



# StorageTek™ T9x40 Tape Drive

**System Assurance Guide**

Part Number: MT5003

Revision: AF





# StorageTek™ T9x40 Tape Drive

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## System Assurance Guide

Sun Microsystems, Inc.  
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# Summary of Changes

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<b>Date</b>	<b>Revision</b>	<b>Description</b>
10/98	A	Initial Release
2/99 - 09/05	B through Y	Refer to these revisions for a description of the changes.
09/06	AA	Refer to this revision for a description of the changes.
01/08	AB	Refer to this revision for a description of the changes.
04/08	AC	Added support for SL3000 library. Revised the order number tables for T9840C & D new parts. Updated the information regarding cartridge ordering. Separated the T9940 conversion bill numbers into their own table.
06/08	AD	Added T9840D Fibre Channel drive information.
12/08	AE	Added <ul style="list-style-type: none"><li>• New short wavelength and long wavelength port kits</li><li>• Airborne contamination information and reference to the Sun Microsystems Data Center Site Planning Guide (P/N 805-5863-13)</li></ul>
4/09	AF	Added: <ul style="list-style-type: none"><li>• IPv6 information</li><li>• Updated the tape drive part number tables in Chapter 5</li></ul>

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# Preface

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This guide contains information about the planning, ordering, and delivery activities required for the T9840 and T9940 tape drives. For more information about library-attached configurations, refer to the system assurance guide for the appropriate library.

The term “T9x40” is used in this publication to generically reflect all models of either drive series. The term “T9840” reflects all models of the T9840 series. The term “T9940” reflects all models of the T9940 series. The specific model suffix is used whenever differentiating to a specific model is appropriate.

The audience for this guide includes Sun marketing representatives, Customer Services Engineers (CSEs), Systems Engineers (SEs), Installation Coordinators (ICs), and customers involved with installation planning.

## ■ Organization

This guide contains the following information:

Chapter 1	“Product Overview” provides an overview of the tape drive, its configurations, and its interfaces.
Chapter 2	“System Assurance” provides a place to list the team members who contribute to an error-free installation.
Chapter 3	“Library Firmware/Host Software” provides links and checklists to determine library firmware and host software currency.
Chapter 4	“Preinstallation Checklists” provides checklists to prepare for the arrival and installation of the tape drive.
Chapter 5	“Information for Ordering” provides information to order the drive, interface cables, data cartridges, and conversion bills.
Appendix A	“Specifications” provides physical and performance specifications and environmental requirements.
Glossary	Defines terms used in this guide.
Index	Helps you find information in this guide.

## ■ Alert Messages

Alert messages call the reader's 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.**

## ■ Related Publications

The following publications either pertain to the use of T9x40 tape drives or assist with planning a full automated tape solution:

Title	Part Number
<i>T9840 Tape Drive User's Reference Manual</i>	95739
<i>T9840B/T9840C Tape Drive FICON Configuration<sup>1</sup></i>	
<i>T9940 Tape Drive Operator's Guide</i>	95989
<i>T9940B Tape Drive FICON Configuration<sup>1</sup></i>	
<i>Crypto Key Management Station Systems Assurance Guide</i>	TM0018
<i>L180/L700x/L1400x Tape Libraries Ordering and Configuration Guide</i>	MT9112
<i>L5500 Automated Cartridge System, System Assurance Guide</i>	MT9142
<i>Nearline Enterprise 9310/4410/9360 System Assurance Guide</i>	ML6500
<i>StreamLine SL8500 Modular Library System, System Assurance Guide</i>	MT9229
<i>Sun StorageTek SL3000 Modular Library System Systems Assurance Guide</i>	316194101
<i>VolSafe Feature Software Information Guide Release 2.0<sup>2</sup></i>	316109301

1. White paper located on the SE Support Tools Web-site.
2. Locate the manual at [http://www.sun.com/storagetek/tape\\_storage/tape\\_media/volsafe/](http://www.sun.com/storagetek/tape_storage/tape_media/volsafe/) - find the link on the right side of the page in the Download Collateral area.

## ■ Conventions

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

Item	Example	Description of Convention
Acronyms	CSA	All uppercase
Buttons	<b>MENU</b>	Sans serif font; capitalization follows interface (usually all uppercase)
Commands	Mode Select	Initial cap
Document titles	<i>System Assurance Guide</i>	Italic
Emphasis	<i>not</i> or <i>must</i>	Italic
File names	<code>fsc.txt</code>	Monospace font
Hypertext links	<a href="#">Figure 2-1 on page 2-5</a>	Blue (prints black in hard-copy publications)
Indicators	<i>Open</i>	Italic; capitalization follows interface (usually initial caps)
Jumper names	TERMPWR	All uppercase
Keyboard keys	<Y> <Enter> or <Ctrl+Alt+Delete>	Sans serif; capitalization follows interface (usually initial caps); enclosed within angle brackets
Menu names	Configuration Menu	Capitalization follows interface; usually title caps
Parameters and variables	Device = <i>xx</i>	Italic
Path names	<code>c:/mydirectory</code>	Monospace font
Port or connector names	SER1	Capitalization follows label on unit; otherwise, all uppercase
Positions for circuit breakers, jumpers, and switches	ON	Default font; capitalization follows interface; otherwise, all uppercase
Screen text (including screen captures, screen messages, and user input)	downloading	Monospace
Switch names	<b>Power</b>	Sans serif; capitalization follows label on unit
URLs	<a href="http://www.sun.com">www.sun.com</a>	Blue (prints black in hard-copy publications); split at forward slash or period

## ■ Documentation, Support, and Training

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# Product Overview

# 1

This chapter provides an overview of T9x40 tape drives.

## ■ Descriptions

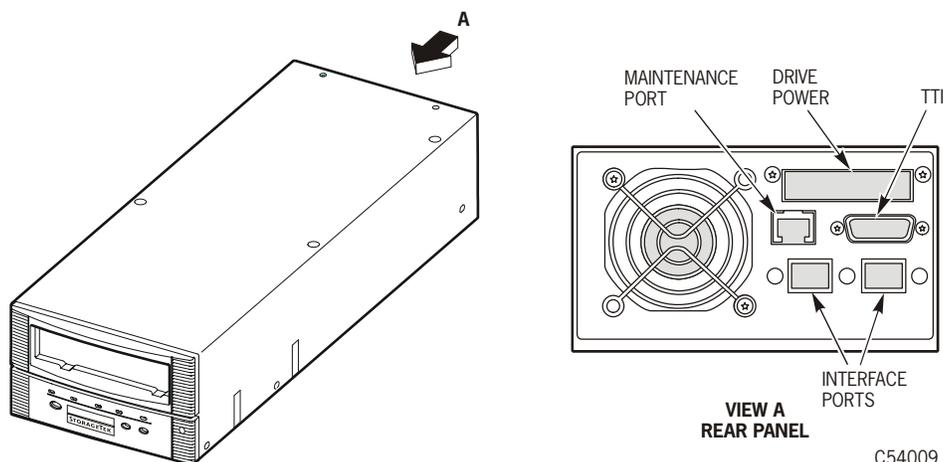
The T9x40 tape drives are small, modular, high-performance drives designed for the enterprise and client-server environments. There are four generations of T9840 access-centric drives and two generations of T9940 high-capacity drives.

### T9840 Tape Drive

The T9840 tape drives (Figure 1-1) provide applications with high data throughput and fast recall. T9840 tape drives read/write dual-reel cartridges (see “9840 Cartridge Description” on page 1-13, for more information about 9840 cartridges). The dual-reel cartridge loads to midpoint, which eliminates tape threading time, and minimizes first-file access time (see Table A-2 on page A-2).

- T9840A/B tape drives read/write 20-GigaByte (GB) dual-reel cartridges.
- T9840C tape drive is an enhanced version for 40-GB recording, using partial response maximum likelihood (PRML) format.
- T9840D encryption-capable drive provides 75-GB recording when using block sizes between 32 KB and 256 KB. With drive code level 1.44.x04 and Key Management System (2.1), the drive complies with FIPS Level 1. Level 1 is the lowest classification and has production-grade requirements.

Figure 1-1. T9840 Tape Drive



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The T9840B/C/D rear panel has a Maintenance Port (standard RJ45 receptacle) for Service Delivery Platform (SDP) and/or Customer Service Engineering (CSE) interface.

The T9840D maintenance port supports the use of the Virtual Operator Panel to perform drive operations, retrieve error information, and configure the tape drive. VOP version 1.0.13 in conjunction with the appropriate drive code level supports the use of an IPv6 address.

T9840 tape drives are also capable of reading/writing specially designated, write-only (VolSafe) cartridges, which provide a non-erasable, non-rewritable storage solution for important data. See “T9x40 VolSafe” on page 1-3 for additional information.

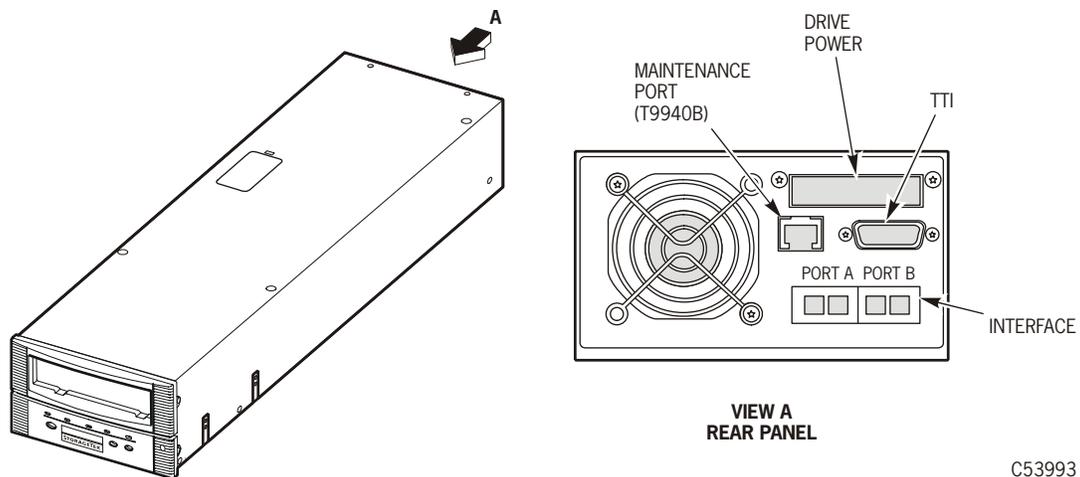
## T9940 Tape Drive

The T9940 tape drives (Figure 1-2) are capacity-centric for data-intensive applications. The T9940A tape drive reads/writes 60-GB, single-reel cartridges (see “9940 Cartridge Description” on page 1-16, for more information about 9940 cartridges). The T9940B tape drive is an enhanced version for 200-GB recording, using PRML format, better performance, (see Table A-14 on page A-13), and better serviceability. Like the T9840B/C/D tape drives, the T9940B tape drive rear panel has a RJ45 Maintenance Port that uses TCP/IP for SDP and/or CSE interface.

The T9940 tape drive is approximately 140 mm (5.5 in.) longer than the T9840 tape drive. The increased length is due to the tape path mechanism being inside the tape drive. The increased length also requires additional mounting space available for installation.

T9940B tape drives are also capable of reading/writing specially designated, write-only (VolSafe) cartridges, which provide a non-erasable, non-rewritable storage solution for important data. See “T9x40 VolSafe” on page 1-3 for additional information.

Figure 1-2. T9940 Tape Drive



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## T9x40 VolSafe

T9x40 VolSafe capability is a combination of hardware (VolSafe enabled tape drives), microcode, and special media (VolSafe cartridges). This combination provides write-once, read-many (WORM) functionality to safeguard selected data files. Once written to a VolSafe cartridge, data cannot be over-written or erased. New data can be added (appended) to a density-compatible VolSafe cartridge until the cartridge is full.

VolSafe cartridges have a magnetic signature in the Media Information Region (MIR), distinct machine readable features, and are visually identified by colored labels and write-protect switches. See [“9840 Cartridge Description” on page 1-13](#) or [“9940 Cartridge Description” on page 1-16](#) for more information on VolSafe cartridge identification features.

### Write

To write to a VolSafe cartridge, a T9x40 tape drive must have compatible data density with the specific VolSafe cartridge, and the drive must be VolSafe-enabled. For instance,

- T9840A/B drives write to 20-GB 9840 VolSafe cartridges only (yellow identification)
- T9840C drives write to 40-GB 9840C VolSafe cartridges only (green identification)
- T9840D drives write to 75-GB 9840D VolSafe cartridges only (purple identification)

**Note:** See [“9840 Cartridge Description” on page 1-13](#), for VolSafe cartridge identification

- T9940B tape drives write to 200-GB 9940B VolSafe cartridges only (see [“9940 Cartridge Description” on page 1-16](#), for VolSafe cartridge identification)

The specific tape drive's VolSafe configuration setting must also be enabled (indicated by Ready A, when a compatible VolSafe cartridge is loaded).

### Read

To read VolSafe cartridges, a T9x40 tape drive only needs to be density-compatible, the tape drive VolSafe configuration setting need not be enabled. The tape drive recognizes VolSafe cartridges as file-protected (Ready F), regardless of the write-protect switch position. For instance, the T9840C tape drive reads 40-GB 9840C VolSafe cartridges and 20-GB 9840 VolSafe cartridges, but T9840A/B tape drives only read 20-GB 9840 VolSafe cartridges.

### Drive - VolSafe Cartridge Compatibility

A 20-GB 9840 VolSafe cartridge, loaded in a T9840C or T9840D tape drive is recognized as file-protected (Ready F), regardless of the cartridge write-protect switch position, and whether the tape drive is VolSafe enabled or not. Therefore, a T9840C or T9840D tape drive reads a 20-GB 9840 VolSafe cartridge, but cannot write to it, even if the tape drive is VolSafe enabled.

Attempts to load a 40-GB 9840C VolSafe cartridge into a T9840A/B tape drive, a 75-GB 9840D VolSafe cartridge into a T9840A/B/C tape drive, or a 200-GB 9940B VolSafe cartridge into a T9940A tape drive results in a load error condition.

Table 1-1 correlates T9x40 tape drives to VolSafe cartridge compatibility.

**Table 1-1. T9x40 Tape Drive - VolSafe Cartridge Compatibility Matrix**

Drive	VolSafe Cartridge			
	9840 (20 GB)	9840C (40 GB)	9840D (75 GB)	9940B (200 GB)
<b>T9840A</b>	Read/Write	Load Error	Load Error	N/A
<b>T9840B</b>	Read/Write	Load Error	Load Error	N/A
<b>T9840C</b>	Read Only	Read/Write	Load Error	N/A
<b>T9840D</b>	Read Only	Read Only	Read/Write	N/A
<b>T9940A<sup>1</sup></b>	N/A	N/A	N/A	Load Error
<b>T9940B</b>	N/A	N/A	N/A	Read/Write

1. T9940A tape drive is not VolSafe compatible.

## ■ Configurations

The following pages describe the T9x40 tape drive configurations.

**Note:** See [Chapter 5, “Information for Ordering”](#) for specific marketing part numbers (PN) availability.

### T9840A

The T9840A tape drive is used in the following configurations:

- Desktop, with a choice of: 1) manual load or 2) cartridge scratch loader (CSL).
- Rack mount, with a choice of: 1) manual load or 2) CSL.
- Library attached, see [“Library-attached T9x40” on page 1-5](#).

### T9840B

The T9840B tape drive is used in the following configurations:

- Desktop, manual load
- Rack mount, manual load
- Library-attached, see [“Library-attached T9x40” on page 1-5](#).

### T9840C

The T9840C tape drive is used in the following configurations:

- Rack mount, manual load
- Library attached, see [“Library-attached T9x40” on page 1-5](#).

## T9840D

The T9840D tape drive is used in the following configurations:

- Rack mount, manual load
- Library attached, see “[Library-attached T9x40](#)”.

## T9940A

The T9940A is used in the following configurations:

- Rack mount, manual load, shipboard
- Library attached, see “[Library-attached T9x40](#)”.

## T9940B

The T9940B is used in the following configurations:

- Rack mount, manual load, shipboard
- Library attached, see “[Library-attached T9x40](#)”.

## Configuration Details

This section provides a list of available configurations for the various drive models. Library configurations are listed first, followed by rack mount, and finally desktop.

### Library-attached T9x40

The *T9840* tape drive is attached to trays for the following StorageTek libraries:

- 9310 (PowderHorn): Up to 80 tape drives in four 20-drive walls
- 9360 (WolfCreek) (*T9840.A only*): Up to 20 tape drives **[end of support]**
- 9710 (TimberWolf) (*T9840.A/B only*): Up to 10 drives **[end of support]**
- 9738 (TimberWolf) (*T9840.A only*): Up to 3 drives **[end of support]**
- 9740 (TimberWolf) [*T9840D is not supported*]: Up to 10 tape drives
- L180 Tape Library: Up to 6 tape drives
- L700/L1400 Tape Library: Up to 12 tape drives
- L5510 LSM (L5500 ACS) [*T9840D is not supported*]: Up to 77 tape drives in four 20-drive walls
- Sun StorageTek™ SL3000 modular library system (*T9840C/D only*): Up to 56 tape drives
- Sun StorageTek™ SL8500 modular library system: Up to 64 tape drives

The *T9940* tape drive is attached to trays for the following StorageTek libraries:

- 9310 (PowderHorn): Up to 80 tape drives in four 20-drive walls
- 9360 (WolfCreek) (*T9940.A only*): Up to 20 tape drives **[end of support]**
- 9740 (TimberWolf): Up to 10 tape drives
- L180 Tape Library (*T9940B only* provided you use the expansion door): Up to 6 tape drives

- L700/L1400 Tape Library: Up to 12 tape drives
- L5510 LSM (L5500 ACS): Up to 77 tape drives in four 20-drive walls
- Sun StorageTek™ SL8500 modular library system (*T9940B only*): Up to 64 tape drives

**Notes:**

1. See “[Related Publications](#)” on page xiv, for ordering information for the StorageTek libraries that accept the T9x40 tape drive, including drive cabinet and minimum software requirements, refer to the system assurance guide for the appropriate library.
2. In the L5500 ACS, the total number of mixed drives, including the Linear Tape Open (LTO) Ultrium tape drives attached to one L5510 LSM is 80 tape drives. The PLM unit, required for LTO drives, blocks three T9x40 power supply slots; therefore, in a mixed 20-drive cabinet, a maximum of 17 tape drive slots are available for T9x40 tape drives.

Additional drive cabinets would also be limited to a maximum 17 slots for T9x40 tape drives, when a PLM is present. However, if the serial TTI (Tape Transport Interface) cable was installed in place of the PLM unit, a second cabinet could have all 20 tape drive slots available for T9x40 tape drives.

While an L5510 LSM could theoretically have up to 77 tape drive slots available for T9x40 tape drives, it will most likely be less. For instance, if four drive cabinets were attached, each with a PLM unit installed, there would be a maximum of 68 drive slots (4 X 17) available for T9x40 tape drives.

The total number of drive cabinets and total mix of T9x40 and LTO tape drives is determined by the site parameters for each library installation.

## Desktop T9840

The desktop configuration of T9840A/B tape drives consist of one manual-load drive and one power supply in a desktop chassis. The T9840A drive can also be contained in a Cartridge Scratch Loader (CSL) desktop chassis.

The operator loads a data cartridge by manually inserting it into the drive loading slot; and, unloads a data cartridge by pressing the **Unload** switch, then manually removing it from the drive loading slot.

With the T9840A desktop CSL chassis, the operator stacks up to seven data cartridges in the CSL mechanism; the mechanism then loads and unloads the cartridges sequentially. Also, operators can manually load/unload a single data cartridge through the loading slot.

## Rack Mount

The rack mount T9840 drive tray chassis mounts into a 483-mm (19-in.) rack cabinet. The chassis consists of single/dual manual-load tape drives. The T9840A drive can also be configured in a rack mount CSL chassis. Each tray can hold:

- One manual-load drive in position A (T9840A/B/C/D)
- Two manual-load drives, side-by-side, positions A and B (T9840A/B/C/D)

- One CSL chassis (one T9840A drive only)

The rack mount configuration of the T9940 tape drive consists of two manual-load tape drives mounted on a shock absorbing platform in a rack mount tray.

### ***Rack Cabinets***

The rack mount configurations of the T9x40 tape drives are designed to fit into a standard 483-mm (19-in.) rack cabinet (such as the SL-RACK-42-Z). If the customer supplies the rack cabinet, make sure that the cabinet is at least 780 mm (30.75 in.) deep. See “[Rack Cabinets](#)” on page A-7 for physical specifications and floor space requirements. You can mount:

- Up to six T9840 drive trays in any combination of one drive, two drive, or CSL configurations in a single rack cabinet.
- Up to four T9940 rack mount drive trays in single rack cabinet.
- T9940 rack mount trays in combination with T9840 and/or T10000 rack mount trays within the same rack cabinet. Therefore, the tray totals are limited to the following combinations:

<b>Drive type:</b>	<b>T9940<sup>1</sup></b>	<b>T9840 or T10000<sup>2</sup></b>
	1	1 to 4
<b>Drive trays:</b>	2	1 to 3
	3	1

1. Each T9940 drive tray is 6U (266.7 mm / 10.5 in.)
2. Each T9840 or T10000 drive tray is 4U (177.8 mm / 7.0 in.)

**Note:** The total vertical space cannot exceed 24U (1066.8 mm / 42.0 in.).

To supply power to rack mount drive trays in a rack cabinet, you must order one internal AC power cord per drive tray to connect to a power strip mounted in the cabinet.

