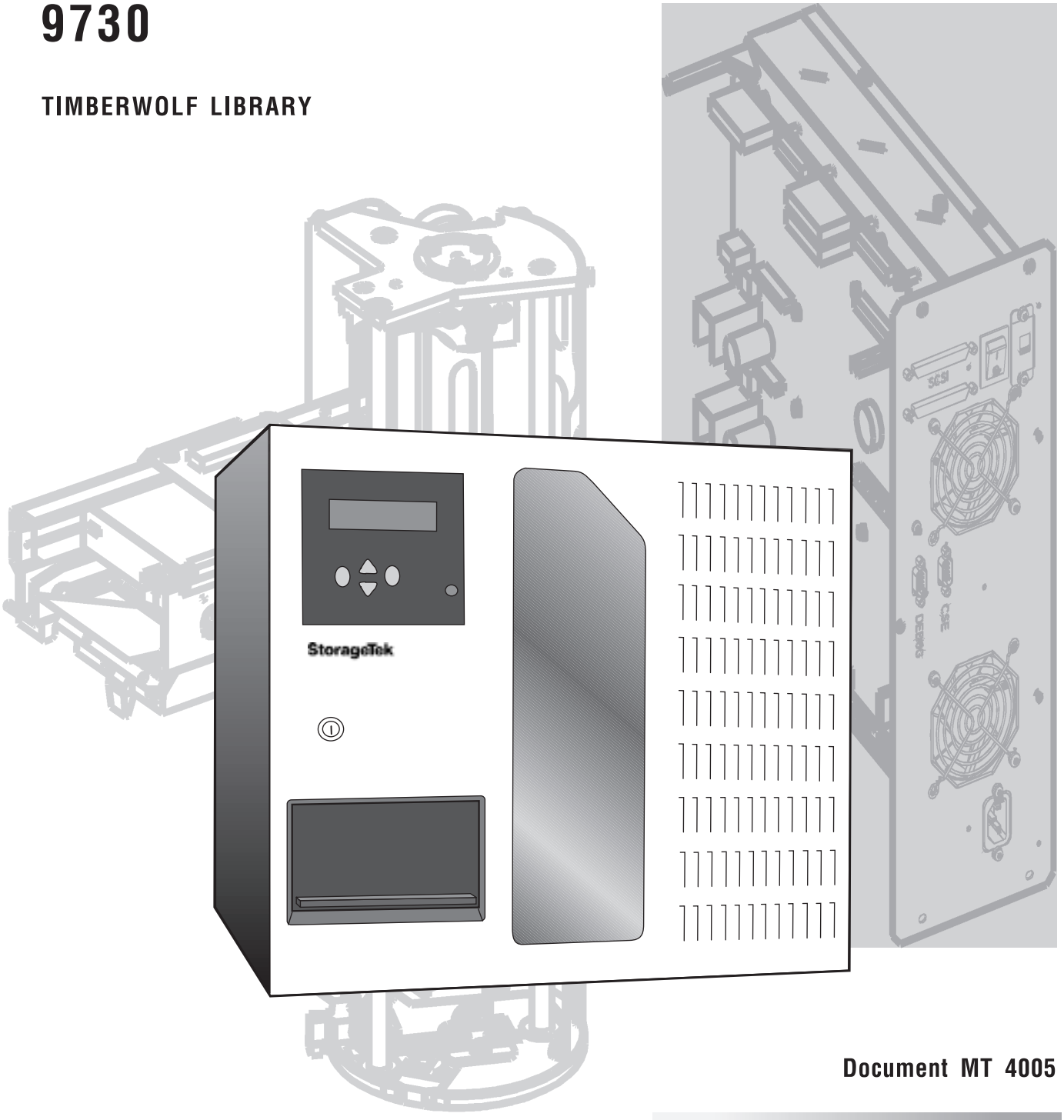
StorageTek

PRODUCT OVERVIEW

9730

TIMBERWOLF LIBRARY



Document MT 4005

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About This Product Overview

The *TimberWolf 9730 Library Product Overview* presents information for those involved in the planning and purchasing of an automated tape library. This includes MIS managers, storage administrators, system programmers, hardware support personnel, and performance specialists.

This product overview provides a high-level description of StorageTek's TimberWolf 9730 Library, including:

- Description of the TimberWolf 9730 Library.
- List of third-party software to which the library connects.
- Non-technical table listing major features and benefits.
- Description of the library's major components.
- Series of configurations for the 9730 and servers.
- List of specifications.
- Set of rack guidelines.
- Profile of typical customers.

Organization

This manual contains the following chapters:

Chapter 1 **Overview:** Introduces the library's engineering innovations at a high-level.

Chapter 2 **Highlights:** Summarizes the library's features and benefits in a handy one-page table.

Chapter 3 **Typical Customers:** Highlights which sizes of organizations will benefit from the 9730 Library.

Chapter 4 **Configurations:** Shows illustrated examples of using the library with a server or servers.

Chapter 5 **Components:** Explains the library's major components, including DLT drives.

Chapter 6 **Serviceability:** Explains that the library can be serviced by operators or Customer Services.

Chapter 7 **Rack Guidelines:** Gives helpful information about mounting the library in a standard rack.

Appendix A **Specifications:** Provides useful specifications about the library, tape drives, and media.

Glossary Contains a list of terms and abbreviations in this manual.

Index For locating information in this manual.

Related Publications

The following list contains the names and order numbers of manuals that provide additional information about the TimberWolf 9730 Library.

Ordering Publications

To order publications contact your sales/marketing representative.

Publication	Part Number
TimberWolf 9730 Library Operator's Guide	95723
TimberWolf 9730 Library Installation Manual	95724
TimberWolf 9730 Library Service Manual	95725
TimberWolf 9730Illustrated Parts Catalog	95726
TimberWolf 9730/7430 Library SCSI Reference Manual	95727
TimberWolf 9730 Library System Assurance Guide	MT 5002

Overview

1

The following topics give you a glimpse of the company and the product. *Expertise* outlines StorageTek's marketplace dominance. *A New Breed* discusses the 9730's bloodlines and capabilities. The remaining topics provide specific information about Accuracy and Speed, Flexibility and Scalability, Total Cost, the Operating System, Connectivity, and *Multi-platform Capability*.

Expertise

StorageTek customers include major, multi-national enterprises. In fact, entire national governments are using StorageTek products to address their demanding information storage and retrieval needs. Banks, brokerages, and armed forces worldwide choose StorageTek products because they are accurate, reliable, and robust. StorageTek has earned a solid reputation by building library systems based on advanced rotational robotics and sophisticated cartridge tape subsystems.

A New Breed from Proud Parents

StorageTek's TimberWolf 9730 Library, a fifth generation library product, brings the same proven quality and technology to a compact and affordable library. Designed to meet the backup and archiving needs of small- and medium-sized businesses, plus enterprises using distributed data, the 9730 creates an innovative new class of entry-level library.

Capitalizing on the proven technology of StorageTek's larger libraries, the compact 9730 stores up to 2.1 terabytes of information (compressed) in a unit about the size of a workstation. Plus, you get the quality, reliability, and solidity of a leading engineering company that has revolutionized automated cartridge tape storage and retrieval.

Accuracy Plus Speed

Advanced rotational robotics combined with StorageTek's camera-based vision system ensure accuracy in storing and retrieving your data. The robot's close proximity to the cartridge cells means you benefit from the system's retrieval and audit speed. Advanced technology enables the 9730 to calibrate itself, so you don't have to.

