StorageTek™ L80

Tape Library

Installation Manual

96054

Revision: K

L80
Tape Library

Installation Manual

We welcome your feedback. Please contact the Sun Learning Services Feedback System at:

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Please include the publication name, part number, and edition number in your correspondence if they are available. This will expedite our response.

Summary of Changes

EC	Date	Edition	Description
111666	August 2001	First	Initial release
111732	March 2002	Second	Refer to this edition for a description of the changes.
111784	August 2002	Third	Refer to this edition for a description of the changes.
111828	February 2003	Fourth	Refer to this edition for a description of the changes.
111854	June 2003	Fifth	Refer to this edition for a description of the changes.
111875	November 2003	Sixth	Refer to this edition for a description of the changes.
111923	July 2004	Seventh	Refer to this edition for a description of the changes.
111948	January 2005	Eighth	Refer to this edition for a description of the changes.
111976	May 2005	Ninth	Add SDLT 600 and LTO Gen 3 information.
114172	October 2006	K	Cover, Copyright, Preface: Added Sun verbiage and branding. Chapter 2: Updated Table 2-5 on page 2-13, Table 2-6 on page 2-14 and Table 2-7 on page 2-15.

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Preface

This manual is for either customers or service representatives, depending upon the service contract. When you have completed the procedures in this manual, refer to the user's guide or service manual to configure your library. See "Related Publications" on page xiv.

Most of the information pertains to library hardware. For specific drive information or for client-generated software commands and console messages, refer to your drive or software documentation.

Organization

This manual has two chapters, one appendix, and an index:

Chapter 1 "Hardware Installation" tells you how to install the hardware portions of the library. It contains a "Quick Installation Procedure" for experienced users and a "Standard Installation Procedure" that guides you through each step of the installation.

Chapter 2 "Locations, Specifications, and Cables" identifies library components, drive label locations, specifications, and external cable part numbers.

Appendix A "SNMP" provides the implementation of the Simple Network Management Protocol (SNMP).

Index The Index helps you locate information.

Alert Messages

Alert messages call your attention to information that is especially important or that has a unique relationship to the main text or graphic.

Note: A note provides additional information that is of special interest. A note might point out exceptions to rules or procedures. A note usually, but not always, follows the information to which it pertains.

CAUTION:
A caution informs you of conditions that might result in damage to hardware, corruption of data, or corruption of application software. A caution always precedes the information to which it pertains.

WARNING:
A warning alerts you to conditions that might result in long-term health problems, injury, or death. A warning always precedes the information to which it pertains.

Mensajes de alerta

Los mensajes de alerta llaman la atención hacia información de especial importancia o que tiene una relación específica con el texto principal o los gráficos.

Nota: Una nota expone información adicional que es de interés especial. Una nota puede señalar excepciones a las normas o procedimientos. Por lo general, aunque no siempre, las notas van después de la información a la que hacen referencia.

PRECAUCIÓN:
Una precaución informa sobre situaciones que podrían conllevar daños del hardware, de los datos o del software de aplicación. Las precauciones van siempre antes de la información a la que hacen referencia.

ADVERTENCIA:
Una advertencia llama la atención sobre condiciones que podrían conllevar problemas de salud crónicos, lesiones o muerte. Las advertencias van siempre antes de la información a la que hacen referencia.

Conventions

Typographical conventions highlight special words, phrases, and actions in this publication.

Item	Example	Description of Convention
Buttons	MENU	Font and capitalization follows label on product
Commands	Mode Select	Initial cap
Document titles	*System Assurance Guide*	Italic font
Emphasis	*not* or *must*	Italic font
File names	`fsc.txt`	Monospace font
Hypertext links	Figure 2-1 on page 2-5	Blue (prints black in hardcopy publications)
Indicators	*Open*	Font and capitalization follows label on product
Jumper names	TERMPWR	All uppercase
Keyboard keys	<Y> <Enter> or <Ctrl+Alt+Delete>	Font and capitalization follows label on product; enclosed within angle brackets
Menu names	Configuration Menu	Capitalization follows label on product
Parameters and variables	Device = *xx*	Italic font
Path names	`c:/mydirectory`	Monospace font
Port or connector names	SER1	Font and capitalization follows label on product; otherwise, all uppercase
Positions for circuit breakers, jumpers, and switches	ON	Font and capitalization follows label on product; otherwise, all uppercase
Screen text (including screen captures, screen messages, and user input)	`downloading`	Monospace font
Switch names	Power	Font and capitalization follows label on product
URLs	http://www.sun.com	Blue (prints black in hardcopy publications)

Related Publications

Refer to the following publications for additional information:

Library Documentation	Part Number
L40/80 Tape Library Drives CRU Instructions	96006
L80 Tape Library CRU Instructions	96051
L80 Tape Library Service Manual	96022
L80 Tape Library Ordering Guide	MT5012
L80 Tape Library User's Guide	96021

Tape Drive Documentation	Part
DLT 7000 Tape Drive Product Manual	31313450x
DLT 8000 Tape Drive Product Manual	Quantum: 81-60118-0x
DLT1 Installation and Operations Guide	Benchmark: 000826-0x
DLT1 Product Specification	Benchmark: 000827-0x
SDLT 220, 320 and 600 Product Manual	CD included with drive
Hewlett Packard LTO Ultrium Publication	CD included with drive
IBM LTO Ultrium Publication	CD included with drive
Quantum's Certance LTO Ultrium Publication	CD included with drive

Other Publications	Part Number
American National Standard Dictionary for Information Processing Systems	ANSI X3/TR-1-82
American National Standard Magnetic Tape and Cartridge for Information Interchange	ANSI X3B5/87-009
Crossroads Fibre Router User's Manual	DS30110
StorageNet 3300 Fibre Channel Router User Manual	461273-01
StorageNet 3400 Multi-Protocol Router User Manual	461271-01
Fiber Optic User's Guide	9433
Magnetic Tape Labels and File Structure for Information Interchange	ANSI X3.27-1978
SCSI-3 Parallel Interface (SPI)	ANSI X3T9.2/91-010R7
Small Computer System Interface	ISO 9316:1989

Additional Information

Sun Microsystems, Inc. (Sun) offers several methods for you to obtain additional information.

Sun's External Web Site

Sun's external Web site provides marketing, product, event, corporate, and service information. The external Web site is accessible to anyone with a Web browser and an Internet connection.

The URL for the external Web site is: http://www.sun.com

The URL for StorageTek™ brand-specific information is:
http://www.sun.com/storagetek/

Customer Resource Center

The Sun StorageTek product Customer Resource Center (CRC) is a Web site that enables members to resolve technical issues by searching code fixes and technical documentation for StorageTek brand products. CRC membership entitles you to other proactive services, such as HIPER subscriptions, technical tips, answers to frequently asked questions, addenda to product documentation books, and online product support contact information. Customers who have a current warranty or a current maintenance service agreement may apply for membership by clicking on the `Request Password` button on the CRC home page. Sun employees may enter the CRC through the SunWeb PowerPort.

The URL for the CRC is http://www.support.storagetek.com

Partners Site

The StorageTek Partners site is a Web site for partners with a StorageTek Partner Agreement. This site provides information about products, services, customer support, upcoming events, training programs, and sales tools to support StorageTek Partners. Access to this site, beyond the Partners Login page, is restricted. On the Partners Login page, employees and current partners who do not have access can request a login ID and password and prospective partners can apply to become StorageTek resellers.

The URL for the StorageTek Partners site is:
http://members.storagetek.com

The URL for partners with a Sun Partner Agreement is:
http://www.sun.com/partners/

Global Services Support Tools

Global Services Support Tools site (also called Field Tools) provides tools that aid in the sales and support of Sun StorageTek brand products and services. This is an internal Web site for employees.

The URL for the Global Services Support Tools is http://sunsolve.central.sun.com/handbook_internal/FieldTools

Documents on CD

Documents on CD (3106600xx) contains portable document format (PDF) files of Sun StorageTek brand product publications. To order Documents on CD, contact your local Customer Services Logistics Depot. *Documents on CD* is only for employees.

Hardcopy Publications

You may order paper copies of publications listed on the CRC or included on the *Documents on CD*.

Service publications have *numeric* part numbers. To order paper copies of service publications, contact your local Customer Services Logistics Depot.

Safety

The following pages describe common practices concerning electrical safety, ergonomics, rack installation, fiber optics, and electrostatic discharge.

Safety Precautions

WARNING:
Potential injury: **On-the-job safety is important; therefore, observe the following safety precautions while you are engaging in any maintenance activity. Failing to follow these precautions could result in serious injury.**

Remove all conductive jewelry, such as watches and rings, before you service powered-on equipment.

- Avoid electrical shock. Be careful when you work near power connectors and supplies.
- Power-off the equipment that is being serviced before you remove a field replaceable unit (FRU) or other component. Remember that dangerous voltages could still be present in some areas even though power is off.
- Ground all test equipment and power tools.
- Lift objects properly; read the information in "Lifting Techniques" on page -xvii.
- Do not remove, cut, or relocate any floor tiles indiscriminately. Before you manipulate floor tiles, be sure that you understand the customer's environment and receive the customer's approval. Remember, each situation is different.
- Enforce good housekeeping practices in the equipment area to help prevent fire and accidents.

Note: Important things to investigate and to be aware of include the use of Halon® gas, under-the-floor smoke detectors, and cables to other equipment installed nearby.

Lifting Techniques

Lifting, regardless of how much or how little, can create serious back stress. If you follow these guidelines, you can reduce the risk of back injury:

- Do not twist your body to pick up something or to put it down. Twisting puts extreme pressure on your back, especially when you lift or carry objects. Instead of

twisting, make the task two separate moves; first lift, and then use your feet to turn your body.

- Plan the lift: first examine the object and then determine how it will be lifted and where it will be placed.
- Choose the appropriate lifting technique. Examine the weight, size, location, frequency, and direction of the lift. Plan to avoid awkward postures, and determine if material-handling aids are needed.
- Place your feet shoulder-width apart, and place one foot a little behind the other. Keep your back straight because even light loads can significantly increase pressure on your spine when you lean forward.
- Whenever you can, grip the load with your whole hand, and use two hands.
- Carry objects at elbow height and close to your body. The farther away you hold an object, the more force it puts on your lower back.
- Lift with your legs instead of your back. Leg muscles are some of the strongest in the body. When you squat and lift with your legs, you can lift more weight safely.
- Alternate lifting tasks with tasks that are less stressful to the same muscles. This technique ensures that your muscles have some recovery time.

Shoulder, Elbow, Wrist, and Hand Safety

Follow these guidelines to minimize the possibility of injury to your shoulders, elbows, wrists, and hands.

- Work within your safety zone—the area between shoulder level and knuckle level of your lowered hands. You face less chance of injury when you work or lift in this area.
- Keep your elbows bent to keep loads close to your body and to decrease the amount of force necessary to do the job. If you use this posture, you will put less weight and pressure on your shoulder.
- Be sure to keep your wrists straight. Avoid bending, extending, or twisting your wrists for long periods of time.
- Do not use a pinch grip to lift large or heavy loads because the way you lift also can affect the tendons in your hand. When you grasp an object between your thumb and fingers, you put a lot of tension on hand and wrist tendons. Use both hands—use one for a while, and then use the other—to give them rest.

Rack Safety and Precautions

WARNING:
Possible personal injury:

- ***Lifting hazard:*** **The library weighs 63.5 kg (140 lb) plus the weight of the drives. With all of the drives and power supplies installed, the weight is 122.5 kg (270 lb). Use at least two people and a mechanical device to lift and position the library. Make sure you read the information in "Lifting Techniques" on page xvii before beginning.**
- **Also consider the library's total weight when you are placing other equipment into the rack. To prevent an unbalanced situation, install the heaviest equipment on the bottom and the lightest equipment on the top. Failure to do so might cause the rack to become unstable and tip over.**

Observe the following safety precautions when you are installing the library into a rack:

- If the rack has front or rear doors, do *not* allow the doors to interfere with the library's ventilation. The rack's internal ambient temperature should not exceed the recommended operating temperature range of the library. The maximum rack air ambient temperature is 40°C (104°F).
- Ensure that rack doors provide adequate clearance to the library.
- Ensure that the combination of the library with other equipment in the rack does not create an overcurrent condition, whether the equipment is connected directly to the branch circuit or to a power distribution strip.
- Ensure that all equipment in the rack has reliable earth ground, whether the equipment is connected directly to the branch circuit or to a power distribution strip.

  Note: The library relies on the ground pin of the power cord for its earth ground.

Fiber-optic Safety

WARNING:
***Eye hazard*. Never look directly into a fiber-optic cable, a fiber-optic connector, or a laser transceiver module. Hazardous conditions might exist from laser power levels that are capable of causing injury to the eye.**

Be especially careful when using optical instruments with this equipment. Such instruments might increase the likelihood of eye injury.

The laser transceivers in fiber-optic equipment can pose dangers to personal safety. Ensure that anyone who works with this Sun StorageTek equipment understands these

dangers and follows safety procedures. Ensure that the optical ports of every laser transceiver module are terminated with an optical connector, a dust plug, or a cover.

Each fiber-optic interface in this Sun StorageTek Fibre Channel equipment contains a laser transceiver that is a Class 1 Laser Product. Each laser transceiver has an output of less than 70 μW and a wavelength of 850 nm. Sun StorageTek's Class 1 Laser Products comply with EN60825-1(+A-11) and with sections 21 CFR 1040.10 and 1040.11 of the Food and Drug Administration (FDA) regulations.

The following translations are for users in Finland and Sweden who wish to identify laser safety and classification:

CLASS 1 LASER
LUOKAN 1 LASERLAITE
KLASSE 1 LASER APPARAT

Laser Product Label

In accordance with safety regulations, a label on each Sun StorageTek Fibre Channel product identifies the laser class of the product and the place and date of the manufacturer. The label appears on top of a Fibre Channel tape drive and near the Fibre Channel connectors on a Fibre Channel tape library. A copy of the label is shown here:

CLASS 1 LASER PRODUCT
LASER KLASSE 1
APPAREIL A LASER DE CLASSE 1
COMPLIES WITH 21 CFR 1040.10 AND 1040.11

Fiber-optic Cable Installation

Follow these guidelines when you install fiber-optic cables:

1. **Cable routing:**
   - **Raised floor:** You may install fiber-optic cables under a raised floor. Route them away from any obstruction, such as existing cables or other equipment.
   - **Cable tray or raceway:** Place the cables in position; do not pull them through the cable tray. Route the cables away from sharp corners, ceiling hangers, pipes, and construction activity.
   - **Vertical rise length:** Leave the cables on the shipping spool, and lower them from above; do not pull the cables up from below. Use proper cable ties to secure the cable.
   - **General:** Do not install fiber-optic cables on top of smoke detectors.
2. **Cable management:**
   - Leave at least 4.6 m (15 ft) of cable at each end for future growth.

- Use strain reliefs to prevent the weight of the cable from damaging the connector.
- Review all information in this manual and in any related manuals about safely handling fiber-optic cables.

3. **Connector protection:**
   - Insert connectors carefully to prevent damage to the connector or fiber.
   - Leave the connector's protective cover in place until you are ready to make connections.
   - Replace the connector's protective cover when the connector is disconnected.
   - Clean the connector before making a connection. Make sure that there are no obstructions and that keyways are aligned.

Fiber-optic Cable Handling

Observe these precautions when you handle fiber-optic cables:

- Do not coil the cable to less than 96 mm (3.75 in.) in diameter.
- Do not bend the cable to less than 12 mm (0.5 in.) in radius. It is most important that a cable's bend radius be no less than 20 times the diameter of the cable.
- Do not pull on the cables; carefully place them into position.
- Do not grasp the cables with pliers, grippers, or side cutters; do not attach pulling devices to the cables or connectors.
- Keep cables away from sharp edges or sharp protrusions that could cut or wear through the cable; make sure that cutouts in the equipment have protective edging.
- Protect the cable from extreme temperature conditions.
- Install the connector's protective cover whenever the connector is not connected.

Electrostatic Discharge (ESD) Damage Prevention

Anyone who handles ESD-sensitive components must be aware of the damage that ESD can cause to electronic components and must take the proper precautions to prevent it. Also, anyone who performs maintenance on Sun StorageTek equipment must complete an ESD-basics course.

CAUTION:
Potential damage to equipment: **Handle ESD-sensitive components *only* under ESD-protected conditions. To meet this requirement, always use the Field Service Grounding Kit (PN 4711) and always follow these ESD precautions and procedures when you are servicing Sun StorageTek equipment or handling ESD-sensitive components.**

ESD Precautions

Always take the following general precautions when you work with ESD-sensitive components:

- Wear ESD protection whenever you install, remove, maintain, or repair Sun StorageTek equipment.
- Keep ESD-sensitive printed-circuit components in their ESD-protective packages until you have taken all ESD-preventive steps and you are ready to install the component.
- Do not allow anyone to touch or handle an unprotected ESD-sensitive component unless that person has taken all ESD precautions.
- Reinstall all equipment covers and close all equipment doors after you have completed the work.
- If the grounding-kit work surface has been exposed to temperatures above 66ºC (150ºF) or below 4.5ºC (40ºF), acclimate the work surface to room temperature before you unroll it.
- Immediately place any component that you have removed into an ESD-protective package.
- Keep the grounding-kit work surface clean.

  Note: To clean the work surface, use a mild detergent and water, and make sure that the surface is completely dry before you use it.

- Periodically check the electrical resistance of the ground cord and the wrist-strap coil cord.

  Note: The ground cord should measure less than 1.2 MΩ, and the coil cord should measure between 0.8 and 1.2 MΩ Repair or replace the cords if they no longer meet these requirements.

ESD-Protection Procedure

Remember that each customer environment is different. Address all the customer's concerns before you work on any equipment.

Prepare the Work Area

1. Before you service the equipment, unfold the grounding-kit work surface completely and place it on a convenient surface.
2. Attach one end of the ground cord to the work surface; secure the snap fastener.

   Note: You will attach the free end in a later step.
3. Slip on an ESD wrist strap. Make sure that the strap is comfortable and makes contact with the entire circumference of your wrist.
4. Snap one end of the coil cord to the wrist band.

Access the Equipment

5. Carefully open the doors to the equipment or remove the covers from the equipment. Do not touch any internal components.

CAUTION:
Be sure that you are properly grounded before you touch any internal components.

6. Attach the free end of the coil cord to the most appropriate place:
   a. If you are working on components from a small piece of equipment, attach the free end of the coil cord to the grounding-kit work surface. In addition, be sure that you touch an unpainted metal surface on the equipment before you touch an internal component.
   b. If you are working on components from a large piece of equipment, attach the free end of the coil cord to a grounding jack or to an unpainted metal surface inside the equipment.

