

ESL and MSL Tape Libraries - Installation, Management, Tips & Techniques

Chuck Roman

Technical Advocate
Nearline Storage Division



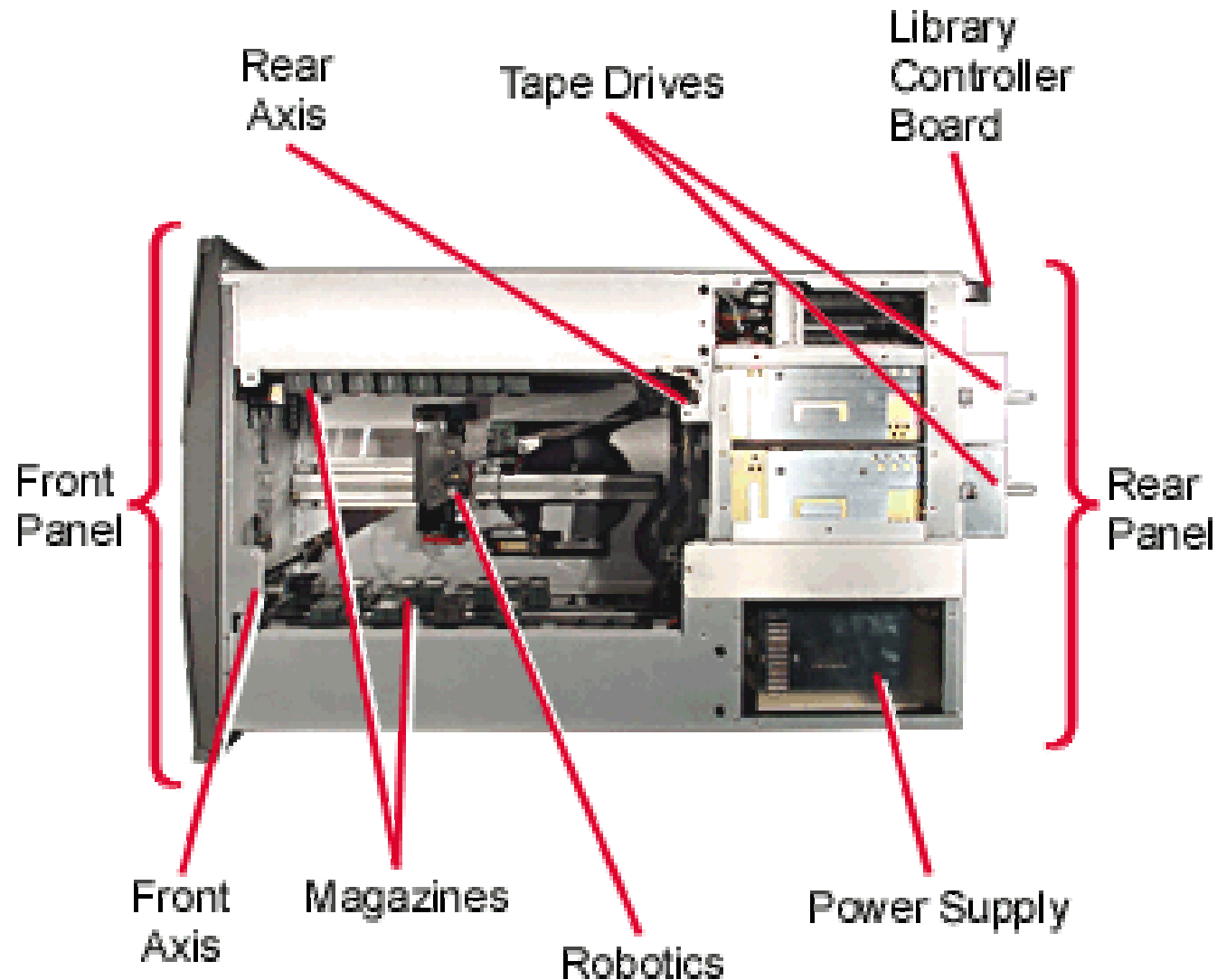
Overview

- Introduction
- MSL libraries
 - Components
 - Cabling
 - Pass-through
 - Management
- ESL libraries
 - Components
 - Cabling
 - Pass-through
 - Management

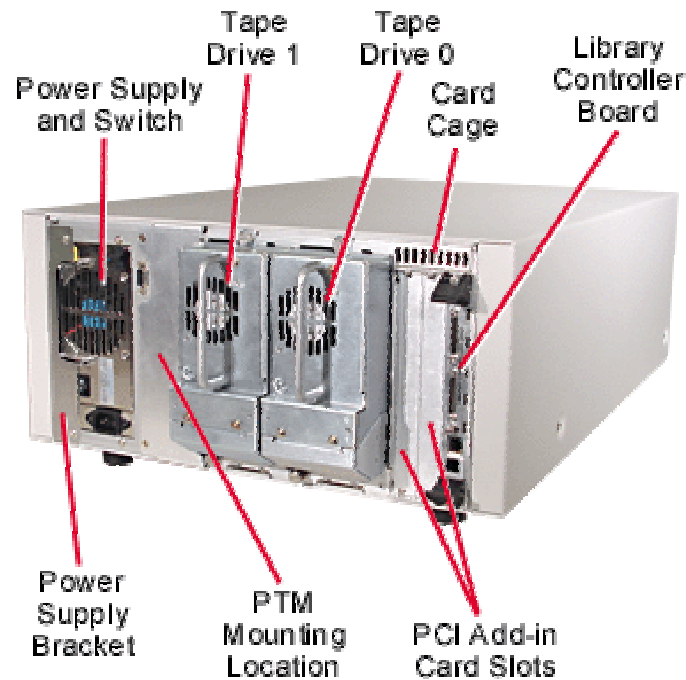
HP StorageWorks MSL5000



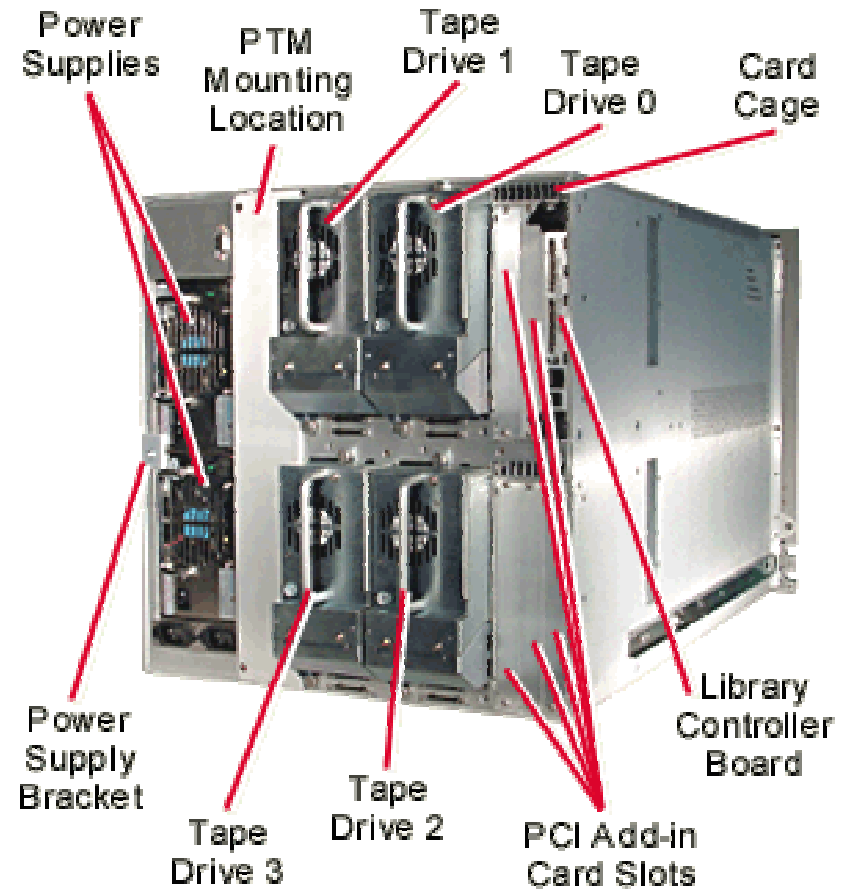
MSL5000 top view



MSL5000 rear view

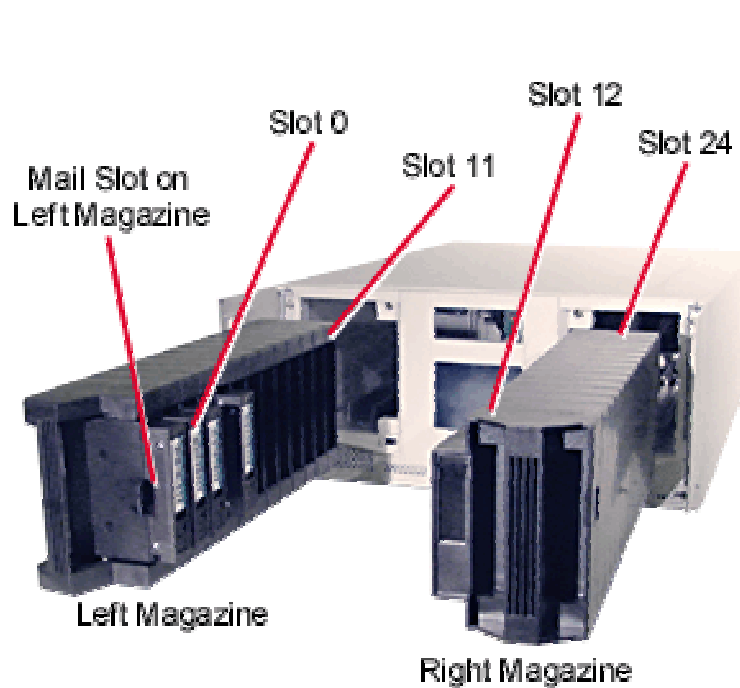


MSL5030

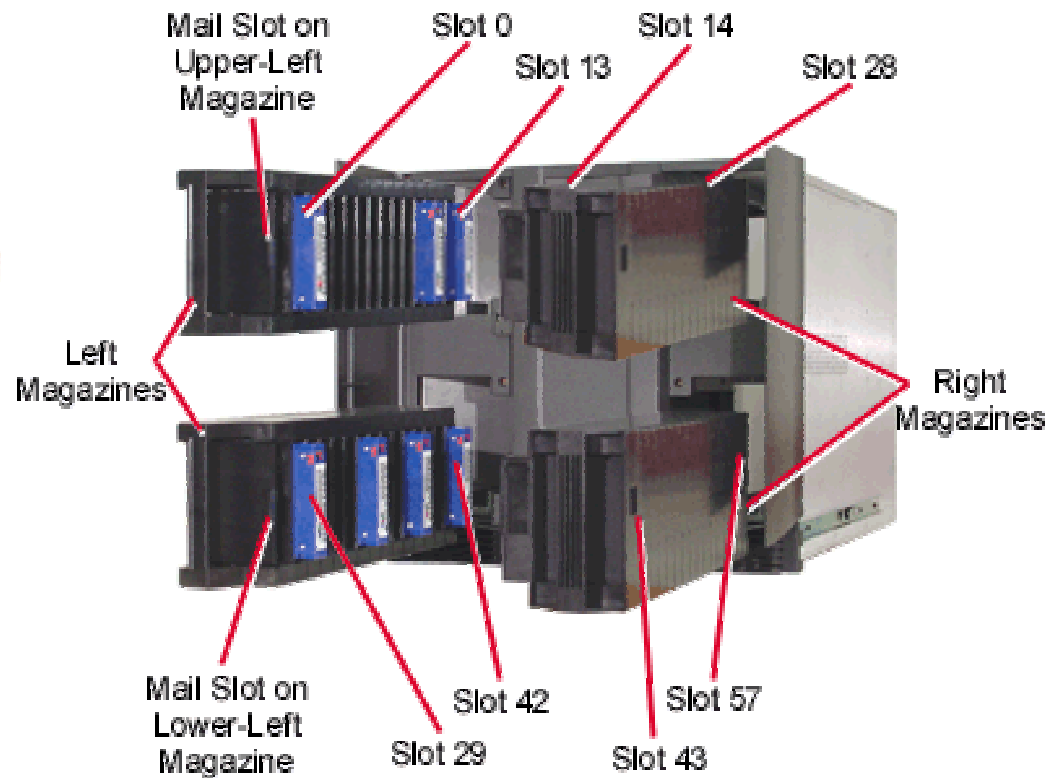


MSL5060

MSL5000 magazines

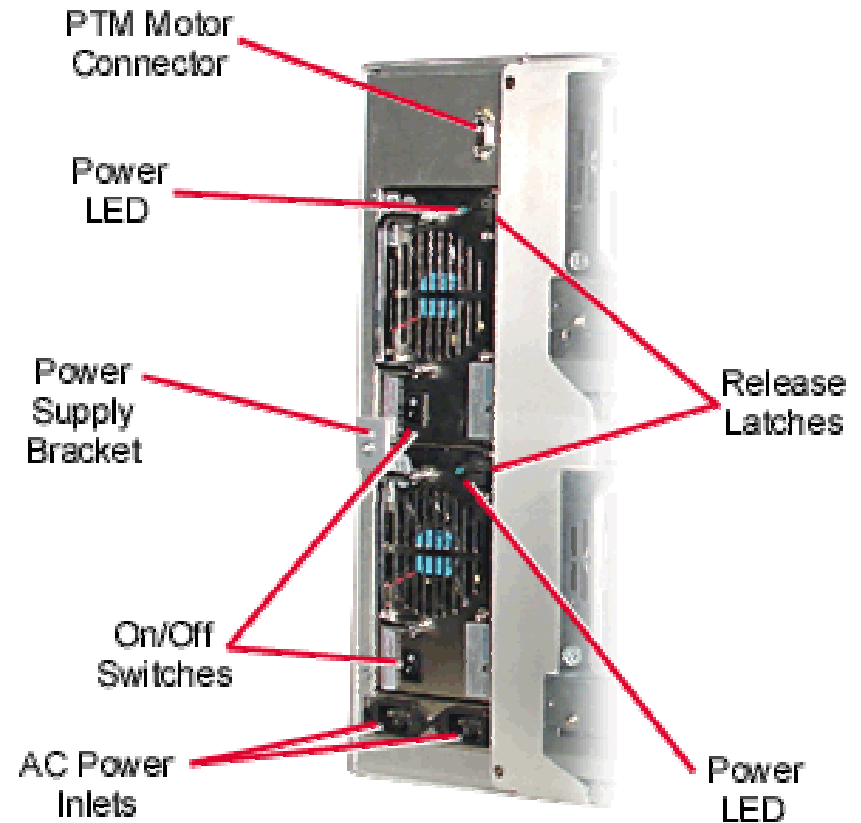
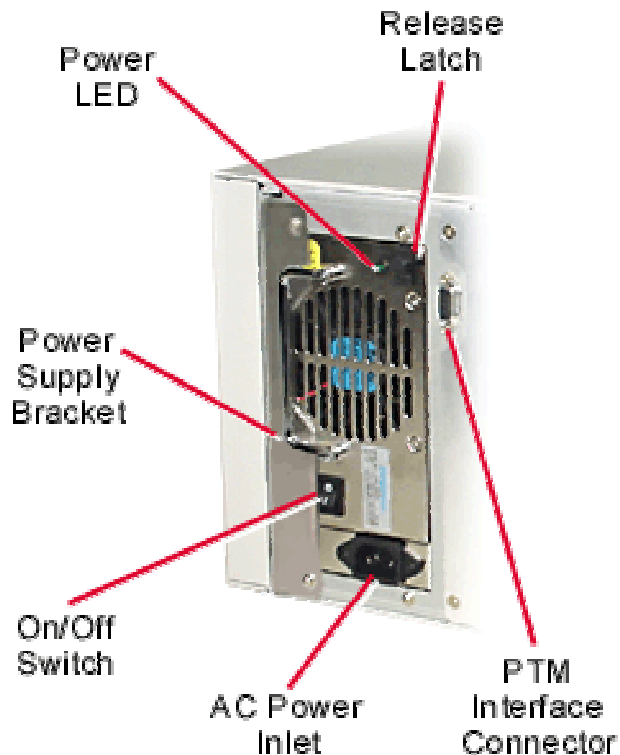