Flexibility and Scalability

The 9730 can grow as your business grows, which protects your investment as well as your information. For example, you can configure your 9730 with one or two DLT drives and 20 cells, then upgrade to three or four DLT drives and up to 30 cells. Add more 9730s as your organization grows and your storage needs increase.

Low Total Cost

When you consider product price, availability, and serviceability, the total cost of ownership makes the 9730 an easy choice. Fewer parts mean increased dependability; for example, the 9730 requires no scheduled periodic maintenance. If you need service, you can count on dedicated international service personnel.

Operating System Integration

Operating systems are continually evolving and becoming more powerful. What was the perfect OS for your needs last month, suddenly can become obsolete. The 9730 accommodates whatever OS you choose, now and in the future. The library integrates seamlessly with the universality of UNIX, the enterprise-wide power of Windows NT, and Novell NetWare. Regardless of your OS, the 9730 performs accurately and reliably.

Connectivity

Complementing its own software products, StorageTek has teamed with leading software developers in the areas of backup and archive, hierarchical storage management (HSM), media management, and disaster recovery. This partnering ensures easy connectivity with leading solutions, such as:

- StorageTek CAM for Solaris
- StorageTek REEL Backup
- Cheyenne ARCserve
- Seagate Backup Exec
- Legato NetWorker
- IBM ADSM
- Spectra Logic's Alexandria
- Veritas NetBackup
- Platinum NetArchive

Multi-platform Capability

Freeing you from worry about platform issues may be the 9730's major benefit. Your platform can range from modest workstation to muscular midrange; choose whatever works best for your business. The 9730 performs well with all hardware, making the platform transparent to users. The 9730's industry-standard small computer system interface (SCSI) ensures your hardware will integrate smoothly.

StorageTek is working to ensure compatibility with Fibre Channel, so when it becomes the standard, your new StorageTek product will be up to date.

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Highlights

2

You can order the TimberWolf 9730 in rack-mountable, desktop, and deskside versions—it is a SCSI-based automated library about the size of a workstation.

Without tape drives, the 9730 weighs 50 kg (110 lbs) and is the least expensive library in the proven TimberWolf series.

Designed to meet the backup and archiving needs of small- and medium-sized departments and workgroups, plus enterprises with distributed data, the 9730 boasts many features and benefits.

Feature	Benefit
Advanced rotational robotics	Smaller and less expensive
Significantly fewer parts	Increased reliability
Camera-based vision system	Accuracy
Unattended operation	Cuts costs, fewer personnel
Stores up to 2.1 compressed TB of data	Large, flexible data capacity
Up to 144 GB/hour data transfer rate	Fast data transfer
20- and 30-slot versions for scalability	Grows as your needs increase
Up to four DLT drives (4000 and 7000)	Configuration flexibility
Supports UNIX/Windows NT/NetWare	Integrates with all operating systems
Rack mountable	Easy placement and access
Automatic drive cleaning	Reduces costly service calls
Operator panel and front window	Convenient monitoring
Hot swappable drives	Availability
High-speed audit (less than 1 minute)	Saves time
Lockable front door with safety interlock	Data security and safety
Cartridge access port (CAP)	Change a tape while operating
Customer-serviceable key components	Lower service cost
Five-cartridge Magazine	Faster manual cartridge swaps

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Typical Customers

3

Small- to medium-sized businesses will benefit greatly from the 9730's compact size and unattended operation. The 9730 can operate beside a desk or in a remote telephone closet. And it can grow as the business grows.

Far-flung enterprises with distributed data can gain a competitive advantage by using several libraries in satellite offices. The 9730 can operate quietly in the background providing years of dependable service.

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Configurations

4

The 9730's flexibility protects your investment because you can easily enhance storage capacity through upgrading and adding libraries as your storage and retrieval needs increase.

Choose from deskside, desktop, and rack-mount models. Typical configurations include:

- Single server per library, dedicated drives
- Multiple servers to one library, dedicated drives per server
- Multiple servers to multiple libraries, dedicated drives per server
- Multiple servers to multiple libraries, all drives available to any server