Replace Components

7. Remove the defective component and place it on the work surface.
8. Remove the replacement component from its ESD-protective package, and install the component in the equipment.
9. Place the defective component in the ESD-protective package.

Clean Up

10. Disconnect the ground cords from the equipment.
11. Reinstall all equipment covers and close all equipment doors.
12. Disconnect the coil cord from your wrist, and, if necessary, disconnect the ground cord from the work surface.
13. Properly store the work surface and the other Field Service Grounding Kit items.

Seguridad

Las siguientes páginas describen prácticas habituales sobre seguridad eléctrica, ergonomía, instalación en bastidor, fibras ópticas y descargas electrostáticas.

Precauciones de seguridad

ADVERTENCIA:
Posibles lesiones: **la seguridad durante el trabajo es importante; por ello, atienda a las siguientes precauciones de seguridad mientras esté realizando alguna actividad de mantenimiento. El incumplimiento de dichas precauciones puede conllevar graves lesiones.**

Antes de realizar cualquier tarea en equipos eléctricos conectados, quítese las joyas y accesorios conductores de electricidad, como relojes y anillos.

- Evite las descargas eléctricas. Tenga cuidado al trabajar en la proximidades de conectores y alimentaciones eléctricas.
- Antes de extraer unidad sustituible in situ u otro componente, apague el equipo y desconéctelo de la red eléctrica. Recuerde que, incluso si están apagados, en algunas áreas pueden quedar tensiones peligrosas.
- Ponga a tierra todos los equipos de prueba y herramientas eléctricas.
- Para levantar objetos, consulte la información de "Técnicas de levantamiento de objetos" on page -xxvi.
- No quite, corte ni cambie de lugar indiscriminadamente las baldosas. Antes de manipular baldosas, asegúrese de conocer el entorno del cliente y de recibir su autorización. Recuerde que cada situación es diferente.
- Aplique las prácticas adecuadas de limpieza en el área del equipo para prevenir incendios y accidentes.

Nota: Entre los factores importantes que deben tenerse en cuenta es la presencia de gas Halón®, detectores de humo subterráneos y cables conductores a otros equipos instalados en las proximidades.

Técnicas de levantamiento de objetos

El levantar equipos o componentes, independientemente de su peso o tamaño, puede provocar serias lesiones lumbares. Siguiendo estas directrices podrá reducir los riesgos de lesiones.

- No incline el cuerpo para levantar o bajar algo. Esta posición supone una tensión extrema para la espalda, en especial al levantar o transportar objetos. En lugar de inclinarse, efectúe dos movimientos: primero levante el componente y, a continuación, utilice los pies para girar el cuerpo.
- Planifique el levantamiento: primero examine el objeto y, a continuación, determine cómo lo levantará y dónde lo colocará.
- Seleccione la técnica de levantamiento adecuada. Examine el peso y tamaño del objeto, su ubicación y frecuencia y dirección en que vaya a levantarlo. La planificación debe hacerse de tal modo que se eviten posturas incómodas. Determine si son necesarios accesorios para la manipulación de materiales.
- Separe bien las piernas y coloque una ligeramente detrás de la otra. Mantenga la espalda recta, porque incluso pesos ligeros pueden incrementar significativamente la presión sobre la espina dorsal al inclinarse hacia adelante.
- En la medida de lo posible, sostenga la carga con toda la mano, y utilice ambas manos.
- Transporte los objetos a la altura del codo y próximos a su cuerpo. Cuanto más lejos tenga que transportar un objeto, más presión aplicará sobre la zona lumbar.
- Levante el objeto haciendo fuerza con las piernas, y no con la espalda. Los músculos de las piernas se cuentan entre los más fuertes del cuerpo. Al acuclillarse y levantar un peso con las piernas, tendrá mayor tolerancia al peso.
- Alterne estas tareas con otras menos pesadas para los mismos músculos. De este modo, los músculos dispondrán de un cierto tiempo de recuperación.

Seguridad de hombros, codos, muñecas y manos

Siga estas instrucciones para reducir al mínimo las posibilidades de lesionarse los hombros, codos, muñecas y manos.

- Trabaje dentro de su zona de seguridad, el área entre el nivel de los hombros y el nivel de los nudillos. Trabajando o levantando objetos dentro de esta área se expondrá a menos probabilidades de lesiones.
- Mantenga los codos inclinados para mantener las cargas próximas a su cuerpo y reducir la fuerza necesaria para realizar la tarea. Con esta postura, aplicará menos peso y presión sobre los hombros.
- Asegúrese de mantener las muñecas rectas. Evite doblarlas, extenderlas o torcerlas durante períodos de tiempo prolongados.

- No levante cargas grandes o pesadas con el puño cerrado, porque el modo de levantarlas también afecta a los tendones de la mano. Al tomar un objeto entre el pulgar y los dedos se aplica mucha tensión a las manos y tendones de las muñecas. Utilice ambas manos alternativamente, para permitir que descansen.

Seguridad y precauciones del bastidor

ADVERTENCIA:
Posibilidad de lesiones físicas:

- ***Peligro de levantamiento:*** **La biblioteca pesa 63.5 kg (140 lb), a lo que hay que añadir el peso de las unidades. Con todas las unidades y fuentes de alimentación instaladas, el peso es de 122,5 kg (270 lb). Para levantar la biblioteca y colocarla en su posición se requieren como mínimo dos personas. Antes de poner manos a la obra, asegúrese de leer la información presentada en "Técnicas de levantamiento de objetos" en la página xxvi.**

- **Al colocar otros equipos en el bastidor, considere también el peso total de la biblioteca. Para evitar un desequilibrio de la carga, coloque los equipos más pesados abajo y los más ligeros arriba. De lo contrario, el bastidor podría desestabilizarse y caerse.**

Al instalar la biblioteca en el bastidor, adopte las siguientes precauciones de seguridad:

- Si el bastidor tiene puertas delanteras o traseras, *no permita* que las puertas interfieran con la ventilación de la biblioteca. La temperatura ambiente en el interior del bastidor no debe ser superior a la temperatura de servicio recomendada de la biblioteca. La temperatura ambiente máxima del interior del bastidor es de 40 °C (104 °F).

- Asegúrese de que las puertas del bastidor permitan el acceso adecuado a la biblioteca.

- Asegúrese de que la combinación de la biblioteca con otros equipos instalados en el bastidor no provoque situaciones de sobretensión, tanto si el equipo está conectado directamente al circuito derivado o a una regleta de distribución.

- Asegúrese de que todos los equipos del bastidor dispongan de una puesta a tierra fiable, tanto si el equipo está directamente conectado al circuito derivado o a una regleta de distribución

  Nota: La puesta a tierra de la biblioteca se conecta a través de la patilla de puesta a tierra del enchufe.

Seguridad de fibras ópticas

ADVERTENCIA:
***Riesgo para la vista*. Nunca mire directamente el interior de un cable de fibra óptica, un conector de fibra óptica o un módulo transceptor de láser. Los niveles de potencia del láser pueden conllevar situaciones de riesgo, susceptibles de lesionar la vista.**

Tenga especial cuidado al utilizar instrumentos ópticos con estos equipos. Dichos instrumentos pueden incrementar las probabilidades de lesiones oculares.

Los transceptores de láser de los equipos de fibra óptica pueden suponer un peligro para la seguridad física. Asegúrese de que toda persona que trabaje con estos equipos de Sun StorageTek entienda los peligros y siga los procedimientos de seguridad. Asegúrese de que todos los puertos ópticos de los módulos transceptores de láser estén terminados con un conector óptico, una cubierta o un tapón de protección contra el polvo.

Todas las interfaces de fibra óptica de estos equipos de canal de fibra de Sun StorageTek contienen un transceptor de láser, categorizado como Producto láser de Clase 1. Cada transceptor láser tiene una salida de menos de 70 μW y una longitud de onda de 850 nm. Los productos de láser de clase 1 de Sun StorageTek cumplen las normas EN60825-1(+A-11) y las secciones 21 CFR 1040.10 y 1040.11 de las normas de la Administración para la Calidad de Alimentos y Medicamentos (FDA).

Las siguientes traducciones están dirigidas a usuarios de Finlandia y Suecia que deseen identificar la categoría y clasificación de seguridad de los dispositivos láser:

LÁSER DE CLASE 1
LUOKAN 1 LASERLAITE
KLASSE 1 LASER APPARAT

Etiqueta del producto láser

De conformidad con las normas de seguridad, cada producto de canal de fibra de Sun StorageTek lleva una etiqueta que identifica la clase de láser del producto, y el lugar y fecha de fabricación. Esta etiqueta aparece sobre la unidad de cinta de canal de fibra, así como en las proximidades de los conectores de las bibliotecas de cintas de canal de fibra. A continuación puede verse una copia de dicha etiqueta:

CLASS 1 LASER PRODUCT
LASER KLASSE 1
APPAREIL A LASER DE CLASSE 1
CUMPLE LAS NORMAS 21 CFR 1040.10 Y 1040.11

Instalación de cables de fibra óptica

Para instalar cables de fibra óptica, efectúe este procedimiento:

1. **Tendido del cable:**

    - **Tarima:** Los cables de fibra óptica pueden instalarse debajo de tarimas. Al tenderlos, manténgalos apartados de cualquier obstrucción, como por ejemplo otros cables o equipos.

    - **Escalerilla portacables o canaleta de cables:** Sitúe los cables en su posición. No tire de ellos a través de la escalerilla portacables. Al tender los cables, manténgalos apartados de esquinas afiladas, colgadores de techo, conductos, tuberías y actividades de construcción.

    - **Longitud de elevación vertical:** Deje los cables en la bobina original y bájelos desde arriba. No tire de ellos desde abajo. Utilice los fijadores adecuados para inmovilizarlos.

    - **General:** No instale cables de fibra óptica encima de detectores de humo:

2. **Instalación de los cables:**

    - Deje como mínimo 4,6 m (15 pies) de cable en cada extremo, en previsión de futuras extensiones.

    - Utilice protectores contra tirones para evitar que el peso del cable dañe el conector.

    - Repase en el presente manual, así como de manuales afines, toda la información relativa a la manipulación segura de cables de fibra óptica.

3. **Protección de los conectores:**

    - Inserte los conectores con todo cuidado para evitar dañar éstos o la fibra.

    - No quite la cubierta de protección del conector hasta que esté preparado para realizar las conexiones.

    - Al desconectar el conector, vuelva a colocar la cubierta de protección.

    - Antes de realizar una conexión, limpie el conector. Asegúrese de que no haya obstrucciones y de que las ranuras de chavetas estén alineadas.

Manipulación de cables de fibra óptica

Al manipular cables de fibra óptica, tenga en cuenta las siguientes precauciones:

- No enrolle el cable a menos de 96 mm (3,75") de diámetro.
- No curve el cable a menos de 12 mm (0,5") de radio. Sun recomienda que el radio de curvatura de un cable no sea inferior a 20 veces el diámetro del cable.
- No tire de los cables: colóquelos con cuidado en su posición.
- No aferre los cables con alicates, pinzas ni fresas. No una los cables ni los conectores a dispositivos de tracción.
- Mantenga los cables apartados de bordes y salientes afilados que pudieran cortarlos o desgastarlos. Asegúrese de que los orificios del equipo dispongan de bordes protectores.
- Proteja los cables contra temperaturas extremas.
- En toda ocasión en que el conector no esté conectado, colóquele su cubierta de protección.

Prevención de daños por descargas electrostáticas (DES)

Quienes manipulan componentes sensibles a las descargas electrostáticas (DES) deben ser conscientes de los daños que éstas pueden provocar en los componentes electrónicos, con el objeto de adoptar las precauciones adecuadas para evitarlas. Asimismo, las personas que realicen tareas de mantenimiento en equipos de Sun StorageTek deben pasar un curso de fundamentos de las descargas electrostáticas.

PRECAUCIÓN:
Posibles daños a los equipos: **Manipule los componentes sensibles a las descargas electrostáticas *sólo* en las condiciones de protección adecuadas. Para cumplir este requisito, utilice siempre el Kit de puesta a tierra del servicio de campo (NP 4711) y cumpla en todo momento estas precauciones y procedimientos al realizar tareas de mantenimiento o servicio técnico de equipos de Sun StorageTek, así como al manipular componentes sensibles a las descargas electrostáticas.**

Precauciones contra descargas electrostáticas (DES)

Al trabajar con componentes sensibles a las descargas electrostáticas (DES), adopte siempre las siguientes precauciones generales:

- Utilice protección contra descargas electrostáticas a realizar tareas de instalación, desinstalación, mantenimiento o reparación de equipos de Storage Tek.
- Mantenga los circuitos impresos sensibles a las descargas electrostáticas dentro de sus embalajes de protección hasta haber adoptado las medidas de prevención adecuadas y esté preparado para instalar el componente.
- No permita que nadie toque o manipule un componente sensible a las descargas electrostáticas no protegido, salvo que dicha persona haya adoptado las precauciones pertinentes.
- Una vez concluido el trabajo, vuelva a colocar todas las cubiertas del equipo y cierre todas las puertas.
- Si la superficie de trabajo del kit de puesta a tierra ha estado sometida a temperaturas superiores a los 66 ºC (150 ºF) o inferiores a los 4,5 ºC (40 ºF), deje que la superficie se aclimate a la temperatura ambiente antes de desenrollarla.
- Coloque inmediatamente sobre esta superficie todo componente que haya retirado de su embalaje de protección contra descargas electrostáticas.
- Mantenga limpia la superficie de trabajo del kit de puesta a tierra.

  Nota: Para limpiarla, utilice agua y un detergente suave, asegurándose de que esté completamente seca antes de utilizarla.

- Compruebe periódicamente la resistencia eléctrica del cable de puesta a tierra y del cable en espiral de la muñequera.

  Nota: Al medir la resistencia del cable de puesta a tierra, debe ser inferior a 1,2 MΩ,; la del cable en espiral debe situarse entre 0,8 y 1,2 MΩ Repare o sustituya los cables si no cumplen estos requisitos.

Procedimiento de protección contra descargas electrostáticas (DES)

Recuerde que cada entorno de cliente es diferente. Responda a todas las dudas e inquietudes del cliente antes de proceder a trabajar en un equipo.

Prepare el área de trabajo

1. Antes de reparar el equipo, desenrolle completamente la superficie de trabajo del kit de puesta a tierra y colóquela sobre una superficie adecuada.
2. Conecte un extremo del cable de puesta a tierra a la superficie de trabajo y ajuste el broche de presión.

   Nota: El otro extremo se conectará posteriormente.
3. Colóquese una muñequera antiestática. Asegúrese de que le resulte cómoda y que haga contacto con toda la circunferencia de la muñeca.
4. Conecte a la muñequera un extremo del cable en espiral.

Acceda al equipo

5. Con todo cuidado, abra las puertas o retire las cubiertas del equipo. No toque ningún componente interno.

   PRECAUCIÓN:
   Antes de tocar cualquier componente interno, asegúrese de estar correctamente conectado a tierra.
6. Conecte el extremo libre del cable en espiral al lugar más adecuado:
   a. Si está trabajando con componentes de un equipo de pequeñas dimensiones, conecte el extremo libre del cable a la superficie de trabajo del kit de puesta a tierra. Asimismo, asegúrese de tocar una superficie metálica no pintada del equipo antes de tocar cualquier componente interno.
   b. Si está trabajando con componentes de un equipo de amplias dimensiones, conecte el extremo libre del cable en espiral a un conector de puesta a tierra o a una superficie metálica no pintada del interior del equipo.

Sustituya los componentes

7. Sustituya el componente defectuoso y colóquelo sobre la superficie de trabajo.
8. Extraiga el componente de recambio de su embalaje de protección contra descargas eléctricas e instálelo en el equipo.
9. Coloque el componente defectuoso dentro del embalaje de protección.

Limpie

10. Desconecte los cables de puesta a tierra del equipo.
11. Vuelva a instalar todas las cubiertas y cierre todas las puertas del equipo.
12. Desconecte el cable en espiral de la muñeca. Si fuese necesario, desconecte el cable de puesta a tierra de la superficie de trabajo.
13. Pliegue correctamente la superficie de trabajo, y guárdela. Guarde también los demás componentes del Kit de puesta a tierra del servicio de campo.

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Hardware Installation

1

This chapter tells you how to install the L80 Tape Library. Two methods are available:

- "Quick Installation Procedure" for users who have installed other L80 Tape Libraries
- "Standard Installation Procedure" on page 1-5 for first-time installers who want help with each step of the process

You might need to ask your system administrator for some of the configuration information, such as the network entries.

See Chapter 2 to become familiar with the component locations, specifications, and cables.

Quick Installation Procedure

If you are experienced with computer equipment and want to install this library with the minimum number of steps, use the following procedure. If you encounter problems, follow the detailed instructions in "Standard Installation Procedure" on page 1-5.

WARNING:
Safety first: **Make sure you read the information in "Safety" on page xvii before beginning. Use at least two people and a mechanical device to lift and position the library. The library weighs 63.5 to 122.5 kg (140 to 270 lb).**

ADVERTENCIA:
La seguridad es lo primero: **Antes de poner manos a la obra, asegúrese de leer la información presentada en "Seguridad" en la página xxv. Para levantar la biblioteca y colocarla en su posición se requieren como mínimo dos personas. La biblioteca pesa entre 63,5 y 122,5 kg (140 a 270 lb).**

Notes: Rack installation requires special procedures.
See "Rack Installation" on page 1-9.

Save all the packing material in case you want to relocate or return the library in the future.

1. Follow the unpacking instructions and remove the library from its shipping container. *Do not remove the library from the pallet until told to do so.*
2. Obtain the door key from the accessory container, and unlock and open the front door.

3. Cut the tie wraps and remove the packing cushion from the Z shaft.
4. Carefully raise the Z carriage and remove the foam securing the hand.
5. Visually inspect the library, storage cells, and drives, using a flashlight if necessary.

WARNING:
Possible personal injury: **Use a mechanical device to lift and position the library. The library weighs 63.5 to 122.5 kg (140 to 270 lb). You can remove the drive trays, power supplies, cartridges, and front door to reduce the weight. Use at least two people.**

ADVERTENCIA:
Posibilidad de lesiones físicas: **Utilice un dispositivo mecánico para levantar la biblioteca y colocarla en su posición. La biblioteca pesa entre 63,5 y 122,5 kg (140 a 270 lb). Es posible desmontar las bandejas de unidades, fuentes de alimentación, cartuchos y la puerta delantera para reducir el peso. Esta operación debe ser realizada como mínimo por dos personas.**

CAUTION:
Possible component damage: **Make sure you follow the ESD procedure described in "Electrostatic Discharge (ESD) Damage Prevention" on page xxii for the drive tray and personality module steps.**

Equipment damage: **Do not grip the library by the power supply or electronics module (EM) handles, or by the fans.**

6. Remove the drive trays, power supplies, cartridges, and front door to reduce the weight.
7. Place the library in the desired location.

