9840 Tape Drive Operations Guide

Abstract

This guide describes how to perform routine system operations for the 9840 tape drive and associated tape libraries on HP NonStop™ servers and Integrity NonStop NS - series servers. These tasks include monitoring the operator panel and performing labeled tape operations, backups, and basic troubleshooting. This guide also describes installing and configuring the 9840 tape drive for the NonStop NS-series server. It is written for system operators.
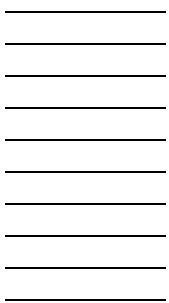
Product Version

N.A.

Supported Release Version Updates (RVUs)

This guide supports G06.11 and all subsequent G-series RVUs and H06.03 and all subsequent H-series RVUs until otherwise indicated by its replacement publication.

Document History

Part Number	Product Version	Published
429596-001	N.A.	March 2001
429596-002	N.A.	June 2005

9840 Tape Drive Operations Guide

Glossary	Index	Examples	Figures	Tables

4. L700 Tape Library

A. 9840 Troubleshooting and Recovery

B. 9840 Menu System

C. Installing and Configuring the Tape Drive for the NonStop NS-Series Server

Safety and Compliance

Index

Examples

Figures

Tables

Contents

What's New in This Manual

Manual Information

Abstract

This guide describes how to perform routine system operations for the 9840 tape drive and associated tape libraries on HP NonStop™ servers and Integrity NonStop NS - series servers. These tasks include monitoring the operator panel and performing labeled tape operations, backups, and basic troubleshooting. This guide also describes installing and configuring the 9840 tape drive for the NonStop NS-series server. It is written for system operators.

Product Version

N.A.

Supported Release Version Updates (RVUs)

This guide supports G06.11 and all subsequent G-series RVUs and H06.03 and all subsequent H-series RVUs until otherwise indicated by its replacement publication.

Part Number	Published
429596-002	June 2005

Document History

Part Number	Product Version	Published
429596-001	N.A.	March 2001
429596-002	N.A.	June 2005

New and Changed Information

Added Appendix C, Installing and Configuring the Tape Drive for the NonStop NS-Series Server.
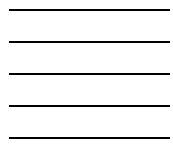
About This Manual

Notation Conventions

Hypertext Links

Blue underline is used to indicate a hypertext link within text. By clicking a passage of text with a blue underline, you are taken to the location described. For example:

This requirement is described under <u>Backup DAM Volumes and Physical Disk Drives</u> on page 3-2.

Change Bar Notation

Change bars are used to indicate substantive differences between this manual and its preceding version. Change bars are vertical rules placed in the right margin of changed portions of text, figures, tables, examples, and so on. Change bars highlight new or revised information. For example:

The message types specified in the REPORT clause are different in the COBO environment and the Common Run-Time Environment (CRE).

The CRE has many new message types and some new message type codes for old message types. In the CRE, the message type SYSTEM includes all messages except LOGICAL-CLOSE and LOGICAL-OPEN.

1 9840 Tape Drive Overview

This section contains:

9840 Tape Drive Description

The 9840 is a small, modular, high performance tape drive designed for NonStop servers. The 9840 tape drive is used in tape enclosure or tape library configurations and is compatible with theses tape libraries: the 9310, 9710, 9740, and L700.

The tape drive measures 82.55 mm (3.25 inches) high, 146.05 mm (5.75 inches) wide, and 381 mm (15 inches) deep. The 9840 features a proprietary design to provide faster average access time, higher data rates, higher capacity, and lower costs compared with similar units in the marketplace.

Fast Data Transfer Rate

Used for unattended backups or archiving, the 9840 tape drive allows the user to backup a higher data capacity at a higher speed. In a noncompressed mode, the 9840 tape drive has a maximum transfer rate of 10 MB/sec.

High-Capacity

The 9840 tape drive accepts the STK1R data cartridge. When this cartridge is used, the amount of data stored on the tape can be up to 20 GB (uncompressed).

Media Durability

The STK1R data cartridge can endure 10,000 loads, 6,500 long-length passes, and 80,000 short-length passes, and a minimum shelf life of 10 years, which provides superior media durability and data reliability.

Data Compression

The 9840 tape drive can write compressed or uncompressed information to a labeled or unlabeled tape. Compression increases the cartridge capacity (over the uncompressed format) by two to three times.Writing compressed data on tape means the tape drive compresses data whenever possible. The specific amount of data stored on the tape is not predictable because the amount of compression varies with the type of data being written. Because of this, the amount of compressed data stored on tape can vary significantly.

The 9840 tape drive can store up to 60 gigabytes (GB) on a STK1R data cartridge.

Table 1-1. 9840 Cartridge Capacities

Cartridge Type	9840 (Uncompressed)	9840 (Compressed)
STK1R Data Cartridge	20 GB	60 GB

Performance

The 9840 tape drive stores and shares information reliably and quickly. It offers the speed, capacity, and access demanded by today's storage-intensive applications and active users. Mainframe-class reliability allows continuous and confident operation. Utilize space more efficiently by attaching more drives to a new or existing library. Unrestricted connectivity and adaptability support unlimited growth for open system to mainframe, Ultra SCSI, Fibre Channel, and ESCON. It fits seamlessly and cost-effectively into current StorageTek automated storage solutions.

The 9840 subsystems have these characteristics:

- Faster backup and restore operations. Move or retrieve data with simultaneous read or write to each controller transport unit. First access to data averages 8 seconds.

- More data storage. Each cartridge holds up to 20 GB uncompressed (60 GB with compression).

- Easy migration to present and emerging technologies.

- Flexible. Mix media within an automated library. Attach additional drives to new or existing libraries.

9840 Tape Drive in Tape Libraries

The 9710 ACS Tape Library can house up to ten 9840 tapes drives. The library holds from 252 to 588 tape cartridges. The robot contained in the 9710 ACS Tape Library is responsible for loading and unloading the tape cartridges in the tape drives as tapes are requested by the system.

9840 Tape Cartridge Description

The tape cartridge used by the 9840 tape drive has a 20-gigabyte capacity (uncompressed). The components are shown in Figure 1-1.

Figure 1-1. The 9840 Tape Cartridge
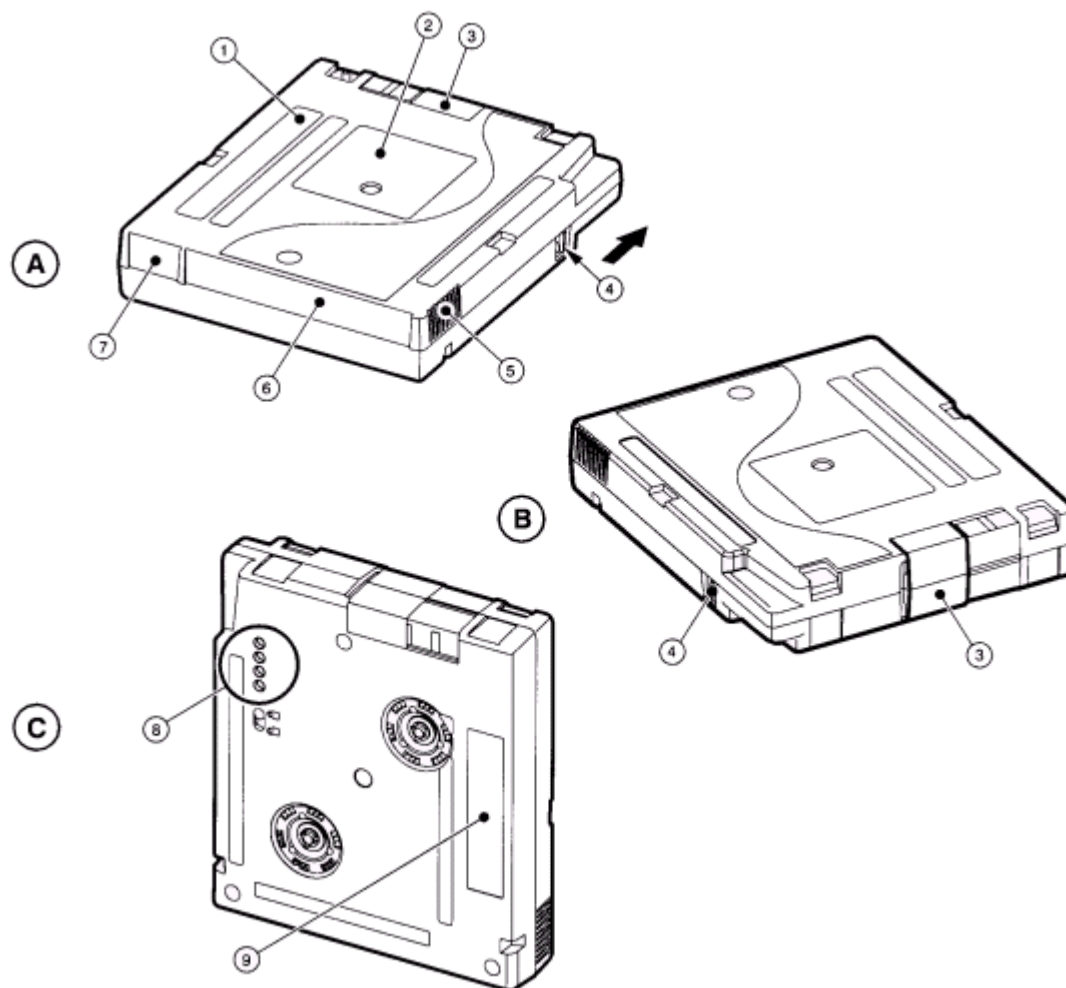
A. Rear view	4. Write protect switch
B. Front view	5. Finger grips
C. Bottom view	6. VOLSER label
1. Manufacturer label	7. Media ID (human or barcode readable)
2. Customer label	8. Media ID (machine readable)
3. Access door	9. Manufacturer part ID

Where to Find More Information

Use this manual in conjunction with these manuals:

Source	Manual
HP	SCF Reference Manual for the Storage Subsystem
HP	S-series Planning and Configuration Guide
HP	Guardian User's Guide
HP	Guardian Disk and Tape Utilities Reference Manual
HP	9840 (CT9840FC-3) Installation and User's Guide for NonStop Servers
STK	9840 Tape Drive User's Reference Manual
STK	9840 Tape Drive Product Manual
STK	9840 Tape Drive System Product Manual
STK	9710 ACS Tape Library Operators Guide

2

9840 Operator Panel

This section contains:

Operator Panel Description

The 9840 operator panel has a ten-digit display, four push-button switches, and four indicators. Figure 2-1 illustrates the 9840 operator panel.

Figure 2-1. 9840 Operator Panel

1. Power indicator

2. Activity indicator

3. Clean indicator

4.   Service indicator

5.   IPL switch

6.   Manual unload device

7.   Unload switch

8.   Operator display

9.   Menu switch

10. Select switch

11. Tape cartridge entry

Operator Panel Switches

Table 2-1 describes the operator panel switches. The **Menu** and **Select** switches (9 and 10) are unique to the 9840 design. Together they enable you to obtain information about the tape drive or to perform special tape operations such as reformatting tapes.

Table 2-1. Operator Panel Switches

Control Name	Control Description
	Pressing this switch causes the tape to rewind and unload, ending with the tape ejected and retrievable.
	If this switch is pressed during a write operation, the tape drive attempts to write the remaining data before it unloads. A display of "UnWr xxxx" (meaning Unwritten Data, where xxxx is a fault symptom code) means that the attempt failed and some data remains unwritten to tape.
	Pressing the Unload switch again causes the loss of this data. For the NonStop servers to save the unwritten data, the operator must issue the following SCSI command sequence before pressing Unload again:
Unload Switch	Recover Buffer Data

Table 2-1. Operator Panel Switches

Control Name	Control Description
	Use the IPL switch to reset the tape drive when necessary. Pressing the indented switch causes Initial Program Load (IPL), identical to the program initiations that takes place automatically after power on sequencing is complete. "IPL Pend" (IPL Pending) is displayed for one second when this switch is pressed.
	During IPL, the following are normally displayed in sequence:
	"LOAD XXXX" (XXXX = SCSI, FBCN)
	"LOAD CC" (Load Common Controller Code)
	"LOAD SERVO" (Load Servo Code)
	"Start Init" (Start Initialization)
IPL Switch	(A corporate ID, indicating tape drive loaded properly and is operational)
	Use the Menu switch to enter and exit the menu system and browse in and out of menus. The menu system allows you to reconfigure the tape drive or perform special operations. Refer to Appendix B, 9840 Menu System for more information.
	When in normal operation mode, pressing this switch will take you to the Online/Offline top menu. To make changes in the tape drive configurations or to perform special operations, the tape drive must be offline. Use the Select switch to change modes.
	The most important Main Menu selections are:
	Offline/Online state
	Drive Configuration State
	Special Drive Operations
Menu Switch	Main Exit
	When in a main configuration menu, pressing this switch selects one of the direct configuration action choices in the Main Menu itself, or the underlying submenus, depending on the structure of the Main Menu. Refer to Appendix B, 9840 Menu System for more information.
Select Switch	When in the configuration submenu, pressing the Select switch selects one of the direct configuration/action choices in the submenu.

Operator Panel LEDs

Table 2-2 describes the 9840 Operator Panel LEDs.

Table 2-2. Operator Panel LEDs

LED Name	Status	Indicator Description
Power (green)	Off	Power is off.
	Flashing	Unit is not functional (powering on, resetting the tape drive by performing an IPL, or collecting dump).
	Flashing doesn't stop:	IPL failed.
	Constantly on	Power on and IPL have executed properly.
Activity (green)	Off	Cartridge is not loaded or ejected.
	Flashing	Tape motion is in progress.
	Constantly ON	Tape loaded, and the tape drive is ready; unit is operational.
Clean (Amber)	Constantly ON	Tape drive requires cleaning.
	Indicator activated for one of these reasons:	Certain intermittent media errors were detected
		A preset length of tape passed over the read/write heads.
Service (Red)	Off	No error was detected.
	Flashing	An error was detected, and dump data has been collected to EEPROM. Following a successful IPL, display alternates between a corporate "XXXX:DMP x"
		Where XXXX = FSC, and x = number of uncollected dumps in EEPROM. Optionally, insert dump-formatted tape to copy data to the tape. The operator can ignore a flashing indicator. Flashing stops and messages are removed when any tape is inserted or any control is pressed. If within one minute the tape drive detects the same FSC, the message "DumpAgain?" is displayed: refer to DumpAgain? Message on page A-3 for instructions.
	Constantly ON	A hardware error was detected and tape drive is not functional. The operator cannot ignore a constant indicator. If resetting the tape drive by performing an IPL does not eliminate the problem, contact your service provider to replace the tape drive.

Table 2-3 explains error indications shown by the Power and Service LEDs. These errors do not cause a specific error message on the alphanumeric display.

Table 2-3. Service and Power LEDs

Service LED	Power LED	Meaning	Action
Off	On	Normal operation	take no action.
Flashing after collection is done	On or flashing	Tape drive error recovered to EEPROM.	Reset the tape drive by performing an IPL to see if the problem repeats.
			If the problem repeats, collect dump data and/or contact your service provider to replace the tape drive.
Off or flashing	Flashing while action takes place	Tape drive error; automatically resetting the tape drive by performing an IPL again or power on initiated	
Off or flashing	Flashing constantly, meaning it does not exit IPL mode	Tape drive failed to power on properly.	Contact your service provider to replace tape drive
On	On	Tape drive failed.	Reset the tape drive by performing an IPL to see if problem repeats.
			If problem repeats, contact your service provider to replace the tape drive.

Operator Panel Display

The operator panel display is a single-line, ten-character alphanumeric display linked to the tape drive and to the NonStop system. Use the display to view the state of the tape drive, fault symptom codes when applicable, and the menu selections and configurations states when the tape drive is in Menu mode.

Messages can be stable or blinking, and two messages can alternate. Operator panel displays might be shown twice, abbreviated in quotation marks and with full spelling. Abbreviated spellings in the quotations show exact display presentation. The full spelling is added to clarify meanings.

Table 2-4 provides an alphabetical list of operator panel error displays and recommended actions. The notation FSC stands for a four-digit alphanumeric fault symptom code. The code itself is not important for identifying the error type in the field.

Note. For removal and replacement of a tape drive, contact your service provider. All other procedures referred to in this table follow the table.

Table 2-4. Operator Panel Messages

Display	Probable Cause	Recommended Action
* (asterisk)	A steady asterisk indicates that the tape drive is online but not loaded	Operator discretion
ASIA DIAG	Normal display while tape drive perform IPL	Wait for IPL to complete.
Bank N Bad	During boot, a section of memory (1,2,3, or 4) is found bad	If IPL doesn't correct problem, contact your service provider to replace the tape drive.
Boot Fail	IPL failed	Reset the tape drive by performing an IPL again.
		If that fails, contact your service provider to replace the tape drive.
BT Monitor	A sequence of pushbuttons took you to an Engineering zone	Reset the tape drive by performing an IPL to clear.
Cnhndnsn	Hardware revision level supported by the firmware in this tape drive, where: n = any number 0-9 c = controller processor level h = host side formatter level d = device side formatter level s = servo level	This message occurs when firmware level is insufficient to control the hardware level in the tape drive. Contact your service provider to install newer level firmware.
CC DIAG	Normal display while tape drive performs IPL	Wait for IPL to complete.

Table 2-4. Operator Panel Messages

Display	Probable Cause	Recommended Action
CHK (FSC)	Operational failure: tape drive is automatically reset by performing an IPL	Wait for IPL to complete and then retry operation. If IPL fails, contact your service provider to replace the tape drive.
Cleaning (*Cleaning*)	Cleaning tape was inserted and the tape drive is now in the process of cleaning	No action is necessary.
CodCrFail1	Unable to write tape Unable to position on tape	Ensure the tape is write-enabled. Try another tape.
CodCrFail2	Unreadable tape format	Reclaim as data tape. Retry operation. Try another tape. If persistent, refer to Forcing a Diagnostic Dump (Reset Drive) on page A-4.
CodeUpDate	The firmware in the tape drive is being updated from the NonStop system: operator panel switches are locked	No action is necessary.
CodUpFail1	Unable to read tape Unable to read position on tape Unable to read image on tape	Try another tape.
CodUpFail2	EEPROM bad	Try another tape. If the problem continues, reset the tape drive by performing an IPL. If problem persists after the IPL, contact your service provider to replace tape drive
CodUpFail3	Unreadable tape format	Reclaim as data tape and recreate code tape. Retry operation. Try another tape. If persistent, refer to Forcing a Diagnostic Dump (Reset Drive) on page A-4.
CodUpFail4	Not a code updated tape	Retry with correct tape. If persistent, refer to Forcing a Diagnostic Dump (Reset Drive) on page A-4.

Table 2-4. Operator Panel Messages

Display	Probable Cause	Recommended Action
DatCrFail1	Unable to create (format) a data tape	Ensure tape is write-enabled.
		Try another drive.
		If persistent, refer to Forcing a Diagnostic Dump (Reset Drive) on page A-4.
DmpCrFail1	Unable to create (format) a dump tape	Ensure tape is write-enabled.
		Try another tape.
		Try another drive.
		If persistent, refer to Forcing a Diagnostic Dump (Reset Drive) on page A-4.
DmpCrFail2	Unreadable tape format	Reclaim as data tape.
		Retry operation.
		Try another tape.
		If persistent, refer to Forcing a Diagnostic Dump (Reset Drive) on page A-4.
DumpToHost	Dump or event log is being transferred to the NonStop system: operation panel switches are locked	No action is necessary.
DmpWrFail1	Unable to write dump to tape	Try another tape: ensure tape is formatted for dump.
	Unable to position on tape	
DmpWrFail2	No dump to process	Force a dump: Refer to Forcing a Diagnostic Dump (Reset Drive) on page A-4.
DumpAgain?	Tape drive detected the same CHK (FSC) within one minute	Refer to DumpAgain? Message on page A-3.
Exp ClCart	Cleaning cartridge is used up	Replace the cleaning cartridge.
FFFF:Dmp Y	Alternates with corporate ID at completion of IPL, where FFFF=FSC of last dump date collected, Y=number of uncollected dumps in EEPROM	Optionally move dumps to the NonStop system or tape: refer to Forcing a Diagnostic Dump (Reset Drive) on page A-4.
Fix_CfgErr	Upon IPL, configuration checksum does not match	Refer to Fix_CfgErr Error on page A-1.
INIT (FSC)	Initialization error	Reset the tape drive by performing an IPL.
		If that fails, contact your service provider to replace the tape drive.

Table 2-4. Operator Panel Messages

Display	Probable Cause	Recommended Action
IPL Pend	IPL Pending is displayed for one second when IPL is pressed	Wait until IPL completes automatically.
Load CC	The common controller code is loading	No action is necessary.
Loading	Tape cartridge is being loaded	No action is necessary.
Load ESCON	Normal display during boot	Wait for IPL to complete.
Load (FSC)	Load/unload operation has failed	Try another tape.
		If another tape works, the original tape is suspect. Refer to [Identifying Unrecoverable Tapes](#) on page A-3.
		If another tape also fails load, reset the tape drive by performing an IPL.
		If failure persists, contact your service provider to replace the tape drive.
Load SCSI	Normal display during boot	Wait for IPL to complete.
Locating	Tape drive is doing a high speed seek	No action is necessary.
Memory Err	RAM failed during IPL	Reset the tape drive by performing an IPL again.
		If that fails, contact your service provider to replace tape drive.
NT Ready F	Non-write protected tape is in process of manual unload	Wait until unload operation completes.
NT Ready U	Write protected tape is in process of manual unload	Wait until operation completes.
Online	The tape drive is operational	No action is necessary.
Power Fail	Power supply has failed	Contact your service provider to replace the power supply.
Reading	The tape drive is in the read mode	No action is necessary.
Ready F	Loaded tape is file protected	Operator discretion.
Ready U	Loaded tape is not file protected	Operator discretion.
Rewinding	The tape drive is rewinding	No action is necessary.
Save Fails	New configuration cannot be saved	Contact your service provider to replace tape drive.
SavingDump	Displayed while saving dump to EEPROM	Normal display. Wait for the dump to complete.

Table 2-4. Operator Panel Messages

Display	Probable Cause	Recommended Action
Start Init	Initialization started	No action is necessary.
A Corporate ID	Displayed at successful IPL completion when the tape drive is operational	This ID might be of StorageTek or another corporate distributor.
Trapped	Boot is trapped in a closed loop	No action is necessary.
UnWr (FSC)	Unload switch was pressed while a write was taking place	Go to "Handling a UnWr xxxx Indication" in Appendix A.
Write Prot	Tape drive attempted to write to a write-protected tape	Change switch on tape cartridge to write-enabled.
Writing	The tape drive is in write mode	No action is necessary.

3 Operating the 9840 Tape Drive

This section contains:

Powering On and Performing an IPL on a Tape Drive

1. Power on the tape drive:

   - If the tape drive power supply does not have a power switch, plug the power supply cable into the library power strip.

   - If the tape drive or drive power supply has a power switch, ensure that the power cord is attached and turn on the power switch.