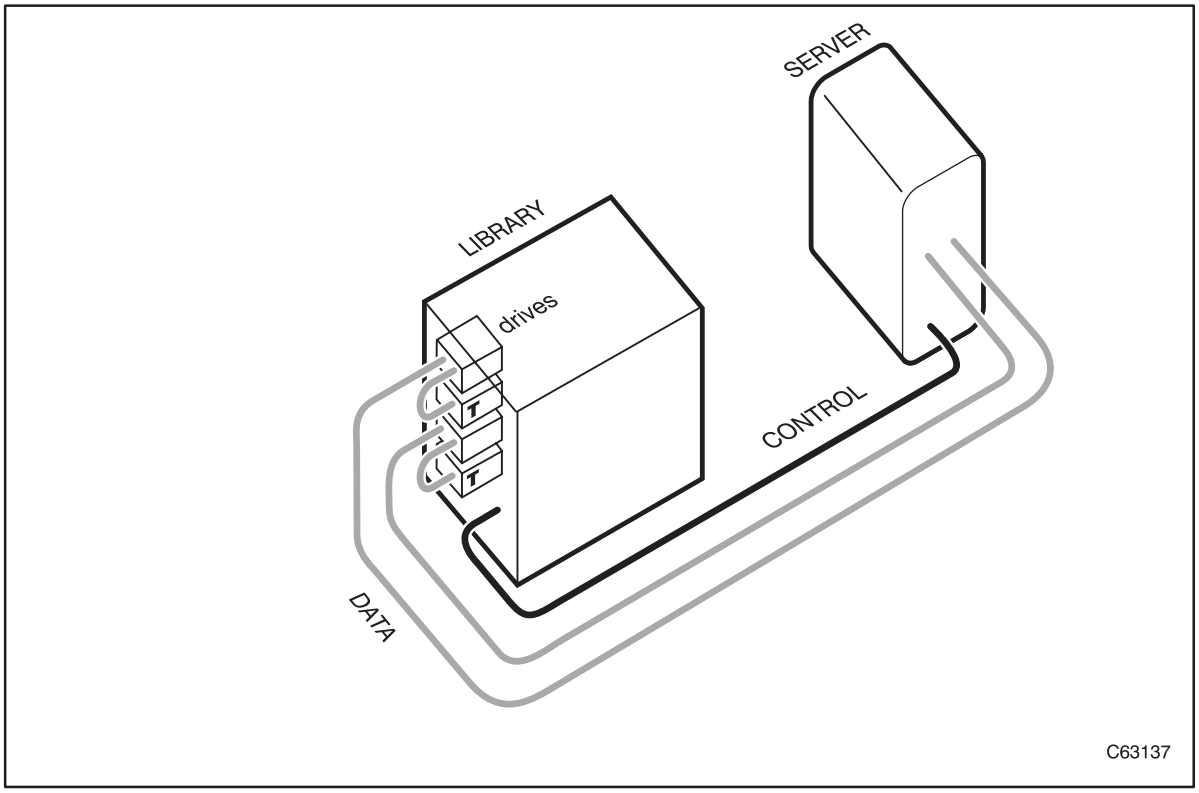


Figure 4–1. Single Server with Dedicated Drives

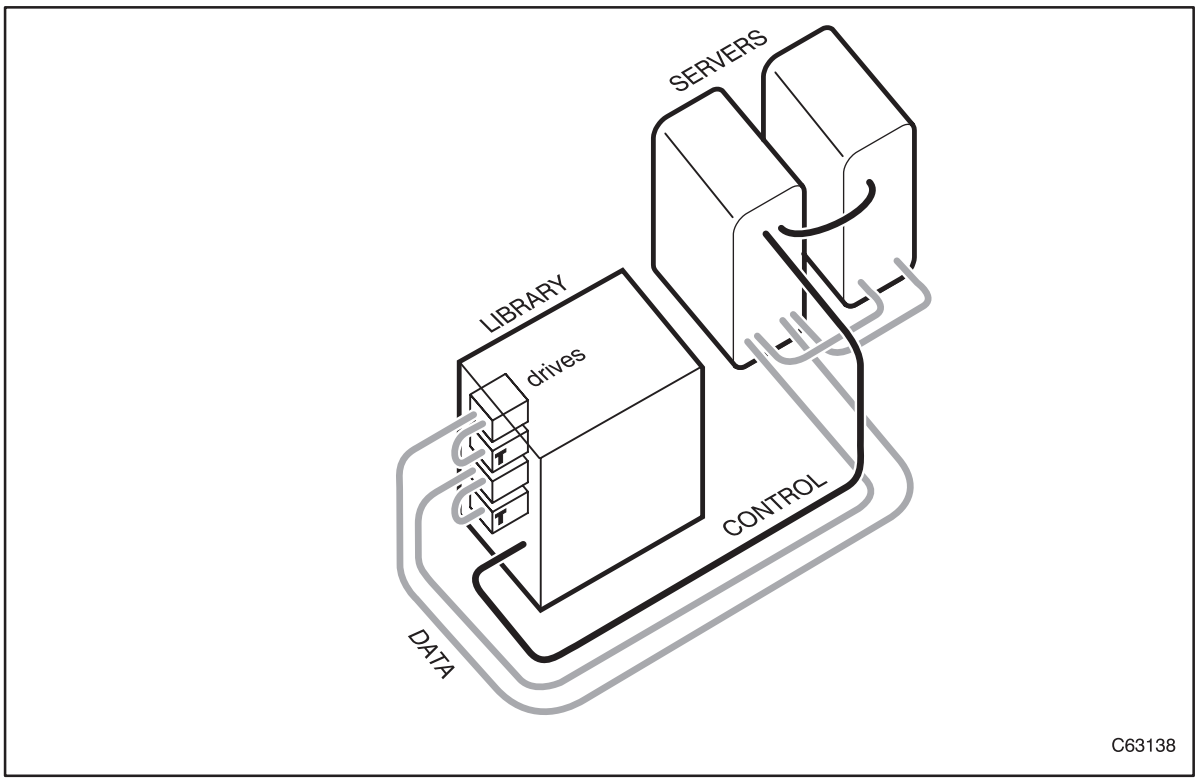


Figure 4–2. Multiple Servers to one Library with Dedicated Drives

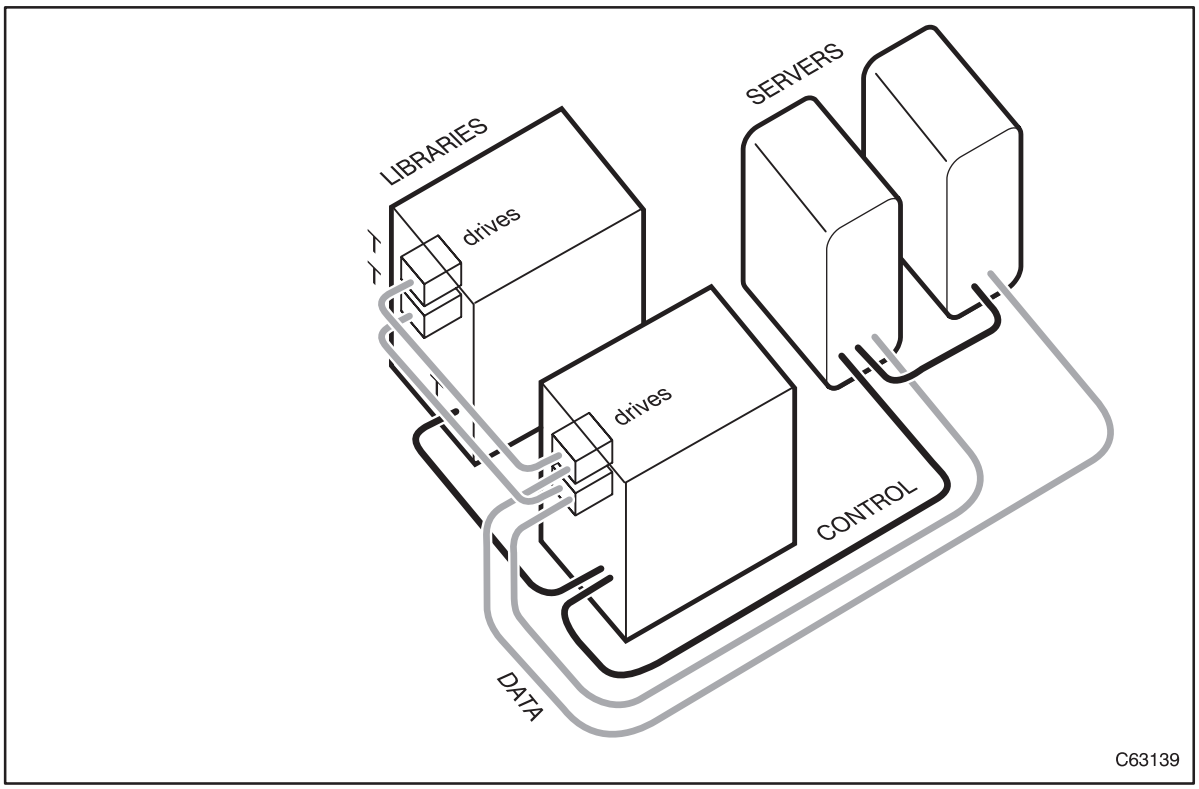


Figure 4–3. Multiple Servers to Multiple Libraries with Dedicated Drives

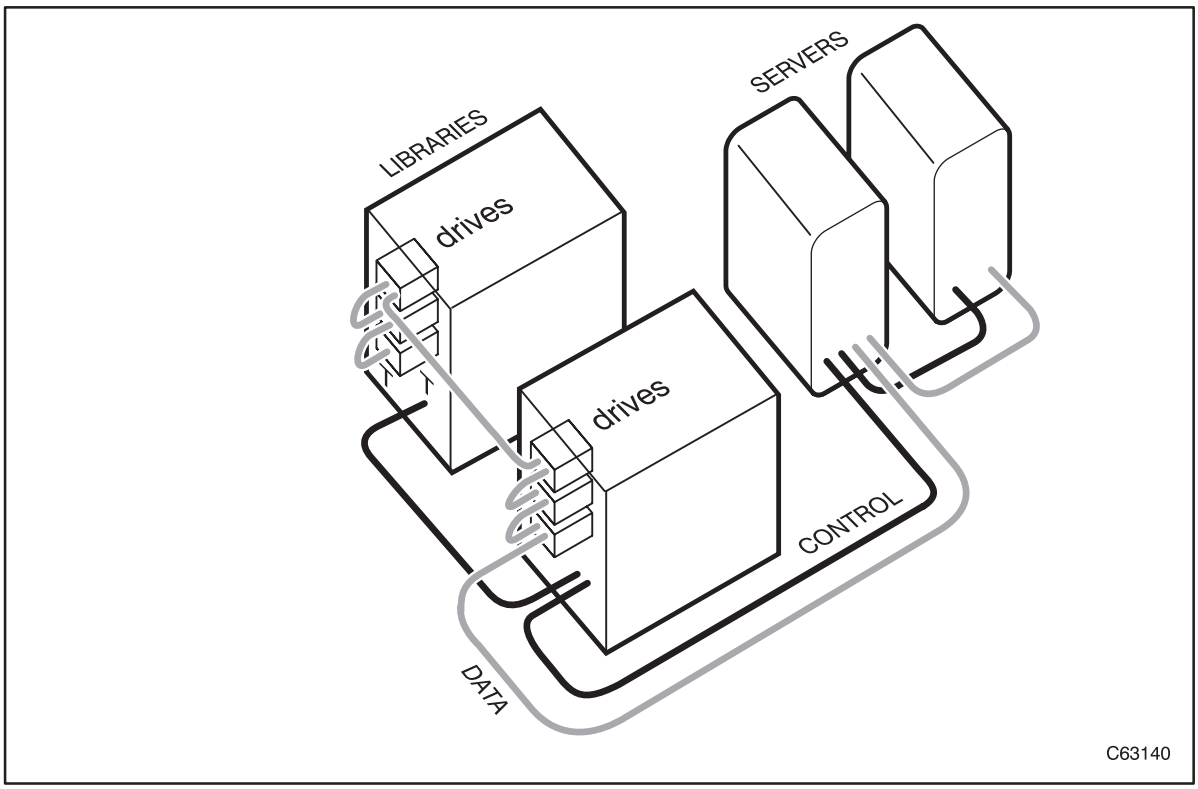


Figure 4–4. Multiple Servers to Multiple Libraries with all Drives Available

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Components

5

The 9730 uses a 32-bit microprocessor to control robotics motion, the vision system, and the SCSI command interface. The user-configurable SCSI bus supports a full complement of commands with either single-ended or differential SCSI alternatives.

Major components include:

- Advanced Rotational Robotics
- Hand–Camera Assembly
- Operator Panel
- Vision System
- Cartridge Cells and CAP
- Load Latch
- Media Type
- Tape Drives

Advanced Rotational Robotics

The cartridge handling system consists of:

- A rotational mechanism for horizontal positioning
- A vertical positioning mechanism
