is measured using the Mcbeth PCMII print contrast meter. PCS must be a minimum of 0.85. Using the PCS measurement will avoid isolated print defects and edge roughness.

- A void is an area within a black area where the PCS is less than 0.85. No voids may be greater than 0.004 inches (0.102 mm) enclosed diameter. There may be no more than five voids in the bar code area per label. Voids may not be any closer to each other than 0.01 inches (0.254 mm).

NOTE

For additional optical requirements and measurement techniques, refer to the AIM Uniform Symbol USS-39 specification.

Label Dimensions

The following figure shows the bar code label dimensions. Dimensions given in inches with millimeters in parenthesis.
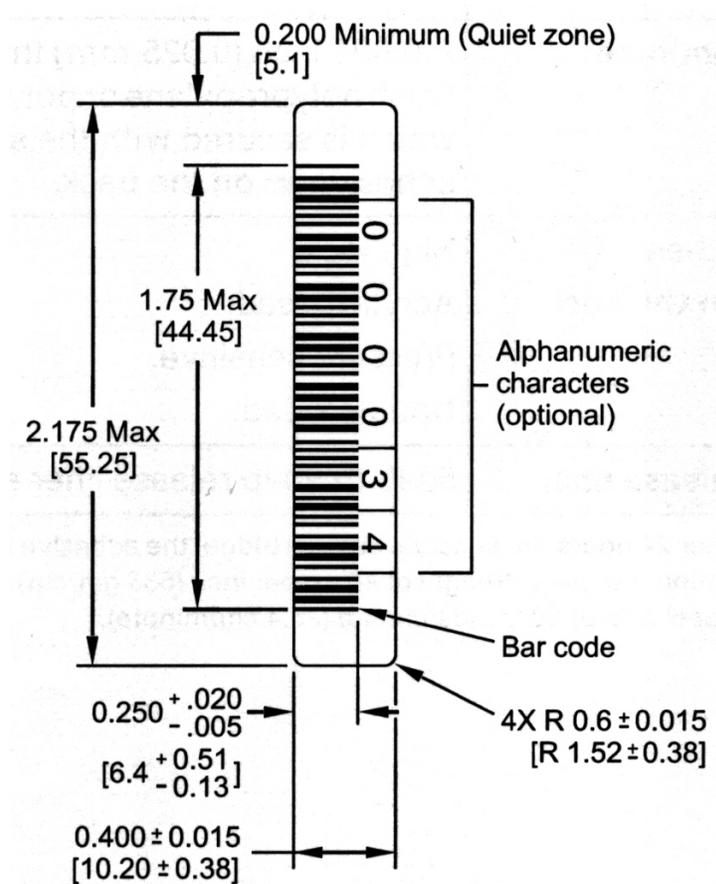
The following table lists the bar code label dimension specifications.

Specification	Dimension
Symbol height	0.44 inches (11.1 mm) as measured to the inside of the edge roughness[1]
Wide to narrow ratio	2.75
Narrow element width	0.017 inches + 0.001/–0.003 inches (0.432 mm +0.03/–0.076 mm)
Nominal width of wide spaces and bars	0.047 inches (1.188 mm)
Inter character gap	0.017 inches +0.001/–0.003 inches (0.432 mm +0.03/–0.076 mm)
Bar code element width maximum	Measured to the outside of the edge roughness[a]. Space width is then the distance between bar maxima.
Quiet zone at the beginning and end of printed barcode string	10X narrow width = 0.17 inches (4.32 mm)
Total bar code string length, including quiet zones	nominal 2.956 inches (74.088 mm)
Barcode string direction	May be printed in either direction on the label but must begin/end with a valid start/stop character (Q)
Edge roughness[a]	0.0015 inches (0.038 mm) maximum
Tolerances	0.XXX± 0.005 inches, 0.XX±.0.03 inches) (0.XXX± 0.127 mm, 0.XX± 0.762 mm)
Variation between all wide bars, white and black	Less than ± 0.0015 inches (0.0381 mm)
Variation between all narrow bars, white and black	Less than ± 0.0015 (0.0381 mm)
Print side	Print the bar code string on the label so it is on the side of the label towards the hub
Label stock dimensions	3.110 x 0.669 inches (79 x 17 mm)[2]
Minimum length for quiet zones, start-stop and data characters	Nominal 2.917 (74.088 mm)
Minimum width	No less than 0.059 inches (1.5 mm) narrower than the cartridge label recess width
Corner cut	0.059 inches (1.5 mm radius)