MSL5026

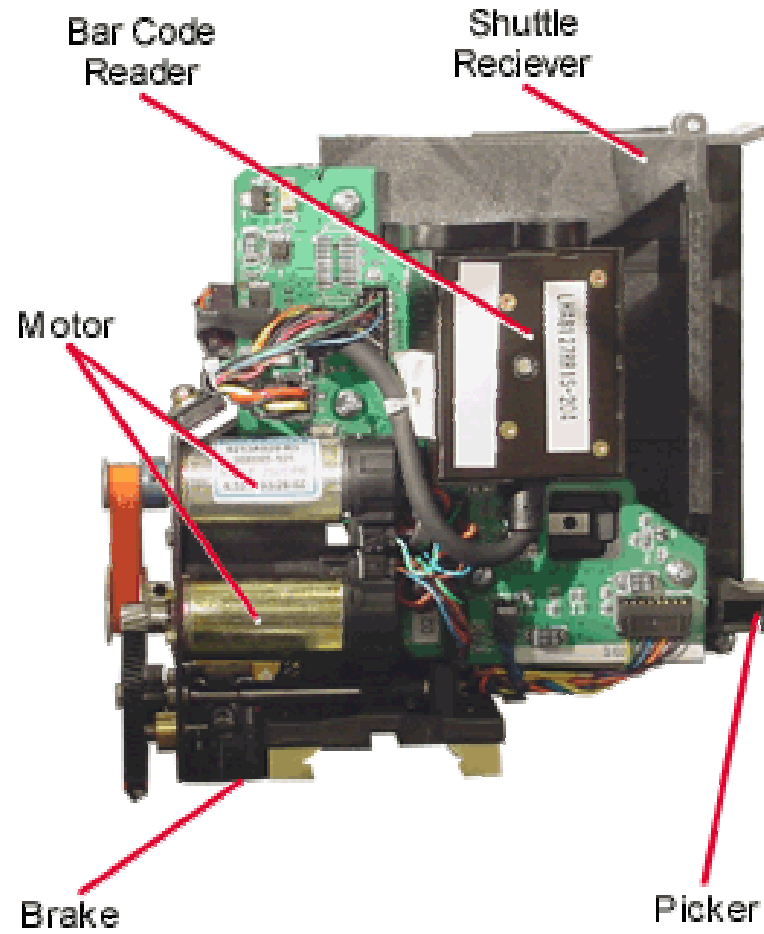


MSL5060

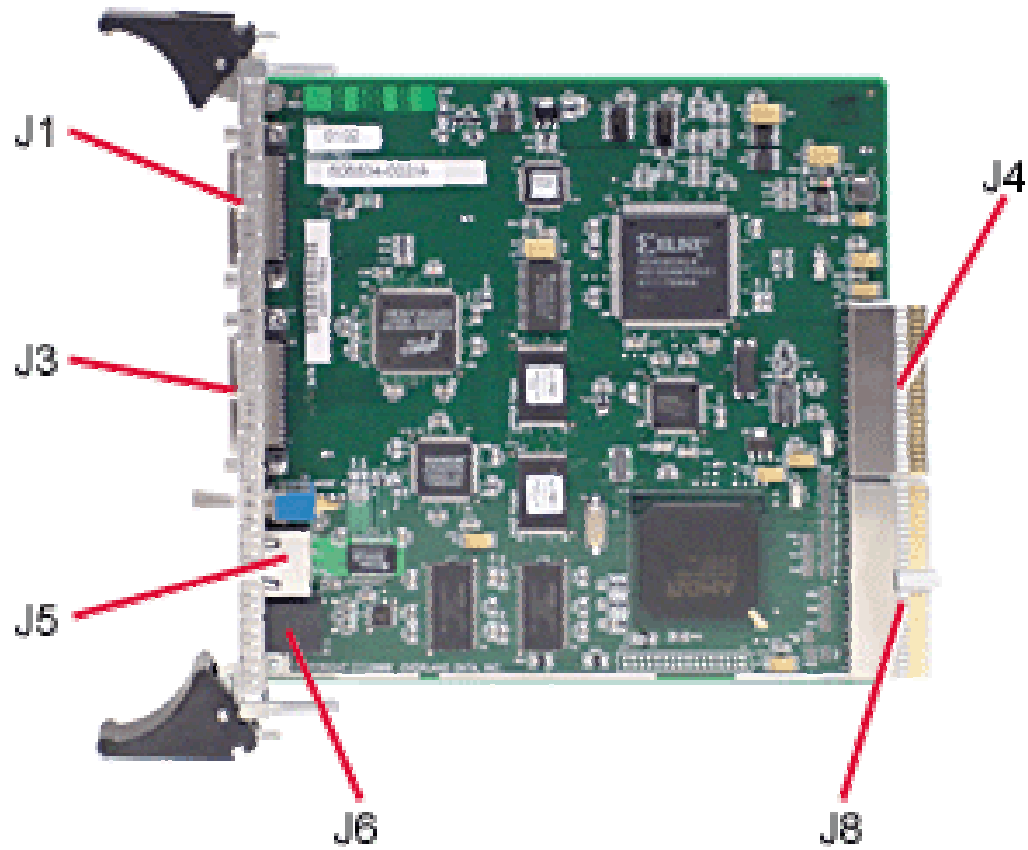
MSL5000 power supply



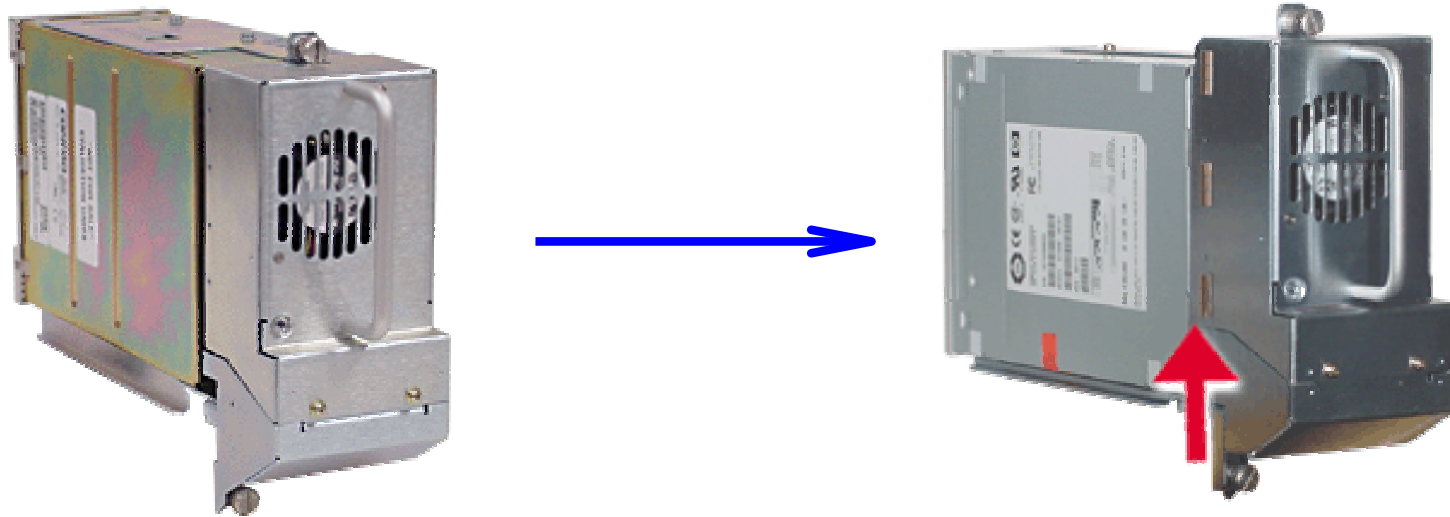
MSL5000 shuttle assembly (robotics)



MSL5000 controller board



Drive upgrades

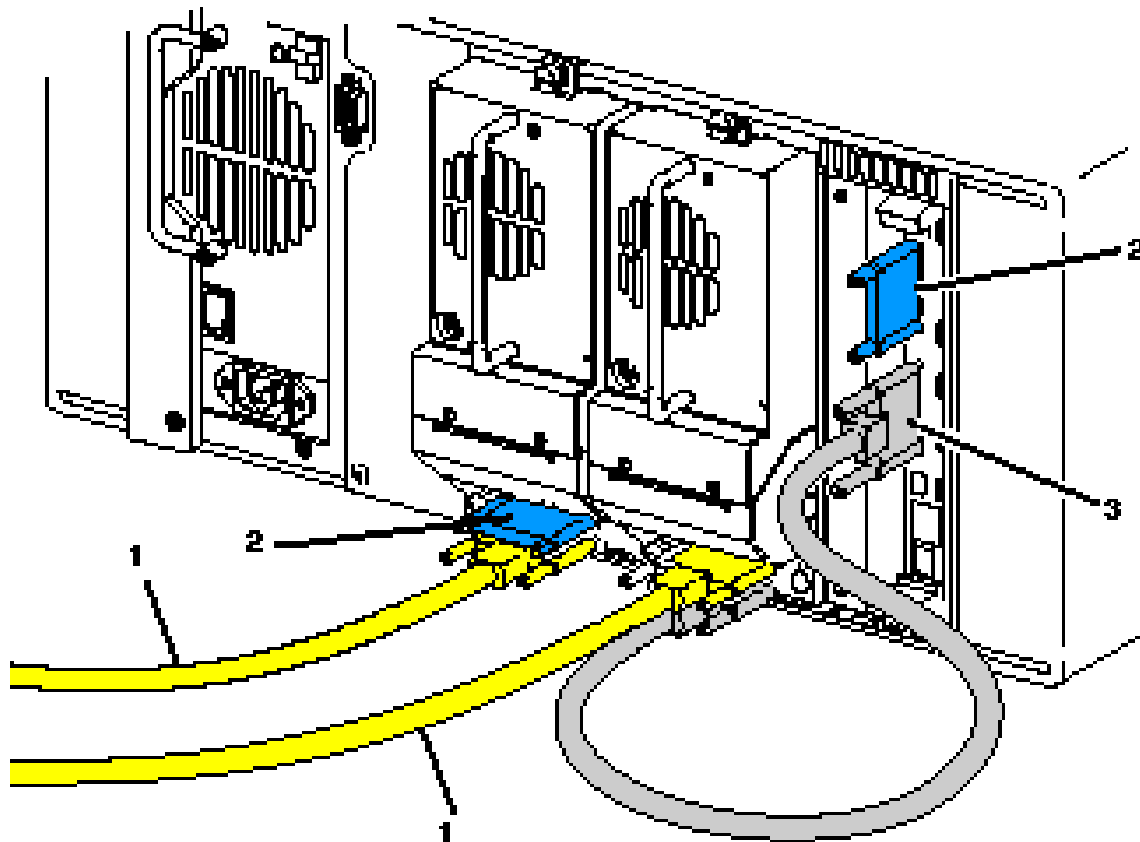


- Verify newer type of drive supported for library
- Update library firmware
- Replace drive

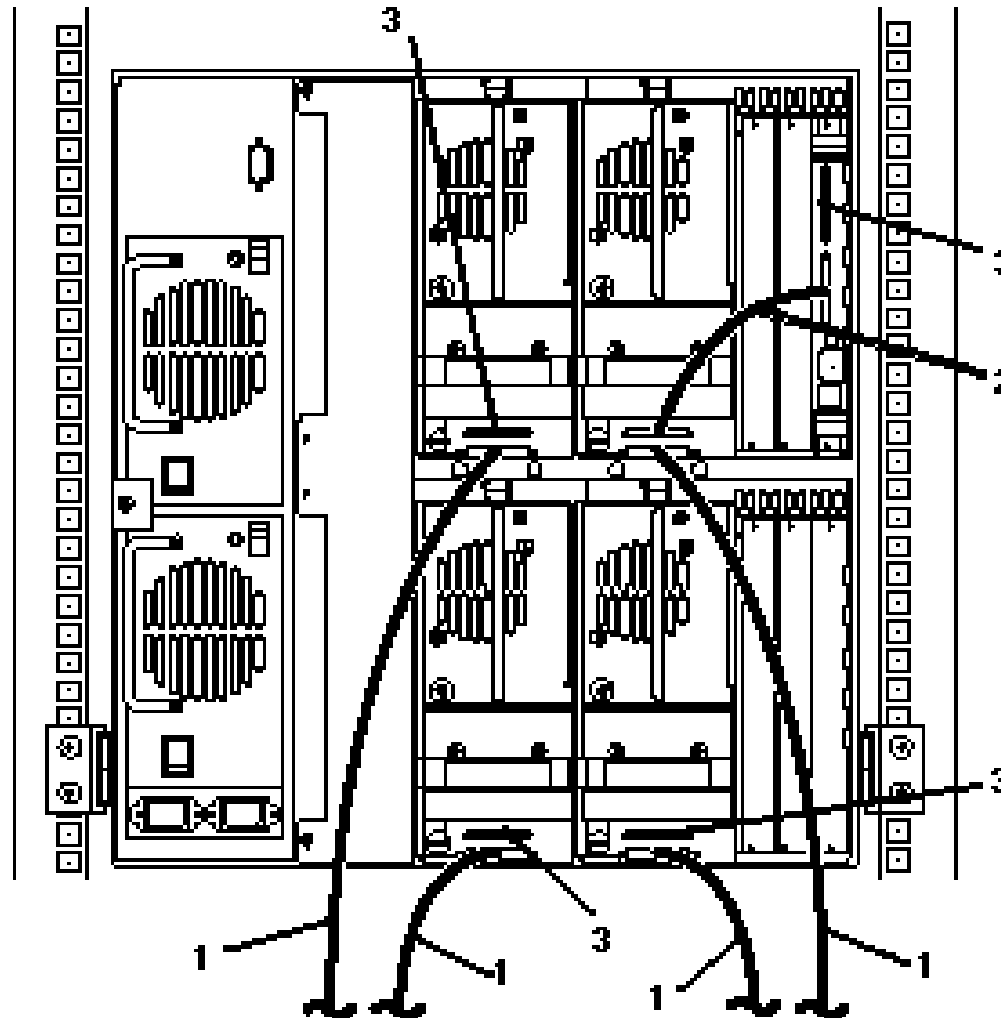
MSL6000 Cabling



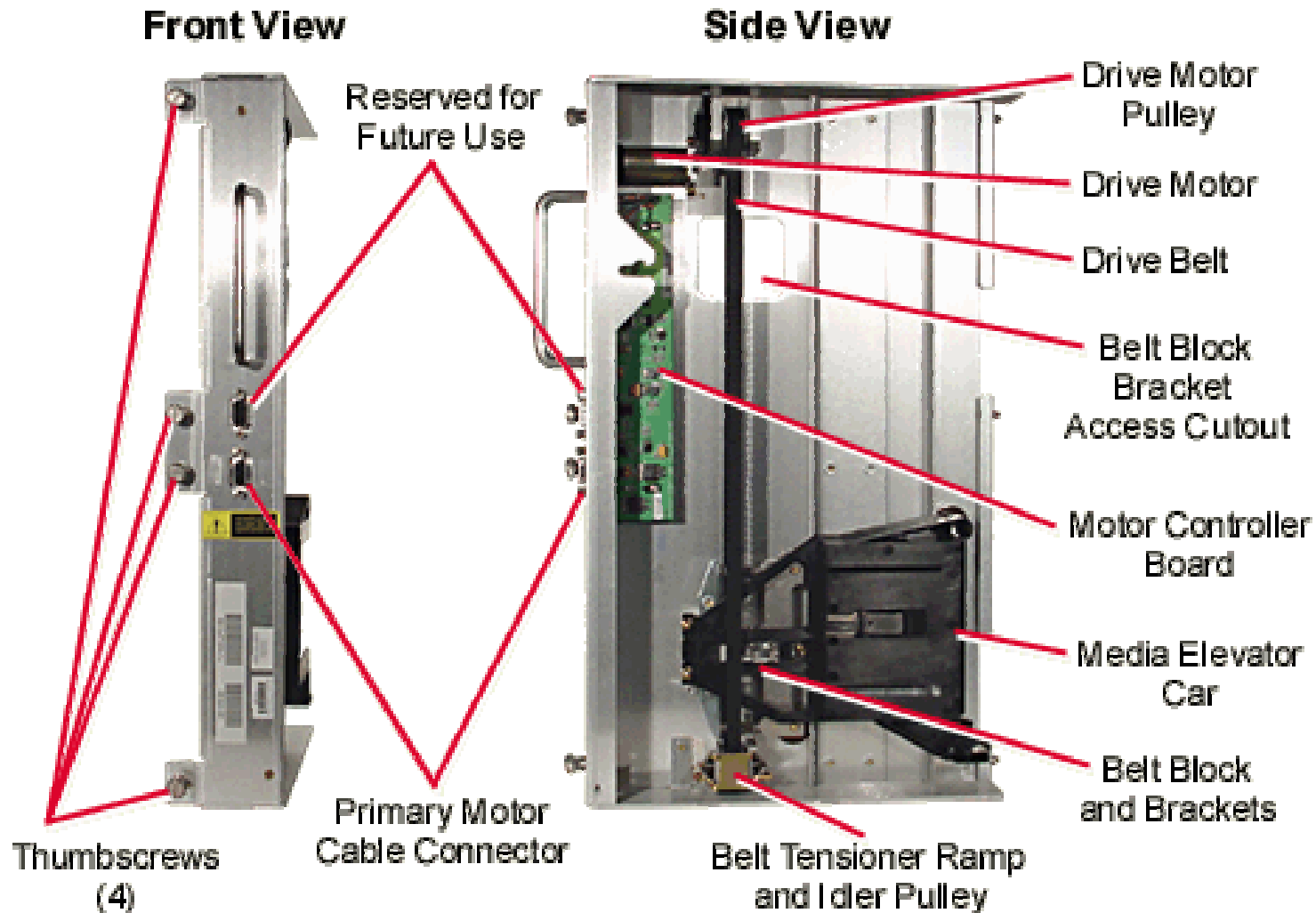
MSL6030 SCSI Cabling



MSL6060 SCSI Cabling



Pass-through mechanism

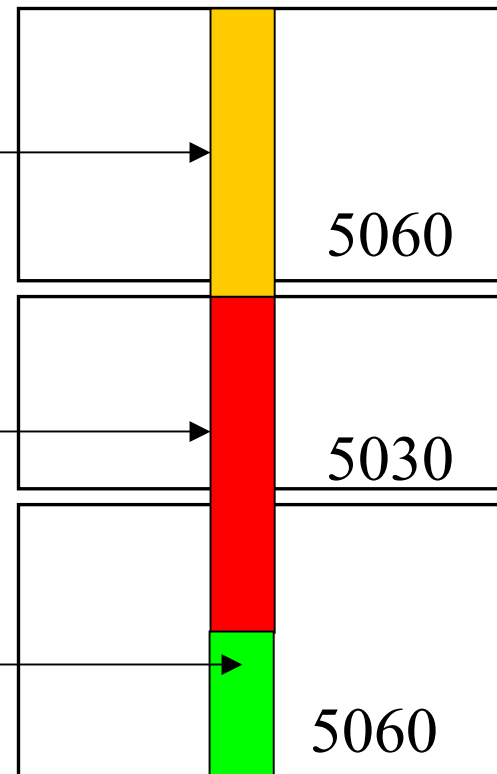


Pass thru module components

MSL5000 Universal PTM
used to connect top 2 units in
stack. Includes elevator
mechanism. (304825-B21)