2. Wait until the tape drive finishes the IPL . Note the following:

   - The messages "CC DIAGS" and "ASIA DIAGS" indicate the IPL diagnostics are active. These messages are informational and require no action.

   - The tape drive powers on automatically to "Online" if drive is operable and no configuration error occurred.

   - The tape drive powers on to "Offline" if a configuration error occurred. The message "FIX_CfgErr" is displayed. Refer to Fix_CfgErr Error on page A-2

Note. If any error is displayed, refer to Appendix A, 9840 Troubleshooting and Recovery for a description of corrective action.

Performing an IPL on the Tape Drive From the Host

Use the SCSI Write Buffer command to accomplish this task.

Checking the Status of Tape Devices

You can use the TSM Service Application or the Subsystem Control Facility (SCF) to check the status of tape drives.

Using the TSM Service Application

For more information, refer to the TSM Service Application online help.

Using the SCF STATUS Command

Use the SCF STATUS command to display current status information about an object. The syntax for the STATUS command is:

```
STATUS [ /OUT file-spec/ ] [ object-spec ]

[ ,DETAIL ]

[ ,SEL state ]
```

OUT file-spec

Directs all SCF output generated for this command to the specified file.

DETAIL

Specifies that all status information should be displayed. If DETAIL is omitted, a single line of data is returned for each object name.

SEL state

Specifies that information should be displayed only for objects that are in the specified state.

Object-spec

Specifies one of the following combinations of object type and object name:

Object Type	Object Name
SCSI	$device-name
SCSI	$device-name-path
SUBSYS	$sto-mgr
TAPE	$tape-name

Wild card characters are supported.

STATUS SCSI Command

This subsection describes the STATUS SCSI command for Open SCSI devices. The command syntax is:

```
STATUS SCSI $ device-name [ -P | -B ]
```

> $ device-name
>
> > specifies the name of the Open SCSI I/O process.
>
> -P | -B
>
> > specifies whether the path is the primary (-P) or the backup (-B).
>
> DETAIL
>
> > Returns all status information.

Examples using STATUS SCSI

These are examples of the STATUS SCSI command:

- To display the status of all Open SCSI devices on the system, type:

  ```
  -> STATUS SCSI $*
  ```

- To display the summary status of the Open SCSI device $DEV00, type:

  ```
  -> STATUS $DEV00
  ```

- To display the detailed status of the Open SCSI device $DEV00, type:

  ```
  -> STATUS $DEV00, DETAIL
  ```

- To display the summary status of the backup path of the Open SCSI device $SD00, type:

  ```
  -> STATUS $SDOO-B
  ```

STATUS SUBSYS Command

This subsection describes the STATUS SUBSYS command. The command syntax is:

```
STATUS SUBSYS $ZZSTO
```

An Example Using STATUS SUBSYS

To display the summary status of storage subsystem manager, type:

```
-> STATUS SUSBSYS $ZZSTO
```

STATUS TAPE Command

This subsection describes the STATUS TAPE command. The command syntax is:

```
STATUS TAPE $tape name
```

Examples using STATUS TAPE

These are examples show the STATUS TAPE command:

- To display the summary status of all tape drives starting with $TAPE:

  ```
  -> STATUS TAPE $TAPE*
  ```

- To display the detailed status of the tape $TAPE0:

  ```
  -> STATUS $TAPE0, DETAIL
  ```

Starting or Stopping a Tape Drive

Taking a Tape Drive Online or Offline

1. If taking the tape drive offline from the host, change the drive to offline for all host paths to the drive.

2. Press the **Menu** switch. The display shows the current state of the drive as either "Online" or "Offline."

3. To change the current state, press the **Select** switch once. Observe the display:

   a. "Offl Pend" means offline is pending (wait for the system response).

   b. "Onl Pend" means online is pending (waiting for the diagnostics completion).

   c. "IPL Pend" means the IPL will start within one second.

   d. A display of "Online" or "Offline" means the transition was successful. This is the new state of the drive.

4. If the drive is now online, exit the Menu mode by pressing **Menu** until "Exit Menu?" is displayed, and then press **Select** to exit.

5. If the drive is now offline, proceed to the other menus by pressing **Menu**.

6. If the drive is being taken online from the host, change the drive to online for all host paths to the drive.

Starting a Tape Device using SCF

Use the SCF START command to initiate the operation of an object (make a stopped device accessible to user processes). Successful completion of the START command leaves the object in a STARTED state.

START Command Syntax

The syntax for the START command is:

```
START [ /OUT file-spec/ ] [ object-spec]
[ , DEBUG  $ terminal-name ]
[ , SEL state ]
[ , SPECIAL ]
```

OUT *file-spec*

Directs all SCF output generated (for this command) to the specified file.

DEBUG $*terminal-name*

Specifies that the process is started in the debug mode against the terminal supplied in the command.

SEL state

Specifies that the command should be issued only to objects that are in the specified state.

SPECIAL

Specifies that the object will start in the SERVICING state, substate SPECIAL. To restart an object in the SERVICING state, issue a RESET command followed by a START command.

object-spec

specifies one of the following combinations of object type and object name:

Object Type	Object Name
SCSI	$*device-name*
SCSI	$*device-name-path*
TAPE	$*tape-name*

START SCSI Command

This subsection describes the START SCSI command. Use the START SCSI command to make a stopped Open SCSI device or path to an Open SCSI device accessible to user processes. The command syntax is:

```
START SCSI {$device-name | $device-name-path}
```

Wild-card characters are supported.

Examples using START SCSI

These examples shows how the START SCSI command:

- To start all Open SCSI devices on the system (that are in the proper state to start), type:

  ```
  ->START SCSI $*
  ```

- To start the backup path to the Open SCSI device $DEV0, type:

  ```
  ->START $DEV00-B
  ```

START SCSI Considerations

Before using the START SCSI command, consider the following:

- Use the SCF STATUS SCSI command to verify that an Open SCSI device has been started.

- If the START SCSI command is failing, see the *NonStop Hardware Support Guide* for troubleshooting ideas.

START TAPE Command

This subsection describes the details about the START TAPE command. Use the START TAPE command to assign a tape drive to a specific NonStop S-series system. The command syntax is:

```
START TAPE $tape-name
```

Wild-card characters are supported.

Examples using START TAPE

These examples show the START TAPE command:

- To start all tapes available on the system, type:

  ```
  -> START TAPE $*
  ```

- To start $TAPE0:

  ```
  -> START $TAPE0
  ```

START TAPE Considerations

If the tape process does not start, use the SCF RESET TAPE, FORCED command prior to starting the tape drive.

Stopping a Tape Device using SCF

Use the SCF STOP command to terminate access to a storage device in an orderly manner. This means that the device isn't stopped until current activity ends. When the STOP command finishes, configured devices are left in a STOPPED state, substate DOWN. The devices remain in the system configuration database.

When the last path to a device is stopped, an implicit refresh operation is also performed. This is a general cleanup operation so that the device will not have any changed buffers or file control blocks outstanding.

STOP Command Syntax

The syntax for the STOP command is:

```
STOP [ /OUT file-spec/ ] [object-spec ]
[ , FORCED ]
[ , SEL state ]
```

OUT file-spec

> Directs all SCF output generated for this command to the specified file.

FORCED

> Specifies that the command should be executed without any interaction with you, even if there are files open on the device. SCF will not prompt you for confirmation.

SEL state

> Specifies that the command should be applied only to objects that are in the specified state.

Object-spec

> Specifies one of the following combinations of object type and object name:

Object Type	Object Name
SCSI	$device-name
SCSI	$device-name-path
TAPE	$tape-name

> Wild-card characters are supported.

STOP SCSI Command

This subsection describes the STOP SCSI command. The STOP SCSI command stops access to the specified Open SCSI device. The command syntax is:

```
STOP SCSI {$device-name | $1dev} [ -P | -B ]
```

$device-name | $1dev

Specifies the name or logical device number of the device.

-P | -B

Specifies whether the path being stopped is the primary (-P) or backup (-B).

Wild-card characters are supported.

Examples using STOP SCSI

These examples show the STOP SCSI command:

- To stop access to the backup path of the Open SCSI device $DEV1:

  ```
  -> STOP $DEV1-B
  ```
- To stop access to all paths of the Open SCSI device $DEV00:

  ```
  -> STOP $DEV00
  ```

STOP TAPE Command

This subsection describes the details about the STOP TAPE command. The STOP TAPE command stops access to the specified tape drive. The command syntax is:

```
STOP TAPE { $tape-name | $1dev }
```

$tape-name|$1dev

Specifies the name or logical device number of the tape device.

An Example using STOP TAPE

This is an example of the STOP TAPE command. To stop access to all tape drives starting with $TAPE, type:

```
-> STOP TAPE $TAPE*
```

Cleaning the Tape Path

You must clean the 9840 tape path with a cleaning cartridge when the amber Clean indicator light comes on. This indicator lights when certain tape errors are detected or a certain length of tape passed through the tape path.

△ **Caution.** Do not use the cleaning cartridge unless the Clean indicator comes on. Cleaning more frequently might cause excessive head wear.

To Dry-Clean the Tape Path

△ **Caution.** Do not wet-clean the 9840 tape path. Cleaning with chemicals or with tools other than the cleaning cartridge is not allowed.

Note. This procedure does not require you to take the tape drive offline.

1. If applicable, unload the drive.

2. Insert a cleaning cartridge into the drive.

Note. If the cleaning cartridge ejects immediately without performing a clean operation and the drive displays "Exp_CLcart," it means that the cleaning tape is used up. Obtain a new cleaning cartridge.

3. Observe the indications:

   - The green Activity indicator flashes to indicate cleaning is taking place.

   - The cartridge ejects and the Clean indicator turns off when cleaning is complete.

   - A displayed "CHK XXXX" message means a cleaning cartridge failure, where "XXXX" is a Fault Symptom Code; try a different cleaning cartridge.

4. Remove the cleaning cartridge when the drive ejects the cartridge.

Performing Tape Cartridge Operations

Write-Protecting a Tape Cartridge

△ **Caution.** Do not degauss 9840 tapes. Servo tracks are written on the tape at the factory. When these tracks are mistakenly erased, the tape cartridge must be discarded.

1. Hold the tape cartridge with the customer label side up and rear volser label toward you.

2. Locate the write protect switch on the right side of the tape cartridge.

3. Move the switch to the front of the tape cartridge (away from you) to write protect position.

Loading a Tape Cartridge

1. Insert the tape cartridge in the drive (see Figure 5-1).

2. Wait for a displayed message:

   - A "Ready F" (File Protect) message means that tape is loaded and is write protected.

- A "Ready U" (File Unprotected) message mans that tape is loaded and not write protected.

- A "Load XXXX" message means that the tape load has failed, where the "XXXX" is a Fault Symptom Code (see Table A-2, in Appendix A, for instructions on how to handle this condition).

Unloading a Tape Cartridge

1. Ensure the tape drive is not selected from the host.

2. Press the **Unload** switch.

3. If the tape fails to eject, see Removing a Stuck Tape Cartridge on page A-6.

If this switch is pressed during a write operation, the drive attempts to write the remaining data before it unloads. A display of "UnWr XXXX" (Unwritten Data) means that the attempt failed and some data remains unwritten to tape.

Pressing the **Unload** switch again causes loss of this data. For the host to save the unwritten data, issue the following SCSI command before pressing Unload again:

- Recover Buffer Data

Reclaiming (Reformat) a Tape Cartridge

When a tape cartridge is corrupted or formatted for special uses such as dump or firmware, it can be reformatted as a data tape and returned to normal usage. This procedure is referred to as reclaiming a tape for normal use.

1. Take the tape drive offline.

2. Press **Menu** until the Drive Mode Main Menu is reached. "Drv Menu?" displays.

3. Press **Select** to enter the Drive Menu.

4. Press **Menu** until "MakeDataTp" appears.

5. Press **Select** to initiate; any tape cartridge present in the drive is ejected.

6. When the "Ld Data Tp" displays, place a write-enabled tape in the drive. The operation starts automatically and erases and reformats any tape.

   If "DatCrFailx" is displayed (where x = 1), see Table A-2 in Appendix A for instructions on how to handle this error condition.

7. When done, exit Drive Mode and remove the tape from the drive.

8. Put the drive online.

Formatting a Diagnostic Dump Tape

To collect a diagnostic dump, you must prepare a tape with a special format so that it will accept diagnostic dump data. Use this procedure to format the tape. This procedure does not do a diagnostic dump.

1. Take the tape drive offline.

2. Press **Menu** until the Drive Mode Main Menu is reached. "Drv Menu?" is displayed.

3. Press **Select** to enter the Drive Menu.

4. Press **Menu** once. "MakeDumpTp"appears.

5. Press **Select** to start. Any tape cartridge present in the drive is ejected.

6. When "Ld Dump TP" is displayed, place a write-enabled tape cartridge in the drive. The operation starts automatically and erases and reformats a new tape and gives it a special dump tape ID coding.

7. 'When done, exit the Drive Mode.

8. Put the drive online.

Using Labeled Tapes

NonStop systems support two standard tape-label formats:

- ANSI

- IBM-MVS

Enabling or Disabling Labeled-Tape Operations using SCF

Note. Because labeled tapes can be cataloged and offer security features for protecting data, you should use labeled tapes with 9840 tape drives.

Use the SCF ALTER SUBSYS command to enable or disable labeled-tape operations. For example, to turn on labeled-tape processing, enter at a TACL prompt:

```
> SCF

-> STOP TAPE $* (Stops all tape operation)

-> ALTER $ZZSTO, LABELTAPE ON

-> START TAPE $*

-> EXIT

-> ZSERVER /NAME $ZSVR, NOWAIT, CPU primary-cpu / backup-cpu
```

To turn off labeled-tape processing, enter at a TACL prompt:

```
> STOP $ZSVR (Stops the tape server process $ZSVR)

> SCF (Starts SCF)

-> STOP TAPE $* (Stops all tape operation)

-> ALTER $ZZSTO, LABELTAPE OFF

-> START TAPE $*
```

For complete details about the ALTER SUBSYS command, including command syntax, see the *SCF Reference Manual for the Storage Subsystem.*

Using the MEDIACOM Utility for Labeled-Tape Operation

MEDIACOM is the utility for managing labeled-tape operations. MEDIACOM replaces TAPECOM and provides the operator interface to the Distribute Systems Management (DSM)/Tape Catalog.

Use MEDIACOM commands to:

● Label new tapes and catalog them

● Handle tape mount requests

● Manage the use of uncataloged tapes

● Create scratch tapes

Using BACKUP and RESTORE

BACKUP and RESTORE are two of the most commonly used utilities for moving files between a NonStop system and cartridge tapes:

● Use BACKUP to copy disk files to magnetic tape on a regular basis.

● Use RESTORE to replace files from tape if one or more disk files are lost or destroyed.

For more information on the BACKUP and RESTORE utilities, refer to the *Guardian Disk and Tape Utilities Reference Manual.*

Restoring Tape Files to Disk

Use the RESTORE utility to copy files from magnetic tape to disk. This example restores the contents of $TAPE to a specified subvolume on $DISK1 located within the same system:

```
-> RESTORE $TAPE, $DISK1.*.*, NOPROMPT
```

Note. When the restore operation requires multiple tape cartridges, the NOPROMPT option prevents user prompts between tapes. The restore operation continues when the tape drive is ready and the robot loads the next requested tape.

Viewing the Contents of a Tape

The RESTORE utility allows the contents of a labeled or unlabeled tape cartridge before restoring files to disk to be viewed. The following example instructs the RESTORE utility to verify the tape on drive $TAPE0, list the files without writing the tape to disk, and leave the tape online so that a RESTORE process can be started without remounting the tape:

```
-> RESTORE $TAPE0,*.*, VERIFYTAPE,LISTONLY, NOUNLOAD
```

Using the BLOCKSIZE Option

Larger BLOCKSIZE values can improve BACKUP performance by increasing the size of data records written to tape. The BLOCKSIZE option specifies the number of 1024-byte increments (blocks) in each record. When using larger block sizes, make sure all tape drives and systems that will read the tape support the BLOCKSIZE specified.

Before using BLOCKSIZE values larger than 28, consider:

- A tape that was backed up with a BLOCKSIZE larger than 28 can be restored only on a system using a D30 or later version of RESTORE on a tape drive that supports the larger block transfers.

- Expanded networks do not support BLOCKSIZE values larger than 28.

For more information about the BLOCKSIZE option, refer to the *Guardian Disk and Tape Utilities Reference Manual.*

Using the NOUNLOAD Option

The NOUNLOAD option directs the BACKUP utility to rewind the final tape and leave it online in the drive when the BACKUP process is completed. If the NOUNLOAD option in the BACKUP command is not specified the robot returns the last tape cartridge to its slot within the 9710 ACS Tape Library, when the drive is finished writing to the tape. The robot then loads the next tape cartridge requested.

```
-> BACKUP $TAPE1, $MYDISK.MYVOL.*, NOUNLOAD
```

Using BACKUP and RESTORE with Tape Libraries

To begin a BACKUP or RESTORE operation when using a tape library, a tape cartridge must be loaded into one of the drives contained within the tape library. For operations requiring a single tape cartridge, the tape drive writes to or reads from the tape, then the robot unloads the tape cartridge (unless the NOUNLOAD option was specified), and loads the next requested tape label cartridge.

Using Multiple Tape Cartridges

For BACKUP or RESTORE operations requiring multiple tape cartridges, the system issues a mount request that the robot receives via the server and the new tape cartridge is loaded. For examples, see the following subsections.

Backing Up Disk Files to Tape

The following example copies all files from the $DISK1.USER2 subvolume to the tape on the tape drive name $TAPE1. The NOPROMPT option instructs the host system not to prompt you before writing to each tape. This option is useful when the backup requires more than one tape cartridge, and the process utilizes a labeled tape environment.

->BACKUP $TAPE1, $DISK1.USER2.*,NOPROMPT

Using Labeled Tapes with Backup and Restore

If labeled tapes are being used, tape DEFINE with BACKUP and RESTORE commands must be used. A tape DEFINE specifies information about a tape file, such as the label type, tape density, and expiration date of the data on the tape. The following example specifies a CLASS TAPECATALOG DEFINE named "=BACK." The BACKUP command copies all the files on the $DATA volume to tape.

```
-> ADD DEFINE =BACK, CLASS TAPECATALOG, LABELS BACKUP&

-> USE OUT, CATALOG OFF

-> BACKUP =BACK, $DATA.*.*,LISTALL, NOPROMPT
```

- The LISTALL option lists the names of all files backed up.

- The NOPROMPT option instructs BACKUP not to prompt you before beginning to write on each tape but to begin when it detects the tape drive is ready.

For more information about labeled-tape processing, see Using Labeled Tapes on page 3-13. For more information on tape DEFINEs, see these manuals:

- *Guardian User's Guide*

- *Guardian Disk and Tape Utilities Reference Manual*

- *DSM/Tape Catalog User's Guide*

BACKUP Requiring Multiple Tape Cartridges

For backups that require more than one tape cartridge, the robot starts with the tape cartridge that was requested to begin the backup process. If the BACKUP command includes the NOPROMPT option, the robot loads additional tapes sequentially without prompting the operator.

For example, if a BACKUP command that requires three tape cartridges is issued, the robot loads the tape cartridges requested in sequential order. The robot unloads the tape from the drive as the BACKUP process finishes and then loads the next tape cartridge.

Note. Tape cartridges are loaded from random slot order. The robot tracks the inventory of tape cartridges by label.

If a BACKUP operation requires additional tape cartridges but the requested tape cartridge is not in the tape library, the tape cartridges already written must be removed (Dismount, Eject) and the requested tape cartridge must be loaded into the CAP (Cartridge Access Port).

Where to Find More Information

This table tells where to get more information on labeled tapes, labeled-tape processing, tape operator tasks, and utilities for managing tape operations:

| For more information about…	Read…
Enabling labeled-tape processing	SCF Reference Manual for the Storage Subsystem
Managing labeled-tape processing	Guardian User's Guide
MEDIACOM and tape-label formats	DSM/Tape Catalog Operator Interface (MEDIACOM) Manual
BACKUP utility, RESTORE utility, or TAPECOM utility	Guardian Disk and Tape Utilities Reference Manual
FUP utility	File Utility Program (FUP) Reference Manual

4 L700 Tape Library

This section contains:

Operator Panel

The operator panel, recessed into the library's rack door, contains buttons, indicators, and a graphic display. Figure 4-1 shows the panel.

Figure 4-1. Operator Panel Display, Control, and Indicators
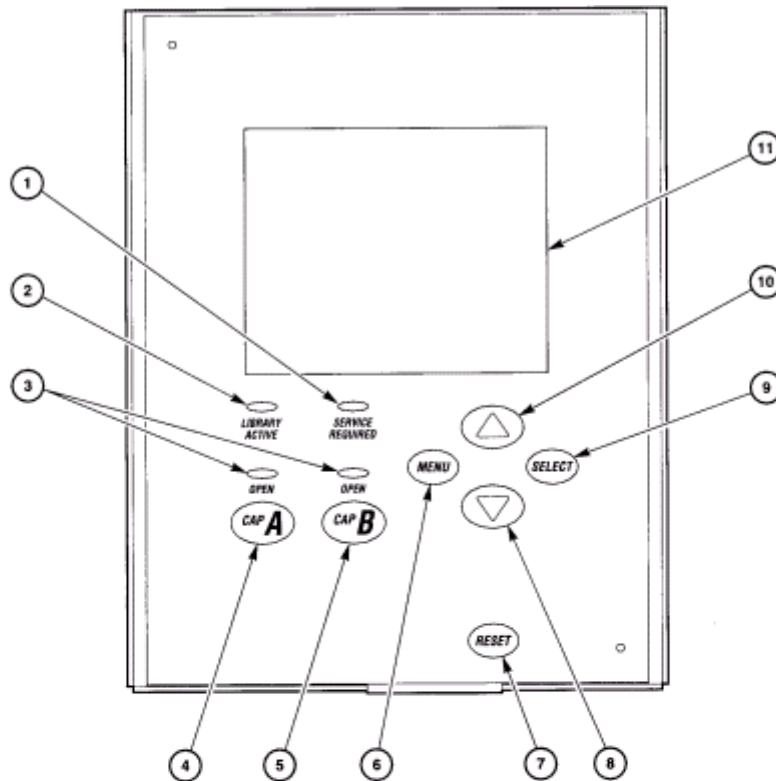
Operator Panel Components (C65083)

1. *Service Required* indicator is steadily red when human intervention is required.
2. *Library Active* indicator flashes green when the library is operational.
3. *Open* indicator is steadily amber when the CAP is open for you to enter or remove cartridges.
4. CAP A open button rotates CAP A for you to access the magazines.
5. CAP B open button rotates CAP B for you to access the magazines
6. MENU button initially places you into the Main Menu screen; subsequently, it returns you to a previously selected screen.
7. RESET button starts an IPL.
8. Arrow down button moves the cursor down the display screen; it also decrements a value underscored on the screen.
9. SELECT button selects an item on a menu; it also saves the currently underscored value and moves the cursor to the next field.
10. Arrow up button moves the cursor up the display screen; it also increments a value underscored on the screen.
11. Graphic display screen shows current information and errors and allows input from menus.