[1]The edge roughness is defined as the transition encountered as a horizontal line is moved vertically from all black to all white. The barcode edge is defined as the edge of all printed area attached to the bar.

[2]Must fit within the label recess on the face of the cartridge without curling up on the sides or ends.

Volume Identifier Formats

- The volume identifier only uses ASCII characters A through Z (41h-5Ah), 0 through 9 (30h-39h), and the combinations of "CLN" and "DG{space} " as described below.

- The prefix "CLN*vnn*L1"is reserved for cleaning cartridges. The "*v*" field is an alphanumeric field to identify a drive unique cleaning cartridge. The "*nn*" alphanumeric field is used to track individual cleaning cartridge activity. (for example, usage and life). When the drive requires cleaning it will request loading of the unique type cleaner cartridge.

- Diagnostic/Service cartridges use the prefix "DG{space}*vnn*L1". The "*v*" field is an alphanumeric field to identify a drive unique diagnostic cartridge if required. The "*nn*" alphanumeric field identifies a specific diagnostic cartridge volume.

- The volume identifier field consists of six left justified alphanumeric characters as specified in *SCSI-3 Medium Changer Commands (SMC) ANSI NCITS 314-199X.*

- The media identifier characters "L*g*"are controlled characters. The "L" designates the LTO type of cartridge. The next character "*g*" (alphanumeric) designates the generation of the LTO cartridge.

APPENDIX D
ERROR CODES

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

CAUTION

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

For detailed information about SCSI error conditions, refer to the Plasmon *V15 SCSI Reference*.

CAUTION

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

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

Table 20. V15 Operator Panel LCD Error Codes

LCD Code	Description	Corrective Action
11	**Source empty.** There is no cartridge in the source location.	Install a cartridge in the source location or redirect the robot to another location.
12	**Destination full.** A cartridge already exists in the destination location.	Remove the cartridge from the destination or redirect the robot to another location.
13	**Put failure.** The robot could not place a cartridge because of mechanical problems.	Open the door and remove the magazines. Make sure there is nothing blocking the robot or the tape drives. Make sure the library and tape drives are not being used by any host, then reset the library. If the error persists, the robot may need to be replaced. Contact your service provider.
14	**Pick failure.** The robot could not pick a cartridge because of mechanical problems.	Open the door and remove the magazines. Make sure there is nothing blocking the robot or the tape drives. Make sure the library and tape drives are not being used by any host, then reset the library. If the error persists, the robot may need to be replaced. Contact your service provider.
15	**No source element.** No magazine was installed at the selected location.	Install a magazine or redirect the robot. If a magazine is already installed when either of these error codes displays, reset the library. If the error persists, contact your service provider.
16	**No destination element.** No magazine was installed at the selected location.	
18	**Source inside drive.** The robot could not successfully pick a cartridge because it was still loaded in the tape drive.	Open the door and manually eject the cartridge from the tape drive. Or, redirect the robot to another source location. If the error persists, contact your service provider.
30	**R axis does not move.** The robot could not move along the reach axis.	Open the door and remove the magazines. Look for anything that might be obstructing the gripper or the robot's path along the reach axis. Make sure the library and tape drives are not being used by any host, then reset the library from the operator panel. If there are no obstructions and the error persists, the robot may need to be replaced. Contact your service provider.

