

Sun StorEdge™ L20/40/60 Tape Library

Just the Facts



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Positioning



Figure 1. The Sun StorEdge™ L20/40/60 tape libraries

Introduction

Customers are recognizing the incredible importance of backing up their data. The growing complexity of heterogeneous distributed systems and the extremely rapid growth of storage requirements are causing considerable interest in enterprise-wide solutions for backing up, restoring, and archiving data. Stemming from this rapid growth is the need for automated, unattended back-up for small businesses and departments within an enterprise. The Sun StorEdge™ L20, L40, and L60 tape libraries effectively address the entry-level to mid-size automation market, providing customers with a solution for their data accessibility and integrity.

The Sun StorEdge L20/40/60 tape library is offered in 20-cartridge, 40-cartridge, and 60-cartridge slot configurations. Native capacities range from 800 GB (for the 20 slot/DLT 8000 library) to 6 TB (for the 60 slot/LTO library). The 20-slot library comes with one or two drives, the 40-slot library comes with two drives and can be expanded up to four drives, and the 60-slot library comes with four drives and can be expanded up to six drives. Drive expansion takes less than 10 minutes. Native aggregate transfer rate of up to 15 MB/sec. per drive allows for 90 MB/sec. transfer rate in a six-drive configuration with LTO. The Sun StorEdge L60 six-drive LTO library can back up 324 GB/hour native.

The Sun StorEdge L20/40/60 tape library consists of a robotic system to remove cartridges from the cartridge slots, load them into the drives, unload them from the drives when the operation is complete, and return them to the cartridge slots. In addition to robotic access, the Sun StorEdge L20/40/60 tape library includes an operator-accessible, single-cartridge or five-cartridge load port. A differential fast/wide SCSI-2 interface provides access to the Sun StorEdge L20/40/60 library from the host Sun™ servers. The Sun StorEdge L20/40/60 libraries are available in rackmount configurations, and the Sun StorEdge L20/40 are available in standalone configurations.



The Sun StorEdge L20/40/60 tape library can be used with VERITAS NetBackup or Solstice Backup™ software, as well as many other storage management software applications, to easily handle unattended backup. The Sun StorEdge L20/40/60 tape library comes standard with a built-in remote management card (RMC) to support remote library configuration and operation, diagnostics, and firmware downloads using a Web-based library administrator. The libraries include a bar code reader for identification of tapes and detection of empty bins. Cartridges are highly accessible and can be accessed via either software or the LCD front panel.

The Sun StorEdge L20/40/60 tape libraries are based on HP's 2/20, 4/40, and 6/60 tape libraries.

Note: *Due to the weight of the units, a service notification via SCOPETOOL or RSCOPETOOL must be entered when selling the rackmounted 40-cartridge and 60-cartridge libraries.*

Key Messages

- **Part of a complete tape backup solution:** Combined with Sun Enterprise™ or Sun Fire™ servers and with backup software (such as VERITAS NetBackup and Solstice Backup software), the Sun StorEdge L20/40/60 tape libraries contribute towards a complete tape backup solution.
- **Flexibility:** The Sun StorEdge L20/40/60 tape libraries are available with either LTO or DLT 8000 drives. Choose LTO for high capacity and throughput, and DLT 8000 for legacy systems and lower price.
- **Entry-level library for small businesses or departments within the enterprise:** At Sun's low-end to mid-range tape library line, the Sun StorEdge L20/40/60 tape libraries allow customers to backup databases as large as 2.6 TB in 8 hours.
- **Scalability:** By starting out with fewer drives, customers can reduce backup windows without starting over. Simply add drive modules.
- **High performance, reliability, and availability:** Warm-swappable drives with on-line repair afford performance, reliability, and availability.
- **Excellent quality:** Sun has an extremely rigorous qualification testing and design collaboration process.
- **One-stop shopping:** Besides hardware and software, Sun offers worldwide installation and maintenance (via a SunSpectrumSM program contract) of Sun StorEdge L20/40/60 tape libraries.

Product Availability

The Sun StorEdge L20/40/60 tape libraries were announced on July 11, 2000. Support for DLT 8000 drive technology was announced on March 6, 2001. Support for LTO drive technology was announced on January 8, 2002.

Notes:

1. For customers who may already have libraries installed with DLT 7000 based technology. Note that there is ABSOLUTELY NO mixing of DLT 7000, DLT 8000, and/or LTO drives within the same library.
2. In order to realize stated performance, customers must utilize an approved backup software package. Approved backup packages include Solstice Backup 6.1 or later software, or VERITAS NetBackup 3.4 or later, with the following patches:
 - Solstice Backup 6.1 jumbo patch 111962-xx AND point patch 111971-xx



- VERITAS NetBackup 3.4 jumbo patch 110539-xx AND point patch 112065-xx

Please check the SunSolve web site at <http://sunsolve.sun.com> for latest versions of the above patches. Point patches will be incorporated in to the next version of the jumbo patch for each product.

Key Features and Benefits

Features	Benefits
<ul style="list-style-type: none"> • Reliability <ul style="list-style-type: none"> – Extensive compatibility testing for servers – 1 million swaps between failures (MSBF) • Manageability <ul style="list-style-type: none"> – Front-panel menu – Web-based comprehensive status monitoring – Remote configuration viewing via remote management card (RMC) • Upgradeability and scalability <ul style="list-style-type: none"> – Scalable architectural design • Serviceability <ul style="list-style-type: none"> – Error alert messages – Field-replaceable units (FRUs) – Warm-swappable drives 	<ul style="list-style-type: none"> – Ease of installation – Investment protection – Clear, intuitive – Ease of use, complete library and drive status – Ease of monitoring and modifying over the network – Helps increase growth capacity – Clear and proactive – Quick time to repair

Target Markets

Typical markets for the Sun StorEdge L20/40/60 tape library include finance, insurance, retail and distribution, oil and gas, government, and military industries. These organizations can use the Sun StorEdge L20/40/60 tape library in several ways including the following:

- File servers and e-mail servers
- Small to medium databases
- Workgroup and departmental servers

This entry-level to mid-range tape library serves all horizontal and vertical markets that require a scalable backup and archive solution. The ideal customer is a Sun mid-range customer (workgroup or departmental servers) with plans to expand in the future, and with a concern for floor space. The Sun StorEdge L20/40/60 tape library provides a performance-scalable backup solution for these customers, as they can order what they need initially, and add drives as their performance needs require.

With the introduction of LTO, the Sun StorEdge L20/40/60 tape library has more than doubled in native capacity and transfer rate. As customer's storage needs continue to double every year, these libraries can keep up with their needs.