Use this panel to:

- Monitor current information about the CAPs, configuration, drives, doors, drive cleaning, hardware and software versions, and library status.

- Help resolve library problems.

- If an error occurs, the display shows a fault symptom code (FSC), which can be given to a systems delivery engineer (SDE) or to the local service representative to help resolve problems. Write down the FSC as soon as it is displayed.

- Set library, network, and drive configurations.

- Manipulate CAPs.

- Replace the drive cleaning cartridges and set the cleaning cartridge usage.

- Run library and drive tests.

- Reset (start an initial program load [IPL] on) the library.

- For specific task instructions refer to Chapter 5, "Configuring and Testing the CTL700 Tape Library," and Chapter 6, "Operating the CTL700 Tape Library."

Indicators

Three indicators on the operator panel provide basic status information: *Library Active, Service Required,* and *Open*. Refer to Figure 4-1 for details about these indicators.

Buttons

Six buttons appear on the operator panel: **CAP**, **RESET**, **MENU**, **SELECT**, and the up and down arrows. The **CAP** and **RESET** let the user directly manipulate the library; the remaining four buttons let the user manipulate the menus and underscored values on the graphic display. Refer to Figure 4-1 for the location and description of each button.

Note. The up arrow, down arrow, and **SELECT** buttons manipulate only values that are under operator control. As the user "scrolls" down a list of selections, the cursor underscores these values. Values that are not underscored cannot be manipulated.

Display Screens

Screens on the graphic display show current information and allow input. Information accessible on the screens includes: drive status, CAP status, library capacity and features, hardware and software versions, SCSI type, cleaning cartridge and Auto Clean status, and error and FSC information.

Except for the CAP status and error and FSC information, these values are set through an automatic configuration process that occurs during an IPL.

These values require user input:

- Cleaning cartridge usage threshold

- Drive configuration: SCSI ID and bus status (on or off bus)

- Network configuration values: library name, IP address,

- Library configuration values: SCSI ID, Fast Load enable/disable, date, time

- Display brightness and contrast

In addition, the display screens must be used to:
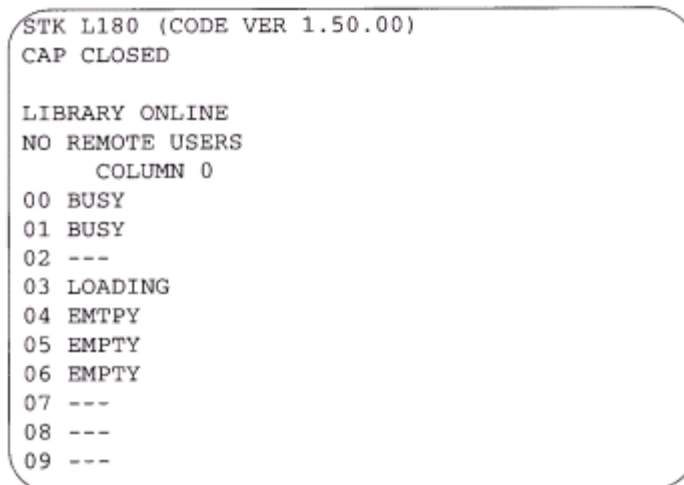
- Export cleaning cartridges through the CAPs

- Run diagnostic tests

The following subsections describe the library's main screens.

Library Status

The Library Status screen is an information-only screen. It is the first screen to appear on the operator panel after an IPL. The screen displays the status of the CAPs, the activity of the library, and the status of each of the installed drives. Figure 4-2 shows an example of the Library Status screen.

Figure 4-2. Library Status Screen

```
STK L180 (CODE VER 1.50.00)
CAP CLOSED

LIBRARY ONLINE
NO REMOTE USERS
      COLUMN 0
00 BUSY
01 BUSY
02 ---
03 LOADING
04 EMTPY
05 EMPTY
06 EMPTY
07 ---
08 ---
09 ---
```

By pushing the **MENU** button from the Library Status screen, the user can access the Main Menu (see Figure 4-3).
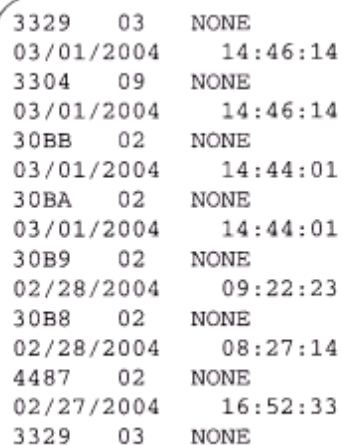
Figure 4-3. Main Menu Screen

```
MAIN MENU:

FSC LOGS
CAP CONTENTS
DRIVE INFO
CLEANING INFO
DIAGNOSTICS
VERSION INFO
CONFIGURATION
```
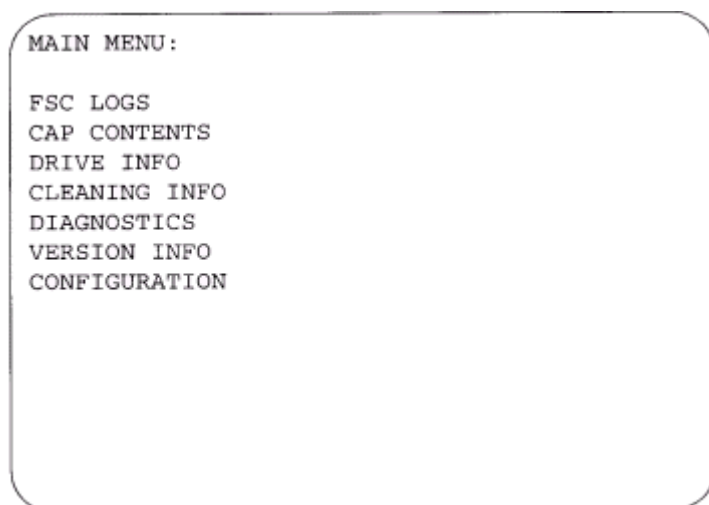
FSC Logs

Accessible from the Main Menu, the FSC Logs screen displays all fault symptom codes
(FSCs), the number of occurrences, and the date and time of the last occurrence. The
screen may be scrolled to display the last 20 events. Figure 4-4 is an example of the
FSC Logs screen.

Note. The following statements apply to the event log screen:

● Events listed in the log might be failures. All events are recorded.

● FSCs are generated for both library and drive errors.
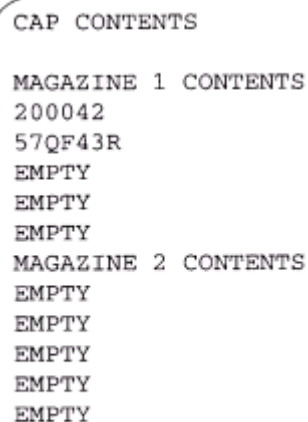
Figure 4-4. FSC Log Screen

```
3329    03    NONE
03/01/2004      14:46:14
3304    09    NONE
03/01/2004      14:46:14
30BB    02    NONE
03/01/2004      14:44:01
30BA    02    NONE
03/01/2004      14:44:01
30B9    02    NONE
02/28/2004      09:22:23
30B8    02    NONE
02/28/2004      08:27:14
4487    02    NONE
02/27/2004      16:52:33
3329    03    NONE
```

CAP Status

Accessible from the Main Menu, the CAP Status screen is an information-only screen. It displays either the VOLSER of a cartridge or a status message for each slot in a CAP magazine. The CAP status screen appears in Figure 4-5.

Note. Scroll down to view the contents of both CAPs.

Figure 4-5. CAP Status Screen

```
CAP CONTENTS

MAGAZINE 1 CONTENTS
200042
57QF43R
EMPTY
EMPTY
EMPTY
MAGAZINE 2 CONTENTS
EMPTY
EMPTY
EMPTY
EMPTY
EMPTY
```

Drive Information

Accessible from the Main Menu, the Drive Information Menu is an information-only screen that lists manufacturing and status information about the selected drive (see Figure 4-6).

Vendor   The manufacturer of the drive

Type   The drive model

Status   The drive's local number and status

Serial Number   The serial number assigned by the drive's manufacturer

Interface Type   The type of client to drive interface (this example shows a SCSI interface)

Code Version   The firmware version of the drive

Figure 4-6. Drive Information Menu

```
DRIVE INFORMATION MENU:

VENDOR: QUANT
TYPE: DLT7000
STATUS: 00 EMPTY

SERIAL NUMBER:
 XXXXXXXXXX

INTERFACE TYPE:
 SCSI I/F

CODE VERSION
 50
```
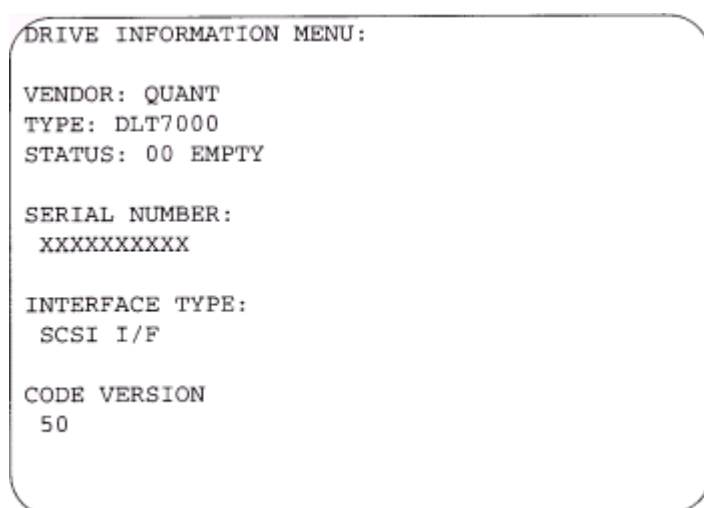
Cleaning Information

Accessible from the Main Menu, the Cleaning Info Menu provides information about cleaning and controls the library's cleaning cartridges. It enables the user to change the warning count for each type of cleaning cartridge. Figure 4-7 shows and example of the Cleaning Info Menu:

Num Clean Cartridges   The total number of cleaning cartridges mounted in the reserved cells within the library

DLT Warn Count   Currently Not Applicable

9840 Warn Count   The number of times the user wants the 9840 cleaning cartridge to be used before the library ejects it

Export Clean Cartridges A procedure for using the CAP to remove cleaning cartridges from the reserved cells

The Cleaning Info Menu enables the user to change the warning count for each type of cleaning cartridge. The menu also lets the user check the number of times a cleaning cartridge has been used.

Figure 4-7. Cleaning Informaion Menu

```
CLEANING INFO

NUM CLEAN CARTRIDGES: 00

DLT WARN COUNT: 000

9840 WARN COUNT: 000

EXPORT CLEAN CARTRIDGES
```
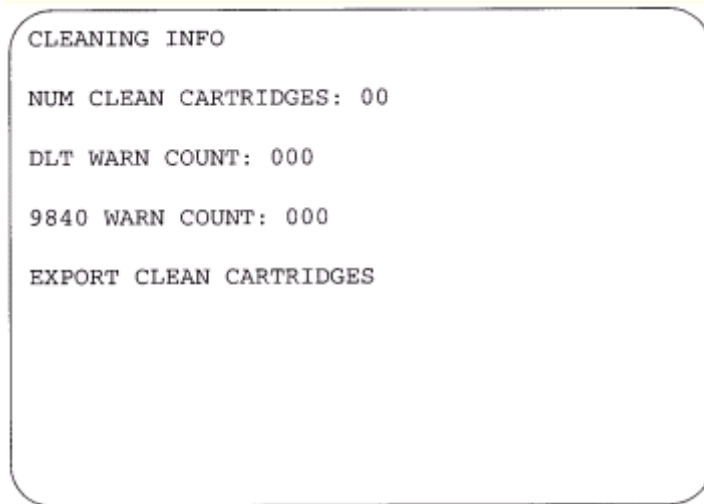
Diagnostic Tests

Accessible from the Main Menu, the Main Diagnostics Menu lets the user perform the following tests:

- Drive -related tests:
  - ° Clean Drive: Enables the user to clean the tape drives.
  - ° Mount: Loads test tapes from a drive.
  - ° Dismount: Unloads test tapes from a drive.
  - ° Mount-Dismount Loop: Loads and unloads test tapes from a drive. The user may designate the number of times the tape library goes through the loop.
- Get-Put Loop

  Gets a diagnostic tape and returns it to the same location. The user may designate the number of times the tape library goes through the loop.
- Demo Mode

  Simulates tape library operation.

Note. All diagnostic tests except for Clean Drive require the tape library and associated drive to be offline.

Figure 4-8. Main Diagnostics Menu

```
MAIN DIAGNOSTICS MENU:

DRIVE DIAGNOSTICS
GET/PUT LOOP
DEMO MODE
```

Version Information

Accessible from the Main Menu, the Version Info Menu is an information-only screen (see the example in Figure 4-9). It displays the version level of the library's functional code, the date and time the code was completed, and the serial number of the logic card (also referred to as the "MPC card").

Figure 4-9. Version Information Menu

```
VERSION INFO MENU:

CODE VERSION:
   1.50.00

CODE BUILT ON:
   OCT 22 1999  16:38:19

HARDWARE / VERSION
   MPC 00000098
```

Configuration Menu

Accessible from the Main Menu (Figure 4-10) routes the user to the configuration menus (library, drive, and network) and to the panel display controls.

Figure 4-10. Configuration Menu

```
MAIN CONFIGURATION MENU

LIBRARY CONFIG
DRIVE CONFIG
NETWORK CONFIG
DISPLAY INFO
```
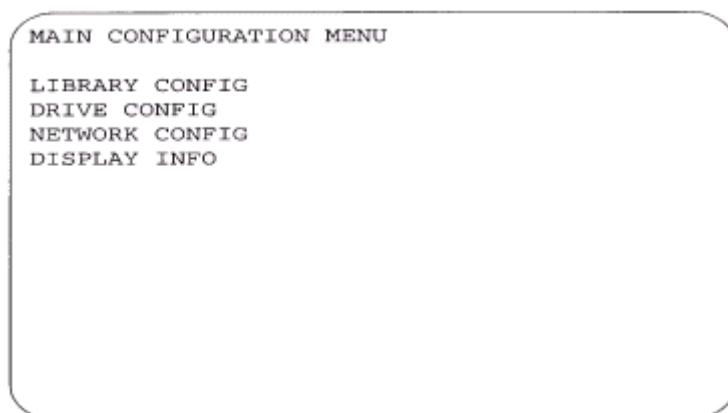
Library Configuration

Accessible from the Main Configuration menu, the Library Config menu displays library capacity information and lets you modify library's configuration. Figure 4-11 shows an example library configuration screen.

The screen lets you:

SCSI ID	Library's SCSI identification number
Fast Load	Fast Load feature on or off
Date	Current date
Time	Current time

The screen lets you set the:

SCSI Type	What type of SCSI bus connects the library to the network (differential or single-ended)
Auto Clean	Whether Auto Clean is enabled
CAPs	The number of CAPs installed
User Cells	How many data storage cells the library contains
Drive Column	The number of drive columns installed
Expansion Frame	Whether an expansion frame is installed
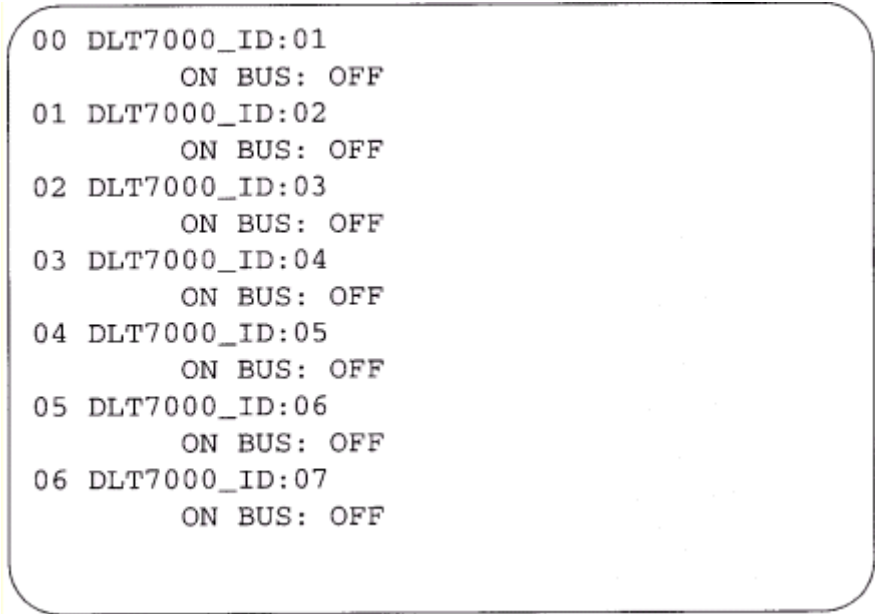
Figure 4-11. Library Configuration Menu

```
LIB CONFIG MENU:

SCI ID: 00
FAST LOAD: OFF
DATE: 03/01/2004
TIME: 23:59

SCSI TYPE: DIFFERENTIAL
AUTO CLEAN: OFF
CAPS: 2
USER CELLS: 336
DRIVE COLUMN: 2
EXPANSION FRAME: NO
```
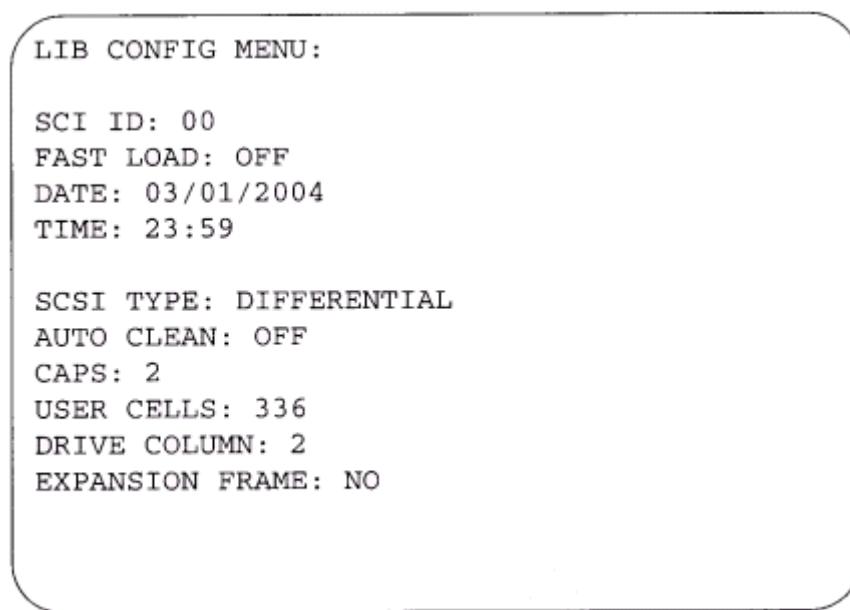
Drive Configuration

Accessible from the Main Configuration Menu, the drive configuration menu lets you modify portions of each drive's configuration. Figure 4-12 shows an example screen. For each drive, the menu displays the tape drive position, drive type, SCSI ID and indicates whether the drive is on the same SCSI bus as the library.

The panel only displays 16 lines per screen. If the library contains more than eight drives, the user must use the down arrow button to scroll to drive 09 and above. For more information, see "Drive Information" in Chapter 5.
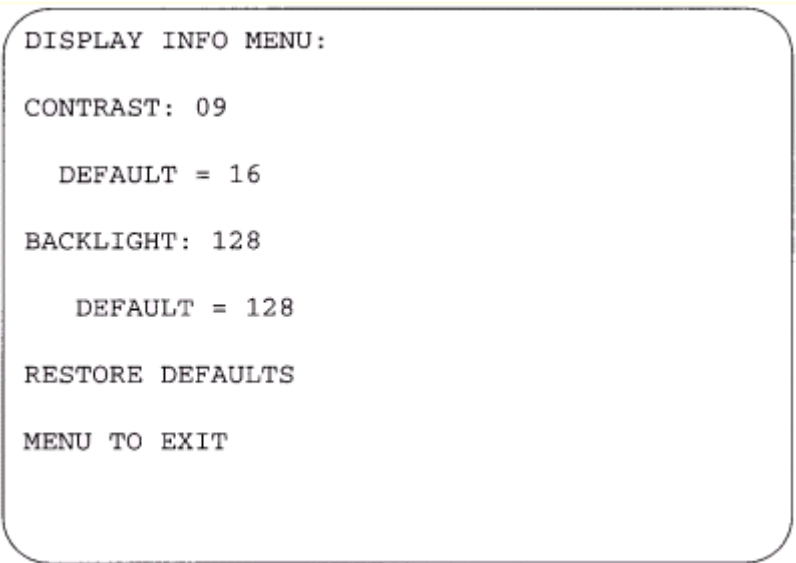
Note. The cursor position is saved on all screens that list the library's drives.

Figure 4-12. Drive Configuration Menu

```
00 DLT7000_ID:01
        ON BUS: OFF
01 DLT7000_ID:02
        ON BUS: OFF
02 DLT7000_ID:03
        ON BUS: OFF
03 DLT7000_ID:04
        ON BUS: OFF
04 DLT7000_ID:05
        ON BUS: OFF
05 DLT7000_ID:06
        ON BUS: OFF
06 DLT7000_ID:07
        ON BUS: OFF
```

Display Information

Accessible from the Main Configuration menu, the Display Inf. menu (see Figure 4-13) leads to menus that let the user adjust the contrast and backlight on the graphic display screen. For more information, see "Screen Characteristics" in Chapter 5.

Figure 4-13. Display Information Menu

```
DISPLAY INFO MENU:

CONTRAST: 09

  DEFAULT = 16

BACKLIGHT: 128

   DEFAULT = 128

RESTORE DEFAULTS

MENU TO EXIT
```

Operations Overview

This table lists the tasks that you can perform through the operator panel menus. The task appear in the order you would find them in the operator panel Main Menu:

- FSC Logs

- CAP Status

- Cleaning Info

- Diagnostics

- Version Info.

- Configuration

Library Power Switch

The library power switch is a circuit breaker or breakers behind the right front door of the tape library. Figure 4-14 shows the power switch location. This switch, attached to the AC power distribution unit (PDU), controls the AC power to the library and drive column.

The power switch has two configurations:

- A single breaker on the AC power distribution unit controls the tape library and a single drive column.

- An optional second breaker, located on the second power distribution unit power and the second drive column and an optional second library power supply.

Note.

1. For this configuration, the second breaker must be connected to a separate electrical circuit.

2. If only one breaker is powered off, the second breaker, if installed, will still be powered on.

To apply power to the library and drive column, lift the switch or switches.

To remove power from the library and drive column.