CAUTION:
Possible equipment damage: **Make sure that the SCSI cable does not block the fan before you close the drive door.**

Possible cable damage: **Make sure you move the SCSI cable out of the way before you close the drive door.**

8. Install the drive trays, power supplies, and cartridges into the library.
9. For the deskside version, install the front door.

   Note: For the rack version, install the front door after you have secured the library to the rack.

10. Using proper ESD procedures, obtain the personality module from the bag taped to the power supply handle, and insert it into its connector at the rear of the library. *The library will not initialize properly unless the personality module is installed.*

    - A 40-cell version uses part 31363390x.
    - A 60-cell version uses part 31363420x.
    - An 80-cell version uses part 31363450x.

11. Attach the cell barrier clip if your library is not an 80-cell version.

    This clip identifies the cells that you may use for your data cartridges.

12. Make sure that the standard power supply modules are installed in the left openings of the power supply racks in the frame, facing the rear of the library.

13. Make sure that the redundant power supply modules, if ordered, are installed in the right openings of the power supply racks in the frame, facing the rear of the library.

14. Connect one end of the power cable into the rear of the library, feeding through the left side.

15. Connect the other end of the power cable into the wall socket.

16. Repeat the two previous steps for redundant power supplies, feeding the power cable though the right side.

17. Power-on the library and drives. The library will begin its initialization routine.

18. When initialization is complete, use the operator panel to configure the library and drives.

    Note: Refer to the user's guide or service manual for any field values that you do not understand.

19. When the configuration is complete, power-off the library and drives.

20. If you are using an external Fibre Channel router, install it according to its user manual:

    - *StorageNet 3300 Fibre Channel Router User Manual*, PN 461273-01
    - *Storagenet 3400 Fibre Multi-Protocol Router User Manual*, PN 461271-01

    Note: If your library has eight drives, you must use two StorageNet 3300 Fibre Channel Routers or one StorageNet 3400 Multi-Protocol router to support all drives.

21. Connect the SCSI cables to the rear of the library.

22. Attach the HVD or LVD label to the SCSI cable connector.

23. Terminate the last drive in the string:

    - HVD uses terminator part 10187075.
    - LVD/SE uses terminator part 10148031.

Note: If your library uses an internal or external Fibre Channel router, attach cables according to the figure under "Connecting Fiber and SCSI Cables" on page 1-16.

24. Power-on the library to activate the firmware.
25. Wait for the library to complete initialization.
26. Press the MENU button.
27. Press the SELECT button.

    The > sign appears to the left of `Door Operations`. The `DOOR MENU: Push SELECT to Prepare Library for Opening Door` message appears.

28. Press the SELECT button.

CAUTION:
Possible hand damage: **Always wait for operator panel to display the `OK To Open Door` message before opening the door. This ensures that the hand is safely seated.**

29. Insert the key into the locks, and unlock and open the door.
30. Insert the labeled cartridges into the library.

    Make sure that the cartridge hub is down and the volume label is facing the robot.

31. Close and lock the door, and remove the key.

    The library will initialize and audit the cartridges.

32. Configure your tape management software at the console.
33. Place the library online.
34. Record your library configuration information in Table 1-6 on page 1-31.
35. Make a copy of the table and give it to the customer. The customer will refer to it when making a service call or ordering features and upgrades.

Standard Installation Procedure

The procedure for the standard installation of the library takes you through each step of the installation process.

Check off the tasks in this list as you complete them:

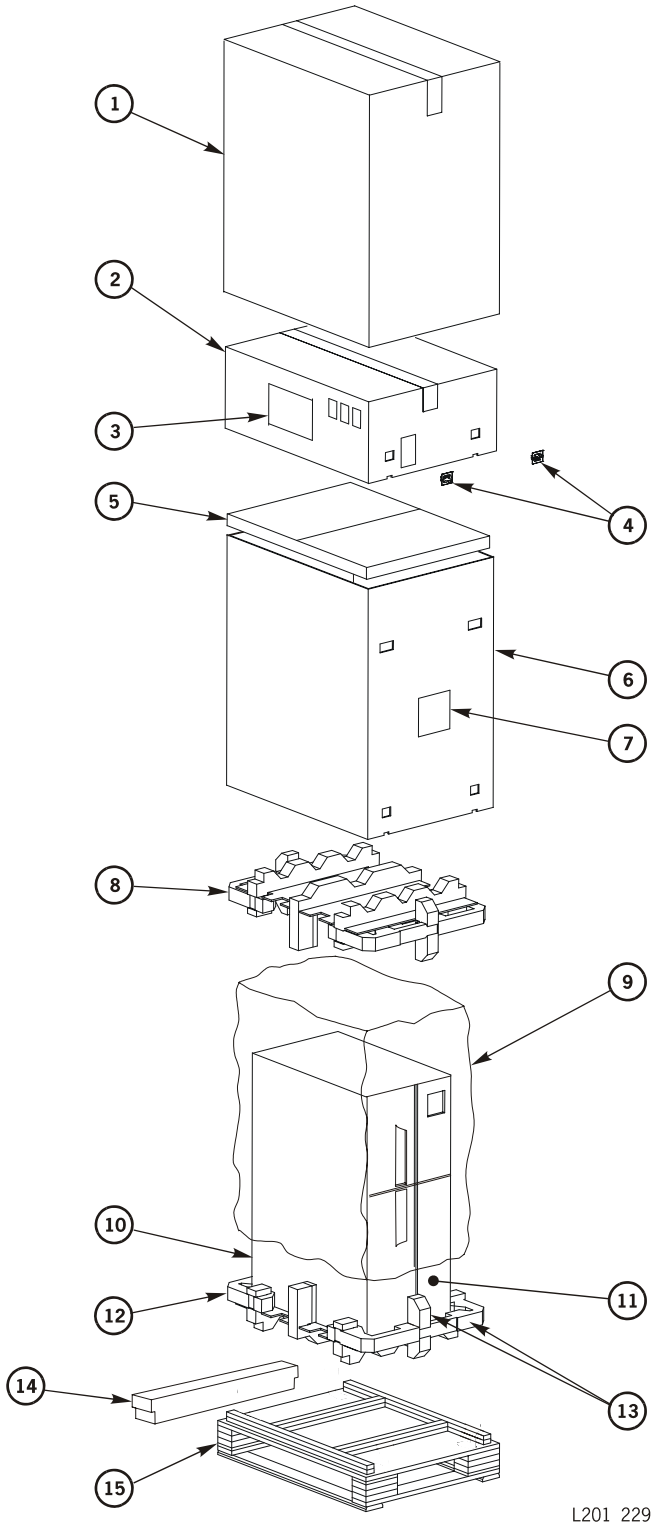
- ❑ 1. **"Preparing for the Installation" on page 1-5**
- ❑ 2. **"Unpacking the Library" on page 1-7**
- ❑ 3. **"Inspecting the Library and Drives" on page 1-8**
- ❑ 4. **"Preparing the Installation Location" on page 1-8**
- ❑ 5. **"Positioning the Library" on page 1-9**
- ❑ 6. **"Installing the Optional External Fibre Channel Router" on page 1-14**
- ❑ 7. **"Connecting the External SCSI Cables" on page 1-14**
- ❑ 8. **"Connecting Fiber and SCSI Cables" on page 1-16**
- ❑ 9. **"Attaching the Personality Module" on page 1-18**
- ❑ 10. **"Attaching the Cell Barrier Clip" on page 1-18**
- ❑ 11. **"Inserting the Cartridges" on page 1-20**
- ❑ 12. **"Installing the Drives" on page 1-27**
- ❑ 13. **"Powering-on the Library and Drives" on page 1-30**

Preparing for the Installation

In general, for a successful installation you should be familiar with:

- SCSI principles (bus termination, terminating power, addressing)
- The SCSI cable plan for your installation
- The SCSI addresses (IDs) already in use by your system
- The SCSI IDs chosen for the devices to be installed (library and drives)
- Fibre Channel principles (termination, cabling, addressing) if your library contains an optional Fibre Channel router

Figure 1-1. Unpacking the Library (L201_ 229)



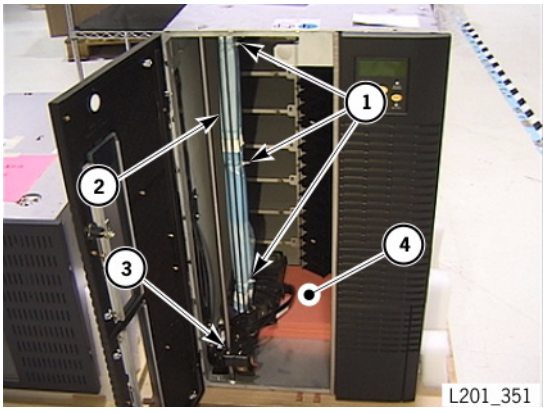
1. Outer Container
2. Container cap
3. Logo label, used for repacking
4. Container locks (Hold so the protruding part is on top. Squeeze the ears and lift the locks to secure them into the openings.
5. Accessory container
6. Sleeve
7. Bar code label, used for repacking
8. Top cushion
9. Plastic bag
10. Library
11. Internal bracing items
12. Bottom cushion
13. Front and rear rail
14. Pallet

Unpacking the Library

Note: Save all the packing material in case you want to relocate or return the library in the future.

Become familiar with the components in the previous figure, and:

1. Cut any packing tape, bands, and seals, and remove the outer container.
2. Remove the container locks.
3. Remove the container cap.
4. Remove the accessory container.
5. Remove the sleeve.
6. Remove the top cushion.
7. Remove the plastic bag.
8. Remove the front and rear rail of the bottom cushion. Make sure that the rear cushion is under the drive end of the library and against the white cushion. *Do not remove the library from the pallet.*
9. Obtain the door key from the accessory container.
10. Insert the key into the two locks on the front door, and unlock and open the door.
11. Cut the tie wraps and remove the packing cushion from the Z shaft.



1. Tie Wraps
2. Packing cushion around Z shaft
3. Z carriage
4. Hand foam

12. Carefully raise the Z carriage and remove the foam securing the hand assembly.

Inspecting the Library and Drives

Visually inspect the library and drives, using a flashlight if necessary:

1. Check the library's exterior and interior for any obvious physical damage or loose parts.
2. Make sure that the cables and accessories you require are present. Refer to your shipping bill. Some items might be shipped in a separate package.

   _____ SCSI cables
   _____ SCSI terminators
   _____ SCSI adapters
   _____ Fibre Channel cables
   _____ AC power cable
   _____ Cartridges and labels
   _____ Personality module (in bag taped to the power supply handle)

3. Report any damaged, missing, or incorrect items to your sales representative.

Preparing the Installation Location

Prepare the installation location:

1. Make sure that the location is clean, dry, level, and adequately ventilated.
2. Allow sufficient space to service the library from the front, right side, and rear. Each of these areas should have a service clearance of 610 mm (2 ft).
3. Make sure that the AC power outlet is near the library and is easily accessible to the library power cable.
4. If you are installing the library in a 483-mm (19-in.) standard-width rack, you must have either brackets or a tray measuring at least 711 mm (28 in.) deep. Make sure that the brackets or tray is installed within the rack before you install the library.

See Figure 2-9 on page 2-11 or Figure 2-10 on page 2-12 to make sure your installation area meets the required dimensions and weight.

Positioning the Library

The library can be ordered for either deskside or rack installation.

Deskside Installation

WARNING:
***Possible personal injury:* Check the path to the intended location and clear it of obstructions before you move the library. Use at least two people and a mechanical device to lift and position the library. The library weighs 63.5 to 122.5 kg (140 to 270 lb).**

ADVERTENCIA:
***Posibilidad de lesiones físicas:* Antes de mover la biblioteca, verifique el trayecto hasta la ubicación de instalación prevista y retire cualquier obstáculo. Para levantar la biblioteca y colocarla en su posición se requieren como mínimo dos personas. La biblioteca pesa entre 63,5 y 122,5 kg (140 a 270 lb).**

CAUTION:
***Equipment damage:* Do not grip the library by the power supply or electronic module handles, or by the fans.**

To install the deskside library:

1. Place the library (still on the pallet) on any level floor within cabling distance of your client-server computer.
2. Use a mechanical device to set the library on the floor.

CAUTION:
***Possible cable damage:* In the next step, move the SCSI ribbon cables out of the way before you close the drive doors.**

3. Install the drive trays, if they were not shipped with the library or if you removed them. See "Installing the Drives" on page 1-27.

Rack Installation

Use a standard 483-mm (19-in.) wide rack with 18 rack units of space to accommodate the library, which sits on customer rack-specific brackets or on a tray provided by the customer. The library is secured to the rack with screws and nut clips to prevent the library from being pulled off the rack.

The rack can have a rear door. The door must extend at least 102 mm (4 in.) beyond the library to allow proper air flow for the library's cooling fans and for cable routing. The maximum rack air ambient temperature is 40ºC (104ºF).

To allow easy access to the CAP and operator panel, the rack should not have a front door. If you install a front door, make sure that the door provides proper ventilation.

The library uses the power cable's ground point for its earth-ground connection. All electrical connections, either directly to the wall or to a power strip in the rack, must be properly grounded. Consider proper electrical circuit and power strip overload protection.

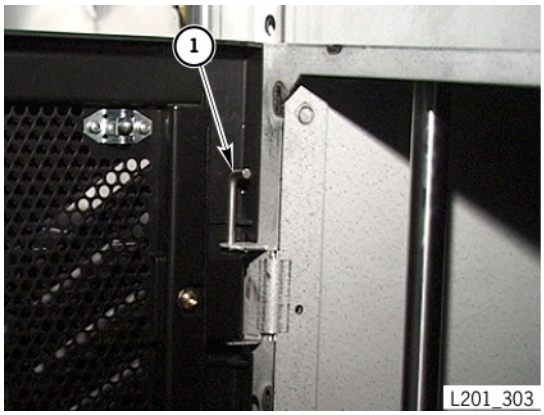
Note: The rack can be ordered from Sun StorageTek or from another vendor. The StorageTek conversion bill number for a black rack is YXL20/40/80-SHELF.

To install the library into a rack:

1. Install the brackets or tray onto the rack if not previously done. The tray must be at least 749.3 mm (29.5 in.) deep.

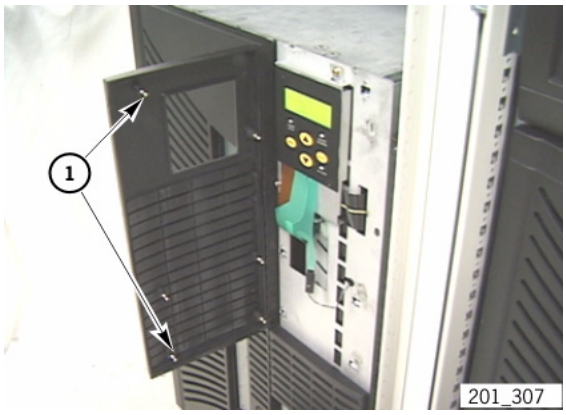
Note: You must remove the front door and two decorative covers to access the holes in the library flanges.

2. Insert the key into each of the two locks on the door, and unlock and open the door.
3. Hold the door *firmly* with your left hand, and remove the bottom hinge pin, then the top hinge pin.



1. Hinge pins (2)

4. Set the door aside.
5. Remove the top right decorative cover over the operator panel by grasping the top of the cover and gently pulling it away from the operator panel.



1. Cover snap pins (6)

6. Remove the middle decorative cover over the operator panel the same way.
7. Measure and note the distances from the bottom of the library flanges to the mounting holes near the four corners of the front of the library frame. Note that the distances for the left and right flange hole spaces are different.
8. Using these distances, Obtain the four nut clips from the accessory kit, install the four nut clips into the rack so that their locations match the hole locations from the previous step.

WARNING:
Possible personal injury: **Use a mechanical device to lift and position the library. The library weighs 63.5 to 122.5 kg (140 to 270 lb). You can remove the drive trays, power supplies, cartridges, and front door to reduce the weight. Use at least two people.**

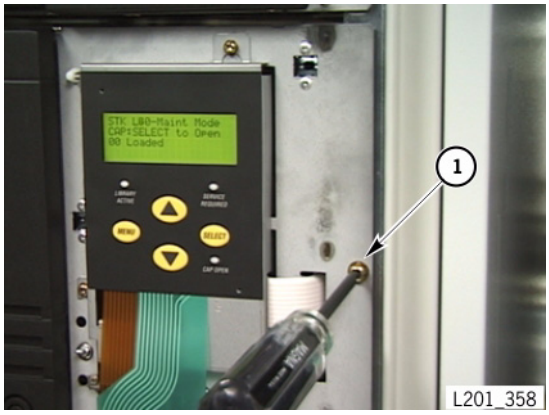
ADVERTENCIA:
Posibilidad de lesiones físicas: **Utilice un dispositivo mecánico para levantar la biblioteca y colocarla en su posición. La biblioteca pesa entre 63,5 y 122,5 kg (140 a 270 lb). Es posible desmontar las bandejas de unidades, fuentes de alimentación, cartuchos y la puerta delantera para reducir el peso. Esta operación debe ser realizada como mínimo por dos personas.**

WARNING:
***Tip hazard*: When installing the library, be careful to keep the rack from tipping over. If you are installing only one library into the rack, place the library on the bottom.**

ADVERTENCIA:
***Peligro de vuelco*: Al instalar la biblioteca, tenga cuidado de que el bastidor no se vuelque. Si en el bastidor va a instalarse una sola biblioteca, colóquela en la parte inferior.**

CAUTION:
***Equipment damage:* Do not grip the library by the power supply or electronics module (EM) handles, or by the fans.**

9. Slide the library onto the previously installed supporting brackets or tray.
10. Secure the library to the rack with four screws through the rack to the screw nut clips on the rear of the rack.



1. Screws (4)

11. Attach the two decorative covers to the library by lining up the pins with the holes and snapping the covers into place.
12. Attach the door with the two hinge pins, inserting the top pin first.

Choosing SCSI HVD or LVD

Your library interface is hardware configured as either high voltage differential (HVD) or low voltage differential (LVD). The HVD interface allows longer cable lengths, but throughput is slower than LVD. The LVD interface restricts cable lengths, but provides faster throughput.