- A hand-camera assembly with cartridge picker, load latch, and fine positioning

Low-friction ball bearing DC brush motors with encoders drive the three mechanisms using a highly reliable, proprietary belt system that provides smooth operation. The belt-drive system requires no periodic maintenance and operates quietly, making it ideal for office environments.

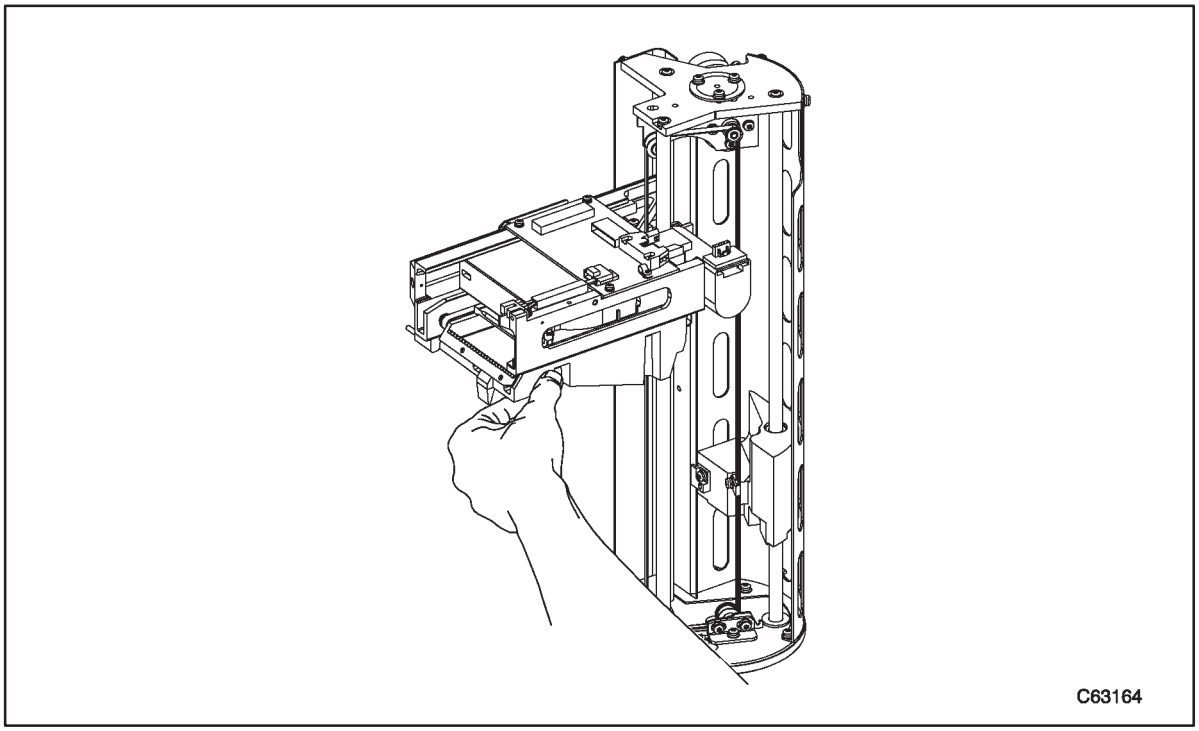


Figure 5–1. Robot and Hand-camera Assembly

Hand-Camera Assembly

The 9730 hand uses a cartridge picker rather than a gripper. The picker "hooks" a detent in the bottom of the cartridge tape and pulls the cartridge from a cell or drive. Once hooked, the cartridge is pulled completely into the hand housing, ensuring cartridge retention even during a power outage.

A sensor determines whether the cartridge is fully retracted into the hand housing, enabling the robot to proceed with repositioning. Once repositioned, the hand pushes the cartridge into its destination. A retention feature, designed into each cell array, mates with a recess in the DLT cartridge. This feature ensures that a cartridge remains seated once it is placed in a cell.