Product Family Placement

Because the optimal choice of a secondary storage system depends on customer requirements and sensitivities, Sun offers a family of solutions to help customers make the best choice for their specific requirements and sensitivities. Sun's tape library offerings include the following (note that all capacities listed are native):

- Sun StorEdge L9 tape autoloader (360-GB DLT1 or DLT 8000, 900-GB LTO library)
- Sun StorEdge L20/40/60 tape library (800-GB to 2.4-TB DLT 8000, 2-TB to 6-TB LTO library)
- Sun StorEdge L1000 tape library (1.2-TB DLT 8000 library)
- Sun StorEdge L180 tape library (3.48-TB 9840, 6.96-TB DLT 8000, 17.4-TB LTO or multimedia library)
- Sun StorEdge L700 tape library (13.8-TB 9840, 27.6-TB DLT, 67.8-TB LTO or multimedia library)
- Sun StorEdge L6000 tape library (120 TB/LSM, 2880 TB/ACS 9840B to 360 TB/LSM, 8640 TB/ACS 9940A library, or multimedia)

Internationalization and Localization

The documentation provided with the Sun StorEdge L20/40/60 tape library is localized into nine languages on a CD: French, Japanese, Korean, Simplified Chinese, Traditional Chinese, Italian, German, Spanish, and Swedish. The operator control panel and printed user manual are in English only.



Selling Highlights

Product Highlights

- Low- to mid-range tape library
- Several configurations with either DLT 8000 or LTO drive technology
- The Sun StorEdge™ L20 and L40 libraries are available as either standalone or rackmount; the Sun StorEdge L60 library is available as rackmount only
- Small footprint: Sun StorEdge L20 library is 5EIA; Sun StorEdge L40 library is 11EIA; Sun StorEdge L60 library is 16EIA
- HVD SCSI interface
- Add drives as performance needs grow
- Highly reliable automation technology
- Standard remote management card
- Standard barcode reader
- Easy-to-navigate LCD front panel with soft buttons
- Viewing window
- Removable magazines
- One- or five-cartridge mailslot
- Warm-swappable drives

Typical Applications

- Backup for active-use databases
To help ensure capacity for multiple backups of data-daily, weekly, and monthly-tape capacity should be configured for at least three to five times the capacity of on-line storage. Typically, customers perform full backups on Saturday with incremental backups during the week.
- Archival
- Hierarchical storage management (HSM)

Enabling Technology

The Sun StorEdge L20/40/60 tape library includes a number of features that make it especially well-suited to backup of enterprise networks and servers. They include:

- Highly reliable robotic technology — automated storage robotics
- DLT and LTO help increase data transfer rates and lower tape wear and tear
- Expandability — the ability to add drives to help increase performance and reduce backup windows



- Remote management card for remote library operations, status, and diagnostics
- Bar code reader for identification of tapes and detection of empty bins
- Highly accessible cartridges, via load port or removable magazines
- Smaller footprint — high storage density conserves rack or desk space
- LCD front panel
- Warm-swappable drives
- Differential SCSI with up to 25-meter cable

Highly Reliable Robotic Technology

The Sun StorEdge L20/40/60 tape library uses either DLT 8000 or LTO tape technologies. The automated storage robotics library is designed, built, and tested for extreme durability.

DLT Technology Overview

Digital linear tape technology uses multichannel linear serpentine recording. Linear serpentine technology uses a multichannel tape. The tape carries data in parallel channels that run past a single stationary head. Each of the channels passes over its own write element within the head. The use of four channels with the DLT 8000 essentially doubles data transfer rates compared to the DLT 4000 (two channels).

Media and read/write head durability further distinguishes digital linear tape technology from other offerings. Digital linear tape implements a simple tape path and operates at a low constant tension, with the tape head being stationary, minimizing wear and tear on both tape and heads. In contrast, helical scan technology utilizes a read/write head positioned on a rotating drum. The drum lays data down diagonally across a slow moving tape. Because the tape is wrapped around the rotating drum, tape and head life are usually lower.

The digital linear tape is one-half inch (12 mm) wide. This width allows for more data to be recorded on digital linear tape than 8-mm or 4-mm tapes, offering higher capacity (40 GB on DLT 8000 tapes versus 20 GB for 8-mm).

Future digital linear tape products will easily grow in capacity by increasing bit density. Performance improvements occur through the addition of new heads and channels, or by increasing the tape speed. Future digital linear tape drives and media should have the same form factor, so should be compatible with today's Sun StorEdge L20/40/60 tape library.

Digital linear tape offers several advanced features, such as full SCSI-2 command set implementation, built-in diagnostics, and a high data transfer rate of 6-MB/sec. native and 12 MB/sec. compressed. The current version of DLT 8000 tapes have a native capacity of 40 GB.

As the digital linear tape technology is evolving to even higher capacity tapes and higher transfer rates, it is a suitable option for enterprise environments where storage needs are increasing rapidly.

LTO Ultrium Overview

HP, IBM, and Seagate jointly conceived and developed Linear Tape Open (LTO) technology. Ultrium is one of two formats under the LTO standard. Ultrium is an open format, endorsed by multiple vendors and licensees and is backed by an independent compliance verification program.



As the three LTO technology partners, HP, Seagate, and IBM, develop data protection technologies based on optical magnetic, magneto-optical and solid state technology, the range of data protection alternatives is increasing. The decision by these technology partners to develop a new tape technology is based on an analysis of current and future data protection options that shows that tape remains unrivaled in terms of cost and capacity. LTO drive technology combines low cost, high storage transfer rate, and reliability of tape.

Benefits of LTO Ultrium

Open standards are better: LTO removes the disadvantages of the proprietary nature of the existing formats such as DLT, AIT and SDLT. Compliance with the Ultrium format ensures media interchange between different vendors' Ultrium products.

Product leadership: LTO Ultrium offers customers the ability to significantly increase capacity and performance today. And with a proven four-generation roadmap, customers can be confident that the technology's capacity and performance will continue to grow as their needs grow, while maintaining compatibility with today's LTO products.

Based on best-of-breed technologies: LTO Ultrium may be a new format, but it is based on well-known, proven technologies. Customers can count on the technology's reliability, and have confidence in the roadmap of the future.

Market acceptance: The proof of any new technology is how it is being adopted. By any measure, LTO Ultrium is experiencing universal market adoption:

- As of January 2002, over 80,000 LTO Ultrium drives and 1 million data cartridges have shipped.
- Thirty-one LTO Ultrium technology licensees
- Eight media licensees
- Six compliant media manufacturers are shipping today
- Universal automation vendor adoption
- Strong system vendor adoption

Remote Management Card

The Sun StorEdge L20/40/60 tape library can be managed remotely via a Web-based, network-attached library management tool that works with an Internet browser to deliver status reports and diagnostic feedback. The remote management card supports the following:

- Library configuration and operation
- Event logging and event notification
- Support for diagnostics, firmware downloads

Bar Code Reader

The Sun StorEdge L20/40/60 tape library has a bar code reader as a standard feature. The bar code reader enables the library to quickly inventory and track cartridges and is compatible with application software. The Sun StorEdge L20/40/60 tape library is also able to detect empty bins using the laser bar code scanner. When a cartridge is present in a bin, the label at the back of the bin is hidden. When the Sun



StorEdge L20/40/60 tape library scans the bin, it instantly recognizes an empty bin and distinguishes between unlabeled cartridges and empty bins. There is no need for additional sensors.

To order additional bar code labels, refer to the Ordering section of this document.