CAUTION:
***Potential equipment damage:* Do not mix LVD and HVD operation on the same bus.**

SCSI Cable Restrictions

The library and drives accept *only* SCSI Type-3 connectors. If you use SCSI Type-1 or -2 connectors, you must use a SCSI Type-1- or SCSI Type-2-to-SCSI Type-3 adapter.

Note: If you are connecting the library or drives to an LVD SCSI bus, the cable can be no longer than 12 m (39.4 ft).

Each interface requires a unique terminator.

The following table lists restrictions for SCSI connections.

Table 1-1. SCSI Cable Length Restrictions

Application	Length Restriction
Single-ended	Stub length: 102 mm (4 in.) 5 to 10 MB/s data transfer rate: 3 m (10 ft) 1 to 5 MB/s data transfer rate: 6 m (20 ft)
High voltage differential	Stub length: 203 mm (8 in.) 1 to 40 MB/s data transfer rate: 25 m (82 ft)
Low voltage differential	Stub length: 102 mm (4 in.) 1 to 80 MB/s data transfer rate: 12 m (39.37 ft)

Host Bus Adapter Requirements

The host bus adapter (HBA) in your server must match the library and drive's SCSI bus type. If the interface to the library is HVD, the server must contain an HVD-compatible HBA; if the interface to the library is LVD, the server must contain an LVD-compatible HBA.

SCSI Device/Bus Type Issues

The following table lists the possible issues you could encounter if you mix interfaces on the same bus.

Table 1-2. SCSI Device/Bus Types: Issues

If you plug a . . .	Into . . .	The result is . . .
Single-ended device	Single-ended bus	Proper connection
	LVD bus	Single-ended mode
	HVD bus	Operation disabled
Low voltage differential device	Single-ended bus	Single-ended mode
	LVD bus	Proper connection
	HVD	*Potential damage*/disabled device
High voltage differential device	Single-ended bus	Disabled device
	LVD bus	*Potential damage*/disabled device
	HVD bus	Proper connection

Installing the Optional External Fibre Channel Router

If you are using an external Fibre Channel router, install it according to its user manual:

- *StorageNet 3300 Fibre Channel Router User Manual*, PN 461273-01
- *Storagenet 3400 Fibre Multi-Protocol Router User Manual*, PN 461271-01

Note: If your library has eight drives, you must use two StorageNet 3300 Fibre Channel Routers or one StorageNet 3400 Multi-Protocol router to support all drives.

If installing an external fibre channel router to replace an internal fibre channel router card, remove the internal fibre channel router card. Refer to the *L80 Tape Library Service Manual, PN 96022*.

Connecting the External SCSI Cables

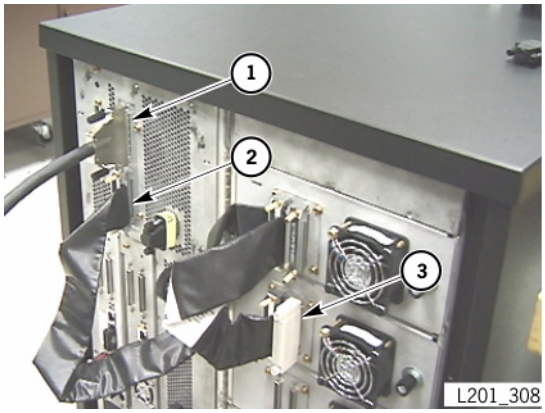
You should be familiar with SCSI principles to correctly cable your system.

Note: You can connect the library and drives to the same bus (on bus) or to separate buses (off bus). However, for the on bus configuration, a bus reset will affect all devices on the bus. Library availability can be improved by ensuring that the library is on a separate bus from the drives.

The library supports the use of:

- Digital linear tape (DLT) 7000E/8000 drives on an HVD interface
- DLT 8000 drives on an LVD interface
- Ultrium linear tape open (LTO) drives on an LVD interface (native) or on an HVD interface (with an optional converter card that is on the drive tray assembly when ordered as HVD from Storage Technology Corporation)
- DLT1 drives on an LVD interface (native) or on an HVD interface (with optional converter card)

The following figure shows one example of how to cable a SCSI library and two drives.



1. Client-server cable
2. SCSI cable
3. SCSI terminator

To attach SCSI cables:

1. Attach a SCSI daisy-chain cable to one rear SCSI port on the drive. These cables should be at least 300 mm (11.81 in.) long if connecting from the LLC card to the top drive slot, or 1 m (3.29 ft.) long if connecting from the LLC card to the bottom drive slot.

2. Connect the client-server cable to the library.

Note: Make sure you properly set the SCSI IDs for the drives and library, or you might stop activity on the SCSI bus. You will set the IDs when you configure the library and drives.

3. Install the provided terminator on the remaining SCSI port of the lowest drive that is installed, and on the client server computer, if required.

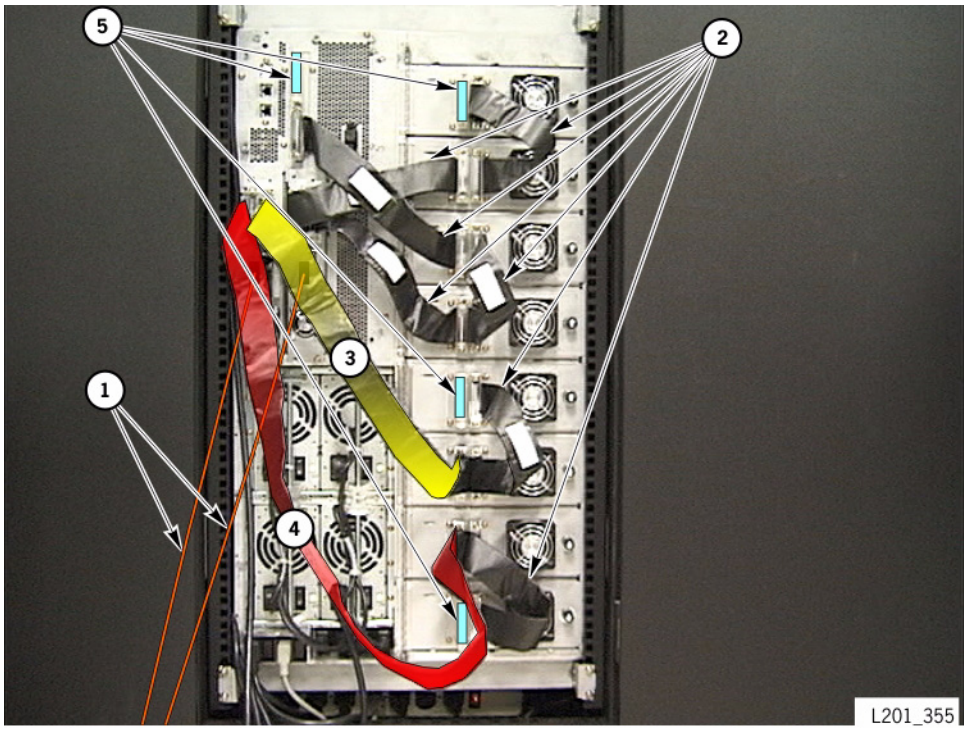
    - HVD uses terminator part 10187075.
    - LVD/SE uses terminator part 10148031.

You can vary this cabling arrangement depending on how your system is configured. For example, you can attach one of the drives to a different bus, in which case that drive would have its own SCSI terminator.

Connecting Fiber and SCSI Cables

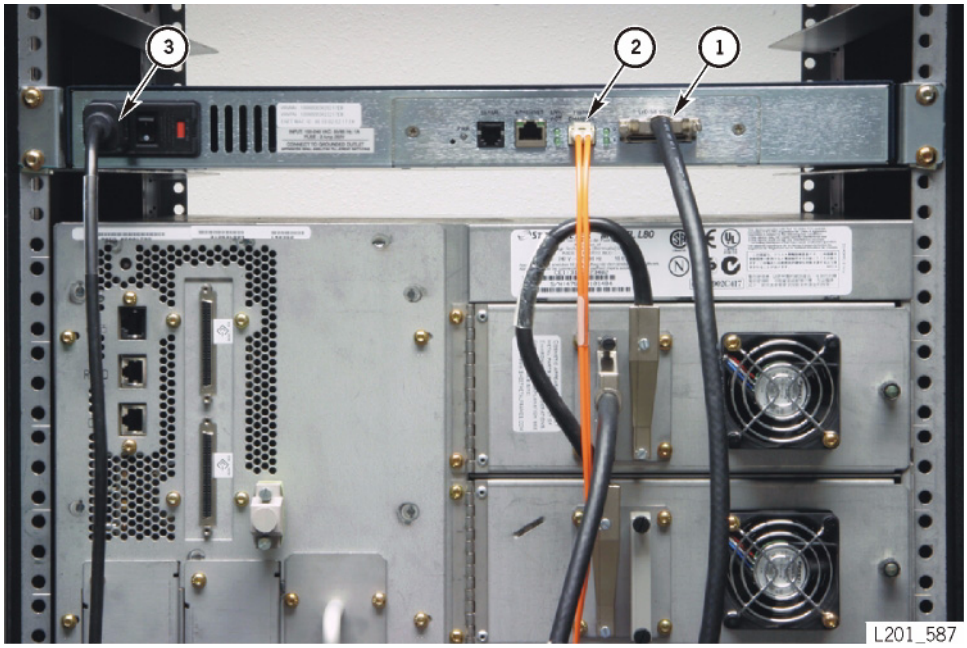
For libraries with a Fibre Channel router card, follow the cable routing shown in the first figure, which shows cabling for four drives.

The second and third figures show a detail of the cable routing to the SN3300 and SN3400 routers, respectively. The cabling library cabling is the same as the first figure.



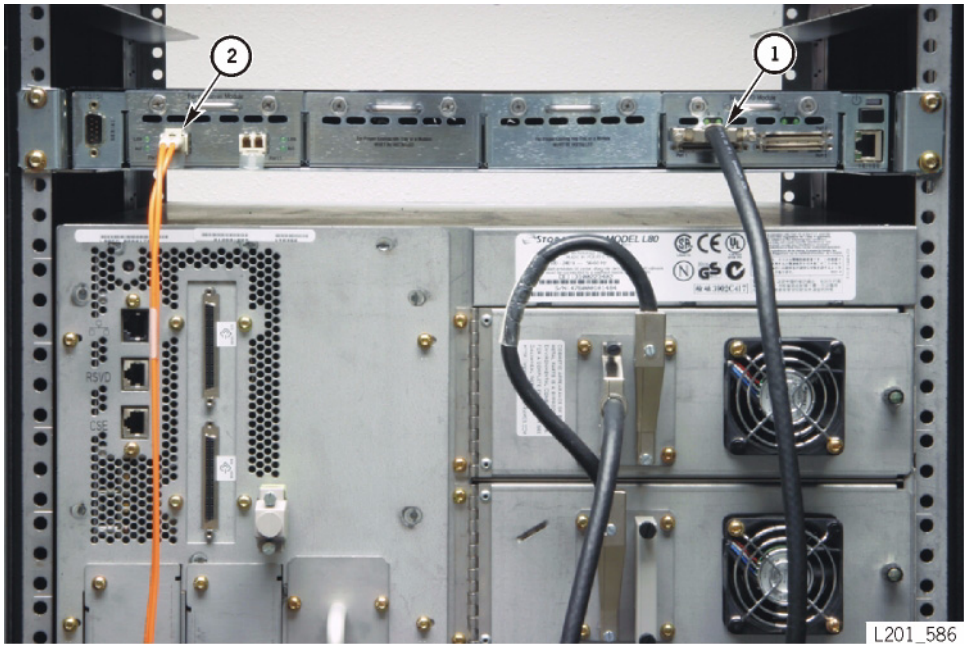
1. Fiber cables to/from host
2. Seven 300 mm (11.81 in.) LVD SCSI cables
3. One 600 mm (1.97 ft) LVD SCSI cable
4. One 1 m (3.29 ft) LVD SCSI cable
5. Four SCSI terminators

SN3300 Fibre Channel Router



1. One of seven 300 mm (11.81 in.) LVD SCSI cables
2. Fiber cables to/from host
3. Power cable (reference)

SN3400 Multi-Protocol Router



1. One of seven 300 mm (11.81 in.) LVD SCSI cables
2. Fiber cables to/from host

Attaching the Personality Module

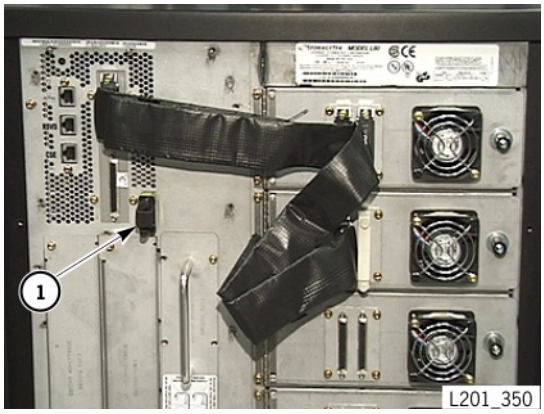
The personality module is a connector that stores the library cell capacity information. The module stores a capacity of 40, 60, or 80 cells. The library does not operate properly unless an authorized module is attached to the rear of the EM.

Attach the module before powering-on the library for proper initialization. Only remove the module when installing an upgrade conversion bill or replacing the library.

CAUTION:
Possible component damage: **Make sure you follow the ESD procedure described in "Electrostatic Discharge (ESD) Damage Prevention" on page xxii before connecting the personality module.**

The personality module is in a bag taped to the power supply handle. Remove the personality module and attach it to its connector:

- A 40-cell version uses part 31363390x.
- A 60-cell version uses part 31363420x.
- An 80-cell version uses part 31363450x.



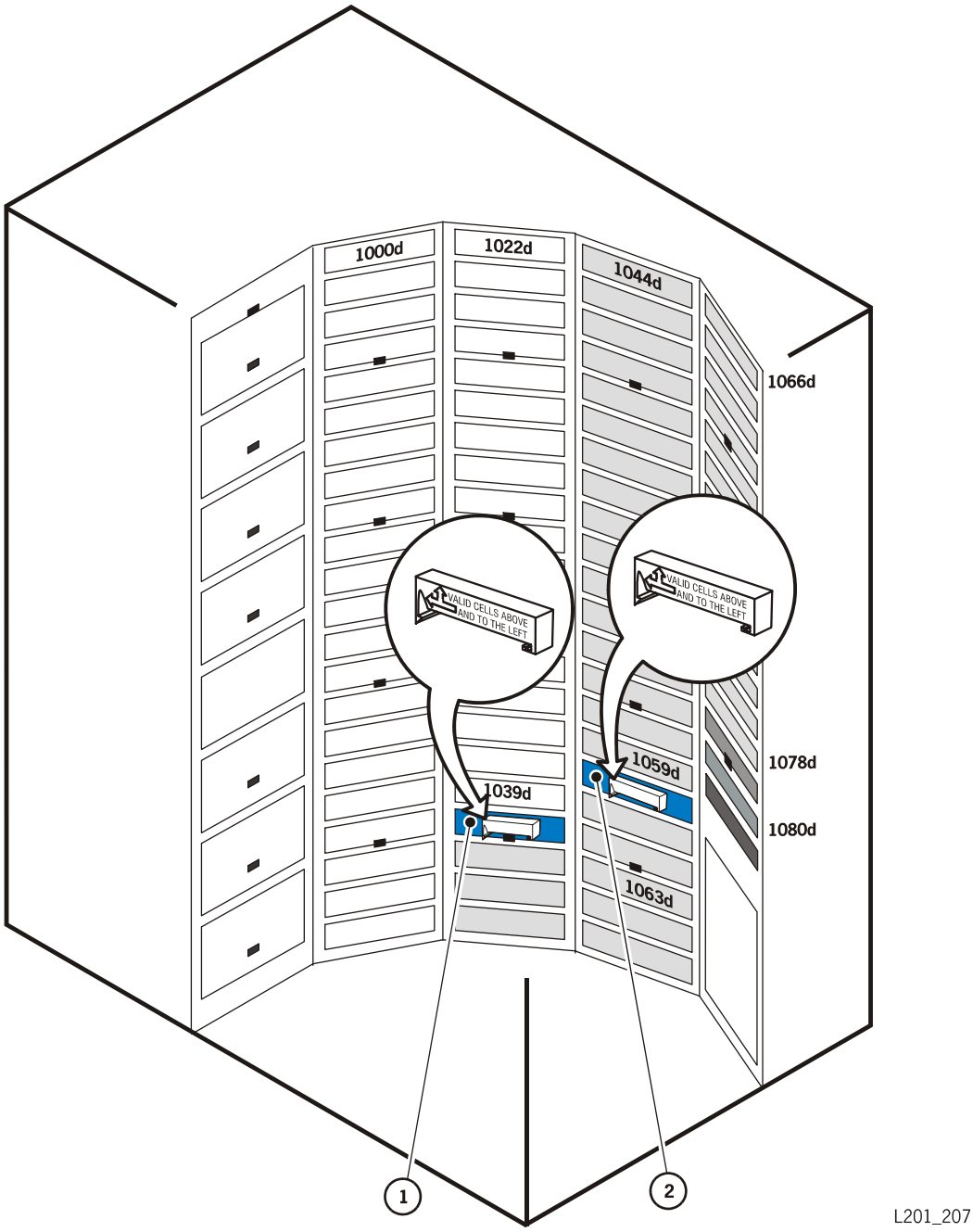
1. Personality module

Attaching the Cell Barrier Clip

If your library is not an 80-cell version, the tape management software only recognizes the data cells designated for the capacity that you ordered. To remind the operator to not place data cartridges into the other cells, attach the cell barrier clip, as shown in the following figure.

Use the `PERS MODULE Menu` on the operator panel to determine your library's cell capacity.

Figure 1-2. Attaching the Cell Barrier Clip (L201_207)



1. Cell barrier clip location for 40-cell version library
2. Cell barrier clip location for 60-cell version library

Inserting the Cartridges

Make sure you refer to "Electrostatic Discharge (ESD) Damage Prevention" on page xxii before proceeding.

Depending on the version and configuration of your library, some storage cells cannot be used. Read the legend on the page following Figure 1-3 on page 1-21.

Note: You do not have to insert a cartridge into every storage cell. The library automatically audits cartridges and empty cells as part of its initialization routine.

CAUTION:
Do not place a white cartridge into cell 1044d, or you will cause an initialization failure.

Inserting the cartridges correctly is critical for library operation. If you do not orient the cartridges correctly or do not insert them all the way into the storage cells, the library might fail, and the operator panel might display an error message. Make sure you insert the cartridge *inside* the black array, not above or beneath it. Figure 1-4 on page 1-23 shows the correct way to insert cartridges into storage cells.