1. Make sure all jobs are complete.

2. Push down on the library power switch or switches.

Figure 4-14. Library Power Switch Location
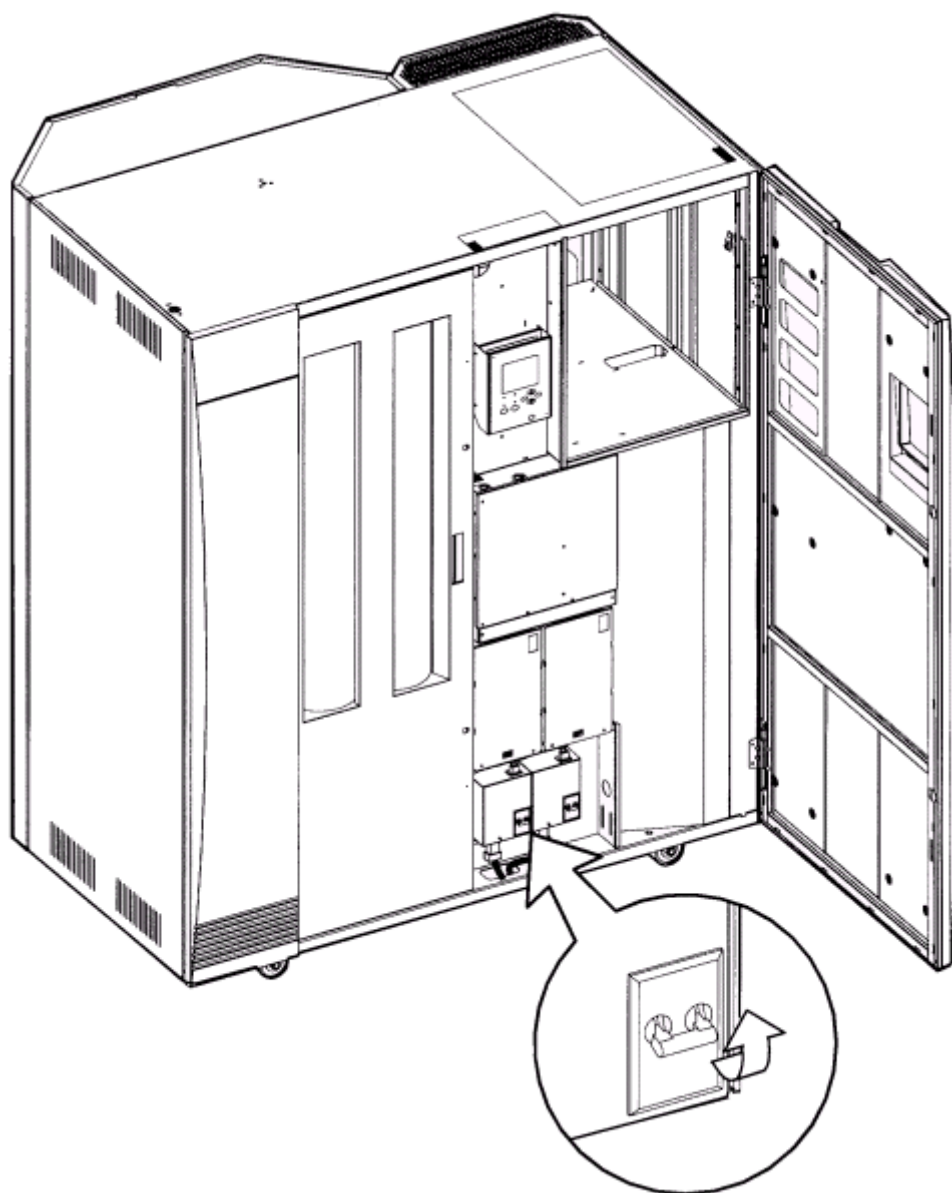
Tape Drive Power Switches

The tape drives are behind the drive access door inside the right side door of the library. Each drive has a power switch that controls the supply of power to only that drive. Figure 4-15 shows the 9840 tape drive power switch location.

To remove power from a drive, turn the drive switch to the "0" position.

To supply power to a drive, turn the drive switch to the "|" position.

Figure 4-15. Drive Power Switch Location
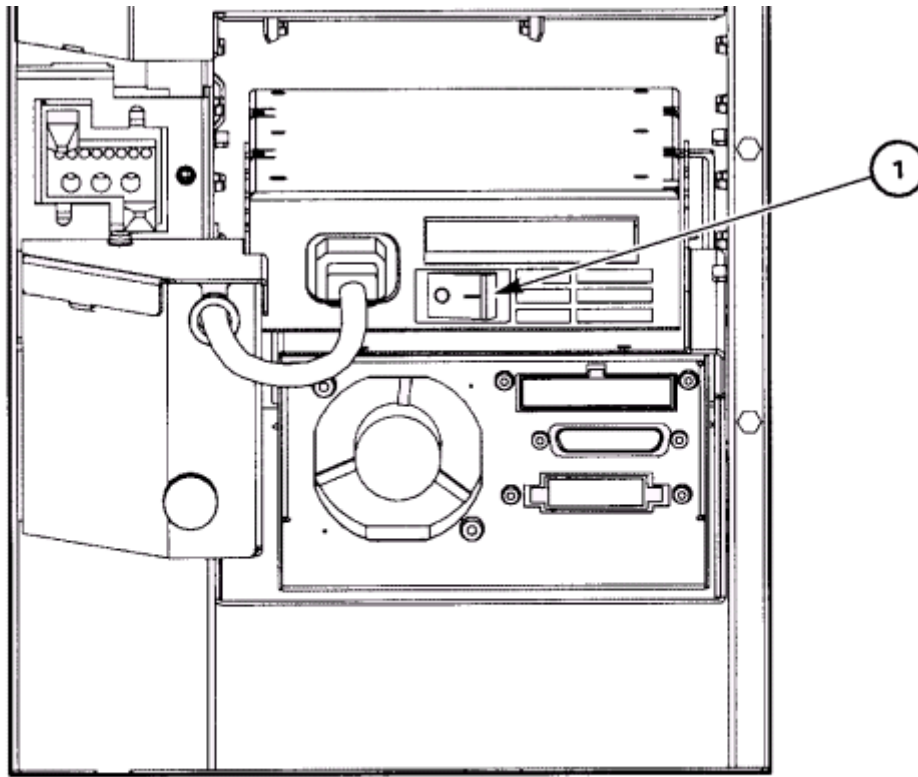
Tape Drive Power Switch Components

1. **9840 drive power switch**

Operating in the Automated Mode

Automated mode is the normal operating mode of the tape library. When the tape library is online and the robot is mounting and dismounting cartridges, monitor the server operator console and the tape library operator panel for messages and respond appropriately.

When a tape library is online, you might also need to:

- Enter cartridges into the tape library through the cartridge access port (CAP)

- Eject cartridges from the library through the CAP

- Replace a cleaning cartridge

- Manually clean a drive

- Review the FSC log

- Run diagnostic tests

The following sections describe how to perform these activities.

Monitoring Status Information

The user can monitor the library, CAP, and drive status information through the library status screen (see Figure 4-1--Operator Panel Display). The user can also monitor CAP magazine status and the cleaning cartridge usage count through operator panel menus.

Drive Status

Table 6-1 summarizes drive status messages that might appear on the library status screen:

Table 4-1. Drive Status Messages

Status Message	Explanation
INIT REQUIRED	You must initialize the drive.
NOT CONNECTED	This drive is not connected to a SCSI bus.
UNKNOWN DRIVE	The library does not recognize the type of drive in this location.
NOT COMMUNICATE	This drive is not communicating with the client, or the drive is powered off.
NOT FUNCTIONAL	This drive is not functioning properly.
NOT LOADABLE	The library cannot load a cartridge into this drive.
CARTRIDGE IN	The drive contains a cartridge, but the cartridge is loaded in this drive.
CLEAN NEEDED	This drive requires cleaning.
CLEAN FAILED	The attempt to clean this drive failed.
LOADING	The library is mounting a cartridge into this drive.
REWOUND	The cartridge in this drive has been rewound.
UNLOADING	The library is dismounting a cartridge into this drive.
LOADED	The library has loaded a cartridge into this drive.
REWINDING	The cartridge in this drive is being rewound.
BUSY	This drive is performing a read or write operation.
CLEANING	The drive is being cleaned.

Note. The operator panel displays only 16 lines per screen. If the library contains more than 8 drives, use the down arrow button to scroll to drive 09 and higher.

Drive Information

To view the details about an installed drive, including its serial number and firmware version:

1. Press the **MENU** button to display the Main Menu.

2. If necessary, press an arrow button until the cursor lines up with DRIVE INFO.

3. Press the **SELECT** button. A list of all the installed drives appears.

4. Use the arrow buttons until the cursor underscores the desired drive.

5. Press the **SELECT** button. The Drive Information Menu will appear (see Figure 4-6). The screen lists the manufacturer, model, status, serial number, interface type, and firmware version of the selected drive. See Table 6-1 for list of drive status messages.

CAP Magazine Status

To check the status of a CAP magazine and its contents:

1. Press the **MENU** button to display the Main Menu.

2. If necessary, press an arrow button until the cursor lines up with CAP STATUS.

3. Press the **SELECT** button. A blank screen will appear.

4. Press the **SELECT** button again. The CAP Contents Menu will appear. The screen lists the VOLSER of each cartridge in an installed magazine or it lists a status message. See Table 6-2 for the status messages that will appear on this list.

Note. Each CAP has four magazines, numbered one through four, from the top location to the bottom.

Table 4-2. CAP Status Messages

Status Message	Explanation
EMPTY	This magazine slot does not contain a cartridge
UNKNOWN	This magazine slot contains a cartridge, but the library has not yet performed the necessary audit to identify the cartridge
UNREADABLE	This magazine slot contains a cartridge, but the camera could not read the cartridge's VOLSER label

Cleaning Cartridge Usage Count

This procedure assumes that you have loaded cleaning cartridges into the reserved cells and has subsequently reset the library. (Taking these steps enables the Auto Clean function.) To check the number of times the cleaning cartridges have been used since they were installed in the library:

1. Press the **MENU** button to return to the Main Menu.

2. Press the arrow buttons until the cursor underscores CLEANING INFORMATION.

3. Press the **SELECT** button. The panel displays the Cleaning Info menu.

4. Press the arrow buttons until the cursor highlights EXPORT CLEANING
    CARTRIDGE.

5. Press the **SELECT** button. The export screen appears, which lists all installed
    cleaning cartridges by domain (or cartridge type), VOLSER, and usage count.

Note. If the usage count for a cleaning cartridge has exceeded its warning count, the export
screen will display EXPIRED. The user must remove this cartridge from the library.

---

6. Press the **MENU** button to exit out of the export screen.

Entering Cartridges Through the CAP

To unlock the CAP, open it, and place cartridges into it:

1. Enter the console command to unlock the CAP.

2. Press the **CAP A** or **CAP B** button on the operator panel to open the CAP. The
    indicator will light.

△ **Caution.** The cartridges must be entered properly or the robot or tape drive might be
damaged, or the tape library could stop operating. Use only 9840 cartridges for 9840 drives.

---

3. Load the cartridges into the magazine. This can be done in one of two ways: Pull
    out and down on the magazine handle or remove the magazine by lifting it out. See
    Figure 6-1.

Figure 4-16. Removing the CAP Magazine
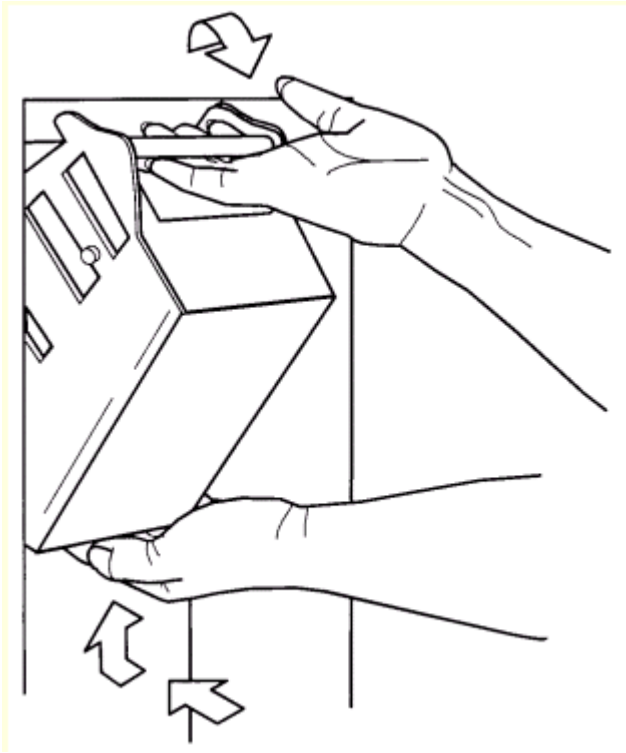
Note. The snap-on retention cartridge cover can be used to keep cartridges in place when carrying the magazine. Remove the clear cover from the back of the magazine by lifting the side edge. To protect the cartridges, place the slots on one edge of the cover into the grooves on the side of the magazine's top panel and snap the other edge into place.

4.   Enter the cartridges into the magazine so they lie flat, with the bar code up and the reel facing away from you.

△ **Caution.** Remove the retention cover before loading the magazine into the CAP.

5.   Return the magazine to its closed position. (If a retention cover is used on the magazine, remove the cover before replacing the magazine.)

6.   Press the **CAP A** or **CAP B** button on the operator panel to close the CAP.

Note. It is strongly recommended that unlabeled cartridges are not entered into the CAP.

Ejecting Cartridges Through the CAP

To unlock the CAP, open the CAP, and remove the cartridges from it:

1. At the console, enter the VOLSERs of the cartridges that are required. The robot retrieves the cartridges and insert them into the CAP.

2. Enter the console command to open the CAP. This unlocks the CAP.

3. Press **CAP A** or **CAP B** button on the operator panel to open the CAP.

4. Remove or pull down the magazine and remove the cartridges and store them outside the tape library.

5. Repeat these steps until all the required cartridges have been removed.

6. Press the **CAP** button to close the CAP.

7. Refer to the console and software documentation for further instructions.

Manually Cleaning a Drive

If the Auto Clean function on the library is not enabled, then the library status screen on the operator panel will display "Clean Needed" whenever a specific drive needs cleaning. To clean this drive:

1. Enter the console command to open the CAP. This will unlock the CAP.

2. Press the **CAP** button on the operator panel to open the CAP.

3. Insert the required cleaning cartridge into the CAP.

4. Press the **CAP** button to close the CAP.

5. Press the **MENU** button until the Main Menu displays.

6. Press the arrow button until the cursor highlights DIAGNOSTICS.

7. Press the **SELECT** button. The panel displays Main Diagnostics Menu.

8. Press the arrow buttons until the cursor highlights DRIVE DIAGNOSTICS.

9. Press the **SELECT** button. The screen displays a list of all installed drives.

10. Use the arrow buttons to highlight the desired drive.

11. Press the **SELECT** button. The Diagnostics for Drive Menu appears.

12. Press the arrow buttons until the cursor highlights CLEAN DRIVE.

13. Press the **SELECT** button. A message will appear stating that the drive will be cleaned at the next opportunity.

14. When the cleaning is complete, the robot will return the cleaning cartridge to the CAP.

15. To clean another drive of the same type, press the **MENU** button to return to the lists of drive, and repeat Steps 10 through 14.

16. When drive cleaning is complete, press the **CAP** button to open the CAP.

17. Remove the cleaning cartridge, and make a record of how many times it has been used.

18. Press the **CAP** button to close the CAP.

Note. The Auto Clean feature is automatically enabled if even one cleaning cartridge is loaded into the reserved cell area and then the library is reset.

Reviewing FSC Logs

A SDE or other StorageTek representative might ask the user to review the library's fault symptom code (FSC) log so the user can better analyze library-related problems. The FSC log records significant events, warnings and errors that the library has generated during operation.

To review the FSC log:

1. Press the **MENU** button until the Main Menu appears.

2. If necessary, press the arrow buttons until the cursor highlights "FSC LOGS."

3. Press the **SELECT** button. The panel displays the FSC log screen.

4. Use the arrow buttons to scroll through the log.

This ample entry on the FSC logs screen, followed by an explanation of the entry's elements:

    3329   03   NONE

    03/01/2004   14:46:14

3229	This four-character code is the FSC.
03	This value indicates the number of times this FSC has occurred.
NONE	This message indicates which, if any, mechanical device was involved.
03/01/2004	These digits indicate the date the FSC occurred. The fields from left to right are month, day, and year.
14:46:14	These digits indicate the time the FSC occurred. The fields from left to right are hour, minutes, and seconds.

Running Diagnostic Tests

Diagnostic tests included in the library's firmware let you manage certain aspects of the library's operation. The library may be placed in the demonstration mode through the Diagnostics screen.

Table 4-3. CTL700 Library Drive Diagnostic Tests

Test	Description
Clean Drive	This function is not a test. It moves a specified cleaning cartridge from the CAP to a tape drive and initiates drive cleaning. When cleaning is complete, it returns the cleaning cartridge to the CAP. This routine does not require the library to be offline.
Mount	This test mounts a diagnostic tape to the selected drive.
Dismount	This test dismounts a diagnostic tape from the selected drive.
Mount-Dismount	This test mounts and dismounts a diagnostic tape from the selected drive.

△ **Caution.** Only trained personnel should perform diagnostic tests. Before performing the diagnostic tests, check that the library and drives are offline.

Running Drive Diagnostic Tests

To run a diagnostic test on a drive:

1. Place the library and drives offline.

2. Press the **MENU** button until the Main Menu displays.

3. Press the arrow buttons until the cursor highlights DIAGNOSTICS.

4. Press the **SELECT** button. The panel displays Main Diagnostics Menu.

5. Press the arrow buttons until the cursor underscores DRIVE DIAGNOSTICS.

6. Press the **SELECT** button. The screen displays a list of all installed drives.

7. Use the arrow buttons to highlight the desired drive.

8. Press the **SELECT** button. The Diags for Drive Menu appears.

9. Press the arrow buttons until the cursor highlights the desired test. For a description of the available tests, see Table 6-3.

10. Press the **SELECT** button. If MOUNT/DISMOUNT LOOP was selected, an editing screen will appear:

    a. Use the arrow buttons to enter the desired value. (The up arrow button increases the value. The down arrow button decreases the value.)

    b. Press the **SELECT** button.

11. The user will be prompted to confirm that the library is wanted in Maintenance Mode (offline) before beginning the test (ARE YOU SURE?). Confirm this by pressing the **SELECT** button. The **MENU** button may be pressed to abort.

12. Wait until the test is complete; the screen displays TEST COMPLETE.

Running a Get-Put Loop

During a Get-Put loop, the hand loads and unloads a cartridge from a storage cell. This tests the functionality of the hand assembly. To run a Get-Put loop:

1. Place the library and tape drives offline.

2. Press the **MENU** button until the Main Menu displays.

3. Press the arrow buttons until the cursor highlights DIAGNOSTICS.

4. Press the **SELECT** button. The panel displays the Main Diagnostics Menu.

5. Press the arrow buttons until the cursor underscores GET PUT LOOP.

6. Press the **SELECT** button. The Get-Put Mode screen appears.

7. You are prompted to confirm that the library is wanted to be in Maintenance Mode (offline) before beginning the test (ARE YOU SURE?). Confirm this by pressing the **SELECT** button. The **MENU** button may be pressed to abort.

8. Wait until the test is complete; the screen will display TEST COMPLETE.

Operating in Demo Mode

△ **Caution.** *Potential for error:* Running the library in the Demo Mode causes the data cartridges to be rearranged. After the Demo Mode is complete, the library must be reset, and the client must be given the command to upload the library audit data to the client.

With the library in Demo Mode (demonstration mode), the hand unloads a cartridge from a storage cell, rotates around on the Z and theta axes, and loads the cartridge back to a different storage cell. This tests the functionality of the robot. To operate in Demo Mode:

1. Place the library and drives offline.

2. Remove all data cartridges from the library.

3. Load a demonstration cartridge into the library.

4. Press the **MENU** button until the Main Menu appears.

5. Press the arrow buttons until the cursor underscores DIAGNOSTICS.

6. Press the **SELECT** button. The panel displays the Main Diagnostics Menu.

7. Press the arrow buttons until the cursor underscores DEMO MODE.

8. Press the **SELECT** button. An edit screen appears.

9. Use the arrow buttons to enter the desired number of loops. The up arrow button increases the value by 100. The down arrow button decreases the value by 100. The maximum number of loops allowed is 2,000.

10. Press the **SELECT** button.

11. The user will be prompted to confirm that the library is wanted to be in Maintenance Mode (offline) before beginning the test (ARE YOU SURE?). Confirm this by pressing the **SELECT** button. The **MENU** button may be pressed to abort.

12. Wait until the test is complete; the screen will display TEST COMPLETE.

13. Press the **RESET** button to reset the library.

Powering Off the Library

To power off the library:

1. Enter the command at the server console to remove the tape library and drives from online status.

2. Press down on the switch or switches (breakers) behind the right front door of the tape library.

Operation in Manual Mode

The following pages describe operations that can be performed when the tape library is in the manual mode. Manual mode occurs when the tape library is not online or loses power.

- When the library is offline, you might have to:
- Open the front door
- Move the robot
- Locate a cartridge in the storage cells
- Remove a cartridge from the hand
- Mount a cartridge in a drive
- Dismount a cartridge from a drive

Before starting any of these tasks, precautions must be taken against electrostatic discharge (ESD).

⚠ **Caution.** *Components are Sensitive to Static Electricity*: Even a small electrostatic discharge could damage an electrical component inside the library. A damaged component might not fail immediately, but over time, it will become worse, possibly causing an "intermittent" problem. Be sure to touch gray, unpainted metal before reaching inside the library.

After the library door has been opened:

1. Touch a gray, unpainted metal surface, such as the library frame just inside the front door.

2. Keep all body movement to a minimum as the tape drives and library components are being touched.

Antistatic wrist straps with clip-on ends are commercially available.

Opening the Library Front Doors

The front doors on the library must be opened to perform manual operations.   Refer to Figure 6-2 as this procedure is performed.

Figure 4-17. Opening the Access Doors
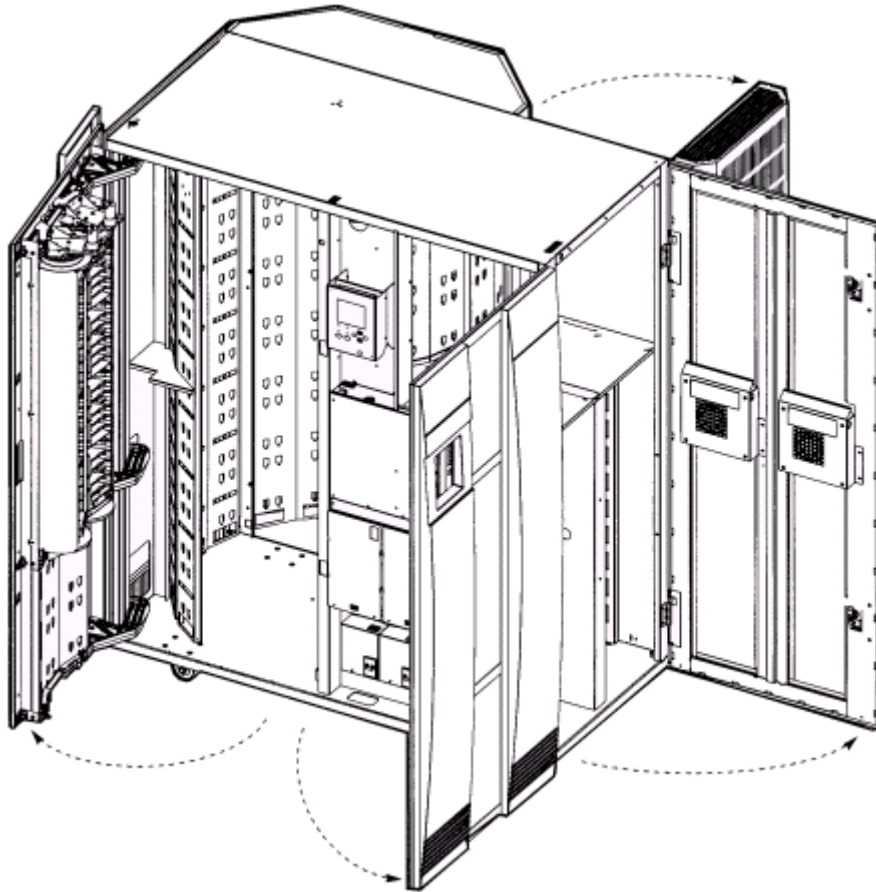
1.   Make sure all jobs have ended and that the tape library is offline.