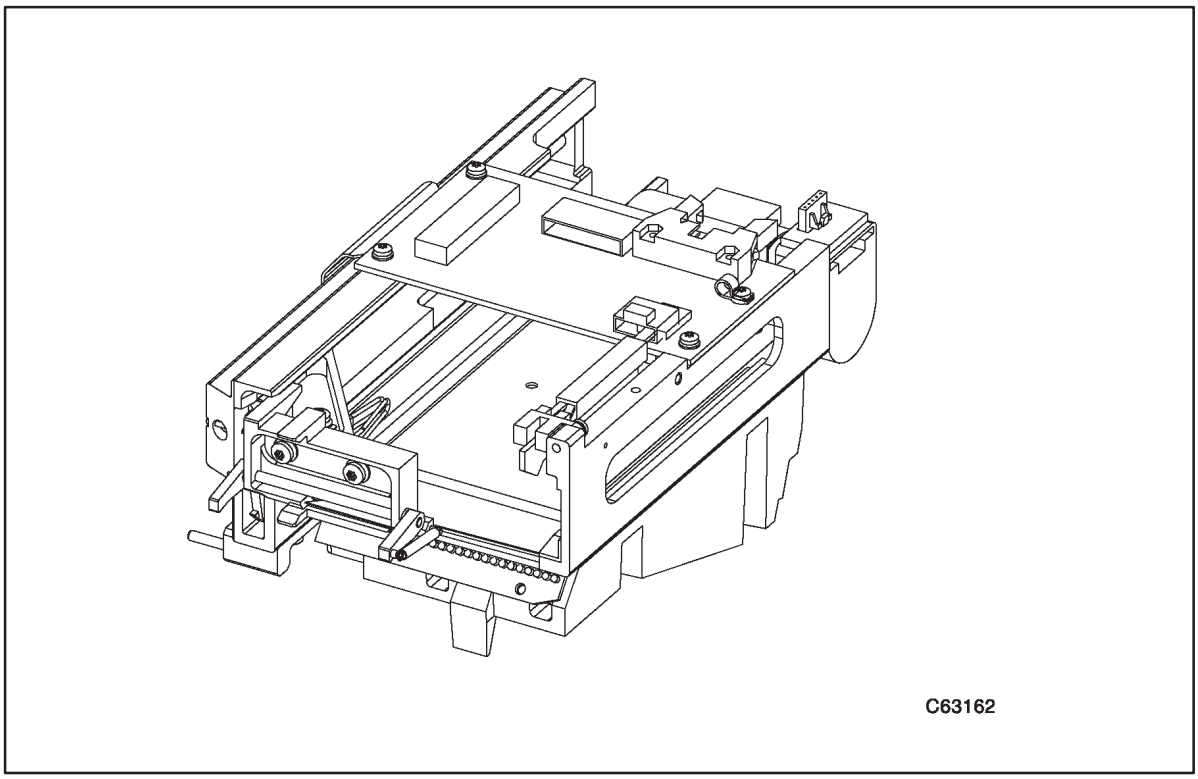


Figure 5–2. Hand-camera Assembly

Operator Panel

The operator panel features three indicators, five function buttons, and a four-line 20-character display that enable you to:

- Define configuration
- Run diagnostic tests
- Display library and tape drive status
- Display error information
- Reset the library

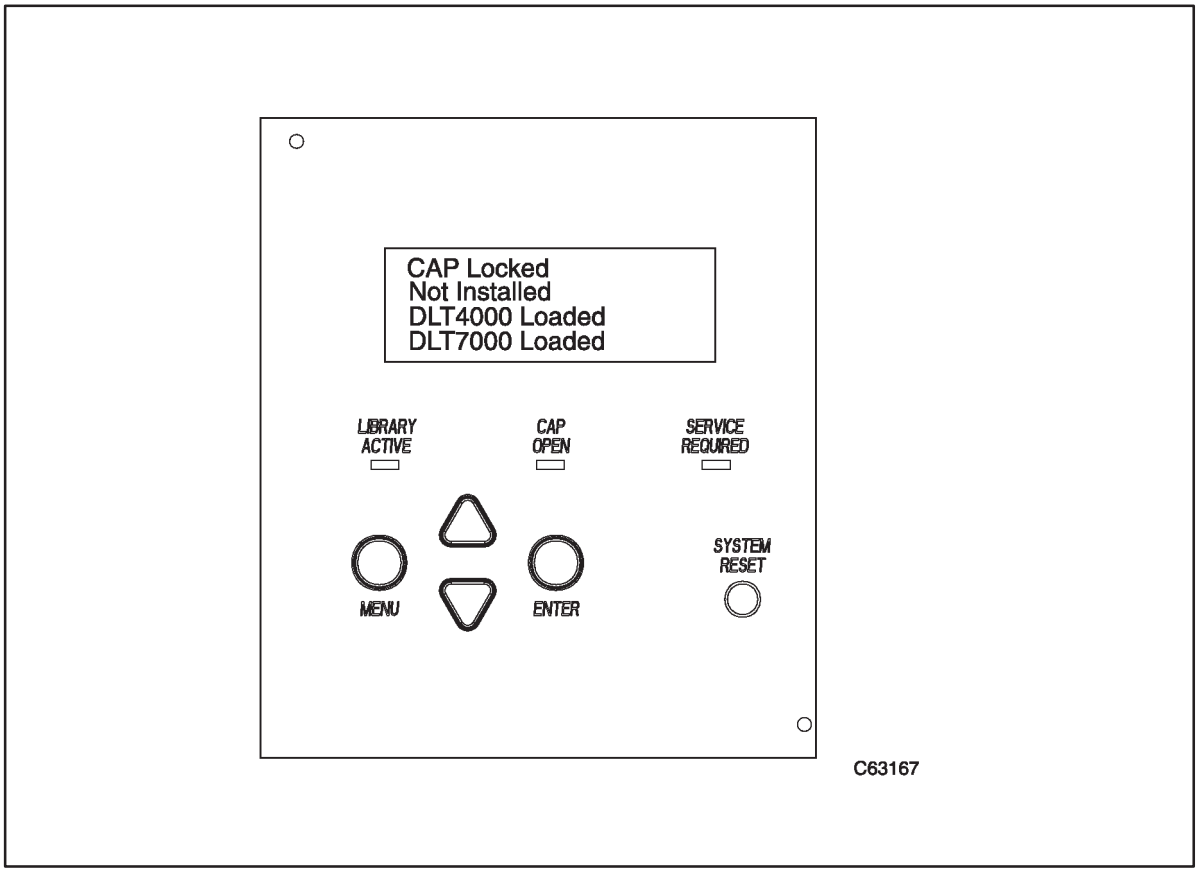


Figure 5–3. Operator Panel

Vision System

The 9730 vision system module:

- Reads bar code labels (doesn't just scan them)
- Verifies target calibration using fine positioning
- Detects empty cells

