Sun™ StorEdge™ L11000 User's Guide

THE NETWORK IS THE COMPUTER™

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Sun StorEdge L11000 User's Guide, Part No. 805-7275-10, Revision A, September 1998

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Regulatory Compliance Statements

Your Sun product is marked to indicate its compliance class:

- Federal Communications Commission (FCC) — USA
- Department of Communications (DOC) — Canada
- Voluntary Control Council for Interference (VCCI) — Japan

Please read the appropriate section that corresponds to the marking on your Sun product before attempting to install the product.

FCC Class A Notice

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

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 the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Shielded Cables: Connections between the workstation and peripherals must be made using shielded cables in order to maintain compliance with FCC radio frequency emission limits. Networking connections can be made using unshielded twisted-pair (UTP) cables.

Modifications: Any modifications made to this device that are not approved by Sun Microsystems, Inc. may void the authority granted to the user by the FCC to operate this equipment.

DOC Class A Notice - Avis DOC, Classe A

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

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

VCCI 基準について

第一種VCCI基準について

第一種VCCIの表示があるワークステーションおよびオプション製品は、第一種情報装置です。これらの製品には、下記の項目が該当します。

この装置は、第一種情報装置(商工業地域において使用されるべき情報装置)で商工業地域での電波障害防止を目的とした情報処理装置等電波障害自主規制協議会(VCCI)基準に適合しております。したがって、本製品を、住宅地域または住宅地域に隣接した地域でご使用になりますと、ラジオ、テレビジョン受信機等に受信障害を与えることがあります。

取り扱い説明書に従って正しくお取り扱いください。

CISPR-22 Warning!

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Achtung!

Dieses ist ein Gerät der Funkstörgrenzwertklasse A. In Wohnbereichen können bei Betrieb dieses Gerätes Rundfunkstörungen auftreten, in welchen Fällen der Benutzer für entsprechende Gegenmassnahmen verantwortlich ist.

Attention!

Ceci est un produit de classe A. Dans un environment domestique, ce produit peut causer des interférences radioélectriques. Il appartient alors à l'utilisateur de prendre les mesures appropriées.

Notice for USA and Canada Only

If shipped to USA, use the UL LISTED power cord specified below for 100-120 V operation. If shipped to Canada, use the CSA CERTIFIED power cord specified below for 100-120V operation.

Plug Cap	Parallel blade with ground pin (NEMA 5-20P configuration)
Cord	Type: SJT, three 14 AWG wires
Length	Maximum: 4.5m (15 feet)
Rating	Minimum: 20 A, 125 V

Attention

LIRE LA REMARQUE DANS LE MODE D'EMPLOI.

Remarque

CETTE REMARQUE NE CONCERNE QUE LES ÉTATS-UNIS ET LE CANADA.

En cas d'envoi aux États-Unis, utiliser le cordon d'alimentation certifié UL et convenant pour 100-120 V.

En cas d'envoi au Canada, utiliser le cordon d'alimentation CERTIFIÉ CSA et convenant pour 100-120 V.

Fiche	Broches parallèles avec une broche de mise à la terre (configuration NEMA 5-15P)
Cordon	Type: SJT, trifilaire 14 AWG
Longeur	Maximum: 4.5m (15 pieds)
Capacité	Minimum: 20 A, 125 V

Vorsicht

Um Feuergefahr und die Gefahr eines elektrischen Schlages zu vermeiden. Darf das Gerät weder Regen noch Feuchtigkeit ausgesetzt werden.

Um einen elektrischen Schlag zu vormeiden, darf das Gehäuse nicht geöffnet werden. Überlassen Sie Wartungsarbeiten stets nur einem Fachmann.

Achtung
Da der interne Laserstrahl in lhre Augen eindringen und Verletzungen verursachen kann, darf das Gehäuse nicht selbst geöffnet werden. Überlassen Sie Wartungearbeiten stets nur einem Fachmann.

Die Verwendung von Brillen, Kontaktlinsen usw.vergrössert die Gefahr.

Zur besonderen Beachtung

Zur Sicherheit
Sollte ein fester Gegenstand oder Flüssigkeit in das Geräteinnere gelangen, trennen Sie das Gerät von der Wandsteckdose ab und lassen Sie es von einem Fachmann überprufen, bevor Sie es weiter verwenden.

Zum Abziehen des Kabels fassen Sie stets am Stecker und niemals am Kabel selbst an.

Zur Aufstellung
Stellen Sie das Gerät weder auf einer weichen Unterlage (z. B. Decke, Teppich) noch in der Nahe von Vorhangen, Tapeten usw, auf, da hierdurch die Ventilationsöffnungen blockiert werden können.

Zur Reiningung
Verwenden Sie zur Reiningung des Gehäuses, des Bedienungspultes und der Bedienungselemente ein trockenes, weiches Tuch oder ein weiches, leicht mit mildem Haushaltsreiniger angefeuchtetes Tuch. Lösemittel wie Alkohol oder Benzin dürfen nicht verwendet werden, da diese die Gehäuseoberfläche ungreifen.

LASER STATEMENT

CLASS I LASER PRODUCT

CAUTION - This product contains a Class II laser. Laser light - DO NOT stare into beam. Avoid Exposure - Laser Light is emitted from the bar code scanner.

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

LASER KLASSE 1

VORSICHT: Dieses Produkt enthält einen Laser der Kategorie II. Laserstrahlen - Der Strichcode-scanner gibt Laserstrahlen aus. VERMEIDEN SIE jeden Blickkontakt und direkten körperlichen Kontakt mit diesen Strahlen.

VORSICHT: Ein nicht ordnungsgemäßer (siehe hier enthaltene Anweisungen) Einsatz bzw. Änderungen der Betriebsleistung können einen gesundheitsgefährdenden Kontakt zur Folge haben.

APPAREIL À LASER DE CLASSE 1

ATTENTION: ce produit contient le rayon laser classe 2. Rayonnement laser - NE PAS fixer les yeux au rayon. Éviter les expositions - Le rayonnement laser est émis partir du lecteur optique de code barre.

ATTENTION: L'utilisation de contrôles ou d'ajustements de performance des procédures autres que ceux indiquées ici peut entraîner une exposition dangereuse.

PRODUCTO LÁSER DE CLASE 1

¡ATENCIÓN! Este producto contiene laser de clase II. Luz de laser - NO mire el rayo. Evite el contacto con la luz: la luz de laser se emite desde el explorador de código de barras.

¡ATENCIÓN! El uso de los controles o ajustes para realizar procedimientos que no son especificados puede provocar una situación peligrosa.

LUOKAN 1 LASERLAITE

ATTENZIONE: questo prodotto emette una luce laser di Classe 2. NON guardare il facsio di luce ed evitare di esporsi alla fonte del laser. Il fascio di luce laser h emesso dal dispositivo di scansione del codice a barre.

ATTENZIONE: l'uso di comandi o regolazioni per eseguire le procedure che non siano quelli specificati in questa documentazione pur causare rischi all 'incolumit' delle persone.

POWER CORD STATEMENT

CAUTION:

This unit may be provided with two power supply cords. Disconnect all power supply cords before servicing.

VORSICHT:

Dieses Gerät kann mit zwei Netzsteckern versehen sein. Trennen Sie alle Netzstecker vor der Wartung.

CAUTION - The Dallas Semiconductor DS1225AB-200 component on the robotic controller board inside this product contains a Lithium battery. Lithium is a hazardous material that must be disposed of in accordance with local, state, and federal laws.

FORSIGTIG - Båndbiblioteket indeholder et lithiumbatteri. Halvleder DS1225AB-200 på robotkontroltavlen indeholder et lithiumbatteri. Lithium kan anses for at være et sundhedsfarligt materiale. Kassér dette batteri i overensstemmelse med lokale og nationale lovbestemmelser.

HUOMAUTUS - Nauhakirjastossa on litiumparisto. Robottiohjainkortin Dallas DS1225AB-200-puolijohteessa on litiumparisto. Litium voidaan luokitella vaaralliseksi aineeksi. Pariston hävittämisessä on noudatettava viranomaisten antamia ohjeita ja määräyksiä.

ATTENTION - La bibliothèque de bande contient une pile au lithium. Le Dallas Semiconductor DS1225AB-200 sur la carte robotic contrôleur contient une pile au lithium. Le lithium est un matériel dangereux. Jeter cette pile conformément aux lois locales, d'état et fédérales.

ACHTUNG! - Die Bandbibliothek enthält eine Lithiumbatterie. Der Halbleiter Dallas DS1225AB-200 auf dem Roboter-Controller enthält eine Lithiumbatterie. Lithium gilt als Schadstoff. Bei der Entsorgung dieser Batterie alle entsprechenden kommunalen, staatlichen und bundesweiten Vorschriften beachten!

ATTENZIONE - La libreria a nastro magnetico contiene una batteria al litio. Il semiconduttore Dallas DS1225AB-200 sulla scheda controller robotic contiene una batteria al litio. Il litio può essere considerato un materiale pericoloso. Eliminare queste batterie in conformità alle normative locali e statali vigenti.

FORSIKTIG - Kassettbiblioteket inneholder et litiumbatteri. Enheten Dallas Semiconductor DS1225AB-200 på robotkontrollkortet inneholder et litiumbatteri. Litium kan anses som et farlig materiale. Batteriet skal kastes i henhold til lokal og nasjonal lovgivning.

PRECAUCIÓN - La biblioteca de cintas contiene una pila de litio. El semiconductor Dallas DS1225AB-200 en el tablero controlador robotic contiene una pila de litio. El litio es un material peligroso. Deseche esta pila de acuerdo con las leyes municipales, estatales y federales.

VARNING! - Magnetbandsbiblioteket innehåller ett litiumbatteri. Dallas halvledare DS1225AB-200 på robotstyrkortet innehåller ett litiumbatteri. Litium kan anses vara ett farligt material. Kassera detta batteri i enlighet med lokala och statliga lagar och förordningar.

Contents

Figures

Tables

Preface

The *Sun StorEdge L11000 User's Guide* provides installation, configuration, and operating instructions for the Sun™ StorEdge™ library system. These instructions are designed for operators, system administrators, and field service engineers who use and service this library.

Before You Read This Book

Before you can install and use the Sun StorEdge L11000 library, it must be uncrated and unpacked as explained in the following publications:

- *Sun StorEdge L11000 Uncrating Instructions - 805-7278-10*
- *Sun StorEdge L11000 Unpacking Instructions - 805-7277-10*

These unpacking instructions are attached to the outside of the library shipping crate.

Although the user's guide is packaged inside the shipping crate, you may receive an advance copy so you can use the information in Chapter 2 to choose an appropriate installation site and prepare for the installation.

How This Book Is Organized

Chapter 1 provides an overview of the library and describes the numbering conventions for bins and tape drives.

Chapter 2 provides basic installation instructions. It assumes the user has already completed the unpacking procedures.

Chapter 3 provides an overview of the library control panel and introduces the operator to the basic procedures for placing the library on line.

Chapter 4 describes operator-level functions, including configuring and calibrating the library, exercising the library, and taking inventory of the library.

Chapter 5 describes service-level functions, including generating reports, testing the library, initializing nonvolatile memory, and changing library passwords.

Chapter 6 discusses common problems and their solutions, setting up a UNIX-based diagnostic station, and the diagnostic software.

Appendix A provides a list of library specifications.

Appendix B describes the procedures involved in relocating the library.

Glossary is a list of words and phrases used in this book and their definitions.

Using UNIX Commands

This document may not contain information on basic UNIX® commands and procedures such as shutting down the system, booting the system, and configuring devices.

See one or more of the following for this information:

- *Solaris Handbook for Sun Peripherals*
- AnswerBook™ online documentation for the Solaris™ software environment
- Other software documentation that you received with your system

Typographic Conventions

TABLE P-1 Typographic Conventions

Typeface or Symbol	Meaning	Examples
`AaBbCc123`	The names of commands, files, and directories; on-screen computer output.	Edit your `.login` file. Use `ls -a` to list all files. `% You have mail.`
`AaBbCc123`	What you type, when contrasted with on-screen computer output.	`% su` `Password:`
AaBbCc123	Book titles, new words or terms, words to be emphasized. Command-line variable; replace with a real name or value.	Read Chapter 6 in the *User's Guide.* These are called *class* options. You *must* be `root` to do this. To delete a file, type `rm` *filename.*

Shell Prompts

TABLE P-2 Shell Prompts

Shell	Prompt
C shell	*machine_name*%
C shell superuser	*machine_name*#
Bourne shell and Korn shell	$
Bourne shell and Korn shell superuser	#

Related Documentation

TABLE P-3 Related Documentation

Application	Title	Part Number
Unpacking	*Sun StorEdge L11000 Unpacking Instructions*	805-7277-10
Service	*Sun StorEdge L11000 Service Manual*	805-7276-10
Upgrade	*Sun StorEdge L11000 Drive Upgrade Instructions*	805-7280-10
Utility CD	*Sun StorEdge L11000 Utility CD Insert*	804-6527-10
User CD	*Sun StorEdge L11000 User CD Insert*	804-6526-10

Sun Documentation on the Web

The `docs.sun.com`[sm] web site enables you to access Sun technical documentation on the Web. You can browse the `docs.sun.com` archive or search for a specific book title or subject at:

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docfeedback@sun.com
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Please include the part number of your document in the subject line of your email.

CHAPTER 1

Library Description

This chapter describes the Sun StorEdge L11000 tape library and consists of the following sections:

L11000 Configurations

The Sun StorEdge L11000 (Figure 1) is an automated storage and retrieval library consisting of up to 16 tape drives and 326 DLT cartridges. When fully populated with CompacTape IV cartridges, the library has a maximum storage capacity of 11.4 terabytes (11,410 gigabytes), based on 326 cartridges at 35 gigabytes (GB) each.

Note – When compression is enabled on each tape cartridge, the maximum storage capacity of the library can be increased up to 22.8 terabytes (22,820 GB).

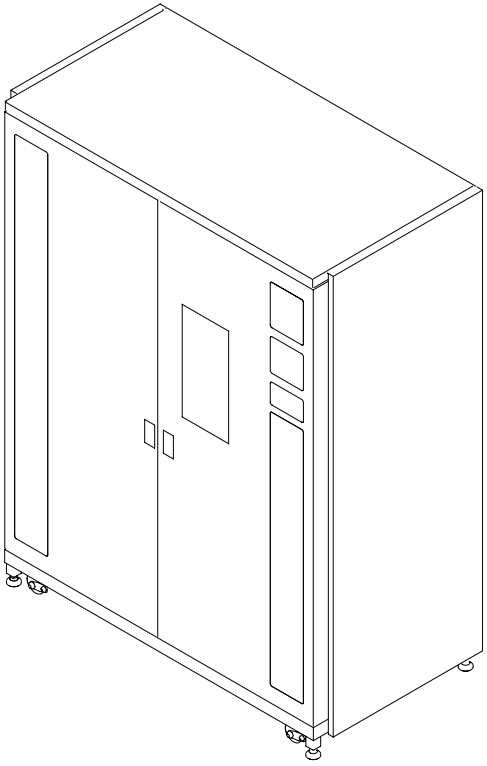

FIGURE 1-1 StorEdge L11000 Front View

Library Models

The StorEdge L11000 is available in four models that support a wide range of storage and performance requirements (TABLE 1-1). Model numbers are created by combining the number of drives and the number of storage bins in the library.

TABLE 1-1 Library Model Characteristics

	StorEdge L11000 Models with 326 Bins			
Characteristic	**4/326**	**8/326**	**12/326**	**16/326**
DLT tape drives	4	8	12	16
Storage bins	326	326	326	326
Storage capacity (in terabytes)	11.4 (up to 22.8 compressed)			
Throughput in 1 hour (in GB)	72	144	216	288
Throughput in 8 hours (in GB)	578	1152	1728	2304

Element Numbering Convention

The library stores tape cartridges in the following locations:

- 170 storage bins on the back wall
- 96 storage bins on the inside of the left door
- 60 storage bins on the inside of the right door
- One load port consisting of two 6-cartridge magazines
- 16 tape drives

FIGURE 1-2 shows the storage bin, load port bin, and tape drive numbering conventions. These conventions are used by the library GUI and the diagnostic software program.

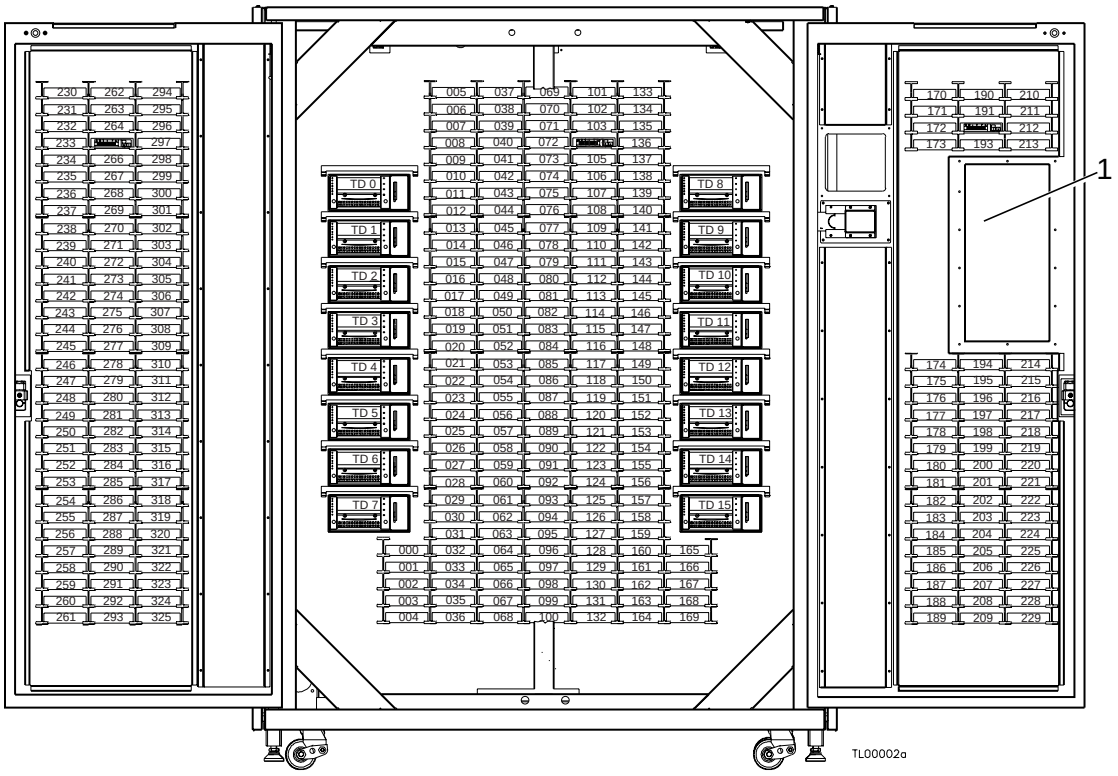

FIGURE 1-2 Element Numbering Conventions

1. Load Port

Features and Benefits

The StorEdge L11000 library delivers the following features and benefits:

- High-capacity, high-performance data storage and retrieval
  - The library contains up to 326 DLT tape cartridges. This provides a maximum uncompressed storage capacity of 11.4 terabytes in only 11 square feet of floor space.
  - The library also contains up to 16 tape drives. This enables the library to achieve a maximum data backup and restore rate of 288 GB/hour.
- Expandable library configurations
  - Up to five libraries can be joined together into one virtual unit. Tape cartridges can be shared between libraries using pass-through mechanisms.
- Access to future expandability and technology upgrades through Prism™ architecture
  - Prism architecture employs standard PCI bus technology to provide greater upgrade flexibility at reduced costs.
  - This technology ensures compatibility with future on-board technologies such as tape drive controllers, high-speed host and network interfaces, and server and tape RAID.
- Reliable, versatile 120 to 240 volt AC auto-switching power supplies
  - Hot-swappable, redundant power modules ensure library operations against power supply failure.
- Advanced cooling system to prevent failures from overheating
- On-line cartridge exchanges: load port with two removable, 6-cartridge magazines for easy insertion of cartridges without interrupting library operations
- Easy serviceability and manageability
  - Hot-swappable DLT drives, power supplies, and fans enable field service engineers to make repairs without taking the library off line.
  - Easy access to critical components that can be easily replaced.
  - A user-friendly, touch screen panel provides a wide range of configuration and service-related functions.
  - LibMON™ software that provides library access through the Internet.