LCD Code	Description	Corrective Action
32	**Barcode module failure.** The barcode module is not functioning properly.	Make sure the library and tape drives are not being used by any host, then reset the library from the operator panel. If the error persists, the barcode module may need to be replaced. You may need to supply a diagnostic listing; you may need new firmware. Contact your service provider.
34	**RRC sensor failure.** The robot gripper sensor failed.	Open the door and remove the magazines. Look for anything that might be obstructing the gripper or the robot's path along the reach axis. Make sure the library and tape drives are not being used by any host, then reset the library from the operator panel. If there are no obstructions and the error persists, the robot may need to be replaced. Contact your service provider.
35	**RRC communication failure.** The library cannot communicate with the robot gripper command processor.	Make sure the library and tape drives are not being used by any host, then reset the library from the operator panel. If the error persists, the robot may need to be replaced. Contact your service provider.
36	**RRC command reject.** An invalid command was sent to the robot command processor.	Make sure the library and tape drives are not being used by any host, then reset the library from the operator panel. If the error persists, the robot may need to be replaced. Contact your service provider.
38	**Cannot load drive.** The robot cannot push the cartridge far enough to load it into the tape drive.	Open the door and remove the magazines. Look for anything that might be obstructing the robot along its reach axis. Make sure the library and tape drive are not being used by any host, then reset the library from the operator panel. If the error persists, contact your service provider.
39	**RRC Command Failure.**	Make sure the library and tape drives are not being used by any host, then reset the library from the operator panel. If the error persists, the robot may need to be replaced. Contact your service provider.

LCD Code	Description	Corrective Action
41	**W axis failed home.** The library could not move the robot to the home position on the wrist axis.	Open the door and remove the magazines. Look for anything that might be obstructing the wrist axis rotation. Make sure the library and tape drives are not being used by any host, then reset the library from the operator panel. If the error persists, contact your service provider.
42	**Wrist front sensor failed.** The library could not determine the position of the robot on the wrist axis.	
43	**Wrist back sensor failed.** The library could not determine the position of the robot on the wrist axis.	
60	**No label.** The barcode scanner could not read the barcode label because there was no label on the cartridge or the label was unreadable.	This error appears on the Label Information screen. If the cartridge has a label, reposition or replace it. If the label does not contain a checksum character, make sure the Verify Barcode Checksums option is off. If the error persists, contact your service provider.
62	**Not present**. The barcode scanner could not read the barcode label because the designated element is not present.	This error appears on the Label Information screen. If necessary, install a magazine or tape drive.
64	**Bad label checksum**. The barcode scanner could not read the label because of a problem with the checksum character.	This error appears on the Label Information screen. If the label does not contain a checksum character, make sure the Verify Barcode Checksums option is off. Check the label for damage and replace the label if necessary. Make sure the library and tape drives are not being used by any host, then reset the library from the operator panel. If the error persists, contact your service provider.
70	**Mbus failed.** The robot command processor experienced an error.	Make sure the library and tape drives are not being used by any host, then reset the library from the operator panel. If the error persists, the robot may need to be replaced. Contact your service provider.
72	**Front door is open.** The front door was open at an invalid time; or the door sensor is malfunctioning.	Close and lock the door. Reset the library from the operator panel. If the error persists, the solenoid or door sensor may need to be replaced. Contact your service provider.