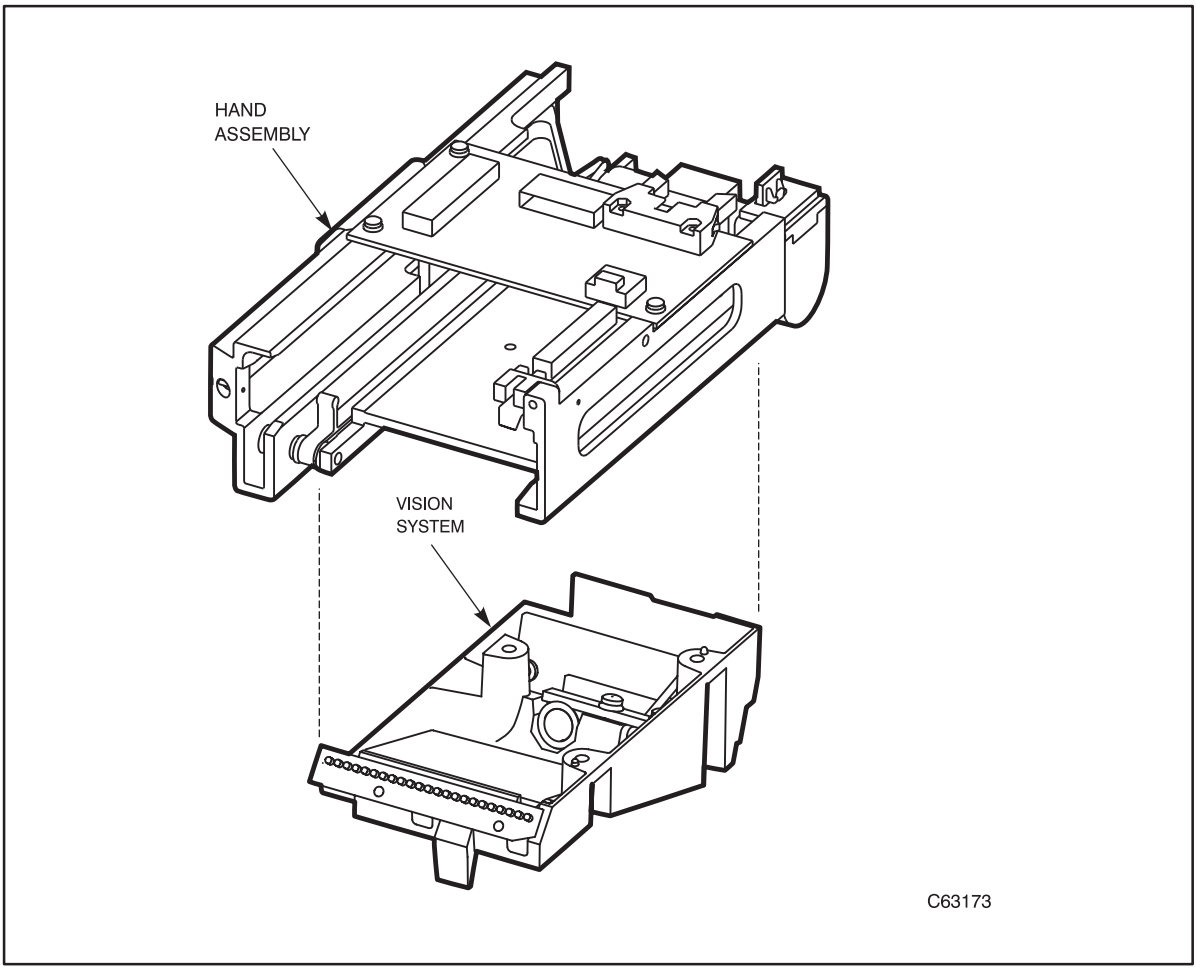


Figure 5–4. Vision System

The line-scan camera design uses a 2,048 element linear charge-coupled device (CCD) imaging array with minimal support circuitry. The camera resides in a housing attached to the hand and is faster and more accurate than a laser scanner. The vision system achieves better accuracy than the competition by calibrating to multiple targets.

The vision system uses high intensity, long life, subminiature light emitting diodes (LEDs) as the light source. The vision system module integrates the light, optics, and imager array in a way that enables the complete vision system to be assembled, tested, and qualified in a single fixture. This simplicity provides exceptional reliability and accuracy at low cost and enables the vision system to read labels in areas with high ambient light.

A unique parallax-corrected, repeating bar-code pattern is molded into the top of each cartridge cell in line with the vision system, enabling empty-cell and unlabeled-cartridge detection on-the-fly during an audit. The 9730 boasts reduced audit time because it doesn't need mechanical verification or the addition of a cartridge-detection sensor.

Cartridge Cells and CAP

You can order the TimberWolf 9730 in two configurations: The entry-level model with 20 storage cells and the high-capacity model with 30 cells. The 20-cell model is physically identical to the 30-cell model, so you can upgrade using hardware and by reconfiguration at the operator panel.

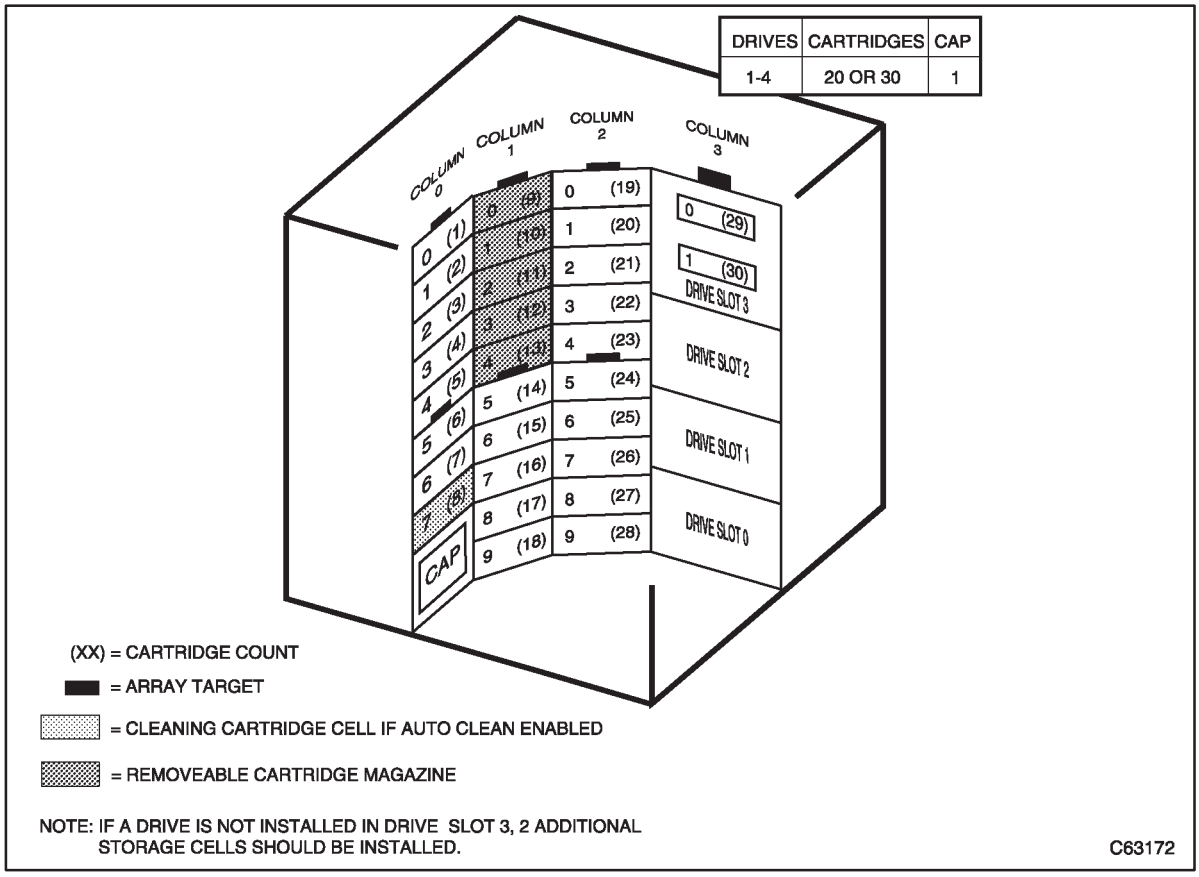


Figure 5–5. Cartridge Cell Array

The cartridge access port (CAP) allows users to load and remove cartridge tapes directly from the 9730 while it continues operating. Users also can open the front door for batch jobs involving mass cartridge changes, like payroll. A handy five-cartridge magazine facilitates fast changes and simplifies cartridge tape storage.

Tape Drives

The 9730 accommodates up to four Digital Linear Tape (DLT) drives, (DLT4000 and/or DLT7000). The drives tie to the host through the SCSI bus

using either the single-ended or differential alternatives. Cables can be connected to each drive or the drives can be daisy-chained to each other on the SCSI bus. When four drives are installed, the 9730 supports 28 cells.