Highly Accessible Cartridges

Cartridges can be accessed via either software or the LCD front panel. If using backup software, it is recommended that the software be used to transfer cartridges from the bins to the load ports (and vice versa), as this keeps the inventory correct within both the software and the hardware. In the offline mode, the load port can be accessed via the front panel without problems.

All media stored in the Sun StorEdge L20/40/60 tape library is stored in five-cartridge magazines for bulk load/unload of data cartridges.

Small Footprint

With a vertical design that yields 800 GB to 2 TB of native storage in each five-EIA (Electronic Industry Association) unit, the Sun StorEdge L20/40/60 tape library delivers high storage capacity per cubic foot capacity. The systems expand up instead of out, so that customers devote minimum floor space to storage.



Reliability, Availability, and Serviceability (RAS)

Reliability

The Sun StorEdge™ L20/40/60 automated storage robotics library is designed, built, and tested for extreme durability.

- Mean swaps between failure (MSBF) 1,000,000
- Mean time between failure (MTBF) 100,000 hours

Availability

The Sun StorEdge L20/40/60 tape library features warm-swappable drives. When a drive malfunctions, the customer does not need to take the library off-line, but must quiesce the SCSI bus (stop data activity).

Whenever a drive is replaced or added, ensure that the firmware levels of all drives are the same, and the new drive has the same SCSI address.

The Sun StorEdge L20/40/60 tape library initiates backups, swaps tapes, cleans drives when needed, skips bad or write-protected media, and automatically writes to the next cartridge, so backups continue without interruption.

No scheduled maintenance down time is required.

Serviceability

The Sun StorEdge L20/40/60 tape library drives can be warm-swapped when the library contains more than one drive.

All serviceable field-replaceable units (FRUs), except the robotic picker mechanism, can be accessed through the front or back of the unit without special tools and without removing the unit from the rack.

The robotic picker mechanism is accessed from the top of the library by simply sliding the unit out of the rack on easy-glide rails.

The average mean time to repair is less than 30 minutes.

Rackmounted tape libraries need not be removed prior to servicing. No special tools are needed.

Warning: Do not remove the library without additional help or an appropriately rated lift device. The Sun StorEdge L20 library with two drives weighs 90 lb. (40.8 kg), the Sun StorEdge L40 library with four drives weighs 174 lb. (79.1 kg), and the Sun StorEdge L60 library with six drives weighs 226 lb. (102.8 kg).



Specifications and Configuration

Sun StorEdge™ L20/40/60 Tape Library with DLT 8000 (Base Enclosure)			
Feature	20-Cartridge Slot Base Enclosure	40-Cartridge Slot Base Enclosure	60-Cartridge Slot Base Enclosure
Drive Type	DLT 8000 ¹	DLT 8000 ¹	DLT 8000 ¹
Capacity (native)	800 GB	1.6 TB	2.4 TB
Number of DLT 8000 Drives that Can Be Used Inside Enclosure	1 to 2	2 to 4	4 to 6
Max. Native Transfer Rate	12 MB/sec. (concurrent operation of 2 drives)	24 MB/sec. (concurrent operation of 4 drives)	36 MB/sec. (concurrent operation of 6 drives)
Average Cartridge Swap Time (slot-to-slot)	30 seconds	30 seconds	30 seconds
Inventory Time	Less than 2.5 minutes (fully loaded, with bar codes)	Less than 3.6 minutes (fully loaded, with bar codes)	Less than 4.8 minutes (fully loaded, with bar codes)
Robotics MTBF	100,000 hours	100,000 hours	100,000 hours
Robotics MSBF (load/unload cycles)	1 million	1 million	1 million
Robotics Firmware Level	1.05.S or later	1.05.S or later	1.05.S or later
Front Panel Control	LCD	LCD	LCD
Power Requirements	175 Watts (typical) 200 Watts (max.) 100 Watts (standby)	340 Watts (typical) 375 Watts (max.) 200 Watts (standby)	500 Watts (typical) 560 Watts (max.) 300 Watts (standby)
Rackmount Version Height "U"	5U	11U	16U
Standard Warranty	1-year, next business day on site.		
¹ DLT 8000 drives are read/write compatible with DLT 7000 written media. However, DLT 7000 and DLT 8000 drives cannot be mixed in the same library.			



Sun StorEdge L20/40/60 Tape Library with LTO (Base Enclosure)			
Feature	20-Cartridge Slot Base Enclosure	40-Cartridge Slot Base Enclosure	60-Cartridge Slot Base Enclosure
Drive Type	LTO Ultrium	LTO Ultrium	LTO Ultrium
Capacity (native)	2 TB	4 TB	6 TB
Number of LTO Drives that Can Be Used Inside Enclosure	1 to 2	2 to 4	4 to 6
Max. Native Transfer Rate	30 MB/sec. (concurrent operation of 2 drives)	60 MB/sec. (concurrent operation of 4 drives)	90 MB/sec. (concurrent operation of 6 drives)
Average Cartridge Swap Time (slot-to-slot)	30 seconds	30 seconds	30 seconds
Inventory Time	Less than 2.5 minutes (fully loaded, with bar codes)	Less than 3.6 minutes (fully loaded, with bar codes)	Less than 4.8 minutes (fully loaded, with bar codes)
Robotics MTBF	100,000 hours	100,000 hours	100,000 hours
Robotics MSBF (load/unload cycles)	1 million	1 million	1 million
Robotics Firmware Level	1.05.S or later	1.05.S or later	1.05.S or later
Front Panel Control	LCD	LCD	LCD
Power Requirements	175 Watts (typical) 200 Watts (max.) 100 Watts (standby)	340 Watts (typical) 375 Watts (max.) 200 Watts (standby)	500 Watts (typical) 560 Watts (max.) 300 Watts (standby)
Rackmount Version Height "U"	5U	11U	16U
Standard Warranty	1-year, next business day on site.		



DLT 8000 Media and Drive Characteristics

DLT 8000 Media and Drive	
Media Characteristics	
Capacity (native)	40 GB ¹
Usage Life	1,000,000 passes
Media Life	30 years at 20 degrees C
Drive Characteristics	
Maximum Sustained Transfer Rate (Native)	6 MB/sec.
Burst Transfer Rate	20 MB/sec.
Read/Write Speed	160 inches/sec. (from BOT)
Search Speed	175 inches/sec.
Average Access Time	60 seconds (from BOT)
Maximum Load Time to BOT	48 seconds (slightly longer with a blank tape)
Maximum Unload Time to BOT	17 seconds
Repositioning Time	1.3 seconds
Average Rewind Time	60 inches/sec.
Maximum Rewind Time	120 seconds
Drive Head Life	530,000 tape motion hours
MTBF (mean time between failure)	250,000 hours (100 percent duty cycle)
Firmware Level	Drive: V20 or later
¹ When drives are replaced in the field, there have been occurrences where "down rev'd" drives are installed (Sun Enterprise Services, for example, does not purge their field stock when new revs are released). Ensure that when drives are replaced or serviced, that all drives are at the most current firmware revision.	