2.   Open the tape library right front door by pulling on the left side of the door.

3.   Open the tape library left front door by using a latch key to unlock both locks. Turn the key counterclockwise to unlock them, then pull open the door.

Moving the Robot

After the tape library doors have been opened, the robot might need to move to make it easier to access the stored cartridges or the tape drives.

Read and observe these following caution before attempting to move any portion of the robot.

△ **Caution.** *Potential Equipment Damage:* To prevent damaging the hand or Z carriage, check that the reach mechanism on the hand is fully retracted before moving any part of the robot. Push the gripper mechanism into the retracted position. If the tape library goes offline due to a power failure, the reach mechanism might be extended into a storage cell or drive. If the robot is rotated when this condition exists, the hand could be damaged.

Move the Z column and Z carriage only as shown in Figures 2-6 and 2-7.

Take precaution against potential ESD damage by touching gray, unpainted metal before reaching into the library. Do not touch exposed electrical parts when moving any part of the robot.

Raising and Lowering the Hand-camera

If the hand is needed to be raised or lowered, slowly and carefully move it by placing your fingers on the hand-camera assembly as shown in Figure 2-7.

Rotating the Z-Column

If you need to rotate the Z column, grasp it and carefully rotate it, as shown in Figure 2-6.

The Z column does not rotate a full 360 degrees. If the column meets resistance and stops before reaching the desired position, it has contacted a stopping mechanism. Do not force it. Rotate the column in the opposite direction.

Locating a Cartridge in the Storage Cells

Figure 5-1 shows the locations of the panels, rows, and columns of the cartridge storage cells in the library. The decal at the top of each column also provides location information. To remove a cartridge from a storage cell, slide the cartridge out.

Removing a Cartridge From the Hand

If the tape library loses power, a cartridge might be left in the hand. It can be removed from the hand and mounted into a drive for a read/write operation.

△ **Caution.** *Possible equipment damage:* Follow the procedures described in the section titled "Moving the Robot." Failing to do so could damage the hand.

Do not touch any electronic components on the hand assembly. The components could easily be damaged.


To remove a cartridge from the hand:

1. Rotate the Z column; move the hand until it is facing the front door.

2. Push on the back of the reach mechanism until the gripper is extended to its full position, as shown in Figure 6-3.

△ **Caution.** *Heated components:* If the robot has been active, the solenoid and switch might be hot to the touch. Wait for the solenoid to cool before touching it.

Figure 4-18. Extending the Gripper
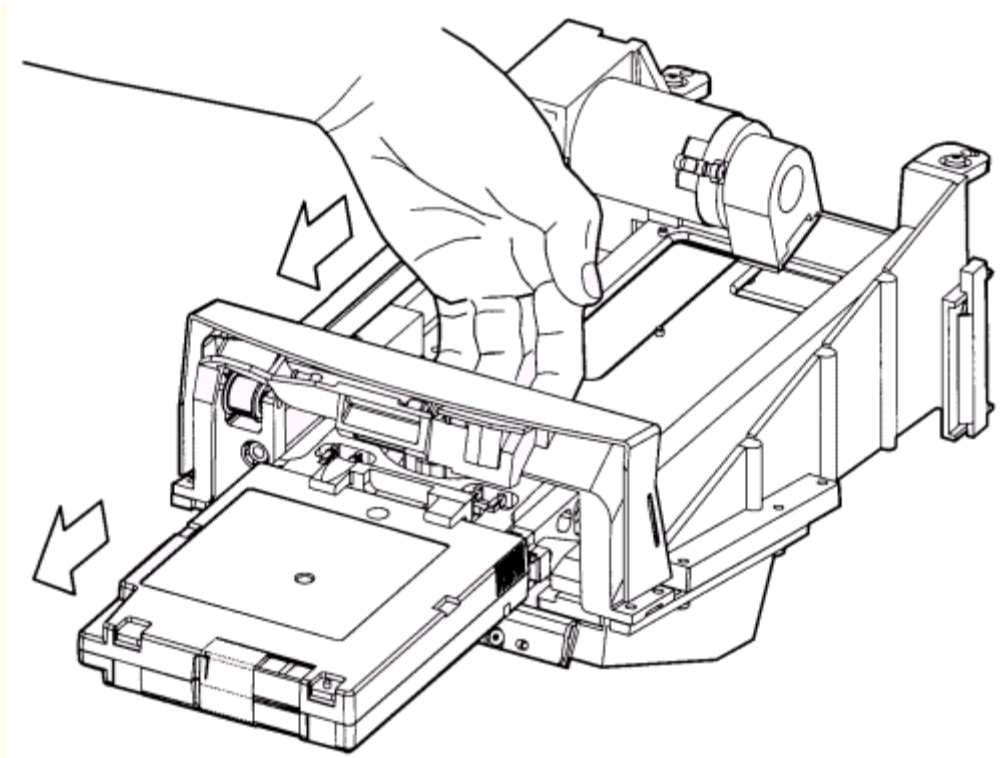
3. Hold the solenoid on top of the reach mechanism with one hand and grasp the cartridge with the other. Rotate the solenoid switch clockwise until the cartridge is released from the gripper, as shown in Figure 6-4.

△ **Caution.** *Potential equipment damage:* Check that the gripper mechanism is fully retracted. If it is left extended and the robot is turned, the gripper mechanism will strike a storage cell. If it is left extended and the hand is facing the tape library door when it is closed, the door will strike the gripper mechanism.

Figure 4-19. Removing the Cartridge from the Hand
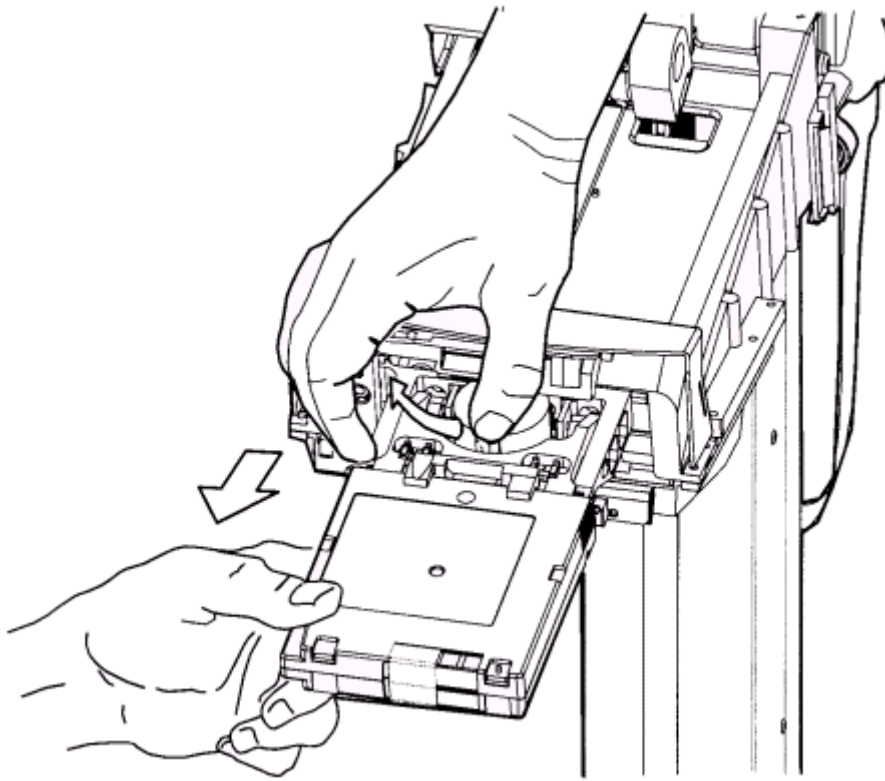
4. Push the gripper mechanism back into the hand until the mechanism is fully retracted.

Loading and Unloading Cartridges Manually

When the library is offline, a cartridge can be loaded to a drive or unloaded from a drive after adequate precautions have been taken. The following pages provide manual load and unload procedures for 9840 drives.

Note. If any cartridges are manually loaded, they must be manually unloaded and stored in a cell or removed.

Loading a Cartridge Into a 9840 Drive

To load a cartridge in a 9840 drive:

1. Obtain the cartridge VOLSER, location, and drive number from the server console.

2. Open the tape library right front door by pulling on the left side of the door.

3. Open the library left front door by using a latch key to unlock both locks. See Figure 6-2. Turn the key counterclockwise to unlock the locks, then pull the door open.

4. Locate the cartridge (see the section titled "Locating a Cartridge in the Storage Cells" in Chapter 5).

5. Insert the cartridge into the 9840 tape drive using the direction shown in Figure 6-5.

Figure 4-20. Loading a Cartridge into the 9840 Tape Drive
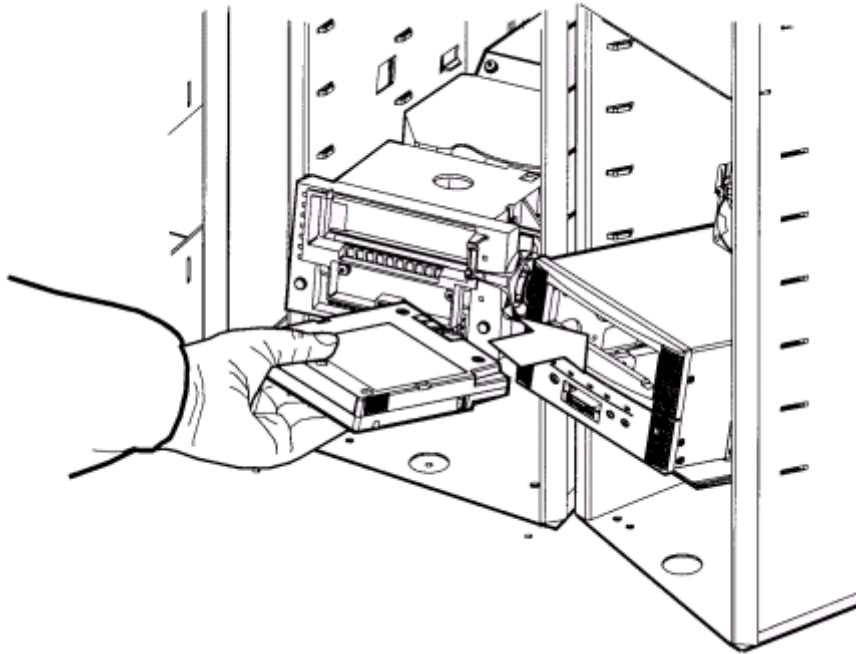
6. Wait for one of the following messages to display on the drive's front panel and take the appropriate action, if necessary:

-   The Ready F (File Protected) message displays when a write-protected cartridge loads successfully.

-   The Ready U (File Unprotected) message displays when a cartridge that is not write-protected loads successfully.

-   The NTReady message displays when the tape in the cartridge has lost tension. Follow the instructions outlined in the *9840 Tape Drive System User's Reference Manual* to correct this condition.

-   The LOADxxxx message displays when the cartridge unsuccessfully loads, where the xxxx is a fault symptom code. Follow the instructions outlined in the *9840 Tape Drive System User's Reference Manual* to correct this condition.

Unloading a Cartridge From a 9840 Tape Drive

To unload a cartridge from a 9840 drive:

1. Make sure that the 9840 drive is not selected by the client.

2. Obtain the drive number from the server console and place the drive offline.

3. Open the tape library right front door by pulling on the left side of the door.

4. Open the library left front door by using a latch key to unlock both locks. See Figure 6-2. Turn the key counterclockwise to unlock the locks, then pull the door open.

5. Press the UNLOAD switch on the front panel of the drive.

    One of the following conditions can occur:

    ●   After the tape rewinds, the cartridge ejects from the 9840 drive. Remove the cartridge from the 9840 drive.

    ●   The cartridge fails to eject after the tape rewinds. Refer to the *9840 Tape Drive User's Reference Manual* to correct the condition.

    ●   If the UNLOAD switch is pressed during a write operation, the 9840 drive tries to write the remaining data before the cartridge unloads. If the UnWrxxxx (Unwritten Data) message displays, where the xxxx is the fault symptom code, the attempt failed and some data remains unwritten to the tape. For more information about recovering from an Unwritten Data condition, refer to the *9840 Tape Drive User's Reference Manual*.

Returning the Library to Online Status

To return the tape library online for automated operations:

1. Refer to your specific drive publications for instructions on making the drives ready.

Note. If any cartridges are manually loaded, they must be manually unloaded and stored in a storage cell or removed from the library.

2. Close and lock the tape library doors. The robot will perform an audit of the cells.

3. Place the tape library online by entering the command at the server operator console.

4. Give the client command to upload audit data to the client.

5. Refer to your specific software publications for instructions on replacing the cartridges removed and on inserting cartridges into the storage cells.

A ≡ 9840 Troubleshooting and Recovery

This section contains:

Handling Errors or Indications

Save Fails Error

Cause. A "Save Fails" error occurs when saving a new configuration. It indicates that the RAM has failed the save operation.

Cause. The tape drive cannot work properly with defective information in RAM.

Cause. Contact your service provider to replace the tape drive.

Fix_CfgErr Error

Cause. A "Fix_CfgErr" error occurs following power on or IPL; the tape drive configuration data was sent from the EEPROM to the RAM and the RAM data failed the ASIA (Application Specific Interface Adapter) checksum test.

Cause. The tape drive completes the IPL but remains offline.

△ **Caution.** This error check does not protect you from entering the wrong configuration in the first place. It only tells you that the RAM content had somehow changed since the configuration data was last entered. If you originally entered a wrong configuration and the circuits are in working order, it will not show up as an error.

This error check does not lock tape drive operation. You can place the tape drive online without changing the tape drive configuration. Do so only if you have determined that an unused bit in the RAM or EEPROM is bad in accordance with the following procedure.

1. Check the tape drive configuration against your records.

2. If the client records and the tape drive configurations match there are two possibilities:

- An unused bit in the RAM or EEPROM has become bad.

- There might be a problem with the ASIA interface.

3. To isolate one of the two possibilities:

    a. Save the configuration again. Because the configuration is already apparently correct, re-saving the configuration generates and stores a new checksum.

       If an unused bit of the RAM has become bad, it is now included in the ASIA checksum and will not show up again as an error.

    b. IPL the tape drive.

    c. If the error is not repeated, it is indicated that an unused bit in the RAM is bad. This problem can now be disregarded. Go to Step 5.

    d. If the problem is repeated and the configuration remains correct, there may be a problem with an unused bit in the EEPROM or the checksum circuit.

    Note. When the configuration in the RAM is correct, the tape drive can usually operate normally while it remains powered on, even it the EEPROM or checksum circuit in the ASIA are damaged.

4. If the client and tape drive configurations do not match, there are two possibilities:

    a. A damaged used are of the RAM.

    b. A damaged used area of the EEPROM.

       Reconfigure the tape drive and save the new configuration.

       1. If a used area of the RAM is bad, the save operation will fail, causing a "Save Fails" error. In that case the "Fix_CfgErr" was caused by a bad RAM. Contact your service provider to replace the tape drive.

       2. If the save operation succeeds, the EEPROM is probably bad. The new configuration is properly saved only to the RAM: The EEPROM may have corrupt data.

       Note. When the configuration in the RAM is correct, the tape drive can usually operate normally while it remains powered on, even if the EEPROM is damaged.

5. If applicable, place the tape drive back online.

6. If the configuration problem repeats on the next IPL, it means that the EEPROM is damaged. Contact your service provider to replace the tape drive.

UnWr xxxx Indication

Cause. "UnWr xxxx" means unwritten data. This display occurs if the Unload switch was pressed during a write operation. It indicates that the tape drive attempted to write the remaining data before it unloaded, but the attempt failed.

Cause. Some data remains unwritten to tape.

Cause. Loss of this data occurs if you press the Unload switch again. Before pressing Unload again, you must issue the following command sequence : In the SCSI environment: Recover Buffer Data. This allows the NonStop system to save the unwritten data.

DumpAgain? Message

Cause. The "DumpAgain?" message alternates with a "CHK xxxx" fault symptom code indication while the Service light flashes. This occurs when the identical "CHK xxxx" fault symptom code is detected within one minute.

Cause. The tape drive becomes non-operational and requires manual intervention.

Cause. With this condition, you may choose to take a dump, but there is no requirement to do so. If you have reason to take the dump, press any control except the **IPL** switch. This saves the dump data to the EEPROM. While the dump is being saved to the EEPROM, the Service light goes out and the display alternates between "SavingDmp" and the "CHK xxxx" display. After saving, the tape drive automatically IPL's.

Refer to Writing the Diagnostic Dump Tape to File on page A-4 to copy the dump data from EEPROM to tape or a file.

If you do not want to take the dump, press the **IPL** switch. This IPLs the tape drive without copying the dump data to the EEPROM.

- If the IPL fails, as indicated by any error message, contact your service provider to replace the tape drive.

- If the IPL is successful, continue with normal operations.

Identifying Unrecoverable Tapes

⚠ **Caution.** Do not degauss 9840 tapes. Servo tracks are written on the tape at the factory. When these tracks are mistakenly erased as by degaussing, you must discard the tape cartridge.

An unrecoverable defective tape, including a degaussed tape, fails in all operations or most operations. A failing tape on one drive should be tested on another drive. If the tape fails on both drives, the tape is most likely bad. To confirm this conclusion:

1. Take another tape and test it on the original drive on the same operation that previously failed. If the operation does not fail with the new tape, conclude that the previous tape is probably defective.

2. Use the Reclaim Menu to reformat the original tape. Refer to Appendix B, 9840 Menu System. If the Reclaim Menu rejects the tape, the tape is unrecoverable and must be discarded.

Forcing a Diagnostic Dump (Reset Drive)

This is a RESET operation. It works the same as an initial program load (IPL), but also forces a diagnostic dump of the present state of the machine. A forced diagnostic dump is usually done in response to an Engineering request to identify drive status at any time during drive operation.

Forcing a diagnostic dump resets the drive and writes the dump to the EEPROM. The EEPROM can accumulate approximately 12 dumps, depending on compression. Dumps remain in the EEPROM until it is full. If EEPROM lacks sufficient space for an additional dump, all previous dumps are erased and only the newest dump remains in the EEPROM.

Note. New dumps are appended to earlier dumps already on the tape.

To force an immediate diagnostic dump from the operator panel to the EEPROM:

1. Press the **Menu** and **Unload** switches for one second to dump present drive status from memory to EEPROM. Dump data collection begins when "CHK FFFF" is displayed and the *Power* indicator begins to flash.

2. Observe the *Service* indicator. When the dump data collection is complete, the *Service* indicator flashes.

3. The drive automatically performs an IPL and returns to online: The display alternates between the corporate ID and FFFF:DmpYY until any normal drive activity is started.

Writing the Diagnostic Dump Tape to File

The dump data on a dump tape can be accessed and read as data. To do so, write-protect the dump tape and load it into a drive. The drive recognizes the dump tape, but because it is write protected, does not go into automatic diagnostic dump operation. Instead, it waits for a read command from the host.

To copy the EEPROM dump data to tape:

1. Take the drive to offline.

2. Remove any tape cartridge from the drive.

3. Insert a write-enabled dump tape in a drive: Data is automatically written to the tape from the drive EEPROM. While data is copied to the tape, the *Activity* indicator flashes. When the copy is done, the tape ejects.

Note. If the tape is file-protected, operation will not take place and the tape will not eject.

Note. If "DmpWrFailx" displays (where x = 1 or 2), refer to on page 2-7 for instructions on how to handle this error condition.

4. When finished, return the drive to online, or replace as necessary.

Use the guidelines in Appendix A of this manual to FTP dump file to destination.

Removing a Stuck Tape Cartridge

When you press the Unload switch, or when the unload function is electronically triggered, and the cartridge fails to eject, you must manually remove the tape cartridge.

△ **Caution.** In the procedure below, do not turn the screw driver counter-clockwise, as it may cause damage to the gears.

1. Insert a flat screwdriver through the hole on the right side of the drive operator panel.

2. Press against the spring-loaded screw inside until it stops.

3. Turn the screw clockwise until the cartridge releases.

Figure A-1. Recovering From a Stuck Cartridge

Place screwdriver here

Operating a Drive Manually in a Tape Library

When a tape library is down, you might have to operate the tape drive manually from inside the library. Press **Unload** on the drive operator panel to ensure the drive is not stuck in an intermediate position.

Performing a Tape Boot or Tape Load

A tape boot/load should only be performed at the advice of service providers.

△ **Caution.** Tape Boot is a destructive function that destroys the files on the system disk. It should be performed only on the advice of service providers. It destroys all information in the system configuration database including all configuration information about tapes, adapters, and more. Unlike the K-series, the system image doesn't contain this information. Many additional steps are required to restore the system to working order.

Performing Processor Memory Dumps to Tape

When the system is running, the normal procedure is to perform a memory dump from the processor to disk, then copy the memory dump to tape. If the entire system is down (all processors are halted), you can perform a tape dump using the TSM Low-Level Link Application. For information about how to perform memory dumps, refer to the *S-series Operations Guide.*

Tape Dump Alerts

Before performing a tape dump:

- All processors in the system must be halted. Tape dumps can only be performed if the entire system is down.

- A tape drive must be connected to a PMF CRU in group 01. Tape drives connected through a ServerNet/DA or to any other PMF CRUs or IOMF CRUs cannot be used for tape dumps.

B 9840 Menu System

This section contains:

Using the Menu System

Menu Structure Overview

Figure B-1 and Figure B-2 are an overview of the 9840 menu system and show the content of the menus. Main Menus are shown in bold and sub-menus are listed below each Main Menu.