Other supported racks:

- CBNT42U is a fully ROHS-compliant, basic 19-inch rack cabinet
- StorageTek RACK001 is a 19-inch 35U rack cabinet, but it is not ROHS compliant

**Note:** If you are installing more than four drive trays in the RACK001, a second power strip and power cord (compatible to the site’s AC power source) are required.

Figure 1-3 shows configurations of the T9840 tape drive.

Figure 1-3. T9840 Tape Drive Configurations

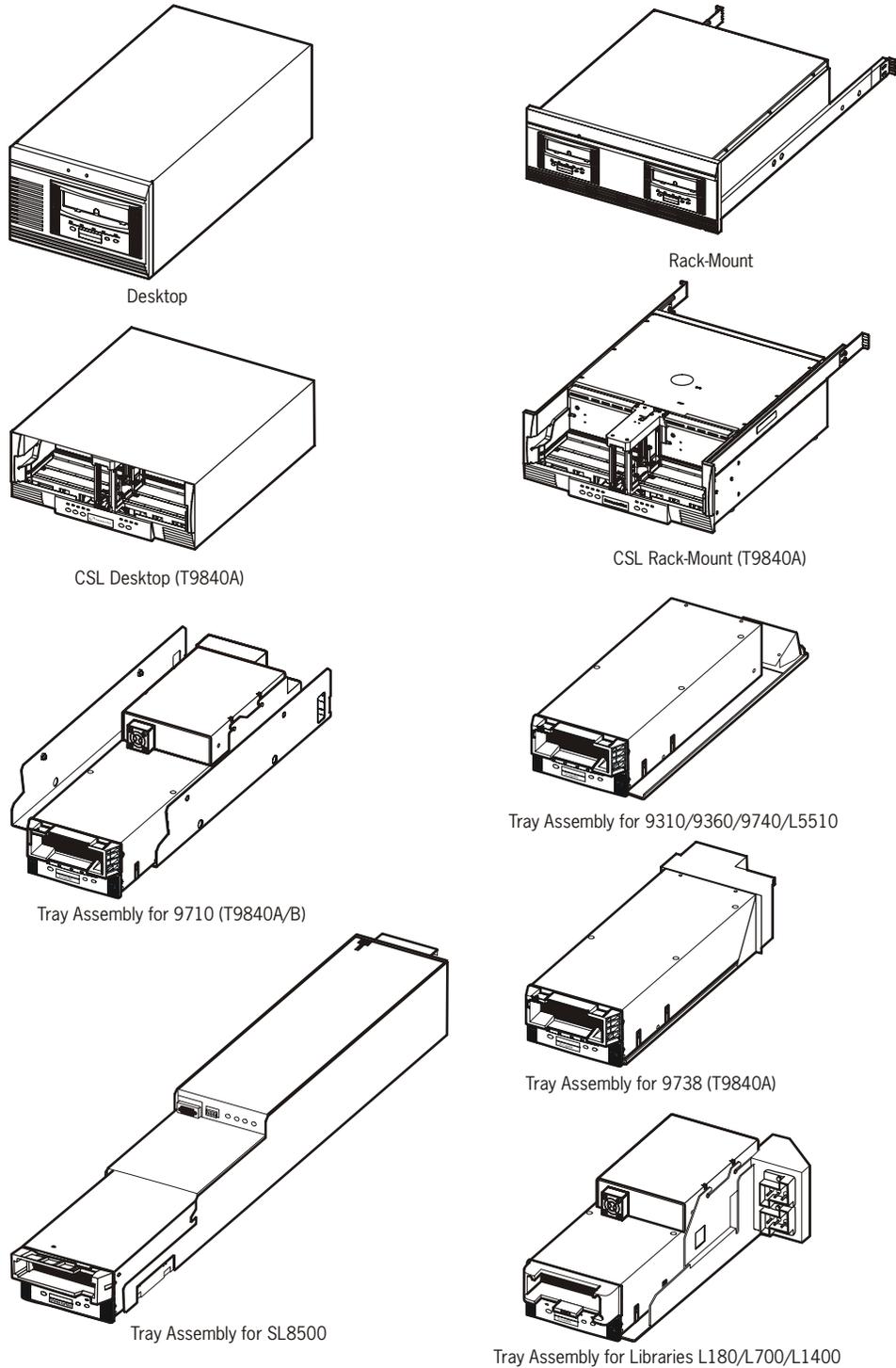


Figure 1-4 shows T9940 tape drive on library trays.

**Figure 1-4. T9940 Tape Drive, Library attached**

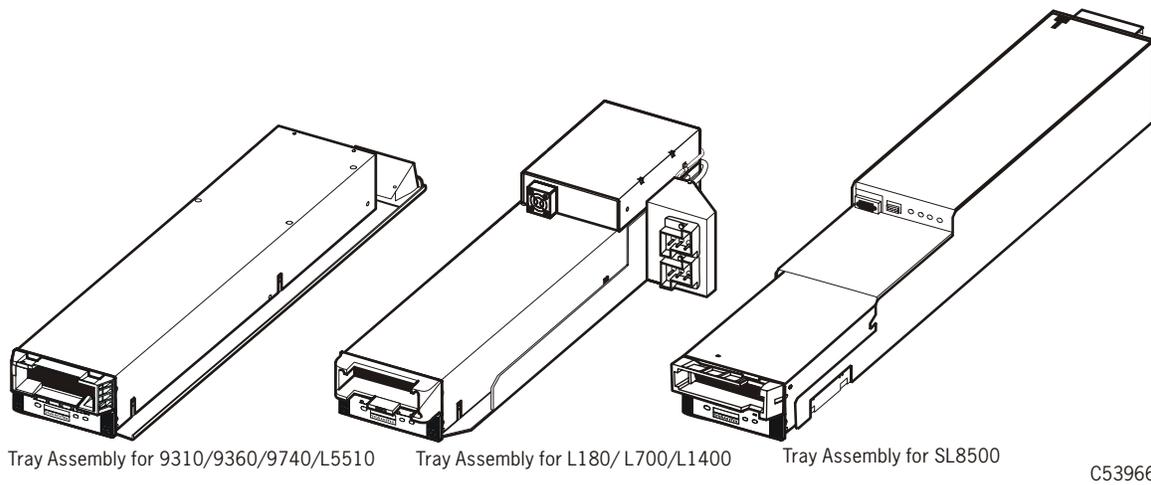
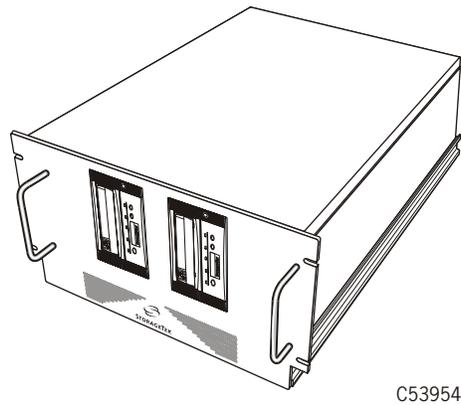


Figure 1-5 shows the T9940 Rack Mount configuration.

**Figure 1-5. T9940 Tape Drive, Rack Mount**



### ***Power Cords***

The power cord options for the desktop and rack mount T9x40 tape drive are:

- Desktop or rack mount 120 VAC operation in the U.S. and Canada with a 120 VAC three-prong standard plug
- Desktop 250 VAC operation outside the U.S. and Canada with a continental European standard plug
- Rack Mount 250 VAC operation in the U.S. and Canada with either a Hubbell or a Russellstoll plug

Order the above power cords by their marketing PNs in the [“Rack Cabinet Order Numbers”](#) on page 5-16.

Power cords that connect T9x40 tape drives to StorageTek libraries ship with the drives. In the case of 9310-, 9360-, 9740-, and L5510- attached drives, the cords connect the tape drive power supply to the 9741/9741E Drive Cabinet power outlet. Refer to the *Nearline Enterprise 9310/4410/9360 LSM System Assurance Guide*, part number ML6500 to order the power cords that connect the 9310-, 9360-, or 9740-attached 9741/9741E Drive Cabinet to the customer's power source. Refer to the *L5500 Automated Cartridge System, System Assurance Guide*, part number MT9142 to order power cords that connect the L5510-attached 9741/9741E Drive Cabinet to the customer's power source.

## Device Emulation Modes Supported (T9840D)

- Fibre Channel:
  - T9840D native mode
  - 3490E11 and 3590E11 (AS400 attachments)
  - T9840C (testing only)
- FICON: 3490E11 and 3590H10
- ESCON: 3490E11 and 3590H10

## ■ Interfaces

The following interface types are available on T9x40 tape drives:

### ESCON

The ESCON-configured T9x40 tape drives have one ESCON Duplex interface port to connect a 62.5-micron ( $\mu\text{m}$ ) ESCON Duplex cable.

- The drive emulates a single-port 3490E or 3590 tape drive.
- 128 logical paths.

**Note:** Maximum total non-repeated channel distance for an ESCON tape drive, using a 62.5 micron multimode cable is 3 km (1.86 mile).

### FC

The FC-configured T9x40 tape drives have dual fiber-optic ports to allow for point-to-point, arbitrated-loop (including redundant-loop) and fabric topology.

- T9x40A tape drives use short wavelength transceivers with SC type ports and operate on a 1-Gb channel.
- The T9840B tape drive uses short wavelength transceivers with LC type ports and operate on a 2-Gb channel.
- The T9840C/D and T9940B tape drives use small form-factor pluggable (SFP) transceivers with LC type ports and operate on a 2-Gb channel. The drives support the use of short or long wavelength SFP modules.

See “[Fibre Channel and FICON Cable Facts](#)” on page 1-12 for information on types of fiber-optic cable and maximum cable lengths.

The FC interface for the T9x40 uses Ultra-SCSI protocol. The FC T9x40 tape drives connect to other devices with the following equipment:

- A hub that connects FC devices to each other in a loop
- A switch that connects FC devices to each other in a fabric

The drive supports connection of both ports, in accordance with ANSI Fibre Channel specifications (ref. InterNational Committee on Information Technology Standards [INCITS] documents: SCSI Primary Commands -3, Section 5.6, and Fibre Channel Protocol -3).

**Note:** The drive will support two hosts, providing that both hosts honor the “reserve/release” and/or the “persistent reserve/release” specifications.

## FICON

Fibre Connection (FICON) is a proprietary IBM channel for the zSeries 900 and the S/390 9672 G5/G6 processors. T9x40 FICON tape drives can be configured with a single-port, short or long wave transceiver; dual-port, short or long wave transceivers; or dual-port, mixed wave (one short wave and one long wave transceiver), using standard FC infrastructure and cables.

The benefits of a FICON channel include greater bandwidth, more logical paths, more devices per channel, and greater distance.

- A total of 256 logical paths are possible. On dual-port tape drives, the 256 total logical paths can be unevenly split between Port A and Port B.
- Approximately six T9x40 FICON tape drives, concurrently reading/writing large (64-KB) blocks, can be attached to a single channel.
- Approximately sixteen T9x40 FICON tape drives, concurrently reading/writing small (16-KB) blocks, can be attached to a single channel.

T9x40 FICON drives use small form-factor pluggable (SFP) transceivers.

The drive supports connection of both ports, in accordance with ANSI Fibre Channel specifications (ref. InterNational Committee on Information Technology Standards [INCITS] documents: SCSI Primary Commands -3, Section 5.6, and Fibre Channel Protocol -3).

**Note:** The drive will support two hosts, providing that both hosts honor the “reserve/release” and/or the “persistent reserve/release” specifications.

## Hardware Configuration Definition

Once you have installed FICON drives, you need to set the hardware configuration definition (HCD) for each drive. Go to the White Papers section of the SE Tools website

at <http://xmen.east.sun.com/setools/aaaNotForCD/Papers/WhitePapers.htm>, then select the appropriate drive article for HCD information and guidelines.

## Fibre Channel and FICON Cable Facts

T9x40 Fibre Channel and FICON tape drives use Fibre Channel cables.

Use multimode cables when connecting to short wave ports. Multimode cables have an orange jacket, and the fiber within the cable is 50 microns in diameter.

Use single mode cables when connecting to long wave ports. Single mode cables have a yellow jacket, a blue LC connector, and the fiber within the cable is 9 microns in diameter.

### Notes:

1. Maximum total non-repeated channel distance for a short wave 850 nm transceiver using a 50 micron multimode cable on a 100 MB/s channel is 500 m (1640 ft).
2. Maximum total non-repeated channel distance for a short wave 850 nm transceiver using a 50 micron multimode cable on a 200 MB/s channel is 300 m (984 ft).
3. Maximum total non-repeated channel distance for a long wave 1310 nm transceiver using a single mode cable is 10 km (6.21 mi).
4. Single mode cable maximum distances can be extended through an amplifier-repeater unit (RPQ) to 20 km (12.4 mi) for a 100 MB/s channel or to 12 km (7.46 mi) for a 200 MB/s channel.

## SCSI

The SCSI-configured T9840A/B and T9940A tape drives have two connectors to attach 68-conductor SCSI P-cables. SCSI enables devices to be connected either directly, in a daisy-chain configuration, or in a combination of direct and daisy-chain configurations. Two connectors facilitate daisy-chaining tape drives. The following SCSI equipment may also be required:

- A terminator that connects to the last device in a SCSI daisy chain
- A bridge that connects SCSI devices to an FC network

A maximum of two daisy-chained devices are possible, with the total SCSI cable length of no more than 25 meters (82 feet).

**Note:** SCSI interface T9x40 Tape Drives are only available as used equipment.

SCSI on the T9x40 is either differential, wide ultra, or a lesser implementation. The T9x40 tape drive does not supply terminator power; therefore, the host bus adaptor (HBA) card must supply SCSI terminator power.

## ■ Tape Cartridges and Labels

The following pages describe the 9x40 data cartridges, VolSafe cartridges, cleaning cartridges, and bar-coded volume serial number (VOLSER) labels. See [“Ordering Cartridges and Labels” on page 5-29](#) to order cartridges and/or labels.

**Note:** Maximum block size is 256 Kilobytes.

### 9840 Cartridge Description

The T9840 tape drives use a cartridge ([Figure 1-6 on page 1-14](#)) that is the same physical size as a 3490 or 9940 data cartridge; however, they are not interchangeable. Three types of cartridges are available: data, VolSafe and cleaning (100 uses maximum).

The media identification labels for 9840 cartridges have unique letters:

<b>R</b>	9840 standard data and VolSafe data cartridges
<b>U</b>	9840 cleaning cartridge (use with T9840A/B/C drives)
<b>Y</b>	9840D cleaning cartridge (use with T9840D only)

### Data Cartridge

The 9840 data cartridges achieve fast access by having both the supply and takeup reels in the cartridge and by facilitating midpoint loading. The standard data cartridge has an uncompressed capacity of:

- 20 GB when written by T9840A/B tape drives,
- 40 GB when written by a T9840C tape drive, or
- 75 GB when written by a T9840D tape drive.

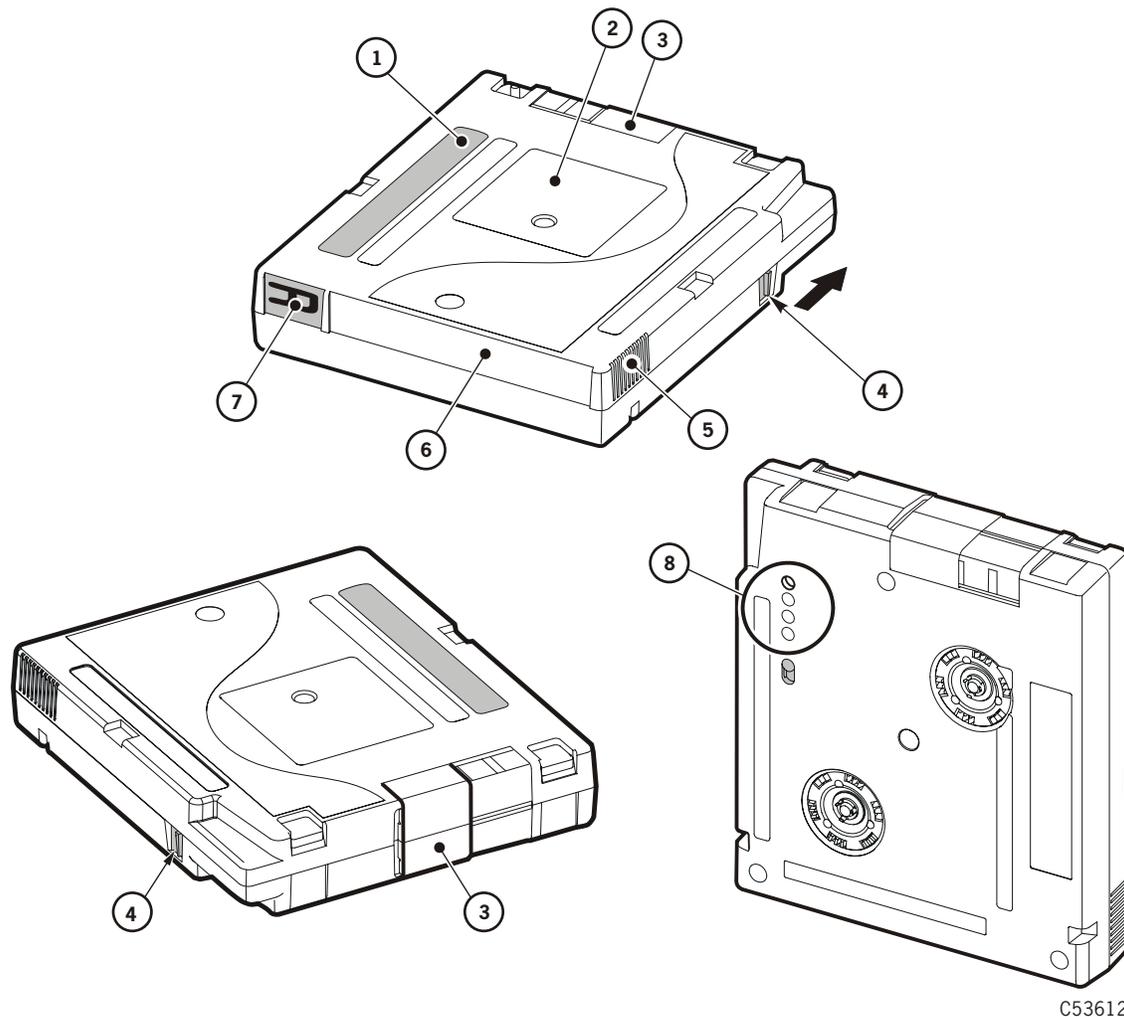
### VolSafe Cartridge

Three variations of the VolSafe data cartridge are available for append-only use:

- 20-GB 9840 VolSafe cartridge, with yellow identifying features
- 40-GB 9840C VolSafe cartridge, with green identifying features
- 75-GB 9840D VolSafe cartridge, with purple identifying features

**Note:** The different VolSafe cartridges are NOT interchangeable (see [“Drive - VolSafe Cartridge Compatibility” on page 1-3](#)).

Figure 1-6. 9840 Cartridge



C53612

1. Manufacturer Label Area
2. Customer Label Area
3. Access Door
4. Write-protect Switch (black on a standard data cartridge, yellow on a 9840 VolSafe cartridge, green on a 9840C VolSafe cartridge, purple on a 9840D VolSafe cartridge, and white on a cleaning cartridge)
5. Finger Grip
6. VOLSER Label Area
7. Media ID (human & barcode identifiable: **R** = standard data or VolSafe data cartridges, **U** = T9840 A/B/C cleaning cartridge, and **Y**=T9840D cleaning cartridge)
8. Media ID (machine readable sensor area - first position recessed on a 9840 VolSafe data cartridge, second and fourth positions recessed on a 9840C VolSafe data cartridge, third and fourth positions recessed on a 9840D VolSafe data cartridge, the first three positions recessed on a U-labeled cleaning cartridge, and the second and third positions recessed on the Y-labeled cleaning cartridge)

## Cartridge Reclaim

**Native reclaim** the ability of a drive to reclaim a cartridge it has previously written.

**Forward reclaim** the ability of a drive to reclaim a cartridge previously written by a legacy drive. Note that the T9840D is able to reclaim a standard data cartridge previously written by a T9840A, T9840B, or T9840C tape drive.

**Backward reclaim** the ability of a drive to reclaim a cartridge written by a non-legacy drive. Note that the T9840A and T9840B drives cannot distinguish between T9840C and T9840D formats.

A cartridge written by a T9840D drive that is loaded on a legacy drive that has been given the instruction to write from BOT will be allowed to write on the cartridge provided the write-protect switch allows it and the cartridge is not a VolSafe cartridge.

**Note:** VolSafe cartridges cannot be forward or backward reclaimed.

A VolSafe cartridge containing 25 blocks, or less, that are all tape marks or 80-byte records will be capable of being native reclaimed.

## 9940 Cartridge Description

The T9940 tape drives use a data cartridge (Figure 1-7) that is the same physical size as a 9840 and 3490 tape cartridge; however, they are not interchangeable. The 9940 data cartridge has a single reel (supply reel) inside the cartridge.