**MSL5000 10U Pass-Thru
Extender. Includes variable
length belts (231824-B23)**

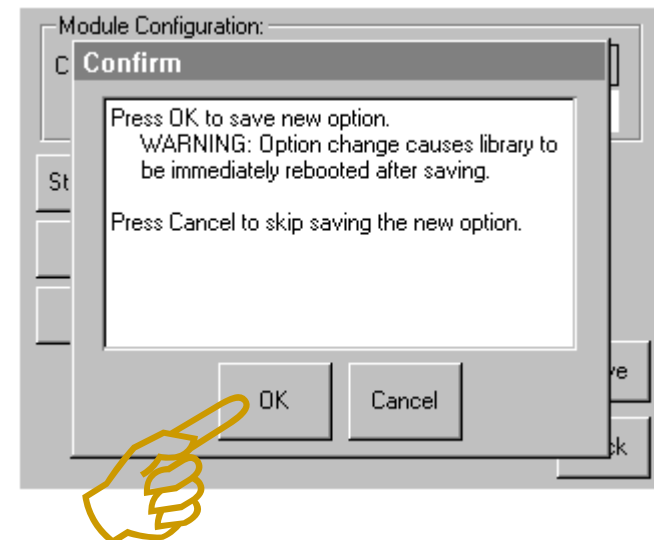
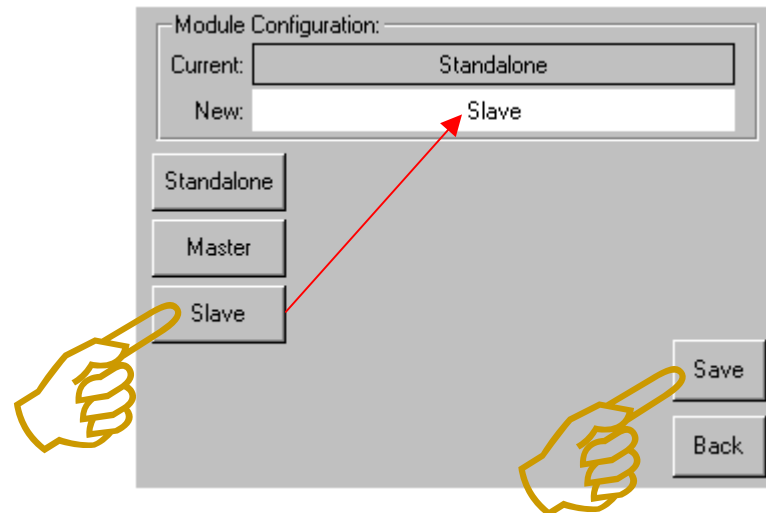
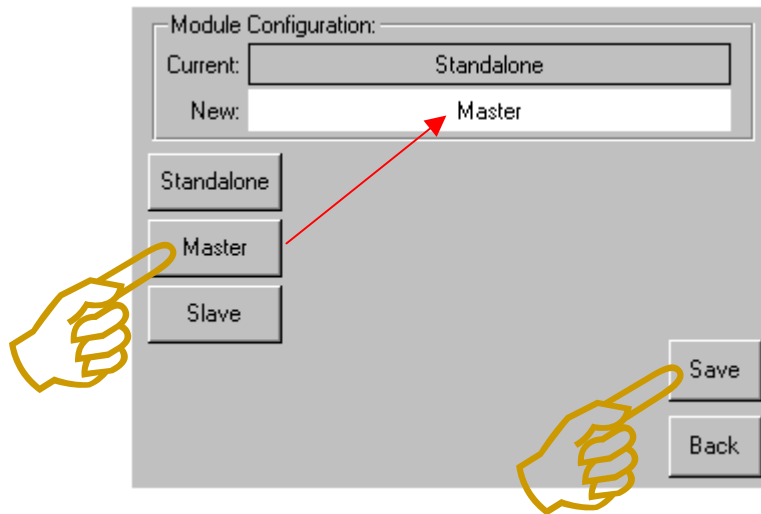
**MSL5000 5U Pass-Thru
Extender. Includes variable
length belts (231824-B22)**



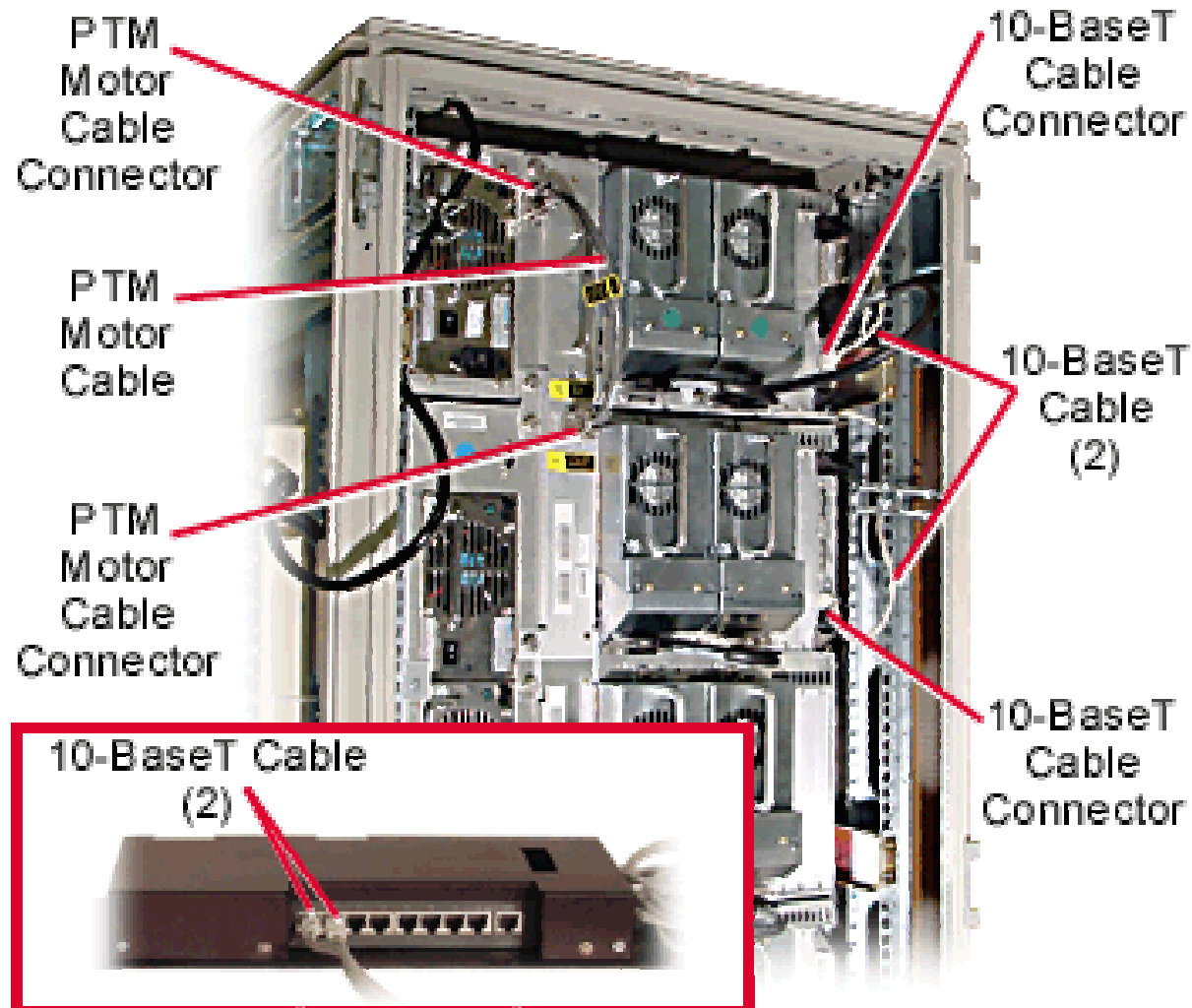
MSL5000 module expansion

- verify minimum firmware (2.28) in all modules
- install router (may require 1U rack space) for private LAN
- remove expansion unit covers from modules
- install msl5000 modules in rack
- extend the expansion unit if necessary – from 10U base up to maximum of 40U
- configure master and slave modules

MSL5000 master/slave config



Pass-through mechanism cabling



Firmware updates – via Library & Tape Tools (preferred option)

The screenshot shows the 'hp StorageWorks library and tape tools' application window. The 'Firmware' icon in the toolbar is selected. The 'Firmware Upgrade' section on the left provides instructions on how to update firmware, mentioning 'File Selection' and 'Local Firmware Files'. The main area has tabs for 'Update Firmware', 'Local Firmware Files', and 'Firmware Update Results'. The 'Update Firmware' tab is active, displaying a table with columns for Device, Current Rev, New Rev, and Status. Two devices are listed: 'Library (MSL5000 Series)' and 'Drive 1 (Ultrium 1-SCSI)'. Below the table, there is a checkbox for 'Force Sequential Updates' which is checked. The 'File Selection' section includes dropdown menus for 'Library Firmware File' (MSL5000 Series, Rev: 0404, 07/26/2002) and 'Drive Firmware File' (Ultrium 1-SCSI, Rev: E30w/OEM20, 07/26/2002), a text field for 'Firmware File Folder' (C:\Program Files\HP StorageWorks Library and Tape Tools), and buttons for 'Options...', 'Browse', and 'Start Update'. A progress bar and 'Time Remaining: unknown' are also visible.

hp StorageWorks library and tape tools

File View Function Options Utilities Help

Identity Firmware Test Support Frontpanel Help

Scan By Product By Connection Instructions

Firmware Upgrade

This screen allows you to update the firmware for your devices.

Select the device(s) you want to upgrade. If firmware for your product is currently available on the local system, this information is shown in the **File Selection** section of the screen. If you do not see any firmware files listed in the **Firmware File** dropdown box, verify that the path to the firmware folder, shown in the **Firmware File Folder** field, is correct. If you do not have the necessary firmware files stored locally, click the **Local Firmware Files** tab to download firmware from the HP website.

When you are ready to begin the firmware upgrade, click **Start Update**.

Update Firmware Local Firmware Files Firmware Update Results

Device	Current Rev	New Rev	Status
<input type="checkbox"/> Library (MSL5000 Series)	0404		not selected
<input type="checkbox"/> Drive 1 (Ultrium 1-SCSI)	E30w		not selected

☒ Force Sequential Updates

File Selection:

Library Firmware File: MSL5000 Series, Rev: 0404, 07/26/2002 Options...

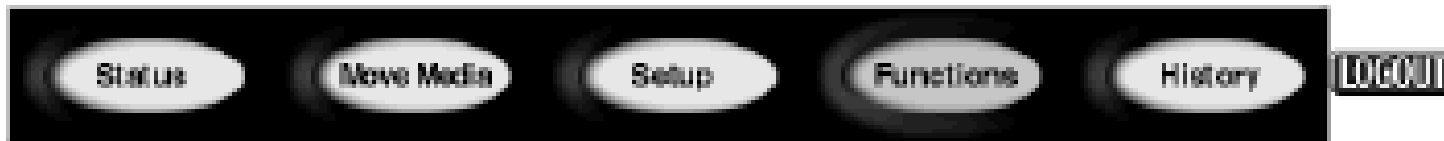
Drive Firmware File: Ultrium 1-SCSI, Rev: E30w/OEM20, 07/26/2002

Firmware File Folder: C:\Program Files\HP StorageWorks Library and Tape Tools Browse

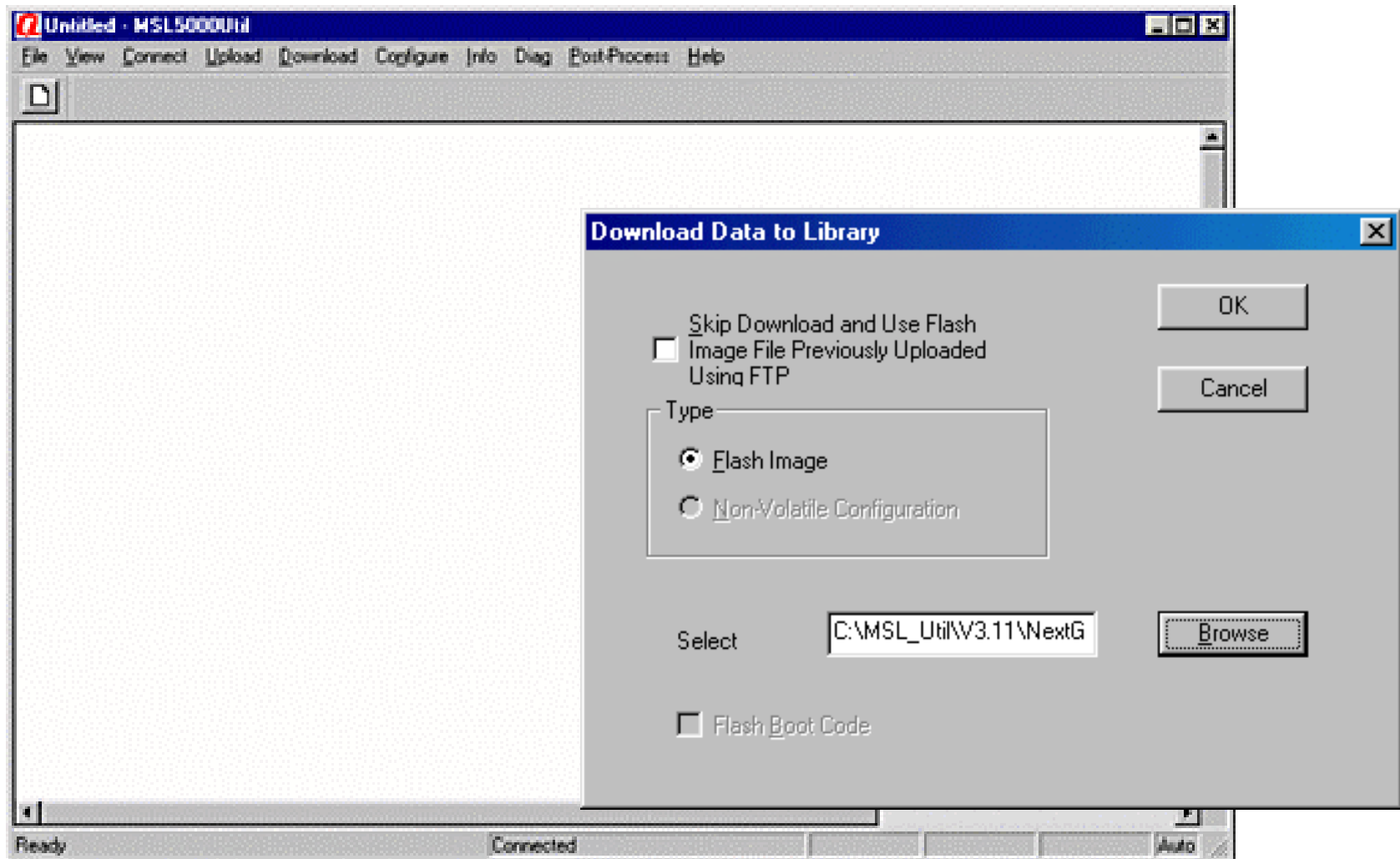
Time Remaining: unknown

Start Update

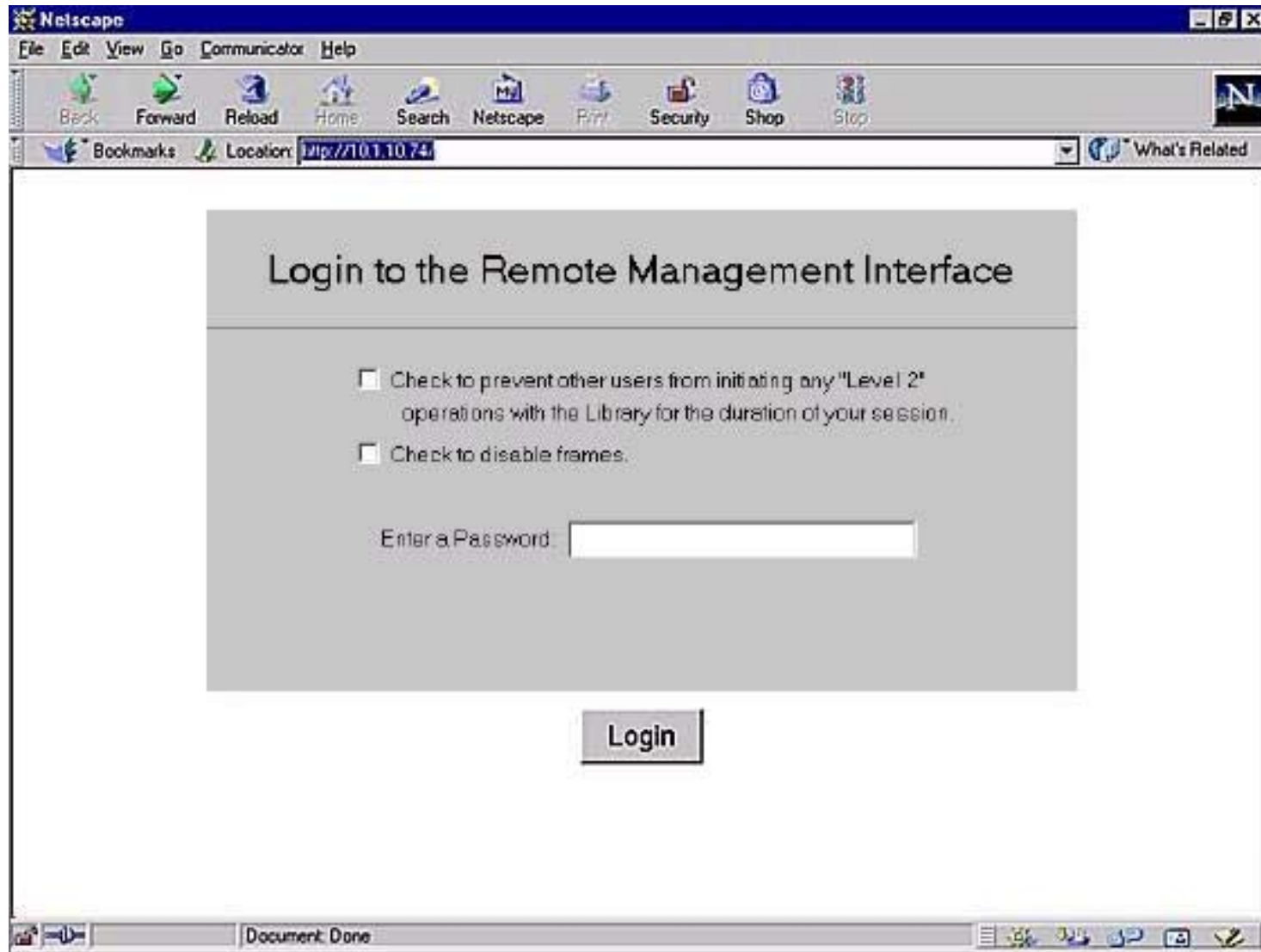
Firmware updates – remote management interface