Note. When the drive is online, the menus in Figure B-1 are available. When the drive is offline, the menus in Figure B-2 are available.
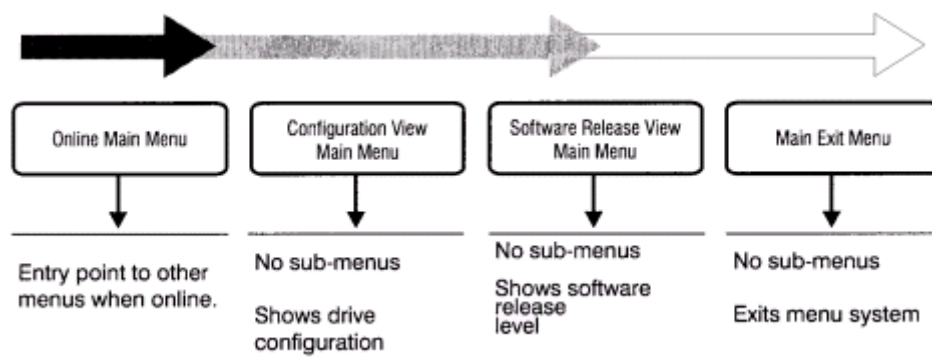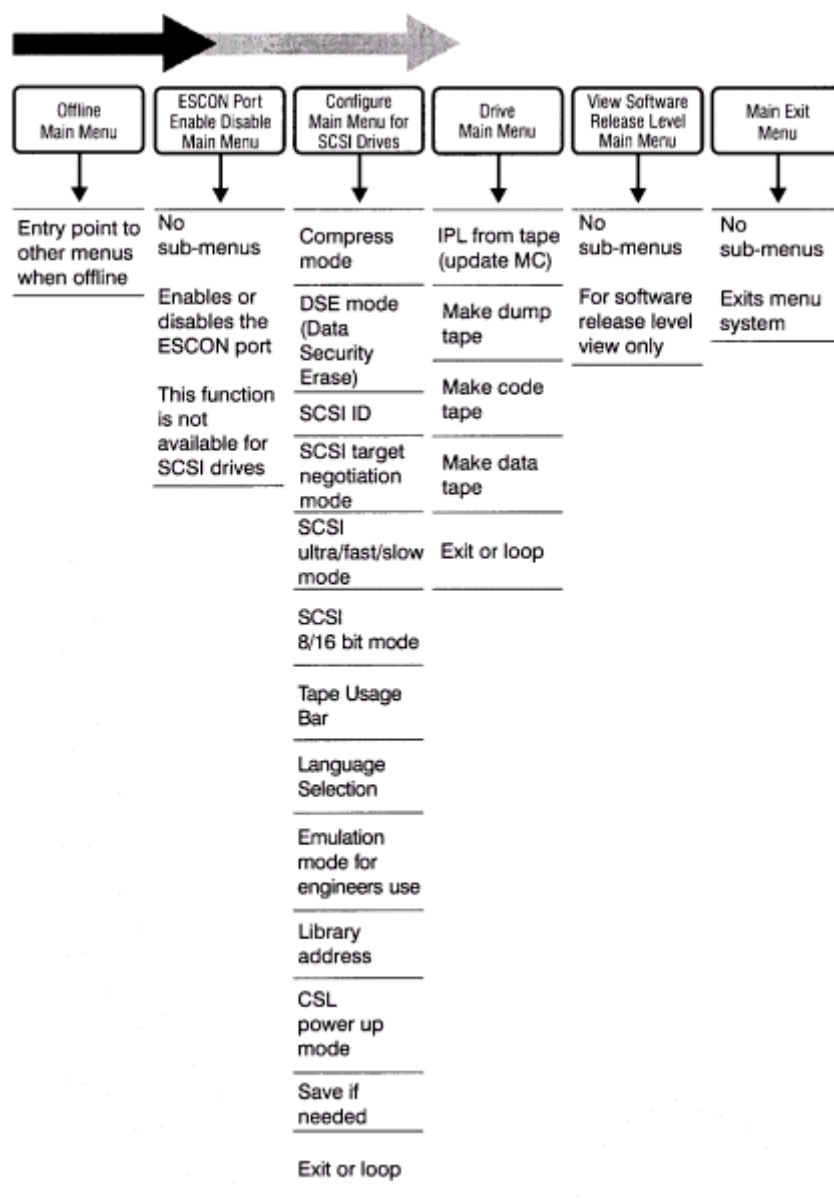
Figure B-1. Online Menu Structure

Online Main Menu	Configuration View Main Menu	Software Release View Main Menu	Main Exit Menu
Entry point to other menus when online.	No sub-menus Shows drive configuration	No sub-menus Shows software release level	No sub-menus Exits menu system

Figure B-2. Offline Menu Structure

Offline Main Menu	ESCON Port Enable Disable Main Menu	Configure Main Menu for SCSI Drives	Drive Main Menu	View Software Release Level Main Menu	Main Exit Menu
Entry point to other menus when offline	No sub-menus	Compress mode	IPL from tape (update MC)	No sub-menus	No sub-menus
	Enables or disables the ESCON port	DSE mode (Data Security Erase)	Make dump tape	For software release level view only	Exits menu system
	This function is not available for SCSI drives	SCSI ID	Make code tape		
		SCSI target negotiation mode	Make data tape		
		SCSI ultra/fast/slow mode	Exit or loop		
		SCSI 8/16 bit mode			
		Tape Usage Bar			
		Language Selection			
		Emulation mode for engineers use			
		Library address			
		CSL power up mode			
		Save if needed			
		Exit or loop			

Examples of Menu Operations, Reference

If you are unfamiliar with the functions of the operator panel and menus, go to the section titled "Examples of Menu Operations" in this appendix. There the user will find sample procedures that can be experimented with.

Instructions for Menu Operations

The next few subsections provides instructions for the menu operations. Each subsection has its own subject:

- One section deals with how to View SCSI Configurations.

- The second section deals with how to Change SCSI Configurations.

- The final section does Drive Operations.

The subsections show all operations sequentially. All the necessary preceding instructions must be followed.

Full Spelling Vs. Abbreviations in Quotation Marks

Operator panel displays might be shown twice: abbreviated in quotation marks and with full spelling. Abbreviated spellings in the quotations show exact display presentation. The full spelling is added to clarify meanings.

"If applicable, press Menu to access"

This is an instruction. It means that you should do one of three things:

1. Do nothing if the user is already at the menu of choice.

2. Press **Menu** once if you are still at the previous menu and wants access to the next menu.

3. Press **Menu** as necessary to reach the menu of choice, or until an Exit Menu is reached.

"Press Menu to exit to the next sub-menu"

This is an instruction. Pressing **Menu** once takes the user to the next sub-menu. Pressing **Menu** twice will take a menu farther. The user can continue until an Exit Menu is reached.

Explanation of the Menu Trees

Figure B-4 through Figure B-6 in this appendix provide graphic operational sequences for the menu operations. Each figure has its own subject:

- Figure B-4 views SCSI configurations

- Figure B-5 changes SCSI configurations

- Figure B-6 does drive operations

The menu trees show the operator panel switches and displays in the order in which they are operated and viewed. Only two switches are used for the menu system: **Menu**

and **Select**. The boxes show the menus and selected displays. The menu trees legend is illustrated in .

Figure B-3. Menu Tree Legend
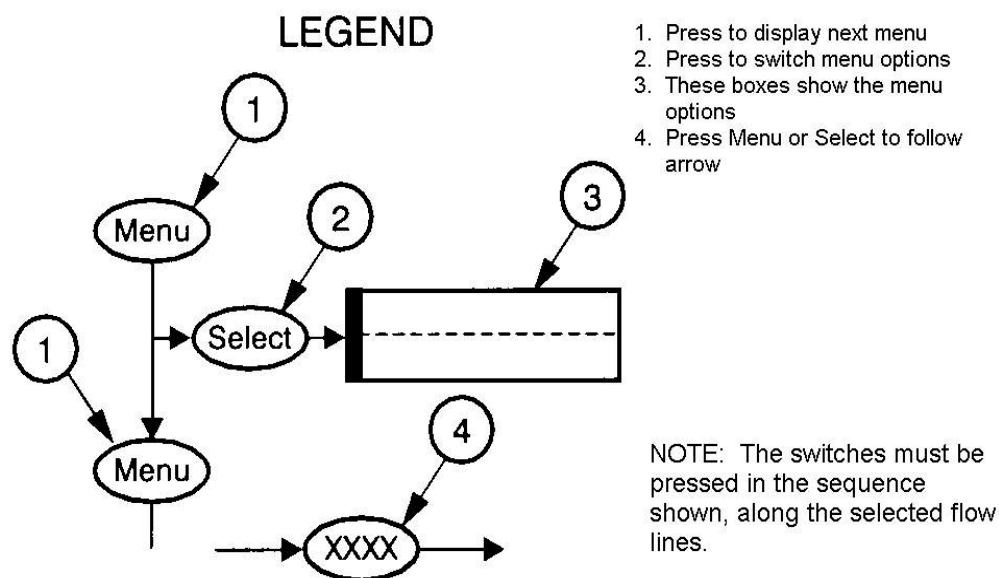
For example, in the View SCSI Configuration menu tree () this sequence is followed:

1. Press **Menu** to view the Online/Offline Menu.

2. Press:

     a. **Select**--to change the status to Online (only if the drive is offline)

     b. **Menu**--to go to the View Configuration Menu

3. Press **Select** to view SCSI configurations.

4. Repeatedly press **Select** or **Menu** to step through the configuration displays.

Note. Although the display on the drive can only show a single line of text at a time and displays only the selected option, the trees display all the possible options.

Note. In all cases but one, when the user changes the 9840 configuration and saves the change, the configuration change is complete. This is not true when the user changes the address in the 9840 by which the library addresses the drive (drive library address). In this case the drive does not know that it has a new address until it is IPLed. The drive will keep responding to its previous address unless it is IPLed after the address is changed.

Δ **Caution.** After saving a configuration change, always IPL the drive if the library address has also been changed.

View SCSI Configuration Status

Figure B-4. View of SCSI Configuration Status Menu
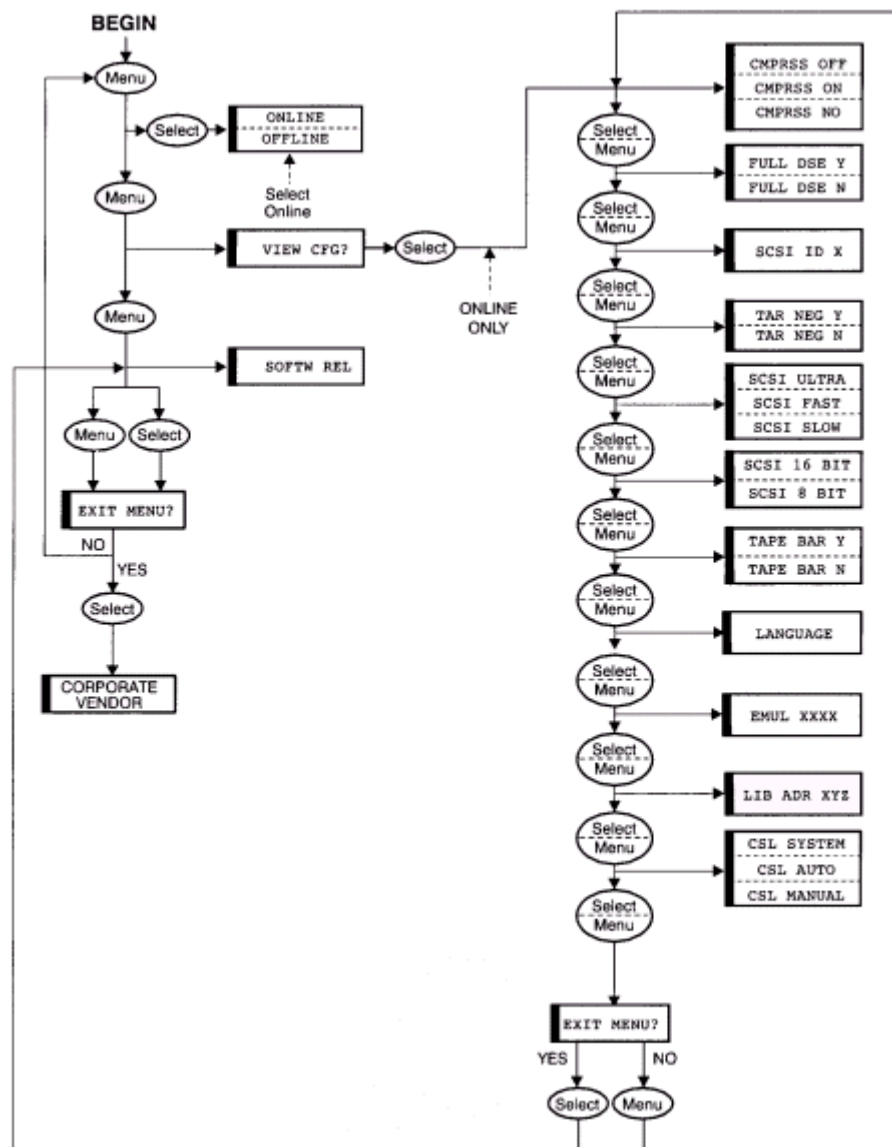
Online/Offline Main Menu

Selections: "Online"

    "Offline"

Default is set to online.

For viewing the configuration, the drive must be online.

1. If applicable, press **Menu** to access.

2. If Online is not displayed, press **Select** to toggle to Online.

View Configuration Main Menu

Selections: "View CFG?" (View Configuration?)

To bypass this menu and view only the software release level, press **Menu** twice. Otherwise follow the instructions.

1. If applicable, press **Menu** once to display the menu.

2. Press **Select** to access: the compression status is displayed.

3. Press **Select** or **Menu** repeatedly to view the rest of the configuration status:

    Data Security Erase (DSE)

    SCSI ID

    Target Negotiation

    SCSI Bus Speed

    SCSI Bus Width

    SCSI Emulation Mode

    Library Address

    CSL Mode

4. Press **Menu** or **Select** to go to the Exit Menu.

5. Press **Menu** to repeat viewing or **Select** to go to the next level, Software Release Level Menu.

Software Level View Menu

Selections: none

Display shows Rx.yy.zzzc where:

x = major revision number

yy = minor revision number

zzz = the integration number

c = channel type (s=scsi, e=escon, f=fibre)

1. If applicable, press **Menu** once to display the software level.

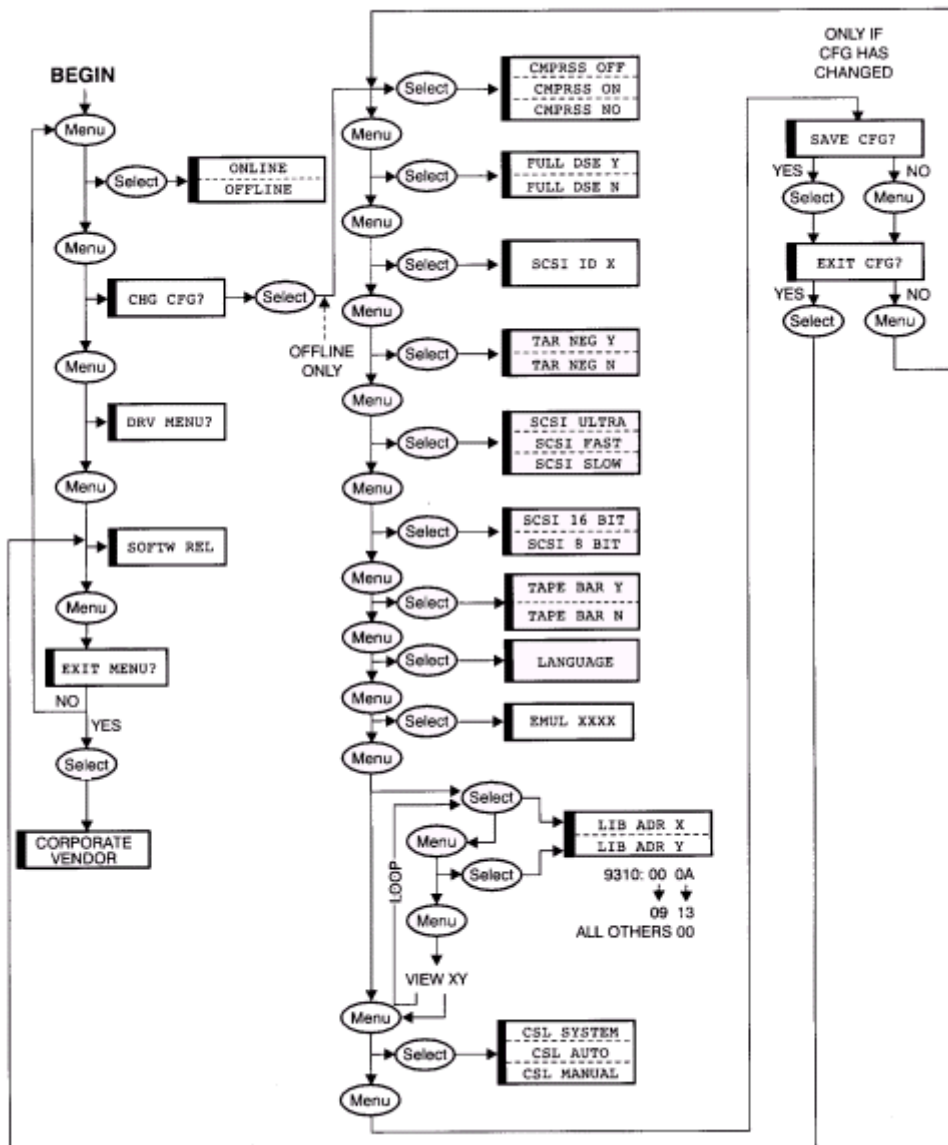2. Press **Menu** again to go to the Exit Menu.

Main Exit Menu

Selections: "Exit Menu?"

This menu gives you the opportunity to repeat the operations.

1. If applicable, press **Menu** to access.

2. To repeat the operation, press **Menu**: this takes you to the beginning.

3. To exit the operation, press **Select**.

SCSI Configuration Menu

Figure B-5. SCSI Configuration Menu

Online/Offline Main Menu

Selections: "Online"

"Offline"

Defaults go to online.

"OffLn Pend" and OnLn Pend" may display while waiting for a system response of diagnostics completion:

1. If applicable, press **Menu** to access.

2. To go online and exit operations:

    a. Press **Select** to toggle to Online.

    b. Press **Menu** repeatedly until "Exit Menu?" displays.

    c. Press **Select** to exit.

3. To change configuration or perform special operations:

    a. Press **Select** to toggle to Offline.

    b. Press **Menu** to exit to next menu.

Configuration Main Menu (Entry Point to Configuration Sub-Menus)

Selections: "Chng CFG?" (Change Configuration)

This is the entry point to the configuration sub-menus: when selected, the configuration status for Compress Mode, next, is immediately available.

1. If applicable, press **Menu** to access.

2. Press **Select** to enter Configuration sub-menus, **OR** press **Menu** to bypass and go to next main menu: next main menu is Drive Main Menu.

Compress Mode Sub-Menu In Configuration Main Menu

Selections: "CMPRSS Off" (Compress Mode Off)

"CMPRSS Yes" (Compress Mode Yes)

"CMPRSS No" (Compress Mode No)

Defaults to the last saved selection.

When **Off**, does not allow data compression: host request has no effect.

When **Yes**, the default is data compression: host can request no data compression.

When **No**, the default is no data compression: host can request data compression.

Press **Select** until the desired option appears.

Press **Menu** to exit to the next sub-menu.

DSE Mode Sub-Menu In Configuration Main Menu

Selections: "Full DSE Y" (Full Data Security Erase Yes)

"Full DSE N" (Full Data Security Erase No)

Defaults to last saved selection.

Full DSE Yes allows full Data Security Erase of all tracks; it consumes much time.

Full DSE No writes information on the media that notifies the drive that no valid data exists beyond this point; it is quicker.

1. If applicable, press **Menu** to access.

2. Press **Select** until the desired option displays.

3. Press **Menu** to exit to the next sub-menu.

SCSI ID Sub-Menu In Configuration Main Menu

Selections: "SCSI ID x"

Defaults to the last saved selection.

Establishes SCSI ID of drive. Provided address range is 0-7 for a narrow channel an 0-F for a wide channel.

1. If applicable, press **Menu** to access.

2. Press **Select** to increment counter to ID value.

3. Press **Menu** to exit to the next sub-menu.

SCSI Target Negotiation Mode Sub-Menu In Configuration Main Menu

Selections: "Targ Neg Y" (Target Negotiation Yes)

"Targ Neg N" (Target Negotiation No)

Defaults to the last saved selection.

When Yes is chosen, it allows drive control unit to initiate negotiations with host and to clarify SCSI transmission speed, in case the host had not done so.

1. If applicable, press **Menu** to access.

2. Press **Select** until the desired option displays.

3. Press **Menu** to exit to the next sub-menu.

SCSI Bus Speed Sub-Menu In Configuration Main Menu

Selections: "SCSI Ultra" (fastest)

"SCSI Fast"

"SCSI Slow" (slowest)

Defaults to last saved selection.

Selects ultra, fast or slow channel transmission speed for drive, to match drive with host capabilities:

1. If applicable, press **Menu** to access.

2. Press **Select** until the desired option displays.

3. Press **Menu** to exit to next sub-menu.

SCSI Bus Width Sub-Menu In Configuration Main Menu

Selections: "SCSI 16 Bit" (wide bus)

"SCSI 8 Bit" (narrow bus)

Defaults to last saved selection.

Selects 8- or 16-bit channel width for drive, to match drive with host configuration.

1. If applicable, press **Menu** to access.

2. Press **Select** to toggle the selections.

3. Press **Menu** to exit to the next sub-menu.

Tape Bar (Tape Usage Bar Chart) in Configuration Main Menu

Selections: "Tape Bar Y" (The tape usage bar chart is wanted to be displayed.)

"Tape Bar N" (The tape usage bar chart is not wanted to be displayed.)

Selects or deselects bar-charts that show how much tape is written and how much tape has been read. See a detailed description under "Tape Bar Chart Explanation."

1. If applicable, press **Menu** to access.

2. Press **Select** until the desired option displays.

3. Press **Menu** to exit to the next sub-menu.

Language Selection in Configuration Main Menu

Selections: "Language?" (What language does the user want to select?)

Selects one of several operator display languages: English, Espanioles, Francais, Italiano, or Deutcher.

1. If applicable, press **Menu** to access.

2. Press **Select** until the desired option displays.

3. Press **Menu** to exit to the next sub-menu.

Emulation Mode Sub-Menu In Configuration Main Menu

Selections: "Emul XXX" (Emulation Mode XXX)

Defaults to last saved selection.

Default is always "Emul STD" unless informed otherwise. Do not use a selection other than STD unless instructed to do so by STK Engineering.

△ **Caution.** There is also an "Emul STD's" selection. Do not use this selection unless instructed to do so by STK Engineering.

---

1. If applicable, press **Menu** to access.

2. Press **Select** until the desired option displays.

3. Press **Menu** to exit to the next sub-menu.

Library Address Sub-Menu In Configuration Main Menu

Selections: "Lib Adr Yz" (Library Address with Nibble Y flashing)

        "Lib Adr yZ" (Library Address with Nibble Z flashing)

Defaults to last saved selection.

For 9710, and 9740 libraries, the addresses of all drives are 00. In each 9310 library cabinet, looking at the back of the drives, the address sequence is:

● Left column from top:0 through 9

● Right column from top: A through 13

△ **Caution.** After saving the configuration change, always IPL the drive if its library address has also been changed.