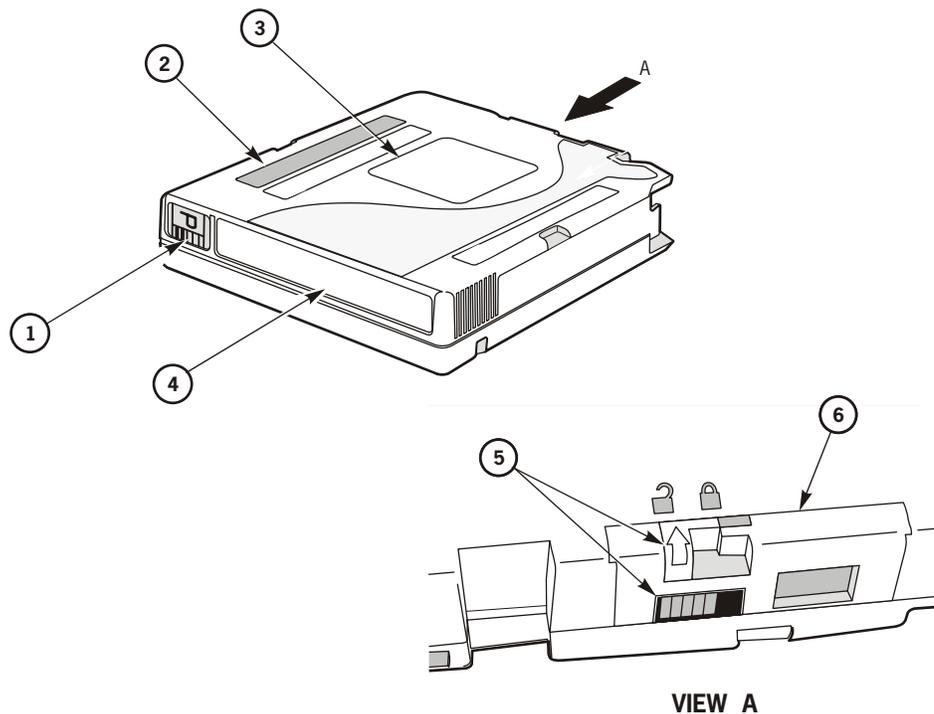
The 9940 data cartridge has a capacity of 60 GB, uncompressed when written by a T9940A tape drive, or 200 GB when written by a T9940B tape drive. A VolSafe (append only) variation of the data cartridge is available. 9940 cleaning cartridges are also available.

The media identification labels for 9940 cartridges have unique letters:

<b>P</b>	9940 standard and VolSafe data cartridges
<b>W</b>	9940 cleaning cartridge

The Media ID sensor area (6 in Figure 1-7) is machine-readable by a distinct pattern for each cartridge type. The sensor area is also color coded for visual identification.

Figure 1-7. 9940 Cartridge



1. Media ID (human & barcode identifiable, yellow background on a VolSafe cartridge, **P** = standard data or VolSafe data cartridge, **W**= cleaning cartridge)
2. Manufacturer Label Area (yellow background on a VolSafe cartridge)
3. Customer Label Area
4. VOLSER Label Area
5. Write-protect Switch
6. Media ID, machine readable sensor area (black on a standard data cartridge, yellow on a VolSafe cartridge, or white on a cleaning cartridge)

## ■ Mixed-Media Management

Extra media management measures must be taken whenever T9x40 tape drives and data cartridges of mixed data density, or mixed Emulation images co-exist in the same library system.

The extra measures essentially involve creation and management of separate media pools/sub-pools for formatted/written 9x40 data cartridges. Guidelines for creation and maintenance of media pools/sub-pools are located in ACSLS, HSC, and independent software vendor (ISV) documentation sets.

### Mixed Data Density

Since all T9840 tape drive models use the same 9840 data cartridge, and both T9940 tape drive models use the same 9940 data cartridge, extra media management measures must be taken because low density tape drives (T9840A/B and T9940A) cannot read data from a data cartridge written in the high-density format by T9840C, T9840D, and T9940B tape drives. The low density tape drives must also have an appropriate drive firmware level to even identify a high-density data cartridge:

- T9840A
  - R1.33.103 or higher to identify a cartridge written by a T9840C drive
  - R1.41.104 or higher to identify a cartridge written by a T9840D drive
- T9840B
  - R1.33.303 or higher to identify a cartridge written by a T9840C drive
  - R1.41.304 or higher to identify a cartridge written by a T9840D drive
- T9840C: R1.41.504 or higher to identify a cartridge written by a T9940D drive
- T9940A: R1.32.215 or higher to identify a cartridge written by a T9940B drive

#### **CAUTION:**

***Data Loss. A low-density tape drive, without the appropriate firmware level, would consider a high-density format cartridge blank and available for scratch or would overwrite data if a write command is issued with the tape positioned at block zero. Use media pools/sub-pools and the appropriate drive firmware level.***

The high-density tape drives can read data from a cartridge written by low-density format tape drives. However, the high-density tape drive can not append data to a low-density data cartridge. An attempt to append a low-density data cartridge on a high-density tape drive will fail, with sense byte data indicating an error, similar to that of a file-protected data cartridge.

**Note:** For additional information about mixed-media management refer to “Cross-Density MIR Processing” in the *T9840 Tape Drive User’s Reference Manual*, PN 85739 and the *T9940 Tape Drive Operator’s Guide*, PN 95989.

**Table 1-2. Data Cartridge Read, Write Append Matrix**

Data Cartridge	Read With				Mid- or End-Volume Append With			
	T9840D	T9840C	T9840B	T9840A	T9840D	T9840C	T9840B	T9840A
Written by T9840D	Yes	No	No	No	Yes	No	No	No
Written by T9840C	Yes	Yes	No	No	No	Yes	No	No
Written by T9840B	Yes	Yes	Yes	Yes	No	No	Yes	Yes
Written by T9840A	Yes	Yes	Yes	Yes	No	No	Yes	Yes

## Mixed Emulation Image

Extra media management measures must also be taken when a mix of T9x40 tape drives with 3490 and 3590 Emulation images co-exist in the same library system.

- Data cartridges written by T9x40 tape drives running with 3590 Emulation image are not readable by T9x40 tape drives running with 3490 Emulation image.
- Data cartridges written by T9x40 tape drives running with 3490 Emulation image are readable by T9x40 tape drives running with 3590 Emulation image, but cannot be written by the 3590 Emulation image tape drive.

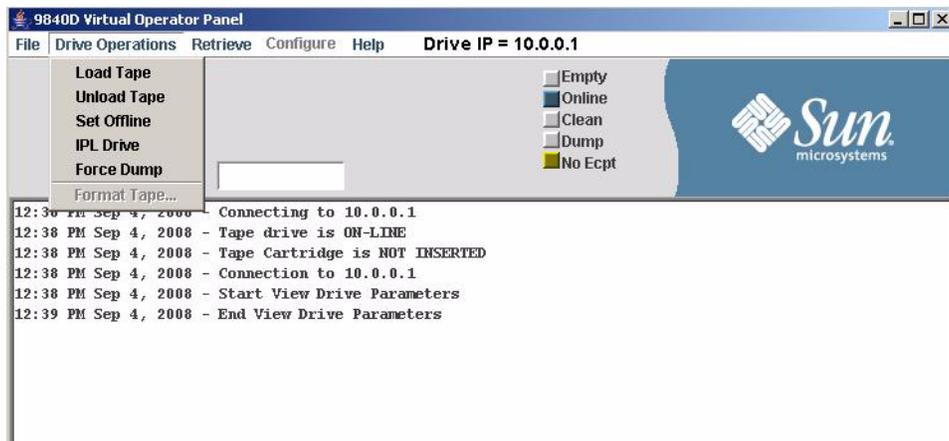
Guidelines for creation and maintenance of media pools/sub-pools are located in HSC and independent software vendor (ISV) documentation sets.

## ■ Virtual Operator Panel

Figure 1-8 shows an example of the virtual operator panel (VOP) graphical user interface (GUI) for the T9840D tape drive. This panel allows operators and service representatives to monitor and perform tasks on a single tape drive.

**Note:** VOP version 1.0.13 in conjunction with the appropriate drive code level supports the use of an IPv6 address.

Figure 1-8. Virtual Operator Panel





The system assurance process is the exchange of information among team members to assure that no aspects of the sale, order, installation, and implementation for the Sun StorageTek T9x40 tape drive are overlooked. The system assurance team members (customers and Sun) ensure that all aspects of the process are planned carefully and performed efficiently to promote an error-free installation and contribute to overall customer satisfaction.

This process begins when the customer accepts the sales proposal.

## ■ System Assurance Planning Meetings

The purpose of the system assurance planning meetings is to:

- Introduce the customer to the T10000 tape drive
- Explain the system assurance process and establish a team
- Identify and define the customer requirements
- Identify the proposed configurations
- Complete the sales order
- Identify any additional items needed (such as cables and tape cartridges)
- Prepare for the installation and implementation
- Schedule and track the entire process

**Table 2-1. System Assurance Task Checklist**

Task	Completed?
Introduce the Sun team to the customer.	Yes ___ No ___
Describe the tape drive to the team members.	Yes ___ No ___
Complete the team member contact sheets in this chapter.	Yes ___ No ___
Review <a href="#">Chapter 3, “Library Firmware/Host Software”</a> and complete the checklists.	Yes ___ No ___
Review <a href="#">Chapter 4, “Preinstallation Checklists”</a> and complete the checklists.	Yes ___ No ___
Does the customer want encryption-enabled tape drives? Note: Refer to the Key Management Station guide for information.	Yes ___ No ___
Order the tape drive, cables, and cartridges (see <a href="#">Chapter 5, “Information for Ordering”</a> ).	Yes ___ No ___
Determine the installation schedule: Date: _____ Time: _____	Yes ___ No ___

## ■ Customer Team Member Contact Sheet

Complete the following with information about the customer team members:

**Name:** \_\_\_\_\_  
**Title:** \_\_\_\_\_  
**Telephone Number:** \_\_\_\_\_  
**FAX Number:** \_\_\_\_\_  
**Cell Phone / Pager:** \_\_\_\_\_  
**E-mail Address:** \_\_\_\_\_

**Name:** \_\_\_\_\_  
**Title:** \_\_\_\_\_  
**Telephone Number:** \_\_\_\_\_  
**FAX Number:** \_\_\_\_\_  
**Cell Phone / Pager:** \_\_\_\_\_  
**E-mail Address:** \_\_\_\_\_

**Name:** \_\_\_\_\_  
**Title:** \_\_\_\_\_  
**Telephone Number:** \_\_\_\_\_  
**FAX Number:** \_\_\_\_\_  
**Cell Phone / Pager:** \_\_\_\_\_  
**E-mail Address:** \_\_\_\_\_

**Name:** \_\_\_\_\_  
**Title:** \_\_\_\_\_  
**Telephone Number:** \_\_\_\_\_  
**FAX Number:** \_\_\_\_\_  
**Cell Phone / Pager:** \_\_\_\_\_  
**E-mail Address:** \_\_\_\_\_

## ■ Client Processor Teams

List names and telephone numbers of the following client processor team personnel:

### CPU Hardware Vendor Contacts

Name: \_\_\_\_\_ Vendor: \_\_\_\_\_

Office: \_\_\_\_\_ Fax: \_\_\_\_\_ e-mail: \_\_\_\_\_

Name: \_\_\_\_\_ Vendor: \_\_\_\_\_

Office: \_\_\_\_\_ Fax: \_\_\_\_\_ e-mail: \_\_\_\_\_

Name: \_\_\_\_\_ Vendor: \_\_\_\_\_

Office: \_\_\_\_\_ Fax: \_\_\_\_\_ e-mail: \_\_\_\_\_

### CPU Software Vendor Contacts

Name: \_\_\_\_\_ Vendor: \_\_\_\_\_

Office: \_\_\_\_\_ Fax: \_\_\_\_\_ e-mail: \_\_\_\_\_

Name: \_\_\_\_\_ Vendor: \_\_\_\_\_

Office: \_\_\_\_\_ Fax: \_\_\_\_\_ e-mail: \_\_\_\_\_

Name: \_\_\_\_\_ Vendor: \_\_\_\_\_

Office: \_\_\_\_\_ Fax: \_\_\_\_\_ e-mail: \_\_\_\_\_

## ■ Sun StorageTek Team Member Contact Sheet

Complete the following with information about the team members:

**Name:** \_\_\_\_\_  
**Title:** \_\_\_\_\_  
**Telephone Number:** \_\_\_\_\_  
**FAX Number:** \_\_\_\_\_  
**Cell Phone / Pager:** \_\_\_\_\_  
**E-mail Address:** \_\_\_\_\_

**Name:** \_\_\_\_\_  
**Title:** \_\_\_\_\_  
**Telephone Number:** \_\_\_\_\_  
**FAX Number:** \_\_\_\_\_  
**Cell Phone / Pager:** \_\_\_\_\_  
**E-mail Address:** \_\_\_\_\_

**Name:** \_\_\_\_\_  
**Title:** \_\_\_\_\_  
**Telephone Number:** \_\_\_\_\_  
**FAX Number:** \_\_\_\_\_  
**Cell Phone / Pager:** \_\_\_\_\_  
**E-mail Address:** \_\_\_\_\_

**Name:** \_\_\_\_\_  
**Title:** \_\_\_\_\_  
**Telephone Number:** \_\_\_\_\_  
**FAX Number:** \_\_\_\_\_  
**Cell Phone / Pager:** \_\_\_\_\_  
**E-mail Address:** \_\_\_\_\_

**Note:** Representatives may include: marketing and sales representative, installation coordinator, systems engineers (SEs), and service representatives.

When you are adding new/used T9x40 tape drive models to existing libraries, you must verify that library firmware level and host software release levels support the new drive models.

## ■ Library Firmware

For library configurations, determine the customer's existing library firmware level, and compare it with the currently available library firmware:

Update library firmware as required to support incoming drive models.

## ■ Host Software Configuration

This section lists the host software that uses T9x40 tape drives and provides a place to record the customer's software configuration.

The T9x40 tape drives operate with MVS, UNIX, or Windows NT platforms. Certification with these platforms and host-based applications is an ongoing process. For up-to-date information about platforms and applications:

- Sun personnel should access the storage software area of MySales (<http://mysales.central/public/storage/storage-software.html>).
- Other persons should contact their storage software marketing representative.

## T9x40-Supported Software

Depending upon the host platform and the type of interface, T9x40 tape drives are subject to one the following software application groups:

- Nearline Control Solutions (NCS), which includes:
  - Host Software Component (HSC)  
**Note:** In HSC, implementation of VolSafe requires definition of esoteric names and cartridge tape subpools. Refer to the *VolSafe Feature Software Information Guide*, Release 2.0 PN 316109301.  
[http://www.sun.com/storagetek/tape\\_storage/tape\\_media/volsafe/](http://www.sun.com/storagetek/tape_storage/tape_media/volsafe/)
  - Multiple Virtual Storage/Client System Component (MVS/CSC)
  - LibraryStation

Use [Table 3-1](#) to record the customer's current NCS software configuration against obtained requirements.

- Automated Cartridge System Library Software (ACSL)
 

Use [Table 3-2 on page 3-3](#) to record the customer's current ACSLS software configuration against obtained requirements.

- Removable Media Library Software (RMLS)

Use [Table 3-3 on page 3-3](#) to record the customer's current RMLS/CSC software configuration against obtained requirements.

## Software Configuration Worksheets

Record the customer's NCS software configuration in [Table 3-1](#).

**Table 3-1. NCS Software Configuration Worksheet**

Item	Processor 1		Processor 2	
	Existing	Required	Existing	Required
Operating system and version or release level				
DFP maintenance level				
Backup/recovery software				
Archival/migration software				
Additional information				

Record the customer's ACSLS software configuration in [Table 3-2](#).

**Table 3-2. ACSLS Software Configuration Worksheet**

Item	Processor 1		Processor 2	
	Existing	Required	Existing	Required
Operating system vendor				
Driver software				
Backup/restore software				
Archival/migration software				
Performance monitoring software				
Data compression software				
Additional information				

Record the customer's RMLS software configuration in [Table 3-3](#).

**Table 3-3. RMLS Software Configuration Worksheet**

Item	Processor 1		Processor 2	
	Existing	Required	Existing	Required
Operating system vendor				
Driver software				
Backup/restore software				
Archival/migration software				
Performance monitoring software				
Data compression software				
Additional information				

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# Preinstallation Checklists

# 4

This chapter provides checklists that the system assurance team should complete before the delivery and installation of the equipment.

## ■ Predelivery Checklist

Table 4-1 lists issues that should be addressed and resolved before equipment delivery. Circle “Yes” or “No” for each item. For unresolved issues, assign an action and a due date to a system assurance team member.

**Table 4-1. Predelivery Checklist**

Item Description	Yes/No	Action Required/Due Date/ Person Responsible
<i>Site Preparation</i>		
Floor plans completed	Yes/No	
Clearance adequate	Yes/No	
Cooling adequate	Yes/No	
Cleanliness acceptable <sup>1</sup>	Yes/No	
Power requirements met	Yes/No	
Cable lengths determined	Yes/No	
Cable routing established	Yes/No	
Future expansion considered	Yes/No	
Dock facilities scheduled	Yes/No	
<i>Hardware Procurement</i>		
Options or features ordered	Yes/No	
Power cables ordered	Yes/No	
Interface cables ordered	Yes/No	
Interface adapters ordered	Yes/No	
Tapes and labels ordered	Yes/No	
1. See the <i>Sun Microsystems Data Center Site Planning Guide</i> (p/n 805-5863-13) and “Airborne Contamination” on page A-4 for additional information.		

**Table 4-1. Predelivery Checklist (Continued)**

<b>Item Description</b>	<b>Yes/No</b>	<b>Action Required/Due Date/ Person Responsible</b>
<i>Software Procurement</i>		
Software prerequisites met	Yes/No	
<i>Software Installation</i>		
Scheduled	Yes/No	
Completed	Yes/No	
<i>JCL Changes</i>		
Scheduled	Yes/No	
Completed	Yes/No	
<i>I/O Generation Changes</i>		
Scheduled	Yes/No	
Completed	Yes/No	
<i>Mixed-media Subpools</i>		
Scheduled	Yes/No	
Completed	Yes/No	
<i>Hardware Installation</i>		
Delivery schedule completed	Yes/No	
Dock hours scheduled	Yes/No	
Pre-staging area set	Yes/No	
Installation team identified	Yes/No	
Site access arranged	Yes/No	
Installation hours defined	Yes/No	
1. See the <i>Sun Microsystems Data Center Site Planning Guide</i> (p/n 805-5863-13) and “Airborne Contamination” on page A-4 for additional information.		

## ■ Delivery and Handling Information

Table 4-2 provides a place to record delivery information.

**Table 4-2. Delivery and Handling Information**

Yes	No	Considerations/Conditions
<input type="checkbox"/>	<input type="checkbox"/>	Is a receiving dock available? If yes, what is the maximum truck length allowed? 12 m / 40 ft____ 14 m / 45 ft____ 15 m / 48 ft____ other____ If yes, what is the maximum truck height? _____ If yes, what is the dock height in inches? _____
<input type="checkbox"/>	<input type="checkbox"/>	Are there any physical impediments to dock use? If yes, list here: _____ _____
<input type="checkbox"/>	<input type="checkbox"/>	Are there any street or alley limitations to dock use? If yes, list here: _____ _____
<input type="checkbox"/>	<input type="checkbox"/>	Are there any days or times when dock hours are controlled or the dock is unavailable? If yes, list here: _____ _____
<input type="checkbox"/>	<input type="checkbox"/>	Will any stairs need to be negotiated? If yes, list here: _____ _____
<input type="checkbox"/>	<input type="checkbox"/>	Will an elevator be used? What are the approved hours for elevator use? _____
<input type="checkbox"/>	<input type="checkbox"/>	Is protective floor covering required? If yes, who will provide the necessary materials and labor? _____ _____
<input type="checkbox"/>	<input type="checkbox"/>	Are transport aids available (cart, hand truck, dolly)? _____ _____

## ■ Access and Administrative Issues

The worksheet in [Table 4-3](#) identifies access restrictions to the computer room and addresses other administrative issues.

**Table 4-3. Access and Administrative Issues**

Yes	No	Considerations/Conditions
<input type="checkbox"/>	<input type="checkbox"/>	Are there physical or statutory limitations of access to the area in which this customer delivery site is located? If yes, list the limited hours here: <hr/> <hr/>
<input type="checkbox"/>	<input type="checkbox"/>	Are there local codes that specify equipment clearances? If yes, list here: <hr/> <hr/>
<input type="checkbox"/>	<input type="checkbox"/>	What ID badges are required to gain access to the customer facility if an outside installer is used? List a point of contact to acquire the required ID badges or to get on appropriate access lists. <hr/> <hr/>
<input type="checkbox"/>	<input type="checkbox"/>	Are there any union or local regulations that would prevent an outside installer from performing any activities? If yes, explain here: <hr/> <hr/>
<input type="checkbox"/>	<input type="checkbox"/>	Does the carrier need to belong to a union? If yes, which union? <hr/> <hr/>
<input type="checkbox"/>	<input type="checkbox"/>	Is there a secure area where test equipment, spare parts and documentation can be stored? If yes, note the location. <hr/> <hr/>

# Information for Ordering

# 5

Use this chapter to help order tape drives, cables, and media for the T9x40 tape drive. If you have answers to the following questions, the task of locating the pertinent part number becomes much easier:

What tape drive model is required?	<input type="checkbox"/> T9840D <input type="checkbox"/> T9840C (used equipment only) <input type="checkbox"/> T9840B (used equipment only) <input type="checkbox"/> T9840A (used equipment only) <input type="checkbox"/> T9940B (used equipment only) <input type="checkbox"/> T9940A (used equipment only)
What host interface is used?	<input type="checkbox"/> FICON <input type="checkbox"/> ESCON (used equipment only) <input type="checkbox"/> Fibre Channel <input type="checkbox"/> SCSI (used equipment only)
Number of FICON or Fibre Channel interface ports <sup>1</sup>	<input type="checkbox"/> 1 port <input type="checkbox"/> 2 port
Type of interface transceiver	<input type="checkbox"/> Long wavelength <sup>2</sup> <input type="checkbox"/> Short wavelength <sup>3</sup>
Will the drive be connected to a library? If yes, which model? <sup>4</sup>	<input type="checkbox"/> SL8500 <input type="checkbox"/> SL3000 <input type="checkbox"/> L180/L700e/L1400M <input type="checkbox"/> 9310/L5500

1. ESCON and SCSI drives have one port only.
2. Long wavelength ports require single-mode (9 micron fiber) cables.
3. Short wavelength ports require multimode cables.
4. Older model libraries are not listed.