Library Components

The StorEdge L11000 library consists of these major components:

- Cabinet
- A touch screen graphical user interface (GUI)
- IntelliGrip cartridge handling mechanism
- Tape drives
- Load port

Cabinet

The cabinet houses all library components including:

- Cartridge handling mechanism (CHM)
- Storage bins
- Control electronics
- Power supply and distribution equipment
- Fans
- DLT tape drives

You can obtain access to these components and monitor and control library operation from the front and back panels of the library cabinet.

Front Panel

The front panel of the library cabinet (FIGURE 1-3) provides the following access to the library:

- Two front doors provide easy access to the CHM and the storage array.
- The viewing window makes it possible to visually monitor library operations.
- A GUI control panel on the right side of the cabinet enables you to monitor and control library components and operations.
- A load port with two removable 6-cartridge magazines provides easy insertion of additional tape cartridges while the library is in operation.
- The power switch for the library is located behind a sliding panel on the right front door.

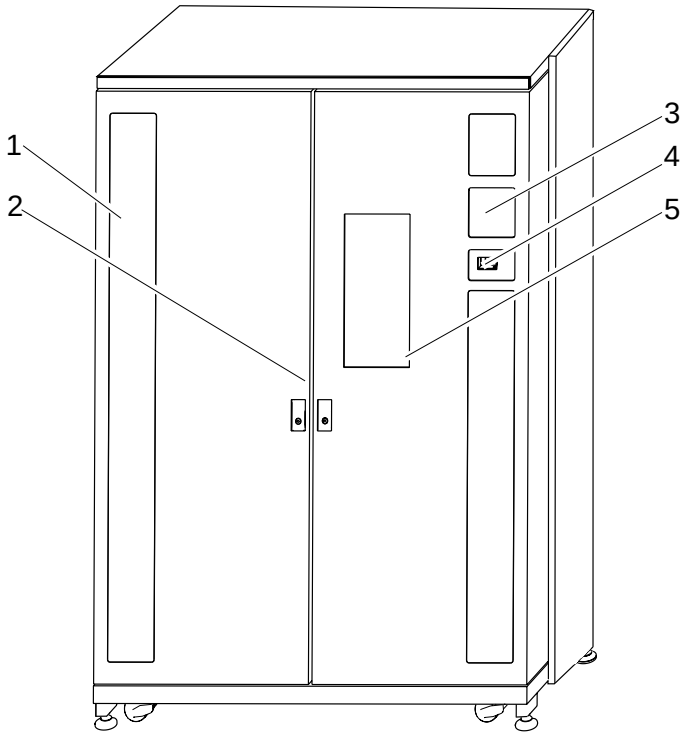

FIGURE 1-3 Front Panel

1. Viewing window
2. Dual doors
3. Touch screen GUI
4. Power switch
5. Load port with two 6-cartridge magazines

Back Panel

The back of the cabinet provides easy accessibility to:

- Cooling fans
- Power, control, and data interfaces
- Tape drives

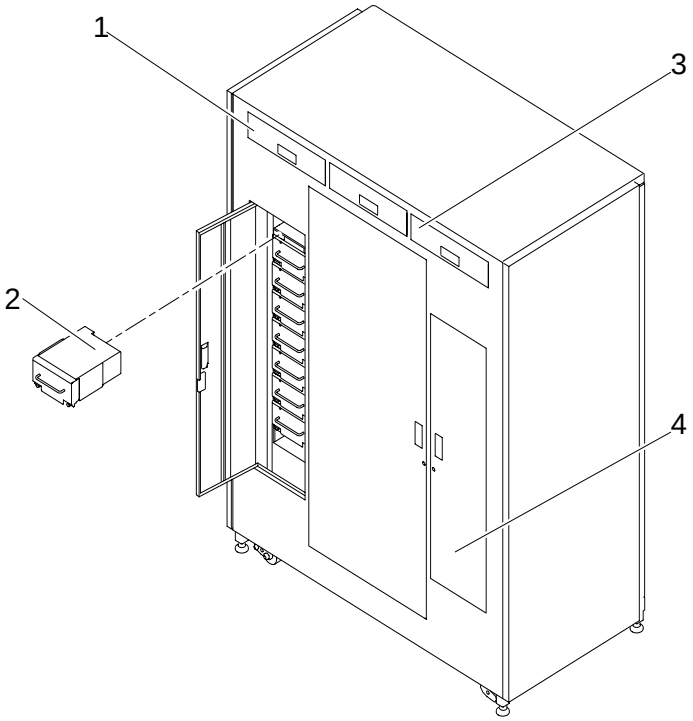

FIGURE 1-4 Back Panel

1. Advanced cooling system
2. Hot swap DLT drives in removable canisters
3. Hot-swap removable fans
4. Easy-access panel

Touch Screen GUI

The GUI features a touch screen menu system for determining library status, configuring the library, and performing certain diagnostic functions.

The GUI menu screen (FIGURE 1-5) consists of:

- A horizontal taskbar (top row)
- A vertical taskbar (left column)
- A main display area

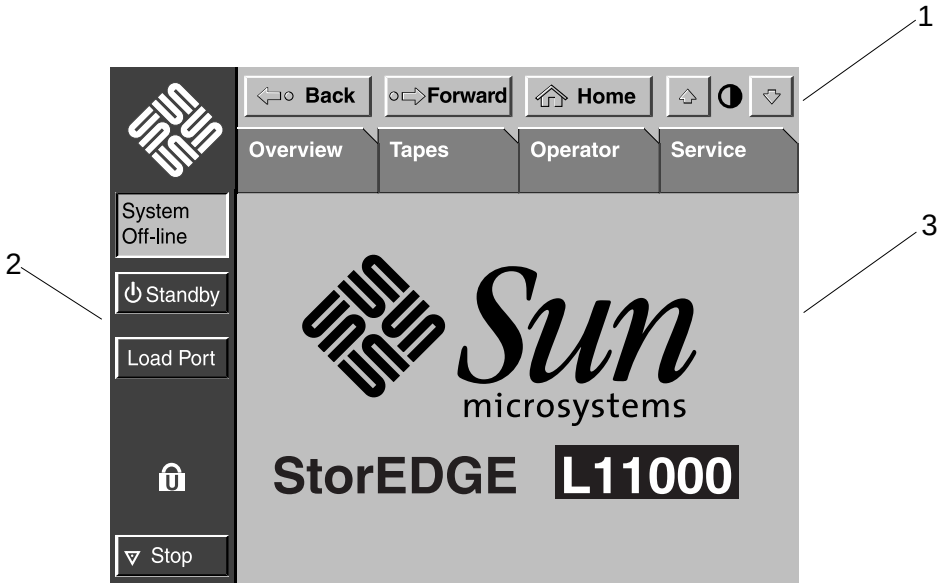

FIGURE 1-5 GUI—Initial Screen

1. Horizontal taskbar
2. Vertical taskbar
3. Main display area

The horizontal taskbar provides four tabs for status, configuration, diagnostic, and operating controls selections.

The vertical taskbar provides various library controls such as system state display, standby, load port, and security level indicator. The Stop button is the power on/off switch for library robotics.

For further information about the library GUI, see Chapter 3.

IntelliGrip Cartridge Handling Mechanism

The cartridge handling mechanism (CHM) of the library consists of the following components:

- Gripper mechanism/bar code reader
- Vertical actuator
- Horizontal actuator
- Extension actuator
- Rotary actuator

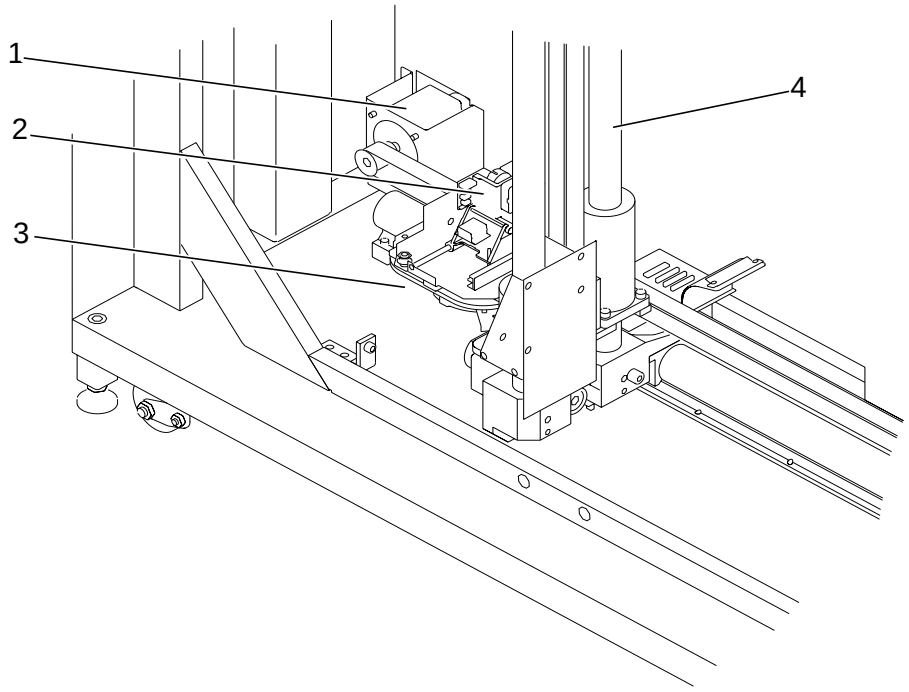

FIGURE 1-6 Advanced Robotics System

1. Horizontal drive motor
2. Gripper assembly
3. Extension axis assembly
4. Vertical carriage assembly

The vertical and horizontal actuators move the gripper into position to pick and place tape cartridges. The rotary actuator rotates the gripper 180 degrees, allowing the gripper to pass cartridges between the front storage bins and the back storage bins or tape drives. The extension actuator extends the gripper forward to make contact with the desired cartridge and then retracts the gripper to remove the cartridge from a bin or drive.

The gripper includes a Class II Laser bar code scanner that reads standard six-character, 3 of 9 bar code labels. The scanner is used to maintain an inventory of the tape cartridges within the library. For example, an inventory occurs automatically whenever the library is turned on or after the door has been closed. You can also initiate an inventory manually from the host computer.

Although the library does not require tape cartridges to have bar code labels, properly labeled tape cartridges and full storage bins speed up the inventory process.

Tape Drives

The StorEdge L11000 library can hold up to 16 DLT7000 tape drives. These advanced half-inch tape devices are capable of storing up to 35 GB of uncompressed data per cartridge.

Note – When fewer than 16 tape drives are installed, the tape drives must occupy consecutive drive bays, beginning with drive bay 0.

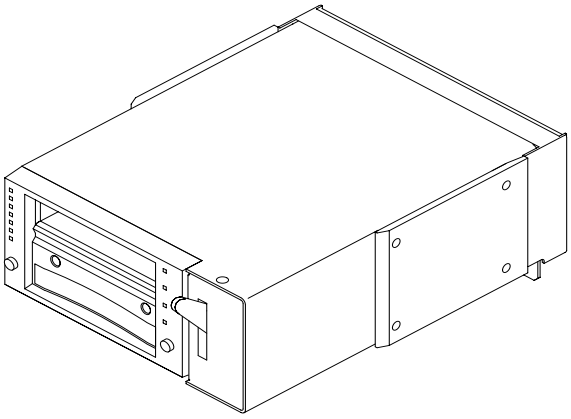

FIGURE 1-7 DLT7000 Drive Assembly

The DLT drives used in the StorEdge L11000 are more reliable than standard DLT drives due to the automated environment.

If a drive experiences read / write errors when the autoclean function is enabled, it automatically requests cleaning. Without user intervention, the IntelliGrip CHM replaces the data cartridge with a cleaning cartridge. When the cleaning procedure finishes, the CHM returns the data cartridge to the drive.

Supported Tape Cartridges

The StorEdge L11000 supports CompacTape III and CompacTape IV cartridges.

Caution – Do not use CompacTape I, CompacTape II, or CompacTape IIIXT cartridges with this library.

Load Port

The load port is a mechanical device in the front panel of the library that enables you to insert up to 12 tape cartridges into the library (or to export up to 12 tape cartridges) without interrupting library operations.

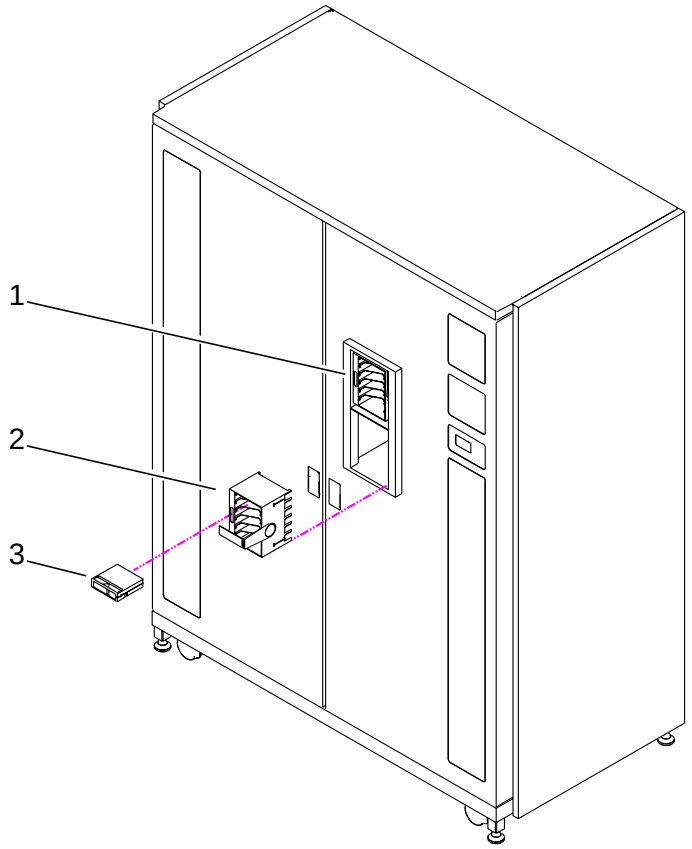

FIGURE 1-8 Load Port

1. Load Port
2. Six-cartridge magazine
3. Tape cartridge

CHAPTER 2

Library Installation

This chapter explains how to install the Sun StorEdge L11000 library. The installation procedure is divided into the following general tasks:

Choosing an Installation Site

When choosing an installation site for the StorEdge L11000 library, consider the following requirements:

- Floor space
- Floor clearance
- Floor strength and inclination
- Power and grounding
- Environmental conditions

These requirements are also described in the *Sun StorEdge L11000 Unpacking Instructions*.

Floor Space

FIGURE 2-1 shows the minimum floor space required by the StorEdge L11000 library.

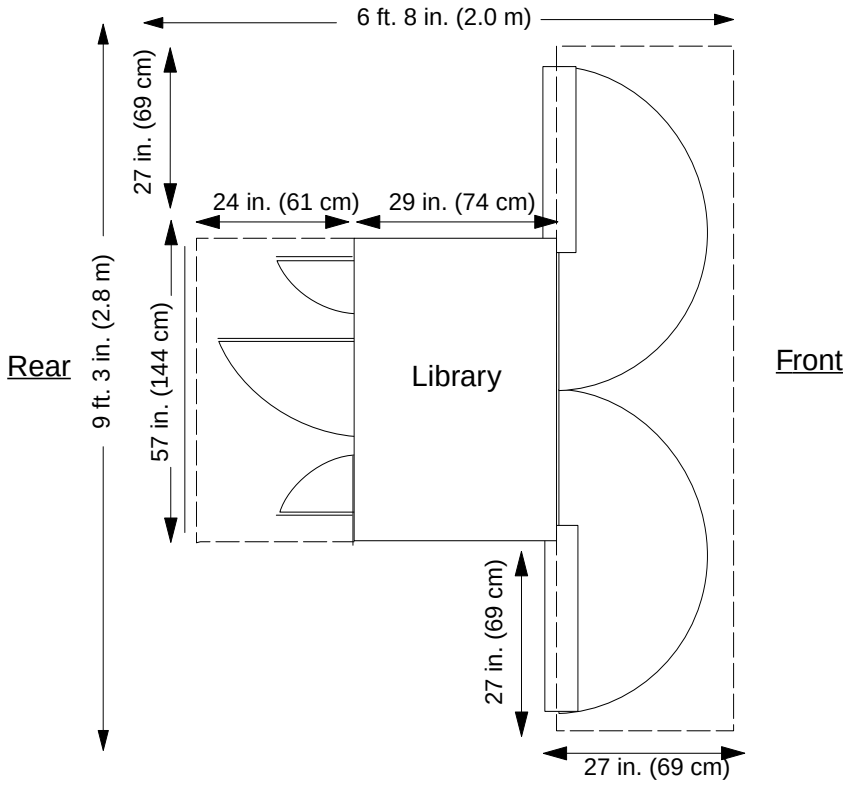

FIGURE 2-1 Minimum Floor Space Requirements—Top View

Floor Clearance

The library has a nominal floor clearance of 0.75 inch (19 mm). Place the library on a level, uncarpeted floor free of defects.

Floor Strength and Inclination

The floor at the installation site must be rated at 250 lb / ft^2 (1221 kg / m^2). This is sufficient to support a fully loaded StorEdge L11000 library.

The floor must also be level to within 0.25 inch (6.4 mm) over a 6-foot-by-6-foot (1.82-meter-by-1.82-meter) area.

Power and Grounding

Caution – This unit may be provided with two power supply cords. Disconnect all power supply cords before servicing

The library's wide-ranging power supplies accept single-phase input power of 90 to 264VAC at 47 to 63 Hz.

The power inlet connector is an IEC-320 C19 connector (FIGURE 2-3). For the United States and Canada, a UL/CSA Certified cord set is furnished. It uses a 14/3 SJT cord and a 5-20P plug.

Outside North America, replace the power cord set with a harmonized 3 x 1.5 mm^2 power cord set that is approved by the country where used.

The library's wide ranging power supply is shown in FIGURE 2-2. The AC power cord receptacle is shown in FIGURE 2-3

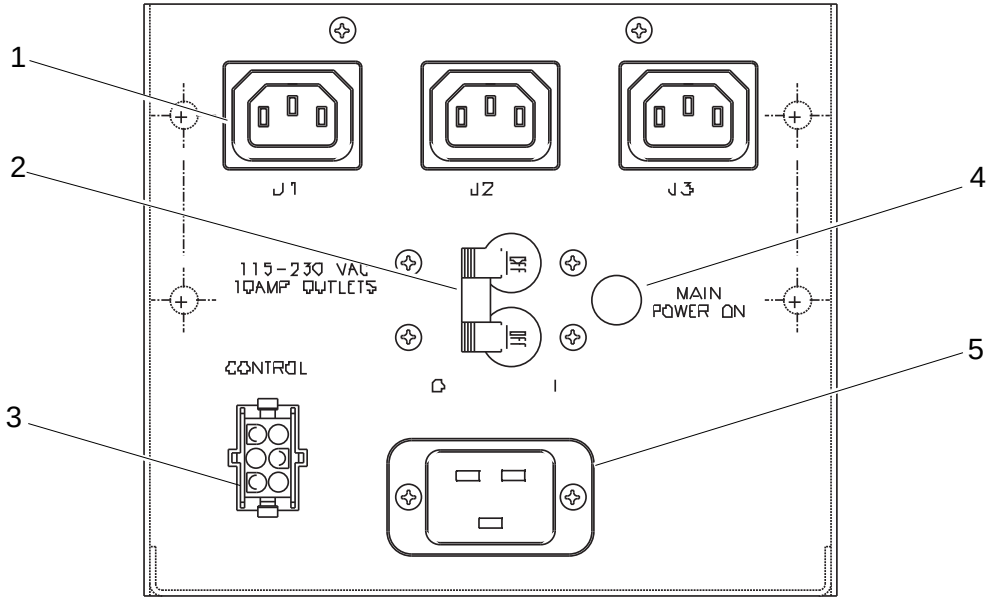

FIGURE 2-2 Library Wide Range Power Supply

1. AC power cord receptacle
2. Circuit breaker
3. Circuit connector
4. AC indicator light
5. Flanged inlet

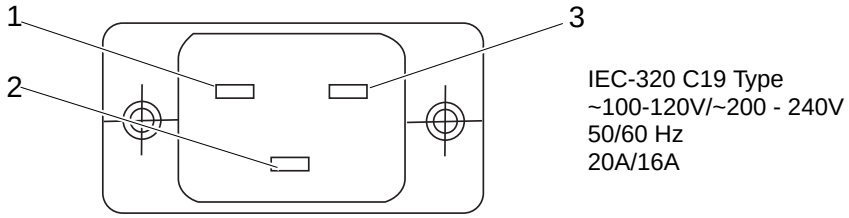

FIGURE 2-3 AC Power Cord Receptacle

1. Line
2. Ground
3. Neutral

Caution – To prevent equipment damage, the installation site must also provide an earth ground cable for the StorEdge L11000 library.