Firmware updates – MSL5000Util



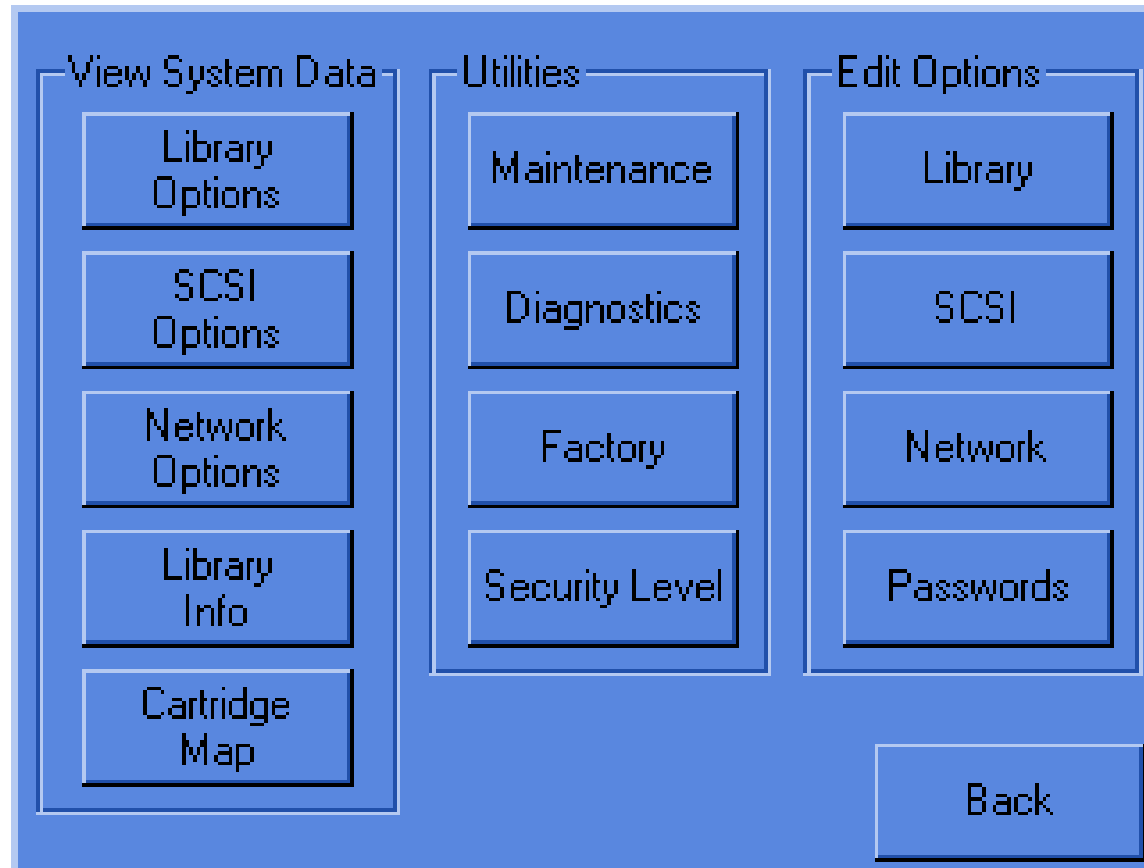
MSL Web Management



Management GUI – main menu




Management GUI – Menu screen



Management GUI – Library Options (1)

View Library Options




Library Remains Offline After Power-up Initialization:	Disabled
Auto Power-up An Installed Drive After Timeout:	Enabled
Unload Mode:	Implicit
Total Reserved Slots:	0
Auto Clean Mode:	Disabled

 [Back](#)

Management GUI – Library Options (2)

View Library Options


Drive and Slot Numbering:	Zero Based
Library Mode:	Random
Sequential Mode:	Unavailable
LCD Contrast Adjust:	16
Mail Slot Mode:	Mail Slot Enabled

Management GUI – Library Options (3)

View Library Options


Barcode Label Size:	8 Chars
Barcode Label Alignment:	Left Align
Barcode Label Check Digit:	Disabled
Barcode Reader:	Retries Enabled
Module Configuration:	Standalone

 [Back](#)

Management GUI – SCSI Options

View SCSI Options

Drive 0 Bus ID:	4
Drive 1 Bus ID:	5
Library SCSI Bus ID:	0
Library SCSI Bus Parity:	Enabled
Mail Slot Access:	"Prevent Allow" Command Inhibits

 [Back](#)

Management GUI – Network Options

View Network Options

IP Address Determination:	User Specified IP Address
IP Address:	10.1.10.98
IP Mask	255.255.0.0
IP Gateway:	10.1.8.99
DNS Server:	10.1.8.14

Back

Management GUI – Library Info



Miscellaneous Library Info

Firmware Revision:	2.38
Local IP Address:	10.1.25.78
Ethernet Address:	00900D112233
Serial Number:	ABCD123456789XYZ

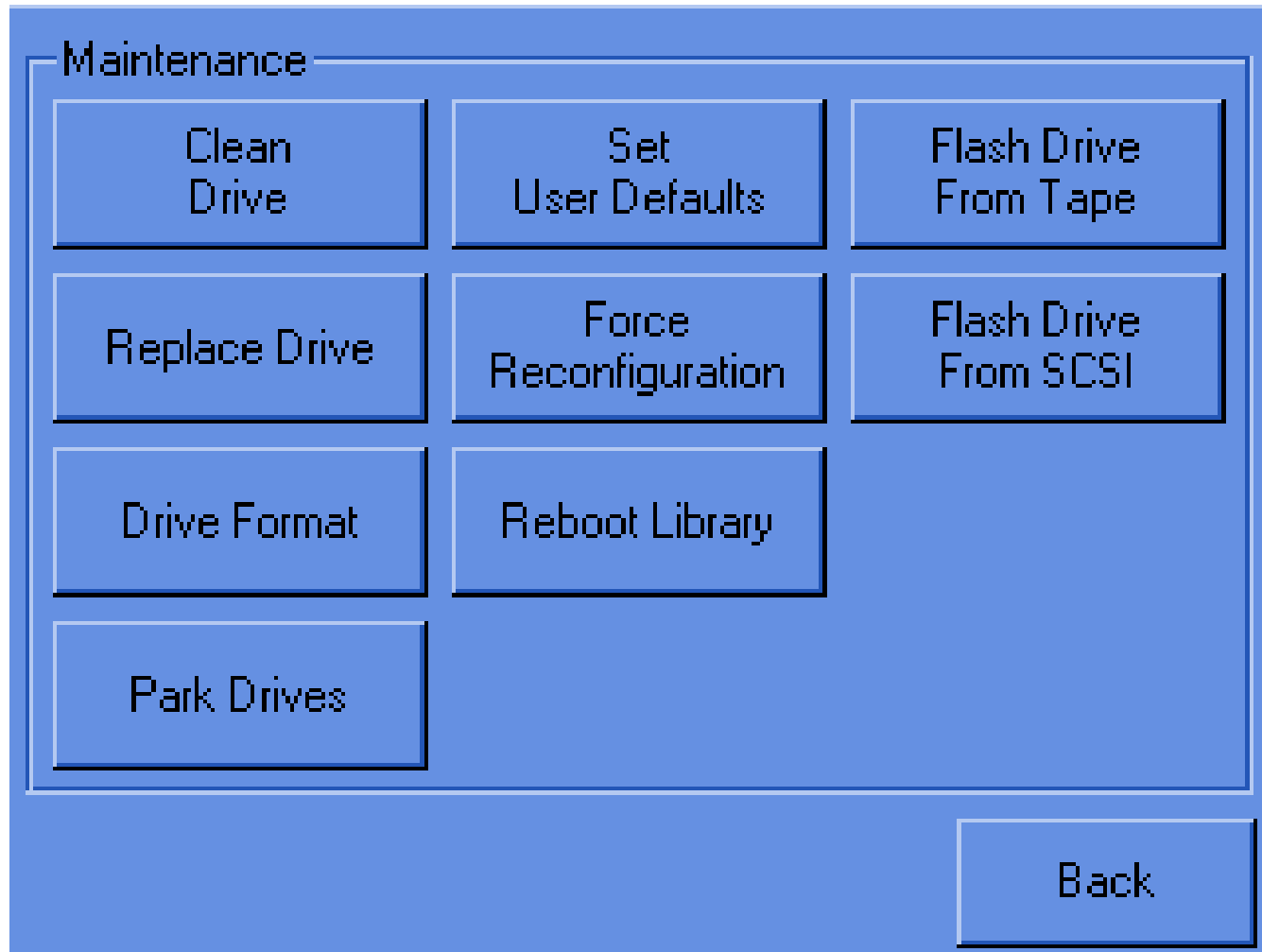
Back

Management GUI – Cartridge Map

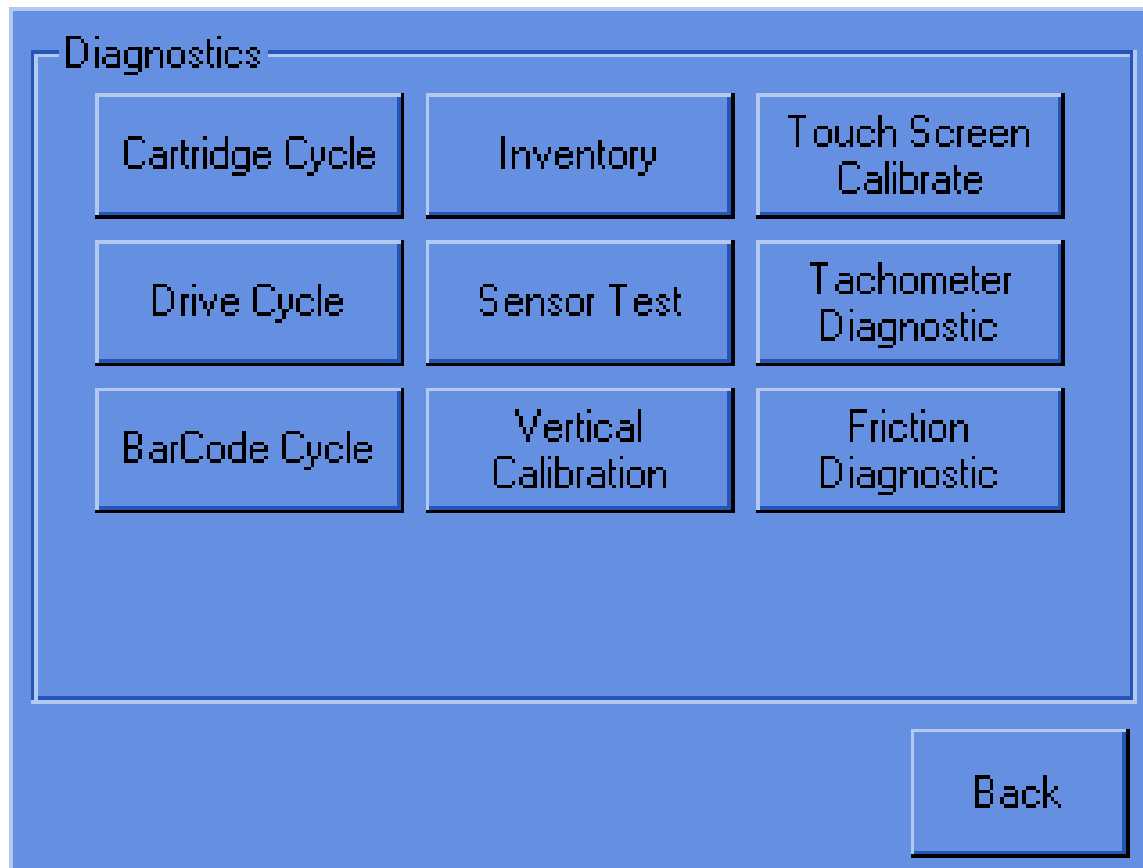
Drive 0		Slot 3	BQB260	Slot 9	JEP123
Drive 1	BQB252	Slot 4		Slot 10	
Mail 0		Slot 5	BQB531	Slot 11	
Slot 0	BQB256	Slot 6		Slot 12	AST532
Slot 1	AST530	Slot 7		Slot 13	
Slot 2		Slot 8		Slot 14	BBR862

  [Back](#)