Check the cartridges to make sure that they are correctly labeled, as described in the user's guide.

Insert as many cartridges into the library as you want and as your configuration allows, making sure you seat them all the way into the storage cells.

Figure 1-3. Determining the Valid Storage Cells (L201_150)

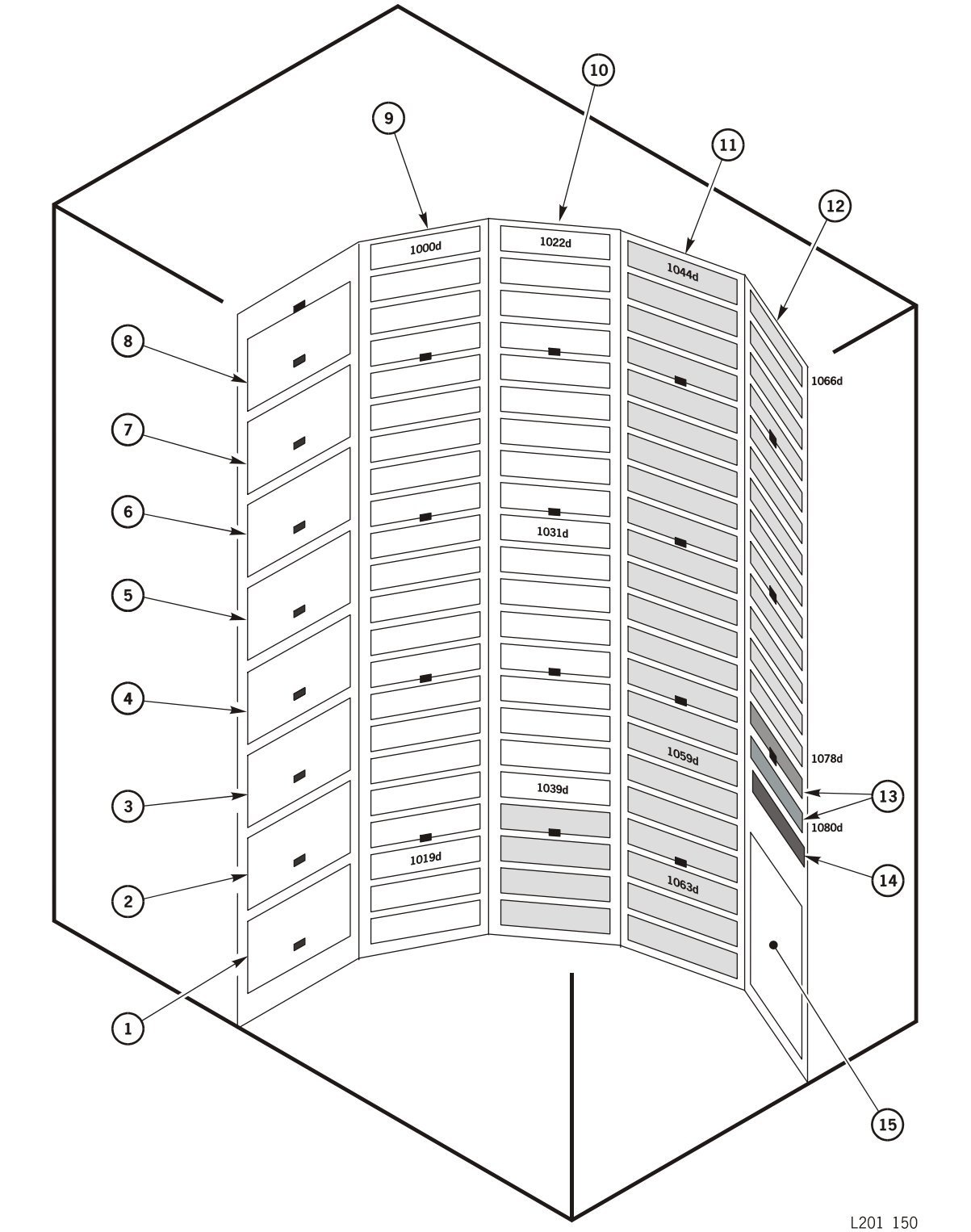


Figure 1-3. Determining the Valid Storage Cells (Continued)(L201_150)

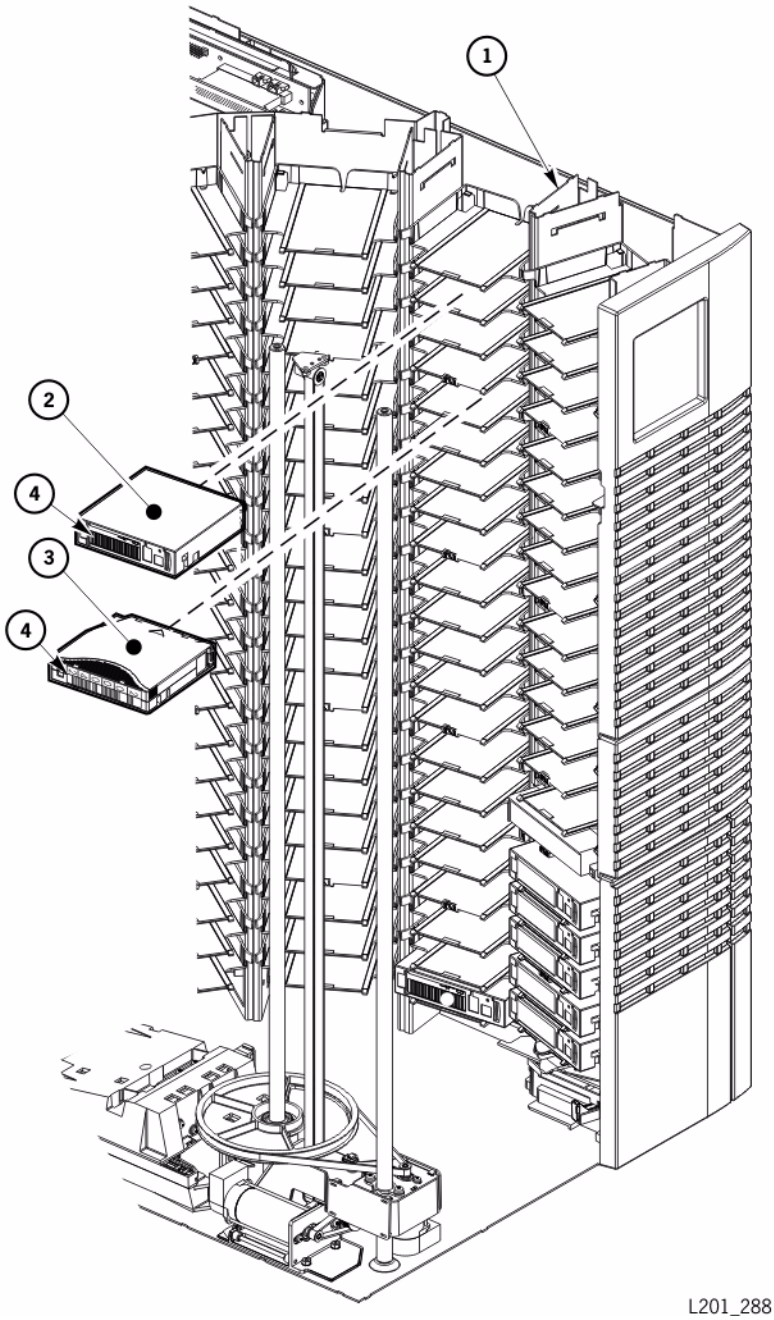
1. Drive Slot 7
2. Drive Slot 6
3. Drive Slot 5
4. Drive Slot 4
5. Drive Slot 3
6. Drive Slot 2
7. Drive Slot 1
8. Drive Slot 0
9. Column 0
10. Column 1
11. Column 2
12. Column 3
13. Cleaning cartridge cells (2) when Auto Clean is enabled
14. Library calibration label
15. CAP (five cells)

Note: In an 80-cell capacity library, if Auto Clean is not enabled, the operator can place data cartridges into the cleaning cartridge cells, making the total capacity 81. If Auto Clean is enabled, the total capacity is 79.

Legend:

- Use Columns 0 and 1 white cells for the 40-cell configuration.
- Use Columns 0 and 1 white cells and Columns 1, 2 and 3 light gray cells for the 80-cell configuration.
- Use the two dark gray cells above the CAP for cleaning cartridges if Auto Clean is enabled.
- The small, black rectangles are targets.

Figure 1-4. Inserting the Cartridges (L201_288)



1. Storage cells
2. DLT cartridge
3. Ultrium cartridge
4. Volume number

Drive Compatibility Issues

Refer to your drive publications and the vendor Web sites for a detailed discussion of drives and cartridges.

The library supports the following drives:

- Ultrium Linear Tape-Open (LTO) drives

  LTO technology was developed by IBM, Hewlett-Packard, and Seagate to provide a clear and viable choice in an increasingly complex array of tape storage options. LTO is an "open format' technology, which means that users will have multiple sources of product and media. The open nature of LTO technology also provides a means of enabling compatibility among different vendor's offerings.

  - Hewlett-Packard's LTO 1, LTO 2, and LTO 3
  - IBM's LTO 1, LTO 2, and LTO 3
  - Quantum's (Certance) LTO 2 and LTO 3
  - Seagate LTO 1 and LTO 2

- Digital Linear Tape (DLT) drives:
  - Quantum Corporation's DLT 7000E, DLT 8000, and Super DLT 220, 320 and 600
  - Benchmark Storage Innovations, Inc's DLT1

You may mix drive types within a library, but please observe the following cautions and tables:

CAUTION:
***Possible data corruption:* Do not mix DLT 7000 and DLT 8000 drives in the same library. If a DLT 7000 cartridge is inserted into a DLT 8000 drive, the tape can be read and written on in 7000 mode. If a DLT 8000 cartridge is inserted into a DLT 7000 drive and a read command is issued, the drive will indicate Medium Error/Calibration Error (03/8000). If a write command is issued at load point, as with most drives, the drive will write over any data present.**

CAUTION:
***Data loss:* Do not mount SDLT 320-formatted cartridges into SDLT 220 drives. An SDLT 220 drive will overwrite the 320 data. To avoid this, carefully manage the locations of the cartridges within your library, and designate the correct drive type for your read/write operations.**

Do *not* mix LVD and HVD operations on the same bus.

DLT1 drives use only DLTtape IV cartridges, and can read—but not write to—DLTtape IV cartridges formatted by DLT 4000 drives.

DLT1 drives use their own cleaning cartridge, part 100099401. Do *not* use this cartridge in DLT drives.

Table 1-3. LTO Drive Backward Readability

	LTO Gen 2 Drive	LTO Gen 3 Drive
LTO 1 media	Read and write	Read only
LTO 2 media	Read and write	Read and write
LTO 3 media	No action	Read and write

Table 1-4. SCSI Device/Bus Types: Issues

If you plug a . . .	Into . . .	The result is . . .
Single-ended device	Single-ended bus	Proper connection
	LVD bus	Single-ended mode
	HVD bus	Operation disabled
Low voltage differential device	Single-ended bus	Single-ended mode
	LVD bus	Proper connection
	HVD	*Potential damage*/disabled device
High voltage differential device	Single-ended bus	Disabled device
	LVD bus	*Potential damage*/disabled device
	HVD bus	Proper connection

The drive interfaces are SCSI high voltage differential (HVD) or SCSI low voltage differential (LVD). The HVD interface allows longer cable lengths, but throughput is slower than with the LVD interface. The LVD interface restricts cable lengths, but provides faster throughput.

The following table shows the types of drives and the interfaces that are supported.

Table 1-5. Compatible Drives and Interfaces

Drive Name	Sustained Native Transfer Rate	Interface	
		HVD[1]	LVD[2]
DLT 8000	6.0 MB/s	Ultra-2 SCSI HVD Fast 40	Ultra-2 SCSI LVD 80MB/s, SE 40MB/s
SDLT 220	11 MB/s	Ultra-2 SCSI HVD Fast 40	Ultra-2 SCSI LVD 80MB/s, SE 40MB/s
SDLT 320	16 MB/s	Ultra-2 SCSI HVD Fast 40	Ultra-2 SCSI LVD 80MB/s, SE 40MB/s
SDLT 600	36 MB/s	N/A	Ultra-3 SCSI LVD 160 MB/s, SE 40 MB/s
Seagate/Certance Ultrium 1 LTO[5]	16 MB/s	Ultra-2 SCSI HVD Fast 40	Ultra-2 SCSI LVD 80 MB/s, SE 40 MB/s
Seagate/Certance Ultrium 2 LTO[5]	34 MB/s	N/A	Ultra-2 SCSI LVD 80 MB/s
Seagate/Certance Ultrium 3 LTO[5]	68 MB/s	N/A	Ultra-3 SCSI Ultra-160 LVD 160MB/s
IBM Ultrium 1 LTO	15 MB/s	Ultra-2 SCSI HVD Fast 40	Ultra-2 SCSI LVD 80 MB/s
IBM Ultrium 2 LTO	35 MB/s	N/A	Ultra-3 SCSI(Ultra-160) LVD 160MB/s
IBM Ultrium 3 LTO	80 MB/s	N/A	Ultra-3 SCSI(Ultra-160) LVD 160MB/s
HP Ultrium 1 LTO	15 MB/s	Ultra-2 SCSI HVD Fast 40	Ultra-2 SCSI LVD 80 MB/s, SE 40MB/s
HP Ultrium 2 LTO	30 MB/s	N/A	Ultra-3 SCSI Ultra-160 LVD 160MB/s
HP Ultrium 3 LTO	80 MB/s	N/A	Ultra-4 SCSI Ultra-320 LVD 160MB/s

1. The maximum burst speed of data transfer for the HVD interface is at 40 MB/s
2. The maximum burst speed of data transfer for the LVD interface varies depending upon the type of SCSI interface.
3. Certance is owned by Quantum Corporation.

Installing the Drives

Use the information in the following paragraphs if you ordered a library that did not have the drives already installed, or if you want to add more drives to your library.

See "Drive Compatibility Issues" on page 1-24.

If you are installing an SDLT 600 drive, make sure that Field Bill 102167 was installed. The field bill replaces the internal fan finger guard with a perforated steel plate to comply with emissions standards.

Note: Because the drive is part of the drive tray assembly, you will actually be installing the assembly.

You should always add drives by starting at the empty slot nearest the top and working downward. The drive numbers are assigned from top (0) to bottom (7). By adding drives in this order, the client software will correctly reflect the drives previously installed.

If you already have some drives installed, observe these precautions before beginning:

CAUTION:
Possible data loss or system problem: **If you must disconnect the external SCSI cables, make sure that you stop all processes attached to this system.**

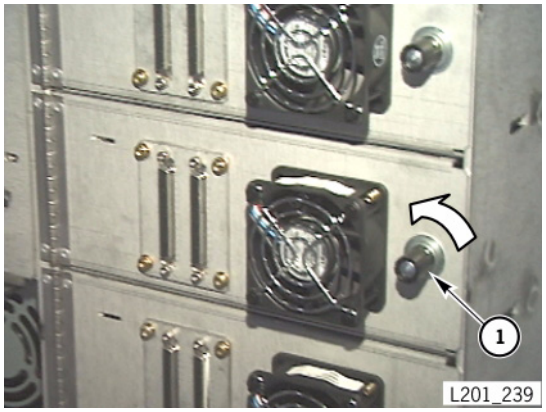
- If the drives are daisy-chained, stop all data processing on the channel to which the drives are connected before disconnecting the drives.
- Make sure that there is no activity on the SCSI bus before disconnecting the external SCSI cables. Stop all processes on the client-server computer.
- Make sure that all signals are terminated at each end of the SCSI bus.
- Do not mix single-ended and differential terminators.

WARNING:
Lifting hazard: **Depending upon the drive type, each drive and tray weighs between 5.0 kg (11 lb) and 5.8 kg (12.7 lb). Make sure that you follow the lifting instructions in "Lifting Techniques" on page xvii.**

ADVERTENCIA:
Riesgo al levantar: **En función del tipo de unidad, cada unidad y bandeja pesa entre 5,0 kg (11 lb) y 5,8 kg (12,7 lb). Asegúrese de seguir las instrucciones de la sección "Técnicas de levantamiento de objetos" en la página xxvi.**

CAUTION:
Possible component damage: **Do not use a screwdriver for the drive door latch knob or drive tray latch knob.**

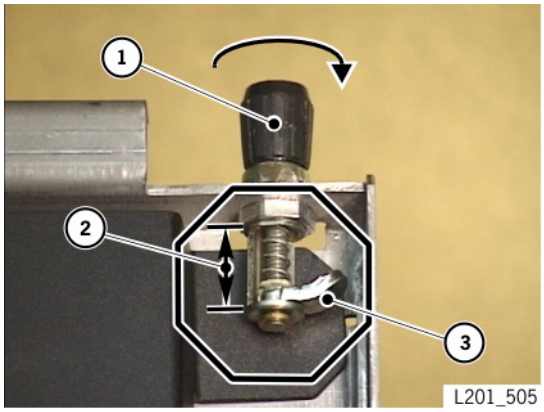
1. At the rear of the library, turn the drive door latch knob to your left to open the drive door.



1. Knob

CAUTION:
Load/unload problems: **The drive tray latch must be fully loosened (disengaged) before you slide the tray into the slot. If the latch arm contacts part of the library frame as it is being tightened, it cannot be rotated to its fully locked position, and the tray will not be firmly locked into the drive slot. This can cause alignment problems and the camera can have problems reading the target.**

2. Holding the drive tray assembly as shown in the figure below, turn the drive tray latch knob all the way to your right so that it is in its fully disengaged position.



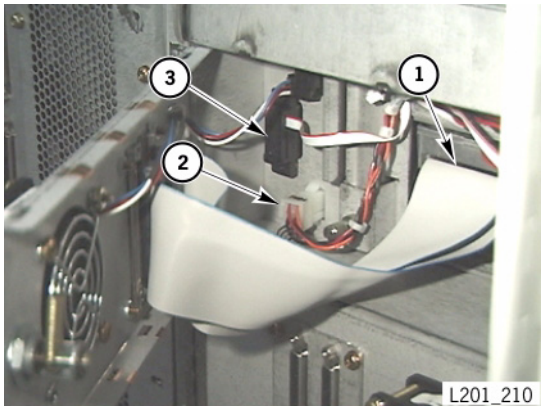
1. Knob
2. Range
3. Latch arm (shown disengaged)

3. Slide the drive tray assembly into the desired slot.

CAUTION:
***Possible component damage:* Do not use a screwdriver to tighten the drive tray latch knob.**

4. Turn the knob all the way to the right to engage the latch and clamp it firmly into the frame.
5. Pull back on the tray to make sure the tray is securely latched. It should not move.