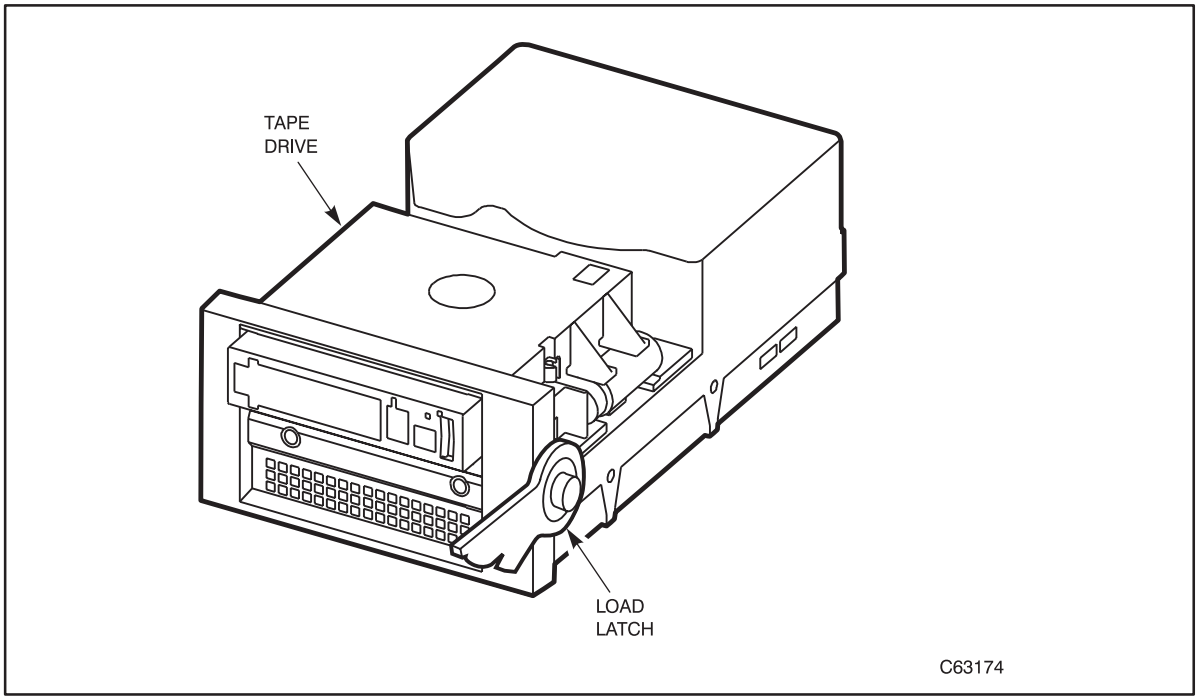


Figure 5–6. Tape Drive

DLT4000 Features

- 128-track serial serpentine
- Recording density of either 62,500 or 82,000 bits per inch
- Formatted capacity of 40 GB/cartridge (2:1 compression)
- Sustained transfer rate of 3 MB/sec (compressed data)
- Fast/narrow SCSI alternative

DLT7000 Features

- 208-track serial serpentine
- Recording density of 86,000 bits per inch
- Formatted capacity of 70 GB/cartridge (2:1 compression)
- Sustained transfer rate of 10 MB/sec (compressed data)
- Fast/wide SCSI alternative

Load Latch

StorageTek engineers developed the load latch to harness the full performance of tape drives. Simple and elegant, the load latch enables the robot to mount cartridges into the drives quickly and automatically. This innovation cuts manufacturing costs, which translates to a lower purchase price. And fewer parts means greater reliability than other drive designs, another significant benefit.

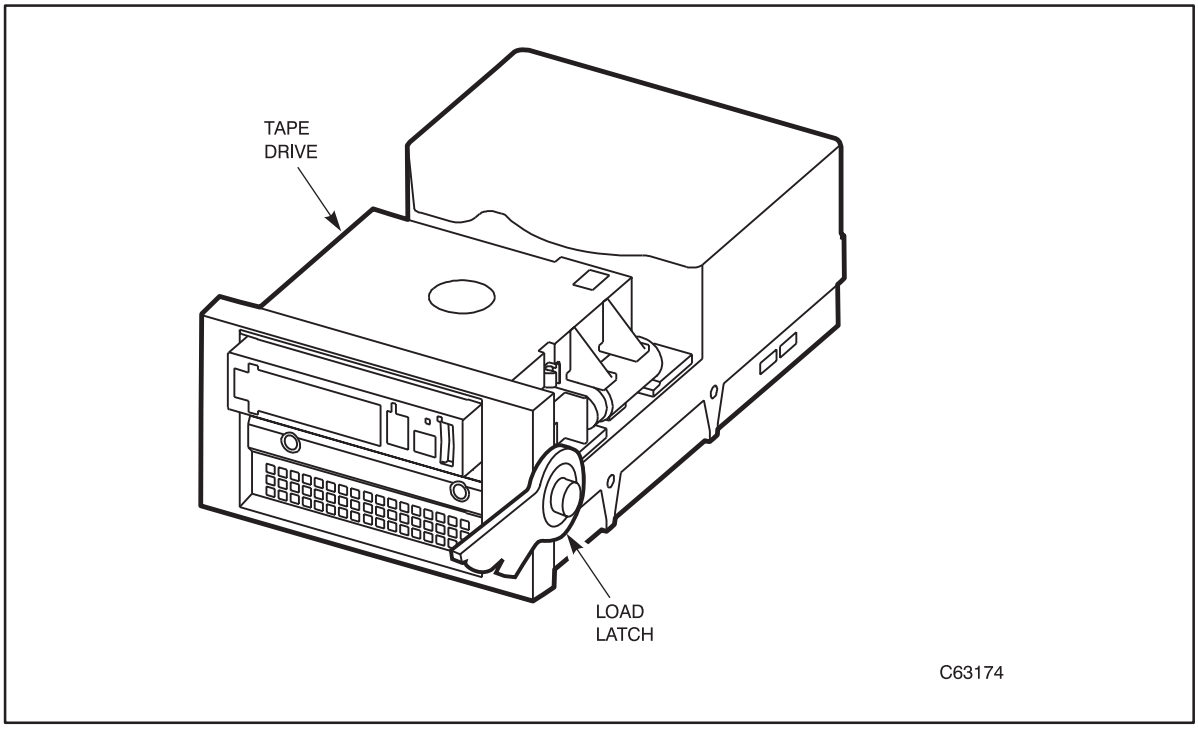


Figure 5–7. Load Latch

Media Type

The library reads and writes on CompacTape III, III XT, and IV cartridge tapes. The cartridge tapes are 10.2 cm by 10.2 cm (4-in. by 4-in.) plastic cartridges that contain 548.6 meters (1,800 feet) of 1/2 inch magnetic tape (1,200 feet for type III). Depending on the type of data, the type of drive, and the compaction and compression algorithms, one cartridge tape can store up to 70 GB of data. Each cartridge tape has the following additional features:

- A write-protect switch to prevent unwanted overwriting.
- A unique bar-coded volume/serial (VOLSER) number that identifies the tape to the host computer, which then indexes stored files to VOLSER numbers.

Serviceability

6

Library Service Access

The 9730 chassis enables full service access from the front and rear of the machine while it remains mounted in an industry-standard rack. The library power supply, library controller, and cooling fans reside in a single slide-out module, which can be easily removed from the rear of the machine. You can remove and replace a tape drive while the library remains operational. Because the 9730 is rack mountable, you benefit from easy installation with servers, disk, and network equipment.

Customer Services

StorageTek's Customer Services team uses advanced systems and tools to support customers. The Customer Services team of almost 2,000 employees supports 22,000 customers in nearly 200 locations worldwide.