Environmental Conditions

The installation site must have the following environmental conditions:

- Humidity: 20 to 80% non-condensing
- Temperature: 0 to 32˚C (50-90˚F)
- Altitude: Sea level to 10,000 feet (3,048 meters)

These environmental conditions apply when the library is in operation.

Note – For additional library specifications (including environmental requirements during shipping and storage), go to Appendix A.

Preparing for the Installation

Before you begin the installation procedure in this chapter, make the following preparations as described in this section:

- Check the packing list
- Provide necessary tools
- Provide tape cartridges
- Designate host and diagnostic workstations
- Take electrostatic discharge (ESD) precautions

Checking the Packing List

After you finish unpacking the library, check the packing list to verify that you have received all library components and accessories. If any part is missing or damaged, contact your authorized Sun reseller for a replacement.

Note – You can also find a list of library components and accessories in the *Sun StorEdge L11000 Unpacking Instructions*.

Tools and Equipment Needed

You must provide the following tools for this installation:

- 3/4-inch open-end wrench
- Level

These tools will be used to level the library.

Providing Tape Cartridges

You must also provide all the tape cartridges used in the library. The library holds 326 CompacTape III or CompacTape IV cartridges.

Note – Use only one type of tape cartridge in the library; do not mix CompacTape III and CompacTape IV cartridges. Do not use CompacTape I, CompacTape II, or CompacTape IIIXT cartridges.

Preserving Tape Cartridges

To preserve the life of DLT cartridges, follow these guidelines for proper care and handling:

- Do not drop or bang the tape cartridge. This can displace the tape leader, making the cartridge unusable and possibly a hazard to the tape drive.
- Store cartridges in a dust-free environment with a temperature of between 10ºC and 40ºC (50ºF to 104ºF) and a relative humidity of between 20% and 80%. For longer life, store the cartridges in their plastic containers at room temperature (22º 4ºCor 72º 7ºF)in a relative humidity of 40% 20%.
- Keep cartridges out of direct sunlight and away from heat sources and sources of electromagnetic interference. If a cartridge is exposed to extremes of heat or cold, stabilize the cartridge at room temperature for the same amount of time it was exposed—up to 24 hours.
- Follow any other guidelines provided by the tape cartridge manufacturer.

Designating Host and Diagnostic Workstations

You must furnish the host and diagnostic workstations that communicate with the StorEdge L11000 library. Additionally, field service engineers may also furnish diagnostic computers when they service the library.

Host workstations communicate with the library using a SCSI interface and the standard SCSI-2 command set. Diagnostic workstations communicate with the library using special diagnostic software (found on the Sun CD-ROM) and a low-speed EIA/TIA-574 (RS-232 for 9-pin connectors) serial interface.

Note – Hosts without a direct SCSI interface require external communications bus converters.

Taking ESD Precautions

Components within the StorEdge L11000 library may contain static-sensitive parts. To prevent damage to these parts while performing installation or maintenance observe the following precautions:

- Keep the library turned off during all installation and maintenance.
- Some replacement parts are hot-swappable and do not require the library to be turned off.

- Keep the library power cord plugged into a grounded power outlet except when working with AC electrical components.

Caution – Avoid contact with the power supplies, EMI filter, and all other AC electrical components while the library is connected to a power outlet.

- Use an antistatic wrist strap when touching the internal components of the library.
- Keep static-sensitive parts in their shipping containers until ready for installation.
- Do not place static-sensitive parts on any metal surface. If you need to put down a static-sensitive part, place it inside its protective shipping bag or on a grounded antistatic mat.
- Avoid direct contact with static-sensitive parts. Avoid touching connectors and discrete components.
- Close library doors and access panels when not working on the library.
- Be very careful when installing the library or handling components in dry climates or environments where cold-weather heating is used. Environments such as these with lower relative humidity have greater potential to produce static electricity.

Note – In environments with high potential for static electricity, take additional precautions such as using an antistatic smock or a grounded antistatic mat.

Performing the Installation

The StorEdge L11000 installation procedure includes the following major steps:

- Uncrating the library
- Positioning the library
- Unpacking the library
- Leveling the library
- Installing tape cartridges

▼ To Uncrate the Library

1. **Choose the unloading side.**

   The StorEdge L11000 may be unloaded from either the right or left side of the pallet.

2. **Verify the minimum floor space requirements.**

   Uncrating the library requires a minimum of 3 feet (91 cm) on all sides. For the side being used for the ramp, uncrating the library requires an aditional 7 feet (214 cm) for a total of 10 feet (305 cm) on that side. FIGURE 2-4 shows the minimum floor space required by the StorEdge L11000 library at its uncrating site.

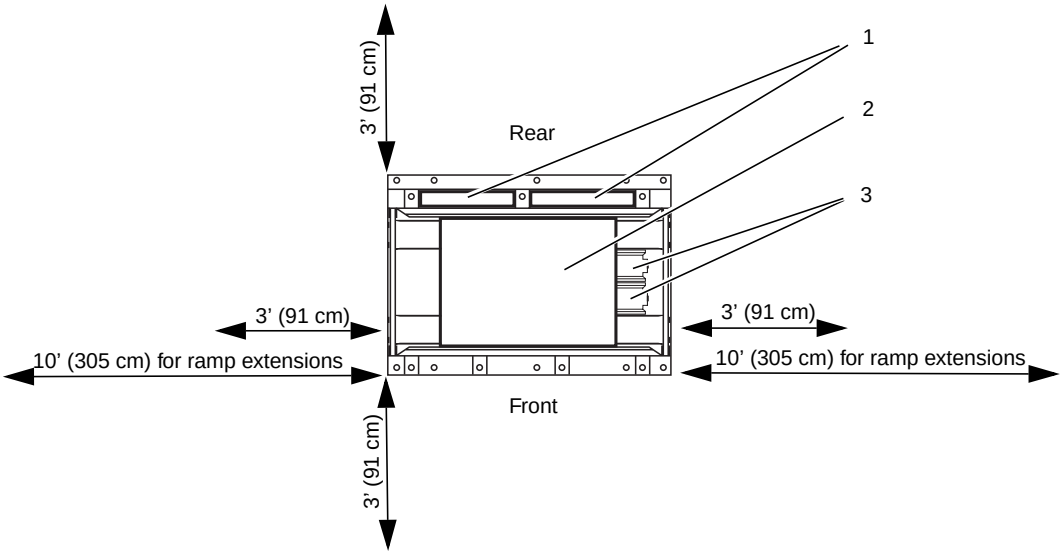

FIGURE 2-4 Minimum Floor Space Requirements—Uncrating Site

1. Accessory Kits
2. Library
3. Ramp Extensions

3. Remove the steel bands.

Cut the two steel bands that secure the library and packing material to the pallet as shown in FIGURE 2-5.

Caution – Use care when cutting the steel bands that secure the library and packing material to the pallet. These bands are under tension and will snap away when cut.

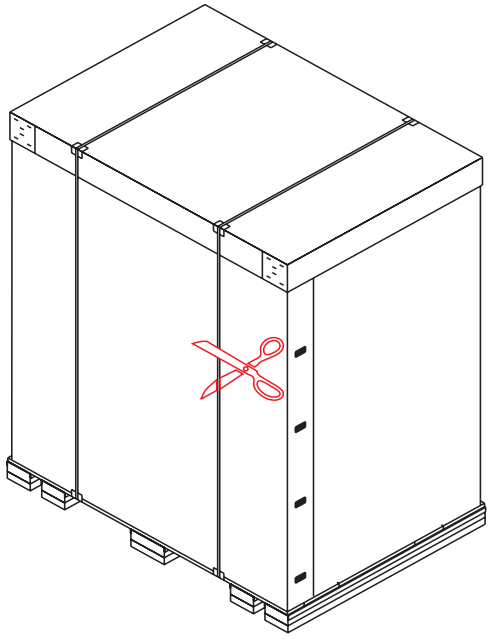

FIGURE 2-5 Removing the Steel Bands

4. **Remove the box top.**

   Lift the cardboard box top cover straight up and off of the pallet as shown in FIGURE 2-6.

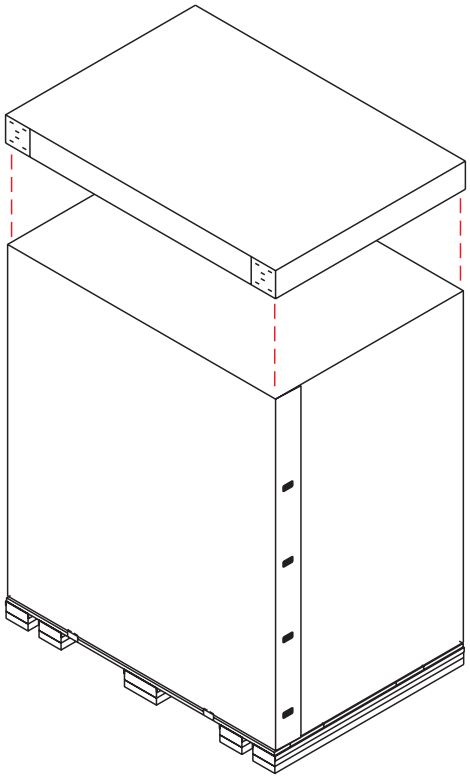

FIGURE 2-6 Removing the Box Top

5. Remove the cardboard box.

From the right side of the container, pull the four cardboard box retaining clips to their open position, remove them, and unwrap the cardboard box from the library as shown in FIGURE 2-7.

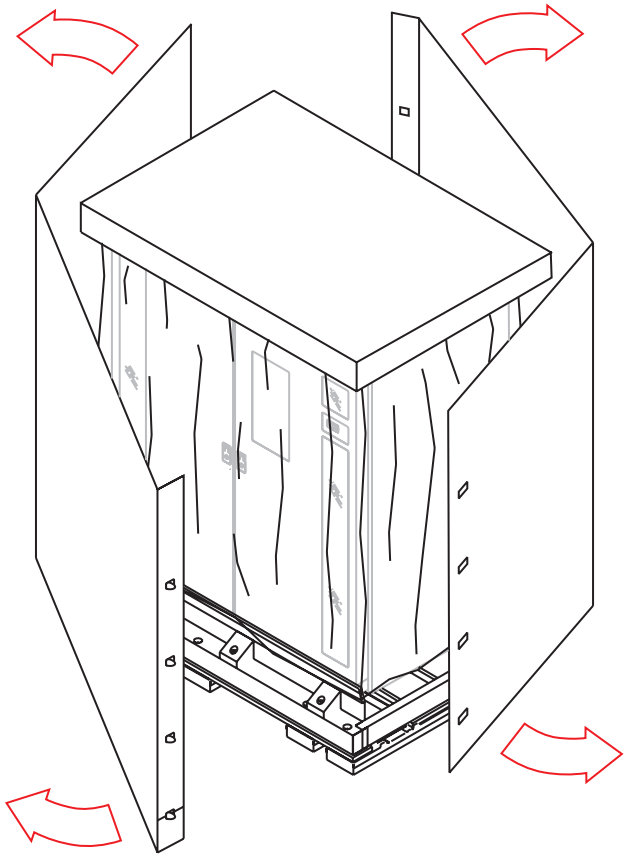

FIGURE 2-7 Removing the Cardboard Box

6. **Remove the accessory kits.**

   Remove the accessory kits from the rear compartment of the crate. Verify that all accessories have been received.

7. **Remove the foam cap.**

   Lift the foam cap up and off of the library as shown in FIGURE 2-8.

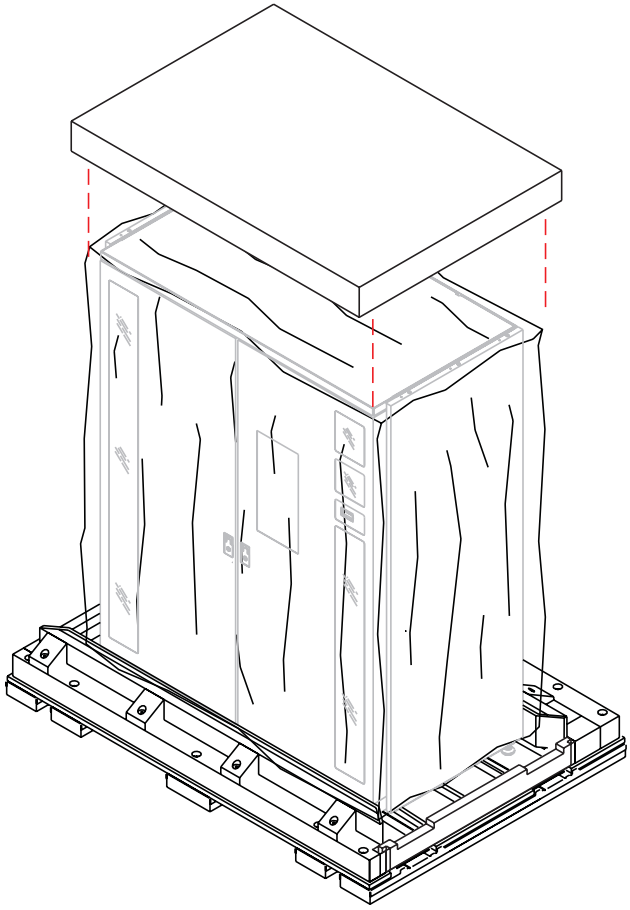

FIGURE 2-8 Removing the Foam Cap

8. Remove the wooden bar.

On the left side of the library, lift the wooden bar out of its brackets on the pallet as shown in FIGURE 2-9.

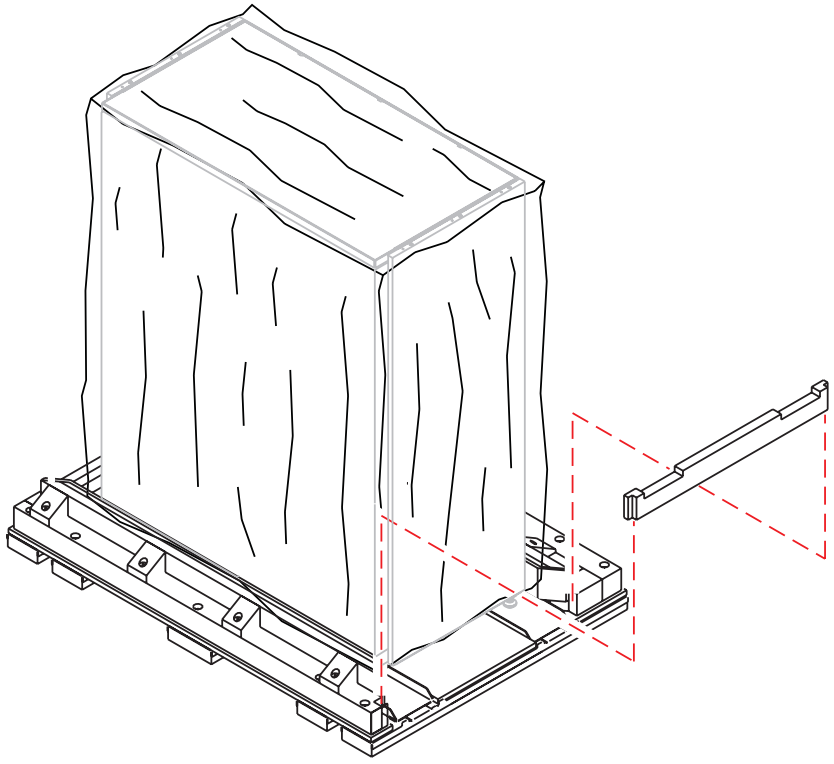

FIGURE 2-9 Removing the Wooden Bars

9. **On the left side of the library, unscrew the bolts that secure the stop blocks.**
   Each stop block is secured with two bolts.

10. **Remove the stop blocks.**
    Remove each stop block from underneath the library as shown in FIGURE 2-10.

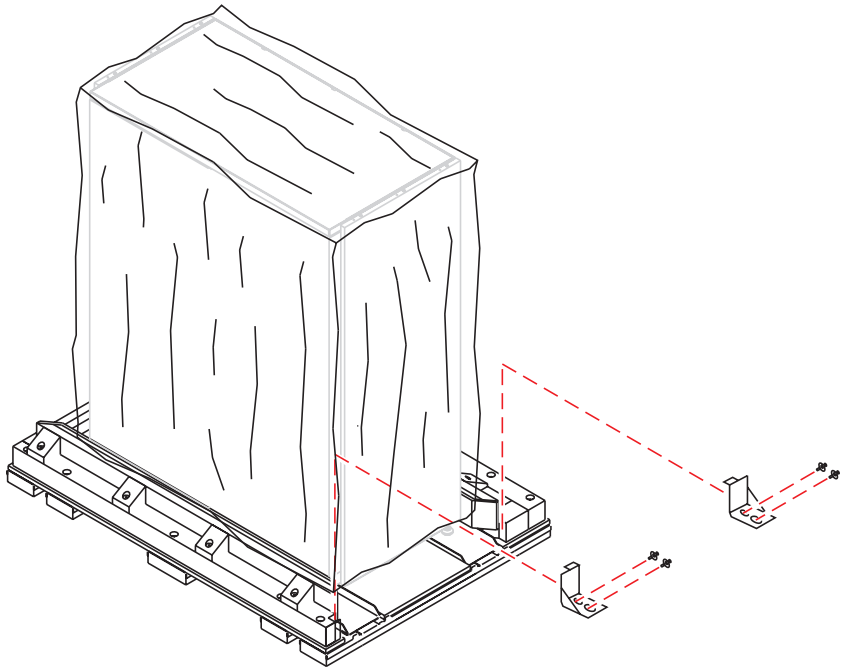

FIGURE 2-10 Removing the Stop Blocks

11. **Replace the wooden bar.**

    Re-insert the left-side wooden bar in its brackets on the pallet to hold the library in place.

12. **Repeat steps 6, 7, and 8 for the right side of the library.**

    Do not replace the right-side wooden bar yet.

13. **Remove the ramp extensions.**

    Slide out the two ramp extensions and the foam block (located underneath the library on the right side) as shown in FIGURE 2-11.

    Place the ramp extensions aside until the library is ready to be positioned.

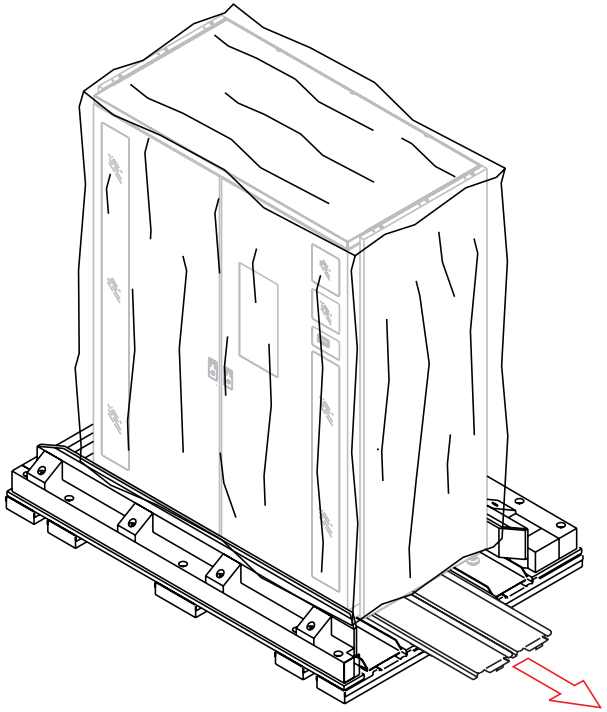

FIGURE 2-11 Removing the Ramp Extensions

14. **Replace the wooden bar.**

    Re-insert the right-side wooden bar into its brackets on the pallet to hold the library in place.

▼ To Position the Library

Caution – The library weighs approximately 1300 pounds (591 kg). Use two or more individuals when rolling the library into position, especially if the library has to be moved over a carpeted area or up or down a ramp.

---

1. **Map out a route to the installation site.**

   Verify the floor clearance, strength, and inclination information found on page 13.

2. **Remove the shipping bag.**

   Carefully lift the shipping bag off of the library as shown in FIGURE 2-12.

Note – Use caution when removing the shipping bag so that it may be used to repack the library.