6. Connect the drive SCSI connector, P903, to the drive.
7. Connect the drive power cable, P904A/B, to the library.
8. Connect the serial interface connector, P6A/B, to the library.



1. P903
2. P904A/B
3. P6A/B

CAUTION:
***Possible equipment damage:* Make sure the SCSI cable does not block the fan before you close the drive door.**

***Possible cable damage:* Make sure you move the SCSI cable out of the way before you close the drive door.**

***Possible component damage:* Do not use a screwdriver to tighten the drive door latch knob.**

9. Close the drive door and secure it by turning the drive door latch knob to your right.
10. Refer to your user's guide to configure the drives.

Powering-on the Library and Drives

To power-on the library and drives:

CAUTION:
Possible equipment damage: **Make sure that the inline power switches are set to "O" before performing Step 1.**

1. Close and lock the front door.
2. Attach the power cable to the power receptacle at rear of the library and plug the cable into an electrical outlet.
3. Press the inline power switches to "—."

   The operator status display shows the `Init in Progress:` message. When initialization is complete, the status display shows the state of the library.
4. Use the library operator panel to configure the library and drives.

   Note: Refer to the user's guide or service manual for any field values that you do not understand.

   Note: You must fully configure the library *before* you configure the tape management software.

Recording Configuration Information

Record your library configuration in Table 1-6 on page 1-31. Then make a copy of the table and give it to the customer. The customer will refer to it when making a service call or ordering features and upgrades.

Table 1-6. L80 Tape Library Configuration Information

Library Serial Number _____	Library Warranty Number _____
Version: 40 cells ❑ 60 cells ❑ 64 cells ❑ 80 cells ❑	
Library Code Version _____ Library SCSI ID _____ Number of Drives Installed _____	
Drive 0 Serial Number _____ Drive 0 Warranty Number _____ Drive Type _____	Drive 0 SCSI ID _____ On Bus ❑ Off Bus ❑
Drive 1 Serial Number _____ Drive 1 Warranty Number _____ Drive Type _____	Drive 1 SCSI ID _____ On Bus ❑ Off Bus ❑
Drive 2 Serial Number _____ Drive 2 Warranty Number _____ Drive Type _____	Drive 2 SCSI ID _____ On Bus ❑ Off Bus ❑
Drive 3 Serial Number _____ Drive 3 Warranty Number _____ Drive Type _____	Drive 3 SCSI ID _____ On Bus ❑ Off Bus ❑
Drive 4 Serial Number _____ Drive 4 Warranty Number _____ Drive Type _____	Drive 4 SCSI ID _____ On Bus ❑ Off Bus ❑
Drive 5 Serial Number _____ Drive 5 Warranty Number _____ Drive Type _____	Drive 5 SCSI ID _____ On Bus ❑ Off Bus ❑
Drive 6 Serial Number _____ Drive 6 Warranty Number _____ Drive Type _____	Drive 6 SCSI ID _____ On Bus ❑ Off Bus ❑
Drive 7 Serial Number _____ Drive 7 Warranty Number _____ Drive Type _____	Drive 7 SCSI ID _____ On Bus ❑ Off Bus ❑
Fast Load: Off ❑ On ❑	Auto Clean: Off ❑ On ❑
Network: Library Name _____ IP Address _____	Subnet Mask _____ Network Gateway _____
Hardware Monitor_____ Warning Temperature _____	Shutdown Temperature _____

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Locations, Specifications, and Cables

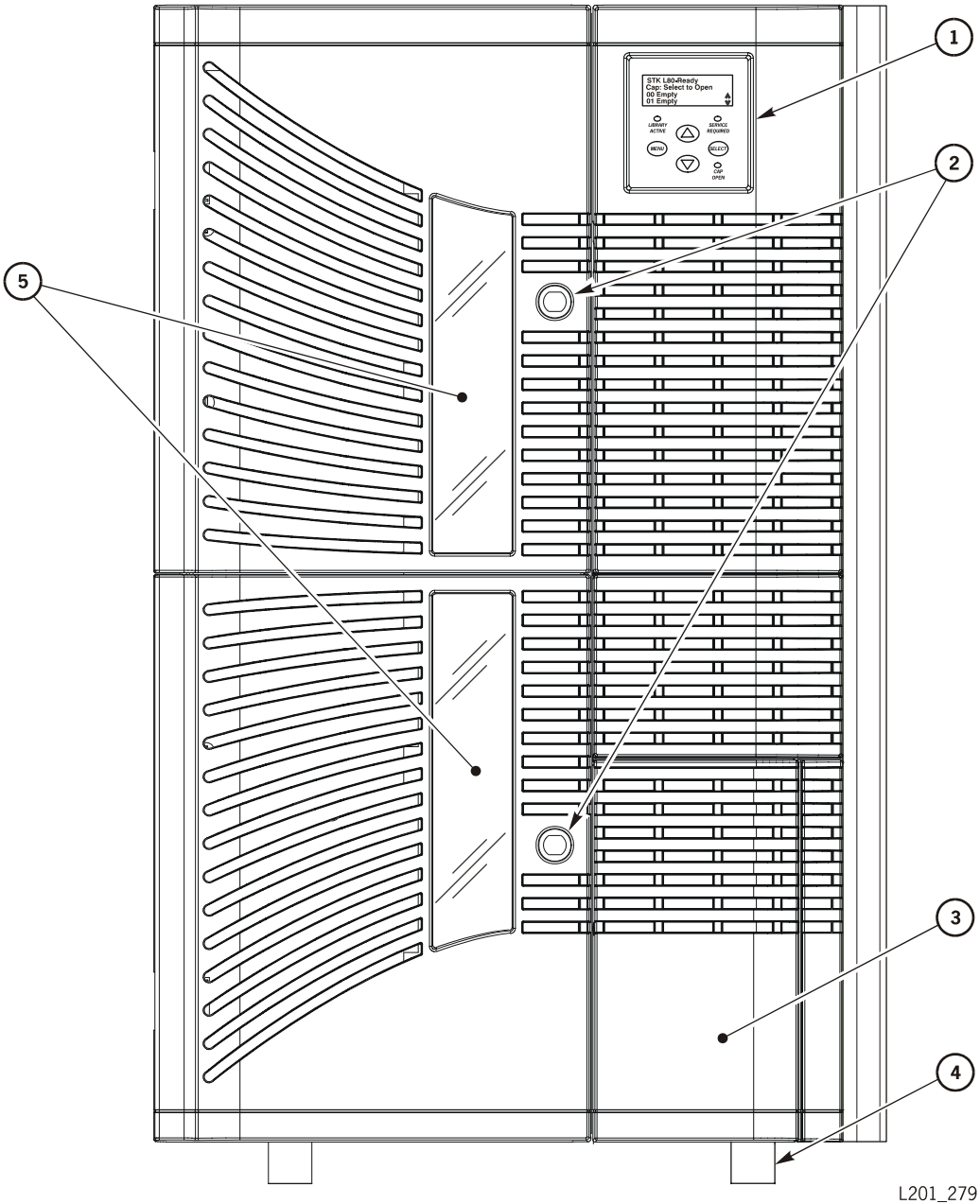
2

This chapter identifies library components, drive label locations, specifications, and external cable part numbers.

Locations

Use the following figures to become familiar with the library components and drive label locations.

Figure 2-1. Front View of Components (L201_279)



1. Operator panel (including status display)
2. Door locks
3. Cartridge access port (CAP)
4. Casters for deskside version
5. Viewing window

Figure 2-2. Rear View of Components (L201_280)

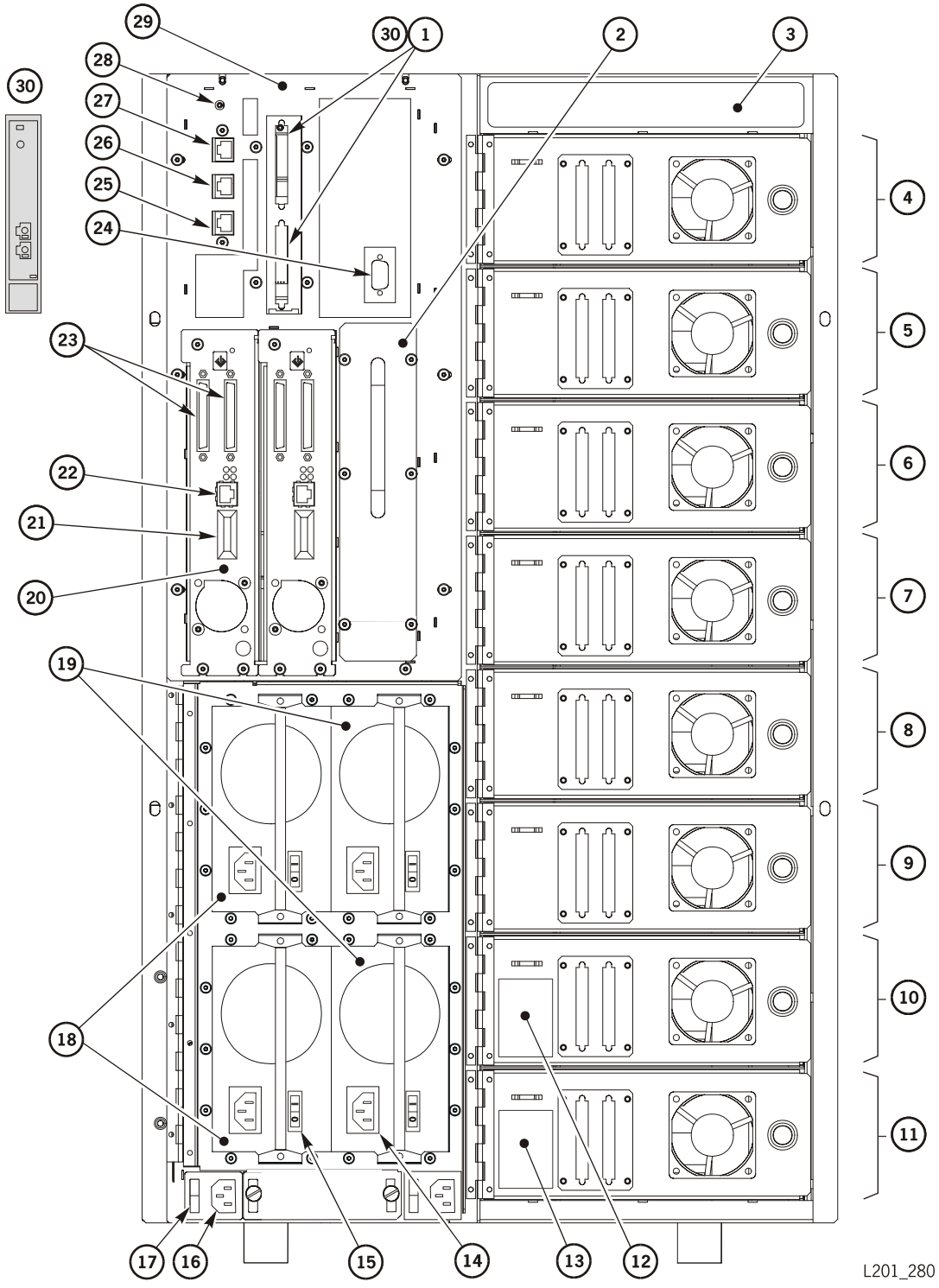


Figure 2-2. Rear View of Components (Continued) (L201_280)

1. Library low voltage differential (LVD) and high voltage differential (HVD) SCSI ports
2. Fibre Channel router power cord access plate
3. Library serial number and agency label
4. Drive 0
5. Drive 1
6. Drive 2
7. Drive 3
8. Drive 4
9. Drive 5
10. Drive 6
11. Drive 7
12. Library warranty identification number
13. Dual power label
14. Power receptacle (4)
15. Power-on/off switch (4)
16. Input line receptacle, for standard supply on the left and redundant supply on the right (2)
17. Input line switch, for standard supply on the left and redundant supply on the right (2)
18. Standard power supplies
19. Redundant power supplies
20. Fibre Channel router card, SCSI LVD (2) (optional)
21. Fibre Channel router port (2)
22. Fibre Channel router CSE serial port (2)
23. SCSI ports to connect library and drives when using the Fibre Channel router card
24. Personality module connector
25. Customer Services Engineering (CSE) port
26. Reserved for Development Engineering
27. Ethernet/Web interface port
28. Library RESET button—use a wooden pencil (*never* a screwdriver or other electrical conductor) to press this button to prevent damaging the button or the LLC card.
29. Electronics module
30. Optional Native Fibre port (card in EM)

Note: The top drive that is installed is Drive 0. If all eight drives are installed, the top drive is Drive 0 and the bottom is Drive 7.

Figure 2-3. Internal View of Components (L201_289)

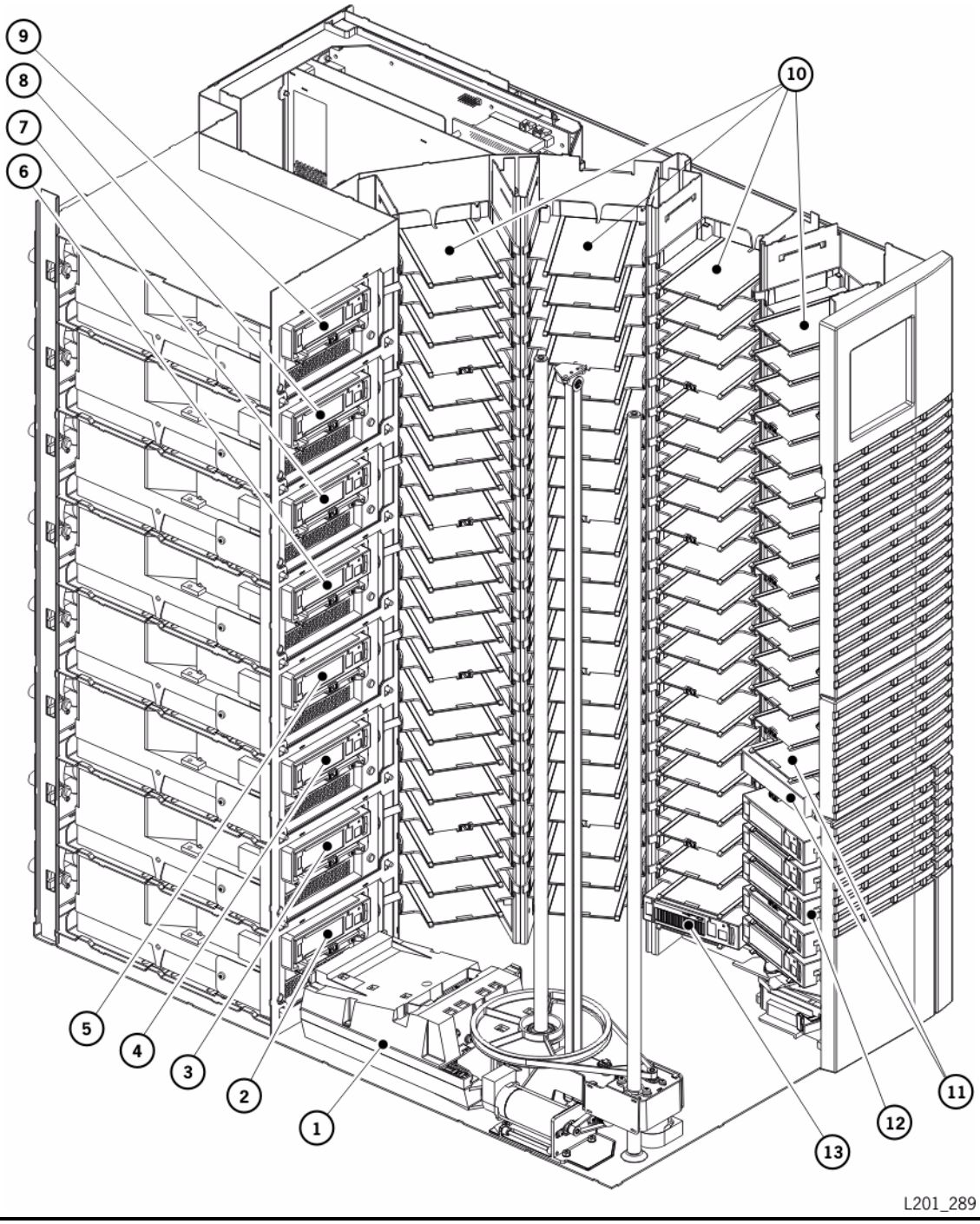
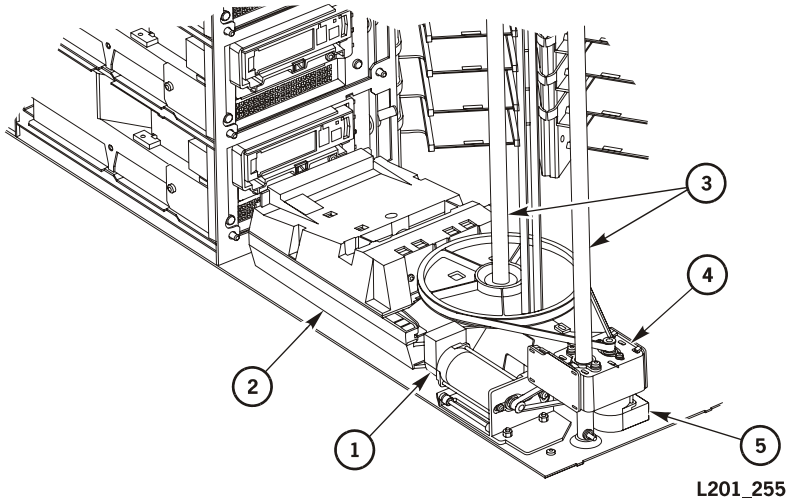


Figure 2-3. Internal View of Components (Continued) (L201_289)

1. Hand
2. Drive 7 (See note.)
3. Drive 6
4. Drive 5
5. Drive 4
6. Drive 3
7. Drive 2
8. Drive 1
9. Drive 0
10. Columns 0 through 3, with 3 on far right
11. Two optional cleaning cartridge cells
12. CAP with removable five-cell magazine
13. Cartridge

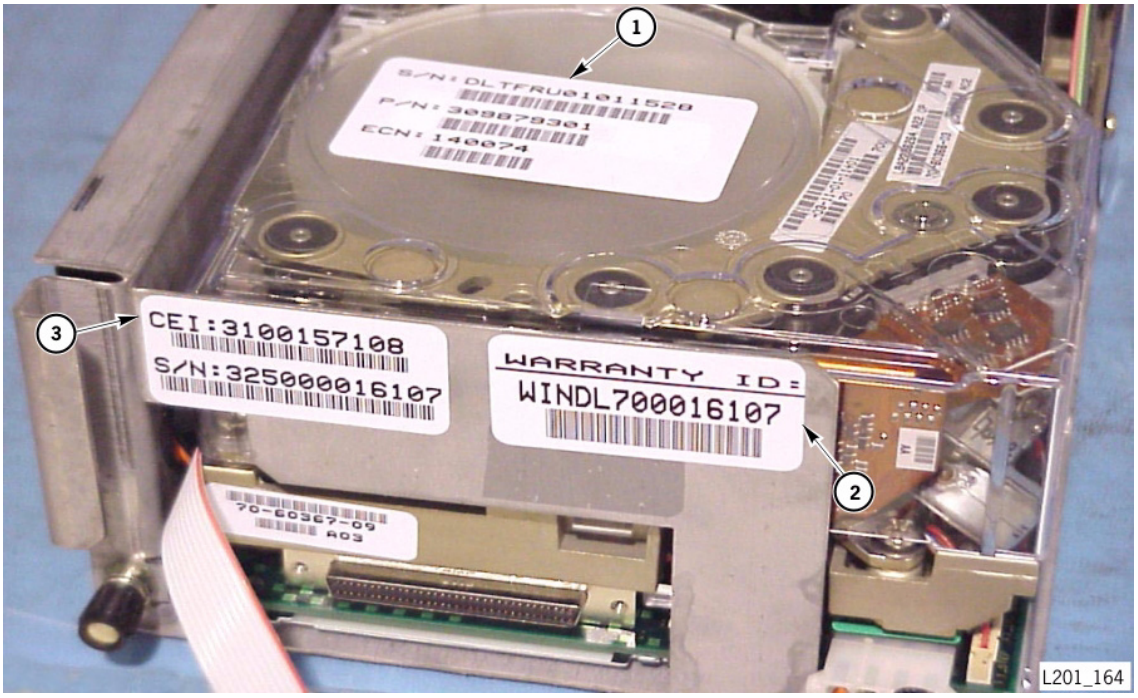
Note: The top drive that is installed is Drive 0. If all eight drives are installed, the top drive is Drive 0 and the bottom is Drive 7.