LTO Media and Drive Characteristics

LTO Ultrium Media and Drive	
Media Characteristics	
Capacity (native)	100 GB
Media Life	25,000 read/write passes
Drive Characteristics	
Maximum Sustained Transfer Rate (Native)	16 MB/sec.
Burst Transfer Rate	80 MB/sec.
Average Access Time	76 seconds (from BOT)
Maximum Load Time to BOT	<10 seconds
Maximum Rewind Time	152 seconds
Drive Life	250,000 hours at 100% duty cycle
Firmware Level	Drive: E1AV
¹ When drives are replaced in the field, there have been occurrences where "down rev'd" drives are installed (Sun Enterprise Services, for example, does not purge their field stock when new revs are released). Ensure that when drives are replaced or serviced, that all drives are at the most current firmware revision.	



Physical Characteristics

Feature	20-Cartridge slots	40-Cartridge slots	60-Cartridge slots
Size, Rackmount Unit (without cartridges)	<ul style="list-style-type: none"> Height: 8.5 in (216 mm) Width: 17.4 in (442 mm) Depth: 27.4 in (700 mm) Footprint: 6 ft² (0.56 m²) Weight with 2 drives: 90 lb. (40.8 kg) 	<ul style="list-style-type: none"> Height: 19.25 in (489 mm) Width: 17.4 in (442 mm) Depth: 27.4 in (700 mm) Footprint: 6 ft² (0.56 m²) Weight with 2 drives: 156 lb. (70.9 kg) 	<ul style="list-style-type: none"> Height: 28 in (711 mm) Width: 17.4 in (442 mm) Depth: 29.9 in (760 mm) Footprint: 6 ft² (0.56 m²) Weight with 4 drives: 208 lb. (94.5 kg)
Size, Deskside Unit	<ul style="list-style-type: none"> Height: 9.7 in (245 mm) Width: 19.2 in (488 mm) Depth: 29.9 in (760 mm) Footprint: 4.66 ft² (0.43 m²) Weight with 2 drives: 105 lb. (48.7 kg) 	<ul style="list-style-type: none"> Height: 20.1 in (510 mm) Width: 19.2 in (488 mm) Depth: 29.9 in (760 mm) Footprint: 4.66 ft² (0.43 m²) Weight with 2 drives: 177 lb. (80.5 kg) 	N/A
Operating Interface	Differential, fast/wide SCSI-2 (HVD SCSI)	Differential, fast/wide SCSI-2 (HVD SCSI)	Differential, fast/wide SCSI-2 (HVD SCSI)
Diagnostic Interface	RS-232C service port 10/100BASE-T Ethernet	RS-232C service port 10/100BASE-T Ethernet	RS-232C service port 10/100BASE-T Ethernet
Control Panel	LCD	LCD	LCD

Environmental Specifications

Feature	Specification
Power <ul style="list-style-type: none"> AC Voltage (Minimum) AC Voltage (Maximum) Frequency Power Inlet (US and Canada) 	100 to 127 VAC autoselecting 200 to 240 VAC autoselecting 50 to 60 Hz IEC-320 connector
Operating Environment <ul style="list-style-type: none"> Relative Humidity Temperature Altitude 	20 to 80 percent, noncondensing 10 to 35 degrees C (50 to 95 degrees F) Sea level to 15,000 ft. (4,572 m)
Nonoperating Environment <ul style="list-style-type: none"> Relative Humidity Temperature Altitude 	10 to 95 percent, noncondensing -40 to 60 degrees C (-40 to 140 degrees F) Sea level to 45,000 ft. (13,716 m)
Maximum Heat Dissipation	830 BTU/hour 207 kCal/hour 245 Watts
Safety	UL1950 listed CSA C22.2-No. 950 TUV-EN 60950-EN 60825-1



Feature	Specification
Emission	FCC Part 15B Class A CE Mark VCCI Class 1 C-Tick GOST BCIQ

Regulations

The Sun StorEdge L20 tape library family meets or exceeds the following requirements:

Safety

Country	Standard
U.S.	UL Listed to UL 1950, 3rd Edition
Canada	CSA Standard CAN/CSA-C22.2 No. 950
Germany	GS licensed to EN 60950, 2nd Edition, 1991 +A1, A2, A3, A4
Norway	Nemko Certified to EN 60950 (1992) A1/A2/A3/A4/A11
Sweden	Semko Certified to EN 60950 (1992) A1/A2/A3/A4/A11
Denmark	Demko Certified to EN 60950 (1992) A1/A2/A3/A4/A11
Finland	Fimko Certified to EN 60950 (1992) A1/A2/A3/A4/A11
European Union	EMKO-TSE (74-SEC) 207/94 CB test Certified

Electromagnetic Compatibility

Country	Standard
U.S.	FCC #47, Part 15, Subpart B, Class A
Canada	ICES-003
Japan	VCCI Class A
European Union	EN 55022/A1 (1995) / CISPR 22 (1997, 3. Ed.), Class A
Australia/New Zealand	AS/NZS 3548:1996

Electromagnetic Interference

Test	Standard
ESD	EN 55024-2 (1998) / IEC 1000-4-2 (1995), 4 kV CD, 8 kV AD
Radiated Electric Field	EN 55024-3 (1998) / IEC 1000-4-3 (1995), 3 V/m
Electrical Fast Transient Burst	EN 55024-4 (1998) / IEC 801-4-4 (1988), 1 kV Peak Power Lines 0,5 kV Signal Lines



Test	Standard
Harmonics	EN 61000-3-2 (1995) / IEC 1000-3-2 (1995), Harmonics
Flicker	EN 61000-3-3 (1995) / IEC 1000-3-3 (1994), Flicker
Surge	EN 61000-4-5:2001 (2kV I/O, 2kV Power LL, 4kV Power LG)
RF Conducted	EN 61000- 6:2001 (10V)
Voltage Dip & Interruption	EN 61000-4-11:2001

Configuration Information

The 20-, 40-, and 60-cartridge slot configurations ship with the following.

Feature	20-Cartridge Slot Base Enclosure	40-Cartridge Slot Base Enclosure	60-Cartridge Slot Base Enclosure
Number of Drives	1 to 2	2 to 4	4 to 6
Fixed Slots	20	40	60
Mailbox Slots (Load Port)	2 drawers, 4 mags	4 drawers, 8 mags	6 drawers, 12 mags
DLT or LTO Media Data Cartridge	1	1	1
Cleaning Cartridge	1	1	1
SCSI Wide Differential Jumper Cable	1 or 2 (1 per drive)	2	4
US Power Cable	1	2	3
Documentation for Installation and Use	yes	yes	yes
Media Label Kits (each contains 25 DLT data bar code labels plus 5 cleaning cartridges labels)	1 package	2 packages	3 packages

Note: The maximum supported length of the differential SCSI bus is 25 meters. Customers must order SCSI cables separately.

Drives, Host Adapters, and SCSI Configurations

Refer to the matrix in the Hardware Compatibility section of this document, or utilize the Tape Library Calculator or WebDesk for assistance.