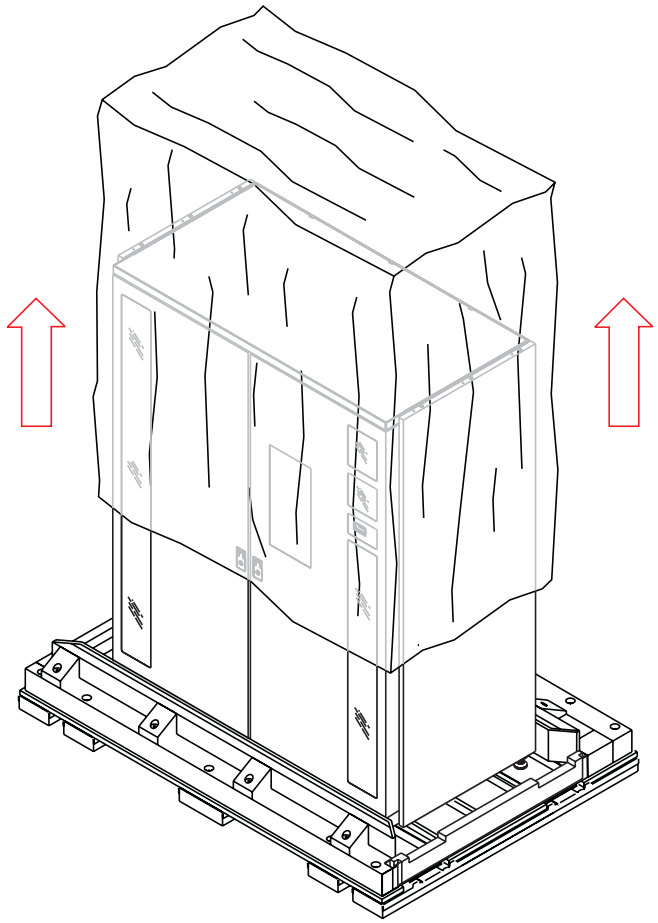

FIGURE 2-12 Removing the Shipping Bag

3. **Inspect the library for any damage that may have occured during shipment.**

4. **Set up the ramp.**

   Place the two ramp extensions in the slots provided at the edge of the pallet as shown in FIGURE 2-13. The ramp may be set up on either the right side or the left side of the pallet.

Note – For clarity, the following illustrations show the ramp set-up procedure from the right side of the library.

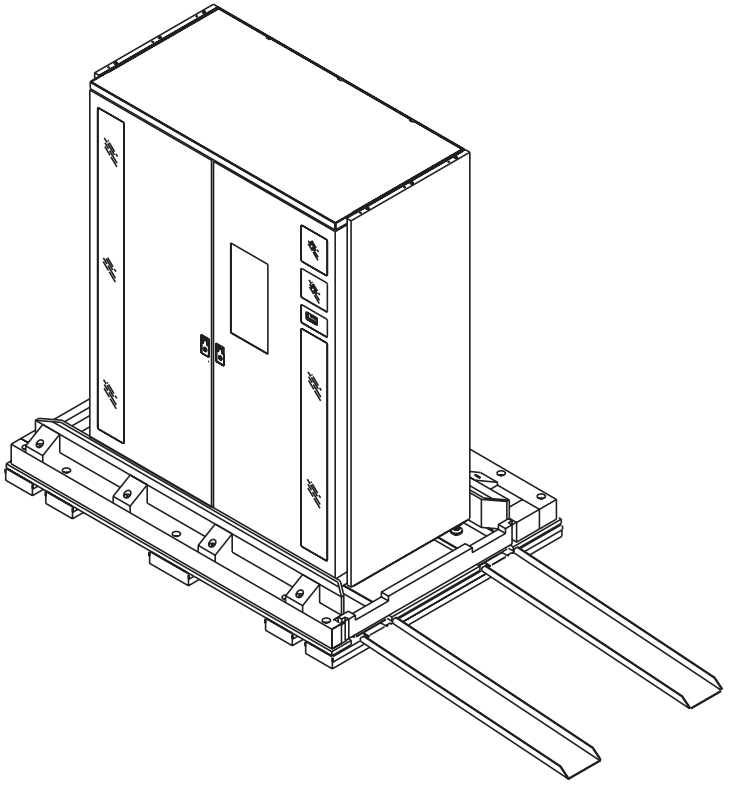

FIGURE 2-13 Preparing the Ramp Sections

5. **Check the leveling feet.**

   Verify that the library's leveling feet are raised. If not, raise each foot as needed by turning the leveling foot counterclockwise until it is 1.27 mm (0.05 in.) above the pallet as shown in FIGURE 2-14.

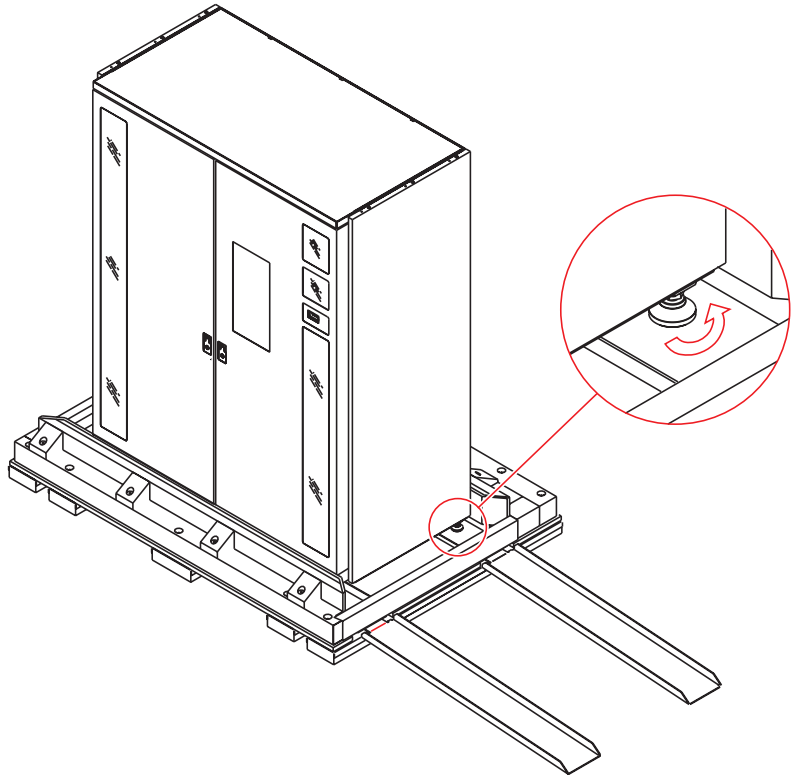

FIGURE 2-14 Raising the Leveling Feet

6. **Move the wooden bar as shown in FIGURE 2-15.**

   a. **Remove the wooden bar from the pallet on the side of the library with the ramp.**

   b. **Place the wooden bar under the ramp extensions for additional support.**

Note – Align the notches in the wooden bar with the ramp extensions.

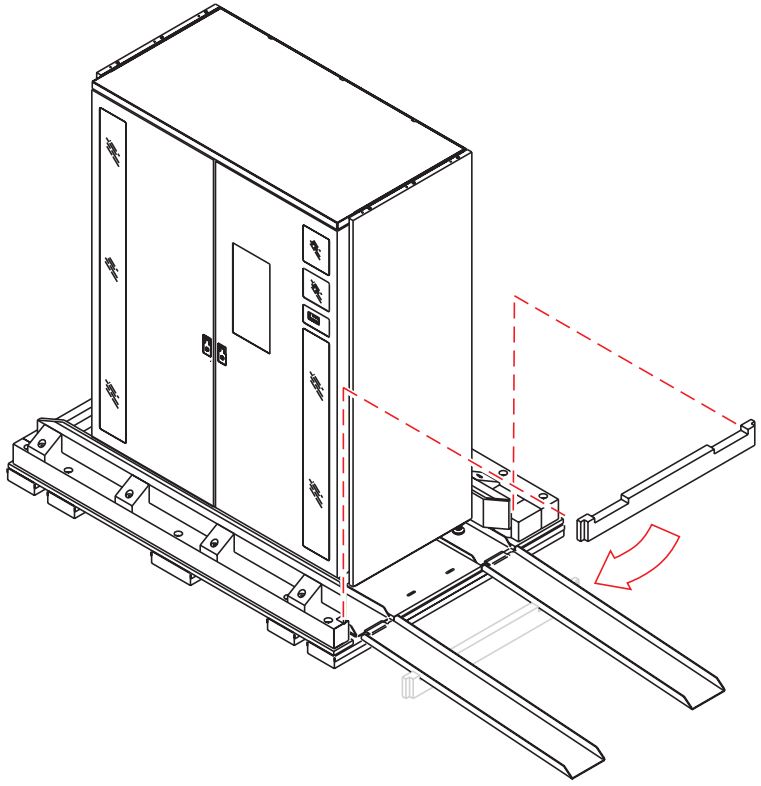

FIGURE 2-15 Removing the Wooden Bar

7. **Move the library down the ramp.**

   With the help of one or more individuals, carefully guide the library down the ramp as shown in FIGURE 2-16. Control the speed of its descent.

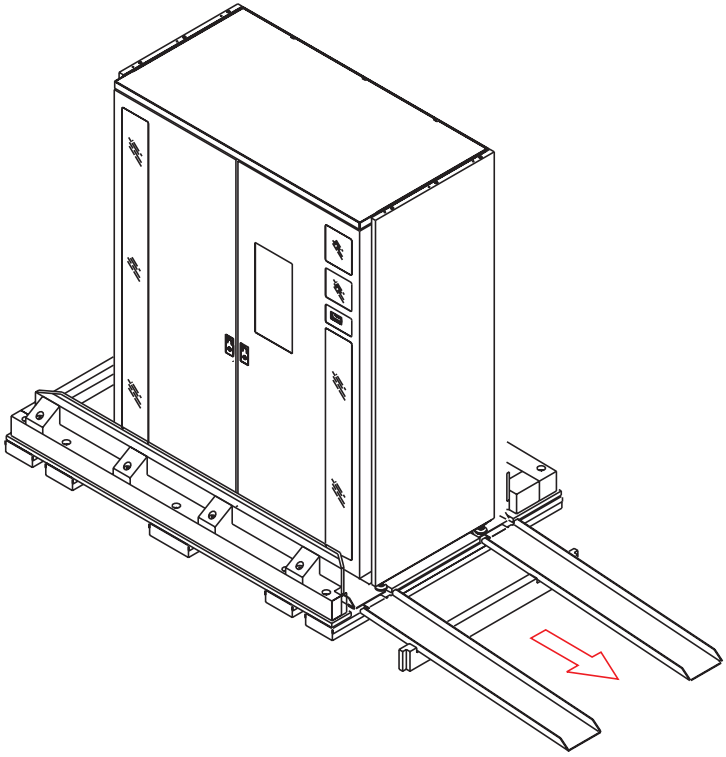

FIGURE 2-16 Rolling the Library Down the Ramp

8. **Carefully roll the library to the installation site and position it as desired.**

   The library should have enough clearance around the cabinet for the field engineer to inspect and level the library.

▼ To Unpack the Library

1. **Using the power cable from the accessory kits, connect the library to a grounded power source.**
2. **Take electrostatic discharge (ESD) precautions as explained in this chapter on page 18.**
3. **Unlock and open the library doors:**

   a. **Using the key from the accessories kit, unlock each door.**

b. Lift each door handle straight up and then turn the handle counterclockwise to unlatch each door.

c. Gently pull on each door handle to open the door.

4. Remove the foam pads inside the front doors and around the robotics.

5. Remove the shipping plate that protects the load port as shown in FIGURE 2-17.

The load port is located in the right door of the library and is secured with a steel plate during shipment.

a. Unscrew and remove the bolts and washers securing the plate to the load port.

b. Remove the shipping plate from the load port.

Note – Use caution when removing and storing the bolts, washers and shipping plate so that they may be used to repack the library.

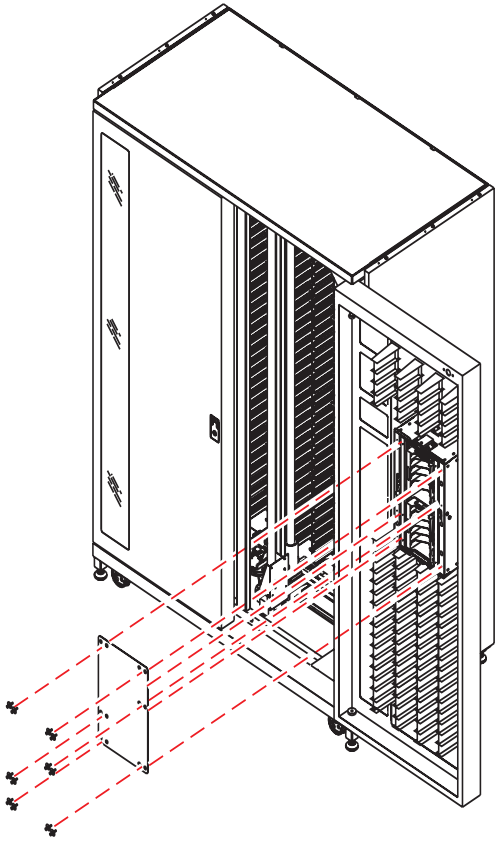

FIGURE 2-17 Removing the Shipping Plate

6. **Remove the restraints that secure the robotics as shown in FIGURE 2-18.**

   The cartridge handling mechanism (CHM) is restrained with three brackets.

   a. **Unscrew and remove the restraining bracket (A) from the CHM and the library floor.**

   b. **Unscrew and remove the restraining bracket (B).**

      Slide the CHM to the left (along the x-axis) to gain access to bracket (B).

   c. **Unscrew and remove the final restraining bracket (C).**

      To gain access to the restraining bracket (C), manually glide the CHM up the y-axis and hold in place, so that the motor assembly is above the library floor.

Note – More than one technician may be required to assist this operation..

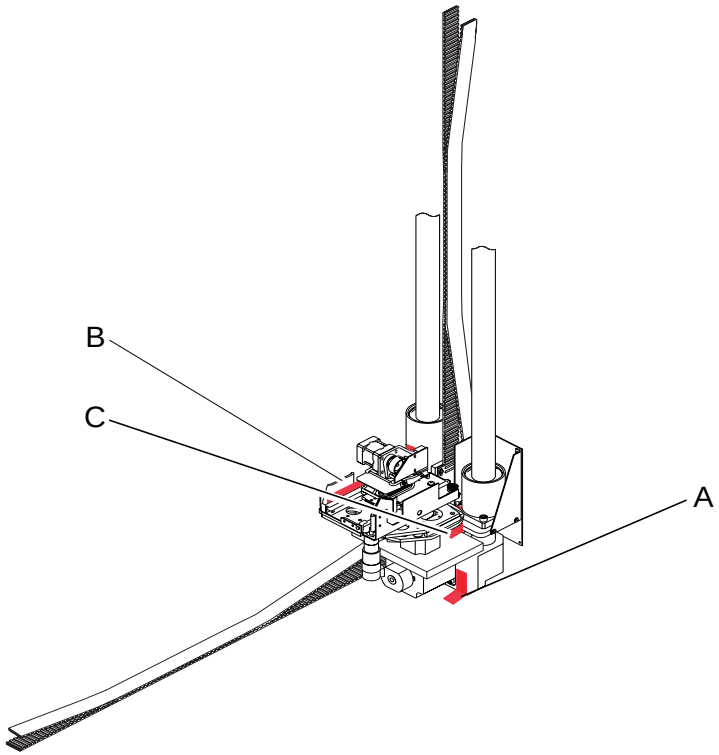

FIGURE 2-18 Robotics Shipping Restraints

▼ To Level the Library

1. **Lower each foot of the library until it makes contact with the floor.**
2. **Apply a 1/4 turn clockwise with the open-end wrench to tighten each foot against the floor.**
3. **Center a carpenter's level on the top front edge of the library.**
4. **Check the gauge on the level. If the front of the library is level, proceed to step 6. If it is not level:**
   a. **Determine the tilt of the library.**
   b. **Lower the foot on the low side of the library by applying a 1/4 turn with the open-end wrench.**
   c. **Repeat this step until the front is level.**
5. **Repeat Step 3 and Step 4 for the left edge, back edge, and right edge of the library.**
6. **Recheck the level on all top edges.**
7. **If necessary, repeat step 3 and step 4 until all four top edges of the library are level.**

Installing the Tape Cartridges

To install the tape cartridges, you need to:

- Label each cartridge
- Set the write-protect switch
- Place cartridges in the fixed bins

Caution – Handle tape cartridges with care. Do not drop or bang them, or place them near anything magnetic.

▼ To Label a Cartridge

Attaching a bar code label to each tape cartridge enables the library to identify the cartridge quickly, thereby speeding up inventory time.

- **Place the label in the slide-in slot on the front of the cartridge as shown in FIGURE 2-19.**

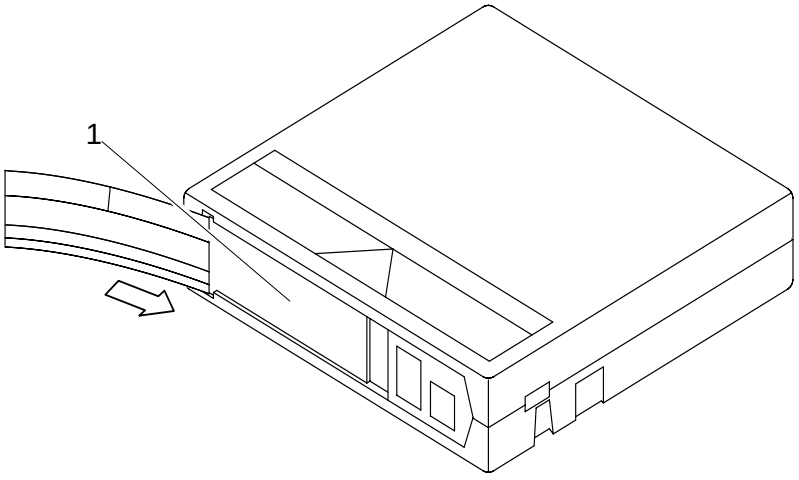

FIGURE 2-19 Inserting a Bar Code Label

1. Slide-in slot

Note – Only use bar code labels that have been designed for CompacTape cartridges. Do not adhere labels to a cartridge anywhere except the slide-in slot.

▼ To Set the Write-Protect Switch

Each CompacTape cartridge has a write-protect switch (FIGURE 2-20). This switch determines whether new data can be written to the cartridge (*write enabled*) or whether data on the cartridge is protected from being erased or overwritten (*write protected*).

- **To write-protect the cartridge, move the switch to the left (as indicated by the arrow in FIGURE 2-20). To write-enable the cartridge, leave the switch in default condition (to the right).**

  An orange indicator appears above the switch when the cartridge is write-protected.

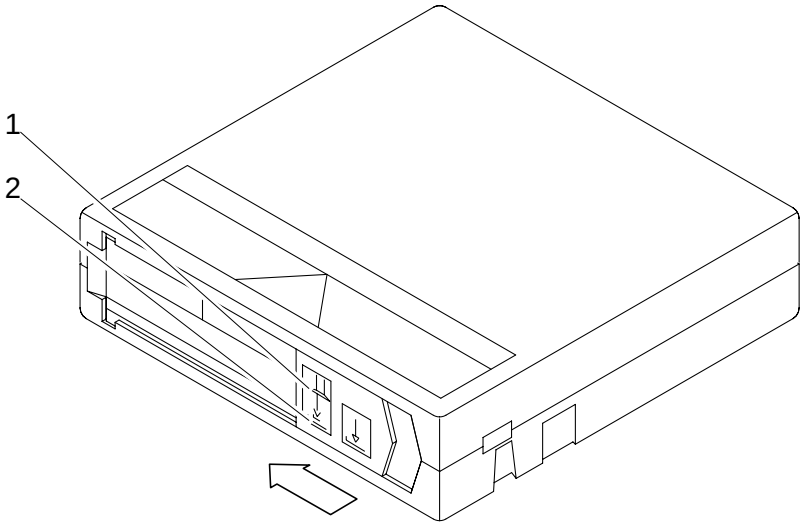

FIGURE 2-20 Setting the Write-Protect Switch

1. Orange indicator 2. Write-protect switch

▼ To Place the Cartridges in Fixed Storage Bins

- **Place a tape cartridge in each fixed storage bin along the back wall of the library and on the inside of the left and right front doors. Be sure all cartridges are properly oriented (as shown in FIGURE 2-21) and seated in the bins.**

  Each cartridge should slide into place with very little force. If a cartridge does not slide into place easily, check the cartridge for correct orientation and structural integrity.