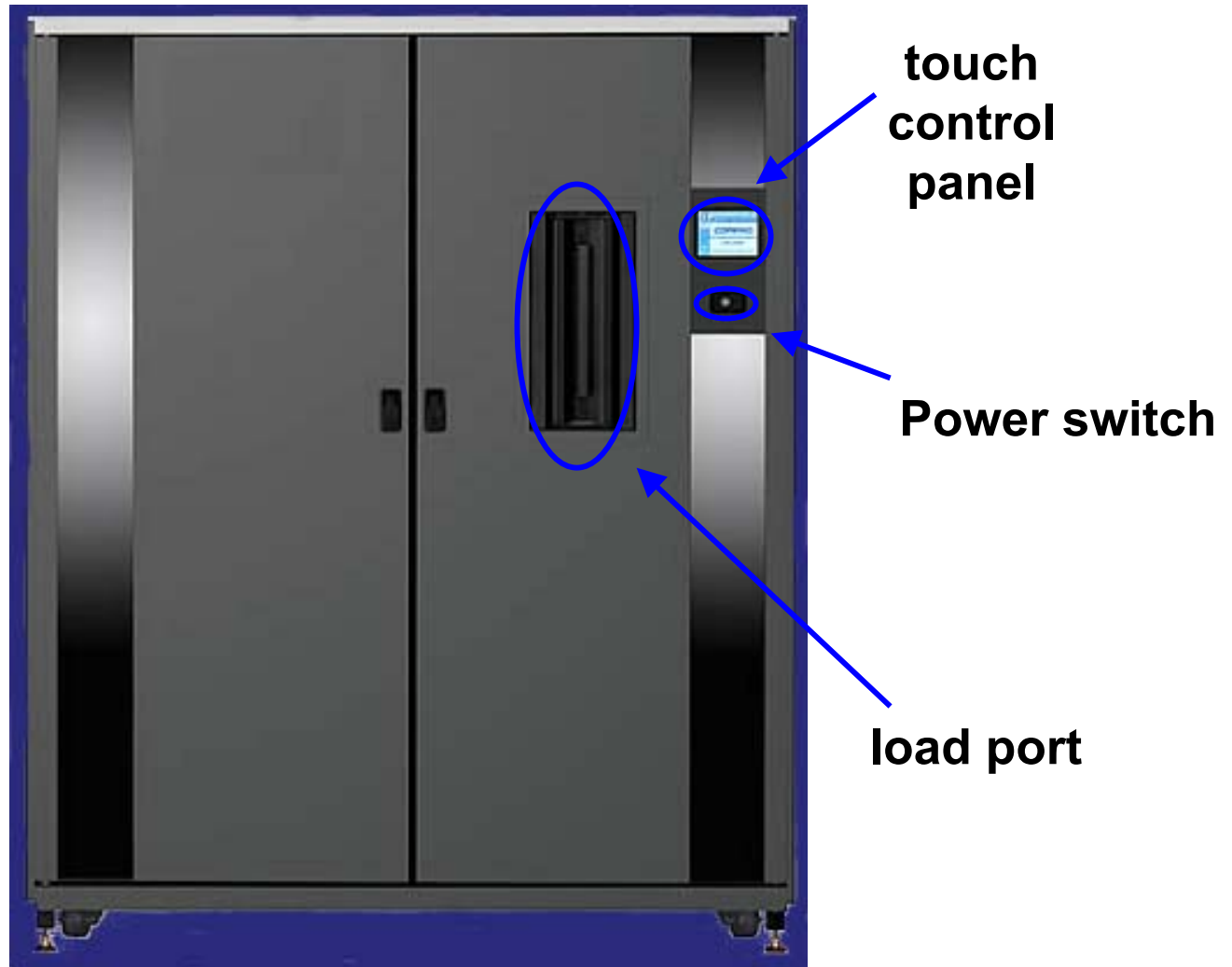
Management GUI – Utilities, Maintenance



Management GUI – Utilities, Diagnostics screen



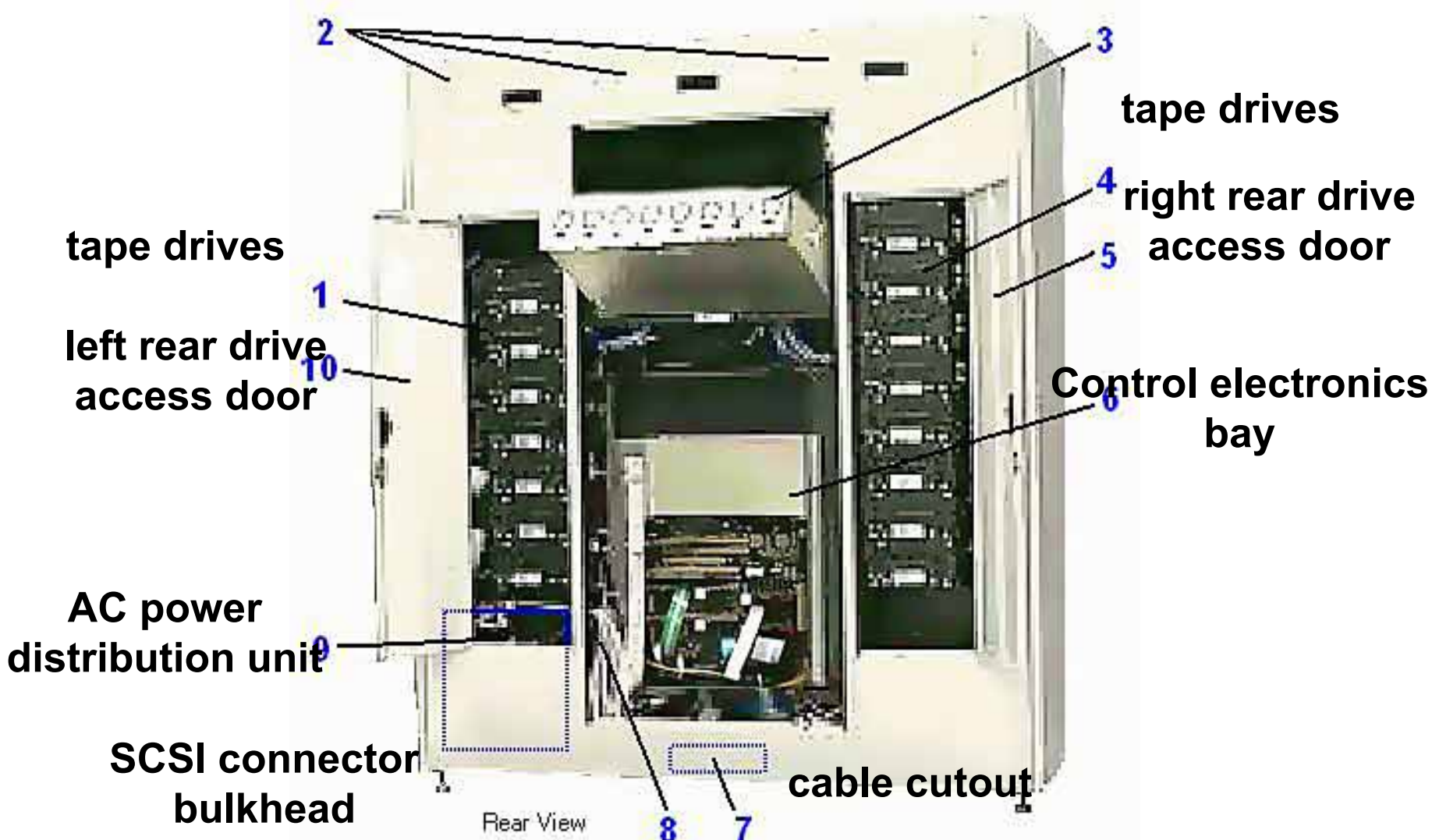
ESL9000 front view



ESL9000 rear view

DC power supply system

fans



ESL9000 internal view

Storage array

window

tape drives

System status module

Vertical axis assembly

GUI control panel

tape drives

load port

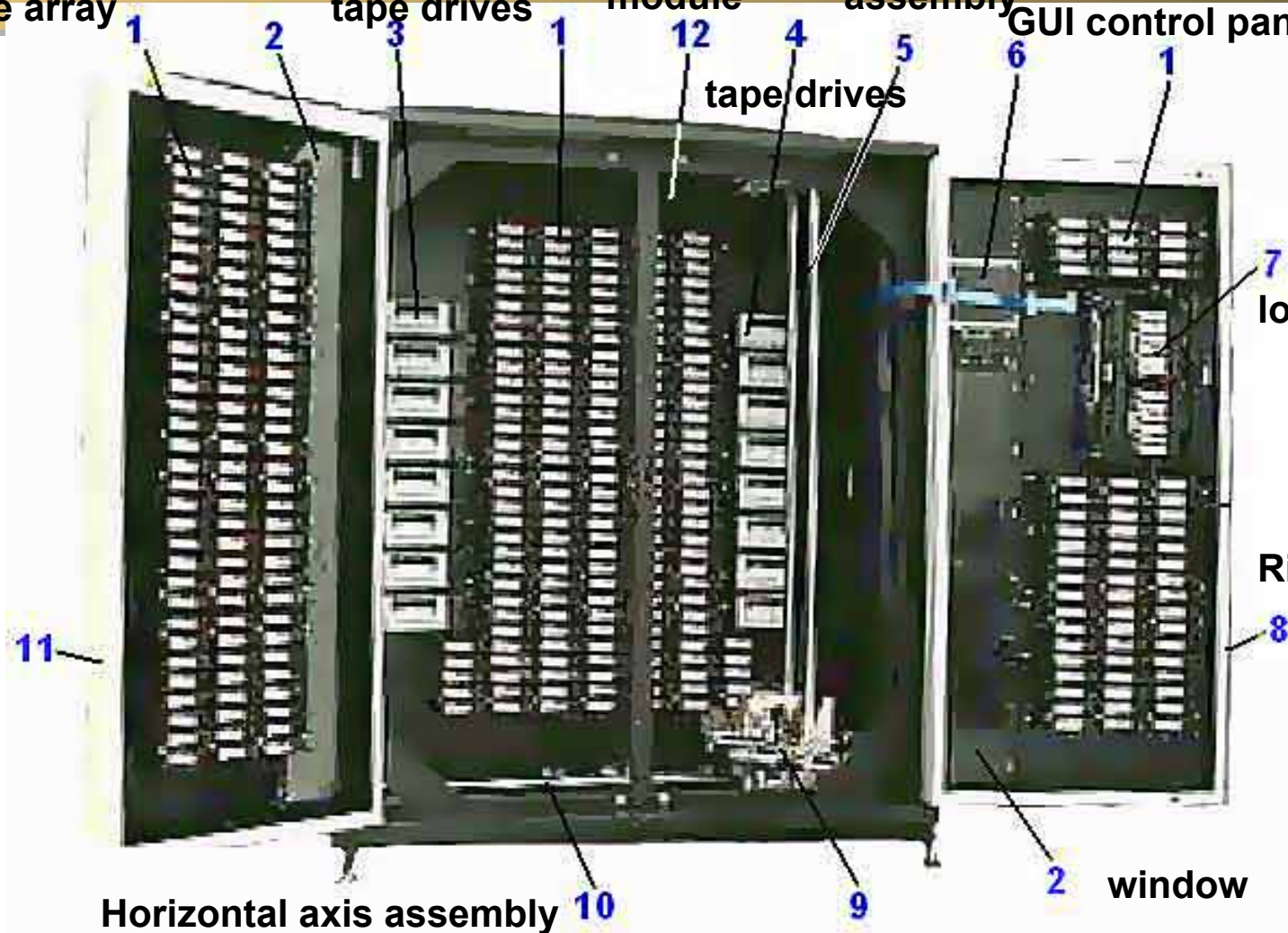
Right front door

Left front door

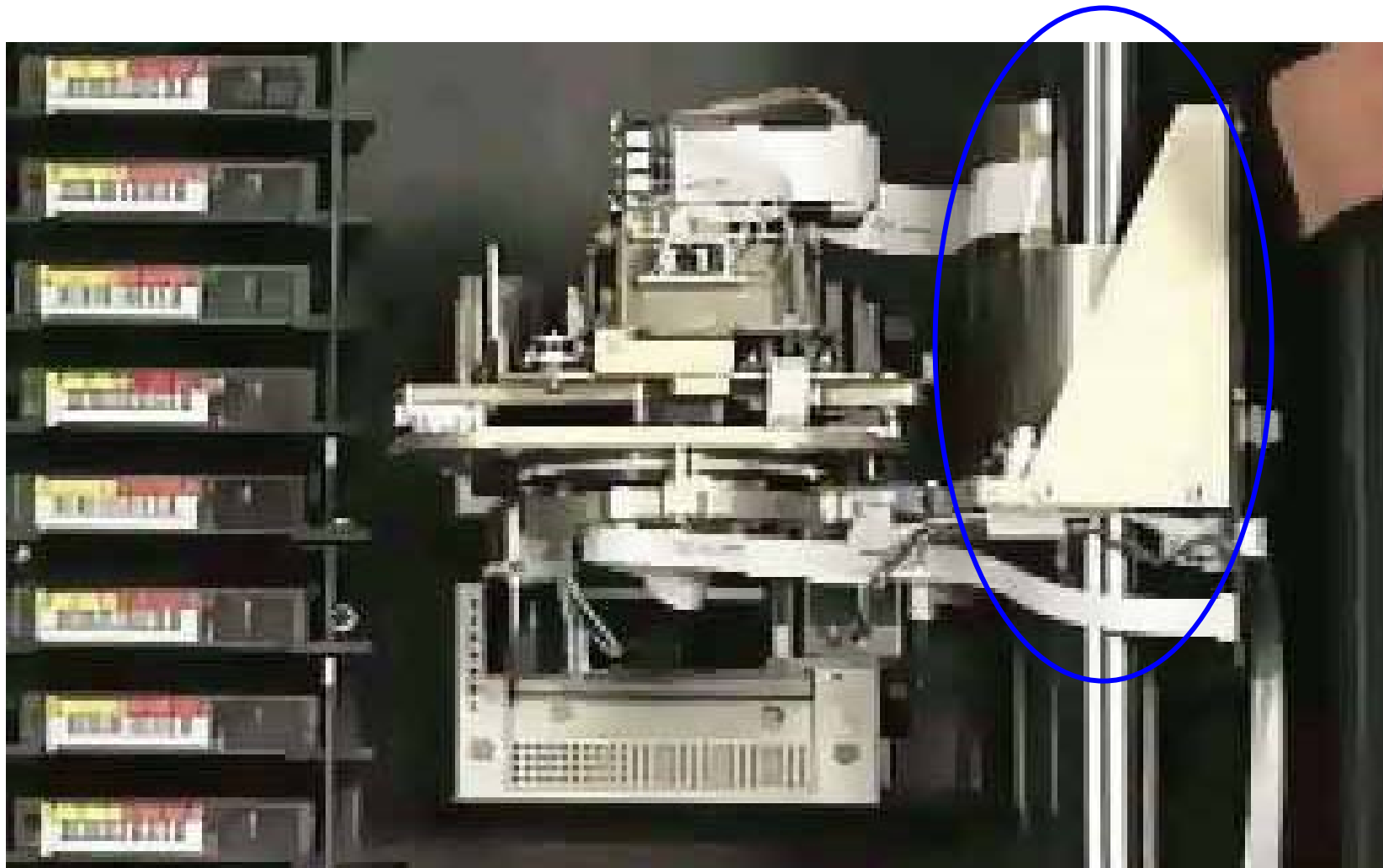
Horizontal axis assembly

extension axis assembly

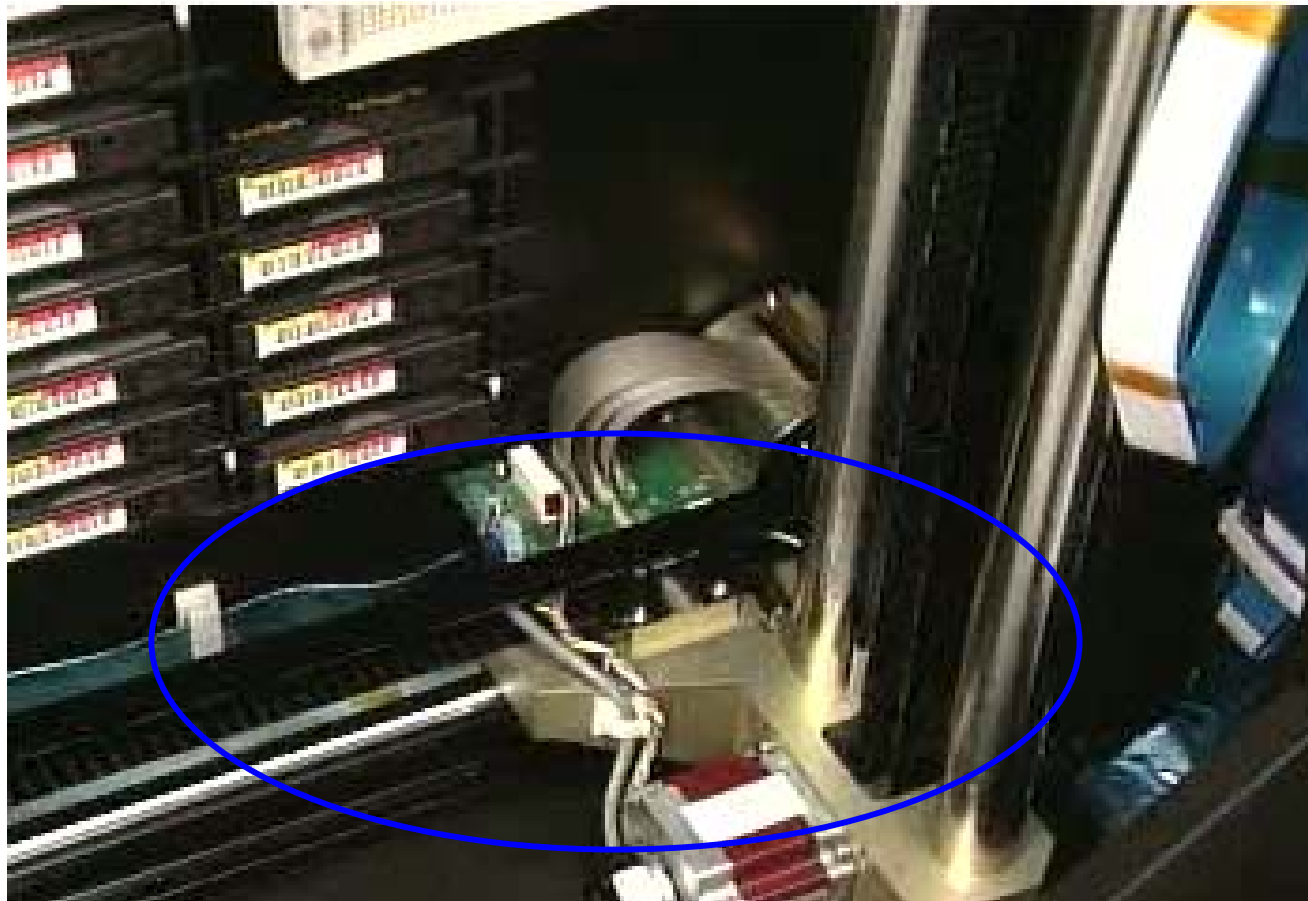
window



ESL9000 vertical axis assembly

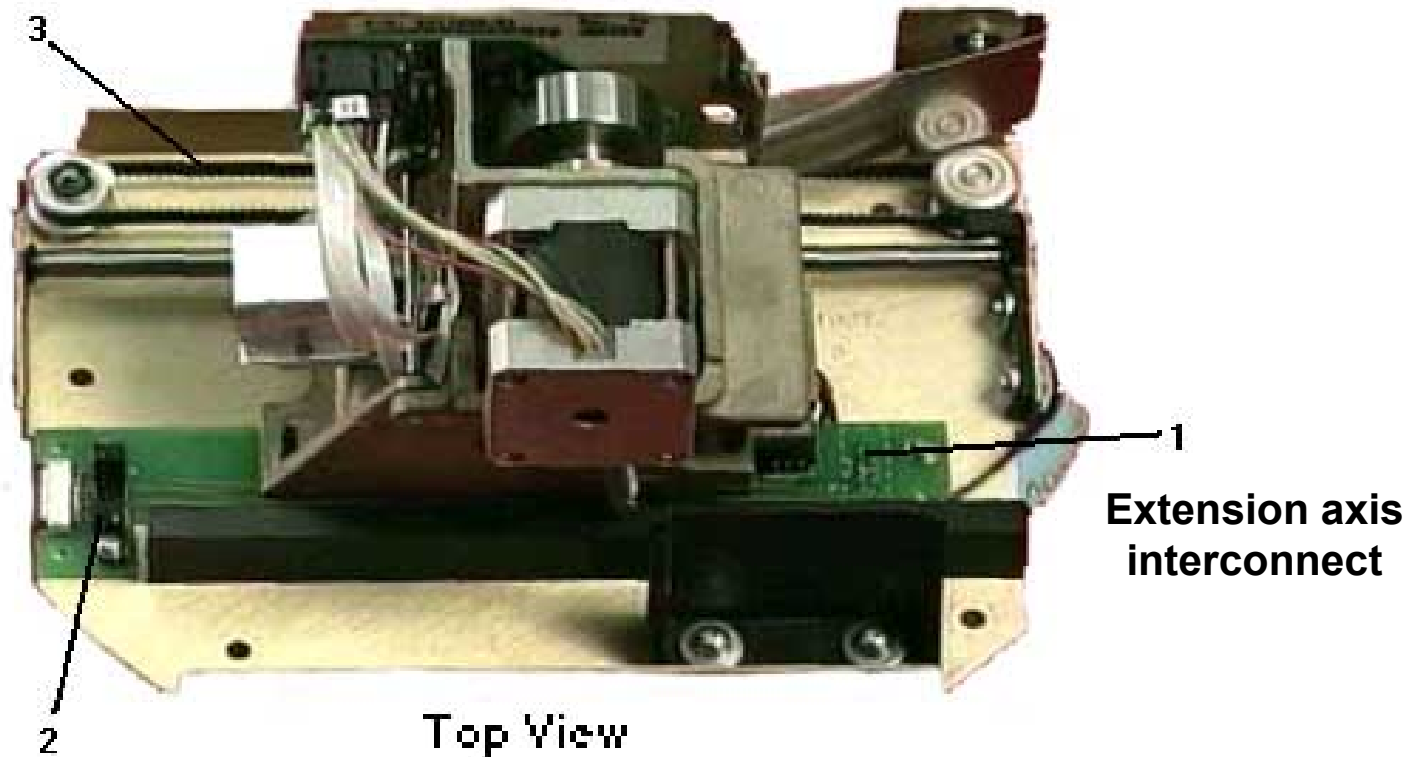