LCD Code	Description	Corrective Action
73	**Stepper Move Fail.** The firmware failed to complete a stepper move.	Make sure the library and tape drives are not being used by any host, then reset the library from the operator panel. If the error persists, contact your service provider.
74	**Unoccupied drive bay**. A tape drive or service access cover is not installed in the drive bay.	Install a tape drive or a drive carrier service access cover. 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 reset the library from the operator panel. If the error persists, contact your service provider. You may be asked to supply a diagnostic listing; you may need new firmware.
77	**Interface disabled**. The library was not in the correct control mode when the operator sent a command.	Set the library to the correct control mode.
80	**Entry/Exit Port Hardware Error.**	Make sure the library and tape drives are not being used by any host, then reset the library from the operator panel. If the error persists, contact your service provider.
87	**EE caddy removed**. The entry/exit port caddy was removed at an unexpected time.	
88	**Entry/Exit Port Motor Error.** Excessive current.	
89	**Caddy not available**. The entry/exit port caddy was not inserted correctly.	Replace the caddy as described in *Replacing Cartridges Using the Entry/Exit Port* in *Chapter 5*. If the error persists, contact your service provider.
90	**Drive HW Error.** The tape drive could not perform an operation because of a hardware error.	Use the Reset Tape Drive option on the operator panel to reset the tape drive. Make sure the library and tape drive is not being used by any host, then reset the library from the operator panel. If the error persists, contact your service provider. You may be asked to supply a diagnostic listing; you may need new firmware.
91	**Command aborted**. A diagnostic command was aborted by the operator.	No corrective action required.

LCD Code	Description	Corrective Action
92	**Drive Offline Error.** The targeted drive has been taken offline and cannot service command requests.	Contact your service provider
93	**Drive swapped.** A drive has been swapped out for another.	No corrective action required, unless no drive was swapped. Then contact your service provider.
95	**Drive removed**. A tape drive was removed while the library was powered on.	Power off the library and install a tape drive or service access cover.
97	**Drive not present**. A move was requested to a drive that is not installed.	Install a drive in the drive bay or send commands to another drive. If a drive is already installed when this message displayed, contact your service provider.
109	**Check cleaning tape**. A clean drive operation failed because the drive did not unload the cleaning cartridge within a reasonable amount of time.	Eject the cartridge from the tape drive and remove it manually (see *Chapter 6*). Install a new cleaning cartridge into the fixed slot (see *Chapter 2*).
116	**Drive comm failed.** The library is unable to communicate with the tape drive.	Check the tape drive SCSI ID and change it, if necessary. Make sure the library and tape drives are not being used by any host, then reset the library from the operator panel. If the error persists, contact your service provider. You may be asked to supply a diagnostic listing; you may need new firmware or a new controller card.
117	**Drive comm timeout.** The library is unable to communicate with the tape drive.	
118	**Drive load cmd fail**. The library was unable to load a cartridge in the tape drive.	Open the door and remove the magazine. Look for anything that might be obstructing the robot's path along the horizontal axis. Make sure the library and tape drives are not being used by any host, then reset the library from the operator panel. If there are no obstructions and the error persists, the robot or a tape drive may need to be replaced. Contact your service provider.
119	**Drive not ready.** The tape drive did not return Ready status after a reset.	Make sure the library and tape drives are not being used by any host, then reset the library from the operator panel. If the error persists, contact your service provider. You may be asked to supply a diagnostic listing; you may need new firmware or a new controller card.

LCD Code	Description	Corrective Action
120	**Drive cmd error**. The tape drive failed to respond to a command from the library.	Make sure the library and tape drives are not being used by any host, then reset the library from the operator panel. If the error persists, contact your service provider. You may be asked to supply a diagnostic listing; you may need new firmware or a new controller card.
130 131 132 133 134 135 136 137	**SCSI chip error: SCSI unexpected int; SCSI int stuck error**. There was a SCSI chip failure.	Make sure all SCSI devices are of the same configuration (see *SCSI Bus Considerations* in *Appendix B* for more information). Make sure the library and tape drives are not being used by any host, then reset the library from the operator panel. If the error persists, contact your service provider. You may be asked to supply a diagnostic listing; you may need new firmware or a new controller card.
140	**Flash erase fail**. The library is unable to erase the flash EEPROM.	Make sure the library and tape drives are not being used by any host, then reset the library from the operator panel. If the error persists, contact your service provider.
141	**Flash program fail**. The library is unable to program the flash EEPROM.	
142	**Checksum miscompare**. The flash EEPROM checksum was bad.	
143	**Invalid header data**. The flash EEPROM header was invalid.	
144	**Can't program RRC card.** The RRC code load failed.	Reset the library from the operator panel. If the error persists, contact your service provider.
194	**All slots are full**. The robot could not find an empty cartridge slot.	Open the library door and remove at least one cartridge from a magazine or fixed slot. Make sure the library and tape drives are not being used by any host, then reset the library from the operator panel. If the error persists, contact your service provider.
195	**All slots are empty**. The robot could not find a cartridge to pick in Demo mode.	Open the library door and insert at least one cartridge in a magazine.