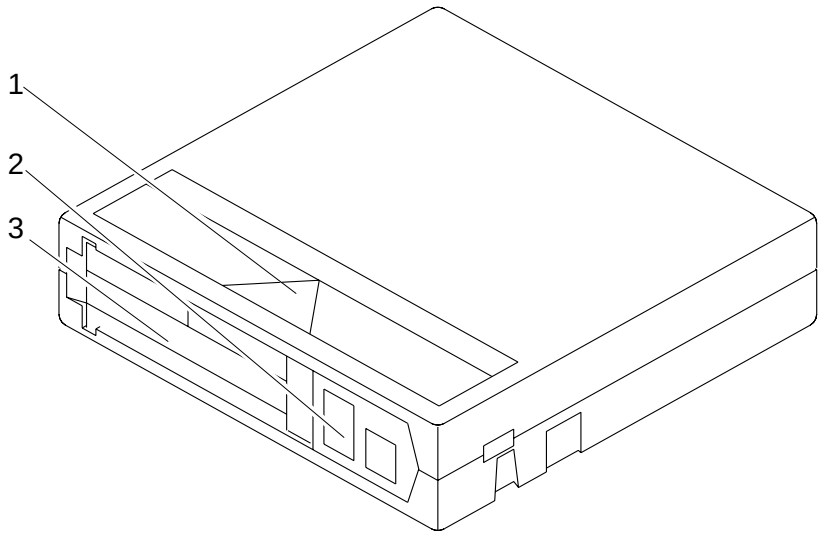

FIGURE 2-21 Correct Tape Cartridge Orientation

1. Insertion Arrow
2. Write-protect Switch
3. Bar Code Label

Caution – Handle tape cartridges with care. Do not drop or mishandle tape cartridges. Rough handling can displace the tape leader, making the cartridge unusable and possibly a hazard to the tape drives.

Preparing the Library for Operation

To prepare the library for operation:

- Lock the library doors and access ports
- Connect the host workstations to the library

▼ To Close the Library Doors and Access Panels

The library has two front doors and three rear access panels.

1. **Close and lock the front doors.**
   a. **Close one door and then the other.**
   b. **Turn the door latches to secure the doors to the library frame.**
   c. **Lower the latches over the door locks. Be sure the door locks fit into the cutouts in the latches.**
   d. **Using the key from the accessory kit, lock the latches in place.**
2. **Close and lock the rear access panels using the hex wrench from the accessory kit.**

▼ To Connect the Host Workstations

Note – Sun ships sufficient SCSI cables and terminators with this library to set up two-drive buses.

- **Attach SCSI cables and jumpers as shown in the applicable figure.**

  FIGURE 2-22 and FIGURE 2-23 show the cabling configurations for the 16-drive and 4-drive library, respectively.

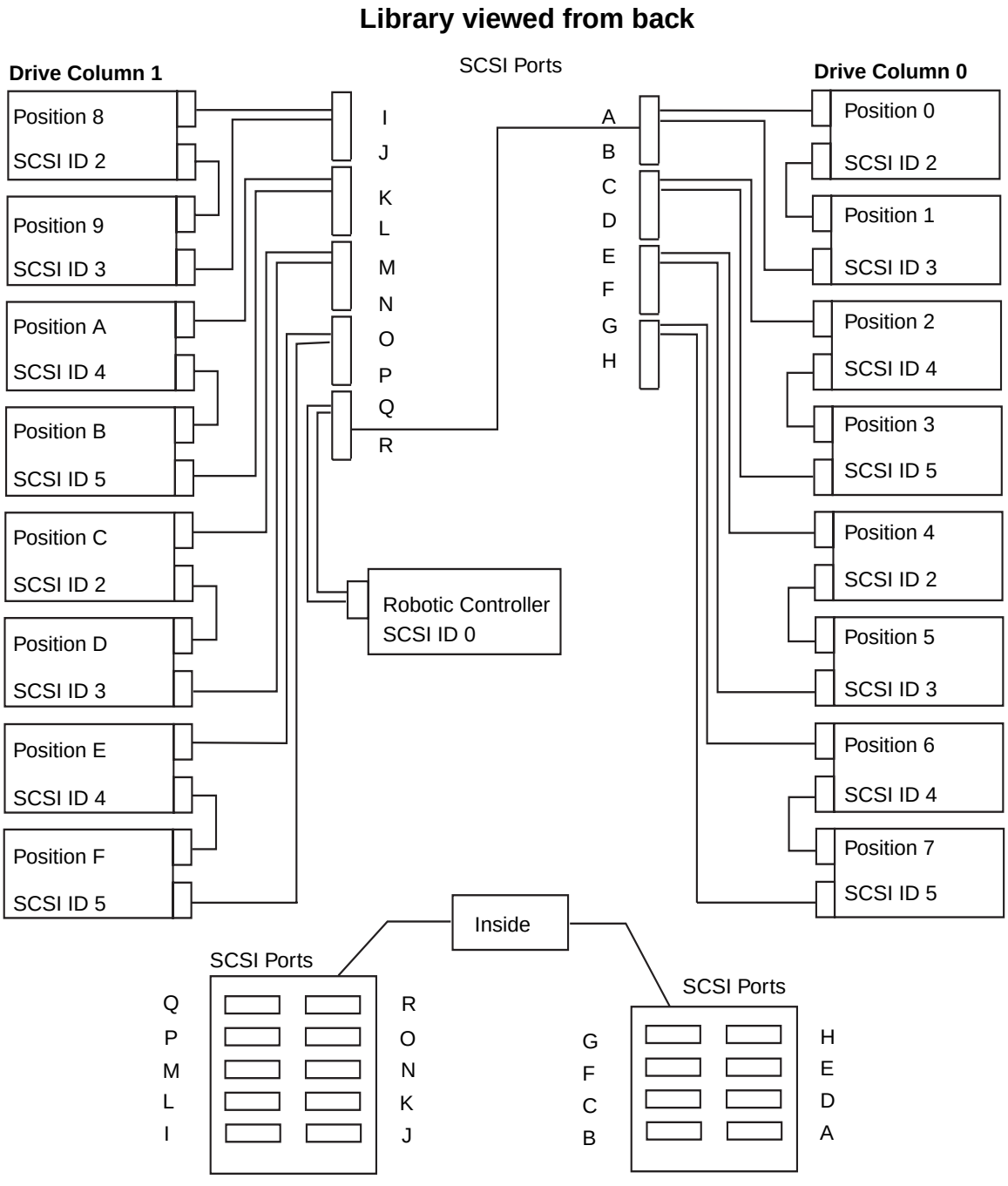

FIGURE 2-22 Cabling Configuration—16-Drive Library

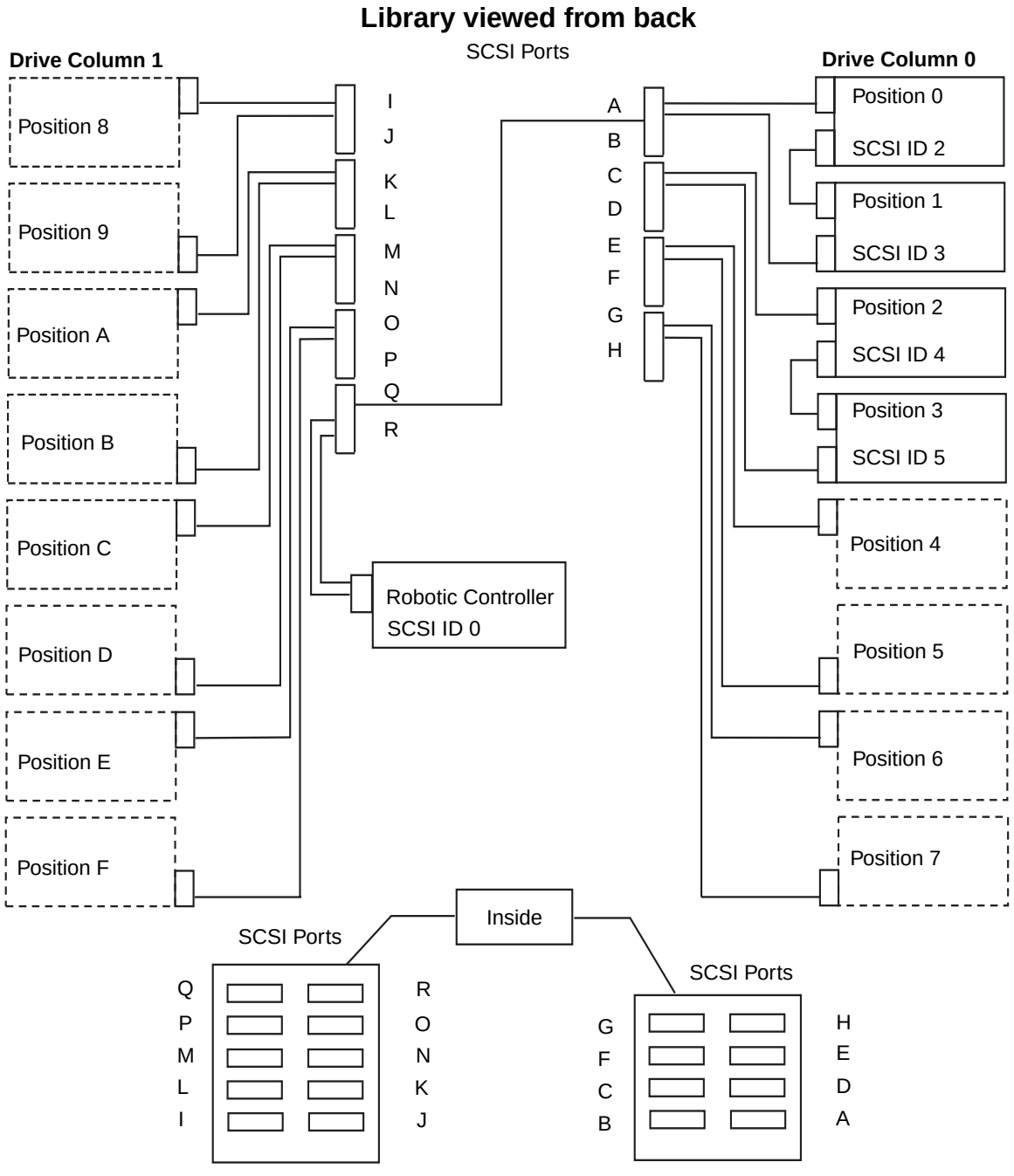

FIGURE 2-23 Cabling Configuration—4-Drive Library

Turning the Library On and Off

This section explains how to:

- Turn on the library
- Place the library on-line or off-line
- Turn off the library
- Test the installation

▼ To Turn On the Library

1. **Verify the following:**
   - All doors and access panels are closed
   - All back panel cable connections are firmly in place

Note – If there are two AC power distribution assemblies, there will be two main circuit breakers.

---

2. **Turn on CB1 on the AC distribution assembly located in the base of the cabinet behind the left tape drive access panel.**

   If the AC distribution assemblies are present turn on CB1 on both assemblies.

3. **Turn on the power switch located below the GUI.**

4. **After several seconds, verify that the current state of the library (“System On-line” or “System Off-line”) appears on the GUI state display.**

▼ To Place the Library On-line or Off-line

- **With the library turned on, press the Standby button on the GUI.**

  Pressing the Standby button toggles the library between on-line and off-line states.

▼ To Turn Off the Library

1. **Place the library off-line by pressing the Standby button**

   The library robotics completes any current commands and then stops.

2. **Verify that the GUI state display indicates “System Off-line.”**

3. **Verify that the cartridge handling mechanism (CHM) is empty by checking the Overview screen on the GUI (see Chapter 3).**

   If there is a tape cartridge in the CHM, perform a Move command to place the cartridge in an available bin.

4. **Turn off the power switch located below the GUI.**

5. **Turn off CB1 on the AC power distribution assembly (or both assemblies if two are present).**

Note – Wait ten seconds before turning on the power switch again.

Testing the Installation

After you finish installing the library, perform the following operations to set up and test the library:

- Calibrate the library
- Exercise the library
- Issue SCSI commands from each of the host computers

For more information about the Calibrate Library and Exercise Library commands, see Chapter 3. For more information about issuing SCSI commands from the host computer, refer to the host computer operating system/application software documentation.

CHAPTER 3

Basic Library Operations

This chapter provides an overview of the touch screen graphical user interface (GUI) and describes the following basic library operating procedures:

Using the GUI

The graphical user interface (GUI) display is located on the front of the library. The GUI consists of a touch screen superimposed over a set of menus that can be used to obtain information about the library, execute library commands, and test library functions (shown in FIGURE 3-1).

GUI functions are grouped into the following four screens:

- *Overview screen* - Displays current tape drive, cartridge handling mechanism (CHM), and load port content and activities.
- *Tapes screen* - Displays tape drive, storage bin, load port, and gripper inventories.
- *Operator screen* - Contains library configuration and control functions (password protected).
- *Service screen* - Contains reporting functions, system tests, and service commands (password protected).

TABLE 3-1 displays the components of these screens.

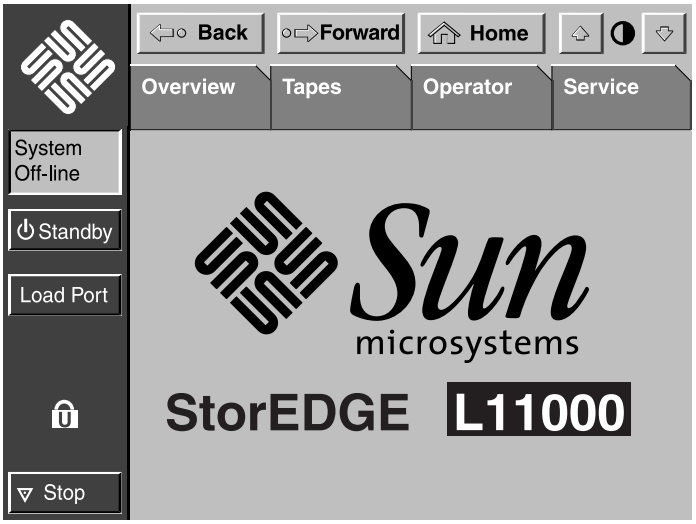

FIGURE 3-1 GUI—Initial Screen

TABLE 3-1 GUI Components

Overview Screen	Tapes Screen	Operator Screen*	Service Screen*
Status display • Tape drives • Activity • Load port	Inventory display • Tape drives • Storage bins • Load port • Transport (CHM)	Configure • Configure Library • Configure Options Control • Move Cartridges • Inventory Tapes • Calibrate Library • Exercise Library • Unload Drive • Unload Imp/Exp (CHM)	Reports • Statistics • Actuator • SysTest Results • Auto Clean Tests • SysTest Library • Operate Axes Miscellaneous • Initialize Nonvol Stats • Initialize Nonvol Config • Change Password

*These screens are password protected.

Basic Operation

You can activate the GUI by touching the screen.

Opening a Screen

To open one of the four main screens, touch the desired tab near the top of the GUI. The Overview and Tapes screens are accessible to any user. The Operator and Service screens require a password.

Once the desired screen appears on the GUI, you can view information or press buttons to run commands and open other screens.

Navigating From Screen to Screen

Three buttons enable you to move backward and forward through screens you have already opened.

- *Back button* - Moves backward screen by screen through previous selections.
- *Forward button* - Moves forward screen by screen through previous selections.
- *Home button* - Returns to the home (initial) screen.

Exiting a Screen

To exit any screen, press the Back or Home button.

While a command is running, a “Command In Progress” dialog box is displayed on the GUI with an Abort button. Pressing Abort cancels the command and stops the ongoing operation.

After pressing Abort, it is still necessary to press the Back button to exit the screen associated with the aborted command.

Library Controls

Library controls are located along the top and left side of the GUI in the horizontal and vertical bars as shown in FIGURE 3-2.

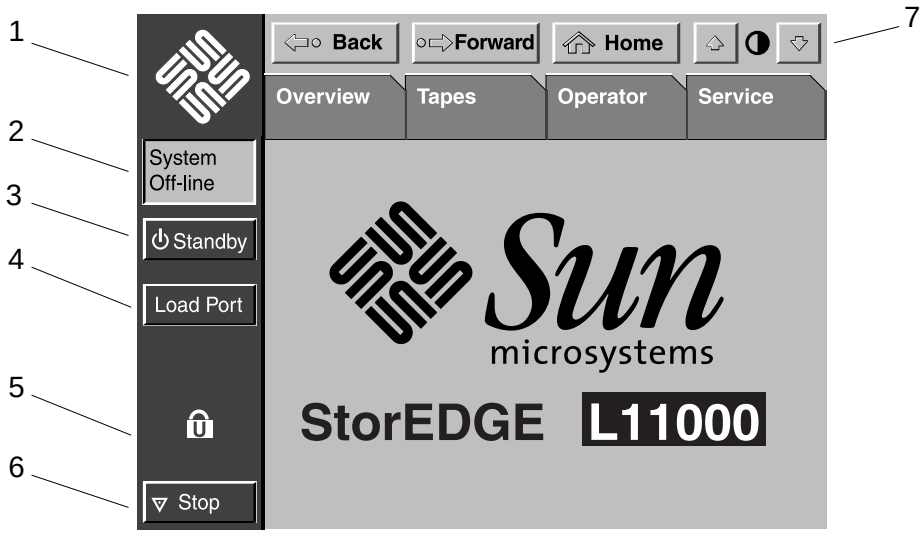

FIGURE 3-2 Library Controls

1. Company logo
2. System state display
3. Standby button
4. Load Port button
5. Lock icon
6. Stop button
7. Contrast buttons

These controls function as follows:

- *Contrast buttons* - Adjust the contrast of the GUI screen.
- *Company logo* - Displays a company information screen.
- *System state display* - Shows the current state of the library (system on-line, system off-line, system stopped, door open, and so on).
- *Standby button* - Toggles the library between on-line and off-line states.
- *Load Port button* - Releases and locks the load port door. If the load port is locked in the closed position, pressing this button releases the load port and then locks it in the open position. If the load port is locked while in the open position, pressing this button releases it, allowing you to rotate the load port to the closed position (where it automatically locks).
- *Lock icon* - Shows the current security level at the GUI. Five security levels are available: service (S), operator (O), user (U), import only (I), and locked (L). TABLE 3-2 describes the attributes of each security level.

- *Stop button* - Halts library activity immediately by stopping power to the library robotics. Pressing the Stop button a second time restores power to library robotics.

TABLE 3-2 Security Levels (listed from highest to lowest)

Level	Lock Icon Indicator	Password Protected	Overview Screen Access	Tapes Screen Access	Operator Screen Access	Service Screen Access	Load Port Access	Stop and Standby Access
Service	S	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Operator	O	Yes	Yes	Yes	Yes	No	Yes	Yes
User	U	Yes	Yes	Yes	No	No	Yes	Yes
Import Only	I	Yes	Yes	Yes	No	No	Yes	No
Locked	L	No	Yes	Yes	No	No	No	No

The default passwords are:

- Service “5678”
- Operator “1234”
- User “2222”
- Import Only “1111”

For more information on password and security levels, go to “Changing GUI Security Levels” on page 53.

Obtaining Library Status

The Overview and Tapes screens on the GUI provide library status. The Overview screen displays a snapshot of the tape drives, robot activity, and load pack inventory (FIGURE 3-3). The Tapes screen displays the inventory of all elements in the library (FIGURE 3-5).

To display the Overview or Tapes screen, press the appropriate tab in the GUI.

Overview Screen

The Overview screen consists of:

- Drive status
- CHM activity
- Load port content and status

FIGURE 3-3 Overview Screen

1. Element number
2. Element status
3. Compression-enabled
4. Cartridge present
5. Bar code number
6. Write-enabled

Drives Status

The Drives area displays if:

- A tape drive has a cartridge
- The cartridge is write-enabled or write-protected
- Compression is enabled

It also displays the bar code number of the cartridge if the label can be read.

For a more detailed view of drive status, press the screen anywhere in the Drives area to display the Tape Drive Status box (FIGURE 3-4). Use the arrow buttons at the bottom of the box to scroll to the desired drive.

To return to the Overview screen, press the screen anywhere in the Tape Drive Status box.

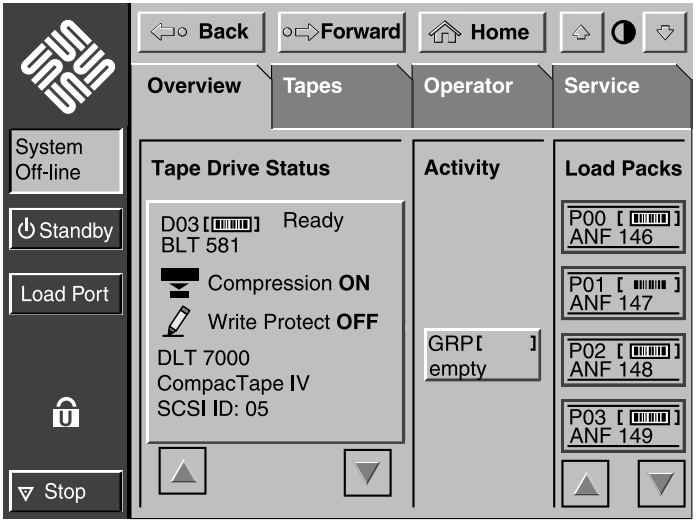

FIGURE 3-4 Tape Drive Status Box

Activity Status

The Activity area shows the source element, the transport medium, and the destination element involved in the activity; the current location of the tape cartridge; and the progress of the activity.