ESL9000 horizontal axis assembly



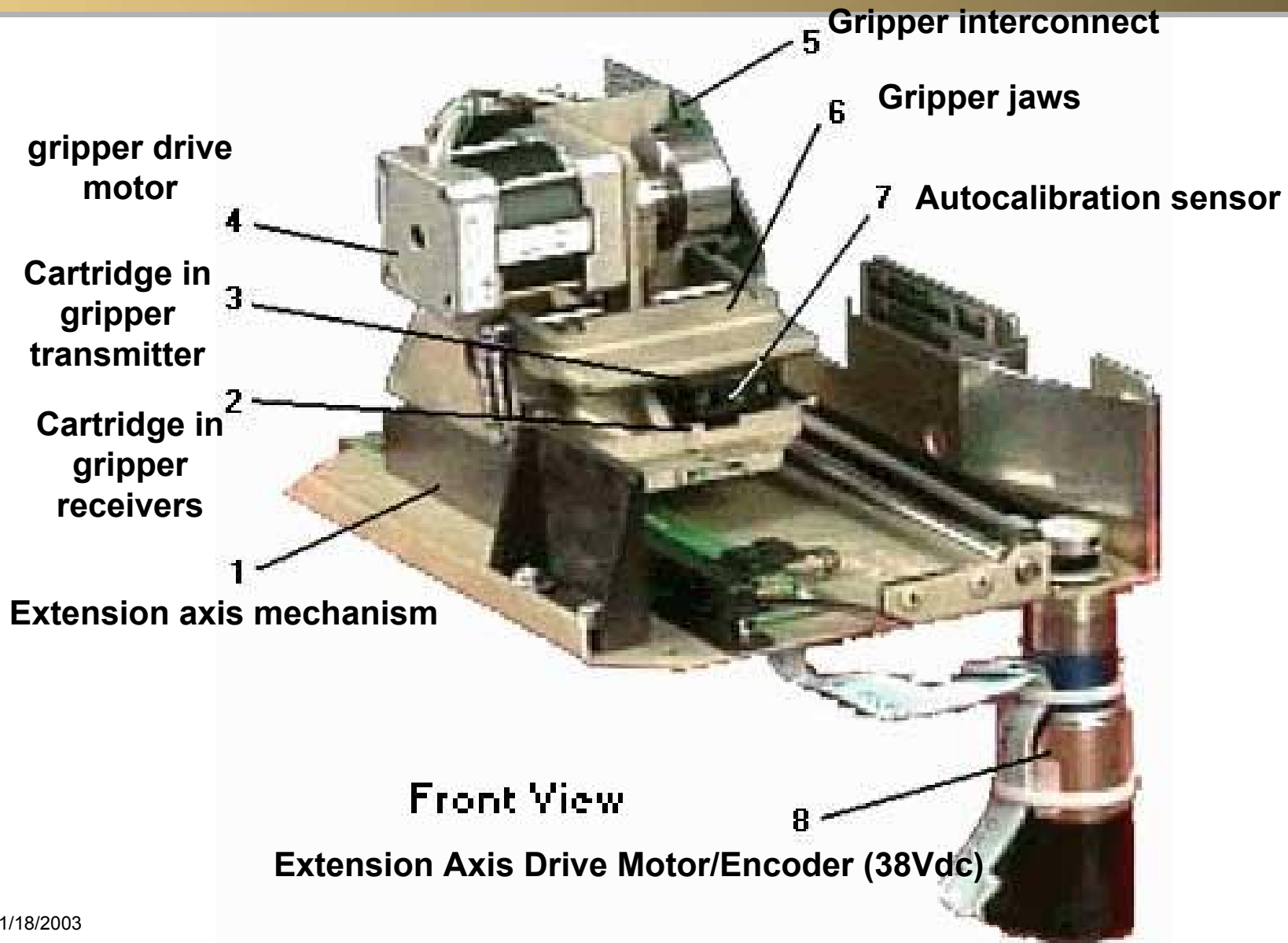
ESL9000 extension axis assembly

Extension axis drive belt



Extension axis home sensor

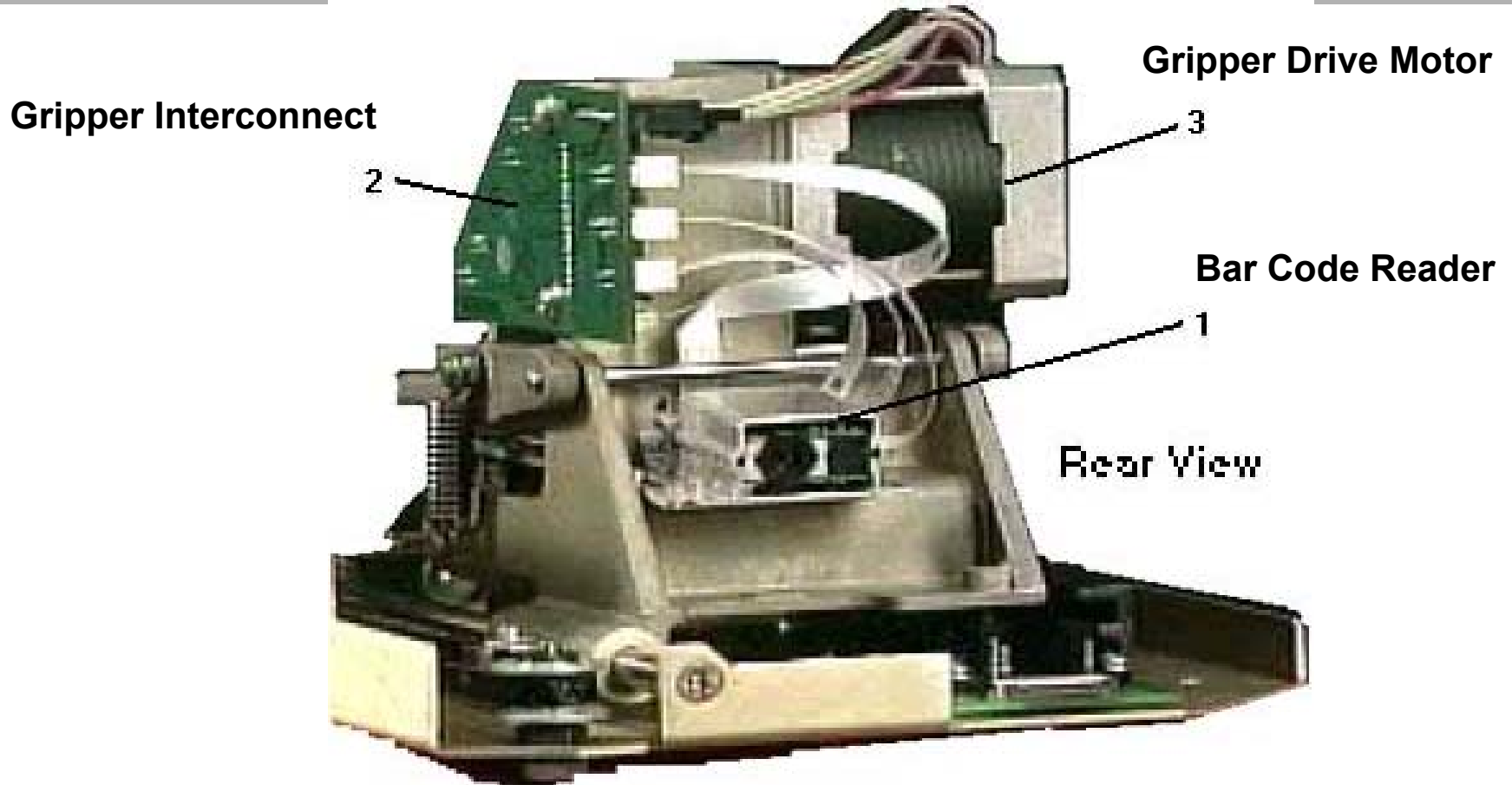
ESL9000 extension axis assembly



Front View

Extension Axis Drive Motor/Encoder (38Vdc)

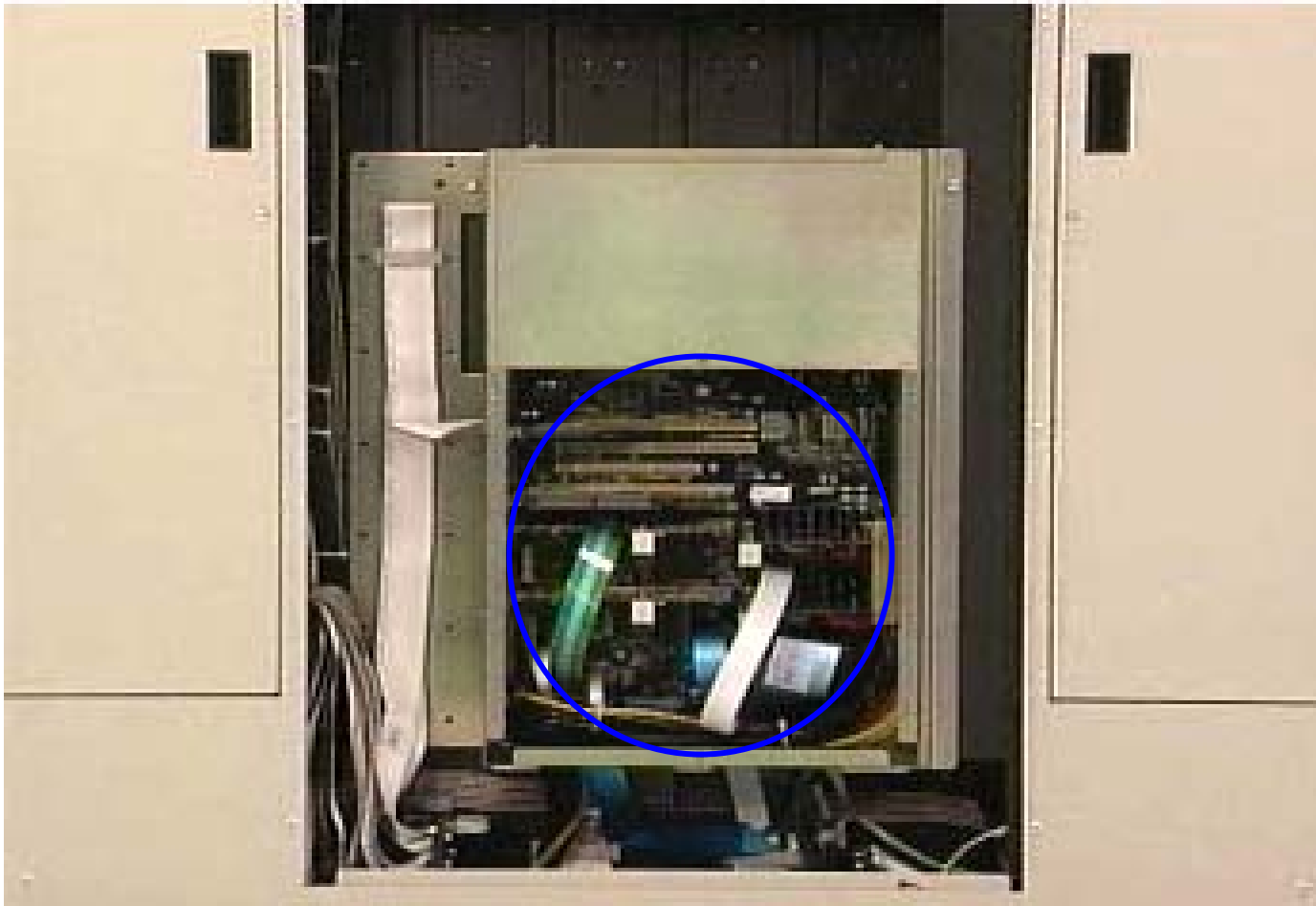
ESL9000 extension axis assembly



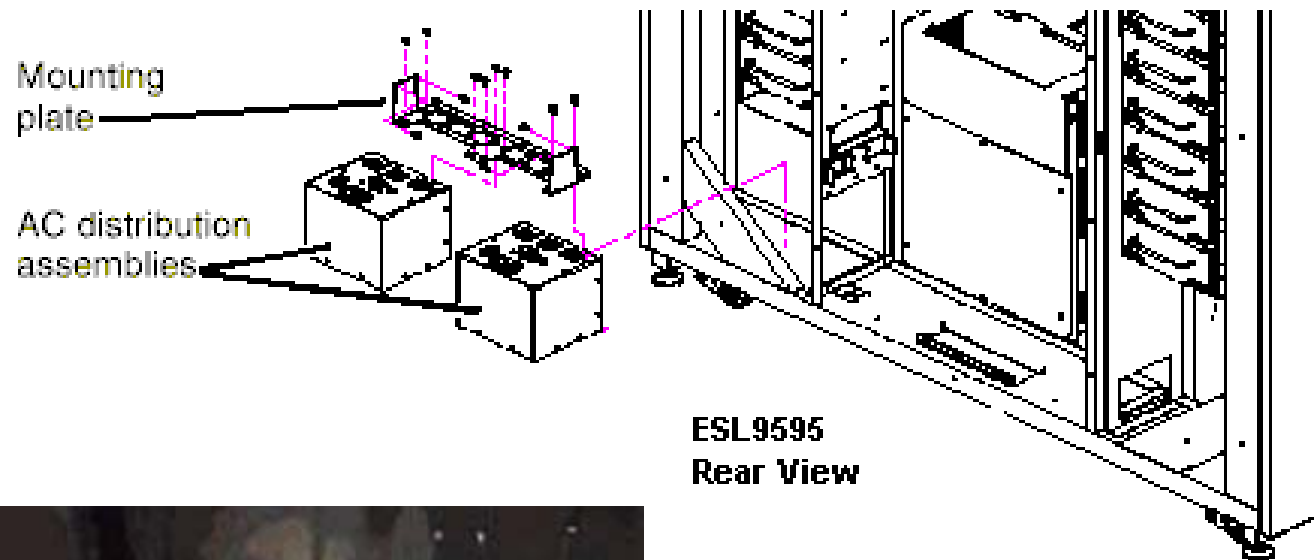
ESL9000 rotary stepper motor



ESL9000 control electronics bay



ESL9000 ac power distribution unit



ESL9000 dc power supply units



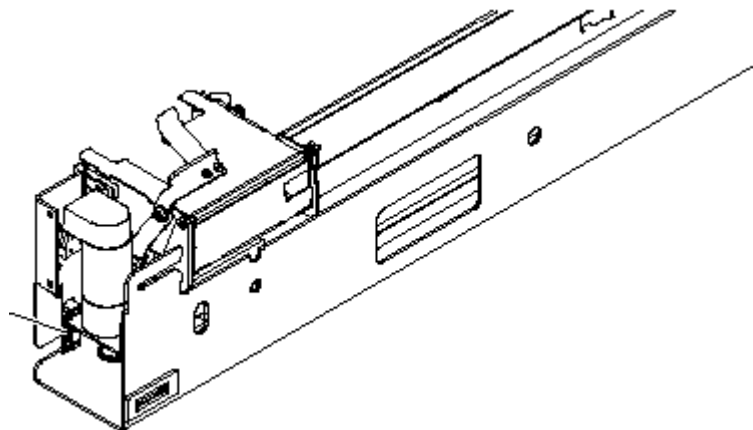
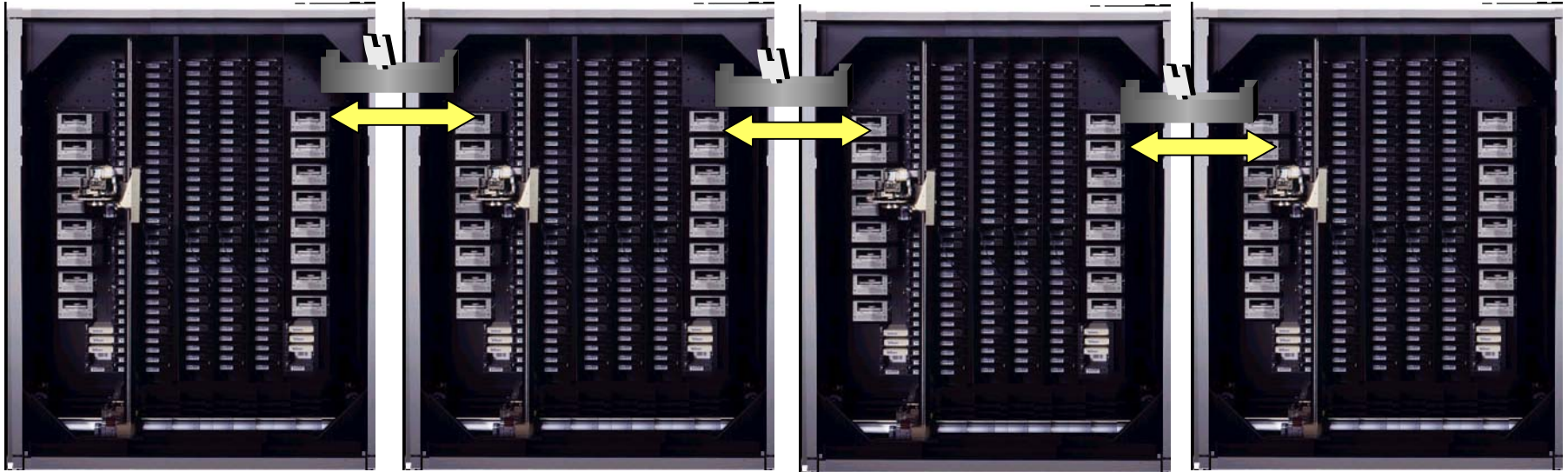
- Hot-pluggable
- 2N redundant