The part numbers are composed of many of the elements listed in the table above. For example, the part number 9840D-FISPSW-85Z is comprised of:

- **9840D** that indicates the tape drive model number
- **FI** indicates a FICON interface
- **SPSW** indicates the drive has a single port (SP) that is short wavelength (SW)
- **85** indicates the library model (SL8500)
- **Z** indicates that the drive complies with ROHS requirements

**Note:** The SL8500 number includes the port(s) and the type of transceiver (the example was SPSW). Numbers for 9310, L180, L700, and L1400 libraries do not include

such a designation. You must order a Conversion Bill to obtain the appropriate number and type of transceiver.

Use these tables to determine the part numbers

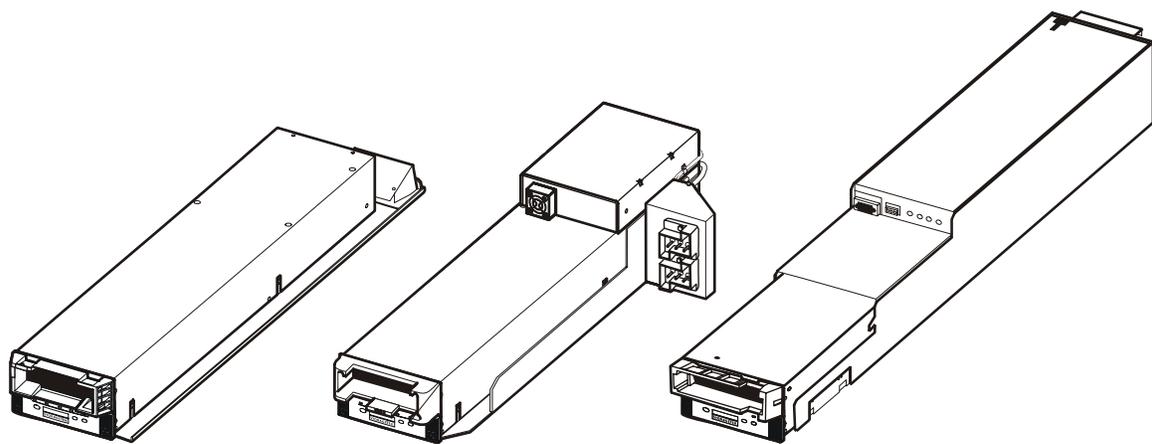
- “Tape Drive Order Numbers for Libraries” on page 5-3
- “Desktop and Rack Mount Tape Drive” on page 5-12
- “Cable Order Numbers” on page 5-17
- “Conversion Bills/Kits” on page 5-25
- “Ordering Cartridges and Labels” on page 5-29

Use conversion bills to obtain the necessary parts to:

- Add a second drive to a rack chassis
- Add a second interface port to drive models that use SFP modules
- Change the type of SFP module in the drive
- Transfer a drive from one library model to a different library model

**Note:** The following figure shows three different drive trays. If you purchased drives for a 9310 library (the image on the left) but you upgrade to an SL8500 library, use a conversion bill to modify your existing drive to work in the new library (the image on the right).

**Figure 5-1. Library Attached Tape Drive**



Tray Assembly for 9310/9360/9740/L5510

Tray Assembly for L180/ L700/L1400

Tray Assembly for SL8500

C53966

## ■ Tape Drive Order Numbers for Libraries

Use this section to determine the order numbers for the purchase of an initial quantity of drives with a new library, to increase the number of drives in your library, or to replace existing drives with newer generation drives:

- [“T9840 Library Attached Tape Drives”](#)
- [“T9940 Library Attached Tape Drives”](#) on page 5-10

**Table 5-1. Library Configuration Summary**

Library	Description
L180	Holds from 84 to 174 cartridges and up to six T9x40 tape drives
L700	Holds from 216 to 678 cartridges and up to 12 T9x40 tape drives
L700e	Holds from 300 to 1,344 cartridges and up to 24 T9x40 tape drives when two libraries are connected by a pass-thru port (PTP)
L1400M	Holds from 300 to 1,344 cartridges and up to 24 T9x40 tape drives
SL3000	Holds from 200 to 4,500 cartridges and up to 56 T9840C/D tape drives
SL8500	A single SL8500 holds up to 10,000 cartridges and up to 64 T9x40 tape drives
9310 <sup>1</sup>	A single 9310 holds up to 6,000 cartridges with up to 80 T9x40 tape drives on four 20-drive walls.

1. This library requires the use of an external drive cabinet on each drive wall. Tape drives are installed in the drive cabinet. There are two cabinet models: 9741001 and 9741E01.

### T9840 Library Attached Tape Drives

- [Table 5-2, “T9840D Library Configuration \(New\) Marketing PNs”](#) on page 5-4
- [Table 5-3, “T9840C \(Used\) ROHS Compliant Marketing PNs”](#) on page 5-6
- [Table 5-4, “T9840C \(Used\) Non-ROHS Marketing PNs”](#) on page 5-7
- [Table 5-5, “T9840B \(Used\) Non-ROHS Marketing PNs”](#) on page 5-8
- [Table 5-6, “T9840A \(Used\) Non-ROHS Marketing PNs”](#) on page 5-9

**Table 5-2. T9840D Library Configuration (New) Marketing PNs**

Description	Sun Marketing PN
<b>9310 Library</b>	
T9840D, FICON, 9310 <sup>1</sup> , 9741 <sup>2</sup> -9741E	9840D-FI-9310Z
Single port long wave	X984/T10K-2GB-LWZ
Single port short wave	X984/T10K-2GB-SWZ
Dual port long wave	(2x) X984/T10K-2GB-LWZ
Dual port mixed wave	X984/T10K-2GB-LWZ and X984/T10K-2GB-SWZ
Dual port short wave	(2x) X984/T10K-2GB-SWZ
T9840D, Fibre Channel, 9310 <sup>1</sup> , 9741 <sup>2</sup> -9741E	9840D-FC-9310Z
<b>Note:</b> You must also order an SFP conversion kit. See the X984/T10K numbers listed for FICON drive above.	
<b>L180/700e/1400M Library</b>	
T9840D, FICON, L180/L700/L1400 <sup>1</sup>	9840D-FI-L1400Z
T9840D, Fibre Channel, L700/L1400	9840D-FC-L1400Z
<b>Note:</b> You must also order an SFP conversion kit for FICON and Fibre Channel drives. See the X984/T10K numbers listed in the 9310 section of the table for the T9840D, FICON drive.	
<b>S13000 Library</b>	
T9840D FICON	
1PLW (single-port long-wave <sup>4</sup> ), SL3000	9840D-FI-S30-1PLZ
1PSW (single-port short-wave <sup>3</sup> ), SL3000	9840D-FI-S30-1PSZ
2PLW (dual-port long-wave <sup>4</sup> ), SL3000	9840D-FI-S30-2PLZ
2PSW (dual-port short-wave <sup>3</sup> ), SL3000	9840D-FI-S30-2PSZ
2PMW (one short wave and one long wave <sup>3,4</sup> )	9840D-FI-S30-2PMZ
T9840D, Fibre Channel	
1PLW (single-port long-wave <sup>4</sup> ), SL3000	9840D-FC-S30-1PLZ
1PSW (single-port short-wave <sup>3</sup> ), SL3000	9840D-FC-S30-1PSZ
<ol style="list-style-type: none"> <li>Interface transceivers (SFP modules) do not ship with the tape drive for the identified library. A complete order consists of a tape drive number plus a port conversion kit (a number beginning with an X).</li> <li>9741 cabinet with louvered rear door requires EMI pad (FB 101201) to operate FC/FICON drives.</li> <li>Short wave (SW) ports require 50/125 micron cables.</li> <li>Long wave (LW) ports require 9/125 micron cables.</li> </ol>	

**Table 5-2. T9840D Library Configuration (New) Marketing PNs (Continued)**

	Description	Sun Marketing PN
<b>SL3000 Library (continued)</b>		
	2PLW (dual-port long-wave <sup>4</sup> ), SL3000	9840D-FC-S30-2PLZ
	2PSW (dual-port short-wave <sup>3</sup> ), SL3000	9840D-FC-S30-2PSZ
	2PMW (one long-wave and one short-wave <sup>3,4</sup> ), SL3000	9840D-FC-S30-2PMZ
<b>SL8500 Library</b>		
T9840D, FICON		
	1PLW (single-port long-wave <sup>4</sup> ), SL8500	9840D-FISPLW-85Z
	1PSW (single-port short-wave <sup>3</sup> ), SL8500	9840D-FISPSW-85Z
	2PLW (dual-port long-wave <sup>4</sup> ), SL8500	9840D-FIDPLW-85Z
	2PSW (dual-port short-wave <sup>3</sup> ), SL8500	9840D-FIDPSW-85Z
	2PMW (one long-wave and one short-wave <sup>3,4</sup> ), SL8500	9840D-FIDPMW-85Z
T9840D, Fibre Channel		
	1PLW (single-port long-wave <sup>4</sup> )	9840D-FCSPWL-85Z
	1PSW (single-port short-wave <sup>3</sup> )	9840D-FCSPSW-85Z
	2PLW (dual-port long-wave <sup>4</sup> )	9840D-FCDPLW-85Z
	2PSW (dual-port short-wave <sup>3</sup> )	9840D-FCDPSW-85Z
	2PMW (one long-wave and one short-wave <sup>3,4</sup> )	9840D-FCDPMW-85Z
<ol style="list-style-type: none"> <li>1. Interface transceivers (SFP modules) do not ship with the tape drive for the identified library. A complete order consists of a tape drive number plus a port conversion kit (a number beginning with an X).</li> <li>2. 9741 cabinet with louvered rear door requires EMI pad (FB 101201) to operate FC/FICON drives.</li> <li>3. Short wave (SW) ports require 50/125 micron cables.</li> <li>4. Long wave (LW) ports require 9/125 micron cables.</li> </ol>		

**Table 5-3. T9840C (Used) ROHS Compliant Marketing PNs**

Description	Sun Marketing PN
<b>Library Attached:</b>	
ESCON, 9310/9740/L550, 9741 <sup>1</sup> -9741E drive cabinets	Y9840C-ES-9310Z
ESCON, L180/L700/L1400	Y9840C-ES-L700Z
ESCON, SL8500	Y9840C-ES-SL85Z
Fibre Channel, 2Gb, 9310/9740/L550, 9741 <sup>1</sup> -9741E drive cabinets	Y9840C-FC-9310Z
Fibre Channel, 2Gb, L180/L700/L1400	Y9840C-FC-L700Z
Fibre Channel, 2Gb, SL8500	Y9840C-FC-SL85Z
FICON, 9310/9740/L550, 9741 <sup>1</sup> -9741E drive cabinets	Y9840C-FI-9310Z
FICON, L180/L700/L1400	Y9840C-FI-L700Z
FICON, SL8500, SPSW (single-port short-wave <sup>2</sup> )	Y9840C-FI-S85-1PSZ
FICON, SL8500, DPSW (dual-port short-wave <sup>2</sup> )	Y9840C-FI-S85-2PSZ
FICON, SL8500, SPLW (single-port long-wave <sup>3</sup> )	Y9840C-FI-S85-1PLZ
FICON, SL8500, DPLW (dual-port long-wave <sup>3</sup> )	Y9840C-FI-S85-2PLZ
FICON, SL8500, DPMW (dual-port mixed-wave <sup>2,3</sup> )	Y9840C-FI-S85-2PMZ
<ol style="list-style-type: none"> <li>1. 9741 cabinet with louvered rear door requires EMI pad (FB 101201) to operate FC/FICON drives.</li> <li>2. Short wave ports require 50/125 micron cables.</li> <li>3. Long wave ports require 9/125 micron cables.</li> </ol>	

**Table 5-4. T9840C (Used) Non-ROHS Marketing PNs**

Description	Sun Marketing PN
<b>Library Attached:</b>	
ESCON, 9310/9740/L550, 9741 <sup>1</sup> -9741E drive cabinets	Y9840C-ES-9310
ESCON, L180/L700/L1400	Y9840C-ES-L700
ESCON, SL8500	Y9840C-ES-SL85
Fibre Channel, 2Gb, 9310/9740/L550, 9741 <sup>1</sup> -9741E drive cabinets	Y9840C-FC-9310
Fibre Channel, 2Gb, L180/L700/L1400	Y9840C-FC-L700
Fibre Channel, 2Gb, SL8500	Y9840C-FC-SL85
FICON, 9310/9740/L550, 9741 <sup>1</sup> -9741E drive cabinets	Y9840C-FI-9310
FICON, L180/L700/L1400	Y9840C-FI-L700
FICON, SL8500, SPSW (single-port short-wave <sup>2</sup> )	Y9840C-FI-S85-1PS
FICON, SL8500, DPSW (dual-port short-wave <sup>2</sup> )	Y9840C-FI-S85-2PS
FICON, SL8500, SPLW (single-port long-wave <sup>3</sup> )	Y9840C-FI-S85-1PL
FICON, SL8500, DPLW (dual-port long-wave <sup>3</sup> )	Y9840C-FI-S85-2PL
FICON, SL8500, DPMW (dual-port mixed-wave <sup>2,3</sup> )	Y9840C-FI-S85-2PM
<ol style="list-style-type: none"> <li data-bbox="212 905 1411 940">1. 9741 cabinet with louvered rear door requires EMI pad (FB 101201) to operate FC/FICON drives.</li> <li data-bbox="212 940 1411 976">2. Short wave ports require 50/125 micron cables.</li> <li data-bbox="212 976 1411 1012">3. Long wave ports require 9/125 micron cables.</li> </ol>	

**Table 5-5. T9840B (Used) Non-ROHS Marketing PNs**

Description	Sun Marketing PN
<b>Library Attached:</b>	
ESCON, 9310/9740/L550, 9741 <sup>1</sup> -9741E drive cabinets	Y9840B-ES-9741X
ESCON, L180/L700/L1400	Y9840B-ES-L700
ESCON, SL8500	Y9840B-ES-SL8500
Fibre Channel, 2Gb, 9710	Y9840B-FC-9710
Fibre Channel, 2Gb, 9310/9740/L550, 9741 <sup>1</sup> -9741E drive cabinets	Y9840B-FC-9741X
Fibre Channel, 2Gb, L180/L700/L1400	Y9840B-FC-L700
Fibre Channel, 2Gb, SL8500	Y9840B-FC-SL8500
FICON, 9310/9740/L550, 9741 <sup>1</sup> -9741E drive cabinets	Y9840B-FI-9741X
FICON, L180/L700/L1400	Y9840B-FI-L700
FICON, SL8500, SPSW (single-port short-wave <sup>2</sup> )	Y9840B-FI-S85-1PS
FICON, SL8500, DPSW (dual-port short-wave <sup>2</sup> )	Y9840B-FI-S85-2PS
FICON, SL8500, SPLW (single-port long-wave <sup>3</sup> )	Y9840B-FI-S85-1PL
FICON, SL8500, DPLW (dual-port long-wave <sup>3</sup> )	Y9840B-FI-S85-2PL
FICON, SL8500, DPMW (dual-port mixed-wave <sup>2,3</sup> )	Y9840B-FI-S85-2PM
SCSI, 9710	Y9840B-SC-9710
SCSI, 9310/9740	Y9840B-SC-9740
SCSI, 9741E drive cabinet	Y9840B-SC-9741E
SCSI, L180/L700/L1400.	Y9840B-SC-L700
1. 9741 cabinet with louvered rear door requires EMI pad (FB 101201) to operate FC/FICON drives.	
2. Short wave ports require 50/125 micron cables.	
3. Long wave ports require 9/125 micron cables.	

**Table 5-6. T9840A (Used) Non-ROHS Marketing PNs**

Description	Sun Marketing PN
<b>Library Attached:</b>	
ESCON, 9310/9740	Y9840A-ES-9310
ESCON, 9310/9740/9360/L5500 (9741E attach)	Y9840A-ES-LGLIB
ESCON, L180/L700/L1400	Y9840A-ES-L700
ESCON, SL8500	Y9840A-ES-SL8500
Fibre Channel, 1Gb, 9710	Y9840A-FC-9710
Fibre Channel, 1Gb, 9738	Y9840A-FC-9738
Fibre Channel, 1Gb, 9310/9740	Y9840A-FC-9740
Fibre Channel, 9310/9740/9360/L5500, 1Gb, UNISYS, 9741E	Y9840A-FC-LGLIB-UN
Fibre Channel, 1Gb, L180 <sup>1</sup> /L700/L1400	Y9840A-FC-L700
Fibre Channel, L180 <sup>1</sup> /L700/L1400, 1Gb, UNISYS	Y9840A-FC-MDLIB-UN
Fibre Channel, 1Gb, SL8500	Y9840A-FC-SL8500
SCSI, 9710	Y9840A-SC-9710
SCSI, 9710, HP	Y9840A-SC-9710-HP
SCSI, 9738	Y9840A-SC-9738
SCSI, 9310/9740	Y9840A-SC-9740
SCSI, 9310/9740/9360/L5500 (9741E attach)	Y9840A-SC-LGLIB
SCSI, L180/L700/L1400	Y9840A-SC-L700
SCSI, L700, HP	Y9840A-SC-L700-HP
SCSI, L700, Tributary Systems, Inc.	Y9840A-SC-L700-TSI
<p>1. Certain L180 Tape Libraries require a replacement internal door panel if the drives are fibre channel. The serial numbers of the libraries are 0-18, 300-420, and 5000-5020. To obtain the replacement internal door panel, order Field Bill 2296.</p>	

## T9940 Library Attached Tape Drives

- [Table 5-7, “T9940B \(Used\) ROHS Compliant Marketing PNs” on page 5-10](#)
- [Table 5-8, “T9940B \(Used\) Non-ROHS Marketing PNs” on page 5-11](#)
- [Table 5-9, “T9940A \(Used\) Non-ROHS Marketing PNs” on page 5-11](#)

**Table 5-7. T9940B (Used) ROHS Compliant Marketing PNs**

Description	Sun Marketing PN
<b>Library Attached:</b>	
ESCON, 9310/9740 <sup>3</sup> /L5500, 9741-9741E drive cabinets <sup>5</sup>	Y9940B-ES-9310Z
ESCON, L180 <sup>4</sup> /L700/L1400 <sup>5</sup>	Y9940B-ES-L700Z
ESCON, SL8500	Y9940B-ES-SL85Z
Fibre Channel, 2Gb, 9310/9740 <sup>3</sup> /L5500, 9741-9741E drive cabinets	Y9940B-FC-9310Z
Fibre Channel, 2Gb, L180 <sup>4</sup> /L700/L1400	Y9940B-FC-L700Z
Fibre Channel, 2Gb, SL8500	Y9940B-FC-SL85Z
FICON, 9310/9740 <sup>3</sup> /L5500, 9741-9741E drive cabinets <sup>5</sup>	Y9940B-FI-9310Z
Single port long wave	Y9x40-FI-1SFP-LWZ
Single port short wave	Y9x40-FI-1SFP-SWZ
Dual port long wave	Y9x40-FI-2SFP-LWZ
Dual port mixed	Y9x40-FI-2SFP-MWZ
Dual port short wave	Y9x40-FI-2SFP-SWZ
FICON, L180 <sup>4</sup> /L700/L1400 <sup>5</sup>	Y9940B-FI-L700Z
FICON, SL8500, SPSW (single-port short-wave <sup>1</sup> )	Y9940B-FI-1PS-S85Z
FICON, SL8500, DPSW (dual-port short-wave <sup>1</sup> )	Y9940B-FI-2PS-S85Z
FICON, SL8500, SPLW (single-port long-wave <sup>2</sup> )	Y9940B-FI-1PL-S85Z
FICON, SL8500, DPLW (dual-port long-wave <sup>2</sup> )	Y9940B-FI-2PL-S85Z
FICON, SL8500, DPMW (dual-port mixed-wave <sup>1,2</sup> )	Y9940B-FI-2PM-S85Z
<ol style="list-style-type: none"> <li>1. Short wave ports require 50/125 micron fiber optic cables.</li> <li>2. Long wave ports require 9/125 micron fiber optic cables.</li> <li>3. 9740 library requires serial (RS-423/RS-232) control path to operate T9940B drives.</li> <li>4. L180 library drive bay requires an expanded rear door to accept T9940B drives.</li> <li>5. You must also order an SFP kit - see the Y9x40 numbers listed under FICON for the 9310.</li> </ol>	