System Compatibility

Operating Environment Support

- Solaris™ 2.6, 7, and 8 Operating Environment
- See the SunSolve web site at <http://sunsolve.sun.com> for the following patches:
 - Solaris 2.6 Operating Environment: 105847-10 or later
 - Solaris 7 Operating Environment: 107460-10 or later
 - Solaris8 Operating Environment: 108725-07 or later (to be on SunSolve in Feb. 2002)

Software Compatibility

- VERITAS NetBackup 3.4 or later, with patches
- Solstice Backup™ 6.1 or later with patches
- Sun StorEdge Utilization Suite Recovery and Archive Service Software (formerly SAM-FS)

Hardware Compatibility

- Ultra™ 10, 60, and 80 workstations
- Sun Blade™ 100 and 1000 workstations
- Sun Enterprise Ultra™ 5S and 10S servers
- Sun Enterprise™ 220R, 250, 420R, and 450 servers
- Sun Enterprise 3500-6500, 10000 servers
- Sun Fire™ 280R, V880, 3800, 4800, 4810, 6800, and 15000 servers

The table below lists maximum configurations and HBA information for the Sun StorEdge L20/40/60 library with DLT 8000 technology.

Tape Library/Automation: L20/40/60 Drive Type: DLT 8000 Max. Drives per Sun StorEdge L20/40/60: 2/4/6						
HBA Part #	Description	SBus/PCI	Type	Support	Max. Direct Attach	Daisy Chain
X6541A	Ultra Fast Wide	PCI	UDWIS/P	Sun Fire 15000	2/2/2	0
X1065A	Ultra Fast Wide	SBus	UDWIS/S	Sun Enterprise 10000	2/2/2	0
X6541A	Ultra Fast Wide	PCI	UDWIS/P	Sun Fire 6800	2/2/2	0
X6541A, X6749A	Ultra Fast Wide	PCI	UDWIS/P	Sun Fire 4800, 4810	2/2/2	0
X6541A, X6749A	Ultra Fast Wide	cPCI	UDWIS/cPCI	Sun Fire 3800	2/2/2	0
X1065A	Ultra Fast Wide	SBus	UDWIS/S	Sun Enterprise 3500 to 6500	2/2/2	0



Tape Library/Automation: L20/40/60 Drive Type: DLT 8000 Max. Drives per Sun StorEdge L20/40/60: 2/4/6						
X6541A	Ultra Fast Wide	PCI	UDWIS/P	Sun Enterprise 250, 450	2/2/2	0
X6541A	Ultra Fast Wide	PCI	UDWIS/P	Sun Enterprise 220R, 420R	2/1/1	0
X6541A	Ultra Fast Wide	PCI	UDWIS/P	Sun Fire 280R, V880	2/2/2	0
X6541A	Ultra Fast Wide	PCI	UDWIS/P	Ultra 60, 80;	2/1/1	0
X6541A	Ultra Fast Wide	PCI	UDWIS/P	Sun Blade 1000	2/1/1	0
X6541A	Ultra Fast Wide	PCI	UDWIS/P	Sun Blade 100	1/0/0	0
X6541A	Ultra Fast Wide	PCI	UDWIS/P	Ultra 10	1/0/0	0
X6541A	Ultra Fast Wide	PCI	UDWIS/P	Ultra 5	1/0/0	0
X1065A	Ultra Fast Wide	SBus	UDWIS/S	Ultra 2	2/1/0	0

The table below lists maximum configurations and HBA information for the Sun StorEdge L20/40/60 library with LTO technology.

Tape Library/Automation: L20/40/60 Drive Type: LTO Max. Drives per Sun StorEdge L20/40/60: 2/4/6						
HBA Part #	Description	SBus/PCI	Type	Support	Max. Direct Attach	Daisy Chain
X6541A	Ultra Fast Wide	PCI	UDWIS/P	Sun Fire 15000	2/2/2	0
X1065A	Ultra Fast Wide	SBus	UDWIS/S	Sun Enterprise 10000	2/2/2	0
X6541A	Ultra Fast Wide	PCI	UDWIS/P	Sun Fire 6800	2/2/2	0
X6541A, X6749A	Ultra Fast Wide	PCI	UDWIS/P	Sun Fire 4800, 4810	2/2/2	0
X6541A, X6749A	Ultra Fast Wide	cPCI	UDWIS/cPCI	Sun Fire 3800	2/2/2	0
X1065A	Ultra Fast Wide	SBus	UDWIS/S	Sun Enterprise 3500 to 6500	2/2/2	0
X6541A	Ultra Fast Wide	PCI	UDWIS/P	Sun Enterprise 250, 450	2/2/2	0
X6541A	Ultra Fast Wide	PCI	UDWIS/P	Sun Enterprise 220R, 420R	2/1/1	0
X6541A	Ultra Fast Wide	PCI	UDWIS/P	Sun Fire 280R, V880	2/2/2	0
X6541A	Ultra Fast Wide	PCI	UDWIS/P	Ultra 60, 80;	2/1/1	0
X6541A	Ultra Fast Wide	PCI	UDWIS/P	Sun Blade 1000	2/1/1	0
X6541A	Ultra Fast Wide	PCI	UDWIS/P	Sun Blade 100	1/0/0	0
X6541A	Ultra Fast Wide	PCI	UDWIS/P	Ultra 10*	1/0/0	0
X6541A	Ultra Fast Wide	PCI	UDWIS/P	Ultra 5*	1/0/0	0
X1065A	Ultra Fast Wide	SBus	UDWIS/S	Ultra 2	1/0/0	0

* Single LTO drive only

The Sun StorEdge L20/40/60 tape library includes extensive built-in diagnostics and setup options that can be used to conduct system tests and generate reports. Diagnostics are stored in flash RAM and are initiated from the operator panel.



The built-in diagnostic functions let customers:

- Initiate library tests
- Monitor library status
- View statistics
- Generate reports via internet browser
- Configure the library
- Move cartridges between bins or between bins and drives
- Test specific phases of robotics operation individually, such as horizontal or vertical movement
- Change passwords

User Interfaces

Monitor Software Remote Management Card (RMC)

Monitoring software is free of charge with each Sun StorEdge L20/40/60 tape library. This software allows remote administration via an Internet browser. The remote management card (RMC) provides error logs and status that can be saved in HTML file and e-mailed to any location for review. Features of the RMC include:

- Event logging
- Event notification SNMP alerts to network management software
- Remote library configuration
- Remote library diagnostics and error logs review
- Visual status monitoring of library inventory, cartridges, and drives

Graphical User Interface (GUI)

The Sun StorEdge L20/40/60 tape library control panel contains the necessary routine to enable library configuration using the GUI and can run some diagnostics routines.

Software Compatibility

The Sun StorEdge L20/40/60 tape library is supported by VERITAS NetBackup, Solstice Backup™ software, and many other storage management software applications. Refer to the SunSolve web site at <http://sunsolve.sun.com> for the appropriate patches.