ESL9000 fans

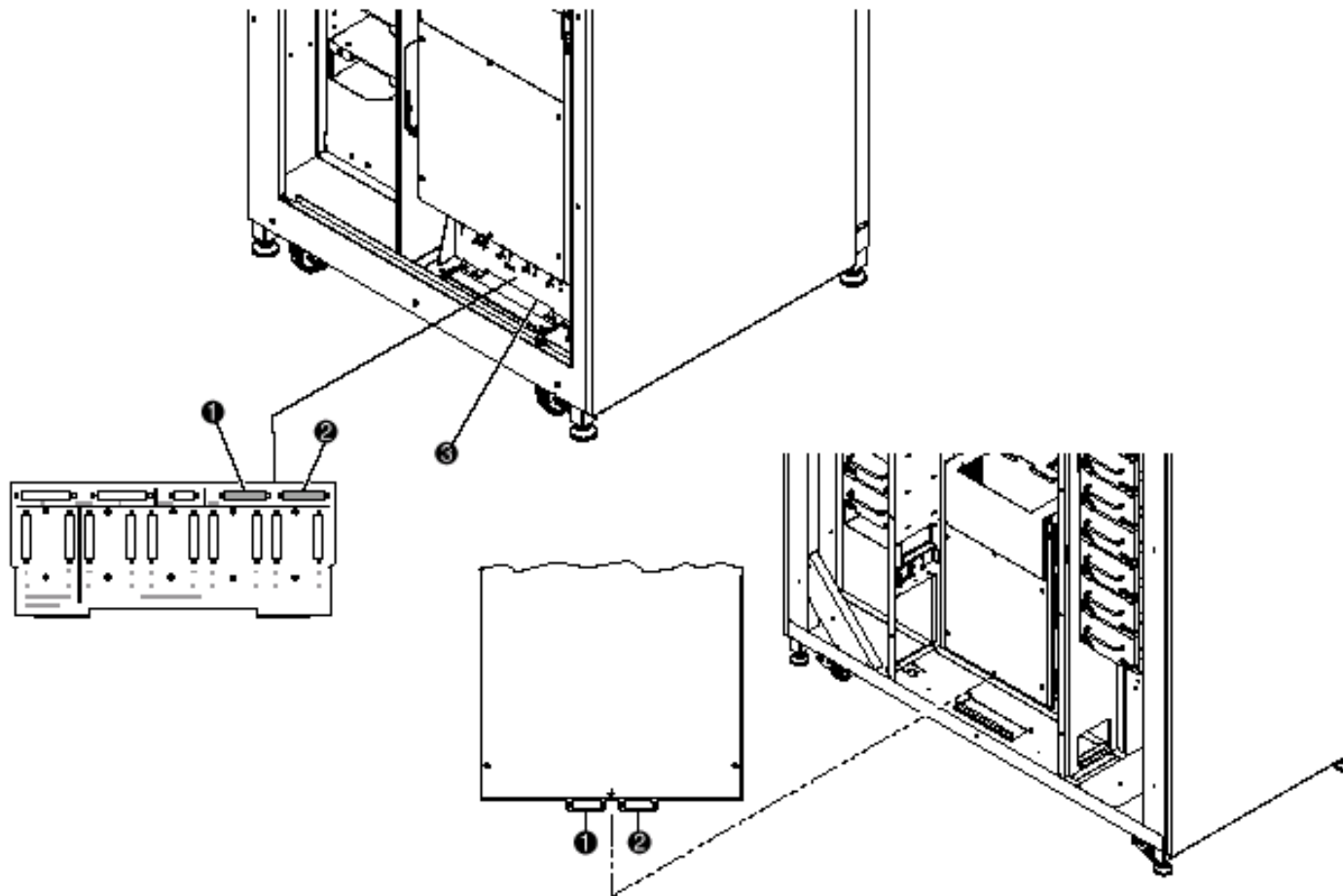


- Hot-pluggable, redundant
- Three exterior LEDs

ESL9000 multi-scaling



ESL9000 multi-scaling cabling



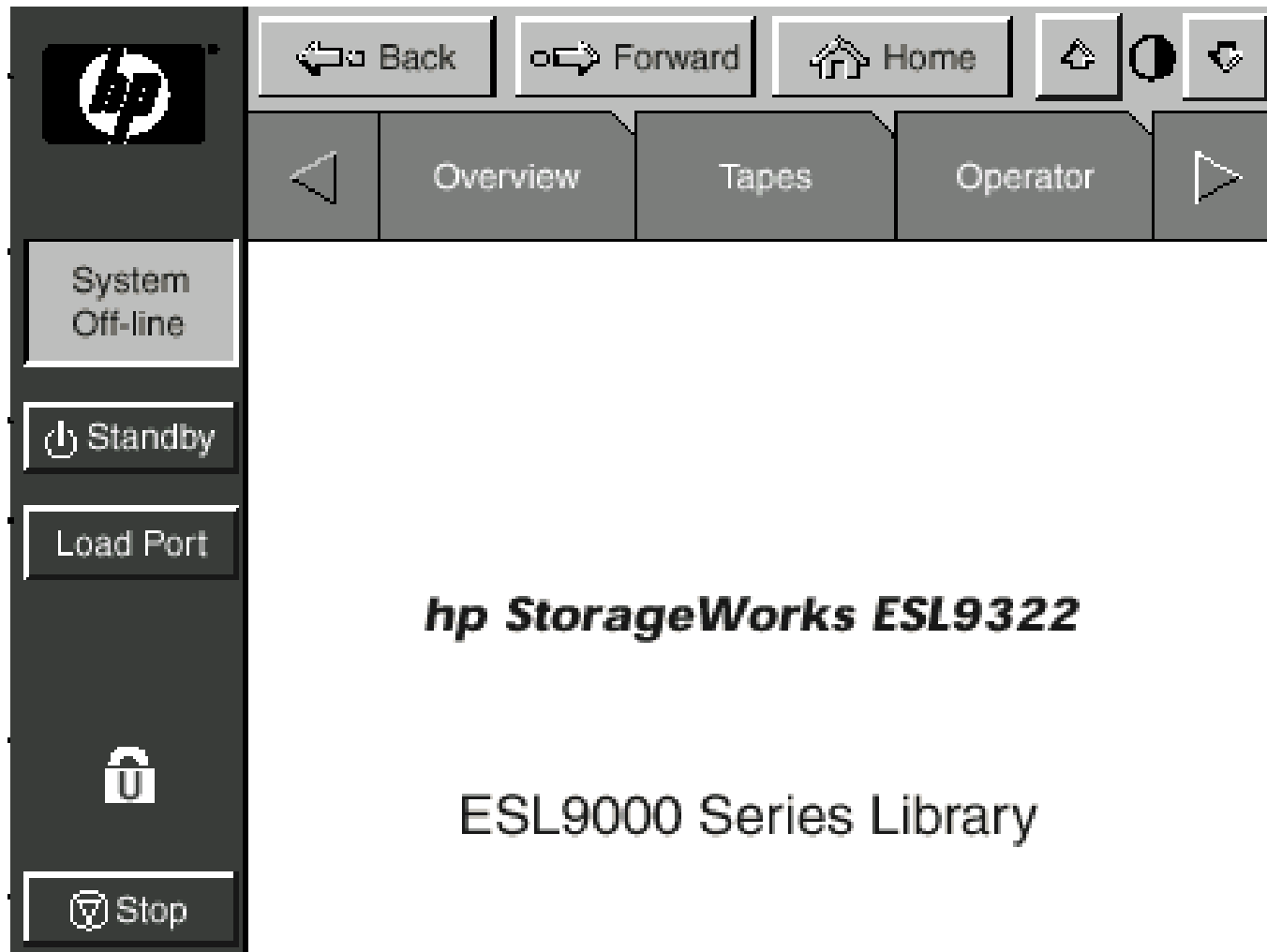
- ❶ Left QSPI connector
- ❷ Right QSPI connector
- ❸ SCSI bulkhead

**Connect right QSPI connector of left library to
left QSPI connector of right library**

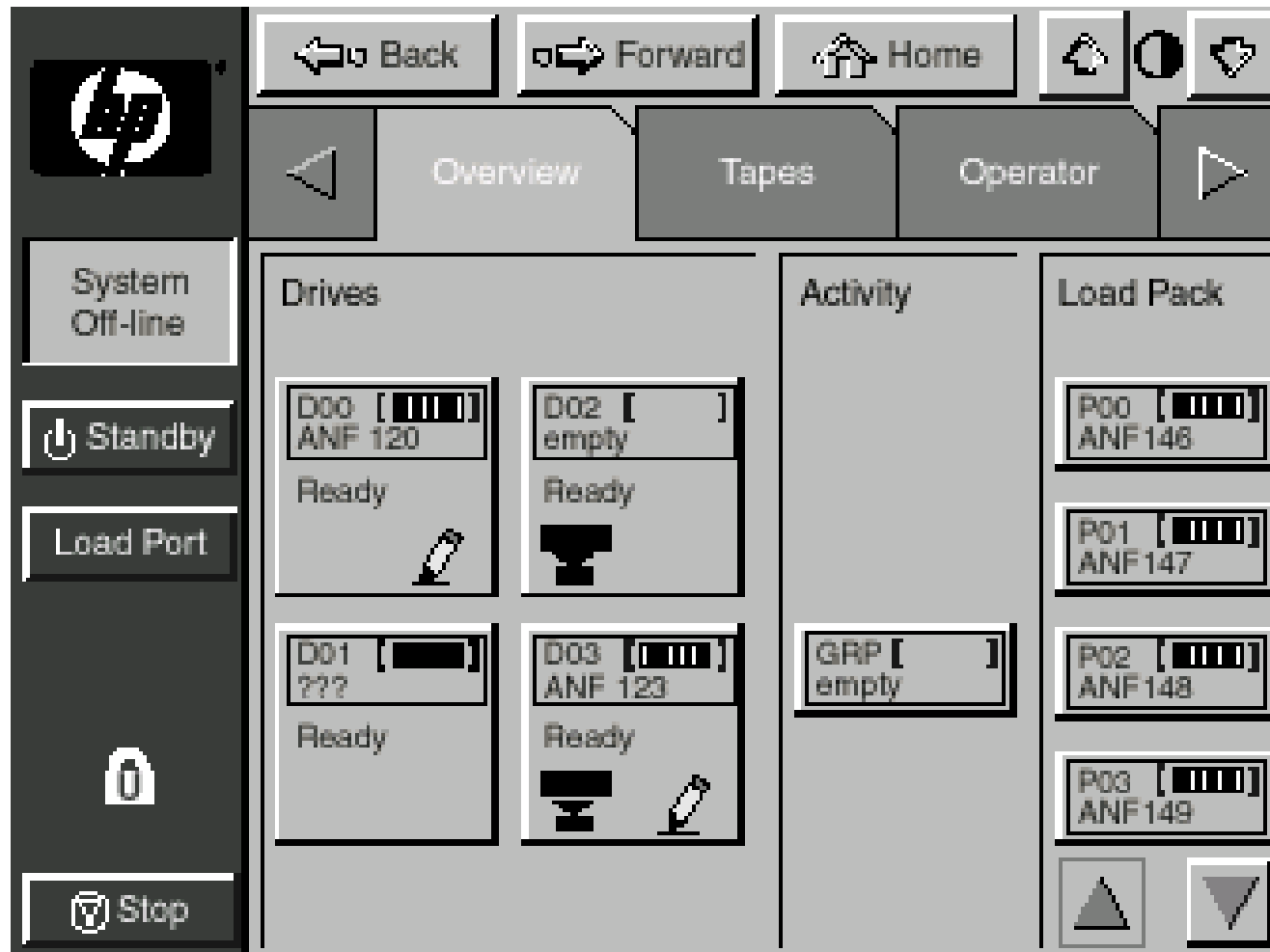
ESL9000 drive upgrade

- Verify newer type of drive supported for library
- Update firmware
- Replace or insert drive