**Table 5-8. T9940B (Used) Non-ROHS Marketing PNs**

Description	Sun Marketing PN
<b>Library Attached:</b>	
ESCON, 9310/9740 <sup>3</sup> /L5500, 9741-9741E drive cabinets	Y9940B-ES-9310
ESCON, L180 <sup>4</sup> /L700/L1400	Y9940B-ES-L700
ESCON, SL8500	Y9940B-ES-SL85
Fibre Channel, 2Gb, 9310/9740 <sup>3</sup> /L5500, 9741-9741E drive cabinets	Y9940B-FC-9310
Fibre Channel, 2Gb, L180 <sup>4</sup> /L700/L1400	Y9940B-FC-L700
Fibre Channel, 2Gb, SL8500	Y9940B-FC-SL85
FICON, 9310/9740 <sup>3</sup> /L5500 <sup>5</sup> , 9741-9741E drive cabinets	Y9940B-FI-9310
FICON, L180 <sup>4</sup> /L700/L1400 <sup>5</sup>	Y9940B-FI-L700
FICON, SL8500, SPSW (single-port short-wave <sup>1</sup> )	Y9940B-FI-1PS-S85
FICON, SL8500, DPSW (dual-port short-wave <sup>1</sup> )	Y9940B-FI-2PS-S85
FICON, SL8500, SPLW (single-port long-wave <sup>2</sup> )	Y9940B-FI-1PL-S85
FICON, SL8500, DPLW (dual-port long-wave <sup>2</sup> )	Y9940B-FI-2PL-S85
FICON, SL8500, DPMW (dual-port mixed-wave <sup>1,2</sup> )	Y9940B-FI-2PM-S85
<ol style="list-style-type: none"> <li>1. Short wave ports require 50/125 micron fiber optic cables.</li> <li>2. Long wave ports require 9/125 micron fiber optic cables.</li> <li>3. 9740 library requires serial (RS-423/RS-232) control path to operate T9940B drives.</li> <li>4. L180 library drive bay requires an expanded rear door to accept T9940B drives.</li> <li>5. You must also order an SFP kit. See the Y9x40 numbers listed in <a href="#">Table 5-7 on page 5-10</a>.</li> </ol>	

**Table 5-9. T9940A (Used) Non-ROHS Marketing PNs**

Description	Sun Marketing PN
<b>Library Attached:</b>	
ESCON, 9310, 9741 drive cabinet	Y9940A-ES-9741
ESCON, 9310, 9741E drive cabinet	Y9940A-ES-9741E
Fibre Channel, 1Gb, 9741 drive cabinet	Y9940A-FC-9741
Fibre Channel, 1Gb, 9741E drive cabinet	Y9940A-FC-9741E
Fibre Channel, 1Gb, L700/L1400 only	Y9940A-FC-L700
SCSI, 9310, 9741 drive cabinet	Y9940A-SC-9741
SCSI, 9310, 9741E drive cabinet	Y9940A-SC-9741E
SCSI, L700/L1400 only	Y9940A-SC-L700

## ■ Desktop and Rack Mount Tape Drive

Use this section to determine the order numbers for the purchase of T9840 or T9940 desktop and rack mount drives:

- [“T9840 Rack Mount and Desktop Drives”](#)
- [“T9940 Rack Mount Drives”](#) on page 5-15
- [“Rack Cabinet Order Numbers”](#) on page 5-16

### T9840 Rack Mount and Desktop Drives

Table 5-10. T9840 Non-library Drives (Sheet 1 of 3)

Description	Marketing Part Number
<b>Rack Mount: T9840D (New)</b>	
FICON, single drive, DPLW (dual-port long-wave <sup>1</sup> )	9840D-FIDPLW1RKZ
FICON, dual drive, DPLW (dual-port long-wave <sup>1</sup> )	9840D-FIDPLW2RKZ
FICON, single drive, DPSW (dual-port short-wave <sup>2</sup> )	9840D-FIDPSW1RKZ
FICON, dual drive, DPSW (dual-port short-wave <sup>2</sup> )	9840D-FIDPSW2RKZ
Fibre Channel, single drive, DPLW (dual-port long-wave <sup>1</sup> )	9840D-FCDPLW1RKZ
Fibre Channel, dual drive, DPLW (dual-port long-wave <sup>1</sup> )	9840D-FCDPLW2RKZ
Fibre Channel, single drive, DPSW (dual-port short-wave <sup>2</sup> )	9840D-FCDPSW1RKZ
Fibre Channel, dual drive, DPSW (dual-port short-wave <sup>2</sup> )	9840D-FCDPSW2RKZ
<b>Rack Mount: T9840C (Used) ROHS Compliant</b>	
ESCON, single drive	Y9840C-ES-RK1Z
ESCON, dual drive	Y9840C-ES-RK2Z
Fibre Channel, 2Gb, single drive	Y9840C-FC-RK1Z
Fibre Channel, 2Gb, dual drive	Y9840C-FC-RK2Z
FICON, single drive, DPLW (dual-port long-wave <sup>1</sup> )	Y9840C-FI-RK1-2PLZ
FICON, dual drive, DPLW (dual-port long-wave <sup>1</sup> )	Y9840C-FI-RK2-2PLZ
FICON, single drive, DPSW (dual-port short-wave <sup>2</sup> )	Y9840C-FI-RK1-2PSZ
FICON, dual drive, DPSW (dual-port short-wave <sup>2</sup> )	Y9840C-FI-RK2-2PSZ
<ol style="list-style-type: none"> <li>1. Long wave ports require 9/125 micron fiber optic cables.</li> <li>2. Short wave ports require 50/125 micron fiber optic cables.</li> </ol>	

**Table 5-10. T9840 Non-library Drives (Sheet 2 of 3)**

Description	Marketing Part Number
<b>Rack Mount: T9840C (Used) Non-ROHS</b>	
ESCON, single drive	Y9840C-ES-RK1
ESCON, dual drive	Y9840C-ES-RK2
Fibre Channel, 2Gb, single drive	Y9840C-FC-RK1
Fibre Channel, 2Gb, dual drive	Y9840C-FC-RK2
FICON, single drive, DPSW (dual-port short-wave <sup>2</sup> )	Y9840C-FI-RK1-2PS
FICON, dual drive, DPSW (dual-port short-wave <sup>2</sup> )	Y9840C-FI-RK2-2PS
FICON, single drive, DPLW (dual-port long-wave <sup>1</sup> )	Y9840C-FI-RK1-2PL
FICON, dual drive, DPLW (dual-port long-wave <sup>1</sup> )	Y9840C-FI-RK2-2PL
<b>Desktop: T9840B (Used) Non-ROHS</b>	
Fibre Channel, 2Gb	Y9840B-FC-DESK
SCSI	Y9840B-SC-DESK
<b>Rack Mount: T9840B (Used) Non-ROHS</b>	
ESCON, single drive	Y9840B-ES-RK-1DR
ESCON, dual drive	Y9840B-ES-RK-2DR
Fibre Channel, 2Gb, single drive	Y9840B-FC-RK-1DR
Fibre Channel, 2Gb, dual drive	Y9840B-FC-RK-2DR
SCSI, single drive	Y9840B-SC-RK-1DR
SCSI, dual drive	Y9840B-SC-RK-2DR
<b>Desktop: T9840A (Used) Non-ROHS</b>	
Fibre Channel, 1Gb	Y9840A-FC-DESK
SCSI	Y9840A-SC-DESK
Cartridge Scratch Loader, ESCON	Y9840A-ES-DESK-CSL
Cartridge Scratch Loader, Fibre Channel, 1Gb	Y9840A-FC-DESK-CSL
Cartridge Scratch Loader, SCSI	Y9840A-SC-DESK-CSL
<b>Rack Mount: T9840A (Used) Non-ROHS</b>	
ESCON, single drive	Y9840A-ES-RK-1DR
ESCON, dual drive	Y9840A-ES-RK-2DR
Fibre Channel, 1Gb, single drive	Y9840A-FC-RK-1DR
Fibre Channel, 1Gb, dual drive	Y9840A-FC-RK-2DR
Fibre Channel, 1Gb, single drive, UNISYS	Y9840A-FC-RK-1DR-UN
1. Long wave ports require 9/125 micron fiber optic cables.	
2. Short wave ports require 50/125 micron fiber optic cables.	

**Table 5-10. T9840 Non-library Drives (Sheet 3 of 3)**

Description	Marketing Part Number
<b>Rack Mount: T9840A (Used) Non-ROHS - Continued</b>	
Fibre Channel, 1Gb, dual drive, UNISYS	Y9840A-FC-RK-2DR-UN
SCSI, single drive	Y9840A-SC-RK-1DR
SCSI, dual drive	Y9840A-SC-RK-2DR
Cartridge Scratch Loader, ESCON	Y9840A-ES-RK-CSL
Cartridge Scratch Loader, Fibre Channel, 1Gb	Y9840A-FC-RK-CSL
Cartridge Scratch Loader, SCSI	Y9840A-SC-RK-CSL
<ol style="list-style-type: none"> <li>1. Long wave ports require 9/125 micron fiber optic cables.</li> <li>2. Short wave ports require 50/125 micron fiber optic cables.</li> </ol>	

## T9940 Rack Mount Drives

Table 5-11. T9940 Non-library Drives

Description	Marketing Part Number
<b>Rack Mount: T9940B (Used) ROHS Compliant</b>	
Fibre Channel, 2Gb, dual drive, shipboard ruggedized	Y9940B-FC-RK-SHZ
FICON, dual drive, DPSW (dual-port, short-wave <sup>1</sup> ), ruggedized	Y9940B-FI-R-2PS-SZ
FICON, dual drive, DPLW (dual-port, long-wave <sup>2</sup> ), ruggedized	Y9940B-FI-R-2PL-SZ
<b>Rack Mount: T9940B (Used) Non-ROHS</b>	
Fibre Channel, 2Gb, dual drive, shipboard ruggedized	Y9940B-FC-RK-SH
FICON, dual drive, DPSW (dual-port, short-wave <sup>1</sup> ), ruggedized	Y9940B-FI-R-2PS-SH
FICON, dual drive, DPLW (dual-port, long-wave <sup>2</sup> ), ruggedized	Y9940B-FI-R-2PL-SH
<b>Rack Mount: T9940A (Used) Non-ROHS</b>	
ESCON, dual drive, shipboard ruggedized	Y9940A-ES-RK-SH
Fibre Channel, 1Gb, dual drive, shipboard ruggedized	Y9940A-FC-RK-SH
SCSI, dual drive, shipboard ruggedized	Y9940A-SC-RK-SH
<ol style="list-style-type: none"> <li>1. Short wave ports require 50/125 micron fiber optic cables.</li> <li>2. Long wave ports require 9/125 micron fiber optic cables.</li> </ol>	

## Rack Cabinet Order Numbers

You can use either the ROHS-compliant 42U (CBNT42U) basic 19-inch rack cabinet or the older non-ROHS 35U rack cabinet (StorageTek RACK001) to house rack-mount trays for all generations of T9x40 drives.

The ROHS-compliant 42U rack cabinet ships with two built-in power strips, two North American compatible power cords, and two European compatible power cords.

If you are installing more than four drive trays into the RACK001 (35U cabinet), it is required to have a second power strip and a second external AC power cord compatible to the site AC power source. To add a second power strip to a previously installed older 35U cabinet, use the second power strip upgrade conversion bill, and include an external AC power cord, compatible to the site AC power source.

**Note:** See [“Power Cords” on page 1-9](#) for a description of the available power cords.

Use the following order worksheet to record rack cabinet requirements:

	Description	Sun Marketing PN <sup>1,2</sup>	Qty
<input type="checkbox"/>	CBNT42U basic 19-inch rack cabinet <sup>5</sup>	SL-RACK-42-Z YSL-RACK-42-Z	_____
<input type="checkbox"/>	StorageTek RACK001 (19-inch cabinet), 1 PDU	YSL-RACK-35	_____
<input type="checkbox"/>	StorageTek RACK001 (19-inch cabinet), 2 PDUs	YSL-RACK-35-2PDU	_____
<input type="checkbox"/>	Second power strip upgrade conversion bill	YXSL-RACK-2STRIP	_____
<input type="checkbox"/>	CORDSET,14,3,N AMER,F/IEC320 (120 VAC, 10 A)	PWRCORD10187048-Z <sup>3</sup>	_____
<input type="checkbox"/>	CORD,3,PWR,F,IEC320,HAR,NOPLG (250 VAC, 10 A)	PWRCORD10187047-Z <sup>3,4</sup>	_____
<input type="checkbox"/>	CORD,14,3,SJT,RS3720DP,IEC320 (250 VAC, 15 A)	PWRCORD315453901-Z <sup>3,6</sup>	_____
<input type="checkbox"/>	CORD,14,3,SJT,IEC309M,IEC320F (250 VAC, 15 A)	PWRCORD315454001-Z <sup>3,7</sup>	_____

1. “Y” first character indicates used equipment.
2. “Z” last character indicates ROHS-compliance.
3. External power cords compatible only with StorageTek RACK001.
4. External cord, StorageTek RACK001 only, customer supplies AC power source compatible plug.
5. Two North American and two European compatible power cords ship with the CBNT42U cabinet.
6. Russellstoll 3720 plug.
7. Hubbell IEC309 plug (male).

## ■ Cable Order Numbers

If you have answers to the following questions, the task of ordering cables becomes much easier:

What host interface is used?	<input type="checkbox"/> FICON <input type="checkbox"/> ESCON <input type="checkbox"/> Fibre Channel <input type="checkbox"/> SCSI (used equipment only)
If FICON or Fibre Channel, how many drive ports will be connected to the host?	<input type="checkbox"/> 1 port <input type="checkbox"/> 2 port <sup>1</sup>
If FICON or Fibre Channel; what type of interface transceiver is being used?	<input type="checkbox"/> Long wavelength <sup>2</sup> <input type="checkbox"/> Short wavelength <sup>3</sup>
If FICON or Fibre Channel; what type of cable is required?	<input type="checkbox"/> Single mode <input type="checkbox"/> Multimode <sup>4</sup>
What type of connector is present on the FICON or Fibre Channel tape drive?	<input type="checkbox"/> LC <input type="checkbox"/> SC (T9840A or T9940A)
What type of connector is present on the non-tape drive end of the cable?	<input type="checkbox"/> ESCON duplex <input type="checkbox"/> ST <input type="checkbox"/> MT-RJ <input type="checkbox"/> LC <input type="checkbox"/> SC
What length of cable is required?	<ol style="list-style-type: none"> <li>1. A separate cable is required for each tape drive port.</li> <li>2. Long wavelength ports require single-mode (9 micron fiber) FC/FICON cables.</li> <li>3. Short wavelength ports require multimode FC/FICON cables.</li> <li>4. Drives using a short wavelength transceiver that are mounted in an SL8500 drive tray or a rack chassis require the use of a 50 micron multimode FC/FICON cable.</li> </ol>

Order numbers are listed for the following cable types:

- [“ESCON Cable Order Numbers” on page 5-18](#)
- [“Single Mode FC/FICON \(LC, long wave\) Cables” on page 5-20](#)
- [“Multimode FC/FICON \(LC, short wave\) Cables” on page 5-21](#)
- [“Multimode FC Cables \(Type SC, 1-Gb\)” on page 5-23 \(T9840A or T9940A\)](#)
- [“SCSI Cables and Accessories” on page 5-24 \(T9840A/B or T9940A\)](#)

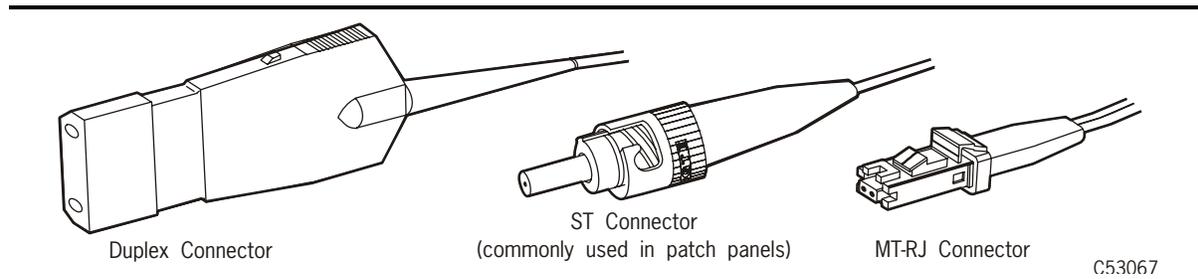
## ESCON Cable Order Numbers

The following ESCON fiber optic cables connect T9x40 ESCON drives to the first component in the interface infrastructure. The 62.5/125 Micron cables are orange in color, and have a Duplex connector at the drive end. The other end could have a Duplex, ST, or MT-RJ connector (see [Figure 5-2](#)).

You must include their length in maximum channel distance calculations.

**Note:** Maximum total non-repeated distance for an ESCON T9x40 tape drive over 62.5-micron multimode cables is 3.00 km (1.86 mile).

**Figure 5-2. ESCON Cable Connectors**



	Description (Sheet 1 of 2)	Sun Marketing PN <sup>1</sup>	Quantity
Duplex to Duplex, 62.5/125 Micron:			
q	13 m (42 ft) Duplex, Plenum	CABLE10800285-Z	_____
q	31 m (100 ft) Duplex, Plenum	CABLE10800286-Z	_____
q	61 m (200 ft) Duplex, Plenum	CABLE10800287-Z	_____
q	107 m (350 ft) Duplex, Plenum	CABLE10800288-Z	_____
Duplex to Duplex, 62.5/125 Micron:			
q	13 m (42 ft) Duplex, Riser	CABLE10800289-Z	_____
q	31 m (100 ft) Duplex, Riser	CABLE10800290-Z	_____
q	61 m (200 ft) Duplex, Riser	CABLE10800291-Z	_____
q	107 m (350 ft) Duplex, Riser	CABLE10800292-Z	_____
Duplex to MT-RJ, 62.5/125 Micron:			
q	13 m (42 ft) Duplex - MT-RJ, Plenum	CABLE10800327-Z	_____
q	31 m (100 ft) Duplex - MT-RJ, Plenum	CABLE10800328-Z	_____
q	61 m (200 ft) Duplex - MT-RJ, Plenum	CABLE10800329-Z	_____
Duplex to MT-RJ, 62.5/125 Micron:			
q	13 m (42 ft) Duplex - MT-RJ, Riser	CABLE10800324-Z	_____
q	31 m (100 ft) Duplex - MT-RJ, Riser	CABLE10800325-Z	_____
□	61 m (200 ft) Duplex - MT-RJ, Riser	CABLE10800326-Z	_____

1. Suffix “-Z” indicates ROHS-compliant component.

Description (Sheet 2 of 2)	Sun Marketing PN <sup>1</sup>	Quantity
<b>Duplex to ST, 62.5/125 Micron:</b>		
<input type="checkbox"/> 3 m (10 ft) Duplex, Plenum	CABLE10800081	_____
<input type="checkbox"/> 7 m (22 ft) Duplex, Plenum	CABLE10800082	_____
<input type="checkbox"/> 13 m (42 ft) Duplex, Plenum	CABLE10800083	_____
<input type="checkbox"/> 22 m (72 ft) Duplex, Plenum	CABLE10800084	_____
<input type="checkbox"/> 31 m (100 ft) Duplex, Plenum	CABLE10800085	_____
	CABLE10800293-Z	_____
<input type="checkbox"/> 46 m (150 ft) Duplex, Plenum	CABLE10800086	_____
<input type="checkbox"/> 61 m (200 ft) Duplex, Plenum	CABLE10800087	_____
<input type="checkbox"/> 77 m (250 ft) Duplex, Plenum	CABLE10800088	_____
<input type="checkbox"/> 92 m (300 ft) Duplex, Plenum	CABLE10800089	_____
<input type="checkbox"/> 107 m (350 ft) Duplex, Plenum	CABLE10800090	_____
<input type="checkbox"/> 122 m (400 ft) Duplex, Plenum	CABLE10800091	_____
<input type="checkbox"/> 3 m (10 ft) Duplex, Riser	CABLE10800070	_____
<input type="checkbox"/> 7 m (22 ft) Duplex, Riser	CABLE10800071	_____
<input type="checkbox"/> 13 m (42 ft) Duplex, Riser	CABLE10800072	_____
<input type="checkbox"/> 22 m (72 ft) Duplex, Riser	CABLE10800073	_____
<input type="checkbox"/> 31 m (100 ft) Duplex, Riser	CABLE10800074	_____
<input type="checkbox"/> 46 m (150 ft) Duplex, Riser	CABLE10800075	_____
<input type="checkbox"/> 61 m (200 ft) Duplex, Riser	CABLE10800076	_____
<input type="checkbox"/> 77 m (250 ft) Duplex, Riser	CABLE10800077	_____
<input type="checkbox"/> 92 m (300 ft) Duplex, Riser	CABLE10800078	_____
<input type="checkbox"/> 107 m (350 ft) Duplex, Riser	CABLE10800079	_____
<input type="checkbox"/> 122 m (400 ft) Duplex, Riser	CABLE10800080	_____
1. Suffix “-Z” indicates ROHS-compliant component.		

## Single Mode FC/FICON (LC, long wave) Cables

Single mode fiber optic cables are used with T9x40B/C/D FICON drives configured with a long-wave SFP module. These cables are yellow in color with blue LC connectors (Figure 5-3 on page 5-21) at the drive end. You must include their length in maximum channel distance calculations.

**Note:** Maximum total non-repeated distance for a 1310 nm, 9 micron (long-wave) single mode cable is 10 km (6.21 mi).

Single Mode cable maximum distances can be extended through an RPQ to 20 km (12.4 mi) for a 100 MB/s channel, or to 12 km (7.46 mi) for a 200 MB/s channel.