LCD Code	Description	Corrective Action
198	**Robot full before command**. The robot, all slots, and all drives contain a cartridge when an Initialize Element Status command was requested.	Open the library door and remove the cartridge from the robot gripper. Reset the library.
199	**Tape in drive**. A cartridge is already loaded in the destination tape drive.	Eject the cartridge from the tape drive and remove it manually (see *Ejecting a cartridge Manually* in *Chapter 6*). **Note:** This error only occurs when the library is operating in Sequential mode.
200	**X axis does not move.** The robot could not move along the horizontal axis.	Open the door and remove the magazines. Look for anything that might be obstructing the robot's path along the horizontal axis. Make sure the library and tape drives are not being used by any host, then reset the library from the operator panel. If there are no obstructions and the error persists, contact your service provider.
201	**X axis has failed home.** The robot could not return to the home position along the horizontal axis.	
202	**X axis position sensor failed.** The library could not complete a move along the horizontal axis.	
203	**X axis EOT fail**. The library could not detect the end-of-travel sensor on the horizontal axis.	Open the door and remove the magazines. Look for anything that might be obstructing the robot's path along the horizontal axis. Make sure the library and tape drives are not being used by any host, then reset the library from the operator panel. If there are no obstructions and the error persists, contact your service provider.
204	**X axis home sensor fail**. The library could not detect the horizontal axis home sensor (safe rotate position).	
205	**X axis scan failed**. The library could not complete a move along the horizontal axis.	
207	**X axis cal fail.** The robot position along the horizontal axis could not be calibrated.	
213	**Invalid Xcard configuration.** An invalid combination of expansion cards is installed in the library.	Make sure the library and tape drives are not being used by any host, then reset the library from the operator panel. If the error persists, contact your service provider. An expansion card may not be properly installed or the wrong card is installed.

LCD Code	Description	Corrective Action
214	**Invalid Slot Config.** The Maximum Number of Slots is set to 1 and the last slot is configured as a cleaning slot.	Change the Max Addressable Slot to a value greater than 1 (see Setting the Max Addressable Slot Option in *Chapter 3*) or turn off the Clean Slot Option (see *Setting the lean Slot Option* in *Chapter 3*).
220	**OS failure.** The library's operating system experienced an error.	Make sure the library and tape drives are not being used by any host, then reset the library from the operator panel. If the error persists, contact your service provider.
221	**Could not set alarm.** The library's operating system experienced an error.	
222	**OS message failure**. The library operating system experienced an error.	
225	**M Bus Timeout.** No acknowledgement from internal M bus device	Ensure no commands are active to the library. Reset the library. If error persists, contact your service provider.
226	**Mbus interrupt timeout.** The robot command processor timed out before setting an interrupt.	Make sure the library and tape drives are not being used by any host, then reset the library from the operator panel. If the error persists, the robot may need to be replaced. Contact your service provider.
227	**Mbus acknowledge failure.** The robot command processor failed to respond to a command.	
230	**DHCP server timeout**. The Ethernet DHCP server could not assign an IP address for the library.	This error occurs only when the optional Ethernet interface is installed. Set the network address to Static and set the desired IP address (see *Setting Ethernet Addresses* in *Chapter 4*).
236	**SCSI Configuration Error.** Configuration start ID is invalid.	If power cycling the library does not recapture this information, contact your service provider.
237	**SCSI Configuration Error.** Configuration field is invalid.	
238	**SCSI Configuration Error.** Configuration value is invalid.	
239	**SCSI Configuration Error.** Configuration buffer ID is invalid.	

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