The Sun StorEdge L20/40/60 tape library is supported on leading database applications as follows:

Database	Solstice Backup	VERITAS NetBackup
Oracle	X	X
Informix	X	X
SAP	X	X
MS Exchange	X	X



Database	Solstice Backup	VERITAS NetBackup
MS SQL Server	X	X
Oracle on Microsoft Windows NT	X	X
Lotus Notes on Microsoft Windows NT	X	X
Lotus Notes on SPARC™ systems	X	X
Sybase	X	X

Software Commands

VERITAS NetBackup and Solstice Backup storage management applications have their own documentation, which helps users get set up and running with tape automation products like the Sun StorEdge L20/40/60 tape libraries.

The AutoLoad that is provided with this library is very useful, but cannot be enabled when used with the current versions of VERITAS NetBackup and Solstice Backup software. Its functionality can be emulated through the use of scripted solutions using the backup product command set. AutoLoad should only be enabled and only import tapes when none of the tape drives have tapes loaded in them.

For information about other software commands, refer to the Solaris Handbook for SMCC Peripherals or the AnswerBook™ documentation for the operating system. The Solaris Handbook for SMCC Peripherals also describes how to determine which SCSI target IDs are available and how to configure the system after installation.

Controller

If the library controller fails, the library is considered non-functional. Since the robotics controller communicates with the robot and all functional controls and calibration values are held on that board, the library is "dead" (even in a manual mode) if a failure occurs with the library controller. This has no impact on the data stored on the tapes in the library.

Racks

The Sun StorEdge L20/40/60 tape library fits into and is supported in a standard 72-inch storage rack. The Sun StorEdge L20 library occupies 5 EIA, the Sun StorEdge L40 library occupies 11 EIA, and the Sun StorEdge L60 library occupies 16 EIA.

Tape Drive Cleaning

Cleaning cartridges can be put into any open slot in the library. Once the library performs an inventory, it identifies to the application software where the cartridge is for accessibility. The Sun StorEdge L20/40/60 tape library does not have auto-clean features. It is up to the ISV to initiate a cleaning requirement. When the DLT or LTO drive requests a cleaning requirement, it sends a "cleaning required" message to the host.

Note: In the case of DLT: *A bad tape may trigger a cleaning request message. However, this does not mean the head needs cleaning, since the next good tape loaded resets the cleaning request message. If the tape cleaning message keeps coming on, the drive needs to be cleaned.*



Ordering Information

Sun StorEdge™ L20/40/60 Tape Library Ordering Process

All configurations for the Sun StorEdge L20/40/60 library includes the following items:

- One Type IV DLT or LTO Ultrium data cartridge
- DLT media care flyer in each configuration (for DLT versions only)
- One DLT or LTO cleaning tape
- US power cord
- User's Guide
- User's Manual CD
- Media label kits (each kit contains 25 bar code data labels plus five cleaning cartridge labels)
- Installation Guide
- Wide differential terminator
- SCSI jumper cable (one per drive)
- Sun content list media

Additional DLT 8000 or LTO tape drives for the Sun StorEdge L20/40/60 include the following:

- DLT 8000 or LTO HVD SCSI drive assembly
- Upgrade manual
- Wide differential terminator
- SCSI jumper cable
- Sun content list
- ESD wrist strap

The following table depicts typical ordering processes for the Sun StorEdge L20/40/60 **DLT 8000** tape library.

Step Number	Marketing Part No.	Req./Optional
1. Order library enclosure <ul style="list-style-type: none"> • 20-cartridge slot enclosure <ul style="list-style-type: none"> – 1 drive, 20 cartridge slot deskside – 1 drive, 20 cartridge slot rackmount – 2 drives, 20 cartridge slot deskside – 2 drives, 20 cartridge slot rackmount • 40-cartridge slot enclosure <ul style="list-style-type: none"> – 2 drives, 40 cartridge slot deskside – 2 drives, 40 cartridge slot rackmount • 60-cartridge slot enclosure <ul style="list-style-type: none"> – 4 drives, 60 cartridge slot rackmount 	Order one of the following: SG-XLIBDLT81-L20 SG-XLIBDLT81R-L20 SG-XLIBDLT82-L20 SG-XLIBDLT82R-L20 SG-XLIBDLT82-L40 SG-XLIBDLT82R-L40 SG-XLIBDLT84R-L60	Required
2. Order additional number of DLT 8000 drives required <ul style="list-style-type: none"> • Maximum number of drives per library enclosure <ul style="list-style-type: none"> – Maximum of 1 drive for SG-XLIBDLT81-L20 and SG-XLIBDLT81R-L20 – Maximum of 2 drives for SG-XLIBDLT82-L20 and SG-XLIBDLT82R-L20 – Maximum of 4 drives for SG-XLIBDLT82-L40 and SG-XLIBDLT82R-L40 – Maximum of 6 drives for SG-XLIBDLT84R-L60 	SG-XTAPDLT8-L20	Optional
3. Order required number of host bus adapters <ul style="list-style-type: none"> – See matrixes under Hardware Compatibility 	X6541A (SCSI-PCI-based) or X1065A (SCSI-SBus-based) or X6749A(SCSI-cPCI-based)	Required
4. Order additional media cartridges as appropriate	SG-XMEDDLTCIV-10	Optional
5. Order additional cleaning cartridges as appropriate	SG-XMEDDLTCL-10	Optional
6. Order backup/restore application of choice <ul style="list-style-type: none"> – Solstice Backup™ software – VERITAS NetBackup software 		Optional
7. Order extra SCSI cable as needed	X979A	Optional
8. Basic installation for the Sun StorEdge tape library	NF-B-INST-ETL	Optional/Included (see note)
9. Order Sun Professional Services Tape Library Implementation Service	PS-EO-DSTLI-1	Optional
<p>Note: The basic installation for the Sun StorEdge tape library is included in the cost of the 40-slot and 60-slot RACKMOUNT units only. The 40-slot and 60-slot RACKMOUNT units are products that need to go through the SCOPETOOL. See below for more information. The 40-slot and 60-slot RACKMOUNT configurations are in the SCOPETOOL because the weight of the units requires a lift to be used. The desktop units and the 20-slot rackmount unit do not need this special service.</p>		



The following table depicts typical ordering processes for the Sun StorEdge L20/40/60 LTO tape library.