Description	Sun Marketing PN <sup>1</sup>	Quantity
<b>LC to LC, 9/125 Micron:</b>		
<input type="checkbox"/> 3 m (9.8 ft) Duplex, Riser	CABLE10800302-Z CABLE10800183	_____
<input type="checkbox"/> 10 m (32.8 ft) Duplex, Riser	CABLE10800331-Z	_____
<input type="checkbox"/> 22 m (72.1 ft) Duplex, Riser	CABLE10800184	_____
<input type="checkbox"/> 50 m (164 ft) Duplex, Riser	CABLE10800333-Z	_____
<input type="checkbox"/> 100 m (328 ft) Duplex, Riser	CABLE10800306-Z	_____
<b>LC to SC, 9/125 Micron:</b>		
<input type="checkbox"/> 10 m (32.8 ft) Duplex, Plenum	CABLE10800330-Z	_____
<input type="checkbox"/> 46 m (151 ft) Duplex, Plenum	CABLE10800188	_____
<input type="checkbox"/> 50 m (164 ft) Duplex, Plenum	CABLE10800332-Z	_____
<input type="checkbox"/> 100 m (328 ft) Duplex, Plenum	CABLE10800305-Z	_____
<input type="checkbox"/> 10 m (32.8 ft) Duplex, Riser	CABLE10800335-Z	_____
<input type="checkbox"/> 22 m (72.1 ft) Duplex, Riser	CABLE10800347-Z	_____
<input type="checkbox"/> 50 m (164 ft) Duplex, Riser	CABLE10800337-Z	_____
<input type="checkbox"/> 100 m (328 ft) Duplex, Riser	CABLE10800304-Z	_____
<input type="checkbox"/> 10 m (32.8 ft) Duplex, Plenum	CABLE10800334-Z	_____
<input type="checkbox"/> 46 m (151 ft) Duplex, Plenum	CABLE10800194	_____
<input type="checkbox"/> 50 m (164 ft) Duplex, Plenum	CABLE10800336-Z	_____
<input type="checkbox"/> 100 m (328 ft) Duplex, Plenum	CABLE10800303-Z	_____
1. Suffix “-Z” indicates ROHS-compliant component.		

## Multimode FC/FICON (LC, short wave) Cables

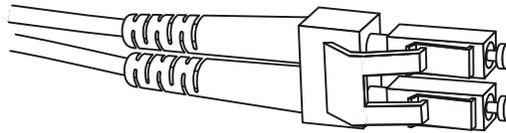
The following multimode fiber optic cables are applicable to T9x40B/C/D FC drives, and T9x40B/C/D FICON drives configured with short-wave SFP modules. They connect the drive to the first component in the interface infrastructure. These cables are orange in color, and have LC connectors at the drive end.

Total non-repeated distance for a 850 nm, 50 micron (short-wave) multimode cable is:

- 300 m (984 ft) **maximum** on a 200 MB/s (2 Gb) channel
- 500 m (1640 ft) **maximum** on a 100 MB/s (1 Gb) channel

You must include their length in maximum channel distance calculations.

**Figure 5-3. LC Cable Connector**



C53423

Description (Sheet 1 of 2)	Sun Marketing PN <sup>1</sup>	Quantity
<b>LC to LC, 50/125 Micron:</b>		
<input type="checkbox"/> 10 m (32.8 ft) Duplex, Riser	CABLE10800310-Z	_____
<input type="checkbox"/> 50 m (164 ft) Duplex, Riser	CABLE10800311-Z	_____
<input type="checkbox"/> 100 m (328 ft) Duplex, Riser	CABLE10800312-Z	_____
<b>LC to SC, 50/125 Micron:</b>		
<input type="checkbox"/> 10 m (32.8 ft) Duplex, Riser	CABLE10800317-Z	_____
<input type="checkbox"/> 50 m (164 ft) Duplex, Riser	CABLE10800318-Z	_____
<input type="checkbox"/> 100 m (328 ft) Duplex, Riser	CABLE10800319-Z	_____
<input type="checkbox"/> 10 m (32.8 ft) Duplex, Plenum	CABLE10800320-Z	_____
<input type="checkbox"/> 50 m (164 ft) Duplex, Plenum	CABLE10800321-Z	_____
<input type="checkbox"/> 100 m (328 ft) Duplex, Plenum	CABLE10800322-Z	_____
1. Suffix “-Z” indicates ROHS-compliant component.		

	Description (Sheet 2 of 2)	Sun Marketing PN <sup>1</sup>	Quantity
<input type="checkbox"/>	<b>Adapter Kit, LC to SC Cabling.</b> <ul style="list-style-type: none"><li>• LC to SC 2m (6.6 ft) Duplex</li><li>• SC Duplex coupler</li></ul>	CABLE315447901-Z CABLE10800343-Z CABLE10800344-Z	_____
	<b>LC to ST, 50/125 Micron:</b>		
<input type="checkbox"/>	10 m (32.8 ft) Duplex, Riser	CABLE10800323-Z	_____
	1. Suffix “-Z” indicates ROHS-compliant component.		

## Multimode FC Cables (Type SC, 1-Gb)

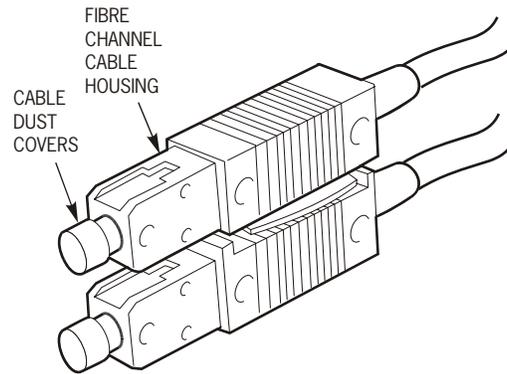
The following multimode fiber optic cables connect T9x40A FC drives to the first component in the interface infrastructure. The cables are orange in color, and have SC connectors at both ends.

Total non-repeated distance for a 850 nm, 50 micron (short-wave) multimode cable is:

- 500 m (1640 ft) **maximum** on a 100 MB/s (1 Gb) channel

You must include their length in maximum channel distance calculations.

**Figure 5-4. SC Cable Connector**



C53988

Description	Sun Marketing PN <sup>1</sup>	Quantity
<b>SC to SC, 50/125 Micron:</b>		
<input type="checkbox"/> 0.25 m (0.8 ft) Duplex, Plenum	CABLE10800301-Z	_____
<input type="checkbox"/> 10 m (32.8 ft) Duplex, Plenum	CABLE10800294-Z	_____
<input type="checkbox"/> 50 m (164 ft) Duplex, Plenum	CABLE10800295-Z	_____
<input type="checkbox"/> 100 m (328 ft) Duplex, Plenum	CABLE10800296-Z	_____
<input type="checkbox"/> 250 m (820 ft) Duplex, Plenum	CABLE10800129	_____
<input type="checkbox"/> 500 m (1640 ft) Duplex, Plenum	CABLE10800130	_____
<input type="checkbox"/> 10 m (6.6 ft) Duplex, Riser	CABLE10800297-Z	_____
<input type="checkbox"/> 30 m (98.4 ft) Duplex, Riser	CABLE10800136 <sup>2</sup>	_____
<input type="checkbox"/> 50 m (164 ft) Duplex, Riser	CABLE10800298-Z	_____
<input type="checkbox"/> 100 m (328 ft) Duplex, Riser	CABLE10800299-Z	_____
<input type="checkbox"/> 250 m (820 ft) Duplex, Riser	CABLE10800139	_____
<input type="checkbox"/> 500 m (1640 ft) Duplex, Riser	CABLE10800140	_____
<input type="checkbox"/> SC Duplex coupler	CABLE10800344-Z	_____

1. Suffix “-Z” indicates ROHS-compliant component.

## SCSI Cables and Accessories

The following SCSI cables are applicable to T9840A/B and T9940A SCSI drives. They connect the drive to the first component in the interface infrastructure. You must include their length in maximum distance calculations.

**CAUTION:**  
**DATA LOSS. DO NOT EXCEED 25 METERS (82 FEET)**  
**MAXIMUM TOTAL SCSI BUS LENGTH [include the interface cable, daisy-chain cable(s), and drive tray/library bulk head Y-cable].**

### SCSI Cables:

	Description	Sun Marketing PN <sup>1</sup>	Quantity
<input type="checkbox"/>	3 m (10 ft) Type CL2 SCSI Ext. Cable, Riser	CABLE10187000-Z CABLE10083309	_____
<input type="checkbox"/>	12 m (49 ft) Type CL2 SCSI Ext. Cable, Riser	CABLE10083376	_____
<input type="checkbox"/>	21 m (69 ft) Type CL2 SCSI Ext. Cable, Riser	CABLE10187001-Z CABLE10083312	_____
<input type="checkbox"/>	3 m (10 ft) Type CL2P SCSI Ext. Cable, Plenum	CABLE10083313	_____
<input type="checkbox"/>	12 m (49 ft) Type CL2P SCSI Ext. Cable, Plenum	CABLE10083381	_____
<input type="checkbox"/>	21 m (69 ft) Type CL2P SCSI Ext. Cable, Plenum	CABLE10083316	_____
<input type="checkbox"/>	300 mm (11.8 in.) SCSI Daisy-Chain Cable	CABLE10187004-Z	_____
<input type="checkbox"/>	340 mm (13.5 in.) SCSI Daisy-Chain Cable, rack mount	CABLE10083616	_____
<input type="checkbox"/>	500 mm (19.7 in.) SCSI Daisy-Chain Cable	CABLE10187005-Z	_____

1. Suffix “-Z” indicates ROHS-compliant component.

**Note:** T9x40 SCSI drives can connect to an AS400 system with the SCSI cables listed above. The AS400 system must have a 6501, 6534, or 2729 IOP card. In addition, the 6501 IOP card requires an interposer, IBM PN 05H3834. Order these items from IBM.

### SCSI Accessories:

The T9x40 tape drive is high voltage differential.

	Description	Sun Marketing PN <sup>1</sup>	Quantity
<input type="checkbox"/>	SCSI Terminator, DIFF	CABLE10187075-Z	_____

1. Suffix “-Z” indicates ROHS-compliant component.

## ■ Conversion Bills/Kits

Conversion bills (CBs) provide instructions and applicable material that allow the:

- Addition of a second drive to a rack chassis
- Transfer of drives from one library type to a different library type
- Modification of the number or type of interface transceiver
- Transfer of drives from one library drive cabinet type to a different library drive cabinet type

Several tables list the conversion bill part numbers:

- [Table 5-12](#) lists the T9840 drive tray conversions
- [Table 5-13 on page 5-27](#) lists T9840D conversions
- [Table 5-14 on page 5-27](#) lists ROHS compliant CBs available for T9840 conversions
- [Table 5-15 on page 5-28](#) lists CBs available for T9940 conversions

**Table 5-12. T9840 Drive Tray Conversion Kits**

Drive Interface	Drive Model	From:	To:	Sun Marketing PN
T9840B/C/D				
N/A	T9840B/C/D	9741	9741E	X9840-9741-9741EZ
	T9840B/C/D	9741E	9741	X9840-9741E-9741Z
ESCON	T9840B/C/D	L180/L700/L1400 L5500, 9740 <sup>2</sup> , 9310	SL8500	9840-ES-LEG-S85Z
	T9840C/D	SL3000	SL8500	9840C/D-S30/S85Z
	T9840C/D	L180/L700/L1400 L5500, 9740 <sup>2</sup> , 9310	SL3000	9840CD-ES-SL3-Z
	T9840B/C/D	SL8500	9310	9840D-8500-9310Z
	T9840B/C/D	L5500, 9740 <sup>2</sup> , 9310	L180/L700/ L1400	9840D-9310-L1400Z
Fiber Channel	T9840B/C <sup>4</sup>	L180/L700/L1400 L5500, 9740 <sup>2</sup> , 9310	SL8500	9840-FC-SL85Z
	T9840B/C/D <sup>5</sup>	L180/L700/L1400 L5500, 9740 <sup>2</sup> , 9310	SL8500	9840D-SPLW-LEG-85Z
	T9840B/C/D <sup>7</sup>	L180/L700/L1400 L5500, 9740 <sup>2</sup> , 9310	SL8500	9840D-SPSW-LEG-85Z
<ol style="list-style-type: none"> <li>1. The conversion kit is ROHS compliant but the drive might not be ROHS compliant.</li> <li>2. 9740 library does not apply to the T9840D tape drive.</li> <li>3. Dual port long wavelength or short wavelength.</li> <li>4. Two port short wavelength.</li> <li>5. Single port long wavelength.</li> <li>6. Single port short wavelength.</li> </ol>				

**Table 5-12. T9840 Drive Tray Conversion Kits (Continued)**

Drive Interface	Drive Model	From:	To:	Sun Marketing PN
Fiber Channel (continued)	T9840C/D <sup>3</sup>	SL3000	SL8500	9840C/D-S30/S85Z
	T9840C/D <sup>3</sup>	SL8500	SL3000	9840C/D-S85/S30Z
	T9840C/D <sup>3</sup>	L180/L700/L1400 L5500, 9310	SL3000	9840CD-FCFI-SL3-Z
	T9840B/C/D	SL8500	9310	9840D-8500-9310Z
	T9840B/C/D	L5500, 9740 <sup>2</sup> , 9310	L180/L700/ L1400	9840D-9310-L1400Z
FICON	T9840B/C <sup>4</sup>	L180/L700/L1400 L5500, 9740 <sup>2</sup> , 9310	SL8500	9840-FC-SL85Z
	T9840C/D <sup>5</sup>	L180/L700/L1400 L5500, 9740 <sup>2</sup> , 9310	SL8500	9840D-SPLW-LEG-85Z
	T9840B/C/D <sup>6</sup>	L180/L700/L1400 L5500, 9740 <sup>2</sup> , 9310	SL8500	9840D-SPSW-LEG-85Z
	T9840C/D <sup>3</sup>	SL3000	SL8500	9840C/D-S30/S85Z
	T9840C/D <sup>3</sup>	SL8500	SL3000	9840C/D-S85/S30Z
	T9840C/D <sup>3</sup>	L180/L700/L1400 L5500, 9310	SL3000	9840CD-FCFI-SL3-Z
	T9840B/C/D	SL8500	9310	9840D-8500-9310Z
	T9840B/C/D	L5500, 9740 <sup>2</sup> , 9310	L180/L700/ L1400	9840D-9310-L1400Z
<b>T9840A</b>				
ESCON	T9840A	L180/700/1400 L5500, 9740, 9310	SL8500	9840A-ES-SL85-Z <sup>1</sup>
Fibre Channel	T9840A	L180/700/1400 L5500, 9740, 9310	SL8500	9840A-FC-SL85-Z <sup>1</sup>
<ol style="list-style-type: none"> <li>1. The conversion kit is ROHS compliant but the drive might not be ROHS compliant.</li> <li>2. 9740 library does not apply to the T9840D tape drive.</li> <li>3. Dual port long wavelength or short wavelength.</li> <li>4. Two port short wavelength.</li> <li>5. Single port long wavelength.</li> <li>6. Single port short wavelength.</li> </ol>				

**Table 5-13. T9840C/D Rackmount Conversion Bills**

Interface	Description	Marketing P/N
<b>T9840D</b>		
ESCON	T9840D, ES, RACKMT, 1X to 2X	X9840D-ES1-2RACKZ
Fibre Channel or FICON	T9840D, LW, RACKMT, 1X to 2X	X9840D-LW1-2RACKZ
	T9840D, SW, RACKMT, 1X to 2X	X9840D-SW1-2RACKZ
<b>T9840C</b>		
Fibre Channel	T9840C, FC, DPSW, RACKMT, 1X to 2X	X9840C-FC-RK-1-2Z

The conversion bills in the following table are used with many of the T9x40 tape drive models and library configurations. Drive part numbers for the 9310 library and L180/L700/L1400 do not include the SFP module. You must order a port conversion bill and the drive part number.

**Table 5-14. T9x40 Common Conversion Bills (ROHS Compliant)**

Description	From:	To:	Sun Marketing PN
<b>New:</b>			
<b>SFP Modules <sup>1</sup> (transceivers) for T9840C or T9840D</b>			
T9840/T10K 2 Gbit, 1 SFP, SW, cable kit			X984/T10K-2GB -SW-Z
T9840/T10K 2 Gbit, 1 SFP, LW, cable kit			X984/T10K-2GB -LW-Z
T9x40, no power supply, 9741/E	9741/9741E	9741E/9741	X9x40-9741E-9741Z
<b>Used SFP Modules: <sup>1</sup></b>			
<i>Used</i> T9x40 FICON, 1 SFP, LW			Y9x40-FI-1SFP-LWZ <sup>2</sup>
<i>Used</i> T9x40 FICON, 1 SFP, SW			Y9x40-FI-1SFP-SWZ <sup>2</sup>
<i>Used</i> T9x40 FICON, 2 SFP, LW			Y9x40-FI-2SFP-LWZ <sup>2</sup>
<i>Used</i> T9x40 FICON, 2 SFP, MW			Y9x40-FI-2SFP-MWZ <sup>2</sup>
<i>Used</i> T9x40 FICON, 2 SFP, SW			Y9x40-FI-2SFP-SWZ <sup>2</sup>
<ol style="list-style-type: none"> <li>1. T9840C Fibre Channel drives use fixed transceivers (SFF) T9840C FICON drives use pluggable transceivers (SFP) T9840D Fibre Channel/FICON drives use pluggable transceivers (SFP) T9940B Fibre Channel drives use fixed transceivers (SFF) T9940B FICON drives use pluggable transceivers (SFP).</li> <li>2. To be ordered along with <i>used</i> 9x40 FICON tape drives.</li> </ol>			

Table 5-15. T9940 Conversion Bills

Interface	Description	From:	To:	Sun Marketing PN
<b>T9940A/B ROHS:</b>				
ESCON	T9940B, ESCON, L700/9741/E - SL8500	L180/L700/L1400, L5500, 9740, 9310	SL8500	9940B-ES-SL85Z
	T9940B, 9310 - L700/ L1400		L180/L700/ L1400	9940B-9310-L700Z
	T9940B, SL8500 - 9310	SL8500	9741/E	X9940B-SL85-9310Z
Fibre Channel <sup>1</sup>	T9940B, FC, L5500 - SL8500	L180/L700/L1400, L5500, 9740, 9310	SL8500	9940B-FC-L55-S85Z
	T9940B, 9310 - L700/ L1400	L5500, 9740, 9310	L180/L700/ L1400	9940B-9310-L700Z
		L180/L700/L1400	9310	9940B-FC-9310-Z
	T9940B, SL8500 - 9310	SL8500	9741/E	X9940B-SL85-9310Z
FICON <sup>2</sup>	T9940B FICON, SPLW - SL8500	L180/L700/L1400, L5500, 9740, 9310	SL8500	9940B-FI-LW-SL85Z <sup>3, 5</sup>
	T9940B FICON, SPSW - SL8500	L180/L700/L1400, L5500, 9740, 9310	SL8500	9940B-FI-SW-SL85Z <sup>4, 5</sup>
	T9940B, 9310 - L700/ L1400	L5500, 9740, 9310	L180/L700/ L1400	9940B-9310-L700Z
	T9940B, SL8500 - 9310	SL8500	9741/E	X9940B-SL85-9310Z
<ol style="list-style-type: none"> <li>1. T9940B Fibre Channel drives use fixed transceivers (SFF).</li> <li>2. T9940B FICON drives use pluggable transceivers (SFP modules).</li> <li>3. Single port long wavelength.</li> <li>4. Single port short wavelength.</li> <li>5. For dual port configurations, order the appropriate SFP module, see <a href="#">Table 5-14 on page 5-27</a>.</li> </ol>				

## ■ Ordering Cartridges and Labels

Sun makes ordering cartridges easy.

- Call 1.877.STK.TAPE to order media from your local Sun reseller or to obtain media pre-sales support.
- Local support e-mail addresses:
  - us.mediaorders@sun.com
  - EMEA.mediaorders@sun.com
  - LA.mediaorders@sun.com
- Label kits:  
Label kits are available in either 60 or 200 piece quantities. The 60 piece kit has 60 data and 6 cleaning cartridge labels. The 200 piece kit has 200 data and 20 cleaning cartridge labels. The end-user will affix the labels to the cartridges. The label ranges are sequentially numbered, non-repeating and cannot be customized.

Not sure what you need or what some terms mean?

Check out *Sun StorageTek Tape Media A Variety of Storage Options* for more details.

**Note:** The different VolSafe cartridges are NOT interchangeable. Make sure to specify the required proper density 9840 VolSafe cartridge when ordering (see [Table 1-1 on page 1-4](#) for additional information).

**Table 5-16. VolSafe Cartridge Summary**

Drive Model	Identification Color	Description
T9840A/B	Yellow	20-GB 9840 VolSafe cartridges can be read and written with T9840A/B drives.
T9840C	Green	40-GB 9840C VolSafe cartridges can be read and written with a T9840C drive.  The T9840C can only read a T9840A/B VolSafe.
T9840D	Purple	75-GB 9840D VolSafe cartridges can be read and written with a T9840D drives  The T9840D can only read a T9840A/B VolSafe cartridge or a T9840C VolSafe cartridge.
T9940B	Yellow	200-GB 9940 VolSafe cartridges are required for use with T9940B drives <sup>1</sup> .

1. The T9940A tape drive is not VolSafe capable.

**Note:** The T9840D requires that you use a unique cleaning cartridge designated with a Y media ID label. The T9840A/B/C drives use a different cleaning cartridge designated with a U media ID label.