---

1. If applicable, press **Menu** once to access, or twice if wishing to bypass. If not bypassing:

2. Press **Select** for Y nibble: Y will flash.

3. Press **Select** to increment Y nibble to the desired value.

4.   Press **Menu** to advance to Z nibble: Z will flash.

5.   Press **Select** to increment Z nibble to the desired value.

6.   Press **Menu** to observe the whole address.

7.   If okay, press **Menu** again to exit to the next sub-menu.

8.   If it is not okay, press **Select** to repeat the process.

Save Configuration Sub-Menu In Configuration Main Menu

Selections: "Save CFG?" (Save Configuration?)

Displays: "Save Fails"

This Sub-Menu displays only if drive is offline **AND** the drive configuration was changed.

1.   If applicable, press **Menu** to access.

2.   To save and go to the configuration exit menu, press **Select**:

3.   "Saving CFG" displays for 2 seconds.

4.   "Save Fails" displays for RAM problems: see Table A-2 in Appendix A for instructions.

5.   To not save and go to the configuration exit menu, press **Menu**.

Exit Configuration Sub-Menu In Configuration Main Menu

Selections: "Exit CFG?" (Exit Configuration?)

This submenu gives the user the opportunity to repeat the configuration.

1.   If applicable, press **Menu** to access.

2.   To repeat, edit, or review the configuration, press **Menu** (goes to Compress Mode, which is the first configuration Sub-Menu).

3.   To exit the menu system:

     a.   Press **Select**.

     b.   Press **Menu** repeatedly until "Exit Menu?" shows.

Main Exit Main Menu

Selections: "Exit Menu?"

This menu gives the user the opportunity to return the drive online, and stay in or exit the menu system.

1.   If applicable, press **Menu** to access.

2. To return to the Online/Offline Main Menu to return drive to online and exit:

   a. Press **Menu**.

   b. Return to the Online/Offline Menu at the beginning of this table.

3. To exit the menu system without returning the drive to online, press **Select**.

Drive Operations Menu

Figure B-6. Drive Operations Menu
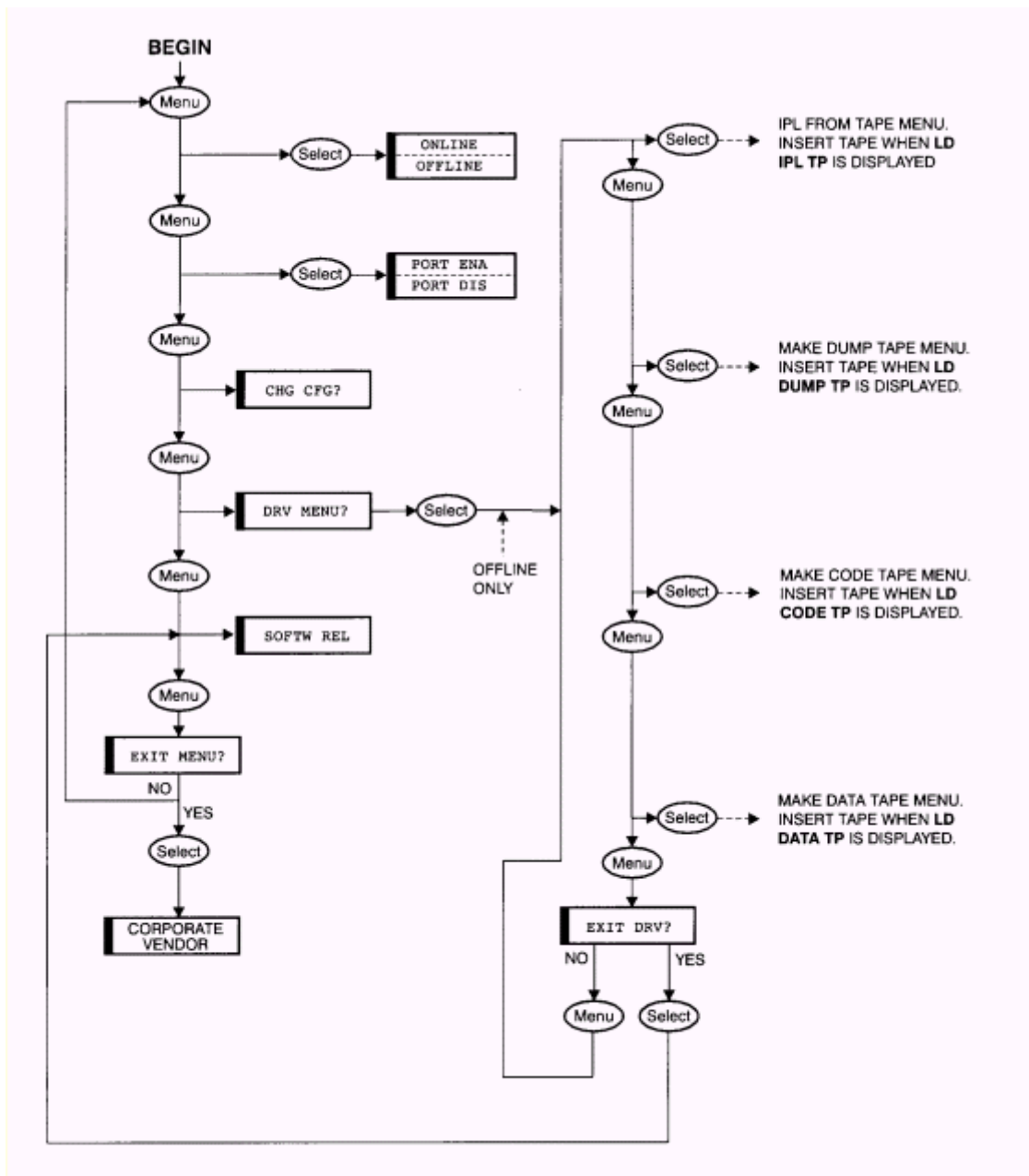
Online/Offline Main Menu

Selections: "Online"

"Offline"

Defaults to Online.

"OffLn Pend", "OnLn Pend" may display while waiting for system response or diagnostics completion.

1. If applicable, press **Menu** to access.

2. To go online and exit operations:

    a. Press **Select** to toggle to Online.

    b. Press **Menu** repeatedly until "Exit Menu?" shows.

    c. Press **Select** to exit.

3. To change configuration or to do special operations:

    a. Press **Select** to toggle to Offline.

Press **Menu** several times to reach the Drive Main Menu.

Drive Main Menu

Selections: "Drv Menu?" (Drive Menu?)

This is the entry point to the drive Sub-Menus.

1. If applicable, press **Menu** to access.

2. Press **Select** to enter the drive Sub-Menus, **OR** press **Menu** to bypass the drive menus.

Code Update Sub-Menu In Drive Main Menu

Selections: "IPL From Tp" (Initial Program Load Drive from New Firmware Tape)

Displays: "CodUpFailsx" (Code Update Fail Number x)

This selection updates the firmware in the drive from the firmware tape inserted in drive.

1. Press **Menu** to bypass. If not bypassing:

2. Press **Select** to activate: if a tape is present in the drive it will be ejected.

3. When "Ld IPL TP" displays, insert write-protected firmware tape with desired code. When done, the drive automatically ejects tape, IPL's, and comes online.

Dump Tape Sub-Menu In Drive Main Menu

Selections: "MakeDumpTp" (Make Dump Tape)

Displays: "DmpCrFailx" (Dump Create Fail Number x)

This selection copies the firmware from the drive to tape. This tape may be used to update other drives using the Code Update Sub-Menu.

1.   If applicable, press **Menu** once to access, or twice to bypass. If not bypassing: Press **Select** to activate: if a tape is present in the drive it will be ejected.

2.   When "Ld Dump Tp" display, insert write enabled tape: old data on tape will be erased.

3.   When tape ejects, insert another, or press **Menu** to exit to next sub-menu.

Create Code Update Sub-Menu In Drive Main Menu

Selections: "MakeCodeTp" (Make Code Tape)

Displays: "CodCrFailx" (Code Create Fail Number x)

This selection copies the firmware from the drive to tape. This tape may be used to update other drives using the Code Update Sub-Menu.

1.   If applicable, press **Menu** once to access, or twice to bypass. If not bypassing:

2.   Press **Select** to activate: if a tape is present in the drive, it will be ejected.

3.   When "Ld Code Tp" displays, insert write enabled tape: old data on tape will be erased.

4.   When tape ejects, insert another, or press **Menu** to exit to next sub-menu.

Reclaim Tape Sub-Menu In Drive Main Menu

Selections: "MakeDataTp" (Make Data Tape)

Displays: "DatCrFailx" (Data Create Fail Number x)

This selection reformats tapes so they can be reused as normal data tapes--referred to as "reclaiming."

Drive Exit Sub-Menu In Drive Main Menu

Selections: "Exit Drv?" (Exit Drive?)

This sub-menu allows the user to repeat the drive menu or exit.

1.   If applicable, press **Menu** to access.

2.   To return to Code Update Sub-Menu (beginning of Drive Main Menu), press **Menu**.

3.   To exit menu system:

    a.   Press **Select**.

    b.   Press **Menu** repeatedly until "Exit Menu?" is displayed.

Main Exit Main Menu

Selections: "Exit Menu?"

This menu gives the user the opportunity to return the drive to online and exit the menu system.

1.   If applicable, press **Menu** to access.

2.   To return to the Online/Offline Main Menu to return drive to online and exit:

    a.   Press **Menu.**

    b.   Return to the online/offline menu at the beginning of this table.

3.   To exit the menu system without returning the drive to online, press **Select**.

Tape Bar-Chart Explanation

The tape bar-chart displays two horizontal bars, one showing how much tape has been written, and the other showing how much tape has been read. When selected from the menu, these bars are shown during read and write operations and when the drive is Ready (idle) Mode. The bar display alternates with the Write, Read, and Ready display depending on the present mode of the drive.

The bar gets its information from the MIR (Media Information Region) on the tape. This information is written to tape when the tape is unloaded. If this information is bad, the bar will not display. To rewrite the MIR information, the host must read the entire tape and then unload it.

The displayed bars use all ten display segments on the operator panel. Each segment is usually employed to a display number, letter, or symbol, but in "Bar Mode," all ten segments are used together to display the horizontal bars.

Each segment has seven vertical dots and five horizontal dots. There are fifty dots the entire length of the display, so that each dot represents 2% travel and each segment represents 10% travel of the bars.

Three rows of dots in the middle of the display represent the read bar and the two outer rows on each side represent the write bar. However, where the read bar has not penetrated, the write bar takes up all the rows. See Figure B-7.

Figure B-7. Tape Bar Chart

1. Read bar
2. Write bar
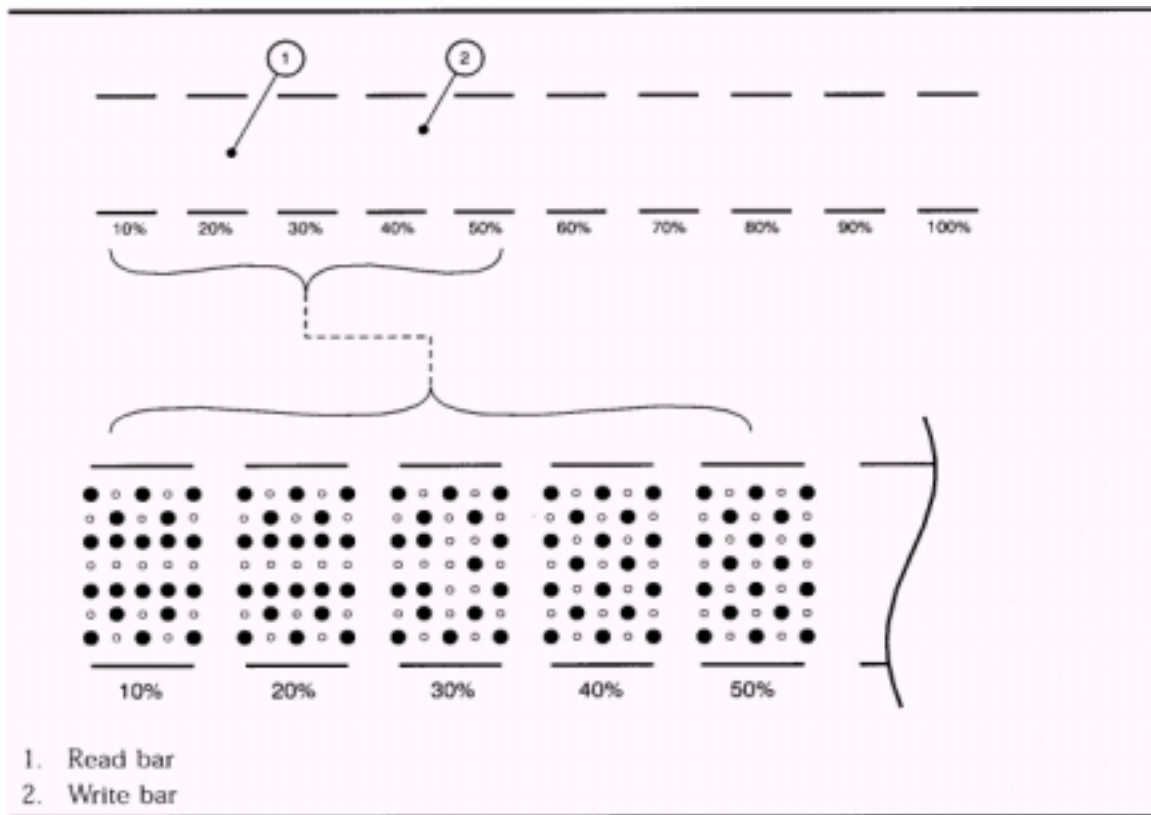
The write bar is in the shaded area. It has a matrixed pattern: only every other dot is lighted. It shows the tape is 50% written.

The read bar is inside the write bar in the unshaded area to the left. The bar shows up as an unlit single row lined with a solid-lighted row on each side. It shows that the tape is 24% read.

Examples of Menu Operations

To become familiar with the functions of the operator panel menus, these pages provide sample procedures.

How to enter the Menu system

1. Enter the menu system by pressing the **Menu** switch once.

    a. Observe the display and ensure that it shows "Online" or "Offline."

    b. If the display does not show "Online" or "Offline," then the user is already in the menu system: see "How to Repeat or Exit the Menu System" for instructions on how to exit.

2. If the user is in the Online/Offline menu and the unit is online, press the **Select** switch once to change to Offline.

3. Press the **Menu** switch to go to the next menu subject, which is Configuration Menu Processing.

Once in the menu system, the user can follow the display prompts, or follow the instructions in the "SCSI Configuration Menu" section.

How to View Drive Configuration of Software Level

1. Enter the menu system by pressing the **Menu** switch once.

    a. Observe the display and ensure that it shows "Online" or "Offline."

2. If Offline, press the **Select** switch once to change to Online.

3. Press the **Menu** switch to go to the Configuration Main Menu. The display will show "View CFG?"

    a. To view the software release level only:

        1. Press **Menu** once more,

        2. Go to Step 4.

    b. To view the drive configuration first:

        1. Press **Select**,

        2. Press **Menu** or **Select** repeatedly to see all the drive configurations, until the user reaches the Configuration Exit Menu.

    c. At the Configuration Exit Menu:

        1. Press **Menu** to repeat the viewing, or,

        2. Press **Select** to exit the Software Release Menu.

4. View the software release level. The format is:

    Rx.yy.zzzc

    Where:

    x = major revision number

    yy = minor revision number

    zzz = the integration number

    c = channel type (s = SCSI, e = Escon, f = Fibre)

5. After viewing the software release level, press Menu to exit the Main Exit Menu: see "How to Repeat of Exit the Menu System," for instructions on how to exit.

How to Save, Abort, or Repeat Configuration Changes

Note. The "saving" option is available only when exiting from the Configuration Main Menu if any configuration menu item was changed. If the configuration wasn't changed, the saving option is bypassed.

After the user has made changes in the configuration selections:

1. Press the **Menu** switch repeatedly until the configuration save menu is reached. The display will show "Save CFG?"

2. Choose from the following as applicable:

   a. To save and exit:

      Press **Select** to save: "Saving CFG" is displayed for about two seconds.

      Press **Select** again to exit to the next main menu.

   b. To abort changes, keep the original configuration, and exit:

      Press **Menu** to not save the changes.

      Press **Select** to exit to the next main menu.

   c. To abort changes and repeat configuration editing:

      Press **Menu** to not save the changes.

      Press **Menu** again to repeat the configuration editing.

How to Repeat or Exit the Menu System

When the user is finished with the menu operations:

1. If applicable, press the **Menu** switch repeatedly until the next exit menu is reached. The display will show "Exit CFG?", "Exit Drv?", or "Exit Menu?"

If the user is at the "Exit CFG?" or "Exit Drv?" Menu

1. To repeat to the previous menu, press **Menu**.

2. To exit to the next main menu, press **Select**.

3. If the user wished to exit all menus, press **Menu** repeatedly until the main exit is reached. "Exit Menu?" will be displayed.

If the User is at the "Exit Menu?" (Main Exit Menu):

1. To return to the menu system or place a drive online:

   a. Press **Menu**: "Offline" will usually be displayed.

   b. To change to Online and exit menu mode:

    c.   To return to the menu system, press **Menu**.

        1.   Press **Select** to toggle drive online/offline status.

        2.   Press **Menu** repeatedly until "Exit Menu?" is displayed, then press **Select** to exit.

2. To exit menu mode altogether without changing drive online/offline status, press **Select**.

3. If the user exited, observe the display. When the user exits Menu mode, a drive status indication such as these is shown:

- A Ready message (indicating that the drive is online and loaded)

- An asterisk (indicating that the drive is online but not loaded)

- An Offline message alternating with an asterisk (indicating the drive is offline)

Example of Menu Selection: SCSI Bus Speed Mode

1. Enter the Menu system and take the drive offline.

2. Repeatedly press **Menu** until the Configuration Main Menu is reached. "Change CFG?" will be displayed.

3. Press **Select** to enter the Configuration Main Menu.

4. Repeatedly press the Menu switch until the display shows "SCSI Ultra," "SCSI Fast," or "SCSI Slow." **What shows is the current selection.**

5. To change the current selection, press the **Select** switch until the desired display is reached. **What shows now is the new unsaved selection.**

6. Press **Menu** as necessary to reach the configuration save menu: "Save CFG?" will be displayed.

7. Choose from the following as applicable:

    a.   To save the changes and exit:

       Press **Select** to save: "Saving CFG" is displayed for about two seconds.

       Press **Select** again to exit to the next main menu.

    b.   To abort the changes, keep the original configuration, and exit:

       Press **Menu** to not save.

       Press **Select** to exit to the next main menu.

    c.   To not save and repeat configuration editing:

       Press **Menu** to not save.

       Press **Menu** again to repeat configuration editing (return to Step 2).

8. If exiting, press **Menu** as necessary to reach the Main Exit Menu: "Exit Menu?" will be displayed.

9. Press **Menu** to return to the Online/Offline Menu: "Offline" will be displayed.

10. Press **Select** to toggle from Offline to Online.

11. Press **Menu** to exit to the menu system.

Example of Menu Selection: Enable/Disable Compression

1. Enter the Menu system and take the drive offline.

2. Repeatedly press **Menu** until the Configuration Main Menu is reached. "Chng CFG?" will be displayed.

3. Press **Select** to enter the Configuration Main Menu.

4. Repeatedly press the **Menu** switch until the display shows "CMPRSS Off," "CMPRSS Yes," or "CMPRSS No." **What shows is the current selection. See the "SCSI Configuration Menu" section for an explanation of these choices.**

5. To change the current selection, press the **Select** switch until the desired display is reached. **What shows now is the new unsaved selection.**

6. Press **Menu** as necessary to reach the configuration save menu: "Save CFG?" will be displayed.

7. Choose from the following as applicable:

8. If exiting, press **Menu** as necessary to reach the Main Exit Menu: "Exit Menu?" will be displayed.

9. Press **Menu** to return to the Online/Offline Menu: "Offline" will be displayed.

10. Press **Select** to toggle from Offline to Online.

11. Press **Menu** to exit the menu system.

C
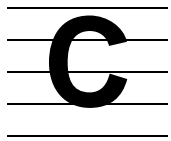
Installing and Configuring the Tape Drive for the NonStop NS-Series Server

This section contains:

Overview

A Fibre Channel to SCSI router must be used to connect the 9840 tape drive to the Fibre Channel ServerNet Adapter (FCSA) on the HP NonStop NS-series server. Figure C-1 shows how the 9840 tape drive is connected to the server by using the router.

Note. For Installation and Configuration information for the NonStop S-series server, see the CT9840-3 Installation and User's Guide.

Figure C-1. Hardware Configuration

9840 Tape Drive

SCSI Cable

**Fibre Channel to
SCSI Router**

FCSA

Fiber Cable

**NonStop NS-Series
Server**
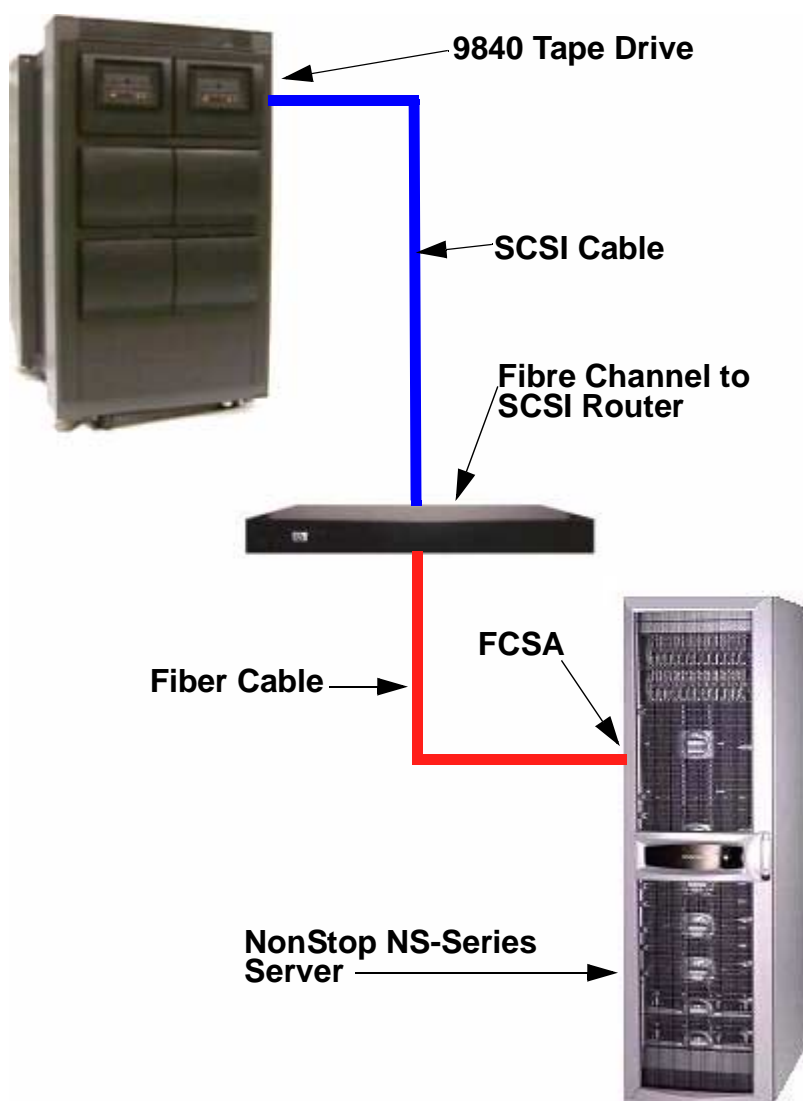
For more information on the router, refer to the *M8201 Fibre Channel to SCSI Router
Installation and User's Guide.*

Installation

1. Connect the small end of the SCSI cable to the Fibre Channel to SCSI router on port 0. For the port location, see Figure C-4 on page C-4.