Step Number	Marketing Part No.	Req./Optional
1. Order library enclosure <ul style="list-style-type: none"> • 20-cartridge slot enclosure <ul style="list-style-type: none"> – 1 drive, 20 cartridge slot deskside – 1 drive, 20 cartridge slot rackmount – 2 drives, 20 cartridge slot deskside – 2 drives, 20 cartridge slot rackmount • 40-cartridge slot enclosure <ul style="list-style-type: none"> – 2 drives, 40 cartridge slot deskside – 2 drives, 40 cartridge slot rackmount • 60-cartridge slot enclosure <ul style="list-style-type: none"> – 4 drives, 60 cartridge slot rackmount 	Order one of the following: SG-XLIBLTO1-L20 SG-XLIBLTO1R-L20 SG-XLIBLTO2-L20 SG-XLIBLTO2R-L20 SG-XLIBLTO2-L40 SG-XLIBLTO2R-L40 SG-XLIBLTO4R-L60	Required
2. Order additional number of LTO drives required <ul style="list-style-type: none"> • Maximum number of drives per library enclosure <ul style="list-style-type: none"> – Maximum of 1 drive for SG-XLIBLTO1-L20 and SG-XLIBLTO1R-L20 – Maximum of 2 drives for SG-XLIBLTO2-L20 and SG-XLIBLTO2R-L20 – Maximum of 4 drives for SG-XLIBLTO2-L40 and SG-XLIBLTO2R-L40 – Maximum of 6 drives for SG-XLIBLTO4R-L60 	SG-XTAPLTO-L20	Optional
3. Order required no. of host bus adapters <ul style="list-style-type: none"> – See matrixes under Hardware Compatibility 	X6541A (SCSI-PCI-based) or X1065A (SCSI-SBus-based) or X6749A(SCSI-cPCI-based)	Required
4. Order additional media cartridges as appropriate	SG-XMEDLTO100GB-10	Optional
5. Order additional cleaning cartridges as appropriate	SG-XMEDLTOHPCL-5	Optional
6. Order backup/restore application of choice <ul style="list-style-type: none"> – Solstice Backup™ software – VERITAS NetBackup software 		Required to achieve stated performance
7. Order extra SCSI cable as needed	X979A	Optional
8. Basic installation for the Sun StorEdge tape library	NF-B-INST-ETL	Optional/Included (see note)
9. Order Sun Professional Services Tape Library Implementation Service	PS-EO-DSTLI-1	Optional
<p>Note: The basic installation for the Sun StorEdge tape library is included in the cost of the 40-slot and 60-slot RACKMOUNT units only. The 40-slot and 60-slot RACKMOUNT units are products that need to go through the SCOPETOOL. See below for more information. The 40-slot and 60-slot RACKMOUNT configurations are in the SCOPETOOL because the weight of the units requires a lift to be used. The desktop units and the 20-slot rackmount unit do not need this special service.</p>		



Service Notification (SCOPETOOL)

The 40-slot and 60-slot rackmount versions go through a process called a service notification, which is done through SCOPETOOL at <http://scope.central> or RSCOPETOOL for resellers. The salesperson or SE enters the customer information including customer name, installation address, phone number, and contact name. The Oracle sales order number is also required in order to submit this for installation.

Ordering Additional Bar Code Labels

Labels for this product are provided by Colorflex, which sells to distributors or tape vendors such as Sun. End users will be directed to their nearest dealer, or may order labels directly from Colorflex via telephone or the Internet with a credit card.

Location	Contact Information
USA	EDP/Colorflex 697 South Pierce Street Louisville, CO 80027 (888) 438-8362
Europe	EDP/Colorflex 43 Redhills Road South Woodham Ferrers Chelmsford, Essex CM35UL UK (44) 1245-322380
Via the Web	http://www.colorflex.com Click on Tri-Optic Media Labels, then either use the "Find a Label" tab to search by Library number, or the "Label Specs" tab to see PDF images of the various labels they produce (arranged by technology).

Note: 25 bar code labels plus 5 cleaning cartridge labels are included with the Media Label Kit that ships with each unit. (1 with the L20, 2 with the L40, and 3 with the L60)



Service and Support

Warranty

The Sun StorEdge™ L20/40/60 tape library warranty is a 1-year, next business day onsite.

SunSpectrum™ Program

The SunSpectrum™ program is an innovative and flexible service offering that allows customers to choose the level of service best suited to their needs, ranging from mission-critical support for maximum solution availability to backup assistance for self-support customers. The SunSpectrum program provides a simple pricing structure in which a single fee covers support for an entire system, including related hardware and peripherals, the Solaris™ Operating Environment software, and telephone support for Sun™ software packages. The majority of Sun's customers today take advantage of the SunSpectrum program, underscoring the value that it represents. Customers should check with their local Sun Enterprise Services representatives for program and feature availability in their areas.

SunSpectrum program support contracts are available both during and after the warranty program. Customers may choose to uplift the service and support agreement to meet their business needs by purchasing a SunSpectrum contract. For more information on the SunSpectrum program offerings refer to the following URL: http://service.central/TS/ESP/SunSpectrum/Feature_Matrix/index.html.

The four levels of SunSpectrum support contracts are outlined below.

Program	Description
Mission-Critical SunSpectrum Platinum™ Support	Designed to support client-server, mission critical solutions by focusing on failure prevention, rapid recovery and year round technical services planning. Support is provided 24 x 7.
Business-Critical SunSpectrum Gold™ Support	Includes a complete package of proactive and responsive services for customers who require maximum uptime for their strategic business-critical systems. Support is provided 24 x 7.
System Coverage SunSpectrum Silver™ Support	Combines the service expertise, responsive on-site support and technical support by telephone and SunSolve™ CD/on-line services. Support is provided 8 a.m. to 8 p.m. Mon. through Fri.
Self-Directed SunSpectrum Bronze™ Support	Provided for customers who rely primarily upon their own in-house service capabilities. Enables customers to deliver high quality service by giving them access to UNIX® expertise, Sun certified replacement parts, software releases and technical tools. Support is provided 8 a.m. to 5 p.m. Mon. through Fri.

Sun Enterprise Services also offers TapeStart, which is installation of this library at the customers site. The order number for this is NF-B-INST-ETL. Contact the local Sun Enterprise Services representative for further information on these services.



Sun Professional Services

Sun Professional Services offers the Sun Professional Services Tape Library Implementation Service, which delivers a working Sun StorEdge™ L20/40/60 tape library backup system. Generally speaking, it integrates the hardware and software components together. This provides customers with a platform that can be used to develop and implement their production backup and restore policies. The Sun Professional Services Tape Library Implementation Service addresses the following:

- Configuring VERITAS NetBackup or Solstice Backup™ software with the backup server system and tape library
- Functional testing of the backup server with an existing client system using single files of UFS for backup and restores.

The customer deliverables are:

- Tape library tested and functional in a production environment
- Full configuration documentation

Hardware installation is not covered under the Sun Professional Services Tape Implementation Service. The hardware must be installed prior to this service being performed. The Sun Professional Services Tape Implementation Service covers configuration of the tape library as well as configuration and installation of VERITAS NetBackup or Solstice Backup software.

The Sun Professional Services Tape Implementation Service does not address any database backup. This service can be provided as a separate quote by Sun Professional Services, however.

This service provides a basic functional, tested backup and restore platform, but does not develop any policies, procedures, nor is the backup and restore platform ready for full production. Additional service needs that customers may have can be discussed with the Sun Enterprise Support Service Sales Representative.

More information about the Sun Professional Services Tape Library Implementation Service can be found on the Sun Professional Services web site. On that site is a Sales Tool section with has an electronic service brief and a sales guide. The service brief is a piece of collateral which may be printed and given to the customer. Go to the URL:

http://sunps.central/Services/Storage/tape_lib_impl.html

A Statement of Work must be completed and approved by the customer and included with the Sales Quote. This ensures a successful Sun Professional Services Tape Library Implementation Service for the customer. The Statement of Work details what activities are performed by Sun Professional Services, the responsibilities of the customer, as well as specific terms and conditions of the service. Contact the local Sun Enterprise Support Service Sales Representative as early in the sales cycle as possible to complete this SOW and to help ensure the included Sun Professional Services can meet customers' needs.