## Tape Media Policies

There are three tape media policies:

- *Usage* policy: The tape storage media (tape cartridge) used in a tape drive and/or automated tape system can have a significant impact on the overall performance of the tape drive and/or automated tape system. The following is Sun's policy regarding tape storage media:
    - Sun warrants tape storage media that is Sun StorageTek branded.
    - The customer can be billed for any service provided by Sun resulting from or related to problems caused by non-Sun StorageTek branded tape storage media.
  - *Endorsement* policy: Sun does not certify, recommend or endorse 3rd party brand tape media. Sun only recommends Sun StorageTek brand media for use in Sun StorageTek libraries and tape drives.
  - *Cancellation* policy: Purchase Orders for tape media entered into Sun's Order Management system (either 'standalone' or included with Sun hardware, software or services) are non-cancelable, non-returnable, and cannot be reworked.
- Note:** The customer is liable for the media portion of the purchase order regardless if the hardware, software or services portion of the purchase order is canceled.

# Specifications

# A

This appendix provides specifications for “T9840” and “T9940” on page A-11.

## ■ T9840

The following information is provided for T9840 tape drives:

- Power specifications
- Performance specifications
- Environmental requirements
- Physical specifications
- Library attachments

## Power Specifications

Table A-1 lists the power specifications for the T9840 Tape Drive.

**Table A-1. T9840 Tape Drive Power Specifications**

Characteristics	Value			
Input voltage	88 to 264 VAC			
Input frequency	48 to 63 Hz			
Power consumption	T9840D:	Fibre		
		Channel	FICON	ESCON
	Write	62 W	62 W	55 W
	Read	58 W	58 W	*
	Idle tape loaded	44 W	43 W	37 W
	Idle no tape loaded	36 W	36 W	29 W
	Rewind	56 W	56 W	48 W
	Load/unload peak	70 W	70 W	70 W
	T9840C			
	65 W - write			
45 W - Idle tape loaded				
38 W - Idle no tape loaded				
Power dissipation	280 Btu/hr			
Power factor	0.95 minimum			
* Not specified.				

## Performance Specification

This section describes tape drive and data cartridge performance specifications.

### Tape Drive

Table A-2 lists the performance specifications of the T9840 tape drive.

**Table A-2. T9840 Tape Drive Performance Specifications**

Characteristics	Values			
	T9840A	T9840B	T9840C	T9840D
<b>Capacity and Performance</b>				
Capacity, native	20 GB	20 GB	40 GB <sup>1</sup>	75 GB <sup>1</sup>
				
Data buffer size	8 MB	32 MB	64 MB	64 MB
Tape speed, read/write	2 m/s	4 m/s	3.295 m/s	3.4 m/s
Maximum block size	256K	256K	256K	256K
Performance, native (head-to-tape)				
(uncompressed)	10 MB/s	19 MB/s	30 MB/s	30 MB/s
(compressed, maximum)	35 MB/s	60 MB/s	60 MB/s	60 MB/s <sup>2</sup>
Burst (FC & FICON)	100 MB/s	200 MB/s	200 MB/s	200 MB/s
Burst (ESCON)	17 MB/s	17 MB/s	17 MB/s	17 MB/s
<b>Interface data</b>				
Fibre Channel	1 Gb	2 Gb	2 Gb	2 Gb
Ultra-SCSI HVD	40 MB/s	40 MB/s	NA	NA
ESCON	17 MB/s	17 MB/s	17 MB/s	17 MB/s
FICON	NA	2 Gb	2 Gb	2 Gb
<b>Access times</b>				
Tape load and thread to ready	7 sec	7 sec	6.5 sec	8.5 sec
File access, first (average)	8 sec	8 sec	8 sec	8 sec
Rewind (maximum/average)	16/8 sec	16/8 sec	16/8 sec	16/8 sec
Unload	8 sec	8 sec	11.5 sec	12.5 sec
<b>Reliability</b>				
Mean time between failure (MBTF)				
Power on @ 100% duty cycle	290,000 hr	290,000 hr	290,000 hr	290,000 hr
Tape load @ 10/day (100K loads)	240,000 hr	240,000 hr	240,000 hr	240,000 hr
Tape path motion (TPM)	216,000 hr	216,000 hr	216,000 hr	216,000 hr
@ 70% duty cycle				
Head life @ 70% TPM duty cycle	5 years	5 years	5 years	5 years
Uncorrected bit error rate	1 x 10 <sup>-18</sup>	1 x 10 <sup>-18</sup>	1 x 10 <sup>-18</sup>	1 x 10 <sup>-18</sup>
Undetected bit error rate	1 x 10 <sup>-33</sup>	1 x 10 <sup>-33</sup>	1 x 10 <sup>-33</sup>	1 x 10 <sup>-33</sup>

- VR<sup>2</sup> is a trademark of Overland Storage.  
VR<sup>2</sup> technology is used to achieve T9840C/D capacity and performance.
- Fibre Channel (FC) write and 55 MB/s FICON write

## Data Cartridge

Table A-3 lists the physical and performance specifications of the 9840 data cartridge.

**Table A-3. 9840 Data Cartridge Performance Specifications**

Characteristic	Value
<b>Cartridge physical data</b>	
Drive compatibility	T9840A, T9840B, T9840C and T9840D
Form factor	1/2 in. cartridge, 3490/3490E
Width	109 cm (4.29 in.)
Length	125 cm (4.92 in.)
Height	2.54 cm (1.00 in.)
Weight	262 g (9.17 oz)
Drop strength	1.00 m (39.4 in.)
<b>Tape media data</b>	
Capacity, native (uncompressed)	20 GB - T9840A/B 40 GB <sup>1</sup> - T9840C 75 GB <sup>1</sup> - T9840D
	
Tracks	288 (T9840A/B/C), 576 (T9840D)
Track-following servo	Factory pre-recorded <b>CAUTION: Bulk-erase will destroy pre-recorded servo tracks. DO NOT DEGAUSS 9840 CARTRIDGES.</b>
Formulation	Advanced metal particle (AMP)
Physical thickness	9 microns (µm)
Physical length	271 m (889 ft)
Recordable length (including MIR)	251 m (823 ft)
<b>Reliability</b>	
Archival life	15 - 30 years
Short-length durability	80,000 write/read passes minimum
Long-life durability	361 full file writes
Load/unloads	10,000 minimum
Uncorrected bit error rate	1 x 10 <sup>-18</sup>
Permanent errors	Zero
1. VR <sup>2</sup> is a trademark of Overland Storage. VR <sup>2</sup> technology is used to achieve T9840C/D capacity.	

## Environmental Requirements

This section describes environmental requirements for the drive, power supply, and cartridges for T9840 tape drives.

### Airborne Contamination

Tape drives and media are subject to damage from airborne particulates (0.3 microns and smaller). The operating environment should strive to adhere to the requirements of a Class 100,000 clean room and the ISO 14644-1 Class 8 or 9 environment. See the *Sun Microsystems Data Center Site Planning Guide* for additional information regarding gasses and other contaminants.

<http://dlc.sun.com/pdf/805-5863-13/805-5863-13.pdf>

### Tape Drive and Power Supply

Table A-4 lists the environmental requirements for the tape drive and the power supply for T9840 tape drives.

**Table A-4. T9840 Environmental Requirements**

<b>Temperature</b>	
Operating	15° to 32°C (59° to 90°F)
Storage	10° to 40°C (50° to 104°F)
Shipping	-40° to 60°C (-40° to 140°F)
<b>Relative Humidity, Non-Condensing</b>	
Operating	20% to 80%
Storage	10% to 95%
Shipping	10% to 95%
<b>Wet Bulb Maximum</b>	
Operating	26°C (79°F)
Storage	26°C (79°F)
Storage	26°C (79°F)
<b>Altitude</b>	
Operating	0 to 3.05 km (0 to 10,000 ft)
Storage	0 to 3.05 km (0 to 10,000 ft)
Shipping	0 to 15.24 km (0 to 50,000 ft)
<b>Air Flow Requirement (Operating Heat Output)</b>	
Drive and power supply operating	73.2 Calories/hr (290.2 Btu/hr)

## Data Cartridges

Table A-5 lists the environmental requirements for 9840 data cartridges.

**Table A-5. 9840 Data Cartridge Environmental Requirements**

<b>Temperature</b>	
Operating <sup>1</sup>	15° to 32°C (59° to 90°F)
Storage (up to four weeks)	5° to 32°C (41° to 90°F)
Storage (archive)	15° to 26°C (59° to 77°F)
Shipping (unrecorded) <sup>2</sup>	-23° to 49°C (-10° to 120°F)
Shipping (recorded) <sup>2</sup>	4° to 40°C (40° to 104°F)
<b>Relative Humidity, Non-Condensing</b>	
Operating <sup>1</sup>	20% to 80%
Storage (up to four weeks)	5% to 80%
Storage (archive)	40% to 60%
Shipping (unrecorded) <sup>2</sup>	5% to 80%
Shipping (recorded) <sup>2</sup>	5% to 80%
<b>Wet Bulb Maximum</b>	
Operating <sup>1</sup>	26°C (79°F)
Storage (non-archive)	26°C (79°F)
Storage (archive)	26°C (79°F)
Shipping (unrecorded) <sup>2</sup>	26°C (79°F)
Shipping (recorded) <sup>2</sup>	26°C (79°F)

1. The conditioning time before use is 24 hours (48 hours preferred).
2. The shipping environment must not exceed the limit of the storage environment, archive or non-archive, for longer than 10 days.

## Physical Specifications

This section lists the physical specifications for T9840 tape drives in three configurations— library-attached, desktop, and rack-mount.

### Library-attached Configuration

The T9840 tape drive fits inside these StorageTek libraries or cabinets:

- 9741/9741E drive cabinet that attaches to 9310, 9740, and L5500 libraries
- 9710 libraries (T9840A/B only) [end of support 12/31/2007]
- 9738 libraries (T9840A only) [end of support 12/31/2007]
- L180 and L700x/L1400x libraries
- SL3000 modular library system
- SL8500 modular library system

Refer to the appropriate library System Assurance Guide for the physical dimensions and weights of the library and frame.

[Table A-6](#) lists the weights of the library tape drives and accessories, including trays, power supplies, and cables.

**Table A-6. T9840 Tape Drive Library-attached Weights**

Library	Drive and Accessory Weights
9310/9740/L5500	7.7 kg (17 lb)
9710(T9840A/B only)	10.4 kg (23 lb)
9738 (T9840A only)	7.5 kg (16.5 lb)
L180/L700x/L1400x	7.4 kg (16.3 lb)
SL3000	9.53 kg (21 lb)
SL8500	8.85 kg (19.5 lb)

### Desktop Configuration

The T9840 desktop configuration is a single enclosed assembly. [Table A-7](#) lists the physical specifications for a desktop installation.

**Table A-7. T9840 Tape Drive Desktop Physical Specifications**

Dimensions and weight of manual-load drive (T9840A/B)	230 mm (9.1 in.) wide 160 mm (6.5 in.) high 483 mm (19 in.) deep plus 76 mm (3 in.) for cables 9.3 kg (20.5 lb)
Dimensions and weight of CSL drive (T9840A only)	483 mm (19 in.) wide 197 mm (7.7 in.) high 630 mm (24.8 in.) deep plus 76 mm (3 in.) for cables 23 kg (50 lb)

## Rack Mount Configuration

Table A-8 lists the physical specifications for the T9840 rack mount configuration.

**Table A-8. T9840 Tape Drive Rack Mount Physical Specifications**

Dimensions	
Width	
Face plate	483 mm (19.0 in.)
Chassis	446 mm (17.56 in.)
Height	178 mm (7.0 in.)
Depth <sup>1</sup>	641 mm (25.25 in.)
Weight	
Single-drive tray	14.5 kg (32 lb)
Dual-drive tray	20.4 kg (45 lb)
CSL tray	18.0 kg (39 lb)
1. Includes 102 mm (4.0 in.) cable bend radius allowance at chassis rear	

## Rack Cabinets

Two rack cabinets are recommended to house T9x40 rack mount drive trays. The original 35U rack cabinet (StorageTek RACK001), and a newer, ROHS-compliant 42U rack cabinet (CBNT42U). Both cabinets require approximately the same floor space, and are fully re-locatable.

Table A-9 lists the physical specifications of both rack cabinets.

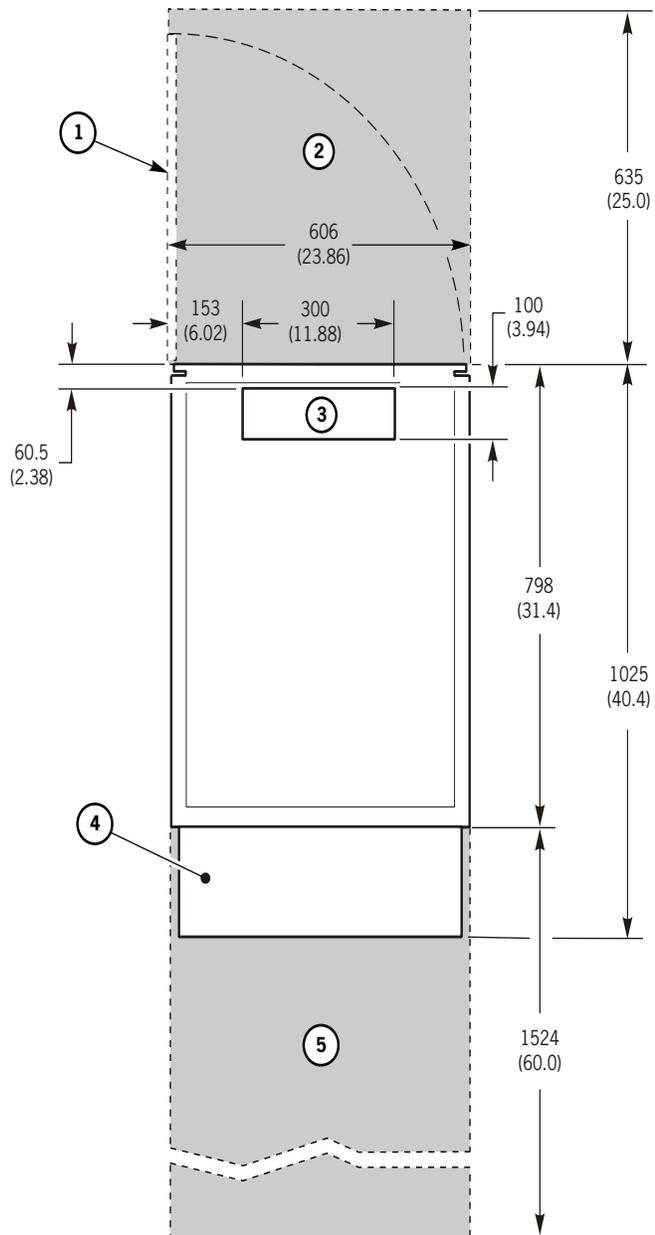
See Figure A-1 on page A-8 for an overhead view of the StorageTek RACK001, and Figure A-2 on page A-9 for an overhead view of the CBNT42U rack cabinet.

**Table A-9. Rack Cabinet Physical Specifications**

Specification	StorageTek RACK001	CBNT42U Rack Cabinet
Dimensions (outside)		
Width	606 mm (23.86 in.)	600 mm (23.62 in.)
Depth	798 mm (31.42 in.)	1000 mm (39.36 in.)
Height	1835 mm (72.25 in.)	2000 mm (78.73 in.)
Service clearances		
Front	1524 mm (60.0 in.)	1524 mm (60.0 in.)
Rear	635 mm (25.0 in.)	635 mm (25.0 in.)
Weight	132 kg (291 .lb)	143 kg (315 .lb)

Figure A-1 is an overhead view of the StorageTek RACK001.

Figure A-1. StorageTek RACK001, Overhead View

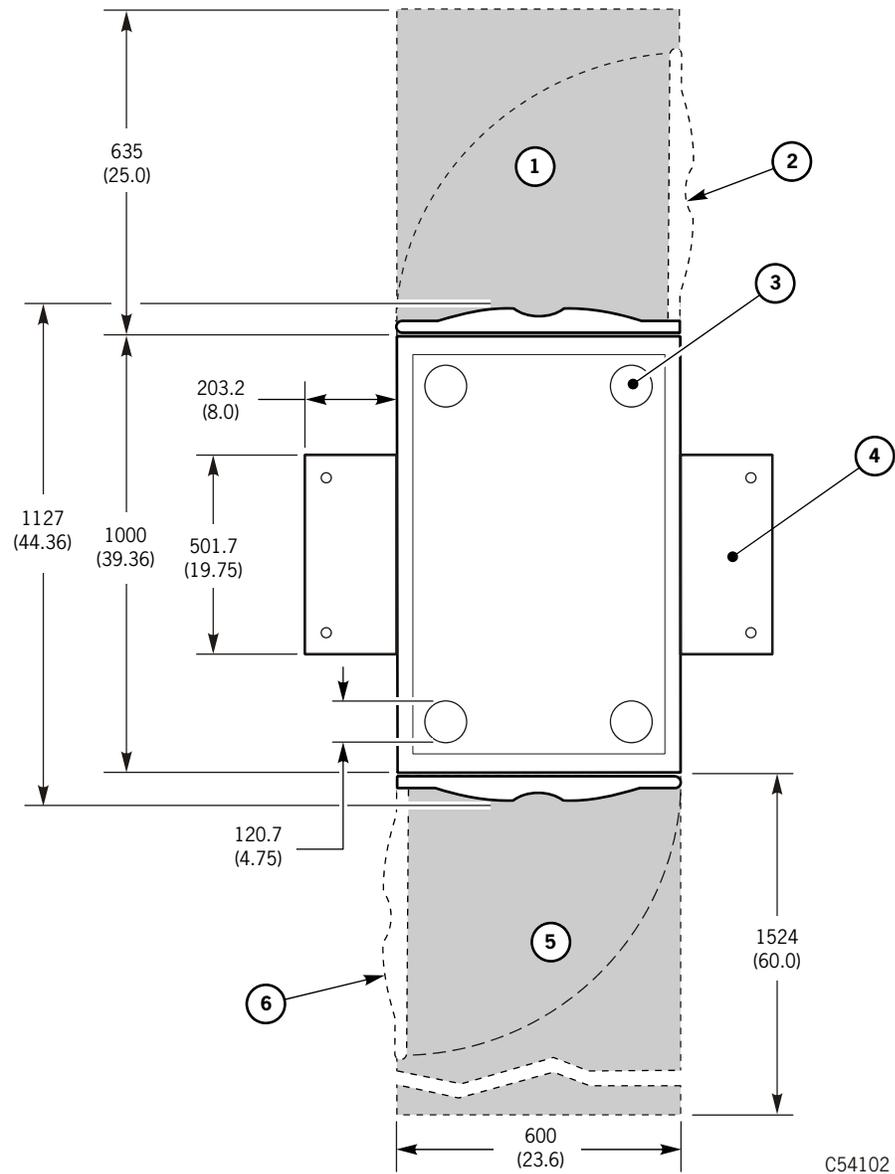


1. Rear door
2. Rear service clearance (door fully open)
3. Cable cut-out (in cabinet floor)
4. Front stabilizer plate
5. Front service clearance (space required to remove tray from extended rails)

**Note:** All dimensions are in millimeters (inches).

Figure A-2 is an overhead view of the CBNT42U rack cabinet.

**Figure A-2. CBNT42U Rack Cabinet, Overhead View**



1. Rear service clearance (door fully open)
2. Rear door
3. Cable access knockout plate (optional overhead cable routing)
4. Side stabilizer plate, 2ea. (should be bolted to the floor)
5. Front service clearance (door fully open and space required to remove tray from extended rails)
6. Front door

**Note:** All dimensions are in millimeters (inches).

## Library Attachments

[Table A-10](#) lists the libraries to which T9840 tape drives can attach. To order the correct accessories to install the T9840 tape drives in a library environment, refer to the system assurance guide for the library.

**Table A-10. T9840 Tape Drive Library Attachments**

Library	Maximum Number of Cartridges	Maximum Number of Drives	System Assurance Guide
9310 PowderHorn	Approx. 6,000	80	<i>Nearline Enterprise 9310/4410/9360 LSM System Assurance Guide</i> , ML6500
9710 TimberWolf <sup>1</sup>	588	10	<i>9710 Library Storage Module System Assurance Guide</i> , part number MR0012
9738 TimberWolf <sup>2</sup>	30	3	<i>TimberWolf 9738 Library System Assurance Guide</i> , MT5006
9740 TimberWolf <sup>3,4</sup>	494	10	<i>TimberWolf 9740 Library Storage Module System Assurance Guide</i> , MT5001
L180	Approx. 180	6	<i>L180/L700x/L1400x Tape Libraries Ordering and Configuration Guide</i> , MT9112
L700x/L1400x	Approx. 700	12	<i>L180/L700x/L1400x Tape Libraries Ordering and Configuration Guide</i> , MT9112
L5500 Automated Cartridge System (ACS) <sup>3</sup>	Maximum 2000/3500 <sup>5</sup>	80 <sup>6</sup>	<i>L5500 Automated Cartridge System System Assurance Guide</i> , MT9142
SL3000	4,500	56 <sup>7</sup>	<i>SL3000 Modular Library System Systems Assurance Guide</i> , 316194101
SL8500	10,088 <sup>8</sup>	64	<i>SL8500 Modular Library System System Assurance Guide</i> , MT9229

1. T9840A/B only.
2. T9840A only.
3. T9840A/B/C only.
4. T9940A/B only.
5. There are two mixed-media configurations in the L5500 ACS.
6. Total number of mixed drives, including the Linear Tape Open (LTO) Ultrium Drives. The LTO required, associated PLM unit blocks three T9x40 power supply slots; therefore, in a mixed drive cabinet, a maximum 17 drive slots are available for T9x40 drives.
7. T9840C/D only.
8. Basic library holds 1,448 cartridges; and, the library can hold 10,088 cartridges when five storage expansion modules are installed.