Load Port Status

The Load Port area identifies tape cartridges currently stored in either pack in the load port. Use the arrow button to view contents not currently displayed.

Tapes Screen

The Tapes screen identifies the tape cartridges residing in the following elements:

- Tape drives
- Storage (fixed storage bins)
- Load port
- Transport (gripper)

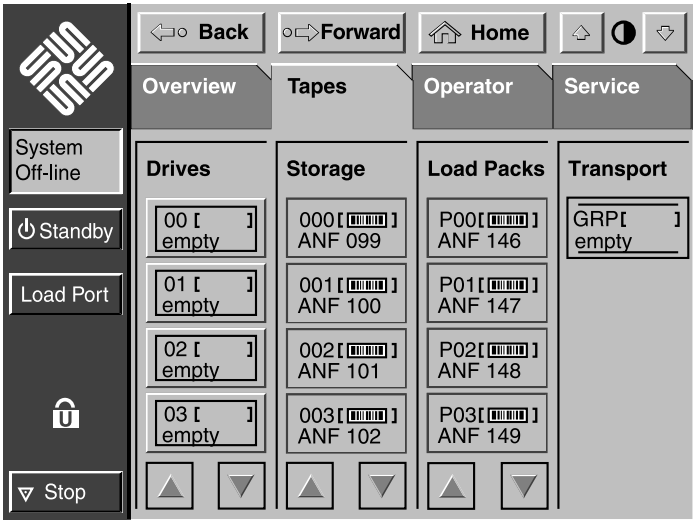

FIGURE 3-5 Tapes Screen

Viewing Storage and Load Pack Elements

The Drives, Storage, and Load Pack categories may contain too many elements to display at once. To scroll through these elements, use the arrow buttons at the bottom of each category.

You can also expand the Drives, Storage, or Load Pack list to fill the screen by touching the desired category anywhere above the scrolling arrows. To return to the start of the Tapes screen, press the Back button.

Changing GUI Security Levels

There are five levels of security for the StorEdge L11000 library GUI:

- *Service (S)* - Provides access to both the Operator and Service screens and all functions on the system bar.
- *User (U)* - Provides access to screens that are not password protected (Overview and Tapes screens) and all functions on the system bar.
- *Operator (O)* - Provides access to the Operator set of screens and all functions on the system bar.

- *Import Only (I)* - Provides access to the Overview and Tapes screens and to the load port button on the system bar (no stop or standby).
- *Locked (L)* - Provides access to the Overview and Tapes screens only.

The current security level (S, O, U, I, or L) appears in the security level indicator (lock icon) at the lower left corner of the GUI.

Securing the GUI

When the User security level is set, access is restricted to the Operator and Service screens. Since these screens control library configuration, testing, and initializing functions, the User security level is the appropriate default condition for routine library operation.

For more information about changing to a higher security level to access the Operator or Service screens, see “Opening the Operator Screen” on page 59 or “Opening the Service Screen” on page 71.

▼ To Change the Security Levels

1. **Press the lock icon.**

   The Password screen will appear (FIGURE 3-6).

2. **Press the desired security level button (Service, Operator, User, Import Only, or Locked).**

3. **Enter a password if necessary.**

   A password is required to enter a higher security level than the current level.

4. **Press the Select button.**

   A screen appears indicating that the new security level has been set successfully.

5. **Press OK.**

   The lock icon displays the new level of security (S, O, U, I, or L).

Note – This procedure is especially useful to change from Operator or Service levels to the User level after running an Operator- or Service-level command.

Note – If the GUI is accessed from the Service (S) or Operator (O) level, and no activity has occured for 15 minutes, the GUI will return to the initial screen (as shown in FIGURE 3-1).

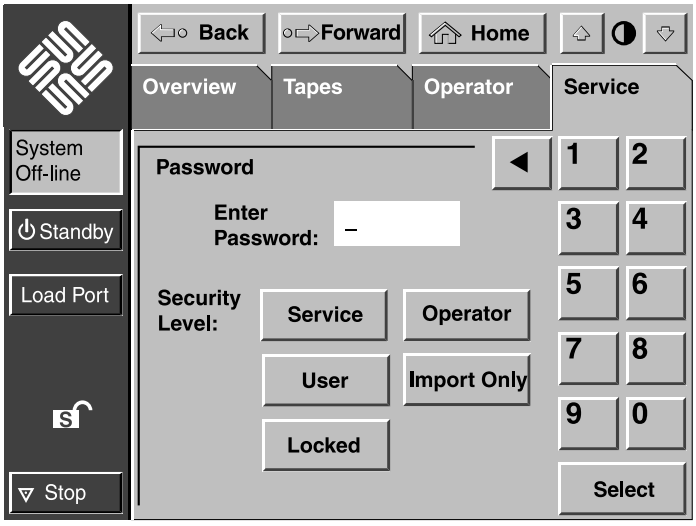

FIGURE 3-6 Password Screen

Inserting and Ejecting Tape Cartridges

This section explains how to insert tape cartridges using the load port mechanism.

Caution – Do not use CompacTape I, CompacTape II, or CompacTape IIIXT cartridges in this library.

▼ To Insert a Tape Cartridge

Caution – Opening or closing the load port door presents mechanical hazards. Do not insert hands or fingers into the load port opening at any time.

Note – To move cartridges to the load port for removal, refer to “Unloading a Drive” on page 68.

1. **Prepare the tape cartridges to be inserted by affixing a bar code label and write-protecting or write-enabling each cartridge as desired.**

   For more information about these procedures, refer to “Installing the Tape Cartridges” on page 36.

2. **Press the Load Port button on the GUI.**

   The library unlocks the load port. The load port door springs open slightly when unlocked.

3. **Use the finger grip on the load port door to open the door completely.**

4. **With the load port door open, place the tape cartridge in an available load port slot.**

   The proper orientation for tape cartridge insertion is shown in FIGURE 2-21.

5. **Manually close the load port door.**

   If auto load is enabled, the library automatically moves a cartridge to an available bin.

▼ To Manually Eject a Cartridge

To manually eject a tape cartridge from one of the tape drives:

1. **Open one or both of the library front doors:**

   a. **Press the Standby button on the GUI.**

      This places the library in off-line state.

   b. **Verify that the GUI state display reads “System Off-line” and that the robotics have stopped moving.**

      The off-line state does not take effect until current commands are completed.

   c. **Take electrostatic discharge precautions as explained in “Taking ESD Precautions” on page 18.**

   d. **Using the key from the accessories kit, unlock each door.**

   e. **Lift each door handle straight up and then turn the handle counterclockwise to unlatch each door.**

   f. **Gently pull on each door handle to open the door.**

2. **Press the Unload button on the drive.**

   When you press Unload, the tape cartridge rewinds. This may take between 10 to 120 seconds. When the rewind process is completed, the Operate Handle indicator will illuminate.

3. **When the Operate Handle indicator comes on, raise the insert/release handle to eject the tape cartridge.**

4. **Pause for 2 seconds, then grasp the tape cartridge and slowly pull it halfway out of the drive.**

   If the tape cartridge leader failed to detach from the take-up leader, push the tape cartridge all of the way back into the drive, press down the insert/release handle, and return to Step 3. Otherwise, continue to Step 5.

5. **Pull the tape cartridge completely out of the drive.**

6. **Close and lock the library doors.**

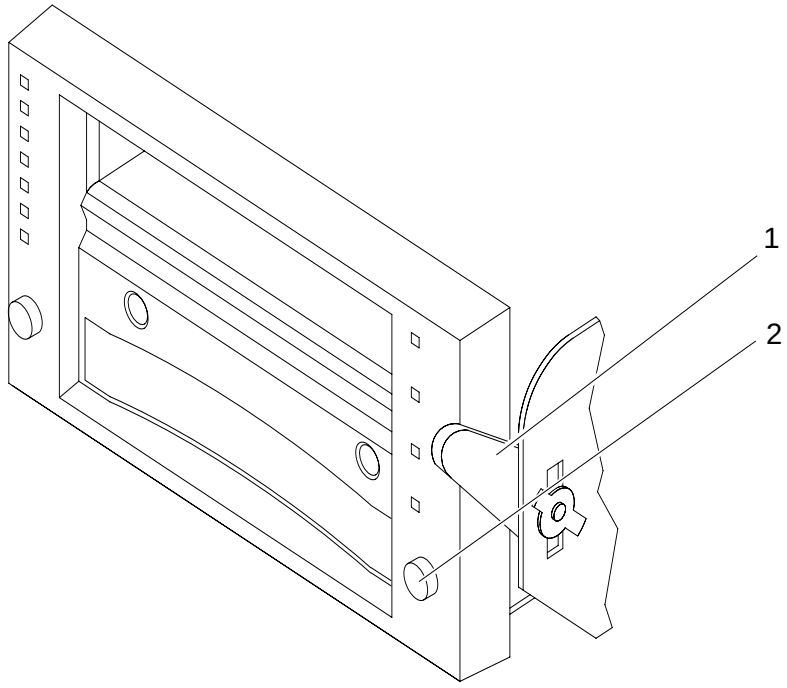

FIGURE 3-7 DLT7000 Drive Front Bezel

1. Insert/release handle (up position) 2. Unload button

CHAPTER 4

Operator Commands

This chapter describes the commands found on the Operator screen of the library GUI. These commands include:

Note – The library must be off-line to perform any of the functions listed above.

Opening the Operator Screen

▼ To Open the Operator Screen

1. **Press the Operator tab.**

   The password screen is displayed (FIGURE 4-1).

2. **Enter the correct operator or service password to gain access to the Operator Screen (**FIGURE 4-2**).**

   The default operator password is 1234.

Note – For information about changing passwords, see “Changing Passwords” on page 77.

FIGURE 4-1 Password Screen

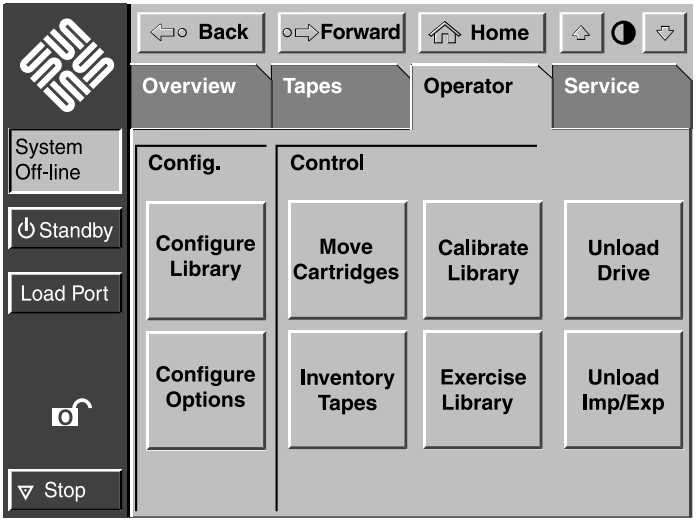

FIGURE 4-2 Operator Screen

Configuring the Library

The Configure command enables you to assign the following:

- Library model number
- Number of storage bins
- Number of drives
- Library SCSI ID
- Tape drive SCSI ID

▼ To Configure Library Attributes

1. **In the Operator screen, press the Configure Library button.**

   The Configure: Library screen is displayed (FIGURE 4-3).

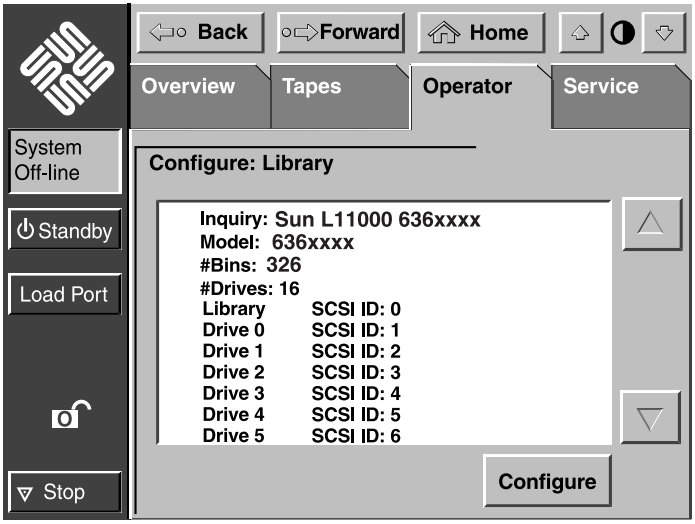

FIGURE 4-3 The Configure: Library Screen

2. **Press the Configure button.**

   The Configure: Library Settings button is displayed (FIGURE 4-4).

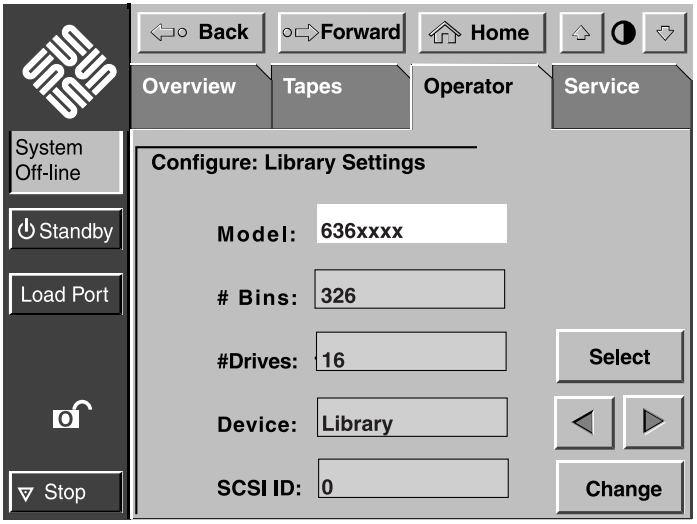

FIGURE 4-4 The Configure: Library Settings Screen

3. **Press the Select button until you highlight the setting you want to change.**
4. **Using the arrow buttons, scroll through available values for the setting.**
5. **Press the Change button to accept the new value.**
6. **Repeat Steps 3 through 5 to make other changes.**
7. **Press the Back button to return to the Configure: Library screen.**

   The options you selected are now part of the library configuration.

Note – Changing the library model number on the configuration screen will automatically change the bin and drive configuration. The number of drives or bins will not be changed by a user individually.

SCSI ID Assignment Guidelines

When selecting SCSI ID numbers using this procedure, remember that each SCSI device on the same bus must have a unique number from 0 to 15. SCSI devices include the library robotics, the host computer, the library tape drives, internal and external hard disk drives, and so on.

If you set up the library with multiple SCSI buses (see Appendix C), you can assign the same number to two or more devices, provided each device is on a different SCSI bus.

Note – Power must be recycled for the new SCSI ID number to become effective.

Configuring Library Options

The Configure Options command enables you to set the following:

- *Power-On State* - Determines whether the library is on-line or in standby mode when powered up.
- *Auto Clean* - Enables the library to perform drive cleaning tasks automatically as needed.
- *Retries* - Causes the library to automatically retry a failed command before issuing an error message.
- *Bar Code Labels* - Turns bar code scanning on or off during inventory. It should be disabled when the library contains cartridges that are not labeled.
- *Auto Inventory* - Causes the library to perform an inventory whenever the library is powered up.
- *Auto Load* - Causes the library to automatically move cartridges in the load packs to empty storage bins as soon as the load port door closes.
- *Temp. Detection* - Enables or disables the over-temperature detection warning and shutdown features of the library.
- *4/52 identity* - Causes the library to return the same inquiry string as the ACL 4/52 library.
- *Power-On Security* - Determines the library security level when powered up.

For more information about these features, refer to the *Sun StorEdge L11000 Software Interface Guide*.

▼ To Configure a Library Option

1. **In the Operator screen, press the Configure Options button.**

   The Configure: Options screen is displayed (FIGURE 4-5).

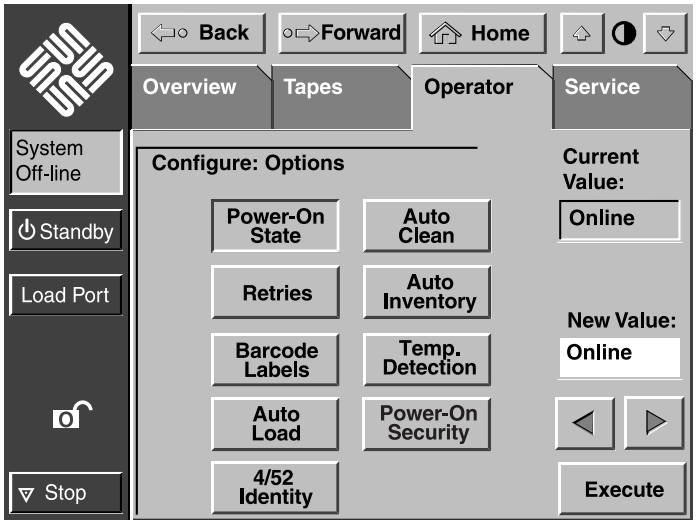

FIGURE 4-5 The Configure: Options Screen

2. **Press the button with the desired option.**
3. **Using the arrow buttons, scroll through available values for the selected option.**
4. **When the desired value appears in the New Value box, press the Execute button to apply the new value.**

   The new value is displayed in the Current Value box.
5. **Repeat Steps 2 through 4 to change other configuration options.**
6. **When you have finished making changes to library options, press the Back button until you return to the initial Operator screen.**

Calibrating the Library

The Calibrate Library command enables you to calibrate the storage bins, the tape drives, the load port, or the entire library. Calibrate the library during initial installation and after any maintenance procedure.

▼ To Calibrate Library Elements

1. **In the Operator page, press the Calibrate Library button.**

   The Calibrate Library screen is displayed (FIGURE 4-6).

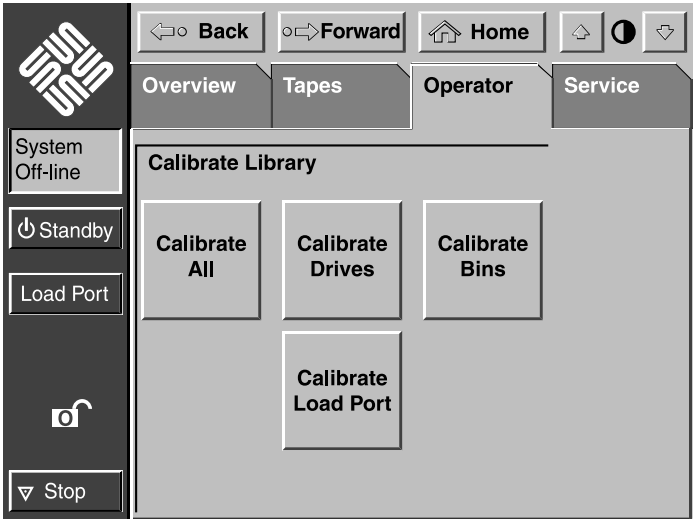

FIGURE 4-6 Calibrate Library Screen

2. **Press the button with the desired calibration option.**

   Pressing Calibrate All causes the drives, bins, and the load port to be calibrated.

   A “Command In Progress” screen is displayed while the calibration process is in progress.

3. **When the calibration process is completed, repeat the steps described above to perform another calibration, if desired.**

Exercising the Library

The Exercise Library command tests the robotics and the calibration by randomly moving tape cartridges from one storage location to another.

▼ To Exercise Library Elements

- **Press the Exercise Library button in the Operator screen.**

  A “Command In Progress”dialog box appears.

  The exercise process runs continuously until you stop the process by pressing the Abort button.

Note – The exercise process is also stopped if an error is detected. In this case, an error message appears in the GUI screen.

Performing an Inventory

The Inventory Tapes command determines the bar code labels of the cartridges in the tape drives, fixed storage bins, and the load port. All elements that contain cartridges without labels are marked as full with no label.

▼ To Perform an Inventory

- **Press the Inventory Tapes button in the Operator screen.**

  A “Command In Progress” dialog box appears.

  The inventory process continues until all storage elements have been checked or until you stop the process by pressing the Abort button.

Note – The inventory process is also stopped if an error is detected. In this case, an error message appears on the GUI screen.