Glossary

Actuators	Robotic components that move inside the library to manipulate cartridges. These include the gripper, extension axis, and vertical and horizontal axes.
Archive	The process of moving data from one medium to another where it is stored for later use.
Autoloader	<p>A peripheral device that contains</p> <ul style="list-style-type: none">• A mechanism for moving cartridges sequentially or under program control• Several storage locations for storage media• One drive capable of reading or writing the media• Interface circuitry <p>When commanded by a host system, autochangers can transport media back and forth between storage locations and the drive residing in the autoloader.</p>
Automatic tape library	A robotic storage and retrieval system for digital linear tape cartridges.
Backup	The process of copying data to a secondary medium for protection in the event that the original copy is lost and needs to be recovered.
Bar code label	The identification label on digital linear tape cartridges.
Bin	A storage receptacle for a tape cartridge.
Compression	A procedure in which data is transformed by the removal of redundant information in order to reduce the number of bits required to represent the data.
Control panel	The panel on the front of the library that contains the Status Display Area, as well as the indicators and control button.
cPCI	The "c" in cPCI stands for compact. PCI connectors on board-level devices can use compact PCI (cPCI) connectors.
Differential	<i>See</i> Single-ended.
DLT	Digital linear tape. Linear tape recording technology (contrasted with helical scan). Digital linear tape technology segments tape media into parallel, horizontal tracks, and records data by running the tape past a stationary head. digital linear tape provides higher performance than helical scan technology.
Fast/wide SCSI	Data transfer rate of 20 MB/sec. Wide devices can be connected to a narrow SCSI interface, but the extra data lines must be terminated.
Helical scan	A means of recording data in narrow tracks that run diagonally across the tape. Formats include 4-mm, 8-mm, and 19-mm, and half-inch tape.
Host	The host computer system acting as controller for the drive.

Host adapter	A device that connects a peripheral device I/O protocol and medium to the computer system's I/O bus.
Host computer	The computer that issues SCSI commands to control the library robotics.
HSM	Hierarchical storage management. A method for keeping infrequently used data in secondary storage, then restoring it automatically when a user calls for the data. The underlying premise behind HSM is that if the most frequently used data is kept in the fastest (primary) storage, most of the time users perceive the overall system performance as if all the data were in fast storage. HSM software transparently "migrates" least frequently used data to more economical media, then restores it automatically as needed. HSM systems can provide users with performance and economy without sacrificing application portability or storage system transparency.
IOPS	Input/output operations per second, a measure of I/O performance usually used to quote random I/O performance.
LCD	Liquid crystal display.
Load	The process in which a drive takes in an inserted cartridge and goes online.
Load port	The operator-accessible component of the library that allows cartridges to be import/export loaded and unloaded into/from the library.
Magazine	A holder for tape cartridges used in robotic handling of media.
MCBF	Mean cycles between failure. An activity-dependent measure of reliability for a robotic cartridge handling system.
MSBF	Mean swaps between failure. A measure of reliability for the robotic cartridge handling system, this is the average expected number of full cartridge exchanges (i.e., the cartridge is unloaded from the digital linear tape drive and placed back into its storage slot, and a new cartridge is removed from its storage slot and loaded into the tape drive) between failures of equipment.
MTBF	Mean time between failure. The average expected time between failures of equipment, usually measured in operating hours.
MTTR	Mean time to repair.
Offline	A drive is offline if a tape is currently unloaded or not in the drive. The host has limited access, and cannot perform any commands that would cause tape motion. The host can, however, load a tape if one is inserted and can execute any diagnostic tests that do not require tape motion.
Online	A drive is online when a tape is loaded. The host has access to all command operations, including those that access the tape, set configurations and run diagnostic tests.
PCI	Peripheral component interconnect. PCI is an industry standard bus used in servers, workstations, and PCs.
Pick	Preparation for placing it in another location.



Rear panel	The rear cosmetic panel of the library that contains the AC power switch, AC power receptacle and connectors for attaching external cabling to the library.
Robotics	The library robotics consist of the following components: gripper mechanism, vertical actuator, horizontal actuator, and extension actuator.
SBus	An I/O (input/output) bus used with host systems or boards designed according to SPARC™ processor architecture.
SCSI	Small computer system interface. A standard command specification and command set that enables computers and peripherals to communicate with each other. Sun's current of tape drives adhere to the SCSI-2 specification.
SCSI address	The octal representation of the unique address (0-7) assigned to a narrow device, or hexadecimal representation of the unique address (0-15) assigned to a wide SCSI device.
Sequential access	Sequential access devices store data sequentially in the order received. Tape devices are the most common sequential access devices. By contrast, disk drives are direct access devices, where data is stored in blocks, not necessarily sequentially.
Single-ended	SCSI devices can be single ended or differential. Single-ended devices transmit signals by setting a line in the cable to a pattern of high and low voltages in relation to a ground line. Differential devices send signals by swapping over high and low states between two lines. This is more expensive to implement, but reduces interference and allows longer cable lengths. Single-ended and differential devices must not be mixed on one SCSI bus.
SWIS/S	Single-ended, wide, intelligent SCSI/SBus host adapter.
Termination	A SCSI bus (or cable) can have many devices plugged into it, but the end of the cable furthest from the host computer must always be terminated to avoid signals being reflected back and interfering with other signals. The terminator both absorbs signals and provides power to the lines in the cable. For this reason, it must itself be provided with power. Terminators can be of two types, active and passive.
Tape library	Type of tape autochanger that allows media to be accessed randomly.
Throughput	A measure of sequential I/O performance, quoted in MB per second. <i>See</i> IOPS.
Transfer rate	The rate at which data is transferred from one device to another, for example from the host computer to the tape drive during backup.



Materials Abstract

All materials are available on SunWIN except where noted otherwise.

Collateral	Description	Purpose	Distribution	Token # or COMAC Order #
Product Literature				
– <i>Sun StorEdge™ L20/40/60 Tape Library Just The Facts</i>	Reference Guide (this document)	Sales Tool	SunWIN	117831
– <i>Sun StorEdge L20/40/60 Tape Library Customer Presentation</i>	Presentation with Slide Notes	Sales Tool	SunWIN Reseller Web	121348
– <i>Sun Product Intro: Sun StorEdge L20/40/60 Tape Library</i>	Introduction E-mail	Sales Tool	SunWIN, Reseller Web, E-mail	117840
– <i>Sun StorEdge L20/40/60 Tape Library Data Sheet</i>	Data Sheet	Sales Tool	SunWIN	117183 DE1158-0
External Web Site				
– <i>Sun StorEdge L20/40/60 Tape Library Product Overview</i>	http://www.sun.com/storage/L20/			
Internal Web Sites				
– <i>Sun StorEdge L20/40/60 Tape Library Product Overview</i>	http://webhome.ebay/networkstorage/products/L20/			
– <i>Sales Process Information</i>	http://gsops.central/sdeskproc/OSP/L20/			
– <i>SCOPE TOOL Service Notification</i>	http://scope.central			