## ■ T9940

The next pages provide the following information for T9940 tape drives:

- Physical specifications
- Power specifications
- Performance specifications
- Environmental requirements
- Library attachments

**Note:** The specifications in this appendix can change. For current information, contact your Sun representative.

### Physical Specifications

This section lists the physical specifications of T9940 tape drives, in rack mount and library attached configurations.

#### Rack-mount Configuration

The rack mount configuration of the T9940 tape drive consists of two drives, mounted on shock absorbers, and two power supplies contained within a rack mount tray.

[Table A-11](#) lists the physical specifications of the T9940 rack mount configuration.

**Table A-11. T9940 Tape Drive Rack Mount Physical Specifications**

Dimensions	483 mm (19.0 in.) wide 267 mm (10.5 in.) high 635 mm (25.0 in.) deep plus 7.6 cm (3 in.) for cables
Weight	36.5 kg (80.5 lb)

**Note:** See [“Rack Cabinets” on page A-7](#) for physical specifications and space requirements for recommended rack cabinets.

## Library-Attached Configuration

The library-attached configuration of the T9940 tape drive mounts on trays that fit inside:

- An 9741 (expanded) or 9741E drive cabinet that attaches to StorageTek 9310, 9360, 9740, and L5500 libraries
- The StorageTek L180/L700x/L1400x library
- The StorageTek StreamLine SL8500 modular library system

Refer to the appropriate library System Assurance Guide for the physical dimensions and weights of the library and cabinet.

[Table A-12](#) lists the weights of the library tape drives and accessories, including trays, power supplies, and cables.

**Table A-12. T9940 Tape Drive Library attached Weights**

Library	Weight, Drive plus Library Tray (SCSI)
9310/9740/L5500	9.1 kg (20 lb)
L180/L700x/L1400x	9.6 kg (21.2 lb)
SL8500	10.4 kg (24.0 lb)

## Power Specifications

[Table A-13](#) lists the power specifications of the T9940 tape drive.

**Table A-13. T9940 Tape Drive Power Specifications**

Characteristics	Value
Input voltage	100 to 240 VAC
Input frequency	50 to 60 Hz
Power consumption	82 Watts
Power dissipation	280 Btu/hr
Power factor	0.96 minimum

## Performance Specifications

This section describes tape drive and data cartridge performance.

### Tape Drive

Table A-14 lists performance specifications of the T9940 tape drive.

**Table A-14. T9940 Tape Drive Performance Specifications**

Characteristic	Value	
	T9940A	T9940B
<b>Capacity and Performance</b>		
Capacity, native	60 GB	200 GB <sup>1</sup>
Data buffer size	16 MB	64 MB
Tape speed, read/write	2 m/sec	3.4 m/sec
Performance, native (head-to-tape)		
(uncompressed)	10 MB/sec	30 MB/sec <sup>1</sup>
(compressed, maximum)	35 MB/sec	70 MB/sec
Burst (FC / FICON)	100 MB/sec	200 MB/sec
Burst (ESCON)	17 MB/sec	17 MB/sec
<b>Interface data</b>		
Fibre Channel	1 Gb	2 Gb
Ultra-SCSI HVD	40 MB/sec	N/A
ESCON	20 MB/sec	20 MB/sec
FICON	NA	2 Gb
<b>Access times</b>		
Tape load and thread to ready	18 sec	18 sec
File access, first (average)	59 sec	59 sec
Rewind (maximum/average)	90/45 sec	90/45 sec
Unload	18 sec	18 sec
<b>Reliability</b>		
Mean time between failure (MTBF)		
Power on @ 100% duty cycle	290,000 hr	290,000 hr
Tape load @ 10/day (100K loads)	240,000 hr	240,000 hr
Tape path motion (TPM)	196,000 hr	196,000 hr
@ 70% duty cycle		
Head life @ 70% TPM duty cycle	8.5 yr.	8.5 yr.
Uncorrected bit error rate	1 x 10 <sup>-18</sup>	1 x 10 <sup>-18</sup>
Undetected bit error rate	1 x 10 <sup>-33</sup>	1 x 10 <sup>-33</sup>

- VR<sup>2</sup> is a trademark of Overland Storage.  
VR<sup>2</sup> technology is used to achieve T9940B capacity and performance.

## Data Cartridge

Table A-15 lists physical and performance specifications of the 9940 data cartridge.

**Table A-15. 9940 Data Cartridge Specifications**

Characteristic	Value
<b>Cartridge physical data</b>	
Drive compatibility	T9940A, T9940B
Form factor	1/2 in. cartridge, 3490/3490E
Width	109 cm (4.29 in.)
Length	125 cm (4.92 in.)
Height	25.4 cm (1.00 in.)
Weight	262 g (9.17 oz)
Drop strength	1.00 m (39.4 in.)
<b>Tape media data</b>	
Capacity, native (uncompressed)	60 GB (Low density, T9940A) 200 GB <sup>1</sup> (High density, T9940B)
Tracks	288 (Low density, T9940A) 576 (High density, T9940B)
Track-following servo	Factory pre-recorded <b>CAUTION: Bulk-erase will destroy pre-recorded servo tracks. DO NOT DEGAUSS T9940 CARTRIDGES.</b>
Formulation	Advanced metal particle (AMP)
Physical thickness	9 microns (µm)
Physical length	700 m (2,296 ft)
Recordable length (including MIR)	650 m (2,134 ft)
<b>Reliability</b>	
Archival life	15 - 30 years
Short-length durability	80,000 write/read passes minimum
Long-life durability	3,000 write/read passes minimum
Load/unloads	10,000 minimum
Uncorrected bit error rate	1 x 10 <sup>-18</sup>
Permanent errors	Zero
1. VR <sup>2</sup> is a trademark of Overland Storage. VR <sup>2</sup> technology is used to achieve T9940B capacity.	

## Environmental Requirements

This section describes environmental requirements for the tape drive, power supply, and cartridges for T9940 tape drives.

### Tape Drive and Power Supply

Table A-16 lists the environmental requirements for the tape drive and the power supply for T9940 tape drives.

**Table A-16. T9940 Environmental Requirements**

<b>Temperature</b>	
Operating	15° to 32°C (60° to 90°F)
Storage	10° to 40°C (50° to 104°F)
Shipping	-40° to 60°C (-40° to 140°F)
<b>Relative Humidity, Non-Condensing</b>	
Operating	20% to 80%
Storage	10% to 95%
Shipping	10% to 95%
<b>Wet Bulb Maximum</b>	
Operating	29°C (84°F)
Storage	35°C (95°F)
Storage	35°C (95°F)
<b>Altitude</b>	
Operating	0 to 3.05 km (0 to 10,000 ft)
Storage	0 to 3.05 km (0 to 10,000 ft)
Shipping	0 to 15.24 km (0 to 50,000 ft)
<b>Air Flow Requirements</b>	
Maximum media temperature	49°C (120°F)
Maximum chip T <sub>j</sub>	90°C (194°F) unless otherwise specified for a particular component

## Cartridges

Table A-17 lists the environmental requirements for 9940 cartridges.

**Table A-17. 9940 Cartridge Environmental Requirements**

<b>Temperature</b>	
Operating <sup>1</sup>	15° to 32°C (60° to 90°F)
Storage (up to four weeks)	5° to 32°C (41° to 90°F)
Storage (archival)	18° to 26°C (65° to 79°F)
Shipping <sup>2</sup>	4° to 40°C (40° to 104°F)
<b>Relative Humidity, Non-Condensing</b>	
Operating <sup>1</sup>	20% to 80%
Storage (up to four weeks)	5% to 80%
Storage (archival)	40% to 60%
Shipping <sup>2</sup>	5% to 80%
<b>Wet Bulb Maximum</b>	
Operating <sup>1</sup>	26°C (78.8°F)
Storage (non-archive)	26°C (78.8°F)
Storage (archival)	26°C (78.8°F)
Shipping <sup>2</sup>	26°C (78.8°F) with no condensation

1. The conditioning time before use is 24 hours.
2. The shipping environment must not exceed the limit of the storage environment, archive or non-archive, for longer than 10 days.

## Library Attachments

Table A-18 lists the libraries to which T9940 tape drives can attach. To order the correct accessories to install T9940 tape drives in a library environment, refer to the system assurance guide for the library.

**Table A-18. T9940 Tape Drive Library Attachments**

<b>Product</b>	<b>Maximum Number of Cartridges</b>	<b>Maximum Number of Drives</b>	<b>System Assurance Guide</b>
9310 PowderHorn	Approx. 6,000	80	<i>Nearline Enterprise 9310/4410/9360 LSM System Assurance Guide, ML6500</i>
9740 TimberWolf	494	10	<i>TimberWolf 9740 Library Storage Module System Assurance Guide, MT5001</i>
L180	Approx. 180	6	<i>L180/L700x/L1400x Tape Libraries Ordering and Configuration Guide, MT9112</i>
L700x/L1400x	Approx. 700	12	<i>L180/L700x/L1400x Tape Libraries Ordering and Configuration Guide, MT9112</i>
L5500 ACS	Maximum 2000/3500 <sup>1</sup>	80 <sup>2</sup>	<i>L5500 Automated Cartridge System System Assurance Guide, MT9142</i>
SL8500	10,088 <sup>3</sup>	64	<i>System Assurance Guide, MT9229</i>

1. There are two mixed-media configurations in the L5500 ACS.
2. Total number of mixed drives, including the LTO Ultrium Drives. The LTO required, associated PLM unit blocks three T9x40 power supply slots; therefore, in a mixed drive cabinet, a maximum of 17 drive slots are available for T9x40 drives.
3. Basic library holds 1,448 cartridges; and, the library can hold 10,088 cartridges when five storage expansion modules are installed.

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# Glossary

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This glossary defines new or special terms and abbreviations used in *this guide*. For definitions about other 9840/T9840/T9940 drive subsystem terms, or terms about other StorageTek products, refer to the glossary in the appropriate manuals.

Many of the definitions are taken from the *IBM Dictionary of Computing*. The following letters in parentheses following the definition indicate the source of the definition:

**(A)** *The American National Standard Dictionary for Information Systems, ANSI X3.172-1990*, copyright 1990 by the American National Standards Institute (ANSI).

**(E)** The ANSI/Electronic Industries Association (EIA) Standard-440-A, *Fiber Optic Terminology*.

**(I)** *The Information Technology Vocabulary*, developed by Subcommittee 1, Joint Technical Committee 1, of the International Organization for Standardization and International Electrotechnical Commission (ISO/IEC/JTC1/SC1).

**(IBM)** *The IBM Dictionary of Computing*, copyright 1994.

**(T)** Draft international standards committee drafts, and working papers being developed by the ISO/IEC/JTC1/SC1.

## A

**access time** The mean time in seconds from the load ready position to a distance being approximately half way from COT (center of tape) to either EOT (end of tape).

**ACSLs** *See* automated cartridge system library software.

**adapter** Hardware used to join different connector types.

**ANSI** American National Standards Institute.

**Arbitrated Loop** One topology used in Fibre Channel that provides multiple connections for devices that share a single loop, over which only two devices can communicate at once.

**Arbitrated Loop Physical Address (AL\_PA)** A one-byte value that identifies a port in an arbitrated loop topology.

**Automated Cartridge System Library Software (ACSLs)** UNIX-based software that allows multiple computing platforms to access a Nearline automated cartridge system (ACS).

## B

**Bit** (1) A unit of information equal to a 1 or a 0.  
(2) Either of the digits 0 or 1 when used in the binary numeration system. (I)

**British thermal unit (Btu)** A standard measure of a device's heat output. The amount of heat required to raise one pound of water one degree Fahrenheit.

**Btu** *See* British thermal unit.

**Byte** (1) A string that consists of a number of bits, treated as a unit, and representing a character. (I)  
(2) A number of bits, treated as a unit, and representing a character.

## C

**Calorie** The amount of heat required to raise one kilogram of water one degree Celsius. Equal to 3.968 Btu.

**cartridge** A storage device that consists of magnetic tape on supply and take up reels, in a protective housing. (IBM).

**Cartridge Scratch Loader (CSL)** In the 9840 tape drive, a device attached to the 9840 drive which automatically feeds cartridges to the drive. Cartridges are manually placed in an input bin, and

after use, are deposited automatically in an output bin.

**cleaning cartridge** A cartridge containing special material used to clean the tape path in a transport.

**Client System Component (CSC)** Software that provides an interface between the client computing system's operating system and the StorageTek library software, such as ACSLS, HSC, or LibraryStation.

**connector** An electrical part used to join two or more other electrical parts. (IBM)

**CSC** *See* Client System Component.

**CSE** *See* Customer Services Engineer.

**CSL** *See* Cartridge Scratch Loader.

**Customer Services Engineer (CSE)**  
A StorageTek employee trained to install, maintain, and repair StorageTek equipment.

**configuration** The manner in which the hardware and software of an information processing system are organized and interconnected. (I)

## D

**daisy chain** A method of device interconnection for determining interrupt priority by connecting the interrupt sources serially.

**data migration** The orderly movement of data from one storage medium to another.

**differential** A SCSI bus alternative with a maximum cable length of 25 meters (82 feet).

## E

**Enterprise Systems Connection (ESCON)** A set of IBM products and services that provide a dynamically-connected environment within an enterprise. (IBM)

**environmental requirement** Any of the physical conditions required for the protection and proper operation of a functional unit; the requirement is

usually specified as a nominal value and a tolerance range. For a device, there may be more than one set of environmental requirements; for example, one set for transport, another for storage, and another for operation. (I) (A)

**equipment rack** A free-standing cabinet or framework that holds electronic equipment.

**ESCON** *See* Enterprise Systems Connection.

## F

**fabric** The FC topology that is similar to a telephone switch in that the initiator of a "call" to the receiving port simply provides the receiver with the port address, and the fabric routes the transmission to the proper port. A fabric differs from a point-to-point or arbitrated loop topology in that it provides for interconnections between ports without having a point-to-point connection. The fabric also serves as a media type converter.

**FC** *See* Fibre Channel

**FIB** Format identifier block. A FIB is required to identify tapes written by a T9840C or T9840D tape drive. The T9840C has a unique FIB, and the T9840D has a unique FIB. Earlier generation drives detect the FIB (T9840A/B identify the FIB for tapes written by either a T9840C or T9840D while the T9840C detects the FIB for tapes written by a T9840D).

**fiber optics** The branch of optical technology concerned with the transmission of radiant power through fibers made of transparent materials such as glass, fused silica, and plastic. (E)

**Fibre Channel (FC)** The ANSI standard that defines an ultra high-speed, content independent, multi-level data transmission interface that can support multiple protocols simultaneously, support connectivity to millions of devices over copper and/or fiber optic physical media, and provides the best characteristics of both networks and channels, over diverse topologies.

**Fibre Connection (FICON)** An ESA/390 and zSeries computer peripheral interface. The I/O interface uses ESA/390 and zSeries FICON

protocols (FC-FS and FC-SB-2) over a Fibre Channel serial interface that configures units attached to a FICON supported Fibre Channel communications fabric.

**FICON** *See* Fibre Connection.

**field replaceable unit (FRU)** An assembly that is replaced in its entirety when any of its components fails. (IBM)

**firmware** An ordered set of instructions and data stored in a way that is functionally independent of main storage; for example, microprograms stored in a ROM. (I)

**FRU** *See* field replaceable unit.

**frame** A cabinet that holds an array of tape drives for attachment to a library.

## G

**GB** *See* Gigabyte.

**Gb** Gigabit, equal to  $10^9$  bits.

**GBIC** *See* Gigabit Interface Converter

**gigabit (Gb)** One billion ( $10^9$ ) bits.

**Gigabit Interface Converter (GBIC)** An adapter that connects a fiber-optic or copper-wire cable to a Fibre Channel hub or switch.

**gigabyte (GB)** One billion ( $10^9$ ) bytes when referring to disk and tape capacity. When referring to memory capacity, one gigabyte equals 1,073,741,824 in decimal notation.

## H

**hardware** All or part of the physical components of an information processing system, such as computers or peripheral devices. (I) (A)

**HBA** *See* host bus adaptor

**host** The primary computer on a network, with which other computers interact.

**host bus adapter (HBA)** A circuit installed in a multi-platform host or device that interfaces between the device and the bus.

**host interface** Interface between a network and host computer. (I)

**Host Software Component (HSC)** The StorageTek software that provides client volume location information through its Control Data Set (CDS) and provides the interface to the Nearline ACS hardware and client operator console.

**HSC** *See* Host Software Component

**hub** A piece of hardware, separate from the actual FC interface accessible on the backplane of a device, which houses the port bypass circuitry for configurations of 8 to 16 ports per hub. Hubs may be cascaded to support larger configurations, and can usually support a mix of both electrical and optical media ports in the same hub.

## I

**IBM** International Business Machines, Inc.

**ID** Identifier or identification.

**interface** Hardware, software, or both, that links systems, programs, or devices. (IBM)

**Internet Protocol (IP)** A protocol used to route data from its source to its destination in a internet environment. (IBM)

**Internet Protocol (IP) v4 address** A four-byte value that identifies a device and makes it accessible through a network. The format of an IPv4 address is a 32-bit numeric value written as four numbers separated by periods. Each number can be from 0 to 255. For example, 129.80.145.23.

**Internet Protocol (IP) v6 address** The next generation Internet protocol. It provides a much larger address space than IPv4. This is based upon the definition of a 128-bit address - IPv4 used a 32-bit address. The format of an IPv6 address is eight fields of four hexadecimal characters separated by colons (for example: 2001:0db8:85a3:0000:0000:8a2e:0370:7334).

**L**

**LCU** *See* library control unit.

**library** (1) A library is composed of one or more automated cartridge systems (ACSs), attached transports (such as cartridge drives or controller transport units), volumes placed into the ACSs, host software that controls and manages the ACSs and associated volumes, and the library control data sets that describe the state of the ACSs. (2) A robotic system that stores, moves, mounts, and dismounts cartridges that are used in data read or write operations. (3) A hardware component in a tape automation system.

**library control unit (LCU)** The portion of an automated library that controls the choosing, mounting, dismounting, and replacing of cartridges.

**library management unit (LMU)** The portion of an automated cartridge system that controls the library storage module and communicates with the Host Software Component.

**LibraryStation** Software that allows an MVS system to be used as a library control server.

**library storage module (LSM)** A housing that contains cartridges and a robot that moves the tapes between storage cells and the attached transports. Synonymous with tape library.

**LMU** *See* library management unit.

**load time** The time from when a cartridge is first put into the loader and the instruction is given to load the cartridge to when the drive becomes ready. This includes the lowering of the elevator, engaging the tape and read/write head, successfully reading of the MIR, successfully read of the FIB (if needed), and then moving the tape to the nearest location of where first data would normally be located on tape.

**long wave** Fiber optics transmission using 1310 nm wavelength laser.

**LSM** *See* library storage module.

**M**

**megabyte (MB)** Megabytes or 1,000,000 bytes for disk or tape storage, but 1,048,576 ( $2^{20}$ ) bytes of memory capacity.

**migration** *See* data migration.

**multimode** An optical fiber designed to carry multiple signals, distinguished by frequency or phase, at the same time.

**Multiple Virtual Storage (MVS)** IBM's Multiple Virtual Storage, consisting of MVS/System Product Version 1 and the MVS/370 Data Facility Product operating on a System/370 processor. (IBM)

**MVS** *See* Multiple Virtual Storage

**N**

**NCS** *See* Nearline Control Solution.

**Nearline** A registered trademark of StorageTek, this term is used in association with StorageTek's family of tape-library information storage and retrieval products.

**Nearline Control Solution (NCS)** An MVS-based Nearline software product that supports multiple MVS images sharing a library complex.

**O**

**operating system** Software that controls the execution of program and that may provide services such as resource allocation, scheduling, input/output control, and data management. Although operating systems are predominately software, partial hardware implementations are possible. (I)

**Orders Management** A StorageTek office that processes orders.

**R**

**rack** *See* equipment rack.

**Removable Media Library Software (RMLS)**

StorageTek software that runs on each iSeries host or LPAR, and provides robotic control via ACSLS to StorageTek libraries.

**RMLS** *See* Removable Media Library Software.

**S**

**SCSI** *See* small computer system interface.

**Shared Services Center** A StorageTek office that processes orders.

**short wave** fiber optics transmission using 850 nm wavelength laser.

**single mode** Fiber with a relatively narrow diameter, through which only one mode will communicate. Single mode fiber carries higher bandwidth than multimode fiber, but requires a light source with a narrow spectral width.

**small computer system interface (SCSI)** An ANSI standard for controlling peripheral devices by one or more hosts.

**software** All or part of the programs, procedures, rules, and associated documentation of a data processing system. Software is an intellectual creation that is independent of the medium on which it is recorded. (I)

**StreamLine™ SL8500 Modular Library**

**System** An automated tape library comprised of:

- Customer interface module
- Robotics interface module
- Drive and electronics module
- Storage expansion module (optional)

**switch** (1) A device or programming technique for making a selection; for example, a toggle, a conditional jump. (A) (2) In Fibre Channel technology, a device that connects Fibre Channel devices together in a fabric.

**System Assurance** The exchange of information among product-installation team members to promote an error-free installation and contribute to customer satisfaction.

**T**

**tape drive** A device for moving magnetic tape and controlling its movement. (I)

**V**

**VOLSER** *See* volume serial number.

**volume serial number** A number in a volume label assigned when a volume is prepared for use in

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