Moving Cartridges

The Move Cartridges command allows you to move any tape cartridge in the library to the destination you specify. This destination can be a storage bin, a tape drive, the load port, or the gripper.

Note – To move a cartridge from a tape drive, first issue an Unload Drive command as explained in “Unloading a Drive” on page 68.

▼ To Move a Cartridge

1. **In the Operator screen, press the Move Cartridges button.**

   The Control: Move Cartridges screen appears with the Source input field active (FIGURE 4-7).

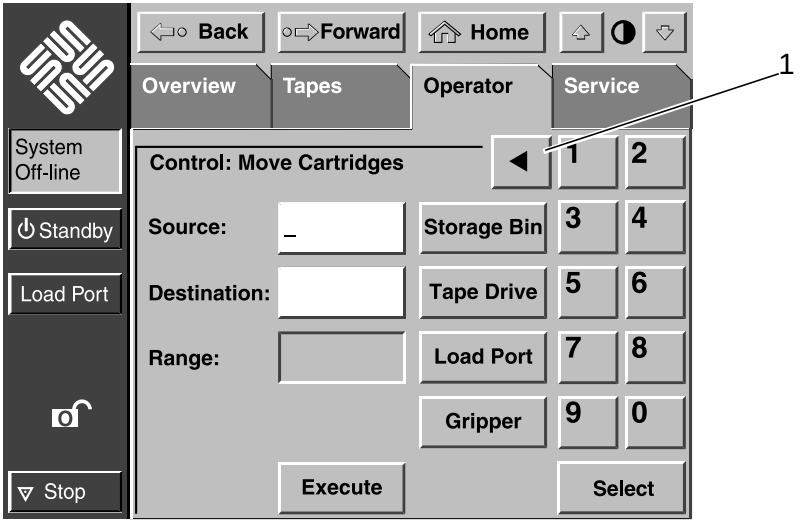

FIGURE 4-7 Control: Move Cartridges Screen

1. Backspace Button. Use this button to erase a partial entry character by character.

2. **Identify the source element of the cartridge to be moved. Proceed as follows:**

   a. **Press the appropriate source element button (Storage Bin, Tape Drive, Load Port, or Gripper).**

      When you select an element type, the range of addresses appears in the Range display below the Destination text box.

   b. **Using the keypad, enter the address of the source element and then press the Destination input field.**

      The source information appears in the Source text box and the Destination text box becomes active.

3. **Identify the destination for the cartridge as follows:**

   a. **Press the appropriate source element button (Storage Bin, Tape Drive, Load Port, or Gripper).**

   b. **Using the keypad, enter the address of the destination element and then press the Execute button. The destination information appears in the Destination text box and the move is initiated.**

   A "Command In Progress" dialog box with an Abort button appears.

   The Move Cartridges command continues until completed unless you press the Abort button to stop the operation.

Unloading a Drive

The Unload Drive command prepares a tape cartridge to be removed from a drive by rewinding and ejecting the cartridge. After unloading the drive, remove the tape cartridge using the Move Cartridges command.

▼ To Unload a Drive

1. **In the Operator screen, press the Unload Drive button.**

   A screen is displayed with a list of drives (FIGURE 4-8).

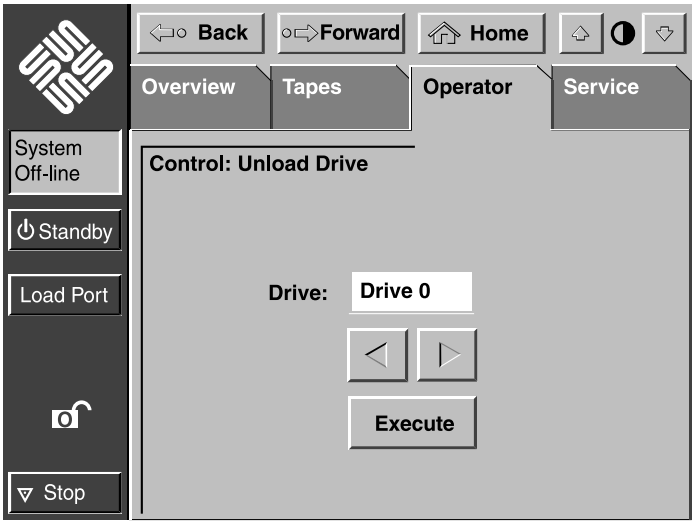

FIGURE 4-8 Unload Drives Screen

2. **Use the arrow buttons to scroll to the desired drive and then press Execute.**

   A "Command In Progress" dialog box is displayed.

   The Unload Drive command continues until completed unless you press the Abort button to stop the operation.

Unloading the Load Port

The Unload Imp/Exp command moves a tape cartridge from the load port to an available storage bin. It must be invoked after inserting a tape into the load port whenever the library auto load feature is disabled (see "Configuring Library Options" on page 63).

Note – You can also use the Move Cartridge command to unload the load port. The Move Cartridge command is especially useful if the destination of the move is important. For more information about the Move Cartridge command, see "Moving Cartridges" on page 66."

▼ To Unload the Load Port

- **Press the Unload Imp/Exp button in the Operator screen.**

  A “Command In Progress” dialog screen appears.

  The Unload Imp / Exp command continues until completed unless you press the Abort button to stop the operation.

CHAPTER 5

Service Commands

This chapter describes the GUI Service screen commands. Topics covered are:

Opening the Service Screen

▼ To Open the Service Screen

1. **Press the Service tab.**

   The Service screen is restricted to individuals with service-level access privileges. When you press the Service tab, the password screen is displayed (FIGURE 5-1).

2. **Enter the correct service password to gain access to the Service screen (**FIGURE 5-2**).**

   The default service password is 5678.

Note – For information about changing passwords, see “Changing Passwords” on page 77.

FIGURE 5-1 Enter Password Screen

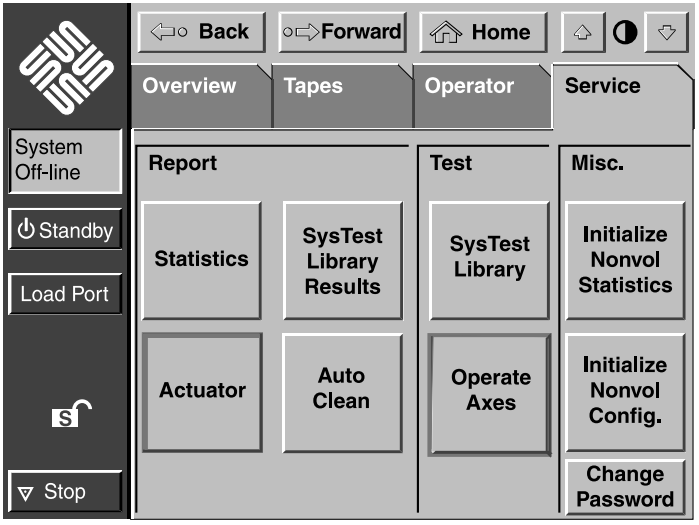

FIGURE 5-2 Service Screen

Generating Reports

The Service screen enables you to generate on-screen reports about the following:

- Statistics regarding library operation
- Actuator positions and status—*not currently supported*
- System test results
- Auto clean status and tracking information

▼ To Generate a Service Report

- **Press the appropriate button in the Service screen.**

  Within a few seconds, the report is displayed on the screen.

Statistics Report

FIGURE 5-3 shows a sample statistics report.

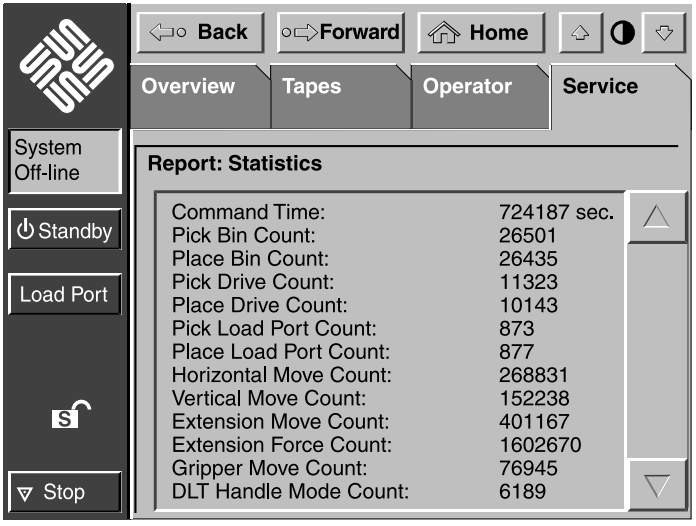

FIGURE 5-3 Statistics Report

SysTest Report

FIGURE 5-4 shows a sample system test report.

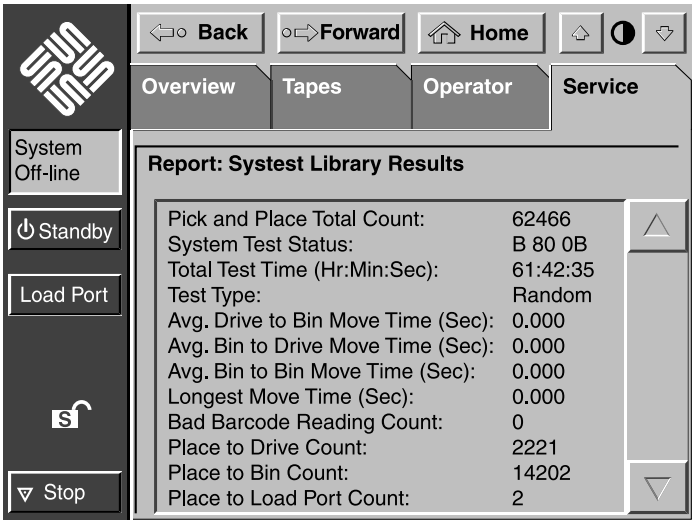

FIGURE 5-4 System Test Report

Auto Clean Report

FIGURE 5-5 shows a sample auto clean report.

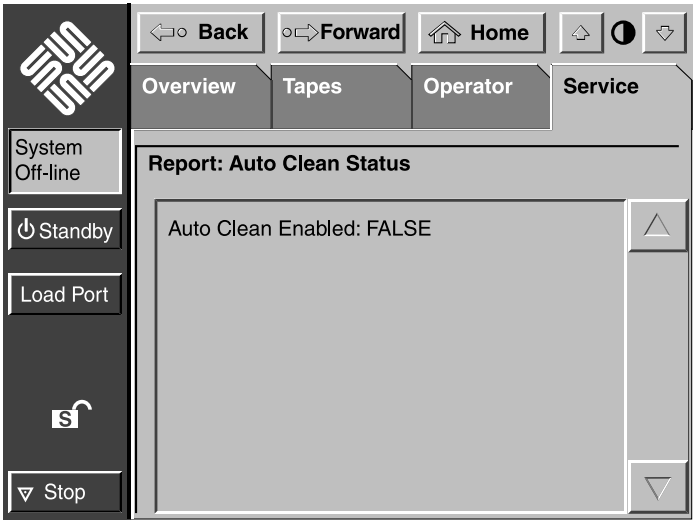

FIGURE 5-5 Auto Clean Report

When you have finished reviewing the report, press the Back button to return to the Service screen.

Testing the Library

The Service screen provides two testing commands:

- *System test* - Tests library operation by swapping tape cartridges between storage bins or drives.
- *Axes operation tests (not currently supported)* - Enables the self-test, home, position, and exercise of specific library axes.

▼ To Perform a System Test

1. **From the Service screen, press the SysTest Library button.**

   The Test: SysTest Library screen is displayed (FIGURE 5-6).

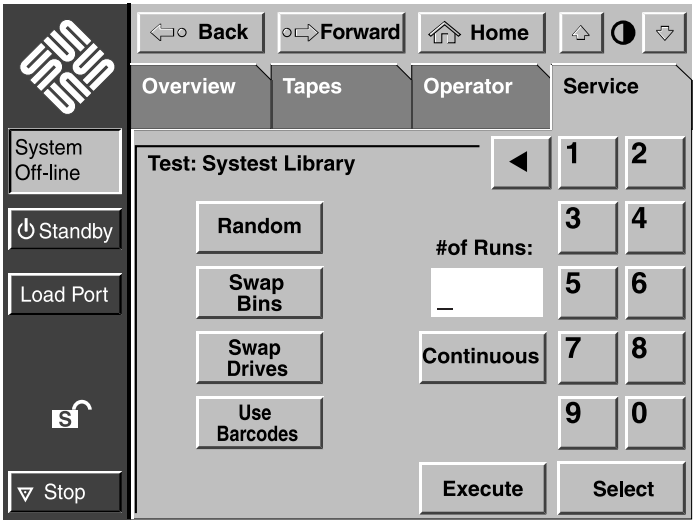

FIGURE 5-6 SysTest Library Screen

2. **Select one of the following system test options:**
   - To test storage bins only, press the Swap Bins button.
   - To test drives only, press the Swap Drives button.
   - To test both bins and drives, press both the Swap Bins and Swap Drives buttons.
3. **Select all desired test options as follows:**
   - To swap cartridges at random, press the Random button. (If you do not select this button, cartridges are swapped sequentially from the first bin or drive.)
   - To have the library read the bar code as it swaps each cartridge, press the Use Barcode button.
   - To have the test repeat itself continuously until aborted, press the Continuous button. Otherwise, enter the number of times you want the test to run.

Note – The Continuous button must be unselected to enter number of Runs.

---

4. **Select the type of test and all test options, then press the Execute button.**

   A "Command In Progress" dialog box is displayed.

   The system test continues until completed unless the Abort button is pressed. If the Continuous button was pressed in Step 3, the Abort button must also be selected to stop the test.

Initializing Nonvolatile Information

The Service screen contains two commands involving information stored in nonvolatile memory:

- *Initialize nonvolatile memory configuration* - Returns the library configuration to its factory-default condition, eliminating any changes made using the Configure Library and Configure Options commands in the Operator screen and invalidates the calibration data.
- *Initialize nonvolatile memory statistics* - Purges nonvolatile memory of all statistical information about library operation. This information is used to generate the statistical report described on page 73.

▼ To Execute Either Command

- **Press the appropriate button in the Service screen.**

1. **A dialog box is displayed, that prompts the user to Continue or Cancel.**
2. **Press Continue. The command will be run and a "Command in Progress" dialog box is displayed.**

Changing Passwords

The Change Password command enables you to change passwords. Valid passwords consist of four to eight numeric characters entered using the keypad in the Change Password screen.

▼ To Change a Password

1. **Press the Change Password button in the Service screen.**

   The Change Password screen is displayed (FIGURE 5-7).

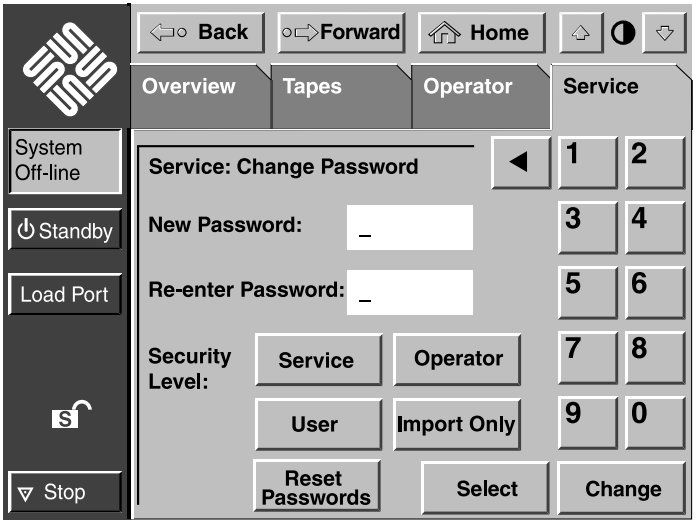

FIGURE 5-7 Change Password Screen

2. **Press the desired security level button.**

   This determines the password to be changed.

3. **Using the keypad, enter a new password and press the Select button.**

   Asterisks representing password characters are displayed in the New Password text box.

4. **Reenter the password and press the Select button.**

   Asterisks representing the password are displayed in the Reenter Password text box.

If You Lose a Password

If you lose the Operator password, you can replace it by opening the Service screen and following the steps to change the password, or press the Reset Passwords button on the Change Password screen. This will reset all passwords to their default values.

The defalult passwords are:

- Service “5678”
- Operator “1234”
- User “2222”
- Import Only “1111”

If you lose the Service password (and can’t access the Change Password screen), contact Sun Technical Support for assistance.

CHAPTER 6

Troubleshooting

This chapter describes problems you may encounter during the setup and operation of the Sun StorEdge L11000 library. Corrective information is provided to help you resolve the problems.

Several of these problems produce error messages on the GUI called *sense data values*. Sense data value messages consist of a number and a description of the error. For a complete list of sense data values, refer to the *Sun StorEdge L11000 Field Service Manual.*

Common Problems and Solutions

The troubleshooting information in this section covers the following topics:

- Startup problems
- GUI problems
- Robotics problems
- Operating problems
- Tape drive problems

Startup Problems

TABLE 6-1 describes the corrective action for problems that occur during startup.

TABLE 6-1 Start-up Problems

Problem	Corrective Action
The library does not power on.	Make sure the library power switch is set to the | (on) position and the power cord is connected to a grounded electrical outlet.
The library or tape drives do not respond on the SCSI bus.	Make sure each SCSI device on the same SCSI bus has a unique address and the last device is properly terminated.
During initialization, the library reports "not ready."	Determine the failure type by checking any previous error codes returned to the host computer. Correct the cause of the error.
One or more tape drives fail to spin up during startup.	Check all SCSI cabling and termination on the back panel of the library. If necessary, contact your field service representative about replacing the drive(s).
The library starts up in standby mode.	Press the Standby button to verify that the library switches to on-line mode**.** You can use the GUI to select either on-line or standby mode at powerup.

GUI Problems

TABLE 6-2 describes corrective actions for GUI problems.

TABLE 6-2 GUI Problems

Problem	Corrective Action
The GUI is blank.	Contact an authorized field service engineer.
The GUI does not respond to touch.	Contact an authorized field service engineer.
An error message appears in the display.	Write down the details of the error message, including the SK, ASC, and ASCQ numeric values. Press OK to clear the message. For instructions about resolving the error, refer to the *Sun StorEdge L11000 Field Service Manual.*

Robotics Problems

TABLE 6-3 describes corrective actions for robotics problems.

TABLE 6-3 Robotics Problems

Problem	Corrective Action
The robot does not move at power up.	Make sure that all internal packing materials (foam pads and tie wraps) have been removed. Check the Stop and Standby buttons; make sure the library is on-line and the Stop button is disabled.
The gripper partially grips a tape cartridge.	Issue a Move Cartridge command to move the cartridge from the gripper to an empty storage bin.
The bar code reader on the gripper fails.	Verify that nothing obstructs the reader. Then, restart the library. If the problem continues, contact a field service engineer.
The robot times out or fails during an operation.	1. Check that the tape cartridge involved in the operation is properly positioned in the bin or drive and ready to be picked. 2. Check that the robot is not obstructed in any way. 3. Retry the operation. 4. If it still fails, contact a field service engineer.
The robot drops a cartridge.	1. Press the Load Port button on the GUI. 2. Unlock and open the front doors. 3. Retrieve the cartridge, orient it properly, and place the cartridge in an empty storage bin. (Do not try to place the cartridge in the gripper.) 4. Afterwards, close and lock the doors. 5. Perform an inventory (see page 66). If the operator manually places a cartridge in an empty bin, he must then run an inventory so the library records the position of the manually placed cartridge.
A cartridge is in the gripper at startup, when a move command is requested, or after a place command is run.	1. Press the Load Port button on the GUI. 2. Unlock and open the front doors. 3. Manually remove the cartridge from the gripper and place it in an empty bin. 4. Then close and lock the doors. 5. Perform an inventory (see page 66). If the operator manually places a cartridge in an empty bin, he must then run an inventory so the library records the position of the manually placed cartridge.
The gripper does not have a cartridge after completing a pick command.	Make sure a cartridge can be found in the source location. Retry the command. If the pick operation fails again, contact a field service engineer.

Operating Problems

TABLE 6-4 describes the corrective action for problems that occur during library operation.