Figure 2-4. Robotic Components (L201_255)



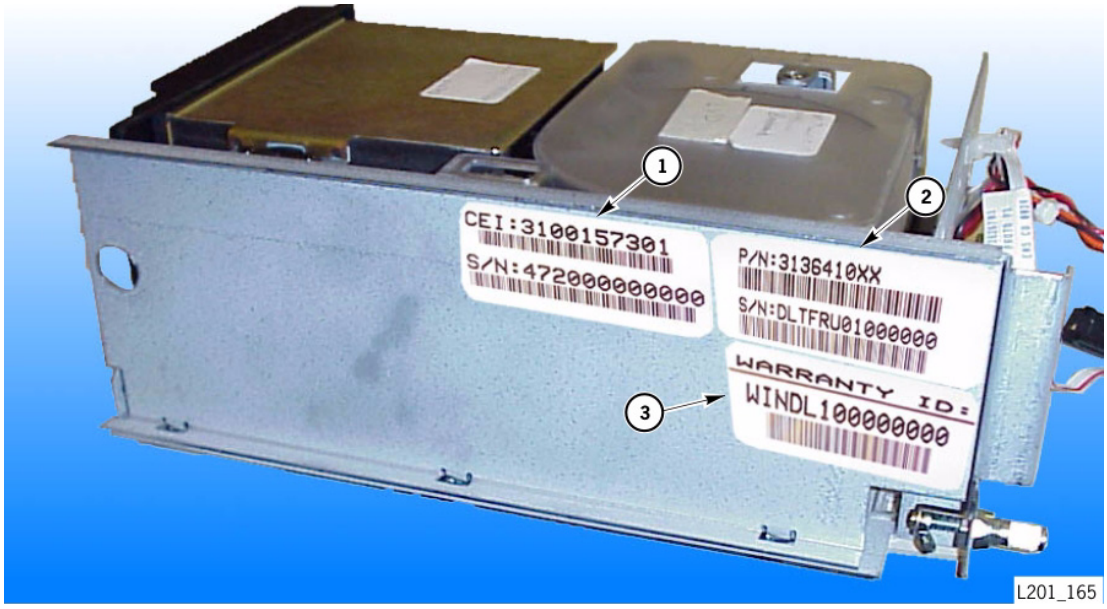
1. Z motor
2. HaZ shaftsnd
3. Z carriage
4. Theta motor

Figure 2-5. DLT Drive Label Locations (L201_164)



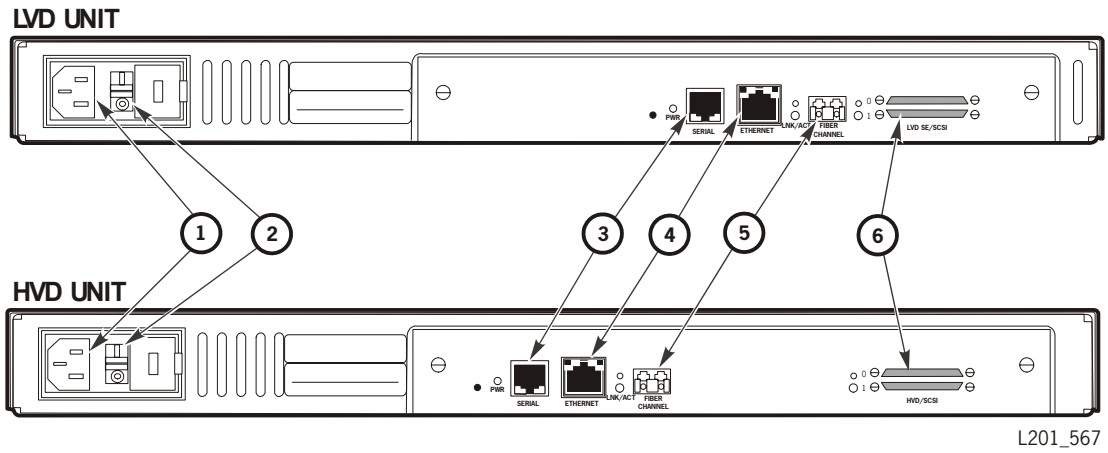
1. Field replaceable unit (FRU) serial number (The drive was ordered to replace a drive that failed.)
2. Warranty identification number
3. Configuration end item (CEI) serial number (The drive was ordered for the initial library installation.)

Figure 2-6. Ultrium LTO Drive Label Locations (L201_165)



1. CEI serial number (The drive was ordered for the initial library installation.)
2. FRU serial number (The drive was ordered to replace a drive that failed.)
3. Warranty identification number

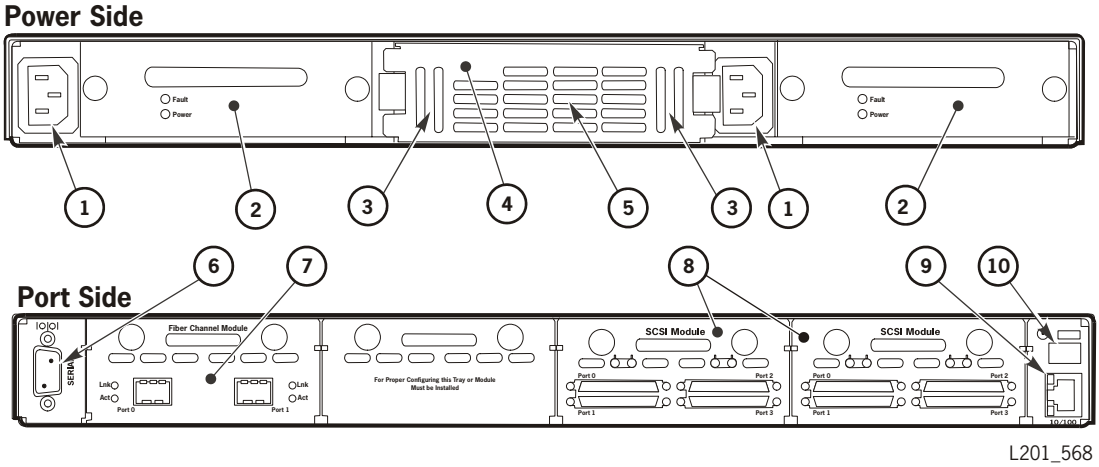
Figure 2-7. SN3300 Fibre Channel Router Components (L201_567)



L201_567

1. Power receptacle
2. Power switch
3. Serial port
4. Ethernet port
5. Fibre channel port
6. SCSI ports

Figure 2-8. SN3400 Fibre Multi-Protocol Router Components (L201_568)



L201_568

1. 1. Power receptacles
2. Power modules
3. Exhaust vents
4. Fan module
5. Air intake
6. Serial port
7. Fibre channel port module
8. SCSI port modules
9. Ethernet port
10. Standby power switch

Specifications

The following pages provide library, drive, and cartridge specifications. See Figure 2-9 on page 2-11 or Figure 2-10 on page 2-12 for library installation dimensions.

For more specific drive and cartridge information, refer to the vendor Web site or documentation.

Library Environment

The following table lists the library environment specifications.

Table 2-1. Library Environment Specifications

Item	Specifications		
	Operating	**Storage**	**Transporting**
Temperature	+10 to +40ºC (+50 to +104ºF)	+10 to +40ºC (+50 to +104ºF)	-40 to +60ºC (-40 to +140ºF)
Humidity	20 to 80%	10 to 95%	10 to 95%
Wet bulb (maximum, noncondensing)	+29.2ºC (+84.5ºF)	+35ºC (+95ºF)	+35ºC (+95ºF)
Altitude	-76 to 3,048 m (-250 to 10,000 ft)		

Library Power

The following table lists the power specifications for the library *without* drives.

Table 2-2. Library Power Specifications

Item	Specification
Input voltage	100-240 VAC, single phase
Frequency	50/60 Hz
Maximum library power consumption	1.42 A at 120 V *or* 0.75 A at 240 V
Maximum heat output	614 Btu/hr
Voltage-amperes	180 VA

Drive and Cartridge Weights

The following table lists the drive and cartridge weights. Refer to the drive publication and vendor Web site for updated information.

Table 2-3. Drive and Cartridge Weights

Item	Weight
DLT drive and tray	5.4 kg (12 lb)
DLT1 drive and tray	2.72 kg (6 lb)
Super DLT drive and tray	3.17 kg (7 lb)
DLT/DLT1/Super DLT cartridge	223 g (7.9 oz)
HP Ultrium LTO drive and tray	5.0 kg (11 lb)
IBM Ultrium LTO drive and tray	5.8 kg (12.7 lb)
Seagate Ultrium LTO drive and tray	5.5 kg (12 lb)
Ultrium 100 GB cartridge	220 g (7.8 oz)

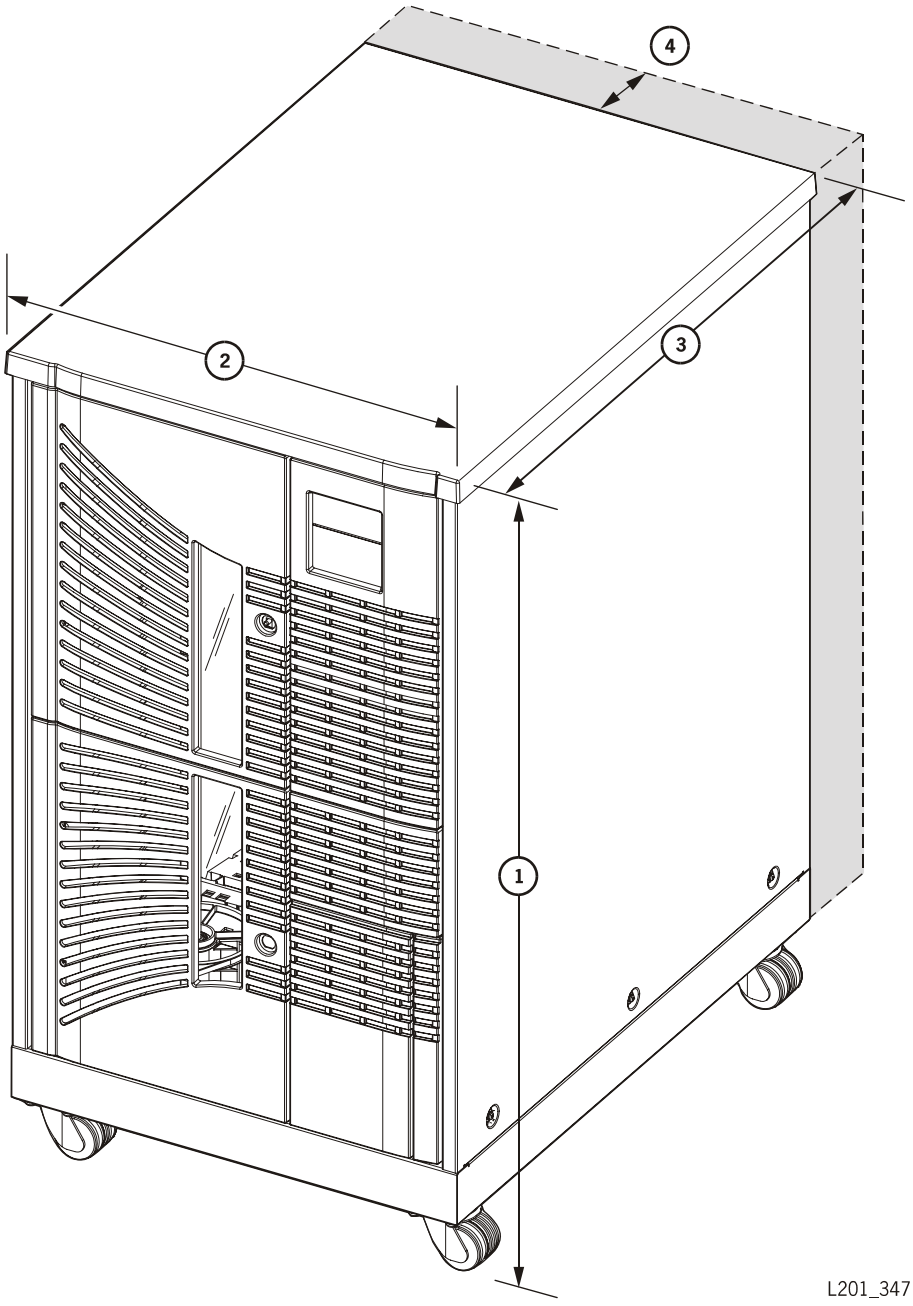
Drive Power

The following table lists the drive power specifications. Refer to the drive publication and vendor Web site for updated information.

Table 2-4. Drive Power Specifications

Drive	Volt- Amperes	Current	Heat output
DLT1	38 VA	0.30 A at 120 VAC 0.16 A at 240 VAC	130 Btu/hr
DLT 7000E	72 VA	0.59 A at 120 VAC 0.30 A at 240 VAC	256 Btu/hr
DLT 8000	65 VA	0.53 A at 120 VAC 0.27 A at 240 VAC	222 Btu/hr
Super DLT	58 VA	0.47 A at 120 VAC 0.24 A at 240 VAC	198 Btu/hr
HP Ultrium LTO	46 VA	0.37 A at 120 VAC 0.19 A at 240 VAC	157 Btu/hr
IBM Ultrium LTO	69 VA	0.56 A at 120 VAC 0.29 A at 240 VAC	236 Btu/hr
Seagate Ultrium LTO	47 VA	0.38 A at 120 VAC 0.20 A at 240 VAC	160 Btu/hr

Figure 2-9. L80 Deskside Version Dimensions and Weight (L201_347)



1. 1011 mm (39.80 in.) height including casters; casters are 72 mm (2.85 in.).
2. 540 mm (21.25 in.) width
3. 740 mm (29.15 in.) depth *without* external cables
4. 102 mm (4.0 in.) dedicated fan exhaust clearance area (shaded area allows for cable and cooling clearances)

Weight (library only) 63.5 kg (140 lb)

Figure 2-10. L80 Rack Version Dimensions and Weight (L201_344)

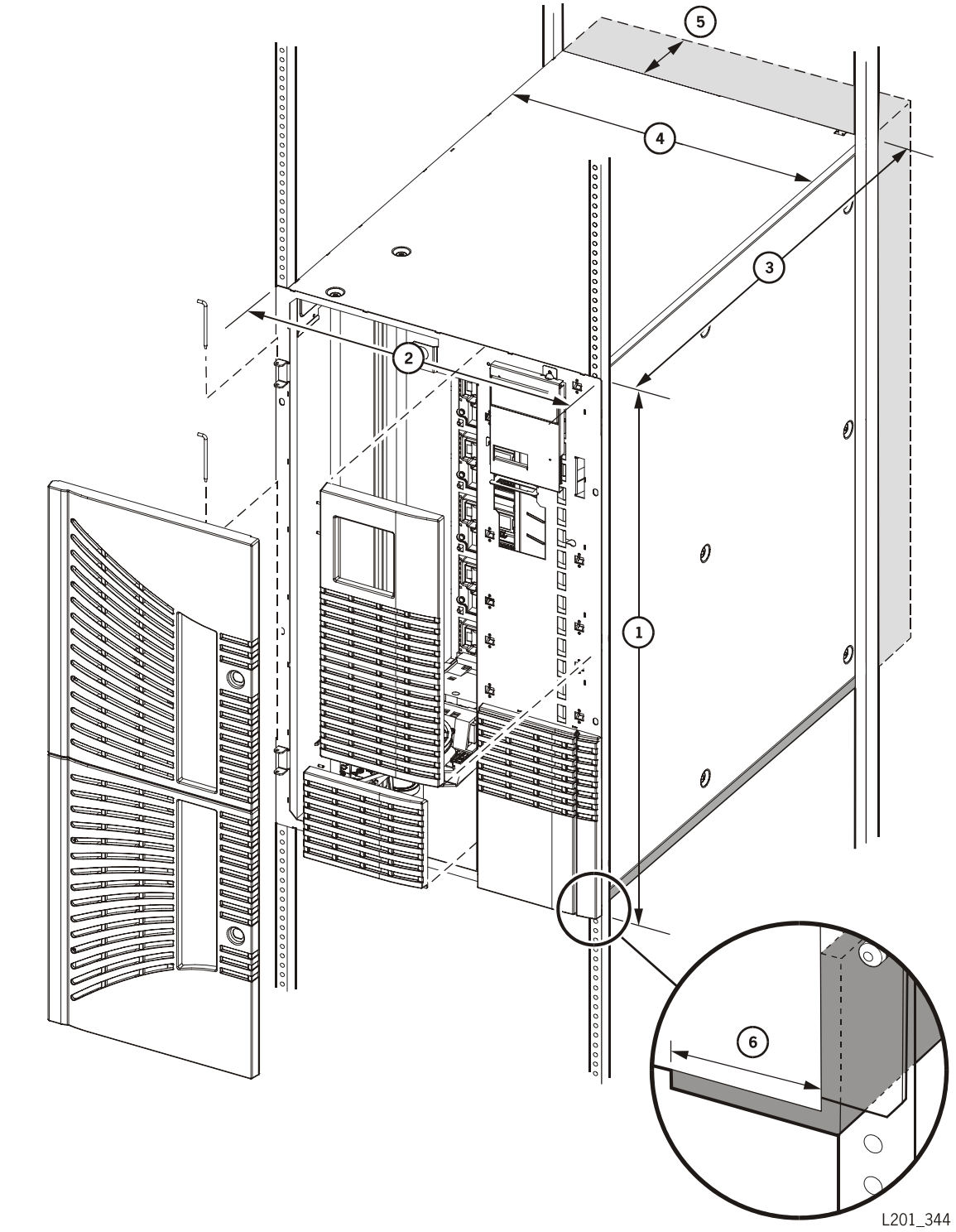


Figure 2-10. L80 Rack Version Dimensions and Weight (Continued) (L201_344)

1. 797 mm (31.39 in.) height
2. 483 mm (19.0 in.) width of front *with* flange
3. 697 mm (27.44 in.) depth *without* external cables; not shown: fans protrude 27 mm (1.06 in.) from back
4. 448 mm (17.65 in.) width
5. 102 mm (4.0 in.) dedicated fan exhaust clearance area (shaded area allows for cable and cooling clearances)
6. 37 mm (1.44 in.)