StorageTek plans to make available three service offerings for the 9730:

BronzeTek assists customers with technical resources to self-maintain their StorageTek equipment. The customer provides the labor necessary to maintain the equipment and StorageTek provides access to knowledge and parts to assist the customer.

SilverTek provides a reduced-cost service option for customers that do not require immediate on-site response and agree to replace certain parts that are designated by StorageTek as customer replaceable.

Availability-Plus supports customers with business-critical support needs requiring same day, on-site response to service equipment.

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Rack Guidelines

7

The self-contained 9730 can be mounted in a rack with other rack-mountable equipment, subject to power and rack loading considerations.

The 9730's dimensions are:

- Width: 48.26 cm (19.0 in.)
- Depth: 72.64 cm (28.6 in.)
- Height: 44.45 cm (17.5 in.)

A standard 19-inch-wide rack should have 10 rack units of space to accommodate the library's height. The library sits on a tray provided by the customer and attaches to the rack's front mounting brackets with four bolts.

The rack can have a rear door, which must promote air flow because the library's cooling fans draw air from the rear and exhaust it to the front. The rack should not have a front door. A rear door must have at least 10.16 cm (4 in.) of clearance from the back of the library (which means the rack must be at least 83.82 cm (33 in.) deep.

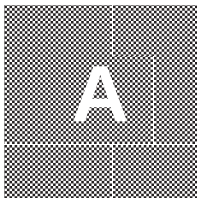
The 9730 weighs approximately 50 kg (110 lbs) without drives or media. When installing the 9730 in a rack, take care to keep the rack from tipping over. Due to the 9730's weight and size, two people are needed to install it in a rack.

The 9730 relies on the power cord's ground point for its earth-ground connection. All electrical connections, either direct to the wall or to a power strip in a rack, must be properly grounded. Consider proper electrical circuit and power strip overload protection.

Servicing a rack-mounted 9730 requires the front and rear to be clear of obstructions for 61 cm (24 in.).

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Specifications



The following specifications apply to the library and to tape media. Specifications include physical, electrical, and environmental information.

Table A–1. Physical Specifications	
Item	**Measurement**
Width	48.3 cm (19 in.)
Height	44.5 cm (17.5 in.)
Depth	72.6 cm (28.6 in.)
Rear clearance, library to any wall or other cabinet	20.5 cm (8 in.)
Front clearance, library to any wall or other cabinet	50.8 cm (20 in.)
Minimum rear clearance required to remove/replace the electronics module or the tape drives	61 cm (24 in.)
Weight with no drives	50 kg (110 lb)
Weight with 4 drives	68 kg (149 lb)

Table A–2. Power Specifications	
Item	**Measurement**
Input Voltage	90–264 VAC, single phase
Frequency	47–63 Hz
Maximum power consumption (library)	1.0 A at 120 V *or* 0.5 A at 240 V
Maximum power consumption (each DLT4000 drive)	0.8 A at 120 V or 0.42 A at 240 V
Maximum power consumption (each DLT7000 drive)	0.92 A at 120 V *or* 0.46 A at 240 V

Table A–3. Functional Data	
Item	**Measurement or Comments**
Media	DLT CompacTape IV, III, and IIIXT
Number of cells	20 or 30 (28 with four tape drives)
Number of tape drives	Up to four DLT4000 or DLT7000 tape drives
Average cartridge access time	Six seconds
Audit time	Less than one minute
Robotics control	SCSI–2 media changer command set, single–ended or differential (selectable in field)
Cartridge access port	Single cartridge capacity
Bar code reader	Standard
Serviceability	Key components are customer–serviceable. The drives are hot–swappable (with independent SCSI interface)

Table A–4. Data Capacity and Throughput		
Capacity (30 Cells, CompacTape IV)	**Uncompressed**	**Compressed (2:1)**
DLT4000	600 GB	1.2 TB
DLT7000	1.05 TB	2.1 TB
Throughput (Four Drives)	**Uncompressed**	**Compressed (2:1)**
DLT4000	21.6 GB/hr.	43.2 GB/hr.
DLT7000	72 GB/hr.	144 GB/hr.

Table A–5. Reliability	
Item	**Measurement**
Mean exchanges between failures (MEBF)	1,000,000
Mean time to repair (MTTR)	less than 30 minutes

Table A–6. Environmental Specifications			
Item	**Measurement**		
	Operating	**Storage**	**Transit**
Temperature	+16 to +32°C (+60 to +90°F)	+4 to +32°C (+40 to +90°F)	–40 to +60°C (–40 to +140°F)
Humidity	10 to 90%	10 to 95%	10 to 95%
Wet bulb (max, non–condensing)	+35°C (+95°F)	+33°C (+92°F)	+35°C (+95°F)
Altitude	–76 to 3,048 m (–250 to 10,000 ft)		

Table A–7. Agency Certifications	
Category	**Certification**
Safety	CSA standard CAN/CSA–C22.2 no. 950–M93
	UL standard 1950, Third Edition
	EN60950
Emissions	FCC #47, Part 15, Subpart B, Class A
	EMC Framework AS/NZS 3598: 1995 (Australia, N.Z.)
	VCCI Class A
	European Union CE emissions standards
	Canadian EMC Law; ICES–003
	BCIQ EMC Law CNS 13438 (Taiwan)
Immunity	European Union CE immunity standards

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Glossary

This Glossary contains terms and abbreviations found in this manual. Refer to glossaries in other manuals for terms about other StorageTek products.

A

Advanced Rotational Robotics StorageTek's proprietary robotics system that stores and retrieves cartridge tapes faster and more accurately than other systems.

C

Camera-based vision system Reads barcode labels on cartridge tapes instead of laser scanning them. The camera-based system performs faster and more accurately than a laser scanner.

Cartridge An encased volume of removable storage media (typically CompacTape IV, Digital Linear Tape).

Cartridge Cell A storage space for a cartridge tape.

Cartridge Access Port (CAP) A device that allows you to enter/eject a cartridge into/out of the library without stopping the robotics movement.

Cell See cartridge cell.

Configuration The ways that a library or libraries can be connected to a server or servers.

Connectivity The ability of a system to operate easily and seamlessly with proprietary software.

CSE Customer Services Engineer.

D

DLT Digital Linear Tape

DLT4000 and DLT7000 High-performance, high-capacity tape drives manufactured by the Quantum Corporation. They feature formatted capacities of 40 GB and 70 GB, respectively, for Digital Linear Tape.

H

Hand-camera The assembly combining the vision system and the robot hand. The hand-camera mounts and dismounts cartridge tapes as well as picks and replaces them.

M

Multi-platform A system's ability to work easily with computers made by various manufacturers. Formerly known as open systems.

N

NetWare A Novell operating system.

O

Operating System Software that controls the operation of a computer, for example, Novell NetWare, UNIX, and Windows NT.

Operator Panel A panel that enables users to control the library.

R

Rack Industry-standard frame that supports the 9730 Library, servsers, and related computer equipment.

Rotational Robotics StorageTek's system of accurate and fast advanced robotics.

S

SCSI Small Computer Systems Interface.

Slot A location for tape drives.

StorageTek Storage Technology Corporation.

T

Tape drive An electromechanical device that writes to, reads, and shuttles magnetic tape. (Up to four DLT4000 and DLT7000 tape drives can be combined in the library.)

U

UNIX A family of operating systems that runs on a wide variety of computers.

V

Vision system A camera-based system that reads barcodes (more accurate than laser scanners).

Windows NT A Microsoft operating system.

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