Table C-1. SCSI Cable Part Numbers and Descriptions

Product Number	Part Number	Description
520-001	529794-001	CBA, 1 meter, VHDCI 68P to HD 68P, HVD SCSI Cable
520-003	529795-001	CBA, 3 meter, VHDCI 68P to HD 68P, HVD SCSI Cable
520-010	529796-001	CBA, 10 meter, VHDCI 68P to HD 68P, HVD SCSI Cable
520-015	529797-001	CBA, 15 meter, VHDCI 68P to HD 68P, HVD SCSI Cable
520-020	529798-001	CBA, 20 meter, VHDCI 68P to HD 68P, HVD SCSI Cable
520-023	529799-001	CBA, 23 meter, VHDCI 68P to HD 68P, HVD SCSI Cable

Figure C-2. SCSI Cable
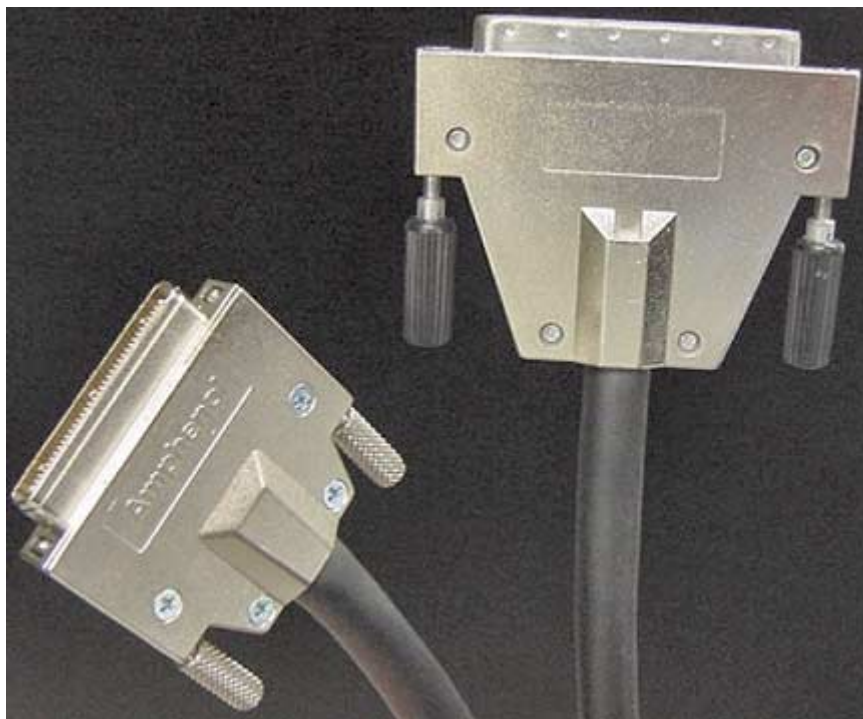
2. Tighten the screws by hand to secure the cable to the unit. Do not use a screwdriver.

3. Connect one end of the fiber cable to the small form-factor pluggable (SFP) on the unit. See Figure C-4 for the location.

4. Attach the power cord to the Fibre Channel to SCSI router's AC power receptacle (see Figure C-4 for location), and then plug the other end into an AC power outlet.

Note. The router does not have protection against lightning surges. Customers located in high risk areas should use external surge protection rated for use in their location and be able to handle the power demand of the router.

Figure C-3.   Front View of the Fibre Channel to SCSI Router

Figure C-4. Rear View of the Fibre Channel to SCSI Router

5. Connect the larger end of the SCSI cable to SCSI port 1 on the rear panel of the 9840 tape drive. See Figure C-6 on page C-6 for the location.

Figure C-5. Front View of the Tape Drive
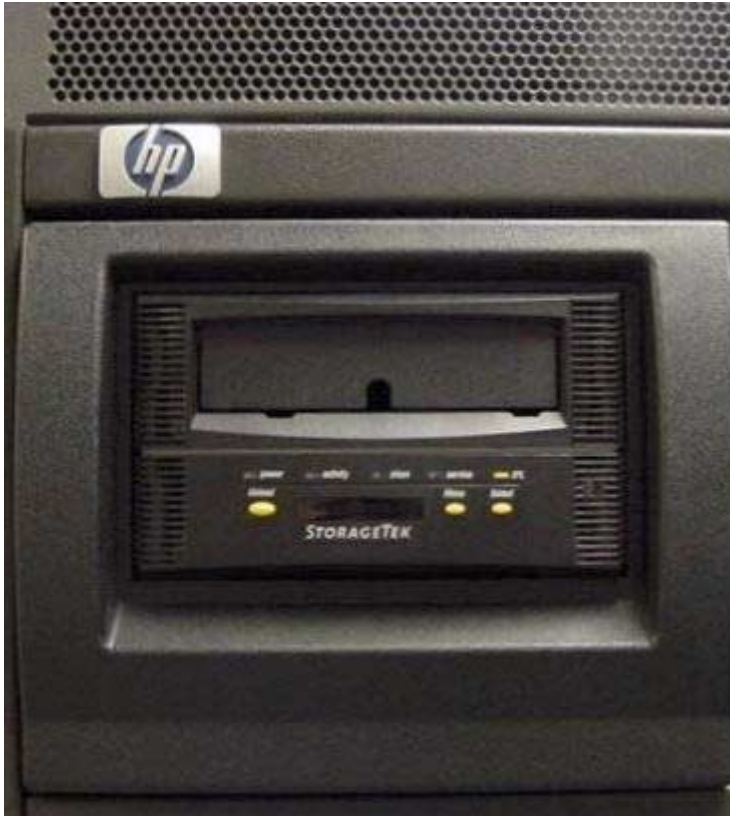
Note. Tape drives are preconfigured to SCSI ID 5.

Figure C-6. Rear View of the Tape Drive
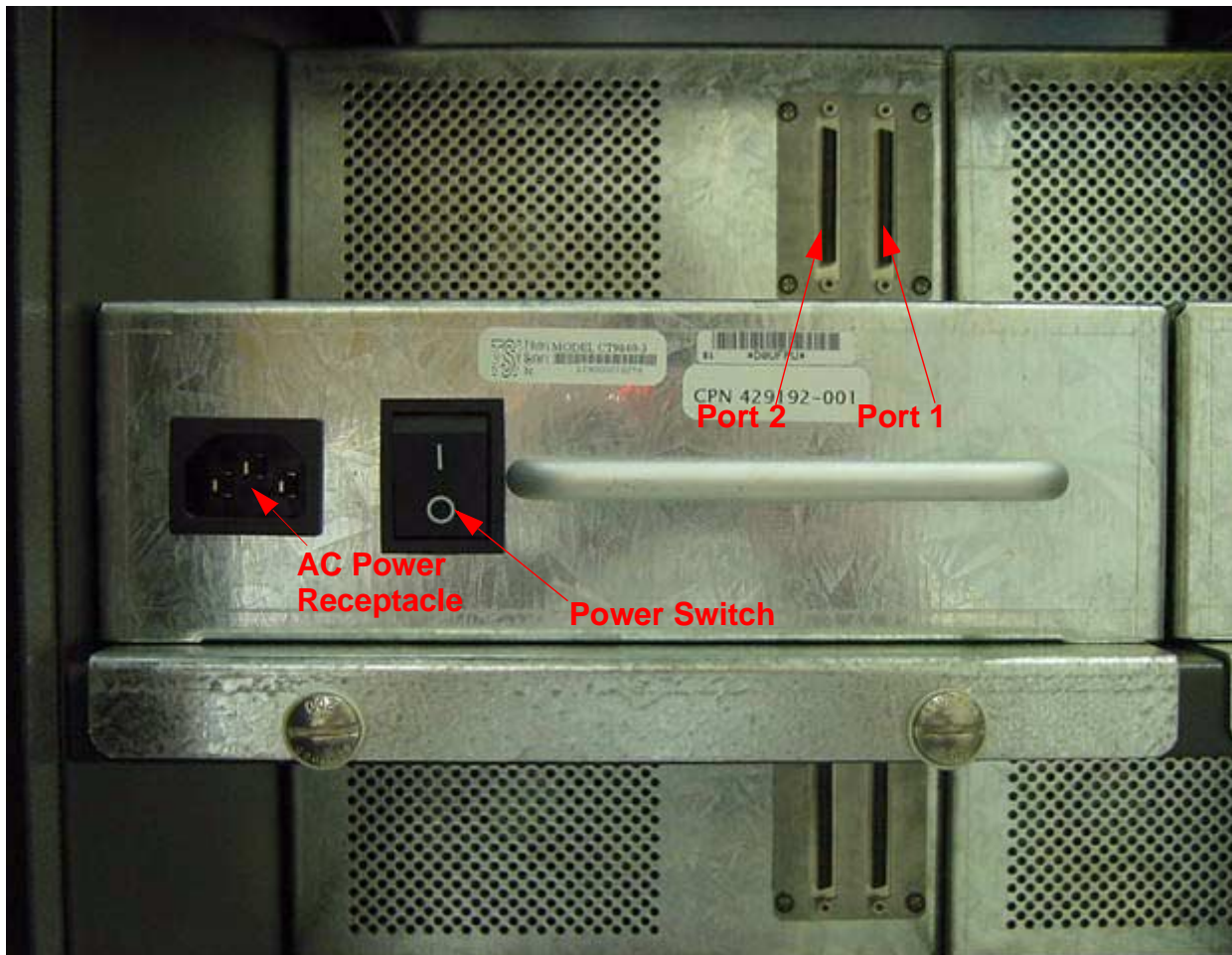
6. Tighten the screws by hand to secure the cable to the unit. Do not use a screwdriver.

7. Connect the supplied differential terminator to SCSI port 2. See Figure C-6 for the location.

8. Tighten the screws by hand to secure the terminator to the tape drive. Do not use a screwdriver.

9. Attach the power cord to the tape drive's AC power receptacle (see Figure C-6 for location), and then plug the other end into an AC power outlet.

Note. The tape drive does not have protection against lightning surges. Customers in high risk areas should use external surge protection rated for use in their location and be able to handle the power demand of the tape drive.

10. Connect the other end of the fiber cable to the Fibre Channel ServerNet adapter
(FCSA) on the NonStop NS-series server. See Figure C-7 for the location of the
FCSA.

Figure C-7. View of Two FCSAs at the Rear of the Server
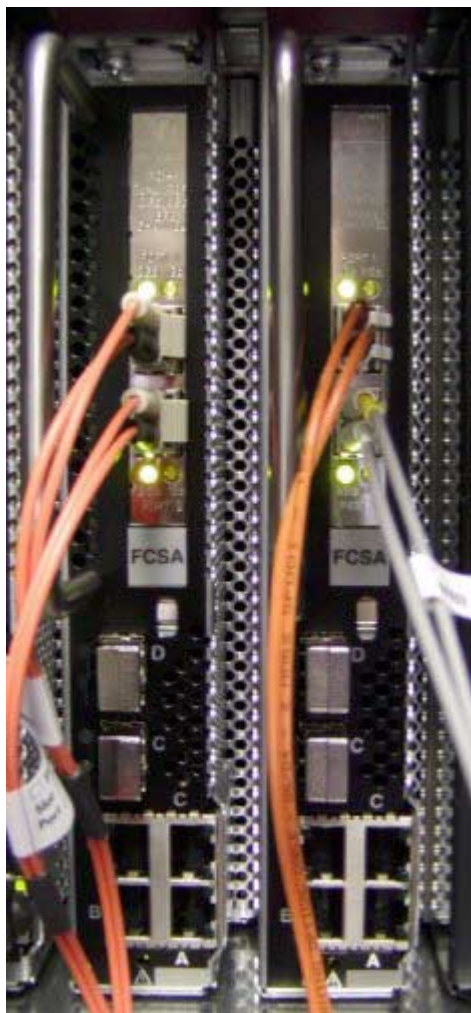
The fiber cable is a multimode/short wave fiber optic cable. This cable is normally an orange color.

Table C-2. Fiber Cables

Connector	Fiber Cable	Fiber Cable Distance
LC - LC	50/125 μm	2-300 meters (6.56-984.25 feet)
LC - LC	62.5/125 μm	3-150 meters (9.84-492.13 feet)

11. Power on the 9840 tape drive. See Figure C-6 for the power switch location. Then wait for it to perform its power-on-self-test (POST).

12. Power on the router, and then wait for it to perform its power-on-self-test (POST).

Configuration

1. In SCF, issue this command:

```
SCF> ADD TAPE $tape, SENDTO STORAGE, LOCATION (group, module,
slot), SAC sac-id, PORTNAME 64-bit-portname, LUN lun-id
```

Example:

```
SCF> ADD TAPE $TAPE1, SENDTO STORAGE, LOCATION (110,2,3), SAC
1, PORTNAME 100000E00C00F000,LUN 1
```

Note. The LUN in SCF should be 1 for the tape drive that is on bus 0. The LUN in SCF should be 3 for the tape drive that is on bus 1.

Note. PORTNAME in SCF corresponds to the WWP name of the router. This name is located on the back of the device.

Figure C-8. Rear View of the Fibre Channel to SCSI Router

WWNN: 100000E00200F000 ◄ WWN Name
WWPN: 100000E00C00F000 ◄ WWP Name
ENET MAC ID: 00:E0:02:00:00:XY ◄ Ethernet MAC ID (Physical Address)
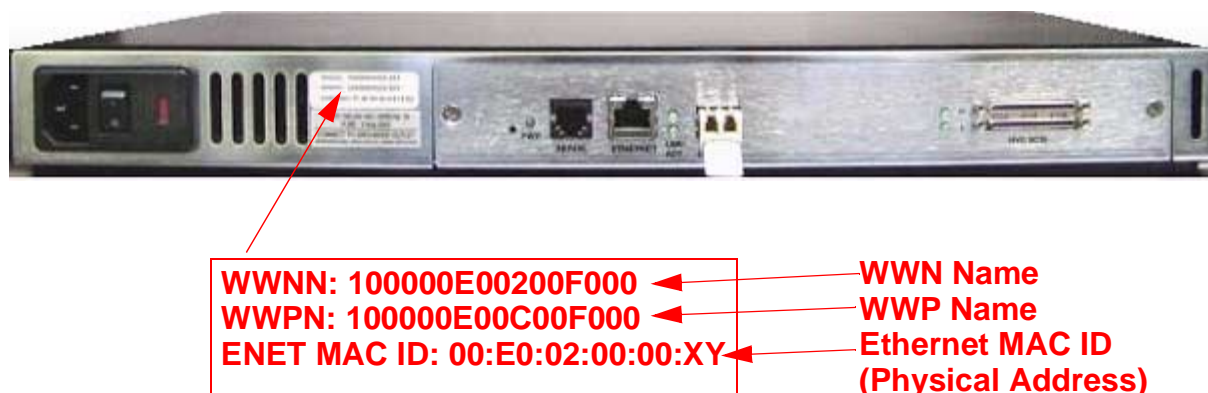
Note. WWN stands for World Wide Name.

Note. WWP stands for World Wide Port.

---

2. To start the tape drive on the server, issue this command in SCF:

```
SCF> START TAPE $tape
```

Example:

```
SCF> START TAPE $TAPE1
```

For complete details about the ADD and START commands, including command syntax, see the *SCF Reference Manual for the Storage Subsystem.*
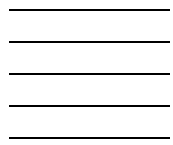
Safety and Compliance

This sections contains three types of required safety and compliance statements:

- Regulatory compliance
- Waste Electrical and Electronic Equipment (WEEE)
- Safety

Regulatory Compliance Statements

The following regulatory compliance statements apply to the products documented by this manual.

FCC Compliance

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio-frequency energy and, if not installed and used in accordance with the instruction manual, may cause interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Any changes or modifications not expressly approved by Hewlett-Packard Computer Corporation could void the user's authority to operate this equipment.

Canadian Compliance

This class A digital apparatus meets all the requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règelment sur le matériel brouilleur du Canada.

Korea MIC Compliance

A급 기기 (업무용 정보통신기기)

이 기기는 업무용으로 전자파적합등록을 한 기기이오니 판매자 또는 사용자는 이 점을 주의하시기 바라며, 만약 잘못판매 또는 구입하였을 때에는 가정용으로 교환하시기 바랍니다.

Taiwan (BSMI) Compliance

警告使用者:

這是甲類的資訊產品，在居住的 環境中使用時，可能會造成射頻 干擾，在這種情況下，使用者會 被要求採取某些適當的對策。

Japan (VCCI) Compliance

この装置は、情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準 に基づくクラスＡ情報技術装置です。この装置を家庭環境で使用すると電波 妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ず るよう要求されることがあります。

This is a Class A product based on the standard or the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance may occur, in which case the user may be required to take corrective actions.

European Union Notice

Products with the CE Marking comply with both the EMC Directive (89/336/EEC) and the Low Voltage Directive (73/23/EEC) issued by the Commission of the European Community.

Compliance with these directives implies conformity to the following European Norms (the equivalent international standards are in parenthesis):

- EN55022 (CISPR 22)—Electromagnetic Interference

- EN55024 (IEC61000-4-2, 3, 4, 5, 6, 8, 11)—Electromagnetic Immunity

- EN61000-3-2 (IEC61000-3-2)—Power Line Harmonics

- EN61000-3-3 (IEC61000-3-3)—Power Line Flicker

- EN60950 (IEC950)—Product Safety

Laser Compliance

This product may be provided with an optical storage device (that is, CD or DVD drive) and/or fiber optic transceiver. Each of these devices contains a laser that is classified as a Class 1 Laser Product in accordance with US FDA regulations and the IEC 60825-1. The product does not emit hazardous laser radiation.

WARNING: Use the controls or adjustments or performance of procedures other than those specified herein or in the laser product's installation guide may result in hazardous radiation exposure. To reduce the risk of exposure to hazardous radiation:

- **Do not try to open the module enclosure. There are no user-serviceable components inside.**

- **Do not operate controls, make adjustments, or perform procedures to the laser device other than those specified herein.**

- **Allow only HP Authorized Service technicians to repair the module.**

The Center for Devices and Radiological Health (CDRH) of the U.S. Food and Drug Administration implemented regulations for laser products on August 2, 1976. These regulations apply to laser products manufactured from August 1, 1976. Compliance is mandatory for products marketed in the Unites States.

SAFETY CAUTION

The following icon or caution statements may be placed on equipment to indicate the presence of potentially hazardous conditions:

DUAL POWER CORDS CAUTION:

"THIS UNIT HAS MORE THAN ONE POWER SUPPLY CORD. DISCONNECT ALL POWER SUPPLY CORDS TO COMPLETELY REMOVE POWER FROM THIS UNIT."

"ATTENTION: CET APPAREIL COMPORTE PLUS D'UN CORDON D'ALIMENTATION. DÉBRANCHER TOUS LES CORDONS D'ALIMENTATION AFIN DE COUPER COMPLÈTEMENT L'ALIMENTATION DE CET ÉQUIPEMENT".

DIESES GERÄT HAT MEHR ALS EIN NETZKABEL. VOR DER WARTUNG BITTE ALLE NETZKABEL AUS DER STECKDOSE ZIEHEN.

Any surface or area of the equipment marked with these symbols indicates the presence of electric shock hazards. The enclosed area contains no operator-serviceable parts.

WARNING: To reduce the risk of injury from electric shock hazards, do not open this enclosure.

DOUBLE POLE FUSING

CAUTION: DOUBLE-POLE /NEUTRAL FUSING.

ATTENTION: DOUBLE POLE/FUSIBLE SUR LE NEUTRE

NOT FOR EXTERNAL USE

CAUTION: NOT FOR EXTERNAL USE. ALL RECEPTACLES ARE FOR INTERNAL USE ONLY.

ATTENTION: NE PAS UTILISER A L'EXTERIEUR DE L'EQUIPEMENT

IMPORTANT: TOUS LES RECIPIENTS SONT DESTINES UNIQUEMENT A UN USAGE INTERNE.

VORSICHT: ALLE STECKDOSEN DIENEN NUR DEM INTERNEN GEBRAUCH.

HIGH LEAKAGE CURRENT

To reduce the risk of electric shock due to high leakage currents, a reliable grounded (earthed) connection should be checked before servicing the power distribution unit (PDU).

Observe the following limits when connecting the product to AC power distribution devices: For PDUs that have attached AC power cords or are directly wired to the building power, the total combined leakage current should not exceed 5 percent of the rated input current for the device.

"HIGH LEAKAGE CURRENT, EARTH CONNECTION ESSENTIAL BEFORE CONNECTING SUPPLY"

"HOHER ABLEITSTROM. VOR INBETRIEBNAHME UNBEDINGT ERDUNGSVERBINDUNG HERSTELLEN"

"COURANT DE FUITE E'LEVE'. RACCORDEMENT A LA TERRE INDISPENSABLE AVANT LE RACCORDEMENT AU RESEAU"

FUSE REPLACEMENT

CAUTION – For continued protection against risk of fire, replace only with same fuse type TCF15, Rated 600V~, 15A. Disconnect power before changing fuses.

Waste Electrical and Electronic Equipment (WEEE)

Information about the Waste Electrical and Electronic Equipment (WEEE) directive can be accessed from the left navigation area of the NTL home page: select **NonStop Computing > Waste Electrical and Electronic Equipment (WEEE)**.

Important Safety Information

Safety information can be accessed from the left navigation area of the NTL home page: select **NonStop Computing>Important Safety Information**. A document window containing a binder of safety information, in several languages, appears. In the document window, click a document title to open the safety information in another language. Local HP support can also help direct you to your safety information.

Index

Menu 2-4
Select 2-4
Unload 2-3

T

Tape cartridge
    loading 3-9
    reclaiming 3-10
    reformatting 3-10
    removing stuck cartridge A-5
    unloading 3-10
    using multiple cartridges with BACKUP and RESTORE 3-14
    viewing contents of 3-13
    write-protecting 3-9
Tape libraries
    using with BACKUP and RESTORE 3-14
Tape library
    operating tape drive manually A-6
Tape load, performing A-6
Trapped message 2-11

U

Unload switch 2-3
Unloading a tape cartridge 3-10
UnWr (FSC) message 2-11
UnWrxxxx Indication A-2
Using BACKUP and RESTORE with tape libraries 3-14
Using labeled tapes 3-11, 3-14
Using multiple tape cartridges with BACKUP and RESTORE 3-14

V

Viewing the contents of a tape 3-13

W

Write Prot message 2-11

Write-protecting a tape cartridge 3-9
Writing a diagnostic dump tape to file A-4
Writing message 2-11

Special Characters

* message 2-7