Weight (library only) 63.5 kg (140 lb)

Power Cord Numbers and Receptacles

Power cords for the library are listed in the table below. All cables are 3 m (9.8 ft).

The receptacle type is listed. Refer to your vendor catalog for the part number.

Table 2-5. Country-specific Power Cords

Input Voltage	Country	Part Number	Receptacle Type
100 to 127 VAC	U.S./Canada	10187019	5-15R
	Japan	10083243	JIS C8303
200 to 240 VAC	Australia	10083244	AS 3112
	Denmark	10083248	DEMKO107/ 10-1973
	Europe	10187018	Schuko
	Europe (Continental) See Note 2.	10187022	IEC309
	Italy	10083245	CEI 23-16/V11
	Korea	10083657	KSC 8305
	South Africa	10083636	BS546
	Switzerland	10083246	CEE 7
	United Kingdom	10083247	BS 1363
	U.S./Canada	10187020	6-15R

Note: This is a harmonic no plug cord for Belgium, Denmark, Finland, France, Germany, Holland, Norway, Sweden, and Switzerland.

Table 2-6. Non-country-specific Power Cords

Input Voltage	Description	Part Number
100 to 127 VAC	SJT IEC320 14AWG, 3 m, receptacle 5-15	10187061
250 VAC	SJT 16 AWG L6-15P, C13, 2.5 m, receptacle L6-15P	10187024
250 VAC	18, 3, SVT, 1mm, M/SH FRT	10187055
	3, F, IEC320 harmonized (see **Note**)	10187047
100 to 240 VAC	International power cord pigtail	10083735

Note: The cord has a plug on one end that attaches to the library and bare wires on the other. Buy the correct end to match your normal wall outlet and attach it to the cord.

External Cables

Use this table to select external cables.

Note: The SCSI universal cables listed below are intended for use with LVD application. The cables used to meet these requirements are inherently more costly and should be used only as required for HVD.

Table 2-7. External Cables

Description	Part Number
Cable assembly, 68 MD, 20 m (65.6 ft) (HVD use only)	10083312
Cordset, SJT, 16AWG, L6-15P	10083639
SCSI universal, 68MD-68MD, 3 m (9.8 ft)	10187008
SCSI universal, 68MD-68MD, 5 m (16.4 ft)	10187009
SCSI universal, 68MD-68MD, 10 m (32.8 ft)	10187010
SCSI universal, 68MD-68HD, 3 m (9.8 ft)	10187011
SCSI universal, 68MD-68VHD, 5 m (16.4 ft)	10187012
SCSI universal, 68MD-68VHD, 10 m (32.8 ft)	10187013
Fibre Channel router RJ45 to DB9 adapter	10410823
Cable assembly, flat shield, SCSI 68, 300 mm (11.8 in.), HVD	313645101
Cable assembly, flat shield, SCSI 68, 600 mm (23.6 in.), HVD	313645201
Cable assembly, flat shield, SCSI 68, 1 m (39.37 in.), universal	313645302
Cable assembly, flat shield, SCSI 68, 300 mm (11.8 in.), LVD	313708802
Cable assembly, flat shield, SCSI 68, 600 mm (23.6 in.) LVD	313708902
Fibre Channel router serial cable with two RJ45 connectors; RJ45 Connector and Consultive Committee on International Telephony and Telegraph (CCITT) cable, 6.1 m (20 ft)	410828902

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SNMP

A

This appendix provides the implementation of the Simple Network Management Protocol (SNMP).

Overview

Sun StorageTek's L-series libraries support Version 1 of the simple network management protocol (SNMPv1). SNMP is an application layer protocol that performs network management operations over an Ethernet connection using a User Datagram Protocol (UDP/IP). Library microcode 2.11 or higher supports SNMP.

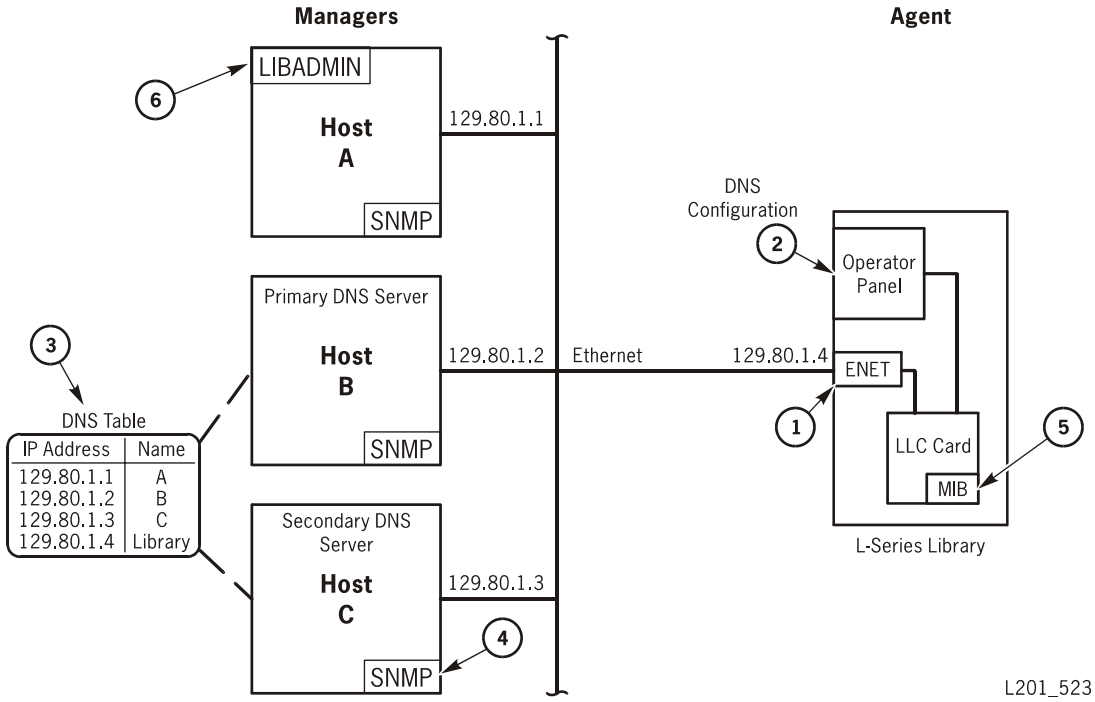
SNMP allows systems administrators to query the library for configuration, operation, and statistical information. SNMP also allows the library to inform the systems administrator of potential problems.

Systems administrators and network managers use SNMP to monitor and receive status from the library, such as:

- Operational state of the library (such as microcode level, serial number, online)
- Status of the cartridge access port (such as open, closed, number of cells)
- Library elements (number of hands, columns, panels, cells, CAPs)
- Number of storage cells and media types stored in the library
- Number and types of drives installed in the library
- Many other variables defined in the database

Figure A-1 on page A-2 illustrates a simple network block diagram that identifies the locations of the SNMP software application, DNS servers, and Library Admin. This figure also identifies the IP addresses, shows a map of DNS names (library names), and other components involved in that configuration (such as operator panel, Ethernet connections, location of the Management Information Base (MIB), and the LLC card.

Figure A-1. SNMP and DNS Network Block Diagram Example (L201_523))



1. Ethernet connection (ENET) for the library.
2. To configure the library to support DNS.
   Note: You must enter the Domain Name Service (DNS) configuration *only* if your Simplified Network Management Protocol (SNMP) agent is set to trap *named* recipients; if SNMP is set for *numbered* recipients (by using IP addresses), no entries are required.
3. An example of a table that matches IP addresses to selected DNS names.
4. SNMP software application that implements the role of manager. Some applications include:
   HP Open View
   IBM NetView
   Sun Microsystems SunNet Manager
5. The MIB is stored on the LLC card. To view the contents of the MIB database, enter:
   http:*//IP.Address/*Lseries.mib or http:*//library_name/*Lseries.mib
6. Library Admin. is an *optional* feature for the library. It provides the GUI-based monitoring system and is *separate* from the SNMP application. Library Admin provides an easy and convenient way to configure the library SNMP agent using a network configuration panel or screen. Library Admin also provides other beneficial functions and display screens for the library.

SNMP Terms

SNMP uses a manager/agent structure, a database, and a small set of commands to exchange information. SNMP terms include:

- **Agent**–A module that resides in a managed device. The agent is responsible for responding to requests from the manager and for sending *traps* to a recipient that inform the systems administrator of potential problems.
- **Community String**–Applications use community strings for access control. The manager includes the community string in its SNMP messages to an agent. The agent consequently can accept or reject the operation.
- **Managed device**–A device that hosts the services of an SNMP agent that provides monitored information and controlled operations using SNMP. L-Series libraries are managed devices.
- **Management Information Base (MIB)**–A collection of information stored in a database that contains configuration and statistical information for a managed device. For L-Series libraries, a copy of the MIB is loaded with microcode and stored on the LLC card. See "Management Information Base" on page A-4 for more information about the MIB.
- **Manager**–A thing that provides the communication link between the systems administrator and the managed devices on the network. A manager station or server allows the systems administrator to get information about the device through the MIB and to receive traps from an agent.
- **Recipient**–A location on a manager where the SNMP agent sends traps. This location is defined by the combination of either the IP address or DNS name and the port number. The default recipient port number is 162.
- **Trap**–A message that reports a problem, error, or a significant event that occurred within the device.

SNMP Commands

SNMPv1 offers a limited number of commands that follow a simple request/response exchange to communicate between the manager and the agent.

The **manager** issues request such as:

- Get–A request for information of a specific variable.
- GetNext–A request for the *next* specific variable.
- Set–A request to change the value of a specific variable.

The **agent** responds with:

- Get-Response–A response to the manager's Get and GetNext commands.
- Trap–An asynchronous message to the recipient about an error or event.

Refer to the SNMP software documentation for additional information.

Access Control

Because community strings provide a weak form of access control in SNMPv1, Sun StorageTek's embedded agent will not rely on the so called "private" community string in order to accept changes to the library's configuration. Access control and authorization for Set operations is performed by using an administrative password. Consequently, Sun StorageTek's embedded agent uses only one community string for both Get and Set operations.

Management Information Base

The MIB is a viewable document that contains descriptions about the characteristics for a managed device. These characteristics are the functional elements for that device which can be monitored using SNMP software.

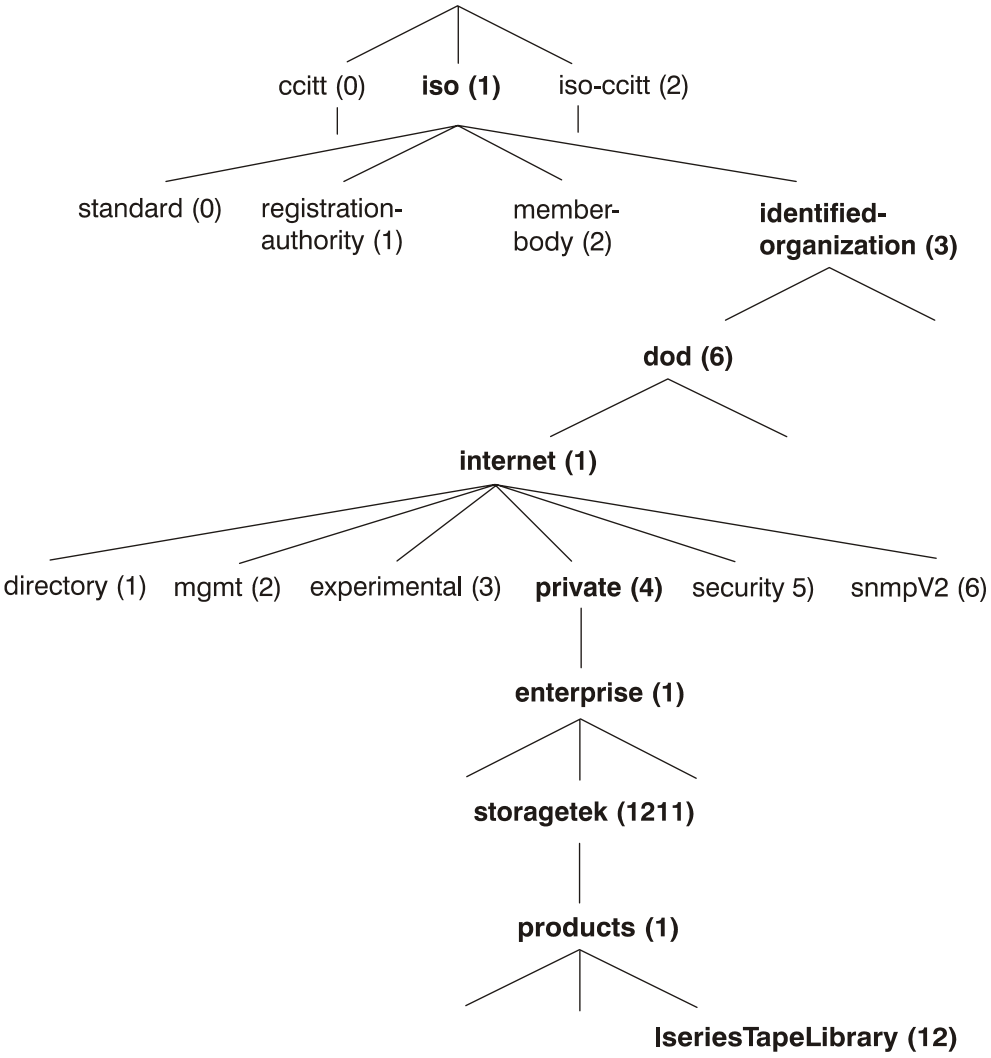
To access and view the contents of the MIB using a Web browser, enter the IP Address or library name and Lseries.mib. For example: http://*IP.Address*/Lseries.mib or http://*library_name*/Lseries.mib.

Note: Sun StorageTek's L-series libraries implement only MIB extensions defined in the LSERIES-TAPE-LIBRARY-MIB under the **private (4)** section as shown in Figure A-2 on page A-5.

Figure A-2 on page A-5 shows the MIB hierarchy as a tree structure where the L-series MIB is located.

Figure A-2. Management Information Base Hierarchy (L201_522))

MIB Title = LSERIES-TAPE-LIBRARY-MIB
Object Name = iso.identified-organization.dod.internet.private.enterprise.storagetek.products.lsereis
Equivalent Object Descriptor = 1.3.6.1.4.1.1211.1.12



Configuration

Three ways to configure the library to support SNMP are:

- Library Admin, an *optional* feature for the library, but it is not required to support SNMP.
- The CLI port (command line interface)
  See Figure A-3 for examples of the help and help snmp commands.
- The SNMP software application—you can also use any SNMP application to change *some* of the agent's settings. You must be MIB-aware and refer to the L-series.mib for specific information.

Figure A-3. CLI Help and Help SNMP Commands

```
cli> help
help [command]              help on a specific command
diag                        execute diagnostics
download                    download new image to prom
fsc                         manipulate fault symptom codes
network                     manipulate network information
snmp                        manipulate SNMP configuration
time                        view/modify library date & time
password                    reset/modify library admin password


cli> help snmp
snmp view                 display SNMP Agent settings
snmp community [string]   set Community String/IP address
snmp [enable|disable]     enable of disable SNMP Agent
snmp port [port number]   set Agent Listening Port Number
                          (Valid: 161, 1024-65535)
snmp grace [number]       set Write Grace Period Number
                            ( 1-5 minutes )
snmp reset                set SNMP Agent configuration parameters
                          to default values
snmp list                 display SNMP Trap Recipient List
snmp add                  add a member to the SNMP Trap Recipient List by
                          answering individual prompts for values.
snmp add [ipaddr|name]    add a member to the SNMP Trap Recipient List using
                          some default values
snmp add [ipaddr|name] [host port number]
                          add a member to the SNMP Trap Recipient List
                          using some default values
snmp delete [[ipaddr|name] [host port number]] | all
                          delete all or a selected member of the SNMP
                          Trap Recipient List
                   Where valid [host port number] values: (162, 1024-65535)

cli> _
```

The library comes configured with some default settings, listed in Table A-1:

Table A-1. SNMP Default Settings

Setting	Default	Description
Port number	`161`	Valid port IDs are 161, and 1024 to 65535
Community String	`public`	Agent community string. When set to *public*, requests coming from *any* community string will be accepted.
Grace Period	`5 minutes`	Once you enter the password, you have 1 to 5 minutes to Set any values for the agent.
Trap Recipient List	`Empty`	This list supports up to 12 recipients with no duplicate entries.
SNMP (agent)	`Disabled`	Enabled or Disabled

Starting SNMP

To start SNMP for the library, you must:

1. Configure the library:
   a. *Enable* the agent
   b. Add recipients to the trap list (if needed)
   c. Make any optional changes to the default settings.
2. *Re-IPL* the library for the changes to take effect.

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