TABLE 6-4 Operating Problems

Problem	Corrective Action
The host computer cannot communicate with the library.	This may be a SCSI bus time-out or a premature disconnect problem. 1. Check cable connections, cable length, SCSI addresses, and termination. 2. Restart the host and the library. 3. If the host and library still are not communicating, contact a field service engineer.
A cable or terminator is disconnected from the library back panel.	Reconnect the cable or terminator according to the guidelines found in the cabling section in “To Connect the Host Workstations” on page 40 of this guide.
A tape cartridge (medium) is reported not present.	This indicates that the gripper did not sense a tape cartridge in a particular storage bin even though the inventory reports that it is present. 1. Check to see if the designated cartridge is present. 2. If it is, make sure it is properly seated. (For a tape drive, make sure the cartridge is completely unloaded.) 3. Then retry the command. 4. If the error persists, contact a field service engineer.
A move command failed.	1. Check the source and destination bins. The source bin should hold the cartridge to be moved; the destination bin should be empty. 2. Make sure the gripper is empty and all actuators are free of obstruction. 3. Also, make sure the library is on-line and the Stop button is released. 4. Retry the command.
A flash memory error is reported.	Contact a field service engineer.
A maximum temperature exceeded warning appears.	Turn off the library and allow it to cool down. Lower the room temperature, if possible, and increase ventilation around the library. (If the operating temperature is too high, the library will automatically shut down until the temperature drops.)

Tape Drive Problems

TABLE 6-5 describes the corrective action for problems with the tape drives.

TABLE 6-5 Tape Drive Problems

Problem	Corrective Action
The library is unable to communicate with a drive.	This is indicated by a Drive Communication Time-out error. Contact a field service engineer.
The tape drive does not eject a cartridge.	1. Reset the library and retry the Unload command. 2. If the tape still does not unload, stop the library, open the front door, and manually unload and eject the cartridge.
A drive handle error occurs.	Contact a field service engineer.
All lights flash on the right side of a drive.	The drive may be damaged. Contact a field service engineer.

APPENDIX **A**

Library Specifications

This appendix lists characteristics and specifications of the Sun StorEdge L11000 library. These characteristics and specifications are categorized as follows:

Physical Characteristics

TABLE A-1 provides dimensions and other physical characteristics of the library unit.

TABLE A-1 Physical Characteristics

Unit Dimensions and Weight	
Width	57 in. (144 cm)
Depth	29 in. (74 cm)
Footprint	11.50 $ft.^2$ (28.8 m^2)
Height	75 in. (191 cm)
Weight	1300 lbs (591 Kg) 16-drive configuration without cartridges
Tape Drives and Cartridges	
Tape Drives, Max. No. and Type	Up to 16 DLT7000 tape drives
Cartridges, Max. No. and Type	0–326 DLT tapes
Host to Library Interfaces	
DLT7000	Differential SCSI-3 “P” Fast & Wide, 68-pin Micro D female connector
Software	SCSI-2 medium changer command set
Power Input	
Power cord	1 or 2 standard US, IEC 320 C19 male connector rated at 125VAC (NEMA 5-20 P connector included)
Host to Tape Drive Interface	
DLT7000	Differential SCSI-3 “P” Fast & Wide, 68-pin Micro D female connector
Software	SCSI-2
Library Diagnostics	
GUI Control Panel Port	2 x 9-pin RS-232C, EIA / TIA-574 female connector with cable
Diagnostics	RS-232C service port for connection to a field service PC or Solaris workstation running diagnostic software

Performance Characteristics

TABLE A-2 lists performance characteristics of the library.

TABLE A-2 Performance Characteristics

Average Swap Time	28 seconds, consisting of two Move Medium commands.
Inventory	Less than 3 minutes, fully loaded with labeled cartridges
MTBF	250,000 power-on hours
MSBF	1 million load / unload cycles
MTTR	Less than 30 minutes
Warranty	1 year onsite

Environmental Specifications

TABLE A-3 provides power-environmental and mechanical-environmental specifications of the library.

TABLE A-3 Environmental Specifications

Power Environment		
Electrical input tolerances	Voltage	90-264 VAC (Auto Ranging)
	Frequency	47-63 Hz
	Power consumption	VA max 1600W
	Electrical connection to power	IEC 320 C19 male connector inside rear door
Climatic Environmental		
Temperature (operating)	Dry Bulb	15 to 32°C (59 to 90°F)
	Wet bulb	25°C (77°F) maximum
	Thermal transition	11°C per hour
Temperature (shipping and storage)	Dry bulb	-40 to 66°C (-40 to 151°F)
	Wet bulb	46°C (115°F) maximum
	Thermal transition	30°C (54°F) per hour
Relative humidity	Operating	20% to 80%, non-condensing
	Shipping and storage	5% to 95%, non-condensing
Altitude	Operating	Sea Level to 10,000 ft. (3,048 m)
	Shipping and storage	Sea Level to 12,000 ft. (3,657.6 m)
Heat dissipation	Operating	5500 BTU / hr (1400 KCal / hr or 1600 watts)
Electromagnetic/Electrostatic Susceptibility		
Direct ESD	Contact discharge	@ 2.0, 4.0, 6.0, 8.0 kV to all external metal panels and doors
	Air discharge	@ 2.0, 4.0, 6.0, 8.0, 10.0, 12.0, 15.0 kV to the front GUI display
Indirect ESD	Contact discharge	@ 2.0, 4.0, 6.0, 8.0 kV to the VCP

TABLE A-3 Environmental Specifications

Radiated fields per IEC-801-3	Unmodulated	27 MHz to 500 MHz @ 3 V/m
Fast transients (EFT or Burst) per IEC801-4	Data cables	@ 0.5kV
	Power cables	@ 1.0kV
Acoustical Noise		
Sound power level	Operating	7.8 Bel
	Idle	7.6 Bel
Sound pressure @ bystander	Operating	63 dB

APPENDIX **B**

Relocating the Library

This appendix explains how to relocate the Sun StorEdge L11000 library. As used in this appendix, the term *relocate* means either to ship the library or simply to move it to a nearby location (for example, from one area in a building to another).

The instructions in this appendix are divided into the following sections:

- Checking the new installation site—page 94
- Preparing the library for relocation—page 95
- Crating the library—page 99
- Preparing the library for operation—page 102

To ship the library or move it using a motor vehicle (for example, a truck or forklift) follow all of the instructions in this appendix.

To move the library to a new location within the same building or facility, follow all instructions in this appendix except for those found in “Crating the Library” on page 99.

Note – These procedures require the original packing materials of the library. If you do not have the original packing materials, contact Sun Customer Service or your Sun reseller.

Caution – Moving or shipping the library without proper packing materials can result in damage to library components.

Checking the New Installation Site

Check the new installation site for the library using the guidelines found in “Choosing an Installation Site” on page 13. Make sure the new location meets all applicable clearance, environmental, and power requirements.

Preparing the Library for Relocation

Take the following steps to prepare the library for relocation:

- Remove tape cartridges
- Install internal packing materials
- Disconnect library cables

Caution – Always prepare the library for relocation before any move.

▼ To Remove Tape Cartridges

1. **Unload and eject all tape cartridges from the tape drives.**
2. **Stop all library operation.**
   a. **Press the Standby button on the GUI.**

      This places the library off-line after the completion of any currently executing operations. When the library is off-line, the GUI state display indicates “System Off-line.”

   b. **Press the Stop button to remove power from library robotics.**
3. **Unlock and open both library doors.**
4. **Remove all tape cartridges from the library bins and tape drives.**
5. **Carefully pack all tape drives for shipment.**
6. **Turn off the library.**

▼ To Install Internal Packing Materials

1. **If the cartridge handling mechanism (CHM) is not in the far right position, gently move it along the horizontal carriage until it is as far right as possible.**
2. **Place a foam block between the extension axis and the floor.**
   a. **Lift the extension axis assembly and place the large foam block between it and the floor of the library.**
   b. **Gently lower the extension axis assembly, resting it on the foam block.**

3. **Insert the restraints as shown in** FIGURE B-1**.**

   The CHM will be restrained with three brackets. Use the screws that were removed from each bracket during the unpacking process (see page 33).

   a. **Using the screws, insert and tighten restraining bracket (C).**

      To gain access to restraining bracket (C), manually glide the CHM up the y-axis and hold in place, so that the motor assembly is above the library floor.

   b. **Insert and tighten restraining bracket (B).**

      Slide the CHM to the left (along the x-axis) for greater access to the area.

   c. **Insert the restraining bracket (A) onto the CHM and the library floor and secure it using the screws provided.**

Note – More than one technician may be required to assist this operation.

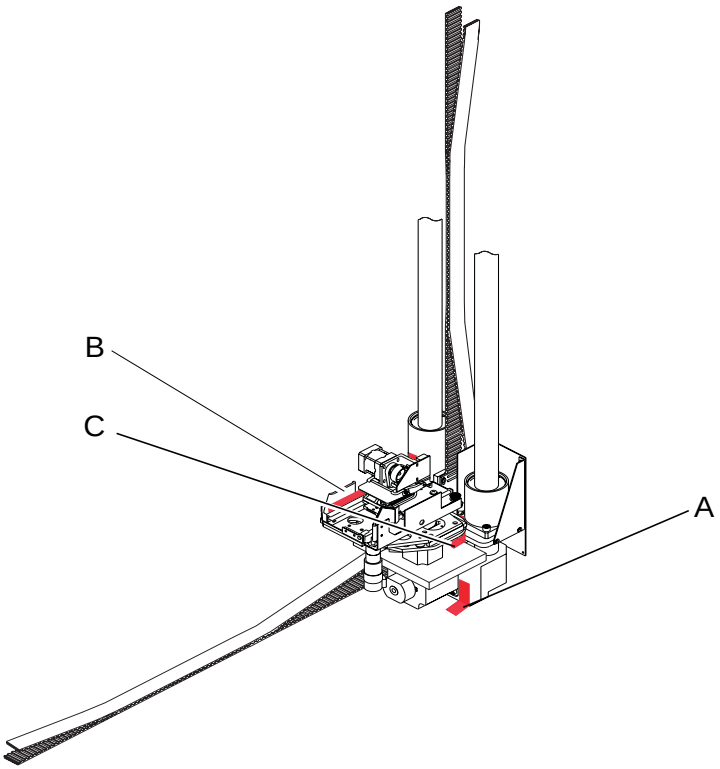

FIGURE B-1 Inserting the Shipping Restraint

4. **Attach the shipping plate that protects the load port as shown in FIGURE B-2.**

   The load port is located in the right door of the library.

   a. **Attach the shipping plate to the load port.**

   b. **Insert the bolts and washers that secure the plate to the load port and secure them using the screws provided during the unpacking procedure (see page 33).**

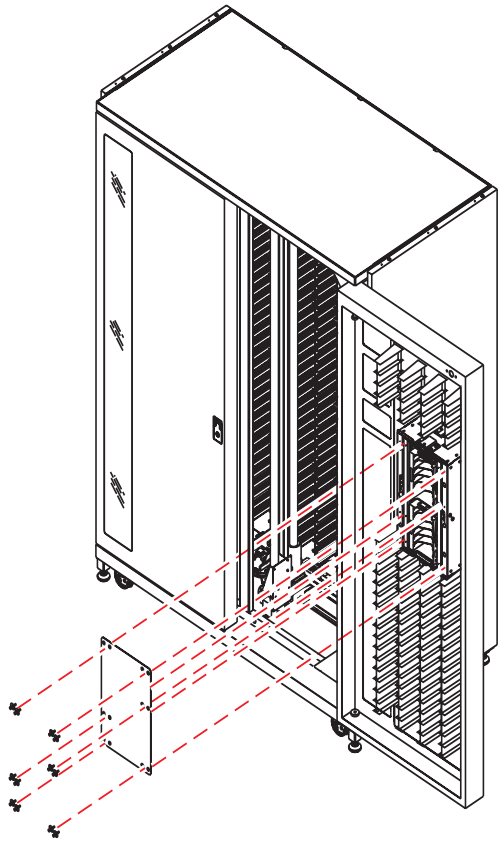

FIGURE B-2 Inserting the Shipping Plate

▼ To Disconnect Library Cables

1. **Disconnect SCSI cables and terminators.**
2. **Disconnect the power cord from the outlet and the back panel of the library.**
3. **Pack all cables with other library accessories.**

Crating the Library

Use this section:

- If you need to ship the library to the new site.
- If you need to transport the library by forklift or similar means.

Skip this section if you are moving the library within a facility. Instead, refer to “Preparing the Library for Operation” on page 102.

▼ To Crate the Library for a New Site

Caution – The library weighs approximately 1300 pounds (591 kg). At least two people should perform any steps that involve moving or guiding the library. Use safe practices when guiding the library and handling the ramp.

1. **Prepare the shipping pallet for the library as shown in FIGURE B-3.**
   a. **Attach the two ramp extensions to the pallet,**
   b. **Place the wooden support bar underneath the ramp extensions**
   c. **Verify that the left wooden bar is attached to the pallet.**
2. **Place the library on the pallet:**
   a. **Raise the library support feet**
   b. **With the help of at least one person, roll the library to a position in front of the pallet ramp.**
   c. **Roll the library onto the pallet.**

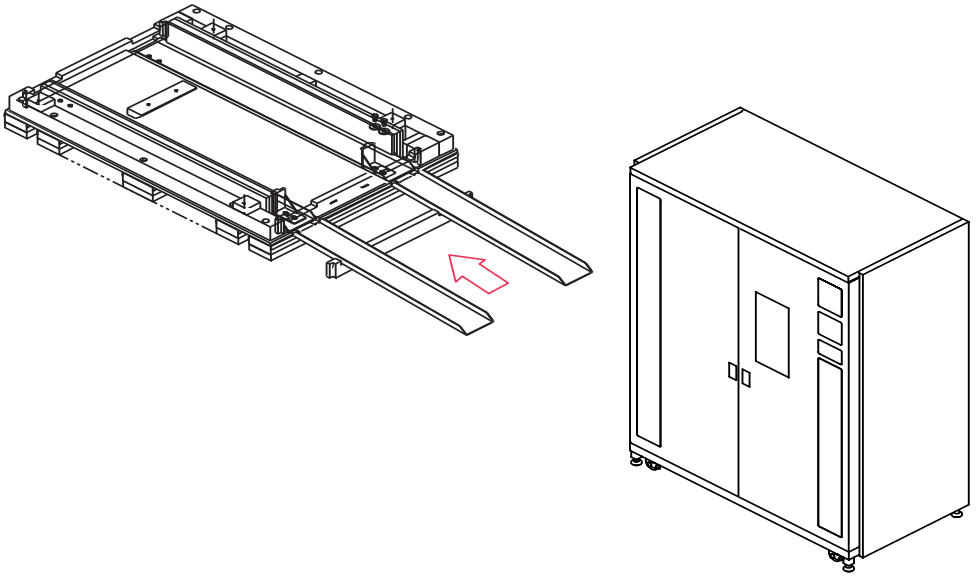

FIGURE B-3 Placing the Library onto the Pallet

3. **Secure the library.**
   a. **Place the shipping bag over the library, and secure it into place.**
   b. **Remove the ramp extensions from the pallet and slide them into the center section.**
   c. **Insert the foam block around the bottom of the library and the pallet.**
   d. **Insert and attach the stop blocks underneath the library on the right side.**
   e. **Attach the wooden bar on the right side of the library.**
   f. **Remove the wooden bar on the left side of the library.**
   g. **Repeat Steps d and e for the left side of the library.**
4. **Place the accessory kits into the cutouts on the back crate panel.**
5. **Place the foam cap over the library.**
6. **Wrap the cardboard crate around the library (FIGURE B-4) and fasten it using the plastic restraining clips.**

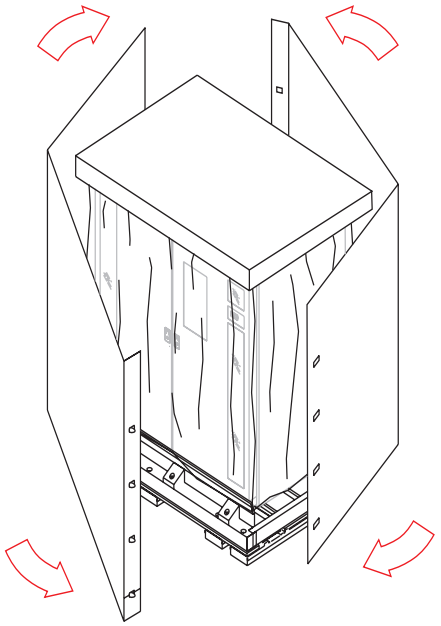

FIGURE B-4 Crating the Library

7. **Place the top on the crate.**
8. **Secure the crate with two steel restraining bands.**

Preparing the Library for Operation

After shipping or moving the library, refer to Chapter 2 to do any of the following:

- Prepare the new installation site
- Receive the library
- Uncrate the library (required in shipping the library)
- Position the library
- Prepare the library for operation

APPENDIX **C**

Laser Regulations

This appendix displays regulations for the Class II Laser bar code scanner used by the gripper assembly in the Sun StorEdge L11000 library. These regulations are defined in the following figures:

- Label product conformation
- Laser light warning labels
- Exposure warning label

Laser Regulation Labels

Product Conformation Label

The rear panel laser statement is shown in FIGURE C-1.

FIGURE C-1 Product Conformation Label

Laser Warning Labels

The laser light warning label is located close to the laser and shown in FIGURE C-2.

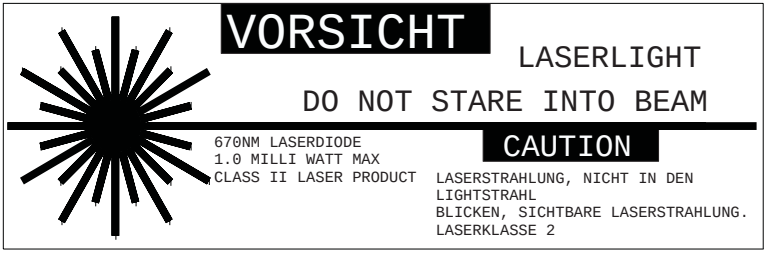

FIGURE C-2 Laser Light Warning Label

Exposure Warning Label

The exposure warning label is located on the laser and is shown in FIGURE C-3 .

FIGURE C-3 Exposure Warning Label

Glossary

actuators	Robotic components that move inside the library to manipulate cartridges. These include the gripper, extension axis, vertical and horizontal axes.
automated tape library	A robotic storage and retrieval system for DLT tape cartridges
bar code label	The identification label on DLT tape cartridges
bar code scanner	A device that is mounted on the extension axis that reads the cartridge bar code labels
bin	A storage receptacle for a tape cartridge
bulk pack	A six-bin removable storage magazine for DLT cartridges that fits inside the right door on the front of the Sun L11000 library
calibration	The software measurements and configuration required for successful operation of the library
DLT	Digital linear tape
EIA/TIA-574	A serial communications cabling and protocol standard for nine pin connectors, sometimes referred to as RS-232. The diagnostic port (DIAG), on the rear of the library, uses this protocol.
extension axis assembly	Mounted onto the vertical axis, the extension axis assembly consists of the gripper assembly and the extension drive motor and belt.
extension axis belt	The drive belt connecting the extension motor / gearbox to the gripper
FCC Class A	Standard established by the U.S. Federal Communications Commission governing electromagnetic emissions
FSE	Field service engineer
gripper assembly	The assembly that mounts on the extension axis and grips cartridges
horizontal belt	The drive belt connecting the horizontal motor to the horizontal axis assembly

host	Host computer
host computer	The computer that issues SCSI commands to control the library robotics
load pack	A six-bin removable storage magazine for DLT tape cartridges that fits inside the left door on the front of the Sun L11000 library. This magazine can be configured to act as an import/export device, if desired.
load port	The operator-accessible component of the library that enables up to twelve cartridges to be import/export loaded and unloaded into or from the library
MSBF	Mean swaps between failures
MTBF	Mean time between failures
MTTR	Mean time to repair
NVRAM	Nonvolatile RAM
on-line	Ready for communications with a host
off-line	Library is not available for communications to host.
place	The act of placing a cartridge in a location after it has been picked from another location.
PROM	Programmable read-only memory
RAM	Random-access memory
rear panel	The rear cosmetic panel of the library that contains the AC power switch, AC power receptacle and connectors for attaching external cabling to the library.
robotics	The library robotics consist of the following components: gripper mechanism, vertical actuator, horizontal actuator, and extension actuator.
SCSI	Small computer system interface. SCSI is a communications standard for attaching peripheral equipment to computers.
sense data values	Control panel error messages
standby mode	Library is not available for host communication, but is available for communication with a diagnostic workstation.
Sun L11000 library	The storage and retrieval component of an automated tape library system using DLT cartridges
tape drive	The mechanism that reads and writes data from and to a tape cartridge
UL	Underwriters Laboratories
vertical belt	The drive belt connecting the vertical motor to the vertical axis assembly

vertical carriage assembly The crossbar and linear bearings mounted on the vertical rails and all components mounted on the crossbar

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