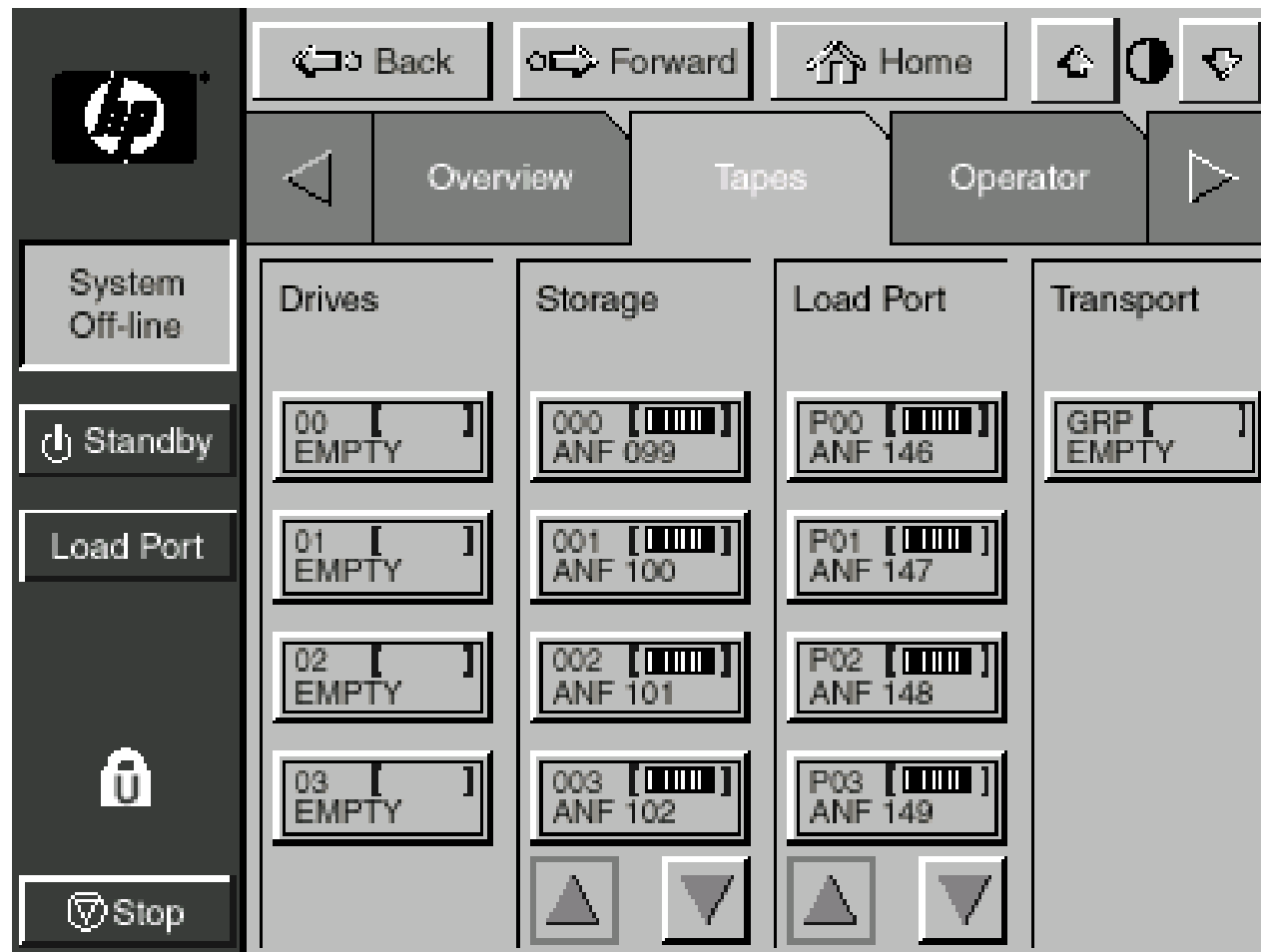
ESL9000 GUI



ESL9000 GUI – Overview tab



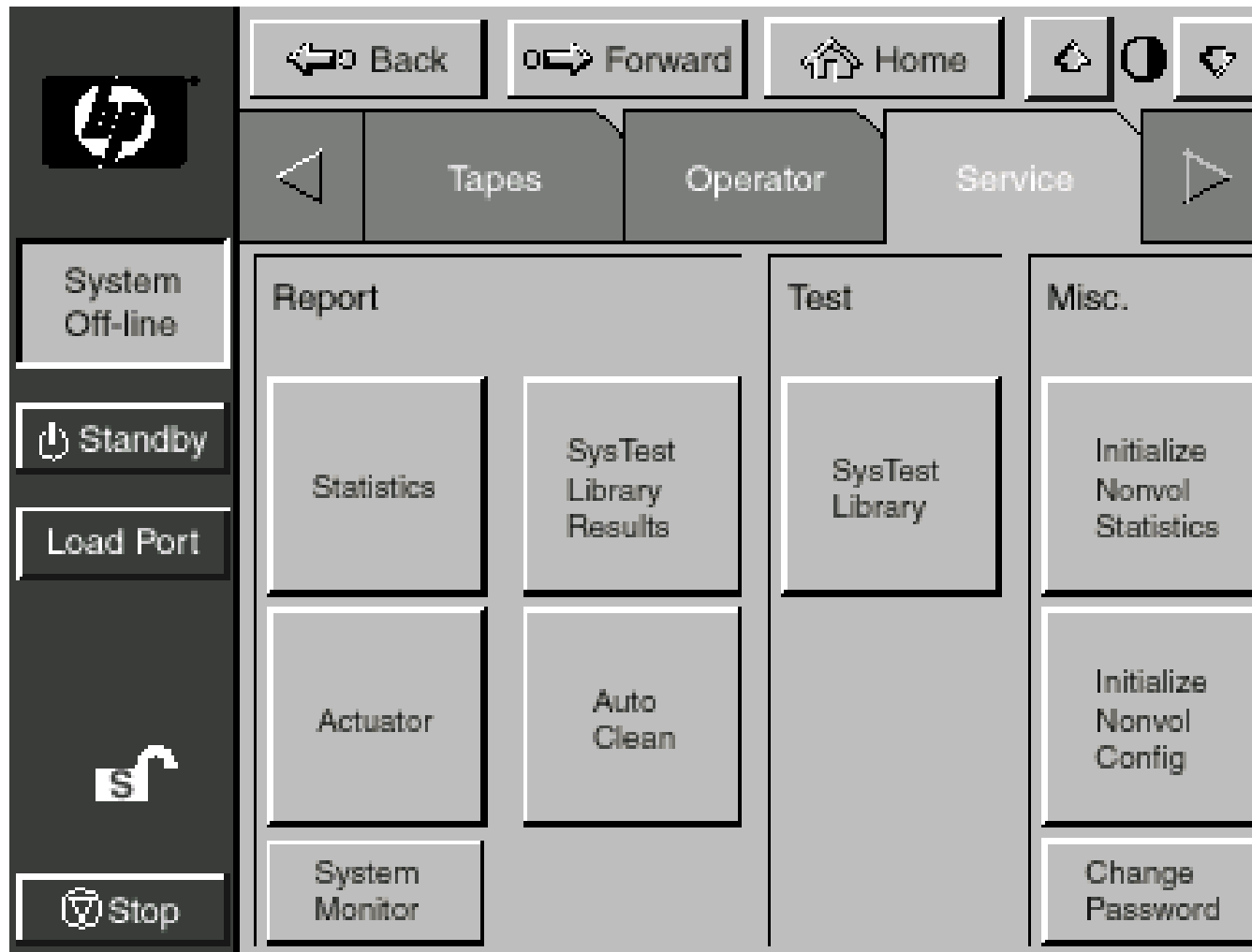
ESL9000 GUI – Tapes tab



ESL9000 GUI– Operator tab



ESL9000 GUI- Service tab



ESL Libraries: Working Smarter in SANs

Jeff Bain

Software Engineer
and Product Manager
HP, Nearline Automation

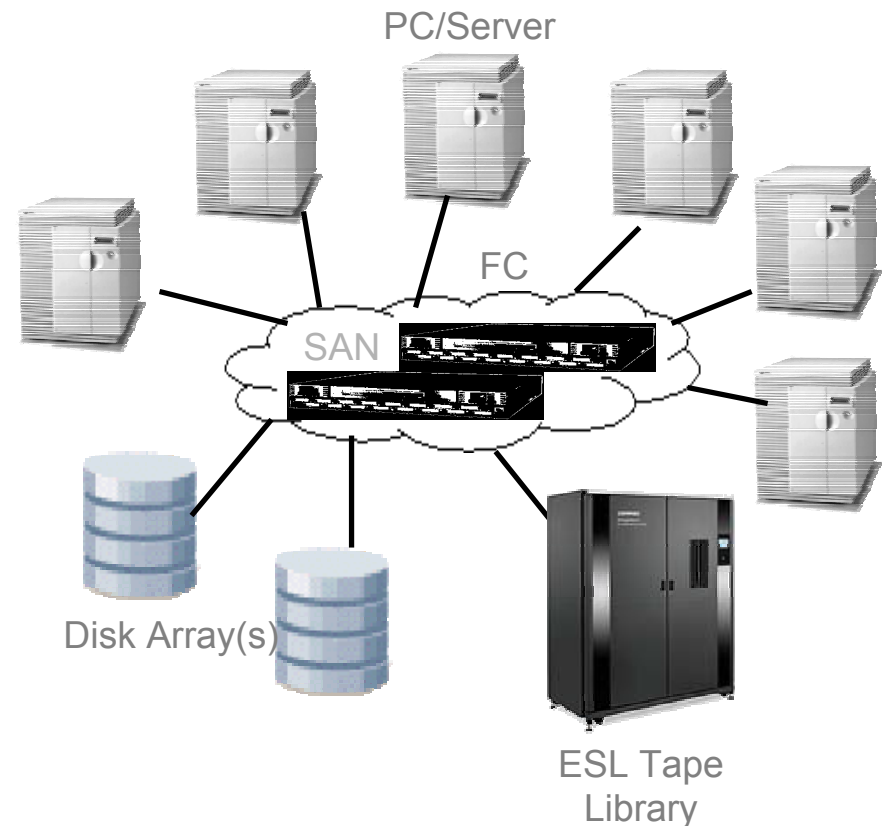


Overview

- Evolution of the SAN
 - What's an Ideal SAN?
 - What's a Typical SAN Today?
 - Why doesn't everyone have an Ideal SAN?
 - What are the pitfalls of a Typical SAN?
- Some Solutions
 - What does HP offer in these areas?
- Evolution of Network Storage
 - HP's Extended Tape Library Architecture
- Summary and Q&A

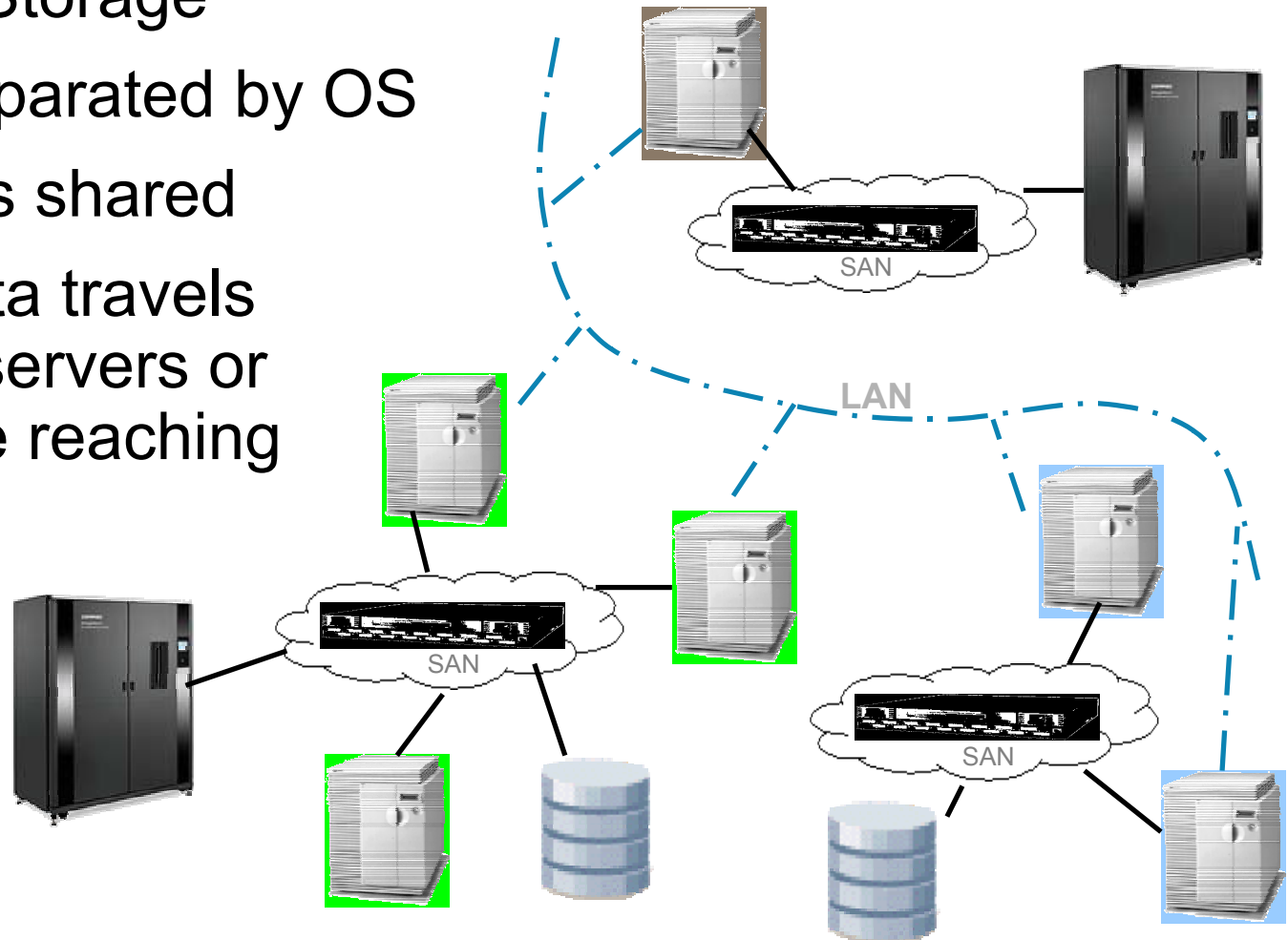
What's an Ideal SAN?

- Multiple servers connected
- All devices shared
- Protocol interoperability
- No bottlenecks
- Easily scaleable
- Direct array-to-tape data transfer possible
- Reliable and stable
- Highly available
- Manageable



What's a Typical SAN Today?

- Islands of Storage
- Servers separated by OS
- Some disks shared
- Backup data travels through a servers or LAN before reaching tape



Why doesn't everyone have an Ideal SAN?

- Long downtime required to move from historical connections to ideal SAN
- **Interoperability problems** with switches, OSs, peripherals prevent ideal connection
- If it ain't (fatally) broken, don't fix it: Stability is good...

What are the pitfalls of a Typical SAN?

■ Bottlenecks

- Due to data transfer through servers and LAN, plus overloaded backup server(s),

■ Application downtime

- As data is transferred from individual servers or SAN islands, most applications have to be shut down

■ Disconnected manageability

- Due to multiple independent SAN islands, and lack of integration in devices and infrastructure

Some Solutions

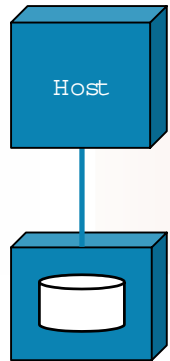
- For **interoperability** problems:
 - Shield drives from disruptive SAN events
 - Control host/HBA-to-drive access granularly
- For **bottlenecks** and **downtime** problems:
 - Move data directly from disk arrays to tape libraries
 - Eliminates necessity of moving data through servers or LAN
 - Needs a disk + tape + software solution
- For **disconnected manageability** problems:
 - Manage individual devices and SANs centrally
 - Select applications that manage whole systems, not just piece-parts

What does HP offer in these areas?

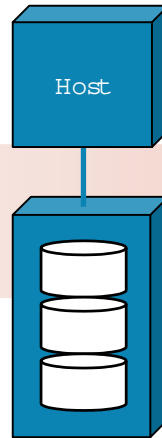
- For interoperability problems:
 - Shield drives from disruptive SAN events
 - Controller-based Architecture (see next slide)
 - Control host/HBA-to-drive access centrally
 - HP StorageWorks Secure Manager
- For bottlenecks and downtime problems:
 - Move data directly from disk arrays to tape libraries
 - HP StorageWorks Direct Backup Engine
 - HP Rapid Backup Solution
- For disconnected manageability problems:
 - Manage individual devices and SANs centrally
 - HP StorageWorks Command View
 - HP OpenView Storage Area Manager

Evolution of Network Storage

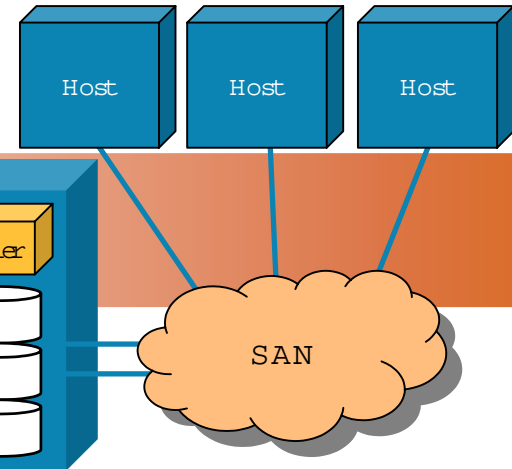
Direct-attach disk drive



JBOD



Network-attached disk array



Attributes of well-designed network storage:

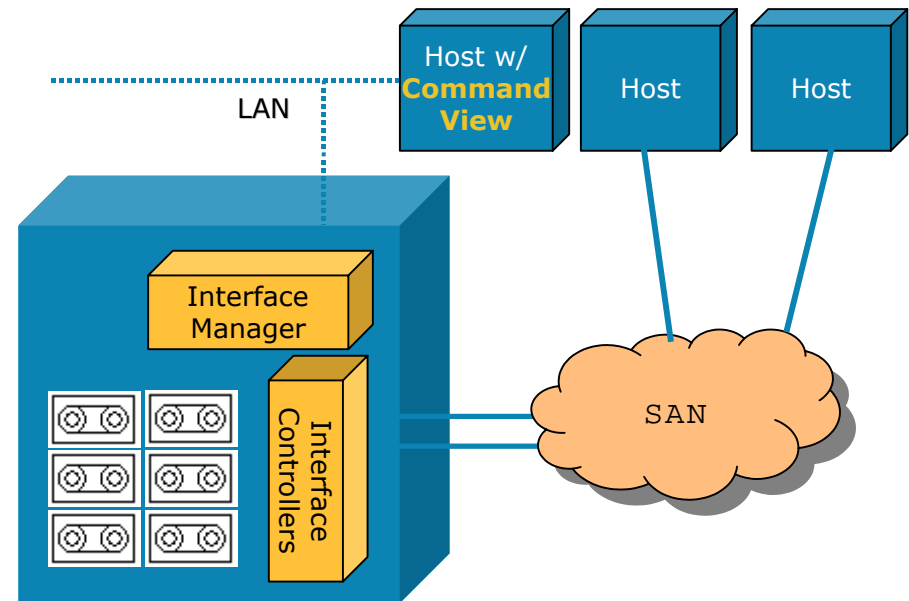
- Consolidated
- Scalable
- Reliable
- Secure
- Shareable
- Manageable

Today's tape libraries

- Native-FC tape libraries provide JBOD equivalent capability
- Additional capability available with router-based tape libraries
- Need more security, reliability, shareability and manageability

HP's Extended Tape Library Architecture

- Interface Controllers
 - interoperability and reliability
 - embedded intelligent features
- Interface Manager
 - ease of use and control
 - self-aware config policies
- Command View software
 - unified manageability without disrupting the SAN
- Direct Backup Engine
 - speed and uptime
- Secure Manager
 - complete security
- Related:
 - HP Rapid Backup Solution
 - HP OpenView Storage Area Manager



Summary and Q&A

- Ideal SANs offer:
 - Interoperability, reliability, availability, manageability
 - Security, speed, and control
- Typical SANs suffer from:
 - Disruptive events, bottlenecks, application downtime, disconnected (piece-parts) manageability
- Solutions:
 - Controller-based architecture, serverless backup, unified management
- HP Solutions:
 - Controller-based Architectures, Secure Manager, Direct Backup Engine, Command View, OpenView Storage Area Manger
- Storage has evolved from direct attach to grouped Just-a-Bunch-Of-Devices to intelligent controller-based system
- HP's **Extended Tape Library Architecture** represents the move to intelligent controller-based systems for the ESL family of tape libraries



Interex, Encompass and HP bring you a powerful new HP World.

